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7. Traffic and Transport

7.1 Summary

- 7.1.1 The Revised Consented Development will be accessed from an upgraded junction at the A836 / U4724 Milton Road and subsequently through an upgraded public road and forest tracks.
- 7.1.2 It is proposed that some of the tracks will follow a different alignment than set out as part of the Consented Development and therefore the existing Core Path will no longer be required to be used in order to access the Revised Consented Development. In locations where it is required to upgrade tracks, these will be constructed of a graded stone and will be up to 6m in width.
- 7.1.3 In order to construct the Revised Consented Development, concrete will be brought in from local suppliers from the south via the A9. An on-site borrow pit will be able to meet the requirements of rock materials for the construction of the windfarm.
- 7.1.4 Specialist loads such as the turbine components will be transported to the site from Scrabster Harbour using specialist vehicles via the A9 and A836. An Abnormal Indivisible Load Route Survey was undertaken to assess the implications of increasing the size of turbine from a maximum blade tip height of 139m associated with the Consented Development to 149.9m which is proposed to be associated with the Revised Consented Development.
- 7.1.5 The construction activities will lead to an increase in traffic flows of 110 vehicles (26 HGV and 84 Cars / LGV) predominantly on the A836 during the construction phase of the Revised Consented Development .
- 7.1.6 An assessment of the likely potential effects using the IEMA guidelines has been undertaken. This determined that not significant residual effects could be expected on the A836 road corridor from the site access junction through to Thurso, relating to the increase in traffic operating on the route during the construction phase of the Revised Consented Development.
- 7.1.7 A comparison between the maximum HGV movements associated with the Consented Development and Revised Consented Development is presented in Table 7.1.

Table 7.1 Comparison of Maximum HGV Movements

Road Link	Consented Development – Maximum HGV Movements during Construction Period			Revised Consented Development – Maximum HGV Movements during Construction Period			Difference between Consented Development’s and Revised Consented Development’s HGV Movements		
	In	Out	Total	In	Out	Total	In	Out	Total
A836	67	67	134	13	13	26	-54	-54	-108

7.1.8 The calculations presented in Table 7.1 suggest that there will be a decrease in the anticipated HGV movements associated with the Revised Consented Development in comparison to the Consented Development. It is anticipated that this will result in a decrease of 108 HGV movements along the A836 during the peak construction period.

7.2 Introduction

7.2.1 This chapter considers the likely significant effects of the Limekiln Wind Farm Section 36C Variation Application (hereafter referred to as 'the Revised Consented Development') on receptors along the transport routes resulting from vehicle movements associated with the construction phases of the Revised Consented Development. The specific objectives of the chapter are to:

- Review the relevant policy and legislative framework;
- Describe the baseline transport conditions;
- Describe the assessment methodology and significant criteria used in undertaking the assessment;
- Describe potential effects, including direct, indirect and cumulative effects;
- Describe the mitigation measures proposed to address likely significant effects; and
- Assess the residual effects remaining following implementation of mitigation.

7.2.2 The assessment has been undertaken by Pell Frischmann and effects have been considered in accordance with the Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)) Guidelines for the Environmental Assessment of Road Traffic (1993). The document is referred to as the IEMA Guidelines in this chapter.

7.2.3 A detailed description of the Revised Consented Development and an overview of the construction methodology is presented in **Chapter 4: Description of the Proposed Development** and the planning context for the Revised Consented Development is presented in **Chapter 5: Planning Policy**.

7.2.4 As with the previous Consented Development application, the main transport and access related environmental effects of the Revised Consented Development will be associated with the construction phase and routing of the following vehicles to / from the site:

- Heavy Goods Vehicles (HGVs) – vehicles 3.5t gross weight (>3.5t); and
- Abnormal Loads – vehicles longer than 18.75 and / or wider than 3m.

7.2.5 This chapter is supported by the following Technical Appendices:

- **Appendix 7.A:** Transport Assessment

7.3 Scope of assessment

Effects to be assessed in full

- 7.3.1 The assessment of effects concentrates on the effects of the Revised Consented Development's construction phase on the transport impacts identified in the baseline review of the desk-based information.

Effects to be scoped out

Operational Effects

- 7.3.2 It is anticipated that the level of traffic of traffic associated with Revised Consented Development would be minimal once the wind turbines are fully operational. Occasional visits may be made to the site for the purpose of maintenance checks. It is envisaged that the types of vehicles that will be used during these visits will be 4x4 or similar, and there may also be an occasional requirement for an HGV to access the site for maintenance and / or repairs. As with the previous Consented Development's planning application, it can be reasonably concluded that the effects of operational traffic would be negligible and therefore detailed consideration of the operational phase of the development is not included in this assessment for the Revised Consented Development.

Decommissioning Effects

- 7.3.3 The traffic effects during the decommissioning phase can only be fully assessed closer to that period, 40 years on from completion of the site. As elements of the development are likely to remain in-situ (such as cable trenches, access tracks etc.) the traffic flows associated with the decommissioning works will be lower than those associated with the construction phase. Therefore, the construction phase represents a worst-case assessment and as such, no further assessment of the decommissioning phase has been considered at this point in time and has been scoped out of the assessment.

7.4 Assessment Methodology

- 7.4.1 A high-level overview of the effects of the traffic movements has been considered in accordance with the Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)) Guidelines for the Environmental Assessment of Road Traffic. The document is referred to as the IEMA Guidelines in this chapter.
- 7.4.2 The methodology adopted in this assessment involved the following key stages:
- Determine baselines;
 - Review development impacts;
 - Evaluate significance of effects on receptors;
 - Identify mitigation; and
 - Assess residual effects.

7.4.3 This chapter considers effects on the following:

- The existing baseline transport conditions of the study area surrounding the Revised Consented Development site;
- The likely infrastructure requirements necessary to enable the Revised Consented Development;
- The likely effects and changes associated with the imposition of construction traffic on the local road network; and
- What measures would be required to mitigate any potential significant effects of the temporary construction traffic.

Legislation and Guidance

7.4.4 An overview of relevant transport planning policies has been undertaken and is summarised below for national and local policies.

National Policy

Scottish Planning Policy (SPP) 2014

7.4.5 The purpose of the SPP is to set out national planning policies which reflect Scottish Ministers' priorities for the operation of the planning system and for the development and use of land.

National Planning Framework 3 (2014)

7.4.6 Scotland's National Planning Framework (NPF3) sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. It sets out the Scottish Government's development priorities over the next 20 to 30 years and identifies national developments which support the development strategy. Scotland's third NPF was laid in the Scottish Parliament on 23 June 2014.

Planning Advice Note (PAN) 75

7.4.7 Planning Advice Note (PAN) 75: Planning for Transport provides advice on the requirements for Transport Assessments. The document notes that:

"... transport assessment to be produced for significant travel generating developments. Transport Assessment is a tool that enables delivery of policy aiming to integrate transport and land use planning."

"All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of the impact of the proposal...For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact."

Transport Assessment Guidance (2012)

- 7.4.8 Transport Scotland's (TS) Transport Assessment Guidance was published in 2012. It aims to assist in the preparation of Transport Assessments (TA) for development proposals in Scotland such that the likely transport impacts can be identified and dealt with as early as possible in the planning process. The document sets out requirements according to the scale of development being proposed.
- 7.4.9 The document notes that a TA will be required where a development is likely to have significant transport impacts but that the specific scope and contents of a TA will vary for developments, depending on location, scale, and type of development.

Local Policy

Highland-wide Local Development Plan (2012)

- 7.4.10 The Highland-wide Local Development Plan (LDP) was adopted by The Highland Council (THC) in April 2012 and is the established planning policy for the Highlands. It sets out a settlement strategy and spatial framework for how the Council foresees development occurring in the forthcoming twenty-year period.
- 7.4.11 The LDP does not contain any specific policy guidance for the Proposed Development. However, Policy 56 is relevant with regards to general transport policy. The relevant transport elements from this policy are:

"Development proposals that involve travel generation must include sufficient information with the application to enable the Council to consider any likely on- and off- site transport implications of the development and should:

incorporate appropriate mitigation on site and/or off site, provided through developer contributions where necessary, which might include improvements and enhancements to the walking/cycling network and public transport services, road improvements and new roads; and

incorporate an appropriate level of parking provision, having regard to the travel modes and services which will be available and key travel desire lines and to the maximum parking standards laid out in Scottish Planning Policy or those set by the Council.

When development proposals are under consideration, the Council's Local Development Strategy will be treated as a material consideration.

The Council will seek the implementation and monitoring of Green Travel Plans in support of significant travel generating developments."

The Highland Council Local Transport Strategy (LTS) (2014)

- 7.4.12 The LTS refers to the road network across rural areas being characterised by 'winding single carriageway roads with passing places'. Reference is also made to the additional pressure that can be placed on sub-standard roads. The LTS also notes that in terms of timber transport, there are initiatives such as tyre pressure moderation which are reducing the damaging effect of forestry lorries on rural roads.

7.4.13 The LTS also mentions the many bridges which are subject to weight restrictions in the Local Authority area. The LTS states that “where possible, the Council, through its Lifeline Bridges programme will invest in the bridges to maintain access either by removing weight restrictions or reducing the weight restriction effect of HGV vehicles.” The aim of the Lifeline Bridges programme is to assist the economy of the area by allowing the efficient transport of essential goods and services, as well as providing for industries that are heavily dependent on large vehicle transport.

Guidance on the Preparation of Transport Assessments (2014)

7.4.14 THC has prepared guidance on how Transport Assessments (TA) should be prepared for development sites within The Highlands. The guidance was published by THC in November 2014.

7.4.15 This TA has noted the guidelines and has provided the required assessment.

Policy Summary

7.4.16 The Revised Consented Development can align with the stated policy objectives and the design of the site and proposed mitigation measures will ensure compliance with the national and local objectives.

Consultation

7.4.17 Pre-application engagement has been undertaken by means of an EIA Scoping Report.

7.4.18 **Table 7.2** summarises the consultation responses received regarding transport and access matters and provides information on where and / or how they have been addresses in this assessment. The following organisations made comment on transport matters:

- The Highland Council Transport Department (as local roads agency);
- Transport Scotland (as trunk roads agency); and
- British Horse Society

Table 7.2 Consultation Responses

Consultee and Date	Scoping / Other Consultation	Response	Response / Action Taken
British Horse Society – 23/03/2021	Scoping	Stated that under the Land Reform (Scotland) Act 2003, horse-riders enjoy a right of access to most of Scotland. Land managers are obliged to respect equestrian access rights and take account of the right of responsible access in managing their land. Infrastructure like gates, bridges, cattle grids etc should be installed with equestrians in mind.	Noted.

Consultee and Date	Scoping / Other Consultation	Response	Response / Action Taken
Transport Scotland – 23/04/2021	Scoping	No objection to the development, provided the Conditions associated with the Consented Development are applied.	Noted.
The Highland Council – 23/04/2021	Scoping	THC advise that feedback should also be obtained from Transport Scotland on their requirements for the public road they manage.	Scoping feedback has been received from Transport Scotland.
The Highland Council – 23/04/2021	Scoping	A Construction Traffic Management Plan should be submitted alongside the planning application.	A Construction Traffic Management Plan has been included as a framework within the Transport Assessment (Appendix 7.A).
The Highland Council – 23/04/2021	Scoping	A Transport Assessment should be submitted alongside the planning application.	A Transport Assessment is provided in Appendix 7.A .
The Highland Council – 23/04/2021	Scoping	A High National Traffic Forecast should be applied in order to calculate future year flows.	A High National Traffic Forecast has been applied to future year flows.
The Highland Council – 23/04/2021	Scoping	It is expected that the developer submits a preferred access route for the development in relation to abnormal loads and vehicles. All other access route options would be provided, having been investigated in order to establish their feasibility.	Noted. This is provided in Appendix 7.A and the Route Survey Report also included in Appendix 7.A .
The Highland Council – 23/04/2021	Scoping	To investigate the current condition of the roads – undertaken by a consulting engineer acceptable to the Council.	A before and after road survey would be undertaken prior to the start of construction works, with THC officers in attendance.
The Highland Council – 23/04/2021	Scoping	Determine the traffic generation and distribution of the proposals throughout the construction and operation periods in order to provide accurate data associated with the proposed development.	Details of traffic generation and distribution are provided in this chapter and in the Transport Assessment (Appendix 7.A).
The Highland Council – 23/04/2021	Scoping	Determine existing traffic flows including use by public transport services, school buses, refuse vehicles, commercial users, pedestrians, cyclists and equestrians.	Existing active travel links are reviewed and traffic flows are provided in this Chapter.
The Highland Council – 23/04/2021	Scoping	Assess the impacts of the proposed development on existing traffic infrastructure, road users and adjacent communities. Swept path analysis to be undertaken in locations where it is envisaged that the transportation of traffic may be problematic. Provision of Trial Runs should be undertaken to ensure that the route is achievable.	Impacts of the Revised Consented Development are provided in this Chapter. Swept path assessments are provided in the Abnormal Indivisible Load Survey in Appendix 7.A . A test run would be undertaken prior to turbine deliveries and once the site access junction works have been completed (to allow loads to turn off the public road).

Consultee and Date	Scoping / Other Consultation	Response	Response / Action Taken
The Highland Council – 23/04/2021	Scoping	Cumulative impacts should be assessed.	Cumulative assessments have been considered. High NRTF growth has been assumed to cater for non-significant traffic growth.
The Highland Council – 23/04/2021	Scoping	Mitigation measures in line with the following should be undertaken to address impacts of the proposed traffic: Carriageway strengthening Strengthening of bridges and culverts Carriageway widening and / or edge strengthening Provision of passing places Road safety measures Traffic management including measures to be taken to ensure that development traffic does not use routes other than the approved routes	Mitigation measures that are appropriate to the scale and duration to the effect have been considered and are detailed in the chapter. These would be secured via a Construction Traffic Management Plan, Section 96 Wear & Tear Agreement and design of the required access infrastructure.
The Highland Council – 23/04/2021	Scoping	Provide details of residual effects.	All residual effects have been considered where they exist

7.5 Baseline characterisation

Study Area

7.5.1 The highway links assessed as part of this assessment are identified below:

- A9 (between Thurso and Scrabster Harbour);
- A9, South of Thurso (near Sordale);
- A9, Thurso (east of River Thurso);
- A9, Thurso (west of River Thurso); and
- A836 (between Thurso and the site access).

Desk Study

7.5.2 The desk study included reviews and identification of the following:

- Relevant transport policy;
- Accident data;
- Sensitive location;

- Any other traffic sensitive receptors in the area (core paths, routes, communities, etc.)
- Ordnance Survey (OS) plans;
- Potential origin locations of construction staff and supply locations for construction material to inform extent of local area roads network to be included in the assessment; and
- Constraints to the movement of the Abnormal Indivisible Loads (AILs) through a Route Survey including swept path assessments.

7.5.3 The methodology adopted within this assessment has been developed from guidance given in the Institute of Highways and Transportation (IHT) 'Guidelines for Traffic Impact Assessment' and also the IEMA 'Guidelines for the Environmental Assessment of Road Traffic'. Methodologies detailed in the IHT guidelines recommend that EIAs for large developments should be assessed in accordance with the IEMA guidelines noted above.

Field survey

7.5.4 A detailed access study was previously prepared by AMEC in February 2012 which identified potential routes to deliver AILs and assessed the most appropriate route from Scrabster Harbour to the site. In order to determine the appropriate routes a site visit was undertaken as part of the study. This study informed the access route which was outlined as part of the Consented Development's planning submission. It is proposed that the access route for the Revised Consented Development will remain the same as that outlined in the consented Development. The Route Survey Report is presented in **Appendix 7.A**.

Assessment of Potential Effect Significance

Criteria for Assessing the Sensitivity of Receptors

- 7.5.5 The Institution of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Impact Assessment' (2005) notes that the separate 'Guidelines for the Environmental Assessment of Road Traffic' (1993) document should be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance of major new developments. The guidelines intend to complement professional judgement and the experience of trained assessors.
- 7.5.6 In terms of traffic and transport impacts, the receptors are the users of the roads within the study area and the locations through which those roads pass.
- 7.5.7 The IEMA Guidelines includes guidance on how the sensitivity of receptors should be assessed. Using that as a base, professional judgement was used to develop a classification of sensitivity for users based on the characteristics of roads and locations. This is summarised in Table 7.3.

Table 7.3 Classification of Receptor Sensitivity

Receptor	Sensitivity			
	High	Medium	Low	Negligible
Users of Roads	Where the road is a minor rural road, not constructed to accommodate frequent use but HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads where there is some traffic calming or management measures.	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junctions capable of accommodating Abnormal Loads.
Users / Residents of Locations	When a location is a large rural settlement containing a high number of community and public services and facilities.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.	Where a location is a small rural settlement, few community or public facilities or services.	Where a location includes individual dwellings or scattered settlements with no facilities.

7.5.8 Where a road passes through a location, users are considered subject to the highest level of sensitivity defined by either the road or location characteristics.

Significance of Effects

7.5.9 The following rules, also taken from the IEMA Guidelines are used to determine which links within the study area should be considered for detailed assessment:

- Rule 1 – include highway links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%); and
- Rule 2 – include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

7.5.10 The Guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development. The impacts and levels of magnitude are discussed below:

- Severance – the Guidelines states that, “severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery.” Further, “Changes in traffic of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ [or minor, moderate and major] changes in severance respectively”. However, the Guidelines acknowledge that “the measurement and prediction of severance is extremely difficult”;

- Driver delay – the Guidelines note that these delays are only likely to be “significant [or major] when the traffic on the network surrounding the development is already at, or close to, the capacity of the system”;
- Pedestrian delay – the delay to pedestrians, as with driver delay, is likely only to be major when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. An increase in total traffic of approximately 30% can double the delay experienced by pedestrians attempting to cross the road and would be considered major;
- Pedestrian amenity – the Guidelines suggests that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its lorry component) is halved or doubled. It is therefore considered that a change in the traffic flow of -50% or +100% would produce a major change in pedestrian amenity;
- Fear and intimidation – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30%, 60% and 90% are regarded as producing minor, moderate and major changes respectively; and
- Accidents and safety – professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents.

7.5.11 While not specifically identified, as more vulnerable road users, cyclists are considered in similar terms to pedestrians.

7.5.12 To determine the overall significance of effects, the results from the receptor sensitivity and magnitude of change assessments are correlated and classified using a scale set out in Table 2.4 of Volume 11, Section 2, Part 5 of the Design Manual for Roads and Bridges (DMRB) and summarised in Table 7.4.

Table 7.4 Significance Criteria

Sensitivity	Magnitude of Impact				
		Major	Moderate	Minor	Negligible
High		Major	Major / Moderate	Moderate	Minor / Negligible
Medium		Major / Moderate	Moderate	Minor	Negligible
Low		Moderate	Minor	Minor	Negligible
Negligible		Minor / Negligible	Negligible	Negligible	Negligible

7.5.13 The DMRB defines the potential changes in effect as follows:

- Large: These effects are considered to be material in the decision-making process;
- Moderate: These effects may be important but are not likely to be material factors in decision making. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a receptor;
- Slight: These effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in improving the subsequent design of the project; and
- Neutral: No effects or those that are imperceptible.

7.5.14 Major, Major/Moderate and Moderate effects are considered to be significant in terms of the EIA regulations, whilst Minor, Minor/Negligible and Negligible effects are considered to be neutral/not significant.

Assessment Limitations

7.5.15 The assessment is based upon an assumed construction programme for the Revised Consented Development. Alterations in the programme, may increase or decrease traffic flows per month.

7.5.16 The assessment is based upon average traffic flows. There may be localised peaks with construction days where flows can be higher for a specific hour, such as a shift change on site.

7.5.17 Assumptions on the origin points for materials have been made to provide a worst-case assessment scenario. Should these origin points change, the effects on surrounding areas may alter to those presented in this assessment.

7.6 Baseline Conditions

Current Baseline

7.6.1 The site is located 1.5 km to the south of the Village of Reay and 3 km south / south west of the Dounreay Nuclear Power Station, in Caitness, Highland.

7.6.2 Access to the site from the strategic highway network (A9) is proposed to be taken from the A836.

7.6.3 The proposed route for abnormal load equipment from Scrabster Harbour to the Development Site is as follows:

- Depart Scrabster Harbour and enter the A9;
- Proceed southbound on the A9 towards the A9 / A836 junction;
- Turn right using the existing over run area at the A9 / A836 junction;
- Continue westbound along the A836;
- Turn left onto the U4724 Milton Road, to the south of Isauld; and
- Proceed to the site along the upgraded public road and new access tracks.

7.6.4 The routes to the site for abnormal loads and HGVs are shown in **Appendix 7.A**. It is anticipated that HGV traffic associated with delivering construction materials will travel northbound along the A9 before joining the A836 and following the same route as the AILs towards the site.

A9

7.6.5 The section of the A9 between Scrabster Harbour and its junction with the A836 is a standard two-way carriageway and is subject to a speed limit of 60 mph.

7.6.6 This section of the access route is not considered to be sensitive to changes in traffic conditions as no sensitive land uses / receptors have been identified and it is an established route to the Harbour for HGV traffic.

7.6.7 Within Thurso, the A9 provides the main west – east connection through the town. To the south, the A9 provides strategic trunk road connections to the south to Falkirk via Inverness, Perth and Stirling.

A836

7.6.8 The A836 is the main section of the access route to the site. The A836 / A9 junction comprises a priority junction, with an over-run area to facilitate turning movements associated with wind turbine deliveries.

7.6.9 The A836 is a rural single carriageway which is approximately 6 m in width and is a route of strategic national importance within the Highlands area. In the vicinity of the site access, the A836 is subject to the national speed limit.

Baseline traffic flows

7.6.10 In order to establish the baseline situation, traffic survey data was sought along the road network in the vicinity of the site.

7.6.11 Due to the travel restrictions associated with the COVID-19 pandemic, the collection of meaningful traffic count data within a neutral flow period has not been possible. Traffic data used in this assessment has therefore been sourced from historic count data provided by the UK Department for Transport (DfT). The locations of the traffic counts are presented in **Appendix 7.A**.

7.6.12 The latest flows outlined by the UK DfT are for the year 2019. In order to calculate the 2021 flows, a high National Road Traffic Forecast (NRTF) was applied to the 2019 flows.

7.6.13 Baseline traffic flows are presented in **Table 7.5**.

Table 7.5 2021 Traffic Flows

		2021 Baseline Flows		
Road	Location	Cars & Lights	HGVs	All Vehicles
A9	Between Thurso and Scrabster Harbour	3222	108	3330
A9	South of Thurso (near Sordale)	3220	288	3508
A9	Thurso, east of River Thurso	14149	356	14505
A9	Thurso, west of River Thurso	3145	204	3349
A836	Between Thurso and the site access	2332	67	2399

Accident Review

- 7.6.14 Personal Injury Accidents (PIAs) are road traffic accidents which have been recorded as either slight, serious or fatal injuries to people.
- 7.6.15 Traffic accident data was obtained from CrashMap UK for the study network from the A9 to the site via A836 for the preceding three-year period. The results are summarised in Table 7.6.

Table 7.6 Summary of recorded PIAs between 2018 and 2020

Year	Severity of injury			Vulnerable road user		
	Slight	Serious	Fatal	Pedestrian	Cyclist	Motorcyclist
A9 Thurso to Scrabster Docks						
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
A9 Thurso to Sordale						
2018	0	0	0	0	0	0
2019	2	0	0	0	0	1
2020	2	0	0	0	0	0
A836 Thurso to Site Access						
2018	2	0	1	0	0	2
2019	1	0	0	0	0	0

Year	Severity of injury			Vulnerable road user		
2020	0	0	0	0	0	0
Total	7	0	1	0	0	3

7.6.16 A total of eight accidents were recorded during the three-year period within the accident assessment area. Of the eight accidents, seven were classified as 'Slight' and one was classified as 'Fatal'. Three accidents involved motorcyclists, of which one was 'Fatal'. One HGV was recorded as being involved in an accident.

7.6.17 The accidents suggest that there are no specific accident patterns or trends within the accident assessment area.

Active Travel Links

7.6.18 A review of Map: 1a-c Reay, Crosskirk & Westfield – Caithness Core Paths Plan shows that one Core Paths runs through the site, Core Path No. CA11.03.

7.6.19 While there are no National Cycle Network routes in the vicinity of the site, a review of the Map of the National Cycle Network (<https://www.sustrans.org.uk/national-cycle-network>) highlights parts of the A836 and the C1001 road, to the north of the site, as an "On-road route not on the National Cycle Network".

Future Baseline Traffic Flows

7.6.20 Background traffic growth will occur on the local road network irrespective of whether the Revised Consented Development is constructed. Projected baseline growth flows for the expected year of construction (anticipated to be 2023) have been calculated by applying NRTF high growth factors.

7.6.21 The future year baseline traffic flows are provided in Table 7.7 for the start of construction in 2023.

Table 7.7 2023 Future Year Baseline Flows

		2023 Baseline Flows		
Road	Location	Cars & Lights	HGVs	All Vehicles
A9	Between Thurso and Scrabster Harbour	3259	109	3369
A9	South of Thurso (near Sordale)	3257	292	3549
A9	Thurso, east of River Thurso	14314	361	14675
A9	Thurso, west of River Thurso	3181	206	3388
A836	Between Thurso and the site access	2359	68	2427

Identification and Evaluation of Key Impacts

- 7.6.22 This section provides an assessment of the effects arising from the traffic predicted to be generated by the Revised Consented Development.
- 7.6.23 Table 7.8 outlines the summary of receptor sensitivity to be assessed in this assessment.

Table 7.8 Summary of Receptor Sensitivity

Receptor	Rationale	Receptor Sensitivity
A9 Users	A class roads that can accommodate HGV traffic with no traffic calming facilities present.	Low
A9 Users in Thurso	A class road passing through large rural settlement containing a high number of community and public services and facilities. Some traffic management and calming measures in place.	Medium
A836 Users	A class roads that can accommodate HGV traffic with no traffic calming facilities present.	Low
Core Path Users	Minor path used by walkers and cyclists, not constructed to accommodate HGV traffic flows	High
Residents in Thurso	Large rural settlement containing a high number of community and public services and facilities.	High
Residents along the A836	Small, dispersed settlements / individual homes with limited community facilities.	Low

7.7 The 'Do Nothing' Scenario

- 7.7.1 In the absence of the Revised Consented Development, or the Consented Development, it is anticipated that traffic growth along the A9 and A836 will occur as these links will experience increased traffic flows from other development pressures, tourism traffic and population flows.

7.8 Design layout considerations

- 7.8.1 Access to the turbines, construction compound and substation will then be via existing forest access tracks, in so far as possible. It is proposed that some of the tracks will follow a different alignment than that set out as part of the Consented Development and therefore the existing Core Path will no longer be required to be used in order to access the Revised Consented Development. In locations where it is required to upgrade tracks, these will be constructed of a graded stone and will be up to 6m in width.

7.9 Assessment of Effects

- 7.9.1 The assessment is based upon the construction effects that may occur within the study area. In order to assess the effects, it is necessary to determine the likely traffic generation associated with the Revised Consented Development.
- 7.9.2 During the 24 month construction period, the following traffic would require access to the site:
- Staff transport, either cars or staff minibuses;
 - Construction equipment and materials, deliveries of machinery and supplies such as concrete raw materials;
 - AILs consisting of the wind turbine components and heavy lift crane(s); and
 - Escort vehicles for AIL deliveries.
- 7.9.3 Except for the turbine components, the majority of traffic would be normal construction plant and would include grading tractors, excavators, high capacity cranes, forklifts and dumper trucks. Most of these vehicles would arrive at site on low loaders.
- 7.9.4 The turbines are delivered in component sections for transport and would be assembled at the site. The nacelle, hub, drive train, blade, tower sections are classified as AIL due to their weight and / or length, width and height when loaded.
- 7.9.5 In addition to the turbine deliveries, one high capacity erection crane would be needed to offload some components and erect turbines. The crane is likely to be a mobile crane with a capacity of up to 1,000 tonnes that would be escorted by boom and ballast trucks to allow full mobilisation on Site. A smaller erector / assist crane will also be present to allow the assembly of the main cranes and to ease overall erection of the turbines.
- 7.9.6 The resulting traffic generation is attached in Technical **Appendix 7.A: Transport Assessment** for review. The peak construction occurs in Month 10 with 26 HGV movements per day (13 inbound and 13 outbound) and 84 Car / LGV movements (42 inbound trips and 42 outbound trips). These figures on average indicate approximately 3 HGV movements per hour on the network at the peak of construction activities.
- 7.9.7 The distribution of development traffic on the network would vary depending on the types of loads being transported. The assumptions for the distribution of construction traffic during the peak months would be as follows:
- All construction traffic enters the site via the site access junction from the A836;
 - Deliveries associated with the onsite batching of concrete on site will arrive via the A9 and A836, passing through Thurso;
 - An on-site borrow pit will be able to meet the requirements of rock materials for the construction of the windfarm;
 - HGV deliveries associated with the HV electrical installation, control buildings, batteries, etc will arrive the A9 and A836, passing through Thurso;

- Staff working at the site are likely to be based locally and assumed that the majority of staff (70%) will come from nearby Thurso, 20% of staff will originate between the site and Thurso and 10% of staff will originate from the west of the site; and
- General site deliveries will be via the A9 and A836 to site.

7.9.8 Loads relating to the turbine components would be delivered to site from Scrabster Harbour via the A9 and A836. This harbour has previously been used for the delivery of wind turbine components. Access from other ports is not feasible due to the nature of constraints that are present within Thurso.

7.9.9 To accommodate the access for the AIL loads, a number of road upgrades will be required and these are detailed in the Route Survey Report included in **Appendix 7.A**, following detailed swept path assessment of identified constraints.

7.10 Construction effects

Predicted percentage impact – Revised Consented Development

7.10.1 To estimate the total trips through the study area during the peak of the construction phase, traffic was distributed through the network and combined with the 2024 Baseline traffic data. The resulting figures were compared with the weekday 2024 Baseline traffic to provide a percentage change in movements. These are illustrated in Table 7.9.

Table 7.9 Summary of Receptor Sensitivity

Survey Location	Cars / LGV	HGV	Total	% Increase Car / LGV	% Increase HGV	% Total Traffic Flow
A9 Between Thurso and Scrabster Harbour	3314	111	3425	0.00%	0.00%	0.00%
A9 South of Thurso (near Sordale)	3312	323	3635	0.00%	8.76%	0.72%
A9 Thurso, east of River Thurso	14616	393	15009	0.41%	7.08%	0.57%
A9 Thurso, west of River Thurso	3294	236	3530	1.82%	12.41%	2.47%
A836 Between Thurso and the site access	2475	95	2570	3.17%	37.60%	4.13%

7.10.2 The total traffic movements are not predicted to increase by more than 30% on all of the study network.

7.10.3 HGV traffic flows on the A836 between Thurso and the site increase by 37.6%, however this increase is temporary and the actual increase in HGV numbers on this

section of the route is 26 vehicle movements per day, on average an increase of 3 HGV per hour during a day at the peak of construction activity.

7.10.4 With regards to the Consented Development, it was noted that the maximum of HGV movements during the construction period will be 134 (67 in and 67 out).¹ A comparison between the maximum HGV movements associated with the Consented Development and Revised Consented Development is presented in Table 10.

Table 7.10 Comparison of Maximum HGV Movements

Highway Link	Consented Development – Maximum HGV Movements during Construction Period			Revised Consented Development – Maximum HGV Movements during Construction Period			Difference between Consented Development’s and Revised Consented Development’s HGV Movements		
	In	Out	Total	In	Out	Total	In	Out	Total
A836	67	67	134	13	13	26	-54	-54	-108

7.10.5 The calculations presented in Table 10 suggest that there will be a decrease in the anticipated HGV movements associated with the Revised Consented Development in comparison to the Consented Development. It is anticipated that this will result in a decrease of 108 HGV movements along the A836 during the peak construction period.

7.10.6 Further assessments should therefore be undertaken the following receptors:

- A836 Users (Low Sensitivity);
- A836 Residents (Low Sensitivity); and
- Core Path Users (High Sensitivity).

7.10.7 It should also be noted the construction phase would be transitory in nature and the peak of construction activities would be short lived.

7.10.8 A review of existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESAs Manual”. The theoretical road capacity has been estimated for each of the road links for a 12-hour period. The assessment presented in **Appendix 7.A** and indicates that none of the study area road links are over or at capacity.

7.10.9 The significance of the potential effects has been determined using the rules and thresholds discussed previously. Table 7.11 summarises the significance on the receptors for the construction phase.

¹ Section 7.6.44 Chapter 7 Traffic and Transport Limekiln Wind Farm Resubmission Environmental Statement

Table 7.11 Construction Phase Effects Summary

Receptors	Severance	Driver Delay	Pedestrian Delay	Amenity	Fear	Accidents & Safety
A836 Users	Slight	Slight	Slight	Slight	Slight	Slight
A836 Residents	Slight	Slight	Slight	Slight	Slight	Slight
Core Path Users	Large	Negligible	Medium	Large	Large	Medium

7.10.10 The assessment of significance suggests traffic flows interacting with the Core Path are considered significant effects, prior to the application of mitigation measures. The effects on amenity on the A836 for road users and residents are considered Slight due to the transitory nature of the traffic flows, the dispersed location of residential properties and that amenity cannot reasonably be expected on the district distributor road network, due to the strategic access nature of the road.

7.11 Cumulative effects

7.11.1 A review of online planning applications identifies there are a number of consented/under construction onshore wind farm and onshore developments in the planning system within a 35km search area of the Revised Consented Development.

7.11.2 These consented/applications wind farms could use the same access route as that proposed for the proposed development. The details of these significant applications are detailed below with their current status in Table 7.12.

Table 7.12 Cumulative Development Summary

Reference	Name	Distance	Number of turbines	Height to blade tip (m)	Current Status
20/01905/S36	The proposed Limekiln Wind Farm Extension	< 1km	5	149.9m	Pending
20/00645/FUL	Drum Hollistan 2 Wind Farm	Approx. 6km	7	125m	Refused
20/03481/FUL	Strathy South Wind Farm	< 20km	39	200m	Pending
13/04469/S36	Strathy Wood Wind Farm	<17km	13	180m	Pending

7.11.3 None of the above schemes can be considered as committed development in that they have either been refused or that a planning determination is still pending. As such no cumulative traffic flows are to be included as a cumulative assessment.

7.11.4 Should any of the current scoping schemes, under planning consideration at present be consented, any crossover of traffic with the proposed development flows would be

addressed via a traffic management plan. The inclusion of further traffic flows in the base line (i.e. including non-consented traffic) would dilute the potential impact that the proposed development would have. As such, the approach taken is considered to be an overly robust assessment.

7.12 Interrelationship between effects

7.12.1 There are no interrelationships between the various effects noted.

7.13 Mitigation

Mitigation During Construction

7.13.1 During the construction period, a project website, blog or Twitter feed would be regularly updated to provide the latest information relating to traffic movements associated with vehicles accessing the site. This would be agreed with the local roads authority.

7.13.2 The following measures would be implemented during the construction phase through the CTMP:

- Where possible the detailed design process would minimise the volume of material to be imported to site to help reduce HGV numbers;
- A site worker transport and travel arrangement plan, including transport modes to and from the worksite (including pick up and drop off times);
- A Traffic Management Plan;
- All materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
- Specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel cleaning facilities may be established at the site entrance, depending the views of The Highland Council;
- Unless otherwise agreed with THC, normal site working hours would be limited to between 0700 and 1900 (Monday to Friday and 0700 and 1300 (Saturday) though component delivery and turbine erection may take place outside these hours;
- Appropriate traffic management measures would be put in place on the A836 to avoid conflict with general traffic, subject to the agreement of the roads authority. Typical measures would include HGV turning and crossing signs and banksman where necessary;
- Provide construction updates on the project website and or a newsletter to be distributed to residents within an agreed distance of the site.
- Adoption of a voluntary speed limit of 15 mph for all construction vehicles through Thurso;
- All drivers would be required to attend an induction to include:
 - A tool box talk safety briefing;

- The need for appropriate care and speed control;
 - A briefing on driver speed reduction agreements (to slow site traffic at sensitive locations through the villages); and
 - Identification of the required access routes and the controls to ensure no departure from these routes.
- 7.13.3 The Highland Council has requested that an agreement to cover the cost of abnormal wear on its network is made.
- 7.13.4 Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route would be recorded to provide a baseline of the condition of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction phase. Any necessary repairs would be coordinated with The Highland Council's roads team. Any damage caused by traffic associated with the Revised Consented Development during the construction period that would be hazardous to public traffic would be repaired immediately.
- 7.13.5 Damage to road infrastructure caused directly by construction traffic would be made good and street furniture that is removed on a temporary basis would be fully reinstated.
- 7.13.6 There would be a regular road review and any debris and mud would be removed from the carriageway using an onsite road sweeper to ensure road safety for all road users.

Abnormal Load Management Plan

- 7.13.7 An AIL Management Plan would be developed. All abnormal load deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim of minimising the effects on the local road network. It is likely that the abnormal load convoys would travel in mid morning to avoid school drop off and pick up times, while general construction
- 7.13.8 The majority of potential conflicts between construction traffic and other road users will occur with abnormal load traffic. General construction traffic is not likely to come into conflict with other road users as the vehicles are smaller and road users are generally more accustomed to them.
- 7.13.9 Advance warning signs would be installed on the approaches to the affected road network. This signage will assist in helping improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).
- 7.13.10 The location and numbers of signs would be agreed post consent and would form part of the wider Traffic Management Proposal for the project.
- 7.13.11 The Abnormal Load Transport Management Plan would also include:
- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking;

- A diary of proposed delivery movements to liaise with the communities to avoid key dates;
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and
- Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

Onsite Measures delivered using a Core Path Management Plan

7.13.12 Within the site, consideration has been given to pedestrians and cyclists alike due to potential interactions between construction traffic and users of the core path. These measures will be formulated into a Core Path Management Plan.

7.13.13 Users of the Core Path will be separated from construction traffic through the use of barriers. Crossing points will be provided where required, with core path users having right of way. Appropriate Chapter 8 compliant temporary road signage would be provided to assist at these crossing for the benefit of all users.

7.13.14 The principal contractor will ensure that speed limits are always adhered to by their drivers and associated subcontractors. This is particularly important within close proximity to the core path and at crossing points. Advisory speed limit signage will also be installed on approaches to areas where core path users may interact with construction traffic.

7.13.15 Signage will be installed on the Site exit that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians and cyclists in the area. This will also be emphasised in the weekly tool box talks.

7.13.16 The British Horse Society has made recommendations on the interactions between HGV traffic and horses. Horses are normally nervous of large vehicles, particularly when they do not often meet them. Horses are flight animals and will run away in panic if really frightened. Riders will do all they can to prevent this but, should it happen, it could cause a serious accident for other road users, as well as for the horse and rider.

7.13.17 The main factors causing fear in horses in this situation are:

- Something approaching them, which is unfamiliar and intimidating;
- A large moving object, especially if it is noisy;
- Lack of space between the horse and the vehicle;
- The sound of air brakes; and
- Anxiety on the part of the rider.

7.13.18 The British Horse Society recommends the following actions that will be included in the site training for all HGV staff:

- On seeing riders approaching, drivers must slow down and stop, minimising the sound of air brakes, if possible;
- If the horse still shows signs of nervousness while approaching the vehicle, the engine should be shut down (if it is safe to do so);
- The vehicle should not move off until the riders are well clear of the back of the HGV;
- If drivers are wishing to overtake riders, please approach slowly or even stop in order to give riders time to find a gateway or lay by where they can take refuge and create sufficient space between the horse and the vehicle. Because of the position of their eyes, horses are very aware of things coming up behind them; and
- All drivers delivering to the site must be patient. Riders will be doing their best to reassure their horses while often feeling a high degree of anxiety themselves.

7.14 Residual Impacts

- 7.14.1 An evaluation of the potential effects of the increase in traffic on the study area roads used for construction traffic was undertaken. The summary of this assessment is provided in Table 7.11.
- 7.14.2 The assessment confirms that most of the traffic and transport effects from the Revised Consented Development would not be significant. No road capacity issues are predicted within the study area during the construction phase.
- 7.14.3 Significant effects were identified for users of the Core Path network at the site. These effects (classified as large) can be mitigated against through the use of a CTMP and specific onsite measures. With the successful implementation of these measures, the effects would be reduced to non-significant.
- 7.14.4 The increase in traffic is from a very low base on the A836 and that the actual number of construction vehicles is numerically small and would only be operating for a short period of time. Whilst the increase in traffic numbers is statistically large, the overall performance of the road is unlikely to deteriorate substantially.
- 7.14.5 It should be acknowledged that the assessment has focussed on the peak in construction traffic activities and that the percentage increases noted are high, given the relatively low level of HGV traffic on the existing network.
- 7.14.6 The construction period is transitory in nature and all impacts would be short lived and temporary. No significant residual effects are predicted during construction.
- 7.14.7 There are no residual effects associated with either the operational or decommissioning phases.

Table 7.13 Summary of Residual Effects

Receptor and Summary of Predicted Effect	Significance	Mitigation Measures	Residual Impact
Core Path Users			
Severance	Significant	CTMP – Temporary signage / route signage and core path users management plan	Not significant (Slight)
Pedestrian Delay and Amenity	Significant	CTMP – Temporary signage / route signage and core path users management plan	Not significant (Slight)
Fear and Intimidation	Significant	CTMP – Temporary signage / route signage and core path users management plan	Not significant (Slight)
Accidents and Safety	Significant	CTMP – Temporary signage / route signage and core path users management plan	Not significant (Slight)

7.15 Summary

- 7.15.1 The proposed development would lead to a temporary increase in traffic volumes on the study road network during the construction phase. Traffic volumes would decrease considerably outside the peak period of construction.
- 7.15.2 The maximum traffic impact associated with construction is predicted to occur in Month 10 of the programme. The greatest impact would occur at the site access where an additional 110 additional trips are included to the network.
- 7.15.3 No road capacity issues are expected on any of the roads within the study area due to the additional construction traffic movements associated with the proposed development as background traffic movements are low, the links are of a reasonable standard and appropriate mitigation is proposed.
- 7.15.4 A review of the road network has been undertaken and significant issues have been noted particularly for users of the Core Path network at the site. These effects (classified as large) would be mitigated through the use of traffic management measures that can be secured by condition in a CTMP and Core Path Management Plan. With the successful implementation of these measures, the effects can be considered as non-significant.
- 7.15.5 On the wider road network, it should be noted that the increase in traffic, especially HGV traffic on the A836 is from a very low base and that the actual number of construction vehicles is numerically small and would only be operating for a short period of time. Whilst the increase in traffic numbers is statistically significant, the overall performance of the road is unlikely to deteriorate substantially.
- 7.15.6 Traffic levels during the operational phase of proposed development would be one or two vehicles per week for maintenance purposes. Traffic levels during the

decommissioning of the proposed development are expected to be lower than during the construction phase as some elements could be left in situ and others broken up on-site.

- 7.15.7 The movement of AIL traffic would require small scale and temporary remedial works at a number of locations along identified delivery route.