Peel Wind Farms (Yell) Ltd

Beaw Field Wind Farm

Transport Assessment

March 2016

REPORT CONTROL

Document: Transport Assessment

Project: Beaw Field Wind Farm

Client: Peel Wind Farms (Yell) Ltd

Job Number: A090047

Document Checking:

Primary Author	Liz Hunter	**Initialled:**	LH

Contributor		**Initialled:**	

Review By	Gordon Buchan	**Initialled:**	GB

Issue	Date	Status	Checked for Issue
1	21/01/16	Revision 01	Liz Hunter
2	March 2016	Issue	Gordon Buchan
3			
4			
5			

Contents

Figures

Drawings

Appendices

1 INTRODUCTION

1.1 WYG has been commissioned by Peel Wind Farms (Yell) Ltd (Peel) to undertake a Transport Assessment (TA) of the transport issues associated with the proposed 17 turbine wind farm development, on land located on the south of Yell in the Shetland Islands, approximately 4 km northeast of Ulsta and 1 km northwest of Burravoe.

1.2 This report has been prepared in accordance with instructions from Peel on the above project details. No liability is accepted for the use of all or part of this report by third parties. This report is © Copyright of WYG 2016 and Peel. No section of this report may be reproduced without prior written approval.

1.3 The report identifies the key transport and access issues associated with the Proposed Development, including the route for abnormal loads. The TA identifies where the Proposed Development may require mitigation works to accommodate the predicted loads; however, the detailed design of these remedial works is beyond the agreed scope of this report. It is the responsibility of the wind turbine supplier (depending upon the final contract) to ensure that the access routes to the Site are fit for purpose and that appropriate consideration for all road users has been made in accordance with the relevant health and safety legislation and ruling transport requirements at the time the project commences onsite.

Report Structure

1.4 Following this introductory chapter the report is structured as follows:

- **Chapter Two** describes the Proposed Development along with details of the proposed abnormal loads;
- **Chapter Three** reviews the relevant transport and planning policies;
- **Chapter Four** sets out the methodology used within the TA;
- **Chapter Five** details the baseline transport conditions encountered within the study area;
- **Chapter Six** describes the trip generation and distribution of construction traffic in the study area;
- **Chapter Seven** summarises the traffic impact assessment;

- **Chapter Eight** considers mitigation proposals for general construction and operational traffic;
- **Chapter Nine** outlines access to the Site for abnormal loads;
- **Chapter Ten** presents a framework Traffic Management Plan; and
- **Chapter Ten** summarises the findings of the TA and outlines the key conclusions.

2 PROPOSED DEVELOPMENT

Site Description and Location

2.1 The Proposed Development is for 17 turbines, on land located on the south of Yell in the Shetland Islands, approximately 4 km northeast of Ulsta and 1 km northwest of Burravoe. The Proposed Development would be accessed via a new junction from the B9081 approximately 3.2km north east of its junction with the A968 in Ulsta.

2.2 The location of the Site is illustrated in Figure 2.1 of this report.

2.3 An indicative layout for the new site access junction is shown on Drawing A090047 SPA014. This is provided with 4.5 m x 160 m visibility splays, felt to be appropriate for the recorded 85th percentile speed of the road (see Table 5.3, Chapter 5 of this report).

2.4 The Proposed Development will comprise:

- Up to 17 wind turbines with a maximum tip height of 145 m;
- Turbine foundations and transformers (external or internal);
- Access roads;
- Grid connection;
- Underground cabling;
- Sub-station and control building;
- Met mast;
- Watercourse crossings;
- Borrow pits for aggregates;
- Temporary site compound;
- Site office; and
- Alterations to roads and road signage.

Turbine Details

2.5 The assessments to identify the effect and required mitigation works on the component transport route were undertaken on the basis of the 'worst case' turbine advised by Peel. Key dimensions of the components are indicated in Table 2.1.

Table 2.1 Blade, Tower and Generator Dimensions

Component	Length	Diameter (Base)	Diameter (Top)
Blade	55.6m	N/A	N/A
Bottom Tower	30.6m	4.5m	4.2m
Generator Ring	5.58m	5.0m	5.0m

2.6 The final turbine model and specification will be the subject of a commercial procurement process following consent of the application. With the ongoing advances in turbine design, at the time of construction a number of new model options may be available.

3 POLICY CONTEXT

Introduction

3.1 A review of relevant transport and planning policies has been undertaken and is summarised below. The review provides the basis for the wider development context of wind farm proposals.

National Policy

Scottish National Planning Framework (NPF)

3.2 The Scottish National Planning Framework (NPF) 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 Government's development priorities over the next 20-30 years and identifies national developments which support the development strategy. Scotland's third National Planning Framework 3 was laid in the Scottish Parliament on June 23, 2014.

Planning Advice Note (PAN) 75

3.3 PAN75: Planning for Transport provides advice on the requirements for Transport Assessments as follows:

"requires a 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."

Onshore Wind Turbines; Online Renewables Planning Advice (May 2014)

3.4 The Scottish Government introduced online renewables advice in February 2011 which has been regularly updated since then. The most recent specific advice note regarding onshore wind turbines was published in May 2014. The advice note identifies the typical planning considerations in determining applications for onshore wind turbines including landscape impact, impacts on wildlife and ecology, shadow flicker, noise, ice throw, aviation, road traffic impacts, cumulative impacts and decommissioning.

3.5 In terms of road traffic impacts, the guidance notes that in siting wind turbines close to major roads, pre-application discussions are advisable. This is particularly important for the movement of large components (abnormal load routing) during the construction period, periodic maintenance and for decommissioning.

Transport Assessment Guidance (2012)

3.6 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.

3.7 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

Shetland Local Development Plan 2014

3.8 The Shetland Local Development Plan (LDP) 2014 was adopted by the Council on 26th September 2014 and is the established planning policy for Shetland. It sets out the Council's land use strategy which recognises existing developments, promotes sustainable economic growth and conserves Shetland's natural and built environment.

3.9 **Policy TRANS3: Access and Parking Standards** indicates that all developments should provide "a safe and adequate access, visibility splay and turning area".

3.10 Other than the above, the LDP does not contain any transport specific requirements in relation to wind farm development.

Shetland Local Development Plan 2014 Supplementary Guidance Onshore Wind Energy

3.11 The supplementary guidance does not contain any transport specific requirements in relation to wind farm development.

Shetland Transport Strategy 2008

3.12 The Shetland Transport Strategy is a statutory document supported by an accompanying Delivery Plan document, which outlines the specific interventions (actions and policies) that the Zetland Transport Partnership (ZetTrans) will implement to meet the objectives of the Strategy.

3.13 The Shetland Transport Strategy does not contain any transport specific requirements in relation to wind farm development.

4 STUDY METHODOLOGY

Introduction

4.1 There are three stages that this assessment considers:

- The Construction Phase of the project;
- The Operational Phase of the project; and
- The Decommissioning Phase of the project.

Project Phases – Transport Overview

4.2 Of these phases, the greatest traffic volumes are associated with the project construction phase. The operational phases are restricted to occasional maintenance operations which generate much lower volumes of traffic that are not considered to be in excess of daily traffic variation levels on the road network.

4.3 The decommissioning phase involves fewer trips on the network than the construction phase, as elements of infrastructure such as access tracks are often left in place, adding to local infrastructure.

4.4 The 'worst case' transport scenario is therefore the construction phase and this assessment concentrates on this phase of the Proposed Development. It should be noted however that the construction effects are short lived and temporary in nature.

Scoping Discussions

4.5 WYG held a meeting with Shetland Island Council (SIC) roads officers in November 2014 to discuss potential transport routes and the scope of any forthcoming transport assessment. Peel then submitted a scoping report to SIC in April 2015 in respect of the Environmental Impact Assessment.

4.6 Key requirements for the TA resulting from these consultations are summarised summarised in Table 4.1

Table 4.1 Summary of Scoping Requirements

Consultation	Requirement	Comment
Meeting with SIC Roads	B9081 will require widening to 5m minimum along its length. Passing places would be required	Treatment of B9081 considered in mitigation section
	Low NRTF growth appropriate for development of Base traffic flows	Low NRTF growth applied
Roads Response to EIA Scoping May 2015	The Transport Assessment should also take into consideration "Transport Assessment Guidance" produced by Transport Scotland in 2012	The TA has been undertaken in line with the TS guidance
	Any assessment should look at not only the installation and removal of the turbines but also the ongoing maintenance and refurbishment of the turbines	All three phases of development are considered in the TA

5 BASELINE CONDITIONS

Road Network

5.1 The Proposed Development would take access from the B9081 and construction traffic would use the B9081 and A968 on Yell, roads including the B9076 and A968 on Mainland and the Toft to Ulsta ferry route to access the Site. All of the roads are local roads managed by SIC.

5.2 The B9081 runs from a junction with the A968 north of the Ulsta ferry terminal, around the south and west of the island to Mid Yell where it connects again with the A968. It provides access to the settlements of Burravoe to the south of the Site and Mid Yell to the north east. The road is a single track rural road with passing places, is approximately 3m wide and is subject to the national speed limit except where it passes through settlements. Through Burravoe and Mid Yell, the speed limits drops to 30mph. Between Ulsta and the proposed site access location, the B9081 is constrained by geometry and structures.

5.3 The B9081 joins the A968, a single carriageway rural road, immediately to the north of the Ulsta ferry terminal at a priority junction. From the junction, the A968 continues north to Gutcher and Mid Yell and south to the ferry terminal. The A968 is subject to the national speed limit except within the ferry terminal where the limit is 5mph.

5.4 From the ferry terminal at Toft on Mainland, the A968 continues southwards as a single carriageway rural road. It connects with the B9076 approximately 3km south of Toft and the A970 some 13km south of that. The route is generally subject to the national speed limit, except where it passes through the settlement of Hillside where the speed limit falls to 30mph.

5.5 The B9076 leaves the A968 at a priority junction and runs westwards, providing access to the Sullom Voe Terminal and Hillswick. The route is a rural single carriageway.

5.6 From its priority junction with the A968 at Hillside, the A970 continues southwards to Lerwick and Sumburgh and north to Brae and Hillswick. The route is a rural single carriageway and generally subject to the national speed limit except where it passes through settlements.

Data Collection Methodology

5.7 WYG identified eight survey sites that would allow an estimation of the potential effects of the construction phase to be made. To gauge the existing road usage, data was obtained from Automatic Traffic Count (ATC) surveys undertaken during week commencing 28th July 2015 at the following locations:

- B9082 south of Cullivoe;
- B9081 north of Burravoe;
- B9081 in the vicinity of the proposed site access junction;
- A968 north of the Ulsta ferry terminal;
- A968 south of the Toft ferry terminal;
- B9076 west of its junction with the A968;
- A968 south of its junction with the B9076; and
- A970 south of its junction with the A968 at Hillside.

5.8 The locations of the traffic count sites are illustrated in Figure 5.1 of this report.

5.9 The ATC data was collected by independent traffic survey specialists, Streetwise, for the week commencing Friday 6th June 2014 during what is considered a neutral period within the calendar year.

Existing Traffic Conditions

5.10 The traffic counters allowed the traffic flows to be split into vehicle classes and the data have been summarised into cars/ light goods vehicles (Lights) and heavy goods vehicles (HGVs) (all goods vehicles >3.5 tonnes gross maximum weight).

5.11 Table 5.1 summarises the 24-hour average weekday traffic data collected at the eight count sites.

Table 5.1 Existing Traffic Conditions (Weekday Average Two-Way Flows)

Survey Location	Cars + Lights	HGV	Total
B9082 south of Cullivoe	217	73	**290**
B9081 north of Burravoe	166	47	**213**
B9081 in vicinity of proposed site access	172	58	**230**
A968 north of Ulsta ferry terminal	452	142	**594**
A968 south of Toft ferry terminal	561	162	**723**
B9076 west of junction with A968	1027	377	**1404**
A968 south of junction with B9076	910	353	**1263**
A970 south of junction with A968	2777	958	**3735**

Baseline Traffic Conditions

5.12 Construction of the project is due to be undertaken during 2019 if consent is granted and is likely to take between 18 and 24 months. For the purpose of this assessment, and to consider the most onerous construction traffic figures, the shorter 18 month construction period was assumed.

5.13 Any lengthening in the programme however will have a reduced effect on the surrounding road network in peak period trip generation terms.

5.14 To assess the likely effects during the construction phase (and as agreed with SIC roads officers), base year traffic flows were determined by applying a National Road Traffic Forecast (NRTF) low growth factor to the surveyed traffic flows.

5.15 The NRTF low growth factor is 1.0276. This factor was applied to the 2015 survey data to estimate the 2019 Base traffic flows shown in Table 5.2.

Table 5.2 2019 Base Traffic Conditions (Weekday Average Two-Way Flows)

Survey Location	Cars + Lights	HGV	Total
B9082 south of Cullivoe	223	76	**299**
B9081 north of Burravoe	171	49	**220**
B9081 in vicinity of proposed site access	177	60	**237**
A968 north of Ulsta ferry terminal	465	146	**611**
A968 south of Toft ferry terminal	577	167	**744**
B9076 west of junction with A968	1056	388	**1444**
A968 south of junction with B9076	936	363	**1299**
A970 south of junction with A968	2854	985	**3839**

Speed Survey

5.16 The ATC sites used to provide traffic volume data were also used to collect speed statistics. The two-way 5-day average and 85th percentile speeds observed at the count locations are summarised below in Table 5.3.

Table 5.3 Speed Summary (Weekday Average Two-Way)

Survey Location	Average Speed (MPH)	85th Percentile Speed (MPH)	Speed Limit (MPH)
B9082 south of Cullivoe	41.9	51.1	**60**
B9081 north of Burravoe	42.1	54.4	**60**
B9081 in vicinity of proposed site access	37.9	47.9	**60**
A968 north of Ulsta ferry terminal	43.1	51.1	**60**
A968 south of Toft ferry terminal	45.1	57.0	**60**
B9076 west of junction with A968	57.9	72.0	**60**
A968 south of junction with B9076	55.1	63.0	**60**
A970 south of junction with A968	55.5	63.4	**60**

5.17 The speed survey data indicates that average and 85th percentile speeds at all sites on Yell are substantially lower than the speed limit. On Mainland, while the average speeds

were all recorded as being below the speed limit, 85th percentile speeds at all locations except immediately south of the Toft ferry terminal were in excess of the speed limit.

Accident History

5.18 WYG obtained road traffic personal injury accident data for the three years from the start of 2012 over a study area comprising the following links:

- B9082 Cullivoe to Gutcher, Yell;
- B9081 Mid Yell to Ulsta, Yell;
- A968 Gutcher to Ulsta, Yelll;
- A968 Toft to Hillside, Mainland;
- B9076 Pund of Loot to Brae, Mainland; and
- A970 Hillside to its junction with the B9075, Mainland.

5.19 The accident data was obtained from the online resource crashmap.co.uk which uses data collected by the police about road traffic crashes occurring on British roads where someone is injured. The data indicates that over the network reviewed which is approximately 180km in length (two way), an average of 3 accidents occur every year of which around 78% are classified as “slight” by the police officer(s) reporting and recording the personal injury accident.

5.20 Table 5.4 below provides a summary of the 9 personal injury accidents recorded along the length of each study area route for the three-year period.

Table 5.4 Accident Data Summary

	Severity			No. Vehs		Vehicle Types			Road Feature			Surface Condition			Lighting	
	Slight	Serious	Fatal	Single	Two or more	Car Only	Car + Motorcycle	Car + Agricultural	Junction	Bend	Other	Dry	Wet or Damp	Snow Frost or Ice	Daylight	Darkness
B9082 Cullivoe to Gutcher, Yell	No Accidents Recorded															
B9081 Mid Yell to Ulsta, Yell	1			1		1								1	1	
A968 Gutcher to Ulsta, Yelll	1			1		1				1				1		1
A968 Toft to Hillside, Mainland	2	1		2	1	2	1		1	2		2	1		2	1
B9076 Pund of Loot to Brae, Mainland		1			1			1	1			1			1	
A970 Hillside to B9075, Mainland	3			1	2	3				2		1	1	1	2	1
Total	**7**	**2**	**0**	**5**	**4**	**7**	**1**	**1**	**2**	**5**	**0**	**4**	**2**	**3**	**6**	**3**

5.21 The table indicates that of the 9 personal injury accidents recorded within the study area:

- 7 or 78% were slight and 2 were serious. No fatal accidents were recorded;
- 5 or 55% were single vehicle incidents while the remaining 4 or 45% involved two or more vehicles;
- 7 or 78% involved cars only while 2 involved cars plus another vehicle type, 1 a motorcycle and 1 an agricultural vehicle;

- 5 or 55% of the accidents occurred at locations on the road where there is a bend and 2 or 22% at a junction;
- 3 or 33% of accidents occurred when the road surface was affected by snow, frost or ice and 2 or 22% when it was wet or damp; and
- 3 or 33% of the accidents occurred during hours of darkness.

5.22 In summary, it is noted that the majority of accidents were slight and involved single vehicles, all the accidents involved cars, and over half occurred when the road surface was affected by snow, frost, ice or rain. None of the accidents involved a goods vehicle which is important to note as the majority of movements associated with the Proposed Development will be undertaken by goods traffic.

Path Network

5.23 The Shetland Islands Council (SIC) Core Path Plan does not indicate any Core Paths in the vicinity of the Site. However, a circular walking route, the 'Ward of Otterswick Walk' which links with the 'Catalina Walk' leading to the Catalina Memorial for those lost in an air crash, follows the B9081 from Hamnavoe, passes the site entrance to the Arisdale Farm, heads north to Ward of Otterswick and then south back to Hamnavoe. The section of the route which follows the B9081 between the site access junction and the Arisdale Farm entrance would be used by construction or operational traffic serving the Proposed Development in addition to the traffic that currently uses the road.

5.24 North of Hamnavoe and within the Site, the route would also be crossed and followed for a short length by the main site access road. The route will therefore also be affected by construction traffic. Within the Site, the walking route is considered a receptor of high significance.

5.25 The full route is indicated in Figure 5.2.

6 DEVELOPMENT TRIPS

Derivation of Development Traffic

6.1 During the 18-month construction period, the following traffic will require access to the to the Site:

- Staff transport, either cars or staff minibuses;
- Construction equipment and materials, deliveries of machinery and supplies such as cement; and
- Abnormal loads consisting of the wind turbine sections and also a heavy lift crane.

6.2 Average monthly traffic flow data were used to establish the construction trips associated with the Site based on the assumptions detailed in the following sections.

Staff Traffic

6.3 Staff would arrive in non-HGV vehicles and where possible will be encouraged to car share. The workforce onsite will depend on the activities undertaken, but, based on previous wind farm construction site experience for a project of this scale which suggests three staff per turbine during the short peak period of construction is likely, the maximum number of staff expected onsite could be around 51 per day.

6.4 For the purposes of estimating traffic movements, it was assumed that 66% of staff would be transported by minibus carrying up to 16 people and 33% would arrive by car (single car occupancy was assumed as the worst case at this stage with potentially fewer movements through car sharing).

6.5 Based on these assumptions, staff transport cars and light vehicles would account for a maximum of 40 vehicle trips (20 trips inbound and 20 trips outbound) per day during the peak period of construction.

Construction Traffic

6.6 An estimate of concrete and steel reinforcement requirements for the turbine foundations was based on a worst case scenario in which the concrete is batched offsite and arrives in mixers for immediate pouring. The total estimated trips required for the

delivery of the concrete and reinforcement is summarised in Table 6.1 and Table 6.2 respectively.

Table 6.1 Ready Mix Deliveries

Foundation Volume (m^3)	No. Turbines	Total Volume (m^3)	Lorry Capacity (m^3)	No. Lorries	No. of Movements
450	17	7650	6	1275	2550

Table 6.2 Steel Reinforcement Deliveries

Foundation Volume (t)	No. Turbines	Total Weight (t)	Lorry Capacity (t)	No. Lorries	No. of Movements
50	17	850	30	29	58

6.7 Electrical cables will be laid in trenches or ploughed. There would be three cables per trench. The total estimated number of trips required to deliver the cabling is summarised in Table 6.3.

Table 6.3 Cabling Movements

Length of Trench / Cable (m)	Length Per Drum (m)	No. of Drums	Drums Per Lorry	No. Lorries	No. of Movements
8750 / 26250	500	53	9	6	12

6.8 The cables may be buried in sand to protect them from damage. Cabling sand would be imported to the Site. The total estimated number of trips required to deliver the cabling sand is summarised in Table 6.4.

Table 6.4 Cabling Trench Movements

Length of Cable Run (m)	Trench Cross-Section (m^2)	Total Volume (m^3)	Density (t/m^3)	Lorry Capacity (t) / No Lorries	No. of Movements
8750	0.3375	2953	1.6	20 / 237	474

6.9 Materials will be required to construct the wearing course of the access tracks, crane hardstandings and turning heads and foundations for the temporary construction compounds and electrical control building. For the purposes of this assessment it was assumed that the majority of material will be extracted from the four borrow pits that have been identified onsite and only the top 200mm of dressing stone will be delivered from offsite quarries. The total estimated trips required for the delivery of track construction and other hardstandings materials is summarised in Table 6.5.

Table 6.5 Track Construction Movements – all from off site sources

Volume of Track / Hardstanding (m3)	Density (t/ m²)	Total (t)	Lorry Capacity (t) / No Lorries	No. of Movements
12830	2	25660	20 / 1283	2566

6.10 It is assumed that there will be one service delivery (food/drink) per working day throughout the 18-month programme. This equates to 44 vehicle movements per month (22 trips inbound and 22 trips outbound).

6.11 In addition, further items will be required to be transported to the Site during the construction phase. These items are detailed in the main delivery schedule table provided in Appendix A of this report.

6.12 It has been assumed that construction activities would take place over 22 working days month.

Turbine Transport

6.13 The turbines are broken down into components for transport to the Site. The nacelle, blade and tower sections are classified as Abnormal Indivisible Loads (AIL) due to their weight, length, width and height when loaded. For the purposes of the report, the 'worst case' numbers of components requiring transport are illustrated in Table 6.6. It should be noted that the actual turbines installed on the Site may have fewer tower sections, resulting in fewer loads being transported to the Site.

Table 6.6 Turbine Components

Component	No. Loads per Turbine
Rotor Blades	**3**
Tower Sections	**4**
Nacelle	**1**
Hub	**1**
Drive Train	**1**
Container	**1**
Nose Cone	**1**
Footings	**1**
Site parts (shared Containers)	**0.2**
Total Movements	**13.2**
Number of Turbines	**17**
Total Vehicle Trips	**224**
Total Vehicle Movements	**448**

6.14 In addition to the turbine deliveries, two high capacity erection cranes would be needed to offload a number of components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 1,000 tonnes that are escorted by boom and ballast trucks to allow full mobilisation onsite. Smaller erector cranes would also be present to allow the assembly of the main cranes and to ease the overall erection of the turbines.

Total Construction Traffic

6.15 The total estimated construction traffic movements are detailed in the main delivery schedule table provided in Appendix A of this report.

6.16 To enable comparison of the observed survey data and estimated 2019 base traffic flows with total volumes including predicted construction traffic, the monthly data were converted to average daily flows for each month of the construction period as shown in Appendix A of this report.

Trip Distribution

6.17 The distribution of development trips on the network will vary depending on the types of loads being transported. All traffic will enter the Site by way of the access junction on the B9081.

6.18 Staff trips were assumed to all originate in Lerwick and workers commute to the Site each day, a very robust assumption given that other residential options exist.

6.19 More specialist deliveries have different distributions on the network. The distributions for these trips were based on the following assumptions:

- All abnormal turbine loads and crane trips will originate from Sullom Voe and access the Site via the B9076 / A968 / Toft-Ulsta Ferry / A968 / B9081;
- All track aggregate material will be sourced from local quarries. There are a number of quarries including Sullom Quarry, Scatster Quarry near Scatster Airport and Vatster Quarry near Laxfirth. Based on the locations of these sites, it is assumed that vehicles delivering aggregate will approach the Site 66% via B9076 / A968 / Toft-Ulsta Ferry / A968 / B9081 and 33% via A970 / A968 / Toft-Ulsta Ferry / A968 / B9081;
- All concrete deliveries will be sourced from local ready mix sites. It is assumed that all concrete would be sourced from the Sullom Quarry and vehicles would approach the Site via B9076 / A968 / Toft-Ulsta Ferry / A968 / B9081; and
- All other deliveries are assumed to route equally via B9076 / A968 / Toft-Ulsta Ferry / A968 / B9081 and via A970 A968 / Toft-Ulsta Ferry / A968 / B9081.

Conclusions

6.20 The results conclude that Month 7 is likely to be the peak period for the construction phase. This corresponds with the delivery of stone for the construction of access tracks and other hardstandings, concrete for turbine foundations and sand for cabling trenches. The activities are anticipated to generate an average of 70 movements per day (35 trips in and 35 trips out), of which 32 would be made by light vehicles (site staff) and 38 by HGV.

6.21 The traffic impact assessment focuses on the peak period traffic flows to illustrate the potential effects on the study network.

7 TRAFFIC IMPACT ASSESSMENT

Construction Traffic

7.1 The 2019 base traffic data was combined with the peak daily construction traffic flows to estimate the total trips on the road network during the peak of the construction phase.

7.2 Table 7.1 illustrates the peak weekday construction traffic flow, Table 7.2 the weekday 2019 base plus peak construction traffic (total) flows and Table 7.3 the percentage increase in 2019 total traffic over 2019 base traffic.

Table 7.1 Weekday Construction Traffic (Weekday Average Two Way Flows)

Survey Location	Cars + Lights	HGV	Total
B9082 south of Cullivoe	0	0	**0**
B9081 north of Burravoe	0	0	**0**
B9081 in vicinity of proposed site access	32	38	**70**
A968 north of Ulsta ferry terminal	32	38	**70**
A968 south of Toft ferry terminal	32	38	**70**
B9076 west of junction with A968	0	28	**28**
A968 south of junction with B9076	32	10	**42**
A970 south of junction with A968	32	10	**42**

Table 7.2 2019 Total Traffic Flows (Base +Construction Traffic)

Survey Location	Cars + Lights	HGV	Total
B9082 south of Cullivoe	223	76	**299**
B9081 north of Burravoe	171	49	**220**
B9081 in vicinity of proposed site access	209	98	**307**
A968 north of Ulsta ferry terminal	497	184	**681**
A968 south of Toft ferry terminal	609	205	**814**
B9076 west of junction with A968	1056	416	**1472**
A968 south of junction with B9076	968	373	**1341**
A970 south of junction with A968	2886	995	**3881**

Table 7.3 % Increase 2019 Total vs 2019 Base Traffic Flows

Survey Location	Cars + Lights	HGV	Total
B9082 south of Cullivoe	0%	0%	**0%**
B9081 north of Burravoe	0%	0%	**0%**
B9081 in vicinity of proposed site access	18%	63%	**29%**
A968 north of Ulsta ferry terminal	7%	26%	**11%**
A968 south of Toft ferry terminal	6%	23%	**9%**
B9076 west of junction with A968	0%	7%	**2%**
A968 south of junction with B9076	3%	3%	**3%**
A970 south of junction with A968	1%	1%	**1%**

7.3 It is anticipated that should any weekend working take place, it would involve limited numbers of staff and associated vehicle movements and no deliveries by HGVs; no detailed analysis has therefore been undertaken.

7.4 No increases in traffic flow are predicted on the A968 north of its junction with the B9081, the B9081 east and north of the site access or any other roads within Yell.

7.5 The results indicate that total traffic movements are not predicted to increase by more than 10% on any routes on Shetland Mainland. On the A968 between Ulsta and its junction with the B9081 and on the B9081, total traffic flows are anticipated to increase by 11% and 29% respectively.

7.6 HGV movements are anticipated to increase by less than 10% on the A970, A968 south of its junction with the B9076 and the B9076 itself. North of the junction of the A968 with the B9076, all roads considered are anticipated to experience uplifts in HGV traffic above 20% with the greatest impact, 63% anticipated on the B9081 between Ulsta and the site access junction.

7.7 Although the uplift on the B9081 is high in percentage terms, this is partly due to the very low baseline levels of HGV traffic on the link. In real terms, the additional number of HGV movements per hour averages less than four within this peak month of construction activity.

7.8 It should be noted that should onsite batching of concrete be progressed, the number of vehicle movements on the external road network associated with the construction of the turbine foundations would be reduced by around a third compared with the import of ready mix concrete.

Operational Traffic

7.9 It is predicted that during the operation of the Site (expected to be for 25 years from commissioning) there would be up to 2 vehicle movements per week for maintenance purposes. Also, there may be occasional abnormal load movements to deliver replacement components in the unlikely event of a major failure.

Decommissioning Traffic

7.10 Prior to decommissioning of the Site, a traffic assessment would be undertaken and appropriate traffic management procedures followed. It is anticipated that the number of associated movements would be less than during the construction phase and that the number of abnormal loads would be drastically reduced.

8 GENERAL TRAFFIC MITIGATION PROPOSALS

Construction Phase

8.1 During the construction period a website containing the latest information relating to traffic movements associated with vehicles accessing the Proposed Development would be maintained. This would be agreed with the local roads authority.

8.2 The following measures would be implemented through a Construction Traffic Management Plan (CTMP) during the construction phase:

- 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 wash facilities will be established at the site entrance;
- Normal site working hours would be limited to between 7am and 7pm (Monday to Friday and 7am and 1pm (Saturday) though component delivery and turbine erection may take place outside these hours;
- Appropriate traffic management measures would be put in place on the A968 B9081 to avoid conflict with general traffic, subject to the agreement of the roads authority. Typical measures would include HGV turning and crossing signs and/ or banksmen at the site access and warning signs;
- Widening of and passing areas on the B9081 between Ulsta and the proposed site access;
- Appropriate traffic management measures would be put in place on the site access and road once constructed to avoid conflict with pedestrians using the walking route;
- Provide construction updates on the project website and a newsletter to be distributed to residents on Yell;
- Adoption of a voluntary speed limit of 30mph for all construction vehicles on the road network between Ulsta and the site access;
- All drivers would be required to attend an induction to include:
  - a safety briefing;

- the need for appropriate care and speed control, particularly over the section of the B9081 between Ulsta and the site access which is a single track road;
- identification of specific sensitive areas;
- identification of the specified route; and
- the requirement not to deviate from the specified route.

- A Traffic Management Plan; and
- Out of hours chartering of the ferry to reduce conflicts with other users.

8.3 The local authority may require an agreement to cover the cost of abnormal wear and tear on roads not designed for that purpose.

8.4 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 state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to public traffic, would be repaired immediately.

8.5 Where required, road improvements would be carried out in agreement with SIC and the appropriate statutory authorities to ensure that during delivery of turbine components minimal damage is caused to road surfaces, verges, street furniture and surrounding vegetation. 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.

8.6 There would be a road edge review on a daily basis and any debris and mud removed from the carriageway using an onsite road sweeper to keep the road clean and safe.

8.7 The impact of construction traffic could be mitigated through the use of alternative methods of material sourcing such as batching of concrete onsite using a mobile batching plant. The use of onsite concrete batching would reduce the number of HGV movements by around a third compared with all concrete being imported.

Operational Phase Mitigation

8.8 Site entrance roads will be well maintained and monitored.

Decommissioning Phase Mitigation

8.9 Similar to the construction phase, a Traffic Management Plan and Construction Traffic Management Plan will be prepared for the decommissioning phase.

9 ABNORMAL LOAD ACCESS REVIEW

Legislative Background

9.1 General construction traffic is covered by the Construction and Use Regulations, whilst AIL traffic is covered under the Road Vehicles (Authorisation of Special Types)(General) Order 2003 which defines an Abnormal Indivisible Load as:

"a load that cannot, without undue expense or risk of damage, be divided into two or more loads for the purpose of being carried on a road and that –

- *On account of its length or width, cannot be carried on a motor vehicle of category N3 or a trailer of category O4 (or by a combination of such vehicles) that complies in all respects with Part 2 of The Construction and Use Regulations; or*
- *On account of its weight, cannot be carried on a motor vehicle of category N3 or a trailer of category O4 (or by a combination of such vehicles) that complies in all respects with-*
  - *Authorised Weight Regulations (or, if those Regulations do not apply, the equivalent provisions in Part 4 of the Construction and Use Regulations); and*
  - *Part 2 of the Construction and Use Regulations."*

9.2 There are four main pieces of legislation that cover AIL movements as defined by the Highways Agency (HA):

- The Road Vehicles (Construction & Use) Regulation 1986;
  This covers all aspects of the vehicles setup from the weights and dimensions through to the braking system and environmental standards.
- The Road Vehicles (Authorised Weight) Regulations 1998;
  This regulation sets the limited maximum weight of the vehicle and axle loading of different vehicle categories.
- The Road Vehicles (Authorisation of Special Types)(General) Order 2003;
  The STGO is for vehicles not covered by either of the above Regulations and covers wind turbine component delivery vehicles which are categorised as N3 for the tractor units and O4 for the specifically designed trailers. It states that the Police, the relevant highway and bridge authorities or the Secretary of State may need to be notified of vehicle movement, dependent on the size of the load.

Notifications can be made online through the 'Highway Agency's Electronic Service Delivery for Abnormal Loads (ESDAL) System' or in paper form using the BE16 form for Special Orders.

- The Road Vehicles Lighting Regulation 1989 (Authorisation of Special Types)(General) Order 2003. This regulation defines whether front, side and rear lamps and reflectors are mandatory and which ones are permitted and which are not permitted.

9.3 Applications for a 'Vehicle Special Order' (VSO) will be made to the Vehicle Certification Agency (VCA) by the haulier at least 10 weeks prior to planned vehicle movements.

Component & Transport Details

9.4 The turbines are broken down into components for transport to the Site.

9.5 The components can be delivered on a variety of transport platforms, with typical examples illustrated in Photo 9.1 and Photo 9.2.

Photo 9.1 Typical Blade Transporter

Photo 9.2 Typical Tower Transporter

9.6 The blades and tower sections are considered as abnormal loads due to their size, whilst the hub, nacelle and drive train join this category due to their weight. Other components such as the transformer and switchgear are transported using standard HGV vehicles. A typical turbine of this scale can be delivered in up to 14.2 deliveries (of which 10 are considered abnormal).

9.7 The total number of abnormal loads associated with the construction of the Proposed Development is 224. This may vary slightly depending upon the final choice of turbine.

9.8 The police generally advise that they will escort up to three abnormal loads as a single convoy. Assuming the worst case scenario of three component parts, it is predicted that up to 57 individual convoys would deliver to the Site.

9.9 In addition to the turbine deliveries, the large erection cranes would constitute abnormal loads.

9.10 The decommissioning of the turbines would result in a similar number of abnormal loads as during the construction phase, with the blades, nacelle, hub and towers being removed. However, it is possible that the turbines could be cut up onsite meaning they could be transported offsite using standard vehicles. Environmental investigations would

be undertaken at an appropriate time to determine whether in situ breakdown would be acceptable.

9.11 At this point in time, it is predicted that the foundations will remain in situ, below 1.2m from finished ground level.

Port of Entry (POE)

9.12 Government policy ensures that maritime loads utilise the closest maritime disembarking point to the Proposed Development access.

9.13 It is assumed that components will be landed at the construction jetty at Sullom Voe and then transported overland to Toft to be shipped to Yell via the existing Toft / Ulsta ferry.

Route from POE to Site

9.14 From Sullom Voe, loads would:

- follow an unclassified road onto the B9076;
- continue eastwards on the B9076, turning left onto the A968 at Pund of Loot;
- continue northwards on the A968 to Toft Voe Pier and take the ferry to the Ulsta Ferry Terminal;
- depart ferry at Ulsta and continue on A968 before turning right onto B9081; and
- continue on B9081 to the proposed site access, turning left off the road.

9.15 The route is indicated in Figure 9.1.

9.16 Use of the Toft / Ulsta ferry link could be restricted to quiet periods during the day when one or two smaller components could be transported with other traffic. The use of the vessels at night time is also considered a practical delivery schedule for larger sections as it may not be feasible to transport blade / tower components at the same time as general traffic.

Constraint Assessment

9.17 An abnormal load route access review of the route between Sullom Voe and the proposed site access junction was undertaken. This identified potential constraint points

(Points of Interest – POI) to the movement of components at the following locations, which are illustrated in Figure 9.1:

- POI 33 – Sullom Voe ferry exit;
- POI 22 - B9076 / A968 Pund of Loot – left turn at junction;
- POI 23 - A968 Sandside – left hand bend;
- POI 24 - A968 Booth of Toft – right hand bend;
- POI 25 - Ulsta ferry Terminal Exit – three point turn required after disembarking the ferry;
- POI 26 - A968 / B9081 – right turn at junction;
- POI 27 - B9081 Flukes Hole - culvert;
- POI 28 - B9081 Whinnerhoul – low utilities;
- POI 29 - B9081 Loch of Ulsta – right hand bend;
- POI 30 - B9081 Hill of Ulsta – right hand bend;
- POI 31 - B9081 Hamna Voe – bridge; and
- POI 32 - B9081 proposed site access – left turn.

9.18 Detailed assessments, including swept path assessments identified that the following modifications will be required to enable the movement of components to the Site:

- POI 22, B9076 / A968 Pund of Loot – left turn at junction. Loads will oversail and overrun the inside of the left turn and oversail the outside of the turn. To permit oversail and overrun on the inside of the turn, two chevron signs, one road sign and three bollards would need to be removed and a load bearing surface would need to be laid;
- POI 23, A968 Sandside – left hand bend. Loads will oversail the inside of the bend and oversail and overrun the outside of the bend. To permit oversail and overrun on the outside of the bend, a section of Armco barrier, a fence, two lighting columns, four chevron signs, two road signs and five bollards would need to be removed, a bus shelter would need to be relocated, load bearing surfaces would need to be laid and a bank would need to be re-profiled;
- POI 24, A968 Booth of Toft – right hand bend. Loads will oversail the inside of the bend and oversail and overrun the outside of the bend. To permit oversail and overrun through the bend, two chevron signs, one road sign, a section of fence and a gate would need to be removed and a load bearing surface would need to be laid;

- POI 25, Ulsta ferry Terminal Exit – three point turn. Loads will oversail and overrun various areas when undertaking the manoeuvre. To permit oversail and overrun four signs, two lighting columns and four bollards would need to be removed, a load bearing surface would need to be laid and parking would need to be suspended on the exit from the terminal;
- POI 26, A968 / B9081 – right turn at junction. Loads will oversail the inside of the turn and oversail and overrun the outside of the turn. To permit oversail and overrun through the turn, four signs, two bollards and a section of fence would need to be removed, a load bearing surface would need to be laid and a culvert would need to be upgraded;
- B9081 – general. The B9081 will be upgraded to 5.0m width with passing places to be provided at locations to be agreed;
- POI 27, B9081 Flukes Hole – culvert. Culvert to be widened;
- POI 28, B9081 Whinnerhoul – low utilities. Overhead utility search required to ensure height clearances are suitable for normal temperature ranges;
- POI 29, B9081 Loch of Ulsta – right hand bend. Loads will oversail the outside of the bend and oversail and overrun the inside of the bend. To permit overrun through the bend, a load bearing surface would need to be laid;
- POI 30, B9081 Hill of Ulsta – right hand bend. Loads will oversail the inside of the bend and oversail and overrun the outside of the bend. To permit overrun through the bend, a load bearing surface would need to be laid;
- POI 31, B9081 Hamna Voe – bridge. Loads will oversail the inside and outside of the bend on approach to the bridge though no mitigation would be required. The bridge would need to be upgraded to meet turbine manufacturers minimum standards and the parapets lowered to allow the passage of components.
- B9081 proposed site access – left turn. A new access junction would be created to include a tarmac surfaced track, load bearing surface and clear visibility splays.

9.19 AIL mitigation works can be designed to be temporary in nature to enable restoration to their original condition (if required by SIC). Areas of widening must be usable for the lifetime of the Proposed Development, although they can be re-vegetated following construction.

General Comments

9.20 The Abnormal Load Access Route Review, identified that a review of the following would be required prior to the delivery of the abnormal loads, to ensure load and user safety:

- A review of clear heights with utility providers and the transport agencies along the route;
- Ensure any vegetation which may foul the loads is trimmed back to allow passage (this is of concern to the hauliers once the load is on the local road network and should be assessed for summer conditions);
- Confirm there are no roadworks or closures that could affect the passage of the loads;
- Check no new or diverted underground services on the proposed route are at risk from the abnormal loads;
- Confirm Police Scotland is satisfied with the proposed movement strategy; and
- The developer contacts the appropriate agencies to ensure that the above points are reviewed before the transport of the components commences.

10 GENERAL TRAFFIC MANAGEMENT PLAN

Proposed Management Measures

10.1 This chapter introduces a number of traffic management measures that could help reduce the effect of construction traffic and AIL convoys. These measures are currently presented as indicative to be confirmed with the relevant local and trunk road authorities and police closer to the time.

10.2 All deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim to minimise the effect on the local road network. It is likely that the convoys would travel in the early morning periods, before peak times while general construction traffic would generally avoid the morning and evening peak periods.

Component & Transport Details

10.3 Traffic to the Site during construction will fall into two categories, namely:

- General construction traffic; and
- AILs – vehicles for the transport of the largest turbine components.

Potential Route Conflict Areas

10.4 The majority of potential conflicts between construction traffic and other road users will occur with AIL 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.

10.5 Potential conflicts between the AIL turbine loads and other road users can occur at a variety of locations and circumstances. The main potential conflicts are likely to occur:

- In rural areas where the loads may straddle the centre line, where fast moving oncoming traffic may be encountered, etc.;
- Where traffic turns at a road junction, requiring other traffic to be restrained on other approach arms; and
- In locations where high speeds of general traffic are predicted.

Advance Warning Signage

10.6 Advance warning signs would be installed on the approaches to the affected road network. Signs such as the examples shown in Figure 10.1 and Figure 10.2 could be installed to help assist drivers. Flip up panels (shown in grey) can be used to mask over days where convoys would not be operating. Figure 10.2 illustrates a cover panel secured by clips that would alert drivers that no convoys were operating during that week.

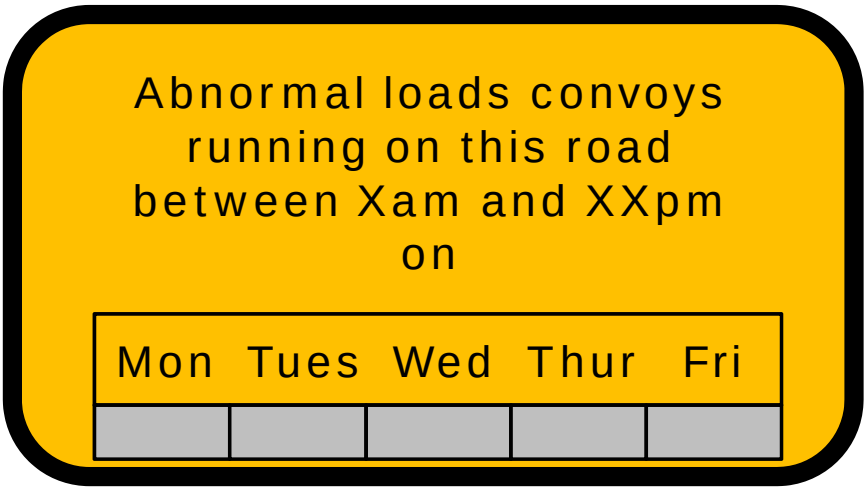


Figure 10.1 Indicative Information Sign

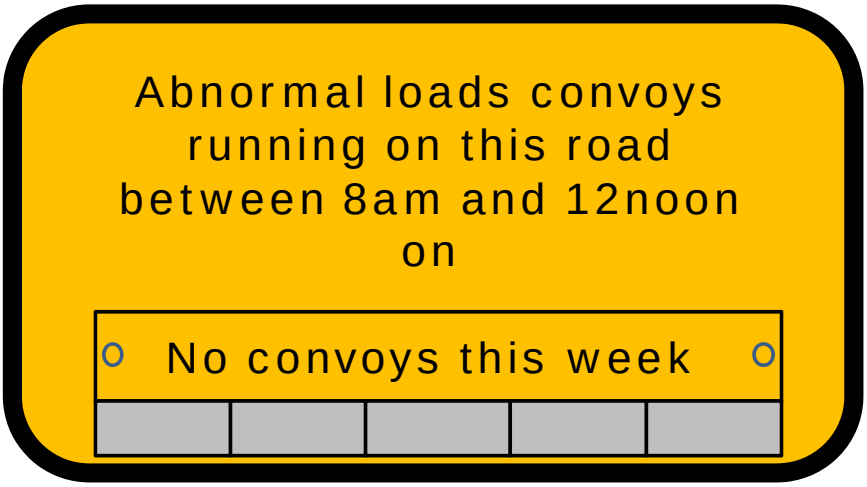


Figure 10.2 Indicative Information Sign

10.7 The purpose of this type of signage is to help improve driver information and allow drivers of oncoming traffic to consider proceeding to the nearest convenient passing point, or breaking their journey until the convoy has moved on.

Public Information

10.8 Information on the movement of abnormal load convoys should be provided to local media outlets to help assist the public. Information could be provided to local newspapers and radio stations.

10.9 Information would relate to expected vehicle movements from Sullom Voe through to the site access. It is hoped that this level of information will make residents aware of convoy movements and help reduce any potential conflicts.

10.10 The developer would also ensure information was distributed through its communication team using a variety of methods including the development website, and local newsletters for distribution to properties along the most affected sections of the proposed access routes, advising of convoy movements and the measures put in place to ensure the safe and efficient operation of the road network.

Convoy System

10.11 A police escort would be required to facilitate the delivery of the predicted loads. The police escort would be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact at all times where possible.

10.12 The abnormal loads convoys would be no more than three AILs long, or as advised by the police, to permit safe transit along the delivery route and to allow limited overtaking opportunities for following traffic where it is safe to do so.

10.13 The times in which the convoys would travel will need to be agreed with Police Scotland. Typical delivery times for similar projects has seen the early morning periods used in constrained sections, as traffic levels are generally lighter than those found in the afternoon.

Other Measures

10.14 The Framework Traffic 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 communications protocol to avoid delays with emergency vehicle traffic;
- A diary of proposed delivery movements to liaise with the communities to avoid key dates such as fetes etc;
- 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.

11 SUMMARY & CONCLUSIONS

Summary

11.1 This report was commissioned by Peel Wind Farms (Yell) Ltd to provide an assessment of the transport issues associated with the Proposed Development on land located on the south of Yell in the Shetland Islands, approximately 4 km northeast of Ulsta and 1 km northwest of Burravoe.

11.2 Existing traffic data established a base point for determining the impact during the construction phase and was factored to future levels to help determine the effect of construction traffic on the local road network.

11.3 The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed Development. During the construction of the Proposed Development, the associated traffic effects are predicted to be greatest on the B9081 between the A968 and the site access junction.

11.4 The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in Month 7 of the programme. During this month, an average of 38 HGV movements (or less than 4 per hour) is predicted per day and it is estimated that there would be a further 32 car and light van movements per day to transport construction workers to and from the Site.

11.5 A review of the local road network was undertaken to assess the feasibility of transporting turbines to the development Site. No capacity issues are expected on any of the roads assessed due to the additional construction traffic movements associated with the Proposed Development as background traffic flows are very low and the links are of reasonable standard.

Conclusions

11.6 The assessment has identified the following:

- That the construction phase of the project will generate the highest level of traffic;
- The construction traffic during the most intensive phase of the construction programme will be short lived;

- That total traffic movements are not predicted to increase by more than 10% on any routes on Mainland. On the A968 between Ulsta and its junction with the B9081 and on the B9081, total traffic flows are anticipated to increase by 11% and 29% respectively.
- HGV movements are anticipated to increase by less than 10% on the A970, A968 south of its junction with the B9076 and the B9076 itself. North of the junction of the A968 with the B9076, all roads considered are anticipated to experience uplifts in HGV traffic above 20% with the greatest impact, 63% anticipated on the B9081 between Ulsta and the site access junction.
- Although the uplift on the B9081 is high in percentage terms, this is partly due to the very low baseline levels of HGV traffic on the link. In real terms, the additional number of HGV movements per hour averages less than four within this peak month of construction activity.
- That the surrounding road network has sufficient capacity to accommodate the temporary construction traffic;
- That the route from the Port of Entry at Sullom Voe is suitable for turbine delivery; and
- That a traffic management plan is required to control construction traffic in the interests of road safety and efficiency.

FIGURES

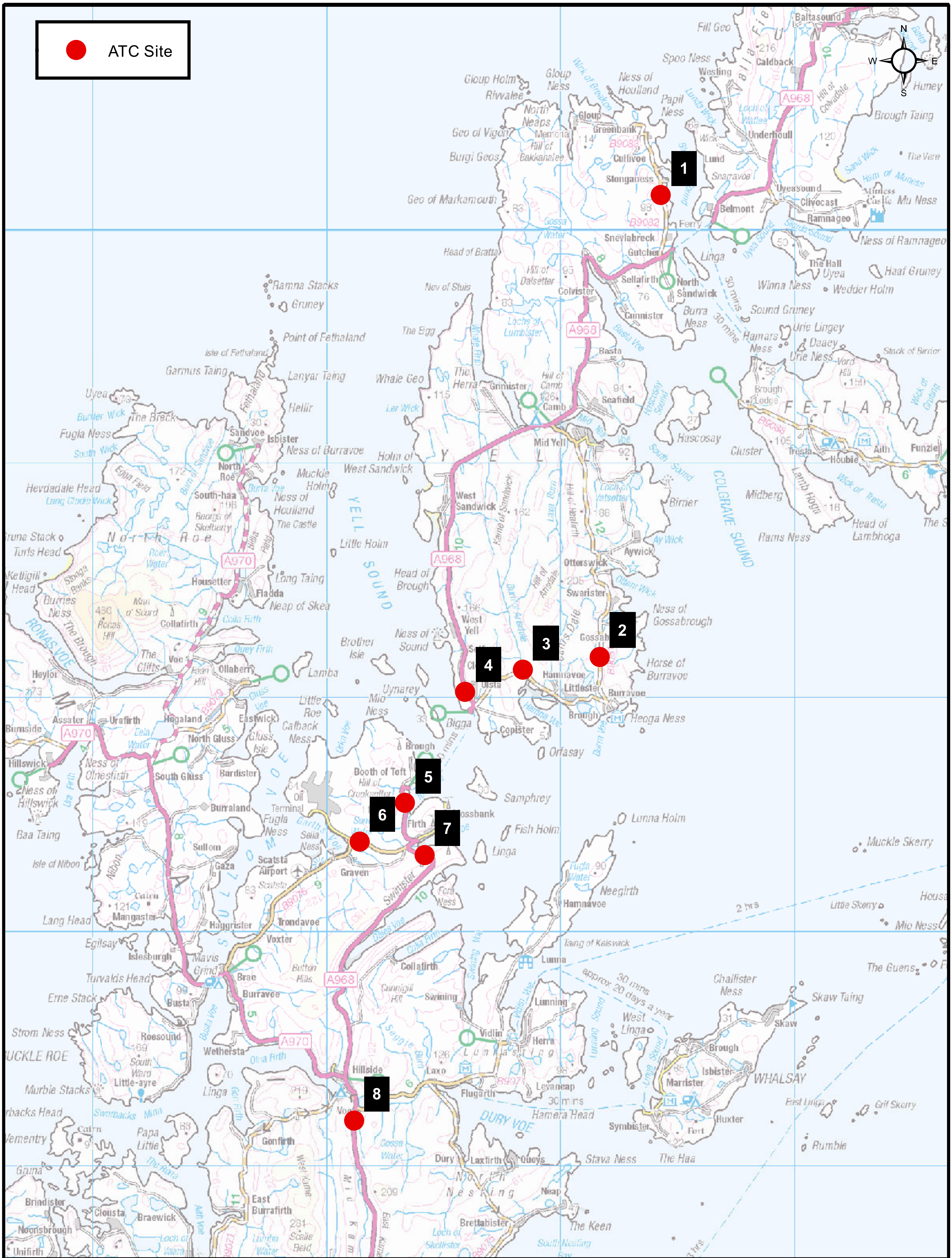
Beaw Field Wind Farm Transport Assessment

Figure 2.1 Site Location

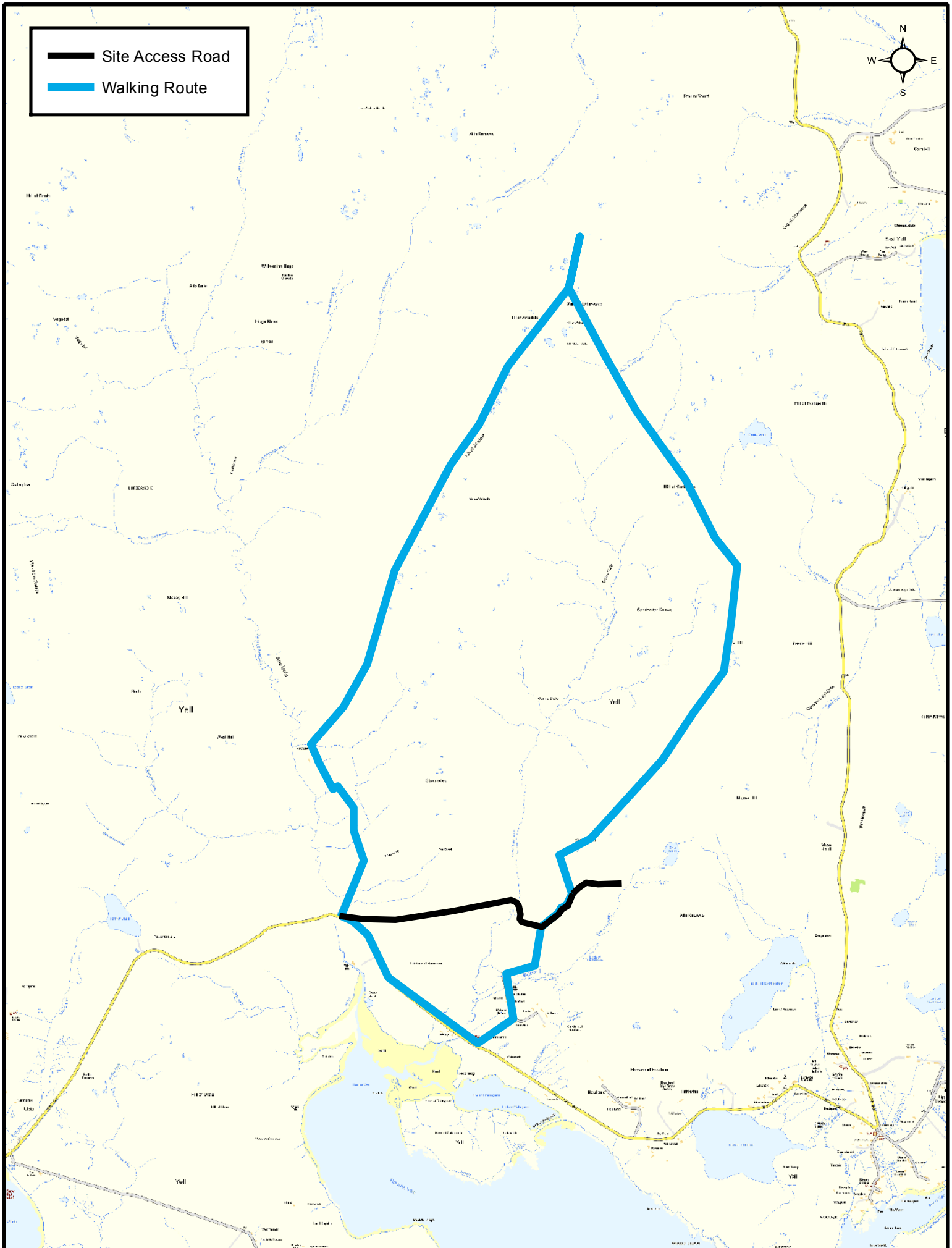
Drawn:	LJ
Date:	Jan 2016
Project Number:	A090047

Client: PEEL Energy

WYG Transport Planning
part of the WYG group
The Cube 45 Leith Street Edinburgh EH1 3AT
t: +44 (0)131 247 5700 e: edinburgh@wyg.com



Beaw Field Wind Farm Transport Assessment	Drawn: LJ	Client: Peel Energy	WYG Transport Planning
Figure 5.1 Automatic Traffic Count Locations (ATC)	Date: Jan 2016		part of the WYG group
	Project Number: A090047		The Cube 45 Leith Street Edinburgh EH1 3AT t: +44 (0)131 247 5700 e: edinburgh@wyg.com



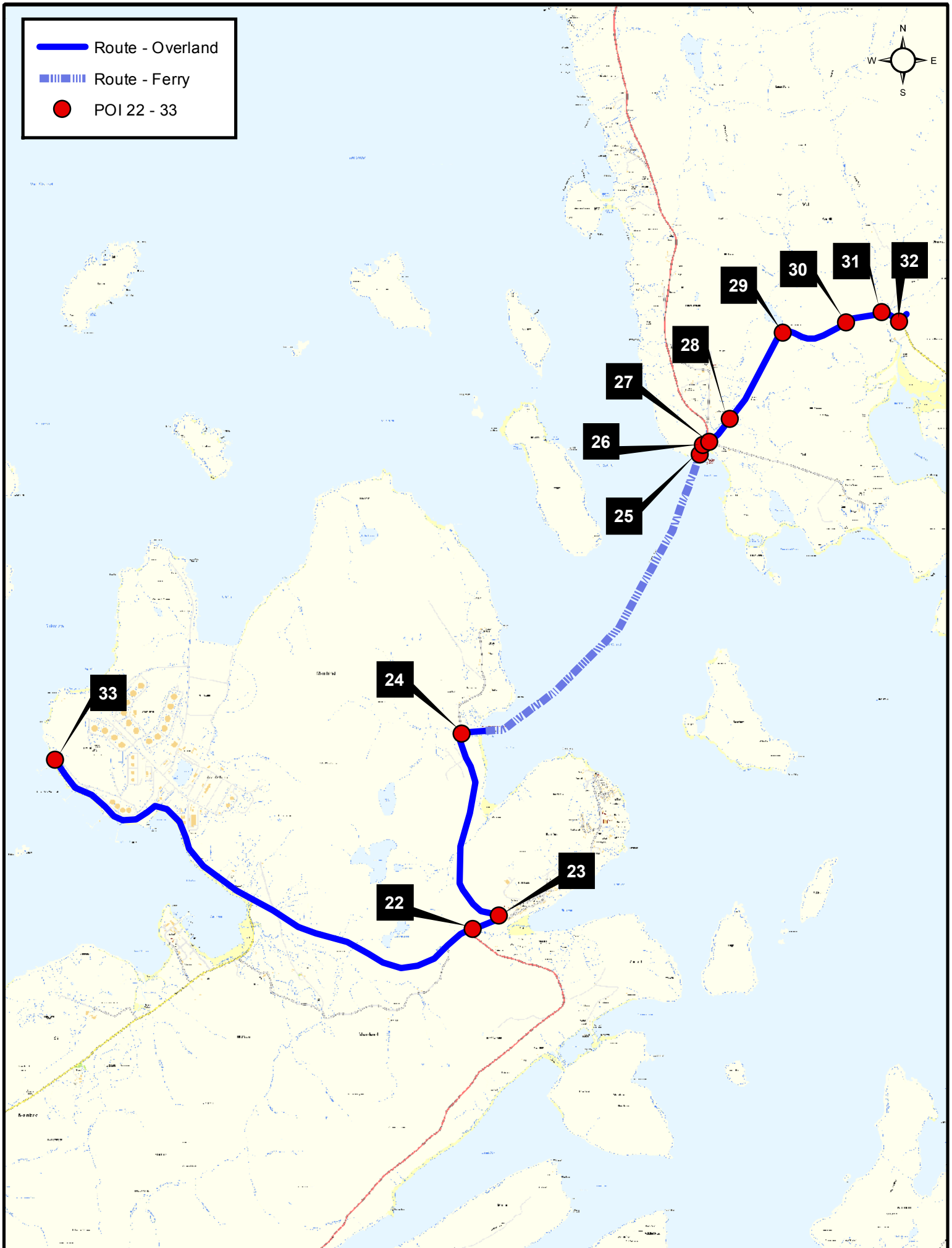
Beaw Field Wind Farm Transport Assessment

Figure 5.2 Ward of Otterswick Walk

Drawn:	LJ
Date:	Jan 2016
Project Number:	A090047

Client: PEEL Energy

WYG Transport Planning
part of the WYG group
The Cube 45 Leith Street Edinburgh EH1 3AT
t: +44 (0)131 247 5700 e: edinburgh@wyg.com



Beaw Field Wind Farm Transport Assessment

Figure 9.1 AIL Delivery Route

Drawn:	LJ
Date:	Jan 2016
Project Number:	A090047

Client: PEEL Energy

WYG Transport Planning
part of the WYG group
The Cube 45 Leith Street Edinburgh EH1 3AT
t: +44 (0)131 247 5700 e: edinburgh@wyg.com

APPENDIX A

Indicative Construction Programme

Beaw Field Wind Farm
Indicative Construction Programme

Activity	Month																		Total Movements	Vehicle Class
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
Site mobilisation	120	120															120	120	480	HGV
General site delivery vehicles	4	12	20	24	30	30	32	36	40	40	40	40	40	40	30	20	4	4	486	HGV
Earth moving plant	10	20												30					60	HGV
Imported stone	400	400	400	400	300	250	250	166											2566	HGV
Reinforcement							12	12	12	12	12								60	HGV
Off-Site Batched Concrete				284	284	284	284	284	284	284	284	278							2550	HGV
Cable Deliveries						3	3	3	3										12	HGV
Cabling Sand						140	140	120	76										476	HGV
Geotextile separators						48	48	48	48										192	HGV
Delivery of HV electrical items						16	16	16	16										64	HGV
Cranage and related vehicles									30					30					60	HGV
AIL Escorts										114	114	114	114						456	Car+LGV
Turbine transporters										112	112	112	112						448	HGV
Staff	88	264	440	528	660	660	704	792	880	880	880	880	880	880	660	440	88	88	10692	Car+LGV
Service (food/water etc)	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	792	HGV
Total estimated movements	**666**	**860**	**904**	**1280**	**1318**	**1475**	**1533**	**1521**	**1433**	**1486**	**1486**	**1468**	**1190**	**1024**	**734**	**504**	**256**	**256**	**19394**	
Working Days	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**		
Daily Average	**30**	**39**	**41**	**58**	**60**	**67**	**70**	**69**	**65**	**68**	**68**	**67**	**54**	**47**	**33**	**23**	**12**	**12**		