Scottish & Southern Electricity Networks

SSEN Transmission

Stannergate 132 kV Substation

Environmental Appraisal

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LIST OF ABBREVIATIONS

ACM	asbestos containing materials
AIL	Abnormal Indivisible Loads
AIS	Air Insulated Switchgear
AOD	Above ordnance datum
ARC	Amphibian and Reptile Conservation
ARG	Amphibian and Reptile Groups
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BMP	Biosecurity Management Plan
BNG	Biodiversity Net Gain
BoCC	Birds of Conservation Concern
BSG	British Geological Survey
BTEX	benzene, toluene, ethylbenzene, xylene
CAR	Controlled Activities Regulations
CEMP	Construction Environment Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CTMP	Construction Traffic Management Plan
DBA	Desk-based assessment
DNO	Distribution Network Operator
DWPA	Drinking Water Protected Area
EA	Environmental Appraisal
EcIA	Ecological Impact Assessment
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
GCR	Geological Conservation Review
GEMP	General Environmental Management Plans
GIS	Gas Insulated Switchgear
GLTA	Ground Level Tree Assessment
GPS	Global Positioning System
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HEPS	Historic Environment Policy for Scotland
HER	Historic Environment Record
HES	Historic Environment Scotland

HGV	Heavy Goods Vehicle
IEMA	Institute of Environmental Management and Assessment
INNS	Invasive Non-native Species
kV	kilovolt
LBAP	local biodiversity action plans
LGV	Light Goods Vehicle
LINCS	Locally Important Nature Conservation Sites
M	metre
MTBE	methyl-tert-butyl-ether
NPF	National Planning Framework
NVC	National Vegetation Classification
OS	Ordnance Survey
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PEA	Preliminary Ecological Appraisal
PFAS	polyfluoroalkyl substances
PPE	Personal protective equipment
PRA	Preliminary Roost Assessment
PRF	Potential Roost Features
PWS	Private Water Supply
RBD	River Basin District
RBMP	River Basin Management Plans
RTP	Regional Transport Partnership
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SF6	Sulphur Hexa-Fluoride
SPA	Special Protection Area
SPP	Species Protection Plans
SSEN	Scottish & Southern Electricity Networks
SSSI	Site of Special Scientific Interest
STGO	Special Types General Order
SVOC	semi volatile organic compounds
SWMP	Surface Water Management Plan
TPH	total petroleum hydrocarbons
UK	United Kingdom
UXO	Unexploded Ordnance

VOC	volatile organic compounds
WCA	Wildlife and Countryside Act
WFD	Water Framework Directive
WPP	Water Protection Plan
WWII	World War II
ZoI	Zone of Influence

1. INTRODUCTION AND PROJECT NEED

1.1 Overview of the Proposed Development

1.1.1 This Environmental Appraisal (EA) has been prepared by AECOM, (hereinafter referred to as "the Consultant") on behalf of Scottish Hydro Electric Transmission plc ("the Applicant") who, operating and known as Scottish and Southern Electricity Networks Transmission ("SSEN Transmission"), own, operate and develop the high voltage electricity transmission system in the north of Scotland and remote islands. In this EA, the Applicant and SSEN Transmission are used interchangeably unless the context requires otherwise. The EA has been prepared to accompany an application for planning permission under the Town and Country Planning (Scotland) Act 1997, (as amended) (the "1997 Act").

1.1.2 The application seeks planning permission under the Act 1997 to construct and operate a new 132 kilovolt (kV) Network Rail Traction Transformer station and a 132kV Gas Insulated Switchgear (GIS) substation, east of Dundee City Centre, immediately north of East Dock Street, and south of Broughty Ferry Road, hereafter referred to as 'the Proposed Development'.

1.1.3 An Environmental Impact Assessment (EIA) Screening Request for the Proposed Development was submitted to Dundee City Council ('the Council') in May 2024 (24/00003/EIASCR) under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. The Screening Opinion received from the Council (June 2024) stated that *"the submission of a formal Environmental Statement is not required in respect of the Proposed Development"*.

1.1.4 This EA has therefore been produced as a non-statutory assessment to allow appropriate environmental management and mitigation to be identified, as presented.

1.1.5 As part of a £120m Scottish Government investment, Network Rail are electrifying Scotland's rail network to help decarbonise and support ambitions to reach Net Zero by 2045. To electrify the rail routes from Dundee to Montrose (via Arbroath), Network Rail have requested a 132kV feeder station to deliver power to the newly electrified lines, with a firm demand of 16.2MW from SSEN Transmission.

1.1.6 The Applicant has a statutory duty under schedule 9 of the Electricity Act 1989 ('the Electricity Act') to develop and maintain an efficient, coordinated, and economical electrical transmission system in its licensed areas. Where there is a requirement to extend, upgrade or reinforce its transmission network, SSEN Transmission's aim is to achieve an environmentally aware, technically feasible and economically viable scheme which would cause the least disturbance to the environment and the people who use the area.

1.1.7 Due to the Applicant's statutory duty under schedule 6 of the Electricity Act, they are obliged to provide these asset upgrades, reinforcements and connections as requested. There is no space at the existing Dudhope Grid Supply Point (GSP) to extend the site to allow the Network Rail connection or to replace and upgrade the transformers. This necessitates the requirement for the Proposed Development to provide a connection for Network Rail and sufficient space to provide a replacement for Dudhope GSP.

1.1.8 A gas insulated switchgear (GIS) substation is proposed to reduce the substation footprint due to the city centre location compared to the alternative Air Insulated Switchgear (AIS) solution.

1.1.9 SSEN Transmission and Network Rail have worked in partnership to plan, design and deliver the required works in a way that reduces risk, minimises disruption and helps to move forward with plans to decarbonise Scotland's railway by 2035

1.1.10 The operational phase of the Proposed Development is expected to commence in October 2027 and will likely include regular monitoring and maintenance throughout its lifespan. It is inevitable that some level of decommissioning of the Proposed Development will be required at the end of its lifespan. This will likely include the removal or replacement of equipment. It is likely that any potential effects from the Proposed Development would be largely reversible, and the land could mostly be returned to its previous state.

1.2 Purpose of this Report

1.2.1 As EIA is not required for the Proposed Development, a statutory assessment of the potential environmental impacts of the Proposed Development has not been carried out.

1.2.2 This non-statutory Environmental Appraisal (EA) Report presents the findings of an assessment of the likely environmental effects of the Proposed Development on the receiving environment. It provides a basic overview of the baseline conditions as understood at the time of writing and the potential effects resulting from the Proposed Development. Where site survey and further assessment are deemed necessary, the methodologies are outlined in that section. In accordance with the Council's pre-application advice, the environmental topics scoped into this EA are:

- Ecology
- Cultural Heritage
- Traffic and Transport
- Hydrology, Hydrogeology and Soils
- Noise and Vibration

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Introduction

2.1.1 This Chapter provides a description of the Proposed Development, including details of the key components and information regarding the construction operation and maintenance of Proposed Development. This description is also used as the basis for the technical assessments as reported in Chapters 4 to 8.

2.2 The Proposed Development Site

2.2.1 As illustrated in Figure 2.1 'Site Location Plan' of Appendix A, the Proposed Development is located on land located in the Stannergate area of Dundee ('the Proposed Development Site').

2.2.2 The Proposed Development Site is a currently disused industrial site in Dundee. The site is dominated by sealed surfaces, buildings and structures associated with the former use of the site. A retaining wall separates the Proposed Development Site between north and south, with the northern part of the site (which formerly housed an abattoir) the more elevated of the two. The Southern part of the site comprises a former oil refinery facility owned by Nynas UK that has been inactive for 10 years. East of this, but within the application site boundary lies the now overgrown Roodyards Road and an area of hardstanding also owned by Nynas, but currently in use by Scotriders for motorbike training centre. To the west and south there are similar industrial areas, with the A92 (East Dock Street) immediately to the south and east. The Proposed Development Site is bound to the north by the Broughty Ferry road, beyond which lies existing residential areas.

2.2.3 Once operational the site will be accessed via a newly created access junction to the west, off Market Street, which will also provide the main access construction and delivery vehicles during the construction phase. A secondary, emergency only access is also proposed, utilising one of the existing eastern access points to the Site situated on East Dock Street.

2.3 Proposed Development Components

2.3.1 The Proposed Development components are illustrated in Figure 2.2, Appendix A and will comprise the following elements:

- One 132 kV GIS Control Building (including staff welfare and maintenance areas);
- Two 132 / 25 kV 25 MVA Traction Transformer buildings to meet Network Rail's energisation requirements; and
- Two 132 / 33 kv 120 MVA Grid Transformer (GSP) buildings.

2.3.2 The following buildings would make up the ancillary aspects of the Proposed Development:

- Temporary Distribution Network Operator (DNO) supply building (for construction phase);
- Permanent Generator Building;
- Permanent 33 kV distribution compound;
- Photovoltaic (PV) panels;
- 25 kV underground cable connection between application site and the Network Rail Feeder Station to be located near to Dundee Railway Station;
- New site access from Market Street;
- Onsite access roads and parking bays including Electric Vehicle provision; and

- Security measures (palisade fencing, security lighting, CCTV).

2.3.3 The following sections detail the key components of the Proposed Development as identified on the Proposed Site Plan Layout drawing (Ref. LT491-STNG-0802-DR-0004).

132kV GIS Control Building

2.3.4 The 132kV GIS Control Building will accommodate of GIS switchgear comprising a minimum of 11 bays (one bus section, two bus couplers and eight feeder bars), including two 120 MVA 132/33 kV transformers.

2.3.5 In addition to the GIS switchgear and secondary systems the Control Building will provide operational office, welfare and spare storage space, and will have a building footprint of approximately 21.6m width, by 48.7m length by 13.2m height.

2.3.6 The proposed GIS Substation Building will comprise a steel portal frame building, with vertical cladding (Kingspan or similar) and will be finished in Merlin Grey (BS 18B25).

2.3.7 Within a GIS substation, live electrical equipment uses a dense gas as the insulating medium, usually Sulphur Hexa-Fluoride (SF6); however, in support of their commitments and responsibilities to the decarbonisation of the electricity network, SSEN Transmission will, where practical, seek to use an alternative SF6 free technology solution. GIS typically allows safe clearance distances between live conductors to be reduced, resulting in a smaller footprint compared to the alternative Air Insulated (AIS) substation.

Traction Transformer Buildings

2.3.8 The two 132 kV Traction Transformer buildings would be located in the western part of the site, adjacent to each other and with the same orientation. The buildings would be approximately 26.3m width by 46.9m length by 17m height. The buildings will comprise a steel portal frame building, with vertical cladding (Kingspan or similar) and will be finished in Merlin Grey (BS 18B25).

2.3.9 The buildings will include double height roller shutter doors (for transformer delivery / access) to the south and west elevations. To provide natural cooling and ventilation for the transformers, there will be a total of ten louvres incorporated in the north elevation and eight in the southern elevation. All external doors and louvres to be colour match to the building.

Grid Transformer Buildings

2.3.10 The two Grid Transformer buildings, situated centrally within the site, would also be set adjacent and with the same orientation. The proposed layout makes an allowance for Mobile Elevating Work Platform (MEWP) access around both buildings. The buildings would be approximately 27.6m width by 39.8m length by 17m height. The buildings will comprise a steel portal frame building, with vertical cladding (Kingspan or similar) and will be finished in Merlin Grey (BS 18B25).

2.3.11 The buildings will include double height roller shutter doors (for transformer delivery / access) to the north and west elevations. To provide natural cooling and ventilation for the transformers, there will be a total of eight louvres incorporated in the north, south and west elevations, with a further five smaller louvres provided in east elevation. All external doors and louvres to be colour match to the building.

Scottish Hydro Electric Power Distribution (SHEPD) Control Building

2.3.12 The Proposed Site Plan Layout also shows the provision of a new 33Kv SHEPD Control Building, situated in the southwest corner of the application site. Whilst shown on the submitted application drawings, it should be noted that this building

does not form part of the application proposals and will be subject to a separate planning application, brought forward by SHEPD in due course.

Operational Infrastructure

2.3.13 Given the scale of the Proposed Developments, a need for permanent operational facilities has been identified to support operational requirements.

- Lighting – the Proposed Development would not be illuminated at night during normal operation. Floodlights would be installed but would only be used in the event of a fault during the hours of darkness; or during the overrun of planned works; or when sensor activated as security lighting for night-time access;
- Permanent access – proposed new site access from Market Street and retained left in / left out emergency only access on East Dock Street;
- Permanent on-site parking – seven on-site parking spaces are proposed to accommodate operational vehicles (cars and vans) required to carry out servicing, maintenance and repairs as required. This provision included four electric vehicle charging spaces.
- Security fencing – a 2.5 m high palisade fence would be installed around the site boundary;
- Earthworks – where necessary a cut-fill exercise will be undertaken to achieve a level platform on which the substation will be constructed; and
- Cabling – on-site underground connectors to and from the proposed infrastructure.

Associated Works

2.3.14 Other Associated Works are required to facilitate construction of the Proposed Development or would occur as a consequence of its construction. The Associated Works relevant to this Proposed Development comprise:

- Removal of existing structures and equipment on site (by way of permitted development and / or demolition warrants where relevant);
- On-site Landscaping mitigation, developed in response to the existing screening requirements to ensure that keys areas of screening are not removed and where possible enhanced; and
- Off-Site Biodiversity Enhancement as set out in the Biodiversity Net Gain Assessment that accompanies this application; and
- Off-site underground cable will be delivered under permitted development rights and provide connections to both the SSEN Transmission distribution network and Network Rail's own Feeder Station (subject to separate approvals to be sought by Network Rail).

2.4 Construction

Construction Compounds

2.4.1 Temporary site compounds would be required during construction, located within the northern area of the site boundary. This would provide office and welfare facilities for site staff, parking, laydown areas, holding and servicing space for construction plant. The areas required may be split into smaller areas across the site, to utilise existing space and to avoid where possible loss of planting across the site. The location of temporary site compounds and access tracks are indicative and the finalised compound locations are requested to be agreed by planning condition on any subsequent consent.

Delivery of Structures and Materials

2.4.2 Pre-mixed concrete would be delivered to site. Hardcore and earthworks materials for the construction of the Proposed Development would be primarily locally imported materials due to the historic context of the site and the potential for contamination.

2.4.3 Where possible, materials that are excavated or produced during construction work from the Development Site (i.e. site-won material) would be used and prioritised over imported material. However, due to the context of the development it is likely that the use of site-won materials would be limited.

Construction Programme and Hours of Working

2.4.4 It is anticipated that construction of the project would take approximately 3 years, starting in June 2026, although detailed programming of the works would be the responsibility of the Principal Contractor in agreement with SSEN Transmission.

2.4.5 Construction activities would in general be undertaken during daytime periods. Working hours are currently anticipated between approximately 07.00 to 19.00 on weekdays and 07.00 to 13.00 on Saturdays. It is anticipated that working hours would be subject to further agreement with Dundee City Council and the imposition of a planning condition.

Construction Traffic

2.4.6 A Construction Traffic Management Plan (CTMP) would be prepared by the Principal Contractor prior to any works commencing, in consultation with the Council and Transport Scotland, as required. The CTMP would describe all mitigation and signage measures that are proposed on the public road network. A Framework CTMP is provided in Appendix I. Further detail on the anticipated traffic movements associated with construction of the Proposed Development, and an assessment of the likely effects and suggested mitigation measures, is provided in the traffic and transport chapter (Chapter 8 'Traffic and Transport').

Reinstatement

2.4.7 Following commissioning of the Proposed Development, all temporary construction areas would be reinstated. Reinstatement will form part of the contract obligations for the Principal Contractor and will include the removal of all temporary access tracks and working areas.

Landscape Mitigation Measures and Biodiversity Enhancement

2.4.8 The following landscape mitigation measures and biodiversity enhancement measures will be provided as part of the Proposed Development:

- Enhancement of existing other broadleaved woodland present at the east of the Proposed Development Site including treatment and removal of invasive non-native plant species (INNS), (giant hogweed), selective felling (targeting non-native species, such as sycamore) to create open spaces. Planting of native tree species, such as oak, birch and rowan will also enhance the value of the woodland.

2.4.9 The woodland was recorded as being in poor condition, following these enhancements, it is predicted that the woodland will reach moderate condition, following the condition criteria set out for Defra Biodiversity Metric 3.11..

Future Maintenance

2.4.10 Regular inspections of equipment will be undertaken to identify any deterioration of components, and these parts will be replaced where needed.

[1] Natural England (2022). Biodiversity Metric 3.1 - Habitat Condition Assessment Sheets

2.5 Operations and Maintenance

Staff

2.5.1 Staff attendance will be on an ad hoc basis for maintenance and fault repairs only.

Maintenance Programme

2.5.2 Regular inspections of equipment will be undertaken to identify any deterioration of components, and these parts will be replaced where needed.

2.6 Mitigation Proposals

2.6.1 Mitigation measures are measures which reduce the potential adverse effects of a proposal. There are two types of mitigation which are considered within this EA:

2.6.2 Embedded Mitigation: This relates to measures that are adopted as part of the design and are an inherent part of the Proposed Development (i.e. do not require additional action, including assessment to be taken). This also includes mitigation measures as a result of following construction good practice.

2.6.3 Additional Mitigation: This relates to measures which have been identified during the assessment of effects in the Technical Chapters and will be taken forward by the Applicant in order to minimise any likely significant effects.

Embedded Mitigation

2.6.4 The layout and design of the Proposed Development has specifically considered the potential impacts on sensitive receptors and features of the surrounding environment. The iterative design process has sought to minimise the potential permanent effects of the Proposed Development on landscape, visual, protected species & habitats, trees, and noise receptors.

2.6.5 Design environmental embedded mitigation measures for the Proposed Development are listed in Table 2-1 'Design Embedded Environmental Mitigation Measures' below.

Table 2-1 Design Embedded Environmental Mitigation Measures

Mitigation Reference	Mitigation Title	Description
EMB1	SSEN Construction Management	Compliance with the Applicant's General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs).
EMB2	Construction Environment Management Plan (CEMP)	Development and adoption of a CEMP during construction to define good practice during construction and deliver mitigation measures set out as part of this EA.
EMB3	Construction Traffic Management Plan (CTMP)	The CTMP would describe all mitigation and signage measures that are proposed on the public road network.
EMB4	Delivery and sourcing of structures and materials.	Where possible materials will be a mix of site-won and locally sourced materials. Concrete would be delivered to site pre-mixed. Hardcore and earthworks materials for the construction of the Proposed Development would be a combination of site won, through cutting of the existing surface to construct the platforms and locally imported materials.
EMB5	Lighting requirements	The Proposed Development would not be illuminated at night during normal operation. Floodlights would be installed but would only be used in the event of a fault during the hours of darkness; or during the overrun of planned works; or when sensor activated as security lighting for night-time access. As far as possible, works should be carried out in daylight to minimise the risk of disturbing protected or notable nocturnal species. If any temporary

Mitigation Reference	Mitigation Title	Description
		artificial lighting is required for construction works, this should be strongly directional and directed only on to the works area, and be turned off when not required, to minimise light spill and adverse effects on nocturnal wildlife.
EMB6	Biodiversity Net Gain	SSEN Transmission has undertaken a Biodiversity Net Gain assessment for the Proposed Development. A Biodiversity Net Gain Report (Appendix B) has been prepared as part of the measures necessary to achieve SSENs target BNG figures.
EMB7	Reinstatement	Following commissioning of the Proposed Development, all temporary construction areas would be reinstated. Reinstatement will form part of the contract obligations for the principal contractor and will include the removal of all temporary access tracks and working areas..

Construction Good Practice

2.6.6 Construction good practice includes compliance with standard construction practices, legislative requirements, and published guidance from statutory bodies which is expected during construction of the Proposed Development.

2.6.7 A Construction Environmental Management Plan (CEMP) will be implemented during the construction period. This will include site specific and best practice construction management measures including measures to manage risks associated with construction of the Proposed Development to the environment and human health including those associated with the following:

- Noise and vibration;
- Surface and groundwater;
- Ecology;
- Cultural heritage;
- Waste (construction); and
- Operation and management of the Proposed Development Site (including construction compounds).

2.6.8 The CEMP will incorporate SSEN Transmission's General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs) which are applied as a standard requirement to all construction sites and practices.

2.6.9 The CEMP will be submitted prior to commencement of construction activities to the Scottish Environment Protection Agency (SEPA) and the Highland Council for approval and will form part of the contractor documents between the Applicant and the appointed construction contractor.

3. METHODOLOGY

3.1 Introduction

3.1.1 This Chapter sets out the approach that has been adopted in undertaking the EA of the Proposed Development, including reference to legal requirements, best practice and assessment parameters.

3.1.2 A detailed overview of the guidance and methodology adopted for each technical study is provided within the respective technical chapters of this EA (**Chapters 4 to 8**).

3.2 Approach to the Environmental Appraisal

3.2.1 The EA has been produced as a non-statutory assessment to allow appropriate environmental management and mitigation to be identified, as presented in **Table 2-1** 'Design Embedded Environmental Mitigation Measures' and **Table 10-1** 'Summary of Mitigation Measures'.

3.2.2 The basic principles followed for the assessment of effects are:

- Establish the baseline environment;
- Consider the extent to which the baseline environment would be altered as a result of the Proposed Development;
- Determine the extent and nature of any likely direct and indirect environmental effects;
- Develop mitigation measures to address these effects; and
- Consider the extent and nature of any remaining environmental effects following mitigation.

3.3 Scope of the Environmental Appraisal

Screening

3.3.1 A Screening Opinion from the Council was sought on 17th May 2024 (24/00003/EIASCR). The opinion confirmed that an EIA was not required for the development, and adopted the following screening opinion:

3.3.2 The Council has considered the characteristics of the development, the location of the development and the characteristics of the potential impact. It is considered that the proposal would not be likely to have a significant effect on the environment. Therefore, the Council's Screening Opinion is that the submission of a formal Environmental Statement is not required in respect of the proposed development.

3.3.3 The Council's Screening Opinion response agreed that technical assessments would be undertaken to inform a voluntary EA, consisting of the following surveys and technical assessments:

- Ecology:
  - Preliminary Ecological Appraisal and Habitat Survey
  - Biodiversity Net Gain (BNG) Assessment
- Hydrology, Hydrogeology and Soils
  - Hydrology and Hydrogeology Assessment
  - Phase 1 Geo-environment desk study and site inspection
- Cultural Heritage
  - Desk-based assessment (DBA) and walkover survey

Consultation

3.3.4 A pre-application advice request was submitted to the Council on 03 April 2024 (Reference PREAPP/019/2024). The response received stated that the following reports/assessments would be required as part of the application for planning consent:

- Preliminary Ecological Assessment
- Biodiversity Net Gain Assessment
- Transport Assessment

3.3.5 In addition, a noise assessment has been carried out to ensure *that "the received noise from the electrical substation(s) shall not exceed NR30 as measured 1 metre external to the facade of residential property"*.

3.3.6 A Proposal of Application Notice (PAN) (Reference 24/00282/PAN) was submitted to the Council on 19th April 2024. Following that two public consultation events were held as follows:

- The first public consultation event was held at the Apex City Hotel in Dundee on 16th of May 2024 (from 2pm-7pm).
- A second public consultation event was hosted on 15th of August 2024 (from 2pm to 7pm), again at the Apex City Hotel, Dundee.

3.4 Cumulative Effects

3.4.1 There are two aspects to Cumulative Effects, defined as follows:

- Interactive effects (also known as intra project effects) which considers the effects from different impact types of the Proposed Development on key receptors such as communities, designated areas or ecosystems; and
- In-combination effects (sometimes known as inter-project effects): The combined effect of the Proposed Development together with other reasonably foreseeable developments (taking into consideration effects at the site preparation and earthworks, construction, and operational phases).

Interactive Effects

3.4.2 Due to the context of Proposed Development, the key receptors and the potential environmental impacts it is not considered that the Proposed Development would result in interactive effects.

In-combination Effects

3.4.3 A study area of 10km was used to define other reasonably foreseeable development proposals. Consideration was then given to potential for cumulative effects to in addition to and in combination with other reasonably foreseeable development proposals. A number of criteria has been considered to inform the selection of developments to be taken forward into the cumulative assessment, these include:

- Development proposals of more than local scale (i.e. national or major development); and/or
- Development proposals where EIA is required, or where there is considered the potential for significant effects on key receptors; and
- Where planning applications (or equivalent consent applications under other consenting regimes) have been submitted but not yet determined, or where requests for EIA scoping opinions have been submitted; or
- Where development consents have been granted but where construction has not commenced at the time of preparation of the EA for the Proposed Development.

3.4.4 The potential for cumulative effects will be considered in relation to other approved or proposed developments within the study area relevant to each issue. The basis for this is that only these developments have the potential to result in significant cumulative effects in combination with those arising from the Proposed Development. The final list of developments to be considered in the cumulative effects assessment has been frozen one month prior to publication to allow sufficient time to compile the EA Report.

3.4.5 The committed development proposals which will be considered are shown in **Table 3-1** below, in assessing the effects of the Proposed Development.

3.4.6 A cumulative appraisal has been undertaken considering the developments in-combination with the Proposed Development. This is presented in **Chapter 9** 'Cumulative Appraisal'.

Table 3-1 Details of Developments for Consideration in Cumulative Assessments

Development	Planning Reference & Description	Potential for Cumulative Effects with the Proposed Development
23/00814/FULM	Eden Project Dundee: Demolition of existing buildings and structures, conversion of existing gas holder and buildings and proposed construction of major mixed use leisure development including education space, landscaped gathering space for different scale events including live performance, public realm, landscaping works, energy centre and related uses, associated car parking and access, infrastructure and engineering operations.	Cumulative developments associated with the construction phase of both developments due to their relative proximity.
23/00813/PPPL	Eden Project Dundee: Erection of a pedestrian bridge and associated infrastructure	Cumulative developments associated with the construction phase of both developments due to their relative proximity.

3.5 Assumptions and Limitations

3.5.1 The key assumptions and limitations applied to the preparation of this EA Report are set out below. Assumptions and limitations specific to certain topics are identified in the appropriate technical chapter.

3.5.2 A number of design elements still include a level of uncertainty and are indicative for the purpose of the EA. However, these elements will be further defined as the design develops. This EA will therefore use a likely worst-case scenario when assessing the environmental effects.

3.5.3 Baseline conditions have been established from a variety of sources, including historical data. Due to the dynamic nature of certain aspects of the environment, this information is subject to change as further information becomes available and as the design progresses.

3.5.4 The design, construction and completed stages of the Proposed Development will satisfy minimum environmental standards, consistent with legislation, practice, and knowledge.

4. ECOLOGY

4.1 Introduction

4.1.1 AECOM has undertaken a Preliminary Ecological Appraisal (PEA) of the Proposed Development. The PEA is provided in Appendix C and a summary of the conclusions are provided below. The following assessment is based on the PEA and a desk study to determine the baseline conditions and any likely impacts from the Proposed Development.

4.2 Information Sources

4.2.1 A habitat survey was carried out of the Proposed Development plus a 50 m buffer where safe access was possible, on 16 May 2024 and 17 June 2024 (the area covered by the field survey is hereafter referred to as the Survey Area).

4.2.2 In addition, a range of desk-study data sources were used to inform the ecological assessment:

- Ordnance Survey (OS) 1:25,000 maps and aerial photography;
- Dundee City Council website;
- NatureScot SiteLink webpage;
- Scotland's environment map;
- SEPA Water Classification Hub;
- Amphibian and Reptile Groups of the UK (ARG UK and Amphibian and Reptile Conservation (ARC) Record Pool;
- Saving Scotland's Red Squirrels;
- Mammal Society Species Hub;
- Dundee City Council Open Data Portal; and,
- NBN Atlas Scotland

4.3 Methodology

Scope of the Assessment

4.3.1 A desk study was carried out to identify nature conservation designations and records of important habitats and species (as defined in below) potentially relevant to the Proposed Development. A stratified approach was taken when defining the desk study area, based on the possible zone of influence (ZoI) of the Proposed Development on different ecological features. Accordingly, the desk study sought to identify:

- Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Wetlands of International Importance (Ramsar) sites within 10 km of the Proposed Development (further where there is hydrological or other ecological connectivity);
- Sites of Scientific Importance (SSSI) within 2 km of the Proposed Development (further where there is hydrological or other ecological connectivity);
- locally designated nature conservation sites within 1 km of the Proposed Development; and,
- records of protected and/or important habitats and species within 1 km of the Proposed Development (within the last ten years).

4.3.2 Ecological features comprise sites designated for nature conservation, habitats, species, and ecosystems (including ecosystem function and processes).

4.3.3 Although all ecological features identified by the PEA were recorded, the primary focus was to determine the presence, or potential presence, of legally protected or otherwise 'important' ecological features. This accords with the CIEEM guidelines on Ecological Impact Assessment (EcIA) which states that "it is not necessary to carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable" (CIEEM, 2022a).

4.3.4 For the purposes of this PEA, important ecological features included the following:

- sites designated for nature conservation, including those designated at international, national and local levels;
- the qualifying features of SACs, SPAs and Ramsar sites, and the notified features of SSSIs, where there is connectivity with the Proposed Development;
- woodland listed on the Ancient Woodland Inventory (AWI);
- habitats listed on Annex I of the Habitats Directive[2];
- species listed on Annex II of the Habitats Directive;
- bird species listed on Annex I of the Birds Directive[3];
- species listed on Schedules 2 and 4 of the Habitats Regulations[4];
- species listed on Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended) (WCA).
- badger *Meles meles*, which is afforded protection under the Protection of Badgers Act 1992 (as amended);
- habitats and species listed on the Scottish Biodiversity List (SBL), which are thus identified as being of principal importance for biodiversity conservation in Scotland;
- all species on the Red List of Birds of Conservation Concern (BoCC) (Stanbury et al., 2021); and,
- invasive non-native species listed on Schedule 9 of the WCA (although this no longer legally applies in Scotland), those considered to be of EU concern under the Invasive Alien Species Regulation[5] and additional species commonly considered to be invasive as listed in Annex B of the NatureScot Developing with Nature Guidance.

4.3.5 Additional features may be considered to be important, for example due to their inclusion in local biodiversity action plans (LBAP) or in species red data books, based on professional judgment.

4.3.6 Information on the relevant wildlife legislation in the list above and on national and local planning policy relevant to nature conservation is provided in **Appendix C**.

Appraisal of Impacts

4.3.7 Habitats identified during the survey were classified according to the UKHab survey method (UKHab Ltd, 2023). However, notes were also made for each habitat of dominant, typical, and important/notable plants (including INNS), and relevant ecological characteristics, which reflect conditions at the time of survey. All habitats within the Proposed Development Site were assigned a condition using the condition

[2] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, commonly referred to as the 'Habitats Directive'.

[3] Directive 2009/147/EC on the conservation of wild birds, commonly referred to as the 'Birds Directive'.

[4] Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), commonly referred to as the 'Habitats Regulations'.

[5] Regulation 1143/2014 on invasive alien species, which is more commonly referred to as the 'Invasive Alien Species Regulation'.

assessment criteria detailed for the Natural England Biodiversity Metric 3.17 (as set out within the SSEN Transmission Biodiversity Net Gain Toolkit).

4.3.8 The habitat survey was 'extended' to include general assessment of the potential for habitats to support protected and/or important species and to note evidence (where found) of such species.

4.3.9 Further information on the appraisal methodology is provided in Appendix C.

Limitations

4.3.10 Desk study information is dependent on records having been submitted for the area in question. As such, a lack of records for particular habitats or species does not necessarily mean they are absent. Likewise, the presence of records for a habitat or species does not automatically mean that they still occur or are relevant in the context of the Proposed Development.

4.3.11 Some areas of dense scrub were not accessed. Although this habitat could be clearly seen from outside, one area of scrub was obstructing old stone block walls from view, which therefore could not be fully assessed for Potential Roost Features (PRF). Some parts of the 50 m buffer around the Proposed Development were inaccessible, for example industrial and residential areas. These habitats were assessed according to aerial imagery. Due to their developed nature no relevant ecological constraints are likely to be present.

4.3.12 Where habitat edges are sharp and coincide with features on base mapping or aerial photography that are considered correct, their placement is based on the accuracy of that data in GIS. Otherwise, habitat edges are best estimates as judged in the field. Note also that habitat transitions can be gradual without sharp boundaries. Consequently, habitat mapping and any stated habitat areas are approximate and should be verified by measurement on site where required for design or construction.

4.3.13 Baseline conditions are increasingly liable to change with further elapsed time since field survey. For example, protected species may establish new refuges, or invasive non-native species may colonise. Any conclusions or recommendations are based on the information collected during the described desk study and field surveys. In line with NatureScot guidance, re-survey is recommended if construction or enabling works will take place more than two years since the date of field survey.

4.4 Baseline Conditions

4.4.1 The following sections detail the results of the desk and field-based studies completed as part of the PEA. Where necessary, recommendations for further study/survey and mitigation measures to protect identified ecological features are provided. Opportunities for the Proposed Development to deliver biodiversity benefits are highlighted in Section 4.6 of this EA Report.

4.4.2 Photographs taken during field survey and referred to in the following sections are presented in Appendix C.

Designated Sites

4.4.3 There are five internationally designated sites within 10 km of the Proposed Development, the details which are provided in Table 4-3.

4.4.4 There are no nationally designated sites for nature conservation (including SSSIs) within the study area. The locations of European sites are shown on Figure 2 of Appendix C.

Table 4-1 Statutory designated sites within the desk study area

Designated Site [site code]	Reason(s) for designation	Location and potential relationship to the Proposed Development
Firth of Tay and Eden Estuary SAC [UK0030311]	• estuaries; • mudflats and sandflats not covered by seawater at low tide; • sandbanks slightly covered by sea water at all times; and • harbour seal Phoca vitulina.	Located, at closest, approximately 245 m south of the Proposed Development. There is no hydrological connection between the site and the SAC. Intervening land comprises industrial areas and roads.
Outer Firth of Forth and St Andrews Bay Complex SPA [UK9020316]	Contains many sheltered areas, such as firths, inlets and sandy bays, used by seabirds and waterbirds to feed, moult, rest and roost. During the breeding season, the SPA provides feeding grounds for thousands of gannets Morus bassanus, kittiwakes Rissa tridactyla, puffins Fratercula arctica and the largest concentration of common terns Sterna hirundo in Scotland. During the winter, the site supports more than 35% of eider Somataria mollissima and over 23% of velvet scoter Melanitta fusca British wintering populations, along with the largest Scottish concentrations of red-throated diver Gavia stellata and little gull Larus minutus.	Located, at closest, approximately 1.4 km south-east of the Proposed Development. There is no hydrological connection between the site and the SPA. Intervening land comprises industrial areas and roads.
Firth of Tay and Eden Estuary SPA [UK9004121] and Ramsar Site [UK13018]	A complex of estuarine and coastal habitats. Designated for: • breeding populations of marsh harrier *Circus aeruginosus* and little tern *Sternula albifrons*; • wintering populations of bar-tailed godwit *Limosa lapponica*, redshank *Tringa tetanus*, greylag goose *Anser anser* and pink-footed goose *Anser brachryehynchus*; and • an internationally important assemblage of birds in the non-breeding season, with the area regularly supporting 48,000 individual waterbirds including cormorant *Phalacrocorax carbo*, shelduck *Tadorna tadorna*, eider *Somataria mollissima*, long-tailed duck *Clangula hyemalis*, common scoter *Melanitta nigra*, velvet scoter, goldeneye *Bucephala clangula*, red-breasted merganser *Mergus serrator,* goosander *Mergus merganser,* oystercatcher *Haematopus ostralegus*, grey plover *Pluvalis squatarola*, sanderling *Calidris alba*, dunlin *Calidris alpina*, and black-tailed godwit *Limosa limosa islandica*.	The boundaries of the SPA and Ramsar site are coincident. They are, at closest, approximately 2.9 km south-west of the Proposed Development. There is no hydrological connection between the site and the SPA/Ramsar site. Intervening land comprises urban areas of Dundee and the Firth of Tay.
Barry Links SAC [UK0013044]	Designated for: • Atlantic decalcified fixed dunes (Calluno-Ulicetea); • humid dune slacks; • embryonic shifting dunes; • shifting dunes along the shorelines with Ammophila arenaria ("white dune"); and • fixed dunes with herbaceous vegetation ("grey dunes").	Approximately 9.2 km east of the Proposed Development. There is no hydrological connection between the Development Site and the SAC. Intervening land comprises urban areas within Dundee and Broughty Ferry.

4.4.5 There is a single Locally Important Nature Conservation Sites (LINCS) within 1 km of the Proposed Development. This is East Dock Street/Broughty Ferry LINCS, located 21 m east of the Proposed Development. The LINCS is designated for linear grassland, tall herb and woodland with several locally rare species. There is no hydrological connection between the Proposed Development and the LINCS. The LINCS is separated from the Proposed Development by the A92 road. Numerous other LINCs and proposed LINCS are present within Dundee, however, these are located > 1 km from the Proposed Development and there are no terrestrial or hydrological connections between the Proposed Development and these sites. The locations of non-statutory sites are shown in Figure 3 of Appendix C.

Habitats

Overview

4.4.6 The Proposed Development is a disused industrial site, largely comprised of urban artificial habitats encroached by scrub, grassland and ruderal/ephemeral vegetation. No protected or SBL Priority Species of plants were note during survey.

4.4.7 Summary descriptions of habitats, and UKHab references, within the Proposed Development Site are provided below. Habitats are presented in Figure 4, Appendix D and illustrative photographs are also provided in Appendix C.

Ancient Woodland

4.4.8 There are no records of Ancient or Long-established Woodland listed under the AWI within 1 km of the Proposed Development. AWI does not pose a constraint to the Proposed Development and is not discussed further in the PEA.

Grassland

4.4.9 Areas of modified grassland (UKHab = g4) are present in various parts of the Proposed Development Site, growing on hardstanding substrates such as crushed stone (Photograph 5). Grassland has developed due to the disuse of the site and generally comprise a short sward. Couch Elymus sp. was the most abundant grass species with Yorkshire-fog (*Holcus lanatus)*, brome *Bromus sp.*, and oat *Avena sp.*, frequently noted, with perennial rye-grass *Lolium perenne* occasional. Although these areas were typically grass dominated, a mixture of forbs were found throughout, including herb-Robert *Geranium robertianum,* purple toadflax *Linaria purpurea*, wood avens *Geum urbanum*, biting stonecrop *Sedum acre*, dandelion *Taraxacum officinale agg.*, hawksbit *Leontodon sp.*, common poppy *Papaver rhoeas*, geranium *Geranium sp.*, field forget-me not *Myosotis arvensis*, common ragwort *Jacobaea vulgaris*, ivy-leaved toadflax *Cymbalaria muralis*, great willowherb *Epilobium hirsutum*, curled dock *Rumex crispus* and lesser trefoil *Trifolium dubium*. Various mosses were also noted. Additional forbs noted in the Scotriders area at the east of the site included creeping thistle *Cirsium arvense*, shining crane's-bill *Geranium lucidum*, cleavers *Galium aparine*, field forget-me-not *Myosotis arvensis*, weld *Reseda luteola*, groundsel *Senecio vulgaris*, and rosebay willowherb *Chamaenerion angustifolium.*

Woodland and Scrub

4.4.10 An area of broadleaved woodland (UKHab = w1g) is present at the east of the Proposed Development Site (Photograph 4). Canopy trees were noted to be semi-mature, with sycamore Acer pseudoplatanus and ash Fraxinus excelsior the dominant species. Other species occasionally noted in the canopy comprise hawthorn Crataegus monogyna and wych elm Ulmus glabra. The shrub layer was noted to be patchy, with butterfly-bush *Buddleja davidii* the dominant species. Young oak *Quercus sp.* and bramble Rubus *Fruticosus agg.* were also recorded. Ivy *Hedera helix* carpets the ground flora in areas, with other species including tutsan *Hypericum androsaemum*, bracken *Pteridium aquilinum*, foxglove *Digitalis purpurea*, giant

hogweed *Heracleum mantegazzianum* and wood avens. An open area was noted in the centre of the parcel, where diseased trees had previously been felled, and giant hogweed treated. Otherwise, no woodland management was evident.

4.4.11 A large area of scrub (UKHab = h3h) bisects the Proposed Development Site between the northern part of the site and the Nynas tank area to the south, and between the tanks and the Scotriders area to the east (Photograph 6). Butterfly-bush generally dominates, although wych elm is also frequent in the Roodyards Road area. Other species occasionally noted comprise bramble, wood avens, and guelder rose Viburnum opulus.

4.4.12 Some individual trees are present within the scrub (Photograph 7), comprising elm *Ulmus sp.* and downy birch *Betula pubescens*.

Urban

4.4.13 Much of the Proposed Development Site is dominated by sealed surfaces (UKHab = u1b6) (Photograph 9). This comprises a mix of concrete and stones, which was noted to support occasional encroaching mosses and ruderal species. Buildings (UKHab = u1b5) and disused industrial infrastructure are also present within the Proposed Development Site.

4.4.14 Areas of sparsely vegetated urban land (UKHab = u1f) are present encroaching areas of hardstanding (Photograph 8), with species composition similar to grassland described above, but with vegetation cover under 50%. This includes a large area of rubble and bricks covered with ivy-leaved toadflax located at the north of the site. Species recorded include willowherb sp., red dead-nettle *Lamium purpureum*, cleavers, purple toadflax, white clover *Trifolium repens*, herb-Robert, ivy, bramble, shining crane's-bill, Yorkshire-fog, false oat-grass *Arrhenatherum elatius*, spear thistle *Cirsium vulgare*, barren brome *Anisantha sterilis*, broad-leaved dock *Rumex obtusifolius*, ribwort plantain *Plantago lanceolata*, tutstan, black *medick Medicago lupulina*, forget-me-not *Myosotis sp.* and ragwort. Sycamore seedlings were noted scattered throughout these areas.

Other habitats

4.4.15 Areas of standing water are present within the Proposed Development Site, comprising sealed surfaces flooded with rainwater (UKHab = r1fg) (Photograph 10), a small square pool with railings covered by duckweed Lemna sp. (UKHab = r1g) (Photograph 11), and a permanently wet area (UKHab = r1g) between a building and an area of scrub with yellow iris Iris pseudacorus, willow Salix sp., and common reed Phragmites australis (Photograph 12).

4.4.16 A stone retaining wall (UKHab = u1e) separates the Proposed Development Site between north and south. Stone walls covered by scrub separate the Scotriders area to the east from the rest of the site. A brick wall separates the tanks to the south from nearby buildings. Walls constructed of stone or brick bound much of the Proposed Development Site, with paladin fencing along a portion of the northern boundary along Broughty Ferry Road.

Bats

4.4.17 The desk study did not return any records of bats within 1 km of the Proposed Development Site.

4.4.18 The majority of habitats on the Proposed Development Site are of Negligible habitat suitability for foraging and commuting bats, given the predominance of artificial surfaces on site and in the wider environment. The woodland and scrub habitat on site provide some limited suitable habitat for foraging and commuting bats, however, there is no connectivity to other suitable habitats within the wider surrounds. Whilst the majority of the Proposed Development Site is un-lit, there is some light spill from

street lighting around the Proposed Development Site boundaries. Some of the better areas for commuting and foraging bats include the woodland areas at the edge of the site to the east, and areas of scrub to the centre of the site.

4.4.19 Numerous buildings and structures are present within the Proposed Development Site, associated with the former industrial use of the site. The PRA found the vast majority of structures present to have Negligible bat roost suitability, due to their metal construction and lack of external fittings (such as soffits), loft spaces or other PRF which bats could utilise.

4.4.20 A single structure was assessed as having Low bat roost suitability, comprising a stone wall along a portion of the north-east boundary of the Proposed Development Site. On the off-site side of the wall, there is a wooden shed. PRF comprise gaps under felt roofing, which is clad over the top of the wall, leading into the internal area of the wooden shed structure. The gaps lead past wooden beams internally. Although gaps were also identified in the stone wall itself, these are superficial and are considered unsuitable for roosting bats. No direct evidence of bats (e.g. droppings, urine staining) was identified.

Other Mammals

4.4.21 No records of badger or pine marten *Martes martes* were returned from within 1 km of the Proposed Development Site. Data from Saving Scotland's Red Squirrels suggests that only grey squirrel *Sciurus carolinensis* are present in this area of Dundee.

4.4.22 No evidence of badger was recorded on Proposed Development Site. The Proposed Development Site offers limited suitability habitat for foraging badger, whilst the substrate of the majority of the site (i.e., hardstanding) is considered unsuitable for badger sett creation. The woodland to the east offers some limited suitability for badger, however, the Proposed Development Site offers no connectivity to suitable habitat, being surrounded by further industrial lands and roads. It is considered that the highly urbanised nature of the Proposed Development Site, coupled with the lack of habitat for sett creation and foraging, likely precludes badger from site.

4.4.23 A grey squirrel was recorded within the woodland at the east of the Proposed Development Site. No evidence of red squirrel, pine marten or hedgehog was identified within the Proposed Development Site. Given the small and isolated nature of the woodland, the woodland is considered unlikely to offer opportunities for these species, and there are no other suitable habitats for these species within the site.

4.4.24 There is no suitable habitat on site, or records returned in the desk study, for wild cat *Felis silvestris*, polecat *Mustela putorius*, shrews *Sorex sp.*, otter, beaver *Castor fiber*, mountain hare *Lepus timidus*, and water vole *Arvicola amphibius*, and no evidence of these species was noted.

Amphibians and Reptiles

4.4.25 Records of grass snake *Natrix natrix* and common frog *Rana temporaria* were returned by the Amphibian and Reptile Groups of the UK (ARG UK) and Amphibian and Reptile Conservation (ARC) Record Pool from the NO43 hectad.

4.4.26 There are no records of smooth newt, palmate newt *Lissotriton helveticus*, great crested newt, common toad *Bufo bufo*, adder *Vipera berus*, slow worm *Anguis fragilis* or common lizard *Zootoca vivipara* within 1 km of the Proposed Development Site.

4.4.27 The small areas of standing water within the Proposed Development Site are generally considered suboptimal for breeding amphibians, given the limited amount of water in these and the lack of marginal vegetation. Only one area of standing water was noted to support emergent vegetation, with yellow iris and common reed

present (Photograph 12). This pond may offer limited opportunities for breeding by common frog, however, given the lack of other suitable waterbodies and terrestrial habitat, it is considered unlikely to be used by amphibians (Photograph 12).

4.4.28 The grassland on the site has a short sward and so is not suitable for common reptiles. A large rubble mount at the north of the Proposed Development Site could be suitable for use as a refugia (Photograph 2), however, given the lack of suitable terrestrial habitat this is considered unlikely.

Birds

4.4.29 The desk study returned numerous records of bird species within 1 km of the Proposed Development Site. Bird species returned in the data search which are listed in Schedule 1 of the WCA, the UKBAP, the Dundee Biodiversity Action Plan (BAP), the Scottish Biodiversity List, and Red or Amber listed bird species according to Birds of Conservation Concern 5 (BoCC) are displayed in Table 4-4.

Table 4-2 Bird species returned in the desk study

Common Name	Scientific Name	Designation
Black-headed gull	Chroicocephalus ridibundus	SBL, Amber list
Common sandpiper	Actitis hypoleucos	Amber list
Dunnock	Prunella modularis	SBL, Amber list, BAP, UKBAP
Greenfinch	Chloris chloris	Red list
Herring gull	Larus argentatus	SBL, BAP, Red list
House Sparrow	Passer domesticus	SBL, UKBAP, BAP, Red list
Lesser black-backed gull	Larus fuscus	Amber list
Lesser redpoll	Acanthis cabaret	Red list, BAP
Oystercatcher	Haematopus ostralegus	Amber list
Pink-footed goose	Anser brachyrhynchus	Amber list
Red-breasted merganser	Mergus serrator	Amber list
Redshank	Tringa totanus	Amber list
Ringer plover	Charadrius hiaticula	Red list
Shag	Gulosus aristotelis	Red list
Song thrush	Turdus philomelos	SBL, BAP, UKBAP, Amber list
Starling	Sturnus vulgaris	SBL, UKBAP, Red list
Swift	Apus apus	SBL, BAP, Red list
Tree Sparrow	Passer montanus	SBL, UKBAP, Red list
Woodpigeon	Columba palumbus	Amber list

4.4.30 Other bird species returned by the desk study comprise Blackbird *Turdus merula*, blackcap *Sylvia atricapilla*, blue tit *Cyanistes caeruleus,* carrion crow *Corvus corone*, coal tit *Periparus ater*, robin *Erithacus rubecula*, mute swan *Cygnus olor*, cormorant and Eurasian treecreeper *Certhia familiaris*.

4.4.31 Few birds were noted during the survey, with some small passerines recorded in the vicinity of the scrub and woodland. Herring gull, a species returned in the desk study were recorded using the tank area at the south of the Proposed Development Site. This area is infrequently accessed and is considered to offer suitable habitat for nesting. There was some indication that nesting may be taking place on top of the tanks. A pair of mallard *Anas platyrhynchos* (Amber listed) were noted on a large puddle within the tank area. There is suitable nesting habitat for other common bird species within the scrub, woodland, individual trees, buildings and structures on site.

Other Protected Species

4.4.32 The habitats within the Proposed Development Site are unlikely to support a large diversity of invertebrates owing to its low botanical diversity. The habitat within the

Proposed Development Site is not likely to support protected or notable invertebrates. There are no suitable habitats for protected crustaceans or fish. These protected species do not pose a constraint to the Proposed Development and are not further considered in this report.

Invasive Non-native Species

4.4.33 The desk study returned one record of the INNS giant hogweed, from within 1 km of the Proposed Development Site.

4.4.34 The field survey identified four INNS plant species, giant hogweed (20 stands), butterfly-bush (45 stands), Spanish bluebell Hyacinthoides hispanica (two stands), and cherry laurel *Prunus laurocerasus* (one stand). Approximate locations of INNS stands are shown on Figure 4 of Appendix C.

4.4.35 Butterfly-bush was widespread across the Proposed Development Site, at different levels of maturity. Most of these stands were relatively young or small, (B2-B7, B10-B12, B15-B17, B19, B24, B25, B27, B31-B35, B37-B40, B42-B45). Extensive, more mature stands are also present, such as B1, B18, and B26 within the centre of the site, and B22 and B23 at the east of the Proposed Development Site. Some stands are of transitional maturity and intermediate size (B13, B14, B20, B21, and B4). Stands B8, B9, B28-B30, and B36 are comprised of young plants scattered throughout an area that is mostly hardstanding.

4.4.36 Giant hogweed is found scattered around the edge of the Scotriders area at the east of the Proposed Development Site, and five small stands were recorded within a border at the north of the Proposed Development Site. The giant hogweed in the Scotriders area has been treated, however a few of the plants were still opening out into flower. The most extensive stands were in the woodland (GH10-12, GH13, GH17, GH18), but many of the smaller plants were just leaves.

4.4.37 Spanish bluebell (HY1, HY2) was contained in a verge border at the north of the Proposed Development Site, which was likely managed as an area of landscaped planting until several years ago.

4.4.38 A single cherry laurel plant was located within the woodland and was noted to be about 1 m in height.

4.5 Appraisal

Designated Sites

4.5.1 There is no hydrological connection between the Proposed Development Site and any European site (including the closest, Firth of Forth Estuary, located approximately 245 m south of the Site). Habitats on site are not considered likely to be suitable for any qualifying bird species of Outer Firth of Forth and St Andrews Bay Complex SPA and Firth of Tay and Eden Estuary SPA.

4.5.2 East Dock Street/Broughty Ferry Road LINCS is located approximately 21 m east of the Proposed Development Site. There will be no habitat loss within the LINCS. However, impacts to the LINCS could occur if a construction pollution event affects LINCS habitat. Cognisance of the LINCS should be taken during construction of the Proposed Development.

4.5.3 With the implementation of a CEMP, it is considered that the construction of the Proposed Development will not have a significant impact on any non-statutory designated site.

Habitats

4.5.4 The habitats on Proposed Development Site are largely artificial, with some areas of encroaching grassland and ruderal vegetation. Areas of scrub are not considered to

be high-quality habitat, being dominated by invasive butterfly-bush. Areas of grassland and sparsely vegetated land are generally species-poor and comprise common species of derelict urban sites. Given the limited extent of these, they are not considered to represent Open Mosaic Habitat on Previously Developed Land (OMH), a Priority Habitat on the UK Biodiversity Action Plan (UKBAP) often recorded on brownfield sites (Maddock, 2008). Current plans suggest the substation infrastructure will require the clearance of the majority of buildings, scrub, grassland, sparsely vegetated land and standing open water within the Proposed Development Site. The removal of these habitats is not considered to pose a constraint to the Proposed Development.

4.5.5 The woodland at the east of the Proposed Development Site will be unimpacted by the Proposed Development. It is recommended that retained woodland is enhanced. Opportunities for enhancement are discussed in more detail in the Biodiversity Net Gain report for the Proposed Development.

Bats

4.5.6 Although of Low suitability for roosting bats, there is potential for the stone wall structure, to the north east of the site at the boundary between the Proposed Development Site and the access accommodation, to support roosting bats and therefore construction works could impact roosting bats. If the structure is to be modified or the area lit, further bat roost survey will be required to determine the presence/likely absence of roosting bats. A single bat emergence survey of identified PRF is recommended to take place during the active season, between May and August, in line with BCT guidance for buildings of Low suitability for roosting bats (Collins, 2023). Given the location of the Proposed Development Site and the absence of suitable vegetation in the surrounding area, the Proposed Development Site is not likely to be important for commuting and foraging bats, and thus commuting and foraging bats do not pose a constraint to the Proposed Development. No further bat activity survey is recommended.

Other Mammals

4.5.7 Given the lack of suitable habitat for badger, red squirrel, pine marten and hedgehog, these species are considered likely absent and do not pose a constraint to the Proposed Development. No further survey in respect in respect of protected mammals is required.

Amphibians and Reptiles

4.5.8 Common amphibians and reptiles are considered likely absent from the Proposed Development Site, and do not pose a constraint to the Proposed Development.

Birds

4.5.9 Active nests of all wild birds are protected under the WCA, and birds listed on Schedule 1 of the WCA are specially protected from disturbance.

4.5.10 Bird species are likely to use scrub and woodland for feeding and foraging, as well as buildings and wall crevices for nest creation.

Other Protected Species

4.5.11 Other protected species are considered likely absent from the Proposed Development Site, and do not pose a constraint to the Proposed Development.

4.6 Recommendations and Mitigation

Other Mammals

4.6.1 Standard measures to protect mammals during construction should be implemented during the construction of the Proposed Development, including:

- ensure excavations are left with a method of escape for any animals that may enter overnight (such as a battered slope sufficient for mammals to walk out), and check them at the start of each working day to ensure no animals are trapped;
- ensure pipes are capped or otherwise blocked at the end of each working day, or if left for extended periods of time, to ensure no animals become trapped; and,
- lighting – as far as possible, carry out works in daylight to minimise the risk of disturbing protected or notable nocturnal species. If any temporary artificial lighting is required for construction works, this should be strongly directional and directed only on to the works area, and be turned off when not required, to minimise light spill and adverse effects on nocturnal wildlife.

Birds

4.6.2 Scrub clearance and building demolitions will be required to facilitate the Proposed Development, which should take place outside the breeding bird season (March to August, inclusive). If any clearance is required during March to August, a suitably experienced ecologist must be present to check all vegetation to be removed prior to clearance. If any active nest(s) are found, the ecologist should establish suitable species-specific exclusion zones from which works and personnel are excluded until the breeding attempt(s) have finished. Since this may result in significant construction delays if active bird nest(s) are found, it is far preferable to clear nesting bird habitat outside the breeding season. If any buildings requiring demolition are used by nesting birds, mitigation to exclude them should similarly be undertaken outside the breeding bird season, and if nesting sites are lost replacements should be installed nearby.

Invasive Non-native Species

4.6.3 In Scotland, the WCA as amended by the WANE Act makes it an offence to cause any plant to grow in the wild outside of its native range. If charged with committing an offence, it is a defence against prosecution to prove that all reasonable steps were taken, and due diligence exercised, in attempting to avoid causing the spread of such species.

4.6.4 If any of the INNS shown on **Figure 4** are likely to be disturbed or removed then, in accordance with best practice, simple biosecurity measures should be implemented to avoid their spread off-site (which may include spread into 'the wild'), and ideally to avoid spread within the Proposed Development Site also. Such measures should be outlined in a Method Statement or Biosecurity Management Plan (BMP) or similar document. Measures would likely include ensuring cleaning of machinery and PPE involved in works in the vicinity of INNS, and ideally retention of all soil and INNS material on site rather than exporting off-site. The BMP/Method Statement would be the responsibility of the client, and it should be produced by an appropriately qualified ecologist. The implementation of the measures suggested in such a document should be undertaken by a suitably experienced and qualified INNS contractor.

4.6.5 Some treatment of giant hogweed has already been started, and this should be continued. Given the possible requirement to produce and adhere to a BMP or Method Statement, INNS are considered a minor constraint, but the mitigation required is likely to be straightforward to implement.

Ecological Enhancement Opportunities

4.6.6 National Planning Framework 4 (NPF4)[6] includes the following statements of policy intent: "To protect, restore and enhance natural assets making best use of nature-based solutions" and "To protect biodiversity, reverse biodiversity loss, deliver positive

[6] Scottish Government (2023) National Planning Framework 4. Available at: https://www.gov.scot/publications/national-planning-framework-4/

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

4.6.7 This section therefore highlights potential opportunities for ecological enhancements, based on the current Proposed Development details and likely ecological impacts. The detail of these would need to be developed following further surveys (where required), confirmation of areas of habitat loss caused by the Proposed Development, and landscaping requirements.

4.6.8 Numerous potential enhancements are also detailed in the NatureScot Developing with Nature Guidance, produced in support of NPF4.

4.6.9 Given the urban nature of the Development Site, the following measures are suggested:

- An area of other broadleaved woodland is present at the east of the Proposed Development Site, the majority of which is assumed to be retained for ecological enhancement. The following biodiversity enhancement measures are proposed:
  - Treatment and removal of invasive non-native plant species (INNS) could uplift this indicator from Poor to Good. Butterfly-bush was noted to be the dominant shrub layer species, with giant hogweed also present. Previous treatment of giant hogweed was evident. Continued treatment and removal of INNS would contribute towards improving the condition of the woodland.
  - Selective felling over time of canopy trees (particularly sycamore) and planting with five or more other native species (e.g. oak *Quercus robur,* birch *Betula spp.*, rowan *Sorbus aucuparia*.
  - An area of open space was noted in the centre of the parcel, where diseased trees had previously been felled and giant hogweed treated. It is recommended that areas of open space are created and maintained within the woodland, to ensure 0-20% of the woodland comprises temporary open space.

4.6.10 SSEN Transmission are exploring potential off-site projects for delivery of further habitat creation within the Dundee Council and nearby Angus Council areas. It is therefore not possible to provide specific detail on the type of habitat creation and/or enhancement measures available to achieve +10% gain. However, creation and/or enhancement of the broad habitat types 'Grassland' and 'Heathland and shrub' is recommended to compensate for the loss of these habitat types. Following the implementation of the above measures, the Proposed Development would align with the above planning policy seeking biodiversity benefits from new developments. Any such measures that are taken forward should be confirmed and detailed (including, as relevant, designs, establishment procedure and subsequent inspect or maintenance requirements) in a document such as a Biodiversity Enhancement Strategy.

4.6.11 Appendix B 'Biodiversity Net Gain Report' has been produced for this site, and whilst there is currently no formal requirement in national/local policy or legislation to conduct BNG assessments for development in Scotland (as there is in England), SSEN have committed to delivering a minimum 10% biodiversity net gain on all projects. A

BNG assessment has been carried out using the SSEN Transmission Biodiversity Net Gain Toolkit[7] to quantity habitat losses and inform the Biodiversity Enhancement Strategy, to offset losses and to achieve, if off-site habitat creation is carried out, biodiversity gains.

[7] SSEN Transmission (2022). SSEN Transmission Toolkit

5. CULTURAL HERITAGE

5.1 Introduction

5.1.1 This EA chapter will assess the potential effects of the Proposed Development on archaeology and cultural heritage.

5.1.2 Archaeology and cultural heritage comprise a diverse range of elements that are referred to throughout this chapter as heritage assets.

5.2 Information Sources

5.2.1 This assessment has been undertaken following the Chartered Institute for Archaeologists' (CIfA) Standard and Guidance for Historic Environment Desk-Based Assessment (2020).

5.2.2 'Our Past, Our Future', released in June 2023 (Historic Environment Scotland (HES)), represents the primary HES policy document. The three main priorities identified in this document are:

- Priority 1: Delivering the transition to net zero;
- Priority 2: Empowering resilient and inclusive communities and places; and
- Priority 3: Building a wellbeing economy.

5.2.3 The report draws on the following technical figures and appendices:

- Appendix A, Figure 5.1 – Heritage Assets within the 250m Study Area adopted for the baseline study;
- Appendix D – Gazetteer of designated and non-designated assets;
- Appendix E – Site Photographs.

5.2.4 External sources used to inform this report are referenced appropriately.

5.3 Methodology

Scope of the Assessment

5.3.1 As part of this assessment, a search of relevant data has been undertaken with material collected for a Study Area of 250m from the Proposed Development. These sources include:

- PastMap[8];
- HES website[9];
- Historic mapping on the National Library of Scotland website[10]; and
- Other available online sources.

5.3.2 Due to the urban nature of the Proposed Development Site, a search of designated assets where there was the potential for impacts on setting was also limited to 250m from the Proposed Development boundary.

5.3.3 All assets are listed in the gazetteers provided in **Appendix D**, these are also shown on **Figure 6**. Assets are referred to in the text by their HES number, with the SM prefix signifying scheduled monuments, while the LB prefix signifies a listed building. Non-designated assets from the Canmore database[11] have no prefix. Assets recorded as part of the walkover survey for the Proposed Development and documentary research has the prefix 'AECOM'.

[8] PastMap [Online] available from: https://www.pastmap.org.uk/

[9] Historic Environment Scotland. [Online] available from: www.historicenvironment.scot

[10] National Library of Scotland [Online] available from: https://maps.nls.uk/

[11] CANMORE Database [Online] available from: https://canmore.org.uk/

Appraisal of Impacts

5.3.4 While the Proposed Development was deemed not to require a full EIA, the following methodology was used when defining the level of potential impact in this Appraisal.

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

5.3.6 The sensitivity (value) of a heritage asset is determined by professional judgement, guided by but not limited to any designated status the asset may hold. The value of an asset is also judged upon a number of different factors including the special characteristics the assets might hold, which can include evidential, historical, aesthetic, communal, archaeological, artistic and architectural interests. This value of a heritage asset is assessed in accordance with the guidance set out in NPF4 and the Historic Environment Policy for Scotland (HEPS) (2019). The sensitivity is defined by the sum of its heritage interests. Taking these criteria into account, each identified heritage asset can be assigned a level of effect in accordance with a five-point scale as set out in Table 5-1.

Table 5-1 Sensitivity (Value) Criteria

Value	Examples
Very High	• World Heritage Sites (WHS); • Assets of acknowledged international importance; and • Historic landscapes of international sensitivity, whether designated or not.
High	• Scheduled Monuments; • Non-designated sites/features of schedulable quality and national importance; • Category A Listed Buildings; • Gardens and landscape on the Inventory of Designed Landscapes of outstanding archaeological, architectural or historic interest; and • Registered Battlefields.
Medium	• Sites/features that contribute to regional research objectives; • Category B and C Listed Buildings; • Locally listed or non-designated buildings that can be shown to have special interest in their fabric or historical association; • Conservation areas; • Historic townscapes or built-up areas with historic integrity in their buildings, or built settings; and • Non-designated historic landscapes of regional sensitivity.
Low	• Non-designated sites/features of local importance; • Non-designated buildings of modest quality in their fabric or historical association; and • Historic landscapes whose sensitivity is limited by poor preservation and/or poor survival of contextual associations or with specific and substantial importance to local interest groups.
Negligible	• Assets with very little or no surviving archaeological interest; • Buildings of no architectural or historical note; buildings of an intrusive character; and • Landscapes with little or no significant historical interest.

5.3.7 Having identified the value of the heritage asset, the next stage in the appraisal identified the level and degree of impact to an asset arising from the Proposed Development. Impacts may arise during construction or operation of the Proposed

Development and can be temporary or permanent. Impacts can occur to the physical fabric of the asset or affect its setting.

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

5.3.9 The level and degree of impact (magnitude of change) is assigned with reference to a four-point scale as set out in Table 5-2. In respect of cultural heritage, an assessment of the level and magnitude of impact is made in consideration of any scheme design mitigation (embedded mitigation). Where no change to the value of the asset is caused, this is be stated and the asset is not taken further in the assessment.

Table 5-2 Magnitude of Change Criteria

Magnitude of Change	Examples
High	Total removal or alteration of an asset, such that the physical resource and /or the key components of its setting are totally altered resulting in complete change to an asset's setting and loss of heritage value of the asset.
Medium	Partial alteration of an asset, such that the heritage value of the resource and/or the key components of its setting are clearly modified.
Low	Minor alteration of an asset, such that the components of its setting are noticeably different, but the physical characteristics are not affected and the impact does not result in a noticeable loss of heritage value.
Negligible	Slight changes to historic elements that hardly affect the setting of an asset and do not result in any loss of value.

Consultation

5.3.10 Initial consultation was undertaken with the Lead Heritage Officer for Fife Council, who also oversees Dundee, by email in April 2024 when details of the project were shared. The Heritage Officer noted that there was no searchable Historic Environment Record (HER) for Fife or Dundee, and as such online data from HES and Canmore should be used. He also noted that the archaeological potential of the Proposed Development Site was negligible due to large areas being reclaimed land, as well as extensive disturbance resulting from demolition of the former 19th century industrial buildings and construction of the gas works.

5.3.11 Consultation by email was followed up with a call when it was also noted that the potential for impacts on the setting of designated assets was low due to the nature of the Proposed Development, as well as existing screening from the built environment and topography. Furthermore, the Proposed Development would see the industrial oil/gas works replaced with infrastructure lower in height.

5.3.12 The Lead Heritage Officer for Fife Council also provided a consultation response to the Pre-Application submission on the 17th June 2024. This included an overview of the Proposed Development Site and concluded that:

- *"The site is considered to be essentially archaeologically sterile".*
- *"The nature, scale, massing and height of the proposed substation will have no greater visual impact on the surrounding area (including the neighbouring listed assets) than the refinery had, probably less".*
- *"Should consent be granted, I would not recommend the need for an archaeological condition."*

Limitations

5.3.13 Much of the information used for this study is based on identification of known heritage assets and non-invasive field observation during a walkover undertaken by AECOM's heritage team 17th June 2024. No evaluation works have been undertaken. As such, it is possible that archaeological features may remain unidentified within the Proposed Development. Where known heritage assets exist, assumptions have been made from this, and other information, about the archaeological potential of the Proposed Development Site; however, these assumptions are the results of professional interpretation and consultation feedback and are not statements of fact.

5.4 Baseline Conditions

5.4.1 This section examines the potential effects and impacts on heritage assets resulting from the Proposed Development.

Land use and Topography

5.4.2 The Proposed Development Site is located to the east of Dundee on land that was largely reclaimed in the 19th century as part of the expansion of the docks and industrial area of Dundee (centred on NGR NO 41705 30862). The southern limits of the Proposed Development Site are located at approximately 3m AOD, while the northern section rises rapidly and lies at approximately 12m AOD. The Proposed Development Site is flanked by two main roads with East Dock Road to the south and Broughty Ferry Road to the north. Market Street forms the western boundary, while East Dock Street takes a turn at the eastern end of the site to join Broughty Ferry Road, and as such also forms the eastern boundary.

5.4.3 The Site is spread over two parcels of land which are divided by Roodyards Road. The eastern parcel, which is the smaller of the two, is occupied by a motorcycle training school, while the western parcel is on the site of the former oil and gas refinery works. Historically, both plots were used for industrial activities from the mid-19th century onwards after the land had been reclaimed.

5.4.4 The solid geology in the general area consists of sandstones, siltstones, and mudstones of the Dundee Flagstone Formation laid down in the Devonian Period, with a drift geology of intertidal silts and clays, and raised marine deposits dating to the Quaternary Period. Towards the north of the Proposed Development Site these drift deposits change to Till, demonstrating that the majority of the site was formerly at the edge of the river channel, with the land rising relatively steeply on its northern boundary.

Designated Assets

5.4.5 A total of four designated assets are recorded within the Study Area, all of which are Category B listed buildings. These include the Guthrie Mausoleum and Rood Chapel in Roodyards Cemetery to the north of the Site (LB25038), as well as a number of houses to the north and northeast (LB25045 and LB25485).

5.4.6 There are no scheduled monuments, Gardens and Designed Landscapes, or Registered Battlefields within the Study Area.

Non-designated Assets

5.4.7 A total of 30 non-designated assets were recorded within 250m of the Site boundary on Canmore (see Appendix D: Gazetteers and Figure 6: Known Heritage Assets). The majority of these assets date to the post-medieval and modern periods and relate to development of the area between the late 18th and 20th centuries. Of these, three assets were recorded within the Site. These are the former East Dock Street Slaughter House (176562), the former East Dock Street Cattle Market (176563), and the former Dundee Flour Mills (191749).

5.4.8 No previously recorded assets dating to the prehistoric, Roman or medieval periods have been recorded within the Study Area, although this is expected as the Proposed Development Site was largely an intertidal zone prior to reclamation of the land in the 19th century.

5.4.9 A prehistoric hillfort has been recorded on the hill known as Dundee Law, approximately 2.5km to the northwest of the Proposed Development Site, while other prehistoric period activity has been recorded in the wider area.

5.4.10 Historically, the focus of settlement from the medieval period onwards was to the west of the Site near the centre of modern Dundee, where a town developed around a natural harbour in the shadow of Dundee Law. The town was granted the status of burgh in the late 12th century, with much of its wealth based on the trade in wool, sheepskins, and cattle hides (Munro, et al., 2006). Dundee continued to develop around the harbour, becoming one of the three Royal Burghs with Edinburgh and Aberdeen (Smith, 2001). However, throughout this period the Site was located outside of the town walls, and while the higher northern limits of the Site possibly formed some of the rich agricultural land that the area was known for, the majority of the site fell within the intertidal zone of the River Tay.

5.4.11 A further survey of the area by William Crawford and Son published in 1793 depicts the approximate area of the Proposed Development Site, with Broughty Ferry Road named as 'Road to the Ferry', and East Dock Street not in existence as the land on which it currently runs had not yet been reclaimed[12].

5.4.12 The first detailed mapping of the Site is from 1865 when the First Edition Ordnance Survey plan was published[13]. This names the street to the north of the Proposed Development Site as Broughty Ferry Road and the road to the south of the Site as East Dock Street, although East Dock Street does not run as far east as it currently does as the land had not been fully reclaimed. The western section of the Site is named as Carolina Port and is largely occupied as garden plots or allotment type features. Two houses named 'Kilcraig' (AECOM001) and 'Craigtay' (AECOM002) are also marked in the northeast corner. Craigtay survives as a former hotel outside of the Site boundary, while Kilcraig would have been within the Site but has been demolished.

5.4.13 The First Edition Ordnance Survey also shows the St John's Burial Ground, which survives as a former cemetery immediately to the north of the Site and contains the Category B listed Guthrie Mausoleum (LB25038). The eastern section of the Site is depicted as a pond/lake as the land reclamation had not been completed.

5.4.14 By the time of the Second Edition Ordnance Survey plan, published in 1903[14], the Site had been largely developed with the northern section occupied by a cattle market (176563) and Kilcraig House (AECOM001), while the lower southern area was occupied by slaughterhouses (176562) and the Dundee Flour Mills (191749). The eastern section of the Site appeared to remain relatively undeveloped with a pond or partially reclaimed area still covering the area.

5.4.15 The situation was largely unchanged by the time of the Third Edition Ordnance Survey plan published in 1922, although a Copper Works (AECOM003) had been

[12] William Crawford and Son Survey of 1793 viewed on View map: William Crawford and Son, Plan of the town, harbour & suburbs of Dundee with the adjacent country - Town Plans / Views, 1580-1919 (nls.uk), accessed 8th July 2024.

[13] Forfarshire Sheet LIV, Published 1865 View map: Ordnance Survey, OS six-inch to the mile, 1st ed., Forfarshire, Sheet LIV - Ordnance Survey Six-inch 1st edition, Scotland, 1843-1882 (nls.uk)

[14] Forfarshire Sheet LIV.6, Published 1903, View map: Ordnance Survey, Forfarshire LIV.6 (Dundee) - Ordnance Survey 25-inch 2nd and later editions, Scotland, 1892-1949 (nls.uk)

constructed within the Site between the Flour Mill and the Slaughterhouse[15]. Development had also started to progress in the eastern section of the Site, with a crane and a few unnamed buildings added to the southern boundary, although the pond type feature is still recorded. This situation remained until the second half of the 20th century when large areas of the Site were cleared for the construction of the oil and gas works which currently occupies the Site.

Walkover Survey

5.4.16 A site walkover survey was undertaken on the 17th June 2024, with both the eastern and western sections of the Proposed Development Site accessed, and the surrounding area also visited to examine possible impacts on setting (see **Appendix E: Photographs 1-22**).

5.4.17 The eastern section of the Proposed Development Site was found to be occupied by the motorcycle training centre, and while infrastructure associated with this use was limited to a number of portacabins, concrete pads were noted across the site from former works (Photographs 1 and 2).

5.4.18 The lower southern area of the western section of the Proposed Development Site was occupied by storage tanks, support buildings and pipework linked to the now redundant oil and gas facility (Photographs 3 to 6), while the upper northern area had been cleared of all structures (Photographs 7 and 8). While most traces of the former slaughterhouses, copper works, and flour mills had been removed, a short section of the southern site boundary appears to represent part of the former abattoir wall (Photograph 9). This wall is of sandstone and contains a number of blocked openings, while glazed tiles were observed on the inner face (Photograph 10).

5.4.19 Other elements include a section of boundary wall surviving on the line of Roodyards Road, which divides the eastern and western Sites (Photographs 11 and 12), as well as old sections of wall along the western boundary on Market Street (Photograph 13) and the northern boundary on Broughty Ferry Road (Photograph 14). Traces of possible structures/foundations were also noted in the northwest corner of the Site where a retaining wall was observed (Photographs 15 to 18). This area also clearly demonstrated the difference in height between the southern lower area of the site and the higher northern section.

5.4.20 While the upper northern area of the Proposed Development Site had been cleared of all structures, a decorative balustrade in concrete was observed providing a boundary along the upper, northern edge of the high ground (Photograph 19).

5.4.21 During the site visit the 250m Study Area was also visited, including the former St John's Burial Ground, containing the Category B listed Guthrie Mausoleum (LB25038). This was found to be locked, but views through the gate and from the road found the burial site to be surrounded by a wall and fairly extensive tree cover, while views towards the existing oil gas tanks were limited due to the difference in height (i.e. the oil / gas tanks being on the lower ground, and the cemetery being on the higher ground), and 'Craigtay' house which also provides some screening (AECOM002) (Photograph 20).

5.4.22 It was unclear if the current building occupying the location of the 19th century structure named Craigtay is the same structure (AECOM002). Based on the footprint as marked on various editions of the Ordnance Survey map, it is assumed it is the same building, although it appears to have been heavily remodelled during the 20th century (Photograph 21).

[15] Forfarshire Sheet LIV.6, Published 1922, View map: Ordnance Survey, Forfarshire LIV.6 (Dundee) - Ordnance Survey 25-inch 2nd and later editions, Scotland, 1892-1949 (nls.uk)

Archaeological Potential

5.4.23 The results of the desk-based research and site visit have demonstrated that the majority of the Proposed Development Site is located on land reclaimed during the early to mid-19th century. This reclaimed land appears to have been disturbed through the construction of various industrial buildings including an abattoir (176562), flour mill (191749), and copper works (AECOM003), all of which were demolished to allow the construction of the oil and gas storage facility. As a result, the potential for the discovery of previously unrecorded assets is considered to be negligible. It is also assumed that human activity pre-dating the 19th century reclamation is limited as the Site appears to have been part of the river channel/inter-tidal mudflats, located outside of the town walls and away from the historic port of Dundee. As such, the potential for human activity predating the 19th century development of the site is negligible.

5.4.24 The upper, northern section of the Site is in an elevated position, and as such is not reclaimed land. Historic mapping from the 18th century shows the area of the Site as located some distance outside of the town walls surrounding Dundee and was used for gardens or as arable land before being developed as a cattle market (176563) and a residential dwelling known as Kilcraig House (AECOM001) in the mid-19th century. The location of the Site outside of the Dundee town walls, its previous agricultural land use, and the extensive post-medieval development and disturbance of the area means that the potential for the discovery of previously unrecorded assets from any period is negligible.

5.5 Appraisal

5.5.1 The appraisal of potential impacts resulting from the Proposed Development has been divided into the construction and operational phases. These are discussed below.

Construction Phase

5.5.2 The construction phase has the potential to result in the following impacts:

- Permanent physical impacts on previously recorded heritage assets due to construction; and
- Permanent physical impacts on previously unrecorded heritage assets due to construction.

5.5.3 The results of the appraisal, as well as consultation with the Lead Heritage Officer for Fife Council, have demonstrated that the majority of the Site is located on reclaimed land which has been disturbed through the construction and later demolition of various industrial buildings including an abattoir (176562), flour mill (191749), and copper works (AECOM003). It is assumed that the remains of these buildings have been largely destroyed during the construction of the oil and gas refinery, however, any remains that might survive are thought to have been extensively disturbed. The buildings that did exist are also well recorded on historic mapping, and as such the value of any remains that might survive are considered to be of low value.

5.5.4 The Proposed Development has the potential to result in physical impacts on any features that might survive within the Site, including any buried remains, although it is currently assumed that the method of construction would not result in the complete loss of all remains.

5.5.5 A number of walls were recorded across the Proposed Development Site as part of the walkover survey, including sections of the southern abattoir wall (176562), and boundary walls linked to the cattle market (176563), and flour mill (191749). These features all represent fragmentary remains of buildings that are well documented on

historic mapping, and as such the value of any remains that might survive are considered to be of low value. Remains/features will be retained as far as possible.

5.5.6 The upper, northern section of the site is not situated on reclaimed land. Historic mapping from the 18th century shows the area of the Proposed Development Site as located some distance outside of the town walls and being used for gardens or as arable land before being developed as a cattle market (176563) and a residential dwelling known as Kilcraig House (AECOM001) in the mid-19th century. Both of these buildings have now been demolished, with the northern section of the Site subject to extensive clearance works. As a result, the potential for the discovery of features linked to the cattle market and Kilcraig House, or previously unrecorded assets, is negligible.

5.5.7 Any remains that are identified are assumed to be linked to the late 19th and 20th century development of the Site, a period which is well documented on cartographic sources, and as such they are considered to be of low value. The development of the northern section of the Site has the potential to partially remove any remains that are identified in this area, although as noted above the potential for uncovering remains is negligible.

Operational Phase

5.5.8 Due to the nature of the Proposed Development, operational impacts are expected to be limited to impacts through change to the setting of heritage assets. The proposed Substation buildings represent the key elements of above ground infrastructure, and as a result these have the greatest potential to result in change to the setting of designated assets.

5.5.9 The new structures would be limited to the lower southern section of the Proposed Development Site, which is currently occupied by the redundant oil storage tanks. There are limited views of these from the upper area, and the listed buildings on Broughty Ferry Road, due to screening from the built environment and the topography/change in elevation. Furthermore, the new infrastructure would be approximately the same height as the current tanks, which are 15 to 16m in height.

5.5.10 As a result, the change to the setting of the designated assets in the surrounding area is not considered likely to affect their significance and, therefore, no operational impacts are predicted.

5.6 Recommendations and Mitigation

5.6.1 As the Proposed Development Site represents largely reclaimed land that has been subject to extensive disturbance throughout the late 19th and 20th century, the archaeological potential is considered to be negligible and no further archaeological works, such as monitoring, are recommended during construction.

5.6.2 A number of extant sections of wall associated with the former industrial activities that were undertaken across the site in the late 19th and early 20th century were observed during the walkover survey. It is recommended that, although of low value, these walls should be retained where possible as they represent one of the few surviving elements of the streetscape from this period in this part of Dundee. However, while it is recommended that these elements are preserved where possible, it is considered that the photographs included in this report provide a basic record of the remains.

5.6.3 The appraisal has not identified any further requirement for additional mitigation measures.

6. HYDROLOGY, HYDROGEOLOGY, GEOLOGY AND SOILS

6.1 Introduction

6.1.1 This chapter will assess the potential effects relating to Hydrology, Hydrogeology, Geology and Soils (including land contamination) in relation to the construction, operation, and decommissioning phases of the Proposed Development (substation).

6.1.2 It details each of these items in turn, including a baseline description, followed by the identification of potential impacts on each receptor and, where relevant, identification of measures proposed to mitigate the impact.

6.2 Information Sources

6.2.1 The data relating to the study area used to develop a baseline for soils, geology, land contamination, Water Framework Directive (WFD) catchments, watercourses and surrounding areas is summarised below:

- Groundsure Report, Ref: GS-GTY-33A-RC8-EHV (April 2024) (included within the Geo-environmental Desk Study, 60727222-RP-001, **Appendix F** - Geo-environmental Desk Study, as **Appendix A**)[16] ;
- Dundee City Council - Contaminated Land Officer correspondence (included within the Geo-environmental Desk Study, 60727222-RP-001, **Appendix F** - Geo-environmental Desk Study, as **Appendix B**)[31];
- The Coal Authority[17];
- Google Earth Pro;
- Bing OS Maps[18] ;
- British Geological Survey (BGS)[19] ;
- BGS 1:50,000 scale map Sheet 49 'Arbroath' (Drift map dated 1981 and Solid map dated 1980) [20]
- UK Topographic Mapping [21];
- Scotland's Soils Mapping [22]
- Scottish Environment Protection Agency (SEPA) Water Environment Hub[23] ;
- SEPA Water Classification Hub[24] ;
- SEPA Flood Risk[25] ;
- NatureScot Viewer[26] ;
- HES[27] ;

[16] Groundsure Report, Ref: GS-GTY-33A-RC8-EHV: Enviro and Geo Insight data and historical mapping (April 2024)

[17] The Coal Authority, Interactive Map (2023). [Online]. Available at: mapapps2.bgs.ac.uk/coalauthority/home.html. [Accessed July 2024].

[18] Bing OS Mapping. [Online]. Available at: https://www.bing.com/maps. [Accessed July 2024].

[19] British Geological Survey (BGS), "Onshore Geoindex," (2020). [Online]. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.196715116.1109809076.1721641924-871990652.1721641924 https://mapapps2.bgs.ac.uk/coalauthority/home.html. [Accessed July 2024].

[20] BGS 1:50,000 scale map Sheet 49 'Arbroath' (Drift map dated 1981 and Solid map dated 1980). [Online]. Available at: https://webapps.bgs.ac.uk/data/maps/maps.cfc?method=listResults&mapName=&series=S50k&scale=&getLatest=Y&pageSize=100&start=100 [Accessed July 2024].

[21] UK Topographic Mapping, [Online]. Available at: https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?center=56.46607%2C-2.9495&zoom=16&popup=56.4656%2C-2.94749. [Accessed July 2024].

[22] Scotland's Soils. [Online]. Available at: https://map.environment.gov.scot/Soil_maps/?layer=5. [Accessed July 2024].

[23] SEPA Water Environment Hub. [Online]. Available at: https://www.sepa.org.uk/data-visualisation/water-environment-hub/. [Accessed July 2024].

[24] SEPA Water Classification Hub. [Online]. Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/. [Accessed July 2024].

[25] SEPA Flood Risk. [Online]. Available at: https://map.sepa.org.uk/floodmaps/FloodRisk/Search. [Accessed July 2024].

[26] NatureScot. [Online]. Available at: https://sitelink.nature.scot/map. [Accessed July 2024].

[27] HES. [Online]. Available at: https://hesportal.maps.arcgis.com/apps/Viewer/index.html?appid=18d2608ac1284066ba3927312710d16d. [Accessed July 2024].

- Zetica UXO Pre-Desk Study Assessment (PDSA) (April 2024) (included within the Geo-environmental Desk Study, 60727222-RP-001, **Appendix F** - Geo-environmental Desk Study, as **Appendix C**);
- UK Radon Map[28] ; and
- Site walkover undertaken on 10th June 2024 (photologs are included within the Geo-environmental Desk Study, 60727222-RP-001, **Appendix F** - Geo-environmental Desk Study, as **Appendix D**).

6.3 Methodology

Scope of the Assessment

6.3.1 The general methodology used to assess the effect of the Proposed Development on the hydrology, hydrogeology, geology and soils of the site and the surrounding area is as follows:

- consultation with SEPA, and the Council to request information relating to water abstractions, contaminated land, historical land use and areas of sensitivity
- desktop study to obtain baseline and historical data
- The Council was contacted concerning Private Water Supply (PWS) information on the 22nd of April 2024.
- site walkover undertaken on 10th June 2024 to obtain baseline data
- identification of the potential effects of the Proposed Development and assessment of their magnitude and potential impact on sensitive receptors
- identification of options for the mitigation of potential effects taking account of SSEN Transmission's GEMPs (**Appendix G** 'GEMPs').

Appraisal of Impacts

6.3.2 The effect of the impacts upon the baseline environment will be defined as a function of the sensitivity of receptors and the magnitude of change. The impact assessment will be undertaken in accordance with standard EIA methodology to identify the level of effect on an environmental receptor based on the sensitivity of the receptor and the magnitude of the change on that receptor resulting from the Proposed Development.

6.3.3 This assessment will also include the impacts of any works required within the Proposed Development upon the baseline environment. Particular attention will be paid to the potential hydrological and water quality impacts upon any water supplies within the vicinity of the site and any aquatic ecological features identified within the ecology chapter.

6.3.4 The study area used for geology and soils is 1 km. For land contamination, hydrology and hydrogeology a study area of 250 m has been used.

Limitations

6.3.5 This chapter is written in the absence of detailed ground investigation information (see **Section 6.6** for further information on recommendations regarding ground investigation).

6.3.6 This chapter should be read considering the legislation, statutory requirements and/ or industry good practice applicable at the time of the assessment being undertaken. Any subsequent changes in this legislation, guidance or design may necessitate the findings to be reassessed in the light of these circumstances.

[28] UK Radon Map. [Online]. Available at: https://www.ukradon.org/information/ukmaps. [Accessed July 2024].

6.3.7 Baseline conditions for the geology and land contamination in relation to the Proposed Development has been established from a variety of sources, based on maps available online at the time of writing this chapter, including a Groundsure report[7], NatureScot, and British Geological Survey (BGS).

6.4 Baseline Conditions

Surface Water Hydrology

6.4.1 Surface water features (and their attributes) within the Proposed Development are described in this section. Under the WFD, 'water bodies' are the basic management units, defined as all or part of a river system or aquifer. Water bodies form part of larger 'river basin districts' (RBD), for which River Basin Management Plans (RBMPs) are used to summarise baseline conditions and set broad improvement objectives. This baseline is presented by each water body, noting that some features are present within the catchments of designated WFD water bodies rather than being designated as a WFD water body in their own right.

6.4.2 For the purposes of this assessment, WFD watercourses within 1 km of the Proposed Development have been identified, while ordinary watercourses, unnamed watercourses and drains have been identified within 200 m of the Proposed Development. Water features have been identified by a review of online Ordnance Survey maps and aerial imagery.

6.4.3 There are three river basin districts in Scotland. The study area falls into the Scotland River Basin District, the largest river basin district which covers most of Scotland. It was created via the Scotland RBD designation order and covers an area of 113,971 km2. The catchment area within the study area id Dundee Coastal (316.08 km2, catchment ID: 43). Lower Tay Estuary

6.4.4 Selected water bodies in Scotland are classified by SEPA under the Water Framework Directive (WFD) with classifications of High, Good, Moderate, Poor or Bad. This section of the River Tay is classified as part of the Lower Tay Estuary (ID: 200438), it was given a classification in 2022 of 'Good' overall condition (Table 6-1). The estuary is located approximately 255 m from red line boundary.

6.4.5 The Lower Tay Estuary begins at NO 35820 27851 and ends at approximately NO 51972 29559 after 16 km. At its widest point it is 5.10 km across. The Tay Estuary including the Upper Tay Estuary begins at the confluence of the Rivers Tay and Earn. Further east from the estuary there is the North Sea.

6.4.6 There are several protected species within the Tay Estuary including, including as noted in Chapter 4 'Ecology', the nationally important breeding colony of Harbour seal (*Phoca vitulina)* which the Tay Estuary features about 2% of the UK's population of this species.

6.4.7 There are also some internationally important birds within the Lower Tay Estuary, including the redshank and the bar-tailed godwit. Beavers *C. fiber* have also been seen around the Tay Estuary with numbers of beavers doubling in this area.

6.4.8 According to SEPA, the main pressures on this water course is a result of agriculture including arable farming, abstraction for renewable energy production, fisheries, water collection and purification, invasive non-native species and sewage disposal, septic tanks and other methods of refuse disposal.

Table 6-1 WFD Classification for Lower Tay Estuary

RBMP Parameter	Lower Tay Estuary (ID:200438) (Cycle 3, 2022)
Overall status	Good
Pre-HMWB Status	Good

RBMP Parameter	Lower Tay Estuary (ID:200438) (Cycle 3, 2022)
Overall ecology	Good
Biological Elements	Good
Fish	Good
Hydromorphology	Good

Ordinary Water Features

6.4.9 No surface water features were identified within the Proposed Development by the Groundsure report or the site walkover. Camperdown Dock is located approximately 210m southwest of the site and the nearest named surface water feature to the Proposed Development is the River Tay located approximately 255m south of the site.

6.4.10 There are drains nearby which likely lead to sewage mains. There is the potential for surface water run-off to enter these drains.

6.4.11 Table 6-2 displays description summaries of the each of the water features included within this study.

Table 6-2 Description Summary of Water Features

Water Feature	Description Summary	Distance to Development
Lower Tay Estuary (D1)	The Lower Tay Estuary begins at NO 35820 27851 and ends at approximately NO 51972 29559 after 16 km. At its widest point it is 5.10 km across. The Tay Estuary including the Upper Tay Estuary begins at the confluence of the Rivers Tay and Earn. Further east from the estuary there is the North Sea WFD classified water feature	The estuary is located approximately 255 m from the Proposed Development boundary.
Sewage Mains (D2)	Surface water drains present which likely lead to sewage mains. This water would be treated before being discharges.	Variable within study area.

Designated Sites

6.4.12 As stated in Chapter 4 'Ecology', there are no designated sites within the Proposed Development boundary. The Firth of Tay and Eden Estuary approximately 255 m south of the site is an SAC. There are no Geological Conservation Review (GCR) sites or other geology related designated sites within 1km of the site.

Geology and Soils

6.4.13 According to BGS mapping[19,20], Made Ground/Artificial Ground is shown to be present along the southern boundary of the Proposed Development area and immediately south of the site. Although very limited Made Ground is mapped within the Proposed Development area, it is also likely to be present across the site based on the historical and current land uses.

6.4.14 A linear feature is recorded on BGS mapping in the north of the site in an approximate east to west orientation; this is a back-feature marking the former coastline. Man-made deposits are shown to the south of the line, indicating the placement of fill materials to reclaim areas of former coastline into developable land. The composition of the infill materials utilised for this reclamation is unknown, and these may represent a potential risk of contamination and ground gas generation, dependent on the materials used.

6.4.15 Superficial deposits underlying the area of the Proposed Development comprise predominantly Raised Marine Deposits (clay, silt, sand and gravel), with Till along the northern boundary and Intertidal Deposits of silt and clay along the southern boundary.

6.4.16 Bedrock is recorded as the Dundee Flagstone Formation which is part of the Arbuthnott-Garvock Group. Outcrops of Midland Valley Siluro-Devonian Mafic Intrusion Suite, Ochil Volcanic Formation and North Britain Siluro-Devonian Calc-Alkaline Dyke Suite are also recorded within the 1 km study area (off-site).

6.4.17 Scotland's Soils Agriculture map[22] indicates that the soils across the site and in the surrounding area are 'urban' soils (not agricultural land). Furthermore, the Scotland's Soils Carbon and Peatland 2016 map[22] indicates 'non-soil'.

6.4.18 According to the Coal Authority mapping[17], the site does not lie within a Coal Mining Reporting Area.

6.4.19 The Groundsure Report states that with regards to non-coal mining, the site is in an area where *"underground mine workings are uncommon, although the geology is similar to that worked elsewhere. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered."*

6.4.20 According to UK Radon mapping[28], the site is within an area classified as having a maximum radon potential of 1 to 3% (meaning areas within the site have a 1 to 3% chance of having a radon concentration at or above the action level of 200 Bq m^{-3}). This indicates that basic radon protection measures will be required, in accordance with Stage 1 Building Control Regulations should the construction of any new occupied buildings within the site be undertaken[29]. However, the Proposed Development does not require the regular occupation of buildings but infrequent visitation for maintenance purposes.

6.4.21 A Zetica PDSA has identified World War II (WWII) military activities on or affecting the site. Zetica recommended that a detailed desk study, whilst always prudent, is not considered essential. AECOM recommend that a preliminary UXO study is purchased prior to any ground investigation / works at the site.

Groundwater

6.4.22 According to the Hydrogeology 625k digital map found on BGS Geoindex (herein 'Hydrogeological Map[19]), the 250 m study area around this site features one aquifer unit: the Arburthnott Garvock Group. On the edge of the study area the unnamed Silurian to Devonian volcanic intrusion is present[23].

Arbuthnott Garvock Aquifer

6.4.23 The Arbuthnott Garvock Group underlying the Proposed Development has been classed as a moderately productive 2b aquifer with groundwater flow through fractures and other discontinuities according to Hydrogeological Map of Scotland. It consists of sandstones which in some places may be flaggy with siltstones, mudstones and conglomerates and interbedded lavas. Thickness can vary from 2,400 to 3,150 m and locally yields of moderate amounts of groundwater.

6.4.24 The Arbuthnott Garvock Group is part of the Lower Old Red Sandstone Aquifer. **6-3** displays the aquifer properties. The Old Red Sandstone aquifers are typically well cemented, with relatively low intergranular porosity and permeability. Baseline groundwater chemistry is described as generally oxic, moderately mineralised and dominated by Calcium Magnesium Bicarbonate (Ca(Mg) HCO_3)[23].

6.4.25 Groundwater flow within the bedrock is dominantly through fractures with minor intergranular flow through fissures and other discontinuities (bedding planes, joints and faults). The bedrock is considered to have a low to high permeability and is

[29] BRE Group Radon: Guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects), dated 2023

[23] British Geological Survey. [online] Available at: https://www2.bgs.ac.uk/groundwater/waterResources/ScotlandsAquifers.html [accessed July 2024]

classified as an aquifer with a moderate to very high productivity. Aquifer properties can be found in Table 6-3.

Table 6-3 Aquifer properties of the Lower Old Red Sandstone

Porosity (%)	Hydraulic Conductivity (m/d)	Transmissivity (m^2/d)	Specific Capacity ($m^3/d/m$)	Storativity	Operational Yield (m^3/d)
~20	0.5	200-300	90-175	~0.002	1,000

Silurian to Devonian Volcanic Aquifer

6.4.26 Unnamed Silurian to Devonian volcanic intrusions are recorded on the Hydrogeological Map as type 2c low productivity aquifers with flow through fractures and other discontinuities. These intrusions consist of mafic lava and mafic tuff. Near surface weathered zones and secondary faults there may be small amounts of groundwater present. Although rock is generally impermeable, it is recorded that rare springs can yield up to 2 L/s.

Superficial Aquifer

6.4.27 A review of the Hydrogeological Map of Scotland indicates that Till and Intertidal Deposits are expected to be of low permeability and low productivity as an aquifer. However, Raised Marine Deposits present are more variable in composition and may be more permeable where gravels are present and therefore have limited potential as aquifers.

Groundwater Level

6.4.28 There is limited groundwater level data available, however from borehole records on BGS Geoindex[19], groundwater levels appear relatively shallow. Some records indicate the groundwater level is around 3.6 - 4.1 mbgl (NO43SW6872 boreholes 1-6) which are located approximately 400 m south-west of the site boundary.

Table 6-4 WFD Groundwater Body Classifications

RBMP Parameter	Dundee (ID:150624) (2022)	Carnoustie Coastal (ID: 150786) (2022)
Overall status	Good	Poor
Quantitative status	Good	Poor
Saline Intrusion	Good	Good
Surface Water Interaction	Good	Poor
Water balance	Good	Good
Chemical status	Good	Good
Chem – Surface Water Interaction	Good	Good
Specific pollutants	Good	Good
Chromium	Good	Good
Zinc	Good	Good
Manganese	Good	Good
Other Substances	Good	Good
Nitrate	Good	Good
Priority substances	Good	Good
Cadmium	Good	Good
Lead	Good	Good
Drinking Water Protected Area	Good	Good
Priority substances	Good	Good
Atrazine	Good	Good

RBMP Parameter	Dundee (ID:150624) (2022)	Carnoustie Coastal (ID: 150786) (2022)
Simazine	Good	Good
Other Substances	Good	Good
Epoxyconazole	Good	Good
Nitrate	Good	Good
General tests	Good	Good
Priority substances	Good	Good
Atrazine	Good	Good
Simazine	Good	Good
Trichloroethene	Good	Good
Benzene	Good	Good
Specific pollutants	Good	Good
Chromium	Good	Good
Other Substances	Good	Good
Electrical Conductivity	Good	Good
Epoxyconazole	Good	Good
Nitrate	Good	Good
Free Product	Good	Good
Vinyl Chloride	Good	Good
Water quality	Good	Good

Groundwater Drinking Protected Areas

6.4.29 All of Scotland's groundwater bodies have been designated as Drinking Water Protected Area[24]. The different protected areas within the study area are in association with the underlying aquifers. Table 6-5 summarises the Drinking Water Protected Areas (Ground). These are all found within the Sub-Basin District Tay. The Drinking Water Protected Area (DWPA) (groundwater) dataset represent the individual groundwater bodies in Scotland. These have been identified by the Scottish Environment Protection Agency in line with the requirements of the Water Environment (DWPA) (Scotland) Order 2013. The dataset is required to fulfil the requirements of the European Union Water Framework Directive.

Table 6-5 Drinking water protected areas

Protected Area Name	Protected Area ID	EPI teams
Dundee	150624	Angus and Dundee, Perth
Carnoustie Coastal	150786	Angus and Dundee

Abstractions

6.4.30 There are no PWS within 2 km of the Proposed Development.

6.4.31 The Council confirmed on the 27 May 2024 that they hold no information relating to Private Water Supplies within the Site boundary up to 2 km from the Proposed Development

6.4.32 Within 2 km of the proposed development there are nine Controlled Activities Regulations (CAR) Licence which can be seen in Table 6-6. The authorisation activities for these are primarily listed as sewage and environmental abstraction services, construction and public surface water.

Table 6-6 CAR Licences

Authorisation No	NGR	Authorisation Activity	Distance From Site (m)
CAR/L/1004523	NO 43570 30970	Sewage (Private) Combined Sewer Overflow (CSO); Sewage (Private) Emergency Overflow (EO)	1800 m from Proposed Development
CAR/L/1011141	NO 41513 30662	Sewage (Private) Combined Sewer Overflow (CSO); Sewage (Private) Emergency Overflow (EO)	284 m from Proposed Development
CAR/R/1030833	NO 42600 31980	Abstraction Environmental Service	1424 m from Proposed Development
CAR/R/1156571	NO 41220 30730	Abstraction Environmental Service	514 m from Proposed Development
CAR/R/1192037	NO 42760 30870	Point Source - Sewage (Private)	1037 m from Proposed Development
CAR/R/5005045	NO 41527 29141	Point Source - Discharge other effluent	1725 m from Proposed Development
CAR/S/5001980	NO 40977 32289	Point Source - Construction Runoff	1611 m from Proposed Development
CAR/S/5007359	NO 40738 30099	Point Source - Discharge other effluent	1238 m from Proposed Development
CAR/S/SEPA2021-791	NO 42102 30830	Point Source - Public Surface Water	382 m from Proposed Development

Groundwater Dependent Terrestrial Ecosystems

6.4.33 There are no Groundwater Dependent Terrestrial Ecosystems (GWDTE) within the study area. Therefore, they will not be considered within this appraisal.

Flooding

6.4.34 Over the past 30 years Dundee has had five floods which have been defined as significant by SEPA[24] and this area has been classified as being at high risk of coastal flooding and low risk of surface water flooding. Two major flood protection schemes are currently under development in this area. These include the Broughty Ferry flood protection scheme[25] which includes a new sea wall being built with extra piling and supports and a setback embankment as well as sand dune replenishment and rock armour which should provide a 1 in 200-year flood protection. Additionally, the Dundee coastline flood protection scheme is also under development which includes a raised, setback sea wall and extra flood defences which should also provide a 1 in 200-year flood protection

6.4.35 Based on flood risk assessments contained within the Groundsure report, risk of coastal flooding (highest risk classified as 1 in 30 years of depths between 0.3 and 1.0 m) was identified along the southern boundary of the Proposed Development area and risk of surface water flooding (highest risk classified as 1 in 30 years of depths between 0.3 and 1.0 m) in two localised areas within the centre of the Proposed Development.

Land Contamination

6.4.36 Since 1992 Nynas UK, a manufacturer of specialty naphthenic oils and bitumen products, were operating the site as a licensed oil refinery facility although the site has been inactive for 10 years.

6.4.37 From current and historical mapping, sources are summarised within the Geo-environmental Desk Study (**Appendix F**) as follows;

6.4.38 On-site sources:

[24] SEPA [Online] Available at: PVA_07_13_Full (sepa.org.uk) [accessed July 2024]

[25] Dundee City Council [Online] Available at: https://www.dundeecity.gov.uk/service-area/city-development/broughty-ferry-flood-protection-scheme [accessed July 2024]

- Made Ground deposits of unknown origin / composition in areas of current and historical development, including residual material from demolition works and infilling of land (including a refuse heap in the eastern-most area of the site)
- Historical activities (slaughterhouse, flour mill, copper works, building trades depot)
- Petroleum storage tanks
- Electrical substation

6.4.39 Off-site sources (within 250m of the site):

- Made Ground associated with off-site construction, reclamation of land and infilling
- Industrial activities including gas works, shipbuilding works, engineering works, creosote works, cold storage works, oil works, bitumen refinery works, copper works, confectionary works, clothing works, jute waterproofing works
- Rail lines
- Graveyard

Summary of Sensitivities

6.4.40 Table 6-7 summarises the sensitivities assigned to the various resources/receptors as discussed in this chapter.

Table 6-7 Sensitivity of Resources/Receptors

Parameter	Sensitivity	Justification
Lower Tay Estuary	Very High	'Good' WFD status and SAC classified watercourse.
Arbuthnott Garvock Aquifer	Medium	Moderately productive aquifer, no GWDTEs or PWS identified.
Silurian to Devonian Volcanic Aquifer	Low	Low productivity aquifer, no GWDTEs or PWS identified.
Superficial Aquifer	Low	Low productivity, limited potential as aquifers
Geology sites	Negligible	No geological sites identified
Soil	Negligible	None-agricultural land / 'non-soil' site
Receptors of Land Contamination; Human Health, Water Environment and the Built Environment	Medium to high[30]	The preliminary conceptual site model (CSM) and risk assessment in the Geo-environmental Desk Study (Appendix F) identified that a moderate/low to moderate risk was present to future site users, construction/maintenance workers and third-party neighbours from potential on-site contamination sources. A moderate/low to moderate risk was also determined to be present to both superficial and bedrock aquifers as well as the River Tay from migration of groundwater and leaching of contaminants. The Built Environment was assessed to have moderate/low risk.

Embedded Mitigation

Ground Investigation

6.4.41 Based on the constraints to development identified within the Geo-environmental Desk Study (**Appendix F**) it is considered that ground investigation works are necessary to obtain information by which to assess these potential constraints. In terms of risks from potential contamination beneath the site, it is considered that several phases of intrusive investigation works should be undertaken to further assess risks.

[30] The overall sensitivity of the receptors to land contamination has been assigned 'medium to high' based on the outcome of the risk assessment in 'Appendix D – Geo-environmental Desk Study' which identified generally moderate/low to moderate risks. See Appendix D – Geo-environmental Desk Study for further details.

6.4.42 This investigation should include the excavation of trial pits and drilling of boreholes to establish the horizontal and vertical extent of Made Ground material on site, logging of ground conditions encountered and to facilitate the collection of soil and groundwater samples for chemical and geotechnical analysis. Boreholes should be installed with monitoring wells to allow groundwater and ground gas monitoring to be undertaken. Vapour risk should also be considered as part of the proposed ground investigation works and subsequent risk assessments.

6.4.43 If ground investigation works are carried out before the demolition/clearance of the site then further investigation would be required following to ensure previously inaccessible areas have been investigated.

6.4.44 The investigation would allow a quantitative risk assessment to be performed for the site and enable the pollutant linkages identified within the Geo-environmental Desk Study to be investigated further.

6.4.45 It is recommended that the following further work / assessment is undertaken to constrain potential risks and liabilities:

- AECOM recommend that a preliminary UXO study is purchased prior to any ground investigation / works at the site.
- Completion of a ground investigation at the site to characterise the potential contaminated land risks further and recommend remediation / mitigation measures if considered to be necessary. Should remediation be required this should be agreed with the regulatory authorities.

6.4.46 The Geo-environmental Desk Study accompanies the planning application for the Proposed Development, submission to and further engagement with the Council's Contaminated Land Officer will be carried out to obtain their approval of the report's findings and engage in the proposed scope of ground investigation works. The scope of the Geo-environmental Desk Study has provided a preliminary characterisation of the site's risk profile, however, as with all desk-based studies there is a degree of uncertainty associated with them. In addition, as with any site there may be localised differences in Made Ground thicknesses, the presence of obstructions and physical or chemical composition, and unrecorded surface or ground disruptions and site activities.

Secondary Consents

6.4.47 It is anticipated that all works will be carried out under the necessary consents/ permits (e.g. CAR licences as required under the Water Environment (Controlled Activities) Regulations 2011[31], and that the Contractor will comply with any conditions imposed by any relevant permission. It is anticipated that the Contractor will ensure all permits/ consents in place for works in, or near watercourses.

6.4.48 The following activities will require CAR authorisation:

- Any discharges of polluting matter, this includes any water runoff from a construction site. This runoff includes any rainfall, meltwater from ice/snow;
- Abstraction of water from the water environment (groundwater and surface water);
- Artificial recharge to groundwater aquifers;
- Direct/indirect discharge and any activity likely to cause a direct or indirect discharge, into groundwater of any hazardous substance or other pollutant;
- Any other activity which directly or indirectly has or is likely to have a significant adverse impact on the water environment.

[31] https://www.sepa.org.uk/regulations/water/

Standard Good Practice Assumptions

6.4.49 The adoption of the CEMP and applicable GEMPs will reduce the probability of a pollution incident occurring and reduce the magnitude of any incident that may occur through a combination of good site environmental management procedures, including minimising storage of topsoil strip volumes, soil management, staff training, availability of contingency equipment and emergency plans.

6.5 Appraisal

6.5.1 This appraisal assumes that good practice measures, including the CEMP, GEMPs, a Surface Water Management Plan (SWMP) and abiding with permit requirements for permitted activities, are adopted to manage potential effects; surface water and groundwater contamination. There is no proposed works to any water feature, therefore, hydromorphology has been scoped out of this assessment. The mitigation measures to prevent pollution and manage drainage will be addressed within a CEMP.

Construction and Decommissioning Phases

6.5.2 During the construction and decommissioning phases of the Proposed Development, there is the potential for the following short-term impacts on the hydrology, hydrogeology, geology and soil environment.

Pollution of Surface Watercourses, Groundwater and Soils

6.5.3 During the construction / decommissioning phases of the Proposed Development, a number of potential pollutants could be introduced during the site works (from construction / decommissioning plant, equipment and materials) including oils, hydrocarbons, inorganics, sulphates, sulphides, cement, concrete, waste and wastewater. During construction works sources of oil and hydrocarbon spillage may be associated with petroleum storage tanks (including potential historical underground fuel storage tanks), plant and machinery during refuelling and or vandalism.

6.5.4 There is the potential for contamination, particularly from the identified on-site sources including; Made Ground deposits of unknown origin / composition in areas of current and historical development, including residual material from demolition works and infilling of land; historical activities (slaughter house, flour mill, copper works, building trades depot); fuel storage tanks; and electrical substation. There is also the potential for off-site sources of contamination (see paragraph 6.4.39). Potential contaminants could include metals and inorganic compounds, pH, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) including benzene, toluene, ethylbenzene, xylene (BTEX) and methyl-tert-butyl-ether (MTBE), mineral oils, coal tar, semi volatile organic compounds (SVOCs), volatile organic compounds (VOCs), sulphates, sulphides, cyanides, phosphate, organic solvents, pathogens, phenols, polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS) and asbestos and asbestos containing materials (ACMs).

6.5.5 These pollutants can also infiltrate and contaminate soils and bedrock and pollute groundwater or nearby surface waters. The most direct pathway for contaminants to reach surface waterbodies is via lateral migration of contaminants via shallow deposits.

6.5.6 Due to the relative distance, drains and industrial area between the Proposed Development and the Tay Estuary it is unlikely that any contaminants would enter the Tay Estuary.

6.5.7 However, if any contaminants enter the Tay Estuary, the dispersion and dilution of the estuary will help to reduce the impacts of contamination.

6.5.8 Ground investigation will confirm whether potential contaminants are present at concentrations likely to represent potential impact to the identified sensitive receptors, and whether remediation/mitigation measures will be necessary prior to development.

6.5.9 Made Ground and unexpected contamination (potentially also in natural soils) should be carefully managed in accordance with GEMP – Contaminated Land to mitigate potential risks. Furthermore, GEMP– Oil Storage and Refuelling and GEMP – Waste Management will also be implemented. See (Appendix G).

6.5.10 Provided the embedded mitigation measures are followed, impacts on water quality, soil and geology from routine construction / decommissioning activities are not considered likely to be significant.

Concrete and Cement Products

6.5.11 Concrete and cement products are highly alkaline and their release into the Water Environment could have an adverse effect on water quality and ecology. There is also the potential for localised pollution of the relatively shallow groundwater during the construction of foundations, and disturbance during the decommissioning phase.

6.5.12 Mobilisation of concrete and cement products may occur during on-site concrete mixing and washing down of areas where mixing has taken place.

6.5.13 The major pathways for cement contaminated water to reach surface waterbodies are either overland flow (suspended in surface water runoff into drains, especially during periods of high runoff rainfall events) or when areas are subject to 'wash down'. However, there are no surface water receptors within close proximity of the Proposed Development. Due to the distance between the site and the Tay Estuary, there is a longer travel time and a larger dispersion effect. There will also be less direct flow paths and potentially barriers that block any pathway for contamination to reach the receptor. Any contaminated water from the site, will likely flow into drains where it will be treated before being discharged into waterbodies. Therefore, cement contaminated water is unlikely to impact water quality of the Tay Estuary.

6.5.14 The main use for concrete on site is limited to foundations for infrastructure. It is proposed that cement be brought to site ready-mixed and poured in-situ. Other elements would be pre-cast. These measures significantly reduce the potential impact from cement contamination to negligible.

6.5.15 Should it be necessary to mix concrete on-site, the measures within GEMP – Working with Concrete will be adhered to.

Soil Excavation and Waste

6.5.16 Disturbance of soil (potentially contaminated as a result of historical activities at the site) and Made Ground for the implementation of foundation excavations has the potential to release potential contamination, and impact surrounding soil and groundwater. Any damage to soil quality affects the long-term functioning of the soils, which degrade and lose structure once excavated. These can result on impacts to the water environment, hydrogeology, and the built environment. Management of soil on-site will be undertaken in accordance with GEMP – Soil Management and GEMP – Waste Management, which will minimise potential impacts to soil.

6.5.17 Soil excavation may have adverse effects on groundwater. Ground investigation will confirm whether connectivity between the site and groundwater receptors.

Operation Phase

6.5.18 During operation, oil filled transformers will be bunded and have adequate containment to prevent release of oils into the surface water drainage system, soil or underlying geology. Oil-water interceptors will be used for potentially oily drainage.

6.5.19 Areas of hardstanding surface as part of the Proposed Development showing signs of damage, erosion or excessive wear would be repaired as necessary. Drainage features would be repaired, reinstated or replaced as necessary to ensure continued efficient operation.

6.5.20 There will be no further impacts during the operation phase from the Proposed Development on hydrology, geology and soils. The use of the substation is not anticipated to cause any contamination to soils or water environments on site or within the surrounding area as maintenance and operation of the Proposed Development will be in accordance with environmental legislation and good practice. There will also be a spillage and emergency procedure in force during the operational phase.

6.6 Recommendations and Mitigation

6.6.1 A summary of the mitigation measures will be provided to the Contractor, who will ensure mitigation measures are implemented. The implementation of the mitigation measures would be managed by a suitably qualified and experienced Environmental Clerk of Works (ECoW).

6.6.2 It is recommended that several phases of ground investigation are carried out at the site to characterise the potential contaminated land risks further and recommend remediation / mitigation measures if considered to be necessary.

6.6.3 Following the ground investigation (and any subsequent remediation / mitigation measures, as required), if any further contamination is identified at any point during construction work, a Discovery Strategy will be implemented, and contact will be made with a suitably competent environmental consultant for further risk assessment to be undertaken.

6.6.4 Protection measures for watercourses, soils, geology and groundwater will be set out in the CEMP, which is to be prepared in consultation with SEPA and submitted prior to the commencement of construction activities. These measures will be in accordance with SSEN Transmission's GEMPs - Soil Management; Working with Concrete; Contaminated Land; Waste Management; Oil Storage and Refuelling; Bad Weather and Dust Management. All of which will be incorporated into a Water Protection Plan (WPP) and Discovery Strategy. Details of each GEMP are shown in Table 6-8.

Table 6-8 General Environment Management Plans (GEMPs)

GEMP	Details on reducing impacts to the water and soil environment
Working with Concrete GEMP (TG-NET-ENV-514, 2023).	Concrete shall not be used within 10 m of any watercourse. Store bulk and bagged cement and concrete will be at least 30 m away from any watercourses, gullies and drains. Washing down of equipment to remove any surplus concrete.
Oil Storage and Refuelling GEMP (TG-NET-ENV-510, 2023).	Maintaining a 30 m buffer from surface water, wetlands, GWDTEs, drinking water and private water supply catchment Clearly identifying any areas where fuelling or fuel storage is not permitted on site plans
Waste Management GEMP (TG-NET-ENV-516, 2023).	All waste to be stored within sealed container or on an impervious surface with barriers to lateral flow.

GEMP	Details on reducing impacts to the water and soil environment
Soil Management GEMP (TG-NET-ENV-511, 2023).	Soil storage should be located 10 m from any watercourses and protected from runoff. Management of soil on-site will be undertaken to minimise potential impacts to soil.
Contaminated Land GEMP (TG-NET-ENV-517, 2023)	Ground investigation (and any subsequent remediation / mitigation measures, as required) is recommended at the Proposed Development, including analysis of soil and water samples for potential contaminants, and more detailed assessments. Any high risk or known areas of contaminated land should be recorded and identified clearly in project documentation. Contamination could be encountered in areas where it is not expected and should be managed to ensure that risks to the environment are identified and controlled. A discovery strategy should be followed.
Bad Weather GEMP (TG-NET-ENV-523, 2023)	Identify an action plan before construction starts that identifies measures to implement in times of extreme weather.
Dust Management GEMP (TG-NET-ENV-520, 2023)	Where dust has the potential to become an issue, a protection plan should be developed. Likely sources of dust and potential receptors should be identified. Appropriate mitigation measures must be put in place to minimise the risk of dust becoming an issue.

6.6.5 Although pathways into the Tay Estuary are unlikely, given its very high importance as a WFD and SAC status waterbody particular consideration should be given when establishing protection measures for the waterbody.

6.6.6 At the time of writing no PWS have been identified within 2 km of the Proposed Development and the closest CAR Licence is 284 m from the Red Line Boundary. Therefore, at the time no monitoring of abstractions is recommended. However, the Contractor is required to consider all construction activities and satisfy themselves that there are no abstractions in the local area. Should any abstractions be identified which require protection, specific mitigation will be developed and agreed with the local property owners and SEPA. If applicable, water quality and/or quantity monitoring before, during and after construction may be required by the Contractor.

6.6.7 The contractor will be required to be aware of the potential for fuels spills when refilling equipment or moving plant that uses fuel to minimise and reduce the possibility of spillages of leaks. Any compound areas during the works will be kept to a high level of housekeeping and all fuel storage, if used for plant or equipment, will be bunded.

6.6.8 The appraisal has not identified any further requirement for additional mitigation measures.

7. NOISE AND VIBRATION

7.1 Introduction

7.1.1 This Chapter presents the results of the noise assessment carried out for the Proposed Development. A summary of noise terminology relevant to this report is included in Appendix H 'Noise Perception and Terminology'.

7.1.2 The Application Site is situated within predominantly industrial area, with the Dundee Museum of Transport located at the North-West corner. Broughty Ferry Road, runs along the north boundary of the Development Site, with residential properties to the North. More details of the site layout and surroundings are provided in Appendix I

7.1.3 Details of noise generating equipment included in the Proposed Development are provided below – all the equipment identified below will be housed within the enclosures identified in Appendix H.

- 2x Grid Transformers;
- 2x Traction Transformers; and
- 4x Cooling Fans (1x fan per transformer).

7.1.4 The Proposed Development will operate 24 hours a day with little variation in its sound emissions. Further details of the sound power levels assumed for this equipment have been provided by the SSEN and are reproduced in Appendix H.

7.2 Information Sources

Environmental Protection Act 1990

7.2.1 The Environmental Protection Act 1990[32] 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.

7.2.2 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.

7.2.3 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

7.2.4 The Control of Pollution Act 1974[33] 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.

[32] Environmental Protection Act 1990, c. 79. Available at https://www.legislation.gov.uk/ukpga/1990/43/contents (accessed 06/11/20)

[33] 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 07/11/20)

7.2.5 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.

7.2.6 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 on site.

7.2.7 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.

National Planning Policy

7.2.8 National Planning Policy Framework 4 (NPF4)[34] is the national spatial strategy for Scotland, published in February 2023. It sets out spatial principles, regional priorities, national developments, and national planning policy. The policies concerned with the Proposed Development and noise are Policies 11 and 23.

7.2.9 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;"

7.2.10 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

7.2.11 Current national guidance on noise is contained in Planning Advice Note (PAN) 1/2011 'Planning and Noise'[35]. 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."

7.2.12 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."

7.2.13 There are no Environmental Noise Directive (END) 'noise action plans' in proximity to the Proposed Development.

[34] Scottish Government (2023) National Planning Framework 4. Available at: https://www.gov.scot/publications/national-planning-framework-4/

[35] The Scottish Government (2011). PAN 1/2011 Planning Advice Note, Planning and Noise.

7.2.14 A Technical Advice Note (TAN)[36] 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."

7.2.15 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

7.2.16 Dundee City Council have published a Local Development Plan[37] which includes land use policies.

"Local Development plan 2019, Sustainable Natural & Built Environment: 8.4: To help developers address environmental and infrastructure issues early in the development process Appendix 3 highlights which of the allocated housing sites require a Flood Risk Assessment and/or Noise Impact Assessment and/or consideration of requirements from the Habitats Regulations Appraisal. The Development Site Assessments document also contains further site or area specific information on environmental issues and constraints across the allocated housing sites and sites within Economic Development Areas, Commercial Centres and Leisure Parks.

8.33: Parts of the City are designated Noise Management and Quiet Areas under the Dundee Agglomeration Noise Action Plan, and all parts of the City must achieve minimum levels of residential amenity."

7.2.17 AECOM have reviewed the published guidance on the dundeecity.gov.uk website and no other local policies or guidance, relevant to this assessment, was identified.

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

37 https://www.dundeecity.gov.uk/sites/default/files/publications/local_development_plan_2019_for_web.pdf (accessed 18/02/2025)

Other Guidance

7.2.18 The noise assessment has been carried out in accordance with the following standards and guidance.

Guidelines for Environmental Noise Impact Assessment

7.2.19 IEMA has released the *Guidelines for Environmental Noise Impact Assessment* (Ref 7-8) and provides formal guidance on the process for undertaking noise impact assessments to allow for greater transparency and consistency between assessments.

British Standard 7445-1:2003 and 7445-2:1991

7.2.20 BS 7445 *Description and measurement of environmental noise* (Refs 7-9 and 7-10) defines parameters, procedures and instrumentation required for noise measurement and analysis.

British Standard 5228:2009+A1:2014

7.2.21 BS 5228-1 *Code of practice for noise and vibration control on construction and open sites – Noise* (Ref 7-11) provides a 'best practice' guide for noise control and includes sound power level (Lw) data for individual plant as well as a calculation method for noise from construction activities.

British Standard 4142:2014 + A1:2019

7.2.22 BS 4142 *Methods for rating and assessing industrial and commercial sound* (Ref 7-12) can be used for assessing the effect of noise of an industrial nature, including mechanical services plant noise. The method compares the difference between 'rating level' of the industrial sound, with the 'background sound level' at the receptor position.

British Standard 8233:2014

7.2.23 BS 8233 *Guidance on sound insulation and noise reduction for buildings* (Ref 7-13) defines criteria for noise levels in and around buildings.

ISO 9613-2:2024

7.2.24 ISO 9613-2:2024 *Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation* (Ref 7-14) specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources.

Consultation with Dundee City Council Environmental Health Officer

7.2.25 The assessment methodology and baseline monitoring strategy were discussed in advance with the Environmental Health Officer (EHO). Due to the operational sound being generated from the plant and equipment within the Development Site and the potential for this to cause annoyance or disturbance at nearby noise sensitive receptors an assessment against the methodology in BS 4142-2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'* was considered most relevant. The EHO also provided the following assessment criteria which would be expected to be attached to any consent:

"The received noise from the Electrical substation shall not exceed NR30 as measured 1 metre external to the façade of residential property."

7.3 Methodology

Scope of the Assessment

- The scope of this EA Noise Chapter is defined as follows:
  - Establishment of nearby noise sensitive receptors (NSRs).
  - 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' (BS 5228-1)[38].
- 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'[39] and fixed limit criteria suitable for use in the absence of measured baseline sound levels.
- Identification of acoustic requirements for mitigation measures if required.

7.3.1 The construction and operation of the Proposed Development is not anticipated to generate significant levels of vibration at nearby NSRs; therefore, consideration of vibration impacts is excluded from the assessment scope. This is on the basis that the planned plant and equipment would not typically generate levels of vibration likely to cause annoyance of disturbance.

Sensitive Receptors

7.3.2 Four residential properties, hotel accommodation, and a cemetery in the vicinity of the proposed development have been identified as NSRs with the greatest potential to be adversely affected by noise associated with the proposed development.

7.3.3 Any additional NSRs further away from the proposed development are less likely to be impacted by noise from the proposed development due to greater sound attenuation with distance, as baseline sound levels are likely comparable. The identified NSRs are shown in Appendix H and provided in the table below.

7.3.4 The NSRs have been identified from satellite imagery and confirmed during site visit. The identified NSRs are detailed in Table 7-1 and shown in Appendix H.

Table 7-1 Noise Sensitive Receptors

Receptor	Represented Property	Coordinates (Lat., Long.)	Use	Sensitivity (see Table 7-2)	Approximate distance from site red line boundary (m)
NSR1	Access Accommodation, 101 Broughty Ferry Road	56.4669, -2.9465	Hotel Accomm.	High	10
NSR2	107 Broughty Ferry Road	56.4671, -2.9454	Residential	High	10
NSR3	109 Broughty Ferry Road	56.4672, -2.9447	Residential	High	10
NSR4	111 Broughty Ferry Road	56.4670, -2.9447	Residential	High	10
NSR5	113 Broughty Ferry Road	56.4670, -2.9445	Residential	High	10
NSR6	103 Broughty Ferry Road	56.4670, -2.9458	Cemetery	High	10

7.3.5 In accordance with PAN & TAN 1/2011 and the IEMA Guidelines, the sensitivity of receptors to noise or vibration is based on their usage. Therefore, the following

38 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'

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

classification has been applied. Note that as a precautionary measure hotel accommodation has been assumed to equivalent be High Sensitivity.

Table 7-2: 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 susceptible to noise or vibration. Sensitive ecological receptors known to be vulnerable to the effects of noise or vibration.	• Residential; • Quiet outdoor areas used for recreation; • Conference facilities; • Schools/educational facilities in the daytime; • Hospitals/residential care homes; • Libraries;
Medium	Receptors moderately sensitive to noise or vibration where it may cause some distraction or disturbance	• Offices; • Restaurants/retail; • Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf).
Low	Receptors where distraction or disturbance of people from noise or vibration is minimal	• Residences and other buildings not occupied during working hours; • Factories and working environments with existing high noise levels; • Sports grounds when spectator or noise is a normal part of the event.

Appraisal of Impacts – Construction and Decommissioning Phases

7.3.6 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.

7.3.7 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.

7.3.8 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 7-3.

Table 7-3: Ambient Level Effect Categories

Assessment Category	Threshold Value (dB) $L_{Aeq,T}$		
	Category A [a)]	Category B [b)]	Category C [c)]
Night-time (23:00 – 07:00)	45	50	55
Evenings and Weekends [d)]	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1: A potentially significant effect is indicated if the LAeq,T noise level arising from the Proposed Development exceeds the threshold level for the category appropriate to the ambient noise level. 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 LAeq,T noise level for the period increases by more than 3 dB due to site noise. NOTE 3: Applies to residential receptors only.			
Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.			

Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values. Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values. 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.

7.3.9 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 within the property that 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.

7.3.10 Table 7-4 presents the magnitude of impact classification associated with the difference between the construction sound level and the relevant Threshold Value at the noise sensitive receptor. This is used in combination with the Receptor Sensitivity and Table 7-5: Magnitude of Impact for Industrial Sound to determine a descriptor to summarise the proposed developments potential for adverse effects.

Table 7-4: Magnitude of Impact for Construction Sound

Construction and Demolition Sound Level above Threshold Value (dB)	Magnitude of Impact
Exceedance of ABC Threshold Value by ≥ +5 dB	Major
Exceedance of ABC Threshold Value by up to +5 dB	Moderate
Equal to or below the ABC Threshold Value by up to -5dB	Minor
Below the ABC Threshold Value by ≥ -5dB	Negligible

Appraisal of Impacts – Operational

7.3.11 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 – $L_{A90,T}$ – 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 – Ls ($L_{Aeq,Tr}$) – 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, Tr";* and
- rating level – $L_{Ar,Tr}$ – 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."*

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

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

7.3.13 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."*

7.3.14 Table 7-5: Magnitude of Impact for Industrial Sound presents the magnitude of impact classification associated with the difference between the construction sound level and the relevant Threshold Value at the noise sensitive receptor. This is used in combination with the Receptor Sensitivity and Table 7-5: Magnitude of Impact for Industrial Sound to determine a descriptor to summarise the proposed developments potential for adverse effects.

Table 7-5: Magnitude of Impact for Industrial Sound

Magnitude Of Impact	BS 4142 Descriptor	Rating Level – Background Sound Level (dB)
High	No BS 4142 descriptor for this magnitude level	>+14
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	≤ +1

Significance of Effects

7.3.15 The level of effect resulting from potential impact would be classified according to the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix in Table 10-7, but where necessary also considering the context of the acoustic environment.

Table 7-6: 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

Limitations

7.3.16 A number of sources of uncertainty have been identified in this assessment. These are provided in the following table, along with the measures taken to reduce them.

Table 7-7: Limitations of Assessment

Source	Description	Mitigating Factors
Prediction of proposed development sound emissions	Predictions of sound pressure levels were undertaken according to ISO 9613; this standard indicates an estimated accuracy of ±3 dB(A) in predicted levels. Plant sound emission data is only partially available.	Predictions were based on an assumption of moderate downwind propagation, and hence could be considered as a worst-case calculation. Plant sound emission calculations were based on worst-case assumptions from several data sources.
Measurements	Any measurement of existing ambient or background sound levels will be subject to a degree of uncertainty. Environmental sound	Avoiding periods of adverse weather conditions and measuring during the night. Night-time sound levels are less likely to be affected by

Source	Description	Mitigating Factors
	levels vary between days, weeks, and throughout the year due to variations in source levels and conditions, meteorological effects on sound propagation and other factors. Hence, any measurement survey can only provide a sample of the ambient levels.	social/economic factors such as school holidays than those during the daytime. Use of suitable Class 1 sound level meters which comply with the relevant standards and have been calibrated at a UKAS accredited laboratory within the previous year. Field calibration of the measurement system on site at the start and end of each monitoring period. Consideration of weather conditions through regular wind speed/direction measurements while on site. Given the very low wind speeds during the measurements, wind direction is unlikely to have affected the measured background sound levels.

7.4 Baseline Conditions

7.4.1 The A92 is a bypass that runs along the south of the site boundary – this is the dominant noise source across much of the site as the road is consistently busy. The slower traffic on Broughty Ferry Road is more noticeable on the higher-level part of the site, to the north end of the development site. The harbour and industrial areas to the south are less noticeable towards the residential receptors, however they still contribute to the baseline sound environment experienced on the site.

Baseline

7.4.2 Unattended baseline monitoring was undertaken at sensitive receptors over seven days (31st January to 7th February 2025) to establish the contributing sources and allow the *background sound levels* to be determined.

7.4.3 Figure 1 in **Appendix H** shows the receptor and monitoring locations. The monitoring procedure for the baseline survey was undertaken with reference to method in BS 4142-2014 'Methods for rating and assessing industrial and commercial sound'[40] and was discussed with the EHO prior to undertaking the baseline survey. The monitoring location was within the Development Site boundary at the coordinates presented in

7.4.4 Table 7-8.

Table 7-8: Monitoring Location Details

Reference	Represented Property	Coordinates
M1	Proposed Development, 174 Broughtferry Road	56.4669, -2.9473

7.4.5 This monitoring location was considered suitable for undertaking a robust assessment on the basis that it is representative of the prevailing baseline sound levels at the nearest noise sensitive receptors.

7.4.6 The full results of the baseline monitoring are presented in **Appendix H** and are summarised in Table 7-9 below.

Weather conditions

7.4.7 A weather station was set up to record meteorological conditions throughout the monitoring period at M1. Periods of precipitation and windspeeds which exceeded 5 m/s were excluded. The number of included periods was considered sufficient to be representative of typical day and night-time sound levels.

[40] BS 4142 'Methods for rating and assessing industrial and commercial sound', British Standards Institution, 2014.

Table 7-9: Baseline Measurements Summary

Table	Daytime (0700-1900)			Daytime (0700-2300)			Evening (1900-2300)			Night-Time (2300-0700)		
Monitoring Location	$L_{Aeq,T}$	L_{A90} Mean	L_{A90} Mode	$L_{Aeq,T}$	L_{A90} Mean	L_{A90} Mode	$L_{Aeq,T}$	L_{A90} Mean	L_{A90} Mode	$L_{Aeq,T}$	L_{A90} Mean	L_{A90} Mode
M1 – North Lot Development Site	67	55	55	66	55	55	63	49	48	59	42	40

7.5 Appraisal of Construction and Decommissioning Phases

7.5.1 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. If piling is required, depending on the piling type adopted by the construction contractor, this activity may also generate relatively high noise and vibration levels. The decommissioning phase is expected to be no worse than this construction phase, and as a result the decommissioning phase is not considered in further detail within this appraisal.

7.5.2 Based on the day/evening/night $L_{Aeq,T}$ levels in Table 7-9 the relevant Threshold Value at NSRs for construction noise would be equal to Category B values in the day-time 70 dB $L_{Aeq,12hr}$ and Category A in the evening and night-time, 55 dB $L_{Aeq,4hr}$ and 45 dB $L_{Aeq,8hr}$ respectively.

7.5.3 Overall, for identified High Sensitivity receptors it is expected to be feasible to meet the relevant Threshold Value at receptors through the application of best practice and by restricting noisier activities that occur for days/weeks to day-time hours. On this basis impact would be Low and effects from construction would be Minor at worst.

7.6 Appraisal of Operational Phase

7.6.1 A model of the substation, its enclosures and surroundings has been developed in CadnaA 2025 MR1 sound mapping software which calculates predictions in accordance with ISO 9613-2[41]. The model has been used to predict the proposed developments sound emissions from the substation at each NSR identified in Table 7-1. Source sound power/pressure levels have been provided by the client and these have been used to represent the plant. The transformers within their buildings have been modelled using a sound reduction spectrum as a representative example, based on 0.8mm steel and an acoustic louvre of thickness 100mm. Further details on the source data, the enclosure construction, its acoustic performance and the prediction methodology are provided in Appendix H.

7.6.2 The proposed items of substation plant that are assessed in this report are:

- x2 Grounding Transformers;
- x2 Traction Transformers; and
- x4 Cooling Fans (1x fan per transformer).

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

7.6.3 As discussed in Section 7.3; to allow an assessment in accordance with BS 4142, the operational sound levels are required in terms of the equivalent A-weighted sound level (L_{Aeq}).

BS 4142 Assessment

7.6.4 The sound from the Proposed Development is expected to be operational 24 hours a day with the potential for operational sound to be audible beyond the Application Site boundary. To undertake a BS4142 assessment it is necessary to determine where, if any, character correction should be applied to the *specific sound level* in order to determine the *rating level* which is then compared to the *background sound level*.

7.6.5 Character corrections for intermittency and impulsivity have not been applied when determining the *rating level* based on the understanding of typical operation of the proposed plant and equipment. It is commonly understood that transformers have the potential to generate sound with low frequency tonal characteristics. Based on this potential and that the predicted *specific sound level* at receptors is relatively low compared to *background sound level* and with reference to the guidance in BS4142 a +2 dB correction has been applied when determining the *rating levels* at NSRs on the conservative assumption it may be just perceptible. Finally given the industrial nature and large amounts of traffic passing through the area it can be observed from the summary of baseline sound level measurements in A weather station was set up to record meteorological conditions throughout the monitoring period at M1. Periods of precipitation and windspeeds which exceeded 5 m/s were excluded. The number of included periods was considered sufficient to be representative of typical day and night-time sound levels.

7.6.6 Table 7-9 and $L_{A90,T}$ day and night histograms in the Appendix H that the prevailing *background sound levels* are high 54 dB $L_{A90,15min}$ in the day and 39 dB $L_{A90,15min}$. Given that the predicted sound levels are considerably below these prevailing background sound levels. it is unlikely that the operational sound will be distinctive at the NSR locations and therefore no character correction has been applied for this when determining the *rating level* at any NSR.

7.6.7 Table 7-10 shows the predicted *specific sound levels*, calculated *rating levels* and measured *background sound levels* at the identified NSRs. The *rating levels* and *background sound levels* are compared in accordance with the methodology in BS 4142. Appendix H gives the details of noise data used as inputs to the 3-dimensional computational model.

Table 7-10 BS 4142 Assessment

NSR	Time Period	Specific Levels $L_{Aeq,r}$ dB	Character correction, dB	Rating level L_{Ar} (dB)	Background level $L_{A90,T}$ (dB)	Excess over Background, dB	BS 4142 impact category
R1	Day	33	2	35	54	-19	Very Low, No adverse impact depending on context
R1	Night	33	2	35	39	-4	Very Low, No adverse impact depending on context
R2	Day	31	2	33	54	-21	Very Low, No adverse impact depending on context
R2	Night	31	2	33	39	-6	Very Low, No adverse impact depending on context

NSR	Time Period	Specific Levels $L_{Aeq,r}$ dB	Character correction, dB	Rating level L_{Ar} (dB)	Background level $L_{A90,T}$ (dB)	Excess over Background, dB	BS 4142 impact category
R3	Day	28	2	30	54	-24	Very Low, No adverse impact depending on context
R3	Night	28	2	30	39	-9	Very Low, No adverse impact depending on context
R4	Day	26	2	28	54	-26	Very Low, No adverse impact depending on context
R4	Night	26	2	28	39	-11	Very Low, No adverse impact depending on context
R6	Day	32	2	34	54	-21	Very Low, No adverse impact depending on context
R6	Night	32	2	34	39	-6	Very Low, No adverse impact depending on context

Assessment Context

7.6.8 The discussion of the context is important to the conclusion of an assessment utilising the methodology in BS 4142. The context is that the development is in an active and established industrial area adjacent to a busy major road, and background sound levels are high. In comparison, the predicted *specific sound levels* are much lower than the measured *residual* and *background sound* levels. The industrial noise generated by the development site is not expected to be distinctive against the background sound levels. On this point, BS 4142 states that:

"Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."

7.6.9 On the basis that the predicted *rating level* is well below the *background sound level* (also the *residual sound level*), the Proposed Development is unlikely to make noise impacts worse.

7.6.10 In addition to the above assessment, following consultation with the EHO (as discussed in section 7.2), the Local Authority would expect the operational noise to not exceed a rating curve of NR30 at 1m from the façade externally. This is considered in the following sub-section.

EHO Noise Rating Requirements

7.6.11 The 3D model of the operational noise has been used to predict the sound pressure level 1 metre from the façade at each of the receptors below. The unweighted octave band levels have been compared to the NR30 rating curve. These are presented below and meet the NR30 criteria.

Table 7-11: Assessment of Operational Noise Levels with EHO NR30 Requirement

	Predicted Sound Level (dB) in each unweighted Octave Band (Hz)									Meets NR30 Criteria at 1m
	31.5	62.5	125	250	500	1000	2000	4000	8000	
NR30 Limit	76	59	48	40	34	30	27	25	23	
NSR1	9	20	32	31	32	29	20	12	0	YES
NSR2	7.5	16.9	28.9	28.1	30.1	26.8	18.3	10.5	-2.1	YES
NSR3	4.1	13.7	25.5	24.7	26.9	24.1	16.6	8.9	-5.3	YES
NSR4	2.5	12.4	24.2	23.2	25.2	22.4	14.8	6.8	-8.6	YES
NSR6	8.2	18.4	30.2	29.1	30.7	27.5	19.4	11.6	-1.3	YES

Operational Noise Appraisal Conclusion

7.6.12 On the basis of the BS4142 assessment outcome and the operational sound levels identified above, the Proposed Development is predicted to be compliant with the Local Authority's requirements. It is considered that there will be a Negligible effect at these High sensitivity receptors (with reference to Table 7-12).

7.7 Recommendations and Mitigation

Construction and Decommissioning Phases

7.7.1 It is recommended that the following noise mitigation measures are adopted to reduce construction noise impacts to as low as practicable:

- Good community relations should be established and maintained throughout the construction process. This should include informing residents on progress and ensuring measures are put in place to minimise noise and vibration impacts;
- Standard construction working hours should be adhered to i.e. 0700-1900 weekdays and 07:00-1300 Saturdays with no working on Sundays or Bank Holidays;
- Fixed and semi-fixed ancillary plant 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 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;
- 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;

- 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.

7.7.2 It is recommended that the measures detailed above are incorporated into any CEMP that is developed for the site. Once specialist sub-contractors have been appointed and detailed information on the proposed methods are known a more detailed consideration of the need for noise and/or vibration mitigation measures can be made if required by the Local Authority.

Operational Phase

7.7.3 Following the outcome of the BS4142 assessment in Table 7-13, no specific operational mitigation measures are required.

8. TRAFFIC AND TRANSPORT

8.1 Introduction

8.1.1 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 IEMA Guidelines: Environmental Assessment of Traffic and Movement[42].

8.1.2 The traffic and movement assessment only considers the construction phase of Proposed Development. The operational phase is unlikely to have a material impact on local roads, as only occasional operational and maintenance traffic is expected.

8.2 Information Sources

8.2.1 The report draws on the following technical figures and appendices:

- Appendix I: Transport Statement
- Figure 8.1: Study Area Roads
- Figure 8.2: Traffic Survey and DfT Traffic Count Locations
- Figure 8.3: Injury Accident Locations 2020-2023

8.2.2 A traffic baseline is derived from 2024 survey data and Department for Transport (DfT) traffic count locations. Traffic surveys were conducted during October 2024 on public roads serving the Proposed Development Site. Seven Automatic Traffic Counts (ATCs) and four Junction Turning Counts (JTCs) were undertaken to provide robust data from which a baseline position was established. The location of the traffic surveys along with DfT count locations used is shown in Figure 8.2: Traffic Survey Locations.

8.2.3 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)[43].

8.2.4 Forecast construction traffic data for the Proposed Development was obtained from data provided by the client. The data encompasses the entirety of the proposed works. The construction period for the substation upgrade is anticipated to last 3 years from 2026.

8.3 Legislation, Policy and Guidance

8.3.1 Environmental effects are assessed in accordance with the Institute of Environmental Management and Assessment (IEMA) Guidelines, 2023 (the "IEMA Guidelines"). The IEMA Guidelines aim to provide practitioners with good practice advice on how to carry out the assessment of traffic and movement as part of a statutory EIA or non-statutory environmental assessment.

8.3.2 In accordance with development planning process, the Proposed Development is also required to comply with various national, regional, and local planning policies. This section therefore incorporates a brief overview of the relevant policy documents and highlights how the Proposed Development satisfies these policies. In addition to this, relevant aspects of specific transport guidance are also detailed.

[42] IEMA, 2023. *IEMA Guidelines: Environmental Assessment of Traffic and Movement* [online]. [Accessed 01 July 2024]. Available from: https://www.iema.net/resources/reading-room/2023/07/12/new-iema-guidance-environmental-assessment-of-traffic-and-movement

[43] Police Scotland, 2024. *Road traffic collision data* [online]. [Accessed 01 July 2024]. Available from: https://www.scotland.police.uk/about-us/how-we-do-it/road-traffic-collision-data/

National Policies

National Transport Strategy NTS2 (2020)

8.3.3 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.

8.3.4 Four priorities support the vision.

- Reduce inequality.
- Take climate action.
- Help deliver inclusive economic growth.
- Improve health and wellbeing.

Climate change: Scottish National Adaption Plan 2024-2029

8.3.5 The Scottish National Adaption 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.

8.3.6 The PS4 objective with the National Adaption 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.

National Planning Framework 4

8.3.7 The National Planning Framework 4 (NPF4) was adopted by the Scottish Ministers on 13 February 2023, following approval by the Scottish Parliament in January. 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.

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

8.3.8 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.

Regional Policies

8.3.9 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 within Dundee City which is within the Tayside and Central Scotland Transport Partnership region (Tactran).

Draft Tactran Regional Transport Strategy 2024-2034

8.3.10 The draft Tactran Regional Transport Strategy (RTS) is in final draft stage which has been submitted to the Minister for Transport for approval.

8.3.11 The RTS is a plan for identifying strategic transport priorities for the Angus, Dundee City, Perth and Kinross and Stirling Council areas. The RTS identifies four strategic objectives which mirror those in Scotland's National Transport Strategy, which are:

- Take climate action
- Improve health and wellbeing
- Reduce inequalities
- Help deliver inclusive and sustainable growth.

Tactran Regional Transport Strategy Refresh (2015-2036)

8.3.12 The Tactran RTS Refresh was approved by the Minister for Transport and Islands in July 2015. The objectives of the RTS are to:

- Economy - Ensure transport helps to deliver regional prosperity
- Accessibility, Equity and Social Inclusion – To improve accessibility for all, particularly for those suffering from social inclusion
- Environment – To ensure that the transport system contributes to safeguarding the environment and promotes opportunities for improvement
- Health and Wellbeing – To promote the health and wellbeing of communities
- Safety and Security – To improve the real and perceived safety and security of the transport network
- Integration – To improve integration, both within transport and between transport and other policy areas

Local Policy

Dundee Local Development Plan (2019)

8.3.13 The Dundee Local Development Plan (DLDP) outlines the city's land use strategy up until 2029, including policies for housing, economic development, transportation and environmental protection.

8.3.14 The DLDP notes that energy generating facilities require large quantities of material to be transported to site via road, rail or even sea. It is further noted within Policy 54 of the DLDP that no development should 'have no detrimental effect on the capacity or safe functioning of the existing road or rail networks.'

8.4 Methodology

8.4.1 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.

8.4.2 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.

8.4.3 For magnitude of change, the IEMA Guidelines describe those changes in traffic of 30%, 60% and 90% should be considered as 'slight', 'moderate' and 'substantial'

respectively. **Table 8-1** reflects the IEMA Guidelines to quantify the magnitude of change for Proposed Development traffic.

Table 8-1 Magnitude of Change

Magnitude of Change	Change in Traffic Annual Average Weekday 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.

8.4.4 Receptors are locations or land-uses categorised by sensitivity or environmental value. **Table 8-2** describes the receptor sensitivity adopted for the assessment of Proposed Development traffic.

Table 8-2 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 international importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

8.4.5 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; and
- Junctions and highway links at (or over capacity).

8.4.6 Table 8-3 summarises the sensitivity of Study Area Roads as environmental receptors. The sensitivity of receptor assessment for each study area road is provided in Appendix I.

Table 8-3 Study Area Roads Sensitivity of Receptors

Road Link	Description	Sensitivity
Tay Road Bridge	50mph dual carriageway trunk road bridge from the Tay Bridge Roundabout to the junction with Dock Street in Dundee. No frontages or footways present across bridge.	Low
A92 East Dock Street (west)	40mph dual carriageway trunk road from the junction with the Tay Bridge to the junction with Market Street. City centre frontages present along most of road link with footways adjacent to both sides of carriageway.	High
A92 East Dock Street (east)	40mph dual carriageway trunk road from the junction with Market Street to the junction with Broughty Ferry Road. Footways present with no residential frontages.	Low
Market Street	30mph two-way single carriageway road between the junction with A92 East Dock Street and Broughty Ferry Road. No residential frontages, however evidence of workplaces present with on-street parked cars and footways adjacent to the carriageway.	Medium
Broughty Ferry Road	30mph two-way single carriageway road from the junction with Market Street to the junction with the A92. Considerable residential frontages with footways adjacent to the carriageway.	High
A92 Broughty Ferry Road	40mph trunk road from the junction with Broughty Ferry Road to the junction with Greendykes Road. Considerable residential frontages present particularly on the northern side of the carriageway, with footway also present adjacent to the carriageway.	High
A930 Broughty Ferry Road	40mph A-Class road from the junction with Greendykes Road to the roundabout accessing the Port Entry road. Considerable residential frontages present particularly on the northern side of the carriageway, with footway also present adjacent to the carriageway.	High
Port Entry road	An entry road into Dundee Port connecting Stannergate Road with the roundabout at the A930. No residential frontages present but footways adjacent to carriageway.	Low
A92 Greendykes Road	30mph trunk road from the junction with Broughty Ferry Road to Scott Fyffe Roundabout. Considerable residential frontages present along with footways adjacent to the carriageway.	High
A92 Arbroath Road west	Two-way single carriageway A-class road from Scott Fyffe Roundabout to the junction with Claypotts Road. Residential frontages present on the western environs of the road link, with recreational and educational facilities present nearby.	High

Road Link	Description	Sensitivity
A92 Arbroath Road east	40mph dual carriageway A-class road from the junction with Claypotts Road to Grange Junction. Limited frontages directly adjacent to carriageway although considerable residential and retail frontages nearby. Footway directly adjacent to carriageway in some areas.	Medium
A972 Kingsway East	40mph dual carriageway trunk road from the Scott Fyffe Roundabout to the junction with the A90. Some footways adjacent to carriageway with residential and retail frontages nearby.	Medium
A90 Kingsway	40mph dual carriageway trunk road from the junction with the A90 to the junction with Old Glamis Road. Some footways adjacent to carriageway with residential and recreational frontages nearby.	Medium
A90 Forfar Road	40mph dual carriageway trunk road leading north out of Dundee from the junction with A972 Kingsway. Some frontages present in southern environs of road link, with retail and recreational facilities present nearby.	Medium

8.4.7 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 8-4** summarises the approach to deriving the significance of effects. Note, table shading indicates likely significant effect subject to assessor's professional judgment.

Table 8-4 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
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

8.4.8 The reporting of significance of environmental effects will also include;

- 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 reversable;
- Short Term / Medium Term / Long Term;
- 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; and

- Adverse – a detrimental, or negative, effect on one or more environmental receptors.

8.4.9 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 it 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 road and junction vehicle capacity assessments are not part of this assessment; and
- Hazardous / Large Loads.

8.4.10 Consideration is given to large / hazardous loads in accordance with IEMA Guidelines as follows. There will be a requirement for transformers to be transported to site. These transformers will be Abnormal Indivisible Loads (AIL) and be transported using Special Types General Order (STGO) regulations. The protocols for AIL transport to site require highway authorities and emergency services notifications and approvals to ensure the safe and efficient movement of AIL to the site. A specialist heavy haulage contractor will be appointed for the transport of AIL and all relevant studies and approvals will be made.

8.4.11 It is expected that AIL's being transported to the Proposed Development Site will originate from Dundee Port, using the Port Entry road, the A930, the A92, Broughty Ferry Road and Market Street to access the site. AIL deliveries are expected to occur outside of the peak construction month. The forecast construction programme can be viewed in **Appendix I**.

8.5 Baseline Conditions

8.5.1 Vehicle access to the Proposed Development will be via the existing public road network. Study Area roads will include the A92, A972, A90, Broughty Ferry Road and Market Street.

8.5.2 The A92 is an east / west routing dual carriageway road with a speed limit of 40mph. It routes past the southern boundary of the Proposed Development Site, connecting to Dundee city centre and the Tay Bridge to the west and the Kingsway to the east. The route forms part of Scotland's trunk road network and connects the site to Fife and Edinburgh to the south and Aberdeen to the north.

8.5.3 The A90 is a dual carriageway trunk road routing north from outside Perth before ring roading the western half of Dundee and heading north towards Forfar. The A972 is also a dual carriageway trunk road and encompasses the eastern section of Dundee's Kingsway.

8.5.4 Broughty Ferry Road is an east / west road which passes the Proposed Development Site along its northern boundary. It is a two-way single carriageway with a speed limit

of 30mph and connects to the A92 in the east via a priority controlled junction. Some on street parking occurs on Broughty Ferry Road in the vicinity of the Proposed Development Site however formal parking is located on the street to the west of the Proposed Development Site. Broughty Ferry Road provides access to Dundee city centre in the west via Blackscroft and Seagate.

8.5.5 Market Street routes north / south along the western boundary of the Proposed Development Site, connecting Broughty Ferry Road and the A92 via priority-controlled junctions. There is a speed limit of 30mph and on street parking is present on both sides of the carriageway. The carriageway is approximately 12m wide, allowing two-way vehicle flow to be maintained despite the on-street parking. Market Street also provides access to Market Mews which leads to the Dundee Transport Museum.

8.5.6 Current traffic conditions on study area roads were established by surveys undertaken in October 2024 and DfT traffic count locations. The location, type and results from the of the traffic surveys are provided in **Appendix I**.

8.5.7 The 2024 traffic surveys and DfT count locations provides information on current vehicle flows as well as speeds, and is used to inform the baseline traffic position for the environmental assessment of traffic and movement. The 2024 traffic data has had a growth factor applied to arrive at a true baseline position for when construction is due to commence. 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.

8.5.8 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 34 slight and 13 serious accidents took place in the 4-year period. No fatal accidents were recorded in this timeframe. This data is proposed to be taken as the baseline position on injury accidents for the environmental assessment of traffic and movement.

8.5.9 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.

8.5.10 Traffic data collected on Study Area Roads is shown in **Table 8-5.**

Table 8-5 2024 Traffic Data

Road	Daily Weekday Traffic (Two-Way)		
	Car & Light Goods Vehicle (LGV)	HGV	Total
Tay Road Bridge	28,382	730	29,112
A92 East Dock Street (west)	23,654	761	24,415
A92 East Dock Street (east)	22,982	769	23,751
Market Street	643	16	659

Road	Daily Weekday Traffic (Two-Way)		
	Car & Light Goods Vehicle (LGV)	HGV	Total
Broughty Ferry Road	6,101	26	6,127
A92 Broughty Ferry Road	27,183	805	27,988
A930 Broughty Ferry Road	13,412	93	13,505
Port Entry road	1,077	112	1,189
A92 Greendykes Road	12,289	432	12,721
A92 Arbroath Road west	22,235	797	23,032
A92 Arbroath Road east	22,391	955	23,346
A972 Kingsway East	26,015	919	26,934
A90 Kingsway	39,433	3,043	42,476
A90 Forfar Road	27,189	2,187	29,376

8.6 Proposed Development Traffic

8.6.1 Forecast construction traffic for the Proposed Development was obtained from information provided by the SSEN. The estimated construction traffic volumes are included within **Appendix I**. The peak month of construction of the substation is forecast to take place in June 2027.

8.6.2 It is forecast that the Proposed Development would generate 194 HGV daily movements (97 arrivals and 97 departures) and 78 Car / LGV daily movements (39 arrivals and 39 departures) during the peak construction month.

8.7 Traffic and Movement Appraisal

8.7.1 For a robust assessment it is assumed all construction materials will be transported to site by road. HGV traffic will route to and from the Proposed Development Site on the study area roads outlined. HGV's have been routed as such to avoid right turn manoeuvres on public roads in the environs of the Proposed Development Site where possible. It is assumed that Car / LGV traffic will also use all study area roads described. An entrance and exit routing strategy to the Proposed Development Site from surrounding public roads is included in **Appendix I**.

8.7.2 **Table 8-6** IEMA Guidelines Roads to be Included in Environmental Assessment compares forecast daily Proposed Development construction traffic against peak

2027 baseline traffic to determine which roads must be included in the environmental assessment in accordance with IEMA Guidelines Rule 1 or Rule 2. Roads to be included in the environmental assessment are marked Yes or No and illustrated in Figure 8.1: Study Area Roads.

Table 8-6 IEMA Guidelines Roads to be Included in Environmental Assessment

Road	2027 Baseline		Proposed Development		% Increase		Environmental Assessment
	HGV	All Vehs	HGV	All Vehs	HGV	All Vehs	
Tay Road Bridge	754	30,064	0	78	0%	0%	No
A92 East Dock Street (west)	786	25,213	28	106	4%	0%	No
A92 East Dock Street (east)	794	24,528	97	175	12%	1%	No
Market Street	17	681	97	175	587%	26%	Yes
Broughty Ferry Road	27	6,327	97	175	361%	3%	Yes
A92 Broughty Ferry Road	831	28,903	194	272	23%	1%	No
A930 Broughty Ferry Road	96	13,947	0	0	0%	0%	No
Port Entry road	116	1,228	0	0	0%	0%	No
A92 Greendykes Road	446	13,137	194	272	43%	2%	Yes
A92 Arbroath Road west	823	23,785	192	270	23%	1%	No
A92 Arbroath Road east	986	24,109	192	270	19%	1%	No
A972 Kingsway East	949	27,815	2	80	0%	0%	No
A90 Kingsway	3,143	43,865	2	80	0%	0%	No
A90 Forfar Road	2,259	30,337	0	78	0%	0%	No

8.7.3 Table 8-6 IEMA Guidelines Roads to be Included in Environmental Assessment shows that three roads require environmental assessment.

Severance of Communities

8.7.4 Table 8-7 presents the significance of effect on the severance of communities as a result of Proposed Development construction traffic. The significance of effects for severance are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 8-7 Severance of Communities Significance of Effect

Road	% Change in Total Traffic	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
Market Street	26%	Negligible	Medium	Negligible
Broughty Ferry Road	3%	Negligible	High	Minor

A92 Greendykes Road	2%	Negligible	High	Minor

8.7.5 Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic on severance of communities is a direct, temporary, **Minor Adverse (Not Significant)** effect.

8.7.6 For severance of communities the significance of effects for Broughty Ferry Road and the A92 Greendykes Road would be minor, with Market Street being negligible.

Fear and Intimidation on and by Road Users

8.7.7 **Table 8-8** presents the significance of effect on Fear and Intimidation on and by Road Users because of Proposed Development construction traffic. Using IEMA Guidelines methodology for fear and intimidation magnitude of change, there is no step change in traffic flows from baseline conditions. The significance of effects are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023. The full fear and intimidation assessment using the IEMA Guidelines is included in **Appendix I**.

Table 8-8 Fear and Intimidation on and by Road Users Significance of Effect

Road	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
Market Street	Negligible	Medium	Negligible
Broughty Ferry Road	Negligible	High	Minor
A92 Greendykes Road	Negligible	High	Minor

8.7.8 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 Adverse (Not Significant)** effect.

8.7.9 For Fear and Intimidation on and by Road Users the significance of effects for Broughty Ferry Road and the A92 Greendykes Road would be minor, with Market Street being negligible.

Road User and Pedestrian Safety

8.7.10 **Table 8-9** presents the significance of effect on Road User and Pedestrian Safety because of Proposed Development construction traffic. A forecast increase in accidents resulting from the presence of construction traffic on Study Area roads is used to establish a magnitude of change. **Appendix I** details of the forecast of accidents by severity calculation. The significance of effects are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 8-9 Road User and Pedestrian Safety Significance of Effect

Road	Magnitude of Change	Sensitivity of Receptor	Forecast Injury Accident			Significance of Effect
			Slight	Severe	Fatal	
Market Street	Negligible	Medium	0.0	0.0	0.0	Negligible
Broughty Ferry Road	Negligible	High	0.0	0.0	0.0	Minor
A92 Greendykes Road	Negligible	High	0.3	0.2	0.0	Minor

8.7.11 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 Adverse (Not Significant)** effect.

8.7.12 For Road User and Pedestrian Safety, the significance of effects for Broughty Ferry Road and the A92 Greendykes Road would be minor, with Market Street being negligible.

Non-Motorised User Amenity and Non-Motorised User Delay

8.7.13 Table 8-10 presents the significance of effect on non-motorised user amenity and delay because of Proposed Development construction traffic. The magnitude of change for these environmental effects is based on the same 30%, 60% and 90% changes in traffic flow used for severance of communities. The significance of effects for severance are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 8-10 Non-Motorised User Amenity and Delay

Road	% Change in Total Traffic	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
Market Street	26%	Negligible	Medium	Negligible
Broughty Ferry Road	3%	Negligible	High	Minor
A92 Greendykes Road	2%	Negligible	High	Minor

8.7.14 Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic on severance of communities is a direct, temporary, **Minor Adverse (Not Significant)** effect.

8.7.15 For non-motorised user amenity and delay the significance of effects for Broughty Ferry Road and the A92 Greendykes Road would be minor, with Market Street being negligible.

Road Vehicle and Passenger Delay.

8.7.16 Table 8-11 presents the significance of effect on road vehicle and passenger delay because of Proposed Development construction traffic. The magnitude of change for these environmental effects is based on the same 30%, 60% and 90% changes in traffic flow used for severance of communities. The significance of effects for severance are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 8-11 Road User and Passenger Delay

Road	% Change in Total Traffic	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
Market Street	26%	Negligible	Medium	Negligible
Broughty Ferry Road	3%	Negligible	High	Minor
A92 Greendykes Road	2%	Negligible	High	Minor

8.7.17 Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic is a direct, temporary, **Minor Adverse (Not Significant)** effect.

8.7.18 For road vehicle and passenger delay the significance of effects for Broughty Ferry Road and the A92 Greendykes Road would be minor, with Market Street being negligible.

8.8 Embedded Mitigation and Summary

8.8.1 Mitigation relating to traffic movements associated with the Proposed Development would be provided by a Construction Traffic Management Plan (CTMP).

8.8.2 The CTMP would operate throughout the construction programme. **Appendix I** contains a Framework CTMP. A detailed CTMP including the following is expected to be conditioned and would be provided once a Principal Contractor is appointed:

- Site and the entry/exit arrangements from public roads;
- Traffic routeing plans – defining the routes to be taken by HGVs to the Site avoiding sensitive locations, and routes to be taken by Car / LGV construction personnel traffic;
- 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; and
- 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.

8.8.3 Construction traffic forecasts for the Proposed Development presented in this chapter provide a robust basis for the assessment of environmental effects.

8.8.4 Prior to mitigation, temporary Minor (not significant) environmental effects are forecast for all environmental effects associated with traffic and movement on Broughty Ferry Road and the A92 Greendykes Road. Mitigation in the form of a CTMP would be Conditioned, and subsequently approved by relevant planning, roads and emergency authorities.

8.8.5 Post-mitigation residual environmental effects associated with Proposed Development construction traffic are forecast to be direct, temporary Negligible (Not Significant). **Table 8-12** provides a summary of the potential effects identified in this chapter.

Table 8-12 Summary of Environmental Effects

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

Road Vehicle & Passenger Delay	Vehicle Traffic	Minor	CTMP	Negligible

8.9 Cumulative Assessment

8.9.1 The cumulative assessment for the Proposed Development considers the consented Eden Project Dundee (23/00814/FULM) located near the Proposed Development Site. There is no public information available with regards to construction traffic associated with the Eden Project Dundee. As its period of construction may overlap with that of the Proposed Development, a broad assumption has been made that construction traffic numbers on study area roads would double for the purpose of the cumulative assessment compared to the assessment of the Proposed Development itself.

Table 8-13 IEMA Guidelines Roads to be Included in Environmental Assessment

Road	2027 Baseline		Proposed Development + Cumulative Development		% Increase		Environmental Assessment
	HGV	All Vehs	HGV	All Vehs	HGV	All Vehs	
Tay Road Bridge	754	30,064	0	156	0%	1%	No
A92 East Dock Street (west)	786	25,213	56	212	7%	1%	No
A92 East Dock Street (east)	794	24,528	194	350	24%	1%	No
Market Street	17	681	194	350	1174%	51%	Yes
Broughty Ferry Road	27	6,327	194	350	723%	6%	Yes
A92 Broughty Ferry Road	831	28,903	388	544	47%	2%	Yes
A930 Broughty Ferry Road	96	13,947	0	0	0%	0%	No
Port Entry road	116	1,228	0	0	0%	0%	No
A92 Greendykes Road	446	13,137	388	544	87%	4%	Yes
A92 Arbroath Road west	823	23,785	384	540	47%	2%	Yes
A92 Arbroath Road east	986	24,109	384	540	39%	2%	Yes
A972 Kingsway East	949	27,815	4	160	0%	1%	No
A90 Kingsway	3,143	43,865	4	160	0%	0%	No
A90 Forfar Road	2,259	30,337	0	156	0%	1%	No

8.9.2 Table 8-13 IEMA Guidelines Roads to be Included in Environmental Assessment shows that six roads require environmental assessment.

Severance of Communities

8.9.3 Table 8-14 presents the significance of effect on the severance of communities because of Cumulative Development construction traffic. The significance of effects for severance are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 8-14 Severance of Communities Significance of Effect

Road	% Increase in Total Traffic	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
Market Street	51%	Low	Medium	Minor
Broughty Ferry Road	6%	Negligible	High	Minor
A92 Broughty Ferry Road	2%	Negligible	High	Minor
A92 Greendykes Road	4%	Negligible	High	Minor
A92 Arbroath Road west	2%	Negligible	High	Minor
A92 Arbroath Road east	2%	Negligible	Medium	Negligible

8.9.4 Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic on severance of communities is a direct, temporary, **Minor Adverse (Not Significant)** effect.

8.9.5 For severance of communities the significance of effects for all study areas roads carrying construction traffic would be minor with the exception of the A92 Arbroath Road east which would be negligible.

Fear and Intimidation on and by Road Users

8.9.6 Table 8-15 presents the significance of effect on Fear and Intimidation on and by Road Users because of Cumulative Development construction traffic. Using IEMA Guidelines methodology for fear and intimidation magnitude of change, there is no step change in traffic flows from baseline conditions. The significance of effects are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023. The full results of the assessment are included in **Appendix I.**

Table 8-15 Fear and Intimidation on and by Road Users Significance of Effect

Road	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
Market Street	Negligible	Medium	Negligible
Broughty Ferry Road	Negligible	High	Minor
A92 Broughty Ferry Road	Low	High	Moderate
A92 Greendykes Road	Negligible	High	Minor
A92 Arbroath Road west	Low	High	Moderate
A92 Arbroath Road east	Low	Medium	Minor

8.9.7 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, **Moderate Adverse (Significant)** effect.

8.9.8 For Fear and Intimidation on and by Road Users the significance of effects for the A92 Broughty Ferry Road and the A92 Arbroath Road west would be moderate. All other study area roads assessed would be minor or negligible.

Road User and Pedestrian Safety

8.9.9 Table 8-16 presents the significance of effect on Road User and Pedestrian Safety because of Cumulative Development construction traffic. A forecast increase in accidents resulting from the presence of construction traffic on study area roads is used to establish a magnitude of change. Appendix I contains the construction traffic accident forecast. The significance of effects for are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 8-16 Road User and Pedestrian Safety Significance of Effect

Road	Magnitude of Change	Sensitivity of Receptor	Forecast Injury Accident			Significance of Effect
			Slight	Severe	Fatal	
Market Street	Negligible	Medium	0.0	0.0	0.0	Negligible
Broughty Ferry Road	Negligible	High	0.0	0.0	0.0	Minor
A92 Broughty Ferry Road	Low	High	0.1	0.0	0.0	Moderate
A92 Greendykes Road	Low	High	0.1	0.0	0.0	Moderate
A92 Arbroath Road west	Low	High	0.1	0.0	0.0	Moderate
A92 Arbroath Road east	Low	Medium	0.1	0.0	0.0	Minor

8.9.10 Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic on Road User and Pedestrian Safety is a direct, temporary, Moderate Adverse (Significant) effect.

8.9.11 For Road User and Pedestrian Safety, the significance of effects for the A92 Broughty Ferry Road, A92 Greendykes Road and the A92 Arbroath Road west would be moderate. All other study area roads assessed would be minor or negligible.

Non-Motorised User Amenity and Non-Motorised User Delay

8.9.12 Table 8-17 presents the significance of effect on non-motorised user amenity and delay because of Cumulative Development construction traffic. The magnitude of change for these environmental effects is based on the same 30%, 60% and 90% changes in traffic flow used for severance of communities. The significance of effects for severance are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 8-17 Non-Motorised User Amenity and Delay

Road	% Increase in Total Traffic	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
Market Street	51%	Low	Medium	Minor
Broughty Ferry Road	6%	Negligible	High	Minor
A92 Broughty Ferry Road	2%	Negligible	High	Minor
A92 Greendykes Road	4%	Negligible	High	Minor
A92 Arbroath Road west	2%	Negligible	High	Minor
A92 Arbroath Road east	2%	Negligible	Medium	Negligible

8.9.13 Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic on severance of communities is a direct, temporary, **Minor Adverse (Not Significant)** effect.

8.9.14 For non-motorised user amenity and delay the significance of effects for all study areas roads carrying construction traffic would be minor with the exception of the A92 Arbroath Road east which would be negligible.

Road Vehicle and Passenger Delay.

8.9.15 Table 8-18 presents the significance of effect on road vehicle and passenger delay because of Cumulative Development construction traffic. The magnitude of change for these environmental effects is based on the same 30%, 60% and 90% changes in traffic flow used for severance of communities. The significance of effects for severance are based on an assessment of all traffic in accordance with the IEMA Guidelines 2023.

Table 8-18 Road User and Passenger Delay

Road	% Increase in Total Traffic	Magnitude of Change	Sensitivity of Receptor	Significance of Effect
Market Street	51%	Low	Medium	Minor
Broughty Ferry Road	6%	Negligible	High	Minor
A92 Broughty Ferry Road	2%	Negligible	High	Minor
A92 Greendykes Road	4%	Negligible	High	Minor
A92 Arbroath Road west	2%	Negligible	High	Minor
A92 Arbroath Road east	2%	Negligible	Medium	Negligible

8.9.16 Classifying the significance of effects: prior to mitigation, the likely effect of construction traffic is a direct, temporary, **Minor Adverse (Not Significant)** effect.

8.9.17 For road vehicle and passenger delay the significance of effects for all study areas roads carrying construction traffic would be minor with the exception of the A92 Arbroath Road east which would be negligible.

8.10 Mitigation and Summary – Cumulative Assessment

8.10.1 Construction traffic forecasts for the cumulative developments presented in this chapter provide a robust basis for the assessment of environmental effects. Prior to mitigation temporary **Moderate adverse (Significant)** environmental effects are forecast for the A92 Broughty Ferry Road, A92 Greendykes Road and the A92 Arbroath Road west. Mitigation will take place in the form of a CTMP and co-ordination of CTMP's with cumulative development sites.

8.10.2 Post-mitigation residual environmental effects associated with cumulative development construction traffic are forecast to be direct, temporary Minor (Not Significant). Table 8-19 provides a summary of the potential effects identified in this cumulative assessment

Table 8-19: Summary of Environmental Effects - Cumulative Assessment

Effect	Receptor	Significance of Effect (Prior to Mitigation)	Mitigation	Residual Effect
Severance	Pedestrian Traffic	Minor	CTMP / Co-ordination of CTMP's with Cumulative Development Sites	Negligible
Fear and Intimidation	Pedestrian & Cycle Traffic	Moderate	CTMP / Co-ordination of CTMP's with Cumulative Development Sites	Minor
Road User and Pedestrian Safety	All Traffic	Moderate	CTMP / Co-ordination of CTMP's with Cumulative Development Sites	Minor
Non-Motorised User Amenity	Pedestrian & Cycle Traffic	Minor	CTMP / Co-ordination of CTMP's with Cumulative Development Sites	Negligible
Non-Motorised User Delay	Pedestrian & Cycle Traffic	Minor	CTMP / Co-ordination of CTMP's with Cumulative Development Sites	Negligible
Road Vehicle & Passenger Delay	Vehicle Traffic	Minor	CTMP / Co-ordination of CTMP's with Cumulative Development Sites	Negligible

9. CUMULATIVE APPRAISAL

9.1.1 This chapter considers the potential cumulative environmental effects as a result of the Proposed Development. The purpose of the assessment is to assess whether the combination of multiple effects upon a common receptor would result in an effect of greater significance than the individual effects (as reported in Technical Chapters 4 to 8).

9.1.2 The developments assessed in Section 9.2 below align with the consideration requirements set out in Section 3.4 'Cumulative Effects' and have the potential for cumulative effects given the likelihood that they would be constructed and operate concurrently with the Proposed Development.

9.2 Appraisal

9.2.1 A cumulative effects assessment is provided in Table 9-1 below.

Table 9-1 Cumulative Assessment

Other Development	Potential Cumulative Effects	Mitigation Measures
23/00814/FULM Eden Project Dundee	There may be cumulative adverse transport impacts during construction of the proposed developments due to an increase in construction traffic. The would be a cumulative beneficial impact on biodiversity during operation of the proposed developments due to the introduction of biodiversity enhancement across the developments.	Adverse impacts on traffic during construction would be mitigation through best practice traffic management measures.

10. SUMMARY OF MITIGATION MEASURES

10.1.1 The Technical Chapters above highlight the potential environmental risks and present and mitigation measures for managing these risks.

10.1.2 The embedded and additional mitigation proposed within this EA is listed below in Table 10-1. The CEMP will include these protection measures.

Table 10-1 Schedule of Mitigation

Mitigation Reference	Title of Mitigation	Timescale	Description
Embedded Mitigation			
EMB1	SSEN Construction Management	Pre-construction and Construction	Compliance with the Applicant's General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs).
EMB2	Construction Environment Management Plan (CEMP)	Pre-construction and Construction	Development and adoption of a CEMP during construction to define good practice during construction.
EMB3	Construction Traffic Management Plan (CTMP)	Pre-construction and Construction	The CTMP would describe all mitigation and signage measures that are proposed on the public road network.
EMB4	Delivery and sourcing of structures and materials.	Construction	Materials will be a mix of site-won and locally sourced materials. Concrete would be delivered to site pre-mixed. Hardcore and earthworks materials for the construction of the Proposed Development would be a combination of site won, through cutting of the existing surface to construct the platforms and locally imported materials.
EMB5	Lighting requirements	Operation	Proposed buildings would not be illuminated at night during normal operation. Floodlights would be installed but would only be used in the event of a fault during the hours of darkness; or during the overrun of planned works; or when sensor activated as security lighting for night-time access. The access roads would not be lit under normal operation. As far as possible, works should be carried out in daylight to minimise the risk of disturbing protected or notable nocturnal species. If any temporary artificial lighting is required for construction works, this should be strongly directional and directed only on to the works area, and be turned off when not required, to minimise light spill and adverse effects on nocturnal wildlife.
EMB6	Biodiversity Net Gain	Pre-construction	SSEN Transmission has undertaken a Biodiversity Net Gain assessment for the Proposed Development. A Biodiversity Net Gain Report (**Appendix B**) has been prepared as part of the measures necessary to achieve SSENs target BNG figures.
EMB7	Reinstatement	Construction	Following commissioning of the Proposed Development, all temporary construction areas

			would be reinstated. Reinstatement will form part of the contract obligations for the principal contractor and will include the removal of all temporary access tracks and work sites.
Additional Mitigation			
EC1	Protection of mammals	Construction	Standard measures to protect mammals during construction as defined in para 4.6.1.
EC2	Avoidance of clearance during breeding bird season	Construction	Scrub clearance and building demolitions should take place outside the breeding bird season (March to August, inclusive). If any clearance is required during March to August, a suitably experienced ecologist must be present to check all vegetation to be removed prior to clearance and identify species-specific exclusion zones if required.
EC3	Invasive Non-native Species (INNS) Method Statement or Biosecurity Management Plan	Pre-construction and Construction	If any of the INNS are likely to be disturbed or removed, then during construction then simple biosecurity measures should be outlined in a Method Statement or Biosecurity Management Plan and implemented to avoid their spread.
HHGS1	Ground Investigation	Pre-construction and Construction	It is recommended that several phases of ground investigation are carried out at the site to characterise the potential contaminated land risks further and recommend remediation / mitigation measures if considered to be necessary.

11. REFERENCES

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