CALEDONIA
Offshore Wind Farm

Code: UKCAL-CWF-CON-EIA-RPT-00005-5009

Volume 5 Proposed Development (Onshore)

Chapter 9 Traffic and Transport

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Volume 5 Chapter 9 Traffic and Transport

Code	UKCAL-CWF-CON-EIA-RPT-00005-5009
Revision	Issued
Date	18 October 2024

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Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekly Traffic
AIL	Abnormal Indivisible Load
AMSC	Approval of Matters Specified in Conditions
ANPR	Automatic Number Plate Recognition
ARN	Affected Road Network
ATC	Automatic Traffic Count
CIA	Cumulative Impact Assessment
CEMP	Construction Environmental Management Plan
CTMP	Construction Traffic Management Plan
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GDP	Gross Domestic Product
HGV	Heavy Goods Vehicle
HDD	Horizontal Directional Drilling
IEMA	Institute of Environmental Management and Assessment
LGV	Light Goods Vehicle
MVKM	Million Vehicle Km's
NCN	National Cycle Network
NMU	Non-Motorised User

NTEM	National Trip End Model
OFTO	Offshore Transmission Owner
OWF	Offshore Wind Farm
OnTI	Onshore Transmission Infrastructure
OS	Ordnance Survey
PAP	Potential Access Point
PIA	Personal Injury Accident
PPP	Planning Permission in Principle
PRoW	Public Rights of Way
RLB	Red Line Boundary
SRN	Strategic Road Network
TA	Transport Assessment
TAG	Transport Assessment Guidance
TEMPro	Trip End Model Presentation Programme
TSRGD	Traffic Signs Regulations and General Directions
T&T	Traffic and Transport

Executive summary

This chapter of the Onshore Environmental Impact Assessment Report (EIAR) assesses the potential effects from the Proposed Development (Onshore) on Traffic and Transport (T&T) receptors during construction, operation and decommissioning.

A full baseline review of all transport network types, including Non-Motorised Users (NMU), public transport, and road networks, was undertaken to identify any key issues that may impact on their current operation.

Throughout the area covered by the T&T receptor points the local road network is largely rural, comprising of rural 'A' roads, 'B' roads and numerous unclassified roads. There are currently no known issues with regards to heavily trafficked roads, particularly in terms of journey delays and / or congestion, although there may be some localised delays during peak weekday periods within the surrounding towns such as Banff.

Pedestrian, cycle networks and public transport services are subject to relatively limited provision, partly due to low levels of demand and the wide spread of trip origins and destinations.

The most likely significant effect on the local road network will result from vehicle movements during the construction phase. Of the 28 onshore receptors that were considered as part of a series of traffic surveys, 12 were identified as exceeding the traffic flow thresholds set by the Institute of Environmental Management and Assessment (IEMA). These 12 onshore receptors are identified as most susceptible to potential effects resulting from the addition of construction traffic.

Following this initial screening exercise, these 12 onshore receptors underwent four detailed sub-assessments, each considering the potential effects associated with four different access points to Onshore Transmission Infrastructure (OnTI). These sub-assessments and the potential extents of the Affected Road Network (ARN) are illustrated in Figure 9-2 to Figure 9-5. Each sub-assessment considered the following potential impacts:

- Severance of communities;
- Driver and passenger delay;
- Non-Motorised User (NMU) delay;
- NMU amenity (including potential impacts on Aberdeenshire core paths and cycle routes);
- Fear and intimidation;
- Road user and pedestrian safety; and
- Hazardous / abnormal load review.

The assessment has taken into account of embedded mitigation measures for evaluating potential effects. The primary mitigation measure, the Outline Construction Traffic Management Plan, serves as a framework to manage construction vehicle movements safely throughout the area covered by the T&T receptor points. It outlines the basic principles and actions to address potential traffic impacts, based upon a 'worst-case' scenario. A more

detailed Construction Traffic Management Plan (CTMP) will be developed at the detailed design stage. This will consider specific activities, route assessments, plans for Abnormal Indivisible Loads (AILs) and internal road management. A Construction Environmental Management Plan (CEMP) will accompany the CTMP and will act as a supporting mitigation measure, reinforcing the vehicle management processes as outlined by the Outline CTMP / CTMP. Monitoring and compliance strategies, such as traffic counters and GPS tracking, will ensure adherence to the Outline CTMP and forthcoming CTMP, with continuous evaluation and feedback mechanisms in place for improvement.

Potential significant effects, prior to the implementation of mitigation, have been identified for receptors at site 9 (the east-west running B9139, located to the west of Banff) and site 21 (an east-west running unclassified road, located approximately 3.5km to the west of Birkenhills). This assessment is based upon a worst-case concurrent construction scenario. Overall traffic numbers would therefore be expected to be lower for the sequential or enabling scenario. Importantly, these significant effects relate solely to the point-based receptors and not the full length of the road which the receptor is located on. Furthermore, these effects are temporary in nature and will be mitigated through the embedded mitigation measures above, no secondary mitigation is proposed.

No significant residual impacts are predicted, either for the Proposed Development (Onshore) or cumulatively with other plans or developments.

9 Traffic and Transport

9.1 Introduction

9.1.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) identifies the potential effects on Traffic and Transport (T&T) associated with the construction, operation and decommissioning of the of the Proposed Development (Onshore).

9.1.1.2 This chapter is supported by the following Technical Appendices:

- Volume 7E, Appendix 9-1: Traffic Survey Report;
- Volume 7E, Appendix 9-2: Outline Construction Traffic Management Plan; and
- Volume 7E, Appendix 9-3: Traffic and Transport Tables and Supporting Data.

9.2 Legislation, Policy and Guidance

9.2.1.1 Volume 1, Chapter 2: Legislation and Policy, of this EIAR sets out the policy and legislation associated with the Proposed Development.

9.2.1.2 The legislation, policy and guidance that relate specifically to the T&T assessment are identified and described in Table 9-1.

Table 9-1: Legislation, policy and guidance

Relevant Legislation, Policy and Guidance	Description
National Planning Framework 4 (NPF4) (Scottish Government, 2023[1])	Forms a part of the terrestrial planning framework. The NPF4 sets out national planning policy requirements, with specific policies relevant to the T&T assessment are Policy 11, Energy, and Policy 13, Sustainable Transport.
Aberdeenshire Local Development Plan 2023 (Aberdeenshire Council, 2023[2])	The Aberdeenshire Local Development Plan guides future development in Aberdeenshire. Specific policies related to the T&T assessment include Policy C2 Renewable Energy, which supports Wind Energy developments that are appropriately sited and avoid unacceptable environmental effects.

Relevant Legislation, Policy and Guidance	Description
Institute of Environmental Management and Assessment (IEMA) publication – 'Environmental Assessment of Traffic and Movement' (IEMA, 2023[3])	Provides systematic and consistent guidance for the assessment of traffic and movement impacts for a wide range of developments.
Aberdeenshire Council 'Standards for Road Construction Consent and Adoption' (Aberdeenshire Council, 2015[4])	The guidance establishes standards for transportation, covering design and construction of new roads linked to development proposals in the Aberdeenshire region. It outlines inspection procedures and management of construction traffic, including the handling of abnormal loads.
Aberdeenshire Council Abnormal Load guidance 'Traffic Management – Abnormal Loads' (Aberdeenshire Council, 2015[5])	This provides general guidance on the transport of large or heavy loads that cannot be divided in either size or weight for the purposes of transport.

9.3 Stakeholder Engagement

9.3.1.1 The Scoping Report was submitted to Aberdeenshire Council in December 2022 who then circulated the report to relevant consultees. A Scoping Opinion was received from Aberdeenshire Council on 1 February 2023. Relevant comments from the Scoping Opinion specific to T&T, along with details of further consultation activities undertaken throughout the pre-application stage, are provided in Volume 7E, Appendix 9-3: Traffic and Transport Tables and Supporting Data.

9.3.1.2 Key outcomes from this engagement included:

- Confirmation of assessment methodology with Aberdeenshire Council; and
- Identification of traffic surveys sites and potential sensitive receptors.

9.4 Baseline Characterisation

9.4.1.1 This section details the current baseline data and information for the access, traffic, and transport components that are located throughout the areas covered by the T&T receptor points and traffic survey sites.

9.4.1.2 Baseline characterisation has been determined through a blend of desk-top studies used to identify existing transport networks within the vicinity of the Proposed Development (Onshore) and a series of traffic surveys which were undertaken in October 2023 to understand the current operation of the local road network.

9.4.2 Red Line Boundary and Assessment Area

9.4.2.1 The Onshore Transmission Infrastructure (OnTI) Red Line Boundary (RLB) includes the following:

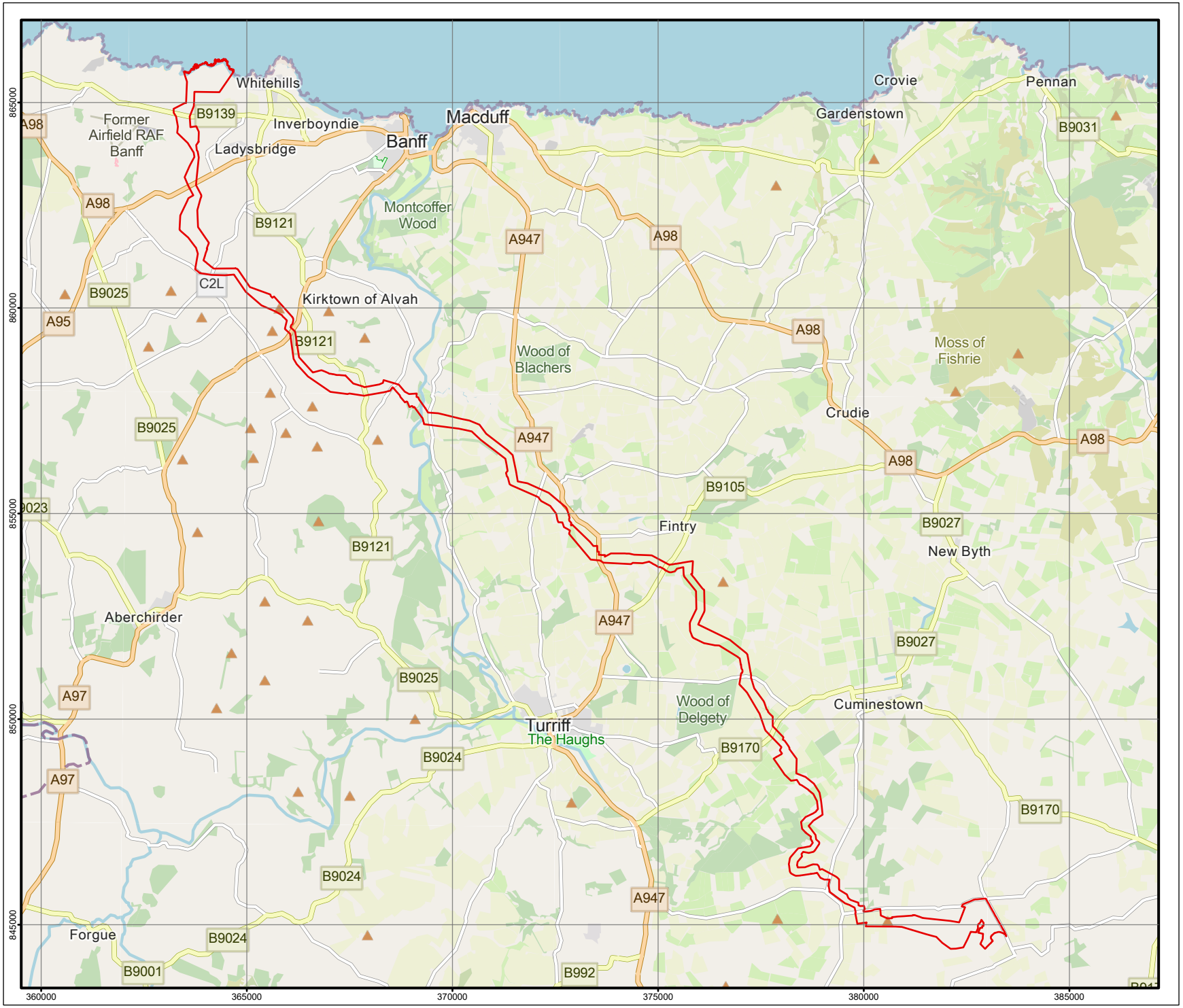
- a Landfall Site on the Aberdeenshire coast at 'Stake ness', located to the west of the town of Banff;
- an Onshore Export Cable Corridor (ONEC) of *circa* 37km (running south-east from the Landfall Site to the Onshore Substation Site);
- an Onshore Substation Site with two Onshore Substations co-located within the same footprint, located within proximity to New Deer; and
- an Onshore Grid Connection Cable Corridor connecting the Onshore Substation to the Grid Connection Point at the existing New Deer Substation (for Phase 1).

9.4.2.2 While Figure 9-1 identifies the Onshore Transmission Infrastructure (OnTI) RLB, the location of the traffic survey sites and therefore the spatial extents of the assessment area is illustrated in Figure 1-1 to 1-5 within Volume 7E, Appendix 9-1: Traffic Survey Report.

9.4.2.3 The outer extent of the survey sites and assessment area is as follows:

- South-west extent: the A97, *circa* 1km south of Yonder Bognie;
- Western extent: the A95, adjacent to Gordonstown;
- Eastern extent: the A9105, *circa* 3.5km east of Fintry; and
- Southern extent: the A947, *circa* 2.4km north of Fyvie.

9.4.2.4 The northern extents of the assessment area are defined by the northern coastline and Landfall Site.



REV	DATE	DOC STATUS	ORIGIN	REVIEW	APP
03	30/08/2024	Approved	CW	GS	GS
02	22/07/2024	For Review	CW	GS	EC
01	04/03/2024	For Review	MM	GS	EC

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ARUP

CONTRACTOR DRAWING NO: UKCAL1_ARP_WNF_ENV_MAP_00168

CONTRACTOR REV: 03

GEODETIC PARAMETERS: OSGB36 / British National Grid (EPSG:27700)

DRAWING TITLE

Figure 9-1: OnTI Red Line Boundary and Spatial Extents of the Assessment Area

STATUS: Approved

SCALE: 1:125,000

DRAWING NUMBER: N/A

SHEET NO: 01 of 01

REV: N/A

9.4.2.5 In accordance with the common industry-wide approach to assessing developments which are not based on a single site, assessing every single link or road within the assessment area is not required. Instead, the T&T assessment takes a receptor-based approach, where potential effects are based on the individual survey sites and the indicative access points into the OnTI RLB boundary.

9.4.2.6 It's important to note that the exact location and number of construction compounds will be identified at the detailed design stage and therefore is not available prior to completion of the T&T assessment.

9.4.2.7 It has been assumed that, as a worst case, four main construction compounds will be located within the ONEC, with smaller satellite compounds located every 2.5km. One of these compounds will facilitate Horizontal Directional Drilling (HDD)[i], which will be the method used for the crossing of the River Deveron.

9.4.2.8 The Landfall Site and Onshore Substation Site will each include their own single construction compounds.

9.4.2.9 The Proposed Development (Onshore) (illustrated in Figure 9-1) and public road network incorporates the following key links:

- A98 near Portsoy;
- West of A98/A95 Junction;
- East of A98/A95 Junction;
- A95 East of Cornhill;
- A98 South of Boyndie;
- A98 Southeast of Inverboyndie;
- A97 Southwest of Banff;
- A947 East of Dounepark;
- A97 North of Aberchirder;
- South of B9025/B9121 Junction;
- North of B9025/B9121 Junction;
- A947 South of Plaidy;
- A947 Northeast of Turriff; and
- B9170 Northwest of Cuminestown.

9.4.3 Data Sources

9.4.3.1 A review was undertaken on relevant literature and data central to this assessment, specifically focusing on access, traffic, and transport. This review

[i] Trenchless crossing techniques such as HDD hereafter referred to as 'HDD' in this chapter of the EIAR.

provided an overview of the current baseline. The primary data sources utilised are outlined in Table 9-2.

Table 9-2: Data sources

Data	Date	Source	Purpose / Data Use
Classified Annual Average Daily Traffic (AADT) traffic data (28 locations agreed with Aberdeenshire Council)	October 2023	Third party specialist survey company	To analyse existing traffic conditions for routes relevant to the assessment area.
Road network	August 2023	Ordnance Survey	To allow for a desktop review of the proposed assessment area in relation to the road network and the types of roads which may be directly impacted by construction.
Core path network	August 2023	Aberdeenshire Council	To determine whether any core paths are potentially impacted during construction.
Cycle routes	August / September 2023	Aberdeenshire Council	To determine whether any cycle routes are potentially impacted during construction.
Public transport	March 2024	Stagecoach	Review of public transport routes to understand if construction of the Proposed Development (Onshore) has the potential to disrupt public transport services.
Accident data	January 2024	CrashMap	To understand whether there are any hotspots for accidents near potential access areas to identify potential required mitigation measures.

9.4.4 Baseline Description

9.4.4.1 The following section provides an overview of the baseline of the T&T assessment area.

Pedestrian and Cycle Networks

9.4.4.2 The only National Cycle Network (NCN) which may be impacted by the Proposed Development (Onshore) is NCN1, which runs east to west across the ONEC and connects the City of Aberdeen to the Highlands.

9.4.4.3 There are three cycle routes that have the potential to be directly impacted by the Landfall Site, namely Fyvie - Turriff Circular; Turriff Circular; and Banff to

Boyndie Circular via Cornhill. The Banff to Boyndie Circular via Cornhill route runs parallel to the A95 (north of Cornhill), and parallel to both the B9139 and the A97 / A98 (on the approach to Banff).

9.4.4.4 There is an Aberdeenshire Council core path running from Banff to Portsoy. This path mainly follows a coastal route, crossing the ONEC and Landfall site. A further local path crosses the ONEC, providing access to/from the Boyndie Visitor Centre and the Boyndie onshore wind farm (illustrated in Photo 1).

Photo 1: Existing local path between the Boyndie Visitor Centre and Boyndie onshore wind farm

Public Transport Network

9.4.4.5 Due to the rural nature and population levels across the T&T assessment area, there is a low level of demand for public transport services. The key existing service of significance is the Stagecoach service 35 which operates from Aberdeen to Elgin / Inverness, intersecting with the Landfall Site between Banff and Portsoy on the B9139 and A98, and to the north of Turriff on the A947. Details of this service are summarised in Table 9-3.

9.4.4.6 Following a desktop review, the other service currently operating within the vicinity of the Proposed Development OnTI is the Watermill Coaches service 248 which runs between New Byth and Inverurie, passing through Cuminestown, Fyvie, and Oldmeldrum. Details of this service are summarised in Table 9-3.

9.4.4.7 Other services operate within the wider surrounding area, but do not necessarily pass through or near any of the Proposed Development (Onshore). For example, the Watermill Coaches service 271 which connects Banff to Fraserburgh.

9.4.4.8 Between Banff and Portsoy there is a bus stop located 300m east of the potential access point from the B9139 into the Landfall Site.

Table 9-3: Local bus services

Service no. and Operator	Route	Daytime frequency	
		Monday – Friday	Saturday and Sunday
35 (Stagecoach)	Aberdeen - Elgin	30 mins	60 mins
248 (Watermill Coaches)	New Byth - Inverurie	0930 (single service departs New Byth) Thursday service only	n/a

Road Network

9.4.4.9 The primary roads, links, and routes that have the potential to be impacted by the Proposed Development (Onshore) include the following:

- A98;
- A97;
- A95;
- A947;
- B9025;
- B9031;
- B9105;
- B9121;
- B9170; and
- B9139.

Rail Network

9.4.4.10 There are no Network Rail lines within the T&T assessment area. The nearest railway line is *circa* 25km south of the OnTI RLB.

Traffic Flows

Existing Traffic Data

9.4.4.11 The Department for Transport (DfT) has extensive historical data for much of the road network within the assessment area. However, as part of this T&T

assessment, a series of traffic surveys were undertaken in October 2023 at a total of 28 sites, including five locations / roads that were identified by Aberdeenshire Council. While the 2023 survey data has been used to provide a more comprehensive, robust and contemporary set of baseline traffic data, the historic DfT data has still been used to allow the undertaking of a benchmarking exercise and provide further context to the 2023 dataset, particularly in relation to understanding the potential impacts of Covid on traffic movements throughout the local area.

9.4.4.12 Details of the 2023 surveys are set out below.

Traffic Surveys

9.4.4.13 Baseline traffic flows were collected from a series of traffic counts that were obtained in October 2023. Full details of these surveys, the survey specification, and the methodology used for collecting the data is presented in Volume 7E, Appendix 9-1: Traffic Survey Report (appended to this chapter).

9.4.4.14 The survey sites identified within the T&T assessment were chosen in relation to the circa 37km ONEC, the Landfall Site, Onshore Substation Site and Onshore Grid Connection Export Cable Corridor. The locations of the survey sites were also informed by a consultation exercise with the transport officers of Aberdeenshire Council where a number of links across the local road network were identified and agreed as being of interest. This process was further supported through a review of the wider road network and identification of potential construction vehicle routing options.

9.4.4.15 The potential location of the proposed construction site(s) and the construction vehicle routing to/from the potential access points into the OnTI RLB was also used to help inform the location of the survey points.

9.4.4.16 The count sites are illustrated in Figure 1-1 to Figure 1-5, Volume 7E, Appendix 9-1: Traffic Survey Report.

9.4.4.17 The T&T assessment is based upon the use of Average Annual Daily Traffic (AADT) data, as summarised in Volume 7E, Appendix 9-1: Traffic Survey Report.

Accident Statistics

9.4.4.18 Accident data has been obtained from the CrashMap database. The CrashMap website serves as an online platform offering information on the location, date, and intensity of documented personal injury accidents on roads in the United Kingdom. The severity of these incidents is categorised as 'Slight,' 'Serious,' or 'Fatal,' based upon the extent of harm to the most critically injured individual. The baseline review for this dataset encompasses a five-year period, from 2018 to 2022.

9.4.4.19 Table 9-4 provides details of the baseline accident statistics. This accident data was obtained for a series of indicative construction site access points located across the OnTI RLB, between the Landfall Site and the Onshore Substation Site in proximity to New Deer. In Table 9-4, within the road column (column no.2),

'N/A' indicates that there were no reported accidents within a 3km radius of the sites between 2018 and 2022.

Table 9-4: Number and severity of accidents within 3km radius to indicative construction site access points (2018 to 2022)

Indicative construction site access point	Road	Severity			Comments
		Slight	Serious	Fatal	
B9139, south-west of Whitehills	N/A	-	-	-	N/A
A98, West of Ladysbridge	A98 / B9025	3	5	-	N/A
Unclassified Road/A97, both west of A97 and B9121 junction	A97	1	-	1	2 vehicles involved, with 1 casualty in 2021 at the junction between the A97 and an unclassified road near the Burn of Brydock.
Unclassified Road(s), both West of the A947/south of King Edwards	A947 / unclassified	2	-	-	N/A
A947, south-east of Plaidy	N/A	-	-	-	N/A
B9105, north-east of Crossfields	A947	1	-	-	N/A
Unclassified Road, south-east of Muiryfold	Auchy Rd / unclassified	3	1	-	N/A
Unclassified Road(s), south of Howe of Teuchar	A947	4	-	-	N/A
	Total	**14**	**6**	**1**	

9.4.4.20 As shown above, a total of 21 accidents have been recorded within the T&T assessment area between 2018 to 2022. Of these, 14 have been categorised as 'slight', six as 'serious', and one as 'fatal'.

Harbours

9.4.4.21 It is anticipated that delivery of the components associated with the Proposed Development (Offshore) would be transported using local ports and harbours and not via the local road network. There are three harbours within close proximity of the T&T assessment area, namely, Portsoy Harbour, Banff Harbour and Macduff Harbour. These harbours as well as others could be utilised during the construction of the Proposed Development (Offshore).

9.4.4.22 The transport of offshore components is therefore excluded from this T&T assessment.

9.4.5 Future Baseline

9.4.5.1 Future baseline conditions are required to account for known committed developments and their associated traffic flows. Given the large spatial extents of the T&T assessment area and the potential distribution of committed development traffic flows, these are already accounted for as part of a 'factoring' exercise whereby traffic flows throughout the entire assessment area are increased based upon the application of growth factors derived from the Department for Transport's (DfT) National Trip End Model (NTEM) and Trip End Model Presentation Programme (TEMPro).

9.4.5.2 The application of growth factors using this approach is considered more appropriate than simply adding the flows from a small number of committed developments, particularly as the TEMPro datasets take into account a wider range of inputs, including population projections, household numbers and employment forecasts, all of which will impact on car ownership / usage throughout Aberdeenshire and surrounding local authority areas. Furthermore, the data which is available on the distribution of committed development traffic flows does not reflect the same extents of the T&T assessment area, meaning that the same survey sites used in this T&T assessment are not mirrored by the known committed development traffic flows.

9.4.5.3 Further information on TEMPRo and its application is set out under the Cumulative Assessment in Section 9.9.

9.4.5.4 As noted in Section 9.4.2.7, this T&T assessment is based upon an assessment of the 'worst case' scenario. As part of the future baseline conditions, the 'worst case' takes into consideration known committed developments, their associated traffic flows and other background traffic growth experienced throughout the wider T&T assessment area. Within the context of the construction phase, this reflects the peak period of construction activities and the greatest volume of construction traffic.

9.4.5.5 Section 9.7.2 provides full details of the analysis that has been undertaken to identify the 'worst case' scenario and the associated future year. The 'worst case' occurs quarter 1 (Q1) of 2030 (year 2). The TEMPro growth factors for the future

year has therefore been based upon the forecast growth of background traffic flows between 2023 and 2030.

9.4.5.6 The inputs that were identified within TEMPro (version 8) were as follows:

- Growth between 2023 and 2030;
- Growth factors based on an average of 'origin' and 'destination' factors;
- Factors derived for car driver / car passenger modes, across an 'average day', reflecting the fact that this assessment is based upon AADT data (i.e. across 7 days); and
- Factors derived for the 'Aberdeenshire Region'.

9.4.5.7 The resulting vehicular growth factor used to forecast the future year baseline traffic flows was 1.030, as shown in Table 9-5 below.

Table 9-5: TEMPro growth factors (2023 – 2030), car driver/passenger

Mode	Region	Year	Origin	Destination	Average (rounded)
Car driver / passenger	Aberdeenshire	2023 - 2030	1.0299	1.0298	1.030

9.4.5.8 The assessment area includes a large number of minor or unclassified rural roads with very low traffic flows and which are unlikely to experience any significant change in the traffic demands that use them. The above growth factor has therefore only been applied to flows on the main 'A' roads, with the resulting flows set out in Section 1.3 of Volume 7E, Appendix 9-3: Traffic and Transport Tables and Supporting Data.

9.4.5.9 By only applying the growth factor to 'A' roads, the percentage change on the rural and unclassified roads due to the addition of construction traffic is going to be higher than without any factoring being applied. Within the context of the IEMA methodology being applied as part of this T&T assessment, this helps provide a more robust and 'worst case' approach to the assessment process. Refer also to Section 9.4.4 which sets out the assumptions that have been made in terms of the use of baseline traffic data, factoring, and the assessment methodology.

9.4.5.10 As discussed in Section 9.4.7, this T&T assessment is based upon the percentage change in link-based vehicular flows following the addition of construction vehicles. The implications of this additional traffic in terms of link and junction capacity are not included, but will instead form part of the Transport Assessment (TA) which will accompany the Approval of Matters Specified in Conditions (AMSC) application.

9.4.6 Summary and key issues

9.4.6.1 Table 9-6 summaries the key findings from the baseline review.

Table 9-6: Baseline review key findings

Transport Topic	Key Issues
Pedestrian and cycle	The proposed development (onshore) may impact the National Cycle Network (NCN1), which runs from the City of Aberdeen to the Highlands. Additionally, three cycle routes (Fyvie - Turriff Circular, Turriff Circular, and Banff to Boyndie Circular via Cornhill) could be directly affected by the landfall site. An Aberdeenshire Council core path along the coast from Banff to Portsoy may also be impacted.
Public transport	The Stagecoach 35 service intersects with the Landfall Site between Banff and Portsoy on the B9139 and A98, as well as to the north of Turriff on the A947. A bus stop is located 300 metres east of the indicative access point from the B9139 into the Landfall Site.
Road network and Traffic Flows	The road network within the T&T assessment area is largely rural, comprising strategic 'A' roads, but also a significant number of 'B' roads and unclassified roads. Many of the unclassified rural roads, some of which may be used to provide access to / from the ONEC during the construction phase, currently provide access to agricultural buildings and farms. There are no known issues with heavily trafficked roads, particularly in terms of journey delays and / or congestion, although there may be some localised delays during peak weekday periods within the surrounding towns such as Banff.
Rail network	There are no rail lines within the immediate T&T assessment area.
Accidents	Accident data sourced from the CrashMap database reveals personal injury incidents on UK roads. These incidents are categorised as 'Slight,' 'Serious,' or 'Fatal,' based upon the severity of harm to the most critically injured individual. The dataset covers a five-year period (2018-2022). Table 9-7 presents baseline accident statistics, including indicative access points along

Transport Topic	Key Issues
	the ONEC. Notably, 21 accidents occurred within the assessment area during this period: 14 were 'slight,' six were 'serious,' and one was 'fatal'.

9.4.7 Data Gaps and Limitations

9.4.7.1 The data gaps and uncertainties associated with this T&T assessment are partly related to the traffic volume estimates which have been drawn from prior experience and which are inherent in all such assessments. Other gaps and limitations include:

- The calculations for construction-stage traffic involve necessary assumptions, primarily concerning material volumes, quantities, and the overall implementation of the construction program. Conservative estimates, outlined in the description of the assessed 'worst-case scenario,' have been utilised whenever possible. This chapter's assessment relies to some extent on estimating construction traffic based upon professional knowledge of similar developments of the proposed scale;
- In accordance with the IEMA methodology that has used as the basis of this T&T assessment, link or junction capacity has been excluded from the analysis. Instead, this will form part of a more detailed TA which, subject to scoping discussions with Aberdeenshire Council, will typically include junction modelling and link capacity analysis; and
- In the cumulative assessment, where there is uncertainty about the timing of nearby developments, it robustly assumes that cumulative developments will occur concurrently with the peak traffic period for the Proposed Development (Onshore). This is accounted for through the application of TEMPro growth factors, as described in Sections 9.4.5.1 to 9.4.5.9.

9.5 EIA Approach and Methodology

9.5.1 Overview

9.5.1.1 This section outlines the methodology for assessing the likely significant effects on traffic and transport from the construction, operation and decommissioning of the Proposed Development (Onshore).

9.5.1.2 The assessment methodology that is used to determine the potential effects of the Proposed Development (Onshore) on the T&T networks within the

assessment area follow the Institute of Environmental Management and Assessment (IEMA) guidelines, as set out in 'Environmental Assessment of Traffic and Movement' (2023)[3]. This document supersedes the 'Guidelines for the Environmental Assessment of Road Traffic' (IEMA, 1993) which, until early-2023, provided the basis of the transport assessment process.

9.5.1.3 It is important to understand the difference between a formal TA and an EIA traffic and movement assessment. As identified with the 2023 IEMA guidelines:

- TAs report on the overall strategy for the development of sites and to maximise accessibility for non-car modes of transport, but also to assess the traffic impact of the proposals; and
- Traffic and movements assessments for EIA present the impact of traffic and movement on people and the environment – which are initially undertaken with reference to daily traffic flows prior to assessing the highest potential impacts, or 'worst case' scenario.

9.5.1.4 The traffic data used within the T&T assessment also informs a separate acoustic assessment which requires 18 hour Annual Average Weekday Traffic (AAWT) flows. The acoustic assessment is independent to this T&T chapter.

9.5.2 Impacts Scoped into the Assessment

9.5.2.1 Following the Onshore Scoping Report being submitted to Aberdeenshire Council in December 2022, the potential effects that have been scoped into this T&T assessment are set out in Table 9-7.

Table 9-7: Traffic and Transport scope of assessment

Potential Impact	Phase	Nature of Impact
Severance	Construction	Direct
Driver and passenger delay	Construction	Direct
Non-motorised user delay	Construction	Direct
Non-motorised user amenity	Construction	Direct
Fear and intimidation	Construction	Direct
Road user and pedestrian safety	Construction	Direct
Hazardous and abnormal load review	Construction	Direct

9.5.3 Impacts Scoped out of the Assessment

9.5.3.1 It is anticipated that the most significant impact on the local road network will result from vehicle movements during the construction phase. Any potential impacts resulting from the operational or decommissioning phases of the Proposed Development (Onshore) have therefore been excluded from the T&T assessment.

9.5.3.2 The impacts subsequently scoped out of the assessment during EIA scoping, and the justification for this, are listed in Table 9-8.

Table 9-8: Impacts scoped out

Potential Impact	Justification
Operational phase	It is assumed that the environmental effects associated with the operational phase will not exceed nor approach those experienced during construction as the sites will be unmanned and visited infrequently. The operational phase is therefore scoped out of the T&T assessment.
De-commissioning phase	The decommissioning traffic volumes associated with the Proposed Development (Onshore) is not yet known. For the purposes of the Onshore Substation Site it is expected that they will be similar to that of the construction traffic volumes. However, the ONEC is assumed to remain in situ. The construction traffic associated with this will therefore be zero. On that basis, the decommissioning phase is therefore scoped out of the T&T assessment.

9.6 Assessment Methodology

9.6.1 Sensitivity and Magnitude Assessment Criteria

9.6.1.1 IEMA guidance (2023)[3] suggests that to determine the significance and magnitude of an effect, the following two rules should be applied:

- **Rule 1:** highway links where flows are predicted to increase by more than 30% and where the number of Heavy Goods Vehicles (HGVs) are predicted to increase by more than 30% should be included as part of the full assessment; and
- **Rule 2**: any other particularly sensitive area(s) where traffic flows are predicted to increase by 10% or more should also be included.

9.6.1.2 Applying these rules as part of a screening exercise identifies those roads, or receptors, which are required to undergo a more detailed assessment in accordance with the following seven elements (IEMA, 2023)[2]:

- Severance of communities;
- Driver and passenger delay;
- Non-Motorised User (NMU) delay;
- NMU amenity (including potential impacts on Aberdeenshire core paths and cycle routes;
- Fear and intimidation;
- Road user and pedestrian safety; and
- Hazardous / abnormal load review.

9.6.1.3 For each of these elements, the magnitude and sensitivity of the potential effects has been based upon the predicted percentage changes in traffic flows, as set out in Table 9-9.

Table 9-9: Sensitivity and magnitude criteria

Sensitivity Receptor	Sensitivity Definitions and Traffic Magnitude
High	• Total change or major alteration to key elements / features of the baseline conditions; • Impact occurs over a large scale or spatial geographical extent and/or is long-term or permanent in nature; and • Generally, **an absolute change of >90% change in traffic** is considered to be a **high magnitude**.
Medium	• Partial change or alteration to one or more key elements / features of the baseline conditions; • Impact occurs over a medium scale / spatial extent and/or has a medium-term duration; and • Generally, **a 60% - 90% change in traffic** is considered to be a **medium magnitude**.
Low	• Minor shift away from the baseline conditions; • Impact occurs over a local to medium scale / spatial extent and/or has a short to medium-term duration; and • Generally, **a 30% - 60% change in traffic** is considered to be a **low magnitude**.
Negligible	• Very slight change from baseline conditions; • Impact is highly localised and short term with full rapid recovery expected to result in very slight or imperceptible changes to baseline conditions or receptor population; and • Generally, **a rule of <30% change in traffic** is considered to be a **negligible magnitude**.

9.6.1.4 The means by which the sensitivity of receptors for transport effects is defined depends upon the element that is being assessed (i.e. severance, delay, amenity, intimidation, etc). Some of these seven elements have their own method to determine sensitivity levels, while others use a qualitative-based approach, applied in accordance with the following descriptions:

- **Negligible**: receptors which are very lightly used (by all users or particularly by vulnerable road users) relative to other receptors within the assessment area or those which have a very high capacity to accommodate change without significant effects arising;
- **Low**: receptors which are lightly used (by all users or particularly by vulnerable road users) relative to other receptors within the assessment area or those which have a high capacity to accommodate change without significant effects arising;
- **Medium:** receptors which are used (by all users or particularly by vulnerable road users) to an average level relative to other receptors within the assessment area or those which have a moderate capacity to accommodate change without significant effects arising; and
- **High:** receptors which are heavily used (by all users or particularly by vulnerable road users) relative to other receptors within the assessment area or those which have a low capacity to accommodate change without significant effects arising. All accidents are considered to fall within this category.

9.6.1.5 Table 9-10 below sets out the seven different T&T potential impacts and the means by which the sensitivity of receptors is determined.

Table 9-10: Methods for identifying receptor sensitivity

Impacts	Method for determining the sensitivity of receptors
Severance of communities	Traffic flow thresholds, as set out in Design Manual for Roads and Bridges (DMRB) LA112 'Population and Human Health' (2020)[6].
Driver and passenger delay	Sensitivity descriptions as set out in Section 9.6.1.4
NMU delay	Traffic flow thresholds, as set out in DMRB LA112 'Population and Human Health' (2020)[6].
Non-motorised user amenity	Sensitivity descriptions as set out in Section 9.6.1.4
Fear and intimidation	Specific weighting system (IEMA, 2023)[3]. This process applies to both receptor sensitivity ***and*** the magnitude of effect. Further details are presented in Section 9.8.9.
Road user and pedestrian safety	Identification of Personal Injury Accident (PIA) rates, with all accidents considered to having a 'high' sensitivity.
Hazardous/ abnormal load review	Qualitative review.

9.6.2 Evaluation of Significance

9.6.2.1 Combining the results from the magnitude and sensitivity assessment, it is then possible to identify the significance of effect of the potential T&T impacts.

9.6.2.2 The evaluation of significance is determined through a combination of receptor sensitivity and magnitude of change, as summarised in Table 9-11.

9.6.2.3 Importantly, significant effects are defined as impacts that fall under the 'moderate' or 'major' categories.

Table 9-11: Evaluation of significance matrix

Significance of Effect		Sensitivity of Receptor			
		Negligible	**Low**	**Medium**	**High**
Impact Magnitude	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible	Minor	Minor
	Medium	Negligible	Minor	Moderate	Moderate
	High	Negligible	Minor	Moderate	Major

9.6.3 Approach to Cumulative Effects

9.6.3.1 The Cumulative Impact Assessment (CIA) assesses the effect of the Proposed Development (Onshore) together with other relevant plans, projects and activities. Cumulative effects are therefore combined from a number of different projects, on the same receptor or resource.

9.6.3.2 The approach to the CIA for T&T follows the process outlined in Volume 1, Chapter 7: EIA Methodology. The list of relevant developments for inclusion within the CIA is outlined in Volume 7A, Appendix 7-1: Cumulative Impact Assessment Methodology.

9.6.3.3 Full details of the T&T CIA are set out further in Section 9.9.

9.6.4 Embedded Mitigation

9.6.4.1 Where possible, mitigation measures will be embedded into the design of the Proposed Development (Onshore). Embedded mitigation measures that have been developed as part of the design are described in Table 9-12.

Table 9-12: Embedded mitigation

Code	Mitigation Measure	Securing Mechanism
M-64	Production of the Outline Construction Traffic Management Plan, as presented in Volume 7E, Appendix 9-2: Outline Construction Traffic Management Plan. The Outline CTMP will then be developed further with submission of a detailed planning application and supporting CTMP at a later date. The Outline CTMP sets out a basic framework and series of vehicle management actions or principles that will help facilitate the safe operation of construction vehicles to, from, and within the limits of the construction boundary. This Outline CTMP is based upon the information available at the time of writing, including but not limited to, an estimation on the location and number of construction compounds (derived from a provisional construction programme). The contents of the Outline CTMP are based upon a 'worst case' scenario whereby the greatest volume of construction traffic has been identified and then routed through the surrounding local road network.	The CTMP will be secured through a condition attached to the Planning Permission in Principle (PPP).
M-39	An Outline Construction Environmental Management Plan (CEMP) has been produced and included alongside the EIAR to support the PPP (Volume 7, Appendix 10: Outline Construction Environment Management Plan). The Outline CEMP includes measures on pollution prevention, noise control, biosecurity, and waste management. The Outline CEMP will then be developed further through the final design process and this will result in a detailed CEMP being submitted for discharge. The CEMP will be implemented to avoid, minimise or mitigate effects on the environment during the construction and decommissioning phases of the Proposed Development (Onshore).	Detailed CEMP secured through a condition attached to the PPP.

9.7 Key Parameters for Assessment

9.7.1.1 Volume 1, Chapter 4: Proposed Development Description (Onshore) details the parameters of the Proposed Development (Onshore) using the Rochdale Envelope approach. This section identifies those parameters during construction, operation and decommissioning relevant to potential impacts on T&T.

9.7.2 Proposed Development (Onshore) Phasing

9.7.2.1 In accordance with the approach described in Volume 1, Chapter 5: Proposed Development Phasing, the assessment of impacts presented in this chapter

considers the enabling, sequential, and concurrent construction scenarios for the Proposed Development (Onshore).

9.7.2.2 Table 9-13 presents each possible construction programme's expected vehicle generation at its peak activity.

Table 9-13: Peak Construction Vehicle Generation Across Different Construction Scenarios (AADT)

Construction scenario	Period	Onshore Substation Site		Landfall Site		ONEC		Total
		HGV	Car / LGV	HGV	Car / LGV	HGV	Car / LGV	
Sequential	Q4, yr. 1	9	58	12	71	90	71	312
Enabling	Q2, yr. 1	17	127	11	59	80	53	347
Concurrent	**Q1, yr. 2**	**14**	**154**	**14**	**71**	**101**	**69**	**422**

9.7.2.3 As shown above, the peak period of construction activity and therefore the 'worst case' scenario, as measured by the total number of daily construction vehicle movements, is identified as the 'concurrent' construction programme option. This comparison functioned as a high-level sensitivity assessment.

9.7.2.4 While the concurrent programme is estimated to commence in quarter one of 2029, lasting approximately 48 months, the construction start date may vary depending upon the detailed design programme (and associated work streams). Following this, there will be an additional period of around 6-12 months for testing and commissioning, making the total construction and commissioning period approximately 60 months.

9.8 Potential Effects

9.8.1.1 The most significant impact on the local road network will result from vehicle movements during the construction phase. Any potential impacts resulting from the operational or decommissioning phases of the Proposed Development (Onshore) have therefore been scoped out. Further details on this scoping process are presented in Section 9.5.2 and Section 9.5.3.

9.8.2 Construction – Potential Access Points, Vehicle Routing and Trip Generation

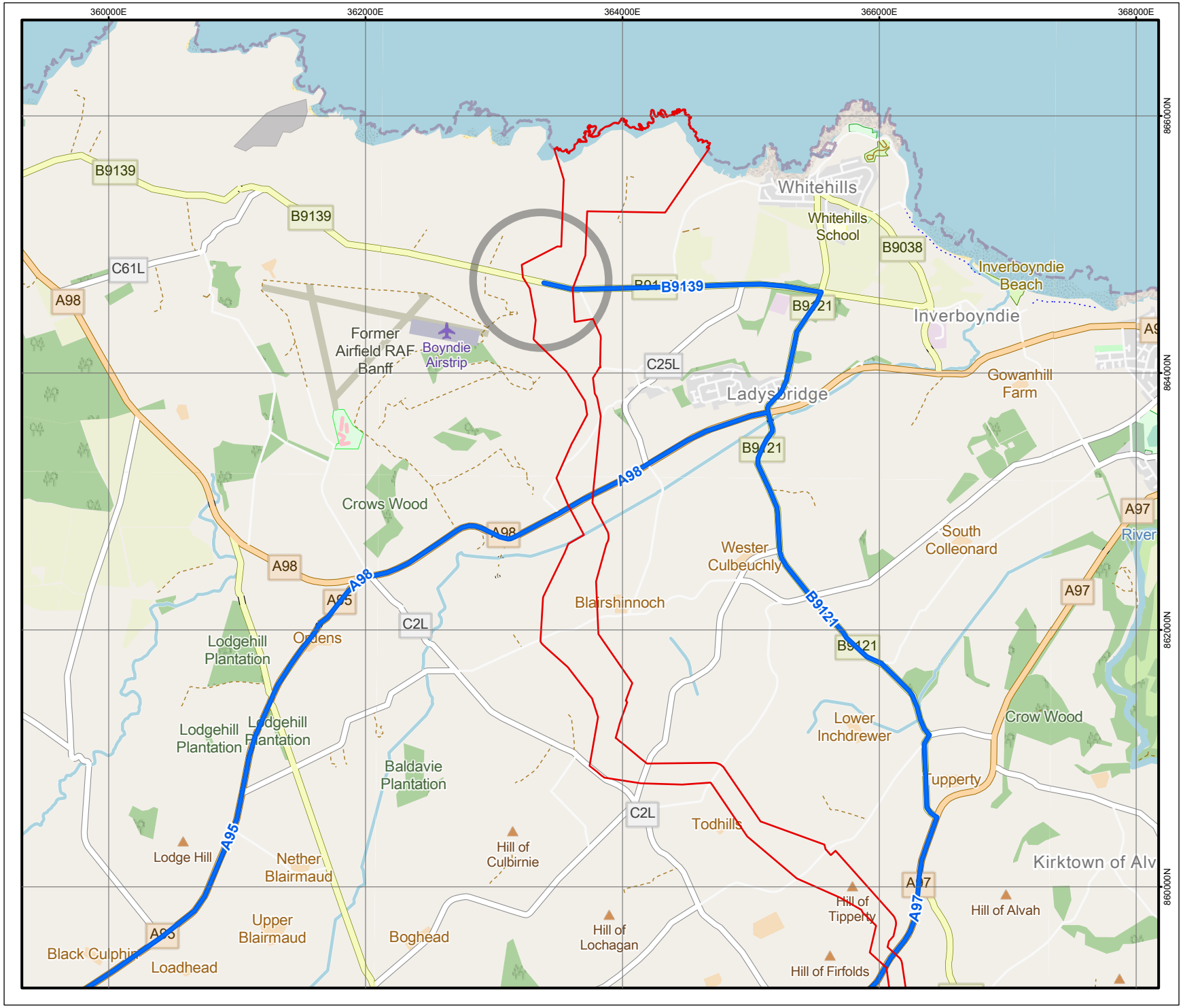
Potential Access Points

9.8.2.1 For the purpose of this T&T assessment and the Outline CTMP, four indicative Potential Access Points (PAPs) into the ONEC construction boundary have been identified and used as a proxy for construction vehicular movements and compound activity. These access points, and their associated sub-assessments, are illustrated in the following:

- Figure 9-2: Indicative Cable Corridor Vehicle Routing & Potential Access Options (Sub-Assessment A);
- Figure 9-3: Indicative Cable Corridor Vehicle Routing & Potential Access Options (Sub-Assessment B);
- Figure 9-4: Indicative Cable Corridor Vehicle Routing & Potential Access Options (Sub-Assessment C); and
- Figure 9-5: Indicative Cable Corridor Vehicle Routing & Potential Access Options (Sub-Assessment D).

9.8.2.2 The figures below are presented in accordance with the numerical sequence of the main construction compound referencing rather than in terms of their geographical sequence.

9.8.2.3 The Landfall Site and Substation Site have their own indicative access points which are included as part of all sub-assessments.



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04	30/08/2024	Approved	CW	NM	GS
03	20/08/2024	For Review	CW	NM	GS
02	29/07/2024	For Review	CW	NM	GS
01	22/04/2024	For Review	DF	NM	GS

CALEDONIA Offshore Wind Farm

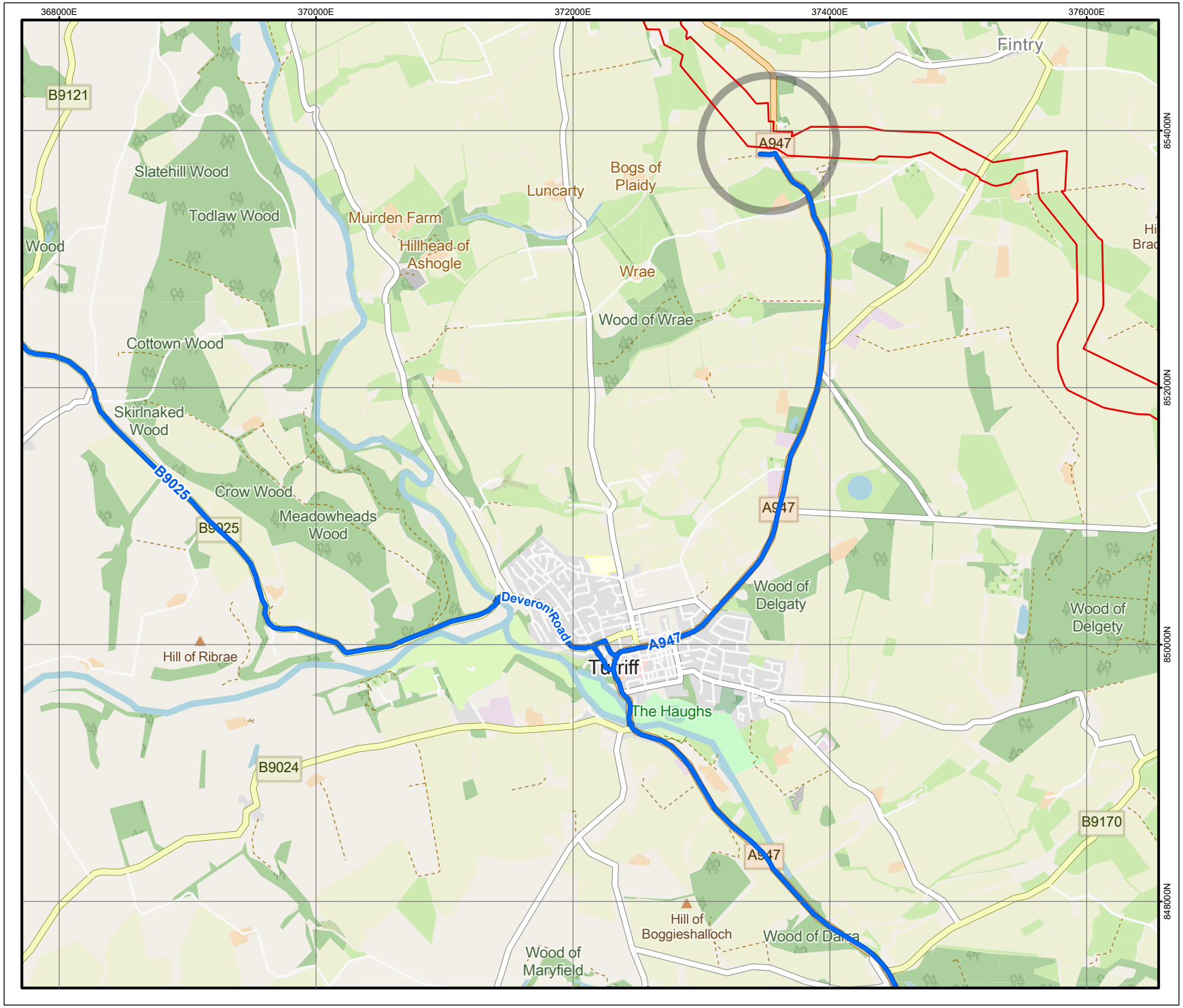
ARUP

CONTRACTOR DRAWING NO: UKCAL1_ARP_WNF_ENV_MAP_00312	CONTRACTOR REV: 04
GEODETIC PARAMETERS: OSGB36 / British National Grid (EPSG:27700)	

DRAWING TITLE

Figure 9-2:
Indicative Cable Corridor Vehicle Routing & Potential Access Options (Sub-Assessment A)

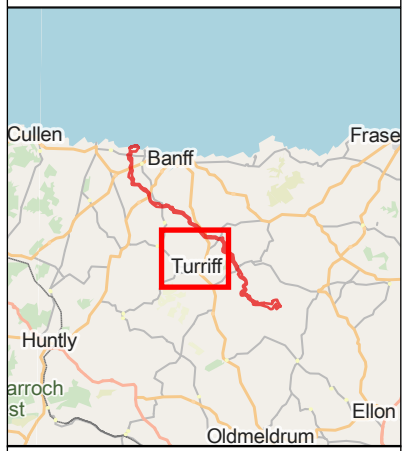
STATUS: Approved	SCALE: 1:40,000	
DRAWING NUMBER: N/A	SHEET NO: 01 of 01	REV: N/A



Onshore Transmission Infrastructure Red Line Boundary

Indicative Access Point

Indicative Vehicle Routing



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01	22/04/2024	For Review	DF	NM	GS

CALEDONIA Offshore Wind Farm

ARUP

CONTRACTOR DRAWING NO: UKCAL1_ARP_WNF_ENV_MAP_00313

CONTRACTOR REV: 04

GEODETIC PARAMETERS: OSGB36 / British National Grid (EPSG:27700)

DRAWING TITLE

Figure 9-3: Indicative Cable Corridor Vehicle Routing & Potential Access Options (Sub-Assessment B)

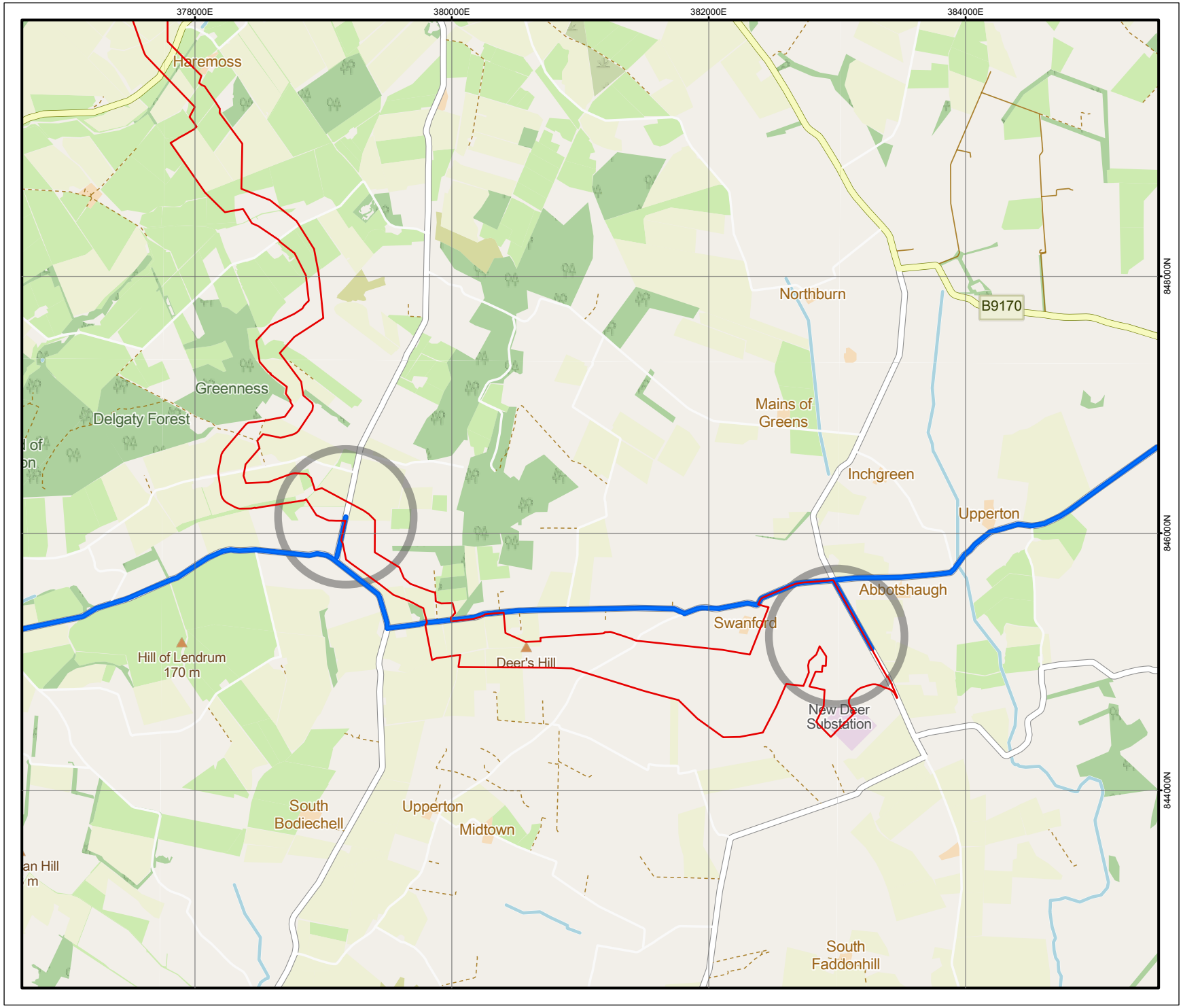
STATUS: Approved

SCALE: 1:40,000

DRAWING NUMBER: N/A

SHEET NO: 01 of 01

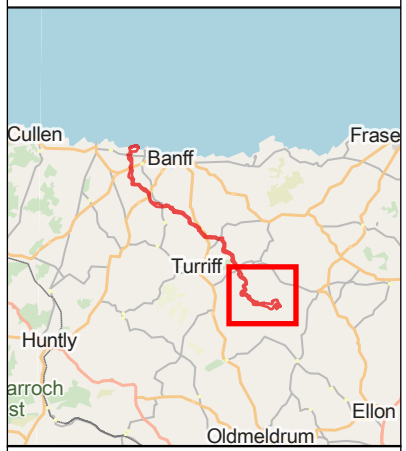
REV: N/A



Onshore Transmission Infrastructure Red Line Boundary

Indicative Access Point

Indicative Vehicle Routing



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02	29/07/2024	For Review	CW	NM	GS
01	22/04/2024	For Review	DF	NM	GS

CALEDONIA Offshore Wind Farm

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CONTRACTOR DRAWING NO: UKCAL1_ARP_WNF_ENV_MAP_00314

CONTRACTOR REV: 04

GEODETIC PARAMETERS: OSGB36 / British National Grid (EPSG:27700)

DRAWING TITLE

Figure 9-4:
Indicative Cable Corridor Vehicle Routing & Potential Access Options (Sub-Assessment C)

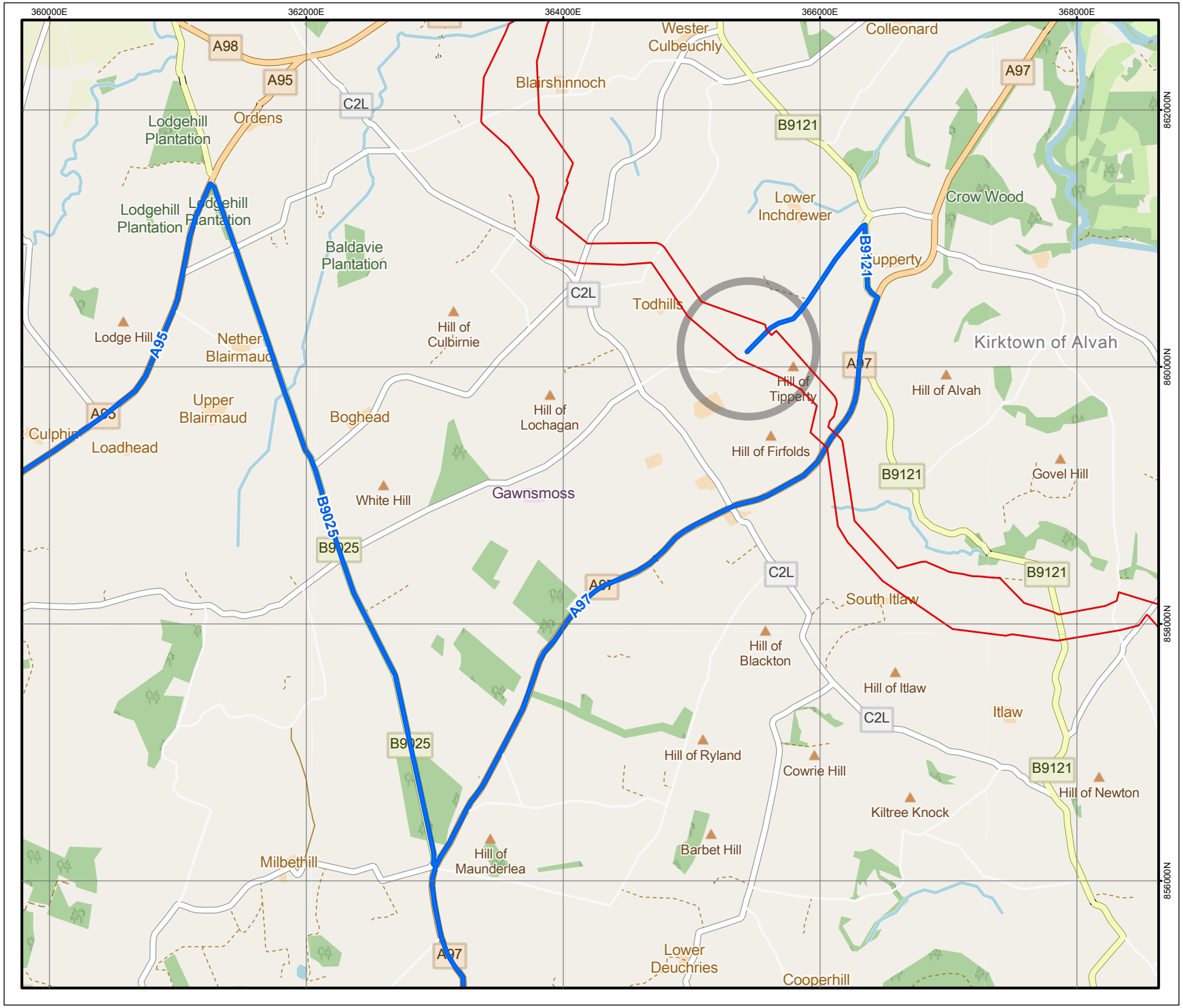
STATUS: Approved

SCALE: 1:40,000

DRAWING NUMBER: N/A

SHEET NO: 01 of 01

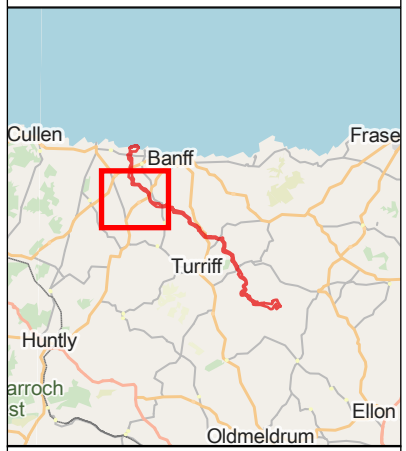
REV: N/A



Onshore Transmission Infrastructure Red Line Boundary

Indicative Access Point

Indicative Vehicle Routing



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01	22/04/2024	For Review	DF	NM	GS

CALEDONIA Offshore Wind Farm

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CONTRACTOR DRAWING NO: UKCAL1_ARP_WNF_ENV_MAP_00315

CONTRACTOR REV: 04

GEODETIC PARAMETERS: OSGB36 / British National Grid (EPSG:27700)

DRAWING TITLE

Figure 9-5:
Indicative Cable Corridor Vehicle Routing & Potential Access Options (Sub-Assessment D)

STATUS: Approved

SCALE: 1:40,000

DRAWING NUMBER: N/A

SHEET NO: 01 of 01

REV: N/A

Landfall Site

9.8.2.4 The current construction programme indicates that construction of the Landfall Site will be delivered from a single compound, provisionally accessed off the B9139. It is possible that this access point will also provide vehicular access to / from the most northern of the ONEC construction compound(s), however, this will be identified as part of the detailed design stage.

Onshore Export Cable Corridor

9.8.2.5 The *circa* 37km ONEC runs between the Landfall Site and the Onshore Substation Site. The ONEC has a width of approximately 100 – 500m.

9.8.2.6 As part of the design development process, a worst-case scenario of four Potential Access Points (PAP) to the main construction compounds has been assumed. The traffic associated with each scenario also includes the construction traffic which is directly attributable to the Landfall Site and Onshore Substation Site. Furthermore, the Landfall Site has been assumed to use the same northern most ONEC access point as identified under Figure 9-2, while the Onshore Substation Site includes its own access point, as shown under Figure 9-4. The main construction compounds will be located along the ONEC with smaller satellite compounds positioned every 2.5km (approximate). This is an estimate based upon the construction programme information available. The exact location and number of construction compounds will be identified at the detailed design stage.

9.8.2.7 Running along the full length of the ONEC will be a 'core' haul road, with a break in the road to allow for HDD construction activities and vehicle movements at the River Deveron. This internal haul road will allow construction vehicles to move between different areas and construction compounds while minimising the need to travel on the public road network. It is acknowledged, however, that where the ONEC crosses a public road, construction traffic will be required to exit the haul road/construction site, cross the public carriageway, then rejoin the haul road on the opposite side.

9.8.2.8 The four main construction compounds will each provide a 'hub' function within the length of the ONEC, providing space for material and plant storage as well as access to the satellite compounds. The final operational details of these main compounds will be further developed as part of the detailed construction programme, to be developed at the detailed design stage.

Onshore Substation Site

9.8.2.9 Based upon the construction information available, and subject to ongoing discussions with the current operator of the Moray East and New Deer Substations, construction of the Onshore Substation Site is currently programmed to be delivered from a single compound, with access taken via an existing junction on the western side of an unclassified road. The indicative construction compound location and PAP is illustrated in Photo 2. The junction is located approximately 500m south of Maryhill Farm.

Photo 2: Proposed location of Substation Site construction access (unclassified road, looking north)
Source: Google

9.8.2.10 This Onshore Substation Site access junction will be designed and delivered in accordance with Aberdeenshire Council highway design guidance.

Construction Vehicle Routing

9.8.2.11 Where plant or materials are required to be transport to / from the construction compounds, it has been assumed that these vehicles will originate from either a westerly, southerly or easterly location, with the total trip generation then being distributed equally between all three origins. Based upon the construction information available, 33.3% of all construction trips will therefore originate from a location west of the construction compound(s), 33.3% from a location south of the compound(s) and 33.3% from a location east of the compound(s).

9.8.2.12 The construction vehicle routing will then be based upon a hierarchy of rules or principles, as set out in Section 3.5 of Volume 7E, Appendix 9-2: Outline Construction Traffic Management Plan.

Construction Scenarios

9.8.2.13 As identified in Section 9.7.2.2, three scenarios have been developed and reviewed to identify the peak period of construction vehicle movements (i.e. the greatest trip generation). Table 9-13 summarises the trip generation of construction vehicles under each of the construction programmes with the 'concurrent' construction scenario identified as generating the greatest combined traffic volumes. It is this scenario that has therefore undergone a more detailed assessment, as set out in the following sections.

Construction Vehicle Categories

9.8.2.14 The majority of general construction traffic travelling to / from the construction compounds will fall under one of two categories, namely:

- Staff transport, Light Goods Vehicles (LGVs), including staff transport and vehicles <7.5t; and
- HGVs, including plant.

9.8.2.15 The construction process will also require the occasional transport of Abnormal Indivisible Loads (AILs). These movements include the transportation of over-sized loads to / from the construction compounds. For example, the transport of transformers, cable drums, etc.

9.8.2.16 Components classified as AILs will be determined by their dimensions and / or weight. Further details on AILs are set out in Section 9.8.11.

Construction Trip Generation (Concurrent)

9.8.2.17 In conjunction with the general construction traffic which will travel to / from the construction compounds via the public road network, a variety of on-site plant will also be in use, including grading tractors, excavators, HIAB-type cranes, forklifts, bulldozers, and dumper trucks. The majority of the earthmoving equipment will be transported onto site through the use of standard HGV low loaders.

9.8.2.18 Construction staff will typically arrive in private vehicles. On-site temporary parking will be provided at construction compounds with the number of spaces being considered on a case-by-case basis.

9.8.2.19 There may be opportunities for staff transport to use minibuses for larger groups of site operatives (for example, groups of staff commuting from local towns such as Banff). This approach will help minimise the number of staff vehicles on the public road network at any one time, particularly during the start and end of the daily work shifts.

9.8.2.20 It is expected that the standard construction hours will be from 07:00 to 19:00hrs, Monday to Friday and 07:00 to 12:00 hrs Saturday. This will, however, be reviewed as part of the full CTMP which will accompany the Approval of Matters Specified in Conditions (AMSC) application.

9.8.2.21 Based upon the provisional construction programme, a trip generation model has been used to forecast the number of construction vehicles related to the peak period, or 'worst case' scenario.

9.8.2.22 This trip generation has then been disaggregated into LGV movements (i.e. cars, vans <7.5t) and HGV movements (i.e. tipper lorries, articulated trucks, etc). The types of construction vehicles likely to be used will vary slightly depending on the construction programme and whether it relates to the Onshore Substation Site, the ONEC, or the Landfall Site. For example, the information set out in Table 9-14 provides an indication of the vehicle types which are likely to be

operating at the Onshore Substation Site. The ONEC and Landfall Site may require a different 'make-up' of vehicle types, but any such differences are expected to be minor.

Table 9-14: Construction scenario and example vehicle types for the Onshore Substation Site

Construction Compound	Construction Vehicle Types
Onshore Substation Site	Leading up to site access - (before construction commencement there will be no works but some visits) - Light vehicles/cars. Site surveys - 0 to 3 months - Light vehicles/vans. Enabling works 3 to 12 months - 20 T Wagons, Articulated flatbeds, Concrete mixers, Articulated low loaders, Light vehicles/vans. Civil works - 12 to 24 months - 20 T Wagons, Articulated flatbeds, Concrete mixers, Articulated low loaders, Light vehicles/vans. Mechanical completion - 24 months to 42 months - Articulated flatbeds, Articulated low loaders, cranes, Light vehicles/vans. Electrical completion 30 to 48 months - Light vehicles and vans. Commissioning 42 months to 60 months - Light vehicles/vans and light/mini excavators

9.8.2.23 The forecast number of HGV and LGV Annual Average Daily Trips (AADT) for use in this T&T assessment are summarised in Table 9-15.

Table 9-15: Construction vehicle generation (peak AADT), (Q1, 2030)

Construction element	HGVs (AADT)	LGVs (AADT)
Onshore Substation Site	14	154
Landfall Site	14	71
ONEC	101	69

9.8.2.24 Details on the origin(s) of the construction vehicles and load types is not yet available at this stage of the design process, however, indicative sources are as follows:

- Steelwork: various sources a determined by local content requirements;
- Concrete: various but within Scotland;
- Gravel: various;

- Cladding: expected to be a UK supplier;
- Asphalt: Scotland;
- Large Equipment: Europe;
- Small equipment: various (UK, Europe and Asia);
- Abnormal Loads, including transformers: arrival at Peterhead via sea, likely from Europe; and
- Construction / installation / civils equipment: Scotland (likely Aberdeen).

9.8.2.25 The routing of construction vehicles will depend upon the location of the construction compounds, with the intention that routing will prioritise 'A roads' wherever possible.

9.8.3 Traffic Flow Screening and Link Selection

Screening Approach

9.8.3.1 Based on the 2023 IEMA Guidance[3], a screening exercise should be undertaken to identify those roads, or receptors, which are required to undergo further assessment. Details on this are set out for the four sub-assessments in the sections below. Figure 9-2 to Figure 9-5 illustrate the location of each of the sub-assessments and their indicative access points in relation to the Onshore Cable Corridor.

Sub-Assessment Screening Results

9.8.3.2 Full details and results from the sub-assessment screening exercise are presented in Table 1-4 to Table 1-7 of Volume 7E, Appendix 9-3: Traffic and Transport Tables and Supporting Data.

9.8.3.3 Table 9-16 provides a summary of these results, identifying the percentage impact of the construction vehicles vs. the future year baseline (2030) for each of the 28 survey sites. Each of the sub-assessments reflects construction vehicles accessing the OnTI RLB at one of four indicative access points, each of which acts as a proxy as to how vehicles may enter / leave the construction area(s).

Table 9-16: Screening assessment summary for sub-assessment areas

Survey site	Road name	Screening criteria exceeded?			
		Sub-Assessment A	Sub-Assessment B	Sub-Assessment C	Sub-Assessment D
1	B9170	No	No	Yes	No
2	Unclassified	Yes	Yes	Yes	Yes
3	Unclassified	No	No	No	No
4	A97	Yes	No	No	Yes
5	A97	Yes	No	No	Yes
6	A98	No	No	No	No
7	A95	Yes	No	No	No
8	A98	No	No	No	No
9	B9139	Yes	Yes	Yes	Yes
10	B9139	No	No	No	No
11	A98	No	No	No	No
12	A947	No	No	No	No
13	A947	No	Yes	No	No

Survey site	Road name	Screening criteria exceeded?			
		Sub-Assessment A	Sub-Assessment B	Sub-Assessment C	Sub-Assessment D
14	B9170	No	No	No	No
15	A947	No	Yes	No	No
16	B9022	No	No	No	No
17	A95	No	No	No	No
18	Unclassified	No	No	No	No
19	B9105	No	No	No	No
20	B9170	No	No	No	No
21	Unclassified	Yes	Yes	Yes	Yes
22	A947	No	No	No	No
23	A98	No	No	No	No
24	B9121	No	No	No	No
25	A98	No	No	No	No
26	B9031	No	No	No	No

Survey site	Road name	Screening criteria exceeded?			
		Sub-Assessment A	Sub-Assessment B	Sub-Assessment C	Sub-Assessment D
27	B9025	No	Yes	No	Yes
28	A97	Yes	Yes	Yes	Yes

9.8.3.4 Based on the screening results presented in Table 9-16, those sites or receptors that exceed the criteria are required to undergo a more detailed assessment in accordance with the seven elements which were previously identified in Section 9.6.1.2, namely:

- Severance of communities;
- Driver and passenger delay;
- NMU delay;
- NMU amenity, including potential impacts on Aberdeenshire core paths and cycle routes;
- Fear and intimidation;
- Road user and pedestrian safety; and
- Hazardous / abnormal load review.

9.8.4 Magnitude of Change

9.8.4.1 Table 9-17 summarises the magnitude of the potential effects for each of those receptors that have been identified as requiring a further detailed assessment. The level of magnitude of the potential effects is based upon the criteria set out in Table 9-9, Section 9.6.1.3. As the level of magnitude is based upon the traffic flows at each of the receptor points, the magnitude of effect remains the same across all seven assessment categories (i.e. severance, driver delay, fear and intimidation, etc).

Table 9-17: Magnitude of change

Receptor Ref	Road	Sub-Assessment(s)	Receptor type / description	Magnitude
1	B9170	C	Rural single-carriage way	Negligible
2	Unclassified	A	Rural single-carriage way	Low
2	Unclassified	B	Rural single-carriage way	Low
2	Unclassified	C	Rural single-carriage way	Low
2	Unclassified	D	Rural single-carriage way	Low
4	A97	A	Rural single-carriage way	Low

Receptor Ref	Road	Sub-Assessment(s)	Receptor type / description	Magnitude
4	A97	D	Rural single-carriage way	Medium
5	A97	A	Rural single-carriage way	Low
5	A97	D	Rural single-carriage way	Low
7	A95	A	Rural single-carriage way	Negligible
9	B9139	A	Single lane, wide enough for 2 cars, passing places available for larger vehicles	High
9	B9139	B	Single lane, wide enough for 2 cars, passing places available for larger vehicles	Low
9	B9139	C	Single lane, wide enough for 2 cars, passing places available for larger vehicles	Low
9	B9139	D	Single lane, wide enough for 2 cars, passing places available for larger vehicles	Low
13	A947	B	Urban single-carriage way	Negligible
15	A947	B	Rural single-carriage way	Negligible
21	Unclassified	A	Narrow single lane with passing places	Low
21	Unclassified	B	Narrow single lane with passing places	Low
21	Unclassified	C	Narrow single lane with passing places	High
21	Unclassified	D	Narrow single lane with passing places	Low
27	B9025	B	Rural single-carriage way	Negligible

Receptor Ref	Road	Sub-Assessment(s)	Receptor type / description	Magnitude
27	B9025	D	Rural single-carriage way	Negligible
28	A97	A	Rural single-carriage way	Negligible
28	A97	B	Rural single-carriage way	Negligible
28	A97	C	Rural single-carriage way	Negligible
28	A97	D	Rural single-carriage way	Negligible

9.8.5 Construction – Severance

9.8.5.1 Within the context of an EIA traffic and movement assessment, severance is the perceived division that can occur within a community when it becomes separated by major transport infrastructure. This may include factors such as the difficulty of crossing a heavily trafficked road, road widths, traffic composition and traffic speeds.

9.8.5.2 The IEMA (2023)[3] guidelines suggest that for severance, receptor sensitivity values are based upon the traffic flow thresholds identified in Design Manual for Roads and Bridges (DMRB) LA 112 'Population and Human Health' (2020)[6]. These thresholds are replicated in Table 9-18 below.

Table 9-18: Construction effect – severance sensitivity thresholds

Sensitivity	Traffic flow threshold
High	Walking/cycling/horse crossing roads with >8,000 veh/day
Medium	Walking/cycling/horse crossing roads with >4,000 – 8,000 veh/day
Low	Walking/cycling/horse crossing roads with >500 - 4,000 veh/day
Negligible	Walking/cycling/horse crossing roads with very low / minimal traffic flows (<500 veh/day)

9.8.5.3 It's important to note that very low baseline flows, commonly found on lightly trafficked, rural roads, are unlikely to experience any / negligible severance impacts even with high percentage changes in traffic. This is taken into consideration in the following sub-assessments.

Sub-Assessment A

9.8.5.4 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-19 summarises the sensitivity of those receptors under Sub-Assessment A. It combines this sensitivity with the magnitude of effect, thus identifying the impact significance on severance of communities.

Table 9-19: Construction effect (severance), Sub-Assessment A

Receptor	Road	Magnitude of change	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
4	A97	Low	Low	Negligible
5	A97	Low	Low	Negligible
7	A95	Negligible	Low	Negligible
9	B9139	High	Negligible	Negligible
21	Unclassified	Low	Negligible	Negligible
28	A97	Negligible	Low	Negligible

9.8.5.5 As shown above, none of the receptors are expected to experience a moderate or major significance of effect within the context of severance during the construction phase. The results suggest that the construction activities will have minor or negligible effect on severance.

9.8.5.6 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment A within the context of severance.

Sub-Assessment B

9.8.5.7 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-20 summarises the sensitivity of those receptors under Sub-Assessment B. It combines this sensitivity with the magnitude of effect, thus identifying the impact significance on severance of communities.

Table 9-20: Construction effect (severance), Sub-Assessment B

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
9	B9139	Low	Negligible	Negligible
13	A947	Negligible	High	Negligible
15	A947	Negligible	Low	Negligible
21	Unclassified	Low	Negligible	Negligible
27	B9025	Negligible	Low	Negligible
28	A97	Negligible	Low	Negligible

9.8.5.8 As shown above, none of the receptors are expected to experience a moderate or major significance of effect within the context of severance during the construction phase. The results suggest that the construction activities will have minor or negligible effect on severance.

9.8.5.9 Based upon these results, no site-specific mitigation measures are expected to be required under Sub-Assessment B within the context of severance.

Sub-Assessment C

9.8.5.10 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-21 summarises the sensitivity of those receptors under Sub-Assessment C. It combines this sensitivity with the magnitude of effect, thus identifying the impact significance on severance of communities.

Table 9-21: Construction effect (severance), Sub-Assessment C

Receptor	Road	Magnitude	Sensitivity	Significance of effect
1	B9170	Negligible	Low	Negligible
2	Unclassified	Low	Negligible	Negligible
9	B9139	Low	Negligible	Negligible
21	Unclassified	High	Low	Minor
28	A97	Negligible	Low	Negligible

9.8.5.11 As shown above, none of the receptors are expected to experience a moderate or major significance of effect within the context of severance during the

construction phase. The results suggest that the construction activities will have minor or negligible effect on severance.

9.8.5.12 Based upon these results, no site-specific mitigation measures are expected to be required under Sub-Assessment C within the context of severance.

Sub-Assessment D

9.8.5.13 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-22 summarises the sensitivity of those receptors under Sub-Assessment D. It combines this sensitivity with the magnitude of effect, thus identifying the effect significance on severance of communities.

Table 9-22: Construction effect (severance), Sub-Assessment D

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
4	A97	Medium	Low	Minor
5	A97	Low	Low	Minor
9	B9139	Low	Negligible	Negligible
21	Unclassified	Low	Negligible	Negligible
27	B9025	Negligible	Low	Negligible
28	A97	Negligible	Low	Negligible

9.8.5.14 As shown above, none of the receptors are expected to experience a moderate significance of effect within the context of severance during the construction phase. The results suggest that all construction activities will have minor or negligible effect on severance.

9.8.5.15 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment D within the context of severance.

9.8.6 Construction – Driver and Passenger Delay

9.8.6.1 Delay to motorised vehicles (drivers and passengers) can typically occur at a number of points across the local road network, including:

- At the entrance to construction sites;
- Roads passing construction sites / the development site; or
- Increases in traffic flows impacting on junction and link capacities, increasing journey times and queue lengths.

9.8.6.2 As noted by the IEMA guidelines (2023)[3] these delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the local road network.

9.8.6.3 Junction capacity and vehicle / driver delay is typically based upon the technical work contained within a formal TA. However, as the Proposed Development (Onshore) is submitting a Planning Application in Principle, no such document will be submitted at this stage. The evaluation of significance on driver and passenger delay as a result of the Proposed Development (Onshore) is therefore based upon the sensitivity of receptor categories as outlined in Section 9.6.1.4.

Sub-Assessment A

9.8.6.4 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-23 summarises the sensitivity of those receptors under Sub-Assessment A. It combines this sensitivity with the magnitude of effect, thus identifying the effect significance on driver and passenger delay.

Table 9-23: Construction effect (driver and passenger delay), Sub-Assessment A

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Medium	Minor
4	A97	Low	Low	Negligible
5	A97	Low	Low	Negligible
7	A95	Negligible	Low	Negligible
9	B9139	High	Medium	Moderate
21	Unclassified	Low	Medium	Minor
28	A97	Negligible	Low	Negligible

9.8.6.5 As shown above, one receptor is expected to experience a moderate significant effect within the context of driver and passenger delay during the construction phase. Receptor 9 (on the B9139) is anticipated to experience a moderate significant effect, with construction activities having a minor or negligible effect on driver and passenger delay at all remaining receptors.

9.8.6.6 Based upon these results, mitigation measures will therefore be required for Sub-Assessment A and Receptor 9. Details on the proposed mitigation measures are set out in Section 9.11.

Sub-Assessment B

9.8.6.7 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-24 summarises the sensitivity of those receptors under Sub-Assessment B. It

combines this sensitivity with the magnitude of effect, thus identifying the effect significance on driver and passenger delay.

Table 9-24: Construction effect (driver and passenger delay), Sub-Assessment B

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Medium	Minor
9	B9139	Low	Medium	Minor
13	A947	Negligible	Medium	Negligible
15	A947	Negligible	Low	Negligible
21	Unclassified	Low	Medium	Minor
27	B9025	Negligible	Low	Negligible
28	A97	Negligible	Low	Negligible

9.8.6.8 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of driver and passenger delay during the construction phase. The results of Sub-Assessment B suggest that the construction activities will only have minor or negligible effect on driver and passenger delay.

9.8.6.9 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment B.

Sub-Assessment C

9.8.6.10 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-25 summarises the sensitivity of those receptors under Sub-Assessment C. It combines this sensitivity with the magnitude of effect, thus identifying the effect significance on driver and passenger delay.

Table 9-25: Construction effect (driver and passenger delay), Sub-Assessment C

Receptor	Road	Magnitude	Sensitivity	Significance of effect
1	B9170	Negligible	Low	Negligible
2	Unclassified	Low	Medium	Minor
9	B9139	Low	Medium	Minor
21	Unclassified	High	Medium	Moderate
28	A97	Negligible	Low	Negligible

9.8.6.11 As shown above, one receptor is expected to experience a moderate significant effect within the context of driver and passenger delay during the construction phase. Receptor 21 is anticipated to experience a moderate significant effect, with construction activities having a minor or negligible effect on driver and passenger delay at the remaining receptors.

9.8.6.12 Based upon these results, mitigation measures will therefore be required for Sub-Assessment C and Receptor 21. Details on the proposed mitigation measures are set out in Section 9.11.

Sub-Assessment D

9.8.6.13 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-26 summarises the sensitivity of those receptors under Sub-Assessment D. It combines this sensitivity with the magnitude of effect, thus identifying the effect significance on driver and passenger delay.

Table 9-26: Construction effect (driver and passenger delay), Sub-Assessment D

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Medium	Minor
4	A97	Medium	Low	Minor
5	A97	Low	Low	Negligible
9	B9139	Low	Medium	Minor
21	Unclassified	Low	Medium	Minor
27	B9025	Negligible	Low	Negligible
28	A97	Negligible	Low	Negligible

9.8.6.14 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of driver and passenger delay during the construction phase. The results of Sub-Assessment D suggest that the construction activities will only have minor or negligible effect on driver and passenger delay.

9.8.6.15 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment D.

9.8.7 Construction – Non-Motorised User Delay

9.8.7.1 The assessment of NMU delay generally serves as a proxy for the delay that NMUs may experience when crossing roads. Pedestrian delay and severance are closely related.

9.8.7.2 In clearly identified in the IEMA guidelines (2023)[3], given the range of local factors and conditions that can influence pedestrian delay (e.g. a discrete delay may have a lesser effect in an urban environment than a rural setting), it is not recommended to set down definitive thresholds.

9.8.7.3 Instead, it is recommended that careful judgment, combined with the traffic flow thresholds identified in DMRB LA 112 'Population and Human Health' (2020)[6] are used to determine the significance of effect.

Sub-Assessment A

9.8.7.4 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-27 summarises the sensitivity of those receptors under Sub-Assessment A. It combines this sensitivity with the magnitude of effect, thus identifying the impact significance on NMU delay.

Table 9-27: Construction effect (NMU delay), Sub-Assessment A

Receptor	Road	Magnitude of change	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
4	A97	Low	Low	Negligible
5	A97	Low	Low	Negligible
7	A95	Negligible	Low	Negligible
9	B9139	High	Negligible	Negligible
21	Unclassified	Low	Negligible	Negligible
28	A97	Negligible	Low	Negligible

9.8.7.5 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of NMU delay during the construction phase. The results suggest that the construction activities will only have minor or negligible effect on NMU delay.

9.8.7.6 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment A.

Sub-Assessment B

9.8.7.7 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-28 summarises the sensitivity of those receptors under Sub-Assessment B. It combines this sensitivity with the magnitude of effect, thus identifying the effect significance on NMU delay.

Table 9-28: Construction effect (NMU delay), Sub-Assessment B

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
9	B9139	Low	Negligible	Negligible
13	A947	Negligible	High	Negligible
15	A947	Negligible	Low	Negligible
21	Unclassified	Low	Negligible	Negligible
27	B9025	Negligible	Low	Negligible
28	A97	Negligible	Low	Negligible

9.8.7.8 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of NMU delay during the construction phase. The results suggest that the construction activities will only have minor or negligible effect on NMU delay.

9.8.7.9 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment B.

Sub-Assessment C

9.8.7.10 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-29 summarises the sensitivity of those receptors under Sub-Assessment C. It combines this sensitivity with the magnitude of effect, thus identifying the effect significance on NMU delay.

Table 9-29: Construction effect (NMU delay), Sub-Assessment C

Receptor	Road	Magnitude	Sensitivity	Significance of effect
1	B9170	Negligible	Low	Negligible
2	Unclassified	Low	Negligible	Negligible
9	B9139	Low	Negligible	Negligible
21	Unclassified	High	Low	Minor
28	A97	Negligible	Low	Negligible

9.8.7.11 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of NMU delay during the

construction phase. The results suggest that the construction activities will only have minor or negligible effect on NMU delay.

9.8.7.12 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment C.

Sub-Assessment D

9.8.7.13 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-30 summarises the sensitivity of those receptors under Sub-Assessment D. It combines this sensitivity with the magnitude of effect, thus identifying the effect significance on NMU delay.

Table 9-30: Construction effect (NMU delay), Sub-Assessment D

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
4	A97	Medium	Low	Minor
5	A97	Low	Low	Negligible
9	B9139	Low	Negligible	Negligible
21	Unclassified	Low	Negligible	Negligible
27	B9025	Negligible	Low	Negligible
28	A97	Negligible	Low	Negligible

9.8.7.14 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of NMU delay during the construction phase. The results suggest that the construction activities will only have minor or negligible effect on NMU delay.

9.8.7.15 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment D.

9.8.8 Construction – Non-Motorised User Amenity

9.8.8.1 In accordance with the IEMA (2023) guidelines[3] pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by elements including traffic flow, traffic composition and pavement width/separation from traffic.

9.8.8.2 The previous 1993 IMEA guidelines[7] suggest that a tentative threshold for judging the significance of change in pedestrian amenity is where the traffic flow (or HGV component) is halved or doubled. While this approach has been established in planning case law, it does not necessarily account for receptor

locations where little, or no pedestrian facilities are available. This is particularly relevant to many of the rural roads and receptor locations throughout the assessment area. The assessment of amenity must therefore pay full regard to specific local conditions and level of NMU facilities.

9.8.8.3 While the 2023 IEMA guidelines[3] make reference to documents such as Transport for London's (TfL) 'Guide to the Healthy Streets Indicators: Delivering the heathy streets approach'[8], such guidelines are not considered appropriate to the rural location of the majority of receptor points. The evaluation of significance on NMU amenity as a result of the Proposed Development (Onshore) is therefore based upon the sensitivity of receptor categories as outlined in Section 9.6.1.4.

9.8.8.4 It is important to understand, however, that the majority of the receptor points are located on rural roads where there are no NMU facilities and therefore very low levels of amenity. Given these locations wouldn't expect to have high levels of amenity due to their location in relation to (the lack of) surrounding NMU networks and trip origins / destination, each of these locations is assumed to have a 'negligible' receptor sensitivity.

Sub-Assessment A

9.8.8.5 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-31 summarises the sensitivity of those receptors under Sub-Assessment A. It combines this sensitivity with the magnitude of effect, thus identifying the effect on significance on NMU amenity.

Table 9-31: Construction effect (NMU amenity), Sub-Assessment A

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
4	A97	Low	Negligible	Negligible
5	A97	Low	Negligible	Negligible
7	A95	Negligible	Negligible	Negligible
9	B9139	High	Negligible	Negligible
21	Unclassified	Low	Negligible	Negligible
28	A97	Negligible	Negligible	Negligible

9.8.8.6 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of NMU amenity during the construction phase. The results suggest that all construction activities will only have minor or negligible effect on NMU amenity.

9.8.8.7 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment A.

Sub-Assessment B

9.8.8.8 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-32 summarises the sensitivity of those receptors under Sub-Assessment B. It combines this sensitivity with the magnitude of effect, thus identifying the effect on significance on NMU amenity.

Table 9-32: Construction effect (NMU amenity), Sub-Assessment B

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
9	B9139	Low	Negligible	Negligible
13	A947	Negligible	Negligible	Negligible
15	A947	Negligible	Negligible	Negligible
21	Unclassified	Low	Negligible	Negligible
27	B9025	Negligible	Negligible	Negligible
28	A97	Negligible	Negligible	Negligible

9.8.8.9 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of NMU amenity during the construction phase. The results suggest that all construction activities will only have minor or negligible effect on NMU amenity.

9.8.8.10 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment B.

Sub-Assessment C

9.8.8.11 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-33 summarises the sensitivity of those receptors under Sub-Assessment C. It combines this sensitivity with the magnitude of effect, thus identifying the effect on significance on NMU amenity.

Table 9-33: Construction effect (NMU amenity), Sub-Assessment C

Receptor	Road	Magnitude	Sensitivity	Significance of effect
1	B9170	Negligible	Negligible	Negligible
2	Unclassified	Low	Negligible	Negligible
9	B9139	Low	Negligible	Negligible
21	Unclassified	High	Negligible	Negligible
28	A97	Negligible	Negligible	Negligible

9.8.8.12 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of NMU amenity during the construction phase. The results suggest that all construction activities will only have minor or negligible effect on NMU amenity.

9.8.8.13 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment C.

Sub-Assessment D

9.8.8.14 Based upon the traffic flow thresholds presented in Table 9-18, Table 9-34 summarises the sensitivity of those receptors under Sub-Assessment D. It combines this sensitivity with the magnitude of effect, thus identifying the effect on significance on NMU amenity.

Table 9-34: Construction effect (NMU amenity), Sub-Assessment D

Receptor	Road	Magnitude	Sensitivity	Significance of effect
2	Unclassified	Low	Negligible	Negligible
4	A97	Medium	Negligible	Negligible
5	A97	Low	Negligible	Negligible
9	B9139	Low	Negligible	Negligible
21	Unclassified	Low	Negligible	Negligible
27	B9025	Negligible	Negligible	Negligible
28	A97	Negligible	Negligible	Negligible

9.8.8.15 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of NMU amenity during the

construction phase. The results suggest that all construction activities will only have minor or negligible effect on NMU amenity.

9.8.8.16 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment D.

9.8.9 Construction – Fear and Intimidation

9.8.9.1 The 2023 IEMA guidelines[3] notes that the extent of fear and intimidation is partly dependant on, but not limited to, the following:

- Total volume of traffic, including HGV composition;
- The speed of vehicles; and
- The proximity of traffic to people, or people's feeling of lack of protection from traffic flows.

9.8.9.2 There are no commonly agreed thresholds for estimating levels of danger from known traffic and physical conditions. A weighting system has therefore been developed by IEMA and applied as part of this assessment. The assessment process, used to identify the sensitivity of receptors, is based upon calculating a 'hazard' score which is based on traffic flows.

9.8.9.3 While the IEMA guidelines suggest using 18-hour traffic flows, the overall T&T assessment presented by this chapter uses 24 hour AADT. It is therefore considered appropriate to continue using the 24 hour AADT flows, particularly as it will maintain consistency throughout each of the sub-assessments.

9.8.9.4 Table 9-35 sets out how a 'hazard' score is identified and assigned based on traffic flows, composition and vehicle speeds.

Table 9-35: Construction effect (fear and intimidation), hazard score categories

AADT, all vehicles (a)	AADT, HGV (b)	Average vehicle speed, mph (c)	Degree of hazard score
>1,800	+3,000	>40	30
1,200 – 1,800	2,000 – 3,000	30-40	20
600 – 1,200	1,000 – 2,000	20-30	10
<600	<1,000	<20	0

9.8.9.5 The total score from all three elements (i.e. AADT, HGV, vehicle speeds) is then combined to provide an indicative 'level' of fear. This has then been aligned with an assumed level of receptor sensitivity, as shown in Table 9-36.

Table 9-36: Construction effect (fear and intimidation), total hazard score

Level of fear and intimidation	Receptor Sensitivity	Total hazard score (a) + (b) + (c)
Extreme	High*	>71
Great	High*	41 – 70
Moderate	Medium	21 – 40
Small	Low	11 – 20
-	Negligible	0 – 10

***** To maintain consistency with the measurement of receptor sensitivity across the other seven elements, the highest level remains 'high'.

9.8.9.6 With receptor sensitivity now identified, the magnitude of effect is approximated with reference to the changes in the level of fear and intimidation from baseline traffic conditions, as summarised in Table 9-37.

Table 9-37: Construction effect (fear and intimidation), hazard score and magnitude

Magnitude of effect	Change in step/traffic flows (AADT) from baseline conditions
High	Two step changes in level
Medium	One step change in level, but with: >400 veh AADT, all vehicles; and/or >500 veh AADT, HGV.
Low	One step change in level, but with: <400 veh AADT, all vehicles; and/or <500 veh AADT, HGV.
Negligible	No change in step changes

Sub-Assessment A

9.8.9.7 Table 9-38 summarises the significance of the 'level' of fear and intimidation associated with Sub-Assessment A.

Table 9-38: Construction effect (fear and intimidation), Sub-Assessment A

Receptor	Receptor Sensitivity	Magnitude	Significance of effect
2	Negligible	Negligible	Negligible
4	Medium	Negligible	Negligible
5	Medium	Negligible	Negligible
7	Medium	Negligible	Negligible
9	Negligible	Negligible	Negligible
21	Negligible	Negligible	Negligible
28	High	Low	Minor

9.8.9.8 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of fear and intimidation during the construction phase. The results suggest that all construction activities will only have minor or negligible effect on fear and intimidation.

9.8.9.9 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment A.

Sub-Assessment B

9.8.9.10 Table 9-39 summarises the significance of the 'level' of fear and intimidation associated with Sub-Assessment B.

Table 9-39: Construction effect (fear and intimidation), Sub-Assessment B

Receptor	Receptor Sensitivity	Magnitude	Significance of effect
2	Negligible	Negligible	Negligible
9	Negligible	Negligible	Negligible
13	Medium	Negligible	Negligible
15	High	Negligible	Negligible
21	Negligible	Negligible	Negligible
27	High	Low	Minor
28	Medium	Negligible	Negligible

9.8.9.11 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of fear and intimidation during the

construction phase. The results suggest that all construction activities will only have minor or negligible effect on fear and intimidation.

9.8.9.12 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment B.

Sub-Assessment C

9.8.9.13 Table 9-40 summarises the significance of the 'level' of fear and intimidation associated with Sub-Assessment C.

Table 9-40: Construction effect (fear and intimidation), Sub-Assessment C

Receptor	Receptor Sensitivity	Magnitude	Significance of effect
1	High	Negligible	Negligible
2	Negligible	Negligible	Negligible
9	Negligible	Negligible	Negligible
21	Negligible	Negligible	Negligible
28	Medium	Negligible	Negligible

9.8.9.14 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of fear and intimidation during the construction phase. The results suggest that all construction activities will only have minor or negligible effect on fear and intimidation.

9.8.9.15 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment C.

Sub-Assessment D

9.8.9.16 Table 9-41 summarises the significance of the 'level' of fear and intimidation associated with Sub-Assessment D.

Table 9-41: Construction effect (fear and intimidation), Sub-Assessment D

Receptor	Receptor Sensitivity	Magnitude	Significance of effect
2	Negligible	Negligible	Negligible
4	Medium	Negligible	Negligible
5	Medium	Negligible	Negligible
9	Negligible	Negligible	Negligible
21	Negligible	Negligible	Negligible
27	High	Low	Minor
28	Medium	Negligible	Negligible

9.8.9.17 As shown above, none of the receptors are expected to experience a moderate or major significant effect within the context of fear and intimidation during the construction phase. The results suggest that all construction activities will only have minor or negligible effect on fear and intimidation.

9.8.9.18 Based upon these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment D.

9.8.10 Construction – Road User and Pedestrian Safety

9.8.10.1 When assessing the likely change in the number of accidents as a direct result of a development, Personal Injury Accident (PIA) rates are commonly used as a unit of measurement. These are typically reported in terms of million vehicle km's (MVKM).

9.8.10.2 Due to the large spatial extent of the assessment area, as well as the lack of detailed traffic data for every single road and link within this wide area (i.e. data on a link-by-link basis, which is not feasible), an assessment of PIA rates has been undertaken on a focused area surrounding each receptor. This area is defined and measured along a 2km stretch of road on which the receptor is located. This comprises 1km upstream and 1km downstream of the receptor in question.

9.8.10.3 The significance of effect is then based on the difference between the two scenarios in terms of the number of accidents per MVKM, based upon industry standard accident rates (TAG Data Book v1.22, November 2023)[9]. These rates are based upon road type (or category), number of lanes, speed limits, and the surrounding environment (i.e. rural, urban).

9.8.10.4 This is considered to be a useful proxy when understanding the extent of any potential change in accident rates as a result of the Proposed Development (Onshore).

Sub-Assessment A

9.8.10.5 Table 9-42 summarises the calculated accident rates for the base 2030 traffic scenario vs. the construction 2030 traffic scenario. This allows the change in the number of anticipated accidents as a result of the Proposed Development (Onshore) to be identified. This is not based on magnitude of effect or receptor sensitivity. Instead, it summarises the quantum of the change.

Table 9-42: Construction effect (road user and pedestrian safety), Sub-Assessment A

Receptor	Road	Accidents per quarter		
		Base 2030	Construction 2030	Difference (rounded)
2	Unclassified	0.010	0.029	+0.019
4	A97	0.004	0.080	+0.076
5	A97	0.004	0.097	+0.093
7	A95	0.037	0.078	+0.041
9	B9139	0.008	0.045	+0.037
21	Unclassified	0.010	0.026	+0.016
28	A97	0.042	0.097	+0.055
Total		**0.115**	**0.452**	**+0.337**

Sub-Assessment B

9.8.10.6 Table 9-43 summarises the calculated accident rates for the base 2030 traffic scenario vs. the construction 2030 traffic scenario. This allows the change in the number of anticipated accidents as a result of the Proposed Development (Onshore). This is not based on magnitude of effect or receptor sensitivity. Instead, it summarises the quantum of the change.

Table 9-43: Construction effect (road user and pedestrian safety), Sub-Assessment B

Receptor	Road	Accidents per quarter		
		Base 2030	Construction 2030	Difference (rounded)
2	Unclassified	0.010	0.029	+0.020
9	B9139	0.008	0.020	+0.013
13	A947	0.303	0.618	+0.316
15	A947	0.097	0.202	+0.106
21	Unclassified	0.010	0.026	+0.017
27	B9025	0.052	0.107	+0.055
28	A97	0.042	0.094	+0.051
Total		**0.521**	**1.097**	**+0.576**

Sub-Assessment C

9.8.10.7 Table 9-44 summarises the calculated accident rates for the base 2030 traffic scenario vs. the construction traffic 2030 scenario. This allows the change in the number of anticipated accidents as a result of the Proposed Development (Onshore). This is not based on magnitude of effect or receptor sensitivity. Instead, it summarises the quantum of the change.

Table 9-44: Construction effect (road user and pedestrian safety), Sub-Assessment C

Receptor	Road	Accidents per quarter		
		Base 2030	Construction 2030	Difference (rounded)
1	B9170	0.057	0.120	+0.063
2	Unclassified	0.010	0.029	+0.020
9	B9139	0.008	0.020	+0.013
21	Unclassified	0.010	0.033	+0.023
28	A97	0.042	0.094	+0.051
Total		**0.126**	**0.296**	**+0.170**

Sub-Assessment D

9.8.10.8 Table 9-45 summarises the calculated accident rates for the base 2030 traffic scenario vs. the construction 2030 traffic scenario. This allows the change in the number of anticipated accidents as a result of the Proposed Development (Onshore). This is not based on magnitude of effect or receptor sensitivity. Instead, it summarises the quantum of the change.

Table 9-45: Construction effect (road user and pedestrian safety), Sub-Assessment D

Receptor	Road	Accidents per quarter		
		Base 2030	Construction 2030	Difference (rounded)
2	Unclassified	0.010	0.029	+0.020
4	A97	0.004	0.021	+0.016
5	A97	0.004	0.018	+0.013
9	B9139	0.008	0.020	+0.013
21	Unclassified	0.010	0.026	+0.017
27	B9025	0.052	0.107	+0.055
28	A97	0.042	0.094	+0.051
Total		**0.130**	**0.315**	**+0.185**

Sub-Assessment Comparisons (road user and pedestrian safety)

9.8.10.9 When considering the projected changes in PIAs across all four sub-assessments, the most significant safety impact, or the 'worst case' scenario, is found under Sub-Assessment B. This assessment predicts an increase of 0.576 PIAs in the first quarter of 2030. Importantly, this applies solely to the receptors listed under Table 9-49, not across the entire T&T assessment area. In other words, across these seven receptors (combined) the potential change in PIAs as a result of the construction vehicles in Q1, 2030 is an increase of 0.576. This is based on the DfT's TAG Data Book standard accident rates, as explained in Section 9.8.10.4.

9.8.10.10 While this increase is considered minor and likely to have a negligible effect on the actual frequency and severity of accidents across these seven receptors, for the purposes of this T&T assessment all accidents are considered to have a 'high' sensitivity. Given that the highest magnitude under Sub-Assessment B is 'low', construction activities are anticipated to have a minor significant effect within the context of road user and pedestrian safety.

9.8.10.11 Based on these results, no receptor-specific mitigation measures are expected to be required under Sub-Assessment B.

9.8.11 Construction – Hazardous and Abnormal Load Review / Abnormal Indivisible Loads

9.8.11.1 Potential conflict between construction traffic and other road users may arise through the transport of Abnormal Indivisible Loads (AILs). This is expected to be due to the dimensions of the loads or the necessity to hold back traffic in constrained areas. Areas of conflict may include:

- In rural areas where wide loads might straddle the centre white line, potentially encountering fast-moving oncoming traffic;
- At road junctions where turning AILs require other traffic to yield on other approach arms;
- Road-side signage, lighting columns or other structures that may restrict the passing of over-sized loads;
- Weight limits on existing culverts and / or bridges that may limit the number of route options available to contractors; and
- The transport of over-sized loads through residential areas or past other sensitive receptors (i.e. schools, etc.).

9.8.11.2 Routes that pass through urban areas present distinct challenges for the transport of abnormal loads (for example, routing through Maud or New Deer to the east of the Substation Site, or Turriff on the southern side of the ONEC). While vehicle speeds may be lower than when compared to rural roads or where national speed limits above 30mph apply, there are increased potential conflicts with other road users, including pedestrians, cyclists, local vehicular traffic, parked vehicles, side junctions, and street furniture.

9.8.11.3 It is anticipated that any AIL will most likely consist of the transportation of electricity transformers. The dimensions of the single largest load (expected to be a 500 MVA transformer) will be approximately 6.0m long, 2.5m wide, 3.0 high, and 1,000 – 1,500 tonnes. The key element impacting on the routing will therefore be weight.

9.8.11.4 Abnormal loads will be transported using multi-axle low loaders via a surveyed route, originating most likely from Peterhead via the Maryhill crossroads. Given that the size of the 500 MVA 275/400kV transformers will be of a similar length to those that were used for the neighbouring Moray East development (i.e. 340 MVA transformers), it is likely that similar multi-axle trailers and tractor units will be used.

9.8.11.5 Cable drums will be delivered using standard low loader HGV. As such these loads are therefore not considered to fall under the AIL category.

9.8.11.6 Full details on the proposed mitigation strategy for AILs is set out in Section 9.11.5.

9.8.12 Operation

9.8.12.1 The low number of likely operational traffic movements, in comparison to the construction phase, provide a safe assumption that the environmental effects during this phase will not exceed that of the construction phase. Based on this, the operational phase has been scoped out of this T&T chapter.

9.8.13 Decommissioning

9.8.13.1 Upon reaching the end of its operational life, the anticipated scenario involves the cessation of the Proposed Development (Onshore), with the removal of all above-ground structures and necessary ground remediation for potential future re-use. The future Offshore Transmission Owner (OFTO) will conduct an assessment at that juncture to determine whether any infrastructure should be retained for future purposes.

9.8.13.2 While decommissioning traffic volumes are not yet known at this stage, it is expected that for the Onshore Substation Site they will be similar to that of the construction phase. However, the ONEC will generate little (if any) traffic as it is assumed this will remain in situ during and after decommissioning. On that basis, it is considered that undertaking an assessment of the construction phase provides a clear understanding of any potential impacts without the need to undertake a separate decommissioning assessment.

9.8.13.3 The decommissioning phase has therefore been scoped out of this T&T assessment.

9.9 Cumulative Effects

9.9.1 Application of TEMPro

9.9.1.1 The T&T assessment is inherently cumulative due to the application of traffic growth factors, as derived from the DfT TEMPro tool (version 8)[10]. This industry standard platform is commonly applied to a wide variety of projects, including those within an EIA context, when needing to forecast future year traffic growth.

9.9.1.2 TEMPro enables traffic growth factors from the DfT NTEM to be derived. This allows the application of forecast local trip ends to estimate traffic growth from regional or national growth. Amongst other inputs and datasets, these factors account for the following:

- Population projections at local authority level (in this case, Aberdeenshire);
- Household information for 2021 to 2061;
- Dwelling projects based on existing local authority Local Development Plans, on effective five-year land supply;
- Employment projections, disaggregated by sector, gender and working status;

- Income index or Gross Domestic Product (GDP) per household within the related car ownership model; and
- Car purchase and running costs.

9.9.1.3 Based upon the inputs and supporting datasets as set out above (Section 9.9.1.2), the potential effect on future traffic changes at the local authority level is accounted for. This includes potential increases in traffic flows *and* potential decreases. The advantage of this approach is that it accounts for *all* potential future traffic changes across the wider network and not simply those that are directly related to a small number of committed developments that will affect a much smaller portion of the surrounding local road network.

9.9.1.4 While the T&T assessment inherently accounts for potential cumulative effects on vehicular traffic flows in the future baseline, it is still considered useful to review the developments listed in Volume 7A, Appendix 7-1: Cumulative Impact Assessment Methodology and how these may impact on the T&T assessment. This is explained in Section 9.9.2 (below).

9.9.2 Effects of other Developments

9.9.2.1 Following a review and screening exercise on a list of potential committed developments for use in the cumulative assessment, as supplied by Aberdeenshire Council, those developments that have been identified as being potentially related to the T&T assessment include the following:

- A) Formation of Onshore Landfall point, laying of underground cable and erection of substation (APP/2023/1454), located north of Peterhead to south of Deer Green Volt offshore wind farm (Flotation Energy Ltd);
- B) Greens 400kv substation (planning application reference unavailable at time of T&T assessment), located at Site 13 Greens (Scottish and Southern Electricity Network);
- C) Stromar offshore wind farm (planning application reference unavailable at time of T&T assessment), unknown location (Stromar Offshore Wind Farm Limited); and
- D) Beauly to Blackhillock to New Deer to Peterhead 400kv Connection (pre-application reference: ECU00005165).

9.9.2.2 Table 9-46 sets out the traffic data that is available for each of the above developments and how this relates to the Proposed Development (Onshore). The key piece of information that is required from each development is the vehicle generation and distribution of their forecast construction traffic. Without this, it is not possible to undertake a separate, quantifiable cumulative assessment.

Table 9-46: Cumulative assessment developments and relationship with the Proposed Development (Onshore)

Development ref and Planning Application ref	Location	Vehicle distribution	Response
A APP/2023/1454	Land from north of Peterhead to south of New Deer, Green Volt Offshore Wind Farm, Aberdeenshire	*"… it has been assumed that cable route trips will occur at each access point as a worst-case scenario"* (Pell Frischmann, 2023)[11]	This T&T assessment for the Proposed Development (Onshore) follows a similar approach to that used for the assessment of the committed development. All construction vehicles are assumed to enter the construction area(s) via a series of single access points. A 'worst case' scenario approach to the assessment of the committed development has also been applied, as mirrored by this T&T assessment for the Proposed Development (Onshore). The construction programme for this committed development is anticipated to commence in 2025 and run for 30 months, with a peak period of construction activity expected to occur in August 2025. This T&T assessment for the Proposed Development (Onshore) is based upon a 'worst case' scenario in 2030. This committed development will therefore have moved into its operational phase by 2030. Importantly, as stated on page 9 of its associated TA, *"the operational phase is restricted to occasional maintenance operation which generates significantly lower volumes of traffic that are not considered to be in excess of daily traffic variation levels on the road network"* (Pell Frischmann, 2023). It can therefore be assumed that by 2030 any operational traffic associated with this committed development will be sufficiently low that it will have a negligible impact on the operation of the surrounding road network. Furthermore, the TA (Pell Frischmann, 2023) does not include any

Development ref and Planning Application ref	Location	Vehicle distribution	Response
			information or data on the likely traffic generation associated with its operational phase. Nonetheless, depending upon grid confirmation and / or the result of any associated commercial discussions there remains a small possibility of overlap between the construction phasing of both the committed development and the Proposed Development (Onshore), and so in the interests of undertaking a robust assessment and understanding any potential cumulative impacts, a qualitative assessment has been undertaken, as set out in Section 9.9.2.3 below.
B Planning ref: n/a	Greens 400kV Substation	The traffic distribution data for this committed development was unavailable at the time of assessment. However, the traffic data used for this T&T assessment can be made available to third parties for them to undertake a cumulative assessment if required.	No data on the estimated construction vehicle generation and/or distribution is provided in the associated planning documents. No cumulative assessment required.
C Planning ref: unknown	Stromar Offshore Wind Farm	The traffic distribution data for this committed development was unavailable at the time of assessment. However, the traffic data used for this T&T assessment can be made available to third parties for them to undertake a cumulative assessment if required.	This development is currently at the scoping stage. No data on the estimated construction vehicle generation and/or distribution is therefore available. No cumulative assessment required.

Development ref and Planning Application ref	Location	Vehicle distribution	Response
D Pre-application ref: ECU00005165	Beauly to Blackhillock to New Deer to Peterhead 400kv Connection	The traffic distribution data for this committed development was unavailable at the time of assessment. However, the traffic data used for this T&T assessment can be made available to third parties for them to undertake a cumulative assessment if required.	This development is currently at the scoping stage, with the Scoping Report dated June 2024. No data on the estimated construction vehicle generation and/or distribution was available at the time of assessment. This includes the location of construction compounds, location of access points into/out of the construction corridor, and the proposed construction vehicle routing. No cumulative assessment required.

9.9.2.3 As part of application, APP/2023/1454, the Greenvolt Traffic and Transport assessment (Pell Frischmann, 2023), traffic data was collected at 14 sites or receptor points. While the majority of the construction traffic associated with APP/2023/1454 is predicted to travel to/from the east (i.e. beyond the assessment area of this T&T assessment), a small number of sites overlap or are located along the same link as those assessed within this chapter. These are summarised in Table 9-47. The same table also summarises the results of the APP/2023/1454 T&T assessment for these sites and the predicted residual effect.

Table 9-47: Survey site location comparison and significance of effect - Greenvolt vs. the Proposed Development (Onshore)

Proposed Development (Onshore)			APP/2023/1454		
Survey site	**Road**	**Significance (pre-mitigation)**	**Survey site**	**Road**	**Residual effect (post-mitigation)**
1		No significant effects	4	A948, south-east of New Deer	Minor adverse – not significant
2		No significant effects	1	Unnamed road, at NGNDSS	Minor adverse – not significant
22		No significant effects	14	A947, Tulloch	Minor adverse – not significant

9.9.2.4 As shown above, the survey sites, or receptors, that form the basis of this T&T assessment, and that also mirror the approximate location of the 3 'equivalent' sites that have been used as part of APP/2023/1454 assessment, all suggest no significant effects as a result of either the Proposed Development (Onshore) or APP/2023/1454 (post-mitigation).

9.9.2.5 On the assumption that all proposed mitigation measures are put in place as part of the construction of both schemes (i.e. the CTMP), this cumulative assessment suggests no significant effects. Crucially, as these are related to construction activities, any such effects will still also only be temporary.

9.9.3 Summary

9.9.3.1 Based upon the above, and that the T&T assessment presented in Section 9.8 is inherently cumulative, the assessment results presented by this chapter already account for the developments identified in Volume 7A, Appendix 7-1: Cumulative

Impact Assessment Methodology. No further cumulative assessment is therefore required in relation to the main T&T assessment. This applies to the construction, operation and decommissioning phases.

9.9.3.2 It is important to note that consultation remains ongoing with developers with regards to refining the potential construction traffic timing and vehicle numbers. The Applicant will continue this dialogue in order to manage future potential construction traffic impacts.

9.10 In-combination Effects

9.10.1.1 In-combination effects may occur through the inter-relationship with another EIAR topic that may lead to different or greater environmental effects than in isolation.

9.10.1.2 There is also the potential for in-combination effects resulting from onshore and offshore works. These are identified within Volume 6, Chapter 5: Intertidal Assessment and are therefore not repeated here.

9.10.1.3 The generation of construction traffic has the potential to impact receptors in terms of noise. These impacts have been taken into account in Volume 5, Chapter 8: Airbourne Noise and Vibration.

9.11 Mitigation Measures and Monitoring

9.11.1 Construction Traffic Management Plan

9.11.1.1 One of the key mitigation measures that will be implemented as part of the construction programme is the Outline Construction Traffic Management Plan. The Outline CTMP is presented in Volume 7E, Appendix 9-2: Outline Construction Traffic Management Plan.

9.11.1.2 The contents of the Outline CTMP are based upon a 'worst case' scenario whereby the greatest volume of construction traffic has been identified and then routed through the surrounding local road network.

9.11.1.3 The contents of the Outline CTMP set out a basic framework and series of vehicle management actions or principles that will help facilitate the safe operation of construction vehicles to, from, and within the limits of the OnTI RLB. The Outline CTMP is based upon the information available at the time of writing, including but not limited to, an estimation on the location and number of construction compounds (derived from a provisional construction programme).

9.11.1.4 A detailed CTMP will be prepared as part of the AMSC planning applications. The CTMP will include further details of specific construction activities, detailed vehicle route assessments, site compound operations and swept path assessments.

9.11.1.5 A Construction Environmental Management Plan (CEMP) will also be developed in parallel to the CTMP, setting out a series of site-specific measures which will be implemented to reduce the effect of noise, dust and excessive vehicle speeds.

9.11.1.6 Following the Outline CTMP, the detailed CTMP will be prepared to identify any potential constraints along the routes identified in Section 9.8.2.11.

9.11.1.7 Potential constraints may include, but will not necessarily be limited to, the following:

- Sub-standard roads or junctions that, based on their current configuration, will not be able to accommodate the swept paths of the forecast construction vehicles;
- Insufficient visibility, particularly at construction access points / junctions;
- Where third party land may be required to provide temporary junction upgrades; or
- The presence of culverts or other structures which are unable to accommodate the weight of the anticipated construction vehicles.

9.11.1.8 As part of a more detailed route constraint review, the full CTMP will include:

- Consideration of verge protection and tree canopies which may foul loads;
- Condition surveying to ascertain the extents of existing road defects prior to construction commencing thereby protecting the developer from spurious damage claims from highway owners / operators;
- A detailed review of recorded accidents and injury data along the proposed vehicle routes. It is expected that this will help inform the development of temporary mitigation measures. The main T&T assessment includes further details of this accident review;
- Swept path assessments at the access points to demonstrate the extents of any temporary over-run areas that may be required, including widened junction bell-mouths. Assessment of the required Aberdeenshire Council visibility splay requirements will also form part of this process; and
- Identification of the limits of the adopted public road.

9.11.2 General Traffic Mitigation Controls

9.11.2.1 The mitigation of any negative effects resulting from the movement of construction vehicles will be managed through the adoption of a 'considerate contractor' approach.

9.11.2.2 Full details of this are set out in Section 4.1 of Volume 7E, Appendix 9-2: Outline Construction Traffic Management Plan.

9.11.3 Signage

9.11.3.1 Signage will be used to warn drivers on the approaches to the affected sections of the local road network, especially in the case of diversions or to advise drivers construction traffic may be in operation along specific routes. Traffic management signage will be provided in accordance with the Traffic Signs Regulations and General Directions (TSRGD) 2016 and Traffic Signs Manual Chapter 8[12].

9.11.3.2 Signage will be used to inform public / staff of compound or delivery areas and speed reductions (i.e. a speed limit of 10mph on the approach to construction site access points). A plan showing all routes and their associated signage will be created as part of the detailed CTMP.

9.11.3.3 Advance warning signs will be provided in advance of all construction access points. Where crossings are proposed, 'Heavy Plant Crossing' signs will be provided on public roads. Site access junctions will also feature 'Caution Site Entrance' signs.

9.11.4 Pedestrian, Cycle and Horse Access Management

9.11.4.1 It will be important to carefully manage all construction activities such that any potential impacts on existing core paths or other Public Rights of Way (PRoW) are kept to a minimum. This is particularly relevant in terms of the existing core path which runs along the coastline on the northern boundary of the Landfall Site as well as the local path that crosses the ONEC, providing access to/from the Boyndie Visitor Centre and the Boyndie onshore wind farm.

9.11.4.2 To mitigate any potential impact, measures will be put in place to ensure that all construction areas are fenced off with clear, warning signs of any potential dangers to NMU's. Construction activities will be planned such that any impact on existing paths will be minimised and diversions avoided where possible. Where temporary path diversions *are* required, this will be for as short a period as possible, with the path being fully re-instated to its original form post-construction.

9.11.4.3 More generally, wherever there are likely to be any potential interactions between construction traffic and NMU's, the following actions will feature as part of a wider Access Management Plan (to be submitted at the detailed design stage):

- Enforcement of construction vehicle speed limits, particularly where construction activities are in close proximity to core paths and other PRoW;
- Signage at all site access points, to remind drivers of the potential presence of pedestrians, cyclists or horse riders;
- Training for all site staff to include the identification of measures which focus on minimising potential accidents between construction vehicles, horses, and

their riders. Such measures, as recommended by the British Horse Society, include;

- Upon seeing horses, drivers must slow down and stop (where safe to do so);
- Minimising the use of air brakes (due to their loudness); and
- When overtaking, drivers must ensure the rider is aware of their presence and give sufficient space between the horse and vehicle.

9.11.4.4 Finally, it is also proposed that any relevant, up-to-date information relating to construction activities is made available through the project website, local newsletters and social media.

9.11.5 Internal Roads Management

9.11.5.1 The management of construction vehicles applies to movements throughout the wider road network but also within the construction sites themselves. Internal vehicle movements will be managed through a series of site-specific rules, as detailed in Section 4.5 of Volume 7E, Appendix 9-2: Outline Construction Traffic Management Plan.

9.11.6 AIL Mitigation

Planning and Key Actions

9.11.6.1 The number of AIL's are not yet known at this stage in the design process, however, it will be identified as part of the final CTMP and AMSC applications where a detailed AIL report will be prepared, clearly setting out load types and routing. Following the implementation of the planning and mitigation measures set out below, it is expected that the management of the transport of AIL's will not give rise to any significant effects.

9.11.6.2 A full convoy operation plan will be developed in consultation with Aberdeenshire Council and Police Scotland representatives (Transport Scotland will also be included in discussions where / if the Strategic Road Network (SRN) is required). This plan will be developed and agreed *before* deliveries to the site will commence.

9.11.6.3 The routing of these loads will be subject to detailed discussions between the contractor, Aberdeenshire Council and Police Scotland. Transport Scotland will also be consulted where / if the movement of AILs requires the use of the trunk road or Strategic Road Network (SRN). All AIL routing will look to avoid populated areas, peak periods, and routes with infrastructure constraints such as bridge weight limits.

9.11.6.4 A detailed review of potential AIL routes will be required for determining junctions that may have constraints for AIL's and their respective convoys. Such

a review will also allow for swept path assessments for the worst-case scenarios, such as the delivery of transformers.

9.11.6.5 AIL signage will be required at the beginning of all routes, as well as along routes where other roads will be connected via junctions. This is to inform road users of AIL's operating in the area, with specific dates and times.

9.11.6.6 It is proposed that all AILs will be delivered under full Police and civilian escort. The escorts and convoy will remain in radio contact at all times.

9.11.6.7 Contingency and Incident Plans for incidents such as tyre punctures, breakdowns and accidents are set out below. In all situations, the safety of personnel and the public is central to the transport of AILs and all reasonable steps to ensure this safety will be undertaken.

9.11.6.8 The timing of deliveries significantly influences the potential effect of convoys on the road infrastructure and surrounding receptors. It's generally advisable to schedule convoy movements outside of peak traffic periods to minimise their effect on background traffic flows.

9.11.6.9 The times at which the convoys will travel will therefore be agreed with the Police. Typical delivery times for similar projects has seen the very early morning periods used in constrained sections as traffic levels are generally lighter than those found in the afternoon, and disruption is therefore minimised.

9.11.6.10 The routing of these loads will be subject to detailed discussions between the contractor, Aberdeenshire Council and Police Scotland. Transport Scotland will also be consulted where / if the movement of AILs requires the use of the trunk road or Strategic Road Network (SRN). All AIL routing will look to avoid populated areas, peak periods, and routes with infrastructure constraints such as bridge weight limits.

AIL Contingency and Accident Plans

9.11.6.11 The basic guidelines that will be followed for handling contingencies such as tyre punctures, breakdowns, and accidents are set out in Volume 7E, Appendix 9-2: Outline Construction Traffic Management Plan. Safety is of utmost importance in all situations.

9.11.7 Monitoring and Compliance

9.11.7.1 To implement and enforce the guidelines and requirements of this Outline CTMP as well as the forthcoming detailed CTMP, a robust monitoring strategy is required. This must clearly identify the contractor's construction traffic co-ordinator who will be the first point of contact for all issues relating to the management of construction vehicles.

9.11.7.2 The purpose of this section is to set out the processes and techniques that will be implemented to ensure that all those involved in the operation and

management of construction vehicle movements do so in accordance with the Outline CTMP and eventually in accordance with the CTMP.

9.11.7.3 A series of monitoring processes will be implemented to allow the safe management of all construction vehicle movements to, from and within the Landfall Site, the ONEC, and the Onshore Substation Site.

9.11.7.4 These processes, which will operate continuously throughout the entire construction programme, will include, but will not necessarily be limited to, the following data collection techniques:

- Permanent classified Automatic Traffic Counters (ATCs) will be placed at the proposed compound and HGV marshalling areas;
- Automatic Number Plate Recognition (ANPR) cameras will be positioned at the proposed compound and HGV marshalling areas;
- Records of vehicle movements will be maintained by gate staff at all site entrances; and
- The use of digital systems, including GPS vehicle tracking, will be mandated as one of the requirements of all hauliers.

9.11.7.5 If advanced technological options are not feasible, simple ATC loops will be positioned at appropriate locations on the approach roads to the construction site access points.

9.11.7.6 Contractors will be responsible for maintaining detailed delivery schedules to supplement traffic counts and provide comprehensive evidence. The contractor's standard obligations will also include a requirement to report and compile details of any on-site accidents or near misses, as well as any that occur on public roads.

9.11.7.7 Monitoring of personnel movements will involve periodic spot surveys to assess car park occupancy and gather feedback and complaints from staff and stakeholders.

9.11.7.8 Appointed contractors will implement a rigorous monitoring system to ensure compliance with proposed speed limits, including periodic physical measurements of vehicles on the highway.

9.11.7.9 To address any gaps or limitations in the detailed CTMP, construction workers, contractors, and suppliers will have access to dedicated communication channels, such as a specific email address, for providing feedback, ideas, and recommendations.

9.12 Residual Effects

9.12.1.1 No secondary mitigation has been proposed or is practicable with respect to the T&T construction effects. As such, the effects remain as reported in Section 9.8.

9.13 Summary of Effects

9.13.1.1 Table 9-48 to Table 9-51 present a summary of the significant effects for each of the Sub-Assessments within this EIAR, any mitigation that may be required, and the residual effects.

9.13.1.2 Where significant effects have been identified as either negligible or low, these have been excluded from the summary table(s).

9.13.1.3 Full details on all effects can be found in Section 9.8.

Table 9-48: Summary of effects (construction), Sub-Assessment A

Construction Impact	Magnitude	Sensitivity of Receptor (and reference)	Significance	Mitigation Measure	Residual Effect
Severance	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Driver and passenger delay	High	Medium (site 9, B9139)	Moderate	Effect is temporary in nature and will be mitigated through the application of a CTMP.	It is anticipated that the CTMP will be used, for example, to identify alternative routes for construction vehicles should particular negative effects be identified throughout the construction period. This will be identified via the monitoring procedures which are an integral component of the CTMP. While the effects will be temporary in nature, their magnitude has still been identified as being high and therefore a comprehensive approach for a mitigation plan in the form of a CTMP will be applied.
NMU delay	n/a	n/a	No significant effects	No mitigation required.	No residual effects.

Construction Impact	Magnitude	Sensitivity of Receptor (and reference)	Significance	Mitigation Measure	Residual Effect
NMU amenity	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Fear and intimidation	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Safety	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Abnormal load	n/a	n/a	No significant effects	No mitigation required.	No residual effects.

Table 9-49: Summary of effects (construction), Sub-Assessment B

Construction Impact	Magnitude	Sensitivity of Receptor (and reference)	Significance	Mitigation Measure	Residual Effect
Severance	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Driver and passenger delay	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
NMU delay	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
NMU amenity	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Fear and intimidation	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Safety	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Abnormal load	n/a	n/a	No significant effects	No mitigation required.	No residual effects.

Table 9-50: Summary of effects (construction), Sub-Assessment C

Construction Impact	Magnitude	Sensitivity of Receptor (and reference)	Significance	Mitigation Measure	Residual Effect
Severance	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Driver and passenger delay	High	Medium (site 21, unclassified)	Moderate	Effect is temporary in nature and will be mitigated through the application of a CTMP.	It is anticipated that the CTMP will be used, for example, to identify alternative routes for construction vehicles should particular negative effects be identified throughout the construction period. This will be identified via the monitoring procedures which are an integral component of the CTMP. While the effects will be temporary in nature, their magnitude has still

Construction Impact	Magnitude	Sensitivity of Receptor (and reference)	Significance	Mitigation Measure	Residual Effect
					been identified as being high and therefore a comprehensive approach for a mitigation plan in the form of a CTMP will be applied.
NMU delay	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
NMU amenity	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Fear and intimidation	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Safety	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Abnormal load	n/a	n/a	No significant effects	No mitigation required.	No residual effects.

Table 9-51: Summary of effects (construction), Sub-Assessment D

Construction Impact	Magnitude	Sensitivity of Receptor (and reference)	Significance	Mitigation Measure	Residual Effect
Severance	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Driver and passenger delay	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
NMU delay	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
NMU amenity	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Fear and intimidation	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Safety	n/a	n/a	No significant effects	No mitigation required.	No residual effects.
Abnormal load	n/a	n/a	No significant effects	No mitigation required.	No residual effects.

9.14 References

[1] Scottish Government (2023) 'National Planning Framework 4', Scottish Government, Edinburgh.

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[6] Design Manual for Roads and Bridges [DMRB] overseen by Highways England, Transport Scotland, Welsh Government, Department for Infrastructure (2020) 'LA 112: Population and Human Health', Highways England, London.

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[11] Pell Frischmann (2023) 'Appendix 13.1 Green Volt Transport Assessment, Onshore EIA Report, Volume 3' Pell Frischmann, Edinburgh

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