CONTENTS

Introduction 6-1
Proposed Development 6-1
Highways Scoping and Study Area 6-1
Existing Conditions 6-2
Local Highway Network 6-2
Existing Traffic Flows 6-9
Accident Records 6-13
Proposed Operation 6-16
Phased Trip Generation 6-16
Site Access 6-20
Environmental Impact 6-21
Link Impact 6-24
Noise & Vibration 6-25
Dust and Dirt 6-26
Driver Severance and Delay 6-26
Community Severance and Delay 6-28
Road Safety 6-28
Vulnerable Road Users 6-30
Mitigation 6-30
Residual Impact 6-30
Cumulative Effects 6-31
Conclusions 6-32

.

Appendix

Appendix 6/A Blyth ATC data
Appendix 6/B Accident data
Appendix 6/C Drill Rig Traffic details

Drawings

Drawing TL6/1 GHV Route Plan
Drawing TL6/2 Proposed Site Access
Drawing TL6/3 Proposed Site Access Swept Path Anaysis

INTRODUCTION

6.1 This chapter of the ES considers the potential environmental effects related to the movement of vehicles associated with the proposed exploratory drilling at Tinker Lane, Retford Road.

6.2 Consideration is given to existing and future traffic levels, to the routing of vehicles on the surrounding highway network and to the resultant capacity and environmental impacts of site generated traffic. The chapter concludes with a summary of the assessments undertaken and an overview of the mitigation measures proposed. It should be noted that the effects on air quality associated with vehicle emissions is addressed in Chapter 7.

Proposed Development

Current Site Usages and Recent Use History

6.3 The Application Site has been described in Chapter 2. The site is currently in agricultural use and is subject to an entry level environmental stewardship agreement.

HIGHWAYS SCOPING AND STUDY AREA

Highways Scoping

6.4 A Scoping Report was submitted to Nottinghamshire County Council (NCC) during October 2015. The report outlined the proposed application and provided an indication of the likely traffic movements which could be generated by the proposals.

6.5 NCC Highways provided a response dated 2nd November 2015 which stated the following key points:

- with reference to the proposed traffic generation it was advised that:

  '…Vehicle numbers are therefore likely to be below the threshold at which the Highway Authority would usually seek a Transport Assessment (30 two-way peak hour movements). However, a Transport Statement will be required to deal with lorry routes prepared in accordance with Planning Practice Guidance'

- with regards to vehicle routing:

  '…To the northwest of the proposed site access the A634 Retford Road is crossed by the A1 over bridge is crossed by the A1 over bridge at a clearance of 4.8m. Lorries below this height wishing to access the A1 will most likely pass in this direction through Blyth. Other vehicles including lorries travelling southeast onto the A638 Great North Road would pass through Barnby Moor and then most likely Retford. A swept-path analysis will be required of the largest vehicle to visit the site to demonstrate that the county road network and the proposed site

access can accommodate the largest vehicle up to the trunk road network'.

- in terms of junction visibility:

  '…The A634 Retford Road is derestricted (60mph). Visibility splays of the order of 2.4m x 215m are likely to be required at the site access subject to being qualified by way of speed-readings to be included in the Transport Statement..'.

Study Area

6.6 Operational HGV traffic associated with each phase, would utilise the principal road network.

6.7 The Application Site is located conveniently within close proximity of the A1(M) at a distance of approximately 4.2km, which can be accessed via the A634 Retford Road and B6045. The A1(M) then provides links to the wider strategic road network.

6.8 The study area has therefore been determined as the A634 between the Application Site access and Blyth, and the B6045 links with the A1(M) to north and south of Blyth which comprise Bawtry Road, the High Street and Spital Road.

EXISTING CONDITIONS

6.9 This section of the chapter discusses the current infrastructure around the Application Site. It includes a description of the existing access of the Application Site, the local road network and non-vehicular access options.

Local Highway Network

Existing Site Access

6.10 The existing site access, is a farm gate and will be the location of the proposed site access, is served directly off the A634 Retford Road on the eastern boundary towards the north of the site. A photograph of the site access is provided at Figure 6-1.

Figure 6-1
Existing Site Access

6.11 The site is separated from the road carriageway by a wide grass verge which is classified as public highway.

A634 Retford Road

6.12 The A634 Retford Road routes along the north-easterly boundary of the Application Site. It runs in a north-west to south-east direction between Blyth and Barnby Moor.

6.13 In the proximity of the Application Site, the A634 Retford Road is a single carriageway road subject to the national speed limit. The road is not lit and there are no footways in the vicinity of the Application Site.

6.14 A photograph of the A634 in the proximity of the site access facing south-east is provided at Figure 6-2.

Figure 6-2
A634 View South

6.15 A photograph of the A634 in the proximity of the site access facing north-west towards Blyth is provided at Figure 6-3.

Figure 6-3
A634 View North

6.16 To the north of the Application Site there are lay-bys on either side of the road, after which there is a staggered junction made up of two narrow lanes which are of a single car width.

6.17 Continuing in a north-west direction for a distance of approximately 2km, the A634 steps down from derestricted speed limit to a 40mph speed limit near to the Blyth Road junction. The junction is located on a bend in the road which results in the A634 approaching Blyth from an east-west alignment.

6.18 A further 300m to the west on entering Blyth the A634 passes under the A1, a bridge which is signed as having a 4.8m height restriction. A photograph of the bridge with an eastbound view is provided at Figure 6-4.

Figure 6-4
A1 Overbridge

6.19 To the west of the A1 overbridge the A634 continues into Blyth flanked by residential development on both sides.

6.20 On the southern side of the A634 Retford Road to the west of the bridge there is a primary school which is signposted. There is a flashing sign which activates a 20mph speed restriction when operational. A photograph of the primary school approach from the east is provided at Figure 6-5 which depicts the flashing school sign.

Figure 6-5
Blyth View West Near to the Primary School

6.21 Blyth is centred on the crossroads of the A634 and the B6045. The junction is arranged as a double mini-roundabout junction with the B6045 forming the north and south arms of the junctions and the A634 forming the west arm of the northern roundabout and the east arm of the southern roundabout junction.

6.22 The junctions form the centre of the village with Public Houses and retail facilities located in the proximity.

6.23 A photograph of the southern roundabout, to which the A634 linking to the Application Site adjoins, is shown at Figure 6-6.

Figure 6-6
A634/B6045 Junction Southern Roundabout

6.24 A photograph of the northern roundabout is provided at Figure 6-7.

Figure 6-7
A634/B6045 Junction Northern Roundabout

6.25 The roundabout junctions were observed on-site and large HGVs were witnessed using both junctions comfortably without any issues.

B6045 High Street/Bawtry Road/Spital Road

6.26 The B6045/Spital Road routes north to south through Blyth providing the main thoroughfare through the village. To the north of Blyth the B6045 is named 'Bawtry Road', through the village the B6045 is named the 'High Street' until the Briber Hill junction, at which point Briber Hill is classified as the B6045. To the south of Briber Hill the High Street continues and becomes 'Spital Road' which routes south.

6.27 To the north of Blyth the B6045 Bawtry Road links with the A1(M) at Junction 34 via a grade separated double roundabout interchange with northbound and southbound on and off-slips. The junction also has a northbound arm, the A614, which links with Bawtry.

6.28 To the south of Blyth Spital Road also links with the A1. The junction only provides northbound off-slip and a southbound on-slip.

A1/A1(M)

6.29 The section of the A1 in proximity of the Application Site is a two lane dual carriageway motorway with a central reserve and dividing barrier, subject to the National Speed Limit.

6.30 The A1 is a major road running in a north-south alignment between London and Edinburgh, and provides Blyth with strategic links to major destinations along the route of the A1 including Sheffield and Leeds to the north and Peterborough and Cambridge to the south.

6.31 To the north of Blyth (north of Junction 34) the road is classified as motorway known as the A1(M), to the south of Junction 34 it is classified as an 'A' Road and remains so until Peterborough.

6.32 Links to other major roads in the vicinity include the M18 at approximately 12km to the north, which in turn provides access to the M1, M180 and M62.

Existing Non-Car Accessibility

6.33 The following section assesses the Application Site in terms of non-car accessibility, specifically pedestrian and cycle infrastructure, and public transport modes within close proximity to the Application Site.

Pedestrian Access

6.34 Pedestrian infrastructure in the vicinity of the Application Site is severely limited. The A634 Retford Road from which Tinker Lane takes its northern access has no pedestrian provision or street lighting along its length. While the verges flanking the carriageway are traversable, the lack of street lighting and the general nature of the A634 Retford Road do not promote walking as a safe or practical means of commuting to the site.

Cycle Access

6.35 Cycle infrastructure in the vicinity of the Application Site is similarly limited with no bespoke cycle routes within a 5km radius of Tinker Lane. The highway network immediately surrounding the Application Site is level and in a good state of repair with little to obstruct visibility, however, the lack of street lighting, and distances involved in commuting to the site via bicycle make it far less likely to be an attractive option to the future workforce at the site.

Public Transport

6.36 The Application Site is also severely limited in terms of public transport accessibility. The nearest bus stop to the Application Site is located on the A634 Retford Road, approximately 2.4km from its junction with Tinker Lane, and is served by the 29 to Retford, and the 595 to Gainsborough.

6.37 Owing to the lack of pedestrian infrastructure along the A634, and the distance between the stop and the Application Site (equating to a 30 minute walk), commuting to the site via bus is unlikely to present a realistic or attractive option to the future workforce at the site.

6.38 The nearest rail station to the Application Site is the Retford rail station, which is more than 8km from Tinker Lane. With no auxiliary public service, i.e. bus, tram, etc. to facilitate a multi-modal commute, the station does not present a viable option in terms of a sustainable commute to the Application Site.

Existing Traffic Flows

A634 in Proximity of the Application Site

6.39 Traffic survey specialists 'Axiom Traffic Limited' were commissioned to undertake Automatic Traffic Counts (ATC) in order to determine existing traffic conditions.

6.40 The ATC was undertaken by means of pneumatic tubes positioned in the carriageway on the A634, located near to the existing site access as shown within Figure 6-8. The pneumatic tubes measure directional traffic flow/vehicle speed and also classify vehicles into various groups.

Figure 6-8
ATC Location on the A634

6.41 Data was recorded between Friday 13th November 2015 and Thursday 19th November 2015 and therefore reflects typical weekday traffic flow conditions on the local highway network (i.e. non-school holiday periods, typical weather conditions etc.). The ATC data 'as received' is attached at Appendix 6/A.

6.42 The data confirms that across the surveyed weekdays, the AM peak occurs between 09:00 – 10:00hrs. The weekday PM peak was observed between 17:00 – 18:00hrs. A summary of the average weekday traffic data recorded is provided within Table 6-9.

Table 6-9
Existing Weekday Traffic Flows

A634 Near the Site	Northbound		Southbound		Two-way	
	Tot	HGV	Tot	HGV	Tot	HGV
AM Peak (09:00-10:00hrs)	199	8	180	5	379	13
PM Peak (17:00-18:00hrs)	217	5	151	2	368	7
24 Hour (00:00-24:00hrs)	2,339	82	1,823	54	4,162	136

6.43 The above summary table shows that the A634 has an average two-way traffic flow of 4,162 vehicles of which 136 were classified as HGV. The data appears to show a sway towards the northbound traffic flow 56:44 northbound/southbound daily split. Both peak periods are subject to similar total traffic flows, although the HGV flows are higher during the AM peak period.

6.44 The ATC data also indicates that the A634 in the proximity of the Application Site has a low level of background HGV traffic.

6.45 The average weekday two-way traffic profile is shown in graph form at Figure 6-10.

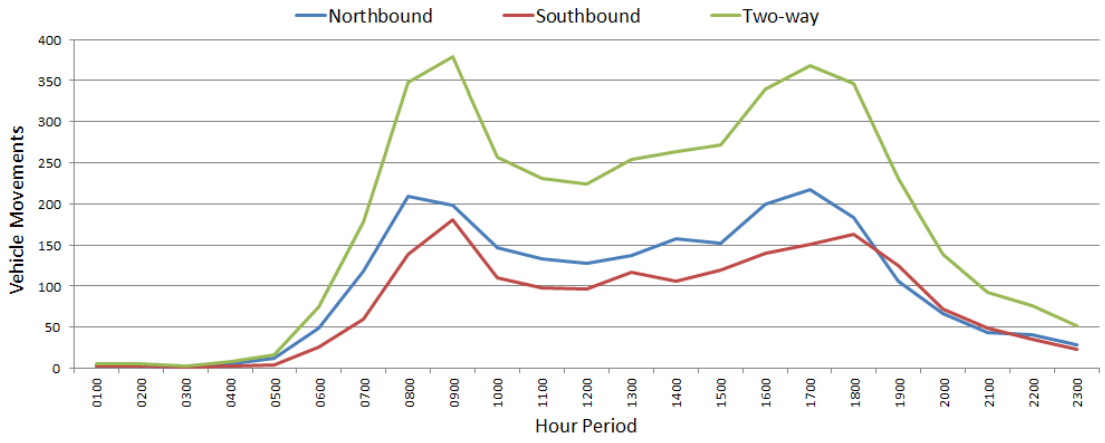

Figure 6-10
A634 Average Weekday Traffic Profile

6.46 The average weekday traffic profile shows the two defined peak periods occurring during the hours beginning 09:00 and 17:00hrs, broadly consistent with standard peak hour trends.

6.47 The average weekday two-way HGV traffic profile is shown in graph form at Figure 6-11.

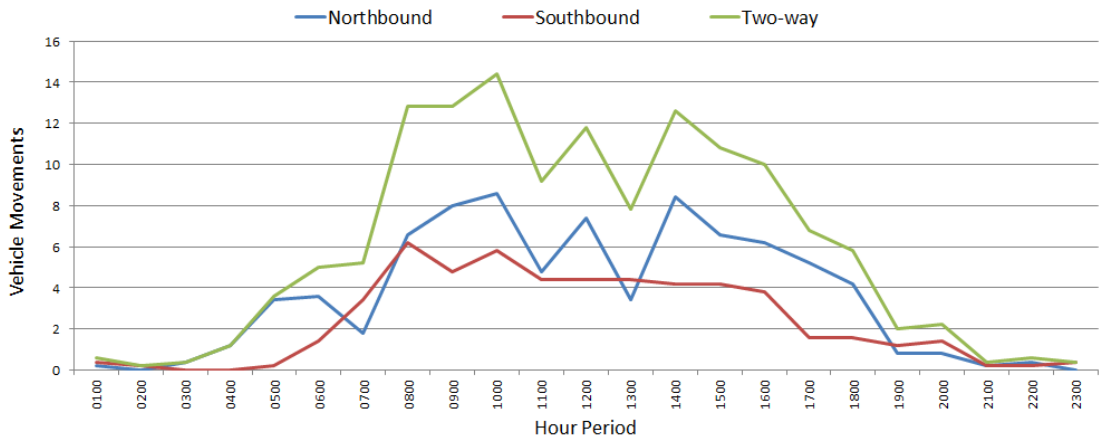

Figure 6-11
A634 Average Weekday HGV Traffic Profile

6.48 The average weekday HGV profile shows three recognisable peaks at 09:00, 12:00, and 14:00hrs. These are shaped mainly by the higher northbound HGV flows.

6.49 The ATC also provides average vehicle speed data. The A634 in the proximity of the Application Site is subject to a 60mph speed restriction.

6.50 A summary of the recorded average vehicle speeds is provided at Table 6-12.

Table 6-12
A634 Vehicle Speed Summary

Direction	85th %ile Speed	Mean Speed
Northbound	59.9mph	52.4mph
Southbound	64.4mph	56.2mph

6.51 The above summary confirms that the mean average vehicle speeds in both directions adhere to the posted speed limit.

Further Traffic Surveys

6.52 Further traffic counts have been undertaken by specialists 'Axiom Traffic Limited' in order to determine the wider existing traffic conditions.

6.53 ATCs were positioned at the following locations:

- B6045 Bawtry Road (north of Blyth);
- Spital Road (south of Blyth); and
- A634 (west of Blyth).

6.54 A summary of the average weekday traffic data recorded is provided within Table 6-13. The raw data 'as received' is also included within Appendix 6/A.

Table 6-13
Existing Weekday Traffic Flows

	Northbound		Southbound		Two-way	
	Tot	HGV	Tot	HGV	Tot	HGV
Link 1 - A634 East						
AM Peak (09:00-10:00hrs)	199	8	180	5	379	13
PM Peak (17:00-18:00hrs)	217	5	151	2	368	7
24 Hour (00:00-24:00hrs)	2,339	82	1,823	54	4,162	136
Link 2 – B6045 Bawtry Road						
AM Peak (09:00-10:00hrs)	400	20	395	24	795	44
PM Peak (17:00-18:00hrs)	369	12	429	20	798	32
24 Hour (00:00-24:00hrs)	4,980	270	4,484	290	9,464	560
Link 3 – Spital Road						
AM Peak (09:00-10:00hrs)	93	13	132	13	225	26
PM Peak (17:00-18:00hrs)	150	11	63	3	213	14
24 Hour (00:00-24:00hrs)	1,230	143	1,053	112	2,283	255
Link 4 – A634 West	**Eastbound**		**Westbound**		**Two-way**	
AM Peak (08:00-09:00hrs)	223	19	168	20	391	39
PM Peak (17:00-18:00hrs)	171	7	254	12	425	19
24 Hour (00:00-24:00hrs)	2,228	166	2,242	165	4,470	331

6.55 The above summary table shows that the busiest link by far is the route to the A1(M) to the north of Blyth which has a two-way flow of 9,464 of which 560 are classified as HGV. This is due to the northbound and southbound access with the A1/A1(M).

Accident Records

6.56 NCC has provided details of recorded road traffic incidents over the most recent five year period available (up to 30/09/2015) within an identified study area.

6.57 The study area includes 4.5km of the A634 Retford Road bearing south-east between Blyth and Barnby Moor.

6.58 The data was forwarded by email on 13th November 2015 in a report format, which featured an incident location plan and details of each incident in the form of raw data.

6.59 The raw data provides limited information pertaining to each incident, including: vehicle group, manoeuvre, direction, and impact points. Information is also provided regarding the severity and nature of any resulting casualty.

6.60 Casualty severities are classified within one of the following categories: Fatal, Serious, and Slight, which are defined below:

- **Fatal** (a crash resulting in a death);
- **Serious** (detention in hospital; includes paralysis, fractures and severe lacerations); or
- **Slight** (includes whiplash, sprains and minor lacerations).

6.61 The data received from NCC are of a limited nature insofar as no narrative descriptions of the individual incidents are included. As such, the descriptions included within the individual incident considerations which follow represent an interpretation of the raw data supplied.

6.62 The raw incident data as received is included at Appendix 6/B. A summary of the data is shown within Table 6-14 below.

6.63 While the study period covers five years, the dates included span six calendar years (2010 to 2015). For example, year one covers the 365 day period between 1st October 2010 and 30th September 2011.

Table 6-14
Recorded Road Traffic Incidents, 2010 to 2015

	2010-11	2011-12	2012-13	2013-14	2014-15	Totals
Slight	2	2	2	2	1	9
Serious	0	0	1	0	0	1
Fatal	0	0	0	0	0	0
Total	2	2	3	2	1	10

6.64 Table 6-14 shows that there have been a total of 9 ‘Slight’ incidents recorded within the study area during the five year period. Only one incident was classified as ‘Serious’, and no incidents classified as ‘Fatal’ occurred during this period.

6.65 The individual incidents are included within the summary below:

2B040911 - Slight

Date: 20/01/11	Time: 10:35	Road Surface: Dry
Location:	A364 / Graves Moor Ln, Blyth.	
Interpreted Incident Description:	Vehicle 1 turns right and into path of Vehicle 2.	
Likely Causation Factors:	Failure to look properly before manoeuvring**.**	

2B120811 - Slight

Date: 10/06/11	Time: 17:45	Road Surface: Dry
Location:	A638 Great North Rd J/W A634 Retford Rd.	
Interpreted Incident Description:	Goods van overtakes a vehicle turning left and collides with a third vehicle emerging from that turning.	
Likely Causation Factors:	Failure to look properly before manoeuvring; Dangerous driving.	

2B288411 - Slight

Date: 26/10/11	Time: 05:54	Road Surface: Wet
Location:	A634 Blyth Rd bend 150 metres west of A638 Great North Rd, Barnby Moor.	
Interpreted Incident Description:	Two vehicles approach a bend from opposite direction, Vehicle 1 strays into oncoming lane and collides with Vehicle 2.	
Likely Causation Factors:	Loss of control; Adverse weather conditions (wet).	

2B073912 - Slight

Date: 21/04/12	Time: 20:06	Road Surface: Dry
Location:	A634 Retford Road, 68 metres southeast of Graves Moor Ln, Barnby Moor.	
Interpreted Incident Description:	Car loses control, leaves carriageway and collides with unspecified permanent object (fence, road sign, hedge etc.).	

Likely Causation Factors:	Unknown.

2B042513 - Slight

Date: 28/02/13	Time: 09:15	Road Surface: Dry
Location:	A634 high St J/W A634 Retford Rd, Blyth.	
Interpreted Incident Description:	Vehicle 1 turns right into side road and into the path of Vehicle 2.	
Likely Causation Factors:	Failure to look properly before manoeuvring.	

2B244013 - Slight

Date: 06/06/13	Time: 18:00	Road Surface: Dry
Location:	A634 Retford Rd J/W B6045 Blyth Rd, at bend, Blyth.	
Interpreted Incident Description:	Motorcycle leaves carriageway on the nearside, impact to the front.	
Likely Causation Factors:	Loss of control.	

4B136613 - Serious

Date: 13/07/13	Time: 12:03	Road Surface: Dry
Location:	A634 Retford Rd, 110 metres south-east of B6045 Blyth Rd, Blyth.	
Interpreted Incident Description:	Motorcyclist impacts offside without leaving carriageway or colliding with another vehicle, suggestive of loss of control / speeding etc.	
Likely Causation Factors:	Unknown.	

2B074914 - Slight

Date: 14/04/14	Time: 17:04	Road Surface: Dry
Location:	A634 High Street J/W A634 Retford Rd, Blyth.	
Interpreted Incident Description:	Vehicle 1 slow to turn right, Vehicle 2 approaching from behind fails to slow in time and collides with rear of Vehicle 1.	
Likely Causation Factors:	Failure to stop in good time.	

2B177414 - Slight

Date: 03/08/14	Time: 16:49	Road Surface: Dry
Location:	A634 High Street J/W A634 Retford Rd, Blyth.	
Interpreted Incident Description:	Vehicle 1 turns right out of a junction as Vehicle 2 turns right into same junction, colliding with off-side of Vehicle 2.	
Likely Causation Factors:	Vehicle 1: Failure to look properly before commencing manoeuvre.	

2B158115 - Slight

Date: 17/07/15	Time: 13:47	Road Surface: Dry
Location:	A634 Retford Rd, 75 metres south-east of Mill Meadow View, Blyth.	
Interpreted Incident Description:	Two vehicles involved, goods van and pedal cycle. Neither vehicle impacts or leaves carriageway, likely scenario: pedal cycle loses control or swerves to avoid collision.	
Likely Causation Factors:	Unknown.	

6.66 Despite the lack of definitive detail within the data provided, it is possible to ascertain the nature of a given incident in almost all cases, and certainly to identify elements which may suggest highway deficiency as a contributory causation factor.

6.67 The accident data has been considered in detail and it has been determined that there are no accident patterns that could be attributed to poor highway design. The incidents recorded are as a result of adverse weather conditions or human error, typically poor driver judgement.

6.68 There have been no accident patterns determined within the study area that includes 4.5km of the A634 Retford Road bearing south-east between Blyth and Barnby Moor, which could be exacerbated by the proposed application.

PROPOSED OPERATION

Phased Trip Generation

6.69 This section describes the determination of the various aspects of vehicular movements associated with the application proposals. This includes the quantity and composition of vehicle trips generated, arrival and departure profiles and route assignment.

6.70 Traffic associated with the proposal site will consist of operational HGV traffic and light vehicle movements generated by staff and visitors.

Construction

6.71 The construction phase would be a day time only operation (07:00 to 19:00hrs Monday to Friday and 07:00 to 13:00hrs on Saturdays) and would take approximately three months to complete. Prior to the construction of the wellsite the monitoring boreholes would be drilled which would generate a maximum of 4 HGV movements.

6.72 The construction activity would generate a maximum of 56 vehicle movements each day (28 in and 28 out) 36 of which would be classed as Heavy Goods Vehicle (HGV).

Drilling

6.73 Drilling activity for the exploratory well would last for approximately four months including the installation and removal of the drilling rig. Drilling would be a 24 hour, seven day per week process.

6.74 The delivery of the drilling rig, taking place over a two week period prior to drilling, would generate average daily HGV movements of 26 per day (13 in and 13 out), approximately 16 of which would be oversize vehicles. Light vehicle movements over this period would average to an approximate total of 20 per day (10 in and 10 out). The removal of the drill rig following the completion of drilling would take place over a two week period and would generate average daily HGV movements of 26 per day (13 in and 13 out), approximately 16 of which would be oversize vehicles. Light vehicle movements over this period would average to an approximate total of 20 per day (10 in and 10 out).

6.75 During the drilling phase HGV movements would be around 12 per day (6 in and 6 out) and light vehicle movements would be around 40 per day (20 in and 20 out). Employment in this phase would increase to around 25 to 30 jobs with the site being operated in shifts to maintain the 24 hour drilling programme for the exploratory well.

6.76 Nottinghamshire Police states that an ‘abnormal load’ is a vehicle that has any one or more of the following factors in place:

- a weight of more than 44,000 kilograms;
- an axle load of more than 10,000 kilograms for a single non-driving axle and 11,500 kilograms for a single driving axle;
- a width of more than 2.9m; or
- a rigid length of more than 18.65m.

6.77 Transportation of the drilling rig will require abnormal load vehicles. Attached at Appendix 6/C is the specification of the Boldon Drilling Rig 92 which represents the worst case in terms of vehicle dimensions. The list indicates that the rig will require a total of 16 abnormal loads on the basis of the above criteria, assuming that the remainder adhere to the minimum axle loading requirements.

Evaluation

6.78 The evaluation period could potentially last up to two years and during this stage the well would be suspended and maintained in accordance with industry best practice and all above ground equipment would be removed from the site apart from the wellhead, site offices and security fencing.

6.79 Traffic movements would be minimal during this period with only monitoring and security visits required and there would be no night time activities or lighting required. No more than 10 light vehicles movements per day would be generated during this phase (5 in and 5 out) and 1 HGV trip, for the purposes of emptying the attenuation tank, a fortnight.

Decommissioning and Restoration

6.80 In the event that the results of the exploration work indicate that further development of the site is not viable, the exploratory well would be plugged and capped.

6.81 Operating hours and maximum traffic movements for the restoration would be the same as for the construction stage and would take approximately 8 weeks to complete.

Trip Generation Summary

6.82 On the basis of the above, and information provided by the drilling specialists, Table 6-15 provides a summary of the traffic which could be generated by the Application Site during each phase.

Table 6-15
Proposed Traffic Forecast Summary – Average Daily

	Duration	Light Vehicles		Heavy Vehicles		Average Daily Movements	
Site Construction (5.5 day weeks)		**Trips**	**Movements**	**Trips**	**Movements**	**Total**	**HGV**
Monitoring Boreholes	4 weeks	-	-	2	4	4	4
Preliminary Works	1 week	10	20	3	6	26	6
Material Delivery	***7 weeks***	***10***	***20***	***18***	***36***	***56***	***36***
Removal of Groundwork Vehicles	1 day	-	-	4	8	8	8
Drilling (7 day weeks)							
Mobilisation	1 week	10	20	8	16	36	16
Drilling	14 weeks	20	40	6	12	52	12
De-mobilisation	2 weeks	10	20	8	16	36	16
De-mobilisation Fence	4 days	1	2	-	-	2	0
Evaluation (5.5 day weeks)							
Monitoring and Security	2 years	5	10	0.1	0.2	10	0.2
Remediation (5.5 day weeks)							
Preliminary Works	1 week	10	20	3	6	26	6
Materials Removal	7 weeks	10	20	18	36	56	36
Removal of Groundwork Vehicles	1 day		-		8	8	8

Worst Case Traffic Generation

6.83 For the purposes of a robust impact assessment the worst case in terms of traffic generation will be considered.

6.84 The traffic generation summary provided at Table 6-15 indicated that the worst case in terms of total vehicles and HGVs would be the Site Construction and Remediation phases during which the site would generate a maximum of 56 vehicle movements each day of which 36 would be classified as HGV.

Trip Distribution/Assignment

6.85 HGV traffic generated by the Application Site would utilise the principal road network remaining on B6045, the 'A' classified roads and motorways.

6.86 HGVs would route to/from the A1 via the junction to the south or the A1(M) via the junction to the north of Blyth depending on their origin/destination. Vehicles would then route through Blyth joining the A634 Retford Road which links with the Application Site. This route is illustrated at Drawing TL6/1

6.87 There is a height restriction on the A634 on the edge of Blyth at the A1 overbridge. The proposed vehicle sizes, including oversized vehicles associated with the drilling rig and crane requirements, have been reviewed and they all have a height below 4.8m. Therefore all HGVs will route via Blyth.

Site Access

6.88 The existing site access will be upgraded in order to serve the application proposals. The proposed site access will be gated and have a width of 13m.

6.89 Junction visibility requirements have been considered with reference to the actual vehicle speeds recorded. The surveyed mean vehicle speeds were 52.4mph northbound and 56.2mph southbound. These speeds demonstrate that the restrictions in the proximity of the proposed site access junction are adhered to.

6.90 Junction visibility levels would therefore be required to meet the standards set within DMRB TD42/95, which states that for 100kph roads a 215m visibility splay ('Y' distance) would be required when set back from the give way line by 4.5m ('X' distance). The access junction design, which shows the visibility splay requirements, is provided at Drawing TL6/2.

6.91 The existing line of visibility to the north is shown within Figure 6-16.

Figure 6-16
Access Junction Visibility to the North

6.92 The existing line of visibility to the south is shown within Figure 6-17.

Figure 6-17
Access Junction Visibility to the South

6.93 As illustrated on the access junction plan and in the above photographs, the upgraded access junction would require clearance of 4 young trees which are currently located to the north and south of the Application Site access.

6.94 Stretching 15m into the site from the point of access, the access road would be constructed as a typical section of highway (e.g. from hard-core and tarmac), and thereafter the internal roads would be constructed from Type 3 stone on geotextile membrane.

6.95 The swept-path requirements for HGVs which would be generated by the Application Site have been assessed. The software Autotracks has been used to simulate the swept-paths of the larger vehicles accessing and egressing the Application Site. The assessment is attached at Drawing TL6/3 which demonstrates that each vehicle can manoeuvre in and out of the site without any issues. Each vehicle would enter and exit the site in a forward gear.

Environmental Impact

Methodology

6.96 This section assesses the environmental impact associated with the movement of vehicles associated with the development. The assessment refers to guidance provided by the Institute of Environmental Management and Assessment (IEMA) in 'Guidelines for the Environmental Assessment of Road Traffic' (the 'IEMA Guidelines').

6.97 The IEMA Guidelines provide two broad rules which can be used to determine the need for a full environmental assessment. The rules form a

threshold, below which the predicted environmental impact is considered to be insignificant:

- highway links where traffic flows would increase by more than 30% (or where the number of HGVs would increase by more than 30%); or
- in sensitive areas where traffic flows increase by more than 10%.

6.98 Given the determined existing conditions of the local highway network, road classification, lack of sensitive receptors and its lack of accident history, for the purposes of this assessment the links studied are not considered to be sensitive. Based on this, the 30% threshold as defined in the IEMA Guidelines is deemed to apply for assessment purposes.

6.99 If the above thresholds are exceeded then a full environmental impact assessment must be undertaken to determine the level of transport related impact borne of the proposed development. The IEMA Guidelines advise that traffic flow variations within +/-10% of baseline levels are indiscernible from the day-to-day fluctuations in traffic flow, creating no material environmental impact. Therefore, increases in traffic of less than 10% are considered to have a negligible impact. Based on the guidance, the following criteria are used to determine the environmental impact of the proposed development:

- noise & vibration – a doubling of traffic flow leads to a 3dB(A) increase in noise level, below which is deemed imperceptible to change receptors;
- dust & dirt – the potential effects arising from dirt and detritus being brought onto the highway, assessment is required where the increase in traffic is above 10%;
- driver severance & delay – capacity assessments are required where traffic levels change by 10% or more, or where the links/junctions experience congestion in the baseline situation;
- community severance & delay – the existing level of community severance is determined and the relative impact of additional traffic assessed based on a sliding scale; and
- vulnerable road users and road safety – assessment is required where the increase in traffic is above 10%.

6.100 Based on the above, the assessment would determine the sensitivity and magnitude of transport related impacts according to the criteria established in Table 6-18 below.

Table 6-18
Transport Impact Criteria

Impact	Sensitivity			Magnitude			
	Low	Medium	High	Negligible	Minor	Moderate	Major
Noise & Vibration	No sensitive receptors	Presence of sensitive receptors	Presence of sensitive receptors adjacent to the road	<99% increase in traffic i.e. a doubling of traffic flow	Quantitative assessment based on predicted increase in traffic against measured baseline		
Dust & Dirt	Limited presence of sensitive receptors	Low to medium presence of sensitive receptors	High presence of sensitive receptors	No off-road vehicle movements /no loose material transport	Qualitative assessment based on type of traffic generated, materials transported and traffic speeds through sensitive areas		
Driver Severance & Delay	Road network not affected	Road network not experiencing congestion at peak times	Road network experiencing congestion at peak times	<10% increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future traffic levels		
Community Severance & Delay	Moderate to high baseline traffic flows / presence of existing severance	Moderate baseline traffic flows / presence of existing severance	Low baseline traffic flows / no presence of existing severance	<10% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic
Vulnerable Road Users	N/A	Limited presence of vulnerable road users	Presence of vulnerable road users	<10% increase in traffic	Qualitative assessment of existing provision and future traffic levels		
Road Safety	N/A	No existing safety risk	Existing safety risk	<10% increase in traffic	Quantitative assessment of existing accident records and predicted increases in traffic		

6.101 The sensitivity and magnitude of each impact are combined to determine the significance, from which the need for mitigation can be identified. The significance definitions are detailed in Table 6-19 below. In terms of the EIA Regulations, a 'Moderate/Substantial' and 'Substantial' effect are taken as being a 'significant' effect.

Table 6-19
Determination of Impact Significance

Magnitude	Sensitivity		
	Low	Medium	High
Negligible	Negligible	Slight	Slight/Moderate
Minor	Slight	Slight/Moderate	Moderate
Moderate	Slight/Moderate	Moderate	Moderate/Substantial
Major	Moderate	Moderate/Substantial	Substantial

Link Impact

6.102 The local road network has been considered in terms of the link impact that would occur as a result of the traffic forecasted for the proposed application over the temporary period.

6.103 All traffic forecasted to be generated by the site has been routed via the A634 and B6045 to/from the A1/A1(M).

6.104 In order to be robust 100% of determined 'worst case' proposal traffic will be routed via each of the count points with the exception of the A634 west of Blyth, where 100% of light vehicle traffic will be routed but no HGVs.

6.105 No traffic growth has been applied to this assessment as it would only serve to reduce the traffic impact. Therefore 2015 background traffic levels have been used.

6.106 Table 6-20 provides a summary of the link impact assessment.

Table 6-20
Link Impact – Daily Traffic

	All Vehicles			HGVs		
	2015 Base	Proposed Traffic	% Change	2015 Base	Proposed Traffic	% Change
Link 1 A634 East	4,162	56	1.3	136	36	26.5
Link 2 B6045 North	9,464	56	0.6	560	36	6.4
Link 3 Spital Road	2,283	56	2.5	255	36	14.1
Link 4 A634 West	4,470	20	0.4	331	0	0

6.107 The robust link impact assessment shows that the proposed traffic forecasted would result in a temporary total increase of just 2.5% of the total existing traffic flow on Spital Road, and an increase in 14.1% in HGV traffic.

6.108 This level of increase is within the advisory thresholds and classified as 'slight' in terms of significance on the basis that it is a minor increase in an area deemed to have low level of highway sensitivity.

6.109 In terms of the highest HGV impact the robust link impact assessment demonstrates that the A634 would be subject to a 26.5% increase in HGV traffic movement which would be across a 7 week period. It is considered that whilst this is still within the recommended thresholds the impact appears greater due to the low level of HGV traffic currently on this link.

6.110 It must be appreciated that whilst these proposed increases are small and unlikely to be perceptible, they would also be temporary. It is also probable that the impacts would be diluted between the north and south links resulting in approximately half the shown impact to the north and south of Blyth.

Noise & Vibration

6.111 As stated in the IEMA Guidelines, variation of +/-3dB(A) represents the minimum perceptible change in noise to nearby receptors, which is typically produced by a doubling or halving of traffic flow. As demonstrated within the link impact assessment the proposals would not result in a doubling of background traffic levels.

6.112 The above assessment confirms that the proposed development traffic would lead to no perceptible change in noise or vibration along any link within the study area road network during hours of operation. The magnitude of the proposed development traffic impact on noise and vibration would therefore be negligible.

6.113 It should be noted that transport related noise is also addressed in Chapter 8.

Dust and Dirt

6.114 The sensitivity to the impact of dust and dirt is based upon the proximity of sensitive receptors to the roadside. The IEMA Guidelines state that "*problems with dust and dirt are unlikely to occur at distances greater than 50m from the road*". The site access is not located within 50m of any sensitive receptors.

6.115 The IEMA Guidelines explain that the impact of dust and dirt will depend, to a large extent, upon the management practices undertaken on site. This assessment determines the level of impact generated by the proposed development under the assumption that no management practices are undertaken.

6.116 The transportation of materials in uncovered containers could lead to dust and dirt impacts throughout the proposed access route network.

6.117 It is expected that, without sufficient mitigation measures, the magnitude of the impact of dust and dirt throughout the study area road network would be high. Appropriate mitigation measures are proposed in order to minimise any impact that is caused in terms of dust and dirt. Such mitigation measures follow best practice guidelines and are routinely used at construction sites throughout the UK. The effectiveness of the mitigation measures is therefore well understood.

6.118 The residual impact in terms of dust and dirt would therefore be slight.

Driver Severance and Delay

6.119 The A634 is a classified 'A' road which currently accommodates an Annual Average Weekday Traffic (AAWT) flow of over 4,000 comprising mixed size vehicles.

Link Impact

6.120 The link impact assessment has demonstrated that the likely increase would be 1.3% in terms of total vehicles, which is well within the daily fluctuations in traffic levels experienced and is therefore unlikely to be perceptible away from the site access junction.

6.121 This level of increase is within the advisory thresholds and classified as 'slight' in terms of significance on the basis that it is a minor increase in an area deemed to have low level of highway sensitivity.

6.122 In terms of the other study links the Application Site would result in a maximum increase of 2.5% at Spital Road to the south of Blyth.

6.123 It must be appreciated that whilst these proposed increases are small and unlikely to be perceptible, they would also be temporary. It is also probable that the impacts would be further diluted between the north and south links in

Blyth resulting in approximately half the shown impact to the north and south of Blyth.

Link Capacity

6.124 The adequacy of the A634, taking into account the volume of traffic recorded, has been considered.

6.125 Theoretical capacity can be determined by reference to TA46/97[1]. The link impact assessment has identified an AAWT flow of 4,162 with a PCU flow of 4,299 (where HGV is classed as 2 PCUs).

6.126 This can be compared against a theoretical capacity of up to 13,000 vehicles Annual Average Daily Traffic (AADT) for a S2 standard carriageway, and as such hypothetically has approximately 90% reserve capacity.

6.127 It has therefore been demonstrated that the A634 currently operates well within theoretical capacity with plenty of headroom to accommodate future traffic growth and it therefore has the capacity to be able to accommodate the predicted short term increase in traffic generated by the proposed development.

Junction Capacity

6.128 Technical guidance provided within DMRB TD42/95[2] states that the use of 'simple' priority junctions, in new build situations, is appropriate up to a level of 300 vehicles AADT 2-way flow on the minor arm. An AADT 2-way flow of 500 vehicles is quoted as being the desirable maximum level of use for an existing junction without upgrading being considered, or where vehicles waiting on the major road to turn right do not inhibit the through flow and create a hazard.

6.129 The proposed application is forecast to generate significantly less than this level of traffic and would comfortably be accommodated within the proposed access junction arrangements without any capacity concerns.

Summary and Conclusion

6.130 The proposals would result in a maximum average of 5 HGVs per hour across a 12 hour operational day. This low level of traffic would be generated across a temporary period.

6.131 On the basis of the link impact, link capacity and junction capacity assessments it is concluded that the impact to driver severance and delay would therefore be negligible.

[1] Design Manual for Roads & Bridges TA46/97 Traffic Flow Ranges for use in Assessment of new Rural Roads
[2] Design Manual for Roads & Bridges TD42/95 Geometric Design of Major/Minor Priority Junctions.

Community Severance and Delay

6.132 The sensitivity of this impact is based upon the presence of communities around the local road network and the existing level of severance due to traffic flow.

6.133 The A634 is a classified 'A' road which currently accommodates an AAWT flow of over 4,000 comprising mixed size vehicles.

6.134 The link capacity assessment undertaken has demonstrated that the A634 currently operates within its theoretical capacity and it will continue to do so comfortably with the addition of the proposal traffic.

6.135 The link impact assessment has demonstrated that the likely increase would be 1.3% in terms of total vehicles, which is well within the daily fluctuations in traffic levels experienced.

6.136 There is a primary school on the A634 Retford Road located approximately 200m west of the A1 overbridge. The typical day at the Primary School of St. Mary and St. Martin starts at 0840hrs and finishes at 1530hrs.

6.137 The construction contractor will seek to impose blackout periods during school days which prevent HGV traffic generated by the site routing through Blyth between the hours of 0800-0900hrs and 1515-1615hrs when school transport activity is present.

6.138 The magnitude of the impact on community severance would therefore be negligible.

Road Safety

6.139 As noted at 6.66, the accident data has been considered in detail and it has been determined that there are no accident patterns that could be attributed to poor highway design. The incidents recorded are as a result of adverse weather conditions or human error, typically poor driver judgement.

6.140 It is considered that the proposed operational traffic route is suitable for the development proposals and would provide direct access to the county's principal roads, whilst limiting impact to residential areas.

6.141 All vehicle types have been reviewed and heights are within the maximum height permitted to pass under the A1 overbridge.

6.142 It is therefore considered that the type and quantity of additional traffic generated by the proposed development over the temporary period would have a negligible impact on the safety of the local road network.

Oversized Loads

6.143 Transportation of the drilling rig will require abnormal loads. Attached at Appendix 6/C is the specification of the Bolden Drilling Rig 92, the largest in terms of vehicle dimensions. The list indicates that the rig will require a total

of 16 abnormal loads on the basis of the criteria provided by Nottinghamshire Police.

6.144 For abnormal loads, at least two working days' notice is required to the relevant local authorities, bridge and structure owners like Network Rail and Police forces along the proposed route in order that they can approve or reject the proposed movement.

6.145 The Highways England's Electronic Service Delivery for abnormal loads (ESDAL) can be used to:

- plot the route;
- notify the police, highways and bridge authorities of your abnormal load movements around the road network;
- get advance notice of any possible route problems; and
- save vehicle details and routes for future use.

6.146 If the ESDAL facility is not used an abnormal loads movement application form must be completed.

6.147 Nottinghamshire Police state that they do not routinely escort abnormal loads but do allow the use of private escort vehicles for the majority of movements by hauliers, either by providing their own vehicles or employing a third party.

6.148 As a general rule they do not require any escort vehicles (Police or private) on the following roads:

- on motorways (in Nottinghamshire on the M1 between junctions 24 and 27), loads up to 4.6m wide, 30m long and 130t in weight are allowed to move without an escort;
- on the A1, A46 and A610 only loads of up to 4.3m wide, 30m long and 130t in weight are allowed without an escort; or
- on all other roads, loads must be below 4.12m wide, 30m long and 100t in weight without escort.

6.149 However, they will provide a police escort on request of the haulier or where it is deemed necessary due to the size of the load or other extenuating circumstances.

6.150 Nottinghamshire Police states that they do not allow the movement of abnormal loads in Nottinghamshire during peak traffic periods between 7:30 and 9:30hrs and 16:30 and 18:30hrs and on the M1 motorway between 15:00 and 20:00hrs on Fridays and Sundays, adding:

"We will generally allow abnormal loads to be moved during the hours of darkness on motorways and the A1, providing the load remains solely on these roads and is lit and signed in accordance with legal requirements. The movement of abnormal loads on all other roads is NOT permitted during the hours of darkness except with the agreement and permission of the Abnormal Loads Officer first".

6.151 Any abnormal load routing will be undertaken adhering to the relevant regulations with full notification provided in line with the Nottinghamshire Police requirements.

Vulnerable Road Users

6.152 The review of local accident data has also demonstrated that there is currently no safety issue relating to vulnerable road users.

6.153 The link capacity assessment undertaken has demonstrated that the road operates well within its theoretical capacity. The link impact assessment has demonstrated that the likely increase would be 0.1% in terms of total vehicles, which is well within the daily fluctuations in traffic levels experienced and is therefore unlikely to be perceptible away from the site access junction.

6.154 The construction contractor will seek to impose blackout periods during school days which prevent HGV traffic generated by the site routing through Blyth between the hours of 0800-0900hrs and 1515-1615hrs when school transport activity is present.

6.155 The impact to vulnerable road users will therefore be negligible.

MITIGATION

6.156 Mitigation measures are proposed to facilitate safe access to the site, whilst also offsetting the potential impact caused by additional HGV traffic on the surrounding road network:

- HGVs will be restricted to the A634 and B6045 where they will gain access to the A1/A1(M) to the north or south of Blyth;
- HGV blackout periods between the hours of 0800-0900hrs and 1515-1615hrs when school transport activity is present;
- ensure that good visibility is maintained at the proposed site access junction i.e. any trees/hedges trimmed;
- ensure that all loose material transported to/from the site is suitably covered and that HGVs are not overloaded, to minimise the impact of dust resulting from material transport;
- the induction of drivers of all HGV traffic accessing the development, highlighting safety issues and ensuring they follow agreed access routes to and from the site; and
- a road sign informing drivers of the site access location and the nature of its operation (to be designed and agreed with the Local Highways Authority).

RESIDUAL IMPACT

6.157 The sensitivity and magnitude of impacts associated with the additional traffic generated by the proposed development are combined according to the significance definitions provided in Table 6-19 above. Table 6-21 below summarises the significance of each impact pre- and post-mitigation, providing a number of suggested mitigation measures that could be employed to achieve the impact reduction.

Table 6-21
Significance of Traffic Impacts associated with the Proposals

Impact	Pre-Mitigation Significance	Suggested Mitigation	Residual Impact
Noise & Vibration	Negligible	N/A	Negligible
Dust & Dirt	Moderate	• No overloading of HGVs • Covering of any materials in transit • Monitoring of dust and dirt levels	Slight
Driver Severance & Delay	Negligible	N/A	Negligible
Community Severance & Delay	Negligible	• HGV Route Restriction • HGV Blackout Periods • HGV Driver Induction	Negligible
Road Safety	Slight	• HGV Route Restriction • HGV Blackout Periods • HGV Driver Induction	Negligible
Vulnerable Road Users	Negligible	• HGV Route Restriction • HGV Blackout Periods • HGV Driver Induction	Negligible

CUMULATIVE EFFECTS

6.158 A review of recent developments granted in the area has identified a solar farm permission at Jubilee Farm. Consultation responses to the Scoping Report have also identified Daneshill Landfill, an extension of time to an existing mineral operation at Scrooby South and potential future mineral allocations at Barnby Moor and Botany Bay, Retford.

6.159 In respect of the potential mineral site allocations and the likely timescales of the proposed development it is considered unlikely that that the mineral sites would be coming forward within a similar timescale. As such they are not considered likely to have a cumulative impact in relation to the proposed development and are not considered further.

6.160 In respect of the proposed solar farm, the construction period is estimated to last 12 weeks and have a total of 112 HGV deliveries over that period (which is an average of less than 10 a week) for which the proposed route is the A1 and A634. After construction traffic generation would be limited to quarterly maintenance visits and call outs to attend to remedial issues. It is noted that the Highways Authority had no objections to the proposed development. Traffic from the other developments referred to at Scrooby and Daneshill relate to existing activities where traffic is already on the network and any vehicles from these developments using the A634/A1 route would have been taken into account in the traffic counts undertaken.

6.161 The adequacy of the A634, taking into account the volume of traffic from the proposed development and the other developments identified above, has been considered and the link impact assessment has identified an Annual Average Weekday Traffic (AAWT) flow of 4,162 with a PCU flow of 4,299

(where HGV is classed as 2 PCUs). This can be compared against a theoretical capacity of up to 13,000 vehicles for a road such as the A634.

6.162 It has therefore been demonstrated that the A634 currently operates well within theoretical capacity with plenty of headroom to accommodate future traffic growth.

6.163 This taken with the scale, nature and duration of the proposed development means that no significant cumulative traffic impacts are predicted to occur.

CONCLUSIONS

6.164 This Chapter of the ES assesses the potential impacts on the highway network as a result of the proposed development.

6.165 A detailed audit of the local highway network has been undertaken. It is concluded that the Application Site is located with good links to the principal road network via the A1/A1(M).

6.166 The Application Site will generate a reasonably low number of vehicles across a temporary period. During the determined 'worst case' period the Application Site would generate a maximum average of 5 vehicle movements per hour across a twelve hour day.

6.167 This level of vehicles is well below the threshold at which the Local Highway Authority would usually seek a Transport Assessment which is 30 two-way peak hour movements, which constitutes a significant impact.

6.168 Accident data has been considered in detail and it has been determined that there are no incident patterns that could be attributed to poor highway design. It has been determined, therefore, that the Application Site does not have any kind of detrimental effect in terms of road safety.

6.169 A review of the proposed vehicle types has determined that all vehicles can route via Blyth and avoid any surrounding villages which may not have the required standard of highway to accommodate HGVs.

6.170 The proposed site access is deemed suitable for the application proposals with adequate junction visibility splays. A swept-path analysis has also been undertaken to demonstrate that all of the required vehicles can be accommodated at the proposed site access.

6.171 Mitigation measures are proposed to further minimise the low level of impact that may be caused by HGV traffic generated by the application proposals.

6.172 In view of the above, the Application Site does not result in any significant effects on road or junction capacity, driver delay, road safety or amenity.