

09.

Traffic and Transport

9. Traffic and Transport

9.1 Introduction

833. This Chapter considers the potential for significant traffic and movement environmental effects resulting from the Proposed Development. It considers traffic and transport effects in accordance with Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement.⁶⁸
834. The scoping opinion received from Fife Council stated that matters that should be scoped into the EIA include Traffic and Transport (construction only). The requirement for construction traffic only to be assessed is also supported by pre-application advice received from Fife Council.
835. This Chapter is supported by the following Figures and Technical Appendix:
- Figure 9.1: Traffic Survey Locations
 - Figure 9.2: Study Area Roads
 - Figure 9.3: Injury Accident Locations
 - Technical Appendix 9.1: Traffic and Transport

9.2 Information Sources

836. A traffic baseline is derived from 2024 survey data as well as Department for Transport (DfT) traffic counts. Traffic surveys were conducted during June 2024 on public roads serving the Proposed Development Site. Six traffic surveys (four automatic traffic counters and two junction counts) were undertaken to provide robust data from which a baseline position was established. Survey locations as well as DfT traffic counts used for the traffic baseline are shown in Figure 9.1: Traffic Survey Locations.
837. Road traffic accident data has been sourced via Police Scotland data which uses Department for Transport (DfT) system CRASH (the Collision Recording and SHaring system).⁶⁹
838. Forecast construction traffic data for the Proposed Development was obtained from data provided by the client. The data encompasses the entirety of the proposed construction works. The construction period is anticipated to last between October 2025 until June 2030.

9.3 Consultation

839. AECOM has scoped the parameters of the assessment with Fife Council, Clackmannanshire Council and Transport Scotland. A summary of the transport specific pre application advice and scoping correspondence is shown in Table 9-1. The transport specific pre-application advice and scoping correspondence is shown in full in Appendix A of Technical Appendix 9.1: Traffic and Transport.

⁶⁸ Institute of Environmental Assessment (2023) The Institute of Environmental Assessment Guidelines for the Environmental Assessment of Road Traffic.

⁶⁹ Police Scotland (2025). *Road traffic collision data* [online]. [Accessed 01 Jan 2025]. Available from: <https://www.scotland.police.uk/about-us/how-we-do-it/road-traffic-collision-data/>

Table 9-1: Consultation Responses

Consultee / Type and Date	Summary of Consultation Response Relevant to Traffic & Transport	Response to Consultee
Fife Council	<ul style="list-style-type: none"> Scoping opinion received from Fife Council required Traffic and Transport (construction only) be scoped into the EIA. Pre-application advice received from Fife Council stated construction traffic should be fully assessed, and considered that the proposal would have no other significant impacts on the site or surrounding area in terms of transportation and road safety. 	<ul style="list-style-type: none"> Construction traffic for the Proposed Development has been considered in this chapter.
Fife Council	<ul style="list-style-type: none"> A construction traffic management report which sets out the type and number of traffic movements expected as a result of the construction phase of the proposal 	<ul style="list-style-type: none"> A Framework Construction Traffic Management Plan has been included in Appendix H of Technical Appendix 9.1: Traffic and Transport.
Fife Council	<ul style="list-style-type: none"> Evidence relating to the land ownership either side of the existing and proposed access onto the public roads and a drawing demonstrating the potential visibility splays that can be achieved. 	<ul style="list-style-type: none"> Drawings of land ownership and visibility splays included in Appendix I of Technical Appendix 9.1: Traffic and Transport.
Clackmannanshire Council	<ul style="list-style-type: none"> Consideration of the impact of the Proposed Development on users of key transport routes including the National Cycle Route 76, and the scope for mitigation of these impacts. 	<ul style="list-style-type: none"> Public road improvements are proposed for the C68 Hawkhill Road including National Cycle Route 76. The improvements will mitigate the effects of Proposed Development construction traffic on the C68 Hawkhill Road.

Consultee / Type and Date	Summary of Consultation Response Relevant to Traffic & Transport	Response to Consultee
Transport Scotland	<ul style="list-style-type: none"> • Provided advice with respect to the use of the A876 and specific requirements for access by abnormal loads only. 	<ul style="list-style-type: none"> • Consultation with Transport Scotland over the use of the A876 has taken place. This consultation has concluded that LGV / HGV access will be via the C68 Hawkhill Road with abnormal load movements only accessing from the A876. This would also be used for emergency egress during operation in the event that Hawkhill Road access point could not be used.

9.4 Legislation and Policy

Legislation

Road Vehicles (Construction and Use) Regulations 1986 and the Special Types General Order (STGO) (2003)

840. In the UK, the dimensions and weights of vehicles used on roads are regulated by the Road Vehicles (Construction and Use) Regulations 1986. Vehicles which do not meet Construction and Use Regulations can be used on roads under the Road Vehicles (Authorisation of Special Types) (General) Order 2003. This Order, commonly referred to as STGO, ensures that oversized or overweight Abnormal Indivisible Loads (AIL) are moved safely and with minimal disruption to other road users.
841. Vehicles transporting AIL are categorised under four main STGO classes, each with specific conditions:
- Category 1: Vehicles carrying loads up to 50,000 kg, requiring a minimum of 6 axles and specific notifications to authorities;
 - Category 2: Vehicles carrying loads up to 80,000 kg, which must adhere to more stringent axle and speed restrictions;
 - Category 3: Vehicles carrying loads up to 150,000 kg, where detailed planning and notification are critical; and
 - Special Order Movements: Vehicles must have a special order if they are more than 150,000kg or 16,500kg in weight per axle, 6.1 m wide or 30 m long in rigid length when loaded. These vehicles are required to give 5 working days' notice to highway and bridge authorities and 2 working days' notice to police.
842. Each category mandates the use of STGO plates, indicating the vehicle's classification and ensuring compliance with weight and speed regulations.

National Policy

National Transport Strategy NTS2 (2020)

843. NTS2 sets out an ambitious and compelling vision for Scotland’s transport system for the next 20 years. The vision is to have a sustainable, inclusive, safe, and accessible transport system, helping to deliver a healthier, fairer, and more prosperous Scotland for communities, businesses, and visitors. Four priorities support the vision.
- Reduce inequality.
 - Take climate action.
 - Help deliver inclusive economic growth.
 - Improve health and wellbeing.

Climate change: Scottish National Adaptation Plan 2024-2029

844. The Scottish National Adaptation Plan 2024-2029 sets out the actions that the Scottish Government and partners will take to respond to the impacts of climate change over this period. It sets out actions to build Scotland’s resilience to climate change through support for our communities, businesses, public services and nature to adapt to the changing climate in a way that is fair and inclusive.
845. The PS4 objective within the National Adaptation Plan focuses on transport systems being prepared for current and future impacts of climate change and being safe for all users, reliable for everyday journeys and resilient to weather related disruption. The document sets out actions for different transport modes to become more adaptable to the impacts of climate change. This includes the trunk road network where actions to improve adaptation to climate change is made up of the following:
- A Trunk Roads Adaptation Plan
 - Collaboration with supply chain partners and stakeholders
 - A Biodiversity Strategy for Transport Scotland
 - Management of disruption risks
 - High wind, flood and landslide management

National Planning Framework 4

846. The National Planning Framework 4 (NPF4) was adopted by the Scottish Ministers on 13 February 2023, following approval by the Scottish Parliament in January. This replaces National Planning Framework 3 (NPF3) 2014, Scottish Planning Policy (SPP) 2014 and Regional Development Plans and is now part of the statutory development plan for Fife and Clackmannanshire, along with FIFEplan (2017) and the Clackmannanshire Local Development Plan (2015).
847. The NPF4 sets out overarching spatial principles to support the planning and delivery of the three key National Planning Policy areas:
- Sustainable Places.
 - Liveable Places.
 - Productive Places.

848. NPF4 identifies a ‘National Spatial Strategy’ and states that development proposals of all forms of renewable, low carbon and zero emissions technologies will be supported including enabling works, such as electricity transmission infrastructure. Under Policy 11 (Energy), development proposals for renewable energy projects have to demonstrate how the following impacts are mitigated and addressed:
- Impacts on public access, including long distance walking and cycling routes and scenic routes;
 - Impacts on road traffic and on adjacent trunk roads, including during construction; and
 - Cumulative impacts.

Transport Assessment Guidance (2012)

849. Transport Assessment Guidance (TAG) produced by Transport Scotland in 2012 provides guidance and information for the content, methodology and approach of producing Transport Assessments, Transport Statements and Travel Plans in support of proposed development sites. It details the importance of establishing the existing transport infrastructure and travel characteristics, as well as the development proposal itself and the measures which will be included to improve infrastructure and services to encourage sustainable travel to the site.

Planning Advice Note (PAN) 75 – Planning for Transport (2005)

850. Scottish Planning Advice Note (PAN) 75 – Planning for Transport is a planning circular produced by the Scottish Government which provides good practice on planning and transport. This includes guidance on integrating transport, transport modelling, policy development, development management, planning agreements and environmental assessment.
851. In terms of Transport Assessments/Statements, it states in Paragraph 41 that “all planning applications that involve the generation of person trips should provide information which covers the transport implications of the development.” It identifies that for smaller developments, “the information on transport implications will enable local authorities to monitor potential cumulative impact.”

Regional Policy

852. The Transport (Scotland) Act 2005 placed a statutory duty on the seven Regional Transport Partnerships (RTPs) in Scotland to produce a Regional Transport Strategy (RTS) for their area. The Proposed Development straddles the Fife Council and Clackmannanshire Council boundary, with both these local authorities sitting within the South East of Scotland Transport Partnership region (SEStran).

SEStran Regional Transport Strategy 2035

853. SEStran Regional Transport Strategy (RTS) provides the framework and a direction for transport in the south-east of Scotland area of which Fife is one of eight partner local authorities. The RTS is designed to address the transport problems and issues being experienced in the SEStran area. The strategy sets out four objectives which are:
- Transitioning to a sustainable, post carbon transport system.
 - Facilitating healthier travel options.
 - Transforming public transport connectivity and access across the region.
 - Supporting safe, sustainable and efficient movement of people and freight across the region.

Local Policy

FIFEplan (2017)

854. The current Local Development Plan (LDP) is the FIFEplan (2017).
855. Fife Council are currently preparing a new Local Development Plan which will replace the existing 2017 FIFEplan and will set out the planning policies and proposals for the use and development of land across Fife.
856. The role of the plan is to set out the policies and proposals for the development and use of land across Fife. The Plan is used to determine planning applications and give guidance to communities and investors on where development can and cannot take place.
857. With regards to transport, the FIFEplan Planning Obligations Guidance states that Transport Assessments should include:
858. ‘A no net detriment assessment of development traffic, which will look to mitigate the adverse effects of development traffic only (i.e. without a need to allow for underlying traffic growth). No net detriment is based on the relative percentage of development traffic versus background traffic at identified locations calculated against a base year and the projected year of opening.’

Fife Council Local Transport Strategy Draft (2023-33)

859. Fife Council’s Local Transport Strategy sets out the proposed vision and action plan of the Council with regards to transport for the next ten years, until 2033. The priorities of the plan are:
- Fair access to daily activities
 - Safe and secure travel for all
 - Just transition to net zero
 - Transport network resilience

Clackmannanshire Local Development Plan (2015)

860. Clackmannanshire Council note that NPF4 is now part of the statutory Development Plan process and Scottish Planning Policy 2014 as mentioned in the Clackmannanshire Local Development Plan is now superseded. As a result, planning applications in Clackmannanshire are assessed against the Local Development Plan and NPF4.
861. Within the Clackmannanshire Local Development Plan, Policy SC11 aims to ensure the impacts of development on the wider transport network are considered and that opportunities to enhance the network are identified. Policy SC12 aims to ensure sustainable transport infrastructure is integrated in the design of new transport proposals and sets out requirements for new development proposals.

9.5 Embedded Mitigation

862. A Construction Traffic Management Plan (CTMP) would operate throughout the duration of the construction programme and is considered to be embedded mitigation for the purpose of this assessment. Appendix H of Technical Appendix 9.1: Traffic and Transport contains a draft CTMP. A detailed CTMP including the following is expected to be conditioned and provided once a principal contractor is appointed.
- Site and the entry/exit arrangements from public roads.

- Traffic routing plans – defining the routes to be taken by HGVs to the Site avoiding sensitive locations.
- Construction traffic hours and delivery times.
- Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions (statutory limits: width, height, axle loading and gross weight), timing restrictions (if applicable) and where access is prohibited.
- Measures to protect the public highway (e.g. wheel wash facilities);
- Measures for the monitoring of the CTMP to ensure compliance from construction drivers and appropriate actions in the event of non-compliance.
- Mechanism for responding to traffic management issues arising during the works (including concerns raised from the public) including a joint consultation approach with relevant road authorities.

9.6 Assessment Methods

863. The assessment methodology follows the IEMA Guidelines 2023. Rule 1 and Rule 2 from the IEMA Guidelines are used to identify roads to be included in the environmental assessment:
- Rule 1. Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%).
 - Rule 2. Include any other specifically sensitive areas where traffic flows have increased by 10% or more.
864. The IEMA Guidelines 30% threshold is based on research and experience of the environmental effects of traffic, with less than a 30% increase in traffic generally resulting in imperceptible changes in environmental effects apart from within specifically sensitive areas. The IEMA Guidelines consider that forecast changes in traffic of less than 10% in specifically sensitive areas creates no discernible environmental effect, hence the second threshold set out in Rule 2.

Magnitude of Change

865. Magnitude of Change evaluates likely changes in traffic conditions on Study Area roads as a result of the Proposed Development. Magnitude of Change is calculated for all Study Area roads included in the assessment following the application of IEMA Guidelines Rule 1 and Rule 2. Magnitude of Change is determined on Study Area roads for the following traffic and movement categories:
- Severance of Communities
 - Fear and Intimidation
 - Road User and Pedestrian Safety
 - Non-motorised User Amenity
 - Non-motorised User Delay
 - Road Vehicle Driver and Passenger Delay
 - Hazardous / Large Loads

Severance of Communities

866. For magnitude of change, DfT has historically set out changes in traffic flow of 30%, 60% and 90% being regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ respectively. Although these thresholds no longer appear in DfT guidance, they have not been superseded by any subsequent guidance and are established through planning case law. This historical guidance is referenced in the IEMA Guidelines 2023 and has therefore been used for the purpose of the severance of communities environmental assessment. For this assessment the DfT thresholds of ‘slight’, ‘moderate’ and ‘substantial’ have been aligned with ‘Low’, ‘Medium’ and ‘High’ magnitudes of change.
867. Table 9-2 reflects the thresholds adopted to quantify the magnitude of change for Severance of Communities.

Table 9-2: Magnitude of Change for Severance of Communities

Magnitude of Change	Change in Traffic (AAWT)	Description
High	90%+	Alteration to baseline conditions such that post development character or composition of baseline condition fundamentally changed.
Medium	60% - 90%	Alteration to baseline conditions such that post development character or composition of baseline condition materially changed.
Low	30% - 60%	Minor shift from baseline conditions such that post development character or composition of baseline condition remains similar to baseline and not materially changed.
Negligible	0% - 30%	Very little change from baseline conditions. Change is barely distinguishable approximating to no-change situation.

Fear and Intimidation

868. The IEMA Guidelines state that the extent of fear and intimidation is dependent on:
- The total volume of traffic;
 - The heavy vehicle composition;
 - The speed of vehicles; and
 - The proximity of traffic to people.
869. IEMA Guidelines provide a degree of hazard methodology for assessing Fear and Intimidation. Degree of hazard is established by scoring traffic on Study Area roads for baseline and Proposed Development traffic conditions. Table 9-3 shows the IEMA Guidelines scoring system applied to all Study Area roads.

Table 9-3: Fear and Intimidation Degree of Hazard

18hr Traffic Flow Average Two-Way Traffic (Vehicles / Hour) (a)	18hr Traffic Flow Total HGV Movements (b)	Average Vehicle Speed MPH (c)	Degree of Hazard Score
+1,800	+3,000	>40	30
1,200 – 1,800	2,000 – 3,000	30 - 40	20
600 – 1,200	1,000 – 2,000	20 - 30	10
<600	<1,000	<20	0

870. For each Study Area road, the total degree of hazard score (a) + (b) + (c) for baseline and Proposed Development traffic conditions is summed to provide a ‘level’ of fear and intimidation in accordance with Table 9-4.

Table 9-4: Levels of Fear and Intimidation

Total Hazard Score (a) + (b) + (c)	Fear and Intimidation Level
71+	Extreme
41 – 70	Great
21 – 40	Moderate
0 – 20	Small

871. Magnitude of change is determined with reference to changes in fear and intimidation levels between baseline and Proposed Development traffic flows in accordance with Table 9-5.

Table 9-5: Fear and Intimidation Magnitude of Change

Change in Level / Change in Daily Traffic	Magnitude of Change
2 Level Changes	High
1 Level Change plus >400 increase in average hourly vehicle flow and / or >500 increase in total 18hr HGV flow	Medium

Change in Level / Change in Daily Traffic	Magnitude of Change
<p>1 Level Change plus</p> <p><400 increase in average hourly vehicle flow</p> <p>and / or</p> <p><500 increase in total 18hr HGV flow</p>	Low
No Level Change	Negligible

Road User and Pedestrian Safety

872. IEMA Guidelines consider the calculation of accident rates a relevant approach for approximating the potential for road safety impacts to materialise as a result of a development. Knowing the expected increase in vehicle kilometres driven on Study Area roads as a result of Proposed Development traffic, it is possible to make an arithmetic assessment of the likely increase or decrease in the number of accidents resulting from changes in traffic flows or composition.
873. Accidents by severity for the 2020-2023 period are combined with traffic flows to produce accident rates by severity per million vehicle kilometres for all Study Area roads. A forecast of vehicle kilometres driven on Study Area roads by Proposed Development traffic for the duration of the construction programme has been calculated. The accident rates per million vehicle kilometres are applied to Proposed Development traffic to produce a forecast of accidents by severity over the duration of the construction stage. Magnitude of change for road user and pedestrian safety is assessed according to Table 9-6.

Table 9-6: Road User and Pedestrian Safety Magnitude of Change

Magnitude of Change	Forecast Increase in Accident by Severity		
	Slight Accident	Severe Accident	Fatal Accident
High	0	0	=>1
Medium	0	=>1	0
Low	=>1	0	0
Negligible	0	0	0

Non-Motorised User Amenity and Delay

874. These effects are closely related to severance as a change in the volume, composition or speed of traffic may affect the relative pleasantness (amenity) or progress (delay) made by non-motorised users. In general, increases in traffic levels are likely to lead to reductions in amenity and increases in delay for non-motorised users. Absolute levels of change to non-motorised amenity and delay will depend on the general level of pedestrian and active travel activity on Study Area roads. The magnitude of change thresholds set out in Table 9-2 for severance are adopted for non-motorised environmental effects.

Road Vehicle Driver and Passenger Delay

875. Where junction capacity testing has been undertaken on Study Area roads, changes to the Level of Service (LoS) provided by each arm of the junction are used to forecast magnitude of change. Table 9-7 summarises the LoS magnitude of change thresholds adopted in this assessment for Road Vehicle Driver and Passenger Delay.
876. Where Study Area roads are assessed by link flow, the Congestion Reference Flow (CRF) of the Study Area road will be used to forecast magnitude of change. The CRF of a Study Area road is an estimate of the daily traffic flow at which the road is likely to be ‘congested’ in peak periods on an average day. CRF is calculated in accordance with CD100 DMRB Extract Volume 5 Section 1 (TA 46/97) which remains applicable to trunk roads in Scotland. To calculate CRF, ‘congestion’ is defined as the situation when the traffic demand exceeds the maximum sustainable throughput of the road. At this point the effect on traffic is likely to include flow breakdown with speeds varying considerably, and queues are likely to form. Table 9-7 summarises the CRF magnitude of change thresholds adopted in this assessment for Road Vehicle Driver and Passenger Delay. CRF magnitude of change adopts 30%, 60% and 90% traffic ‘levels’ to represent thresholds for changes in vehicle delay, with the stipulation that for Low, Medium and High magnitudes of change there must also be at least one change in traffic level as a result of Proposed Development Traffic.

Table 9-7: Road Vehicle Driver and Passenger Delay Magnitude of Change

Magnitude of Change	Junction Capacity Testing LoS on Junction Arms	Study Area Road Congestion Reference Flow
High	A, B or C to E or F	1 or More Level Change plus CRF >90% CRF
Medium	A, B or C to D	1 or More Level Change plus CRF 60% - 90%
Low	A or B to C	1 Level Change plus CRF 30% - 60%
Negligible	No Change in LoS	No Level Change

Sensitivity of Receptors

877. Receptors are locations or land-uses categorised by sensitivity or environmental value. **Table 9-8** describes the receptor sensitivity adopted for the assessment of Proposed Development traffic.

Table 9-8: Sensitivity of Receptors

Receptor Sensitivity	Description
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.

Receptor Sensitivity	Description
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.

878. For the purposes of assessment, receptors are identified in accordance with IEMA Guidelines.
- People at home.
 - People at work.
 - Sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors)
 - Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools)
 - Retail areas.
 - Recreational areas.
 - Tourist attractions.
 - Collision clusters and routes with road safety concerns.
 - Junctions and highway links at (or over capacity)
879. For every study area road each of the above land-use and environmental interests was assessed on a scale of 1 to 5. Sensitivity of receptor 1 to 5 ratings were assigned as follows.
- Negligible Sensitivity = 1
 - Low Sensitivity = 2
 - Medium Sensitivity = 3
 - High Sensitivity = 4
 - Very High Sensitivity = 5
880. For each study area road an average sensitivity of receptor rating is calculated from the individual land-use and environmental interest scores. However, any study area road which has one or more rating of High Sensitivity (4) or Very High Sensitivity (5) is defaulted to that rating.
881. Appendix B of Technical Appendix 9.1: Traffic and Transport provides an assessment of study area roads and the sensitivity of the IEMA Guidelines receptors that may be present on those roads.
882. Extents of study area roads are shown in Figure 9.2: Study Area Roads. IEMA Guidelines state that judgement will inevitably be required to define geographical boundaries of the

environmental assessment. The guidelines further state that such judgements will tend to be based on a combination of experience and assumptions that should be made explicit in the EIAR. As such, study area roads for chosen for this assessment are based on a combination of experience and professional judgement. The route choice provided by other roads is likely to dilute Proposed Development traffic sufficiently that it will be unlikely to meet IEMA Guidelines criteria regarding the impact of development traffic which may need to be considered in order to demonstrate environmental effects.

883. Table **Table 9-9** summarises the sensitivity of study area roads as environmental receptors.

Table 9-9: Road Link Sensitivity of Receptors

Road Link	Description	Sensitivity	Reasoning
A977 north	A-class national speed limit road between Gartarry Roundabout and Forestmill.	Low	Limited frontages with no footways or cycle routes present.
A907 west	Section of A-class national speed limit road reducing to 40mph from the Gartarry Roundabout to Clackmannan Road Roundabout.	Medium	Some frontages nearby and footways present as road moves west towards Alloa.
A907 east	A-class national speed limit road between Gartarry Roundabout and Blairhall.	Low	Limited frontages with no footways or cycle routes present.
A977 Kilbagie Roundabout	Small section of A-class national speed limit road between Kilbagie Roundabout and Gartarry Roundabout.	Low	No frontages present on route. Shared use path offset from carriageway.
A977 Kilbagie	National speed limit trunk road from Kilbagie Roundabout, reducing to 40mph near the junction with the Substation Access road.	Medium	Some residential frontage present, with golf course and other amenities nearby. Footway present on one side of the carriageway.

Road Link	Description	Sensitivity	Reasoning
A977 Feregait	Section of trunk road from the junction with the Substation Access road to the junction with Toll Road in Kincardine. Speed limit reduces from 40mph to 30mph upon entering Kincardine.	High	Considerable residential frontage present with footways directly adjacent to carriageway on both sides of the road.
Substation Access Road	Narrow two-way single carriageway road from the junction with the A977 to the junction with Hawkhill Road.	Low	No frontages on route, footway is present on one side of the carriageway.
C68 Hawkhill Road	Single track road from the junction with the Substation Access road northwards.	High	Limited frontages however route is designated as part of the NCN and core path network. It currently has no separated footway or cycle route, but is clearly signed by Fife Council as walking and cycling friendly road.
A876	National speed limit trunk road between the Clackmannanshire Bridge and Kilbagie Roundabout	Low	Limited frontages present on route. Small section of footway present near the Clackmannanshire Bridge.
Clackmannanshire Bridge	National speed limit trunk road crossing over the River Forth.	Medium	No frontages present on route. Footway is directly adjacent to carriageway with no buffer.

Road Link	Description	Sensitivity	Reasoning
A876 S Approach Road	70mph speed limit trunk road from the roundabout with the Clackmannanshire / Kincardine Bridges to the junction at Bowtrees.	Low	No frontages, footways or cycle routes present.
Kincardine Bridge	Trunk road crossing over the River Forth to Kincardine, with a reduced speed limit of 30mph.	Low	No frontages present on route. Footways present on both sides but are separated from the carriageway via a buffer.
A985 west	National speed limit trunk road from the Kincardine Bridge to the roundabout with Toll Road.	Low	Limited frontages present on route with no footway or cycle route directly adjacent to the carriageway.
A985 east	National speed limit trunk road between the roundabout with Toll Road and the junction with the B9037.	Low	Limited frontages present on route with only a small section of footway present adjacent to carriageway.

Significance of Effect

884. For traffic generated by the Proposed Development the significance of environmental effect is derived from a combination of the Magnitude of Change and the Sensitivity of Receptor. **Table 9-10** summarises the approach to deriving the significance of effects. Note, Table shading indicates likely significant effect subject to assessor’s professional judgment.

Table 9-10: Significance of Effects

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

		Sensitivity of Receptor				
		Very High	High	Medium	Low	Negligible
Magnitude of Change	Low	Moderate	Moderate	Minor	Negligible	Negligible
	Negligible	Minor	Minor	Negligible	Negligible	Negligible

885. The reporting of significance of environmental effects will also include whether the effect is:
- Temporary – where the effect occurs for a limited period of time and the change at a defined receptor can be reversed.
 - Permanent – where the effect represents a long-lasting change at a defined receptor which is not reversible.
 - Short Term (less than 6 months) / Medium Term (6 months – 1 year) / Long Term (more than 1 year)
 - Direct – where the effect is a direct result (or primary effect) of the Proposed Development.
 - Indirect – a secondary effect which occurs within or between environmental components. This may include effects on the environment which are not a direct result of the Proposed Development, often occurring away from the Proposed Development as a result of a complex interactions with other environmental factors.
 - Secondary – an induced effect arising from the actions or presence of a project, such as changes to the pattern of future land use or improvements to local road networks.
 - Beneficial – an effect beneficial to one or more environmental receptors.
 - Adverse – a detrimental, or negative, effect on one or more environmental receptors.
886. The potential environmental effects of traffic, transport and access considered in this assessment of the Proposed Development are:
- Severance of communities – the perceived division that can occur when a community becomes separated by a major traffic route (existing or proposed).
 - Fear and Intimidation on and by road users – the effect on the perceived vulnerability of pedestrian traffic relating to changes in traffic flows and or speed.
 - Road user and pedestrian safety – the potential for effects on rate and severity of accidents relating to changes in traffic flows.
 - Non-motorised Amenity – broadly defined as the relative pleasantness of a pedestrian or cycle journey. The potential for effects relates to changes in traffic flows.
 - Non-motorised User Delay – the effect on travel time. The potential for effects relates to changes in traffic flow.
 - Road vehicle driver and passenger delay - the effect on travel time. The potential for effects relates to changes in traffic flow, noting that junction modelling is part of this assessment.

- Hazardous / Large Loads - the effect relates to developments that involve the transportation of dangerous or hazardous loads, and or the transport of Abnormal Indivisible Loads to or from a development site. The assessment must clearly outline the number and composition of such loads. Where the number is considered to be significant an appropriate routing and risk strategy must be identified.

9.7 Traffic and Transport Baseline

887. Current traffic conditions on study area roads were established by surveys undertaken in June 2024 and from DfT traffic count data. The location, type and results of the traffic surveys are provided in Appendix C of Technical Appendix 9.1: Traffic and Transport as well as being shown in Figure 9.1.
888. The 2024 traffic survey and DfT traffic count data is used to inform the baseline traffic position for the environmental assessment of traffic and movement. The 2024 data has had a growth factor applied to arrive at a true baseline position for the peak construction month of March 2026. This provides a robust assessment in terms of applying IEMA Guidelines Rule 1 and Rule 2 to determine which roads should be included in the environmental assessment.
889. Road traffic accident data has been sourced via Police Scotland data which uses DfT system CRaSH for the 4-year period of 2020-2023. On study area roads this data shows that 13 ‘slight’ and 10 ‘serious’ accidents took place in the 4-year period. No ‘fatal’ accidents were recorded on study area roads during this time period. The location of accidents on study area roads are shown in full in Figure 9.3: Injury Accident Locations.
890. Vehicle traffic generated by the construction of the Proposed Development may potentially affect other public road traffic as follows; non-motorised traffic including pedestrians, cyclists and core path users; and other vehicular traffic including freight, public transport and emergency service vehicles.
891. Table **Table 9-11** shows the 2024 baseline traffic data collected for study area roads.

Table 9-11: 2024 Traffic Data

Road Link	Daily Weekday Traffic (Two-Way)		
	Car & LGV	HGV	Total
A977 north	6,529	700	7,229
A907 west	14,189	722	14,911
A907 east	2,178	195	2,373
A977 Kilbagie Roundabout	20,397	1927	22,324
A977 Kilbagie	4,400	81	4,481
A977 Feregait	4,509	90	4,599
Substation Access Road	330	7	337

Road Link	Daily Weekday Traffic (Two-Way)		
	Car & LGV	HGV	Total
C68 Hawkhill Road	258	5	263
A876	17,905	1287	19,192
Clackmannanshire Bridge	17,996	1292	19,288
A876 S Approach Road	29,645	1769	31,414
Kincardine Bridge	10,733	781	11,514
A985 west	8,631	555	9,186
A985 east	9,544	1479	11,023

9.8 Proposed Development Traffic

892. Forecast construction traffic for the Proposed Development was obtained from information provided by SPT. The estimated construction traffic volumes are included within Appendix D of Technical Appendix 9.1: Traffic and Transport. The peak month of construction of the substation is forecast to take place in March 2026.
893. It is forecast that the Proposed Development would generate 158 daily HGV movements during March 2026 (79 arrivals and 79 departures) with 70 daily Car / LGV movements (35 arrivals and 35 departures) also during this month.
894. Vehicle access to the Proposed Development will be via the existing public road network. Study area roads are the A876 (T), A977 (T), A907, A985 (T) and local roads in the immediate environs of the Proposed Development.
895. No construction traffic is proposed to route directly through the town of Kincardine. Construction traffic would access the Proposed Development Site via the Kilbagie Roundabout and the A977, conducting a right turn onto the Substation Access Road and continuing on to the C68 Hawkhill Road. The C68 Hawkhill Road is a single track road with the Substation Access Road being a narrow two-way single carriageway road until its junction with the A977.
896. Construction traffic would leave via the C68 Hawkhill Road and the Substation Access Road before turning north onto the A977 (T) at its junction with the Substation Access Road. Public road improvements are proposed for the C68 Hawkhill Road. These are described in full section 9.10 and shown in drawing within Appendix I of Technical Appendix 9.1: Traffic and Transport.

9.9 Traffic and Transport Appraisal

897. For a robust assessment it is assumed all construction materials will be transported to site by road. For assessment purposes no materials are assumed to originate from within the site. This assumption is made for assessment purposes and is consistent with the principles of the Rochdale Envelope and the assessment of a realistic worst case.

898. It is also assumed construction traffic generated by the Proposed Development travels on all study area roads, with the exception of the A977 Feregait through the centre of Kincardine. This assumption is very unlikely to occur in reality as the eventual distribution of construction traffic will rule out a real-world requirement for every construction vehicle to use every study area road. However, this assumption provides for a robust assessment of Proposed Development traffic on study area roads for the purposes of Rule 1 and Rule 2 assessment.
899. Table **Table 9-12** compares forecast Proposed Development construction traffic against the 2026 baseline traffic to determine which roads must be included in the environmental assessment in accordance with IEMA Guidelines Rule 1 or Rule 2. 2026 has been used as baseline for traffic to coincide with the forecasted peak in construction traffic. Roads to be included in the environmental assessment are marked Yes or No. Traffic growth calculations for the 2026 baseline figures are included in full in Appendix E of Technical Appendix 9.1: Traffic and Transport.

Table 9-12: IEMA Guidelines Road to be Included in Environmental Assessment

Road Link	2026 Baseline		Proposed Development		% Increase		Environmental Assessment
	HGV	All Vehs	HGV	All Vehs	HGV	All Vehs	
A977 north	720	7,434	158	228	22%	3%	No
A907 west	743	15,334	158	228	21%	1%	No
A907 east	201	2,440	158	228	79%	9%	Yes
A977 Kilbagie Roundabout	1,982	22,958	158	228	8%	1%	No
A977 Kilbagie	83	4,608	158	228	190%	5%	Yes
A977 Feregait	93	4,730	0	0	0%	0%	No
Substation Access Road	7	347	158	228	2195%	66%	Yes
C68 Hawkhill Road	5	270	158	228	3073%	84%	Yes
A876	1,324	19,737	158	228	12%	1%	No
Clackmannanshire Bridge	1,329	19,836	158	228	12%	1%	No

Road Link	2026 Baseline		Proposed Development		% Increase		Environmental Assessment
	HGV	All Vehs	HGV	All Vehs	HGV	All Vehs	
A876 S Approach Road	1,819	32,306	158	228	9%	1%	No
Kincardine Bridge	803	11,841	158	228	20%	2%	No
A985 west	571	9,447	158	228	28%	2%	No
A985 east	1,521	11,336	158	228	10%	2%	No

900. Table 9-12 **Table 9-12** shows that four study area roads are to be included in the environmental assessment of traffic and transport.

Severance of Communities

901. **Table 9-13** Table presents the significance of effect on the severance of communities as a result of Proposed Development construction traffic. Severance of communities is the perceived division that can occur within a community when it becomes separated by a major transport infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.
902. Severance of communities magnitude of change is derived from overall traffic increases generated by the Proposed Development traffic, classified in accordance with Table 9-2.
903. The significance of effects for severance are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 9-13: Assessment of Severance of Communities

Road Link	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A907 east	9%	Negligible	Low	Negligible
A977 Kilbagie	5%	Negligible	Medium	Negligible
Substation Access Road	66%	Medium	Low	Minor

Road Link	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
C68 Hawkhill Road	84%	Medium	High	Moderate

904. Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic on severance of communities is a direct, temporary, **Moderate Adverse (Significant)** effect on C68 Hawkhill Road.
905. For severance of communities the significance of effects for most study areas roads carrying construction traffic would be minor or negligible. Only the C68 Hawkhill Road is forecast to have a moderate significance of effect.

Fear and Intimidation on and by Road Users

906. Table **Table 9-14** presents the significance of effect on Fear and Intimidation on and by Road Users as a result of Proposed Development construction traffic. The Fear and Intimidation assessment has been conducted using the ‘degree of hazard’ methodology as set out in IEMA Guidelines and classified in Table 9-3, Table 9-4 and Table 9-5. The derivation of the fear and intimidation calculations are included in full within Appendix F of Technical Appendix 9.1: Traffic and Transport.

Table 9-14: Fear and Intimidation on and by Road Users

Road Link	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A9707 east	Negligible	Low	Negligible
A977 Kilbagie	Negligible	Medium	Negligible
Substation Access Road	Negligible	Low	Negligible
C68 Hawkhill Road	Negligible	High	Minor

907. Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic for Fear and Intimidation on and by Road Users is a direct, temporary, **Minor (Not Significant)** effect on C68 Hawkhill Road.
908. For Fear and Intimidation on and by Road Users the significance of effects for most study areas roads carrying construction traffic would be negligible. Only the C68 Hawkhill Road is forecast to have a minor significance of effect.

Road User and Pedestrian Safety

909. Table **Table 9-15** presents the significance of effect on Road User and Pedestrian Safety as a result of Proposed Development construction traffic. Road user and pedestrian safety assesses environmental effects based on rate and severity of accidents relating to changes in traffic flows. Recorded injury accidents for the four-year period 2020-2023 were used to calculate an accident rate by severity (slight, serious, fatal) per million vehicle kilometres travelled on Study Area roads. Proposed Development vehicle kilometres by Study Area road

are applied to the accident rates to produce a forecast of accidents by severity. Table 9-6 shows the magnitude of change thresholds adopted for this assessment, with Appendix G of Technical Appendix 9.1: Traffic and Transport detailing the forecast of accidents by severity calculation.

Table 9-15: Road User and Pedestrian Safety Significance of Effect

Road Link	Magnitude of Change	Sensitivity of Receptor	Forecast Injury Accident			Significance of Effect
			Slight	Severe	Fatal	
A9707 east	Negligible	Low	0.0	0.0	0.0	Negligible
A977 Kilbagie	Negligible	Medium	0.0	0.0	0.0	Negligible
Substation Access Road	Negligible	Low	0.0	0.0	0.0	Negligible
C68 Hawkhill Road	Negligible	High	0.0	0.0	0.0	Minor

- 910. Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic on Road User and Pedestrian Safety is a direct, temporary, **Minor (Not Significant)** effect on C68 Hawkhill Road.
- 911. For Road User and Pedestrian Safety, the significance of effects for most study areas roads carrying construction traffic would be negligible. Only C68 Hawkhill Road is forecast to have a minor significance of effect.

Non-Motorised User Amenity

- 912. Table 9-16 presents the significance of effect on non-motorised user amenity. The 1993 IEMA Guidelines suggest that a threshold for judging the significance of changes in pedestrian amenity would be where traffic flow has halved or doubled. It also states that these thresholds are expressed as a starting point for any assessment and therefore, to establish a significance of effect, the same 30%, 60%, 90% magnitude of change thresholds as applied in the ‘severance of communities’ assessment have been used and are shown in Table 9-2.

Table 9-16: Non-Motorised User Amenity

Road Link	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A907 east	9%	Negligible	Low	Negligible
A977 Kilbagie	5%	Negligible	Medium	Negligible
Substation Access Road	66%	Medium	Low	Minor

Road Link	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
C68 Hawkhill Road	84%	Medium	High	Moderate

913. Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic is a direct, temporary, Moderate Adverse (**Significant**) effect on C68 Hawkhill Road.

914. For non-motorised user amenity the significance of effects for most study areas roads carrying construction traffic would be minor or negligible. Only the C68 Hawkhill Road is forecast to have a moderate significance of effect.

Non-Motorised Delay

915. Table 9-17 presents the forecast effects on non-motorised user delay. The IEMA Guidelines state that pedestrian delay and severance are closely related effects and can be grouped together and that changes in the volume of general traffic may affect the ability of pedestrians to crossroads. The non-motorised user assessment has therefore been undertaken using the same magnitude of change thresholds as the severance assessment.

916. The IEMA Guidelines state that “The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively.” These thresholds are used to determine the magnitude of change for the assessment of non-motorised user delay and are shown in Table 9-2.

Table 9-17: Non-Motorised Delay

Road Link	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A907 east	9%	Negligible	Low	Negligible
A977 Kilbagie	5%	Negligible	Medium	Negligible
Substation Access Road	66%	Medium	Low	Minor
C68 Hawkhill Road	84%	Medium	High	Moderate

917. Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic is a direct, temporary, Moderate Adverse (**Significant**) effect on C68 Hawkhill Road.

918. For non-motorised user delay the significance of effects for most study areas roads carrying construction traffic would be minor or negligible. Only the C68 Hawkhill Road is forecast to have a moderate significance of effect.

Road Vehicle Driver and Passenger Delay

919. Table Table 9-18 presents the assessment of driver delay. The IEMA Guidelines state that traffic delays can occur at site entrance junctions and on roads passing development sites where there is likely to be additional traffic. Driver delay is assessed in terms of potential congestion resulting from Proposed Development. Junction modelling analysis has been undertaken at junctions which will be affected by Proposed Development construction traffic

to assess changes in the Level of Service at these junctions. The change in junction level of service has informed the magnitude of change for driver delay. Thresholds adopted for the magnitude of change for this assessment are shown in Table 9-7, with full methodology and junction modelling outputs can be viewed in Appendix M of Technical Appendix 9.1: Traffic and Transport.

920. Study area roads that are not affected by junctions modelled as part of this assessment have been assessed against the change in traffic flows applied in the ‘severance of communities’ assessment.

Table 9-18: Road Vehicle Driver and Passenger Delay

Road Link	Change in Junction Level of Service	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A907 east	-	9%	Negligible	Low	Negligible
A977 Kilbagie	No change	5%	Negligible	Medium	Negligible
Substation Access Road	No change	66%	Low	Low	Negligible
C68 Hawkhill Road	No change	84%	Low	High	Moderate

921. Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic is a direct, temporary, **Moderate Adverse (Significant)** effect on C68 Hawkhill Road.
922. For road vehicle driver and passenger delay the significance of effects for most study areas roads carrying construction traffic would be negligible. Only the C68 Hawkhill Road is forecast to have a moderate significance of effect.

Hazardous / Large Loads

923. Proposed Development hazardous and large loads will be transported to the Proposed Development Site by road. The legislation detailing the movement of Hazardous / Large Loads is the Road Vehicles (Construction and Use) Regulations (1986) and Special Types General Order (STGO) (2003) detailed in Section 9.4 Legislation and Policy of this report.
924. The movement of large loads is regulated and will be subject to agreement with the relevant roads authorities and Police Scotland. Appropriate routes must be considered for the movement of large loads and mitigation strategies must secure their safe passage. If frequent large load movements are anticipated consideration must be given to whether other traffic impacts could be induced e.g. severance, fear and intimidation, driver delay, etc.
925. Large Loads will access the Proposed Development Site via a temporary access from the A876. This temporary access will be used by Abnormal Load construction traffic only, with standard HGV and LGV traffic accessing the Proposed Development Site via the C68 Hawkhill Road. Abnormal load movements associated with the Proposed Development are limited to the delivery of supergrid transformers via the A876.

926. There is no law requiring vehicles moving under STGO to be accompanied by an escort vehicle, although the police can stipulate an escort vehicle is used where they consider necessary. Large loads traveling to the Proposed Development Site will be escorted where necessary. On Study Area roads that are high sensitivity receptors large loads will obey all speed limits and traffic directions (including lawful directions from escort vehicles or Police Scotland).
927. The number of large loads for the Proposed Development is considered to be sufficiently low that they would have no discernible impact on the magnitudes of change already established in this assessment for severance, fear and intimidation, road safety, non-motorised user amenity, and non-motorised user delay on Study Area roads. This will result in no change to environmental effects already established on Study Area roads.
928. The National Speed Limit (NSL) on single carriageway roads in Scotland for goods vehicles above 7.5 tonnes maximum laden weight is 40 mph. On NSL roads STGO Category 1 vehicles are also permitted to travel at 40 mph, i.e. no different to other HGV in that regard. STGO Category 2 and 3 vehicles are restricted to 30 mph on NSL roads.
929. On Study Area roads general HGVs following a Category 2 or Category 3 large load for the entire route would experience an increase in journey time. This is due to the 10 mph speed limit difference between those vehicle types on NSL roads. General HGVs would likely have to follow rather than overtake large loads. Cars and LGV should be able to overtake Category 1-3 large loads on Study Area NSL roads when permissible and safe to do so.
930. Category 2 or Category 3 large loads going to site can only travel at 30 mph on national speed limit roads. They will be relatively few in number with potentially just one arrival to site per hour. During the course of a trip along Study Area roads other HGV travelling at NSL (40 mph) would gradually catch and then have to follow slower moving large load traffic. As large load vehicles will be few in number, instances of other HGV having to follow slower moving large loads for protracted distances on Study Area roads should be limited.
931. It is therefore considered large loads would have no additional impact on the magnitude of change already established in this assessment for driver delay on Study Area roads. This will result in no change to the environmental effects already identified in this assessment for driver delay on Study Area roads.

9.10 Additional Mitigation

932. Additional Mitigation relating to traffic movements associated with the Proposed Development would be focused primarily on public road improvements (PRI) proposed for the C68 Hawkhill Road. These include temporary passing places and improvements to passing places on the single track road, limited road widening on bends, and the provision of a fully segregated pedestrian/cycle route to the north of the vehicle carriageway. Drawings showing these proposed improvements are provided in Appendix I of Technical Appendix 9.1: Traffic and Transport.

9.11 Residual Effects

933. Prior to mitigation temporary **Moderate adverse (Significant)** environmental effects are forecast for the C68 Hawkhill Road. It is anticipated that mitigation in the form of public road improvements (PRI) on the C68 Hawkhill Road and a CTMP would be required in terms of the conditions attached to consents for the Proposed Development, and subsequently approved by relevant planning authorities in consultation with the roads authorities.

934. Post-mitigation residual environmental effects associated with Proposed Development construction traffic are forecast to be direct, temporary **Minor adverse (Not Significant)**. Table 9-19 provides a summary of the potential effects identified in this Chapter.

Table 9-19: Residual Environmental Effects

Effect	Receptor	Significance of Effect (Prior to Mitigation)	Mitigation	Residual Effect
Severance	Pedestrian Traffic	Moderate	PRI	Minor
Fear and Intimidation	Pedestrian & Cycle Traffic	Minor	PRI	Negligible
Road User and Pedestrian Safety	All Traffic	Minor	PRI	Negligible
Non-Motorised User Amenity	Pedestrian & Cycle Traffic	Moderate	PRI	Minor
Non-Motorised User Delay	Pedestrian & Cycle Traffic	Moderate	PRI	Minor
Road Vehicle & Passenger Delay	Vehicle Traffic	Moderate	PRI	Minor

9.12 Monitoring

935. Monitoring is primarily associated with the CTMP. The detailed CTMP and compliance with it would likely be secured as a planning condition. It would be prepared in consultation with Fife Council, Clackmannanshire Council and Transport Scotland primarily by the Construction Contractor.
936. Roads authorities would be liaised with throughout the construction of the Proposed Development. Regular contact would help to inform the levels of CTMP monitoring, review and improvement as necessary.

9.13 Cumulative Assessment

937. The cumulative assessment for the Proposed Development considers the cumulative developments set out in Table 2-2 (reproduced in this chapter as Table 9-20). Construction traffic numbers for each of the individual cumulative assessment sites are including in Appendix J of Technical Appendix 9.1: Traffic and Transport. The location of cumulative assessment sites has been reviewed and the sites included in Table 9-20 will or are likely to use study area roads meaning there is the potential for a cumulative effect.

Table 9-20: Cumulative Developments

Planning Application / Reference Name	Description	Location	Status
Kincardine Grid Services - 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
Kincardine BESS - ECU00004987	342MW Battery Energy Storage System	Land west of Kincardine Substation, Alloa, FK10 4BJ	Application
Meadowend Farm 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 fencing, CCTV, security lighting and landscaping	Land At Meadowend Farm, Kennet, Clackmannanshire, FK10 4DP	Pre-Application
Central Scotland Overhead Line Upgrades (DWUP, ECUP and LWUP) - ECU00005132	Includes an increase in the operating voltage of the existing XL, ZCN and ZCS routes from 275kV to 400kV as well as removal of existing towers and	XL – Blairingone to Kincardine Substation ZCN/ZCS – Longannet to Denny North Substation	Pre-Application

Planning Application / Reference Name	Description	Location	Status
	construction of new towers to connect the overhead lines to the proposed Kincardine North Substation.		
Kilbagie BESS - ECU00005240	Installation of a BESS with a capacity of up to 250MW and associated infrastructure.	Land at Kilbagie to the north of the proposed Kincardine North Substation	Application
Aggregate Storage Building and associated hardstanding - 24/00979/FULL	Aggregate storage building unit including welfare, and hardstanding areas as well as loading areas.	Located in Fife south of Proposed Development south of Hawkhill Road at the disused railhead.	Approved (pending construction)
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.	Located in Fife within the Site and extending south to Hawkhill Road, crossing it into the existing Kincardine Substation.	Pre-application (screening)
Temporary installation of transformers at Kincardine Substation - 25/02355/SCR	Temporary installation of two 400kV transformers within the existing Kincardine Substation site.	Located in Fife within the footprint of the existing Kincardine Substation, approximately 1km south of the KINN substation platform.	Permitted Development (pending construction)

938. For this assessment, it has been assumed that construction traffic for these developments will follow the same routing for Car / LGV and HGV traffic as the Proposed Development. **Table 9-21** shows study area roads that are to be included in the cumulative development assessment.

Table 9-21; IEMA Guidelines Road to be Included in Cumulative Development Environmental Assessment

Road Link	2026 Baseline		Proposed Development + Cumulative Development		% Increase		Environmental Assessment
	HGV	All Vehs	HGV	All Vehs	HGV	All Vehs	
A977 north	720	7,434	285	511	40%	7%	Yes
A907 west	743	15,334	285	511	38%	3%	Yes
A907 east	201	2,440	285	511	142%	21%	Yes
A977 Kilbagie Roundabout	1,982	22,958	285	511	14%	2%	No
A977 Kilbagie	83	4,608	477	847	573%	18%	Yes
A977 Feregait	93	4,730	51	123	55%	3%	Yes
Substation Access Road	7	347	457	803	6348%	232%	Yes
C68 Hawkhill Road	5	270	341	663	6632%	245%	Yes
A876	1,324	19,737	497	891	38%	5%	Yes
Clackmannanshire Bridge	1,329	19,836	497	891	37%	4%	Yes
A876 S Approach Road	1,819	32,306	497	891	27%	3%	No
Kincardine Bridge	803	11,841	265	467	33%	4%	Yes
A985 west	571	9,447	265	467	46%	5%	Yes
A985 east	1,521	11,336	265	467	17%	4%	No

Table shows that 11 study area roads are to be included in the cumulative development environmental assessment of traffic and transport.

Severance of Communities – Cumulative Assessment

939. Table presents the significance of effect on the severance of communities as a result of cumulative assessment construction traffic. Severance of communities is the perceived division that can occur within a community when it becomes separated by a major transport infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.
940. Severance of communities magnitude of change is derived from overall traffic increases generated by the cumulative Development traffic, classified in accordance with Table 9-2.
941. The significance of effects for severance are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 9-22: Assessment of Severance of Communities – Cumulative Developments

Road Link	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A977 north	7%	Negligible	Low	Negligible
A907 west	3%	Negligible	Medium	Negligible
A907 east	21%	Negligible	Low	Negligible
A977 Kilbagie	18%	Negligible	Medium	Negligible
A977 Feregait	3%	Negligible	High	Minor
Substation Access Road	232%	High	Low	Moderate
C68 Hawkhill Road	245%	High	High	Major
A876	5%	Negligible	Low	Negligible
Clackmannanshire Bridge	4%	Negligible	Medium	Negligible
Kincardine Bridge	4%	Negligible	Low	Negligible
A985 west	5%	Negligible	Low	Negligible

942. Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic on severance of communities is a direct, temporary, **Major Adverse (Significant)** effect on C68 Hawkhill Road.
943. For severance of communities the significance of effects for most study areas roads carrying construction traffic would be negligible or minor, with the Substation Access Road being **Moderate Adverse (Significant)**. Only the C68 Hawkhill Road is forecast to have a major significance of effect.

Fear and Intimidation on and by Road Users – Cumulative Assessment

944. Table 9-23 **Table 9-23** presents the significance of effect on Fear and Intimidation on and by Road Users as a result of cumulative development construction traffic. The Fear and Intimidation assessment has been conducted using the ‘degree of hazard’ methodology as set out in IEMA Guidelines and classified in Table 9-3, Table 9-4 and Table 9-5. The derivation of the fear and intimidation calculations for the cumulative assessment are included in full within Appendix J of Technical Appendix 9.1: Traffic and Transport.

Table 9-23: Fear and Intimidation on and by Road Users - Cumulative Developments

Road Link	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A977 north	Negligible	Low	Negligible
A907 west	Negligible	Medium	Negligible
A907 east	Negligible	Low	Negligible
A977 Kilbagie	Negligible	Medium	Negligible
A977 Feregait	Negligible	High	Minor
Substation Access Road	Negligible	Low	Negligible
C68 Hawkhill Road	Negligible	High	Minor
A876	Negligible	Low	Negligible
Clackmannanshire Bridge	Negligible	Medium	Negligible
Kincardine Bridge	Low	Low	Negligible
A985 west	Negligible	Low	Negligible

945. Classifying the significance of effects: prior to mitigation, the likely cumulative effect of traffic for Fear and Intimidation on and by Road Users is a direct, temporary, **Minor Adverse (Not Significant)** effect on A977 Feregait and C68 Hawkhill Road.
946. For Fear and Intimidation on and by Road Users the significance of effects for most study areas roads carrying cumulative traffic would be negligible. A977 Feregait and C68 Hawkhill Road are forecast to have a minor significance of effect. The minor significance of effect for the A977 Feregait is based on assumptions made regarding cumulative development traffic not related to the Proposed Development.

Road User and Pedestrian Safety – Cumulative Assessment

947. Table 9-24 presents the significance of effect on Road User and Pedestrian Safety as a result of cumulative Development construction traffic. Road user and pedestrian safety assesses environmental effects based on rate and severity of accidents relating to changes in traffic flows. Recorded injury accidents for the four-year period 2020-2023 were used to calculate an accident rate by severity (slight, serious, fatal) per million vehicle kilometres travelled on Study Area roads. Cumulative Development vehicle kilometres by Study Area road are applied to the accident rates to produce a forecast of accidents by severity. Table 9-6 shows the magnitude of change thresholds adopted for this assessment, with Appendix L of

Technical Appendix 9.1: Traffic and Transport details the forecast of accidents by severity calculation.

Table 9-24: Road User and Pedestrian Safety Significance of Effect – Cumulative Developments

Road Link	Magnitude of Change	Sensitivity of Receptor	Forecast Injury Accident			Significance of Effect
			Slight	Severe	Fatal	
A977 north	Negligible	Low	0.0	0.0	0.0	Negligible
A907 west	Negligible	Medium	0.0	0.0	0.0	Negligible
A907 east	Negligible	Low	0.0	0.0	0.0	Negligible
A977 Kilbagie	Negligible	Medium	0.0	0.0	0.0	Negligible
A977 Feregait	Negligible	High	0.0	0.0	0.0	Minor
Substation Access Road	Negligible	Low	0.0	0.0	0.0	Negligible
C68 Hawkhill Road	Negligible	High	0.0	0.0	0.0	Minor
A876	Negligible	Low	0.0	0.0	0.0	Negligible
Clackmannanshire Bridge	Negligible	Medium	0.0	0.0	0.0	Negligible
Kincardine Bridge	Negligible	Low	0.0	0.0	0.0	Negligible
A985 west	Negligible	Low	0.0	0.0	0.0	Negligible

948. Classifying the significance of effects: prior to mitigation, the likely effect of cumulative traffic for Road User and Pedestrian Safety is a direct, temporary, **Minor Adverse (Not Significant)** effect on A977 Feregait and C68 Hawkhill Road.
949. For Road User and Pedestrian Safety the significance of effects for most study areas roads carrying cumulative traffic would be negligible. A977 Feregait and C68 Hawkhill Road are forecast to have a minor significance of effect. The minor significance of effect for the A977 Feregait is based on assumptions made regarding cumulative development traffic not related to the Proposed Development Site

Non-Motorised User Amenity – Cumulative Assessment

950. Table 9-25 presents the cumulative assessment significance of effect on non-motorised user amenity. The 1993 IEMA Guidelines suggest that a threshold for judging the significance of

changes in pedestrian amenity would be where traffic flow has halved or doubled. It also states that these thresholds are expressed as a starting point for any assessment and therefore, to establish a significance of effect, the same 30%, 60%, 90% magnitude of change thresholds as applied in the ‘severance of communities’ assessment have been used and are shown in Table 9-2.

Table 9-25: Non-motorised User Amenity Significance of Effect - Cumulative Assessment

Road Link	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A977 north	7%	Negligible	Low	Negligible
A907 west	3%	Negligible	Medium	Negligible
A907 east	21%	Negligible	Low	Negligible
A977 Kilbagie	18%	Negligible	Medium	Negligible
A977 Feregait	3%	Negligible	High	Minor
Substation Access Road	232%	High	Low	Moderate
C68 Hawkhill Road	245%	High	High	Major
A876	5%	Negligible	Low	Negligible
Clackmannanshire Bridge	4%	Negligible	Medium	Negligible
Kincardine Bridge	4%	Negligible	Low	Negligible
A985 west	5%	Negligible	Low	Negligible

- 951. Classifying the significance of effects: prior to mitigation, the likely effect of cumulative traffic on non-motorised user amenity is a direct, temporary, **Major Adverse (Significant)** effect on C68 Hawkhill Road.
- 952. For non-motorised user amenity the significance of effects for most study areas roads carrying construction traffic would be negligible or minor, with the Substation Access Road being **Moderate Adverse (Significant)**. Only the C68 Hawkhill Road is forecast to have a major significance of effect.

Non-Motorised User Delay

- 953. Table presents the forecast cumulative effects on non-motorised user delay. The IEMA Guidelines state that pedestrian delay and severance are closely related effects and can be grouped together and that changes in the volume of general traffic may affect the ability of pedestrians to crossroads. The non-motorised user assessment has therefore been undertaken using the same magnitude of change thresholds as the severance assessment.

954. The IEMA Guidelines state that “The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively.” These thresholds are used to determine the magnitude of change for the assessment of non-motorised user delay and are shown in Table 9-2.

Table 9-26: Non-motorised User Delay Significance of Effect - Cumulative Assessment

Road Link	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A977 north	7%	Negligible	Low	Negligible
A907 west	3%	Negligible	Medium	Negligible
A907 east	21%	Negligible	Low	Negligible
A977 Kilbagie	18%	Negligible	Medium	Negligible
A977 Feregait	3%	Negligible	High	Minor
Substation Access Road	232%	High	Low	Moderate
C68 Hawkhill Road	245%	High	High	Major
A876	5%	Negligible	Low	Negligible
Clackmannanshire Bridge	4%	Negligible	Medium	Negligible
Kincardine Bridge	4%	Negligible	Low	Negligible
A985 west	5%	Negligible	Low	Negligible

955. Classifying the significance of effects: prior to mitigation, the likely effect of cumulative traffic on non-motorised user delay is a direct, temporary, **Major Adverse (Significant)** effect on C68 Hawkhill Road.
956. For non-motorised user delay the significance of effects for most study areas roads carrying construction traffic would be negligible or minor, with the Substation Access Road being **Moderate Adverse (Significant)**. Only the C68 Hawkhill Road is forecast to have a major significance of effect.

Road Vehicle and Passenger Delay

957. Table 9-27 presents the assessment of driver delay. The IEMA Guidelines state that traffic delays can occur at site entrance junctions and on roads passing development sites where there is likely to be additional traffic. Driver delay is assessed in terms of potential congestion resulting from Proposed Development. Junction modelling analysis has been undertaken at junctions which will be affected by Proposed Development construction traffic to assess changes in the Level of Service at these junctions. The change in junction level of service has informed the magnitude of change for driver delay. Thresholds adopted for the

magnitude of change for this assessment are shown in Table 9-7, with full methodology and junction modelling outputs can be viewed in Appendix M of Technical Appendix 9.1: Traffic and Transport.

958. Study area roads that are not affected by junctions modelled as part of this assessment have been assessed

Table 9-27: Road Vehicle and Passenger Delay - Cumulative Assessment

Road Link	Change in Junction Level of Service	Traffic Increase (All Vehicles)	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
A977 north	-	7%	Negligible	Low	Negligible
A907 west	-	3%	Negligible	Medium	Negligible
A907 east	-	21%	Negligible	Low	Negligible
A977 Kilbagie	No change	11%	Negligible	Medium	Negligible
A977 Feregait	No change	4%	Negligible	High	Minor
Substation Access Road	No change	135%	Low	Low	Negligible
C68 Hawkhill Road	No change	173%	Low	High	Moderate
A876	No change	5%	Negligible	Low	Negligible
Clackmannanshire Bridge	-	4%	Negligible	Medium	Negligible
Kincardine Bridge	-	4%	Negligible	Low	Negligible
A985 west	-	5%	Negligible	Low	Negligible

959. Classifying the significance of effects: prior to mitigation, the likely effect of cumulative traffic on non-motorised user delay is a direct, temporary, **Moderate Adverse (Significant)** effect on C68 Hawkhill Road.
960. For road vehicle and passenger delay the significance of effects for most study areas roads carrying construction traffic would be negligible or minor. Only the C68 Hawkhill Road is forecast to have a moderate significance of effect.

Mitigation and Residual Effects – Cumulative Assessment

961. Prior to mitigation temporary Major adverse (Significant) environmental effects are forecast for the C68 Hawkhill Road. Mitigation will take place in the form of PRI, a CTMP and co-

ordination of CTMP’s with cumulative development sites. A key aspect of mitigation will be the scheme on the C68 Hawkhill Road to segregated pedestrian and cycle traffic.

- 962. Monitoring of this mitigation is primarily associated with the CTMP. The detailed CTMP and compliance with it would likely be secured as a planning condition. It would be prepared in consultation with Fife Council, Clackmannanshire Council and Transport Scotland primarily by the Construction Contractor with additional co-ordination of cumulative development sites CTMP’s sought to reduce pressure on the surrounding road network.
- 963. Post-mitigation residual environmental effects associated with cumulative development construction traffic are forecast to be direct, temporary **Minor (Not Significant)**. Table 9-28 provides a summary of the potential effects identified in this Chapter.

Table 9-28: Summary of Environmental Effects - Cumulative Assessment

Effect	Receptor	Significance of Effect (Prior to Mitigation)	Mitigation	Residual Effect
Severance	Pedestrian Traffic	Major	Co-ordination of CTMP’s with Cumulative Development Sites. C68 Hawkhill Road improvement scheme including segregated pedestrian / cycle route as identified above.	Minor
Fear and Intimidation	Pedestrian & Cycle Traffic	Minor	Co-ordination of CTMP’s with Cumulative Development Sites. C68 Hawkhill Road improvement scheme including segregated pedestrian / cycle route as	Negligible

Effect	Receptor	Significance of Effect (Prior to Mitigation)	Mitigation	Residual Effect
			identified above.	
Road User and Pedestrian Safety	All Traffic	Minor	Co-ordination of CTMP's with Cumulative Development Sites. C68 Hawkhill Road improvement scheme including segregated pedestrian / cycle route as identified above.	Negligible
Non-Motorised User Amenity	Pedestrian & Cycle Traffic	Major	Co-ordination of CTMP's with Cumulative Development Sites. C68 Hawkhill Road improvement scheme including segregated pedestrian / cycle route as identified above.	Minor
Non-Motorised User Delay	Pedestrian & Cycle Traffic	Major	Co-ordination of CTMP's with Cumulative Development Sites. C68 Hawkhill Road improvement	Minor

Effect	Receptor	Significance of Effect (Prior to Mitigation)	Mitigation	Residual Effect
			scheme including segregated pedestrian / cycle route as identified above.	
Road Vehicle & Passenger Delay	Vehicle Traffic	Moderate	Co-ordination of CTMP's with Cumulative Development Sites. C68 Hawkhill Road improvement scheme including segregated pedestrian / cycle route as identified above.	Minor

9.14 Summary

- 964. This chapter assesses the environmental effects of traffic and movement associated with the Proposed Development. Environmental effects are assessed in accordance with IEMA Guidelines.
- 965. A summary of relevant transport legislation, policy and consultation is included in this chapter. Consultation responses have been received from Fife Council, Clackmannanshire Council and Transport Scotland, and this chapter takes cognisance of those responses where appropriate.
- 966. The Study Area considers roads likely to be affected by Proposed Development construction traffic. The roads included in this assessment are the A82, A831 and A833.
- 967. The sensitivity of receptors on Study Area roads has been determined in accordance with IEMA Guidelines. The categories for assessment of sensitivity encompass people at home, people at work, vulnerable road users, tourism, accident records and current traffic conditions on Study Area roads.
- 968. Sensitivity of receptor and magnitude of change have been used to determine the significance of effects on roads within the Study Area across seven categories: severance of communities, fear and intimidation by road users, road user and pedestrian safety, non-

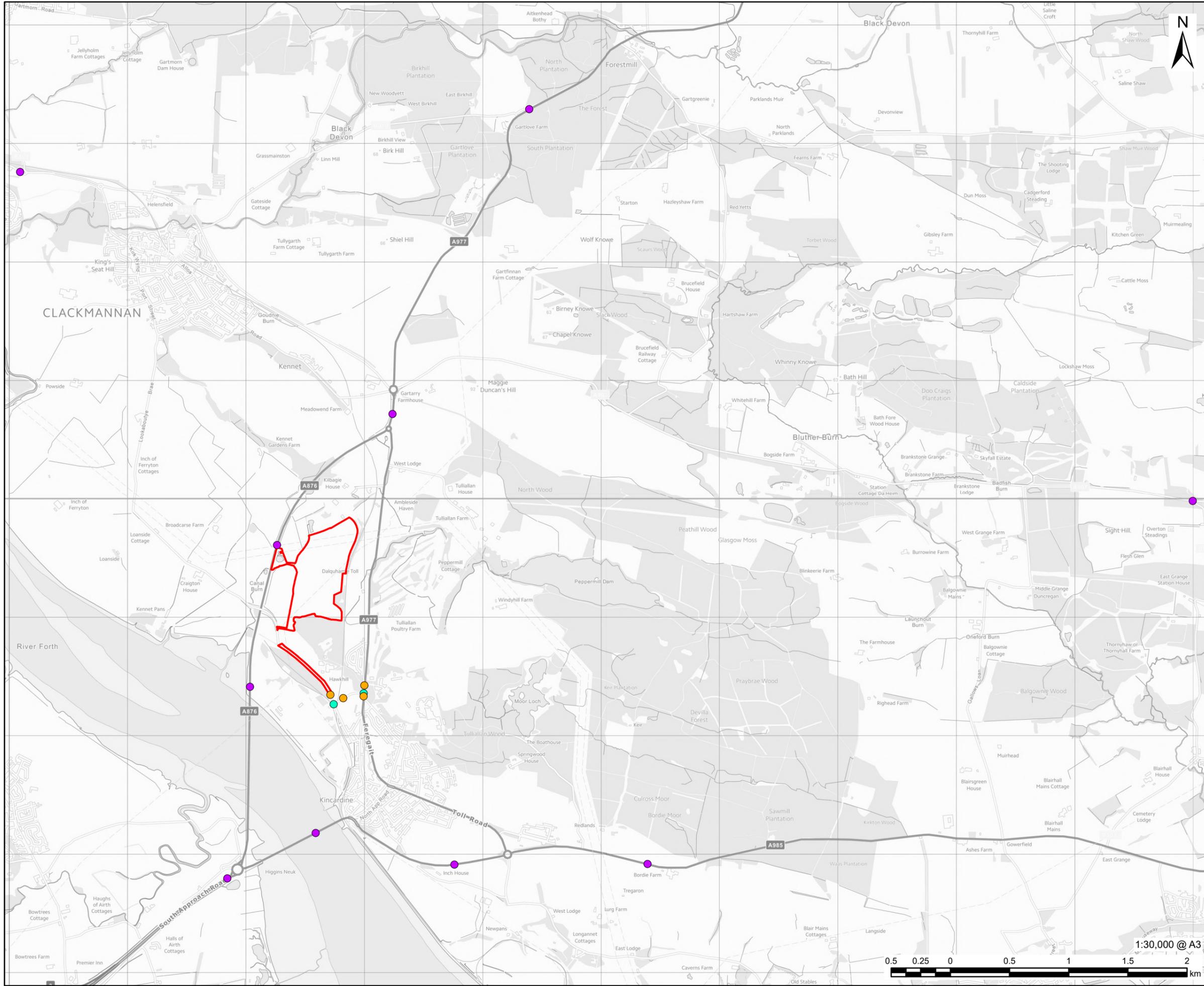
motorised user amenity, non-motorised user delay, road vehicle driver and passenger delay and hazardous / large loads.

969. Study Area roads have been assessed during the Construction Phase of the Proposed Development, and a cumulative assessment has been undertaken to assess the impact of the Proposed Development in combination with other potential developments in the area. A summary of significant effects for the categories assessed are shown in Table 9-28.

Table 9-28: Summary of Significant Effects

Effect	Proposed Development		Cumulative Development	
	Prior to Mitigation	Residual Effect	Prior to Mitigation	Residual Effect
Severance	Moderate	Minor	Major	Minor
Fear and Intimidation	Minor	Negligible	Minor	Negligible
Road User and Pedestrian Safety	Minor	Negligible	Minor	Negligible
Non-Motorised User Amenity	Moderate	Minor	Major	Minor
Non-Motorised User Delay	Moderate	Minor	Major	Minor
Road Vehicle & Passenger Delay	Moderate	Minor	Moderate	Minor

970. Mitigation is proposed in the form of a CTMP and PRI. The goal of the CTMP will be to minimise the likelihood of significant environmental effects occurring by managing traffic to and from the Proposed Development Site. In addition in order to mitigate cumulative effects, additional mitigation is proposed comprising coordination of CTMPs with adjacent developments. PRI on the C68 Hawkhill Road would include temporary passing places and improvements to passing places on the single track road, limited road widening on bends, and the provision of a fully segregated pedestrian/cycle route to the north of the vehicle carriageway.



PROJECT

Kincardine North Substation

CLIENT

SP Energy Networks

CONSULTANT

AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND

- Site Boundary
- DFT Traffic Count
- Automatic Traffic Counter
- Junction Turning Count

NOTES

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ISSUE PURPOSE

EIA REPORT

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60635450

FIGURE TITLE

Traffic Survey Locations

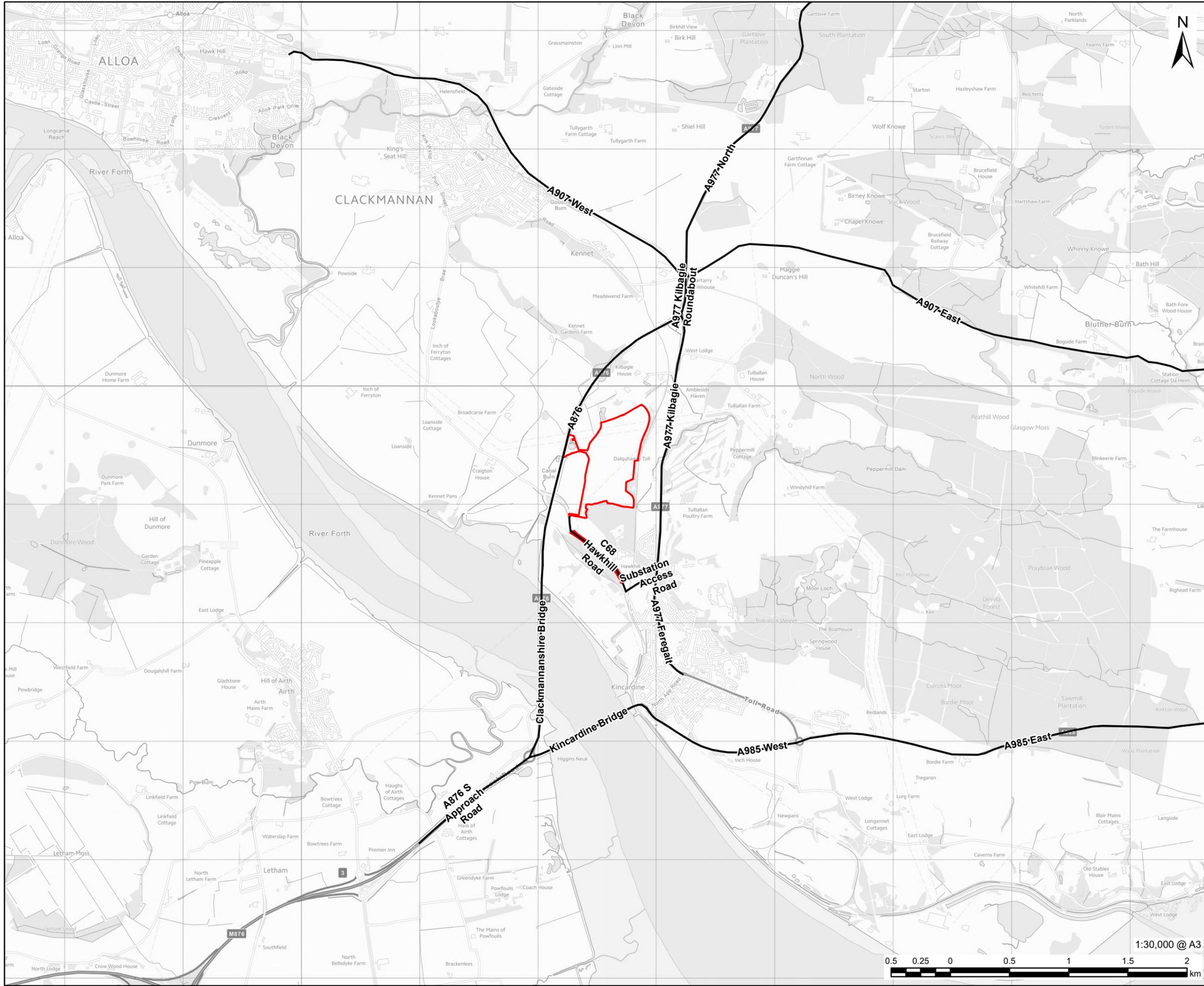
FIGURE NUMBER

Figure 9.1



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LEGEND

- Site Boundary
- Study Area Road

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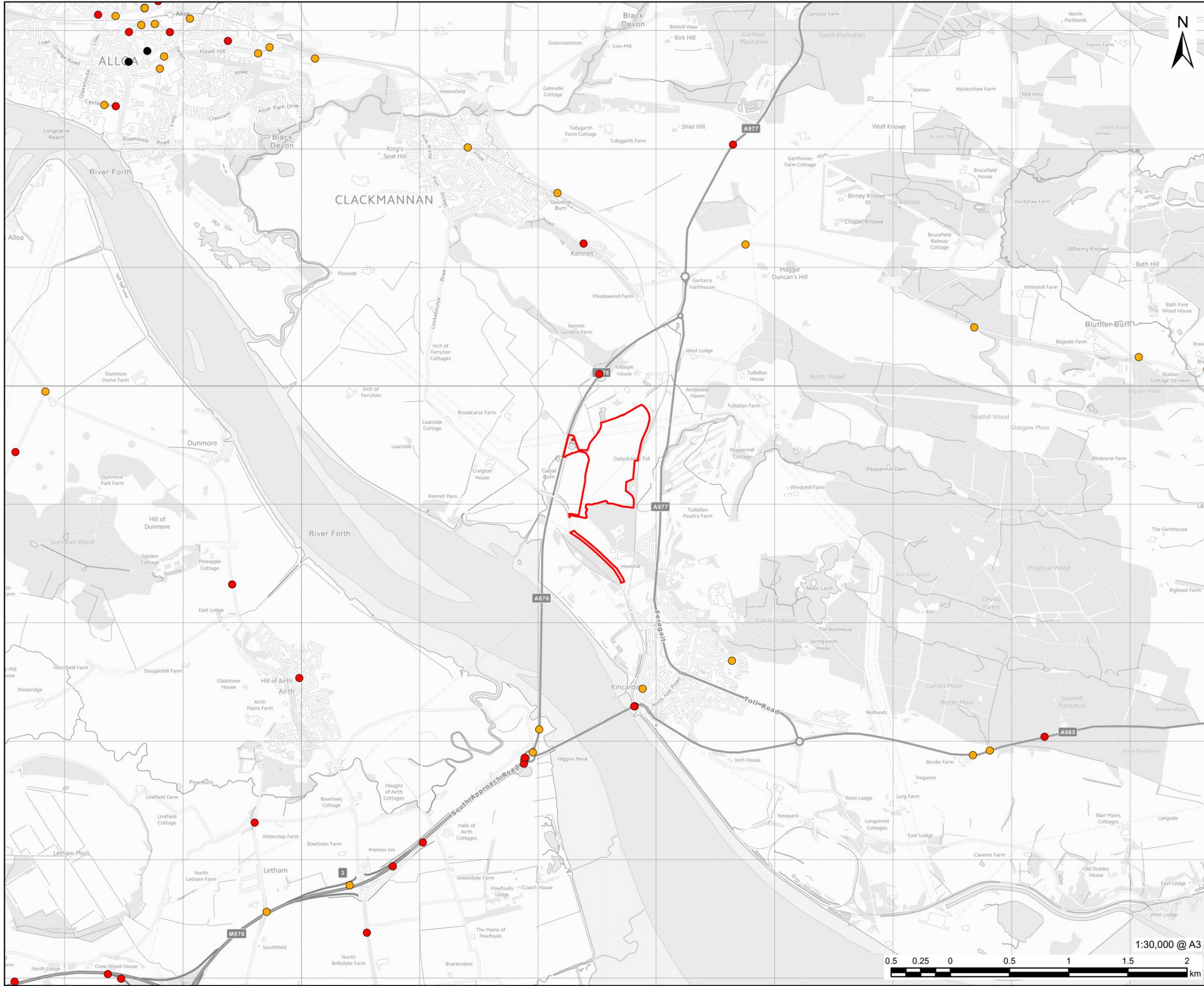
FIGURE TITLE

Study Area Roads

FIGURE NUMBER

Figure 9.2

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LEGEND

- Site Boundary
- Injury Accident Location
- Slight
- Serious
- Fatal

NOTES

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ISSUE PURPOSE

EIA REPORT

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60635450

FIGURE TITLE

Injury Accident Locations

FIGURE NUMBER

Figure 9.3

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10.

**Construction
and
Operational
Noise**

10. Construction and Operational Noise

10.1 Introduction

971. This chapter presents the assessment of the likely noise and vibration effects occurring a result of Kincardine North Substation (Proposed Development). The construction and operation of the Proposed Development will not cause vibration-related effects as potential receptors are greater than 100m away so this has not been assessed.
972. The Proposed Development will be located near Kincardine, Fife at the site ('the Development Site') as described in Chapter 4 'Project Description' The Proposed Development and nearest NSRs are shown in Figure 10.1 in Appendix 10.2. The Proposed Development will operate 24 hours a day with little variation in its sound emissions.
973. As stated in Chapter 2, decommissioning effects have been scoped out of this assessment. 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 not been assessed. 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.
974. A summary of noise terminology relevant to this chapter is included in Volume 3, Appendix 10.1 'Noise Perception and Terminology'.

10.2 Legislative and Planning Policy Context

Legislation

Environmental Protection Act 1990

975. The Environmental Protection Act 1990 (Ref 10.1) identifies that noise (and vibration) emitted from premises (including land) can, at certain levels, be prejudicial to health or give rise to statutory nuisance. Local authorities are required to investigate any public complaints of noise and if they are satisfied that a statutory nuisance exists, or is likely to occur or recur, they must serve a noise abatement notice. A notice is served on the person responsible for the nuisance. It requires either the abatement of the nuisance; or works to abate the nuisance to be carried out; or it prohibits or restricts the activity. Contravention of a notice without reasonable excuse is an offence. A right of appeal to the Sheriff Court exists within 21 days of the service of a noise abatement notice.
976. No statutory noise limits exist for determining a nuisance; therefore, the Local Authority can take account of various guidance documents and existing case law when investigating complaints. Lower noise level limits are generally applied when considering the acceptability of a planning permission than those which would be used when considering whether an existing noise source amounts to a statutory nuisance. Demonstrating the use of Best Practicable Means (BPM) to minimise noise levels is an accepted defence against a noise abatement notice.

Control of Pollution Act 1974

977. The Control of Pollution Act 1974 (Ref 10.2) requires that BPM (as defined in Section 72) are adopted to control construction noise on any given site as far as reasonably practicable. Sections 60 and 61 provide the main legislation regarding enabling works and construction site noise and vibration. If noise complaints are received, a Section 60 notice may be issued by the Local Authority with instructions to cease work until specific conditions to reduce noise have been adopted.
978. Section 61 provides a means to apply for prior consent to carry out noise generating activities during construction. Once prior consent has been agreed under Section 61, a Section 60 notice cannot be served provided the agreed conditions are maintained onsite.
979. Whilst construction noise and vibration are factors which can be considered during the planning process, Local Authorities have alternative powers under Sections 60 and 61 of to regulate these issues if complaints arise.

The Pollution Prevention and Control (Scotland) Regulations 2012

980. The Pollution Prevention and Control (Scotland) Regulations 2012 define the framework in Scotland to control pollution from any installation or mobile plant carrying out operational activities through permits, inspections and control of emissions. The permit covers the inclusion of best available techniques (BAT) and, relating to noise, will typically require periodic review of BAT and compliance monitoring to be undertaken by the license holder.

Planning Policy

National Planning Policy

981. National Planning Policy Framework 4 (NPF4) is the national spatial strategy for Scotland, published in February 2023 (Ref 10.3). It sets out spatial principles, regional priorities, national developments, and national planning policy.
982. The policies concerned with the Proposed Development and noise are Policies 11 and 23.
983. Policy 11 supports development proposals for all forms of renewable, low-carbon and zero emissions technologies. Section (e) refers to project design and mitigation with respect to demonstrating how the following impacts are addressed:

“i. impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;”

984. Policy 23 supports development proposals that will have positive effects on health, whilst proposals will not be supported where significant adverse effects on health are likely. Section (e) states:

“Development proposals that are likely to raise unacceptable noise issues will not be supported. The agent of change principle applies to noise sensitive development. A Noise Impact Assessment may be required where the nature of the proposal or its location suggests that significant effects are likely.”

Planning Advice Note 1/ 2011 Planning and Noise

985. Current national guidance on noise is contained in Planning Advice Note (PAN) 1/2011 ‘Planning and Noise’ (Ref 10.4). Paragraph 2 states that PAN 1/2011 promotes:
- “the principles of good acoustic design and a sensitive approach to the location of new development. It promotes the appropriate location of new potentially noisy development, and a pragmatic approach to the location of new development within the vicinity of existing

noise generating uses, to ensure that quality of life is not unreasonably affected and that new development continues to support sustainable economic growth.”

986. Paragraph 3 of PAN 1/2011 states that:

“The Environmental Noise (Scotland) Regulations 2006 transposed the European Directive 2002/49/EC (the Environmental Noise Directive) into Scottish law. They require Scottish Ministers and airport authorities to manage noise through a process of strategic noise mapping and noise action plans. In the areas affected by the Regulations, planning authorities have a role in helping to prevent and limit the adverse effects of environmental noise.”

987. There are no Environmental Noise Directive (END) ‘noise action plans’ in proximity to the Proposed Development.

988. A Technical Advice Note (TAN) (Ref 10.5) accompanies PAN 1/2011 and provides technical guidance on noise assessment to support the PAN. Paragraph 2.5 of the TAN states:

“For a quantitative assessment of the noise impacts, the noise level change needs to be related to the sensitivity of the receptor so that the significance of the noise level change can be determined. Hence, the significance of the noise impact at a particular receptor can be determined from the magnitude of the noise change and the sensitivity of that receptor to the change in noise. The magnitude of the noise level change can be assessed relative to an absolute threshold level or relative to the pre-existing ambient noise level.”

989. Paragraph 3.20 of the TAN also states:

“In deciding if a significant impact occurs in regard to the assessment of industrial noise, or noise of an industrial nature, using the methodology of BS 4142 (where appropriate); the Scottish Government consider impacts are normally not significant (in a quantitative sense only) the difference between the Rating and background noise levels is less than 5 dB(A), and that usually the threshold of minor significant impacts is when the difference between the Rating and background noise levels is at least 5 dB(A); and commonly do not become sufficiently significant to warrant mitigation until the difference between the Rating and background noise levels is more than 10 dB(A).”

Local Policy

990. Fife council have published Policy for Development and Noise’ (2021) (Ref 10.6 and Ref 10.7), the relevant part of which is set out below:

“FIFEplan 2017, Policy 2.2:Housing and Policy 5: Employment Land and Property Policy 10: Amenity are relevant to the consideration of noise issues in planning applications. The selection of a site, the design of a development and the conditions which may be attached to a planning permission can all play a part in preventing, controlling and mitigating the effects of noise. Discussions with the planning authority prior to submitting an application will assist in deciding the level of detail required from an applicant in respect of noise. The specification of mitigation measures required should be balanced against the degree of risk to environmental quality, public health and amenity. More detailed assessments may be required for proposals that are likely to generate significant noise; for noise sensitive proposals which may affect existing noise sources and for proposals that may affect noise levels within or close to Noise Management Areas or Quiet “

991. Clackmannanshire council's Local Development Plan (2015) Policy EA11 - Environmental Quality (Ref 10. 8) states:
“Developments that have the potential to negatively impact the quality of the environment, either individually or in combination with other developments, such as through air, water, soil, noise or light pollution, will only be acceptable where the developer has demonstrated, to the satisfaction of the Council, that all reasonable measures to minimise any such impacts have been taken, and any unavoidable impacts will be appropriately mitigated”
992. AECOM have reviewed the published guidance on the Fife.gov and Clacks.gov website, no other policy or guidance which is relevant to this assessment was identified.

Chapter Specific Guidance

993. The following documents have been referred to as part of this assessment. Further details can be found in the Assessment Methodology section below:
- BS 7445-1:2003 – ‘Description and Measurement of Environmental Noise’ (Ref 10.11)
 - BS 5228-1:2009+A1:2014 – ‘Code of practice for noise and vibration control on construction and open sites- Part 1: Noise’ (Ref 10.9)
 - BS 4142:2014+A1:2019 ‘Methods for Rating and Assessing Industrial and Commercial Sound’ (Ref 10.10)
 - BS 8233:2014 ‘Guidance on sound insulation and noise reduction for Buildings’ (Ref 10.13)
 - ‘Calculation of Road Traffic Noise’ (CRTN) (Ref 10.14)
 - Noise Advisory Council (NAC) A guide to measurement and prediction of the Equivalent Continuous Sound Level, L_{eq} (Ref 10.15)
 - Design Manual for Road and Bridges (DMRB) LA 111 (Revision 2) ‘Noise and Vibration’ (Ref 10.16)

10.3 Assessment Methodology

994. This section discusses the specific guidance and assessment criteria, provides further detail on the scope of the assessment and outlines the limitations and assumptions made in undertaking the assessment.

Scope of Assessment

995. The scope of this assessment is as follows:
- Review of plans and mapping data to identify nearby noise sensitive receptors (NSRs);
 - Consultation with Environmental Health Departments at Fife Council and Clackmannanshire Council regarding the proposed assessment method;
 - Establish baseline sound levels in the locality;
 - Qualitative assessment of construction noise impacts in accordance with the guidance in BS 5228:2009+A1 2014 ‘Code of practice for noise and vibration control from construction and open sites – Part 1: Noise’ (Ref 10.9);
 - Quantitative assessment of change in road traffic noise due to construction traffic on the public highway network used by construction traffic, potentially affecting NSRs in proximity to those routes.

- Quantitative assessment of impact of the change in substation sound emissions on NSRs in accordance with BS 4142:2014 + A1:2019 ‘Methods for rating and assessing industrial and commercial sound’ (Ref 10.10);
- Identification of acoustic requirements for mitigation measures if required; and
- Review of other proposed developments in the vicinity and assessment of likely cumulative effects.
- The assessment of operational traffic on local road network has been scoped out due to limited operational traffic movements.

996. Beyond about 100m vibration levels from typical sources are usually below the thresholds for human perception or building damage. As stated above, neither the construction nor operation of the Proposed Development are anticipated to generate significant levels of vibration at nearby NSRs due to distance, therefore, consideration of vibration impacts is excluded from the assessment scope.

Study Area

997. The extent of the Study Area has been defined based on the closest NSRs in each direction from the Proposed Development for both the construction and operational phases as these are representative of the most sensitive receptors. Any additional NSRs are further away from the Proposed Development and therefore are less likely to be impacted by noise from the Proposed Development compared to the closest NSRs due to greater sound attenuation with distance.

Noise Sensitive Receptors

998. The NSRs closest to the Proposed Development have been identified. NSR1 and NSR3 were selected for baseline monitoring NSR1 resides within Fife and is expected to have similar levels as NSR2 due to the primary noise source in the area being traffic and their similar distances from the A977. NSR3 which falls under Clackmannanshire was selected as the third closest receptor, the primary noise source for NSR3 is the A876 to the East. The identified NSRs are shown in Table 10-1 and provided below in Table 10-1. The ecological receptors are considered in Chapter 6.

Table 10-1 Nearest Sensitive Receptors

Receptor Number	Use	Approximate distance from site red line boundary (m)
NSR1	Residential	300 – East
NSR2	Residential	280 – East
NSR3	Residential	950 - Northwest

Guidance and Standards

BS 5228-1: 2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites. Part 1: Noise (with 2014 amendment)’

999. Details of the proposed construction schedule and plant to be used are not available at this stage, therefore a quantitative construction noise and vibration assessment has not been possible. Instead, a qualitative assessment focussing on Best Practicable Means (BPM) has been completed. This considers the potential for significant effects to occur based on

distance and timings of the proposed works but does not quantitatively assess the impact of the proposed works. This is considered appropriate for this stage of the Proposed Development, to highlight potential significant effects, and where necessary recommend mitigation measures and best practice to achieve construction noise threshold.

- 1000. BS 5228-1 provides practical information on construction noise and vibration reduction measures and promotes a BPM approach to control noise and vibration. The calculation method provided in BS 5228-1 is based on the number and types of equipment operating, their associated sound power level (L_w), and the distance to NSRs, together with the effects of any screening.
- 1001. BS 5228-1 contains a methodology for the assessment of the significance of effect of construction noise in relation to the ambient noise levels, known as the "ABC method". The criteria for significance provided in BS 5228-1 are reproduced in Table 10-2.

Table 10-2 Construction noise threshold of potentially significant effect at dwellings

Assessment Category	Threshold Value (dB $L_{Aeq,T}$)		
	Category A (a)	Category B (b)	Category C (c)
Night-time (23:00 – 07:00)	45		55
Evenings and Weekends (d)	55		65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
<p>NOTE 1: A potentially significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the Proposed Development exceeds the threshold level for the category appropriate to the ambient noise level.</p> <p>NOTE 2: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values) then a potentially significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.</p> <p>NOTE 3: Applies to residential receptors only.</p>			
<p>(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.</p> <p>(b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.</p> <p>(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.</p> <p>(d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.</p>			

- 1002. For the appropriate period (day, evening/weekend, night), the ambient noise level is determined and rounded to the nearest 5 dB. The appropriate Threshold Value is then derived. The construction noise level is then compared with this Threshold Value. If the noise level from the works exceeds the Threshold Value, then there is the potential for a significant effect to occur. However, in line with best practice, this indicator of a potential significant

effect is then further considered using professional judgement and accounting for a range of other factors, including:

- The duration of the impact. Based on the guidance in BS 5228-1, construction noise levels above the Threshold Value for less than 10-days (or 10-evenings/weekends or nights) in any 15 consecutive days, or 40-days or less (or 40 evenings/weekends or nights) in any 6-month consecutive period would not normally be considered significant.
- The timing of the impact, e.g. night-time impacts being more likely to be considered significant than daytime impacts.
- The location of the impact at the NSR, for example, an NSR may contain areas which are more or less sensitive than others, e.g. in a school, its office spaces or kitchens would be considered less sensitive than the classrooms.
- The nature, times of use and design of the NSR, e.g. an NSR which is not used at night would not be considered sensitive to night-time construction works.

1003. Design Manual for Roads and Bridges LA 111 Noise and Vibration (Revision 2), Calculation of Road Traffic Noise (CRTN), and A Guide to Measurement and Prediction of the Equivalent Continuous Sound Level Leq, 1978.
1004. The Proposed Development has the potential to affect traffic flows on existing public highways in the area around the Site during construction refer to Chapter 9 Traffic and Transport. This preliminary assessment focuses on the impact at existing NSRs located alongside the existing local road network.
1005. Construction traffic noise has been appraised by considering the increase in traffic flows during the construction works, following the guidance of CRTN, NAC guidance and DMRB, as appropriate.
1006. 24-hour Annual Average Daily Traffic (AADT) flow data have been provided for the 'with' and 'without' construction traffic scenarios for the following parameters for each road link in 2026.
- Annual Average Daily Traffic (AADT);
 - Percentage HGV; and
 - Vehicle speed (km/h).
1007. These AADT flows, which include weekend traffic, have been taken as a proxy for the 18-hour (06:00 – 24:00) Annual Average Weekday Traffic (AAWT) data required by CRTN / NAC guidance. Where links are border line Significant Adverse this implication of this difference will be considered in further detail as appropriate.
1008. Based upon the available traffic data, CRTN Basic Noise Level (BNL) calculations have been undertaken to predict the change in noise level between the 'with' and 'without' the construction traffic the Proposed Development, where flows are greater than 1000 vehicles AAWT, in order to determine if any existing roads are predicted to be subject to a potentially significant change in daily traffic flows.
1009. The Noise Advisory Council (NAC) prediction method detailed in 'A Guide to Measurement and Prediction of the Equivalent Continuous Sound Level Leq' is applicable for prediction of noise levels from low traffic flows. i.e. less than 1000 vehicles AAWT, where CRTN is not valid. This has been used as necessary to supplement the CRTN calculations.

BS 4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound'

1010. The impact of the sound levels from the Proposed Development on nearby NSRs has been assessed using BS 4142. This standard is widely used for assessing the effect of noise of an industrial nature, including substation noise. BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The method compares the *rating level* of the sound source under consideration with the *background sound level* in the vicinity of residential locations. The relevant parameters are as follows:

- ambient sound level, L_a , $L_{Aeq,T}$ dB – defined in BS 4142 as the “equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far, at the assessment location over a given time interval, T. The ambient sound comprises the residual sound and the specific sound when present”;
- residual sound level, L_r , $L_{Aeq,T}$ dB – defined in BS 4142 as the “equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T’, where the residual sound is the ‘ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound”;
- background sound level – $L_{A90,T}$ dB– defined in BS 4142 as the “A-weighted sound pressure level that is exceeded by the residual sound for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels”;
- specific sound level – L_s ($L_{Aeq,Tr}$) dB – defined in BS 4142 as the “equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r ”; and
- rating level – $L_{Ar,Tr}$ dB – defined in BS 4142 as the “specific sound level plus any adjustment made for the characteristic features of the sound”, as follows:
 - *Up to 6 dB for tonal characteristics, Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.*
 - *Up to 9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.*
 - *If intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.*
 - *Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.”*

1011. When comparing the background and the rating sound levels, BS 4142 states that:

- a. *“Typically, the greater the difference, the greater the magnitude of impact.*
- b. *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context.*
- c. *A difference of around +5 dB is likely to be an indication of an adverse impact, depending upon the context.*

d. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon the context.”

1012. Importantly, as indicated above, BS 4142 requires that the rating level of the sound source under assessment be considered in the context of the environment when defining the overall significance of the impact. BS 4142 suggests that in assessing the context, all pertinent factors should be taken into consideration, including the following:

- “The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.”

1013. BS 4142:2014 states that an one hour assessment period is considered during the day and a 15-minute assessment period at night as required.

BS 8233:2014 ‘Guidance on sound insulation and noise reduction for Buildings’

1014. BS 8233:2014 provides guidance for the control of noise in and around buildings. It provides design guidance for noise generated inside or outside the building including noise level criteria and control measures, and a methodology for calculating internal noise levels depending on the performance of the building fabric.

1015. Of relevance to this assessment, for “steady external noise sources” it provides guideline values for internal ambient noise levels within dwellings. These are reproduced in Table 10-3

Table 10-3 Indoor Ambient Noise Levels for Dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining Room	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

1016. BS 8233:2014 also provides information on noise rating (NR), which is a graphical method for assigning a single number rating to a noise spectrum, which can be used to specify the maximum acceptable level in each octave band of a frequency spectrum.

Consultation Undertaken to Date

1017. Measurement positions and acoustic survey measurement metrics were confirmed with the Fife Environmental Health Officer (EHO) and a rating level of no more than +5dB over the *background sound level* was agreed. Further correspondence with the Local Authority was sought regarding internal noise levels and the following response was received on 17/02/2025.

“Unless otherwise agreed in writing with the LPA, noise emitted from the infrastructure of the site shall not exceed: NR 35 when measured in any amenity space of the houses nearby, or NR25 in any bedroom of the houses nearby.”

1018. While the nearest NSRs to the Proposed Development are located in Fife, the Environmental Health Department at Clackmannanshire Council was also contacted in relation to establishing the assessment methodology and assessment criteria.

Method of Baseline Sound Collation

1019. The monitoring procedure for the baseline survey was conducted at two locations as discussed with the EHO and was undertaken according to BS 7445:2003 ‘Description and Measurement of Environmental Noise’ (Ref 10.11). Sound monitoring equipment was positioned at the measurement locations (MLs) shown in Figure 10.1 to gather a representative free field profile of baseline ambient sound levels at NSRs around the Proposed Development over a minimum period of 5 days (including weekend and night) and accompanying weather monitoring.
1020. Long-term measurements have been undertaken in 15 minute logging intervals for parameters L_{Aeq} , L_{A90} and L_{Amax} as minimum over the relevant time period.
1021. Any periods with windspeeds exceeding 5 m/s and periods of rainfall are excluded from the results based on observation while in the region and from public weather data sources.
1022. Baseline conditions are discussed in the section below.

Determining Magnitude of Impact

Construction Noise

1023. The magnitude of the impact of the construction noise is based on the difference between the likely construction noise level at the receptor and the Threshold Value for potentially significant effects derived using the methodology in BS 5228-1:2009 in Table 10-2, as shown in Table 10-4.

Table 10-4 Construction Noise Magnitude of Impact for Residential Receptors

Construction and Demolition Sound Level above Threshold Value (dB)	Magnitude of Impact
Exceedance of ABC Threshold Value by $\geq +5$ dB	High
Exceedance of ABC Threshold Value by up to +5 dB	Medium
Equal to or below the ABC Threshold Value by up to -5 dB	Low
Below the ABC Threshold Value by ≥ -5 dB	Very Low

Construction Noise – Daytime Construction Works Traffic on the Public Highways

1024. The Proposed Development has the potential to affect traffic flows on existing roads in the area within and surrounding the Site during construction, as referred to in Volume 1, Chapter 11 Traffic and Transport. This assessment focuses on the impact at existing NSRs located alongside the existing local road network.
1025. Construction traffic noise has been assessed by considering the increase in traffic flows during the construction works, following the guidance of CRTN13 and DMRB15. Where flows

of less than 1000 are predicted for both the future baseline and future baseline with development construction traffic the method presented by the Noise Advisory Council (NAC) is used instead as CRTN is not considered appropriate.

1026. 18-hour (06:00 – 24:00) Annual Average Weekday Traffic (AAWT) data have been approximated using the 24-hour Annual Average Daily Traffic (AADT) obtained for the construction programme on a monthly basis ‘with’ and ‘without’ construction traffic. AADT includes weekends and in over a whereas AAWT does not. Where links are border line Significant Adverse this implication of this difference will be considered in further detail as appropriate.
1027. The predicted level difference between ‘with’ and ‘without’ construction traffic scenarios determines if any existing roads are predicted to be subject to a potentially significant change in 18-hour traffic flows. Basic Noise Level (BNL) calculations have been undertaken to predict the change in noise level between the ‘with’ and ‘without’ scenarios. The criteria for the assessment of traffic noise changes arising from Proposed Development construction works have been taken from Table 3.17 of DMRB and are provided in Table 10-5.

Table 10-5 Construction Traffic Noise Criteria

Magnitude of Impact	Change in traffic noise level ($L_{A10,18hr}$ dB)
High	≥ 5
Medium	≥ 3 to < 5
Low	≥ 1 to < 3
Very Low	≤ 1

1028. An increase in road traffic flows of 25 % (where the traffic speed and composition remain consistent) equates to an approximate increase in road traffic noise of 1 dB L_A . A doubling of traffic flow would be required for an approximate increase in 3 dB L_A .
1029. It is generally accepted that changes in noise levels of 1 dB L_A or less are imperceptible, and changes of 1 to 3 dB L_A are not widely perceptible. Consequently, at the selected road traffic noise receptors the magnitude of the predicted change in noise levels uses the scale shown in Table 10-5 with respect to construction traffic.

Operational Noise

1030. Table 10-6 illustrates the adopted magnitude of impact scale used in this assessment based upon the numerical level difference. For BS 4142 assessment purposes, for a residential receptor, a significant adverse effect is set at a rating level above the background sound level of +10 dB, while the level at which adverse effect occurs is +5 dB, although the consideration of context (including the absolute level of the sound under consideration) can vary the overall classification of effects.

Table 10-6 Operational Noise Magnitude of Impact for Residential Receptors

Magnitude of Impact	BS 4142 Descriptor	Rating Level – Background Sound Level (dB)
High	No BS 4142 descriptor for this magnitude level	+14/> =15
Medium/High	No BS 4142 descriptor for this magnitude level	+12/+13
Medium	Indication of a significant adverse effect, depending upon context	+9/+10/+11
Low/Medium	No BS 4142 descriptor for this magnitude level	+7/+8
Low	Indication of an adverse effect, depending upon context	+4/+5/+6
Very Low / Low	No BS 4142 descriptor for this magnitude level	+2/+3
Very Low	Indication of low impact, depending upon context	≤ 0/+1

Determining Sensitivity of Receptors and Significance of Effect

- 1031. The following subsections set out how the significance of effect is determined by combining magnitude of impact and receptor sensitivity.
- 1032. Receptor sensitivity in this assessment has been assigned based on the example definitions provided in Technical Advice Note Table 2,1 (2011) (Ref 10.5) see Table 10-7 below.

Table 10-7 Sensitivity/Value of Receptors

Sensitivity / value of resource / receptor	Description	Examples of receptor usage
Very High	Receptors where noise or vibration will significantly affect the function of a receptor.	Auditoria/studios; Specialist medical/teaching centres, or laboratories with highly sensitive equipment.
High	Receptors where people or operations are particularly	Residential; Quiet outdoor areas used for recreation;

Sensitivity / value of resource / receptor	Description	Examples of receptor usage
	<p>susceptible to noise or vibration.</p> <p>Sensitive ecological receptors known to be vulnerable to the effects of noise or vibration.</p>	<p>Conference facilities;</p> <p>Schools/educational facilities in the daytime;</p> <p>Hospitals/residential care homes;</p> <p>Libraries.</p>
Medium	Receptors moderately sensitive to noise or vibration where it may cause some distraction or disturbance	<p>Offices;</p> <p>Restaurants/retail;</p> <p>Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf).</p>
Low	Receptors where distraction or disturbance of people from noise or vibration is minimal	<p>Residences and other buildings not occupied during working hours;</p> <p>Factories and working environments with existing high noise levels;</p> <p>Sports grounds when spectator noise is a normal part of the event.</p>

1033. Non-residential receptors are not considered here as none were identified as being potentially affected by construction or operational phases of the Proposed Development.

1034. The following terminology has been used in the assessment to define noise effects:

- Adverse - detrimental or negative effects to an environmental resource or receptor;
- Neutral - effects to an environmental resource or receptor that are neither adverse nor beneficial; or
- Beneficial - advantageous or positive effect to an environmental resource or receptor.

1035. The effect resulting from each individual potential impact type above has been classified according to the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix presented in Table 10-8 but where necessary also considering the context of the acoustic environment.

Table 10-8 Classification of Effects

Sensitivity/ value of resource/ receptor	Magnitude of Impact			
	High	Medium	Low	Very Low
Very High	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

1036. Where adverse or beneficial effects have been identified, these have been assessed against the following significance scale, derived using the matrix presented in Table 10-8:
- Negligible – imperceptible effect of no significant consequence;
 - Minor – slight, very short or highly localised effect of no significant consequence;
 - Moderate – limited effect (by extent, duration or magnitude), which may be considered significant; or
 - Major – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.
1037. For the purposes of this assessment, Negligible and Minor effects are considered to be Not Significant, whereas Moderate and Major effects are considered to be Significant.

Limitations and Assumptions

1038. The following sources of information that define the Proposed Development have been reviewed and form the basis of the assessment of likely significant noise and vibration effects:
- Baseline sound monitoring survey data
 - Indicative construction plant and equipment (Chapter 4 Project Description)
 - 24 hour AADT has been used to represent the 18 hour AAWT flows for calculating a BNL from each road link used by construction traffic on the public highway network. It is expected that this assumption will still provide a robust appraisal of potential effects;
 - Indicative concept layout plans for the Proposed Development
 - Items of plant including sound power level data for the Proposed Development. This has been supplemented with a representative transformer frequency spectrum data
 - Ordnance Survey (OS) mapping of the Proposed Development and surrounding area; and
 - Topographical data (Light Detection and Ranging (LIDAR) data) and aerial photography
1039. To evaluate noise effects during the construction phases it is necessary to have knowledge of the variables listed above. Construction Contractors may use different working methods and plant to achieve the same ends. Therefore, a qualitative assessment has been undertaken based on available information.

1040. In order to ensure a robust assessment of the likely significance of the environmental effects of the Proposed Development, the work has been undertaken adopting reasonable worst-case assumptions, where necessary.
1041. The following assumptions have been made for the Proposed Development operational stage:
- The proposed substation site has been modelled as a hard standing with point sources representing the proposed transformers.
 - The operational noise model has assumed that the Proposed Development will operate continuously at full load, 24 hours a day to present a worst-case assessment.
 - It has been assumed that potential operational sound of a tonal, impulsive or intermittent nature will be designed out of the Proposed Development during the detailed design phase by the selection of appropriate plant, building cladding, louvres and silencers/attenuators as necessary. However, a +3 dB character correction for other distinctive sound has been included at NSRs where this potential exists above the background sound level.
1042. The following limitations have been identified:
- Baseline sound surveys were carried out continuously over 5 days which is considered to be an adequate time span to obtain representative baseline data, although some variation can occur in both ambient activities and prevailing weather beyond this period, possibly due to atypical conditions. Weather conditions during the surveys were fair and suitable for environmental surveys. During periods of wind with speeds outside of the suitable range, or during precipitation, data have been excluded from the data used for the assessment. Therefore, environmental survey uncertainties raising the potential background sound level and informing the operational sound assessment have been reduced to a minimum or removed and are not considered significant.

10.4 Baseline Conditions

1043. The Proposed Development is located within the Fife Council area with a small part of the northwest located in Clackmannanshire. The Site is located approximately 1km north of Kincardine town centre. The Development Site is bordered to the east by the A977 and bordered to the west by the A876. These roads connect and border the Site to the north. The Site is additionally bordered by farmland.
1044. The acoustic environment at the Measurement Locations (MLs) and NSRs is consistent with a rural area that is remote and generally free from continuous road traffic, commercial or industrial related sounds. The dominant sound source noted during measurements was birdsong but road noise, wind blowing through trees, and the nearby watercourse also contributed to the soundscape.
1045. ML1 is adjacent to the A977, approximately 30m away and therefore experiences greater contribution from road traffic, but movements on this road are not continuous and at night would be infrequent and sporadic at most. ML1 is representative of NSR1 and NSR2. ML2 is located approximately 380m from A977 and 140m from the A876, ML2 experiences distant road noise but the soundscape is predominantly made up of bird noise and wind blowing through trees. ML2 is representative of NSR3.
1046. Unattended baseline monitoring was undertaken at Measurement Locations representative of noise sensitive receptors over five days 1st to 5th August 2024 to establish the contributing

sources and allow the ambient and *background sound levels* to be determined. Figure 10.1 shows the NSRs represented by the monitoring locations. The results are presented in detail in Appendix 10.4 and are summarised in Table 10-9 below.

Table 10-9 Summary of measured sound levels at monitoring locations

Monitoring Location	Daytime				Evening				Night-time			
	$L_{Aeq,T}$	L_{AFmax}	L_{A90}	L_{A90}	$L_{Aeq,T}$	L_{AFmax}	L_{A90}	L_{A90}	$L_{Aeq,T}$	L_{AFmax}	L_{A90}	L_{A90}
	Mode		Mean		Mode		Mean		Mode		Mean	
ML1 (NSR1 & NSR 2))	51	85	45	44	46	75	38	40	44	78	32	33
ML2 (NSR3)	49	84	46	45	44	70	41	39	41	73	34	33

Future Baseline

1047. In considering the future baseline for the assessment area, no significant changes in road traffic flows are anticipated, and as such, road traffic noise levels are expected to remain broadly consistent with current conditions. However, it is recognised that there are other energy developments currently at the planning stage within the wider area. Should these schemes progress, they have the potential to influence the existing rural sound climate, both during construction and operation.

10.5 Development Design and Embedded Mitigation

Construction

1048. Measures to mitigate noise and vibration would be implemented during the Proposed Development construction phase to minimise impacts at NSRs such as local residential receptors and ecological receptors, particularly with respect to activities required outside of normal working hours.
1049. Mitigation included in the construction environmental management plan (CEMP) includes the following noise mitigation measures to reduce construction noise impacts to as low as practicable. As a minimum the Contractor will follow best practice and guidance in BS 5228-1 with regard to mitigation of noise during construction.
- Proposed construction working hours, as stated in Chapter 4, should be adhered to i.e. 07:00-19:00 weekdays and 08:00-17:00 Saturdays with no working on Sundays or Bank Holidays (including site deliveries);
 - Fixed and semi-fixed ancillary plant required during construction such as generators, compressors and pumps should be located away from the northern and eastern boundaries;
 - All plant used on site should be regularly maintained, paying particular attention to the integrity of silencers and acoustic enclosures;
 - All equipment should be shut down when not in use;
 - The loading and unloading of materials should take place away from NSRs, ideally in locations which are acoustically screened from nearby NSRs;
 - Materials should be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant should be kept to a minimum;

- Modern plant should be selected which complies with the latest EC noise emission requirements. Electrical plant items (as opposed to diesel powered plant items) should be used wherever practicable. All major compressors should be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers;
 - Site operations and vehicle routes should be organised to minimise the need for reversing movements, and to take advantage of any natural acoustic screening present in the surrounding topography;
 - Prior to any piling works being undertaken, an assessment of piling techniques would be undertaken to ensure the least disturbing techniques are used as far as possible and identify any additional noise mitigation requires. A piling method statement would be provided to Fife and Clackmannanshire Council prior to commencement of piling works. Any piling works would be restricted to day-time hours only.
 - No employees, subcontractors and persons employed on the site should cause unnecessary noise from their activities e.g. excessive 'revving' of vehicle engines, music from radios, shouting and general behaviour etc. All staff inductions at the site should include information on minimising noise and reminding them to be considerate of the nearby residents;
 - As far as practicable, noisier activities should be planned to take place during periods of the day which are generally considered to be less noise sensitive i.e. not particularly early or late in the day; and
 - Measures should be put in place to ensure that employees know that minimisation of noise will be important at the site.
1050. A final CEMP would be prepared prior to works commencing once specialist sub-contractors have been appointed and detailed information on the proposed methods are known and the mitigation measures will be confirmed to ensure the construction noise thresholds are not exceeded.
1051. Regular communication with the local community throughout the construction period would also serve to publicise the works schedule, giving notification to residents regarding periods when higher levels of noise may occur during specific operations e.g. piling operations, and providing lines of communication where complaints can be addressed. A communication plan would be included in the Final CEMP.
1052. The appointed Principal Contractor should be a member of the 'Considerate Constructors Scheme' and as a minimum they will have to follow the above best practice and guidance in BS 5228-1 (Ref 10.9).
1053. Based on the information provided in BS 5228-1 (Ref 10.9) Table B.1 it is likely that the embedded measures can provide up to 5 to 10 dB of further reductions of construction noise levels at sensitive receptors.

Operation

1054. The substation is located at least ~300m from residential receptors which significantly reduces noise levels via distance attenuation. Power transformers and Shunt Reactors will be operated in accordance with the limits provided as follows:

- Power Transformers and cooling equipment will emit a maximum sound power level that shall not exceed 87 dB L_{WA} measured in accordance with IEC 60076-10 at rated voltage.
- Earthing / Auxiliary Transformers will emit a maximum sound power level that shall not exceed 70 dB L_{WA} measured in accordance with IEC 60076-10 at rated voltage.
- Shunt Reactors will emit a maximum sound power level that shall not exceed 83 dB L_{WA} per three-phase set measured in accordance with IEC 60076-10 at rated voltage.

1055. The sound associated with the maintenance of the substation will be lower than the operational sound, therefore have not been assessed further in this chapter.

10.6 Assessment of Likely Impacts and Effects

Construction Phase

1056. Construction work of any type that involves heavy plant activity will generate noise, which may result in complaints if appropriate scheduling and control of works is not exercised. Noise levels generated by construction activities and experienced by NSRs, depends upon a number of variables, the most significant of which are:
- The level of noise generated by plant or equipment used on-site, generally expressed as the sound power level;
 - The periods of operation of the plant on the Site, known as its ‘on-time’;
 - The distance between the noise source and the NSR; and,
 - The attenuation of sound due to ground absorption, air absorption and barrier/screening effects.
1057. Construction works will involve initial earthworks to level out the site, construction (including piling) of the new infrastructure (foundations, roads and drainage), installation of the new electrical plant and landscaping works.
1058. The initial earthworks stage, which is expected to involve the use of excavators and dump trucks, is likely to generate the highest noise levels. Based on AECOM’s experience of similar projects, the remainder of the works are expected to generate lower noise levels. Depending on the piling type adopted by the construction contractor, this activity may also generate relatively high noise levels.
1059. For residential NSRs the ‘ABC’ method (detailed in BS 522801 Section E.3.2) sets construction noise thresholds for residential NSRs for different time periods (e.g. day, evening, night and weekends) based on the existing ambient sound levels as set out in Table 10-2. The predicted construction noise levels are then compared to these construction noise threshold values to indicate whether a potentially significant effect is likely to occur at residential NSRs.
1060. The measured baseline ambient sound levels have been used to determine indicative BS 5228-1 ‘ABC’ noise threshold categories. NSR1, NSR2 and NSR3 considered in this assessment fall within ABC Category A for all time periods. On this basis the applicable Threshold Values for the construction noise assessment at all receptors are:
- 65 dB L_{Aeq} 07:00 and 19:00 Monday to Friday and Saturdays 07:00 – 13:00;
 - 55 dB L_{Aeq} 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays; and
 - 45 dB L_{Aeq} at all other times.

1061. The closest properties (NSR1 and NSR2) to the proposed works are around 300 m from the Site boundary. At this distance it is considered likely that implementation of the standard construction mitigation measures outlined above would sufficiently control impacts such that the Threshold Values are unlikely to be exceeded for the vast majority of the works. If exceedances do occur, these are likely to be of short duration associated with specific activities during the working day (i.e. very unlikely to have continuous loud construction noise for the full working day) such that effects would not be significant. NSR3 is located further away, approximately 950m northwest of the Site boundary, therefore the construction noise levels at this receptor would be lower due to distance attenuation. As the piling methods have not yet been confirmed, initial predictions have been undertaken for a worst case scenario of impact piling (hammer-driven piling). At the closest NSR (approx. 280 m) the predicted levels are below the daytime construction threshold values.
1062. Assuming that the Construction threshold values are not exceeded, with reference to Table 10-4 the magnitude of impact is Low which for a high sensitivity receptor is classed as Minor Adverse effect which is Not Significant in EIA terms.

Construction Traffic on the Public Network

1063. The potential changes in road traffic noise during the construction phase of the Proposed Development have been considered.
1064. In Table 10-9 the change in Basic Noise Level (BNL) is determined for the peak construction year (2026) as worst case.

Table 10-10 BS 4142 Predicted change in road traffic noise during construction (2026)

Road Link	2026 Baseline				2026 Baseline + Construction Traffic				Change in BNL, dB	Magnitude of impact
	AADT flow	% HGV	Speed (km/m)	Predicted BNL dB,	AADT flow	% HGV	Speed (km/m)	Predicted BNL dB,		
A977 north	7,434	10	97	71.8	7,662	11	97	72.2	0.4	Very Low
A907 west	15,334	5	64	71.2	15,562	6	64	71.5	0.3	Very Low
A907 east	2,440	8	97	66.5	2,668	13	97	67.7	1.2	Low
A977 Kilbagie Roundabout	22,958	9	97	76.5	23,186	9	97	76.6	0.1	Very Low
A977 Kilbagie	4,608	2	58	64.5	4,836	5	58	65.6	1.1	Low
A977 Feregait	4,730	2	57	64.6	4,730	2	57	64.6	0.0	No Change
Substation Access Road	347	2	44	51.7	575	29	44	55.1	3.4	Medium
C68 Hawkhill Road	270	2	43	51.4	498	33	43	54.6	3.2	Medium
A876	19,737	7	97	75.5	19,965	7	97	75.7	0.2	Very Low
Clackmannans hire Bridge	19,836	7	97	75.6	20,064	7	97	75.7	0.2	Very Low

Road Link	2026 Baseline				2026 Baseline + Construction Traffic				Change in BNL, dB	Magnitude of impact
	<i>AADT flow</i>	% HGV	Speed (km/m)	Predicted BNL dB,	<i>AADT flow</i>	% HGV	Speed (km/m)	Predicted BNL dB,		
A876 S Approach Road	32,306	6	113	78.8	32,534	6	113	78.9	0.1	Very Low
Kincardine Bridge	11,841	7	48	69.1	12,069	8	48	69.5	0.4	Very Low
A985 west	9,447	6	97	72.2	9,675	8	97	72.6	0.4	Very Low
A985 east	11,336	13	97	74.1	11,564	15	97	74.4	0.2	Very Low

1065. The assessment of the predicted change in road traffic noise levels due the addition of construction traffic highlights a medium magnitude of impact, resulting in a Moderate adverse effect on Substation Access Road and C68 Hawkhill Road. All other roads in the vicinity of the site are predicted to experience a no change to Low magnitude of impact, resulting in Negligible to Minor adverse effects (Not Significant) at nearby NSRs.
1066. There is only one NSR along the Substation Access Road and C68 Hawkhill Road, Hawkhill Farm, which is owned by SPT. The property will be kept vacant during the construction works.

Operational Phase

1067. The operational phase of the Proposed Development has the potential to produce audible sound beyond the site boundary.
1068. The key noise generating items of substation plant that are assessed are:
- 2 x power transformer with cooler unit (adjacent fans and pumps)
 - 2x earthing / auxiliary transformers
 - 2x shunt reactors
 - 1x standby diesel generator (emergency use only and automatic self-test at pre-determined times.)
1069. Details of the model setup, sound power levels and spectrum used in the predictions are provided in Appendix 10.5.

BS 4142 Assessment

1070. To undertake the BS 4142 assessment the specific sound levels, rating level and background sound level are required at each assessment location.
1071. The assessment is based on the difference between the representative background sound level and the predicted rating level, $L_{Ar,Tr}$ dB (i.e. the specific sound level $L_{Aeq,Tr}$ plus any character correction) at the NSR. Positive differences indicate an excess of the rating level over the background sound level.
1072. A model of the substation and surroundings has been developed in CadnaA MR1 2024 sound mapping software which calculates predictions in accordance with ISO 9613-2 (Ref 10.12). The model has been used to predict the Proposed Development's sound emissions from the substation at the NSRs identified in Table 10-1. Sound power/pressure levels have been provided by SP Transmission and these have been used to represent the plant. Further details on the source data and prediction methodology are provided in Appendix 10.3 and Appendix 10.5.
1073. The substation sound is present 24 hours a day with little variation; hence no correction has been applied for on-time. As stated in the assumptions and limitations section, it has been assumed that potential operational sound of a tonal, impulsive or intermittent nature will be designed out of the Proposed Development during the detailed design phase by the selection of appropriate plant, building cladding, louvres and silencers/attenuators as necessary. The specific sound would likely be distinctively different to the background sound so a +3 dB correction has been included where the specific sound is greater than the background sound level. A comparison of specific sound level, rating level and maximum background sound level is provided in Table 10-11 and Table 10-12.
1074. Results are provided for typical operation (without generator) and emergency (with generator) operation. The noise propagation model results showed that operational noise levels would

be highest at NSR1 without the generator running and at NSR2 with the generator. These locations are provided in Table 10-11.

Table 10-11 BS 4142 Daytime BS 4142 Assessment Results

Receptor	Specific sound level $L_{Aeq,15min}$ (dB)	Rating Correction (dB)	Rating level $L_{Ar,15min}$ (dB)	Daytime background sound level $L_{A90,1hour}$ (dB)	Daytime exceedance	BS 4142:2014 Descriptor	Magnitude of Impact
NSR1 – Ground floor (typical operation)	17	0	17	43	-26	Indication of low impact, depending upon context	Very low
NSR1 – First floor (typical operation)	19	0	22	43	-24	Indication of low impact, depending upon context	Very low
NSR1 – Ground floor (emergency operation)	37	0	37	43	-6	Indication of low impact, depending upon context	Very low
NSR1 – First floor (emergency operation)	39	0	39	43	-4	Indication of low impact, depending upon context	Very low
NSR2 – Ground floor (typical operation)	17	0	17	43	-26	Indication of low impact, depending upon context	Very low
NSR 2 – First floor (typical operation)	19	0	19	43	-24	Indication of low impact, depending upon context	Very low

Receptor	Specific sound level $L_{Aeq,15min}$ (dB)	Rating Correction (dB)	Rating level $L_{Ar,15min}$ (dB)	Daytime background sound level $L_{A90,1hour}$ (dB)	Daytime exceedance	BS 4142:2014 Descriptor	Magnitude of Impact
NSR2 – Ground floor (emergency operation)	37	0	37	43	-6	Indication of low impact, depending upon context	Very low
NSR2 – First floor (emergency operation)	40	0	40	43	-4	Indication of low impact, depending upon context	Very low
NSR3 – Ground floor (typical operation)	8	0	8	44	-36	Indication of low impact, depending upon context	Very low
NSR3 – First floor (typical operation)	11	0	11	44	-33	Indication of low impact, depending upon context	Very low
NSR3 – Ground floor (emergency operation)	31	0	31	44	-13	Indication of low impact, depending upon context	Very low
NSR3 – First floor (emergency operation)	34	0	34	44	-10	Indication of low impact, depending upon context	Very low

*Note: The standby generator is considered during emergency operation.

Table 10-12 BS 4142 Night-time BS 4142 Assessment Results

Receptor	Specific sound level $L_{Aeq,15min}$ (dB)	Rating Correction	Rating level $L_{Ar,15min}$ (dB)	Night-time background sound level $L_{A90,15min}$ (dB)	Night-time exceedance	BS 4142 Descriptor	Magnitude of Impact
NSR1 – First floor (typical operation)	19	0	19	27	-8	Indication of low impact, depending upon context	Very low
NSR1 – First floor (emergency operation)	39	3	42	27	+15	Indication of a significant adverse effect, depending upon context	High
NSR2 – First floor (typical operation)	19	0	19	27	-8	Indication of low impact, depending upon context	Very low
NSR2 – First floor (emergency operation)	40	3	43	27	+16	Indication of a significant adverse effect, depending upon context	High
NSR3 – First floor (typical operation)	11	0	11	28	-17	Indication of low impact, depending upon context	Very low
NSR3 – First floor (emergency operation)	34	3	37	28	+9	Indication of an adverse effect, depending upon context	Medium

1075. The values presented in Table 10-11 and Table 10-12 produce a very low magnitude of impact at all NSRs assessed during both the daytime and night-time during typical operation. This would result in Negligible (Not Significant) effects.
1076. However, exceedances of the criteria of a rating level that is no more than +5 dB over the background sound level, occur during emergency operation, due to the standby generator during the night-time period at NSRs 1, 2 and 3. The magnitude of impact at NSRs 1 and 2 at the first floor during the night-time period is High, this would result in Major (Significant) effects, subject to consideration of context. The magnitude of impact at NSR 3 at the first floor during the night-time period is Medium, this would result in Moderate (Significant) effects, subject to consideration of context.

Consideration of Context

1077. Potential significant adverse effects are predicted when the standby generator is in use, however, there should only be exceedances during an emergency and an allowance may be made by the Local Authority for this context. For night-time noise sources BS 8233 recommends a night-time (23:00-07:00) 8-hour sound level of 30 dB L_{Aeq} inside bedrooms (for reasonably steady sound source) to avoid sleep disturbance (See Table 10.11). Assuming an open window provides 15 dB attenuation, the internal sound level of 30 dB inside bedrooms is achieved at NSRs 1 and 2 when the emergency generator is in use.
1078. Furthermore, with respect to the Local Authority's response regarding noise rating curve criteria in Section 10.3 Consultation Undertaken to Date, the predicted *specific sound levels* at NSRs in octave bands has been used to determine compliance with the stated NR 35 when measured in the amenity space of the houses nearby and NR 25 within the bedroom.
1079. In the daytime, amenity space predicted levels are below the NR 35 curve in all octave bands for both the typical and emergency operation scenarios. In the night-time, predicted levels in the bedroom are below the NR 25 curve in all octave bands for both the typical and emergency operation scenarios. This is based on a partially opened window and a representative façade building envelope. Predicted internal NR values for typical and emergency operation scenarios are provided in Appendix 10.6.
1080. Where possible, mitigation should be used to minimise the sound emissions from the standby generator (see Section 10.7 for further details).
1081. Taking into account the context of the temporary occasional use of the standby generator and potential mitigation options, the operation of the Proposed Development with the standby generator is not likely to result in significant adverse effects at the nearest NSRs.

10.7 Mitigation and Residual Effects

Construction

1082. There is potential for adverse impacts if the construction noise thresholds are exceeded. Construction plant and methodologies should be reviewed at later stages when more detail is available and compared against these threshold values. If exceedances are predicted to occur further mitigation should be implemented such as temporary screening. At this stage it is predicted that final residual effects after good practice and additional mitigation (if required) are implemented would be minor adverse or less.

Operational

1083. No exceedances are predicted to occur during typical operation however, exceedances are predicted to occur during emergency operation when the standby generator is in use.

1084. Potential mitigation options to minimise emissions from the standby generator include:
- Specifying a quieter standby generator. It is understood that an urban diesel generator could be specified which has a sound pressure level at 1 m that is 10 dB quieter than the rural option considered in this assessment. This would reduce the *rating sound level* by 10 dB in emergency operation scenarios and result in a 1 dB exceedance of the *background sound level* at NSR2 First Floor, which would be an indication of low impact
 - Locating the standby generator further away from the NSRs which are located to the east of the substation.
 - Local screening or enclosure of the generator
1085. If allowance cannot be made for exceedances during emergencies, mitigation should be implemented which could be expected to provide at least 5 – 10 dB mitigation. This should bring both daytime and night-time exceedances within the +5 dB criteria agreed by Fife Council and the significance of effects will be Not Significant.
1086. It is understood that the standby generator will be tested once a month for 1 hour. Due to the predicted exceedances at nighttime, the test should be carried out during daytime periods only.

10.8 Cumulative effects

1087. The cumulative operation and construction of other developments has potential to give rise to background levels. A cumulative assessment was undertaken with reference to surrounding proposed developments. The majority comprise energy-related infrastructure, including consented Battery Energy Storage Systems (BESS), BESS schemes at the pre-application stage, modifications to the existing overhead lines (OHLs) and aggregate storage building and hardstanding.
1088. The following developments have been considered but scoped out the cumulative assessment, this is due to the early stage of these developments and lack of noise information or low likelihood of them generating audible noise which could combine with the Proposed Development.
- Overhead Line modifications to connect to KINN- ECU00005132
 - Underground Cable from KINN to existing Kincardine Substation - 25/02494/SCR
 - Temporary installation of transformers at Kincardine Substation - 25/02355/SCR and;
 - Meadowend Battery Energy Storage System (BESS) - ECU00005178
1089. It is considered that the above developments do not have associated operational noise impacts except for the Temporary installation of transformers at Kincardine Substation which is a permitted development pending construction and Meadowend Battery Energy Storage System (BESS) which is under Pre-application screening. Without associated noise impact assessments these developments cannot be assessed for cumulative operational noise but have potential to contribute to operational cumulative noise. Kincardine substation is located approximately 900m south west of NSR1, given this distance, cumulative construction and operational impacts are unlikely.
1090. Construction noise has also been considered and ruled out due to lack of information available.
1091. The following developments with associated Noise Impact Assessments have been considered and assessed where necessary:

- Aggregate Storage Building and Associated hardstanding - 24/00979/FULL
- Kilbagie Battery Energy Storage System (BESS) - ECU00005240,
- Kincardine Battery Energy Storage System (BESS) - ECU00004987 and;
- Kincardine Grid Services Complex - ECU00003326.

1092. Kincardine Grid Services Complex and Aggregate Storage building and associated hardstanding are located approximately 900 m south west of NSR 1 and Kincardine Battery Energy Storage System (BESS) is located approximately 600 m east of NSR 1. At these distances, cumulative construction and operational impacts are unlikely, assuming each development follows BPM during the construction phase and does not exceed operational sound limits. Kilbagie BESS is approximately 125 m south west of NSR 3.

Construction

1093. No detailed quantitative construction has been provided for cumulative developments in the local area. If construction schedules overlap cumulatively and within close proximities, there is potential for short term impacts however with the implementation of BPM it is likely these effects will be reduced.

Operational

1094. The Kincardine Battery Energy Storage System (BESS) proposed development is located approximately 900m to the south west of NSR 1 (closest NSR) and the assessment does not share any common receptors due to being further away. In addition, the BS4142 assessment for this development indicates that there would be no exceedances in operational levels during daytime and night-time at NSRs which are closer than NSR 1. Therefore, it is unlikely this proposed development would impact background levels from operational noise.
1095. The Kincardine Grid Services is located approximately 600 m west of NSR 1 (closest NSR). The Kincardine Grid Services Complex is subject to the same criteria as other proposed developments in the Fife area, with a specified rating level not exceeding +5 dB above background, together with compliance with NR 25 within bedrooms during night-time. The development is able to demonstrate compliance with the internal NR criteria at night and is predicted to operate at +2 dB relative to the external night-time limit at the closest NSR, indicating a negligible impact during typical operation of the Proposed Substation Development.
1096. Kilbagie BESS is approximately 125 m south west of NSR 3. The Kilbagie BESS demonstrates compliance with the NR25 internal criterion at the shared receptor NSR 3; however, the predicted external night-time specific sound level is 39 dB. The specific sound level of the Proposed Development during normal operation at NSR 3 is 11 dB, therefore cumulative operational sound will be due to Kilbagie BESS. During the scenario of the emergency generators operate at night, the cumulative specific sound would be a 1 dB higher which would be a negligible contribution in comparison with the Kilbagie development alone.
1097. With regard to potential cumulative construction and operational noise arising from the committed developments in combination with activities within the Proposed Development red line boundary, the nature of the works, spatial separation, and/or programme phasing indicate that significant cumulative noise effects are not anticipated

10.9 Summary and Conclusion

1098. AECOM have assessed the potential noise impacts of the Proposed Development.

1099. Sound measurements were undertaken to determine representative background noise levels.
1100. A qualitative assessment of construction noise was completed, and an indicative scheme of best practice noise control measures has been provided.
1101. The change in road traffic noise due to construction traffic on the public network as been assessed, there is potential for a moderate adverse effect at NSRs along the Substation Access Road and C68 Hawkhill Road, however there is only one NSR along these roads (Hawkhill Farm), which is owned by SPT. The property will be kept vacant during the construction works
1102. Operational sound predictions were made based on sound emissions data for the proposed transformers, shunt reactors, and standby generator provided by SPT and measurements made by AECOM.
1103. During typical operation (without the standby diesel generator) the predicted rating levels are significantly below the background sound levels for both daytime and night-time. On this basis, it is concluded that the Proposed Development will have a negligible adverse effect, which is Not Significant.
1104. During emergency operation (with the standby diesel generator) the rating levels of the proposed development are predicted to exceed the background sound levels by 9 - 16 dB. According to the guidance in BS 4142, this is an indication that a major significant adverse effect depending on the context is likely. However, when taking into context the occasionally use of the standby generator in emergency situations, the short duration once a month for testing and potential mitigation options, the significance of effects will be Not Significant.
1105. The NR criteria specified by Fife Council are also met for both typical and emergency operation scenarios.
1106. The cumulative effects arising from committed developments in the vicinity have also been assessed, no significant cumulative effects are anticipated assuming each development follows BPM during construction phase and operational sound limits are not exceeded.

10.10 References

Ref 10.1 Environmental Protection Act 1990, c. 79. Available at <https://www.legislation.gov.uk/ukpga/1990/43/contents> (accessed 09/10/24)

Ref 10.2 Control of Pollution Act 1974, c. 60 and 61. Available at <https://www.legislation.gov.uk/ukpga/1974/40/part/III/crossheading/construction-sites> (accessed 09/10/24)

Ref 10.3 Scottish Government (2023). National Planning Framework 4 (NPF4)

Ref 10.4 The Scottish Government (2011). PAN 1/2011 Planning Advice Note, Planning and Noise.

Ref 10.5 The Scottish Government (2011). Technical Advice Note – Assessment of Noise.

Ref 10.6 <https://www.fife.gov.uk/kb/docs/articles/planning-and-building2/planning/development-plan-and-planning-guidance/local-development-plan-fifeplan> (accessed 09/10/24)

Ref 10.7 https://www.fife.gov.uk/__data/assets/pdf_file/0026/255338/Planning-Policy-for-development-and-noise2.pdf (accessed 09/10/24)

Ref 10.8 <https://www.clacks.gov.uk/document/6862.pdf> (Accessed 09/09/25)

Ref 10.9 British Standards Institution (2014). BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'

Ref 10.10 British Standards Institution (2019). BS 4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

Ref 10.11 BS 7445 'Description and Measurement of Environmental Noise', British Standards Institution, 2003.

Ref 10.12 International Standards Organisation (2024). ISO 9613-2 2024 'Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation'

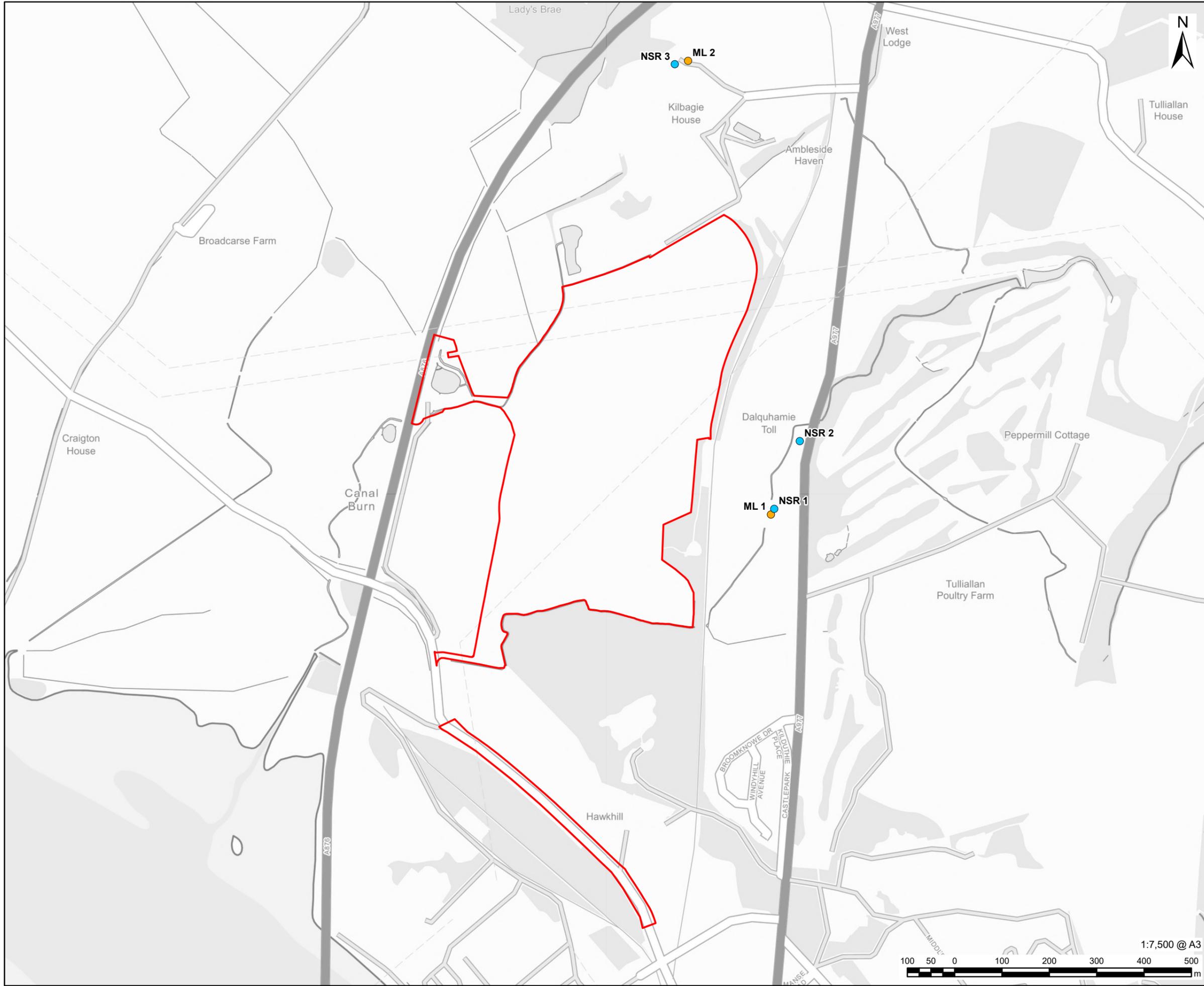
Ref 10.13 BS 8233:2014 '*Guidance on sound insulation and noise reduction for Buildings*'

Ref 10.14 Department of Transport/Welsh Office, 1988. Calculation of Road Traffic Noise (CRTN).

Ref 10.15 Noise Advisory Council, 1978. 'A Guide to Measurement and Prediction of the Equivalent Continuous Sound Level L_{eq} '.(NAC)

Ref 10.16 Design Manual for Road and Bridges (DMRB) LA 111 (Revision 2) 'Noise and Vibration'

10.1



PROJECT
Kincardine North Substation

CLIENT
SP Energy Networks

CONSULTANT
AECOM Limited
One Trinity Gardens
Newcastle
NE1 2HF
www.aecom.com

LEGEND

- Site Boundary
- Monitoring Location
- Noise Sensitive Receptor

NOTES
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ISSUE PURPOSE
EIA REPORT

PROJECT NUMBER
60635450

FIGURE TITLE
Noise Monitoring Locations

FIGURE NUMBER
Figure 10.1



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11. Other Environmental Aspects

11. Other Environmental Aspects

11.1 Introduction

1107. As described in Chapter 2 of this EIAR, the scope of the EIA is based on the scoping opinions provided by Fife and Clackmannanshire Councils. While it was agreed that a number of aspects could be scoped out Fife Council requested that information was provided for them within the EIAR. For completeness, this chapter provides an overview of those aspects that were scoped out of the EIA. Clackmannanshire Council made a small number of comments in relation to aspects which were scoped out which are also addressed below.

11.2 Trees and Woodland

1108. The impact of the Proposed Development on trees and woodland in relation to ecology and landscape is assessed in Chapter 6 Ecology and Chapter 7 Landscape and Visual Amenity. There are no sites on the Ancient Woodland Inventory within or immediately adjacent to the Proposed Development. There are also no ancient or notable trees on the Ancient Tree Inventory within or immediately adjacent to the Proposed Development. The majority of the Site is comprised of agricultural land with existing trees or woodland along the field boundaries. With the exception of removal of vegetation at the proposed A876 access point, no tree removal is proposed. Tree planting is proposed as part of landscape planting including planting to strengthen and increase the depth of the existing boundary planting. No significant effects on trees or woodland are likely as a result of the Proposed Development.

11.3 Water Environment

1109. There are a small number of surface water features within or adjacent to the Site. This includes part of the Canal Burn which follows part of the application boundary in the north/northeast of the Site flowing northeast to southwest, a small settlement pond adjacent to the A876 access point which drains into the Canal Burn via a ditch and an unnamed watercourse which forms the southern extent of the application boundary flowing east to west towards the Hawkhill Road access point.
1110. At its nearest the point the substation platform is approximately 100m southeast of the Canal Burn and more than 200m north of the unnamed watercourse. Components of the Proposed Development which are in closer proximity to surface watercourses include the access road from the A876 which crosses the Canal Burn and an unnamed watercourse, the access road from Hawkhill Road which lies to the west of an unnamed ditch, drainage outfalls as well as areas of proposed landscape planting. As set out in the description of the Proposed Development, as a part of the access from the A876 the existing culvert crossing of the Canal Burn may require to be strengthened (subject to further investigation) while an additional culvert of the unnamed watercourse is also required.
1111. A number of standard working practices are set out in the Schedule of Mitigation (chapter 13) which will prevent likely significant effects on these watercourses. These measures will be incorporated into a Construction Environmental Management Plan (CEMP) which be adhered to during construction. This includes implementation of pollution prevention measures, siting of temporary compounds and storage areas or stockpiles away from watercourses and establishment of temporary and/or permanent drainage measures to manage and treat runoff.

1112. 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.
1113. 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.
1114. There are two watercourse crossings required on the temporary access road from the A876 access point; the first is an existing culvert crossing of a ditch which would require to be strengthened and potentially widened and the second is a crossing of the Canal Burn. There are no new watercourse crossings required on the permanent access road from Hawkhill Road. The unnamed watercourse that flows along the southern boundary crosses the existing junction through a culvert. Modifications to the existing culvert as well as the new crossing of the Canal Burn will be designed in accordance with SEPA guidance on culvert design.
1115. Through a combination of design and construction mitigation measures no significant effects on the water environment are likely as a result of the Proposed Development. Flood risk is addressed in a separate Flood Risk Assessment that accompanies the planning application.

11.4 Ground Conditions (Geology and Soils)

1116. There are no geological designations or peat/carbon rich soils present at or within the vicinity of the Proposed Development. The underlying solid geology is comprised of the Scottish Coal Measures Group which includes sandstone, siltstone and mudstone. Superficial deposits consist of raised tidal flat depots which include silt and clay. There are no records of any peat deposits present on the site. The site is currently agricultural land, however, Coal Authority records identify the Site as lying within a Development High Risk Area which relates to historic coal mine workings. Ground investigations have been undertaken to evaluate ground risks and inform the design of the Proposed Development including any specific design requirements with regard to previous mining activity, for example areas in which localised grouting may be required. No significant effects on ground conditions are likely as a result of the Proposed Development. Note that a separate Coal Mining Risk Assessment and ground investigation reports accompany the planning applications.

11.5 Land Use, Tourism and Recreation

1117. The majority of the Site is currently used for agriculture growing a range of crops. The national-scale Land Capability for Agriculture Map identifies the Site as class 3.2 which is land capable of average production though high yields of barley, oats and grass can be obtained. This is outside of the definition of prime agricultural land which is class 3.1 and above. While approximately 32ha of agricultural land will be permanently lost to the Proposed Development, there are extensive areas of class 3.2 land throughout Fife and Clackmannanshire and in this context the loss is considered to be minimal and therefore not significant. In addition, NPF4 Policy 5 'Soils' advises that development of lesser quality agricultural land that is culturally or locally important for primary use, as identified by the LDP will only be supported where it is for that essential infrastructure and there is a specific locational need and no other suitable site. As set out in Chapter 3, the Site of the Proposed

Development has been selected following consideration of alternatives. It was concluded that, on balance, no other suitable sites could be identified and there is a locational need for the proposed Site given its proximity to the existing overhead lines which will connect to it.

1118. There are no tourism or recreational resources within the Site, however, Tulliallan Golf Club lies around 360m to the east while National Cycle Network 76 (NCN76) and a Core Path follows the route of the Hawkhill Road to the south of the Proposed Development. Given distance and intervening vegetation and development, significant effects on the Golf Club or users of it are considered unlikely. With regard to Hawkhill Road and users of the NCN/Core Path, the application boundary includes a smaller area running parallel to the road which would enable the installation of a temporary path which would segregate users from any construction traffic using Hawkhill Road. As a result, no significant effects on users of the NCN/Core Path are likely.
1119. In the wider area a small number of Core Paths are present as well as a glamping and caravan site lying approximately 1km to the west within Clackmannanshire. Impacts on these resources relate to secondary effects on the amenity of users of the paths or visitors to the glamping and caravan site (for example visual or noise impacts). These are assessed in Chapter 7 Landscape and Visual Amenity and Chapter 10 Construction and Operational Noise.
1120. In its scoping opinion Clackmannanshire Council highlighted the glamping and caravan business advising that measures to mitigate impacts should be considered. Potential impacts on the glamping site would relate to impacts on amenity of visitors or which might deter visitors (for example noise or visual effects). Typically, the distance between the glamping site and the Proposed Development is such that it reduces potential adverse effects; in particular with the mitigation measures described in chapter 10 significant noise effects will not occur. With regard to visual amenity, the Proposed Development includes planting proposals on its western boundary to reduce impacts in views from the west and integrate the Proposed Development into the Site. Significant visual effects including from viewpoints to the west of the Proposed Development are identified in construction and year 1 of operation but these will reduce as landscape planting matures such that they will be minor adverse and not significant in the long term. Noise and visual effects are not considered likely to impact on the amenity of users of glamping site nor would they deter visitors to the site such that they would significantly affect the business.

11.6 Major Accidents and Disasters

1121. The Institute for Environmental Management and Assessment (IMEA) defines major accidents as “events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the Client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.” and disasters as “may be a natural hazard (e.g., earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.”
1122. Consideration has been given to the vulnerability of the Proposed Development to a major accident or disaster, as well as the potential for the Proposed Development to cause a major accident. With the exception of flood risk, which is considered within a separate Flood Risk Assessment, the Proposed Development is not located in an area in which natural disasters or extreme weather events such as earthquakes or wildfires are likely to impact it. The substation includes appropriate security measures including security fencing, lighting and

cameras to reduce the risk of interference. As a result the Proposed Development is not considered to be vulnerable to major accidents or disasters and unlikely result in significant environmental effects. The Proposed Development is not considered likely to be a cause of a major accident. The substation is designed in accordance with relevant standards and guidelines to ensure it can be safely operated and therefore is unlikely to be a cause of a major accident. No significant effects are likely to occur because of major accidents or disasters as a result of the Proposed Development.

11.7 Air Quality

1123. The Proposed Development is not located in or close to an Air Quality Management Area and air quality is generally considered to be good. The nature of the Proposed Development is such that it does not result in emissions to air that are likely to reduce air quality. While there will be an increase in traffic as well as potential generation of dust during construction this is limited to relatively short periods and will be mitigated through good construction practices as set out in the Schedule of Mitigation in chapter 13 of this EIAR. The Proposed Development is not considered to result in likely significant effects on air quality.

11.8 Climate Change

1124. The Proposed Development is not considered likely to result in significant effects on climate change. By helping to increase the capacity of the electricity network and enable the increased connection of renewable energy, the Proposed Development is intended to help to mitigate the effects of climate change. With regard to climate resilience and potential impacts of climate change on the Proposed Development, the main risk of climate induced effects relates to flood risk which is considered in the Flood Risk Assessment which accompanies the planning application. No significant effects on climate change are likely as a result of the Proposed Development.

11.9 Human Health

1125. The Proposed Development has been sited away from residential properties as far as possible reducing potential impacts on people including human health from the construction and operation of the substation. Potential impacts on human health as a resulting from construction activities, such as noise and dust are not likely to significantly affect people due to a combination of measures embedded into the design and construction of the Proposed Development and the distance from the substation to settlement or other community areas.
1126. With regard to Electric and Magnetic Fields (EMF), information is provided in Chapter 4 Project Description. The Proposed Development is designed to comply with exposure limits which are set by the Government on advice from public health bodies. The exposure limits for EMFs are derived from the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines, published in 1994 and 1998 respectively and recently updated in March 2020. Electricity transmission substations, such as the Proposed Development, do not produce very large fields themselves (generally less than a microtesla). No significant effects on human health are likely as a result of the Proposed Development.

12.

Cumulative Effects

12. Cumulative Effects

12.1 Introduction

1127. This chapter of the EIAR describes the assessment of likely significant cumulative and in-combination effects arising from the Proposed Development. These are effects that would act in combination resulting in an effect of greater significance (either beneficial or adverse) than an individual effect on its own. There are two types of cumulative effects considered in this assessment:
- Intra-project effects: These effects (sometimes also referred to as combined or interactive effects) occur where effects of the Proposed Development combine to affect a single receptor. An example would be where a local resident is affected by dust, noise and a loss of visual amenity during the construction of the Proposed Development, with the result being a greater nuisance than each individual effect alone.
 - Inter-project effects: The combined effects of the Proposed Development with other developments which may not, on an individual basis result in likely significant effects but, together (i.e. cumulatively), have a likely significant effect. The assessment of inter-project effects has been reported in each aspect chapter (6-10) but are summarised here for completeness.

12.2 Intra-project effects

Overview

1128. For an intra-project effect to occur a receptor must be affected by more than one type of effect, for the purpose of the assessment these are referred to as ‘shared receptors’. Shared receptors experiencing two or more types of effect with a significance of effect greater than negligible, have the potential to experience a significant intra-project effect.
1129. The following shared receptors that could be affected by more than one type of effect during the construction and operation of the Proposed Development have been identified. This draws on the results of the assessments reported in chapters 6-11 of this EIAR. For completeness the intra-project effects assessment has included consideration of those aspects which have previously been scoped out (addressed in Chapter 11). Shared receptors comprise:
- Residential receptors – this group comprises residential properties in the vicinity of the Proposed Development including scattered individual properties on the A977 to the east of the Proposed Development, properties (including holiday accommodation) in the wider area to the west of the A876, Hawkhill Farm to the south as well as clustered settlement to the southwest on the outskirts of Kincardine.
 - Recreational receptors – this comprises users of cycling and walking routes in the vicinity of the Proposed Development. This includes National Cycle Network Route 76 which extends around the Firth of Forth and utilises Hawkhill Road to the south of the Proposed Development as well as Core Paths R745 and R746 which also utilise Hawkhill Road as well as Core Path 101 which lies to the west of the A876.

Residential receptors

Construction

- 1130. Residential receptors could be affected by a combination of visual, noise, traffic and air quality effects during construction of the Proposed Development.
- 1131. The visual assessment (chapter 7) identifies residual effects on the visual amenity during construction from viewpoints representative of residential properties and holiday accommodation ranging from minor (not significant) to moderate adverse (significant).
- 1132. The noise assessment (chapter 10) does not identify significant residual effects resulting from construction of the Proposed Development. With proposed mitigation measures in line with Best Practicable Means (BPM) to be secured through a Construction Environmental Management Plan (CEMP), the residual effects are assessed to be minor adverse (not significant).
- 1133. The traffic assessment (chapter 9) assesses the effects of construction traffic on the local road network. With a Construction Traffic Management Plan in place, residual effects are assessed as negligible or minor adverse (not significant). Additional mitigation, comprising Public Road Improvements ((PRIs) is required on Hawkhill Road to minimise disturbance.
- 1134. The assessment of air quality impacts (chapter 11) does not identify significant residual effects on air quality during construction. With proposed mitigation measures to be secured through a CEMP, effects from dust generated during construction will not be significant.
- 1135. Overall, intra project effects on residential receptors from construction will not be greater than the individual effects described above. A range of mitigation measures are proposed and would be secured through a CEMP. These will prevent or reduce effects that might otherwise result in combined effects on residential receptors. Effects will vary for different residential receptors largely due to their proximity to the Proposed Development with the visual amenity of some receptors likely to be significantly affected, however, the level of the effect will not be increased by other construction related effects. No significant intra-project effects will affect residential receptors during construction of the Proposed Development.

Operation

- 1136. Residential receptors could be affected by a combination of visual and noise effects during operation of the Proposed Development. Once operational, traffic generated by the Proposed Development would be limited and therefore would not contribute to a significant intra-project effect.
- 1137. The visual assessment (chapter 7) identifies residual effects on visual amenity during operation from viewpoints representative of residential properties and holiday accommodation. These range from negligible to minor adverse (not significant).
- 1138. The noise assessment (chapter 10) does not identify significant residual effects resulting from ordinary operation of the Proposed Development, however, it does identify the potential for significant effects when operating the standby generator should appropriate mitigation not be implemented. A number of potential measures could be applied to reduce effects from the standby generator which it is proposed are secured by condition.
- 1139. Overall, intra-project effects on residential receptors from operation will not be greater than the individual effects described above. Mitigation measures are incorporated into the Proposed Development or, in the case of the standby generator proposed to be secured by planning condition prior to operation. No significant intra-project effects will affect residential receptors during operation of the Proposed Development.

Recreational receptors

Construction

- 1140. Recreational receptors could be affected by a combination of visual, noise, traffic and air quality effects during construction of the Proposed Development.
- 1141. The visual assessment (chapter 7) identifies residual effects on the visual amenity during from viewpoints representative of recreational receptors including National Cycle Route 76 and core paths. These range from minor adverse (not significant) to major adverse (significant).
- 1142. The noise assessment (chapter 10) does not identify significant residual effects on resulting from construction of the Proposed Development. With proposed mitigation measures in line with Best Practicable Means (BPM) to be secured through a Construction Environmental Management Plan (CEMP), the residual effects are assessed to be minor adverse (not significant).
- 1143. The traffic assessment (chapter 9) assesses the effects of construction traffic on the local road network. With a Construction Traffic Management Plan in place, residual effects are assessed as negligible or minor adverse (not significant). Additional mitigation, comprising Public Road Improvements ((PRIs) is required on Hawkhill Road to minimise disturbance.
- 1144. The assessment of air quality impacts (chapter 11) does not identify significant residual effects on air quality during construction. With proposed mitigation measures to be secured through a CEMP, effects from dust generated during construction will not be significant.
- 1145. Overall, intra project effects on recreational receptors from construction will not be greater than the individual effects described above. A range of mitigation measures are proposed and would be secured through a CEMP. These will prevent or reduce effects that might otherwise result in combined effects on recreational receptors. While significant effects will occur on recreational receptors these are limited to effects on visual amenity only. No significant intra-project effects will affect residential receptors during construction of the Proposed Development.

Operation

- 1146. Recreational receptors could be affected by a combination of visual and noise effects during operation of the Proposed Development. Once operational, traffic generated by the Proposed Development would be limited and therefore would not contribute to a significant intra-project effect.
- 1147. The visual assessment (chapter 7) identifies residual effects on visual amenity during operation from viewpoints representative of recreational receptors including National Cycle Route 76 and core paths. These range from to minor adverse (not significant) to major adverse (significant) for different viewpoints.
- 1148. The noise assessment (chapter 10) does not identify significant residual effects on Noise Sensitive Receptors (NSRs) representative of recreational receptors resulting from operation of the Proposed Development. The distance between the Proposed Development and recreational resources provides effective attenuation and prevents significant effects.
- 1149. Overall, intra-project effects on residential receptors from operation will not be greater than the individual effects described above. Effects will vary for different recreational receptors largely due to their proximity to the Proposed Development with the visual amenity of some receptors utilising National Cycle Route 76 or core paths likely to be significantly affected, however, the level of the effect will not be increased by other operational effects. No

significant intra-project effects will affect recreational receptors during operation of the Proposed Development.

12.3 Inter-project effects

Overview

1150. As set out in Chapter 2, a review of planning applications (or other pre-application enquiries) made to Fife Council and Clackmannanshire Council within the past five years has been undertaken to identify other developments with which the Proposed Development could result in cumulative environmental effects.
1151. 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). Table 12.1 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 12.1 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	Pre-application (scoping)	Located in Fife within the Site of the Proposed Development adjacent to the substation platform.

Development	Description	Status	Location
	erection of new towers and removal of existing towers to enable connection to KINN.		
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.
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.

Ecology

1152. Residual effects resulting from the Proposed Development are assessed as either being negligible or of less than local significance and therefore are not significant. As a result in terms of cumulative effects it was concluded that because the effects of the Proposed Development in isolation are minimal, when combined with other proposed developments that the cumulative effects would similarly not be significant.
1153. In relation to the Firth of Forth Special Protection Area (SPA) and Ramsar site consideration was given to the cumulative effects occurring as a result of the loss of functionally linked habitat. This considered cumulative development within 5km of the Proposed Development

as well as within 2km of the designation as this would identify particular pressure on the qualifying species in a concentrated area. While the assessment identified a cumulative loss of potentially suitable foraging habitat, it concluded that this would not have a significant effect on pink-footed goose or curlew because the cumulative schemes are highly localised around already developed areas with the largest areas of alternative suitable habitat in the wider landscape remaining undisturbed.

Landscape and Visual

1154. The landscape and visual cumulative assessment considered two scenarios, firstly one in which the Proposed Development was considered alongside those schemes which have been consented and/or are in construction, and secondly a scenario in which the Proposed Development was considered alongside all other relevant schemes including those consented, in construction and in the application stage.
1155. The landscape assessment considered that there is very limited potential for significant cumulative landscape effects on due to a combination of the limited visibility of the Proposed Development and limited nature of change to the landscape. The cumulative landscape assessment therefore takes a targeted approach, focusing on those landscape receptors where the potential for cumulative landscape effects is greatest: Landscape Character Type (LCT) 196 Coastal Flats, Fife and LCT 153 Carselands. The other LCTs would not experience any perceptible cumulative effects.
- LCT 196 Coastal Flats- Fife: In scenario 1 the cumulative effects were considered to be minor adverse and therefore not significant. It was concluded that the Proposed Development and other consented schemes would not alter the most valued characteristics of the LCT. In scenario 2 there would be an increase in the presence/perception of electrical infrastructure within the LCT, however, this was considered to be small due to the presence of existing infrastructure and therefore would be minor adverse and not significant.
 - LCT 153 Carselands: There would be cumulative effects on this LCT in scenario 1 as no schemes which have been considered and/or are in construction are located within it. In scenario 2 there would be a slight increase in the perception of electrical infrastructure, however, the cumulative effect would be negligible and therefore not significant.
1156. The visual assessment concluded that there would be no likely significant cumulative visual effects would occur.
- Viewpoint 1 Broomknowe Drive – in both scenarios 1 and 2, none of the cumulative developments will be visible due to the presence of woodland block planting and aspect of view therefore no likely significant cumulative visual effects will occur.
 - Viewpoint 2 Farmstead along National Cycle Route 76 – in scenario 1 the Proposed Development would be viewed alongside the Kincardine Grid Services Complex adjacent to the A876, however, due to the presence of existing overhead lines which are a prominent feature in the view, the cumulative effect is minor adverse and therefore not significant. In scenario 2, additional overhead line towers connecting into Kincardine North would be visible along with the Proposed Development and Kincardine Grid Services Complex. Overall, cumulative visual effects are minor adverse and therefore not significant.
 - Viewpoint 3 National Cycle Route 76 at Canal Burn – in scenario 1 the Proposed Development would be seen alongside the Kincardine Services Grid Complex, however, views would be more oblique and filtered by vegetation. Overall, the cumulative visual

effects in scenario 1 are negligible and not significant. In scenario 2 additional overhead line towers connecting into Kincardine North would also be visible. A combination of vegetation and distance means cumulative visual effects from scenario 2 would be negligible.

- Viewpoint 4 National Cycle Route 76 near Hawkhill Farm – in scenario 1 part of the Kincardine Grid Services Complex would be seen alongside the Proposed Development, however, the existing overhead line towers are dominant in the immediate and surrounding context. Cumulative effects in scenario 1 are minor adverse and not significant. In scenario 2 additional developments would also be visible including additional overhead line towers the Kilbagie Battery Energy Storage System (BESS). Cumulative effects in scenario 2 are minor adverse and not significant.
- Viewpoint 5 Clackmannan Tower – in scenario 1 while the Kincardine Grid Services Complex would be seen alongside the Proposed Development, a combination of distance, the expansiveness of the view and presence of existing electrical infrastructure means the cumulative effect would be minor adverse and not significant. In scenario 2 additional developments would be visible but would not detract from the view. Overall cumulative effects in scenario 2 are minor adverse and not significant.
- Viewpoint 6 Maggie Duncan’s Hill – in scenario 1 visibility is similar to that described above for viewpoint 5. Kincardine Grid Services Complex would be visible alongside the Proposed Development visibility would be limited due to distance. Overall, the cumulative visual effects in scenario 1 are negligible and not significant. In scenario 2 additional developments would be visible but would not detract from the view. Overall cumulative effects in scenario 2 are minor adverse and not significant.
- Viewpoint 7 Kennet Pans/ Kennet Core Path - 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 and therefore there will be no cumulative effects. In scenario 2 the upper levels of new overhead line towers would be visible due to their height, however, this would be not be dissimilar to the existing overhead line and therefore cumulative effects in scenario 2 are negligible and not significant
- Viewpoint 8 A876 Northbound Layby – in scenario 1 the Kincardine Grid Services Complex 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. Existing overhead line towers dominate the view from this viewpoint. Overall, cumulative effects in scenario 1 are negligible and therefore not significant. In scenario 2 the Kincardine Grid Services Complex, the Proposed Development and new overhead line towers would occupy a small to medium sized area of the view. 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. Overall, in scenario 2 the cumulative effects are minor adverse and therefore not significant.

Cultural Heritage

1157. As the Proposed Development will not result in significant physical impacts on heritage assets, there is no potential for a cumulative physical impacts with other developments. As

such, the cumulative assessment was limited to the potential for cumulative impacts through change to the setting of designated assets within the 1km study area.

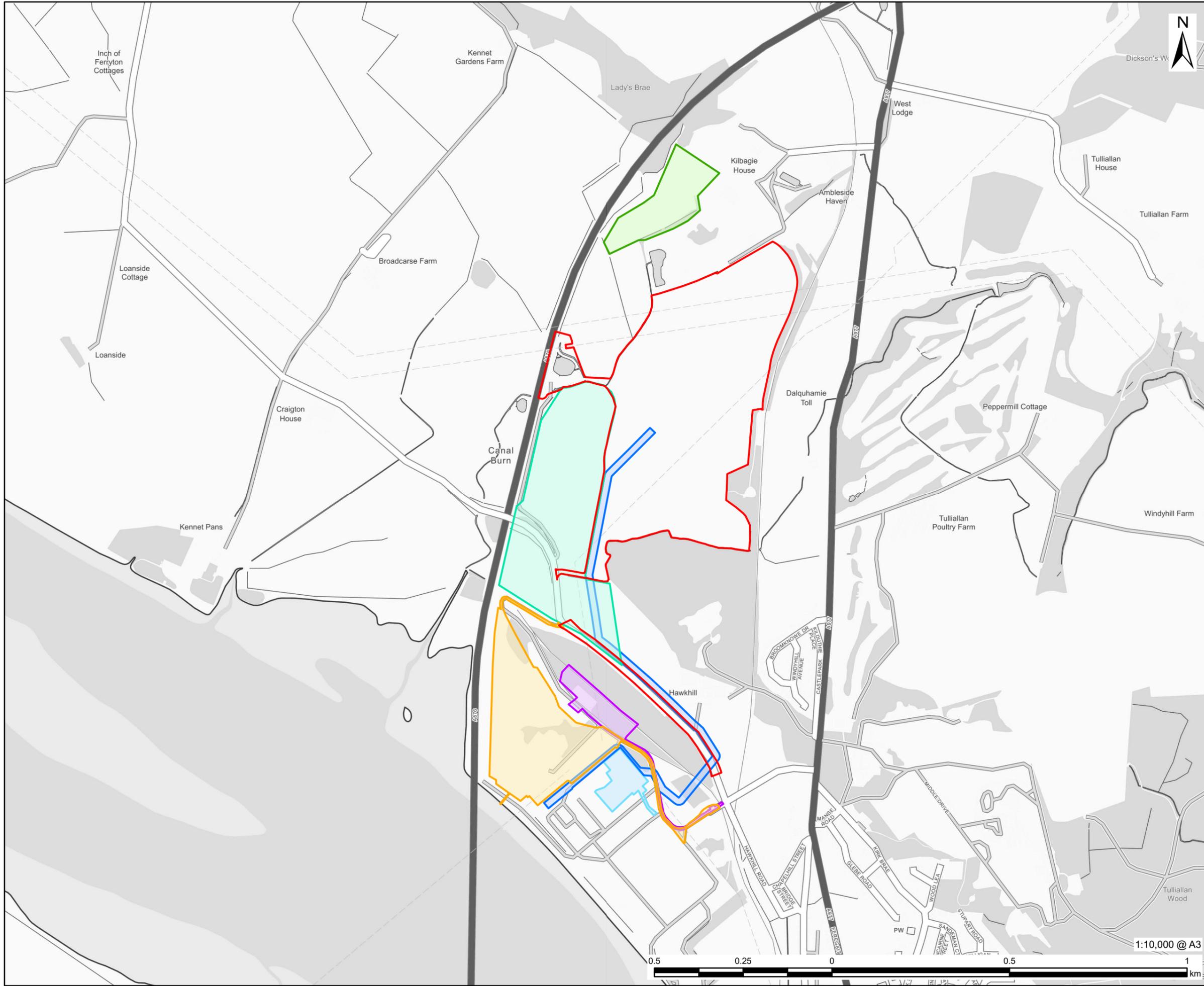
1158. The assessment concluded that there would be no cumulative impact through change to the setting of designated assets. This is largely a result of the cumulative developments being linked to power and infrastructure and therefore of a similar nature to the current landscape character, as well as aspects such as existing screening which would limit views. Furthermore, a review of the assessments for the schemes which are either consented or at application stage concluded that they would not result in significant impacts on the designated assets assessed as part of this assessment.

Traffic and Transport

1159. The assessment of cumulative traffic and transport effects considered the likely significant cumulative effects of construction traffic generated by other developments in addition to the Proposed Development. The cumulative assessment considered the same aspects of traffic and transport:
- Severance of Communities
 - Fear and intimidation
 - Road user and pedestrian safety
 - Non-motorised user amenity
 - Non-motorised user delay
 - Road vehicle and passenger delay
1160. The cumulative assessment concluded that with the mitigation measures proposed as part of the Proposed Development including a Construction Traffic Management Plan, improvements to Hawkhill Road and provision of a temporary segregated pedestrian/cycle route, cumulative effects would be negligible to minor adverse and therefore not significant.

Construction and Operational Noise

1161. The assessment of cumulative noise effects considered the potential for cumulative construction and operational noise effects. Where cumulative developments either at application stage or consented, included noise information this has been considered as part of the cumulative assessment.
1162. The distance between cumulative developments, the Proposed Development and Noise Sensitive Receptors (NSRs) as well as a committed mitigation measures is such that significant cumulative noise effects are considered unlikely to occur.



AECOM

PROJECT

Kincardine North Substation

CLIENT

SP Energy Networks

CONSULTANT

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LEGEND

- Site Boundary
- Other Planning Application
 - 24/00979/FULL
 - 25/02355/SCR
 - 25/02494/SCR
 - ECU00003326
 - ECU00004987
 - ECU00005240

NOTES

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ISSUE PURPOSE

EIA REPORT

PROJECT NUMBER

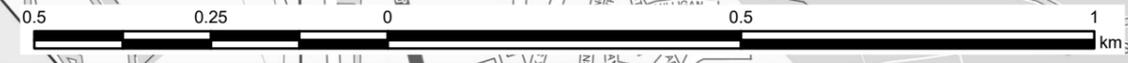
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FIGURE TITLE

Cumulative Effects

FIGURE NUMBER

Figure 12.1



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13.

Schedule of Mitigation

13. Schedule of Mitigation

13.1 Introduction

1163. The Schedule of Mitigation incorporates all of the measures proposed as part of the design, construction and operation of the Proposed Development to avoid, prevent, reduce and offset adverse environmental effects, and where relevant deliver environmental enhancements.

13.2 Schedule of Mitigation

Overview

1164. Tables 13.1 to 13.2 provide a consolidated list of all mitigation and monitoring measures which have been identified in the EIAR. This includes those measures which are embedded in the design of the Proposed Development or will be implemented during its construction and operation as well as additional mitigation measures identified in the EIAR to be included in the design, construction or operation of the Proposed Development. Measures are presented for each environmental aspect including those scoped out at scoping stage where relevant.

Design Measures

Table 13.1 Schedule of Mitigation – Design (inc. Operation) Measures

Environmental Aspect	Design (inc. Operation) Measures
General measures (applying to more than one aspect)	<ul style="list-style-type: none"> The design of the Proposed Development has sought to reduce its footprint as far as possible through the selection of switchgear technology and use of existing accesses. The new watercourse crossing of the Canal Burn and upgraded existing crossing of the unnamed ditch will be designed following SEPA Engineering in the water environment: Good practice guide for river crossings (SEPA, 2010). The temporary track installed to the north of Hawkhill Road to separate pedestrians and cyclists from construction traffic will not require removal of mature trees. Any localised widening will be to the south avoiding mature trees. Lighting of the substation platform will be directional with care to minimise potential for light spillage beyond the site particularly towards nearby properties to the east and south of the site as well as towards the adjacent road network.

Environmental Aspect	Design (inc. Operation) Measures
Ecology	<ul style="list-style-type: none"> • The new watercourse crossing of the Canal Burn and any upgrades to the existing crossing of the unnamed ditch will be designed to allow movement of animals including fish and otters. • Tree, scrub, and hedgerow planting will be carried out as part of the landscape plan and as compensation for minor loss of immature scrub. This will include: <ul style="list-style-type: none"> ▪ planting of broadleaved woodland and dense scrub ▪ expanding the existing mature woodland to the south. ▪ planting of species-rich hedgerow around the Site ▪ planting of neutral grassland using an appropriate seed mix containing native species • Woodlands will be designed to integrate with existing species assemblages present around the Site, using native species of as local provenance • Measures proposed to enhance biodiversity will be set out 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 while also seeking to positively enhance biodiversity. • Brash from scrub clearance to facilitate access from the A876 will be retained within the Site and arranged into log piles at woodland edges. • 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 <ul style="list-style-type: none"> ▪ 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

Environmental Aspect	Design (inc. Operation) Measures
	<p>any INNS5 (e.g. Scotia Seeds7 Pond Edge Mix graded into Wet Meadow Mix).</p>
Landscape and Visual	<ul style="list-style-type: none"> • An Outline Landscape Plan has been developed with measures including planting and bunding incorporated to provide some partial screening and/or filtering of views of the Proposed Development. • The Plan identifies areas of proposed planting including tree and shrub planting on the site boundary as well as grassland reinstatement outside of the substation platform and other hardstanding areas. • Proposed tree planting includes some planting on the western side of the site between the approved Kincardine Grid Services complex and the proposed substation, 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.
Traffic and Transport	<ul style="list-style-type: none"> • Public road improvements are proposed for the C68 Hawkhill Road. These comprise <ul style="list-style-type: none"> – Construction of temporary passing places as well as improvement of existing ones, – Limited road widening on bends, and – Provision of a fully segregated pedestrian/cycle route to the north of the vehicle carriageway.
Noise and Vibration	<ul style="list-style-type: none"> • Power transformers and Shunt Reactors will be in accordance with the limits provided as follows: <ul style="list-style-type: none"> ▪ Power Transformers and cooling equipment will emit a maximum sound power level that shall not exceed 87 dB LWA measured in accordance with IEC 60076-10 at rated voltage. ▪ Earthing / Auxiliary Transformers will emit a maximum sound power level that shall not exceed 70 dB LWA measured in accordance with IEC 60076-10 at rated voltage. ▪ Shunt Reactors will emit a maximum sound power level that shall not exceed 83 dB LWA per three-phase set measured in accordance with IEC 60076-10 at rated voltage.

Environmental Aspect	Design (inc. Operation) Measures
	<ul style="list-style-type: none"> ▪ Standby generator will be tested once a month for 1 hour. during daytime hours. • Other potential mitigation measures to minimise emissions from the standby generator comprise: <ul style="list-style-type: none"> ▪ Specifying a quieter standby generator. It is understood that an urban diesel generator could be specified which has a sound pressure level at 1 m that is 10 dB quieter than the rural option considered in this assessment. This would reduce the rating sound level by 10 dB in emergency operation scenarios and result in a 1 dB exceedance of the background sound level at NSR2 First Floor, which would be an indication of low impact ▪ Locating the standby generator further away from the NSRs which are located to the east of the substation ▪ Local screening or enclosure of the generator
Water Environment	<ul style="list-style-type: none"> • The drainage design will be based on Sustainable Urban Drainage System (SUDS) principles incorporating filter drains, swales and settlement ponds to manage and treat surface water runoff prior to discharging back into watercourses. • The drainage design will be finalised taking account of the Surface Water Management Strategy (SWMS) which accompanies the planning application. • 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. • The drainage design will include oil interceptors to collect any fuels contained within runoff. An appropriately bunded oil containment system will be installed to collect any potential fuel leaks from electrical equipment within the substation platform which contain oil as an insulating medium.

Construction Measures

Table 13.2 Schedule of Mitigation – Construction Measures

Environmental Aspect	Construction Measures
<p>General measures (applying to more than one aspect)</p>	<ul style="list-style-type: none"> • 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. • An Ecological/Environmental Clerk of Works (ECoW) will be employed for the duration of the construction of the Proposed Development • Lighting of the construction site will be directional with care to minimise potential for light spillage beyond the site particularly towards houses, live traffic, and neighbouring habitats especially where there are known populations of sensitive species. • Lighting will be used only when required and will comprise lighting of work areas and access and egress with low level directional lighting. Motion sensor lighting will be used in areas of high security risk and access and egress.
<p>Ecology</p>	<ul style="list-style-type: none"> • All personnel involved in the construction of the Proposed Development will be made aware of the ecological features within the Zol 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. • 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. • Pre-construction surveys should be undertaken. This will comprise surveys for otter, water vole, badger, pine marten, and red squirrel. In addition, a GLTA of any trees

Environmental Aspect	Construction Measures
	<p>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. The surveys will be carried out not 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.</p> <ul style="list-style-type: none"> • 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). • 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). • 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). • 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) • Measures to prevent the injury or mortality of animals will be adopted, including: <ul style="list-style-type: none"> ▪ excavations will be provided with a means of escape for animals that may fall in overnight, such as a ramp or battered slope; ▪ 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. • The temporary access route from the A876 will be micro-sited to avoid the loss of reedbed SBL priority

Environmental Aspect	Construction Measures
	<p>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.</p> <ul style="list-style-type: none"> All habitats affected by construction of the temporary access road, excluding arable fields and willow scrub, will be reinstated post-works.
Cultural Heritage	<ul style="list-style-type: none"> Prior to commencement of construction a programme of evaluation trenching will be carried out. This will be focused on areas of disturbance including the substation platform, permanent access road and drainage. The design of the evaluation trenching will be finalised in consultation with Fife Council’s Archaeological Advisor with a trenching sample assumed to be approximately 3%.
Traffic and Transport	<ul style="list-style-type: none"> A Construction Traffic Management Plan (CTMP) would operate throughout the duration of the construction programme. Appendix H of Technical Appendix 9.1: Traffic and Transport contains a draft CTMP. The detailed CTMP would include: <ul style="list-style-type: none"> Site and the entry/exit arrangements from public roads. Traffic routing plans – defining the routes to be taken by HGVs to the Site avoiding sensitive locations. Construction traffic hours and delivery times. Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions (statutory limits: width, height, axle loading and gross weight), timing restrictions (if applicable) and where access is prohibited. Measures to protect the public highway (e.g. wheel wash facilities); Measures for the monitoring of the CTMP to ensure compliance from construction drivers and appropriate actions in the event of non-compliance. Mechanism for responding to traffic management issues arising during the works (including concerns raised from the public) including a joint consultation approach with relevant road authorities.
Construction and Operational Noise	<ul style="list-style-type: none"> Threshold Values for the construction noise assessment at all receptors should not be exceeded during the construction works:

Environmental Aspect	Construction Measures
	<ul style="list-style-type: none"> ▪ 65 dB L_{Aeq} 07:00 and 19:00 Monday to Friday and Saturdays 07:00 – 13:00; ▪ 55 dB L_{Aeq} 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays; and ▪ 45 dB L_{Aeq} at all other times. <ul style="list-style-type: none"> • As a minimum the Contractor will follow best practice and guidance in BS 5228-1 with regard to mitigation of noise during construction. • Fixed and semi-fixed ancillary plant required during construction such as generators, compressors and pumps should be located away from the northern and eastern boundaries; • All plant used on site should be regularly maintained, paying particular attention to the integrity of silencers and acoustic enclosures; • All equipment should be shut down when not in use; • Prior to any piling works being undertaken, an assessment of piling techniques would be undertaken to ensure the least disturbing techniques are used as far as possible and identify any additional noise mitigation requires. A piling method statement would be provided to Fife and Clackmannanshire Council prior to commencement of piling works. Any piling works would be restricted to day-time hours only; • The loading and unloading of materials should take place away from residential properties, ideally in locations which are acoustically screened from nearby noise sensitive receptors; • Materials should be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant should be kept to a minimum; • Modern plant should be selected which complies with the latest EC noise emission requirements. Electrical plant items (as opposed to diesel powered plant items) should be used wherever practicable. All major compressors should be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers;

Environmental Aspect	Construction Measures
	<ul style="list-style-type: none"> • Site operations and vehicle routes should be organised to minimise the need for reversing movements, and to take advantage of any natural acoustic screening present in the surrounding topography; • No employees, subcontractors and persons employed on the site should cause unnecessary noise from their activities e.g. excessive 'revving' of vehicle engines, music from radios, shouting and general behaviour etc. All staff inductions at the site should include information on minimising noise and reminding them to be considerate of the nearby residents; and • As far as practicable, noisier activities should be planned to take place during periods of the day which are generally considered to be less noise sensitive i.e. not particularly early or late in the day. • Regular communication with the local community throughout the construction period would also serve to publicise the works schedule, giving notification to residents regarding periods when higher levels of noise may occur during specific operations, and providing lines of communication where complaints can be addressed. A communication plan would be included in the CEMP.
Water Environment	<ul style="list-style-type: none"> • During all phases of the Proposed Development, pollution prevention measures will be adopted, following SEPA Pollution Prevention Guidelines (PPG), General Binding Rules (GBRs) and Guidance on Pollution Prevention (GPP), including the following: <ul style="list-style-type: none"> – 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 50 m away from any watercourse; and,

Environmental Aspect	Construction Measures
	<ul style="list-style-type: none"> – where works in or on the banks of watercourses are required, for example to install or modify watercourse crossings, appropriate measures will be implemented to ensure a ‘dry’ working area and avoid pollution. • If dewatering is required onsite then water arising from dewatering operations will be treated prior to controlled discharge. This may include the construction of temporary ‘construction’ SuDS or the use of the elements of the permanent drainage scheme. • Concrete mixing and washing out should be avoided onsite where possible. Should it be required it will be undertaken at least 50m away from surface watercourses with appropriate bunding to prevent accidental spillage. • There will be no disposal of foul sewage on site during construction. All foul water will be discharged into a temporary toilet cabin. The tank will be regularly emptied and removed for off-site disposal by a licensed contractor. Welfare waste from the temporary construction compound and car park area will be taken off site and disposed of at an appropriate licensed facility.
Ground Conditions	<ul style="list-style-type: none"> • Soil management methods covering handling, storage and reinstatement of soils will be set out in the CEMP and agreed with SEPA. This will include: <ul style="list-style-type: none"> – Keeping soil disturbance to a minimum – Minimising exposed areas of soil at any one time; – Storing top-soil and sub-soil separately; and – Re-using excavated soils on-site where possible. • Ground investigation will be undertaken to inform the detailed design of the Proposed Development, and should it be required any subsequent remediation or ground improvements. This will include consideration of: <ul style="list-style-type: none"> – The presence of or risks posed by previous mining activity; – The nature and extent of soil or groundwater contamination present; – The risks to human health and the wider environment from potential contaminants; and – The risk of ground gas being present.

Environmental Aspect	Construction Measures
Land Use, Tourism and Recreation	<ul style="list-style-type: none"> • Prior to and for the duration of construction a segregated temporary access will be established to the north of Hawkhill Road enabling pedestrians and cyclists to continue to safely use the Core Path and national cycleway while avoiding potential conflicts with construction traffic exiting the Proposed Development and traveling eastbound on Hawkhill Road.
Air Quality	<ul style="list-style-type: none"> • Dust pollution from earthworks activities will be limited through the use of the following measures: <ul style="list-style-type: none"> ▪ Topsoil will be stripped as close as reasonably practicable to the period of excavation or other earthworks activities to avoid risks associated with runoff or dust generation. ▪ Stockpiles will be covered, seeded or fenced to prevent wind-whipping (generation of airborne dust through erosion). ▪ Materials that have a potential to produce dust will be removed from site as soon as possible, unless being re-used on-site. • To minimise the impact from trackout of dirt and debris the following measures will be implemented: <ul style="list-style-type: none"> ▪ a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas will applied; ▪ dust sweeper(s) on the access road and along Hawkhill Road, to remove any material tracked out of the site. ▪ vehicles entering and leaving sites will be sheeted/covered to prevent escape of materials during transport;

14.

Summary and Conclusions

14. Summary and Conclusions

14.1 Summary of Assessment

1165. SP Transmission is seeking planning permission from Fife Council and Clackmannanshire Council for the construction of a new 400kV substation to be known as Kincardine North Substation. The Proposed Development is located on agricultural land to the north of Kincardine, Fife. It comprises a new substation as well as associated access, drainage, landscaping and ecological enhancement. An EIA of the proposed Kincardine North Substation has been undertaken and results reported in this EIAR. Table 14.1 below provides a summary of the assessment, in particular highlighting whether a likely significant effect has been predicted for those environmental aspects scoped into the assessment when taking into account proposed mitigation measures i.e. it presents a summary of the residual effects.

Table 14.1 Summary of Assessment – Likely Significant Effects

Environmental Aspect	Construction Effects	Operational Effects
Ecology	No likely significant effects	No likely significant effects
Landscape	No likely significant effects	No likely significant effects
Visual Amenity	Likely significant effects	Likely significant effects*
Cultural Heritage	No likely significant effects	No likely significant effects
Traffic and Transport	No likely significant effects	n/a - scoped out
Noise and Vibration	No likely significant effects	No likely significant effects**

* Some significant visual effects in year 1 of operation reducing as landscape planting matures and reduces impacts.

** Some short duration significant noise effects could occur in night-time periods when the standby generator is in use subject to final design and mitigation.

14.2 Conclusions

1166. The results of the EIA ensure that Fife and Clackmannanshire Council, statutory consultees as well as other interested parties including local communities are aware of the likely environmental effects of the Proposed Development and whether these may be significant or not. It is important to note that 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 the Proposed Development acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties are aware of the Proposed Development's environmental effects (in particular those which are likely to be significant) so that they may be considered alongside other material considerations in determining the planning application.

1167. The EIA of the Proposed Development has identified and assessed the likely significant effects which would result from its construction and operation. Through careful siting and including mitigation within the design and construction of the Proposed Development, the majority of likely significant environmental effects have been prevented, avoided or reduced. While some significant effects have been identified these are limited to effects on visual amenity. These have been mitigated as far as possible through the inclusion of landscape planting within the design of the Proposed Development including extensive planting, however, due to the open nature of the landscape and views into the site some significant effects will remain during the initial operation of the Proposed Development reducing as landscape planting matures.

