

Kincardine North Substation

Environmental Impact Assessment Report

Volume 2. Main Report

November 2025



Prepared for:

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Availability of the EIA Report

This EIAR and all supporting documentation for the planning application will be available on the Fife Council website <https://planning.fife.gov.uk/online/>.

Hard copies of the EIAR are available for viewing at Kincardine Library 2 Keith St, Kincardine, Alloa FK10 4ND

Representations regarding the application can be made using the online planning system at <https://planning.fife.gov.uk/online/>.

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01.

Introduction

1. Introduction

1.1 Introduction

1. This Environmental Impact Assessment Report (EIAR) has been prepared by AECOM on behalf of SP Transmission (also referred to in this EIAR as ‘the Applicant’). It accompanies an application under the Town and Country Planning (Scotland) Act 1997 for planning permission for a new substation, known as Kincardine North Substation (referred to in this EIAR as ‘KINN’ or the ‘Proposed Development’). The EIAR describes the identification and assessment of the likely significant environmental effects of KINN and enables statutory consultees and decision-makers to consider these as part of the determination of the planning application.
2. The Proposed Development will help to reinforce and increase the capacity of the electricity transmission network. It is located on the western boundary of Fife at Kilbagie and extends into Clackmannanshire where it meets the A876. The location of the Proposed Development is illustrated in **Figure 1.1**.
3. Three existing 275 kilovolt (kV) overhead lines (known as the XL, ZCN and ZCS routes) currently cross the site and would be uprated to 400kV and connected to the Proposed Development while a new 275kV underground cable would be installed between KINN and the existing Kincardine Substation. The uprating and connection of the existing overhead line routes will be subject to separate applications to the Scottish Ministers under section 37 of the Electricity Act 1989 but is considered within this EIAR in respect of potential cumulative effects on the environment. The proposed 275kV underground cable is considered to permitted development under Class 40 (Electricity Undertakings) of The Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (GPDO) and therefore does not require consent, however, it is also considered within this EIAR in respect of cumulative effects on the environment. A more detailed description of KINN is contained in **Chapter 4 Project Description**.

1.2 About the Applicant

4. SP Energy Networks (SPEN) is the trading name for Scottish Power Energy Networks 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 Licence holder under the Electricity Act 1989.
5. 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 supply and generation 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.

6. In addition, in formulating proposals for electricity transmission infrastructure, SP Transmission is subject to duties under Schedule 9 of the Electricity Act 1989 that it: *“(a) shall 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) shall 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.”* Further information on SP Transmission’s duties under Schedule 9 are contained in its Schedule 9 Statement (Ref 1.3)
7. The planning application for KINN has been prepared and made by SP Transmission taking account of their statutory duties and licence obligations.

1.3 Background to the Proposed Development

Background to the Proposed Development

8. 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.
9. 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 farms are typically located in more geographically remote locations, they require new electricity network infrastructure both to connect renewable generation to the network as well as to transport the electricity generated to areas of demand.
10. 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 Scottish Hydro Electric Transmission’s (SHE Transmission) 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.
11. As described in the previous section, SP Transmission has a number of statutory duties and licence obligations which underpin the need for the Proposed Development. KINN is an integral part of planned network reinforcements which will help to increase the capacity of the transmission system.

Need for the Proposed Development

12. National Energy System Operator (NESO) is responsible for the planning and operation of the 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 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 Proposed Development, identified as LWUP, was given a ‘proceed’ signal in successive publications in NOA 2021/22 published in January 2022 (Ref 1.1), and the NOA Refresh published in 2022 (Ref 1.2) in parallel with the publication of the Holistic Network Design (HND). The latter set out a blueprint for the connection of offshore wind needed to meet the Government’s 2030 targets (also referred to as the ‘Pathway to 2030’), and also recommended the development of ‘LWUP’ which underscores the need for the d Development. Kincardine North substation is part of the LWUP project. The Holistic Network Design (HND) process, promoted by NESO, identified a need for network enhancements in the Kincardine area, driven by a requirement to increase the boundary capability of the electricity transmission network between SP Transmission and SHE Transmission. This boundary, known as the B4 boundary, requires an increase in its capability due to the connection of onshore and offshore wind in the north of Scotland. In addition, there is an asset condition driver to remove the existing 275kV substation at Longannet from the network. KINN will be the long term replacement of the existing Longannet 275kV Substation on the network.

1.4 EIA and Consenting Requirements

13. The Proposed Development requires planning permissions from Fife and Clackmannanshire Councils under the Town and Country Planning (Scotland) Act 1997. While the majority of the Proposed Development is located within Fife, a small proportion to the west, including the proposed temporary access from the A876, is located within Clackmannanshire.
14. The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 are the relevant EIA Regulations with regard to applications under the Town and Country Planning (Scotland) Act 1997, and are referred to as the “EIA Regulations” in this EIAR. These set out two schedules, ‘Schedule 1 Development’ for which EIA is mandatory and ‘Schedule 2 Development’ for which EIA may be required if certain thresholds are met. KINN is not development of a type identified in Schedule 1 of the EIA Regulations and therefore EIA is not a mandatory requirement.
15. In relation to Schedule 2, the Proposed Development does not fall under the descriptions of development in ‘Category 3 Energy Industry’ but could broadly be interpreted as an industrial estate development under ‘Category 10 Infrastructure Projects’ with substations having some similar characteristics to industrial estate developments. In such instances the requirement for EIA can be determined through submission of a screening opinion request to the relevant authorities, however, SPEN considered it appropriate to undertake a proportionate level of environmental assessment having regard to SP Transmission’s statutory duties as a transmission licence holder under the Electricity Act 1989 and the guidance contained in Circular 1/2017 Environmental Impact Assessment Regulations (Ref 1.4). As such the EIA has been undertaken on a voluntary basis.
16. To inform the scope of this EIAR, Scoping Opinion requests were made to Fife and Clackmannanshire Councils in May 2024 with the feedback provided by the Fife and Clackmannanshire Councils and other consultees informing the scope of the EIA reported within this EIAR. In addition, feedback received from pre-application advice from the Councils has also been considered in the EIAR where relevant.

1.5 Structure of the EIA Report

EIA Report Structure

17. The EIA Report is published in three volumes
- **Volume 1. Non-Technical Summary (NTS):** this contains a non-technical summary describing the Proposed Development as well as the findings of the EIA process.
 - **Volume 2. Main Report including figures:** this comprises the following chapters:
 - **Ch01. Introduction:** provides a brief overview of the Proposed Development including its EIA and consenting requirements as well as an outline of the structure and content of the EIA Report;
 - **Ch02. Approach to EIA:** describes the general approach to the EIA process and how the requirements of the EIA Regulations have been addressed as well as setting out feedback from the Scoping Opinion and how it has been addressed.
 - **Ch03. Site Selection and Alternatives:** describes the approach to and consideration of alternative sites in line with SP Transmission’s statutory duties under the Electricity Act 1989
 - **Ch04. Description of the Proposed Development:** provides a description of the Proposed Development including its design, construction, operation and maintenance.
 - **Ch05. Planning Policy Context:** provides an overview of relevant national and local planning policies.
 - **Ch06. Ecology:** describes the results of the assessment of the Proposed Development’s likely significant effects on ecology including designated sites, habitats and protected species.
 - **Ch07. Landscape and Visual Amenity:** describes the results of the assessment of the Proposed Development’s likely significant effects on landscape and visual amenity.
 - **Ch08. Cultural Heritage and Archaeology:** describes the results of the assessment of the Proposed Development’s likely significant effects on cultural heritage and archaeology.
 - **Ch09. Traffic and Transport:** describes the results of an assessment of the likely significant effects resulting from the construction of the Proposed Development on traffic and transport.
 - **Ch10. Construction and Operational Noise:** describes the results of the assessment of likely significant effects from noise resulting from the construction and operation of the Proposed Development.
 - **Ch11. Other Environmental Aspects:** provides an overview of other environmental aspects which were scoped out of the EIA at scoping stage.
 - **Ch12. Cumulative effects:** describes the results of cumulative effects arising from other projects in the vicinity of the Proposed Development including proposed overhead line modifications as well as other approved and planned developments as well as intra project effects.

- **Ch13. Schedule of Mitigation:** summarises the measures proposed as part of the design, construction and operation of the Proposed Development to prevent, avoid, reduce or offset adverse environmental effects.
- **Ch14. Summary and Conclusions:** provides an overall summary of the results of the EIA and identifies whether effects are likely to be significant or not.
- **Volume 3. Technical Appendices:** this contains supporting technical information to the specialist assessment chapters contained within Volume 2 as well as copies of the Scoping Opinions provided by the Councils.

Statement of Expertise

18. Regulation 5(5) of the EIA Regulations requires developers to ensure that EIA Reports are prepared by competent experts and accompanied by a statement outlining the relevant expertise or qualifications of such experts.
19. As noted in the introduction, this EIA Report has been prepared by AECOM. AECOM is a founding member of the Institute of Sustainability and Environmental Professional's (ISEP) Quality Mark scheme. This is a voluntary scheme, operated by ISEP, through which AECOM's EIA activity is reviewed including an annual independent review of EIAs undertaken. The Quality Mark demonstrates that AECOM's EIAs and wider EIA-related practices are independently rated and regularly monitored to high standards.
20. Details of the EIA team including their relevant qualifications and experience are contained in **Volume 3 Appendix 1.1**.

Availability of the EIA Report

This EIAR and all supporting documentation for the planning application will be available on the Fife Council website <https://planning.fife.gov.uk/online/>.

Hard copies of the EIAR are available for viewing at Kincardine Library 2 Keith St, Kincardine, Alloa FK10 4ND

Representations regarding the application can be made using the online planning system at <https://planning.fife.gov.uk/online/>.

Other Reports Accompanying the Planning Application

21. In addition to the to the EIAR, the planning application is accompanied by the other supporting reports including:
 - Design and Access Statement (DAS)
 - Planning Statement
 - Flood Risk Assessment (FRA)
 - Surface Water Management Strategy
 - Coal Mining Risk Assessment (CMRA)
 - Phase 2 Ground Investigation Factual Report
 - Phase 2 Ground Investigation Interpretative Report
 - Pre-Application Consultation (PAC) Report

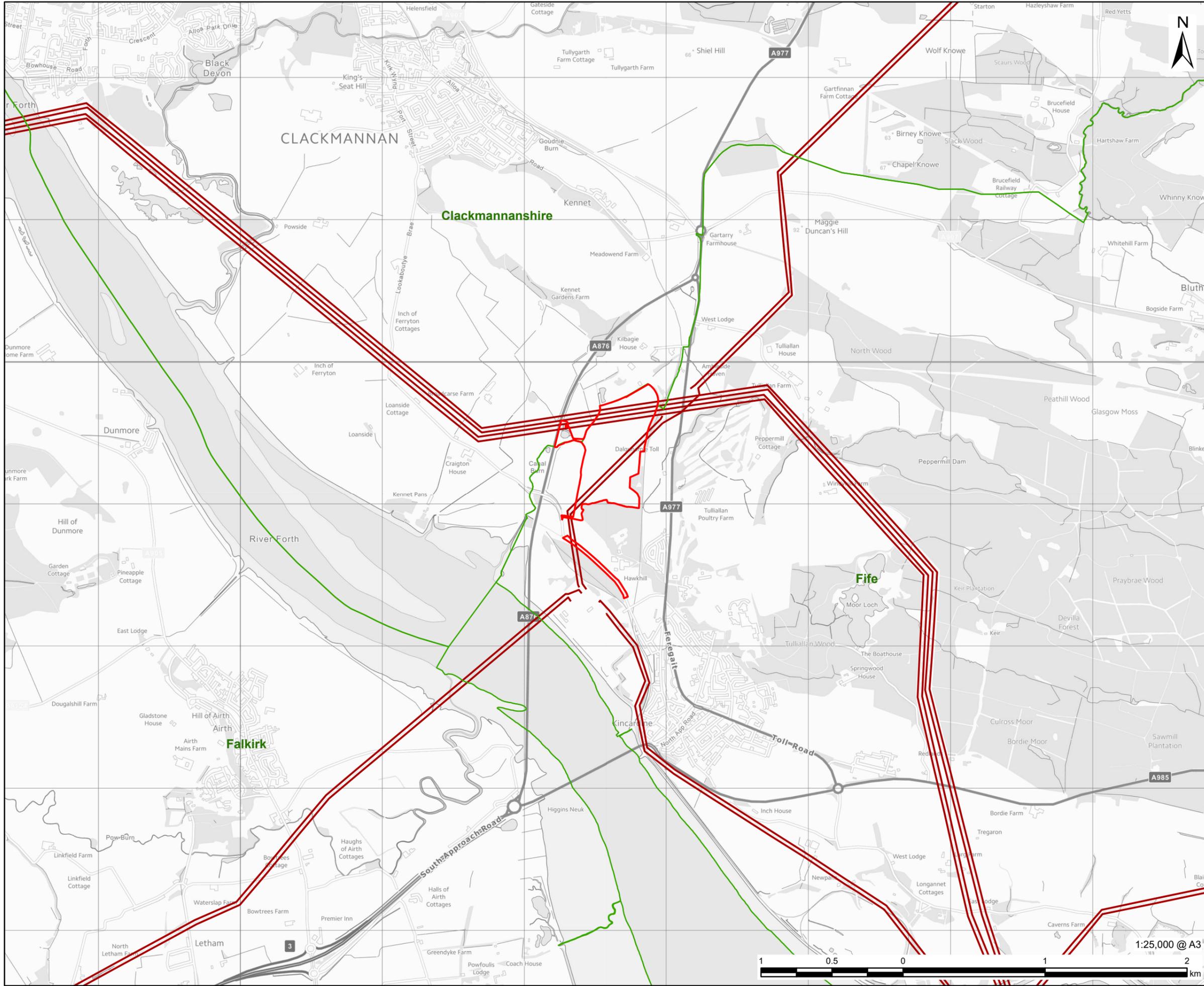
1.6 References

Ref 1.1 Network Options Assessment (January 2022), National Grid Electricity System Operator

Ref 1.2 Network Options Assessment Refresh (July 2022), National Grid Electricity System Operator

Ref 1.3 Schedule 9 Statement, SP Transmission

Ref 1.4 Circular 1/2017 Environmental Impact Assessment Regulations (2017), Scottish Government



PROJECT

Kincardine North Substation

CLIENT

SP Energy Networks

CONSULTANT

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LEGEND

- Site Boundary
- Local Planning Authority Boundary
- SPT Overhead Transmission Network
- Existing 275kV

NOTES

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ISSUE PURPOSE

EIA REPORT

PROJECT NUMBER

60635450

FIGURE TITLE

Location of the Proposed Development

FIGURE NUMBER

Figure 1.1

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02.

Approach to EIA

2. Approach to EIA

2.1 Introduction

22. This chapter describes the general approach to and scope of the Environmental Impact Assessment (EIA) of the Proposed Development. It provides general information about the EIA process including the key steps taken in the approach to EIA to identify baseline conditions and identify and assess the likely significant effects as well as describe the terminology used. For a detailed description of topic specific assessment methods reference should be made to the relevant chapter and/or Appendix, for example for a description of the approach to landscape and visual assessment of the Proposed Development, see Chapter 7. Landscape and Visual Amenity and Appendix 7.1.

2.2 About Environmental Impact Assessment

23. EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development. Through the early identification and evaluation of the likely significant environmental effects of a proposed development, EIA enables appropriate mitigation to be identified and incorporated into the proposed development's design to mitigate its permanent or operational effects, or commitments to be made to environmentally sensitive construction methods and practices. Where appropriate it also enables the identification of monitoring during construction and/or operation to ensure that corrective actions can be taken to ensure the effectiveness of mitigation.
24. The EIA of the Kincardine North Substation (KINN) has been undertaken in parallel with the design process thereby maximising opportunities to mitigate likely significant effects as they have been identified. This approach ensures mitigation is embedded in the design of the Proposed Development and forms an integral component of it.
25. The results of the EIA also ensure that decision-makers, in this case Fife and Clackmannanshire Councils, statutory consultees as well as other interested parties are aware of a proposed development's potential environmental effects and whether these are likely to be significant or not. The results of the EIA should be taken into account by the decision-makers as part of the determination of the applications.

2.3 Legislative Requirements

Need for EIA

26. The relevant EIA legislation with regard to applications for planning permission under the Town and Country Planning (Scotland) Act 1997 are the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations). The EIA Regulations include two schedules of development; Schedule 1 lists development for which EIA is mandatory and Schedule 2 lists development for which EIA may be required if it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.
27. KINN is not development of a type identified in Schedule 1 of the EIA Regulations and therefore EIA is not a mandatory requirement. In relation to Schedule 2, the Proposed Development does not fall under the descriptions of development in 'Category 3 Energy Industry' but could broadly be interpreted as an industrial estate development under 'Category 10 Infrastructure Projects' with substations having some similar characteristics to

industrial estate developments. In such instances the requirement for EIA can be determined through submission of a screening opinion request to the relevant local planning authorities. Circular 1/2017 Environmental Impact Assessment Regulations advises that “the basic test of the need for EIA in a particular case is the likelihood of significant effects on the environment.” Therefore, development outside the criteria set out in Schedule 1 or 2 does not preclude significant effects arising, particularly where the development is in an environmentally sensitive location.

28. Considering both SP Transmission’s statutory duties as a transmission licence holder under the Electricity Act 1989 and the guidance contained in Circular 1/2017, SPEN considered it appropriate to undertake a proportionate level of environmental assessment and have therefore undertaken this EIA on a voluntary basis.

Content of an EIA Report

29. Regulation 5 and Schedule 4 of the EIA Regulations set out the information which an EIA Report must include. Table 2.1 below provides an overview of the requirements set out in Regulation 5 and Schedule 4 and where they are addressed within this EIAR.

Table 2.1 EIA Regulations – Schedule 4 Requirements

Legislative Requirement	Where it is contained within the EIAR
<p>1. A description of the development, including in particular:</p> <p>(a) a description of the location of the development;</p> <p>(b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;</p> <p>(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;</p> <p>(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.</p>	<p>A description of the Proposed Development is contained in Chapter 4 of the EIAR.</p>
<p>2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.</p>	<p>A description of the alternative substation sites considered as well as the reasons for selecting the proposed site with reference to environmental, technical and</p>

Legislative Requirement	Where it is contained within the EIAR
	economic factors is set out in Chapter 3 of the EIAR.
<p>3. A description of the relevant aspects of the current state of the environment (the “baseline scenario”) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of relevant information and scientific knowledge.</p>	<p>A description of the current baseline as well as the ‘future baseline’ in the absence of the Proposed Development is contained in the technical assessments in Chapters 6-11 of the EIAR.</p>
<p>4. A description of the factors specified in regulation 4(3) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.</p>	<p>The results of baseline studies and the environmental factors likely to be significantly affected by the Proposed Development (referred to as receptors) have been identified and are reported in chapters 6-12 of the EIAR.</p>
<p>5. A description of the likely significant effects of the development on the environment resulting from, inter alia:</p> <ul style="list-style-type: none"> (a) the construction and existence of the development, including, where relevant, demolition works; (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources; (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste; (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); (e) the cumulation of effects with other existing and / or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; (g) the technologies and the substances used. 	<p>The likely significant effects resulting from the Proposed Development are assessed and reported in Chapters 6-12 of the EIAR.</p>

Legislative Requirement	Where it is contained within the EIAR
<p>The description of the likely significant effects on the factors specified in regulation 4(3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union level (as they had effect immediately before IP completion day) or United Kingdom level which are relevant to the project including in particular those established under the law of the United Kingdom that implemented Council Directive 92/43/EEC and Directive 2009/147/EC.</p>	
<p>6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.</p>	<p>Relevant assessment methods as well as any assumptions or limitations are set out in in Chapters 6-12 of the EIAR.</p>
<p>7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.</p>	<p>Embedded mitigation measures are outlined in Chapter 4 of the EIAR which contains a description of the Proposed Development. Additional mitigation measures are identified in Chapters 6-12 of the EIAR. The mitigation measures are also summarised in Chapter 13.</p>
<p>8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to assimilated law such as any law that implemented Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments may be used for this purpose</p>	<p>The Proposed Development is not expected to result in significant adverse effects as a result of its vulnerability to major accidents or disasters. Further information is provided in Chapter 11 of the EIAR.</p>

Legislative Requirement	Where it is contained within the EIAR
provided that the requirements of any law that implemented the Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	
9. A non-technical summary of the information provided under paragraphs 1 to 8.	A separate non-technical summary (NTS) that sets out the key findings of the EIA is available as Volume 1 of this EIAR.
10. A reference list detailing the sources used for the descriptions and assessments included in the EIA report.	Where relevant, reference lists are provided at the end of each EIAR chapter.

2.4 Scope of the EIA

30. Scoping opinions were requested from Fife and Clackmannanshire Councils in May 2024. In reaching their opinions the Fife and Clackmannanshire Councils are required to consult with the relevant consultees. The scoping opinion request set out the proposed scope of the EIA, in particular those aspects of the environment in which likely significant environmental effects would potentially occur and which were therefore proposed to be scoped into the EIA and those aspects of the environment in which significant environmental effects were considered unlikely and therefore proposed to be scoped out of the EIA.
31. The scoping opinions provided by the Fife and Clackmannanshire Councils as well as advice provided by those bodies with whom they consulted are summarised below in Table 2.2. This also sets out where the points raised have been addressed within the EIAR or, where relevant, in other reports accompanying the planning application (**see bold underlined text**). Copies of the Scoping Opinions are provided in Volume 3. Technical Appendices, Appendix 2.1.

Table 2.2 Summary of Scoping Opinions

Consultee	Summary of Response and how it has been addressed
Fife Council	<p>Set out the aspects which should be scoped into the EIA and those which could be scoped out. Fife Council also provided comments with regard to a range of topic specific matters including:</p> <ul style="list-style-type: none"> • Providing advice in relation to requirements regarding the assessment of alternatives. Alternatives are addressed in Chapter 3 of this EIAR.

Consultee	Summary of Response and how it has been addressed
	<ul style="list-style-type: none"> • Requiring the EIAR to include a summary of all mitigation measures proposed. <u>Chapter 13 of this EIAR includes a summary of mitigation commitments.</u> • Advising that while certain matters could be scoped out of the EIA information should be provided on these. <u>This is included in Chapter 11 of this EIAR.</u> • Land and Air Quality Services noting that ground investigations are to be undertaken and requesting that contaminated land risk assessment be provided. <u>This is included in the Coal Mining Risk Assessment and Ground Investigation Reports which accompanies the applications.</u> • Archaeology advisor noted that the EIAR should include consideration of the potential for buried archaeology to be present, a strategy to test for the presence or not of buried archaeology, a strategy to mitigate the impact of development on physical deposits that may exist on site and consideration of the visual impact on the surrounding historic environment. <u>These matters are addressed in Chapter 8 of the EIAR.</u> • Built Heritage advisor requested that consideration be given to the impact of the Proposed Development on the setting of non-designated heritage assets including Kilbagie House and Mill, industrial archaeology around the former Kilbagie Mills site and historic farmsteads and buildings to the west at Broadcarse and Craighton. <u>This is addressed in Chapter 8 of the EIAR.</u> • Natural Heritage advisor confirmed that the proposed scope was appropriate but requested that consideration be given to impacts on the existing SUDS pond. They also advised that scrub removal will necessitate some compensatory planting measures, and that landscaping should consider the use of native species. <u>These are addressed in Chapters 6 and 7 of the EIAR.</u> • Transport advised that consideration be given to transport-related matters during construction (and decommissioning periods) and agreed that once operational the Proposed Development would not generate significant traffic. <u>An assessment of construction traffic is contained in Chapter 9 of the EIAR.</u> The effects of decommissioning on transport-related matters have not been assessed. The lifespan of the equipment within the proposed substation is approximately 40 years, however, it is expected that this would be extended through replacement or refurbishment. In the event that the Proposed Development was no longer required and could be

Consultee	Summary of Response and how it has been addressed
	<p>decommissioned then a Decommissioning Plan would be prepared and planning permission would be obtained, if required, in accordance with the relevant legislation in place at the time</p>
<p>Clackmannanshire Council</p>	<p>Provided advice on those aspects which should be considered within the EIAR including:</p> <ul style="list-style-type: none"> • The locational requirement for the proposed site and the need to set out alternatives considered. <u>This is addressed in Chapter 3 of the EIAR.</u> • The potential landscape and visual impact given the flat and open nature of the landscape, in particular noting the potential impact in views from the west including those on a tourism facility recently developed at Broadcarse Farm. <u>This is considered in chapter 7 of the EIAR.</u> • Consideration of the impact of users of key transport routes including A876 and National Cycle Route 76. <u>This is considered in chapter 7 of the EIAR.</u> • The approach to landscape mitigation in particular the use of native screen planting to reduce impacts in views from the west. <u>This is considered in chapter 7 of the EIAR.</u> • The impact on the historic relationship between Kilbagie and Kennetpans. <u>This is considered in chapter 8 of this EIAR.</u>
<p>Nature Scot (NS)</p>	<ul style="list-style-type: none"> • Nature Scot noted that there are no protected areas present at the proposed site and offered no further comment.
<p>Historic Environment Scotland (HES)</p>	<ul style="list-style-type: none"> • HES noted that there are no designated sites within the Proposed Development but there are a small number in the wider area including Tulliallan Castle scheduled monument, Kennetpans Distillery scheduled monument and Tulliallan Garden and Designed Landscape. HES noted the potential to impact the setting of these sites. <u>This is addressed in Chapter 8 of the EIAR.</u>
<p>Scottish Environment Protection Agency (SEPA)</p>	<ul style="list-style-type: none"> • SEPA provided advice with respect to design and proximity to water environment features, flood risk, peatland/carbon rich soils, ground water and pollution prevention. Details of how the design has considered water environment features are set out in Chapter 4. <u>Flood risk is considered in a separate Flood Risk Assessment which accompanies the application.</u> There are no peatland or carbon rich soils present so this has been scoped out. <u>Details of pollution prevention measures are set out in Chapter 4 and Chapter 13 of this EIAR.</u>

Consultee	Summary of Response and how it has been addressed
	<ul style="list-style-type: none"> – Provided guidance in relation to level of detail required in site layout plans. <u>A description of the Proposed Development and accompanying plans is contained in Chapter 4 of this EIAR.</u> – Engineering activities affecting the water environment. As far as possible the design of the Proposed Development seeks to avoid engineering activities in the water environment and adhere to 50m buffers to reduce potential impacts. <u>Further details are provided in Chapters 4 and 11 of this EIAR.</u> – Disturbance and re-use of excavated peat and other carbon rich soils. No carbon rich soils or peat are present on the site therefore this is not considered in this EIAR. – Disruption to Groundwater Dependent Terrestrial Ecosystems (GWDTEs) and groundwater abstractions. No GWDTEs or groundwater abstractions have been identified therefore this is not considered in this EIAR. – Pollution prevention and environmental management. <u>Details of pollution prevention and environmental management measures are contained in Chapter 13 of this EIAR.</u>
Scottish Water	<ul style="list-style-type: none"> • Confirmed that there are no Scottish Water drinking water catchments or abstractions which are designated as Drinking Water Protected Areas that may be affected. • Advised that they would not allow surface water connections into the combined sewer system to prevent potential sewer flooding.
Transport Scotland	<ul style="list-style-type: none"> • Provided advice with respect to the use of the A876 and specific requirements with regard to access and movement of abnormal loads. <u>This is considered in Chapter 4 and Chapter 9 of this EIAR.</u>

32. Based on the scoping opinion provided by Fife Council and advice received the following aspects were scoped into the EIA:
- Ecology (chapter 6)
 - Landscape and Visual Amenity (chapter 7)
 - Cultural Heritage and Archaeology (chapter 8)
 - Traffic and Transport (construction only) (chapter 9)
 - Noise (chapter 10)
 - Cumulative Effects (chapter 12)
33. In their scoping opinion it was noted that Fife Council referred to the aspects which it agreed could be scoped out (trees and woodland, ground conditions, water environment, land use, tourism and recreation, major accidents and disasters, climate change and human health)

but requested that information relating to these was also provided. This is included in ‘Other Environmental Aspects’ (chapter 11) of this EIAR.

34. The Scoping Opinion provided by Clackmannanshire Council also advised that Ecology (chapter 6), Landscape and Visual Amenity (chapter 7) and Cultural Heritage (chapter 8) should be scoped into the EIA. It also requested consideration of indirect impacts on the amenity of users of tourism accommodation and transport routes (chapter 7 and 11).
35. As noted above in addition to the Scoping Opinions pre-application advice was provided by Fife Council and Clackmannanshire Council. Points raised in the advice which are relevant to the EIA are summarised below:
 - Fife Council’s preapplication consultation advice set out planning policy considerations in the context of the Development Plan relevant to a range of matters addressed in the EIA as well as provided advice on the submission and determination of the planning application. Specific requirements comprise:
 - Site Selection Appraisal – chapter 3 of this EIAR sets out the consideration of alternatives including alternative sites for the Proposed Development.
 - Landscape and Visual assessment – chapter 7 of this EIAR contains a Landscape and Visual Assessment of the Proposed Development.
 - Noise report – chapter of this EIAR contains an assessment of construction and operational noise of the Proposed Development.
 - Details regarding economic benefits – details of economic benefits associated with the Proposed Development are set out in the Planning Statement.
 - Construction Traffic Management Report – chapter 9 of this EIAR contains an assessment of construction traffic generated by the Proposed Development.
 - Evidence relating to landownership in relation to access design – a plan showing land in the control of the Applicant accompanies the application.
 - Surface Water Management Plan – a Surface Water Management Strategy accompanies the planning application.
 - Flood Risk Assessment – a Flood Risk Assessment accompanies the planning application.
 - Maintenance and management plan for the proposed surface water management solution – details are contained in the Surface Water Management Strategy.
 - Ecological Appraisal Report – chapter 6 of this EIAR contains an ecological impact assessment of the Proposed Development.
 - A Landscaping Plan – a plan showing proposed hard and soft landscaping design is provided as part of the Landscape and Visual Assessment
 - A supporting statement outlining compliance with National Planning Framework 4 (NPF4) policies 1 and 2 – a separate Planning Statement considering compliance with the Development Plan accompanies the planning application.
 - Coal Mining Risk Assessment – a separate Coal Mining Risk Assessment accompanies the planning application.

- Clackmannanshire Council’s pre-application consultation advice identified a number of points to be addressed in the planning application:
 - Details of the locational requirement for the proposed site and consideration of alternative sites including on brownfield land – chapter 3 of this EIAR sets out the consideration of alternatives including alternative sites for the Proposed Development.
 - Advised that consideration should be given to the potential impact holiday accommodation located at Broadcarse Farm – chapter 11 of this EIAR contains an assessment of potential impacts on the holiday accommodation.
 - Advised that measures would be required to mitigate the adverse impacts of the Proposed Development including provision of native screen planting – chapter 7 of this EIAR contains a Landscape and Visual Assessment of the Proposed Development as well as a plan showing proposed hard and soft landscaping design.
 - Advised that the Proposed Development would erode the historic relationship between Kilbagie and Kennetpans. Cultural heritage impacts are considered in chapter 8 of this EIAR.

2.5 Approach to EIA

Key Stages in EIA

36. The key stages in the EIA are:
- Scoping studies: Scoping was the first step in the EIA process. Regulation 17 allows developers to request a scoping opinion as to the content of an EIA Report. Scoping opinions were requested from Fife and Clackmannanshire Councils to ensure that the EIA addressed their and other consultees’ requirements. Subsequent chapters set out comments received in scoping and how they have been addressed in undertaking the EIA.
 - Baseline studies and consultation: For each environmental aspect, these have comprised a combination of desk-based studies and field surveys to establish an understanding of the existing environmental conditions ('the baseline') within a specific study area and therefore ensure an accurate assessment of the likely significant effects of the Proposed Development. The scope of baseline studies has been agreed with relevant consultees as part of scoping and, where appropriate, additional consultation.
 - Impact prediction and identification of mitigation: The potential environmental impacts of the Proposed Development (both beneficial/positive and adverse/negative) have been predicted and evaluated using a range of specialist methods which are described in subsequent chapters. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified, with the aim of preventing or reducing impacts as much as possible. Where possible mitigation measures have been incorporated into the design of the Proposed Development, referred to as embedded mitigation, such that they inform its detailed design and / or how it shall be constructed. A preliminary assessment of likely effects is undertaken to identify their significance and where possible identify additional mitigation measures to be applied which could reduce them.

- Identification of likely significant effects: As stated above, the purpose of the EIA is to determine the likely significant effects of the Proposed Development. 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. As described above a preliminary assessment of the significance of effects is undertaken taking account of mitigation embedded in the design and construction of the Proposed Development. Where appropriate, for example where a likely significant effect may remain, additional mitigation measures may also be identified. In some instances additional mitigation may be applied where effects are not likely to be significant. The EIAR presents the significance of the likely residual effects of the Proposed Development i.e. those which remain, taking into account of additional mitigation and stating whether these are significant or not.

Characterisation of the Baseline Environment

37. In order to assess the likely significant effects resulting from the Proposed Development it is necessary to first establish the environmental conditions that currently exist at or close to the Proposed Development (referred to as ‘the baseline’) as well as the likely evolution of the baseline without the Proposed Development (referred to as ‘the future baseline’).
38. An understanding of the baseline environment for each environmental topic has been established 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 chapters of this EIAR set out the baseline studies which have been undertaken and the sources of information which have been consulted in undertaking the EIA.

Types of Effects

39. The assessment of effects considers a range of different effects including, as appropriate to each environmental topic: adverse and beneficial effects, direct effects and indirect effects, temporary (or short term) effects, longer term, operation and permanent effects as well as cumulative, effects.

Direct Effects and Indirect Effects

40. Direct effects are those where there is a physical connection between the Proposed Development 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

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

Longer Term, Operational & Permanent Effects

42. Longer term, operational and permanent effects are those which would occur as a result of the Proposed Development, 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 Proposed Development, or effects which occur for a period of time following completion of construction or during operation only.

Decommissioning Effects

43. Decommissioning effects would be those which would occur as a result of the removal of the Proposed Development 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 nature of the Proposed Development and the effects associated with decommissioning being similar to those of construction, decommissioning effects have been scoped out of assessment.

Residual Effects

44. Residual effects are those effects that remain having taken account of additional mitigation measures. As noted above, the approach taken to the EIA of the Proposed Development means that much of the mitigation is an inherent part of the design (design measures) and how it will be constructed (construction measures). As a result, the significance of some residual environmental effects may be the same as the significance of the likely 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 Proposed Development 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 likely effects as opposed to the likely residual effects.

Cumulative Effects

45. 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 Proposed Development 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 Proposed Development with other relevant developments which may not, on an individual basis result in likely significant effects but, together (i.e. cumulatively), have a likely significant effect.
46. With regard to inter-project effects, a review of planning applications (or other pre-application enquiries) made to Fife Council, Clackmannanshire Council and the Energy Consents Unit within the past five years has been undertaken to identify other developments with which the Proposed Development could result in cumulative environmental effects.
47. For the majority of environmental aspects, the relatively localised nature of the impacts resulting from KINN mean that the search area for cumulative developments is relatively small extending up 1km from the Proposed Development, however, for some aspects additional cumulative developments may also be considered as appropriate that aspect (for example landscape and visual effects may be experienced over a greater distance).
48. Within 1km of the Proposed Development the following cumulative developments have been identified that have the potential for cumulative impacts. Note that small domestic developments such as house extensions have not been considered as by their small nature they are unlikely to combine with the Proposed Development to result in significant cumulative effects. Table 2.3 identifies the key cumulative developments which have been

considered in the cumulative assessment for all aspects, however, as noted above some aspects may also include consideration of additional cumulative developments.

Table 2.2 Key Cumulative Developments

Development	Description	Status	Location
Kincardine Battery Energy Storage System (BESS) (ECU00004987)	342 megawatt BESS and associated access, drainage and landscaping.	Approved (pending construction)	Located in Fife to the south/southwest of the Proposed Development south of Hawkhill Road
Kincardine Grid Services Complex (ECU00003326)	Grid services facility comprising BESS and synchronous condenser as well as associated access, drainage and landscaping.	Approved (pending construction)	Located in Fife to the immediate west of the Proposed Development adjacent to the A876.
Aggregate Storage Building and associated hardstanding (24/00979/FULL)	Aggregate storage building unit including welfare, and hardstanding areas as well as loading areas.	Approved (pending construction)	Located in Fife south of Proposed Development south of Hawkhill Road at the disused railhead.
Overhead Line modifications to connect to KINN (ECU00005132)	Increase in operating voltage of existing overhead lines (XL, ZCN and ZCS) as well as erection of new towers and removal of existing towers to enable connection to KINN.	Pre-application (scoping)	Located in Fife within the Site of the Proposed Development adjacent to the substation platform.
Underground Cable from KINN to existing Kincardine Substation (25/02494/SCR)	Installation of 275kV underground cable circuit between KINN and existing Kincardine Substation approximately 1.9km long.	Pre-application (screening)	Located in Fife within the Site and extending south to Hawkhill Road, crossing it into the existing Kincardine Substation.

Development	Description	Status	Location
Temporary installation of transformers at Kincardine Substation (25/02355/SCR)	Temporary installation of two 400kV transformers within the existing Kincardine Substation site.	Permitted Development (pending construction)	Located in Fife within the footprint of the existing Kincardine Substation, approximately 1km south of the KINN substation platform.
Kilbagie Battery Energy Storage System (BESS) (ECU00005240)	Up to 250MW BESS and associated infrastructure.	Application (submitted, decision pending)	Located in Clackmannanshire approximately 50-100m north of the Proposed Development.
Meadowend Battery Energy Storage System (BESS) (ECU00005178)	Up to 500MW BESS and associated infrastructure.	Pre-application (screening)	Located in Clackmannanshire approximately 640m north of the Proposed Development.

Transboundary Effects

49. The EIA Regulations also require consideration of transboundary effects; these are effects which occur in one country as a result of proposed development or activity in another country. In relation to the Proposed Development, its scale and location mean that is not considered likely to result in transboundary effects therefore they have not been considered any further.

Identification and Assessment of Likely Significant Effects s

50. There is no statutory definition of what constitutes a ‘significant’ effect within the EIA Regulations, however, the determination of the significance of effects is important to informing the decision-making process. The process typically involves consideration of two aspects of a potential effect, namely the sensitivity and/or value of the receptor or resource being affected, and the magnitude of the impact occurring on the receptor/resource.
51. The significance of the effects including residual effects (i.e. those that are predicted to remain after the mitigation measures have been implemented) can be determined by a range of factors including:
- Scale of impact
 - Duration of impact (e.g. temporary or permanent)
 - Nature of effect (e.g. direct or indirect, adverse or beneficial)
 - Sensitivity of the receptor
52. The following subsections provide an overview of the general approach to EIA, however for each environmental aspect a topic specific method has been used and is described in later chapters.

Describing the Sensitivity, Value or Importance of Receptors

53. The sensitivity of the baseline conditions is assessed according to the relative importance of existing environmental features on or near to the site of the Proposed Development, or by the sensitivity of receptors which could potentially be affected by it. Criteria for the determination of sensitivity or importance or value of receptors are established based on approved guidance, legislation, statutory designation and / or professional judgement.
54. The criteria in Table 2.4 Sensitivity or Value Criteria provide a general definition for determining the sensitivity, value or importance of receptors.

Table 2.4 Sensitivity or Value Criteria

Sensitivity or Value	Description
Very high	The receptor has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low capacity to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value or importance.

Describing the Magnitude of Impacts

55. The magnitude of potential impacts on environmental baseline conditions is identified through consideration of the Proposed Development, taking into account the scale or degree of change from the existing baseline as a result of the effect. Consideration is given to the duration and reversibility of the effect as well as consideration of relevant legislative or policy standards or guidelines.
56. General criteria for defining the magnitude of an impact are set out in Table 2.5 Impact Magnitude Criteria, below. Key factors influencing this include:
 - The physical or geographical scale of the impact, (note that this is relative to the scale of the receptor or resource affected).
 - The duration of the impact - will it be short term, lasting for a few days or weeks, or long term, lasting for a number of years.
 - The frequency of the impact - will it occur hourly, daily, monthly or will it be permanent, lasting for the duration of the development.

- The reversibility of the impact - can it be reversed following completion of construction or decommissioning of the development.

Table 2.5 Impact Magnitude Criteria

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

Describing the Significance of Effects

57. The general approach adopted for evaluating the significance of effects is outlined in Table 2.6 below. A combination of the magnitude of the impact under consideration and the sensitivity of the receiving environment determines the significance of effect. For some specialist topics, additional categories have been added where a greater level of definition is required. It should be noted that this approach provides a general framework but should not be treated as a simple matrix; professional judgement is applied in all cases.

Table 2.6 Approach to the Assessment of Significance

Magnitude	Sensitivity or Value of Receptors				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible

Magnitude	Sensitivity or Value of Receptors				
	Very High	High	Medium	Low	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

58. The significance of the effects arising from the Proposed Development is reported using a seven-point scale, as set out in Table 2.7. Effects predicted as likely to be Negligible or Minor are considered to be 'Not Significant'. Effects assessed as Moderate or Major are considered to be 'Significant'.

Table 2.7 Significance Classifications

Classification	Description	Significant
Major (adverse or beneficial)	A large and/or detrimental change to a valuable/sensitive receptor; likely or apparent exceeding of applicable (often legal) threshold or a major departure from national targets.	Yes
	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.	
	Potentially associated with sites and features of national importance or likely to be important considerations at a regional or local scale. Major effects may relate to impacts on resources or features which are rare and cannot be relocated, or if lost, cannot be replaced.	
Moderate (adverse or beneficial)	A medium scale change which, although not beyond an accepted (often legal) threshold, may 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.	Yes
	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.	

Classification	Description	Significant
Minor (adverse or beneficial)	A small change that, whilst adverse, does not exceed accepted thresholds, legal or guideline standards. Unlikely to be a departure from planning policy.	No
	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.	
Negligible	A very small change that is so small and/or unimportant that it is not a key factor in the overall balance of issues. 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

59. A significant adverse effect is not necessarily one that would make the Proposed Development 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 likely environmental impacts (in particular those which are likely to be significant) of the Proposed Development and consider these alongside other material considerations in determining the application for planning permission.

60. In subsequent chapters of this EIAR the general criteria described above have been made more specific for each aspect of the environment based on relevant standards or guidelines. A detailed explanation of the approach to assessing impacts and the specific criteria to be used for each aspect is set out in later chapters.

Approach to Mitigation

61. Some mitigation measures are embedded within the design of Proposed Development, whilst others may require adherence to particular constraints on construction methods or mode of operation. The final assessment of residual significance will take into account the mitigation measures and constraints that have been incorporated into the Development. The likely effects taking account of mitigation are referred to as the likely residual effects.

62. A standard hierarchal approach to the development of mitigation measures has been followed with the aim of ‘designing out’ adverse effects as much as possible (avoiding, preventing or reducing adverse effects) as well as seeking opportunities to maximise or enhance beneficial effects. The EIA has largely been undertaken in parallel with the design of the Proposed Development providing opportunities to incorporate mitigation measures into its design or how it will be constructed.

63. The following approach has been used for developing and categorising mitigation:

- Design Measures: These are measures embedded in the design of KINN that may inform/constrain the detailed design and may also influence its operation These

measures are considered in the preliminary assessment of likely significant effects prior to any additional mitigation (where appropriate).

- **Construction Measures:** These are measures incorporated into how the Proposed Development will be constructed and typically relate to standard good practice. These measures are considered in the preliminary assessment of likely significant effects prior to any additional mitigation (where appropriate).
- **Additional Measures:** These are other measures which have been identified following the preliminary assessment of effects and could include additional design or construction measures and result in the identification of residual effects i.e. those remaining after the application of all mitigation.
- **Compensation Measures:** These are measures to be implemented in the event that a residual effect cannot be sufficiently mitigated. These measures are not considered within the assessment rather, where appropriate, identified after it.

64. The EIAR also identifies where it is considered appropriate to undertake monitoring as part of construction and/or operation of the Proposed Development. Monitoring provides a mechanism to take remedial action in the event that unforeseen significant effects occur or mitigation is not effective.

2.6 Level of Design Information

65. A detailed design for KINN has been developed for the planning application. It forms the basis of the description in chapter 4 and the basis of assessment in chapters 6-12. The design described in this EIAR is considered to present a realistic worst case scenario and thereby ensures that the assessment considers the realistic worst case in terms of likely significant environmental effects. Where appropriate, assessments set out specific parameters or assumptions related to the Proposed Development which have informed their assessment.

03.

**Site Selection
and
Alternatives**

3. Site Selection and Alternatives

3.1 Introduction

66. Regulation 5(2) and Paragraph 2 of Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 requires EIA Reports to provide “a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment”.
67. This chapter sets out the approach to identifying and assessing alternative sites with reference to established site selection practices in line with SP Transmission’s statutory duties under the Electricity Act 1989 as well as describing the alternative sites considered and why the proposed site was selected.

3.2 Identification and Assessment of Alternative Substation Sites

Overview

68. SPEN’s approach to the development of new electricity transmission infrastructure is set out in ‘Major Infrastructure Projects: Approach to Routeing and Environmental Impact Assessment’ (Ref 3.1). It describes their general approach to the routeing and siting of new electricity transmission infrastructure taking account of SP Transmission’s statutory duties and licence obligations. This requires a range of environmental, technical and economic factors to be considered and balanced. The document also sets out established industry practices that are applied to the routeing of overhead lines and siting of substations, known as the Holford Rules and Horlock Rules respectively. Copies of these are contained in **Volume 3 Appendix 3.1**.

General Siting Considerations

69. In line with SP Transmission’s statutory duties and licence obligations and drawing upon established practice, siting considerations comprise environmental, technical and economic factors.
- Environmental factors: substation siting must take account of alternative sites’ potential environmental impacts. Following SP Transmission’s statutory duties and licence obligations this is interpreted as seeking to preserve features of natural and cultural heritage interest and to do what SP Transmission reasonably can to mitigate any effects that delivery of the proposal on the alternative sites would have on such features as well as more widely taking account of the potential impact on the environment and people.
 - Technical factors: site options must be technically feasible. This is interpreted as it must be technically feasible to build, operate and maintain substation sites. Technical considerations include matters which would affect these aspects for example safety considerations as well as existing topography, ground conditions and accessibility.
 - Economic factors: site options must be economically viable taking account of other siting considerations. This does not necessarily mean the lowest cost option is preferred, rather the relative difference in costs must be considered having in relation to the environment and technical benefits or disbenefits of alternative options.

Established Practice for Substation Siting

70. Guidelines, known as the ‘Holford Rules’, regarding the routeing of high voltage overhead lines were developed in the late 1950s. While focused on overhead line routeing, reviews of the Rules were undertaken in the early 1990s by the then National Grid Company (NGC) Plc. (now NGET) and in 2003 by Scottish Hydro Electric Transmission Limited (SHETL). These reviews included the addition of supplementary notes and clarifications including supplementary notes with regard to the siting of the substations which are set out below:
- ‘Supplementary Notes on the Siting of Substations*
- a. *Respect areas of high amenity value (see Rule 1) and take advantage of the containment of natural features such as woodland, fitting in with the landscape character of the area.*
 - b. *Take advantage of ground form with the appropriate use of site layout and levels to avoid intrusion into surrounding areas.*
 - c. *Use space effectively to limit the area required for development, minimizing the effects on existing land use and rights of way.*
 - d. *Alternative designs of substations may also be considered, e.g. ‘enclosed’, rather than ‘open’, where additional cost can be justified.*
 - e. *Consider the relationship of towers and substation structures with background and foreground features, to reduce the prominence of structures from main viewpoints.*
 - f. *When siting substations take account of the effects of line connections that will need to be made.’*
71. In addition to the Holford Rules, guidelines to inform the siting and design of substations, known as the Horlock Rules were devised in 2003 and updated in 2006 by NGC. The objective of the guidelines is to mitigate the environmental effects of substations as far as reasonably possible through site selection and design. In summary the Horlock Rules promote consideration of the following factors:
- Overall System Options and Site Selection: In the development of system options including new (or replacement) substations, consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.
 - Amenity, Cultural or Scientific Value of Sites: The siting of new (or replacement) National Grid Substations, cabling sealing end (CSE) compounds and line entries should as far as reasonably practicable seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections. Areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas should be protected as far as reasonably practicable.
 - Local Context, Land Use and Site Planning: The siting of Substations, extensions and associated proposals should take advantage of the screening provided by landform and existing features and the potential use of site layout and levels to keep intrusion into

surrounding areas to a reasonably practicable minimum. The proposals should keep the visual, noise and other environmental effects to a reasonably practicable minimum. The land use effects of the proposal should be considered when planning the siting of Substations or extensions.

- Design: In the design of new substations or line entries, early consideration should be given to the options available for terminal towers, equipment, buildings and ancillary development appropriate to individual locations, seeking to keep effects to a reasonably practicable minimum. Space should be used effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation. The design of access roads, perimeter fencing, earthshaping, planting and ancillary development should form an integral part of the site layout and design to fit in with the surroundings.
- Line entries: In open landscape especially, high voltage line entries should be kept, as far as possible, visually separate from low voltage lines and other overhead lines so as to avoid a confusing appearance. The inter-relationship between towers and substation structures and background and foreground features should be studied to reduce the prominence of structures from main viewpoints. Where practicable the exposure of terminal towers on prominent ridges should be minimised by siting towers against a background of trees rather than open skylines.

3.3 Do Nothing

72. A 'Do Nothing' or 'Delay' option would be inconsistent with SPT's various statutory duties and licence obligations. The Proposed Development is required to help enable growth in renewable electricity and support the transition to net zero also alleviating constraints on the electricity transmission system. As a result a 'Do Nothing' or Delay' option was discounted.

3.4 Alternative Technologies

73. There are broadly two main types of substation; those which use Air Insulated Switchgear (AIS) and those which use Gas Insulated Switchgear (GIS).
- AIS substations use air as the insulation medium for electrical equipment. Equipment is predominantly located outdoors requiring a larger footprint to ensure the necessary safety clearance areas between equipment.
 - In GIS substations some equipment including switchgear can be located within buildings as it uses gas as the insulation medium. This enables safety clearance areas to be reduced meaning that the footprint of a GIS substation is therefore significantly smaller than that of an equivalent AIS substation.
74. For all of its new substations, SP Transmission evaluates the merit of both AIS and GIS technology. This includes but is not limited to consideration of environmental impacts, land availability, technical considerations such as required switchgear rating and the economics of each option. In relation to KINN SP Transmission has identified GIS as the preferred technology. In considering the alternative sites described below in section 3.5, SP Transmission concluded that none of these locations could accommodate the footprint of a new 400kV substation utilising AIS.

3.5 Alternative Sites

Overview

75. Alternative substation sites were identified by SP Transmission in both greenfield and brownfield settings considering the technical requirements such as substation footprint as well as:
- Their proximity to the existing overhead lines (XL, ZCN and ZCS routes) which would be connected to the substation noting that it is preferable to minimise the requirement to reconfigure or extend these overhead lines; and
 - Their proximity to the existing Kincardine Substation, which requires an underground cable connection between it and the Proposed Development for network security reasons in the event of an outage on XL route (i.e. it is not integral to the ordinary operation of the Proposed Development).
76. The location of alternative sites is shown in **Figure 3.1 Alternative Substation Sites**. Seven sites, including how they would be connected to the existing network, were evaluated considering environmental, technical and economic factors in line with SP Transmission’s statutory duties. SP Transmission’s appraisal of alternatives is contained in Appendix 3.2.
77. As part of the consideration of alternatives for this EIAR, AECOM undertook a further review of environmental and planning considerations alongside SP Transmission’s original appraisal. The following sections set out the key findings of appraisal undertaken by AECOM in relation to each site.
- Site 1. New substation at the former Paper Mill site near to the Kilbagie Crossing
 - Site 2. New substation on the northeast of the Kilbagie Crossing
 - Site 3. New substation on the southeast of the Kilbagie Crossing at Windyhill Farm
 - Site 4. New substation west of the A876
 - Site 5. New substation in the Longannet area
 - Site 6. New substation at the existing Kincardine Substation
 - Site 7. New substation on the southwest of the Kilbagie Crossing

Site 1. Northwest of Kilbagie Crossing at the former Paper Mill

78. Site 1 is located on the former paper mill site to the north of the existing ZCN/ZCS overhead line routes on land between the A876 (to the west) and the A977 to the east. A waste management facility currently occupies Site 1. While its historic and more recent industrial use is considered to be compatible with a substation, the existing facility would require to be displaced as there is insufficient space for both it and the substation to occupy Site 1.
79. The substation has a larger footprint than the existing facility and would be more prominent in the setting of two adjacent listed buildings; Mill House, a grade C listed building to the immediate north of Site 1 (close to the site boundary) and Kilbagie House, a grade B listed building lying approximately 50m north of Site 1. Kilbagie House is identified on the Buildings at Risk Register (BARR). The proximity of Site 1 to designated heritage sites means that development of the substation on Site 1 is likely to result in significant effects on the setting of the adjacent listed buildings that could be avoided by siting the substation elsewhere.
80. While Kilbagie House is unoccupied there is property to the north/northwest of Site 1 which appears to be in residential use. A substation at Site 1 would be within approximately 100m

of the property with potential amenity impacts including noise and visual effects. There is some additional land in the intervening area which could be used for landscape planting, however, this is unlikely to prevent permanent effects due to size of the substation and proximity to the property.

81. The overhead line works associated with a substation on Site 1 are unlikely to result in any additional environmental impacts other than those on the listed buildings, however, works associated with the XL route are considered to be more technically constrained due to the distance between the site and the overhead line. The connection between Site 1 and the existing Kincardine Substation would require to be by underground cable due to a number of constraints. While environmental impacts are largely limited, there would be increased temporary disturbance associated with cable installation along the A977.
82. In planning terms Site 1 is located entirely within Clackmannanshire. Site 1 is subject to an allocation in the Clackmannanshire Local Development Plan (LDP); policy B11 covering business, industrial, storage or distribution uses. While a substation does not fall explicitly within those use classes it would not prevent an application being made, however, it may be considered a departure from the LDP.
83. Overall while Site 1 benefits from close proximity to the existing overhead lines the substation is to be connected to, and benefits from existing access via the A977, it is not considered preferable due to the likely impact on the setting of adjacent listed buildings, likely impact on amenity and the requirement to displace the existing waste management facility.

Site 2. Northeast of Kilbagie Crossing near Tulliallan Farm

84. Site 2 is located to the east of where the existing overhead lines cross at Kilbagie with the XL route to the immediate north and the ZCN/ZCS route to the immediate south. Site 2 is an unoccupied area of land located to the south of the access road to an operational quarry site and north of Tulliallan Golf Course. It currently comprises mature woodland identified in the Native Woodland Survey of Scotland (NWSS) as native birchwood. Land is in agricultural use and used for grazing livestock.
85. The development of a substation at Site 2 would require the removal of all of the woodland which is around 4ha. Development of Site 2 would have localised impacts on landscape through the introduction of the substation and the loss of woodland, as well as on ecology through the loss of habitat. It is more distant to the cultural heritage constraints such as the listed buildings located in the vicinity of Site 1 so potential setting effects are not considered to be a significant constraint.
86. Due to the Site 2's proximity to the existing overhead lines, the works required are limited and unlikely to result in any additional environmental impacts other than those already occurring due to the substation. The connection between Site 2 and the existing Kincardine Substation would require to be by underground cable due to a number of constraints. This would follow the same route as for Site 1 largely following the A977. While environmental impacts are limited, there would be increased temporary disturbance associated with cable installation along the road.
87. In planning terms Site 2 is located entirely within Fife. The site is not subject to any specific allocations or designations in the adopted Fife LDP. It is located in open countryside so would be subject to policies pertaining to development in the countryside. The loss of woodland would also introduce additional planning policy considerations with respect to the Scottish Government's Control of Woodland Removal Policy and would likely require proportionate compensatory planting which would increase the amount of land required for

development, if an off-site solution could not be agreed. Loss of these trees would also be contrary to the intentions of policy 6 of National Planning Framework 4, which seeks to protect and expand forests, woodland and trees.

88. Site 2 benefits from close proximity to the existing overhead lines and direct access from the A977, however, it is not considered preferable due to the loss of a relatively large area of mature woodland which would result in landscape and ecology effects which could otherwise be avoided by siting the substation elsewhere.

Site 3. Southeast of Kilbagie Crossing near Windyhill Farm

89. Site 3 is located on agricultural land to the east of Tulliallan Garden and Designed Landscape and west and north of woodland which is identified on the Ancient Woodland Inventory as being long established of plantation origin. The ZCN/ZCS overhead line routes lie to the immediate east/northeast of the site, however, XL route is located over 1 km away to the northwest.
90. The existing woodland would provide some screening of Site 3 particularly in views from the west, however, it would be located close to residential properties at Windyhill Farm with increased potential for impacts on amenity including noise and visual effects. Tulliallan Castle Scheduled Monument lies approximately 1.5km to the west of Site 3 and could experience some setting impacts, however, these may be partly mitigated by the existing woodland screening around the monument. The existing land use at Site 3 is predominantly agricultural, however, there is a single wind turbine to the south of the farm. In order to locate the substation on Site 3 and ensure proximity to the ZCN/ZCS overhead line, the existing wind turbine would likely need to be relocated further west or removed.
91. While Site 3 is adjacent to the ZCN/ZCS overhead lines it would require underground cable routes to connect to the XL route at the Kilbagie Crossing and the existing Kincardine Substation. In order to connect to the XL route, the underground cable route would either cross part of Tulliallan Castle Garden and Designed Landscape or Tulliallan Golf Course or require a significantly longer, less direct route around them. In order to connect to the existing Kincardine Substation, the underground cable route would cross part of Tulliallan Castle Garden and Designed Landscape as well as the Police Scotland College campus at Tulliallan. Routeing an underground cable through these areas, in particular the Garden and Designed Landscape, is not considered preferable due to the environmental impact which would occur. Site 3 is also constrained in terms of access as it would require the use of the access to Windyhill Farm or to the Police College to be used and also extended.
92. In planning terms Site 3 is located entirely within Fife. It is not subject to any specific allocations or designations in the adopted Fife LDP. It is located in open countryside so would be subject to policies pertaining to development in the countryside.
93. Overall Site 3 is not considered to be preferable due to the potential impacts of the substation on existing land use and amenity as well as the impacts of underground cable connections on Tulliallan Garden and Designed Landscape.

Site 4. West of the A876

94. The site is located on agricultural land used for crop growing to the immediate west of the A876. The existing ZCN/ZCS overhead line route is routed to the immediate north of the site, however, XL route lies 500-600 m to the east on the other side of the A876.
95. Site 4 is within a prominent location on relatively flat low-lying land with very little existing vegetation or woodland to screen or filter views. As a result, it is considered to have greater potential for significant landscape and visual effects compared to alternative sites. There are

residential properties in relative close proximity to the west, north-west and south-west of the site which could experience amenity impacts including visual and noise effects. There are scheduled monuments approximately 500-600m to the southwest (Kennetpans Distillery) and 600-700m southeast (Tulliallan Castle) which could experience setting impacts, however, existing woodland may mitigate this in relation to the latter. Part of the Firth of Forth Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) lies within approximately 500 m of the site. While direct impacts on the designated site would be avoided there is the potential to affect its qualifying species through disturbance.

96. The ZCN/ZCS overhead lines lie to the immediate north of the site and new turn-ins would be directly visible from residential properties to the north/north-west. Site 4 would require underground cable routes to connect to the XL route south of the Kilbagie Crossing and to the existing Kincardine Substation. While it is directly west of the A876 access is considered to be complex due to the requirement for a new junction on an existing A-road with any access road also requiring a new watercourse crossing of the Canal Burn which flows parallel to the road.
97. In planning terms Site 4 is located entirely within Clackmannanshire. It is located in open countryside so would be subject to policies pertaining to development in the countryside.
98. Overall Site 4 is not considered to be preferable due to the potential impacts of the substation on landscape character, the amenity of nearby residential properties as well as its relative increased proximity to sites designated for cultural heritage and ecological reasons.

Site 5. At or near Longannet former Power Station

99. The existing Longannet Power Station site is subject to an allocation in the Fife LDP. While this refers to energy-related re-development it also places an emphasis on employment uses. A new substation is not likely to provide any significant long-term employment opportunities and therefore development of a substation on the former power station site would likely be considered a departure from the LDP. The site is also subject to planning permission in principle relating to the redevelopment of the site for a range of commercial uses including business, general industrial and storage and distribution.
100. As a result, two sub-options were identified for Site 5, one to the west of the ZCN/ZCS overhead line and one to the east of the ZCN/ZCS overhead line. Both sites are located on land to the immediate north of the former power station site on land which is used for agricultural purposes, typically for grazing livestock.
101. Site 5 lies close to the River Forth/Firth of Forth in an area identified as being at high risk of coastal flooding on SEPA's Flood Risk Map for Planning. Development of this site would require works such as land raising to mitigate flood risk and protect the substation. Land to the north of Site 5 is screened by woodland which is identified on the Ancient Woodland Inventory. Subject to precise siting there is the potential to impact part of the designated woodland. A high-pressure gas pipeline also traverses this area, placing technical limitations on both sub-options.
102. Due to the distance between XL overhead line route and Longannet (approximately 4km), the XL route would require to be turned onto ZCN/ZCS overhead lines. The location of these turns and associated overhead lines is in proximity to constraints including Tulliallan Golf Course, Tulliallan Castle Scheduled Monument and Tulliallan Garden and Designed Landscape increasing the potential for environmental impacts.
103. Overall Site 5 is not considered preferable due to flood risk and the potential environmental impacts of the substation and associated overhead line and underground cable works, as well as proximity to a gas pipeline.

Site 6. At or near existing Kincardine Substation

104. Site 6 lies adjacent to the existing Kincardine Substation on the former Kincardine Power Station site immediately adjacent to the River Forth/Firth of the Forth.
105. Its proximity to the existing substation provides opportunities to effectively integrate it into the landscape compared to alternatives located in more characteristically rural or farmland areas to the north. Existing woodland to the north of the site would also help to screen and/or filter views of it from locations to the north/northeast and northwest. Site 6 is located close to parts of the Firth of Forth SPA, SSSI and Ramsar but would not be directly impacted. While direct impacts on the designated site would be avoided there is the potential to affect its qualifying species through disturbance for example construction noise or lighting.
106. Site 6 lies directly adjacent to the River Forth/Firth of Forth in an area identified as being at high risk of river and coastal flooding on SEPA's Flood Risk Map for Planning. Development of Site 6 would require significant land raising to protect the substation similar to what was constructed for the existing Kincardine Substation. The extent of flood protection required was identified as a significant environmental, technical and cost constraint due to the land required for the new substation and associated flood protection measures.
107. While the XL overhead line route is in close proximity to Site 6 new underground cable connections would be required to connect to the ZCN/ZCS routes in the Kilbagie area. Underground cable routes from Kincardine to Kilbagie would be space constrained due to a combination of the physical and environmental constraints which are present. Access to the site from the A977 is well established and not considered to constrain development of the site, however, given the requirement to increase ground levels to protect the site from flooding, Site 6 is likely to require more vehicle movements compared to alternatives.
108. In planning terms Site 6 is located entirely within Fife. The Fife LDP identifies the wider former power station site as a safeguarded employment area. A new substation is not likely to provide any significant long-term employment opportunities and therefore development of a substation on Site 6 would likely be considered a departure from the LDP.
109. Overall Site 6 is not considered preferable due to a combination of flood risk and potential environmental impacts of the associated overhead line and underground cable works.

Site 7. Southwest of the Kilbagie Crossing

110. Site 7 is located to the south of the ZCN/ZCS overhead lines and west of the XL overhead line close to where the lines cross. The site comprises agricultural land which is used for arable purposes.
111. Electrical infrastructure including the overhead lines and sealing end compounds are a well-established feature in the landscape which provides some opportunities to integrate a substation into the landscape. The Firth of Forth SPA and SSSI is located approximately 600m to the south/southwest of the site but should not be directly impacted. While direct impacts on the designated site would be avoided, the relatively increased proximity increase the potential to affect its qualifying species through disturbance for example construction noise or lighting. Tulliallan Castle, a scheduled monument, lies approximately 400m to the south of the site and may experience some setting impacts, however, the existing woodland in which the Castle is sited may help to reduce these to some extent.
112. The overhead line works associated with a substation on Site 7 are unlikely to result in any additional environmental impacts due to the proximity of the ZCN/ZCS and XL routes. An underground cable connection would be required to the existing Kincardine Substation, however, compared to other options a relatively direct route crossing agricultural land and

avoiding environmental designations is possible. The proximity of the site to the A876 as well as Hawkhill Road to the south provides opportunities for access.

- 113. Land to the south of the site is subject to consent for a Battery Energy Storage System (BESS) so the development of energy infrastructure in this area has some recent precedent in relation to planning. Site 7 is located on the boundary between Clackmannanshire and Fife meaning a planning application would require to be submitted to both authorities. The site is not subject to any allocation or designation in either Fife or Clackmannanshire’s LDPs and would be classed as countryside so would be subject to policies pertaining to development in the countryside.
- 114. Site 7 benefits from close proximity to the existing overhead lines and from existing access. While it does not avoid environmental impacts, it is generally distant from environmental designations or constraints as well as residential properties and/or there is some potential for mitigation.

Summary of Alternative Sites Appraisal

Table 3.1 Summary of Alternative Sites Appraisal

Alternative	Summary
Site 1. New substation at the former Paper Mill site near to the Kilbagie Crossing	This option would affect existing land use and be in closer proximity to listed buildings and residential property with increased potential for impacts. It would require longer underground cable circuits to the existing Kincardine substation and more extensive overhead line works to make the necessary connections to the existing XL Route.
Site 2. New substation on the northeast of the Kilbagie Crossing	The option would require the removal of all native woodland and have localised impacts on landscape on ecology. It would require longer underground cable circuits to the existing Kincardine substation and would also result in the loss of the native woodland in the area.
Site 3 New substation on the southeast of the Kilbagie Crossing at Windyhill Farm	The substation location largely avoids environmental designations, however, it would require significantly longer underground cable circuits to the existing Kincardine substation potentially crossing Tulli Allan Garden and Designed Landscape as well as require new access to be established. Additional underground cable circuits would also be required to make the necessary connections to the existing XL Route. Development of a substation in this location is considered likely to require more complex and expensive earthworks to construct the substation platform.
Site 4. New substation west of the A876	The option is within a prominent location with greater potential for significant landscape and visual effects compared to alternative sites. Additional underground cable circuits are expected to be required to make the necessary

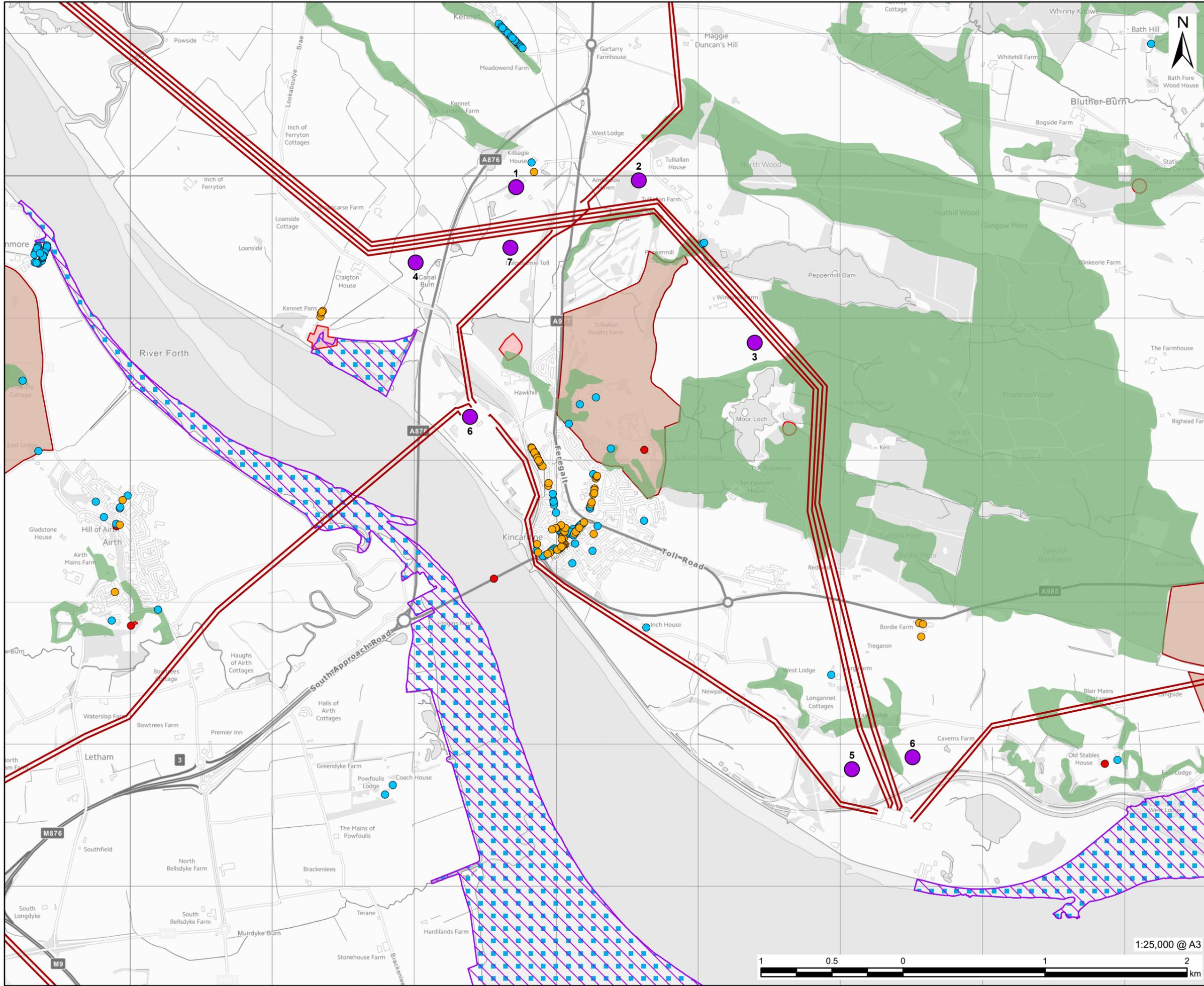
Alternative	Summary
	connections to the southern section of the existing XL Route. This location could also require the diversion of the Canal Burn and flood risk mitigation works due to the potential issues associated with coastal and surface water flooding.
Site 5. New substation in the Longannet area	This option is located in an area at risk of flooding and would require works such as land raising to mitigate flood risk and protect the substation. The site is also located in area allocated in the Fife Local Development Plan for employment. It would require significantly longer underground cable circuits to the existing Kincardine substation and complex overhead line diversion works around the Kilbagie Crossing.
Site 6. New substation at the existing Kincardine Substation	This option is not considered preferable due to a combination of flood risk, the extent of flood protection measures that would be required and potential environmental impacts of the associated with the scale of overhead line and underground cable works that would be required.
Site 7. New substation on the southwest of the Kilbagie Crossing	This option is considered to be preferable. It is generally located away from sensitive receptors such as environmental designations or property and compared to other options minimises the extent of overhead line and underground cable works required.

3.6 Preferred Option

115. Overall, taking account of and balancing environmental, technical and economic factors in line with SP Transmission’s statutory duties and licence obligations means that site 7 to the southwest of the Kilbagie Crossing is preferred. A key benefit of site 7 is its proximity to the existing overhead lines which require to be connected to the substation as this reduces the works required to reconfigure existing overhead lines and does not require any significant increase in the length of overhead lines in the area. Alternative sites are typically located further away from one or all of these overhead lines increasing the technical complexity, cost and/or environmental impact of connecting them to the new substation. The only other sites in such close proximity are Site 1 and Site 2 which are considered to be less preferable due to the environmental impact of siting the substation; at Site 1 its proximity to and impact on listed buildings and existing land use and at Site 2 the requirement to remove native woodland and impact on landscape and ecology. Alternative sites (sites 3, 4, 5 and 6) are only close to one of the overhead lines which require to be connected to it, and the sites or the required connections are considered to be more technically constrained and/or have a greater environmental impact compared to site 7. Site 6 at the existing Kincardine Substation was discounted due to a combination factors linked to flood risk and protection measures including the impact, cost and land required to provide the necessary level of flood protection. For those reasons site 7 is preferred having regard to SP Transmission’s statutory duties and forms the basis of the site to which the planning application relates.

3.7 References

Ref 3.1 Approach to Routeing and Environmental Impact Assessment: 2nd version (2020) SP Energy Networks



PROJECT

Kincardine North Substation

CLIENT

SP Energy Networks

CONSULTANT

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LEGEND

- Alternative Substation Site
- Existing 275kV Overhead Transmission Network
- Category A Listed Building
- Category B Listed Building
- Category C Listed Building
- Garden and Designed Landscape
- Scheduled Monument
- Special Protection Area
- Site of Special Scientific Interest
- Ancient Woodland Inventory Site

NOTES

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ISSUE PURPOSE

EIA REPORT

PROJECT NUMBER

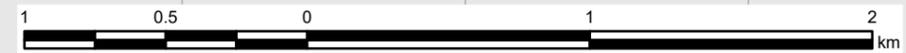
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FIGURE TITLE

Alternative Sites

FIGURE NUMBER

Figure 3.1



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04.

Project

Description

4. Description of the Proposed Development

4.1 Introduction

116. This chapter provides details of the Proposed Development which forms the basis of the assessments reported within Chapters 6-12. It describes the permanent components of the Proposed Development including highlighting any parameters which have been used to inform the Environmental Impact Assessment (EIA). It also describes temporary works required to enable construction of the Proposed Development.

4.2 Site Description

117. The Proposed Development is located on agricultural land bounded to the west by the A876 and to the east by the Stirling-Alloa-Kincardine railway line. The application boundary is illustrated in **Figure 4.1 Site Location Plan** and is 35.3 hectares (ha) in total. There are two components to the application boundary; the main site which is approximately 34.1ha and a smaller area following Hawkhill Road to the south which is approximately 1.7ha. The majority of site is predominantly flat and low lying with elevations varying between 4.8 and 8.5mAOD with the area where the substation platform is proposed. The Canal Burn follows the application boundary in northwestern corner of the site and is crossed by part of the application boundary before it flows under the A876 through a culvert. An unnamed watercourse lies to the south of the site where the application boundary meets existing woodland to the north of Hawkhill Farm. An existing pond lies to the north/northwest of the site and is understood to treat runoff from the A876. Currently the majority of site is used for arable farming and therefore there is limited vegetation. A narrow band of woodland is present on the eastern margin of the site where it abuts the railway line. A larger area of woodland lies to the south of the application boundary separating the site from Tulliallan Castle and Hawkhill Farm buildings to the south. Land to the west of the site, between the site and the A876, is the subject of planning consent for a Battery Energy Storage System (BESS), known as the Kincardine Grid Services Complex. Existing overhead lines, known as the XL, ZCN and ZCS routes, currently traverse the site, however, these will be diverted into and connected to the Proposed Development (see section 4.4. for more information). The application boundary meets Hawkhill Road to the south/southeast of the flyover crossing the A876. There is an existing access to the west of the site from the A876 via a locked field gate as well as from the south of the site via Hawkhill Road. As noted above a smaller section of the application boundary to the south parallels Hawkhill Road extending in a southwestern direction for approximately 700m where temporary measures are proposed to manage construction traffic. This section of the site incorporating Hawkhill Road also coincides with a section of National Cycle Network Route 76 and Core Paths R745 and R746.

4.3 The Proposed Development

Overview

118. The Proposed Development comprises the construction of a new 400kV substation to be known as Kincardine North (KINN) and associated access roads (including internal roads), drainage and landscaping (including ecological enhancement). As noted above the existing overhead lines crossing the site will be turned into and connected to the proposed

substation, however, these works are subject to a separate application to the Scottish Ministers under section 37 of the Electricity Act 1989. For completeness, the overhead line works are briefly described in section 4.4 below.

Kincardine North Substation

Overview of the Substation

119. The proposed substation is required as part of upgrades to the electricity transmission system in central Scotland which will reinforce and increase the capacity of the network. While the application boundary occupies approximately 35.8ha and comprises the whole agricultural field as well as some adjacent land, the actual permanent substation footprint is much smaller. The substation will be located within a secured fenced platform approximately 193m by 254m (4.97ha, or approximately 14% of the application boundary area). Land outside of the substation platform is used for related development including access, drainage and landscaping as well as for temporary compounds and storage during construction.
120. The substation platform is located to the north of the application boundary and orientated in a southwest to northeast direction. The platform will be constructed to a finished ground-level of approximately 8mAOD, no greater than 1-2m above existing ground levels. The Flood Risk Assessment (FRA) which accompanies the planning application confirms the substation is not at risk of flooding so does not require substantial works to raise the ground-level.
121. The substation uses Gas Insulated Switchgear (GIS) technology which helps to reduce its overall footprint. This means that part of the substation housing the switchgear will be located indoors within a building while other electrical equipment including busbars and overhead line tower gantries, that the existing overhead lines (XL, ZCN and ZCS) will be connected to, will be located outdoors within the fenced platform. The GIS building is approximately 86.5m by 30.5m by 12.2m. **Figure 4.2 Site Layout** provides an overview of the permanent site layout. In addition to the substation the Proposed Development includes access roads, drainage and landscape planting.

Access and Internal Roads

122. Permanent access to the Proposed Development will be via a new 600m long road extending northwards from the existing junction with Hawkhill Road north through the site to the substation platform. Additional permanent roads will be constructed outside of the main substation platform to provide access around the site, for example for maintenance of drainage. Additional internal roads will be constructed within the fenced substation platform allowing access to the GIS building and outdoor electrical equipment.
123. A temporary access road will be constructed from the A876 access point east to the substation platform. This will be utilised for the delivery of transformers only. This will require an existing culvert crossing a ditch which drains south from the existing pond to the Canal Burn to be strengthened and potentially widened as well as require a new culvert crossing of the Canal Burn. While this access is temporary it will be left in-situ in for emergency access and egress or in the event access is required from the A876 for larger scale maintenance.

Drainage

124. For the purposes of the planning application a preliminary drainage design has been developed. This takes account of the Surface Water Management Strategy (SWMS) which also accompanies the planning application. The drainage design is based on Sustainable Urban Drainage System (SUDS) principles.

125. It is proposed that surface water from the hardstanding areas of the site will be conveyed via drainage ditches to SUDS ponds (to the north and south of the site) where the water will be attenuated, before discharging at a controlled rate to nearest watercourses; the Canal Burn to the north of the site and an unnamed watercourse to the south of the site. Access tracks will first discharge to swales adjacent to the roads, before discharging to the SUDS ponds. A bunded oil containment system will be installed to collect potential fuel leaks from within the substation platform.
126. Self-contained chemical toilets will be installed within the Proposed Development to handle foul waste.

Landscape Planting

127. A landscape planting scheme has been developed which also accompanies the planning application. This identifies areas of proposed planting including tree and shrub planting as well as hedgerow creation on the site boundary and grassland planting and reinstatement outside of the substation platform and other hardstanding areas. Proposed tree planting includes some planting on the western side of the site at the proposed access point from A876 and between the approved Kincardine Grid Services complex and the Proposed Development, on the northern boundary towards Kilbagie and on the southern boundary supplementing the existing woodland between Hawkhill Farm and the Proposed Development. Some tree planting is also proposed on the eastern boundary increasing the depth of existing planting which separates the site from the railway line. Further information regarding landscape planting is contained in Chapter 7.

Ground Improvement Works

128. Subject to further ground investigation, potential ground improvement works including localised grouting to infill and stabilise historic mine workings within the application boundary may be required. The full extent of ground improvement works is subject to further detailed design.

Summary of Permanent Components of the Proposed Development

129. **Figure 4.2** provides an overview of permanent components of the Proposed Development. In summary these include:
- Hardstanding platform up to 4.97ha on which the substation will be located
 - GIS substation comprising a building as well as outdoor electrical equipment
 - Internal access roads within the substation platform to allow for maintenance
 - Car parking for up to 7no. vehicles including 2no. electric vehicle (EV) charging points
 - Up to 3m high palisade security fencing around the substation platform perimeter
 - Up to 3m high post and wire fence a minimum of 5m beyond the internal palisade fence
 - Security measures including motion-sensor lighting and cameras
 - Watercourse crossings of an unnamed ditch and the Canal Burn
 - Approximately 600m of permanent road providing access via Hawkhill Road
 - Approximately 200m of additional permanent access roads within the site
 - Improved junction at Hawkhill Road as means of permanent operational access
 - Access road to the A876 for emergency access/egress

- Drainage system including swales, filter drains and settlement ponds
- Landscape planting on the margins of the site to screen, filter and backcloth views
- Potential ground improvement works to infill and stabilise historic mine workings

Summary of Temporary Components of the Proposed Development

130. **Figure 4.3** provides an overview of temporary components of the Proposed Development required to enable construction. In summary these include:
- Temporary access via the A876 for abnormal loads (transformers) accessing the site from the A876 access point.
 - Temporary track running parallel to Hawkhill Road between the site access point and the four-way junction to provide a segregated space for pedestrians and cyclists during construction.
 - Vehicle holding area close to the junction on Hawkhill Road as well as potential passing places on Hawkhill Road as part of proposed temporary traffic management measures.
 - Temporary construction compound and laydown area including site office and welfare facilities as well as temporary car parking.
 - Soil stripping including segregated storage of topsoil and subsoil as well as earthworks as part of site establishment.
131. In addition to **Figures 4.1, 4.2 and 4.3**, a number of detailed design drawings have been prepared as part of the planning application and have been considered as part of the planning application. Reference should be made to the drawings listed in Table 4.1.

Table 4.1 Planning Application – Relevant Design Drawings

Drawing No./Reference	Title/Description
SP42000542	Site Location Plan
SP4199697	Site Location Plan
SP4194854	Site Location Plan with Council Boundaries
BT3151-2-1100-DR-SPTEC-0100	Proposed Substation Compound and Access Road Layout
SP4190208	Substation and Tower Elevations
LKUP-LUDD-XX-KINNXXXX-DR-CC-0603	Earthworks Platform Cross Sections
SP4199696	Class 14 Boundaries for Hawkhill Road improvements
SP4199290	Site Location Plan with Class 14 Boundaries for Hawkhill Road improvements

Drawing No./Reference	Title/Description
SP4107664	3m High Lochrin-Bain Combi Security Fence

4.4 Overhead Line and Underground Cable Works

Overview

132. As noted above existing overhead lines, known as the XL, ZCN and ZCS routes, currently traverse the site, however, these will be diverted into and connected to the Proposed Development. In addition to these, a 275kV underground cable will be installed between the proposed Kincardine North Substation and existing Kincardine Substation. The overhead line works are subject to separate consent applications under section 37 of the Electricity Act 1989 while the underground cable is permitted development under the Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (GPDO), however, these works are summarised in this EIAR given their interrelationship. Figure 4.4 provides an overview of the overhead line works and underground cable.

XL Route

133. Proposed works to the XL route would include the construction of new terminal towers to turn in and connect it to the Proposed Development as well as the removal and replacement of existing line towers. Overall, one existing tower is to be removed and four new towers installed. Temporary masts will be required to enable the continuous operation while permanent towers are constructed to connect to the Proposed Development. The new towers connecting XL route to Kincardine North would be located to the east and southwest of the Proposed Substation. Subject to consenting requirements it is likely XL Route will be updated on a phased basis, initially operating in its current form at 400kV before being reconfigured at a later date to enter and exit Kincardine North substation.

ZCN and ZCS Route

134. Proposed works to the ZCN and ZCS routes would include the construction of new terminal towers to turn in and connect them to the Proposed Development as well as the removal and replacement of existing line towers. Overall, two existing towers are to be removed and six new towers installed. Temporary masts will be required to enable the continuous operation while permanent towers are constructed to connect to the substation. The new towers connecting ZCN and ZCS routes to Kincardine North would be located to the northeast and northwest of the Proposed Substation.

Underground Cable Route

135. The proposed underground cable route is approximately 1.9km in length. It follows the access track proposed between the substation and Hawkhill Road southwards and from there it heads southeast paralleling Hawkhill Road to the north of the road crossing open grassland/fields. It crosses Hawkhill Road and the railway sidings to the south/southeast of Hawkhill Farm and from there largely follows existing roads within the former Kincardine Power Station site for a short distance into the existing Kincardine Substation on its western side.
136. The proposed underground cable route comprises six 275kV underground cables laid within a 3m wide trench up to 2.5m deep. Works to install the underground cables would occur within a temporary working corridor approximately 20m wide. This working corridor will be reduced to 10m wide through trees, comprised of a 3m wide trench and 7m wide working area. The cable route would involve open cut installation methods in which a trench would

be excavated with the cable laid directly into the trench and backfilled with excavated material.

4.5 Construction of the Proposed Development

Overview of Construction Activities

137. The construction of the Proposed Development will follow a well-established sequence of activities including the following main activities:
- Pre-construction surveys
 - Site establishment and enabling works including establishment of access
 - Earthworks, ground improvement works, piling works and drainage
 - Formation of the substation platform and other civil works
 - Construction of the substation building
 - Installation of electrical plant and equipment
 - Connection works within the substation
 - Commissioning activities
 - Removal of temporary construction facilities
 - Reinstatement and landscaping

Construction Programme and Hours of Working

138. Subject to planning permission and land rights, construction of the Proposed Development will commence in 2026. The overall construction programme is 4-5 years.
139. In general construction works will take place between 0700 - 1900 (Monday – Friday) and 0800 – 1700 (Saturday). No works are anticipated on Sundays or Bank Holidays, however, should this be required Fife and Clackmannanshire Councils would be notified in advance. Some works may be required outside of core working hours including:
- Works which by their nature may need to be undertaken out of hours to minimise disruption to the local community such as delivery of supergrid transformers (SGTs).
 - Start up and close down activities one hour either side of the core working hours to enable efficient mobilisation of construction activities.
 - The completion of operations commenced during the core working hours which cannot be stopped for safety or efficiency reasons, for example concrete pours.
 - Plant testing or commissioning; these are unlikely to involve high numbers of operatives or use of heavy plant or machinery.

Construction Access Arrangements and Site Management

Overview

140. As outlined above there are two proposed entry/exit points to the site. The primary point of access is via Hawkhill Road to the south of the Proposed Development ('the Hawkhill access point'). This will be used for all construction access excluding abnormal loads and will also be the permanent access to the substation. A secondary access point ('the A876 access

point’) will be utilised during construction only to facilitate the delivery of abnormal indivisible loads (AILs) (the transformers to be located within the Proposed Development).

The Hawkhill Road access point

141. The existing junction onto Hawkhill Road (‘the Hawkhill access point’) will be used for construction and permanent access. This is considered to be suitable for use with some upgrades. In order to limit the impact of construction traffic on Hawkhill Road, traffic management measures will be deployed. This will include the installation of temporary passing places on Hawkhill Road as well as a temporary path to the north of the road to segregate pedestrians and cyclists from construction traffic. All temporary works including the path and passing places will be removed following construction, however, the access via Hawkhill Road will be adopted as the permanent means of access and egress for staff accessing the Proposed Development during ordinary operation.

The A876 access point

142. An existing field access will be upgraded to enable access to the Proposed Development via a left turn-in from the A876. This will be for AILs only so will not be subject to intensive or extended use. Improvements to the existing track will be required including surfacing works, improvements to an existing culvert and installation of a new culvert and extension of the access track to the Proposed Development. While the A876 access is for construction only it these works will be left in-situ in the event of emergency access or egress or for future maintenance (i.e. replacement of SGTs).

4.6 Operation of the Proposed Development

Overview

143. Following completion of commissioning, the Proposed Development will operate continuously throughout the year as part of the electricity transmission system. During ordinary operation the substation will be unmanned as it will be operated remotely. Mandatory inspection and maintenance will take place regularly during its lifetime. Staff numbers carrying out planned inspection and maintenance will vary from individuals to small teams undertaking inspections or routine maintenance, however, should more extensive unplanned works be required this would involve more staff.

Permanent Access Arrangements

144. During operation access to the Proposed Development will be via Hawkhill Road to the south of the site and following the proposed internal road to the substation compound. In the event of major maintenance works, for example the replacement of a SGT, temporary access via the A876 would require to be established. In such an instance, traffic management measures and any other temporary works would be agreed with Transport Scotland and the LPAs.

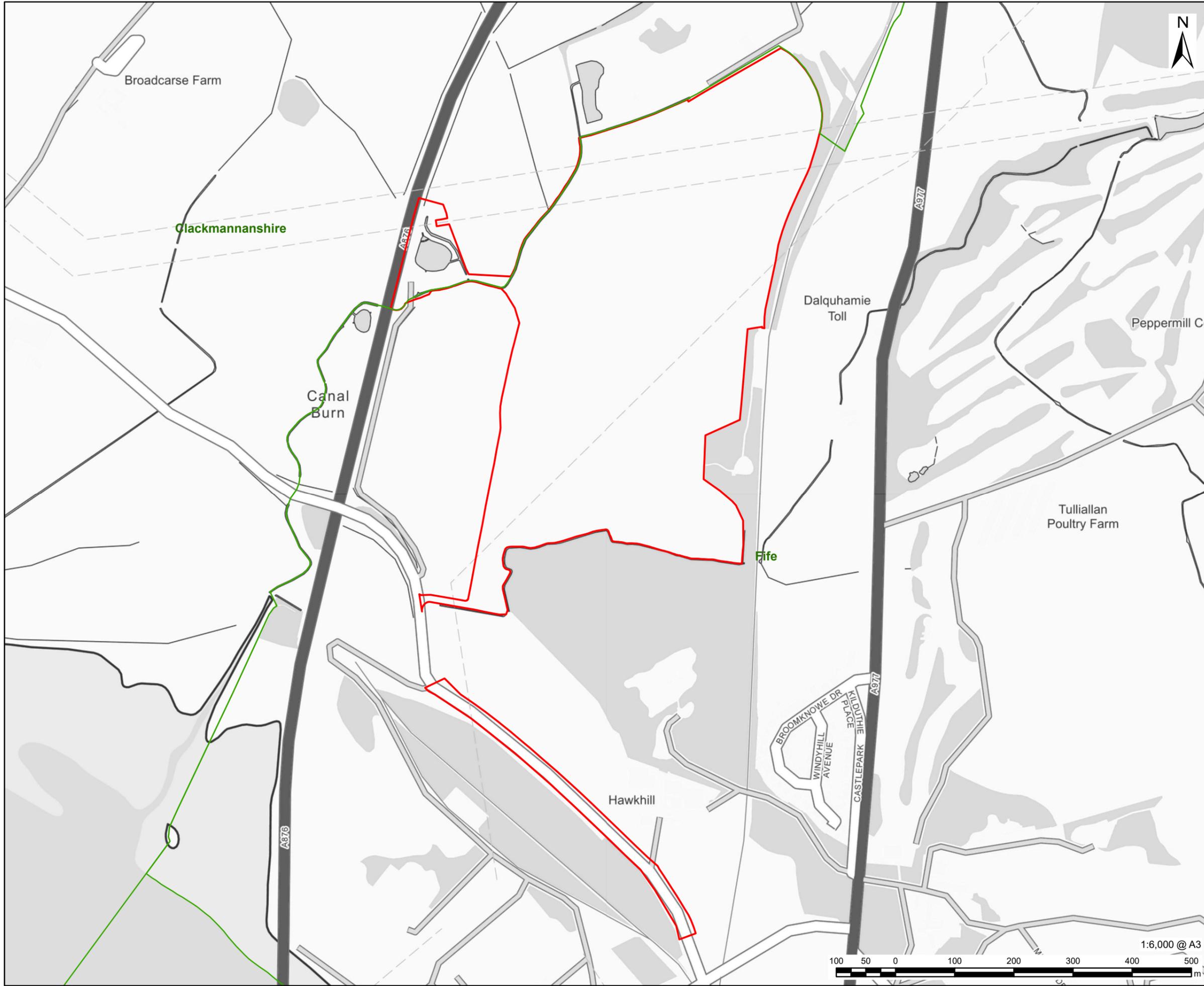
Electric and Magnetic Fields

145. All equipment that generates, distributes or uses electricity produces Electric and Magnetic Fields (EMFs). Electric fields depend on the operating voltage of the equipment producing them. They are shielded by most common building materials, trees and fences, and diminish rapidly with distance from the source. Magnetic fields depend on the electrical currents flowing, which vary according to the electrical power requirements at any given time. Magnetic fields are not significantly shielded by most common building materials or trees but do diminish rapidly with distance from the source.

146. Exposure limits for EMFs in the UK are set by the Government on advice from public health bodies. The exposure limits for EMFs derived from the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines, published in 1994 and 1998 respectively and recently updated in March 2020 (Appendix 4.1). Electricity transmission substations, such as the Proposed Development, do not produce very large fields themselves (generally less than a microtesla).

Decommissioning

147. It is not envisaged that the Proposed Development would be decommissioned, it is proposed as permanent development. The lifespan of the equipment within the proposed substation is approximately 40 years, however, it is expected that this would be extended through replacement or refurbishment.
148. In the event that the Proposed Development was no longer required and could be decommissioned then a Decommissioning Plan would be prepared and planning permission would be obtained, if required, in accordance with the relevant legislation in place at the time. The substation equipment and materials would be removed and taken for recycling where possible. It is expected that the platform, access roads and foundations would be removed (the latter to approximately 1m deep). and land reinstated. The process of decommissioning would be similar to construction meaning the likely significant environmental effects would be comparable. As a result, decommissioning has not been assessed in the EIA Report.



AECOM

PROJECT

Kincardine North Substation

CLIENT

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LEGEND

- Site Boundary
- Local Planning Authority Boundary

NOTES

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ISSUE PURPOSE

EIA REPORT

PROJECT NUMBER

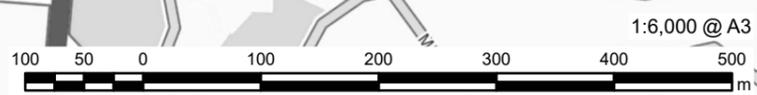
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FIGURE TITLE

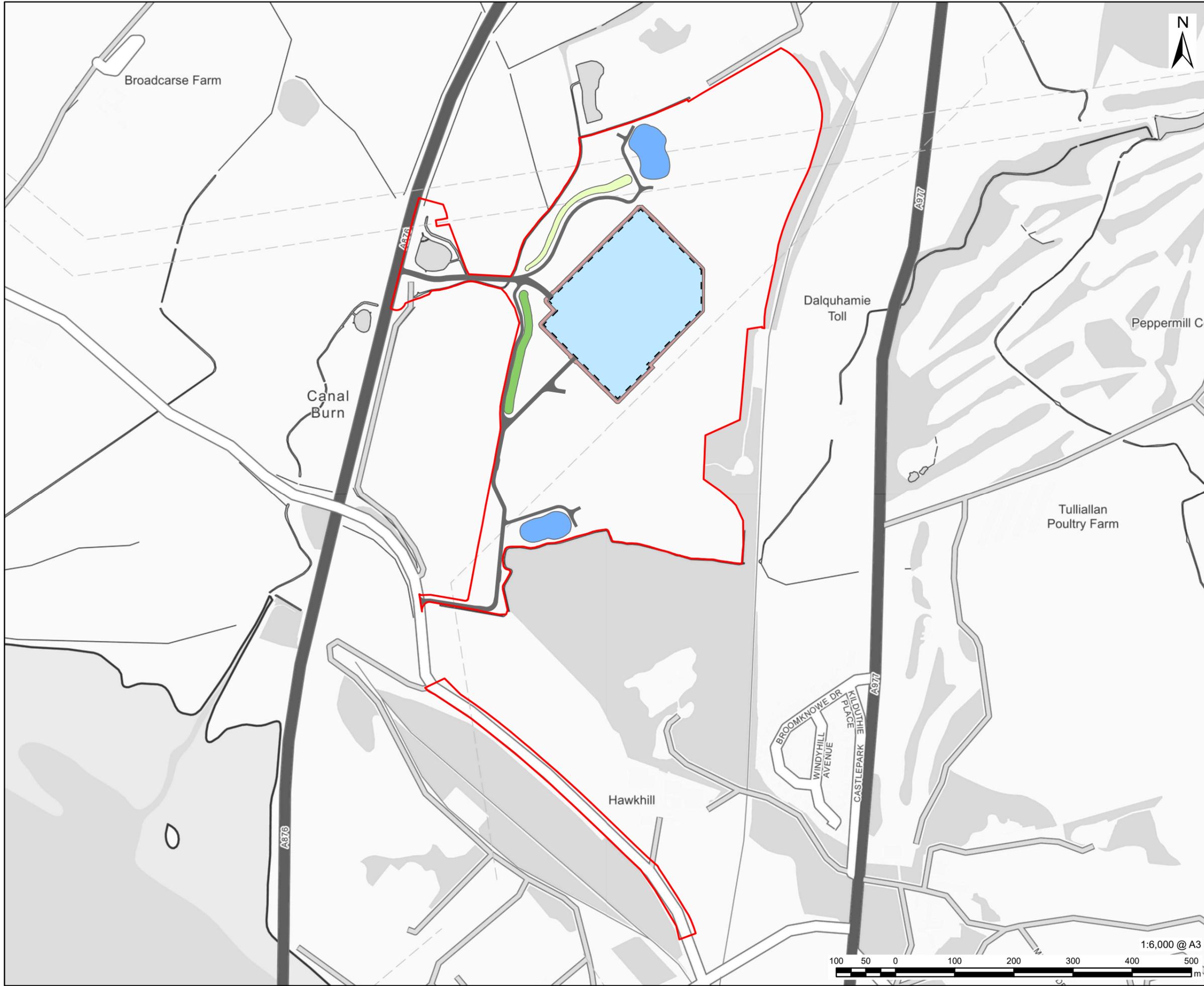
Site Location

FIGURE NUMBER

Figure 4.1



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LEGEND

- Site Boundary
- Fenceline
- Access Track
- SUDS
- Screening Bund
- Substation Platform
- Swale
- Earthworks

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FIGURE TITLE

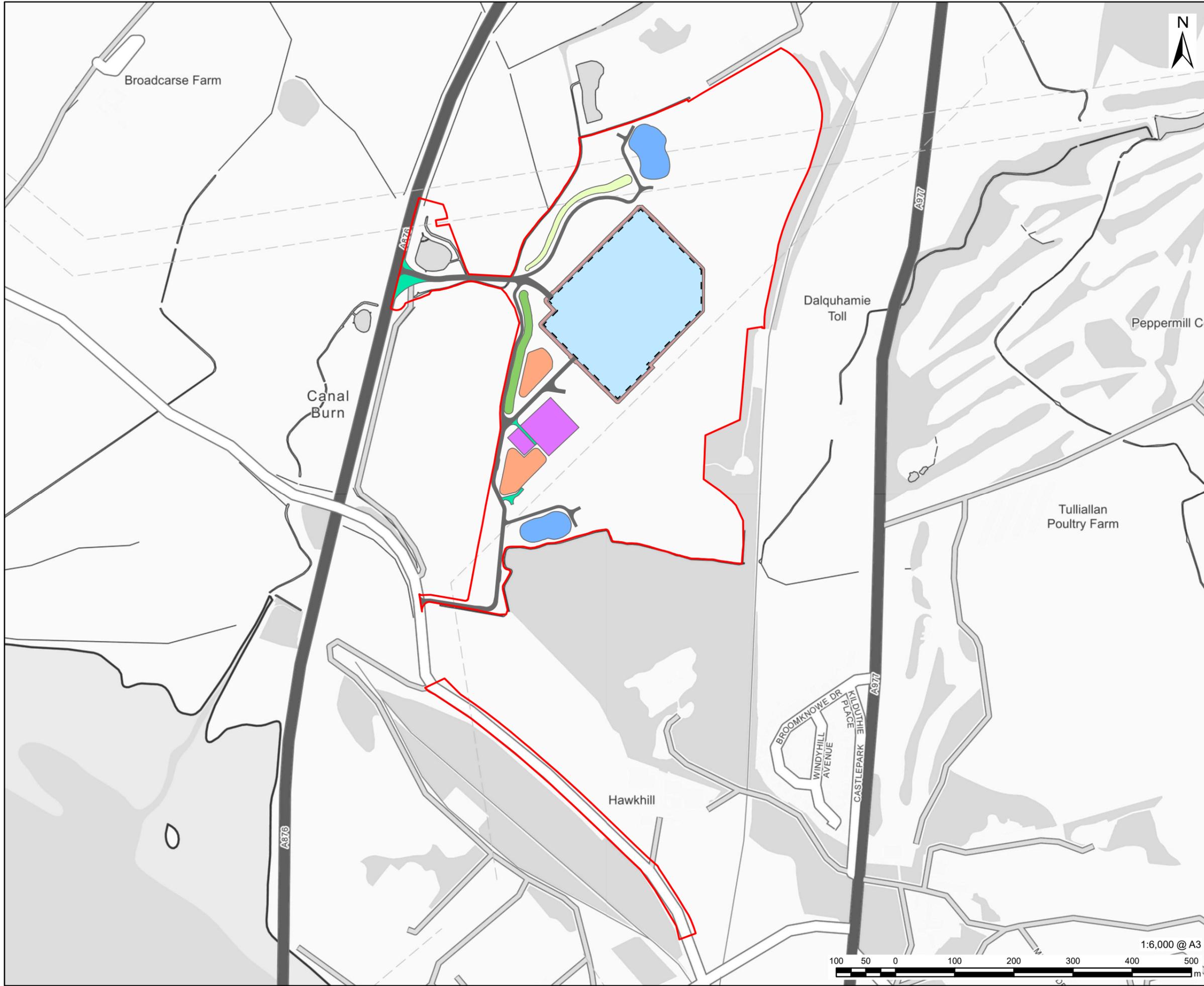
Site Layout

FIGURE NUMBER

Figure 4.2



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LEGEND

- Site Boundary
- Permanent Fenceline
- Permanent Access Track
- Permanent SUDS
- Permanent Screening Bund
- Permanent Substation Platform
- Permanent Swale
- Permanent Earthworks
- Temporary Construction Compound
- Temporary Soil Storage Bund
- Temporary Access Track

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EIA REPORT

PROJECT NUMBER

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FIGURE TITLE

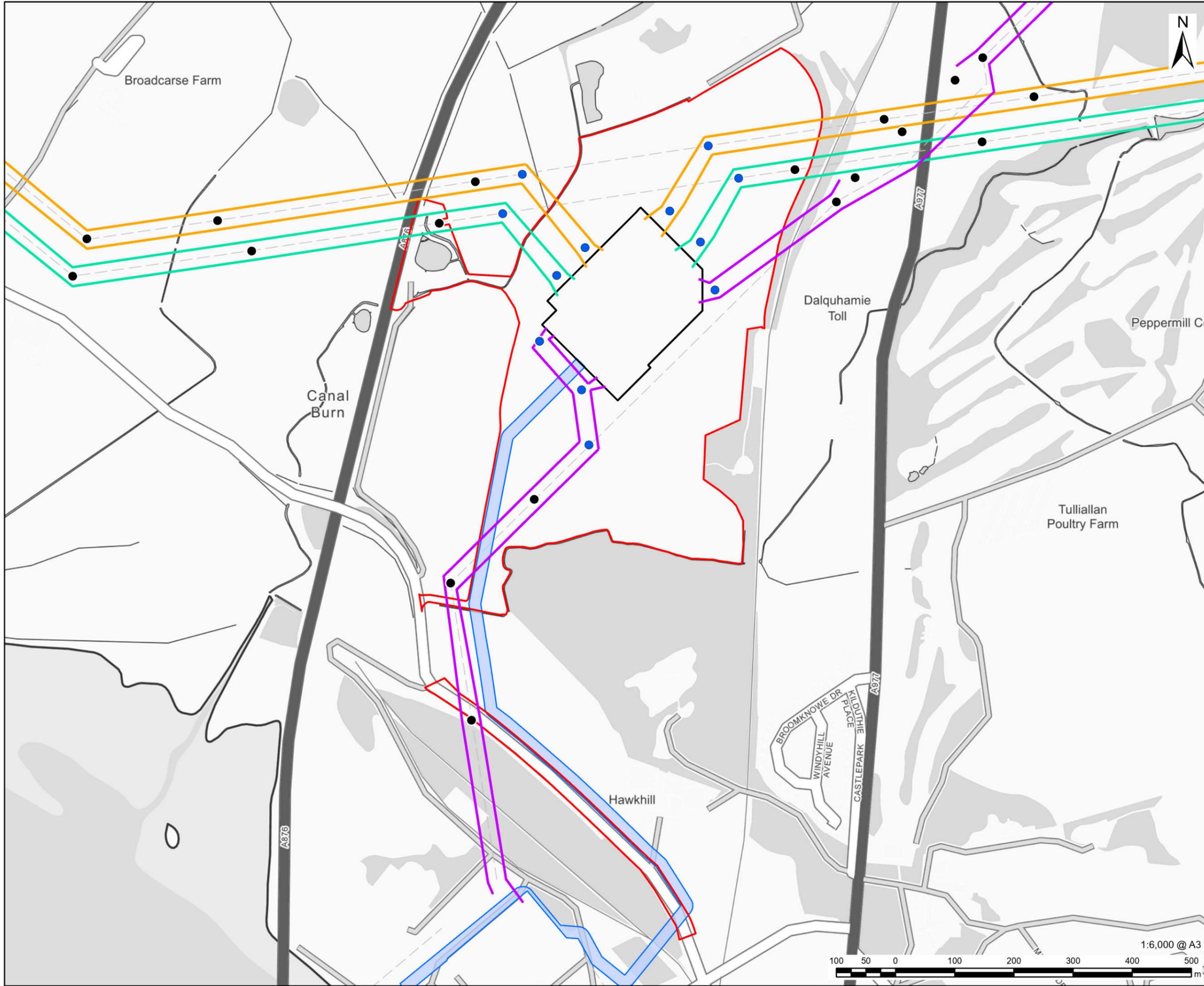
Site Layout and Temporary Works

FIGURE NUMBER

Figure 4.3



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LEGEND

- Site Boundary
- Substation Platform
- Proposed 275kV Underground Cable
- Tower Location**
- Existing Tower
- New Tower
- SPT Overhead Transmission Network**
- ZCN Route - Proposed New Route
- ZCS Route - Proposed New Route
- XL Route - Proposed New Route

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ISSUE PURPOSE

EIA REPORT

PROJECT NUMBER

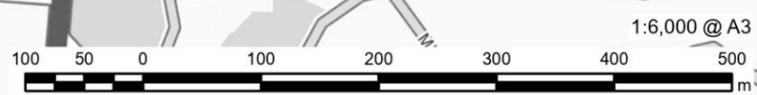
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FIGURE TITLE

Other Works

FIGURE NUMBER

Figure 4.4



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05.

Planning

Policy Context

5. Planning Policy Context

5.1 Introduction

149. The following chapter summarises planning policy which is considered to be relevant to the Proposed Development. This includes policies pertaining to climate and energy which provide background to and establish the need for the Proposed Development as well as relevant Development Plan policies which would be considered as part of the determination of the planning application.

5.2 Climate Change and Energy Policy Context

Climate Change Plan 2018-2032 (2020 update)

150. The Climate Change Plan 2018 - 2032 is the Scottish Government's plan for meeting the Scottish Government's greenhouse gas emission reduction targets to 2032. The Scottish Government declared a state of climate emergency in April 2019 and in doing so placed climate change at the centre of all policy decisions. As a result, amendments were made to the Climate Change (Scotland) Act 2009 through the Climate Change (Emissions Reduction Targets (Scotland)) Act 2019 to create a legally binding target for net Scottish emissions to reach net zero by 2045, and an interim target of reducing emissions by 75% by 2030. To reflect the legislative changes, in December 2020, the Scottish Government produced the Update to the Climate Change Plan (CCP) 2018 – 2032: Securing a Green Recovery on a Path to Net Zero.
151. It should be noted that the interim targets were repealed by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2024, after it was accepted that the 2030 interim target could not be met, and has been replaced by a framework for a carbon budget-based approach for setting emissions reduction targets. The Climate Change Plan has not yet been updated to address these changes. The target to be net zero by 2045 remains legally binding. The Climate Change Plan sets out a strategy for reducing greenhouse gas emissions across all sectors. With regard to electricity, the Plan reaffirms the Scottish Government's commitment to the rapid increase of renewable energy. The Plan expresses the need for Scotland to continue to export large amounts of clean electricity and to maintain its position as a net exporter of electricity. For this to be realised, reinforcements of the electricity transmission system, such as the Proposed Development are critical.

Offshore Wind Policy Statement (2020)

152. The Scottish Government's Offshore Wind Policy Statement was published in 2020. It identifies a target of up to 11 GW of installed offshore wind capacity in Scottish Waters by 2030. The scale of the offshore wind development in Scottish Waters is reflected in the most recent seabed leasing rounds, ScotWind (2022) and INTOG (2023) overseen by Crown Estate Scotland (CES), with approximately 30GW of offshore wind capacity in development.

Onshore Wind Policy Statement (2022)

153. The Scottish Government's Onshore Wind Policy Statement was published in 2022. It sets out a target to achieve a minimum of 20GW of installed capacity of onshore wind in Scotland by 2030. The Policy Statement notes that delivering 20GW targets will require investment in electricity networks with new infrastructure required to be delivered at pace. The 20GW target was most recently reaffirmed in late 2023 with the publication of the Onshore Wind

Sector Deal¹ which sets out commitments from the Scottish Government and the onshore wind industry to deliver on the 2030 target.

Draft Energy Strategy and Just Transition Plan (2023)

154. The Draft Energy Strategy and Just Transition Plan (2023) sets out the Scottish Government’s policies and commitments in relation to energy production and use as well as how to ensure those works and communities whose livelihoods are bound up with the current energy system will not be left behind as the sector changes in response to net zero. The Plan also reconfirms the targets set out in the Onshore Wind and Offshore Wind Policy Statements and identifies the need for significant investment in the electricity transmission system to meet 2030 targets.

Green Industrial Strategy (2024)

155. The purpose of the Green Industrial Strategy is to ensure that Scotland realises the maximum possible economic benefits from opportunities created by the transition to net zero. It reaffirms the Onshore Wind Policy Statement targets highlighting a commitment to deliver at least 20GW of onshore wind by 2030. With regard to offshore wind, it notes that Scotland currently has a potential pipeline of over 40GW. The Strategy also makes a number of commitments in relation to onshore electricity networks including aiming to accelerate consenting timescales for electricity transmission developments in order to support more rapid expansion of new network infrastructure.

Clean Power 2030 Action Plan (2024)

156. The Clean Power 2030 Action Plan sets out how the United Kingdom will achieve clean power by 2030 addressing three major challenges: the need for a secure and affordable energy supply, the creation of essential new industries and the need to reduce greenhouse gas emissions and limit the country’s contribution to climate change. The Plan recognises the need for the electricity network to undergo unprecedented expansion in order to connect new generation and meet future demand as the economy electrifies.

5.3 The Development Plan

Overview

157. The Development Plan comprises the National Planning Framework (NPF) and the Local Development Plan (LDP) for the area. Therefore, the Development Plan for the Proposed Development comprises NPF4 as well as the LDPs for Fife Council and Clackmannanshire Council; the Fife LDP (adopted 2017), and the Clackmannanshire LDP (adopted 2015). A small part of the western side of the Proposed Development where it connects to the A876 lies within Clackmannanshire with the majority including the substation itself will be located entirely within Fife.

National Planning Framework

158. National Planning Framework 4 (NPF4) 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 eighteen 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.

¹ Onshore Wind Sector Deal (2023), Scottish Government <https://www.gov.scot/publications/onshore-wind-sector-deal-scotland/>

159. Development contributing to the delivery of ‘Strategic Renewable Electricity Generation and Transmission Infrastructure’, is classed as a ‘National Development’ in NPF4, 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’ (HoD Regulations), and it falls within one or more of the Classes of Development specified in NPF4. The Classes of Development include: *“New and/or upgraded infrastructure directly supporting on and offshore high voltage electricity lines, cables and interconnectors including converter stations, switching stations and substations.”*
160. The HoD Regulations provide that various classes of development should be categorised as major development, including development where the area of the site is or exceeds 2 hectares. The application site for the Proposed Development is 35.8 hectares.
161. Therefore, as the Proposed Development is new electricity transmission network infrastructure supporting increased renewable energy generation, and would otherwise have been classified as major development, it is classed as ‘National Development’, as it would assist in the delivery of the Spatial Strategy for Scotland.

162. NPF4 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 NPF4 and the LDP policy, NPF4 takes precedence given that it is the more recently adopted Plan. Table 5.1 summarises relevant NPF4 policies and related EIA topics.

Table 5.1 Relevant NPF4 Policies

NPF4 Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 1: Tackling the climate and nature crises	Policy 1 gives significant weight to the climate emergency and nature crisis in order to ensure that these are recognised as priorities in all plans and decisions taken regarding new development.	<ul style="list-style-type: none"> • Ecology and Biodiversity (Ch06) • Other Environmental Aspects (Ch11)
Policy 2: Climate mitigation and adaptation	Policy 2 is intended to encourage, promote and facilitate development that minimises emissions which would otherwise contribute to climate change as well as development which adapts to current and future impacts arising from climate change.	<ul style="list-style-type: none"> • Other Environmental Aspects (Ch11) • Flood Risk Assessment (separate)
Policy 3: Biodiversity	Policy 3 protects biodiversity and requires proposals for national or major development to conserve, enhance and restore biodiversity.	<ul style="list-style-type: none"> • Ecology and Biodiversity (Ch06)
Policy 4: Natural Places	Policy 4 protects internationally, nationally, regionally and locally important nature assets such as sites designated for landscape or ecological purposes as well as protected habitats and species.	<ul style="list-style-type: none"> • Landscape and Visual (Ch07) • Ecology and Biodiversity (Ch06)
Policy 5: Soils	Policy 5 provides protection to carbon-rich soils and peatlands as well as prime agricultural land.	<ul style="list-style-type: none"> • Other Environmental Aspects (Ch11) • Ground Investigation (separate)
Policy 6: Forestry, Woodland, and Trees	Policy 6 provides protection to trees and woodland encouraging the retention and expansion of both.	<ul style="list-style-type: none"> • Other Environmental Aspects (Ch11)

NPF4 Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 7: Historic Assets and Places	Policy 7 protects historic environment assets and requires development proposals with the potential to significantly impact them to be accompanied by an assessment considering their cultural significance.	<ul style="list-style-type: none"> • Cultural Heritage (Ch08)
Policy 11: Energy	Policy 11 is intended to encourage, promote and facilitate all forms renewable energy development including new and replacement electricity transmission infrastructure. It also sets out a range of impacts which must be considered in the design of proposals including on a range of environmental aspects.	<ul style="list-style-type: none"> • All Chapters (Ch06-12)
Policy 13: Sustainable Transport	Policy 13 is intended to encourage, promote and facilitate developments which encourage sustainable forms of transport. It advises that development proposals will be supported where they demonstrate that transport requirements have considered sustainable travel and investment hierarchies.	<ul style="list-style-type: none"> • Project Description (Ch04) • Traffic and Transport (Ch09)
Policy 14: Design, Quality and Place	Policy 14 promotes quality in design and advises that development proposals will be supported where they are consistent with six qualities of successful places (healthy, pleasant, connected, distinctive, sustainable and adaptable).	<ul style="list-style-type: none"> • Project Description (Ch04) • Landscape and Visual (Ch07) • Design and Access Statement
Policy 22: Flood Risk and Water Management	Policy 22 seeks to ensure that flood risk is not exacerbated by development proposals, and facilitates the delivery of sustainable flood risk management solutions. It sets out conditions which must be satisfied in instances where	<ul style="list-style-type: none"> • Flood Risk Assessment (separate)

NPF4 Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
	development proposals are at risk of flooding or located within a flood risk area.	
Policy 23 Health and Safety	Policy 23 seeks to protect people and places from environmental harm and mitigate risks that could arise from safety hazards. It sets out a number of factors to be considered including in relation to air quality and noise.	<ul style="list-style-type: none"> • Construction and Operational Noise (Ch10) • Air quality (Ch11)

Fife Local Development Plan

The relevant Local Development Plan (LDP) for the Proposed Development within Fife is FIFEplan which was adopted in September 2017. FIFEplan sets out the planning strategy and policies to guide development within Fife and is supported by Supplementary Guidance (SG). Table 5.2 summarises relevant FIFEPlan policies and related EIA topics.

Table 5.2 Relevant FIFEPlan Policies

Fife LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 1: Development Principles	This policy sets out three Parts (A-C) which define criteria that should be addressed or satisfied: Part A with regard to the location of development, Part B with regard to development impact and Part C with regard to supporting information or assessments.	<ul style="list-style-type: none"> • Alternatives (Ch03) • Project Description (Ch04)
Policy 3: Infrastructure and Services	The policy requires that the development be designed and implemented to provide the necessary infrastructure and operate sustainably.	<ul style="list-style-type: none"> • Project Description (Ch04) • Traffic and Transport (Ch09)
Policy 7 Development in the Countryside	This policy aims to safeguard the countryside from inappropriate development and sets out criteria that must be addressed for proposals in countryside locations.	<ul style="list-style-type: none"> • Alternatives (Ch03) • Landscape and Visual (Ch07)

Fife LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
Policy 10 Amenity	Policy 10 states that development will only be supported if it does not have a significant detrimental impact on the amenity of existing or proposed land uses. Development proposals must demonstrate that they will not lead to a significant detrimental impact on amenity including on air quality, land contamination, nuisance (e.g. noise and light), traffic, visual amenity and on adjacent land uses.	<ul style="list-style-type: none"> • Landscape and Visual (Ch07) • Traffic and Transport (Ch09) • Construction and Operational Noise (Ch10) • Other Environmental Aspects (Ch11)
Policy 11 Low Carbon Fife	Policy 11 states that planning permission will only be granted for new development where certain criteria are met including in relation to materials, flood risk, drainage and transport.	<ul style="list-style-type: none"> • All Chapters (Ch06-12)
Policy 12 Flooding and the Water Environment	Policy 12 sets out that development will only be supported where they can demonstrate that certain factors can be met including that they do not increase flooding or flood risk at the site or elsewhere, affect storage capacity on the functional floodplain or detrimentally impact on the ecological quality of the water environment.	<ul style="list-style-type: none"> • Project Description (Ch04) • Other Environmental Aspects (Ch11) • Flood Risk Assessment • Surface Water Management Plan
Policy 13 Natural Environment and Access	Policy 13 states that development proposals will only be supported where they protect or enhance natural heritage and access assets including sites designated for landscape or ecological reasons, woodlands, protected species and habitats, landscape character, carbon-rich soils and Core Paths and other recreational routes.	<ul style="list-style-type: none"> • Ecology and Biodiversity (Ch06) • Landscape and Visual (Ch07) • Other Environmental Aspects (Ch11)
Policy 14 Built and Historic Environment	Policy 14 states that development which protects or enhances buildings or other built heritage of	<ul style="list-style-type: none"> • Cultural Heritage (Ch08)

Fife LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
	special architectural or historic interest will be supported. Proposals will not be supported where it is considered that they will harm or damage historic environment assets.	

Clackmannanshire Local Development Plan

163. The relevant Local Development Plan (LDP) for the Proposed Development within Clackmannanshire is the Clackmannanshire LDP adopted in August 2015. The LDP sets out strategic objectives and planning policies to guide development within Clackmannanshire and is supported by Supplementary Guidance (SG). Table 5.3 summarises relevant Clackmannanshire LDP policies and related EIA topics.

Table 5.3 Relevant Clackmannanshire LDP Policies

Clackmannanshire LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
SC11 Transport Networks	This policy aims to ensure the impacts of development on the wider transport network are considered and that opportunities to enhance the network are identified. This includes safeguarding and enhancing the Core Path network as appropriate.	<ul style="list-style-type: none"> • Traffic and Transport (Ch09)
SC12 Development Proposals - Access and Transport Requirements	This policy aims to ensure sustainable transport infrastructure is integrated in the design of new transport proposals and sets out requirements for new development proposals.	<ul style="list-style-type: none"> • Project Description (Ch04) • Traffic and Transport (Ch09)
SC14 Renewable Energy	This policy aims to encourage the use of renewable energy and sets out that renewable or low carbon energy generation including associated transmission infrastructure will normally be supported where a range of criteria,	<ul style="list-style-type: none"> • All Chapters (Ch06-12)

Clackmannanshire LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
	including its impacts, are appropriately addressed.	
SC20 Water and Drainage Infrastructure and Capacity	This policy aims to ensure that developments are served by required standards of water and drainage infrastructure including requiring an appropriate SUDS system	<ul style="list-style-type: none"> • Project Description (Ch04) • Other Environmental Aspects (Ch11) • Flood Risk Assessment • Surface Water Management Plan
SC23 Development in the Countryside -General Principles	This policy aims to safeguard the countryside from inappropriate development and sets out criteria that should be satisfied for development within the countryside.	<ul style="list-style-type: none"> • Alternatives (Ch03) • Landscape and Visual (Ch07) • Ecology and Biodiversity (Ch06)
EP3 Business and Industrial Uses Outwith Existing or Allocated Business Sites	This policy sets out criteria in relation to business and industrial proposals outside of allocated sites identified within the LDP.	<ul style="list-style-type: none"> • Landscape and Visual (Ch07) • Noise and Vibration (Ch10) • Other Environmental Aspects (Ch11)
EA1 Clackmannanshire Green Network	This policy supports the implementation of Central Scotland Green Infrastructure requiring new development to contribute to Green Network principles where possible.	<ul style="list-style-type: none"> • Ecology and Biodiversity (Ch06)
EA2 Habitat Networks and Biodiversity	This policy encourages the protection and enhancement of biodiversity and habitat networks by safeguarding the integrity of features of the landscape which are important because of their linear and continuous structure or function as	<ul style="list-style-type: none"> • Ecology and Biodiversity (Ch06)

Clackmannanshire LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
	intermediate sites for the movement of both fauna and flora.	
EA3 Protection of Designated Sites and Protected Species	This policy aims to protect designated sites and protected species. Where a development proposal could have a detrimental impact on a protected species or a likely significant effect on designated sites requires an assessment to be undertaken.	<ul style="list-style-type: none"> Ecology and Biodiversity (Ch06)
EA4 Landscape Quality	This policy aims to protect and enhance the quality and distinctive character of Clackmannanshire’s landscape and Special Landscape Areas.	<ul style="list-style-type: none"> Landscape and Visual (Ch07)
EA7 Hedgerows, Trees and Tree Preservation Orders	This policy aims to retain trees, woodland and hedgerows that make a positive contribution to local amenity and notes that where development results in the loss of existing woodland, trees or hedgerows that replacement planting will be required.	<ul style="list-style-type: none"> Landscape and Visual (Ch07) Ecology and Biodiversity (Ch06)
EA9 Managing Flood Risk	This policy aims manage the risk of flooding from all sources: river, coastal, surface water, sewers, groundwater, reservoirs and other infrastructure and sets out a general presumption against proposals for development or land raising on a functional flood plain and in areas where there is a significant flooding probability from any source, or where the proposal would increase the probability of flooding elsewhere.	<ul style="list-style-type: none"> Flood Risk Assessment (separate)

Clackmannanshire LDP Policy	Policy Summary	Relevant EIA Topics/Other Application Documents
EA11 - Environmental Quality	This policy seeks to protect the quality of the environment and where development has the potential to affect the development, for example through noise, light, soil, water or air impacts requires all reasonable measures to mitigate such impacts to be taken.	<ul style="list-style-type: none"> • Project Description (Ch04) • Noise and Vibration (Ch10) • Other Environmental Aspects (Ch11)
EA12 Water Environment	This policy aims to protect and enhance the water environment.	<ul style="list-style-type: none"> • Project Description (Ch04) • Other Environmental Aspects (Ch11)
EA13 Significant Soil Resources	This policy aims to protect the areas of prime agricultural land and carbon rich soils from inappropriate development and sets out criteria that should be addressed where such development is proposed in such areas.	<ul style="list-style-type: none"> • Other Environmental Aspects (Ch11)
EA19 Scheduled Monuments	This policy aims to protect Scheduled Monuments and other identified nationally important archaeological resources.	<ul style="list-style-type: none"> • Cultural Heritage (Ch08)
EA20 Other Archaeological Resources	This policy aims to protect other archaeological resources and preserve them in situ wherever possible.	<ul style="list-style-type: none"> • Cultural Heritage (Ch08)
EA22 Listed Buildings	This policy aims to protect listed buildings and their settings.	<ul style="list-style-type: none"> • Cultural Heritage (Ch08)

5.4 References

- Ref 5.1 Climate Change Plan (2020), Scottish Government
<https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/>
- Ref 5.2 Offshore Wind Policy Statement (2020), Scottish Government
<https://www.gov.scot/publications/offshore-wind-policy-statement/>
- Ref 5.3 Onshore Wind Policy Statement (2022), Scottish Government
<https://www.gov.scot/publications/onshore-wind-policy-statement-2022/>
- Ref 5.4 Onshore Wind Sector Deal (2023), Scottish Government
<https://www.gov.scot/publications/onshore-wind-sector-deal-scotland/>
- Ref 5.5 Draft Energy Strategy Just Transition Plan (2023), Scottish Government
<https://www.gov.scot/publications/draft-energy-strategy-transition-plan/>
- Ref 5.6 Green Industrial Strategy (2024), Scottish Government
<https://www.gov.scot/publications/green-industrial-strategy/documents/>
- Ref 5.7 National Planning Framework 4 (2023), Scottish Government
<https://www.gov.scot/publications/national-planning-framework-4/documents/>
- Ref 5.8 FIFEPlan Local Development Plan 2 (2017), Fife Council, <https://fife-consult.objective.co.uk/kse/event/30240/section/4395822>
- Ref 5.9 Clackmannanshire Local Development Plan (2015) Clackmannanshire Council,
<https://www.clacks.gov.uk/property/ldpadopted/>

06.

Ecology

6. Ecology

6.1 Introduction

164. This chapter reports the assessment of the likely impacts and effects of the construction and operation (including maintenance) of the Proposed Development on ecological features. Where appropriate, this chapter provides details of mitigation measures which have been identified to avoid, reduce, or compensate for adverse effects on ecological features as well as proposed enhancement measures.
165. This chapter is supported by Figures 6.1 to 6.6 (note that due to the persecution of some protected species, Figure 6.5 is confidential), as well as the following Appendices:
- Appendix 6.1: Ecological Impact Assessment Method;
 - Appendix 6.2: Great Crested Newt; and
 - Appendix 6.3: Statement to Inform Habitats Regulations Appraisal
166. Appendix 6.3 provides information to allow the determining authorities to carry out the Habitats Regulations Appraisal (HRA) of the likely effects from the Proposed Development on European sites (which comprise Special Areas of Conservation (SAC) and Special Protection Areas (SPA)).
167. The area encompassed by the application boundary is herein referred to as the ‘Site’ and is shown on Figure 6.1.
168. Throughout this chapter, species are given their common and scientific names when first referred to and their common names only thereafter. Nomenclature for vascular plants follows Stace (2019) and for bryophytes, Smith (2004) and Paton (1999). Where no common name is available to distinguish between species (for example, within the *Sphagnum* genus of mosses), these are referred to by their scientific name on every mention. All distances are cited as the shortest distance ‘as the crow flies’, unless otherwise specified.

6.2 Legislation and Policy

Legislation

169. This assessment has been carried out in the context of relevant nature conservation legislation including, but not necessarily limited to, the following:
- Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (more commonly referred to as the ‘Habitats Directive’);
 - Council Directive 2009/147/EC on the conservation of wild birds (more commonly referred to as the ‘Birds Directive’);
 - Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy (the ‘Water Framework Directive’ (WFD));
 - Convention on Wetlands of International Importance (‘Ramsar Convention’);
 - Regulation 1143/2014 on invasive alien species (the ‘Invasive Alien Species Regulation’);
 - Conservation (Natural Habitats, &c.) Regulations 1994 (the ‘Habitats Regulations’);
 - Wildlife and Countryside Act 1981 (the ‘WCA’);

- Nature Conservation (Scotland) Act 2004;
- Wildlife and Natural Environment (Scotland) Act 2011 ('WANE Act');
- Protection of Badgers Act 1992;
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003; and
- Water Environment (Controlled Activities) (Scotland) Regulations 2011 ('CAR Regulations').

Planning Policy

170. Information on relevant planning policy can be found in Chapter 5 of this EIAR. However, a brief summary of national and local planning policy relevant to nature conservation is given under the following sub-headings.

National Planning Policy

171. National Planning Framework 4 (NPF4) was formally adopted by Scottish Ministers on 13 February 2023. Policies 3 and 4 (Biodiversity and Natural Places) of NPF4 include the following statements of policy intent: *“To protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks”* and *“To protect, restore and enhance natural assets making best use of nature-based solutions”*.
172. Policy 3 Biodiversity requires developments to contribute to the enhancement of biodiversity. This includes restoring degraded habitats and building/strengthening nature networks where relevant. The policy states that national development (such as the Proposed Development) will only be supported where it can be demonstrated that they will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention. It requires proposals for national development to demonstrate:
- i. the proposal is based on an understanding of the existing characteristics of the site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats;
 - ii. wherever feasible, nature-based solutions have been integrated and made best use of;
 - iii. an assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements;
 - iv. significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their longterm retention and monitoring should be included, wherever appropriate; and
 - v. local community benefits of the biodiversity and/or nature networks have been considered.
173. In compliance with the above, the Proposed Development has sought to both protect existing ecological features within the Site and to deliver an overall gain for biodiversity. At the time of preparing this chapter, there was no formal policy requirement in Scotland to undertake quantitative Biodiversity Net Gain (BNG) assessment as part of the planning process for infrastructure developments. Measures which will be taken to enhance biodiversity are detailed in Section 6.9: Biodiversity Enhancement.

174. Policy 4 Natural Places provides protection to natural assets including designated sites and protected species. In relation to ecological interests it sets out the following:
- (a) Development proposals which by virtue of type, location or scale will have an unacceptable impact on the natural environment, will not be supported.
 - (b) Development proposals that are likely to have a significant effect on an existing or proposed European site (Special Area of Conservation or Special Protection Areas) and are not directly connected with or necessary to their conservation management are required to be subject to an “appropriate assessment” of the implications for the conservation objectives.
 - (c) Development proposals that will affect a Site of Special Scientific Interest will only be supported where:
 - i. The objectives of designation and the overall integrity of the areas will not be compromised; or
 - ii. Any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance.
 - All Ramsar sites are also European sites and/ or Sites of Special Scientific Interest and are extended protection under the relevant statutory regimes.
 - Development proposals that affect a site designated as a local nature conservation site or landscape area in the LDP will only be supported where:
 - i. Development will not have significant adverse effects on the integrity of the area or the qualities for which it has been identified; or
 - ii. Any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental or economic benefits of at least local importance.
 - The precautionary principle will be applied in accordance with relevant legislation and Scottish Government guidance.
 - Development proposals that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present on a site or may be affected by a proposed development, steps must be taken to establish its presence. The level of protection required by legislation must be factored into the planning and design of development, and potential impacts must be fully considered prior to the determination of any application.
175. Prior to the United Kingdom’s (UK) exit from the European Union (EU), Scotland’s SACs and SPAs were part of a wider European network of such sites known as the ‘Natura 2000 network’. They were consequently referred to as ‘European sites’. Now that the UK has left the EU, Scotland’s SACs and SPAs 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 National Site Network’. However, it is current Scottish Government policy to retain the term ‘European site’ to refer collectively to SACs and SPAs (Scottish Government, 2020).
176. Policy 6 Forestry, Woodland and Trees is intended to provide protection to and encourage expansion of forests, woodland trees. Its sets out:

- a) Development proposals that enhance, expand and improve woodland and tree cover will be supported.
- b) Development proposals will not be supported where they will result in:
 - i. Any loss of ancient woodlands, ancient and veteran trees, or adverse impact on their ecological condition;
 - ii. Adverse impacts on native woodlands, hedgerows and individual trees of high biodiversity value, or identified for protection in the Forestry and Woodland Strategy;
 - iii. Fragmenting or severing woodland habitats, unless appropriate mitigation measures are identified and implemented in line with the mitigation hierarchy;
 - iv. Conflict with Restocking Direction, Remedial Notice or Registered Notice to Comply issued by Scottish Forestry.
- c) Development proposals involving woodland removal will only be supported where they will achieve significant and clearly defined additional public benefits in accordance with relevant Scottish Government policy on woodland removal. Where woodland is removed, compensatory planting will most likely be expected to be delivered.
- d) Development proposals on sites which include an area of existing woodland or land identified in the Forestry and Woodland Strategy as being suitable for woodland creation will only be supported where the enhancement and improvement of woodlands and the planting of new trees on the site (in accordance with the Forestry and Woodland Strategy) are integrated into the design

Local Planning Policy

177. The Proposed Development lies on the boundary between Fife Council and Clackmannanshire Council local authority areas. Consequently, relevant local planning policies are stated in Fife’s Local Development Plan (LDP) ‘FIFEplan’, adopted in September 2017, and in the Clackmannanshire LDP, adopted in August 2015. Table 6-1 and Table 6-2 below list those LDP policies relevant to nature conservation.

Table 6-1. Summary of relevant policies within FIFEplan

Policy	Relevant supporting policy
Policy 1: Development Principles	Avoid flooding and impacts on the water environment. Safeguard or avoid the loss of natural resources, including effects on internationally designated nature conservation sites. Provide green infrastructure as required in settlement proposals and identified in the green network map.
Policy 7: Development in the countryside	Development must be located and designed to protect the overall environmental quality of the area.
Policy 11: Low Carbon Fife	Planning permission will only be granted where it has been demonstrated that sustainable urban drainage measures will ensure that there will be no increase in the rate of surface water run-off in peak conditions or detrimental impact on the ecological quality of the water environment.

Policy	Relevant supporting policy
Policy 12: Flooding and Water Environment	<p>Development proposals will only be supported where they can demonstrate that they will not, individually or cumulatively:</p> <ul style="list-style-type: none"> • increase flooding or flood risk from all sources (including surface water drainage measures) on the site or elsewhere; • reduce the water conveyance and storage capacity of a functional flood plain; • detrimentally impact on ecological quality of the water environment, including its natural characteristics, river engineering works, or recreational use; • detrimentally impact on future options for flood management; • require new defences against coastal erosion or coastal flooding; or • increase coastal erosion on the site or elsewhere.
Policy 13: Natural Environment and Access	<p>Development proposals will only be supported where they protect or enhance natural heritage and access assets including:</p> <p>designated sites of international and national importance, including Natura 2000 sites and Sites of Special Scientific Interest (SSSI);</p> <p>designated sites of local importance, including Local Wildlife Sites (LWS);</p> <p>woodlands (including native and other long-established woods), and trees and hedgerows that have a landscape, amenity, or nature conservation value;</p> <p>biodiversity in the wider environment;</p> <p>protected and priority habitats and species;</p> <p>carbon rich soils (including peat); and</p> <p>green networks and greenspaces.</p>

Table 6-2. Summary of relevant policies within Clackmannanshire LDP

Policy	Relevant supporting policy
Policy SC14: Renewable Energy	<p>Proposals for associated transmission infrastructure, including any mitigation measures proposed, will normally be supported, where they meet criteria including:</p> <p>the development would not have a significant adverse impact on the natural and built environment, including designated areas of nature conservation value, the water environment, and the carbon stocks in carbon rich soils;</p>

Policy	Relevant supporting policy
	<p>the development would not impact upon the integrity of the Firth of Forth SPA or River Teith SAC either alone or in combination with other projects and plans; and,</p> <p>they would not result in any significant adverse amenity, landscape or ecological impacts as a result of the cumulative impacts associated with existing sites, extensions and undeveloped sites with planning permission. The potential impact from other proposals at the same stage of the planning process will be a material consideration.</p>
<p>Policy SC23: Development in the Countryside – General Principles</p>	<p>Proposals outwith settlements will only be supported where the applicant has demonstrated that the proposed site meets criteria including:</p> <p>the proposals respect the character of the site and its location, and maintain and enhance the visual amenity and distinctive landscape character of the surrounding area, and will be expected to contribute to the green network objectives set out in the Green Infrastructure Supporting Guidance (SG); and</p> <p>the proposals will not contribute to adverse effects on the integrity of the Firth of Forth SPA either alone or in combination with other projects and plans.</p>
<p>Policy EP3: Business and Industrial Uses Outwith Existing or Allocated Business Sites</p>	<p>Business and industrial proposals outwith the business and industrial sites identified in the Plan, will only be supported where criteria are met including:</p> <p>the proposed development would not result in adverse effects upon the integrity of the Firth of Forth SPA either alone or in combination with other projects and plans.</p>
<p>Policy EA1: Clackmannanshire Green Network</p>	<p>The aim of this policy is to support the implementation of the Central Scotland Green infrastructure by ensuring that new development contributes to its objectives where possible:</p> <p>wherever possible, new development should contribute to Green Network principles and objectives as set out in this Plan and the Green Infrastructure SG and demonstrably enhance the Clackmannanshire Green Network;</p> <p>the potential impact of all new development proposals on the Green Network will be assessed to ensure that they comply with the principles set out in the Green Infrastructure SG;</p> <p>all new development will be expected to contribute to the enhancement of the connectivity, quality and/or extent of the network, except where this impractical. Proposals for new development must demonstrate how this has been incorporated into the proposed design of the development, or alternatively how enhancement will be achieved through off-site provision;</p> <p>and</p>

Policy	Relevant supporting policy
	development resulting in any reduction in the connectivity, quality or extent of the network will not be permitted unless adequate proposals for mitigation can be agreed.
<p>Policy EA2: Habitat Network and Biodiversity</p>	<p>This policy aims to encourage the protection and enhancement of biodiversity and habitat networks by safeguarding the integrity of features of the landscape which are important because of their linear and continuous structure or function as intermediate sites for the movement of both fauna and flora.</p> <p>All development proposals will be expected to fulfil the following criteria:</p> <ul style="list-style-type: none"> maximise the potential of their development to contribute positively to biodiversity conservation and enhancement (and seek mitigation for any adverse impacts of development); protect and enhance existing habitat networks in or adjacent to the development site; mitigate any negative impacts on habitats, species or network connectivity either resulting from the development or as a result of the cumulative effects of developments locally; and identify opportunities to strengthen the existing habitat network by creating new habitat links. <p>Wherever possible, development proposals should contribute to the objectives of the Clackmannanshire Biodiversity Action Plan; and the ongoing improvement of the Integrated Habitat Network and the Clackmannanshire Green Network, in accordance with the Green Infrastructure SG.</p>
<p>Policy EA3: Protection of Designated Sites and Protected Species</p>	<p>This policy aims to protect designated sites and protected species by requiring an appropriate appraisal to assess the impact on international designations, protected species, national designations, and local designations.</p> <p>In all cases, developments will only be supported where appropriate mitigation and enhancement measures are proposed to conserve, as far as possible, the site’s wildlife or habitat interest and provide for replacement of habitats or features where damage is unavoidable. These measures will be agreed either through the use of planning conditions or a legal agreement.</p>
<p>Policy EA7: Hedgerows, Trees and Tree Preservation Orders</p>	<p>Where necessary, endangered trees and woodlands will be protected through the designation of Tree Preservation Orders (TPOs). Development will not be supported within TPO areas unless the applicant demonstrates that the proposals will not adversely affect the longevity, stability or appearance of the trees.</p> <p>Where development is permitted which will involve the loss of existing woodland, trees or hedgerows, development proposals must include appropriate replacement planting in terms of</p>

Policy	Relevant supporting policy
	number, size and species. The use of native species or species of known biodiversity value will be favoured.
Policy EA11: Environmental Quality	Though not directly relevant, this policy aims to protect the quality of the environment which indirectly affects ecological features (e.g. through disturbance of species or pollution of habitats).
Policy EA12: Water Quality	Though not directly relevant, this policy aims to protect and enhance the water environment which indirectly affects ecological features (e.g. aquatic species and habitats).

Guidance

178. The following guidance was used when designing the field survey carried out to inform this assessment and to determine the scope and method of the assessment itself:
- *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2024);
 - standing advice notes for protected species published by NatureScot (2024c);
 - Fife Local Biodiversity Action Plan (LBAP);
 - FIFEplan supplementary guidance (Fife Council, 2025);
 - Clackmannanshire Biodiversity Action Plan (BAP); and
 - Clackmannanshire LDP supplementary guidance (Clackmannanshire Council, 2025).
179. In addition, other industry-standard good practice guidelines for surveying for protected/important ecological features were also followed and are referenced throughout Section 6.4: Assessment Methodology.

6.3 Consultation

180. Fife Council and Clackmannanshire Council were consulted for pre-application advice and a scoping opinion. Pre-application advice/information relevant to ecology offered by each local authority is provided below.
181. Fife Council:
- Relevant policies within NPF4 and FIFEplan were highlighted within pre-application advice (discussed under Planning Policy above);
 - The Natural Heritage Officer (NHO) initially advised that habitat within the Site is likely to be of relatively low ecological value but may be important for a range of bird species. The NHO later clarified that the application site is within arable fields and that the substation compound is at some distance from nearby woodland (baseline habitats are described under Habitats in Section 6.5 Baseline Conditions);
 - The NHO recommended that construction works and clearance of the Site should be undertaken outside of the bird breeding season; where this is not possible a nesting bird check would be required (committed to under Embedded Mitigation in Section 6.76 Likely Significant Effects);

- The following should be fully considered when submitting an application for planning:
 - An ecological appraisal including phase 1 survey and protected species surveys should be provided (detailed in Section 6.5 Baseline Conditions);
 - A supporting statement illustrating compliance with Policy 3 of NPF4 and Making Fife's Places Supplementary Guidance (2018) should be provided including proposals relating to natural heritage and biodiversity; this should include the use of native species of local origin in landscaping (commitment is made to using native species in landscaping under Habitat Creation and Landscaping in Section 6.7 Mitigation, and per Section 6.9 Biodiversity Enhancement details will be provided in a LEMP); and
 - Full details of all trees within and adjacent to the site was initially requested but it was later accepted that trees and woodland can be scoped out of further assessment (woodland habitats (both priority and non-priority habitat types) are scoped out in Section 6.6 Likely Significant Effects);
- The NHO initially highlighted the need to assess impacts on the existing SuDS pond and later clarified that an assessment of effects on the SuDS pond adjacent to the A876 should be made in the ecology chapter, including the following impacts: physical disturbance, pollution, dust (impacts are considered under Impacts on Reedbeds During Construction in Section 6.6 Likely Significant Effects). Works in the vicinity of the SuDS pond should be covered by the CEMP (included in Embedded Mitigation);
- The NHO emphasised the need for compensatory planting measures since scrub removal is required to facilitate access, utilisation of native species is a priority for Fife Council (compensatory planting is discussed under Habitat Creation and Landscaping in Section 6.7 Mitigation); and
- The proposal should ensure enhancement of site biodiversity (described in Section 6.9 Biodiversity Enhancement).
- SEPA provided general guidance relating to proposals on peatland or carbon rich soils and disruption to GWDTEs. There is no peatland or GWDTEs within the Zol of the Proposed Development so these are not considered in this assessment.

182. Clackmannanshire Council:

- The Planning Officer advised that the development should deliver measures to enhance the biodiversity value of the site and seek to integrate with and enhance existing green infrastructure in the area (described in Section 6.9 Biodiversity Enhancement); and
- The Planning Officer also calls for consideration to be given to measures which naturalise and enhance the canal burn (habitat creation will include planting riparian woodland as described in Section 6.7 Mitigation).

6.4 Assessment Methodology

Study Area

183. The Zone of Influence (Zol) of the Proposed Development is the area over which ecological features may be subject to impacts as a result of its construction, operation and/or decommissioning, and may extend beyond the Site.

184. As described in Chapter 4: Project Description, the Proposed Development is intended to be permanent and would not be decommissioned. The lifespan of the equipment within the proposed substation is approximately 40 years, however, it is expected that this would be extended through replacement or refurbishment. As a result, decommissioning is not considered further in this assessment. In the event that the Proposed Development was to be decommissioned then a Decommissioning Plan would be prepared and planning permission would be obtained.
185. The Zol will vary for different ecological features depending on their sensitivity to environmental change. It is therefore appropriate to identify different Zol for different features. As recommended by the Chartered Institute of Ecology and Environmental Management (CIEEM) in CIEEM (2024), professionally accredited or published studies and guidance, where available, were used to help determine the likely Zol, as well as professional judgement. However, CIEEM also highlight that establishing the Zol should be an iterative process and can be informed by further desk study and field survey. Where limited information was available, the Precautionary Principle (European Union, 2000) was adopted and a Zol estimated on that basis.
186. The study areas used for desk study and field survey, and which are reported below, were designed to allow sufficient data to be collected to establish the baseline condition of ecological features.
187. The field survey areas adopted do not necessarily extend to the full Zol of the Proposed Development. As stated above, the Zol of a project is the area over which impacts on ecological features could occur. However, at distance from a project, any such impacts may not give rise to significant effects, these being the focus of Ecological Impact Assessment (EclA) according to the guidelines published by CIEEM. The field survey areas adopted for this assessment were sufficiently precautionary to allow for an assessment of potentially significant effects from the Proposed Development on ecological features, including within the wider Zol, beyond the field survey areas².

Assessment Scope

188. The scope of survey and assessment described in this chapter was informed by the guidance contained in the published documents listed under Guidance in Section 164: Legislation and Policy, on the responses of consultees (as set out in Section 6.3: Consultation), and on the results of detailed study once underway.
189. NatureScot has devised 21 'Natural Heritage Zones' (NHZ) covering the whole of Scotland (SNH, 2002a), which reflect biogeographical differences across the country. Assessment of the impacts on ecological features in this EIA has been carried out in the context of the Eastern Lowlands NHZ (NHZ 16), within which the Proposed Development is located (see Figure 6.1). This includes the assessment of cumulative effects which has considered the potential for in-combination effects to arise due to other energy developments and land use changes within NHZ 16.
190. NHZ 16 is characterised by its low coastline and extensive floodplains. It is part of the Midland Valley in Scotland, a low-lying region framed by the Grampian Highlands to the

² By way of a theoretical example to illustrate this concept: otter *Lutra lutra* hold large home ranges and use the habitat within these for foraging. Construction activities within the home range of an otter could be said to have a Zol which extends to the full home range, which may extend to dozens of kilometres. However, these works may only have a significant effect on the impacted otter in their immediate vicinity, for example by preventing them from foraging within a few hundred metres of the activities. The field survey area in this case would focus on the area over which significant effects could occur, rather than the potential Zol, which could encompass the entire home range.

north-west and the Southern Uplands to the south-west. This NHZ is of particular importance for agriculture, river systems, coast and estuaries, and settlements (SNH, 2002b).

191. The guidelines for EclA published by CIEEM (2024) recommend that only those features that are ‘important’ and that could be significantly affected by the Proposed 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*”.
192. Consequently, for the purposes of the desk study, field survey and assessment described in this chapter, ‘important’ ecological features were taken to be:
- Sites designated for nature conservation, including those designated at national and local levels;
 - The qualifying features of SACs, SPAs and Ramsar sites within at least 10 km of the Proposed Development (or further where a hydrological or other ecological connection may exist), and the notified features of SSSIs within at least 2 km of the Proposed Development;
 - Woodland listed on the Ancient Woodland Inventory (AWI);
 - Habitats listed on Annex I of the Habitats Directive;
 - Species listed on Annex I of the Birds Directive;
 - Species listed on Annex II of the Habitats Directive;
 - Species listed on Schedules 2 and 4 of the Habitats Regulations;
 - Species listed on Schedules 1, 5 and 8 of the WCA;
 - Badger *Meles meles*, which is afforded protection under the Protection of Badgers Act 1992;
 - Habitats and species listed on the Scottish Biodiversity List (SBL), which are thus identified as being of principal importance for biodiversity conservation in Scotland;
 - Species on the Red List of Birds of Conservation Concern (BoCC) 5 (Stanbury *et al.*, 2021);
 - Species or species assemblages shown to indicate Good habitat conditions, for example Good Ecological Status or better in relation to the WFD; and,
 - Invasive non-native species listed on Schedule 9 of the WCA (although this no longer legally applies in Scotland), those considered to be of EU concern under the Invasive Alien Species Regulation, and those listed in Annex B of NatureScot’s Developing with Nature Guidance (NatureScot, 2022).
193. Other habitats or species that may be rare, scarce or otherwise important are also included where deemed appropriate through available information and/or professional judgement.

Desk Study

194. A desk study was carried out to identify nature conservation designations and records of important habitats and species (as defined under Assessment Scope in Section 6.4: Assessment Methodology) potentially relevant to the Proposed Development. A stratified approach was taken when defining the desk study area, based on the likely Zol of the

Proposed Development on different ecological features. Accordingly, the desk study sought to identify:

- SPAs, SACs, and Ramsar sites within at least 10 km of the Proposed Development (or further where a hydrological or other ecological connection may exist);
- SSSIs (or other nationally designated sites) within 2 km of the Proposed Development (or further where a hydrological or other ecological connection may exist);
- any other locally designated nature conservation sites within 1 km of the Proposed Development;
- records of protected and/or important habitats and species within 1 km of the Proposed Development made in the last ten years; and,
- local policies relevant to nature conservation.

195. Study areas are shown on Figure 6.2 and Figure 6.3.

196. A range of data sources were used for the desk study, as set out in Table 6-3.

Table 6-3: Desk study data sources

Data source	Date accessed	Data obtained
Amphibian and Reptile Groups of the UK (ARG UK) and Amphibian and Reptile Conservation (ARC) Record Pool (https://www.recordpool.org.uk/)	25 September 2024	Amphibian/reptile hectad records.
Ancient Tree Inventory (https://ati.woodlandtrust.org.uk/)	18 December 2024	Locations of known veteran or notable ancient trees.
Fife Council website (https://www.fife.gov.uk/)	25 September 2024	<ul style="list-style-type: none"> • LDP policies relevant to nature conservation. • Local non-statutory nature conservation designations and/or green infrastructure assets.
Fife Nature Records Centre	11 October 2024	<ul style="list-style-type: none"> • Records of protected and/or important species. • Records of non-statutory sites.
Mammal Society Species Hub (https://www.mammal.org.uk/species-hub/full-species-hub/discover-mammals/)	25 September 2024	Information on protected and important mammals.

Data source	Date accessed	Data obtained
Marine Scotland Maps National Marine Plan Interactive (NMPi) (https://marinescotland.atkinsgeospatial.com/nmpi/)	25 September 2024	Atlantic salmon <i>Salmo salar</i> distribution in Scotland
NatureScot Natural Spaces webpage (https://cagmap.snh.gov.uk/natural-spaces/)	25 September 2024	<ul style="list-style-type: none"> • Ancient Woodland Inventory for Scotland. • Results of Native Woodland Survey of Scotland (NWSS).
NatureScot SiteLink webpage (https://sitelink.nature.scot/home)	25 September 2024	<ul style="list-style-type: none"> • Internationally designated sites within at least 10 km of the Proposed Development. • Nationally designated sites within at least 2 km of the Proposed Development.
NBN Atlas Scotland (https://scotland.nbnatlas.org/)	25 September 2024	Commercially-available records of protected and/or important species within 1 km of the Proposed Development, made since 2000.
Ordnance Survey (OS) 1:25,000 maps and aerial photography (https://www.bing.com/maps/)	25 September 2024	Habitats and connectivity relevant to interpretation of planning policy and potential protected/important species constraints.
Saving Scotland's Red Squirrels (scottishsquirrels.org.uk)	25 September 2024	Red squirrel <i>Sciurus vulgaris</i> records.
Scotland's Environment Map (https://map.environment.gov.scot/sewebmap/)	25 September 2024	Obstacles to fish migration.
SEPA Water Classification Hub (https://www.sepa.org.uk/data-visualisation/water-classification-hub/)	25 September 2024	Status of watercourses and standing waters.
The National Water Vole Database & Mapping Project (NWVDMP) (https://www.wildlifetrusts.org/national-water-vole-database-mapping-project)	25 September 2024	Water vole <i>Arvicola amphibius</i> hectad records.

Field Survey

197. A summary of the ecological field surveys carried out to collect baseline data relevant to the Proposed Development is given under the following sub-headings. All surveys were carried out by suitably experienced AECOM ecologists with experience in the relevant subject areas.
198. All field surveys took place on 15 and 16 April 2024, with the sole exception of wintering bird surveys for which survey dates are provided under the corresponding header below. All field mapping was carried out using Esri Field Maps on a GPS-enabled tablet with aerial photography, to maximise accuracy. Field data was subsequently refined as necessary in GIS for figure production.

Habitat Survey

199. A habitat survey was carried out of the Site (as it was understood at the time of survey) plus a 25 m buffer where access was possible and safe (see Limitations and Assumptions, below, for further discussion). Owing to the nature of works and that the footprint of the substation is far smaller than the Site and is situated centrally within the boundary, a 25 m buffer was considered sufficient to inform the baseline. The survey followed the Phase 1 habitat survey method (JNCC, 2010), by which all areas of land within the survey area are assigned standard habitat types and ecological notes are recorded. Notes were made for each habitat which reflect conditions at the time of survey. Typical and important/notable plants (including invasive non-native species) were recorded using the DAFOR (D=dominant; A=abundant; F=frequent; O=occasional; R=rare) scale, and relevant ecological characteristics were documented.

Bat Surveys

200. In accordance with industry-standard guidelines published by the Bat Conservation Trust (BCT) (Collins, 2023), a Daytime Bat Walkover (DBW) was carried out to assess the suitability of habitats for roosting, commuting and foraging bats. Suitability was categorised according to the descriptions given in Table 6-4. Preliminary Roost Assessment (PRA) of structures and Ground Level Tree Assessment (GLTA) were also completed concurrently with the DBW, both within the Site (as it was understood at the time of survey) plus a 25 m buffer where access was possible and safe.
201. Following Collins (2023), structures were assigned a suitability category based on the presence of Potential Roost Features (PRF), as set out in Table 6-4. Trees were assessed as having 'PRF-M', where they had potential suitability for use by multiple bats (including maternity colonies), or 'PRF-I', where they contained features unlikely to be PRF-M but are potentially suitable for only individual or very small numbers of bats.
202. PRFs searched for included suitable holes, cracks or splits in trees, and any possible ingress points to buildings or structures. Where such features existed, searches were made for evidence of bat use such as droppings, staining, foraging remains, auditory evidence and the presence of live or dead bats. The diameter at breast height (DBH) was noted for all trees with PRFs.
203. Note that, as discussed under Limitations and Assumptions in Section 6.4: Assessment Methodology, the search for PRFs was highly constrained by lack of land access.

Table 6-4: Bat habitat suitability categories (from Collins (2023))

Suitability	Description of roosting habitats (in structures)	Description of commuting and foraging habitat
None	No habitats on Site likely to be used by any roosting bats at any time of year (i.e., a complete absence of crevices/suitable shelter at all ground/underground levels).	No habitat features on Site likely to be used by any commuting or foraging bats at any time of year (i.e., no habitats that provide continuous lines of shade/protection for flight lines, or generate/shelter insect populations available to foraging bats).
Negligible	No obvious habitat features on Site likely to be used by roosting bats. However, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on Site likely to be used for commuting or by foraging bats. However, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool/stable hibernation site, but could be used by individual hibernating bats).	Habitat that could be used by small number of bats for commuting such as a gappy hedgerow or unvegetated stream, but isolated (i.e., not very well connected to the surrounding landscape by other habitat). Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting, such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat. These structures	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for commuting such as river valleys, streams, hedgerows, lines of trees and woodland edge.

Suitability	Description of roosting habitats (in structures)	Description of commuting and foraging habitat
	have the potential to support high conservation status roosts (e.g., maternity or classic cool/stable hibernation site).	High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed grassland. Site is close to and connected to known roosts.

Great Crested Newt Surveys

204. Great crested newt *Triturus cristatus* survey methods are summarised below, and full details are provided in Appendix 6.2 Great Crested Newts.
205. A desk-based search for ponds within 250 m of the Site (as it was understood at the time of survey) was carried using aerial imagery and OS mapping. Four ponds potentially suitable for great crested newt were identified – KINN01, KINN02, KINN03 and KINN04. Two further waterbodies to the north of the site were scoped out due to being unsuitable (a large metal tank or drum filled with rainwater and a dry concrete SuDS). The locations of these ponds in relation to the Proposed Development are shown on Figure 6.5.
206. Habitat Suitability Index assessment (HSI assessment) was carried out on ponds KINN01, KINN02 and KINN03 following industry-standard guidance (ARGUK, 2010; Oldham, 2000). This included field-based observations of habitat attributes: location, area, drying, water quality, shade, waterfowl, fish, number of waterbodies within 1 km, macrophyte cover, and waterbody surface area.
207. The ten field scores (one per habitat attribute) are converted into suitability index scores which are multiplied together then calculated to the power of 0.1, to give a HSI score between 0 (indicating unsuitable habitat) and 1 (representing optimal habitat). The system is not sufficiently precise to conclude that any particular waterbody with a high score will support great crested newt or that a waterbody with a low score will not support the species, though it does provide useful context regarding the suitability of a waterbody for great crested newt.
208. At the same time as HSI assessment, environmental DNA (eDNA) sampling was carried out. This involved the collection of water samples to be analysed for the DNA of species of interest, in this case great crested newt, following approved field and laboratory protocols (Biggs *et al.*, 2014). Kits for eDNA collection were provided by SureScreen and collected samples were subsequently transported to SureScreen for analysis.
209. KINN04 could not be accessed and no HSI assessment nor eDNA sampling was carried out at this location (see Limitations and Assumptions below).

Otter, Water Vole and Beaver Survey

210. Surveys for otter *Lutra lutra*, water vole and beaver *Castor fiber* were carried out along all watercourses and other waterbodies within a suitable buffer of the Site as it was understood at the time of survey (100 m for otter and 25 m for water vole and beaver), as far as access was possible and safe (excluding land east of the railway – see Limitations and Assumptions below).
211. The surveys followed guidance in published literature (Campbell *et al.*, 2012; Chanin, 2003; Dean *et al.*, 2016; Liles, 2003; Strachan, 2007; Strachan *et al.*, 2011). Any evidence found

during the survey was mapped and accompanying field notes taken. Evidence of otter searched for included refuges (holts and layups), spraints (faeces), footprints, trails and foraging signs. Where found, spraints were recorded as fresh, recent or old, according to their apparent age. Evidence of water vole searched for included latrines, footprints, droppings, burrows, trails, and foraging evidence. Evidence of beaver searched for included refuges (burrows or lodges), trails, footprints, scent mounds, feeding caches and foraging signs. Where found, foraging signs were recorded as fresh, old, or mixed.

212. Surveyors walked in the channel of watercourses where possible and visually inspected all parts of the banks. Where dense vegetation (especially scrub) prevented this, searches for field signs were made as far as access allowed.

Badger and Pine Marten Survey

Surveys for badger and pine marten *Martes martes* were carried out in areas of potentially suitable habitat within 25 m of the Site (as it was understood at the time of survey), as far as access was possible and safe. Note that, as discussed under Limitations and Assumptions below, badger and pine marten survey was highly constrained by lack of land access.

The surveys followed guidance in published literature (Scottish Badgers, 2018; Birks, 2002; Harris *et al.*, 1989). Any evidence of badger or pine marten found during the survey was mapped and accompanying field notes taken. Badger evidence searched for included setts, spoil heaps, bedding, guard hairs, latrines, footprints, trails, scratch marks and foraging activity. If present, setts were classed as main, annexe, subsidiary or outlier where possible, and holes described as well-used, partially used, or disused, based on relevant guidance (Scottish Badgers, 2018). Pine marten evidence searched for included den sites, scats and footprints.

Other Terrestrial Species

213. No dedicated red squirrel, wildcat *Felis silvestris*, mountain hare *Lepus timidus*, brown hare *Lepus europaeus* or hedgehog *Erinaceus europaeus* survey was carried out. However, any sightings of these mammal species, or evidence of them (such as squirrel-eaten cones), were noted if encountered during all fieldwork.
214. Observations of reptiles, other amphibians and important invertebrates were recorded if encountered during all fieldwork, but no targeted survey was carried out for these species.

Wintering Waterbird Surveys

215. Survey of wintering waterbirds³ was carried out once per month from October 2023 to March 2024 inclusive, in areas of suitable habitat within the Site (as it was understood at the time of survey) plus a 500 m buffer. The surveys were stratified according to tide times (as given for Kincardine by the UK Hydrographic Office <https://easytide.admiralty.co.uk/>) and focussed on high and low tides, to investigate use of the area by birds under different tidal conditions. Where possible, surveys were carried out from two hours before to two hours after the focal tide condition and comprised a similar number of high and low tide surveys.
216. The surveys broadly followed the method adopted by the British Trust for Ornithology (BTO) for the national WeBS scheme (BTO, 2017), which itself is based on the 'look-see' method described in Bibby *et al.* (2000). However, while the WeBS scheme does not involve the collection of any spatial data, the location of birds present within the survey area was

³ The BTO define 'waterbirds' as wildfowl (ducks, geese and swans), waders, rails, divers, grebes, cormorants, herons, gulls and terns. This BTO definition has been adopted in this EIA.

recorded during the non-breeding waterbird surveys carried out for the Proposed Development.

217. Binoculars and a telescope were used to scan the fields within the Site for birds from a single vantage point and then the surveyor drove around, stopping at suitable vantage points to scan the surrounding fields for birds. All waterbirds encountered during the survey were counted and mapped. Gulls over-flying the survey area were not recorded.
218. Details of the waterbird survey visits are provided in Table 6-5.

Table 6-5. Wintering waterbird survey details

Survey date	Tidal state	Tide time	Start time	End time	Weather conditions
31/10/23	High	09:13	08:13	11:00	No wind. Partly cloudy with excellent visibility. Temperature 6-9°C.
21/11/23	Low	14:36	12:45	15:36	Force 1-2 south-westerly winds. Overcast but excellent visibility. Temperature 7-6°C.
11/12/23	High	13:50	12:15	15:15	No wind. Partly cloudy with excellent visibility. Temperature 6°C.
15/01/24	Low	10:25	09:25	12:30	Force 1-2 north-westerly winds. Clear skies and excellent visibility. Temperature -1 to 1°C.
07/02/24	High	12:50	11:15	14:30	Force 2 westerly winds. Clear skies and excellent visibility. Temperature 5°C.
13/03/24	Low	10:00	09:00	12:00	Force 2 south-westerly winds. Overcast and drizzly but excellent visibility. Temperature 9-10°C.

Assessment Methodology

219. The assessment of impacts and effects on ecological features described in this chapter was conducted in accordance with the guidelines published by CIEEM (2024). This may differ from the approach described in Chapter 2, however, it aligns with industry-standard good practice. The principal steps involved in the CIEEM approach can be summarised as:
- baseline conditions are determined through targeted desk study and field survey to identify features that are both present and might be affected by the Proposed Development (both those likely to be present at the time works begin, and for comparison, those predicted to be present at a set time in the future);
 - the importance of identified ecological features is evaluated to place their relative biodiversity and nature conservation value into a geographic context, determining those that need to be considered further within the impact assessment;
 - the potential impacts of the Proposed Development on relevant ecological features are described, considering established best practice, legislative requirements and embedded design measures;
 - the likely significant effects (adverse or beneficial) on relevant ecological features are assessed;

- measures to avoid or reduce any likely significant effects, if possible, are developed in conjunction with other elements of the design (including mitigation for other environmental disciplines);
 - any likely residual effects of the Proposed Development and their significance are reported;
 - scope for enhancement measures is considered; and,
 - monitoring of mitigation and enhancement measures is carried out and remedial action undertaken, where this is found to be necessary, to achieve desired outcomes.
220. For the purposes of this EIA, the geographical level of ‘National’ means Scotland, ‘Regional’ is defined as the area encompassed by NHZ 16, and ‘Local’ as the area within 10km of the Proposed Development.
221. In line with CIEEM guidelines, the terminology used within this chapter draws a clear distinction between the terms ‘impact’ and ‘effect’. Within this chapter, these terms are defined as follows:
- impact – actions resulting in changes to an ecological feature (for example, demolition of a building which supports roosting bats); and,
 - effect – the outcome resulting from an impact acting upon the conservation status or structure and/or function of an ecological feature (for example, killing/injuring bats and reducing the availability of breeding habitat because of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned).
222. Impacts are assessed in view of the conservation status of the habitats and species under consideration. CIEEM (2024) states that, for habitats, “*conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area*”. NatureScot defines the conservation status of a species as “*the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest*” (SNH, 2018). A species’ conservation status is considered to be ‘favourable’ when:
- population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats;
 - the natural range of the species is not being reduced, nor is it likely to be reduced for the foreseeable future; and,
 - there is (and probably will continue to be) a sufficiently large habitat to maintain its population on a long-term basis.
223. NatureScot recommends that the concept of the favourable conservation status of a species should be applied at a national (Scottish) level in order to determine the level of significance of an effect arising from the impact(s) of development (SNH, 2018). However, as highlighted previously, this assessment has also been conducted in the context of NHZ 16, within which the Proposed Development is located. Therefore, even where an impact may not affect the conservation status of a species at the national level, the potential for effects on the conservation status of that species within the NHZ has also been considered.
224. For the purposes of this EIA, effects predicted to be significant on an ecological feature at the Regional or greater geographic level are considered to be ‘Significant’ in broader EIA terms,

whereas those predicted to be significant only at the Local or Negligible levels, are considered to be 'Not Significant' in broader EIA terms.

225. A detailed description of the CIEEM method for impact assessment is provided in Appendix 6.1: Ecological Impact Assessment Method.

Limitations and Assumptions

226. The aim of the desk study was to help characterise the baseline context of the Proposed Development and provide valuable background information that may not be captured by field survey alone. Information obtained during the desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for particular species does not necessarily mean they do not occur in the study area. Likewise, the presence of records for a particular species does not automatically mean that these still occur within the area of interest or are relevant to the Proposed Development.
227. Where habitat edges are sharp and coincide with features on base-mapping or aerial photography that are considered correct, their placement is based on the accuracy of that data in GIS. Otherwise, habitat edges are best estimates as judged in the field. Note also that habitat transitions can be gradual without sharp boundaries. Consequently, habitat mapping and any stated habitat areas are approximate and should be verified by measurement on Site where required for design or construction.
228. Survey areas were based on the Proposed Development boundary as it stood at the time of survey. The final Site boundary includes an additional access road to the south which has been surveyed at the time of writing. This limitation primarily affects habitats which border existing roads where there are no or limited proposed works. Where applicable, online resources such as Street View (Google, 2024) were used to inform assessment and it is assumed mature trees which border the Hawkhill access are not to be felled or lopped.
229. A large proportion of the survey area beyond the Site boundary, particularly that to the south (around Norris Knowe), could not be surveyed due to land access issues. This limited the protected species surveys by preventing access to pond KINN04 and to suitable badger and pine marten habitat. However, this is not a major constraint to the habitat survey, given that the habitats in this area were broadly visible from adjacent accessible land, and that all land within the Site boundary (as it stood at the time of survey) was successfully surveyed.
230. The strip of woodland immediately adjacent to the railway on the east of the Site boundary could not be accessed for some of its length due to the presence of Network Rail safety fencing and signage. This is not considered a significant limitation as the sloping nature of this woodland meant that the majority of it could be visually inspected from the adjacent field.
231. Land to the east of the railway was not accessed during the survey, including the upstream end of the brick culvert through which an unnamed tributary of Canal Burn flows; however, this is not considered a limitation because any habitats or protected species refuges (if present) would be screened from disturbance (or other impacts) from the Proposed Development by the steep railway embankment. Furthermore, the culvert could be inspected sufficiently from the downstream end as the full length was visible.
232. The unnamed watercourse which flows along the southern edge of the Site was not surveyed for protected species west of where it is culverted under the road. Here, the watercourse flows under dense bramble scrub and any possible disturbance impact would be dampened by the main road.
233. Only one survey for water vole was carried out at the start of the suitable survey season (mid-April-September). It is however, recommended that a second survey for water vole is

completed to account for seasonal changes in distribution (Strachan *et al.*, 2011). This limitation is considered when drawing conclusions about water vole presence.

234. No dedicated red squirrel survey was carried out since no woodland would be directly impacted by the Proposed Development, and therefore no dreys within such woodland would be destroyed. Any dreys would also be unlikely to be disturbed given that the woodlands are located more than 50 m from the substation. Nonetheless, it is assumed red squirrels are present within woodlands around the Site.
235. No dedicated fish survey was carried out since in-channel works are highly localised along artificial drainage ditches. Suitability for fish species was assessed with only eel *Anguilla Anguilla* likely to occur. A precautionary approach is taken to conclude the ecological baseline for this species and eel are assumed to be present in both watercourse channels abutting the Site.
236. The likelihood of deviations from baseline conditions increases with elapsed time since survey. While the baseline is not expected to change sufficiently to alter the impact assessment, the precise situation regarding protected/important species may nevertheless differ (for example, new otter holts may become established). In line with NatureScot guidance, pre-application surveys should be repeated if the application is delayed more than two years since the date of field survey and pre-construction surveys should be completed as close to the construction period as possible, and no more than 3 months before the start of works to ensure compliance with legislation (NatureScot, 2024c).

6.5 Baseline Conditions

Designated Sites

Statutory Designated Sites

237. Firth of Forth SPA and Ramsar site are the only internationally designated sites within the Zol of the Proposed Development. These sites are designated for a wide range of non-breeding birds detailed in Appendix 6.3: Statement to Inform Habitats Regulations Appraisal (NatureScot, 2018; NatureScot, 2025).
238. Firth of Forth SSSI is also situated within the Zol of the Proposed Development and is largely concurrent with the SPA and Ramsar site. In addition to an array of non-breeding birds (for which the Firth of Forth SPA and Ramsar site are designated) and geological features, the following are notified biological features of this SSSI:
 - breeding ringed plover *Charadrius hiaticula*, shelduck *Tadorna tadorna*, and eider *Somateria mollissima*;
 - coastal habitats (maritime cliff, saltmarsh, and sand dunes);
 - mudflats and saline lagoons;
 - lowland neutral grassland;
 - transition grassland;
 - vascular plant assemblage;
 - beetle assemblage; and,
 - northern brown argus *Aricia artaxerxes*.
239. These largely concurrent sites are all situated, at closest, 245 m west and downstream of the Proposed Development, and are hydrologically connected to the Site via the Canal Burn.

Intervening land comprises the A876, a small agricultural field and strips of scrub / woodland to the west of the Site, and Kincardine Generating Station to the south. The location of these sites in relation to the Proposed Development is shown on Figure 6.2.

240. The River Teith SAC is approximately 13.4 km northwest of the Proposed Development and is hydrologically connected via the River Forth and Firth of Forth. However, this SAC lies upstream of the confluence of the Firth of Forth and the Canal Burn (which flows through the Site), and habitats within the Site are not suitable for qualifying features of this SAC. Therefore, the River Teith SAC is considered outside of the Zol of the Proposed Development.
241. Note also that Slamannan Plateau SPA is approximately 14.5 km southeast of the Site; however, it is designated only for Taiga bean goose *Anser fabalis fabalis* which travel significantly shorter distances from roost sites to forage than other important goose species, hence this is considered outside the Zol of the Proposed Development.
242. Similarly, South Tayside Goose Roosts SPA and Ramsar site, which is designated for waterbird species including pink-footed goose *Anser brachyrhynchus* and greylag goose *Anser anser*, is just over 20 km northwest of the Site. The maximum limit at which connectivity to a goose SPA can be assumed is generally considered to be 20 km (Patterson, 2013). Therefore, this SPA is regarded as being outside the Zol of the Proposed Development.

Non-statutory Designated Sites

243. There are no non-statutory designated sites within 1 km, or further afield, which are connected hydrologically or ecologically to the Proposed Development.

Habitats

Desk Study

244. No woodland listed on the AWI is present within or immediately adjacent to the Site; however, four areas of long-established plantation woodland are present within 1 km. The closest of these are associated with Old Tulliallan Castle Woods and Tulliallan Golf Club, which are approximately 115 m and 200 m from the Proposed Development, respectively. The location of AWI woodland in relation to the Proposed Development is shown in Figure 6.3.
245. Additionally, numerous veteran and notable trees are recorded on the Ancient Tree Inventory within 1 km of the Site. These are spread around Scottish Police College, at closest, 600 m east of the Site.
246. No watercourses within the Site have been assessed under the Water Framework Directive; however, the Upper Forth Estuary, which encompasses the Firth of Forth between Kincardine and Stirling and is downstream of and hydrologically connected to the Site, is classed as having Moderate overall status and is rated Good for fish. Its hydromorphology lowers the overall rating as it has been designated as a heavily modified water body (HMWB).

Field Survey

247. Habitats recorded during field survey are shown on Figure 6.4 with priority habitats highlighted where present.
248. The Site is dominated by arable crops except along existing tracks / roads and field boundaries where there are strips of scrub and unmanaged neutral grassland. There is one pond present in the far western part of the Site with transitional swamp habitat around the margins, and heavily modified watercourses flow along the northern and southern edges of the Site boundary.

Woodland and scrub

249. One area of mature broadleaved woodland considered to be Lowland Mixed Deciduous Woodland (LMDW) SBL priority habitat was identified during the survey. It is located adjacent to the railway south-east of the Site and is dominated by mature birch *Betula* sp. with occasional willow *Salix* sp.. Wych elm *Ulmus glabra*, sycamore *Acer pseudoplatanus*, rowan *Sorbus aucuparia*, oak *Quercus* sp. and immature ash *Fraxinus excelsior* are also found more rarely. Occasionally shrubs including dog-rose *Rosa canina* and hawthorn *Crataegus monogyna* are present.
250. The ground flora is dominated by neutral grasses with abundant bramble *Rubus fruticosus* agg. and wild strawberry *Fragaria vesca*. Frequently there is raspberry *Rubus idaeus*, nettle *Urtica dioica*, cleavers *Galium aparine*, germander speedwell *Veronica chamaedrys*, and, rarely, red campion *Silene dioica*, lesser celandine *Ranunculus ficaria*, herb-Robert *Geranium robertianum*, primrose *Primula vulgaris* and ground-ivy *Glechoma hederacea*. Locally, particularly to the south, there are patches of bluebell *Hyacinthoides non-scripta* and wood anemone *Anemone nemorosa* which together may indicate that the woodland is of ancient semi-natural origin. It is not listed on the AWI, although it is contiguous with the area of long-established plantation associated with Old Tulliallan Castle Woods.
251. An additional area of mature woodland which also likely qualifies as LMDW is located adjacent to the above, south of the Site. This could not be fully inspected due to access constraints; however, it appeared to support similar tree species with additional non-native conifers. This may indicate that this woodland is of lower quality than that described above, and it is possible the woodland should be classed as ‘mixed’ rather than purely ‘broadleaved’, although ancient woodland indicators including bluebell could still be seen in abundance from accessible land. A small fragment of this woodland located slightly further west along an unnamed watercourse was entered and found to support dog’s-mercury *Mercurialis perennis*, another ancient woodland indicator.
252. The remaining woodland within the surveyed area, located north-east of the Site, is not of sufficient quality to qualify as LMDW, being relatively immature and having a scrubby and species-poor ground flora. It is dominated by ash with abundant hawthorn and elder *Sambucus nigra* within the shrub layer. The ground flora supports mainly nettle, bramble and neutral grasses, with occasional cleavers, rosebay willowherb *Chamerion angustifolium*, common hogweed *Heracleum sphondylium* and, rarely, red campion.
253. The majority of scrub within the surveyed area is bramble, hawthorn, willow or gorse *Ulex europaeus* with occasional elder and raspberry, often with ruderal species such as rosebay willow herb scattered throughout.
254. Locally, surrounding Pond KINN03, the scrub is damper and comprises immature goat willow *Salix caprea* and hawthorn with a ground flora containing occasional common reed *Phragmites australis*. This is not considered to qualify as any SBL priority habitats due to the immaturity of the woodland and sparseness of wetland herbs in the ground flora.

Neutral grassland

255. Semi-improved neutral grassland is locally present on road verges and along ditches within the surveyed area. It is not of particular note and is dominated by grasses such as false oat-grass *Arrhenatherum elatius*, Yorkshire fog *Holcus lanatus* and red fescue *Festuca rubra*. Frequently there is ribwort plantain *Plantago lanceolata*, dock *Rumex* sp., bramble, common hogweed, creeping thistle *Cirsium arvense* and daisy *Bellis perennis*. Locally around ponds KINN01 and KINN02 the grassland is slightly more diverse with occasional common

knapweed *Centaurea nigra*, yarrow *Achillea millefolium*, cuckooflower *Cardamine pratensis*, meadow vetchling *Lathyrus pratensis* and, rarely, wild angelica *Angelica sylvestris*.

256. Also present and of minimal ecological note is poor semi-improved grassland. This is located mainly along field edges used by agricultural vehicles and in locally damp parts of fields which have not been resown. It is overwhelmingly dominated by false oat-grass with occasional dock, creeping thistle and colt's-foot *Tussilago farfara*.

Agricultural habitats

257. The vast majority of the surveyed area (and almost the entire Site excluding access routes) is dominated by heavily modified agricultural land in the form of improved pasture and cereal crops. This includes stubble from harvested crops and ploughed areas. There are no noteworthy field margins around the arable fields. Improved grasslands include damp horse-grazed fields south of the Site.

Aquatic habitats

258. Two ponds are present within the area surveyed for habitats – ponds KINN02 (within the Site) and KINN03 (approximately 30 m north of the Site).
259. Both KINN02 and KINN03 are likely man-made sustainable drainage systems (SuDS) associated with the adjacent A876 road and industrial yard, respectively. Both are surrounded by common reed dominated swamp and constitute Reedbed SBL priority habitat. Additional marsh marigold *Caltha palustris*, yellow iris *Iris pseudacorus*, meadowsweet *Filipendula ulmaria* and duckweed *Lemna minor* were noted at KINN02 and bulrush *Typha latifolia* at KINN03.
260. An additional two ponds – KINN01 and KINN04 – are outside the area surveyed for habitats but are considered for their potential to support great crested newt (see Section 6.5: Great Crested Newt below).
261. Canal Burn, which flows along the northern border of the Site, appears artificially canalised with a maximum width of 2 m. The water appeared deep with a soft substrate, though this could not be confirmed due to safety concerns. Locally in the north the Canal Burn is densely vegetated by common reed and reed canary-grass *Phalaris arundinacea*. To the east, the Canal Burn is locally culverted, both within the agricultural fields and where it is crossed by the A876. Immediately east of the A876 the banks of the Canal Burn are very steep and dominated by scrubby vegetation. The Canal Burn is fed from the north by KINN02 via a smaller, locally culverted watercourse.
262. An unnamed tributary of the Canal Burn borders the main part of the Site to the south. This also has a maximum width of approximately 2 m and an unknown depth with likely soft substrate, becoming more shallow and narrower to the east. There is extensive evidence of iron oxide deposits, and of recent ditch mechanical clearance/widening. The bankside habitat is of managed farmland to the north and mature woodland to the south. No significant in-channel vegetation is present. The banks of this tributary also become steeper and scrubbier to the west, and it is culverted beneath the A876.
263. The unnamed tributary and Canal Burn converge to the west of the A876, approximately 260 m before it joins the Firth of Forth, which, at this point, is brackish and tidal.

Other habitats

264. Tall ruderal vegetation is present in patches along the unnamed tributary which runs along the southern boundary of the Site. This comprises Japanese knotweed *Reynoutria japonica*, an invasive non-native species (INNS) that is discussed in more detail below.

265. The industrial yard located north of the Site contains hardstanding and industrial/office buildings. There is also a bare earth track used by agricultural vehicles along the south-westerly edge of the Site.

Species

Bats

266. No records of bats were identified during the desk study; however, the Site is within the distribution range of the following bat species (JNCC, 2019):

- brown long-eared bat *Plecotus auritus*;
- common pipistrelle *Pipistrellus pipistrellus*;
- Daubenton's bat *Myotis daubentonii*;
- Nathusius' pipistrelle *Pipistrellus nathusii*;
- Natterer's bat *Myotis nattereri*;
- noctule *Nyctalus noctula*;
- soprano pipistrelle *Pipistrellus pygmaeus*; and,
- whiskered bat *Myotis mystacinus*.

267. Habitats within the Site itself are considered to be of Low suitability for commuting and foraging bats. This is because the vast majority of the Site (including the entirety of the substation footprint) comprises arable fields which have extremely limited foraging / commuting potential for bats. However, there may be some greater suitability associated with the woodlands, occasional scattered trees and wetland habitats surrounding the Site, which have some connectivity to habitats in the wider area via habitat along the railway and field edges. Thus, if bats are present, they most likely occur along the perimeter of the Site. Habitats surrounding the Site will not be directly affected by works required to facilitate the Proposed Development.

268. Three trees with potential to support roosting bats were identified within the surveyed area during GLTA and are described below in Table 6-6.

Table 6-6. Trees with the potential to support roosting bats

Ref	Tree description	PRF description	Suitability	Photo	Relationship to Proposed Development
T01	Mature coppiced willow DBH = 75 cm	Trunk rotten and with stripped bark towards east and south-east. Resulting feature between 1 and 2 m above the ground, internal cavity is likely to be moist but could provide shelter for a couple of bats.	PRF-I		Within the Site; 100 m west of substation footprint; ~5 m south and on the opposite side of Canal Burn to temporary access track.

Ref	Tree description	PRF description	Suitability	Photo	Relationship to Proposed Development
T02	Mature willow DBH = 100 cm	Hollow rotten trunk from 1 m above ground which is exposed on the north-facing side and in higher branches, but also extends up into a branch where there is potentially a sheltered cavity. Drop-zone from feature is clear.	PRF-M		Immediately adjacent to Site but separated by Canal Burn; 150 m north of substation footprint; ~50 m west of proposed SuDS.
T03	Mature ash	Several features on tree with the potential to extend into small cavities: Knothole facing south-east at 8 m above the ground. Pruning cut at 6 m above the ground facing south. Several features facing north at 6 m above the ground. Rot feature at 4 m above the ground facing north.	PRF-M		On northern Site boundary; 300 m north-east of substation footprint; ~180 m east of proposed SuDS.

269. Owing to survey restrictions (discussed under Limitations and Assumptions in Section 6.4: Assessment Methodology), it is possible additional trees are present within the zone of influence of the Proposed Development. In the absence of data, it is presumed mature trees in the woodland south of the Site and along the southern access road from Hawkhill contain features suitable for roosting bats.

Otter

270. The desk study did not identify any records of otter; however, otter is widespread in Scotland (JNCC, 2019) including the Eastern Lowlands.

271. A single otter refuge was identified during field surveys: a layup approximately 5 m from the south-east corner of the Site and 350 m south-east of the substation footprint, located in a large culvert (approximately 2 m diameter) carrying the unnamed tributary of the Canal Burn beneath the railway (see Plate 6.1). Tree planting as part of the proposed landscape and biodiversity plan (discussed in Section 6.7: Mitigation) extends into the south-eastern corner of the Site, 5 m from the identified layup.
272. A pile of old and recent spraints was observed on the shelf at the culvert entrance and more may have been present within. The culvert extends for approximately 20 m, and the upstream end could be seen clearly through the opening but was not accessed for closer inspection (discussed under Limitations and Assumptions in Section 6.4: Assessment Methodology). This feature is likely used by foraging and resting otter but is not considered a holt due to the large openings at either end limiting the shelter provided.

Plate 6.1. Photograph of a large culvert which passes under the railway line and is used as a layup by otter



273. An additional two spraint sites were identified within the surveyed area. One of these was further west along the unnamed tributary of the Canal Burn, downstream of the layup, and comprised one fresh and two old spraints. The other was a single recent spraint found on the bank of pond KINN01 which is likely accessed via Canal Burn. No other field signs of otter were recorded during surveys. All evidence of otter recorded during field surveys is shown on Figure 6.5.
274. The Canal Burn and an unnamed tributary of the Canal Burn flow along the north-westerly and southerly boundaries of the Site, flowing from north-east to south-west. Both watercourses are typical of ditches in an agricultural landscape and have little opportunity

for holt establishment. However, no survey was carried out south-west of where the unnamed tributary flows under the adjacent road (discussed under Limitations and Assumptions in Section 6.4: Assessment Methodology). Nonetheless, it is extremely unlikely there are any holts present within 30 m of proposed works. As discussed below under Fish, watercourses and waterbodies within and around the Site are of poor quality for most fish species, a key prey item for otter, but may support a limited number of amphibians and offer suitable commuting routes.

275. It is likely that the watercourses are utilised by opportunistic otter commuting throughout the wider landscape between habitats with greater prey availability such as the Firth of Forth or Peppermill Dam.

Water Vole

276. No records of water vole were returned during the desk study, and the nearest hectad with a positive water vole record from the NWVDMP is at least 2 km from the Site (both south and north-east) with either no direct hydrological connection or an impassable barrier to movement (i.e. the River Forth).
277. No evidence of water vole was recorded during field surveys which, despite alterations to the Site boundary, covered all areas of suitable habitat where water vole could potentially be impacted (if present). This included any signs of historic occupancy (burrows often remain intact for many years though may be less obvious when infrequently used outside of breeding season). Although results are limited by lack of second survey (discussed under Limitations and Assumptions in Section 6.4: Assessment Methodology), the influence of obvious iron oxide pollution reduces habitat suitability for water vole and American mink is understood to be present within the area (discussed further under Non-native Species below).
278. Water voles are therefore considered likely absent from the Site.

Beaver

279. The desk study returned one record of beaver provided by Fife Nature Records Centre. Details about this record are limited (though it is assumed to be an individual sighting) and the location accuracy of this record was 10 km², so its relevance to the Proposed Development is uncertain.
280. During the field survey, a willow adjacent to the unnamed ditch in the far south-west of the Site showed evidence of having been historically gnawed by beaver. However, no recent evidence was found during the survey. Although it is possible for beaver burrow entrances to be concealed underwater, the vast majority of the banks were visible and where water was opaque, limiting visibility, watercourses had a very soft silty substrate which is highly unlikely to support a large burrow structure.
281. Beaver is therefore considered to be likely absent from the Site and no refuges are present within 20 m of the Proposed Development.

Pine Marten

282. The desk study identified two records of pine marten provided by Fife Nature Records Centre; however, these records are only accurate to 10 km², so it is unclear how relevant they are to the Proposed Development.
283. No evidence of pine marten was recorded during field surveys, including potential dens; however, access to suitable habitat was limited (discussed under Limitations and Assumptions in Section 6.4: Assessment Methodology). Pine martens are highly unlikely to use arable fields which occupy the majority of the Site and would certainly not take refuge within these habitats.

284. Therefore, pine martens are considered absent from the Site, but on a precautionary basis are considered present within suitable habitat south of the Site where dens may be present.

Red Squirrel

285. The desk study identified nineteen records of red squirrel provided by Fife Nature Records Centre to the south and east of the Site, spread across trees and woodland associated with Old Tulliallan Castle, Tulliallan Golf Club, and Kincardine town. Further records submitted to Saving Scotland's Red Squirrels also indicate that red squirrels are present in these areas. The closest record of red squirrel identified during the desk study is approximately 200 m east of the Site.
286. No evidence of red squirrel was incidentally recorded during field surveys for other protected species; however, survey within suitable habitat was limited by access constraints (discussed under Limitations and Assumptions in Section 6.4: Assessment Methodology).
287. Considering arable fields are unsuitable habitat, red squirrel are considered largely absent from the Site but are likely present along tree lines and within woodlands which border the Site to the east and south.

Badger

288. No records of badger were identified during the desk study. Nor was any definitive evidence of badger identified during field surveys; however, survey within suitable habitat was limited by access constraints (discussed under Limitations and Assumptions in Section 6.4: Assessment Methodology).
289. A single mammal burrow was identified beyond inaccessible railway fencing, adjacent to the Site boundary but 190 m from the substation footprint. Tree and scrub planting as part of the proposed landscape and biodiversity plan (discussed further in Section 6.7: Mitigation) is proposed adjacent to this burrow. It comprised a single large hole with recent spoil at the entrance and an associated well-trodden trail. The feature could not be inspected further (e.g. to search for the presence of badger hairs / footprints) due to the presence of the fence. If occupied by badger, this burrow likely functions as an outlier sett at most owing to the singular entrance hole and lack of badger evidence in the surrounding area. Woodland south of the Site which could not be accessed during the survey also has the potential to support badger setts.
290. Badger are considered largely absent from the Site but present within surrounding woodland and along tree lines on a precautionary basis. They may also commute and/or forage around field edges on an occasional basis; however, if they regularly foraged within the Site, there would be evidence to this effect which was not the case.

Other Important Mammals

291. The following records of other important mammals were identified during the desk study, provided by Fife Nature Records Centre:
- eight records of brown hare *Leptus europaeus* associated with open habitats east and south of the Site (records were at least 400 m from the Site);
 - seven records of hedgehog *Erinaceus europaeus* mainly south and east of the Site, with one record of roadkill on the A876, approximately 200 m west of the Site; and
 - one record of minke whale *Balaenoptera acutorostrata* from within the River Forth, approximately 1 km south of the Site.

292. During the field survey four brown hares (a SBL priority species) were incidentally recorded exhibiting courtship behaviour within the main arable field on Site. The location of these sightings is shown on Figure 6.5. No other important mammals or field signs indicative of their presence were recorded during field survey; however, habitats around the edge of the Site, specifically rough grassland, scrub, and woodland, are suitable to support hedgehog.
293. There is no habitat suitable for marine mammals, mountain hare, or wildcat and these species are considered absent from the Site.

Birds

294. The desk study identified records of 52 important bird species provided by Fife Nature Records Centre. Of these, the following species may be present in habitats within or adjacent to the Site for foraging and roosting, species underlined may also breed in these habitats and qualifying features of relevant designated sites (detailed under Designated Sites above) are written in bold:

- barn owl *Tyto alba*;
- **bar-tailed godwit *Limosa lapponica***;
- black-headed gull *Chroicocephalus ridibundus*;
- black-tailed godwit *Limosa limosa*;
- bullfinch *Pyrrhula pyrrhula*;
- **curlew *Numenius Arquata***;
- fieldfare *Turdus pilaris*;
- **golden plover *Pluvialis apricaria***;
- greenfinch *Chloris chloris*;
- greylag goose;
- grey partridge *Perdix perdix*;
- herring gull *Larus argentatus*;
- house martin *Delichon urbicum*;
- house sparrow *Passer domesticus*;
- kestrel *Falco tinnunculus*;
- lesser redpoll *Acanthis cabaret*;
- linnet *Linaria cannabina*;
- little egret *Egretta garzetta*;
- mediterranean gull *Ichthyaetus melanocephalus*;
- merlin *Falco columbarius*;
- mistle thrush *Turdus viscivorus*;
- **northern lapwing *Vanellus vanellus***;
- peregrine *Falco peregrinus*;

- redwing *Turdus iliacus*;
 - ruff *Calidris pugnax*;
 - short-eared owl *Asio flammeus*;
 - siskin *Spinus spinus*;
 - skylark *Alauda arvensis*;
 - song thrush *Turdus philomelos*;
 - starling *Sturnus vulgaris*;
 - swift *Apus apus*;
 - tree sparrow *Passer montanus*;
 - twite *Linaria flavirostris*;
 - whooper swan *Cygnus cygnus*;
 - woodcock *Scolopax rusticola*; and
 - yellowhammer *Emberiza citronella*.
295. Following consultation with the groundskeeper, it is indicated that barn owls may nest in Old Tulliallan Castle, which is 200 m south of the Site and 460 m south of the substation footprint.
296. Pink-footed goose, curlew and herring gull *Larus argentatus* were the only waterbirds recorded during field surveys. Flocks of pink-footed goose and curlew were observed foraging within the Site at high and low tide; both species are qualifying features of the Firth of Forth SPA, Ramsar site and SSSI. Curlews were regularly recorded during field surveys, whereas pink-footed geese were only recorded in early 2024.
297. Additionally, two grey partridges were incidentally recorded more than 500 m west of the Site in a nearby field. Field survey results are summarised in Table 6-7 and Figure 6.6 shows where target (and incidentally recorded) birds were observed foraging on the ground.

Table 6-7: Wintering bird survey results

Survey month	Tidal state	Species	Number of birds ⁴	Location and proximity to Site
October 2023	High	Curlew	40	In the adjacent field, south-west of the Site, where planning for Kincardine Grid Services Complex has been approved. ~20 m from the Site and 95 m from the substation footprint.
November 2023	Low	Curlew	44 + 5	Two groups in adjacent fields (one where planning for Kincardine Grid Services Complex has been approved and another north of KINN02). The larger group were within 5 m of the Site to the south-west and the smaller group were within the westernmost part of Site where it

⁴ Where large flocks occurred, counts are approximate.

Survey month	Tidal state	Species	Number of birds ⁴	Location and proximity to Site
				overlaps the adjacent field to the north-east. The closest individuals were ~75 m from the substation footprint.
		Herring gull	2	In an arable field approximately 450 m west of the Site and 550 m west of the substation footprint.
December 2023	High	Curlew	10 + 4 + 9	Three groups in adjacent fields (one where planning for Kincardine Grid Services Complex has been approved and another north of KINN02). The larger group were ~45 m south-west of the Site and the smaller group were within the westernmost part of Site where it overlaps the adjacent field to the north-east. The closest individuals were ~140 m west of the substation footprint.
January 2024	Low	No target species observed		
February 2024	High	Curlew	150 + 12 + 5	Three groups observed in fields west of the Site. The closest group was ~270 m from the Site and ~500 m west of the substation footprint.
		Pink-footed goose	200	In an arable field approximately 500 m west of the Site and ~800 m south-west of the substation footprint on the banks of the Firth of Forth.
March 2024	Low	Pink-footed goose	200 + 145	Two groups of birds were observed in the main arable fields within the Site. Some individuals were observed within the substation footprint.

298. Peak numbers of curlew and pink-footed goose observed within the Site or adjacent fields during one survey visit was 49 (in November 2023) and 345 (in March 2024) respectively which represents approximately 9% and 3% of the Firth of Forth SPA populations when considering the latest population estimates (Woodward *et al.*, 2015).

Great Crested Newt

299. No records of great crested newt were identified during the desk study. The nearest hectad within which great crested newt have been recorded on RecordPool is south of the Firth of Forth (a significant barrier to movement).
300. The desk study identified six waterbodies within 250 m of the Site. Two waterbodies, both located within the industrial yard north of the Site, were scoped out of further survey due to their being unsuitable; one was a large industrial tank at ground level with no means for a newt to access/egress, the other is a large artificial drainage area which rarely wets and contains sparse terrestrial vegetation.

301. The results of the HSI assessment and eDNA sampling for the ponds are provided in Table 6-8. Full details of the HSI assessment and eDNA analysis for each waterbody are provided in Appendix 6.2 Great Crested Newts and the location of each pond is identified on Figure 6.5.

Table 6-8. Great crested newt HSI assessment and eDNA survey results

Pond reference	Description	Relation to Site	HSI Score*	HSI suitability category*	eDNA analysis result**
KINN01	SuDS pond with poor water quality and high cover of common reed.	35 m west of the Site. Connected via Canal Burn.	0.68	Average	Negative
KINN02	Large SuDS pond with poor water quality. Open centrally with dense common reed around perimeter transitioning into marsh habitat.	Within Site. Upstream of Canal Burn.	0.72	Good	Negative
KINN03	Pond comprising two distinct areas of open water with moderate water quality, bordered by scrub. Southern area is peripherally vegetated with common reed and northern area is covered by bulrush.	20 m north of the Site. Upstream of Canal Burn.	0.73	Good	Negative
KINN04	Unknown	125 m south of the Site. No hydrological connectivity.	Unknown - no access to KINN04		
*As calculated/assigned following HSI methodology					
**As provided by SureScreen following water sample analysis					

302. Great crested newts live in a metapopulation structure comprising multiple breeding ponds typically within 500 m of one another (NatureScot, 2024c). Aside from the surveyed ponds (none of which support great crested newt), the nearest identified ponds to KINN04 are approximately 380 m east within a golf course and are separated by an active railway line as well as the A977 meaning KINN04 is highly isolated. Therefore, although KINN04 could not be accessed to confirm presence or absence via targeted survey, it is highly likely great crested newt are absent from this pond and the Site.

Other Common Amphibians

303. Records of other amphibians including common toad *Bufo bufo*, common frog *Rana temporaria*, and palmate newt *Lissotriton helveticus* are available on Record Pool within the hectads which overlap the Site. Common amphibians may occur along field margins or

within adjacent woodland and rough grassland habitats, particularly in proximity to wetland habitats such as ditches and ponds, but are highly unlikely to be present centrally within the Site where the substation footprint is situated. Considering the absence of optimal amphibian habitat in the area there is unlikely to be a significant population of common amphibians within the Site.

Reptiles

304. Common lizard *Zootoca vivipara* is present within the hectads overlapping the Site, as recorded via Record Pool. However, arable land is highly unfavourable for reptile species; which require habitats offering foraging, shelter, and basking opportunities, such as mosaics of rough grassland, moorland and scrub with open areas. Although common lizard and slow worm *Anguis fragilis* could occur in limited numbers along field edges and in surrounding habitats, the arable fields which dominate the Site are entirely unsuitable for these species. Furthermore, there is no suitable habitat in or around the Site for adder *Vipera berus*. Considering the limited availability of suitable habitat within the Site and poor connectivity due to enclosure by the A876 and A977 there are unlikely to be significant populations of any reptiles within the Site.

Fish

305. No records of fish were identified during the desk study; however, migrating Atlantic salmon are present within the River Forth, downstream of the Site according to NMPI. Watercourses which border the Site are not considered suitable for most notable fish species (including Atlantic salmon) for the following considerations:
- there is a high frequency of obstacles to migration (especially the numerous culverts)
 - water quality is poor and was observed to be both slightly brackish and with evidence of iron oxide deposits
 - substrate is likely soft which does not offer suitable spawning habitat, and
 - there is a lack of connectivity to suitable spawning habitat upstream (if present).
306. There is, however, limited suitability for watercourses within the Site to support eel. Without targeted survey to confirm presence/absence, eels are assumed to be present in watercourses around the Site on a precautionary basis.

Invertebrates

307. Two records of cinnabar moth *Tyria jacobaeae* and one record of grey dagger *Acronicta psi* were identified within 1 km of the Site during the desk study review. These records were provided by Fife Nature Records and were located south of the Site near Kincardine. Cinnabar moths show foraging preference for ragwort *Senecio jacobaea* as this is where they source the toxins which makes them unpalatable to predators (Dempster, 1982). Ragwort does not grow in intensively farmed arable fields since it cannot tolerate regular soil cultivation, hence is absent across the majority of the Site.
308. Grey daggers are most associated with broadleaved woodland so may be present around the Site, particularly to the south. There is no suitable habitat for grey daggers within the Site. Therefore, these important moth species are considered likely absent from the Site; however, it is possible a few cinnabar individuals may forage within the westernmost reach of the Site.
309. The Site is predominantly an area of arable crop which is species-poor and not likely to support any other notable invertebrates. Peripheral habitats within the Site are typical of those in the Eastern Lowlands and are not of particular value to invertebrate assemblages.

Non-native Species

310. No records of non-native flora were identified during the desk study; however, records of grey squirrel *Sciurus carolinensis* are interspersed with records of red squirrel on Saving Scotland's Red Squirrels, particularly around Kincardine town. Also, American mink *Neovison vison* has been recorded in National Grid Reference NS98 (within which the Site is situated) as part of the NWVDMP.
311. Japanese knotweed was noted in five locations along the drainage ditch to the south during field surveys, the locations of which are shown on Figure 6.4. In two incidences, individual plants were recorded and the remaining three comprised larger stands, between 5 and 20 m long. Old stems from the previous year were only noted at a single location. None of the plants observed exhibited particularly vigorous growth, and there was no definitive evidence of herbicide treatment. The stands were recorded to be sparse, with unhealthy individual stems present; this was considered a likely result of constant disturbance of the soil from agricultural activities.
312. Two stands of Japanese knotweed are adjacent to the proposed SuDS pond; one single plant on the opposite side of the unnamed tributary and a larger stand which has been frequently disturbed by agricultural activities. The larger stand is spread across approximately 10m², with old stems present and no signs of treatment. Tree planting is proposed for the south-east corner of the Site as part of the proposed landscape and biodiversity plan (discussed in Section 6.7: Mitigation). This is adjacent to the 20 m long stand comprising immature plants and a separate single stem of Japanese knotweed.

Future Baseline

Baseline at Time of Construction

313. Construction of the Proposed Development is anticipated to commence in 2026 and last for approximately 4-5 years. Land within the Site is managed predominantly as an arable field and as such is likely to be subject to routine operations, including ploughing, seeding and harvesting. Whilst in the intervening period between preparation of this chapter and commencement of construction it is anticipated that the field would change seasonally, it would remain arable in nature and the ecological value of this habitat would not change.
314. Subsequently, the status of most taxa discussed in the baseline would be expected to remain similar at the time of construction. Considering the rapid expansion of beaver across the Forth and Tay catchments, it is possible that beaver may settle in suitable habitat around the Site in future.
315. No designated nature conservation sites or other nature conservation designations (such as ancient woodland) would be affected by ongoing management. In respect of habitats, the existing peripheral habitats would be expected to largely remain intact and as described in the current baseline.
316. The assessment of impacts on ecological features presented in this chapter has therefore been conducted on the basis that habitats and the status/distribution of species will remain materially unchanged from the baseline conditions identified in this chapter by the time of construction of the Proposed Development.

Baseline in the Absence of the Proposed Development

317. For the purposes of considering the baseline in the absence of the Proposed Development for this chapter, a point twenty years in the future has been adopted.
318. In the absence of the Proposed Development, agricultural management of the arable fields which cover the majority of land within the Site would be likely to continue. The habitat within

the Site would therefore continue to be of relatively low ecological value. The small area of scrub in the west of the Site would likely mature and may marginally improve biodiversity.

319. As noted above, the rapid expansion of beaver across the Forth and Tay catchments indicates that the local beaver population will increase and individuals may settle in suitable habitat around the Site in future. Similarly, with their continued expansion in Scotland, pine marten density is expected to increase in the Fife region until it reaches carrying capacity.
320. Increasing average temperatures and more frequent/intense extreme weather events (e.g. heatwaves, floods, and droughts) that are projected to occur as a result of climate change may alter vulnerable habitats (e.g. wetlands) and are likely to result in a shift in the distribution of animal and plant species. Such changes are unlikely to be notable within the Application for the following reasons:
- the Proposed Development is situated in central Scotland, away from the extreme edges of many species distributions and unlikely to see a noticeable shift in the short-term; and
 - the vast majority of habitats are highly modified agriculturally managed fields, and although management may change in response to changing climate, the land is likely to remain agricultural in nature and of poor ecological value.
321. Otherwise, the conditions identified by the studies described in this chapter are likely to remain unchanged in the absence of the Proposed Development.

6.6 Likely Significant Effects

Embedded Mitigation

322. Embedded mitigation measures are incorporated into the design of a development and aim to avoid or reduce adverse effects, including those on ecological features. Embedded mitigation can be considered at the impact assessment stage, whereas specific mitigation measures which are not part of the design and are developed after the initial impact assessment, are assessed at a later stage when considering the residual effects.
323. The Proposed Development has sought to avoid impacts on ecological features through design in the following ways:
- The Proposed Development is located almost entirely in arable fields which are of very low ecological value. All access track infrastructure follows existing farm tracks or historic access routes, except where it would be constructed within arable fields.
 - All new watercourse crossings and upgrades will be designed following SEPA's Culverting of Watercourses - Position Statement and Supporting Guidance (SEPA, 2015) to allow passage of animals including fish and otter.
 - Widening of Hawkhill Road will be conducted southwards as far as possible, with no mature trees on the northern boundary of the road being felled. If northward extension is required, this will be done at gaps between trees.
 - The substation uses Gas Insulated Switchgear (GIS) technology which helps to reduce its overall footprint and minimise habitat loss.
324. In addition to the design mitigation measures already described, a range of measures that are standard good practice for developments of this type, and which are required to comply with environmental protection legislation, will also be implemented. These are well-developed and have been successfully implemented on infrastructure projects across the

country so there is a high degree of confidence in their success. They can therefore be treated as embedded mitigation. These will include:

- All personnel involved in the construction and operation (and decommissioning) of the Proposed Development will be made aware of the ecological features within the ZoI and the mitigation measures and working procedures that must be adopted. This will be achieved as part of the induction process and through the delivery of Toolbox Talks, where required.
- An Ecological/Environmental Clerk of Works (ECoW) will be employed for the duration of the construction of the Proposed Development. The remit of the ECoW will include, but may not be limited to:
 - carrying out pre-works checks for protected species and other important ecological features;
 - advising on exact infrastructure placement within micro-siting tolerances;
 - monitoring of, and advising on, storage of overburden to minimise habitat damage;
 - monitoring of any vegetated turves that may be stored for later reinstatement;
 - advising on habitat reinstatement;
 - monitoring of pollution control measures and advising on placement of ditches, settlement ponds, etc. to minimise habitat damage; and,
 - monitoring of protected species, and liaising appropriately to resolve any issues that arise, if necessary, including obtaining further derogation licence(s) and developing associated proportionate mitigation.
- A Construction Environmental Management Plan (CEMP) will be prepared and submitted for approval by Fife Council and Clackmannanshire Council, in consultation with SEPA and NatureScot, where necessary, prior to commencement of construction. The CEMP will set out all environmental management measures and the roles and responsibilities of construction personnel.
- Owing to the presence of Japanese knotweed within the Site, a Biosecurity Management Plan will be produced by a suitability qualified ecologist to mitigate risks and prevent spread of this INNS in accordance with legislation. This will include an updated survey to clarify the extent of INNS to be undertaken no more than three months prior to construction commencing. The appointed ECoW will oversee implementation of appropriate mitigation which is likely to include exclusion zones. Reference to the BMP, including associated roles and responsibilities, will be clearly detailed in the CEMP.
- During all phases of the Proposed Development, pollution prevention measures will be adopted, following SEPA Pollution Prevention Guidelines (PPG) and Guidance on Pollution Prevention (GPP), including the following:
 - controls and contingency measures will be provided to manage run-off from construction areas and to manage sediment;
 - all oils, lubricants or other chemicals will be stored in an appropriate secure container in a suitable storage area, with spill kits provided at the storage location and at places across the Site;

- in order to avoid pollution impacts to soils, vegetation and watercourses/waterbodies during construction, all refuelling and servicing of vehicles and plant will be carried out in a designated area which is bunded, has an impermeable base, and will be situated at least 50m away from any watercourse; and,
- where works in or on the banks of watercourses are required, appropriate isolation of the working area will be implemented;
- Works near or at any retained native trees or semi-natural woodland will follow guidance in British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations (British Standards Institution, 2012).
- Any artificial lighting required for construction works will be directional to avoid or minimise light spill beyond immediate works areas and will be of a sensitive nature, following Guidance Note GN08/23 Bats and Artificial Lighting At Night (ILP and BCT, 2023).
- Site preparation including vegetation clearance will take place, as far as possible, outside the general breeding bird season (March to August, inclusive). Where vegetation must be cleared in the breeding season, the appointed ECoW will carry out nesting bird check(s).
- Measures to prevent the injury or mortality of animals will be adopted, including:
 - excavations will be provided with a means of escape for animals that may fall in overnight, such as a ramp or battered slope;
 - ECoW will monitor the fencing of working areas to ensure no animals are trapped within;
 - except where required to remain open for passage of water, pipes that animals could enter will be capped overnight; and,
 - plant and machinery will be inspected before use each day to check for the presence of animals which may have taken shelter within or beneath.

Features Scoped out of Further Assessment

325. As stated under Assessment Scope in Section 6.4: Assessment Methodology, relevant ecological features are those that are ‘important’ and have the potential to be significantly affected by the Proposed Development (CIEEM, 2024). In view of the baseline data obtained through desk study and field survey, the features in Table 6-9 have been excluded from further assessment because they will not be significantly affected due to one or more of the following:
- a. available data indicates that they are likely to be absent from the Zol of the Proposed Development;
 - b. it is clear that no impact from the construction or operation of the Proposed Development is possible; and/or
 - c. they are features that, although identified as being ‘important’ by the criteria adopted in this chapter, are common and widespread and their conservation status is clearly not threatened by the Proposed Development.

Table 6-9: Ecological and ornithological features scoped out of further assessment

Feature	Rationale for exclusion from further assessment in this chapter
Ancient woodland	There is no ancient woodland within the Site. All areas of long-established plantation identified in the AWI in proximity to the Site are more than 100 m away hence will not be directly impacted by the Proposed Development. Where hydrological connectivity exists, long-established plantations are upstream of the Site. Therefore, there is no possible means by which the Proposed Development could indirectly impact these woodlands, including via pollution.
Arable fields	The arable fields which dominate the Site are species-poor and of very low ecological value. They are also subject to routine agricultural operations. Furthermore, fields of this nature are abundant throughout Scotland including the Eastern Lowlands.
All other terrestrial habitats not identified as being important under Habitats in Section 6.5: Baseline Conditions	Other habitat types which are common and widespread, both locally and nationally, were recorded within the Site. This includes neutral grassland, scrub, and broadleaved woodland which are of low floristic diversity, have limited conservation value, and/or will not be directly impacted by the Proposed Development.
Habitats identified as being important under Habitats in Section 6.5: Baseline Conditions but which lie outside the Site	LMDW identified during field survey which is of higher ecological value owing to the presence of ancient woodland indicators is located south and southeast of the Site, outside of the Site and 140 m from the substation footprint, hence will not be directly impacted by the Proposed Development. Furthermore, embedded pollution prevention measures mean that there will be no impact from pollution on these woodlands.
Ponds	There will be no direct impact on any ponds from the Proposed Development and embedded pollution prevention measures mean that there will be no impact from pollution.
Watercourses	The watercourses which run along the northern and southern edges of the Site are not considered important habitat, since they do not support a diversity of notable habitats / species. Implementation of standard pollution prevention measures (described under Embedded Mitigation above) mean that there will be no impact from waterborne pollution on these habitats. Culverts will be designed in adherence with SEPA guidance to avoid impacts on watercourses.
Great crested newt	Field survey indicates great crested newt is absent from three of the ponds within 250 m of the Site. Although presence/absence was not definitively confirmed at KINN04, the isolation of this pond in the wider environment, combined with the negative result from other ponds, means great crested newt is considered likely absent from the ZoI of the Proposed Development.

Feature	Rationale for exclusion from further assessment in this chapter
Water vole	No desk study records of water vole were identified, and field survey results indicate they are likely absent from the Zol of the Proposed Development. Furthermore, direct impacts on watercourses as result of watercourse crossings affect a very small extent of the available habitat and standard pollution prevention measures (described under Embedded Mitigation above) would be sufficient to avoid pollution impacts.
Beaver	<p>Watercourses within the Zol of the Proposed Development have very soft substrate and are generally not suitable for establishing beaver refuges. Furthermore, signs of beaver activity recorded during surveys was very old and comprised only minimal foraging evidence. Therefore, at present it is considered beaver are likely absent from the Zol of the Proposed Development.</p> <p>Furthermore, direct impacts on watercourses are very limited and standard pollution prevention measures (described under Embedded Mitigation above) would be sufficient to avoid pollution impacts. If beaver were to settle in watercourses around the Site, any possible impact would be minor and appropriately mitigated under licence where this is required.</p>
Brown hare and hedgehog	<p>It is likely that hedgehog occurs in areas of suitable habitat within the Site, along field edges and in adjacent woodland and scrub. Observations of brown hare were made within the Site, within arable fields.</p> <p>Both species are relatively common and widespread, and any potential impacts upon them will be easily mitigated through standard animal protection measures (described under Embedded Mitigation above). Furthermore, alternative habitat in the form of arable fields is common in the surrounding landscape and across NHZ16.</p>
Wildcat and mountain hare	The Site lies outside the recognised range of wildcat (JNCC, 2019), there is no suitable habitat for mountain hare, and no desk study records of these species were identified. It is therefore considered very likely these species are absent from the Zol of the Proposed Development.
Non-native animals (e.g. grey squirrel and American mink)	There is no mechanism by which the construction or operation of the Proposed Development could facilitate the spread of these non-native animal species, which are already believed from desk study information to be present around the Site.
Non-native plants	It is possible that non-native plants present within the Site could be spread as a result of the Proposed Development, in the absence of suitable measures. However, the embedded BMP will stipulate mitigation measures to prevent any spread and ensure compliance with legal obligations. Subsequently, the Proposed Development will not result in any spread of non-native species.

Feature	Rationale for exclusion from further assessment in this chapter
Non-breeding bird species that are not qualifying features of the Firth of Forth SPA, Ramsar site, and SSSI	Wintering birds including herring gull recorded during field surveys and fieldfare identified in the desk study may use the site for foraging over the winter. These species are typically wide ranging during the non-breeding period, and there is extensive alternative cropland habitat available in the wider landscape.
Common reptiles and amphibians	Records of only common lizard and common frog were identified by the desk study. Arable fields which dominate the Site do not provide suitable habitat for these species and other suitable habitat is extremely limited within the Site. Therefore, only small populations of these species are likely to be present if at all. Considering also that these species are relatively common and widespread, any possible impacts from the Proposed Development would not threaten their conservation status.
Fish (excluding eel)	Watercourses within and around the Site comprise agricultural drainage ditches which are unsuitable for most important fish species, except eel. Any other fish species which may be present are likely to be in small numbers and any possible impacts from the Proposed Development would not threaten their conservation status. The Firth of Forth (downstream of the Site) is used by migrating Atlantic salmon, however, standard pollution prevention measures (described under Embedded Mitigation above) mean that there will be no impact from water pollution resulting from the Proposed Development.
Invertebrates	Although two notable moth species were identified by the desk study, given the very poor quality and species diversity of habitats within the Site (mainly arable fields) it is considered very unlikely that the Site would support many notable invertebrates. Invertebrates which may occur within the Site are likely to be common and widespread, particularly in similar habitats across the Eastern Lowlands, and any possible impacts from the Proposed Development would not threaten their conservation status.

Importance of Ecological Features

326. The assessed importance of those ecological features identified in the baseline conditions, and which have not been scoped out under Features Scoped out of Further Assessment above, is set out in Table 6-10, together with a rationale. Importance has been assessed considering geographic scale, in accordance with CIEEM (2024) guidelines.

Table 6-10: Importance of ecological and ornithological features

Feature	Importance	Rationale
Firth of Forth SPA and Ramsar Site	International	This is a nature conservation site designated at an international level. Note that all Firth of Forth SPA and Ramsar site qualifying/notified bird features are assessed

Feature	Importance	Rationale
		as part of the designated site assemblage only, i.e. and not also as part of the 'wider countryside' population.
Firth of Forth SSSI	National	This is a nature conservation site designated at a national level.
Reedbed	Local	Reedbed SBL priority habitat is present in narrow margins within the Site around pond KINN02 and north of the Site around pond KINN03. As is the case within NHZ16, reedbeds around SuDS or in other wetlands can provide islands of semi-natural habitat in an otherwise highly modified landscape. However, reedbeds within the Site are only marginally greater than 5 m wide hence are on the cusp of qualifying as SBL priority habitat. Furthermore, these habitats are not uncommon and owing to the very small extent present within the Site, it is considered to be Locally important.
Bats	Local	The suitability of habitat on Site is of relatively low suitability for bats, comprising improved agricultural land, with limited linear features for commuting/foraging. The Proposed Development will involve the loss of open grassland field, which presents very limited opportunity for bat foraging.
Otter	Local	Otter receives legal protection through its listing on Schedule 2 of the Habitats Regulations and Schedule 5 of the WCA. Evidence of otter activity was found along watercourses and the edge of waterbodies around the Site, but the only refuge recorded was a layup in the southeast corner of the Site. Watercourses around the Site are relatively small and likely only support a small number of opportunistic otters, probably on an occasional basis to commute and forage. Considering the size of the national population (estimated to be around 8,000 individuals), and the widespread distribution across Scotland, including the Eastern Lowlands, the Site is assumed to support a population of otter of Local importance only.
Pine marten	Local	Pine marten is protected by Schedule 5 of the WCA. Pine marten may be present in woodland around the Site (two desk study records were identified); however, the arable fields which dominate the Site is unsuitable for this species. Furthermore, pine marten is relatively common nationally (e.g., Mammal Society, 2018) and in this part of central Scotland (e.g., Croose <i>et al.</i> , 2013). Consequently, the population within the Site is considered Locally important, at most.
Red squirrel	Local	Red squirrel is protected by Schedule 5 of the WCA. However, it is widespread and relatively common in suitable habitat in central Scotland, north of the central belt. The arable fields that dominate the Site are unsuitable

Feature	Importance	Rationale
		for red squirrel, however, red squirrels are likely to be present in woodlands around the perimeter of the Site.
Badger	Local	Badger receives legal protection as this species is susceptible to human persecution. It is a common and widespread species across lowland Scotland. The arable fields within the Site, are sub-optimal for badger sett creation; however, surrounding woodland and scrub offer good quality habitat for sett establishment. The Site offers potential foraging habitat, particularly around field edges and within grasslands. Nonetheless, the population of badger which may use the land within and in proximity to the Site is assessed as being of no more than Local importance.
Breeding birds (including important species)	Local	The Site and surrounding woodland/scrub offers suitable habitat for some common and important bird species including skylark, grey partridge, yellowhammer, and linnet. However, similar habitat is abundant in the surrounding area and species present are likely to be those which commonly occur within the Eastern Lowlands. As a result, populations of breeding birds in proximity to the Site are of Local importance.
Eel	Local	The waterbodies on Site are very small and negatively affected by pollution. They are also representative of many other watercourses across the Eastern Lowlands. Any presence of eels is highly likely to involve a very small number of individuals which are important at a Local scale.

Potential Impacts of the Proposed Development

327. The following broad categories of impact could arise during the construction and/or operation of the Proposed Development and are considered, where potentially relevant, in relation to each of the ecological features scoped in to detailed assessment in Table 6-10:
- temporary or permanent habitat loss (e.g. where temporary construction compounds are created, or the substation platform is constructed);
 - temporary or permanent changes to hydrological conditions which may affect vegetation and habitats (e.g. where water crossings or drainage measures are installed);
 - loss of habitat which supports protected and/or important species;
 - creation of barriers to animal movements (e.g. the construction of watercourse crossings could inhibit the movement of fish);
 - temporary disturbance and/or displacement of species during construction (e.g. foraging or roosting birds);
 - potential for direct mortality of species during construction (e.g. as a result of increased vehicular traffic);

- potential for direct mortality of species during operation (e.g. direct mortality of bats due to collision with substation infrastructure); and,
- potential to spread invasive non-native plant species.

Pollution during construction

328. Pollution of surface water, groundwater, soils and vegetation will be avoided through adoption of industry-standard good practice mitigation measures at all stages of the Proposed Development in order to meet legal and regulatory requirements. These measures are normal practice for development of this type and are considered as embedded.
329. According to the Institute of Air Quality Management (IAQM) (IAQM,2024) guidance, dust generated by plant and machinery on construction sites can have a ‘medium’ impact on habitats located at distances 20-50 m from works areas, and that this impact lessens with increasing distance. However, as stated previously, standard pollution prevention techniques will be implemented during the construction of the Proposed Development, and this will include dust suppression (for example through wetting of access tracks during periods of dry weather), where necessary. These measures are standard practice for a development of this type and therefore considered to be embedded.
330. The Design Manual for Roads and Bridges (DMRB) advises that air quality impacts only need to be assessed where a project will increase annual average daily traffic (AADT) of light vehicles (e.g. cars) by more than 1,000 movements and/or heavy-duty vehicles (HDV) by more than 200 movements (Standards for Highways, 2024). As set out in Chapter 9 of this EIAR, the increase in vehicular movements on all affected link roads generated by the construction of the Proposed Development is not predicted to be greater than 70 light vehicle and 158 HDV movements per day at the peak of construction. As this falls well below the screening threshold recommended in the DMRB, there will be no significant effect on any ecological feature as a result of airborne pollution generated by emissions from construction traffic.

Pollution during operation

331. The Proposed Development will not produce any emissions or pollution to air, water, or the ground.
332. No permanent lighting is proposed for the operation phase except for motion-activated security lighting which will be situated centrally within the Site around the substation footprint. Artificial lighting can negatively affect ecological features, particularly through behavioural alteration. However, effects reduce with increased distance from the lighting source. For example, the behaviour of light-sensitive bats can be disrupted within a radius of up to 50 m from the source (Azam *et al.*, 2018) and the substation footprint is at least 70 m from the field edge where more suitable foraging and commuting habitat is present.
333. It is anticipated security lighting will rarely be triggered during operation. This is because the Site is not readily accessible by the public since there is perimeter fencing to the north, east and south and a major road to the west. Once triggered, lights will remain illuminated for no more than a few minutes so any impact would be temporary.
334. Considering that the impact of artificial lighting is expected to be highly localized both spatially and temporally, it is concluded that this will not have a significant impact on any ecological features.
335. As discussed in Chapter 10 Construction and Operational Noise, the magnitude of operational noise levels are generally very low and can be easily habituated to. This is considered less impactful than intermittent noise generated by routine farming operations at

baseline, which is more likely to be perceived as a threat and cause disturbance. Furthermore, tree and hedgerow planting around the perimeter of the Site will act as a sound barrier, reducing the amount of noise-spill into surrounding habitats.

336. Only in emergency operation where a standby generator must be used would noise increase to a moderate level. Mitigation would be implemented to reduce or shield noise in this scenario and any possible impact on ecological features would be temporary.
337. Considering also the baseline noise levels from the adjacent A876 and active railway, operational noise will not have a significant impact on any ecological features.

Impacts on Firth of Forth SPA and Ramsar Site During Construction

338. Details of the impacts on the Firth of Forth SPA and Ramsar Site are included in Appendix 6.3: Information for Habitats Regulations Appraisal.
339. In summary the HRA concluded that there would be no significant effects on the SPA or Ramsar site from impacts including habitat loss and disturbance/displacement of qualifying features.

Impacts on Firth of Forth SSSI During Construction

340. The Firth of Forth SSSI is largely concurrent with the Firth of Forth SPA and Ramsar site, particularly at its closest point to the Site. Therefore, and although the notified features of the SSSI are not identical to the SPA/Ramsar site, for the same justifications as set out in Appendix 6.3: Information for Habitats Regulations Appraisal which remain applicable to all of the biological notified features of the SSSI, there will be no significant effects on the Firth of Forth SSSI from the Proposed Development during its construction phase and this is Not Significant.

Impacts on Reedbeds During Construction

341. Habitats listed on the SBL are considered to be of principal importance for biodiversity by Scottish Ministers. A small extent of Reedbed SBL priority habitat is present within the Site around the perimeter of pond KINN02 and is considered to be locally important. Reedbed habitat can be valuable where they provide patches of semi-natural wetland within larger areas of highly modified, intensively managed and ecologically less diverse farmland (as occurs within and around the Site). Works in proximity to reedbed habitat comprise the construction of a temporary access road (including an extended off slip road) from the A876. No works are required within the reedbed habitat.

Habitat Loss

342. No loss of reedbed habitat is anticipated from the Proposed Development since the temporary access road will follow a previously utilised route and road verge, and will remain on topographically higher ground with no need to extend into the basin of the existing SuDS. As a result, there will be No Effect from loss of reedbed which is Not Significant.

Spread of INNS

343. Japanese knotweed was identified on both banks of the unnamed watercourses which flows along the southern boundary of the Site. Implementation of biosecurity protocols identified in the BMP (produced as part of embedded mitigation) will prevent any spread of INNS, including Japanese knotweed.
344. Though highly unlikely (and illegal), if Japanese knotweed was introduced to the area, it may outcompete common reed at the dryer margins of the pond but is unlikely to do so in heavily waterlogged areas (Richards *et al.*, 2008). The subsequent loss of habitat would therefore be minor.

345. Consequently, spread of INNS is predicted to have Negligible Effect on reedbed priority habitat which is Not Significant.

Pollution

346. Waterborne pollution could theoretically damage reedbeds through transfer of pollutants in surface run-off. However, standard pollution prevention measures will be implemented, and it is unlikely that polluted surface water run-off will cause damage to this habitat. There is consequently predicted to be negligible effect on reedbed habitat as a result of waterborne pollution during construction.
347. Construction traffic may be a source of airborne pollution from the Proposed Development through stirring up dust and vehicle emissions. Reedbed habitat within the Site is in close proximity to the A876 and is surrounded by arable fields and therefore currently endures relatively high levels of air pollution at baseline. Effects of vehicle emissions on habitats are generally not regarded as significant where traffic flow is less than 1,000 vehicles or 200 heavy vehicles per day (Standards for Highways, 2024) and the rate of vehicular traffic during construction will be much less than these quantities. Furthermore, standard pollution prevention measures, such as wetting dirt tracks would be implemented throughout the construction period which would suppress any impact from dust. Therefore, airborne pollution is not considered a relevant impact to reedbed habitats.
348. There will consequently be Negligible Effect from water- or airborne pollution on reedbed habitat during construction, and this is Not Significant.

Impacts on Bats During Construction

349. There is very little opportunity for roosting bats within the Site, though two trees with the potential to support multiple roosting bats, and an additional tree with potential to support only a couple of bats were recorded during field surveys at the edge of the Site boundary. Limitations to field survey (as described under Limitations and Assumptions in Section 6.4: Assessment Methodology) mean trees south and east of the Site have not been subject to comprehensive GLTA so it is possible greater roost resource exists in these areas. Habitats within the Site itself are considered to be of Low suitability for commuting and foraging bats. Woodlands, occasional scattered trees and wetland habitats surrounding the Site offer more suitable habitat for bats to forage and commute along.

Loss of Potential Bat Roosts

350. Tree T01 (shown on Figure 6.5) is the closest tree with a PRF identified during field survey to proposed works; however, it is separated from the nearest component; the proposed temporary access route from the west, by the 2 m channel of Canal Burn. Therefore, the Proposed Development will not result in any damage to this tree. The remaining two trees with PRFs identified are located along the northern boundary, where the nearest proposed works is a SuDS feature at least 50 m away. There will, therefore, be no damage to these trees or their roots from construction activities.
351. The southern access road from Hawkhill, which has not been surveyed (see Limitations and Assumptions in Section 6.4: Assessment Methodology), is bordered by a line of semi-mature to mature trees which may contain suitable features for roosting bats. As specified under Embedded Mitigation in Section 6.6: Likely Significant Effects, any widening of this road will be done so southwards as far as possible and it is not proposed to fell any trees within this line to enable the Proposed Development.
352. Subsequently, there will be No Effect from direct loss or damage to potential bat roost sites.

Disturbance of Roosting Bats

353. There are no trees within 100 m of the substation footprint, hence there will be no disturbance of roosting bats from the main works.
354. Works in proximity to trees with identified PRFs and wooded areas not surveyed (which may contain trees with PRFs) comprise construction of a temporary access route, construction of SuDS ponds, widening of an existing road, and tree planting. These works may cause disturbance; however, it is important to consider the baseline level of disturbance when assessing this impact on bats (Reason and Wray, 2023). Currently, the Site is subject to routine farming operations including ploughing and harvesting which involve the use of heavy, noisy machinery on an occasional basis. Furthermore, and particularly relevant to T01, baseline disturbance includes that from vehicular movement along the A876, including large lorries.
355. Works in proximity to trees involve the use of standard construction machinery, such as excavators and dumper trucks, which would not be dissimilar in their impact from tractors and combine harvesters used for routine farming operations which occur at baseline. Furthermore, these ancillary works are not anticipated to take long (a small part of the construction programme). Increases to vehicular traffic from the Proposed Development will be most notable along the southern access track from Hawkhill, although this too is frequented by large farm vehicles at baseline. Considering the low numbers of vehicle movements anticipated during construction of the Proposed Development, and bats' abilities to habituate to vibration and noise levels, construction traffic is unlikely to cause disturbance to bats potentially roosting in these trees.
356. Disturbance as a result of the Proposed Development is unlikely to have a significant effect on roosting bats (i.e. is unlikely to alter the conservation status of any bat species) due to:
- the small number of PRFs identified (the closest of which to proposed works is suitable for only a couple of individuals and not a maternity/hibernation colony);
 - the large distance between the main works and trees (with the potential to have PRFs);
 - the extent of available mature woodland south-east of the Site which is likely to contain alternative roost resource that will remain sheltered from any noise and vibration;
 - the low quality of habitats within the Site for bats meaning there are likely to be few individuals present and at risk;
 - the type and duration of works in proximity to potential roosts; and,
 - the moderate baseline levels of disturbance.
357. As stated under Embedded Mitigation in Section 6.6: Likely Significant Effects, any lighting used for construction works will be directional to avoid light spill onto ecological features. The use of lighting near trees around the perimeter of the Site will be avoided as far as possible and, where needed, will be directed so as not to illuminate any trees with potential to support roosting bats. There will thus be no effect from artificial illumination of bat roosts.
358. It is therefore concluded that there will be Negligible Effect on roosting bats from disturbance during the construction phase and this is Not Significant.

Loss or Obstruction of Commuting/Foraging Habitats

359. The Proposed Development will have a negligible effect on watercourses from the perspective of bat commuting and foraging. Watercourses are poor quality for foraging and commuting at baseline, with few trees, highly disturbed riparian vegetation and minimal

invertebrate communities expected due to the influence of brackish water and agricultural pollutants. Therefore, bats are unlikely to frequently use these as commuting routes. New/upgraded water crossings are assumed to extend to a maximum length of 12 m (typically in the order of up to 5-8m but for the purposes of the assessment a worst case of 10-12m has been assumed) which are unlikely to act as a barrier if watercourses are used as a commuting route as bats have been recorded successfully crossing motorways of greater width when following tree lines in the wider landscape (Abbott *et al.*, 2012).

360. Felling of immature broadleaved trees in the west of the Site is required to facilitate temporary access to the Proposed Development. However, this would be at a very small scale in an already fragmented habitat (less than 350m² of immature willows will be removed). This copse of willows is isolated by the adjacent A876 and large expanse of highly modified agricultural land (which is poor quality for foraging bats), so it is unlikely to be accessed by many bats for foraging and is not an important resource.
361. For similar reasons, the adjacent SuDS pond (KINN02) is unlikely to be an important foraging resource for bats. Considering the isolation of this feature in the landscape, loss of the nearby copse of trees would not disrupt access beyond baseline conditions, where poor connectivity exists. Construction of additional SuDS ponds as part of the site drainage design could in the longer term increase foraging opportunity within the Site by supporting invertebrate communities.
362. Therefore, the minimal loss of immature trees and the slight increase in wetland habitat for foraging/commuting bats is considered likely to have Negligible Effect on bats and this is Not Significant.

Disturbance of commuting/foraging bats

363. The main component of the Proposed Development (the substation) is situated centrally within the Site, more than 70 m from the field edges where habitats of greater value for commuting/foraging bats are present. Therefore, the greatest risk of disturbance to commuting/foraging bats arises from vehicular movement and ancillary works (i.e. works associated with watercourse crossings and construction of adjacent access roads and SuDS features).
364. During the bat activity season (approximately April to September/October), construction works will predominantly take place during daylight hours (considering standard working hours are 07:00-19:00 and it is light in central Scotland during this period, certainly between May and August inclusive) with minimal activities required outside standard working hours (see Chapter 4: Project Description). Where works are required around dawn/dusk or during hours of darkness, any lighting used will be directed onto works areas and away from the perimeter of the Site where better habitat for foraging/commuting is located (as detailed under Embedded Mitigation above).
365. Disturbance to foraging or commuting bats as a result of construction activities is therefore unlikely and, even if it were to occur, would impact bats over a very small area relative to comparable habitat present within the wider landscape. Furthermore, low suitability of habitats within the Site means few individuals are likely to be present and at risk of being disturbed.
366. It is therefore concluded that there will be a Negligible Effect on foraging and commuting bats from disturbance during the construction phase and this is Not Significant in EIA terms.

Impacts on Otter During Construction

367. Minimal evidence of otter activity was recorded during field surveys and habitats within the Site are unlikely to be supportive of holts, though otter are present and active around the perimeter of the Site where the two watercourses flow. It is likely that the watercourses are utilised by opportunistic otter commuting throughout the wider landscape. Otters receive legal protection under the Habitats Regulations. However, the Scottish otter population is estimated at approximately 8,000 individuals and it is believed that the species may now be nearing carrying capacity (Harris and Yalden, 2008). Fish represent between 50-95% of the diet of otter (Chanin, 2003) but other prey sources can be seasonally important, including spawning amphibians and young waterbirds. Otter territories are generally very large, extending up to 21km in size for females and 48km for males (Harris and Yalden, 2008).

Resting Otter (Loss of Refuges/Disturbance)

368. One layup was recorded during field survey outside of the southeastern corner of the Site and more than 200 m from the nearest main construction works; the construction of a new SuDS feature. Since there are no resting sites within the Site, there will be no loss of such features.
369. The only otter resting site recorded during field surveys is not at risk of disturbance from the main construction works associated with the substation platform and permanent access arrangements as it is more than 30 m away (NatureScot, 2024c). However, resting otter could be disturbed by tree planting in the south-eastern corner of the Site (approximately 5 m from the recorded layup). These works will take place during daylight hours, when otters are less likely to use layup features. Layups are typically less important to otter than holts since the restricted cover makes them more vulnerable. Disturbance over a few days to one rest site within an otter's territory would have negligible effect on that individual's ability to survive and certainly no effect on the local population.
370. Sections of watercourse which could not be surveyed are not considered at risk of disturbance owing to the presence of the A876 (to the west of the site) and railway line and embankment (to the east) which would shield features in the unlikely event they are present, dampening the effects of noise and vibration. The use of artificial lighting during construction will be minimised and, where required, will be directed onto works areas to avoid light spill towards the identified layup.
371. Consequently, construction activities associated with the Proposed Development are anticipated to have Negligible Effect on resting otters. Nonetheless, a licence would be required from NatureScot where a 30 m buffer zone around the layup cannot be maintained.

Loss of Commuting/Foraging Habitat

372. Two watercourse crossings are required as part of the access from the A876; one upgrade of an existing crossing of an unnamed ditch that connects to the existing SuDS pond east of the A876, and one new crossing of the Canal Burn. It has been assumed that each watercourse crossing point will extend to a maximum length of 12 m, meaning the total possible loss of watercourse which could be used by foraging otters is 19 m (accounting for the proposed upgrade and new watercourse crossing). This is very small in the context of an otter territory (which, as stated, can extend over tens of kilometres), and will have no material effect on the success of otter foraging, especially considering affected watercourses offer poor suitability for prey species.
373. Watercourse crossings will not create any permanent barrier to movement since the upgraded culvert will remain as passable to fish and otter it is at baseline, and the new water crossing will be designed to adhere to SEPA guidance and remain passable to otter and other

aquatic species. Furthermore, otter readily use passable culverts and bridge structures (e.g. Serronha *et al.*, 2013).

374. During the construction of watercourse crossings, if works will span multiple days, works areas will be left so as to be passable to otter, e.g. by ensuring there are means to leave and re-enter the watercourse if the channel is diverted. Since otters are highly mobile and capable of crossing terrestrial habitat (e.g. Ozkazanc *et al.*, 2019), this will not reduce available commuting habitat but will temporarily reduce available foraging habitat at a small scale. Considering the degree of habitat loss combined with low prey availability in affected watercourses and greater prey resource elsewhere, construction and upgrading of watercourse crossings will not affect an otters' ability to forage within its large territory.
375. It is therefore considered that there will be Negligible Effect on otter from the loss of commuting or foraging habitat and this is Not Significant.

Changes to Prey Resource

376. There will be no likely significant effects as a result of pollution of watercourses during construction due to implementation of standard mitigation measures. During the installation of watercourse crossings, this will include ensuring that works areas are dry (for example by over-pumping or temporarily diverting the watercourse). There will consequently be no impacts on aquatic fauna (potential otter prey) as a result of aquatic pollution.
377. The new watercourse crossing will be designed in line with SEPA guidance to maintain fish passage and the upgraded culvert will be designed to improve/retain passage compared to the existing structure. Movement of aquatic species would, therefore, only be affected temporarily during construction works when drying of the works area is required.
378. Considering the small length of affected watercourse, the risk of fish casualties during construction of watercourse crossings is likely to affect few individuals, if any (see Impacts on Eels During Construction below), and loss of a small number of potential prey items would certainly not influence an otters' ability to survive.
379. Construction of a new SuDS pond, if suitable, may support amphibians and on the longer term marginally increase the prey resource for otter. This change would have a negligible effect on foraging otter considering the foraging resource which already exists within an individual's territory.
380. Consequently, there would be Negligible Effect on otter from changes to prey resource during construction and this is Not Significant.

Disturbance Whilst Commuting/Foraging

381. Standard working hours during construction are 07:00-19:00 and it is daylight in central Scotland during this period, certainly between May and August inclusive. However, over the autumn and winter months, up to five and a half standard working hours will be during dawn/dusk/in darkness (when otters are most active). Furthermore, some activities may be required outside these standard working hours (see Chapter 4: Project Description). Any lighting used (including temporary security lighting or where works are required around dawn/dusk or during hours of darkness) will be directed away from watercourses to minimise the potential impact of disturbance on otter (as per Embedded Mitigation above).
382. The main component of the Proposed Development (the substation) is situated centrally within the Site, more than 100 m from the nearest watercourse. Therefore, the greatest risk of disturbance to commuting/foraging otter arises from vehicle movement, ancillary works (works associated with watercourse crossings and construction of adjacent access roads and SuDS features), and landscaping (tree and scrub planting). Otter in the area will have

habituated considerably to vehicular traffic owing to the proximity of the A876 and regular farming activity, so disturbance from construction traffic will be limited. If otter commuting and/or foraging around the Site were to be disturbed by on-going works, this is very unlikely to have a significant effect on the local population for the following reasons:

- the area which could possibly be impacted will be very small relative to the size of an otter territory;
- the number of individuals which could possibly be impacted is likely to be very small (one or two individuals plus possibly mobile cubs) considering the territorial nature of otter;
- the watercourses around the Site with potential to be impacted by works do not provide optimal foraging resource or cover and are highly likely to be of lower value to foraging otter compared to, for example, the Firth of Forth (which is located just over than 200m from the Site); and
- effects would be temporary due to standard working hours and the duration of the construction phase.

383. Nonetheless, positioning of the Site means that disturbance of surrounding watercourses could temporarily disrupt movement between nearby foraging resources (the Firth of Forth and Peppermill Dam). There would still be a negligible effect on otters considering the vastness of their territories and that disturbance would be temporary.

384. Consequently, disturbance from construction activities of the Proposed Development will have a Negligible Effect on commuting/foraging otter which, in the context of this EIA, is Not Significant.

Injury or Mortality

385. As described above, works will largely take place in daylight, and therefore mostly outside periods when otters are most active. Vehicular traffic volumes will be low and all vehicles will be bound by standard construction site safety protocol to travel at low speeds. Considering also the motility of otter and that otters in the area are used to avoiding vehicles associated with regular farming activities, the probability of otter casualties as a result of vehicle collision during construction is extremely low. Standard measures to protect all animals from harm during construction will be implemented, including providing a means of escape from excavations, etc. (see Embedded Mitigation above).

386. It is therefore concluded that there will be Negligible Effect on otter from injury/mortality and this is Not Significant.

Impacts on Pine Marten During Construction

387. Pine marten are omnivorous and feed on small rodents, birds, beetles, carrion and vegetative matter, including berries. They inhabit woodland areas but will incorporate open habitats including tussocky grassland and scrub within their home range (Kubasiewicz, 2014). The Scottish pine marten population is estimated by NatureScot (2024b) as being 3,700 adults and is believed to be increasing. The species range has also increased from the core Highland region and pine marten are now present across much of the country.

Habitat Loss

388. No mature trees or established woodland would be lost as a result of the Proposed Development, and less than 350 m² of immature willow scrub, one of the few habitats theoretically suitable for use by pine marten within the Site, would be lost. However, the affected patch of scrub is isolated in a largely agricultural landscape and is situated adjacent

to the A876, both of which are likely to be avoided by pine marten (Stringer *et al.*, 2018). It is therefore highly unlikely pine marten utilises this small patch of immature woodland.

389. Subsequently, there is considered to be No Effect on pine marten from habitat loss.

Destruction/Disturbance of Dens

390. There is no optimal habitat for pine marten den establishment within the Site, hence there is no risk of a pine marten den being damaged or destroyed during construction activities associated with the Proposed Development.
391. As the woodland south of the Site was not comprehensively surveyed, there is potential for it to contain pine marten den sites. Historically pine marten natal dens were associated with arboreal cavities; however, owing to the lack of mature woodland in Scotland a range of den types are now utilised, including bird nests and squirrel dreys (Birks *et al.*, 2005). In lieu of comprehensive survey, this assessment assumes pine marten dens are present on a precautionary basis. Considering the territorial nature of pine marten, and their typical home range, the Proposed Development could disturb, at most, one pair from their respective dens (including the possibility of a natal den).
392. The closest works to this woodland are construction of a SuDS pond and access track whilst the main substation footprint is more than 150 m from the woodland edge. Tree planting will also take place along the edge of this woodland; however, the nature of this activity is unlikely to disturb resting pine marten considering baseline conditions. Whilst vehicle movements have the potential to cause disturbance, if this was the case, any suitable den sites would already be avoided at baseline due to regular farming activities which take place within the arable fields.
393. Therefore, the greatest risk of disturbance of pine marten dens relates to construction of the south-western access road and the southernmost SuDS feature. The works to construct this SuDS would be short-term in nature, and much less than the overall construction programme. Any possible disturbance would therefore be temporary, and over a short period of time.
394. Pine martens use multiple den sites, so displacement from a non-natal den would have negligible effect. In the event of the worst possible outcome, disturbance during construction could result in a single female failing to reproduce one year (for example, by abandoning young in the natal den). However, the distribution of pine marten is expanding throughout the Eastern Lowlands (Croose *et al.*, 2013) and this is unlikely to have a detrimental impact on the local population.
395. On balance, and notwithstanding legal obligations regarding pine marten which can be addressed through pre-construction surveys, it is concluded that possible disturbance of a single natal den will have a Negligible Effect on pine marten which is Not Significant in the context of this EIA. Nonetheless, a licence would be required from NatureScot where a 30 m or 100 m buffer zone around non-breeding or breeding dens cannot be maintained.

Disturbance Whilst Commuting/Foraging

396. Standard working hours during construction are 07:00-19:00 when it will be daylight in central Scotland, certainly between May and August inclusive. However, over the autumn and winter months, up to four standard working hours will be during dawn/dusk/in darkness (when pine martens are most active). Furthermore, some activities may be required outside these standard working hours (see Chapter 4: Project Description); however, these are likely to relate to construction of the substation which is more than 100 m from the woodland edge. Where works are required around dawn/dusk or during hours of darkness, any lighting

used will be directed away from woodland edges to minimise the potential impact of disturbance on pine marten (as per Embedded Mitigation above). Any temporary security lighting will also be directed away from woodland edges.

397. Disturbance of commuting/foraging pine marten will therefore largely be avoided, especially as pine marten are unlikely to venture into the arable habitats within the Site (Stringer *et al.*, 2018). In the unlikely event that a foraging or commuting individual is disturbed during construction activities, this is likely to cause minimal impact since there is ample habitat more suited to pine marten available south of the Site which would remain undisturbed. Furthermore, the response of commuting/foraging pine marten to disturbance from construction activities in proximity to woodland habitats can be expected to be similar to their response to regular farming activities which occur at baseline. Construction of the south-western access road and the southernmost SuDS feature, which are closest to suitable pine marten habitat, will be completed in a relatively short period of time, and considerably less than the overall four to five-year construction programme. Any possible disturbance would therefore be temporary, over the short-term.
398. It is therefore considered that there will be Negligible Effect on commuting/foraging pine marten from disturbance during construction.

Injury or Mortality

It is considered extremely unlikely there would be any pine marten casualties during construction for the following reasons:

- As described in the paragraphs above, construction work will occur mostly outside periods when pine martens are most active;
 - vehicular traffic volumes will be low and all vehicles will be bound by standard construction site safety protocol to travel at low speeds;
 - it is likely only a couple individuals are present in the area, if any;
 - pine marten are a highly vigilant and motile species;
 - pine marten typically avoid open agricultural fields (Stringer *et al.*, 2018);
 - any individuals in the area would be accustomed to avoiding vehicles associated with regular farming activities; and
 - standard measures to protect all animals from harm during construction will be implemented, including providing a means of escape from excavations, etc. (see Embedded Mitigation above).
399. On the basis of the above, it is predicted that there will be No Effect on pine marten from injury or mortality during construction of the Proposed Development, and this is Not Significant.

Impacts on Red Squirrel During Construction

Habitat Loss

400. The only habitat within the Site suitable for use by red squirrel is a line of trees in the far south-west of the Site, however, they are likely present within the woodlands which surround the Site, particularly to the south. The line of mature trees in the far south-west of the Site will not be felled as part of the Proposed Development, nor will there be any direct loss of surrounding habitats. Therefore, there will be No Effect from habitat loss on red squirrel.

Disturbance Whilst Resting/Breeding

401. It is possible that squirrel dreys are present in the woodland adjacent to the Site. The maximum disturbance distance considered for breeding dreys is 50 m (NatureScot, 2024c), so whilst disturbance of red squirrel dreys could theoretically occur as a result of construction activity, the area prone to such disturbance will be small. The only construction activities within 50 m of the adjacent woodland is the construction of one SuDS pond and the south-westerly access road. Construction of these components will be completed in a relatively short period of time and disturbance would be temporary. There will also be minimal vehicular traffic passing the woodland; however, red squirrels within the surrounding woodlands will be habituated to noise and vibration from heavy machinery since regular farming activities occur within baseline conditions. Tree planting will take place along the woodland edge; however, the nature of this activity is unlikely to disturb red squirrel considering baseline conditions. Furthermore, red squirrels use multiple dreys within their home range and are frequently observed moving kits from one to another.
402. Consequently, displacement from a drey due to disturbance from construction activities would have Negligible Effect on red squirrel. Nonetheless, a licence would be required from NatureScot where a 5 m buffer zone around non-breeding or 50 m buffer zone around breeding dreys cannot be maintained.

Injury or Mortality

403. As red squirrels are arboreal and rarely visit the ground (especially into open areas of unsuitable habitat as is present across the Site), they are at low risk of traffic collision. Movement of construction vehicles along tracks will also be infrequent and slow-moving, and standard measures to protect all animals from harm during construction will be implemented, including providing a means of escape from excavations, etc. (see Embedded Mitigation above).
404. It is therefore concluded that there will be No Effect on red squirrel from injury or mortality during the construction phase, and this is Not Significant.

Impacts on Badger During Construction

405. Although badger receive legal protection from harm and disturbance, this is primarily due to persecution of this species. Badgers are common and widespread through much of mainland Scotland, with between 7,300-11,200 main setts estimated to exist (Rainey *et al.*, 2009).

Destruction/Disturbance of Setts

406. No definitive evidence of badger activity was recorded during field surveys; however, one possible outlier sett was recorded on outside of the Site. NatureScot (2024a) advise that disturbance of badgers occupying a sett can occur up to 30m from typical construction works, this being extended up to 100m for more disruptive activities such as piling and blasting. As the identified outlier sett is more than 100 m from the substation, drainage, and access components, and on the opposite side of security fencing, the possible sett is not at risk of damage, destruction or obstruction. There is no risk of disturbance to a badger occupying the sett from most construction activities; however, tree planting will occur next to the disused sett. If this sett was to become active during construction, it is at risk of mild disturbance, though the nature of this activity means disturbance is unlikely.
407. It is also possible other setts may be present within the inaccessible woodland south of the Site; however, high levels of badger activity would be expected in proximity to a main sett.

Since this was not the case along the southern edge of the Site it is considered unlikely a main sett is present towards the edge of the adjacent woodland.

408. There will be no direct impact on habitats surrounding the Site so if there are unidentified setts present, they are not at risk of destruction or obstruction during the construction phase.
409. The main substation footprint is more than 100 m from the non-surveyed area so there is no risk of the main works disturbing badgers occupying unidentified setts. However, works associated with construction of the south-westerly access road and southernmost SuDS pond may disturb badgers occupying a sett (if any are present within the adjacent woodland). The nature of these works means only setts within 30 m would be considered at risk of disturbance. Badgers are fairly resilient to human activities, and any setts so close to an intensively managed arable field would be subject to frequent noise and vibration from regular farming activities at baseline.
410. Considering the above, it is concluded there would be, at most, Negligible Effect on badger setts from construction activities, and this is Not Significant. Nonetheless, a licence would be required from NatureScot where a 30 m buffer zone around sett entrances cannot be maintained.

Habitat Loss

411. Although no definitive evidence of badger activity was recorded, the Scottish Badger Distribution Survey (Rainey *et al.*, 2009) estimates that main badger setts occur at highest densities in areas dominated by broadleaved woodland, arable farmland and intensive grassland, as occurs within and around the Site. Arable fields are typically suboptimal for foraging but can be an important secondary resource (NatureScot, 2018). The Proposed Development would, therefore, result in the loss of up to 31 ha of foraging and commuting habitat. Badger territories are wide ranging, with territories spanning 100-300 ha (Kruuk, 1989), and in the context of the wider landscape, this loss is unlikely to impact any local clans' ability to survive and would certainly not affect the conservation status of badger.
412. It is therefore concluded that there will be Negligible Effect on badger from loss of commuting/foraging habitat and this is Not Significant.

Injury or Mortality

413. Standard working hours during construction are 07:00-19:00 and for a large part of the year it is daylight in central Scotland during this period, certainly between May and August inclusive. However, over the autumn and winter months, up to four standard working hours will be during dawn/dusk/in darkness (when badgers are active). Furthermore, some activities may be required outside these standard working hours (see Chapter 4: Project Description).
414. There will be an increase in the volumes of vehicular traffic during the construction phase of the Proposed Development, both within the Site and along approach routes. However, it is not anticipated that the Proposed Development would result in increased injury or mortality of badgers for the following reasons:
- the majority of works will take place during the day when badgers are securely ensconced in their setts;
 - the major approach road (the A876) experiences high traffic volumes as standard so the increase would be trivial;
 - badger occurrence is likely to be rare within the Site owing to the lack of evidence found during field survey;

- vehicles will be restricted to low speeds when moving within the Site; and
- standard good practice mitigation measures to reduce the risk of badger injury or mortality (such as providing a means of escape from excavations) will be implemented, as described under Embedded Mitigation above.

415. Consequently, there will be Negligible Effect on badger from injury or mortality during construction and this is Not Significant.

Impacts on Breeding Birds During Construction

Loss of Nesting Habitat

416. The Site predominantly offers suitable habitat for ground nesting birds. Based on the baseline information, skylark and grey partridge are considered to be important species that are most likely to nest in open agricultural habitats or field margins
417. The Proposed Development would result in the permanent loss of up to 31 ha of this habitat. Grey partridge densities vary from 1.3 to 18.4 pairs per km² (Sotherton *et al.*, 2014) with high densities occurring where favourable habitat management practices are implemented. Based on a density of 0.5 skylark pairs per ha (Donald and Vickery, 2000) and 18.4 grey partridge territories per km², this could equate to the loss of up to 15 skylark territories and six grey partridge territories. This is highly likely to be an overestimate given the detrimental impacts of intensive farming practices, though remains a negligible fraction of the UK populations (estimated to be 1.6 million skylark territories and 37 thousand grey partridge territories in 2016 (Woodward *et al.*, 2020)). Furthermore, agricultural fields akin to those within the Site are abundant in the surrounding area, particularly to the north and west, meaning alternative breeding habitat is plentiful.
418. The Site also offers suitable habitat for scrub nesting species such as yellowhammer. Up to 350 m² of willow scrub will be cleared to enable the construction of an access road from the west of the Site. Whilst theoretically suitable, this patch of scrub is unlikely to be an important nesting resource since:
- it is an extremely small patch of immature scrub;
 - the scrub is relatively isolated from other wooded habitats; and
 - nesting birds would be highly disturbed by the adjacent A876.
419. Given the availability of better-quality alternative habitat in the landscape surrounding the Site which is more extensive and better connected, the minor loss of isolated scrub habitat is considered insignificant.
420. There will be no direct loss of any woodlands, so woodland nesting birds will not be affected by habitat loss.
421. It is therefore concluded that permanent loss of nesting habitat will have Negligible Effect on local bird populations which is Not Significant.
422. Regardless of the above, active nests of all wild birds are protected under the WCA. Therefore, site preparation including vegetation clearance will be planned to take place, as far as possible, outside the general breeding bird season (March to August, inclusive). Where vegetation must be cleared in the breeding season, the appointed ECoW (as described under Embedded Mitigation above) will carry out nesting bird checks and establish any exclusion zones as required.

Disturbance while Nesting

423. Woodlands surrounding the Site have the potential to support nesting birds, including barn owl which may nest in a nearby castle which is 200 m south of the Site and 460 m south of the substation footprint. Baseline levels of disturbance originating from routine farming operations (including ploughing and harvesting) and traffic along the A876 mean some level of habituation can be expected from birds nesting in this area. Also, considering that the major component of the Proposed Development (the substation footprint) is located centrally within the Site, away from surrounding habitats, the risk of disturbing nesting birds within the woodlands is minimal. Works around the perimeter of the Site, adjacent to woodland, comprise construction of SuDS ponds and access roads, and tree planting associated with landscaping. Furthermore, the woodland habitat extends for approximately 700 m southeast of the Proposed Development, providing ample suitable habitat away from disturbance during construction.
424. It is therefore concluded that disturbance of nesting birds within surrounding woodland habitats will have Negligible Effect which is Not Significant.

Impacts on Eels During Construction

425. Owing to the habitats present, the only important fish species which may be present in watercourses around the Site is eel.

Injury or Mortality

426. In-channel works are required for the upgrade of one existing watercourse crossing and the construction of one new watercourse crossing. Works will last a fraction of the works schedule and will involve temporarily drying up to a maximum of 24 m of watercourse (though this is likely to be closer to 16 m). It is possible for injury or mortality to occur during construction works; however, works are highly localised and would affect few individuals, if any. Furthermore, eels are capable of living and navigating out of water for a long time, which reduces the risk of mortality.
427. Considering the extent of similar watercourses in the surrounding landscape, the chances of eel being present in the extremely small stretch of watercourse affected by the Proposed Development is minimal. Furthermore, injury or mortality of few individuals is unlikely to have a significant effect on the local eel population which occurs at higher densities elsewhere in the River Forth catchment (Forth Rivers Trust, 2025).
428. It is therefore concluded that there will be Negligible Effect on eels from injury or mortality as a result of the Proposed Development and this is Not Significant.

Barriers to Movement

429. The new watercourse crossing will be designed in line with SEPA guidance to allow fish passage and the upgraded culvert will be designed to improve/retain passage compared to the existing structure. Therefore, any impact from blocking movement would only occur when the crossings are being constructed/upgraded.
430. As works will be short-term, there will be Negligible Effect on eel from preventing movement up-/downstream temporarily, and this is Not Significant.

Pollution

431. Waterborne pollution could theoretically affect the water environment through transfer of pollutants in surface run-off. However, standard pollution prevention measures will be implemented, and there will be no pollution of watercourses which could damage this habitat.

432. There will consequently be No Effect from waterborne pollution on eels during construction, and this is Not Significant.

Impacts from Maintenance During the Operation Phase

433. Since the Proposed Development will be operated remotely, visits by people and vehicles will only be for maintenance activities as required. This is unlikely to need more than a small team, however, should more extensive, unplanned works be required this would involve more staff and a longer duration of works. Therefore, operational impacts would only arise in the event that larger maintenance works are required, and it is anticipated this would occur very infrequently, if at all. Depending on the works required, possible impacts may include those identified for construction above, but at a lesser magnitude.
434. No construction impacts were found to have significant effects; therefore, it is concluded that maintenance work during the operational phase would have No Significant Effect on any ecological features.

6.7 Mitigation

435. Specific mitigation measures will be implemented to minimise the adverse effects on ecological features identified in this chapter. In some cases, measures will be implemented where these can be readily achieved even where the effects have been assessed as Not Significant in EIA terms.
436. Furthermore, in certain instances, measures will be required to ensure compliance with relevant wildlife legislation, even when an effect which is not significant in EIA terms on a relevant species was concluded. Some of these measures are considered as embedded but are repeated here in greater detail for clarity.

Habitat Retention/Reinstatement

437. The temporary access route from the west will be micro-sited to avoid the loss of reedbed SBL priority habitat. The area to avoid will be demarcated by the appointed ECoW using, for example, brightly coloured setting out flags and/or posts and rope.
438. All habitats affected by construction of the temporary access road, excluding arable fields and willow scrub, will be reinstated post-works.
439. These measures will be detailed clearly in the CEMP.

Habitat Creation and Landscaping

440. Tree, scrub, and hedgerow planting will be carried out as part of the landscape plan (portrayed in Figure 7.5). This will offset minor loss of immature scrub and enhance the overall biodiversity value of the Site (as described in Section 6.9: Biodiversity Enhancement).

Woodland, Tree and Scrub Planting

441. More than 5 ha of broadleaved woodland and dense scrub will be planted in a number of locations on the margins of the Site, expanding the existing mature woodland to the south. Planting will be planned to achieve a complex vertical structure with a graded woodland edge which transitions into scrub. Woodlands will be designed to integrate with existing species assemblages present around the Site, using native species of as local provenance as possible (Forestry Commission Scotland, 2006), and certainly no INNS⁵.
442. Consequently, trees planted in the southern areas will mostly comprise birch and willow, and will aim to resemble the canopy of the adjacent LMDW. In the north, the existing

⁵ Any species listed in Annex B of the Developing with Nature Guidance (NatureScot, 2023).

woodland block is dominated by ash *Fraxinus excelsior*; however, due to the prevalence of ash dieback in Scotland⁶, it is not recommended that ash trees are planted within the Site. Where trees are planted adjacent to waterbodies (such as the unnamed burn that flows along the southern border), suitable riparian species will be used. These will comprise locally native willows (including rarer species such as tea-leaved willow *Salix phylicifolia*, dark-leaved willow *Salix myrsinifolia*, and purple willow *Salix purpurea* where possible) and common alder *Alnus glutinosa*.

443. Additional suitable tree and scrub species which will be used across the Site include:
- aspen *Populus tremula* (a priority species in Fife LBAP);
 - blackthorn *Prunus spinosa*;
 - elder *Sambucus nigra*;
 - hairy dog rose *Rosa caesia* and/or soft downy rose *Rosa mollis* (if neither species can be sourced dog rose *Rosa canina* is also suitable);
 - hawthorn *Crataegus monogyna*;
 - pedunculate oak *Quercus robur* and/or sessile oak *Quercus petraea*;
 - rowan *Sorbus aucuparia*; and,
 - wych elm *Ulmus glabra*.

Hedgerow Creation

444. Continuous species-rich hedgerow will be created in a number of locations on the margins of the Site. Hedgerows will contain at least five native scrub species of as local provenance as possible, and certainly no INNS⁵. Suitable species listed for use in woodlands above are also be suitable for use in hedgerows.

Grassland Creation

445. The remainder of the Site not used for the permanent components of the Proposed Development (substation footprint and access tracks) will be sown to form neutral grassland using an appropriate seed mix containing native species and certainly not containing any INNS⁵ (e.g. Scotia Seeds⁷ MG5 Meadow Mix). Owing to the enrichment of soil through agricultural activities, a species-rich meadow is unattainable.

Update Surveys for Protected Species and Species Protection Plan

446. Currently, NatureScot considers pre-application survey data for relevant protected species present within the Zol of the Proposed Development to be out-of-date after two years/two survey seasons (NatureScot, 2024c). Surveys to update the baseline would be required if the planning application is delayed beyond this period and/or to inform any license application.
447. If required, update surveys will cover protected species known to occur in the vicinity of proposed works, or for which there is a reasonable possibility of such species moving into this vicinity. This will comprise surveys for otter, water vole, beaver, and badger. In addition, a GLTA of any trees which may be directly impacted (i.e. subject to lopping or felling), or located within 30 m of works with potential to cause disturbance to roosting bats, will also be conducted. However, lopping, felling and pruning of trees is not currently anticipated to be

⁶ Ash dieback is a disease caused by the fungus *Hymenoscyphus fraxineus* which causes leaf loss and crown dieback. It is often fatal to young trees.

⁷ <https://www.scotiaseeds.co.uk/>

associated with the Proposed Development. These surveys will follow standard guidance and will take place within the survey buffers typically required by NatureScot (2024c).

448. As described above, even where effects on protected species are predicted to be Not Significant, the refuges of these species, and often the animals themselves, are nevertheless subject to legal protection regardless of the importance of individual refuges or populations. As prescribed under Embedded Mitigation in Section 6.6: Likely Significant Effects, pre-commencement surveys will be carried out to ensure compliance with legislation. These surveys will be carried out no longer than three months prior to commencement of works. The results of the surveys will be detailed in a Species Protection Plan (SPP), which will also include the results of the surveys described in this chapter. The SPP will be submitted to the appointed construction contractor, Fife Council and Clackmannanshire Council. The SPP will provide detailed information on the measures which must be adopted during construction works to comply with relevant legislation and which are described in the remainder of this section.

Species-specific Mitigation Measures

Bats

449. This impact assessment is carried out under the assumption that there will be no direct impact on any trees identified as having suitability to support roosting bats or that were not surveyed for potential roost features. However, should it be determined that such impacts (e.g. branch lopping) be necessary, then further survey will be conducted, in accordance with the BCT guidelines (Collins, 2023).
450. No other specific mitigation is required for bats, with all other impacts expected to have negligible effect on bats.

Otter

451. As set out above, an update survey for otter will be carried out if required, as determined by a suitably experienced ecologist, and the ECoW will also carry out pre-construction surveys for otter in advance of works. The known layup will be monitored for use, although it is beyond 30 m of most works activities except tree planting, so disturbance is not likely to occur (NatureScot, 2024c). A licence will be sought from NatureScot to enable tree planting within 30 m of the layup, if necessary.
452. All watercourse crossings will be constructed in line with SEPA guidance to maintain passage of otter and fish under most conditions. The final design details of watercourse crossings will be provided prior to commencement of works to SEPA for appropriate consultation.
453. Works within 30 m of watercourses (works associated with watercourse crossings or construction of adjacent access roads and SuDS features) will take place during daylight hours only (no in-channel works will be carried out between 1 hour before sunset and 1 hour after sunrise).
454. No other specific mitigation is required for otter, with all impacts expected to have negligible effect on this species.

Pine Marten and Red Squirrel

455. As set out above, the ECoW will carry out pre-construction surveys for these species in advance of works.
456. If any pine marten dens or red squirrel dreys are identified within distances where they are vulnerable to disturbance from construction works (NatureScot, 2024c), these must be carried out under licence to permit the potential disturbance of that ecological feature.

457. No other specific mitigation is required for pine marten and red squirrel, with all impacts expected to have negligible effect on these species.

Badger

458. As set out above, an update survey for badger will be carried out if required, and the ECoW will also carry out pre-construction surveys for badger in advance of works. The suspected badger sett will be monitored for use, though this is beyond the distance at which disturbance as a result of works activities is likely to occur and not likely to be subject to impacts, except in relation to tree planting.
459. If the sett becomes active, a licence will be sought from NatureScot to enable tree planting within 30 m of the sett entrance.
460. No other specific mitigation is required for badger, with all impacts expected to have negligible effect on this species.

Birds

461. No specific mitigation is required for birds, with no impacts expected to have a significant effect on this group.
462. However, site preparation including vegetation clearance will take place, as far as possible, outside the general breeding bird season (March to August, inclusive). Where vegetation must be cleared in the breeding season, the appointed ECoW will carry out nesting bird check(s) (as described under Embedded Mitigation in Section 6.6: Likely Significant Effects) in advance of works and establish any exclusion zones as required.

Eel

463. eDNA survey will be carried out to confirm the presence/absence of eel in Canal Burn. If present the following additional mitigation will be implemented:
- In-channel works will be scheduled to avoid crucial fish spawning/migration windows depending on what species are identified through eDNA (i.e. August-October and April-June, inclusive for eels).
 - Regardless of timings of works, a qualified aquatic ecologist will be employed to carry out fish rescue when the works areas along watercourses are initially dried. This will involve relocating eels from the from the works areas prior to drying and preventing them from re-entering until works are complete and the flow is returned. This will prevent mortality during construction.
464. No other specific mitigation is required for eel, with all impacts expected to have negligible effect on this species.
465. However, per Embedded Mitigation in Section 6.6: Likely Significant Effects, all watercourse crossings will be constructed in line with SEPA guidance to maintain passage for otter and fish under most conditions. The final design details of watercourse crossings will be provided prior to commencement of works to SEPA.

6.8 Residual Effects

466. For the purposes of this assessment, only effects which are judged as being Regionally, Nationally or Internationally Significant (according to the CIEEM method for Ecological Impact Assessment) were considered to be Significant in EIA terminology. On this basis, no Significant effects were predicted on any ecological features in the absence of any mitigation. Measures to further reduce adverse effects have been included where they can

be readily achieved even where the effects have been assessed as Not Significant in EIA terms. Furthermore, in certain instances, measures will be required to ensure compliance with relevant wildlife legislation, even when an effect which is not significant in EIA terms on a relevant species was concluded

467. Subsequently, all residual effects are, at most, **Negligible**, hence all effects of the Proposed Development on important ecological features (during both construction and operation) are **Not Significant** in EIA terms.
468. Habitat creation through landscaping (woodland, scrub, hedgerows, and grassland) will have a beneficial effect (of Negligible significance) on the following ecological features:
- bats;
 - pine marten;
 - red squirrel;
 - badger; and
 - nesting birds.

6.9 Biodiversity Enhancement

469. In compliance with the requirements of policy 3 of NPF4, the SPT is committed to delivering a range of measures which are positive for biodiversity as part of the Proposed Development. These measures will be set out in fuller detail following granting of planning permission in a Landscape and Biodiversity Strategy (LBS). The LBS will take a synergistic approach to minimising the permanent ecological and landscape effects of the Proposed Development whilst also seeking to enhance the biodiversity value of the Site. It will be submitted to Fife Council and Clackmannanshire Council for approval, in consultation with NatureScot, prior to the commencement of any construction activities associated with the Proposed Development. The LBS will include all habitat creation summarised under Habitat Creation and Landscaping in Section 6.7: Mitigation as well as the following additional measures and will detail a monitoring programme to ensure the desired outcomes are achieved.

SuDS Design

470. The SuDS ponds will be designed to appear and function as naturally as possible in line with guidance (Woods Ballard *et al*, 2015). Where possible, this will include the following measures to benefit biodiversity
- The features will remain permanently wet;
 - Edges will be appropriately sloped (gradually declining to provide different water levels). Where possible, the SuDS pond will be constructed to have a variety of different depths, with banks of varying steepness, to provide structural diversity;
 - Marginal areas which are seasonally inundated will be seeded with an appropriate wetland herb seed mix containing native species and certainly not containing any INNS⁵ (e.g. Scotia Seeds⁷ Pond Edge Mix graded into Wet Meadow Mix).

Other Measures

471. Brash from scrub clearance to facilitate the western access will be retained within the Site and arranged into log piles at woodland edges.

Benefits for Biodiversity

472. Implementing the above habitat creation, SuDS pond design and deadwood provision will greatly improve biodiversity within the Site; especially considering baseline conditions largely comprise highly modified arable fields.
473. Woodland, scrub, and grassland habitats are generally of higher ecological value than arable fields, owing to the greater diversity of plant species which occur. Creation of more diverse habitats within the Site fulfils FIFEplan Policy 13: Natural Environment and Access by enhancing natural heritage.
474. Woodland and scrub (including hedgerows) also provide food and shelter for a range of wildlife which likely occur in the general area, including bats and red squirrel which are both priority species in the Fife LBAP. Furthermore, riparian woodland can increase the value of watercourses by providing shade which helps to regulate water temperature and provide shelter for faunal species that may utilise the watercourses. Integrating rarer willow and rose species (which are native to this region) has the added benefit of reinforcing the national populations and further increasing diversity.
475. Neutral grasslands, as will be created within the Site, support a greater diversity of wildlife than arable habitats and may support invertebrates, small mammals, and birds of prey. Rough grassland can also support ground nesting birds such as skylark and grey partridge which are priority species associated with the lowlands.
476. Nature-friendly SuDS pond design provides conditions suitable for more diverse habitats and will support a greater invertebrate assemblage, subsequently increasing the foraging resource for species such as bats and birds. Furthermore, ponds are a priority habitat in the Fife LBAP.
477. Utilising brush from essential scrub clearance to provide deadwood within the Site will offer opportunities for food and shelter to a range of wildlife. They are of particular importance to hedgehog, reptiles and amphibians for hibernation, as well as many invertebrate species.
478. The spatial arrangement of woodlands, scrub, and hedgerows within the Site substantially improves connectivity with similar habitats in the wider landscape. Also, the mosaic of open grassland, increased tree/scrub cover, and new/improved waterbodies provides synergistic benefits by meeting providing varying habitat types suitable for different behaviours and life stages.
479. Although the above measures will not be implemented at a scale sufficient to have a beneficial effect of Local Significance, at a Site level, these enhancements will have a permanent beneficial effect of Site significance.

6.10 Monitoring

480. In cases where mitigation measures are well-established, routinely implemented, and have a proven track record of effectiveness, ongoing monitoring is generally not required (CIEEM, 2024). Therefore, no monitoring is considered necessary for the majority of mitigation measures set out in Section 6.7.
481. However, an LBS will be prepared that details a monitoring programme of biodiversity enhancement actions (including habitat creation and landscaping) to ensure the desired outcomes are achieved for both biodiversity and landscaping.

6.11 Cumulative Assessment

482. Inter-cumulative (in-combination) effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2024). As noted in Section 6.8: Residual Effects, there are no significant residual effects from the Proposed Development.
483. Where there is no possibility of an effect (as opposed to a small but insignificant effect), there cannot be any cumulative effect with other projects or plans as there will be no addition from the Proposed Development.
484. Similarly, for all impacts for which it was concluded that there would be Negligible Effect, it is considered that the effect of that impact from the Proposed Development in isolation will be so minimal that it is highly unlikely that there is any possibility of significant cumulative effects arising from the combined impact(s) of other identified projects (see Table 2-2).
485. As a result with the mitigation measures described above implemented, all residual effects are, at most, Negligible, the Proposed Development will not act cumulatively with other projects to give rise to significant adverse effects on ecological features.
486. Note that a separate in-combination assessment on qualifying features of the Firth of Forth SPA and Ramsar site is provided in Appendix 6.3: Information for Habitats Regulations Appraisal.

6.12 Summary

487. Table 6- below summarises the outcome of impact assessment during construction, showing the pre-mitigation effect, residual effect and final significance (significant or not significant). No Likely Significant Effects on any important ecological features during the construction phase were identified during the impact assessment.
488. Per the assessment in Appendix 6.3, loss of functionally-linked habitat and disturbance and displacement of qualifying species resulting from the Proposed Development will not have a significant effect on the Firth of Forth SPA and Ramsar site. For the same reasons given in Appendix 6.3 for the SPA/Ramsar site, there will be no significant effect on the Firth of Forth SSSI.
489. It is also considered that there would be No Likely Significant Effects on any important ecological features from the Proposed Development during its operational phase for the following reasons:
- there will be no emissions or pollution to air, water, or the ground;
 - the Proposed Development will not be permanently lit, motion activated security lighting will be used;
 - operational noise levels will be low, less startling than baseline farming operations, and can easily be habituated to; and
 - any impact from maintenance works would be less than during construction.
490. Habitat creation and landscaping and other enhancement measures will have a permanent positive effect of negligible significance on biodiversity.

Table 6-11. Summary of construction effects on ecological features

Ecological feature	Ecological importance	Description of impact ⁸	Effect	Mitigation	Residual effect	Significance
Reedbed priority habitat	Local	Habitat loss	No Effect	Demarcation of avoidance zone around habitat.	No Effect	Not Significant
		Spread of INNS	Negligible Effect	Embedded measures identified by BMP.	Negligible Effect	Not Significant
		Pollution	Negligible Effect	Embedded standard pollution controls.	Negligible Effect	Not Significant
Bats	Local	Loss of potential bat roosts	No Effect	Mature trees will not be felled or lopped to accommodate access.	No Effect	Not Significant
		Disturbance of roosting bats	Negligible Effect	Embedded lighting design and working hours.	Negligible Effect	Not Significant
		Loss or obstruction of commuting/foraging habitat	Negligible Effect	Tree and scrub planting and creation of new SuDS ponds increases habitat suitability for bats within the Site.	Negligible Effect	Not Significant
		Disturbance of commuting/foraging bats	Negligible Effect	Embedded lighting design and working hours.	Negligible Effect	Not Significant
Otters	Local	Resting otter (loss of refuges/disturbance)	Negligible Effect	Maintain a 30 m buffer around otter layup where possible and obtain a derogation licence where not possible.	Negligible Effect	Not Significant

⁸ Impacts arise during construction unless otherwise specified.

Ecological feature	Ecological importance	Description of impact ⁸	Effect	Mitigation	Residual effect	Significance
		Loss of commuting/foraging habitat	Negligible Effect	Embedded passable design of new watercourse crossing.	Negligible Effect	Not Significant
		Changes to prey resource	Negligible Effect	Embedded passable design of new watercourse crossing.	Negligible Effect	Not Significant
		Disturbance whilst commuting/foraging	Negligible Effect	Embedded lighting design and working hours. Works within 30 m of watercourses will take place during daylight.	Negligible Effect	Not Significant
		Injury or mortality	Negligible Effect	Embedded working hours and low vehicle speeds.	Negligible Effect	Not Significant
Pine martens	Local	Habitat loss	No Effect	Tree and scrub planting and rough grassland creation will improve habitat suitability for pine marten within the Site.	Negligible Effect	Not Significant
		Destruction/disturbance of dens	Negligible Effect	Maintain a 30 m buffer around dens (100 m if used for breeding) where possible and obtain a derogation licence where not possible. Construction of south-westernmost access road will be carried out between June and February.	Negligible	Not Significant
		Disturbance whilst commuting/foraging	Negligible Effect	Embedded lighting design and working hours.	Negligible Effect	Not Significant

Ecological feature	Ecological importance	Description of impact ⁸	Effect	Mitigation	Residual effect	Significance
		Injury or mortality	No Effect	Embedded working hours and low vehicle speeds.	No Effect	Not Significant
Red squirrels	Local	Habitat loss	No Effect	Tree planting will increase available habitat suitable for red squirrel within the Site.	Negligible Effect (Permanent Beneficial Effect of less than Local Significance)	Not Significant
		Disturbance whilst resting/breeding	Negligible Effect	Maintain a 5 m buffer around dreys (50 m if used for breeding) where possible and obtain a derogation licence where not possible.	No Effect	Not Significant
		Injury or mortality	No Effect	Embedded low vehicle speeds.	No Effect	Not Significant
Badgers	Local	Destruction/disturbance of setts	Negligible Effect	Maintain a 30 m buffer around sett entrances where possible and obtain a derogation licence where not possible.	Negligible	Not Significant
		Habitat loss	Negligible Effect	Grassland creation offers more suitable foraging habitat for badgers than baseline conditions. Tree and scrub planting will also increase habitat suitability of the Site for use by badgers.	Negligible Effect	Not Significant

Ecological feature	Ecological importance	Description of impact ⁸	Effect	Mitigation	Residual effect	Significance
		Injury or mortality	Negligible Effect	Embedded working hours and low vehicle speeds.	Negligible Effect	Not Significant
Breeding Birds	Local	Loss of nesting habitat	Negligible Effect	Tree planting and scrub/hedgerow creation increases habitat suitable for tree nesting birds. Rough grassland creation offers suitable nesting habitat for some ground nesting birds.	Negligible Effect	Not Significant
		Disturbance while nesting	Negligible Effect	Site preparation will not take place during breeding season (March to August, inclusive) where possible. Exclusion zones around active nests will be demarcated where not possible.	Negligible Effect	Not Significant
Eels	Local	Injury or mortality	Negligible Effect	eDNA survey and fish rescue if eels are present.	No Effect.	Not Significant
		Barrier to movement	Negligible Effect	In-channel works which block fish passage will be minimised during autumn as far as possible.	Negligible Effect.	Not Significant
		Pollution	Negligible Effect	Embedded standard pollution controls.	Negligible Effect.	Not Significant

6.13 References

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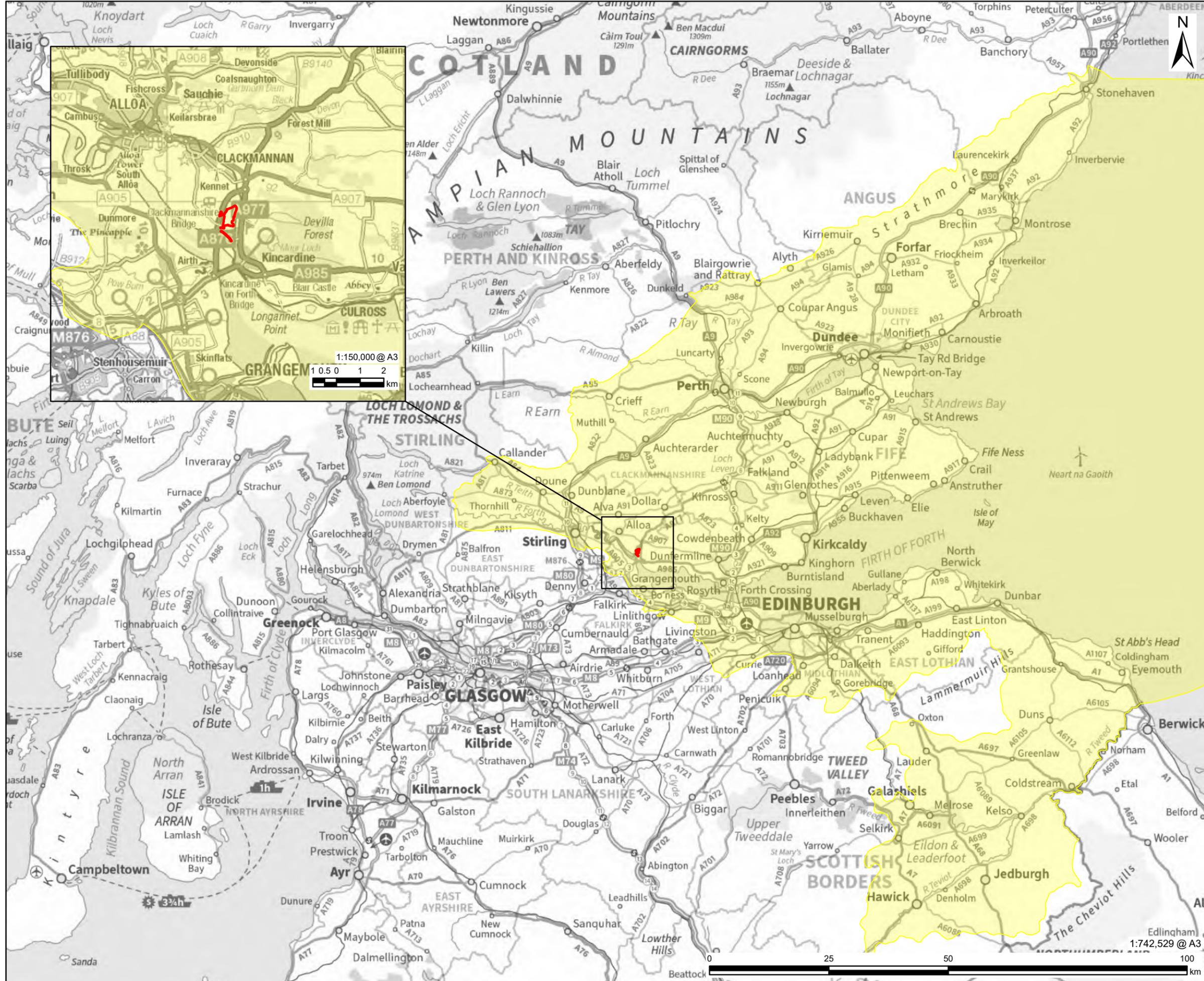
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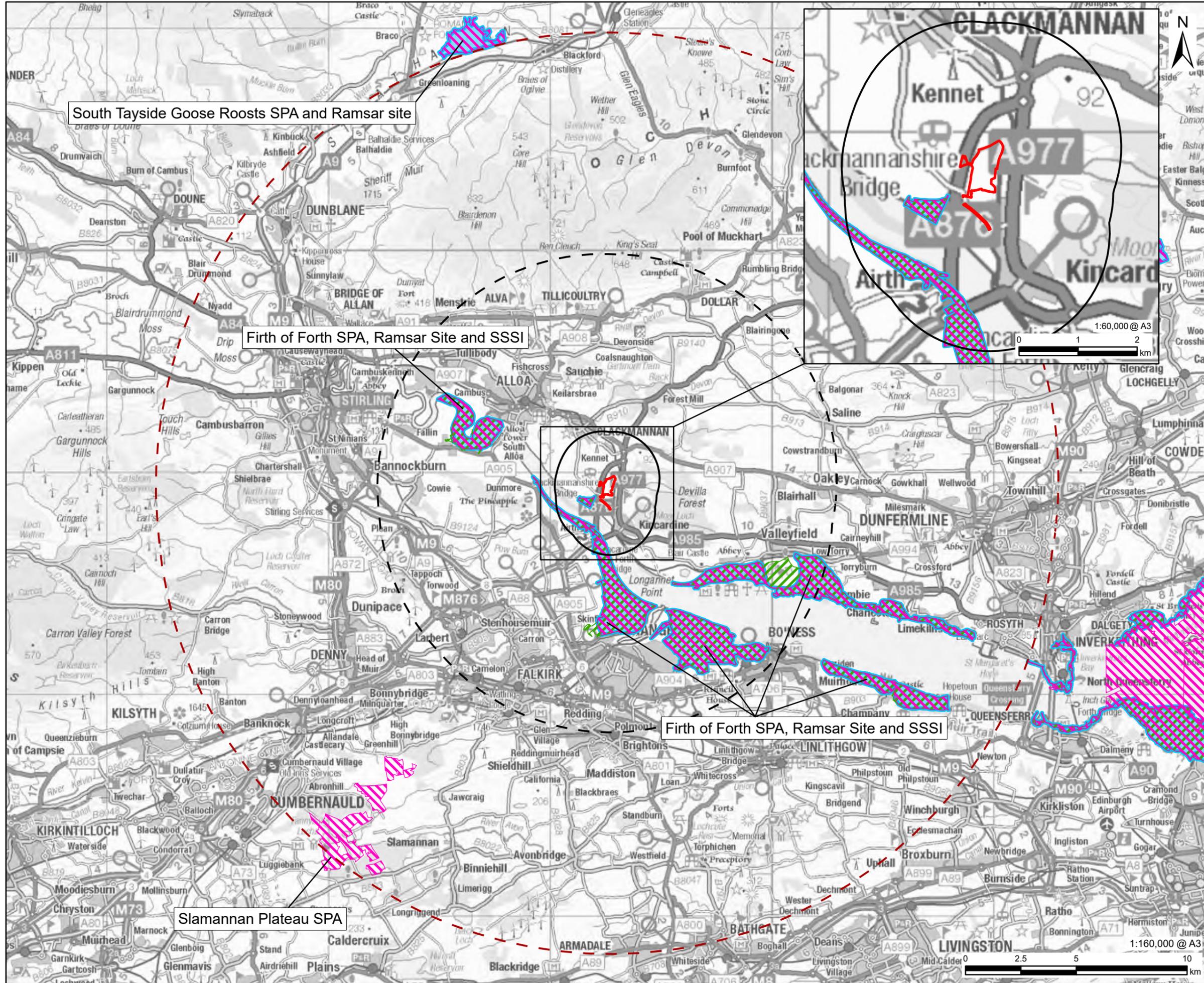


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FIGURE TITLE
Site Location

FIGURE NUMBER
Figure 6.1



PROJECT
Kincardine North Substation
400 kV

CLIENT
SPEN

CONSULTANT
AECOM Limited
www.aecom.com

LEGEND

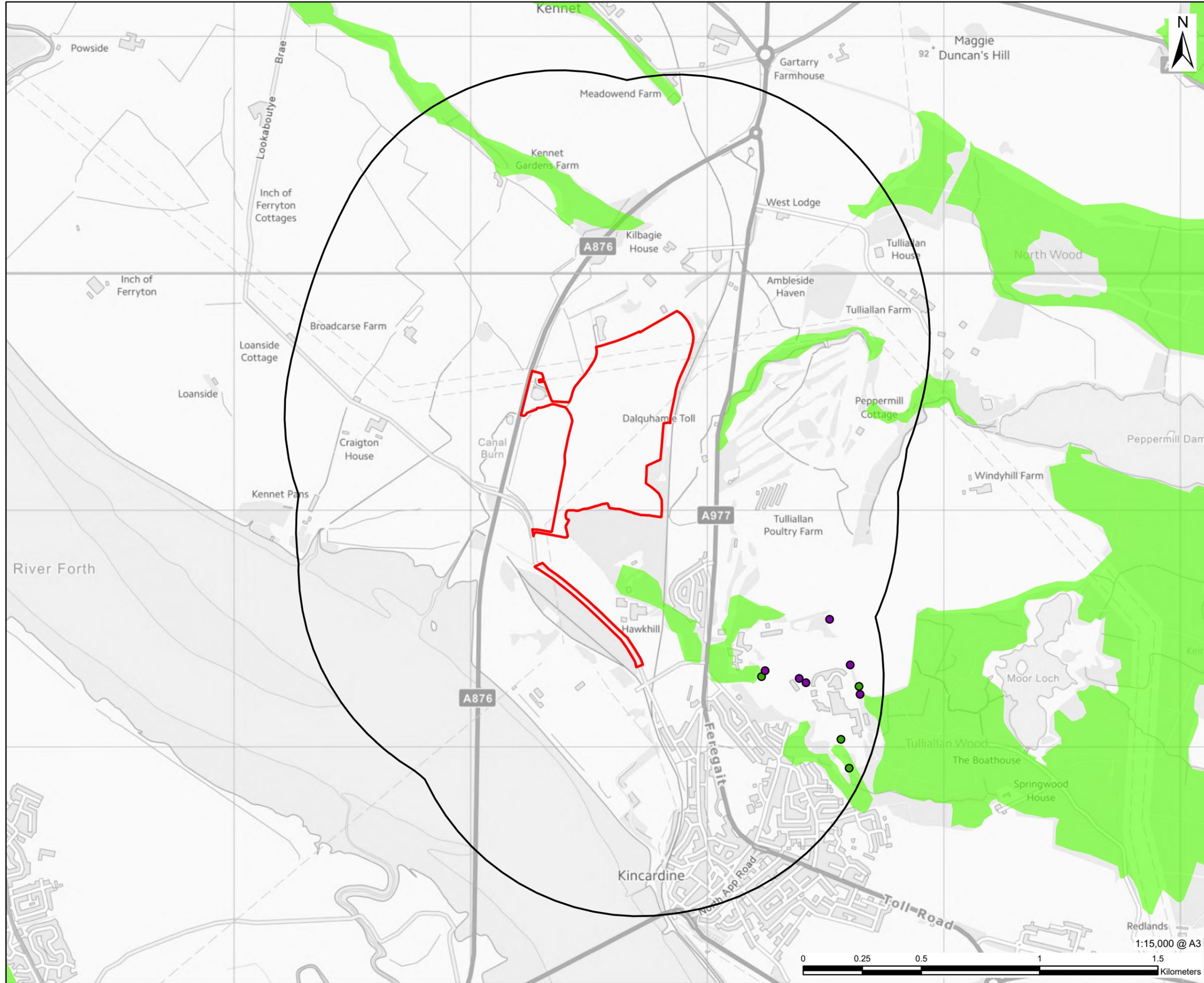
- Site
- Desk study 2 km search area
- Desk study 10 km search area
- Desk study 20 km search area
- Statutory Designated Sites**
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Wetland of International Importance (Ramsar Site)

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FIGURE TITLE
Statutory Designated Sites

FIGURE NUMBER
Figure 6.2



PROJECT
Kincardine North Substation
400 kV

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- LEGEND**
- Site
 - Desk study 1 km search area
 - Ancient Woodland Inventory**
 - Long-established (of plantation origin)
 - Ancient Tree Inventory**
 - Veteran tree
 - Notable tree

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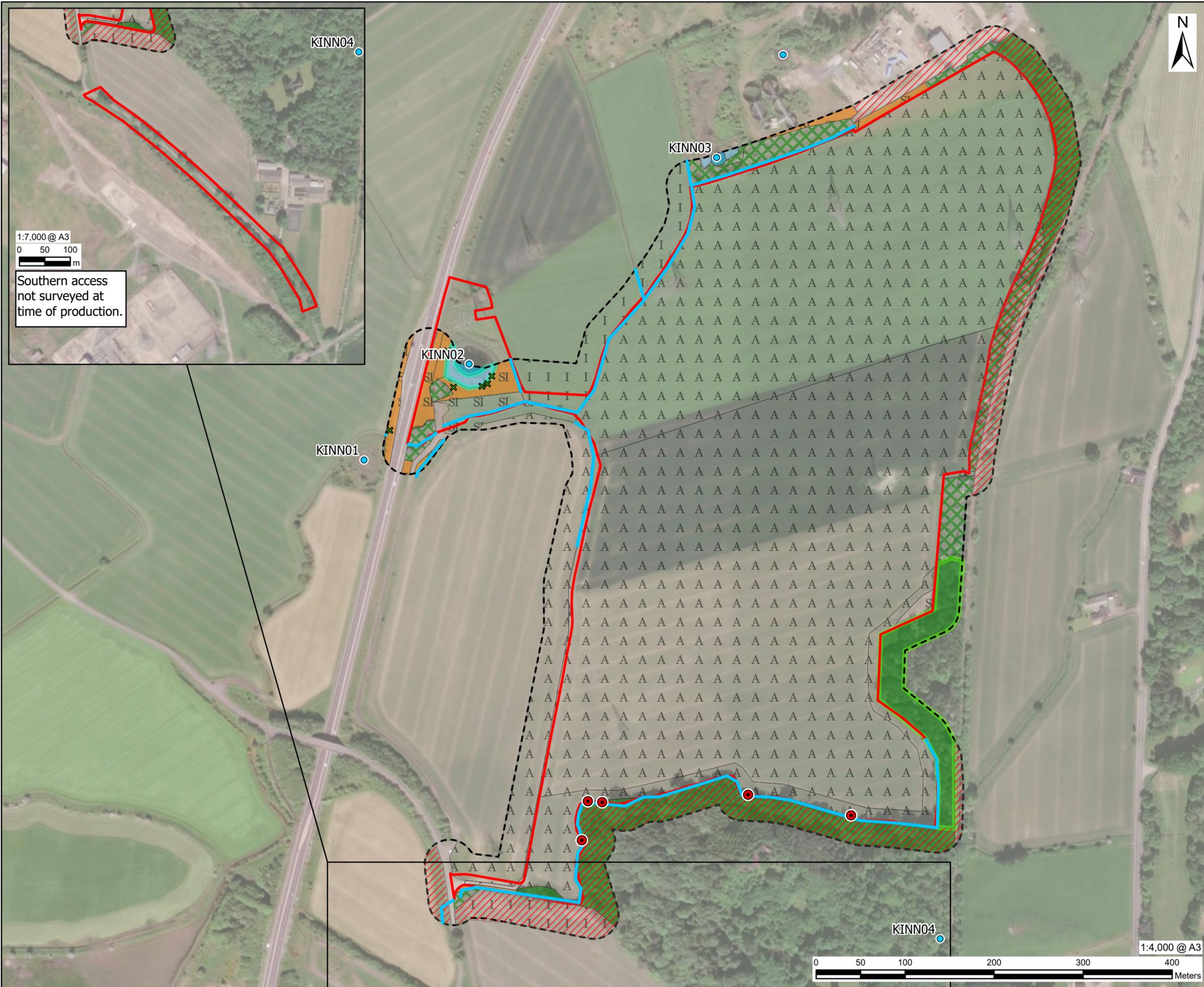
FIGURE TITLE
Ancient Woodland/Tree Inventory

FIGURE NUMBER
Figure 6.3



LEGEND

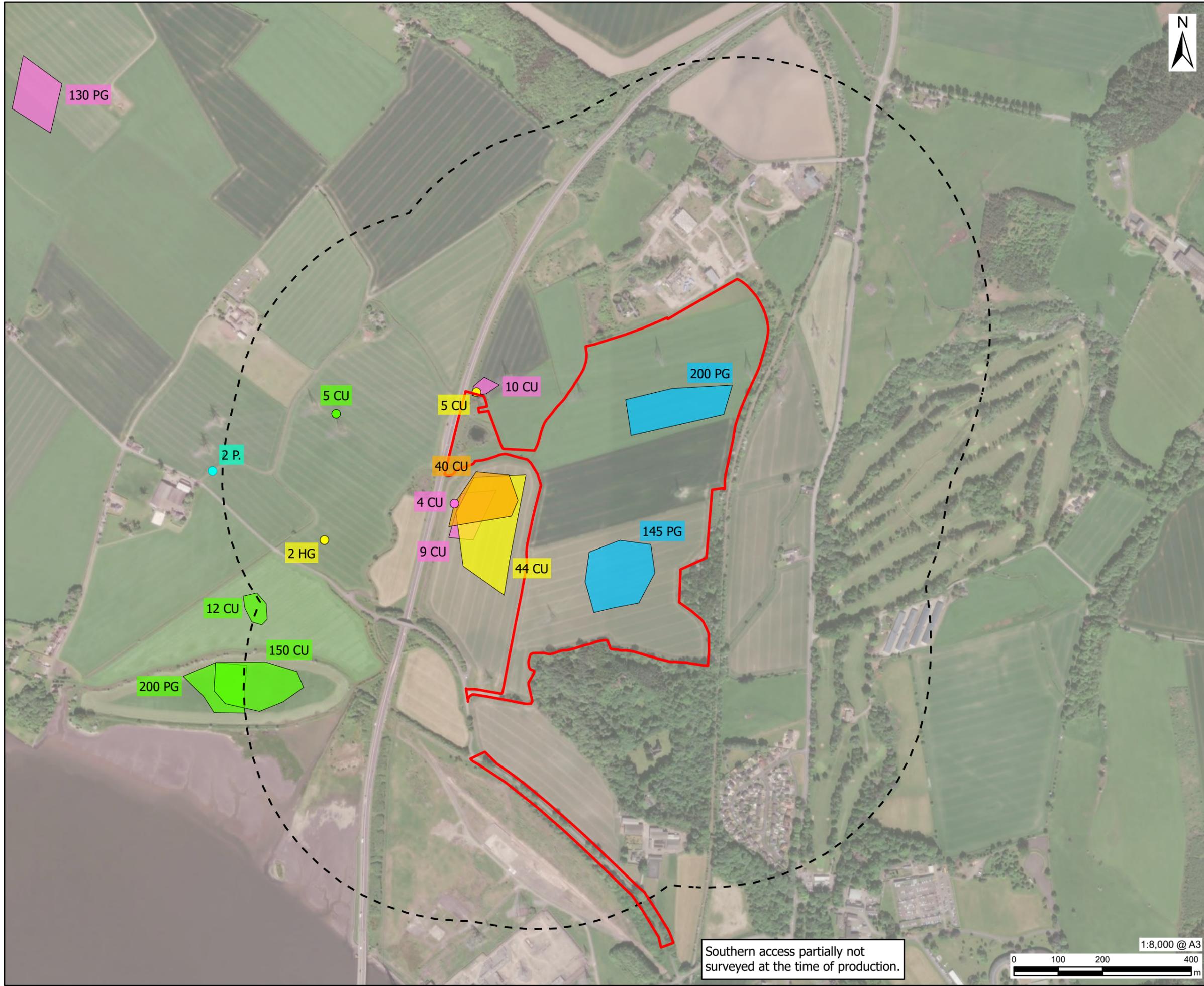
- Site
- 25 m buffer on previous Site boundary (habitat survey area)
- No access (if surveyed then done so from adjacent areas)
- Phase 1 habitat survey**
- Ponds
- ✕ A2.2 Scrub - scattered
- Japanese knotweed
- G2 - Running water
- A1.1.1 - Broadleaved woodland - semi-natural
- A2.1 - Scrub - dense/continuous
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- B6 - Poor semi-improved grassland
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- G1 - Standing water
- J1.1 - Cultivated/disturbed land - arable
- J4 - Bare ground
- SBL priority habitats**
- Lowland Mixed Deciduous Woodland
- Reedbed



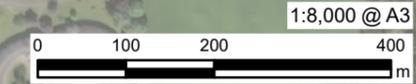
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Maxar, Microsoft

FIGURE TITLE
Habitat Survey Results

FIGURE NUMBER
Figure 6.4



Southern access partially not surveyed at the time of production.



07.

**Landscape
and Visual
Amenity**

7. Landscape and Visual Amenity

7.1 Introduction

491. This chapter addresses the potential landscape and visual impacts and effects of the construction and operation (including maintenance) of the Proposed Development.
492. The LVIA is proportionate and is focussed on assessing the likely significant effects of the Proposed Development on the surrounding landscape and visual resource. Where appropriate, this chapter provides details of mitigation and/or enhancement measures which have been identified to minimise adverse landscape and visual effects.
493. This LVIA is supported by the following figures and Appendices:
- Figure 7.1 - Zone of Theoretical Visibility and Representative Viewpoints
 - Figure 7.2 - Topography
 - Figure 7.3 - Landscape Character
 - Figure 7.4 - Landscape Designations
 - Figure 7.5 - Outline Landscape Masterplan Plan
 - Appendix 7.1 - LVIA Methodology
 - Appendix 7.2 - Annotated Photo Viewpoints

7.2 Consultation

494. Consultation for this assessment was undertaken in April to June 2023 and consideration has been given to the scoping opinions and other consultation responses received from the organisations shown in Table 7-1 below.
495. Pre-Application advice was sought from Fife and Clackmannanshire Councils. Although the majority of the proposed site is within the Fife Council area the proposed and transformer delivery access would be from the A876 in Clackmannanshire, therefore Clackmannanshire Council were also approached for Pre-Application Advice.

Table 7-1 Consultation Responses

Consultee / Type and Date	Summary of Consultation Response Relevant to Landscape	Response to Consultee
Fife Council Pre-Application Advice /Scoping Opinion 12.04.2023	<ul style="list-style-type: none"> • Any future application should include a Landscape and Visual Impact Assessment including a ZTV of 2 kilometres and photomontages, visualisations, 	<ul style="list-style-type: none"> • This has been undertaken in this report.

Consultee / Type and Date	Summary of Consultation Response Relevant to Landscape	Response to Consultee
	wireframes and viewpoint assessments.	
Clackmannanshire Council Pre-Application Advice /Scoping Opinion 05.06.2023	<ul style="list-style-type: none"> • Consideration should be given to the potential impact of the development on the Glamping and Camping Broadcarse Farm to the west of the A876, and the scope for mitigation of these impacts; • Consider the impacts on persons travelling on the A876 and NCR 76; • Consider whether the development would be incongruous, and whether it would erode landscape character. • It is considered that measures would be required to mitigate the adverse impacts if the project is approved. This could include the provision of native screen planting around the development to effectively mitigate the visual and landscape impacts, particularly the impacts on persons travelling on the A876 and NCR 76. 	<ul style="list-style-type: none"> • A viewpoint was taken from the 102 Core Path, representing views of recreational users and residents at Broadcarse Farm; • Viewpoints which represent the A876 and NCR 76 have been assessed; • The site is situated within LCT 196 where a key characteristic is ‘Variety of other land uses, particularly industrial’. This has been considered during the assessment. See section 7.5. • Added to Figure _7.5_Outline Landscape Mitigation Plan_v1_250130.

496. Based on the consultation responses, the ZTV analysis and types of visual receptors, the defined study area includes, but are not limited to, the following: settlements and residential receptors; users of National Cycle Routes and those using Core Paths; people using ‘major’ (A and B) roads; and people using the local ‘minor’ road network.

7.3 Policy Context

497. This section of the chapter provides an overview of the relevant legislation, planning policy and technical guidance relevant to the landscape and visual assessment.

Legislation

498. The European Landscape Convention (ELC)⁹ was signed by the UK Government in 2006 and came into effect in March 2007. The ELC recognises landscape in law. It focuses specifically on landscape issues and highlights the importance of integration of landscape into areas of policy, to promote protection, management and planning of all landscapes including the assessment of landscape and analysis of landscape change.
499. The ELC defines landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”. The ELC considers landscape as a whole (land or marine), from urban to rural areas, and whether special or degraded.

National Planning Framework (NPF 4) 2024

500. National Planning Framework 4 (NPF4)¹⁰ is the national spatial strategy for Scotland. NPF4 highlights the importance and value of landscape to Scotland and notes the importance of landscape in place making and sustaining local distinctiveness.
501. Policy 11 ‘Energy’ of NPF4 sets out that development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported, including grid transmission and distribution infrastructure. It notes under criterion (e)(ii) that developments must demonstrate how project design and mitigation have addressed any significant landscape and visual impacts. It quantifies however that it should be recognised that such impacts are to be expected for some forms of renewable energy and where impacts are localised and/or appropriate design mitigation has been applied, they will generally be considered acceptable.
502. NPF4 sets out six overarching spatial principles as follows:
- *“Just transition. We will empower people to shape their places and ensure the transition to net zero is fair and inclusive.*
 - *Conserving and recycling assets. We will make productive use of existing buildings, places, infrastructure, and services, locking in carbon, minimizing waste, and building a circular economy.*
 - *Local living. We will support local liveability and improve community health and wellbeing by ensuring people can easily access services, greenspace, learning, work, and leisure locally.*
 - *Compact urban growth. We will limit urban expansion so we can optimise the use of land to provide services and resources, including carbon storage, flood risk management, blue and green infrastructure, and biodiversity.*

⁹ Council of Europe (2006). Council of Europe Landscape Convention [Online]. Available at <https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/176>

¹⁰ Scottish Government, 2023. National Planning Framework 4 [Online]. Available at: <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>

- *Rebalanced development. We will target development to create opportunities for communities and investment in areas of past decline, and manage development sustainably in areas of high demand.*
 - *Rural revitalisation. We will encourage sustainable development in rural areas, recognising the need to grow and support urban and rural communities together.*"
- "By applying these spatial principles, our national spatial strategy will support the planning and delivery of:*
- *"Sustainable Places, where we reduce emissions, restore, and better connect biodiversity;*
 - *Liveable Places, where we can all live better, healthier lives; and*
 - *Productive Places, where we have a greener, fairer, and more inclusive wellbeing economy."*

503. Table 7-2 below outlines the policies in the NPF4 most relevant for this project in relation to landscape and visual matters.

504. Of note, Policy 4 (part d) refers to development proposal effects on local landscape designations. The policy sets out that development proposals should "not have significant adverse effects on the integrity of the area or the qualities for which it has been identified" or that "any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental or economic benefits of at least local importance".

Table 7-2. Relevant Policies in NPF4 to Landscape and Visual Impact Assessment

Sustainable Places	Policy	Policy Principles
Tackling the Climate and nature crises	Policy 1	Policy Intent: To encourage, promote and facilitate development that addresses the global climate emergency and nature crisis. Policy Outcomes: • Zero carbon, nature positive places.
Climate mitigation and adaptation	Policy 2	Policy Intent: To encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change. Policy Outcomes: • Emissions from development are minimised; and • Our places are more resilient to climate change impacts.
Biodiversity	Policy 3	Policy Intent: To protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks. Policy Outcomes:

Sustainable Places	Policy	Policy Principles
		<ul style="list-style-type: none"> • Biodiversity is enhanced and better connected including through strengthened nature networks and nature-based solutions.
Natural Places	Policy 4	<p>Policy Intent: To protect, restore and enhance natural assets making best use of nature-based solutions.</p> <p>Policy Outcomes:</p> <ul style="list-style-type: none"> • Natural places are protected and restored. • Natural assets are managed in a sustainable way that maintains and grows their essential benefits and services.
Forestry, woodland, and trees	Policy 6	<p>Policy Intent: To protect and expand forests, woodland, and trees.</p> <p>Policy Outcomes:</p> <ul style="list-style-type: none"> • Existing woodlands and trees are protected, and cover is expanded. • Woodland and trees on development sites are sustainably managed.
Historic assets and places	Policy 7	<p>Policy Intent: To protect and enhance historic environment assets and places, and to enable positive change as a catalyst for the regeneration of places.</p> <p>Policy Outcomes:</p> <ul style="list-style-type: none"> • The historic environment is valued, protected, and enhanced, supporting the transition to net zero and ensuring assets are resilient to current and future impacts of climate change. • Redundant or neglected historic buildings are brought back into sustainable and productive uses. • Recognise the social, environmental, and economic value of the historic environment, to our economy and cultural identity.
Energy	Policy 11	<p>Policy Intent:</p> <p>To encourage, promote and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies</p>

Sustainable Places	Policy	Policy Principles
		including hydrogen and carbon capture utilisation and storage (CCUS). Policy Outcomes: • Expansion of renewable, low-carbon and zero emissions technologies.

Planning Advice Notes

505. The Scottish Government produce Planning Advice Notes (PAN) that provide advice on good practice. The following PAN relates to the Proposed Development and should be considered as part of a landscape and visual appraisal:
- PAN 60 – Planning for Natural Heritage. The Planning Advice Note 60 – Planning for Natural Heritage¹¹ was published by the Scottish Government in 2000. This document refers to safeguarding and enhancing landscape character as well as the use of published Landscape Character Assessments.

FIFEplan 2017

506. The majority of the Proposed Development is within the Fife Local Authority Area, the Local Development Plan (FIFEplan)¹² was adopted in 2017. A new Local Development Plan (Fife’s Place Plan) is under development but at the time of writing not yet adopted. The following planning policies are relevant to the application site and have informed the approach to the LVIA and mitigation:
- ‘Policy 1: Development Principles: Development proposals will be supported if they conform to relevant Development Plan policies and proposals and address their individual and cumulative impacts. Development proposals must meet one of the points in Part A and conform to all applicable requirements in Parts B and C.’
 - Part A outlines the need for development to be in a defined boundary, compliant with policies or supported by the Local Development Plan.
 - Part B states development proposals must address their impact by complying with relevant criteria and policies including protecting cultural resources, safeguarding natural resources, green belt areas and the historic environment.
 - Part C asserts that provisions must be made to minimise and manage impact generated by the development proposal and the proposal should contribute to the area’s potential for energy from renewable sources.
 - *Policy 10: Amenity:* The development proposal must maintain the integrity of the site and its surrounding landscape, including air and noise pollution. Mitigation must be in place to safeguard the characteristics of the landscape, deter visual impact from the proposal and to not impact any existing or proposed operations or facilities.

¹¹ *Scottish Natural Heritage (2000) Planning Advice Note 60 – Planning for Natural Heritage (PAN 60)*. The Scottish Government, Edinburgh.

¹² Fife Council, 2017. The adopted FIFEplan [Online]. Available at: <https://www.fife.gov.uk/kb/docs/articles/planning-and-building2/planning/development-plan-and-planning-guidance/local-development-plan-fifeplan>

- *Policy 13: Natural Environment and Access:* Development proposals must protect and enhance natural heritage and access assets, including biodiversity; landscape designations (including Local Landscape Areas, identified on the accompanying Proposals Map); access including Core Paths and bridleways; and landscape character and views.
- *Policy 14: Built and Historic Environment:* The development must protect or enhance the built and cultural heritage of Fife and adhere to the six qualities of successful places and demonstrate how it intends to meet these qualities. The interpretation of these is described in Making Fife’s Places Supplementary Guidance.

Making Fife’s Places Supplementary Guidance 2018

507. As set out in Policy 14 of the FIFEPlan, the development proposal must adhere to the supplementary guidance, of which relevant to the Proposed Development is Making Fife’s Places (2018)¹³. The document outlines Fife Council’s expectations of good design, how to achieve this and details six qualities which are at the core principle of the document; distinctive, easy to move around and beyond, safe and pleasant, adaptable, welcoming and resource efficient. Planning approval is most likely consented if these qualities are met.

Clackmannanshire Council Local Development Plan 2015

508. A small section of the Proposed Development to the north, situated to the west of Canal Burn where it meets the A876, lies within the Clackmannanshire Local Authority Area, the Local Development Plan¹⁴ was adopted in 2015.
509. Policy EA4 Landscape Quality references the protection of Special Landscape Areas, identified on the accompanying Proposals Map; and relevant Landscape Character Assessments. A new Local Development Plan is being prepared but not yet adopted at the time of writing.

7.4 Methodology

510. The methodology adopted for this assessment is based upon guidance contained within the following published documents:
- Guidelines for Landscape and Visual Impact Assessment, Third Edition¹⁵;
 - Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3) Technical Guidance Note - 2024-01¹⁶; and,

¹³ Fife Council, 2018. Making Fife’s Places Supplementary Guidance 2018 [Online]. Available at: https://www.fife.gov.uk/_data/assets/pdf_file/0016/162322/Making-Fifes-Places-Supplementary-Guidance-August-2018.pdf

¹⁴ Clackmannanshire Council, 2015. Clackmannanshire Local Development plan [Online]. Available at: <https://www.clacks.gov.uk/site/documents/developmentplanning/localdevelopmentplanadoptedaugust2015relateddocuments/>

¹⁵ Landscape Institute and Institute of Environmental Management and Assessment. (2013). *Guidelines for Landscape & Visual Impact Assessment* (Third Edition). Routledge.

¹⁶ Landscape Institute (2024) *Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3) Technical Guidance Note - 2024-01*. Available at: https://www.landscapeinstitute.org/wp-content/uploads/2024/08/LITGN-2024-01-GLVIA3-NC_Aug-2024.pdf (Accessed: 16/10/2024).

- Visual Representation of Development Proposals. Technical Guidance Note 06/19¹⁷.
511. This is the standard reference for undertaking landscape character and visual appraisals in the UK. Following appraisal of the baseline landscape and visual context of the Proposed Development, this LVIA assesses the:
- Nature of the receptor based on sensitivity of both landscape and visual receptors derived from susceptibility and value;
 - Nature of impact based on magnitude derived from scale/extent, duration and reversibility, whether adverse or beneficial (if applicable); and,
 - Significance of the effects based on a combination of the receptor and nature of the impact using professional judgement and supported by reasoned evidence.
512. The detailed description of the assessment methodology is included in Appendix 7.1 LVIA Methodology.
513. For the purposes of the LVIA the following are key components of the design:
- Hardstanding platform constructed to a finished ground-level of approximately 8 mAOD and to cover an area of 193 m by 254 m;
 - GIS substation comprising a building (assumed to be 14.5 m tall, 12.5 m GIS building plus up to 2 m hardstanding) and outdoor electrical equipment (assumed to be 18 m tall, 16 m maximum height of equipment plus up to 2 m hardstanding);
 - Up to 3m palisade security fencing around the substation platform perimeter;
 - Screening bund along a section of the western site perimeters;
 - Watercourse crossings of an unnamed ditch and the Canal Burn;
 - Approximately 600m of permanent road providing access via Hawkhill Road;
 - Scrub removal required to facilitate the proposed A876 access point;
 - Drainage system including swales, filter drains, and 2no. SUDs ponds to the north and south of the site;
 - Operational lighting sufficient to meet HSE requirements, and motion triggered low light spill to reduce glare and sky glow; and,
 - Landscape mitigation planting on the margins of the site to screen, filter and backcloth views.
514. More details on proposed development components can be found in Section 4.3. For the purposes of this study, the new substation would comprise a new 400kV substation utilising Gas Insulated Switchgear (GIS). The overall footprint of the new substation would be in the order of approximately 5 hectares excluding land required for mitigation, such as landscape planting, sustainable urban drainage systems (SuDS) or biodiversity net gain (BNG).

¹⁷ Landscape Institute (2019). Visual Representation of Development Proposals. Technical Guidance Note 06/19 [Online]. Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf

Temporal Scope

515. The key issues for the assessment of the likely landscape and visual effects relating to the Proposed Development include;
- Temporary access via the A876 for abnormal indivisible loads required for transformer delivery;
 - Temporary impacts during the construction phase, such as the presence of materials and equipment, construction of access tracks, foundations, SUDS, and the emergence of electrical infrastructure;
 - Temporary construction compound and laydown area, including a site office, welfare facilities, and temporary car parking;
 - Indirect impacts from both construction and operational phases, including effects on landscape character and visual amenity due to the visibility of the development; and,
 - Permanent impacts during the operational phase, such as the presence of electrical infrastructure, access tracks, and substation.

Study Area

516. Definition of the study area may be determined either by specific development type guidance or by professional judgment based on the anticipated Zone of Theoretical Visibility (ZTV), see Figure 7.1, informed by digital terrain modelling. Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3)¹⁵ suggests that the study area should be proportionate to the Proposed Development itself and may include refinement by professional judgement.
517. In the case of the Proposed Development, the study area was defined by a combination of the ZTV, professional judgement and field survey verification. The combination of these factors has resulted in a study area which encompasses land within a 5 km radius from the Proposed Development although the location of representative Viewpoints reflects the much more limited extent of visibility and likely effects. Beyond this distance it is anticipated that the Proposed Development will be unlikely to give rise to significant landscape or visual effects. The study area is shown on Figure 7.1.

Zone of Theoretical Visibility Analysis

518. The study area and scope of the LVIA has been established by initial analysis of topographic maps, terrain analysis and a site survey. The site survey indicated that, for most points of the compass, beyond the extent of the 5 km study area, the Proposed Development will be unlikely to give rise to appreciable visual effects although there is theoretical visibility from land to west and to the south of the 5 km boundary.
519. A screened computer generated ZTV was run for the Proposed Development and generated using a 5 m Ordnance Survey (OS) Digital Terrain Model (DTM) incorporating screening from vegetation based on woodland from the National Forestry Inventory (NFI) using an assumed height of 10 m; and buildings or other structures derived from OS Open Map Local with an assumed height of 10m. The ZTV is based on a maximum equipment height of 18 m.
520. The screened ZTV includes the other elements of screening as well as topography, such as buildings, trees, woodland and hedgerows within the model. In practice this produces a more realistic mapping of theoretical visibility, noting that not all screening elements are likely to be available to add into the DTM.

521. The ZTV indicates areas from where it may be possible to view part of or the entire Proposed Development, however, the use of the ZTV needs to be qualified by the following considerations:
522. The ZTV is limited by the detail of the digital terrain model data used and does not take account of local topographic variations.
- Some areas of theoretical visibility may comprise woodland (not accounted for in the NFI) or agricultural land, where there is effectively no public access and the likelihood of views being experienced is consequently low.
 - The ZTV does 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.
523. These limitations mean that the ZTV tends to overestimate the extent of visibility, both in terms of the areas from which the Proposed Development is visible and the extent of the Proposed Development which is visible. Consequently, the ZTV should be considered as a tool to identify areas of potential visibility for further targeted survey and assessment, and not a measure of the visual effect.
524. The receptors identified have been selected on the basis that they fall within the ZTV (Figure 7.1). As illustrated by the ZTVs, the pattern of theoretical visibility is mostly concentrated to the west and south mainly due to the underlying topography and lack of boundary vegetation. Woodland planting including shelterbelt blocks as well as intervening landform prevents widespread visibility from the north and east which mainly limits the extent of theoretical visibility to within approximately 1 km of the Site. Pockets of more distant visibility are theoretically available across the areas of rising land to the north-east and to the north-west, and south-west across the Firth of Forth. Site work verified that due to a combination of distance and intervening vegetation visibility of the Proposed Development from these more distant locations is greatly reduced. Therefore, except for VP5 Clackmannan Tower, these more distant locations have been excluded from this.

Limitations

525. The construction assessment is based on the construction information that is currently available and detailed in Chapter 4.4. As with all construction assessments, the exact details of construction activities would not be fully known before a specific contractor is appointed to complete the works who would determine their exact construction methods and programme during the detailed design stage. The assessment of construction effects on landscape and visual receptors is based on the available information and drawings and is considered to be a worst case scenario.
526. The operational assessment has been considered as a worst-case scenario, during winter of Year 1 of operation.
527. Zone of Theoretical Visibility (ZTV) maps have been used as a tool to inform the assessments. ZTVs present theoretical visibility of the Proposed Development based on a topographical model and although areas of woodland and buildings have been included, the ZTV tends to overstate actual visibility and requires review and verification during a site survey. The use and limitations of ZTVs is explained further in this document and in Appendix 7.1 – LVIA methodology.
528. The visual assessment is based on a series of representative Viewpoints related to key receptor groups. The on-site evaluation of magnitude of impact and significance of effects has been undertaken from the nearest publicly accessible location, and as such,

assumptions as to the orientation of the main views from receptor locations have been made. For all locations the assessment is based on an assumed worst-case location within each receptor group and as such the assessment of effects on individual receptors may differ locally from that stated.

529. No technical difficulties or practical problems were encountered in carrying out the appraisal presented in this document. Land was accessed in accordance with The Land Reform (Scotland) Act 2003¹⁸, with most locations accessed via Core Paths. A site visit was conducted in June 2024 for viewpoint photography and site appraisal. Viewpoint photography has been captured during summer when trees are in leaf. GLVIA31515 guidance suggests that consideration be given to seasonal variation in effects where appropriate but acknowledges that the timing of the appraisal may mean that this is not practical. In this LVIA potentially important differences between seasonal views have been indicated in the appraisal and taken into consideration in reaching conclusions.
530. The assessment of likely significant effects on receptors at these locations is made based on a worst-case approach of a clear bright day in winter as per best practice and to be consistent with the approach for other receptors in this assessment. Any assessment of residual effects on these and all other receptors is based on summer at year 15 of operation. This approach is consistent with best practice and allows proposed mitigation planting to be taken into consideration in the assessment of long-term residual effects.

7.5 Baseline Conditions

531. The baseline section of the LVIA records the existing conditions of the Study Area. Establishing a baseline helps to gain an understanding of what makes the landscape distinctive and what its important components or characteristics are. The baseline is instrumental in the identification of the landscape character receptors, visual receptors and Viewpoints that are included in the assessment.

Site Context

532. The site, as defined by the application boundary, occupies 36 hectares (ha), of which the substation footprint is approximately 5 ha, and is comprised of agricultural farmland bounded to the west by the A876 and to the east by the freight only Stirling-Alloa-Kincardine railway line, with a settlement on the edge of Kincardine located 250 m to the southeast. The site is bordered by a series of woodland blocks and belts predominantly along the southern and eastern boundaries. In the wider area large, open landscapes are common. To the west fields are without enclosure resulting in a visually permeable setting.
533. Approximately half of the Site's western edge is dictated by Canal Burn, which runs from the southern point of the old Kilbagie Distillery site to the A876. The other half is informed by an existing field boundary. A tract of land to the west of the site, between the site and the A876, is the subject of an approved application for a Battery Energy Storage System (BESS), known as the Kincardine Grid Services Complex.
534. To the south of the site is a large woodland block, part of the 90-acre designed parkland which contains the old Tulliallan Castle, a scheduled monument. The eastern edge of the site is dictated by a railway line which travels north to south, and the northern boundary is dictated by the old Kilbagie distillery. There is an existing access to the west of the site from the A876 via a locked field gate as well as from the south of the site via Hawkhill Road.

¹⁸ Land Reform (Scotland) act 2003 (2003), *Legislation.gov.uk*. Available at: <https://www.legislation.gov.uk/asp/2003/2/contents> (Accessed: 24 January 2025).

535. Electrical infrastructure has an existing and notable influence within the landscape and the wider setting. Various overhead transmission lines (OHLs) present large-scale manmade features within the local landscape area, three of which traverse the proposed site. Historically energy related infrastructure features have been commonplace within the 5 km study area, with the existing Kincardine Substation building located approximately 500 m to the south. The site of the old Kincardine power station on the north shore of the Firth of Forth is now occupied by Kincardine Substation which plays an important role in central and southern Scotland’s electricity network.
536. The study area is well served by a network of recreational routes including long-distance trails, Core Paths and cycle routes. The Fife Coastal Path runs for over 100 miles, starting at Kincardine on the Forth Estuary. Several Core Paths connect to this long-distance walking route, including the Old Kincardine Power Station loop trail and other recreational routes like the National Cycle Route 76 (NCR 76). In the wider area there is an informal trail to Maggie Duncan’s Stane to the north and Clackmannanshire Core Path 102 to the west. These routes are considered further in the visual baseline and informed the selection of representative Viewpoints.
537. The former Kennetpans Distillery, a scheduled monument, stands on the north bank of the River Forth, less than a kilometre west of the site. About a mile to the north lies the former Kilbagie Distillery. These two historic distilleries were connected by a canal which traversed the site, part of which remains visible today to the southwest.
538. Approximately 650 m southwest of the site lies the Kincardine Bridge, a Category A listed structure known for its unique architectural and technical features. It serves as a crucial transportation link in the area.

Designations Relevant to Landscape

539. The site is not subject to any locally, nationally or internationally important landscape designations.
540. One of the Special Landscape Areas (SLA) identified in the Clackmannanshire Local Plan is located over 5 km to the northeast of the study area. The Forest SLA, an area of land between Gartmoor Dam and Forestmill, is designated for its special landscape quality. The special qualities of this area include the “variety of woodland cover from large-scale commercial plantations to semi-natural wet woodland”¹⁹ and the striking views of a rolling wooded landscape in contrast to the surrounding urban development. The Forest Local Landscape Area is not considered further for detailed assessment due to its distance from the development.
541. There are a number of ecological and cultural heritage designations within the study area, and these can inform landscape value and may be of importance in terms of visitor destinations and visual amenity. These include the Sites of Special Scientific Interest (SSSI) at Linn Mill, Craigmad Wood, and Gartmorn Dam to the north of the study area, and the Firth of Forth to the south of the study area.
542. There are also listed buildings within the study area including the category B listed Kilbagie House and category C listed Kilbagie Mill. Both buildings sit within approximately 200m from the site boundary at the closest point.

¹⁹ Clackmannanshire Council (2025). Local Development Plan (adopted August 2015) related documents. Available from: <https://www.clacks.gov.uk/site/documents/developmentplanning/localdevelopmentplanadoptedaugust2015relateddocument/s/>. [Accessed: January 2025]

Tulliallan GDL

543. Listed buildings at the Tulliallan Castle estate (including the category A Scottish Police building) are also located to the southeast of the study area within the grounds of the non-statutory Gardens and Designed Landscape (GDL) at Tulliallan Castle.
544. Tulliallan Castle is located 240 m east of the site at its closest and is bounded by the A977 to Alloa on its west side, and by the A985 on its south side. *“This designed landscape, which is now run as Scotland’s police training college, comprises parkland, woodland, gardens and some outstanding architectural features. The formal gardens and Italian garden are also notable features.”*²⁰ There are also extensive views to the west and to the Ochil Hills to the north.
545. This GDL is noted to be of outstanding artistic interest and contributes to the cultural and perceptual associations within the landscape. A site visit to the GDL undertaken as part of the Cultural Heritage section of this ES, noted that there are no views of the Proposed Development from most areas of Tulliallan Garden and Designed Landscape (GDL00379), with the existing woodland, topography, and late 20th century buildings that form part of the police training collage providing screening. The open central areas of the designed landscape may have some limited views, although these are not thought to be extensive as only the very tops of the existing overhead line towers are visible, and these are considerably taller than the Proposed Development. Therefore, no effects on special qualities or setting of the GDL are anticipated as a result of the Proposed Development and therefore it is not considered further in this LVIA.

Landscape Baseline

Landscape Character

546. National Landscape Character Types (LCTS) and online mapping were published in 2019 by NatureScot²¹ and describes the areas of consistent and recognisable landscape character. The site is located within LCT 196 Coastal Flats- Fife²². The LCTs considered within the scope of this LVIA are set out below and shown on Figure 7.3 - Landscape Character.

LCT 196 Coastal Flats- Fife

547. This LCT occupies the central part of the study area and is one of 17 compartments across the wider landscape. The majority of the site is situated within this LCT. This landscape is characterised by medium arable fields interspersed with electrical infrastructure corridors.
548. Key characteristics:
- *“Flat, low-lying, open, large scale, exposed coastal landscapes at sea level.*
 - *Intensively cultivated, geometrically laid out, large to medium scale, predominantly arable fields or forests with rectilinear, fenced enclosures or without enclosure.*
 - *Variety of other land uses, particularly industrial and other built developments, golf courses and other grasslands.*

²⁰ Historic Environment Scotland, 1987. Inventory Garden & Designed Landscape – Tulliallan [Online]. Available at: <https://portal.historicenvironment.scot/designation/GDL00379>

²¹ NatureScot, 2019. National Landscape Character Assessment [Online]. Available at: <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions>

²² *Landscape Character Type 196 COASTAL FLATS - FIFE* (2019) *Scottish Landscape Character Types Maps and Descriptions*. Available at: <https://www.nature.scot/sites/default/files/LCA/LCT%20301%20-%20Coastal%20Basin%20-%20Final%20pdf.pdf> (Accessed: 24 January 2025).

- *Slightly sinuous or angular roads raised above the fields with stone dykes or open sides.*
- *Isolated, scattered or regularly spaced farmsteads, conspicuous due to lack of screening, in contrast to the designed landscapes which are well screened by policy planting and shelterbelts.*
- *Straight ditches, sea walls and flood banks with small bridges.*
- *Conspicuous landmarks in the flat landscape, such as the large hotels at St Andrews, docks and harbours.*
- *Coastal landscape character always influenced by the sea and views of the sky and the sea.*
- *Typically dominated either by the areas of development or the coast.*
- *Away from the urban areas and forestry it is a large scale, open (and in high winds very exposed), simple, flat, balanced landscape with varied textures and colours and slow movement.*
- *In the plantations it is a small scale, confined, uniform, tended, very calm and sheltered landscape with straight lines, simple patterns and little variation in colours or textures.*
- *Seaward views are invariably extensive and may be extensive across the Flats themselves. Landward, views are generally towards the Coastal Cliffs, Coastal Braes, Coastal Hills - Fife or Coastal Terraces – Fife.”*

549. This LCT is not subject to any landscape designations. There are some recreational routes in the area, with notable energy transmission infrastructure and blocks of woodland present. The landscape within the study area is strongly representative of the LCTs characteristics as a whole. The uniform, flat and expansive arable fields where scenic quality and the influence of the Forth is of limited scenic quality. Taking this into account, landscape value is low.

LCT 153 Carselands²³

550. The Carselands Landscape Character Type occurs in two large areas around the River Forth and occupies the south western part of the study area straddling both sides of the River Forth. The site's A876 access track is within this LCT.

551. Key characteristics:

- *“Flat, open, large scale Carselands of predominantly open agricultural landcover forming the floor and former floodplains of the River Forth, River Devon and Black Devon.*
- *Important as landscape setting of Stirling, Stirling Castle, and the Ochil Hills.*
- *Absence of settlement across the Carselands, restricted to villages on the peripheral slopes and scattered farmsteads along the valley floors.*
- *Periodic extensive flooding continues to influence land use.*
- *Trunk roads run in parallel to the northern and southern perimeters of the Carselands.*

²³ *Landscape Character Type 153 CARSELANDS (2019) Scottish Landscape Character Types Maps and Descriptions. Available at: <https://www.nature.scot/sites/default/files/LCA/LCT%20153%20-%20Carselands%20-%20Final%20pdf.pdf> (Accessed: 24 January 2025).*

- *Distinct character of group of Hillfoot villages, and their relationship with streams issuing from Ochil Hills within Lower Devon area, as well as major overhead power lines and their pylons.*
- *Recent expansion of settlement boundaries at edge of carse making new development very visible.*
- *Industrial and agricultural buildings, and bonded warehouse on open carseland prominent in views within Lower Devon area*
- *Largest remaining intact raised bog in Britain at Flanders Moss, with international importance for nature conservation.*
- *Importance of Carse of Forth open farmland for flocks of wintering geese.*
- *Open views across carse accentuated by consequent dramatic contrast with the adjacent escarpments of the Ochils and Fintry, Gargunnoch and Touch Hills.”*

552. This LCT is not subject to any landscape designation. The land within the study area is typical of this LCT, where the width and flatness of the carse are emphasised by the lack of woodland and defined field boundaries. The scenic qualities of the flat and expansive rural landscape are disturbed by major OHLs and their towers, as well as pockets of industrial development. Taking this into account, landscape value is low.

LCT 186 Lowland Hills and Valleys²⁴

553. This LCT forms a series of low hills and valleys that occupies the eastern section of the study area.

554. Key characteristics:

- *Variety and subtlety of landform.*
- *Generally dominated by open, regular farmland patterns of medium scale fields of arable and grasslands.*
- *Variable pattern of post and wire fences and mostly tall hedges with hedgerow trees.*
- *Extensive areas of forestry, shelter planting, roadside planting and policies linked to large estates.*
- *Regular, often linear, pattern of the distribution of steadings and larger settlements and towns, all of which are generally well related to the landscape.*
- *Towns in valleys enclosed by the landform of low hills which form a rural backdrop.*
- *Network of roads often well related to landform.*
- *Dominant linear and point features of forests and tree groups, individual trees or local buildings.*
- *A generally tended, safe, quiet, balanced and calm landscape, but also a busy, random, disturbed and noisy one in the more urban, industrialised areas.*
- *Variety of interrelated middle and long distance views of, from and across the low hills.*

²⁴ *Landscape Character Type 185 LOWLAND HILLS AND VALLEYS (2019) Scottish Landscape Character Types Maps and Descriptions*. Available at: <https://www.nature.scot/sites/default/files/LCA/LCT%20186%20-%20Lowland%20Hills%20and%20Valleys%20-%20Final%20pdf.pdf> (Accessed: 24 January 2025).

555. The Tulliallan GDL is located within this LCT and the easternmost part of the study area. The parkland and belted woodland are valued landscape elements that define the northern setting of Kincardine. The network of gently undulating regular farmland patterns, vegetative boundaries and woodland blocks contribute to the overall scenic quality of the landscape. The landscape's variety, continuity, maturity, and subtlety contribute to the scenic quality and the area hosts a range of recreational pursuits. Taking all of this into account, landscape value is considered to be medium.

LCT 154 Lowland Valleys Fringes²⁵

556. This LCT occurs in four areas of central Scotland and occupies the northern aspect of the study area.

557. Key characteristics:

- *“Low, undulating and gently rolling landform separating the Lowland River Valleys - Central.*
- *Transitional landscape between the low lying Carselands and the more open hill fringes.*
- *Often dissected by distinctive narrow river valleys.*
- *Varied landcover of enclosed arable farmland, rough grassland and lush pasture.*
- *Unified pattern of small settlements and scattered farmsteads.*
- *Field boundary patterns well-defined by trees, shelterbelts, hedgerows and small woodlands.*
- *Swathes of broadleaf woodland and coniferous forest cover integrate with the undulating landform.*
- *Crossed and encircled by a network of communication routes, often running perpendicular to the gently sloping landform.*
- *Transitional nature of the landscape provides varying views across the wide, open Carselands and river valleys, and to the lowland hills which often form a dramatic backdrop.”*

558. This LCT contains the Clackmannanshire LCA. The study area is typical of this LCT, with ribbons of woodland and field boundaries dominating the farmland character of the area. Long distance views are often possible with local recreational routes traversing areas of elevated landform. On balance, the value of the Lowland Valley Fringes is medium as a result of the moderate scenic quality and landscape quality.

LCT 192 Coastal Hills – Fife²⁶

559. This LCT is formed by thirteen areas located all around the coast of Fife and occupies a small area of the southeast of the study area. Figure 7.1a (KNSS_20240619_P2_v1 Zone of Theoretical Visibility: Bare Earth shows no inter-visibility to the Proposed Development. Due to location of and distance from the Proposed Development it is unlikely there would be any

²⁵ *Landscape Character Type 154 LOWLAND VALLEY FRINGES (2019) Scottish Landscape Character Types Maps and Descriptions.* Available at: <https://www.nature.scot/sites/default/files/LCA/LCT%20154%20-%20Lowland%20Valley%20Fringes%20-%20Final%20pdf.pdf> (Accessed: 24 January 2025).

²⁶ *Landscape Character Type 192 COASTAL HILLS - FIFE (2019) Scottish Landscape Character Types Maps and Descriptions.* Available at: <https://www.nature.scot/sites/default/files/LCA/LCT%20192%20-%20Coastal%20Hills%20-%20Fife%20-%20Final%20pdf.pdf> (Accessed: 24 January 2025).

significant effects on the key characteristics of the LCT and it has therefore been excluded from the assessment.

Visual Baseline

Visual Receptors

560. Visual receptors within the scope of this assessment are described in the following section and are grouped into the following categories:

- Residential, comprising those in residential dwellings;
- Recreational, includes walkers and users of promoted cycling routes;
- Visitors to places of interest, including those visiting local hills; and,
- Transport users, including users of the local road and rail transport network.

Residential

561. Nearby settlements and residential properties including Kincardine, and isolated properties within Broadcarse, Craighton, Tulliallan, Kennet and Kennet Gardens. Views experienced from residential receptors are represented by Viewpoints 1, 2, and 7.

Recreational

562. Users of recreational main routes such as the Fife Coastal Long-Distance path and National Cycle Route 76, and Core Paths including Clackmannanshire Core Paths 101 and 102. Views experienced from recreational receptors are represented by Viewpoints 2, 3, 4, 5, and 7.

Visitors to Places of Interest

563. Recreational visitors to places of interest engaged in outdoor recreation such as Highland Gateway Glamping and Caravanning and Clackmannan Tower. Views experienced from recreational receptors visiting places of interest are represented by Viewpoints 5, 6 and 7.

Transport Users

564. Transport users within the study area include the A876 and A977 to the west and east of the site respectively. There is a network of adjoining local roads connecting farmsteads and individual residential dwellings. This receptor group also includes those using the local freight rail network. Views experienced from transport receptors are represented by Viewpoint 3 and 8.

Representative Viewpoints

565. Eight representative Viewpoints have been selected from publicly accessible locations, to form the basis of the visual assessment and to reflect the various visual receptors identified above. A description of the baseline view and its value is provided overleaf in Table 7-3 and is supported by baseline photography contained in Appendix 7.2.

Table 7-3. Representative Viewpoints

ID	Viewpoint	Receptor Group	Easting	Northing	Reason for Selection
1	Broomknowe Drive	Residential	2571806	• 13345 21	• Representative of residents of Broomknowe Drive.
2	Unclassified Road, (National Cycle Route 76 and Core Path 101), Craigton	Residential and Recreational- Cycle Network	291668	• 291668	• Representative of those using the NCR76/ Clackmannan/Canal Burn 101 Core Path as well as residential receptors from dwellings.
3	Unclassified Road (National Cycle Route 76 and Core Path 101) at Canal Burn	Recreational- Cycle Network Transport	2576695	• 133895 9	• Representative of those using the NCR76/ Clackmannan/Canal Burn 101 Core Path.
4	Unclassified Road (National Cycle Route 76 and Core Path R745) West of Hawkhill Farm	Recreational- Cycle Network	292275	• 688912	• Representative of those using the NCR76/ Clackmannan/Canal Burn 101 Core Path
5	Clackmannan Tower	Recreational- Core Path and Place of Interest	2573049	• 136012 2	• Representative of recreational receptors accessing Clackmannan Tower and those using Clackmannanshire 99 Core Path.
6	Maggie Duncan’s Hill	Recreational- Place of Interest	293955	• 690956	• Representative of recreational receptors using accessing Maggie Duncan’s Hill.

ID	Viewpoint	Receptor Group	Easting	Northing	Reason for Selection
7	Broadcarse (Highland Gateway Caravan Park) Core Path 102	Residential, Recreational – Core Path and Place of Interest	291820	• 689929	• Representative of residents and tourists associated with the Highland Gateway Glamping and Caravanning and those using the Clackmannanshire 102 Kennet Pans/Kennet Core Path.
8	A876 Northbound Layby	Transport Users (Road)	292222	• 689514	• Representative of transport receptors using the A876 trunk road.

Viewpoint 1: Broomknowe Drive

566. This viewpoint is representative of residents along Broomknowe Drive. The view looks northwest across a private garden and agricultural fields towards Kilbagie taken from the corner of the A977 and Broomknowe Drive intersection. The foreground is dominated by the open garden of a single storey private dwelling. To the east the A977 highway is visible over a low hedge as it ascends in the midground, travelling north towards Kilbagie, with the constant movement of vehicles being a noticeable element. Mature roadside vegetation screens views to the east.
567. In the midground, medium-scale fields are divided by post and wire fences which are screened by scrub planting. Mature trees puncture field boundaries in irregular intervals. To the north, a small business complex is visible, set back from the A977.
568. Two 275 kV lines traverse the midground views beyond which, a dense woodland backdrop extends from behind the private dwelling to the A977. A small, framed view within the wooded backdrop reveals a bridge which forms part of the railway line that determines the eastern boundary of the site.
569. The scenic quality of the linear woodland expanse experienced by residential receptors is disrupted by a series of OHL towers that cross the horizontal extent of the view, punctuating the skyline above the Ochil Hills in the background.
570. Overall, this is a medium value view with some detracting factors.

Viewpoint 2: Unclassified Road (National Cycle Route 76 and Core Path 101), Craigton

571. This viewpoint is representative of those using the unclassified single-track road that forms part of NCR76 and Core Path 101, as well as residential receptors at Craigton and Craigton cottages. The view looks northeast across agricultural fields towards Kilbagie from the road. An agricultural track stretches from the foreground to the middle ground, flanked by expansive, flat agricultural fields. The field boundaries are open, with a scrubby verge on one side and a wooden post and wire fence on the other. In the middle ground the vegetated verge is the only defining feature in an otherwise broad view.
572. A significant amount of overhead transmission lines and associated lattice towers and poles are clustered in the centre of the view, just below the horizon. The A876 highway is visible as it ascends in the middle ground, moving along an embankment towards Kilbagie, with the constant movement of vehicles being a noticeable element. Beyond this, several large water treatment chambers, a tall chimney stack, and a prominent three-story building can be seen. The isolated dwellings at Kilbagie are also notable as the terrain rises to the north of the view.
573. The terrain ascends in the distance, with the open field at Maggie Duncan's Hill framed on either side by the large woodland blocks at the Forest and Devilla Forest. The presence of large infrastructure elements dominates the view, detracting from its overall appeal. 33 kV OHL and two parallel sets of overhead line (OHL) towers recede from the foreground to the background, breaking the skyline. The overhead transmission line infrastructure in the land parcel to the south of the Kilbagie roundabout is also a prominent feature in the view.
574. This view is representative of views experienced by residential and recreational receptors along a quiet rural route that also forms part of NCR76 and the Core Path. Overall, this is a typical view across the landscape where OHL towers are prominent manmade features within an otherwise agricultural landscape. Visual value is considered to be low.

Viewpoint 3: Unclassified Road (National Cycle Route 76 and Core Path 101) at Canal Burn

575. The view extends northeast across agricultural fields towards Kilbagie. In the immediate foreground, a tarmac side track from the unclassified road leads to a wooden post and rail fence. This field stretches to the middle ground, where a fragmented hedgerow with intermittent hedgerow trees marks the western boundary before the terrain rises to the embanked A876. To the east, a low, scrubby verge delineates the edge of a farm track before another field is enclosed by the rising terrain up to the A977. A clear change in vegetation within the central field of view delineates the burn that traverses the site. A strip of woodland to the east partially obscures views of the highway.
576. Large industrial and infrastructure elements are clustered in the distant centre of the view, just below the horizon. These include several large water treatment chambers, industrial outbuildings, and a parking area surrounding a three-story building for Tillicoultry Quarries. These elements do not break the skyline and do not dominate the view. The terrain ascends in the background of the view, where fields and woodland create a densely wooded backdrop, with only the isolated dwelling at Kilbagie and the chimney stack at Tillicoultry Quarries visible.
577. In the far distance, the terrain rises up to the Ochil Hills, which are discernible during periods of good visibility. OHL towers are a dominant, visually detracting element in the view and interrupt the skyline. Towers and the lattice of wires extend across the horizontal extent of the midground view. This view is representative of sequential views experienced by recreational and transport receptors through gaps in the vegetation along NCR76 and the Core Path.
578. Overall, this is a view across a landscape where OHL towers are prominent man-made features within an otherwise agricultural landscape. The visual value is considered to be low.

Viewpoint 4: Unclassified Road (National Cycle Route 76 and Core Path R745) West of Hawkhill Farm

579. This viewpoint is representative of those using the unclassified road which forms part of NCR76 and Core Path R745. The view looks northward across agricultural fields towards Kilbagie. In the immediate foreground, a large, flat field is enclosed by a wooden post and rail fence which is obscured by dense scrubby roadside vegetation which follows alongside the tarmac road. A tarmac side road bounded by two mature hedgerows can be glimpsed. The large area of woodland in the foreground is associated with Tuli Allan Castle Scheduled Monument, whilst a strip of woodland partially obscures views of the highway.
580. Large industrial and infrastructure elements are clustered modestly in the centre of the view, just below the horizon. These include several large water treatment chambers, substantial industrial outbuildings, and a parking area surrounding a three-story building for Tillicoultry Quarries. The terrain ascends in the background of the view, where fields and woodland create a wooded backdrop, with only the isolated dwelling at Kilbagie and the distillery chimney stack visible.
581. In the far distance, the terrain rises up to the Ochil Hills, which are discernible during periods of good visibility. OHL towers are a dominant, visually detracting element in the view and interrupt the skyline. Towers extend from the foreground to the background, and two parallel sets of OHLs cross the midground of the view. This view is representative of sequential views experienced by recreational receptors through gaps in the vegetation along NCR76 and the Core Path.

582. Overall, this is a typical view across the landscape where OHL towers are prominent manmade features amid an otherwise agricultural landscape. Visual value is considered to be low.

Viewpoint 5 Clackmannan Tower

583. This is an open and expansive panoramic view to the south east from the grounds of the Clackmannan Tower which is a late 14th century medieval tower house; a Scheduled Monument within the Clackmannan Conservation Area. Clackmannan Tower is in a conspicuous elevated position at the summit of King's Seat Hill offering views across a rural landscape with views of the Firth of Forth to the Pentland Hills in the background. The viewpoint is located near Clackmannan, along Clackmannanshire Core Path 99, offering residents and visitors an easily accessible spot with high amenity value.
584. Small scale fields, separated by post and wire fences or low hedgerows lead down to expansive and open large-scale fields with little or no boundary vegetation. Midway down the slope a series of discreet telegraph poles serve the small-scale farmstead, with multiple barns and outbuildings clustered together partly screened by a mature tree. Sporadic mature trees punctuate the slope, transforming into a densely wooded tract to the south east.
585. The flat and open landscape in the midground contains isolated farmsteads which are visually exposed due to the lack of trees or boundary vegetation. Pockets of vegetation can be seen sporadically across the landscape. To the east dense expanses of woodland are visible, with pockets to the south becoming more fragmented as they approach the Firth of Forth. This view is representative of views experienced by recreational receptors.
586. The Firth of Forth segregates the midground views from the contrasting backcloth of Grangemouth, a large industrial port, and the Pentland Hills behind. Grangemouth introduces a distant yet noticeable industrial presence on the horizon. The detracting and incongruous nature of the port is enhanced by tall lattice towers associated with the overhead lines as well as the presence of Clackmannanshire and Kincardine bridges, which dissever views of the Firth of Forth. These detracting features are notable but do not form the focus of the view. Due to the cultural and recreational importance of Clackmannan Tower visual value is considered to be high.

Viewpoint 6 Maggie Duncan's Hill

587. This is an open and expansive view to the south from the trigonometrical point at the top of Maggie Duncan's Hill offering views across a rural landscape with views of the River Forth. Although not located along a Core Path, it is accessible to recreational users via farm tracks from the A907.
588. A large pastoral field in the foreground descends to a post and wire fence leading onto another large pastoral field in the fore to middle ground. This field is bound by fragmented hedgerows with occasional hedgerow trees. Next to this a smaller arable field is adjacent to a number of properties screened to the south by a woodland block.
589. In the middle ground a series of large rectilinear fields bound by hedgerows lined with tall hedgerow trees and linear blocks of woodland. To the east, the field is also bound by the large woodland block of the western edge of Devilla Forest. To the west, the landform rises up limiting views beyond. The Kilbagie roundabout is notable in the middle ground with views of the A876 entering a cutting before disappearing out of view. The A977 is less prominent partially screened by tall trees around the Tulliallan golf course. In the background of the view, the parcels of land located between the major roads comprise small fields bound by hedgerow vegetation and trees that form a wooded backdrop to the historic site of the Kilbagie distillery. Beyond this the large, flat fields fall down to the River Forth. In the far

distance, Stenhousemuir, Falkirk, Campsie Fells, and a number of wind turbines located on the higher ground in this area are perceptible during periods of good visibility.

590. There are a number of visually detracting elements in the view. Overhead Line towers cross the fore and middle ground. The OHLs are concentrated around the parcels of land located between the major roads where the OHL towers and substation infrastructure are noticeable. The highways are also a noticeable detracting element with moving vehicles being a discernible and constant element.
591. The view offers a sweeping panorama from a high vantage point, representative of recreational receptors not using the Core Path network, encompassing a predominantly rural and forested landscape, with distant glimpses of the River Forth serving as a picturesque frame. While the overhead lines, bridges, and highways detract somewhat from the overall aesthetic, they do not dominate the scene and thus, the visual value of the view is medium.

Viewpoint 7 Broadcarse (Highland Gateway Caravan Park) Core Path 102

592. The view is open and vast, primarily composed of agricultural fields that stretch towards distant hills and Devilla Forest. It features large, flat fields that span from the foreground to the middle ground. The boundaries of these fields are marked by fragmented hedgerows, consisting of large vegetation blocks and occasional hedgerow trees. The A876 highway is visible as it ascends in the middle ground, passing along an embankment towards the Kilbagie roundabout.
593. Woodland blocks in the middle ground merge to form a wooded backdrop, interrupted by a large agricultural building with tanks, water treatment chambers, and a tall chimney stack. The terrain rises into the distance, with the extensive woodland blocks of Devilla Forest and Bath Moor Plantation creating a forested horizon.
594. However, the view is degraded by the extensive presence of infrastructure. This includes a series of parallel overhead line (OHL) towers that traverse from the foreground to the background, punctuating the horizon, a wind turbine, and a large quarry building at Tulliallan Quarry (part of the Tillicoultry Quarries group). The A876 highway is viewed obliquely, however the constant movement of vehicles enhances its visual impact.
595. This viewpoint, captured from the Clackmannanshire 102 Kennet Pans/Kennet Core Path, is representative of the views experienced by residents and recreational users staying at Highland Gateway Glamping and Caravanning and those using the Core Path network. The existing OHLs are prominent features, extending from the mid-ground to the skyline across the entire panoramic extent of the view. The vertical elements of the towers provide high contrast to the flat and open context of the agricultural fields.
596. Overall, this is a typical view across an ordinary agricultural the landscape where OHL towers are prominent manmade features. Visual value is considered to be low.

Viewpoint 8 A876 Northbound Layby

597. The view from the northbound lane of the A876 is predominantly influenced by detracting features which are set against a densely wooded backdrop of woodland associated with Tulliallan Castle Schedule Monument and Tulliallan GDL. The dual carriageway, bordered by low metal crash barriers, is immediately visible. Beyond this, a narrow grass verge is present before the embanked terrain descends. Patches of hedgerow vegetation, including small trees, intermittently obscure the view further afield. Large lattice towers associated with a series of overhead lines are viewed across the entire horizontal extent. A parallel set of OHLs are situated close to the road and their associated lattice towers are prominent in the foreground before diminishing into the distance towards Kilbagie.

598. When the view extends beyond these elements, it reveals a landscape of small, irregularly shaped fields that stretch flat to the middle ground. This is followed by a mound of scrubland soil, sporadically planted with trees, which conceals the freight railway line. An exception to this is towards the northeast, where the terrain ascends to a small, rectangular field leading to a solitary dwelling at Kilbagie. This field is intersected by smaller overhead wires.
599. In the far distance, the fields and expansive woodland areas at Lady's Brae to the north, and Devilla Forest to the east, create a densely forested horizon. This view is representative of views experienced by transport receptors.
600. The vertical elements of electrical utilities, including towers and turbines, and highway infrastructure dominate the view and contrast the flat and open context of the agricultural fields in the main field of view. Therefore, visual value is assessed as low.

Future Baseline

601. Predicting the future baseline involves a degree of speculation and uncertainty as acknowledged at paragraph 5.33 in GLVIA3 (Landscape Institute and Institute of Environmental Management and Assessment , 2013). It requires projecting forward any trends in change and considering how they may affect the landscape over time. The nature of the future baseline is influenced by a combination of natural and human processes, including climate change. Scoping and consented development proposals are able to influence the future baseline and are discussed in the cumulative assessment in section 7.9 below.
602. The landscape of the study area is predominantly characterised by farmland interspersed with woodland, hedgerows and tree planting. In the absence of the proposed development this pattern of land use and the network of vegetation will continue to mature and the inherent character and contribution that it makes to views and visual amenity is unlikely to substantially change.

7.6 Embedded Mitigation

603. The primary aims of the landscape design are to reduce the visual prominence of the Proposed Development and assimilate it into the landscape context, while providing an enhancement to the provision for biodiversity. The proposed landscape design considers the existing conditions and the feedback from scoping and pre-application advice. The landscape mitigation design has been prepared to accompany the application and is shown in Figure 7.5, Outline Landscape Masterplan Plan. The proposed landscape elements include a combination of landform and planting that will provide partial screening from the adjacent farm and residential properties.
604. The outline landscape proposals are embedded mitigation which is taken in consideration in the conclusions of this assessment. At year 1 trees and shrubs will be newly planted and by year 15 will have established and delivering their envisaged function.

7.7 Landscape Assessment

605. Landscape effects will arise from both direct changes to the physical fabric of the landscape alongside indirect changes, including the way in which these physical changes alter how the landscape is perceived. The landscape appraisal considers the direct effect of the Proposed Development on LCT196 Coastal Flats Fife and LCT 153 Carselands.
606. LCT 154 Lowland Valley Fringes, LCT 186 Lowland Hills and Valleys, and LCT 192 Coastal Hills - Fife would not be directly affected by the proposed development. The potential for them to be indirectly affected by change in landscape character as a result of views of the

proposed development is very limited, as evidenced by Figure 7.1 Zone of Theoretical Visibility and Representative Viewpoints compared against Figure 7.3 Landscape Character. Consequently, any effects on the character of LCT 154 Lowland Valley Fringes, LCT 186 Lowland Hills and Valleys, and LCT 192 Coastal Hills - Fife is likely to be very low magnitude or none and not result in any likely significant effects, and therefore no further consideration is undertaken in this assessment.

607. This assessment has evaluated the worst-case scenario for operational effects, focusing on landscape impacts during winter of year 1 of operation and then at year 15, when mitigation tree and shrub planting has matured.

LCT 196- Coastal Flats Fife

608. The LCT specifically highlights that “High voltage power lines are prominent features in the Kincardine area”. Other elements of the landscape include the expansive, flat, and largely featureless agricultural fields with a loss of internal field boundaries and only a handful of remaining trees. These elements are interrupted by the OHL and towers. These characteristics are the most representative of the baseline for this LCT. Within the study area, the value of the landscape is considered to be low.
609. Given the existing baseline that includes large electrical infrastructure elements alongside large-scale arable farmland, it is considered that the landscape has some ability to accommodate the type of development proposed. As such landscape susceptibility of the LCT is low.
610. The low value combined with the low susceptibility results in a low landscape sensitivity.

Construction

611. During construction direct impacts will result from the change in land use from agricultural land, levelling areas of ground, and the removal of hedgerows and some areas of scrubland. The loss of these landscape elements will be of a small scale and of a localised geographical extent within a small part of the LCT. The presence of construction activity including storage of materials and movement of plant will result in a slight alteration to the character which will be limited in extent due to localised screening and the existing baseline and concentration of detracting elements in the immediate context of the site. Therefore, magnitude of landscape change during construction will be low. The significance of landscape effect during construction will therefore be minor adverse (not significant).

Operation

612. At operation the Proposed Development will extend the influence of electrical infrastructure related development within the study area. The loss of characteristic rural landscape elements along with the introduction of more large-scale infrastructure will adversely affect the landscape character and setting. Landscape effects will be limited to the local area and lessened by the pre-existing context of electrical infrastructure of this part of the LCT. Therefore, magnitude of landscape change at operation will be low. Considering the low landscape sensitivity and low magnitude of landscape change, the significance of landscape effect during operation will therefore be minor adverse (not significant) in year 1 reducing to very low magnitude by year 15 when planting better integrates the proposed development into the landscape context, and an effect of negligible significance.

LCT 153 - Carselands

613. This LCT is noted to be ‘important as a landscape setting of ... the Ochil Hills’, however key landscape characteristics also feature detracting elements within the landscape such as the presence of ‘industrial and agricultural buildings and bonded warehouse open carseland

prominent in views within Lower Devon area as well as and major overhead powerlines and their pylons'. These detracting elements are the most representative of the baseline for this LCT due to the close proximity to major OHLs and industrial features. As such, the LCT would be robust to the change and therefore landscape susceptibility is assessed as low.

614. The low value combined with the low susceptibility results in a low landscape sensitivity.

Construction

615. During construction direct impacts will result from the removal of localised road-side vegetation to enable a slip road junction from the A876. The loss of these landscape elements will be of a very small scale and of a localised geographical extent within a very small part of the LCT. The presence of construction activity, particularly the movement of plant will increase movement of vehicles on a main trunk road and would not result in a change of character or perception due to the concentration of detracting elements in the immediate context of the site. Therefore, magnitude of landscape change during construction will be very low. The combination of a low sensitivity with a very low magnitude would result in a negligible adverse (not significant) effect during construction.

Operation

616. At operation the culvert and access track from the A876 will be left in-situ in the event access is required from the A876 for larger scale maintenance. This will extend the influence of road infrastructure within the context of a main trunk road in a small and localised area. Due to the track being used infrequently there would be a very limited increase in vehicle movement within the area. Therefore, magnitude of landscape change at operation will be very low. Considering the low landscape sensitivity and very low magnitude of landscape change, the significance of landscape effect during operation will therefore be negligible adverse (not significant) at year 1 and year 15.

Summary of Landscape Assessment

617. Table 7-4 below summaries the results of the landscape assessment.

Table 7-4 Summary of Landscape Assessment

ID	Landscape Character Type (LCT)	Phase	Sensitivity	Magnitude of Effect	Level of effect
1	LCT 196- Coastal Flats Fife	Construction	Low	Low	Minor
1	LCT 196- Coastal Flats Fife	Operation Y1	Low	Low	Minor
1	LCT 196- Coastal Flats Fife	Operation Y15	Low	Very Low	Negligible
2	LCT 153 - Carselands	Construction	Low	Very Low	Negligible
2	LCT 153 - Carselands	Operation Y1	Low	Very Low	Negligible

ID	Landscape Character Type (LCT)	Phase	Sensitivity	Magnitude of Effect	Level of effect
2	LCT 153 - Carselands	Operation Y15	Low	Very Low	Negligible

7.8 Visual Assessment

618. This section provides an assessment of the nature of effects experienced during construction and Year 1 of operation at each of the eight representative Viewpoints. Where a viewpoint has multiple receptor types, the most sensitive receptor has taken precedence within the visual appraisal.
619. This assessment has evaluated the worst-case scenario for operational effects, focusing on visual impacts during winter when leaf cover provides minimal screening, specifically assessing conditions in the first year when landscape mitigation planting is yet to be established.

Viewpoint 1: Broomknowe Drive

Sensitivity

620. The value of this view is judged to be medium. This viewpoint is representative of residents of Broomknowe Drive where the viewers' attention or interest is focussed on their surroundings and is an important aspect of the visual experience. The presence of OHLs and towers are set within a landscape of relatively common features albeit with a densely wooded backdrop with the Ochil Hills in the distance. Visual susceptibility is high.
621. The combination of the medium value and high susceptibility results in a high sensitivity.

Construction

622. Construction activities would be discernible in a small horizontal extent of the view and limited to tall construction plant such as cranes over the roofline and further screened by the densely wooded belt in the midground. As views would be oblique to the focus of the view the magnitude of change would be very low and short-term.
623. The high sensitivity of the receptor combined with the very low magnitude of change would result in a negligible adverse (not-significant) effect during construction.

Operation

624. As a worse case, the development would be limited to theoretical views from rear second storey windows at operation. Views from rear gardens are unlikely due to the high level of screening along the sites eastern edge and from woodland associated with Tulliallan's Castle. Any potential change to the view would be barely perceptible the magnitude of change would very low at operation.
625. The high sensitivity of the receptor combined with the very low magnitude of change would result in a very low adverse (not significant) effect at operation year and year 15.

Viewpoint 2: Unclassified Road (National Cycle Route 76 and Core Path 101), Craighton

Sensitivity

626. The value of this view is judged to be low. This viewpoint is representative of views for recreational receptors using Core Path 101, cyclists using the NCR76 and views from adjacent residential receptors including those at Craighton Farm. For recreational and residential receptors attention is likely to be focused on the landscape or a particular view, particularly from the residential properties, whilst receptors engaged in cycling may find the views of slightly lesser importance. The view is of less importance to road users. Visual susceptibility is high due to the orientation of residential dwellings.
627. Due to the combination of the low value view and high susceptibility, the overall sensitivity is medium.

Construction

628. Construction activities would be noticeable in open views along this route, viewed obliquely to the direction of travel. Views towards construction activities would be noticeable in the midground if stationary along parts of this Core Path. The movement of plant would be seen in the context of the A876 trunk road. The earthworks, construction plant and erection of buildings and electrical infrastructure would be noticeable in the view but would not change the overall composition due to being perceived in the same context as the existing OHLs and associated towers. Roadside and onsite vegetation removal is unlikely to be visible from this distance.
629. The medium sensitivity of the receptor combined with the medium magnitude of change would result in a moderate adverse (significant) effect during construction.

Operation

630. At operation, the Proposed Development would be noticeable in open views along this route, viewed obliquely to the direction of travel or noticeably within the midground views if stationary. The Proposed Development would be viewed against the A876 and an existing backdrop of infrastructure with existing OHLs being the dominant detracting element. Due to the majority of view being open the magnitude of effect has been judged as medium at operation.
631. The medium sensitivity of the receptor combined with the medium magnitude of change would result in a moderate adverse (significant) effect at operation year 1 reducing to a low magnitude of change and minor adverse effect by year 15 (not significant).

Viewpoint 3: Unclassified Road (National Cycle Route 76 and Core Path 101) at Canal Burn

Sensitivity

632. The value of this view is judged to be low. This viewpoint is representative of views for recreational receptors using Core Path 101 and cyclists using the NCR76, as well as vehicle users of the road. For both non-vehicle receptor types the viewers' attention or interest is focussed on their surroundings and is an important aspect of the visual experience. For the recreational and residential receptor types the scenic value places the viewers' focus on their surroundings as an important aspect of the visual experience, particularly from the residential properties, whilst receptors engaged in cycling may find the views of slightly lesser importance. The view is of less importance to road users. The presence of OHLs and towers within a landscape of relatively common features. Visual susceptibility is medium.
633. The combination of the low value and medium susceptibility results in a medium sensitivity.

Construction

634. Construction activities would be noticeable in sequential, intermittent, and passing views along this route viewed obliquely to the direction of travel. Views towards construction activities would be noticeable in the midground if stationary along parts of this Core Path. The movement of plant, earthworks and construction of buildings and electrical infrastructure would be noticeable but would not change the overall composition of the view due to being viewed in the same context as the A876 trunk road. Considering this, the magnitude of change would be medium, yet short-term.
635. The medium sensitivity of the receptor combined with the medium magnitude of change would result in a **moderate adverse** (significant) effect during construction.
636. Operation
637. At operation, the Proposed Development would be noticeable in intermittent, passing views along this route between gaps in vegetation viewed obliquely to the direction of travel. Views of the development would be noticeable within the midground views. Mitigation planting would aid in screening the site and the Proposed Development would be viewed against the A876 and an existing backdrop of infrastructure with existing OHLs being the dominant detracting element. Due to the majority of view being sequential and fleeting the magnitude of change has been judged as **medium** at operation.
638. The medium sensitivity of the receptor combined with the **medium** magnitude of change would result in a **moderate adverse** (significant) effect at operation in year 1, reducing to low magnitude at year 15 and a minor adverse effect (not significant).

Viewpoint 4: Unclassified Road (National Cycle Route 76 and Core Path R745) West of Hawkhill Farm

Sensitivity

639. The value of this view is judged to be low. This viewpoint is representative of views for recreational receptors using Core Path 101 and cyclists using the NCR76. Recreational receptors tend to focus on their surroundings, and the scenic value is an important aspect of the visual experience. The primary focus along these routes are therefore the expansive views toward the Ochil Hills and Southern Highlands to the west. The view is of less importance to road users. Prioritising the consideration of the recreational receptor this results in a medium susceptibility.
640. The combination of the low value and medium susceptibility results in a medium sensitivity.

Construction

641. Construction activities would be noticeable in sequential, intermittent, and passing views along this route between gaps in vegetation viewed obliquely to the direction of travel. Views towards construction activities would be prominent if stationary along parts of this Core Path where the height and scale of activity would become the focus of views. The movement of plant, earthworks and construction of buildings and electrical infrastructure substantially change the composition of the view, as the temporary access track in the foreground would funnel vision towards the centre of the site. Considering this the magnitude of change would be high, yet short-term.
642. The medium sensitivity of the receptor combined with the high magnitude of change would result in a moderate adverse (significant) effect during construction.

Operation

643. At operation, the Proposed Development would be noticeable in intermittent, passing views along this route between gaps in vegetation viewed obliquely to the direction of travel. Views of the development would be noticeable within the midground views if stationary. The Proposed Development would be viewed against an existing backdrop of infrastructure with existing OHLs being the dominant detracting element. Due to the majority of view being sequential and fleeting the magnitude of change has been judged as medium at operation year 1 and reducing to low by year 15 when mitigation planting would substantially screen the site.
644. The medium sensitivity of the receptor combined with the medium magnitude of change would result in a moderate adverse (significant) effect at operation in year 1 and a minor adverse (not significant) effect at operation year 15.

Viewpoint 5: Clackmannan Tower

Sensitivity

645. The value of this view is judged to be high. This viewpoint is representative of views for recreational receptors visiting the historic Clackmannan Tower, using the Clackmannanshire 99 Core Path and/or following the Clackmannanshire ‘Tower Trail’. Clackmannan Tower is in a conspicuous elevated position at the summit of King’s Seat Hill in Clackmannan and is visible from miles around. There are wide-angled long-distance views across the Firth of Forth to the Pentland Hills. For this receptor type the viewers’ attention or interest is focussed on their surroundings and is an important aspect of the visual experience. Visual susceptibility is high.
646. The combination of the high value and high susceptibility results in a high sensitivity.

Construction

647. Within the context of the baseline view, construction work would be a noticeable change in the composition of the view. Ground level activities would be visible due to the open and expansive flat terrain of the site, yet it is unlikely from this elevated viewpoint that these would be visible against the skyline. These impacts will be lessened by the presence of the existing towers in the fore, and background views, as well as the distance to any construction activities. The scale and proximity of change in middle distance view will be experienced over a short-term duration. The development would extend the presence of infrastructure in the wider view, slightly altering the composition of the view and thus assessed as a low magnitude of change.
648. This combined with high sensitivity would result in a minor adverse (not significant) effect during construction.

Operation

649. At operation the development would result in a noticeable change in the composition of the view, and the substation would be perceived as an extension of the existing industrial and electrical context. The scale and proximity of the change in the middle-distance views would be permanent, At year 1. mitigation planting will not be effective in reducing the visual impact of the development, due to the small size of plants at year 1, resulting in the change remaining as a low magnitude. By year 15 the mitigation planting will reduce the magnitude of effect to very low magnitude.
650. This combined with high sensitivity would result in a moderate adverse (significant) effect at operation year 1 and a minor adverse effect at year 15 (not significant).

Viewpoint 6: Maggie Duncan's Hill

Sensitivity

651. The value of this view is judged to be medium. This viewpoint is representative of views for recreational receptors accessing local places of interest, with views towards the Firth of Forth. For this receptor type the viewers' attention or interest is focussed on their surroundings and is an important aspect of the visual experience, however the presence of OHLs and towers within a landscape of relatively common features. Visual susceptibility is medium.
652. Visual sensitivity as a result is considered to be medium.

Construction

653. Within the context of the baseline view, construction work would be a noticeable change in the composition of the view. Ground level activities would be visible due to the open and expansive flat terrain of the site. Other than tall lifting equipment, it is unlikely from this elevated viewpoint that construction plant would be visible against the skyline. These impacts will be lessened by the presence of the existing towers in the fore, mid, and background views, as well as the distance to any construction activities. The scale and proximity of change in middle distance views which will be experienced over a short-term duration would result in a noticeable change of the composition of the view and thus assessed as a low magnitude of change.
654. This combined with medium sensitivity would result in a minor adverse (not significant) effect during construction.

Operation

655. At operation the development would result in an unobtrusive change in the composition of the view, predominantly due to the distance. The substation would be perceived as an extension of the existing industrial and electrical context. The scale and proximity of the change in the middle-distance views would be permanent resulting in an unobtrusive change of the composition of the view and thus assessed as a low magnitude of change.
656. This combined with medium sensitivity would result in a minor adverse (not significant) effect at operation year 1 reducing to very low magnitude and negligible adverse by year 15.

Viewpoint 7: Broadcarse (Highland Gateway Caravan Park) Core Path 102

Sensitivity

657. The value of this view is judged to be low. This viewpoint is representative of views for recreational receptors using Core Path 102 and views from adjacent residential receptors including those at Broadcarse Farm and the Highland Gateway Glamping and Caravanning site. For both receptor types the viewers' attention or interest is focussed on their surroundings and is an important aspect of the visual experience, particularly from the residential properties. Susceptibility as a result is considered to be high.
658. Visual sensitivity is medium.

Construction

659. Construction activities would be discernible within across the horizontal extent of mid-range views. These activities would encompass the movement of vehicles and personnel, earthworks, and the presence of tall machinery. The use of haul roads by vehicles would introduce additional movement, however this would be seen in the context of the A876. The intensity of activity and movement may fluctuate throughout the duration of the works, but

the presence of construction at the compound would be a constant element. The scale and proximity of changes in views would be experienced over a short-term duration within a highly localised setting. These changes would be somewhat mitigated by the existing backdrop of electrical infrastructure, including the presence of existing towers and the A876, resulting in a medium magnitude of change.

660. This combined with medium sensitivity would result in a moderate adverse (significant) effect during construction.

Operation

661. At operation, the Proposed Development would be a noticeable addition within a largely unchanged panorama. The Proposed Development would be viewed against an existing backdrop of electrical infrastructure. Whilst the existing OHLs would remain the dominant detracting element the Proposed Development would increase the perception of development. Mitigation planting will reduce the visual impact of the development over time but at year 1 there will be a medium magnitude of change.
662. This combined with medium sensitivity would result in a moderate adverse (significant) effect at operation year 1 reducing to low magnitude and a minor adverse effect by year 15.

Viewpoint 8: A876 Northbound Layby

Sensitivity

663. The value of this view is judged to be very low. This viewpoint is representative of views of road and public transport users using the A997 trunk road. For this receptor type, the attention or interest is not focused on their surroundings and where the view is incidental to their enjoyment. Susceptibility as a result is considered to be low.
664. Visual sensitivity is assessed to be low.

Construction

665. During the construction phase, substantial activities would be visible in the foreground, including vehicle and personnel movement, earthmoving, temporary road structures, machinery, and site fencing. Tall lifting machinery, although localised, would be a dominant feature within the context of existing OHL towers. Despite fluctuations in activity intensity, the construction presence at the compound would be constant. The construction compound, although viewed obliquely, would dominate the view, representing a major change due to the nature of the baseline and construction activity. The change, experienced over a short-term duration, would be somewhat mitigated by the existing infrastructure backdrop and other prominent detracting elements. However, the construction would result in a result in a high magnitude of change.
666. This combined with low sensitivity would result in a moderate adverse (significant) effect during construction.

Operation

667. At operation, the Proposed Development would be prominent within a wide portion of passing foreground views. The scale of building heights and site infrastructure would be obtrusive and would extend the scale and proportion of electrical infrastructures to a wider area; however, the focus of views is likely to be to the north towards the Ochil Hills and not the Proposed Development. Mitigation planting would aid in screening the development over time, and the Proposed Development would be viewed against an existing backdrop of electrical infrastructure to the left hand side however at year 1 the development would result in a high magnitude of change.

668. A high magnitude of change combined with low sensitivity would result in a moderate adverse (significant) effect at operation year 1 due to proximity of visible elements, reducing to medium magnitude by year 15 and minor adverse (not significant) as planting matures.

Summary of Visual Assessment

669. Table 7-5 below summaries the results of the visual impact assessment in construction, operation year 1 and year 15.

Table 7-5: Summary of Visual Assessment

ID	Viewpoint	Phase	Value	Susceptibility	Sensitivity	Magnitude of Change	Level of effect
1	Broomknowe Drive	Construction	Medium	High	High	Very Low	Negligible Adverse
1	Broomknowe Drive	Operation Y1	Medium	High	High	Very Low	Negligible Adverse
1	Broomknowe Drive	Operation Y15	Medium	High	High	Very Low	Negligible Adverse
2	Farmstead along National Cycle Route 76	Construction	Low	Medium	Medium	Medium	Moderate Adverse
2	Farmstead along National Cycle Route 76	Operation Y1	Low	Medium	Medium	Medium	Moderate Adverse
2	Farmstead along National Cycle Route 76	Operation Y15	Low	Medium	Medium	Low	Minor Adverse
3	National Cycle Route 76 at Canal Burn	Construction	Low	Medium	Medium	Medium	Moderate Adverse
3	National Cycle Route 76 at Canal Burn	Operation Y1	Low	Medium	Medium	Medium	Moderate Adverse
3	National Cycle Route 76 at Canal Burn	Operation Y15	Low	Medium	Medium	Low	Minor Adverse

ID	Viewpoint	Phase	Value	Susceptibility	Sensitivity	Magnitude of Change	Level of effect
4	National Cycle Route 76 near Hawkhill Farm	Construction	Low	Medium	Medium	High	Moderate Adverse
4	National Cycle Route 76 near Hawkhill Farm	Operation Y1	Low	Medium	Medium	Medium	Moderate Adverse
4	National Cycle Route 76 near Hawkhill Farm	Operation Y15	Low	Medium	Medium	Low	Minor Adverse
5	Clackmannan Tower	Construction	High	High	High	Low	Minor Adverse
5	Clackmannan Tower	Operation Y1	High	High	High	Low	Minor Adverse
5	Clackmannan Tower	Operation Y15	High	High	High	Very Low	Negligible Adverse
6	Maggie Duncan's Hill	Construction	Medium	Medium	Medium	Low	Minor Adverse
6	Maggie Duncan's Hill	Operation Y1	Medium	Medium	Medium	low	Minor Adverse
6	Maggie Duncan's Hill	Operation Y15	Medium	Medium	Medium	Very Low	Negligible Adverse
7	Kennet Pans/ Kennet Core Path	Construction	Low	Medium	Medium	Medium	Moderate Adverse
7	Kennet Pans/ Kennet Core Path	Operation Y1	Low	Medium	Medium	Medium	Moderate Adverse
7	Kennet Pans/ Kennet Core Path	Operation Y15	Low	Medium	Medium	Low	Minor Adverse
8	A876 Northbound Layby	Construction	Low	Low	Low	High	Moderate Adverse

ID	Viewpoint	Phase	Value	Susceptibility	Sensitivity	Magnitude of Change	Level of effect
8	A876 Northbound Layby	Operation Y1	Low	Low	Low	High	Moderate Adverse
8	A876 Northbound Layby	Operation Y15	Low	Low	Low	Medium	Minor Adverse

7.9 Cumulative Assessment

670. This chapter considers the likely cumulative environmental effects as a result of the Proposed Development. The purpose of the assessment is to assess whether the combination of effects from the addition of the proposed development to other developments, upon a common receptor, would result in an effect of greater significance than the individual effects.
671. Best practice guidance states that a landscape and visual cumulative assessment should focus on the most significant cumulative effects and conclude with a clear assessment of those which are likely to influence decision making. Therefore, only the relevant cumulative schemes have been considered within this assessment. Cumulative schemes within the scope of this assessment are limited to the schemes within Table 7-6 below.

Table 7-6 Other Developments Considered in the Cumulative Assessment

Planning Reference Name	Application/ Description	Location	Status
Kincardine Grid Services Complex (ECU00003326)	Installation and operation of a group of grid services facilities including the storage and management of energy and associated infrastructure	Land adjacent to the A876 at Kincardine, Fife, at National Grid Reference (NGR) 292273, 689157	Consented
Overhead Line modifications to connect to KINN (ECU00005132)	Increase in operating voltage of existing overhead lines (XL, ZCN and ZCS) as well as erection of new towers and removal of existing towers to enable connection to KINN.	Pre-application (scoping)	Located in Fife within the Site of the Proposed Development adjacent to the substation platform.
Kincardine Battery Energy Storage System (BESS) (ECU00004987)	342MW Battery Energy Storage System	Land west of Kincardine Substation, Alloa, FK10 4BJ	Application
Meadowend Battery Energy Storage System (BESS) (ECU00005178)	S36 application for the construction and operation of an energy generating system, which will comprise a battery energy storage system which will store up to 500mw of energy, together with associated infrastructure, substation, security	Land At Meadowend Farm, Kennet, Clackmannanshire, FK10 4DP	Pre-Application

Planning Reference Name	Application/ Description	Location	Status
Underground Cable from KINN to existing Kincardine Substation (25/02494/SCR)	fencing, CCTV, security lighting and landscaping Installation of 275kV underground cable circuit between KINN and existing Kincardine Substation approximately 1.9km long.	Pre-application (screening)	Located in Fife within the Site and extending south to Hawkhill Road, crossing it into the existing Kincardine Substation.
Aggregate Storage Building 25/00801/FULL	Erection of aggregate storage building (Class 6) including ancillary welfare unit and formation of car parking/hardstanding with associated loading areas (Section 42 application to vary condition 3 of 24/00979/FULL)	Kincardine Power Station Site, Kincardine, Fife	Approved
Kilbagie Battery Energy Storage System (BESS) (ECU00005240)	Installation of a BESS with a capacity of up to 500MW and associated infrastructure.	Land at Kilbagie to the north of the proposed Kincardine North Substation	Application

672. Two cumulative scenarios have been defined based on their planning status and these are set out below:
- **Cumulative Scenario 1:** The cumulative baseline for this scenario includes schemes which have been consented and/or are under construction in addition to existing operational schemes.
 - **Cumulative Scenario 2:** The cumulative baseline for this scenario includes schemes at application stage in addition to existing operational schemes and those which have been consented and/or are under construction.
673. The assessment of cumulative magnitude of change and level of effect involves consideration of the additional change resulting from the Proposed Development at operation to each cumulative baseline scenario.

Cumulative Landscape Appraisal

674. Potential cumulative effects would occur where the addition of the Development to the cumulative baseline would increase the prominence of energy infrastructure to the extent that they would potentially become either an influential characteristic or character-defining feature of a landscape. As a result of the restricted nature of potential visibility and the limited nature of change resulting from the Proposed Development identified in the LVIA, it is considered that there is very limited potential for significant cumulative landscape effects on

the landscape receptors found within the study area. The cumulative landscape assessment therefore takes a targeted approach, focusing on those landscape designations and LCTs where the potential for cumulative landscape effects is greatest within LCT 196 Coastal Flats, Fife and LCT 153 Carselands. The other LCTs would not experience any perceptible cumulative effects.

LCT 196 Coastal Flats- Fife

675. Landscape Sensitivity has been identified as Low.
676. In Scenario 1, the Kincardine Grid Services is included as it is the only development consented. It would add to the overall presence of electrical infrastructure within the Coastal Flats LCT and there an increase in the perception of electrical infrastructure confined to a small area of the overall LCT. The potential for in-combination views with the Proposed Development is likely. Given the existing presence of electrical infrastructure within this section of the Coastal Flat LCT the addition of the Proposed Development will not alter the more valued characteristics of this LCT.
677. Taking all of this into account the cumulative magnitude of effect is low. The cumulative level of effect is therefore judged to be Minor Adverse.
678. In Scenario 2, the Kincardine BESS, Kincardine Underground Cable to Kincardine North and Central Overhead Line Upgrades (DWUP, ECUP & LWUP) are included in addition to the Kincardine Grid Services. The majority of developments are located in close proximity to the Proposed Development (approx. within 1km) in all directions. The Kincardine BESS is located within 1km southwest of the Proposed Development closer to the River Forth. In-combination views are unlikely due to the distance, intervening infrastructure and presence of surrounding mature tree planting. The Kincardine Underground Cable to Kincardine North is unlikely to have any inter-visibility due to it being located below ground. The Central Overhead Line Upgrades (DWUP, ECUP & LWUP) will have a level of inter-connectivity with the Proposed Development and therefore will have a level of inter-visibility, particularly given its elevated nature across the skyline. This development is however connected to an existing network of OHLs visible within this area and therefore emphasises the existing presence of electrical infrastructure within the area. The extent of potential change will be somewhat reduced due to the mentioned existing OHL towers. Overall, there would be a small increase in the perception of electrical infrastructure within this area of the LCT. The potential for in-combination views with the Proposed Development is confined to the Central Overhead Line Upgrades (DWUP, ECUP & LWUP) and Kincardine Grid Services if all developments are constructed.
679. Taking all of this into account the cumulative magnitude of effect is Medium. The cumulative level of effect is therefore judged to be Minor Adverse.

LCT 153 Carselands

680. Landscape Sensitivity has been identified as Low.
681. As none of the cumulative developments listed are located within this LCT there would be no cumulative effect relating to Scenario 1.
682. In Scenario 2, the Kilbagie BESS and part of the Central Overhead Line Upgrades (DWUP, ECUP & LWUP) would be located within this LCT. There will be a slight increase in the perception of electrical infrastructure confined to a small area of the overall LCT. The potential for in-combination views would be unlikely given the differing heights of both structures. The introduction of the Proposed Development would no cumulative impact on the Carselands LCT.

683. Taking all of this into account the cumulative magnitude of effect is Low. The cumulative level of effect is therefore judged to be Negligible.

Cumulative Visual Appraisal

684. Potential significant cumulative effects would occur where the addition of the Development to the cumulative baseline would increase the prominence of energy infrastructure to the extent that they would potentially become either an influential characteristic or character-defining feature in views across the landscape.

Viewpoint 1 Broomknowe Drive

685. Visual sensitivity is judged to be high.
686. In Scenario 1, no consented developments would be visible due to the presence of woodland block planting and aspect of view. The existing presence of OHL towers across the skyline is, and will remain, the main presence of electrical infrastructure with the backdrop of the Ochil Hills.
687. Taking all of this into account the cumulative magnitude of change is none. The cumulative level of effect is therefore judged to be Neutral.
688. In Scenario 2, none of the listed cumulative schemes will be visible given the presence of woodland block planting/intervening vegetation.
689. Taking all of this into account the cumulative magnitude of change is none. The cumulative level of effect is therefore judged to be Neutral.

Viewpoint 2 Farmstead along National Cycle Route 76

690. Visual sensitivity is judged to be medium.
691. In Scenario 1, the Kincardine Grid Services would be visible due to the relatively flat topography of the lands it would be located on. This would tie in with the existing network of OHL towers which are a prominent feature across the skyline spanning from left to right within this viewpoint.
692. Taking all of this into account the cumulative magnitude of change is Low. The cumulative level of effect is therefore judged to be Minor Adverse.
693. In Scenario 2, the Central Overhead Line Upgrades (DWUP, ECUP & LWUP) and Kincardine Grid Services would be visible due to the increased elevation along the footprint of the Central Overhead Lines (DWUP, ECUP & LWUP). The upper levels of the OHL towers associated with the Central Overhead Line Upgrades (DWUP, ECUP & LWUP) would be visible and would tie in with the existing network of OHL towers which are a prominent feature across the skyline spanning from left to right within this viewpoint. In-combination views with the Proposed Development, the Central Overhead Lines (DWUP, ECUP & LWUP) and Kincardine Grid Services are considered likely.
694. Taking all of this into account the cumulative magnitude of change is Low. The cumulative level of effect is therefore judged to be Minor Adverse.

Viewpoint 3 National Cycle Route 76 at Canal Burn

695. Visual sensitivity is judged to be low.
696. In Scenario 1, the Kincardine Grid Services would again be visible. Similarly to viewpoint 1 & 2, the addition of the Proposed Development will not be dissimilar to the existing presence of OHL and pylon towers focused within this area. Any views from this location will be

intermittent and viewed obliquely to the direction of travel. The presence of mature tree growth along field boundaries would help filter views towards the Kincardine Grid Services.

697. Taking all of this into account the cumulative magnitude of change is low. The cumulative level of effect is therefore judged to be Negligible.
698. In Scenario 2, the Central Overhead Lines (DWUP, ECUP & LWUP) and Kincardine Grid Services will be visible. In-combination views between both developments and the Proposed Development may be possible but will be filtered by the distance and presence of mature tree and woodland block planting across this viewpoint.
699. Taking all of this into account the cumulative magnitude of change is Low. The cumulative level of effect is therefore judged to be Negligible.

Viewpoint 4 National Cycle Route 76 near Hawkhill Farm

700. Visual sensitivity is judged to be low.
701. In Scenario 1, part of the Kincardine Grid Services would again be visible at closer proximity. Given the dominance of OHL towers within the immediate and surrounding context, the Kincardine Grid Services would occupy a small area of this view.
702. Taking all of this into account the cumulative magnitude of effect is Low. The cumulative level of effect is therefore judged to be Minor Adverse.
703. In Scenario 2, the Central Overhead Lines (DWUP, ECUP & LWUP), Kincardine Grid Services and Kilbagie BESS will be visible alongside the Proposed Development. Inter-visibility is likely between the Central Overhead Lines (DWUP, ECUP & LWUP), Kincardine Grid Services and Proposed Development so there will be an increased presence of electrical infrastructure within a focused area. Inter-visibility is considered likely between the Kincardine Grid Services and Proposed Development given their proximity to each other and relatively flat topography in the foreground. The Kilbagie BESS site would be discernible given the distance and interspersed field boundary vegetation present along the more sloping lands in the background of this view.
704. Taking all of this into account the cumulative magnitude of change is Medium. The cumulative level of effect is therefore judged to be Minor Adverse.

Viewpoint 5 Clackmannan Tower

705. Visual sensitivity is judged to be high.
706. In Scenario 1, the Kincardine Grid Services would be visible (in the background) due to the lack of field boundary vegetation however, visibility would be low and/or imperceptible given the distance from this expansive panoramic view. Given the dominance of OHL towers/electrical infrastructure within the surrounding context, the Kincardine Grid Services would occupy a small area of this view and therefore not alter the overall composition
707. Taking all of this into account the cumulative magnitude of effect is Negligible. The cumulative level of effect is therefore judged to be Minor Adverse.
708. For Scenario 2, the Central Overhead Lines (DWUP, ECUP & LWUP), Kincardine Grid Services and Proposed Development would occupy a small area of the overall view and be imperceptible given the distance from this viewpoint. Inter-visibility is considered likely between the Kincardine Grid Services and Proposed Development, given their proximity to each other and relatively flat topography in the background, however this again would be imperceptible given the distance. It is not anticipated that the addition of the Proposed Development alongside the Central Overhead Lines (DWUP, ECUP & LWUP) and Kincardine Grid Services would detract from the overall characteristics/more valued parts of this view.

709. Taking all of this into account the cumulative magnitude of change is very low. The cumulative level of effect is therefore judged to be Minor Adverse.

Viewpoint 6 Maggie Duncan's Hill

710. Visual sensitivity is judged to be medium.
711. In Scenario 1, visibility is similar to that of viewpoint 5; the Kincardine Grid Services would be visible (in the background) due to the lack of field boundary vegetation and sloping topography however, visibility would be low and/or imperceptible given the distance from this expansive panoramic view. This view is largely framed by the River Forth, blocks of woodland, arable fields, a glimpse of a major road and scattered farmsteads. A band of mature tree field-boundary vegetation (in the middle distance) provides partial screening towards the lower fields. The existing OHL towers and towers are concentrated around parcels of land between the major roads alongside roadside hedgerow.
712. Taking all of this into account the cumulative magnitude of change is very low. The cumulative level of effect is therefore judged to be Negligible.
713. In Scenario 2, the Central Overhead Lines (DWUP, ECUP & LWUP), Kincardine Grid Services and Proposed Development would occupy a small area of the overall view. It is not anticipated to detract from the more valued characteristics of this view given the distance and sloping landform. Visibility would be somewhat imperceptible from this point.
714. Taking all of this into account the cumulative magnitude of change is Low. The cumulative level of effect is therefore judged to be Minor Adverse.

Viewpoint 7 Kennet Pans/ Kennet Core Path

715. Visual sensitivity is judged to be low.
716. In Scenario 1, none of the consented developments will be visible given the low-lying elevation along this view and field-boundary vegetation in the background.
717. Taking all of this into account the cumulative magnitude of change is none. The cumulative level of effect is therefore judged to be Neutral.
718. In Scenario 2, the upper levels of the Central Overhead Lines (DWUP, ECUP & LWUP) would be visible due to the height. This would not be dissimilar to the existing presence of OHL towers which dominate the skyline from this point.
719. Taking all of this into account the cumulative magnitude of change is Low. The cumulative level of effect is therefore judged to be Negligible.

Viewpoint 8 A876 Northbound Layby

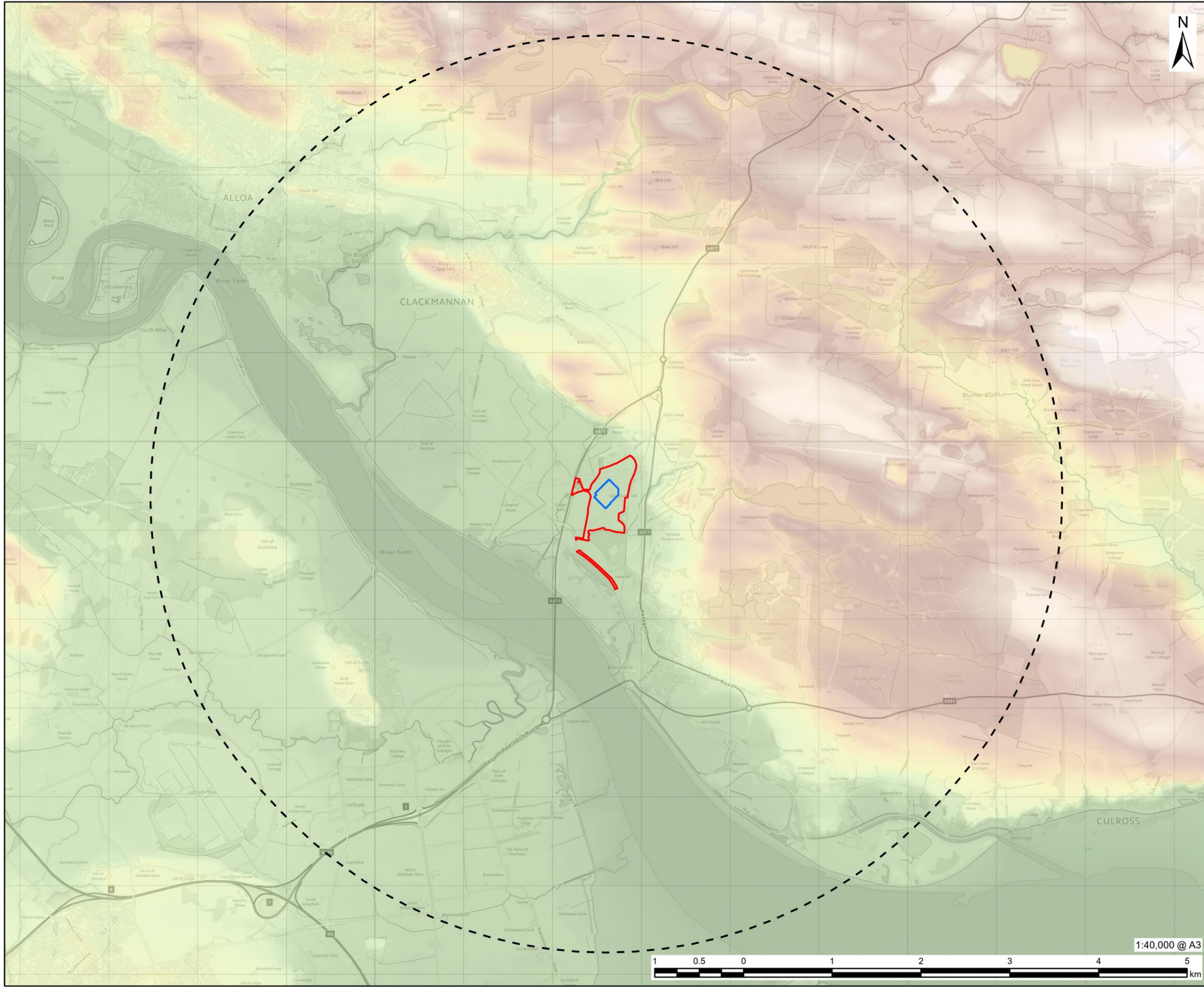
720. Visual sensitivity is judged to be Low.
721. In Scenario 1 the Kincardine Grid Services would be visible through breaks in roadside/field-boundary vegetation. Visibility would be intermittent and transient due to the direction of high-speed traffic along this major road route. The presence of existing OHL towers dominates the view as it moves into the backdrop of woodland planting.
722. Taking all of this into account the cumulative magnitude of change is very low. The cumulative level of effect is therefore judged to be Negligible.
723. In Scenario 2, the Central Overhead Lines (DWUP, ECUP & LWUP), Kincardine Grid Services and Proposed Development would occupy a small to medium sized area of the overall view. The backdrop of woodland planting will help to backcloth the appearance of the structures associated with the Kincardine Grid Services and Proposed Development but less so for the

Central Overhead Lines (DWUP, ECUP & LWUP). There would be an increase to the overall presence of electrical infrastructure within this area however due to the transient nature of the view and direction of traffic this will be fleeting and glimpsed.

724. Taking all of this into account the cumulative magnitude of change is Medium. The cumulative level of effect is therefore judged to be Minor Adverse.

7.10 Summary

725. The Proposed Development is situated in agricultural farmland bounded to the west by the A876 and to the east by the freight only Stirling-Alloa-Kincardine railway line, with a settlement on the edge of Kincardine located 250 m to the southeast. The site is bordered by a series of woodland blocks predominantly along the southern and eastern boundaries. Land to the west of the site, between the site and the A876, is the subject of an approved application for a Battery Energy Storage System (BESS), known as the Kincardine Grid Services Complex.
726. Electrical infrastructure has an existing and notable influence within the landscape and the wider setting. Various overhead transmission lines (OHLs) present large-scale manmade features within the local landscape area, three of which traverse the proposed site, with the existing Kincardine Substation building located approximately 500 m to the south.
727. Landscape effects have been assessed by reference to National Landscape Character Types (LCTS) and online mapping published in 2019 by NatureScot. Effects on landscape character have been assessed in construction, Year 1 of operation and at Year 15, in order to assess the short term impacts from construction, the “worst case” impacts at year 1 when mitigation planting on Figure _7.5_Outline Landscape Mitigation Plan_v1_250130 has not matured and then at year 15, when the increased height of the tree and shrub planting provides mitigation. No significant effects on landscape character are assessed for any stage of the construction or operation due to the context, screening and development of landscape mitigation over time.
728. Visual impacts of the Proposed Development have been evaluated for eight representative locations in the study area. Views from within the study area would be relatively localised and substantially limited by the presence of intervening landform and vegetation. Mitigation planting shown on Figure _7.5_Outline Landscape Mitigation Plan_v1_250130 visual effects will be ineffective as a screen in construction and year 1 due to plant size being typically 1m in height or less. By year 15 native tree and shrub planting will better integrate the proposed development into the context creating a more effective screen. Once established, the proposed landscaping would slightly reduce the visual prominence of the Proposed Development in these views by partially screening the lower parts of the building and softening the view with the presence of woodland planting along the earth mound. Due to the proximity to the Proposed Development. This results in reduced magnitude of effect at some viewpoint locations as indicated in Table 7.5 Summary of Visual Effects.
729. Significant effects on visual amenity will occur during construction at VP2 Farmstead along National Cycle Route 76, VP3 National Cycle Route 76 at Canal Burn, VP4 National Cycle Route 76 near Hawkhill Farm, VP7 Kennet Pans/ Kennet Core Path and VP8 A876 Northbound Layby, either due to proximity with no intervening screening or elevation at more distant locations.
730. Significant effects in year 1 of operation will remain as described for construction but reduce to non-significant by year 15 for all representative viewpoints due to the mitigation planting within the site boundary.
731. No significant cumulative effects are likely.



PROJECT
Kincardine North Substation

CLIENT
SP Energy Networks

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 AECOM Limited
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LEGEND

- Site Boundary
- 5km Study Area
- Substation Boundary

Topography (OS Terrain 5) - m

- 114.93
- 2.33

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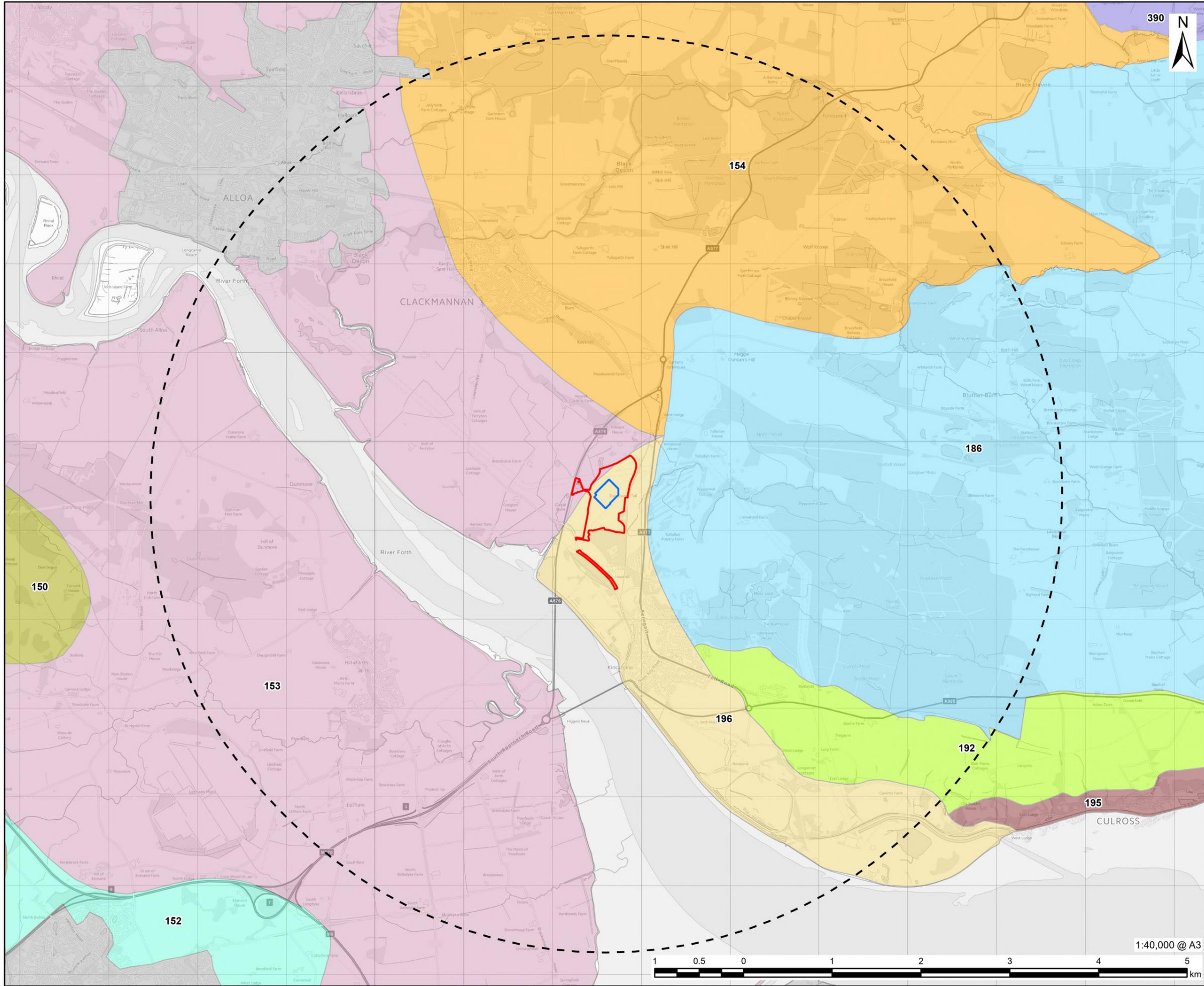
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FIGURE TITLE
 Topography

FIGURE NUMBER
 Figure 7.2



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- LEGEND**
- Site Boundary
 - Substation Boundary
 - 5km Study Area
- Landscape Character Type**
- Urban
 - 150: Lowland Hill Fringes - Central
 - 152: Lowland River Valleys - Central
 - 153: Carselands
 - 154: Lowland Valley Fringes
 - 186: Lowland Hills and Valleys
 - 192: Coastal Hills - Fife
 - 195: Coastal Braes
 - 196: Coastal Flats - Fife
 - 390: Lowland Basins

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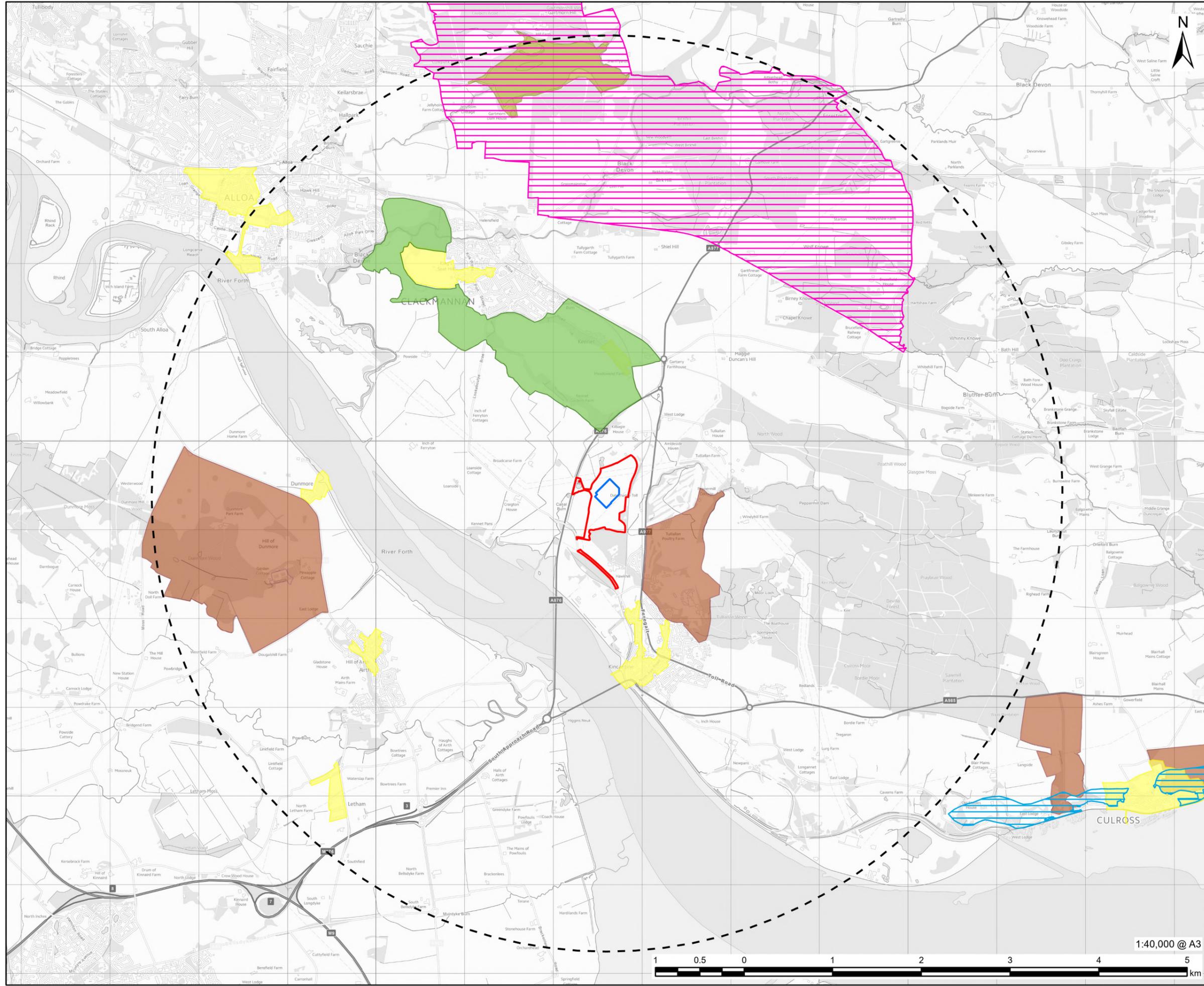
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60635450

FIGURE TITLE
Landscape Character

FIGURE NUMBER
Figure 7.3



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- LEGEND**
- Site Boundary
 - Substation Boundary
 - 5km Study Area
 - Local Landscape Area (Fife)
 - Special Landscape Area (Clackmannanshire)
 - Country Park
 - Garden and Designed Landscape
 - Conservation Area
 - Greenbelt

NOTES

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60635450

FIGURE TITLE

Landscape Designations

FIGURE NUMBER

Figure 7.4

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