15 Access, Traffic and Transport

Introduction and Overview

15.1 This chapter assesses the potentially significant traffic and transport environmental related effects of the proposed wind farm.

15.2 The main traffic and transport related effects will be associated with the construction phase and the routing of the following vehicles to/from the site:
   - Heavy Goods Vehicles (HGVs) - vehicles 3.5 t gross weight (>3.5 t); and
   - Abnormal Loads - vehicles longer than 17 m and/or wider than 4 m

15.3 Once the wind turbines are operational, it is envisaged that the amount of traffic associated with the scheme would be minimal. Occasional visits will be made to the site for maintenance checks. The vehicles used for these visits are likely to be a 4x4 or similar and there may be an occasional need for an HGV to access the site for maintenance and repairs. It is considered 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. Furthermore the impact of operational traffic was accepted as being likely to be insignificant during the scoping stage of the assessment.

15.4 Decommissioning effects have not been considered as the baseline conditions are likely to have changed substantially from present. However, in general terms vehicle movements can be expected to be less than that associated with construction due to the retention in situ of some elements of the infrastructure.

15.5 Following a summary of relevant policy, this chapter outlines the methodology that has been adopted for this assessment and describes the existing and future baseline conditions. The chapter then considers the environmental measures that have been incorporated into the scheme, the estimated trip generation during the construction phase and the effects that are likely to occur. The chapter concludes with a summary of the significance of effects and identifies appropriate mitigation measures.

Methodology

Policy and Guidance

15.6 The following policy and guidance has been taken into account in this assessment.

National Policy

15.7 Advice on transportation is provided within the Scottish Planning Policy (SPP) and PAN75: Planning for Transport (2005). PAN75 provides good practice guidance for planning authorities and developers. One of the objectives of the document is to highlight the linkages between the planning and transportation systems.

15.8 The objectives of PAN75 and SPP are to integrate planning and transport at the national, regional, strategic and local level and to promote more sustainable transport choices both for carrying people and moving freight.

Local Policy

15.9 Local policies are contained within the Scottish Borders Local Plan. The policy of most relevance to the assessment of transportation impacts related to the proposed wind farm is Policy INF2: Protection of Access Routes:
   - When determining planning applications and preparing development briefs and in accordance with the Scottish Borders Access Strategy, the Council will seek to uphold access rights by protecting existing access routes including: statutorily designated long distance routes; Rights of Way; walking paths; cycle ways; equestrian routes; waterways; identified Safe Routes to School and in due course Core Paths.
   - Where development would have a significant adverse effect on continued access to or enjoyment of an access route or asserted Right of Way, alternative access provision will be sought at the developer’s cost either by diverting the route or incorporating it into the proposed development in a way that is no less attractive and is safe and convenient for public use. Unless such appropriate provision can be made, the development will be refused.

15.10 Additionally, Policy H2 Protection of Residential Amenity addresses potential transport impacts.

15.11 Development that is judged to have an adverse impact on the amenity of existing or proposed residential areas will not be permitted. To protect the amenity and character of these areas, any developments will be assessed against:
   - The principle of the development, including where relevant, any open space that would be lost; and
   - The details of the development, particularly in terms of:
     - The scale, form and type of development in terms of its fit within a residential area;
     - The generation of traffic or noise; and
     - The level of visual impact.

Guidance Documents

15.12 The 2002 Scottish Executive publication Guide to Transport Assessment for Development Proposals in Scotland also provides advice and guidance, and in terms of environmental assessment refers to PAN58 - Environmental Impact Assessment (Scottish Executive, 1999). However, neither publication provides any specific guidance on the approach to traffic and transport related assessments.

15.13 The Institute of Environmental Management and Assessment (IEMA) publication Guidance Notes No. 1: Guidelines for the Environmental Assessment of Road Traffic (hereafter referred to as the IEMA guidelines) (1993) sets out a methodology for assessing potentially significant environmental effects.

Assessment Scope and Approach

15.14 The main traffic and transport related environmental effects will be associated with the movements of HGVs and abnormal load vehicles to and from the development site during the construction phase of the proposed Penmanshiel Wind Farm. Consideration has been given to the most suitable routing of
general construction traffic and abnormal loads to and from the development site as detailed in paragraph 15.45.

15.15 This chapter provides an assessment of the impact of HGVs on the preferred general HGV construction routes. Effects associated with abnormal loads are not considered further as, whilst they will have a disproportionate effect on local residents, the impact on users of the abnormal load routes and the land uses that front them will only be temporary for the duration of the 120 abnormal load deliveries (associated with the turbine tower and turbine blades) which are required within the 12-18 month construction programme. All abnormal loads will be escorted and the movement of these vehicles will be programmed to avoid busy periods. The police and relevant highways authorities will be notified when abnormal loads are being transported. Any works that are required to be carried out on the highway in order to accommodate these vehicles will be undertaken under the appropriate Acts/Agreements. It is also appropriate to consider mitigation measures measures which will be outlined in a Traffic Management Plan (TMP) to reduce the potential for effects as far as reasonably possible. These are likely to include temporary road signage requirements, off-loading proposals, construction traffic routeing and timing of deliveries, deliveries to be co-ordinated by a logistics manager to prevent queuing of vehicles. Potential contents of the TMP are discussed in more detail in paragraph 15.102 to 15.105.

15.16 Once the proposed Penmanshiel Wind Farm is operational, it is envisaged that the amount of traffic associated with the scheme would be minimal. Occasional visits may be made to the development site for maintenance checks. The vehicles used for these visits are likely to be a 4x4 or similar and there may be an occasional need for an HGV to access the development site for maintenance and repairs. It is considered that the effects of operational traffic would be negligible and therefore the operational phase of the development is not considered any further in this assessment.

15.17 The proposed Penmanshiel Wind Farm will be designed with an operational life of 25 years at which stage it will be decommissioned. When the turbines are decommissioned after the 25-year operational period, there may be an effect on the local highway network due to the movements of HGVs and abnormal loads associated with the removal of equipment and materials from the development site. However, it is likely that only the above-ground elements will be removed, with turbine bases and access tracks left in situ. The level of traffic generation during decommissioning would therefore be less than during construction. Furthermore, any baseline data collected for the purposes of the current assessment will no longer be relevant at such an extended assessment horizon. Therefore, no further consideration is given to possible decommissioning impacts.

Potential Receptors

15.18 The methodology used in this chapter (adopting that advocated by the IEMA guidelines) includes evaluating:

- Potential effects on local roads and the users of those roads, including public transport users, pedestrians and cyclists; and
- Potential effects on land uses and environmental resources fronting those roads, including the relevant occupiers and users.

15.19 The IEMA guidelines also identify groups, locations and areas which may be sensitive to changes in traffic conditions and which should be considered for assessment. These potentially affected parties include:

- People at home;
- People in work places;
- Sensitive groups including children, elderly and disabled;
- Sensitive locations, e.g. hospitals, churches, schools, historical buildings;
- People walking;
- People cycling;
- Open spaces and recreational areas;
- Sites of ecological/nature conservation value; and
- Sites of tourist/visitor attraction

15.20 Key traffic related environmental effects include:

- Those considered relevant in this assessment:.
  - Severance
  - Driver Delay
  - Pedestrian Delay
  - Pedestrian Amenity
  - Fear and Intimidation
  - Accidents and Safety
- Those not considered relevant in this assessment:.
  - Hazardous Loads
  - Air Pollution
  - Dust and Dirt
  - Ecological Effects
  - Heritage and Conservation
  - Noise
  - Vibration
  - Visual Effects

15.21 The potential receptors for assessment are based on the roads that are likely to be subject to change. A change in traffic characteristics of roads, as a result of traffic generated during construction, is likely to affect users of those roads and the land uses that front them.

Methodology for Prediction of Effects

15.22 The estimated traffic generation resulting from the construction phase of the proposed development is compared with baseline traffic flows in order to determine the percentage increase in traffic on each road that has been taken forward for assessment.

15.23 In order to define the scale and extent of this assessment, the IEMA guidelines identify the following rules by which to undertake an assessment of potentially significant traffic and transport related environmental effects:

- Rule 1: Include roads where traffic flows are predicted to increase by more than 30% (or where the number of HGVs are predicted to increase by more than 30%); and
- Rule 2: Include any specifically sensitive areas where traffic flows are predicted to increase by 10% or more.
15.24 Sensitivity can be defined by road user groups such as school children and the elderly or areas where there is sizeable pedestrian activity but poor pedestrian facilities. A ‘sensitive’ area may therefore lie adjacent to a school, for example.

Significance Evaluation Methodology

15.25 The significance of each effect will be considered against the criteria within the IEMA guidelines, where possible. However, the IEMA guidelines state that:

“...for many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources.”

15.26 In this assessment, significance falls into two categories; not significant and significant. The latter corresponds to significant impacts in accordance with the EIA Regulations. In the absence of established significance criteria for traffic and transport impacts, professional judgement has been used to assess whether the impacts on traffic and transport are considered to be significant, using the IEMA guidelines to identify the scale and extent of the assessment to be undertaken.

15.27 The IEMA guidelines also state that:

“...the detailed assessment of impacts is...likely to concentrate on the period during which the absolute level of an impact is at its peak, as well as the hour at which the greatest level of change is likely to occur.”

15.28 The criteria used to determine the magnitude of each of the potentially significant traffic-related environmental effects described above is based on the advice provided within the IEMA guidelines, summarised in paragraphs 15.29 to 15.41.

Severance

15.29 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery and is used to describe the factors that separate people from other people and places. For example, severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to quite minor traffic flows if they impede pedestrian access to essential facilities.

15.30 The effects of severance can be applied to motorists, pedestrians or residents. The IEMA guidelines suggest that changes of traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively. However, there are no predictive formulae which give simple relationships between traffic factors and levels of severance.

15.31 The IEMA guidelines state that marginal changes in traffic flow are unlikely to create or remove severance, but that consideration in determining whether severance is likely to be an important issue should be given to factors such as road width, traffic flow and composition, traffic speeds, the availability of crossing facilities and the number of movements that are likely to cross the affected route. Consideration should also be given to different groups such as the elderly and young children.

15.32 The extent to which additional traffic will exacerbate this problem will be assessed in accordance with Rule 1 (i.e. where traffic flows are predicted to increase by more than 30%) on the A1(T). Effects below 30% (Rule 1) are considered to be not significant.

Driver Delay

15.33 Delays to non-development traffic can occur at several points on the local highway network as a result of the additional traffic that would be generated by a development. The IEMA guidelines state that delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system.

Pedestrian Delay

15.34 Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads, and therefore, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend upon the general level of pedestrian activity, visibility and general physical conditions of the crossing location.

15.35 Given the range of local factors and conditions which can influence pedestrian delay, the IEMA guidelines do not recommend that thresholds be used as a means to establish the significance of pedestrian delay, but recommend that reasoned judgements be made instead. However the IEMA guidelines do note that, when existing traffic flows are low, increases in traffic of around 30% can double the delay experienced by pedestrians attempting to cross a road.

Pedestrian Amenity

15.36 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic.

15.37 The IEMA guidelines note that changes in pedestrian amenity may be considered significant where the traffic flow is halved or doubled, with the former leading to a beneficial effect and the latter an adverse effect.

Fear and Intimidation

15.38 The scale of fear and intimidation experienced by pedestrians is dependent on the volume of traffic, its HGV composition, its proximity to people or the lack of protection caused by such factors as narrow pavement widths, as well as factors such as the speed and size of vehicles.

15.39 There are no commonly agreed thresholds by which to determine the significance of the effect. However, the IEMA guidelines note previous work that has been undertaken which puts forward thresholds that define the degree of hazard to pedestrians by the average traffic flow, 18 hour/day heavy vehicle flow and average speed over an 18 hour day in miles per hour.

15.40 The IEMA guidelines also note that special consideration should be given to areas where there are likely to be particular problems, such as high speed sections of road, locations of turning points and accesses. Consideration should also be given to areas frequented by school children, the elderly and other vulnerable groups.

Accidents and Safety

15.41 Where a proposed development is expected to produce a change in the character of the traffic on the local road network, as a result of increased HGV movements for example, the IEMA guidelines state the implications of local circumstances or factors which may elevate or lessen risks of accidents, such as junction conflicts, would require assessment in order to determine the potential significance of accident risk.
Data Sources

15.42 The following data sources were used to inform this assessment:
- Permanent Automatic Traffic Counts (ATC): two, annual (monthly), classified counts were obtained from Transport Scotland;
- Personal Injury Accident (PIA) data for the study area were obtained from Transport Scotland and have been used to determine if there is a history of accidents in the area;
- DETR (1997). National Road Traffic Forecasts (Great Britain). Used to determine traffic growth factors from the base year to the year of assessment;
- The Quality Scheme for Ready Mixed Concrete (QSRMC). Available at http://www.qsrmc.co.uk/index2.php: Used to identify the nearest concrete supplier to the site; and

Consultation

15.43 The relevant highway authorities were consulted in order to address the issues of road safety, driver distraction and appropriate routing for abnormal load vehicles. Those consulted were as follows:
- Scottish Borders Council (SBC) – The Local Authority to which the planning application is submitted. The highway authority will determine the traffic and transport related concerns, if any;
- Transport Scotland - The national transport agency for Scotland; and
- BEAR Scotland (BEAR) - The infrastructure maintenance and management organisation working on behalf of Transport Scotland since 2001.

15.44 A summary of consultation responses is provided in Table 15.1.

Table 15.1: Consultation Responses

<table>
<thead>
<tr>
<th>Consultee</th>
<th>Summary of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scottish Borders Council</td>
<td>Scottish Borders Council have no concerns with the proposal.</td>
</tr>
<tr>
<td>Transport Scotland</td>
<td>AMEC has contacted Paul Winn at Transport Scotland who passed the request onto BEAR South East and Lothian and Borders Police. No direct response has been provided from Transport Scotland regarding this proposal.</td>
</tr>
<tr>
<td>BEAR Scotland (South East)</td>
<td>“We have no concerns over the proposed movements with regards to load and trust the load will be escorted and the haulier has taken all reasonable precautions by surveying the route prior to movement.”</td>
</tr>
<tr>
<td>Lothian and Borders Police</td>
<td>“As this route from Blythe has been used before, Lothian and Borders Police have no issues in principal with the route proposed but we would require that any loads exceeding our maximum dimensions for self escort are given a police escort on a cost recovery basis chargeable to the contractor.”</td>
</tr>
</tbody>
</table>

Baseline Information

Routing Assumptions

15.45 General construction materials are proposed to be transported to the development site via the A1(T) to the south of the development site. General HGVs are assumed to turn onto the Harelawside Lay-by from its priority junction to the west with the A1 at Grantshouse. From here, vehicles will travel toward Harelawside Farm access track from where the site is proposed to be accessed.

15.46 The assumed route for the abnormal loads carrying turbine components is: Blyth Docks - A1061 - A189 - A19 - A1(T) - Harelawside Lay-by (Figure 15.1). No height restrictions were identified on this route that would restrict the movement of abnormal loads. It is proposed that abnormal loads will travel north from Blyth Dock, route past the A1(T)/Harelawside Lay-by priority junction and navigate the Castle Dykes roundabout to travel back south on the A1(T). This will aid abnormal loads to manoeuvre from the A1(T) onto Harelawside Lay-by as existing junction geometry is assumed to restrict movements undertaking a right-turn.

15.47 As detailed in Table 15.1 a consultation was undertaken with Transport Scotland to determine the feasibility of this route to site. It should be noted that Drone Hill Wind Farm is situated approximately 500 m to the east of the proposed Penmanshiel wind farm at its closest point and straddles the A1107 at Drone Hill. Turbine deliveries to Drone Hill Wind Farm will also travel up the A1(T) but will turn onto the B6438 at Reston then left to Templehall and onto the A1107.

Current Baseline

15.48 The site is located approximately 22 km north-west of Berwick-upon-Tweed and approximately 13 km west of Eyemouth. It is bounded by the A1(T) to the south and west, Howpark Road to the east and the A1107 to the north.

15.49 Descriptions of roads in the vicinity of the site are provided in paragraphs 15.50 to 15.57.

A1(T)

15.50 The A1(T) forms part of Transport Scotland’s Trunk Road Network. Within Scotland, the A1(T) routes from Lamberton to Edinburgh. It is operated and maintained by BEAR Scotland.

15.51 The A1(T) is a single carriageway two-way road and subject to a 60 mph speed limit in the vicinity of the site. Sections of the A1(T) are dualled and subject to a 70mph speed limit. The road is of a predominately rural nature sided by grass verges. The East Coast Main railway line routes alongside the A1(T) in the vicinity of the site.

15.52 Two formal right turn lanes are provided on the A1 which provide safer access to the residential properties situated on the northern side of the A1 which in turn form the settlement of Grantshouse. A pedestrian footway is provided on the northern side of the carriageway and routes between Mansfield (residential properties of Grantshouse) to Harelawside Lay-by. The footway is approximately 300 m in length.

15.53 This section of road is not considered to be sensitive to changes in traffic conditions due to the fact that no sensitive land uses/receptors have been identified.

Harelawside Lay-by

15.54 Harelawside Lay-by has two priority junctions with the A1(T) and is located immediately east of Grantshouse. The first is situated approximately 95 m west of the site access (Harelawside Farm) and the second approximately 440 m south of this junction on the A1(T).

15.55 These two access roads connect to form Howpark Road which then routes north-east towards the A1107.

15.56 Several residential properties are accessed from these minor access roads including Harelawside Farm which will be used as the site access. A picnic area, café, and public toilet facilities are provided on the minor access road which form a rest area frequently visited by HGVs. HGVs park on the roadside.
no formal parking spaces are currently provided although planning permission has recently been applied for to develop a formal lorry park. No pedestrian facilities are provided along the length of this road. Site traffic will not however utilise this section of road.

15.57 The section of road between the A1(T) and the site access is not considered to be sensitive due to the fact that no sensitive land uses/receptors have been identified along the 95 m section.

Rights of Way

15.58 It is the applicant’s intention route the wind farm access tracks along part of the ‘Lairds Way’ Right of Way which crosses the development site. As a result there may be a requirement for a temporary diversion during the construction phase.

15.59 In line with Policy INF2 - Protection of Access Routes contained within the Local Plan, appropriate diversion signs/stiles will be installed along the route and the surface will be prepared to a level appropriate for public access prior to the closure of the existing Right of Way.

15.60 The temporary permissive route mitigation measures (e.g. signage, barriers, adequate sight distances, speed restrictions, induction of delivery drivers) will be put in place to maintain public safety through the working site.

15.61 If no suitable diversion is available the applicant may have to apply for a temporary closure during the construction phase.

Existing Traffic Flows

15.62 In order to establish the baseline situation, traffic survey data were sought along the road network in the vicinity of the development site. Average Daily Traffic Flows in 2010 have been obtained from the Transport Scotland for the A1(T) at two locations within the vicinity of the site. This data provides a daily average flow of the number of vehicles passing a point in the road network each day averaged over a four-week (Monday to Saturday) period in a neutral month. Neutral months are months where travel patterns are closest to the average. Surveys undertaken outside neutral months are generally unrepresentative of average travel patterns for example; data collected in July and August would be affected by school holidays whilst December would be affected by Christmas. The locations of the traffic counts are identified in Figure 15.2.

15.63 ‘Neutral’ months include March, April, May, June, September and October. Counts have been recorded in October 2010, the most recent ‘neutral’ month available at the time of writing.

15.64 The existing two-way traffic flows for the times during which the development site is likely to be open for construction activities (Monday to Saturday 07:00 - 19:00) are detailed in Table 15.2.

Table 15.2: Existing 12-hour average two-way traffic counts Monday to Saturday (2010)

<table>
<thead>
<tr>
<th>Survey Location</th>
<th>HGVs (inc Public Service Vehicles (PSVs))</th>
<th>Light Vehicles</th>
<th>Total Traffic (inc HGVs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) A1(T) at Penmanshiel</td>
<td>1,197</td>
<td>6,253</td>
<td>7,450</td>
</tr>
<tr>
<td>2) A1(T) South of Grantshouse</td>
<td>1,394</td>
<td>5,426</td>
<td>6,820</td>
</tr>
</tbody>
</table>

Personal Injury Accident Data

15.65 Personal Injury Accidents (PIAs) are road traffic accidents where either slight, serious or fatal injuries to people have been recorded. The data would generally include such information as the location of the accident, number of casualties, modes of travel involved, age and gender of those involved and factors contributing to the accident.

15.66 Recorded PIAs were obtained from Transport Scotland for the A1(T) and Harelawside Lay-by in the vicinity of the development site for a three year period between 1 January 2008 and 31 December 2010. The accident assessment area is illustrated in Figure 15.3.

15.67 The recorded PIAs were reviewed in order to determine whether there is a history of accidents in the vicinity of the development site. The results are summarised in Table 15.3.

Table 15.3: Summary of Recorded PIAs (2008-2010)

<table>
<thead>
<tr>
<th>Years</th>
<th>Severity of Injury</th>
<th>Vulnerable Road User</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slight</td>
<td>Serious</td>
</tr>
<tr>
<td>A1(T)</td>
<td>2008</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>2</td>
</tr>
<tr>
<td>Harelawside Lay-by</td>
<td>2008-2010</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

15.68 A total of 8 accidents were recorded during the three-year period between January 2008 and December 2010. Of these eight accidents recorded, five were classified as ‘slight’ and three classified as ‘serious’. No ‘fatal’ accidents were recorded. None of the recorded accidents involved vulnerable road users.

15.69 One of the recorded accidents occurred at the A1/Harelawside Lay-by northern priority junction which resulted in serious injury. The causation factor of this accident was attributed to driver error as no other vehicles were involved in the accident. The vehicle overturned and resulted in the car driver sustaining serious injury. The accident took place during day light hours in wet conditions.

15.70 Of the eight accidents recorded during the survey period, one involved a 3.5 t HGV which resulted in slight injury.

15.71 It is concluded that eight accidents within a three-year survey period do not constitute an accident and safety issue within the vicinity of the site. There are no accident patterns or clusters which may represent a concern.

Evaluation of Resources

15.72 In terms of defining ‘sensitive’ areas according to the IEMA guidelines, the A1(T) is not considered to be ‘sensitive’ due to the fact that there no receptors such as housing fronting the highway, churches,
Predicted Effects of the Scheme

Predicted Traffic Movements

15.81 Estimated traffic generation during the construction phase has been based on the Penmanshiel Wind Farm Delivery Table provided by the Applicant.

15.82 Estimates have been made for trips generated by construction staff working at the development site. These staff could arrive/depart by various modes of transport from/to different locations and, therefore, trip generations are difficult to predict. However, it is considered unlikely that 15 arrivals and 15 departures during a twelve-hour working day (07:00-19:00) will trigger an assessment of potentially significant environmental effects. Staff trips have therefore been omitted from total number of vehicle movements.

15.83 The requirement for imported material may be reduced by reusing suitable aggregate materials excavated on-site from foundations and cable trenches. However, for the purposes of the assessment it has been assumed that all aggregate will be imported, by road, in order to present a worst-case.

15.84 Excavated soil will, as far as possible, be re-used on-site to reinstate the construction area. However, not all material will be suitable for disposal this way and low levels of spoil and other construction wastes will need to be disposed of off-site. At this stage the potential volumes of construction wastes that could be generated are unknown and therefore any traffic movements required for the export of construction wastes off site are unknown. There is potential for vehicles transporting construction materials to the development site to be utilised for the export of any construction wastes off-site.

Summary of Predicted Movements

15.85 Tables 15.5 and 15.6 summarise the predicted traffic generations associated with each relevant construction phase of the development.

Table 15.5: Predicted Traffic Generations

<table>
<thead>
<tr>
<th>Phase</th>
<th>Purpose</th>
<th>Total deliveries for duration of project</th>
<th>Total Journeys (In and Out)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber Felling</td>
<td>Site Clearance</td>
<td>1,800</td>
<td>3,600</td>
</tr>
<tr>
<td>Site Set-Up</td>
<td>Portacabin Delivery; Skip Delivery; Generator Delivery; Water and Fuel, Excavators, Roller-Compactor</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Road and Hardstandings</td>
<td>Stone for: site tracks, control building, sub-station, met-mast, turning heads, laydown areas, pathways and crane hardstandings</td>
<td>6,321</td>
<td>12,642</td>
</tr>
<tr>
<td>Foundation Construction</td>
<td>Concrete for: turbine foundations, piles, transformer plinths, comms and met mast, steel delivery, foundation bolts and bolt cages</td>
<td>961</td>
<td>1,922</td>
</tr>
<tr>
<td>Turbine Erection</td>
<td>Delivery of blades; nacelles; met mast; hub and rotor; turbine erection and tool containers</td>
<td>138</td>
<td>276</td>
</tr>
<tr>
<td>Cable Installation</td>
<td>Cable delivery, excavator and cable laying</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Sub-station and Control Building</td>
<td>Concrete delivery; brick delivery; roofing and cladding; switchgear and electrical equipment</td>
<td>41</td>
<td>82</td>
</tr>
</tbody>
</table>

Information Gaps

15.78 No traffic data was available for Harelawside Lay-by in vicinity of the site access. As a result an exercise comparing the volume of construction traffic against baseline traffic flows cannot be undertaken on this section of road. However, this is not considered to be of concern, as to compensate, it will automatically be assumed that the level of additional traffic at this location will exceed the thresholds identified by the IEMA guidelines, and a detailed evaluation of effects will be undertaken on the length of road assumed to form part of the construction traffic route.

15.79 No further information gaps have been identified.

Design Evolution

15.80 There is no specific mitigation within the design layout which will address potential traffic and transport impacts.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Purpose</th>
<th>Total deliveries for duration of project</th>
<th>Total Journeys (In and Out)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinstatement</td>
<td>Removal of temporary compound; laydown area and gatehouse</td>
<td>1,535</td>
<td>3,070</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td>470</td>
<td>940</td>
</tr>
<tr>
<td>Site De-mobilisation</td>
<td>Portacabin removal; skip removal; generator removal; fuel and water removal; roller-compactor and excavator removal</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>TOTAL LOGGING</td>
<td></td>
<td>1,800</td>
<td>3,600</td>
</tr>
<tr>
<td>TOTAL CONSTRUCTION</td>
<td></td>
<td>9,511</td>
<td>19,022</td>
</tr>
</tbody>
</table>

Source: RES UK & Ireland Limited (RES)

It is predicted that the construction period of the proposed development will be approximately 12-18 months. Table 15.6 shows the maximum daily two-way (in and out) movements to occur in one day and the approximate period of delivery.

### Table 15.6: Maximum daily deliveries during 12-18 month Construction Programme

<table>
<thead>
<tr>
<th>Phase</th>
<th>Vehicle</th>
<th>Maximum daily Journeys per day per phase (in and out)</th>
<th>Approximate Period of Delivery (12-18 month programme)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber Felling</td>
<td>Logging Truck</td>
<td>12</td>
<td>Begins 6 months prior to start of main construction</td>
</tr>
<tr>
<td>Site Set-Up</td>
<td>Low Loader</td>
<td>10</td>
<td>January to February</td>
</tr>
<tr>
<td>Road and Hardstandings</td>
<td>Tipper Trucks</td>
<td>80</td>
<td>January to May</td>
</tr>
<tr>
<td>Foundation Construction</td>
<td>Low Loader</td>
<td>4</td>
<td>March</td>
</tr>
<tr>
<td></td>
<td>Mixer Trucks</td>
<td>100</td>
<td>March to May</td>
</tr>
<tr>
<td></td>
<td>Flat Bed</td>
<td>60</td>
<td>March to May</td>
</tr>
<tr>
<td></td>
<td>30t to 50t crane</td>
<td>2</td>
<td>March to May</td>
</tr>
<tr>
<td>Turbine Erection</td>
<td>Low Loader</td>
<td>30</td>
<td>January to March and September</td>
</tr>
<tr>
<td></td>
<td>Extendible Trailer</td>
<td>12</td>
<td>September</td>
</tr>
<tr>
<td></td>
<td>120t to 150t crane</td>
<td>2</td>
<td>September</td>
</tr>
<tr>
<td>Cable Installation</td>
<td>Flat Bed</td>
<td>4</td>
<td>June</td>
</tr>
<tr>
<td></td>
<td>Low Loader</td>
<td>2</td>
<td>June</td>
</tr>
<tr>
<td></td>
<td>Telescopic Handler</td>
<td>2</td>
<td>June</td>
</tr>
<tr>
<td>Sub-station and Control Building</td>
<td>Flat Bed</td>
<td>6</td>
<td>August</td>
</tr>
<tr>
<td></td>
<td>Mixer Truck</td>
<td>60</td>
<td>July</td>
</tr>
<tr>
<td>Reinstatement</td>
<td>Tipper Trucks</td>
<td>80</td>
<td>November to December</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Skip lorry, small tanker, light goods van</td>
<td>8</td>
<td>January to December</td>
</tr>
</tbody>
</table>

Source: RES UK & Ireland Limited (RES)

As each concrete turbine foundation must be poured on the same day, the movements of concrete lorries are restricted to a total of 15 days, with all deliveries for one turbine base required during the same day. As a result there will be 15 days during the 12-18 month construction programme when a total of 100 (rounded up) HGV movements of concrete will occur (50 HGVs in and 50 HGVs out). It is assumed that deliveries of other materials will not take place when concrete is being poured.

It is predicted that the maximum traffic impact associated with the construction phase of the development is predicted to occur in January to May (an approximate 5 month period) during the construction programme. Frequent trips are anticipated due to the delivery of stone for on-site tracks and crane hardstandings. During these months, an average of 80 HGV movements is predicted to be generated on each working day, i.e. 40 in and 40 out.

Timber removal operations can pause to avoid days with heavier construction traffic volumes. Timber can continue to be felled on those days and would be stored on site for removal later.

### Assessment of Effects

#### Percentage Impact

The effects of construction related traffic identified in Table 15.6 has been calculated, in percentage terms, relative to the background traffic in the construction year of the development (2013). This exercise has been conducted for maximum traffic impact which is estimated to occur between months January and May when an average of 80 daily HGV movements are predicted. For the purposes of this assessment it has been assumed that 100% of construction traffic will route north or south on the A1(T). In reality this is unlikely to occur due to the fact that construction HGVs are likely to disperse between the north and south to a variety of origins/destinations. Table 15.7 shows the predicted percentage impact at each traffic count locations.

### Table 15.7: Predicted Percentage Impact at Traffic Count Locations.

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Vehicles</th>
<th>Base HGVs</th>
<th>Construction HGVs</th>
<th>Percentage Impact Total Flow</th>
<th>Percentage Impact HGVs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) A1(T) at Penmanshiel</td>
<td>7,793</td>
<td>1,252</td>
<td>80</td>
<td>+1.0%</td>
<td>+6.4%</td>
</tr>
<tr>
<td>2) A1(T) South of Grantshouse</td>
<td>7,134</td>
<td>1,458</td>
<td>80</td>
<td>+1.1%</td>
<td>+5.5%</td>
</tr>
</tbody>
</table>

The above exercise has been conducted for the predicted worst-case period for traffic generations which predicts the maximum traffic impact occurring between January to May, based on an average of...
80 daily HGV movements per day (40 in and 40 out). On average this equates to an average of three deliveries into the development site per hour over a 12-hour period (Monday to Saturday 07:00-19:00).

15.92 The percentage impact shows it is predicted that there will be an increase in total traffic flows during the assessment period of:

- Survey Site 1 - A1(T) at Penmanshiel: Increase in total traffic by 1.0% and an increase in HGVs of 6.4%; and
- Survey Site 2 - A1(T) at south of Grantshouse: Increase in total traffic of 1.1% and increase in HGVs of 5.5%

Construction Effects

15.93 As explained in paragraph 15.78 no traffic data was available for Harelawside Lay-by in the vicinity of the site access. However, it will automatically be assumed that the level of additional traffic at this location will exceed the thresholds identified by the IEMA guidelines, and a detailed evaluation of effects will be undertaken.

15.94 Potential effects during the construction phase of the proposed Penmanshiel Wind Farm include: Severance; Driver Delay; Pedestrian Delay; Pedestrian Amenity; Fear and Intimidation and Accidents and Safety.

Operational Effects

15.95 As noted earlier, effects associated with the operation of the proposed Penmanshiel Wind Farm are not considered an appropriate part of this assessment, as they are not likely to have any significant effects.

Decommissioning Effects

15.96 As noted earlier, effects associated with the decommissioning of the proposed Penmanshiel Wind Farm are not considered an appropriate part of this assessment.

Cumulative Effects

15.97 It is has been established that Blackburn Wind Farm is proposed within a 4 km radius of Penmanshiel wind farm, near Blackburn Farm. Information relating to the opening year of construction and completion year was not available at the time of writing however; the construction programme is anticipated to last for ~12-18 months and consist of 6 turbines.

15.98 Two additional wind farm projects (Drone Hill and Brockholes) are located within a 4 km radius of Penmanshiel wind farm. Construction on Drone Hill commenced in April 2011 and is likely to be complete before construction starts for Penmanshiel wind farm. Brockholes wind development is also likely to be complete before construction commences for Penmanshiel Wind farm.

15.99 In the event of parallel construction activities, with traffic movements affecting the A1(T), a joint Traffic Management Plan (TMP) may be developed. This would be aimed at minimising the adverse environmental effects associated with the traffic and transport during construction. Furthermore, predicted HGV movements resulting from the construction phase of the development are unlikely to have a significant impact on the A1(T) due the fact that is highly trafficked and therefore increases in HGV traffic would be negligible.

Mitigation and Enhancement Measures

15.100 Whilst the majority of effects are not significant it is recognised that there is potential for reducing effects as far as reasonable through the development and implementation of a TMP; this will also ensure any residual effects on highway safety are not significant.

15.101 The TMP will detail environmental measures aimed at minimising adverse environmental effects associated with traffic and transport during construction. The TMP will be agreed between the developer, the Contractor, the local highway authority and any other relevant parties prior to the start of construction.

15.102 The TMP is likely to include details on car parking, measures to encourage multi-occupancy of vehicles bringing construction personnel to site, temporary road signage requirements, off-loading proposals, construction traffic routing and timing of deliveries. It is envisaged that, during construction, deliveries will be co-ordinated by a logistics manager to prevent queuing of vehicles.

15.103 The TMP will look at the preferred access route for HGVs and abnormal loads. A preliminary test run is expected to be undertaken using an abnormal load vehicle on the critical sections of the proposed route, in collaboration with the police and the local highway authority. Liaison between local residents and RES will be undertaken as part of the TMP, including the scheduling of major traffic movements to reduce impact on local residents where possible.

15.104 Other environmental measures will include the following:

- All construction vehicles and site personnel will be instructed to use only the approved access routes to the site;
- Construction plant, equipment and vehicles will be parked onsite. No vehicles associated with the proposed development will be parked on the public roads;
- Road sweeping facilities will be provided, as required, in order to keep the site entrances and the approach routes used by construction vehicles free from vehicle deposits and debris. Road sweeping will also be undertaken at frequent intervals;
- Wheel and vehicle body washing facilities will be provided in order to keep the site entrances and routes used by construction vehicles free from vehicle deposits and debris;
- Daily inspections by nominated site staff will take place to confirm that the mitigation measures implemented on site are effective, and that corrective action will be taken where necessary;
- Following discussion and agreement with the local highway authority, appropriate information and signs will be provided on the approach to the proposed site accesses; and
- The police will be notified when abnormal loads (i.e. turbine components) are being transported.

15.105 Environmental measures will also be required to minimise potentially significant environmental effects occurring from the transportation of construction materials (e.g. noise, dust and the risk of water pollution). Whilst these impacts are discussed in other chapters within the EIA, they include some elements relevant to traffic and transport, such as:

- Ensuring the proper transport of materials e.g. vehicle loads will be enclosed or covered with tarpaulin to restrict the escape of particulate matter;
- Proper servicing and maintenance of vehicles will be undertaken to avoid any leaks or spills of oil, petrol or concrete; and
- Drip trays will be placed under standing machinery (when not on hard standing areas with existing provision in place) to avoid oil and petrol pollution.
Table 15.8: Implementation of Environmental Measures

<table>
<thead>
<tr>
<th>Environmental Measure</th>
<th>Responsibility for Implementation</th>
<th>Compliance Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing traffic and transport related effects through a TMP</td>
<td>RES UK &amp; Ireland Limited (RES)</td>
<td>Planning Condition</td>
</tr>
</tbody>
</table>

Assessment of Residual Effects

15.106 As explained in paragraph 15.78 increases on Harelawside Lay-by are assumed to exceed the 10% threshold recommended by IEMA. A detailed evaluation of giving the likely significance of each effect occurring on this road is summarised.

Severance

15.107 As detailed in paragraph 15.91 the HGV construction traffic equates to approximately three HGV deliveries per hour over a 12-hour period (Monday to Saturday 07:00-19:00), or six HGV journeys per hour, which is unlikely to result in a severance issue. It is considered that this will have a short term effect as traffic generations will be less than this figure during the rest of the 12-18 month construction programme. It is unlikely that increases in traffic would result in difficulties for people to cross the Harelawside Lay-by. It is assumed that HGVs would only route on a short section of this road.

15.108 This effect is considered to be not significant, though it is appropriate to consider some additional management in the form of a TMP to reduce the potential for effects as far as reasonably possible.

Driver Delay

15.109 Modest and temporary localised delays may occur during, for example, the delivery of six daily abnormal loads during turbine erection and during 15 days when concrete for the turbine bases is being delivered. However, an additional three HGVs per hour, equating to an average of one HGV delivery every 20 minutes or six HGV journeys per hour is not expected to result in driver delay on a road that is lightly trafficked.

15.110 Effects on driver delay are therefore considered to be not significant, though it is appropriate to consider some additional management in the form of a TMP which is likely to address temporary road signage requirements, scheduling and timing of vehicles and proposals for temporary removal/replacement of street furniture.

Pedestrian Delay

15.111 Three deliveries per hour or six HGV journeys per hour are unlikely to have a significant impact on pedestrian delay. It is considered that this will have a short-term effect as traffic generations will be less that this figure during the rest of the construction programme.

15.112 Taking these factors into consideration, the effect on pedestrian delay is considered to be not significant.

Pedestrian Amenity

15.113 As detailed above, three deliveries per hour (one HGV every 20 minutes) or an average of just over six HGVs for delivery and return journey would not have a significant effect and it is considered that any effect would have a short-term duration.

15.114 As this is based on the worst-case scenario, the effect on pedestrian amenity is considered to be not significant.

Fear and Intimidation

15.115 Despite the short-term increase in traffic, the level of fear and intimidation experienced by pedestrians is considered to be not significant. Nonetheless some additional controls in the form of a TMP can be implemented.

Accidents and Safety

15.116 The potential effects of abnormal loads on highway safety are considered to be not significant, given that there will be relatively few in number. Nonetheless, all abnormal loads will be escorted and the movement of these vehicles programmed to avoid busy periods.

15.117 Potential effects on highway safety relate to the transfer of dirt and debris from the site onto the carriageway. This has the potential to be significant and will be dealt with through environmental measures incorporated into the scheme, which are described in paragraph 15.104 and 15.105.

15.118 In summary, it is considered that there are unlikely to be significant effects upon road safety and accident levels; furthermore the PIA review indicated that there are no existing safety issues with the road network.

Summary and Conclusions

15.119 The main transportation effects will be associated with the movements of commercial HGVs, generated by the proposed Penmanshiel Wind Farm to and from the development site, during the construction phase of the development on the A1(T) and Harelawside Lay-by.

15.120 Traffic flow data was obtained from the Transport Scotland for the A1(T) during 2010. The data then had a growth factor applied to adjust it to the expected values in the year of assessment, 2013.

15.121 Estimates of traffic generation associated with the construction phase of the project have been derived from Penmanshiel Wind Farm Delivery Table provided by RES. The maximum traffic impact associated with construction phase of the development is predicted to occur between January and May. During these months, an average of 80 HGV movements is predicted to be generated on each working day, i.e. 40 in and 40 out. This equates to an average of three deliveries per hour over a 12 hour working day (Monday-Saturday 07:00-19:00) or just over six HGVs per hour for delivery and return journey.

15.122 During days involving concrete deliveries (15 days out of the construction programme), it is predicted that there will be 100 HGV movements (50 in and 50 out) per day over 15 days.

15.123 This assessment has identified the construction period as the only phase in the lifecycle of the proposed Penmanshiel Wind Farm where effects from traffic may be anticipated. Table 15.9 therefore summarises the effects and evaluation of significance during the construction phase only.
Table 15.9: Effects and Evaluation of Significance - Harelawside Lay-by

<table>
<thead>
<tr>
<th>Effect</th>
<th>Type of Effect</th>
<th>Probability</th>
<th>Sensitivity or Value</th>
<th>Magnitude</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severance Severance Negative</td>
<td>Unlikely</td>
<td>Local</td>
<td>Low</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Driver Delay Driver Delay Negative</td>
<td>Unlikely</td>
<td>Local</td>
<td>Low</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Pedestrian Delay Pedestrian Delay Negative</td>
<td>Unlikely</td>
<td>Local</td>
<td>Low</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Pedestrian Amenity Pedestrian Amenity Negative</td>
<td>Unlikely</td>
<td>Local</td>
<td>Low</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Fear and Intimidation Fear and Intimidation Negative</td>
<td>Unlikely</td>
<td>Local</td>
<td>Low</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Accidents and Safety Accidents and Safety Negative</td>
<td>Possible</td>
<td>Local</td>
<td>Low</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

This summary rationale applies to all receptors. A maximum average of 80 HGV trips are estimated to be generated on each working day between January and May. This equates to an average of just over six HGVs per hour over a 12 hour working day. All changes are temporary and abnormal loads will be escorted. Good practice measures such as wheel washing facilities at the site exit will minimise risk of accidents. Some additional controls in the form of a TMP can be implemented if necessary.

Key

<table>
<thead>
<tr>
<th>Probability</th>
<th>Sensitivity or Value</th>
<th>Magnitude</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certain</td>
<td>International</td>
<td>High</td>
<td>S - Significant</td>
</tr>
<tr>
<td>Likely</td>
<td>National</td>
<td>Medium</td>
<td>NS - Not Significant</td>
</tr>
<tr>
<td>Possible</td>
<td>Regional</td>
<td>Low</td>
<td>NE - No Effect</td>
</tr>
<tr>
<td>Unlikely</td>
<td>Local</td>
<td>Negligible</td>
<td></td>
</tr>
</tbody>
</table>

References

Scottish Borders Council (1998) Scottish Borders Local Plan
Scottish Executive (2002), Transport Assessment for Development Proposals
Scottish Executive Development Department (1999), Planning Advice Note 58: Environmental Impact Assessment (PAN58)
Scottish Executive Development Department (2005), Planning Advice Note 75: Planning for Transport (PAN75)
Scottish Government (2010), Scottish Planning Policy (SPP)
FIGURE 15.1
ABNORMAL LOADS AND CONSTRUCTION TRAFFIC ROUTES

Key:
- Red: Site boundary
- Green: Abnormal load route
- Blue: HGV traffic
FIGURE 15.3
PERSONAL INJURY ACCIDENT (PIA) STUDY AREA

Key:
- Site boundary
- Accident assessment area
- Site Access

PENMANSHIEL WIND FARM

29307-E12A.DWG PANNG
SCALE - 1:15,000
ENVIRONMENTAL STATEMENT

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