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**Brigg Renewable Energy Plant
Scawby Road, Scawby Brook, North Lincolnshire
Transport Assessment**

Prepared on behalf of:



Eco2



AXIS
Camellia House
76 Water Lane
Wilmslow
SK9 5BB

Tel: 01625 418 718
Fax: 01625 418 678

www.axisped.co.uk

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1.0 INTRODUCTION

- 1.1 This Transport Assessment has been prepared by AXIS on behalf Eco2 to consider highways and transport issues related to proposals for a Biomass Renewable Energy Plant (hereafter referred to as the Brigg Renewable Energy Plant or Brigg REP) at Scawby Road, Scawby Brook, near Brigg. The proposals involve the development of an electricity generating facility with an installed capacity of 40MW. Electricity would be generated by a steam turbine which would be driven through the combustion of biomass material (primarily straw) supplied via contracts with local farmers.
- 1.2 This report has been prepared to appraise the Local Planning & Highway Authority (North Lincolnshire Council - NLC) of the anticipated highways and transport issues associated with the development of the Brigg REP. The site is proposed to operate with an annual input capacity of approximately 240,000 tonnes per annum (tpa) of delivered biomass material, with the energy generating process resulting in approximately 25,000 tpa of ash waste (by weight) to be transported off-site.
- 1.3 The scope and nature of the assessment issues included within this Transport Statement report reflects the extent of local highways and traffic issues identified as likely being of material interest to the Local Highway Authority (LHA). In addition, further scoping discussions have also been undertaken with officers of the trunk road authority (the Highways Agency (HA)) who are responsible for the operation and management of the M180. A copy of the submitted scoping report on anticipated highways issues is provided as Appendix A to this report.
- 1.4 The report has been prepared to reflect March 2007 Department for Transport (DfT) "Guidance on Transport Assessment" for the preparation of Transport Assessment reports. The structure of this Transport Assessment is therefore as follows:

- A description of the site location and existing conditions - including a description of the local highway network immediately adjacent to the site, prevailing local planning and highway policy, local network accident history and historical background traffic demand patterns.
- A description of the development proposals for the site - including a review of the proposed access strategy and its acceptability with respect to prevailing local highway standards;
- An assessment of the anticipated future traffic generation to / from the site and the distribution of these trips over the local network;
- A consideration of the potential traffic impact of the traffic generated by the development scheme at key local junctions and highway links on the immediate highway network.
- Summary and conclusions.

2.0 **SITE LOCATION & EXISTING CONDITIONS**

2.1 **Site Location**

2.1.1 The location of the Brigg REP proposal site is illustrated in Figure 1 to this report. This plan identifies the strategic location of the site in relation to the built up area of the settlements of Scawby Brook, Scawby and Brigg and the general alignment of B1206 Scawby Road and connections to the A18 and M180 junction 4.

2.1.2 Photographs of existing key network layout features, including an aerial photograph of the immediate study area to the site are illustrated in Appendix B to this report.

2.2 **Review of prevailing Local Planning & Highway Policy**

2.2.1 A full review of planning policy relevant to the development of the Brigg REP facility is provided as Chapter 5 to the Environmental Statement prepared to support the formal planning application (Axis Doc Ref: 552-01 / Environmental Statement / Final).

2.2.2 In the case of Brigg REP scheme, the relevant statutory Development Plan comprises:

- Regional Spatial Strategy for Yorkshire and the Humber to 2016 (RSS 12), December 2004; and
- North Lincolnshire Local Plan (adopted May 2003).

2.2.3 The Brigg REP site lies within a defined development area boundary within the North Lincolnshire Local Plan - associated with the Former British Sugar Site at Brigg. This land is identified as being suitable for industrial /

commercial development of a B1 / B2 / B8 nature. Development policy at the site is effectively set out in Local Plan policies IN1 and IN8 (see Figure 2a).

2.2.4 Policy IN8 specifically identifies the allocation of development at the former British Sugar site for industrial development and states the following:

“IN8 Planning permission for new industrial development will be allowed for Use Class B1 business development, Use Class B2 general industrial development and Use Class B8 warehouse and storage development at the former British Sugar site, Scawby Road, Scawby Brook, Brigg. Proposals will be required to achieve a high standard of landscaping.”

2.2.5 The supporting local plan descriptive text to the policy provides an additional review of the site and identifies the core development area and anticipated access arrangements as identified below:

“The land to the south of the site has recently been developed with a combined cycle gas power station, after the closure of the sugar factory. This has left an area of land which previously included the major part of the former production areas, the existing buildings, extensive hard standing, surfaced car park and concreted storage areas. Access to the site will be gained from the existing approach road to the west.”

2.2.6 In addition the development of the Brigg REP scheme would accord with general policy and strategic criteria as set out in a range of national and strategic guidance such as The May 2007 Energy White Paper, UK Biomass Strategy, PPS22 “Renewable Energy”, Supplement to PPS1 on Climate Change and the Regional Spatial Strategy. These core policy documents identify the advantages of delivering renewable energy facilities and the locational factors which must be considered when assessing renewable energy facilities. Paragraph 24 of PPS22 notes:

“...for biomass projects the need to transport crops to the energy production plan does have the potential to lead to increases in traffic. Local planning authorities should make sure that the effects of such increases are minimised by ensuring that generation plant are located in as close proximity as possible to sources of fuel that have been identified. But in determining planning applications, planning authorities should recognise that there are other considerations (such as connections to the grid and the potential to use heat generated from the project) which may influence the most suitable locations for such projects.”

2.2.7 The supplement document to PPS1 also fully supports the use of renewable energy and in paragraph 19 it requires policies within Local Development Documents (LDD) to “*promote and not restrict renewable and low-carbon energy and supporting infrastructure*”. Paragraph 22 provides a number of guidelines for planning authorities which include:

- Look favourably on proposals for renewable energy, including on sites not identified in development plan documents;
- There is no requirement for applicants to demonstrate overall need for renewable energy and its distribution, nor question the justification for renewable energy generation in a particular location;
- The local approach to protecting landscape should be consistent with PPS22 and should not prevent the supply of any type of renewable energy.

2.2.8 Relevant local transport policy for new development in North Lincolnshire Area is outlined in the North Lincolnshire Local Plan. In addition the local policy approach identified within the Local Plan must also be considered alongside the general policy and strategy identified in the 2nd Local Transport Plan (2006/7 – 2010/11) for North Lincolnshire.

2.3 Description of existing site and local highway network conditions

Existing Site Conditions

- 2.3.1 The Brigg REP proposal site comprises circa 5.26 hectares of previously developed land, formerly occupied by British Sugar's Brigg works. It lies approximately 800 metres east of the B1206 Scawby Road (from which the site is accessed) and 500 metres west of the River Ancholme. The immediate area to the proposal site and existing highway connections are illustrated in Figure 2b to this report.
- 2.3.2 The proposal site is located approximately 1.5 kilometres south-west of the town of Brigg and 1.8 kilometres east of the village of Scawby. The smaller settlement of Scawby Brook is around 600 meters to the north-west and provides a linear settlement based on the alignment of the B1206 Scawby Road. The site is ostensibly flat and stands at a level of circa 3-4 m AOD.
- 2.3.3 Most of the buildings that comprised the former British Sugar works have now been demolished to ground level, leaving areas of concrete hard surfacing. The buildings remaining on the site include a manned security office and unoccupied former factory offices, stores and warehouses.
- 2.3.4 The site is bordered to the north by Scawby Beck and beyond that, what are understood to be former power station ash settling lagoons. Arable pastureland borders the site to the east and west and there are also a number of mature trees intermittently bordering the north, east and west of the site.
- 2.3.5 To the immediate south of the site is Glanford Brigg Gas Fired Power Station. This facility is currently operational, providing 'on demand' electricity to the National Grid. The Glanford Brigg Power Station shares the main access

road to the Brigg REP proposal site, however, existing vehicle movements to / from the existing facility are limited.

Existing Site Access

- 2.3.6 As noted above, the Brigg proposal site is currently served via a western vehicle connection to the B1206 Scawby Road. This access represents the former operational access to the British Sugar site and is shared with the adjacent Glanford Brigg Gas Power Station facility. The access road is currently of a 7.0m wide route corridor of generally straight horizontal alignment with 1.0m – 1.5m verges on both sides of the route but no footway. It is understood that the route does not represent an adopted highway route and is in private ownership, with rights of access to / from the proposal site.
- 2.3.7 The existing site access road connects to B1206 Scawby Road at an off-set cross-roads layout. The other access arm to the junction being Brigg Road which provides local access to the village of Scawby. This cross-roads junction is of a ghost island layout design to allow for the storage of right turn vehicles 'off-line' from main through movements on the B1206, thereby assisting in managing both highway capacity and safety. The site access road connection and the Scawby Road connection are off-set by approximately 100m (measured centre to centre).
- 2.3.8 The ghost island layout of the immediate section of the B1206 to the site access connection is of a non-standard layout, being formed within the existing taper of the main Scawby Road / Brigg Road layout (see Appendix B to this report). Notwithstanding this, B1206 Scawby Road provides of the order of 11m at this location, which is suitable to accommodate HGV movements on the mainline route and the storage of a further HGV within the central right turn area.

2.3.9 At the connection to B1206 Scawby Road, the existing site access route is of the order of 6.5 – 7.0m in width and is bounded on its immediate northern side by buildings and land associated with an animal kennels business. The existing junction connection provides left turn entry / exit radii of the order of 8.5m.

2.3.10 B1206 Scawby Road is of 60mph national speed limit at the site access. Approach speed data collected for the southbound approach movement (from Scawby Brook) at the existing stream crossing point (see Figure 3) identifies that existing highway conditions are such that vehicle operating speeds are, in practice, less than the maximum speed limit for the route. These speed surveys demonstrated that recorded off peak 85th percentile wet weather speeds were as follows (see Appendix C to this report):

- AM off-peak survey: 50.5mph
- PM off-peak survey: 51.5mph

2.3.11 Reference to recent updated guidance on the calculation of lateral and forward visibility as set out in TRL Research Report 661 demonstrates that vehicle approach speeds of 50 – 60mph would require the following levels of lateral visibility (see Appendix C including for an additional 3m for maximum vehicle bonnet length):

- 50mph approach speed: 93m – 138m*
- 60mph approach speed: 124m – 190m*

(*Design speed dependent on road surface conditions)

2.3.12 Figure 3 to this report illustrates the existing lateral sightlines available from the site access road when measured on suitable topographic / OS survey plans. Existing provision within the highway boundary is currently measured as outlined below:

- Leading Direction (to the north): 2.4m by 147m
- Non-leading direction (to the south): 2.4m by 102m / 139m

(Sightline measured to inside kerb / approach lane)

2.3.13 The above review demonstrates that existing lateral visibility in the critical leading direction is entirely suitable for observed approach traffic speeds on the B1206 Scawby Road. Available sightlines of 150m in this direction exceed maximum visibility requirements, even including for snow covered road conditions. Existing visibility provision in the non-leading direction is considered suitable for 50-60 mph operation based on typical road surface conditions when measured to the outside of the main approach road. The current good visibility provision at the junction is considered to be reflected by the excellent highway safety record, which has seen no accident incidents over the past 5 year period (see section 2.5 to this report).

Local Highway Network Connections

2.3.14 The B1206 Scawby Road acts as the main local distributor route for the Scawby Brook area and would accommodate all traffic movements to / from the Brigg REP proposal site. The route corridor is typically of a single carriageway nature of minimum 7.0 – 7.3m width in the immediate vicinity of the site, with no footways and no street lighting.

2.3.15 To the south of the site, the route provides connections to the B1207 at Hibaldstow and onward connections to the A15 and Lincoln / Market Rasen and Gainsborough. Approximately 1.3km to the south of the site access connection to Scawby Road, the B1206 crosses the Gainsborough – Brigg – Grimsby rail line at an un-manned level crossing. Larger HGV / long vehicles using this section of route are required to stop in provided lay-by's and phone the rail signal manager for permission to cross the level crossing. This southern section of route corridor is therefore not currently considered as representing a practical route for regular HGV movements. Alternative access

to the southern A15 corridor served is provided by connections via the B1026 through Scawby Brook and the A18.

- 2.3.16 Brigg Road to the west of the proposal site provides local access to the village of Scawby, some 1.8km from the proposal site. Brigg Road is a typical rural access road route of 7.0m width with little frontage development at the Scawby Road end of the route corridor, with the road narrowing within the village, with residential frontage properties and on-street car parking (subject to 30mph speed limit within the village).
- 2.3.17 Scawby Road to the north serves the immediate local settlement of Scawby Brook and onward connections to the town of Brigg and the A18. The route passes through a sharp bend approximately 500m to the north of the site access road connection. This sharp bend also acts as a speed limit boundary, with the section of route through Scawby Brook operating under 40mph controls. The Scawby Brook section provides a wide single carriageway route, with footways on both sides of the route and residential properties set well back from the highway boundary. Very little on-street parking was observed on this section of route. A large HGV rental / haulage depot was noted within the village of Scawby Brook and located close to the terminal mini-roundabout junction with the A18.
- 2.3.18 B1026 terminates at a mini-roundabout junction with the A18 (see Appendix B to this report). This junction has been designed to incorporate larger HGV service vehicles and includes for significant hatching / narrowing of approach lanes to the junction to promote safe operation. To the east of this junction the A18 provides local connections to Brigg Town Centre. To the north / west the A18 route provides district distributor road connections to the A15 main roundabout connection some 3.3km to the west. The A15 provides immediate connections to M180 junction 4 and onward links to Lincoln and surrounding settlements. The A18 continues westwards to provide connections to the

town of Scunthorpe. The A18 between Brigg and the A15 roundabout is of a single carriageway distributor road nature and operates under a 60mph speed limit to the west of the connection to the B1208. The route is approximately 7.0m in width, with little to no frontage development along its length.

2.4 Existing Local Network Traffic Demand Conditions

2.4.1 Traffic flow information for the immediate local highway network to the proposal site has been derived from available historical traffic survey information held by North Lincolnshire Council and new traffic counts carried out specifically to inform this study. The data sources available are outlined below:

- B1206 Scawby Rd / Site Access / Brigg Road: February 2008 12hr count (Axis count);
- B1206 Scawby Rd / A18 Mini Roundabout: July 2006 12hr count (NLC count);
- A18 Arties Mill / B1208: July 2004 12hr count (NLC count).

2.4.2 Figure 4(a-d) to this report, illustrates observed background hourly turning count movements at the above key local junctions. Count data has been factored to a single base year of 2008 and presented for the following assessment periods:

- 08:00 – 09:00 'Traditional AM peak'
- 12:00 – 13:00 Off-peak lunchtime period
- 17:00 – 18:00 'Traditional PM peak'
- 07:00 – 19:00 12 hour core weekday period

- 2.4.3 Figure 5a&b to this report illustrates the observed background demand profile across the section of B1206 Scawby Road through the settlement of Scawby Brook (as taken from the July 2006 mini-roundabout count data). This profile demonstrates that traffic demand during the core weekday day-time hours is low, being of the order of just 350-500 vehicles per hour (2-way). Traffic demand is noted to rise during the traditional weekday AM & PM peak periods, with maximum two-way demand recorded for the hour 16:00 - 17:00 when 607 vehicle movements were recorded.
- 2.4.4 In general traffic movements on the immediate local network to the proposal site have been noted to be generally free flowing, even during the traditional AM & PM peak periods. Some localised queuing has been observed during peak background demand periods on approaches to the B1206 / A18 mini roundabout at Scawby Brook, but such congestion does not appear to result in significant impact on the operation of the immediate section of the B1206.
- 2.4.5 On-site observations of local link operation and the generally free flow nature of the immediate network to the site are supported by a review of formal link capacity assessment via reference to DfT guidance TA79/99 "Traffic Capacity of Urban Roads". This guidance note suggests that the capacity of a typical all-purpose single carriageway road similar to the B1206 Scawby Road through the settlement of Scawby Brook (i.e. a 7.3m wide route subject to a 40mph speed limit, carrying mixed traffic, with frontage access, side roads, bus stops, etc – UAP3) is of the order of 1300 vehicles in the peak travel direction. Reference to Figure 4 to this report demonstrates that the highest recorded hourly vehicle directional demand flow on B1206 Scawby Road during the July 2006 surveys being of the order of just 30% of this capacity threshold.

2.5 Personal Injury Accident Records

2.5.1 Personal Injury Accident data (PIA) for the immediate highway network to the Brigg REP proposal site has been provided by North Lincolnshire highways for the 5 year time period 1 January 2003 to 31 December 2007. A summary plan of the location of all recorded accidents is summarised as Figure 6 to this report.

2.5.2 Review of Figure 6, illustrates that 8 accidents have been recorded over the full search area. Two of these accidents were classified as 'serious' incidents, with the remaining 6 incidents being of a 'slight' nature. No fatal accident incidents were recorded during the 5 year search period (see table below), with the last recorded incident taking place in 2005.

Year	Accident Type			Total
	Fatal	Serious	Slight	
2003	0	1	2	3
2004	0	1	2	3
2005	0	0	2	2
2006	0	0	0	0
2007	0	0	0	0
Total	0	2	6	8

2.5.3 More detailed review of the PIA data illustrates that none of the recorded accidents took place at the proposed site access connection and none involved an HGV or other large service vehicle.

2.5.4 Review of the location of the recorded accident events identifies that the majority of the recorded accidents took place at the local junctions rather than on key links, where the potential for conflicts between different traffic streams is greatest. Identified accident locations are as follows:

- B1206 Brigg Road / Scawby Road Ghost Island Junction: 3 incidents;

- Sharp bend in B1206 Scawby Road to west of Scawby Brook: 1 incident (serious)
- B1206 Scawby Road in Scawby Brook: 1 incident;
- B1206 Scawby Road / A18 mini-roundabout: 3 incident (1 serious).

2.5.5 It is important to note that two of the incidents recorded at the mini-roundabout junction took place on the A18(E) approach arm (from Brigg Town centre), which is not proposed to be affected by operational routing associated with the proposed Brigg REP scheme (see Sections 4.1 & 4.2 to this report).

2.5.6 Given the above review of accident history, which identifies no accident problems associated with the operation of the existing site access and no clear accident causation trends associated with HGV traffic movements, it is not considered that there are any existing highway safety issues which would call the Brigg REP proposal scheme into question.

2.6 **Site Accessibility**

2.6.1 Due to the nature of the proposed REP facility, the more remote farmland nature of straw origins and the general requirement to locate such development away from high concentrations of residential properties, it is not considered that the proposals are likely to generate a substantial requirement for travel by alternative modes to road transport. Notwithstanding this, however, the site would still be operated by a limited number of staff who would travel to / from the site on a daily basis. The availability of practical alternative travel modes to the site would therefore improve site accessibility and assist in managing car traffic demand to minimum levels, especially when viewed in combination with operational Travel Plan measures at the proposal (see section 3.4 to this report).

Walk / Cycle Access

2.6.2 The Brigg REP proposal site provides only limited opportunities for walking and cycling links from the proposal site to nearby settlements. It is considered unlikely that significant trips on foot would take place, as the site is located approximately 800m from the main connection with B1206 Scawby Road. Neither the site access road or the indeed the immediate sections of Scawby Road provided dedicated pedestrian footways. Strictly limited areas of population lie within a suitable maximum walking catchment of the site (1.2km – 2.0km).

2.6.3 The Brigg REP site, does however, offer some opportunities for regular staff cycling access to the local towns and villages such as Scawby Brook, Scawby and Brigg. All of these locations lie within a 5km cycle catchment of the proposed REP site and can be accessed via relatively quiet local roads such as Scawby Road and Brigg Road. Figure 7 to this report illustrates a 20 minute cycle catchment from the proposal site, based on an average cycling speed of 20kph.

Access to Public Transport

2.6.4 The Brigg REP proposal site is not currently directly served by public transport services. Closest bus routes to the site are available on Scawby Road and are available close to the site access road connection. Details of these local bus routes are illustrated in Figure 8 to this report, with service frequencies and connections summarised in the table below:

Route Number	Route Description	Day Time Frequency
9	Brigg – Scawby – Hibaldstow – Bishop Norton - Lincoln	1 Bus Friday Only
365	Scunthorpe – Scawby – Brigg – Barnetby - Kimmington	6-7 buses per day
391	Redbourne – Hibaldstow – Brigg – Scawby – Ashby - Scunthorpe	1 bus per day
394	Redbourne – Hibaldstow - Brigg	4-5 buses per day

2.6.5 The above bus connections are available from an approximately 800m walk from the Brigg REP proposal site and are therefore outside a preferred day to day walking catchment for regular access to local public transport. (Ref: Institution of Highways and Transportation Document "Guidelines for Planning for Public Transport in Developments"). Given the strictly limited number of staff proposed to be employed at the Brigg REP site (see Section 3 to this report), however, and the shift patterns proposed, it is not anticipated that the site would generate a significant level of public transport demand or that direct access by public transport services would be necessary.

3.0 DESCRIPTION OF THE DEVELOPMENT PROPOSALS

3.1 Proposed Development Scheme & Operating Process

3.1.1 The scheme proposals for the Brigg REP site promote the construction of a Renewable Energy Plant to generate electricity via the combustion of biomass material (primarily straw) supplied from within a local catchment. The site is proposed to process of the order of 240,000 tonnes per annum (tpa) of biomass input material and would generate a 40MW operating electricity supply.

Development Scheme Elements

3.1.2 A masterplan of the proposed development scheme is illustrated in Figure 9 to this report. Review of the masterplan layout demonstrates that the proposed scheme would comprise the following elements:

- New internal access connection to the existing shared site access road serving the existing Glanford Brigg Gas Power Station;
- Main boiler house for the combustion of straw / input materials and associated stack of 50-60m;
- Storage barn facilities capable of storing up to 3 days straw input (to allow continuous electricity generation across weekends and during periods when input deliveries might be reduced in number);
- Associated infrastructure including a separate office, external hard-standing for vehicle manoeuvring / parking, a weighbridge, and an electricity sub-station;
- Perimeter landscaping.

Site operation activities

- 3.1.3 All input vehicles to the site would be operated under an appropriate transport logistics contract, with materials transported using large HGV vehicles specifically modified in order to maximise biomass loads. Details of an analysis of anticipated levels of straw loss during the transport of straw materials are provided in Appendix D to this report. This demonstrates that due to the nature of transport vehicles and the efficient baling of materials, straw loss is not anticipated to be significant. Indeed, any loss would be likely to be experienced on those local routes immediate to straw origins.
- 3.1.4 The use of maximum size HGV's to serve the site ensures high input straw tonnages per vehicle and maximises delivery performance - therefore reducing overall vehicle demand movements to / from the site and managing overall vehicle kilometres travelled. The use of a contract vehicle strategy also allows for the close control of vehicle routeing / management and the ability to deliver suitable local routeing agreements to minimise vehicle impact (see paragraphs 3.22 – 3.26).
- 3.1.5 Incoming straw loads to the site would be unloaded from input HGV on site by four grab cranes - with a typical crane unloading time of the order of 30 minutes per vehicle. Input straw product would be transferred to the on-site barns where it would be stored until required. The grab cranes would include for weight measuring to record straw input levels and allow monitoring of stored supply levels.
- 3.1.6 As straw bales are required for fuel, the grab cranes would transfer them to a high level conveyor for transfer to the boiler house. The bales would then be shredded prior to being fed onto the combustion grade. The combusted biomass would heat water to drive a steam turbine which would in turn generate electricity..A small quantity of lime reagent would be added to the

burn process in order to assist in the removal of waste products from the flue gases.

3.1.7 Non straw fuel to the Brigg REP facility (i.e. non treated wood, etc) would be handled in much the same manner as above, but would be required to be 'weighed-in' via an on-site weighbridge and would be unloaded in a separate specific on-site wood store area. Materials would then be transferred to the boiler house by conveyor

3.1.8 Physical waste arisings from the Brigg REP facility would be limited to ash from the combustion process and residual lime reagent. Ash products would be quenched (wetted) and sold as an agricultural soil conditioner. Anticipated quantities of derived ash would equate to approximately 5.8% of biomass input by weight. These ash waste arisings can effectively be separated into:

- Bottom Ash - making up approximately three quarters of all ash arisings;
- Fly Ash – making up the remainder of ash waste.

NB - The wetting of the bottom ash would effectively result in a doubling of the export weight of the product. This water for the ash wetting process would be derived via the re-use of collected rainwater on site.

3.1.9 The proposed Brigg REP facility has a design life of 25 years, but could continue on beyond this operating horizon via an appropriate schedule of refurbishment.

Proposed Operating Hours

3.1.10 The Brigg REP site would operate for 50 weeks of the year (allowing for a 2 week shutdown / maintenance period during the summer), with the plant anticipated to be operational for of the order of 94-95% of this operational period (taking into account likely lost time anticipated due to short planned shut-downs and other contingencies). The combustion process will require an average hourly throughput of the order of 30 tonnes of straw to the facility and 0.2 tonnes of lime reagent. The on-site storage barns would allow for the storage of up to 3 days straw supply - allowing for both uninterrupted operation of the boiler over weekend periods (when product input movements would be restricted) and some operational flexibility.

3.1.11 It is proposed that the combustion process at the Brigg REP facility would operate on a 24 hour basis, 7 days a week basis. Deliveries of biomass material and exports of ash waste, however, would be restricted to 5.5 days a week, viz:

- Monday – Friday 07:00 - 19:00, and;
- Saturdays 08:00 - 14:00.

No deliveries would take place on a Sunday or Public holidays

Staffing Levels

3.1.12 Due to the high level of automation within the loading / unloading and combustion process, it is not anticipated that operation of the site would require significant staff input. Site operation would be undertaken via a two 12hr shift system, with a small number of other additional 'day staff'.

3.1.13 It is anticipated that for a typical working weekday, the site would be manned on the basis of the following staffing levels:

- Day Staff – 10 members of staff;
- Shift Staff (12hr shifts) – 4 staff per shift

3.2 **Site Access**

3.2.1 As noted above, vehicular access to the proposal site would be taken via the existing access road to the Glanford Brigg Gas Power station and the connection to B1206 Scawby Road (see Figure 10 to this report).

HGV Routeing Agreement

3.2.2 In order to support the operation of the Brigg REP facility it is proposed that operational (HGV) traffic movements to / from the site would only be undertaken via the agreed route corridor illustrated in Figure 11 to this report. This route corridor approach would restrict traffic to roads suitable to accommodate regular HGV movements and would avoid operational traffic impact on the villages of Scawby and Brigg town centre.

3.2.3 Swept path assessments have been undertaken at the mini-roundabout junction of B1206 / A18 (see Appendix E). These assessments demonstrate that the existing junction layout is suitable to accommodate two-way articulated FTA maximum articulated and drawbar trailer HGV units over the proposed servicing route, without the need for highway improvements works.

3.2.4 It is anticipated that virtually all REP operational straw delivery traffic would access the site via the key strategic routes of M180 / A15, with the only exceptions being those limited trips from any local straw origins within the immediate locality.

3.2.5 The routeing agreement would be rigorously enforced by the site operator who would have direct control over nearly all HGV movements to / from the site, due to the fact that all delivery trips would be managed via the use of:

- HGV units directly owned and operated by the site operator, or;
- Contracted material providers whose terms of contract would include routeing agreements;
- Disciplinary procedures for HGV drivers delivery to / from the site

3.2.6 The above routeing agreement would be supported by a suitable signing strategy on local links and at key junctions.

3.3 **Car Parking**

3.3.1 Sufficient car parking would be made available for staff and visitor parking in dedicated car parking areas. Figure 9 to this report demonstrates that of the order of 20 car parking spaces would be provided within a formal car parking area close to the main control room and welfare facilities. At least one car parking space would be provided at disabled standard.

3.3.2 In addition to the staff and visitor parking areas, a suitable standard coach parking lay-by facility would also be provided on site to serve educational visits.

3.4 **On-site Staff Facilities**

3.4.1 Site operator, Eco2 is committed to encouraging staff and visitor journeys to the site by alternative travel modes to the private car where practical. As part of this commitment, the scheme design would include:

- A suitable secure area for cycle parking (accommodating up to 10 cycles);
- Staff shower and changing area available for staff who walk / cycle to work;
- On site staff catering facilities to encourage staff to stay on-site for the duration of the working day and avoid excess travel.

3.4.2 The site operator would also ensure that a 'Travel Plan' Noticeboard is provided on site to promote issues to staff such as healthy living and up-to-date public transport information (including timetables and maps for services available from the nearby bus stops at Scawby Road and / or local rail connections at Brigg station). A simple framework for the delivery of these Travel Plan initiatives is provided as Appendix F to this report.

3.5 **Development Construction Issues**

3.5.1 Construction of the Brigg REP project would take place in five main phases which are likely to be the subject of several separate construction contracts. These phases are:

- Enabling works and demolition;
- Site establishment;
- Structural works;
- Process / equipment installation;
- Commissioning.

Details of the main processes associated with each phase are outlined further within Section 14 of the Environmental Statement. It should be noted, however, that the Brigg REP proposal site has already been substantially cleared and prepared for re-development. It is therefore not anticipated that significant construction traffic levels would be generated by initial enabling

works / site establishment phases in particular. Final requirements re: the import of additional bulk fill will be established after a full evaluation of available materials on site.

- 3.5.2 The precise nature of construction operations can only be fully determined following detailed design of project elements. It is anticipated, however, that construction of the main facility would involve a standard range of building and engineering activities, which have been summarised below.
- 3.5.3 Subject to obtaining the necessary planning permission, permits and licenses, it is currently anticipated that construction work would commence in the first quarter of 2010 and last around 30 months (i.e. 2011 / 2012). Enabling works would start slightly earlier, however, and similarly commissioning work may extend beyond this period.
- 3.5.4 Construction hours are proposed to be 07:00 to 18:00 weekdays and 08:00 to 13:00 on Saturdays. No work is planned on Sundays or Bank Holidays. However, there may be occasions, as is often the case with major engineering contracts, that work would need to be undertaken outside of these hours. It is suggested that non-standard working hours be controlled by a suitably worded planning condition, whereby Eco2 could carry out such work with prior notification and agreement with North Lincolnshire Council.
- 3.5.5 Eco2 recognise that the delivery of the Brigg REP scheme would represent a major construction project in the local area and that it is essential that any disturbance to neighbours and the local community be minimised during the construction period. To this end it is proposed that a Construction Management Plan is prepared (under the control of a planning condition), to ensure that the best available techniques necessary to minimise / mitigate adverse effects would be adopted. It is anticipated that the Construction Management Plan would encompass:

- Agreed operating hours;
- Agreed delivery hours;
- Construction noise management;
- Construction dust management;
- Surface water management;
- Vehicle parking;
- Vehicle routeing;
- Storage of materials;
- Construction lighting.

Anticipated Traffic Effects of Construction Activity

- 3.5.6 Traffic associated with the construction of the Brigg REP project is proposed to be managed via the implementation of the Construction Traffic Management Plan, agreed following consultation with local planning and highway authority officers and the Highways Agency. This would cover a range of issues such as the operational hours of construction, the anticipated levels of staffing and parking provision and the management of construction materials delivery vehicles.
- 3.5.7 In addition, the Plan would seek to ensure that all construction HGV related traffic on the local network, is routed on the B1206 Scawby Road to the north to link with the A18 / A15 / M180 (see Figure 11 to this report). These HGV haulage routes are considered to be suitable to accommodate large HGV movements and would minimise impact on key local settlements. No construction HGV's would be permitted to utilise the local route of Brigg Road through the village of Scawby.
- 3.5.8 Peak construction traffic demand is anticipated to take place from 2010 through to the final year of completion. Due to the nature of the proposed

buildings to be constructed on site (mainly steel framed traditional large industrial units), the limited requirement for construction of heavy masonry / concrete construction and the fact that the site is already predominately cleared and ready for development (thus limiting demolition traffic) it is not anticipated that the construction of the site would generate substantial levels of HGV traffic over the local highway network.

3.5.9 Development construction would also be phased in order to minimise development construction demand and limit hourly increases in development traffic demand. Even at peak levels, construction traffic demand is not anticipated to be close to reaching those levels associated with the operation of the site post opening of the proposed REP land use. Vehicle deliveries to / from the site during the construction phase would be managed to avoid impact on traditional AM / PM rush hour periods where at all practical. In addition, further on-site vehicle management practices would seek to limit typical construction traffic impacts such as dirt, dust, noise and vehicle related vibration.

3.5.10 On the basis of the above review, it is not considered that the proposal site would generate a material change in demand conditions which would warrant network improvements over and above those already proposed to accommodate the operation of the REP scheme.

4.0 **ANTICIPATED TRIP GENERATION AND DISTRIBUTION FROM THE DEVELOPMENT SITE**

4.1 **Estimated Development Trip Generation**

4.1.1 Anticipated demand estimates for trip movements to / from the proposed Brigg REP facility have been calculated via a 'first principles' approach, based on main site operating assumptions such as anticipated site processing capacity, site operating / delivery hours and anticipated input / export vehicle tonnages. Base information and operating assumptions have been provided by Eco2 and have been developed through operational experience at similar facilities in the UK and Europe.

Operating Demand Assumptions

4.1.2 Calculation of the 'first principles' estimate of vehicle trip movements is outlined in Appendix G to this report and is based on the following methodology:

- Maximum site processing capacity of 240,000tpa of straw / input material;
- Site operational for 50 weeks per year;
- Material delivered / collected over 5.5 days per week;
- Material delivered / collected over a 12 hour day (weekday);
- Ash waste product produced at rate of 5.8% of total input material levels (including for dampening of ash).

4.1.3 Biomass material would be input to the boiler house on a continuous basis over a 24hr period during site operational periods, with a predicted hourly demand capacity of approximately 30 tonnes per hour. In order to achieve maximum site operating capacity, straw would need to be delivered at a

relatively constant rate across the year, with straw supplies stored off-site at farm origins for use throughout the year. As noted above, some limited straw stocks would be stored on-site within the storage barns (3-days supply) however, this would be only designed to cover those days when deliveries do not take place.

- 4.1.4 On the basis of a 50 week operational year, it can be anticipated that site average weekly operating capacity would be of the order of 4800t per week of input material (taking account of predicted availability rate of 94-95% during main operational periods – see Appendix G). Assuming a typical 5.5 day weekly delivery / export window, it can be anticipated that maximum site demand would be of the order of 867 tonnes per full working day of biomass input and 136 tonnes per day ash production (including char and moisture weight).

Vehicle Operating Assumptions

- 4.1.5 The following operating vehicle loading tonnages are anticipated to be achieved when servicing the Brigg REP facility. These tonnage estimates have been generated via reference to operational experience at other locations and the loading capacity of the proposed contracted vehicle fleet:

- HGV Straw Input: 19 tonnes per vehicle;
- Lime Input: 30 tonnes per vehicle;
- Bottom Ash Export: 23 tonnes per vehicle;
- Fly Ash Export: 16 tonnes per vehicle.

- 4.1.6 All vehicles would operate in one direction only (i.e. either arrive full / leave empty or vice versa). No 'back-loading' would take place at the site.

Staff Traffic Movements

- 4.1.7 It is anticipated that the Brigg REP facility would be operated according to the staffing levels identified in paragraph 3.1.12. In order to ensure a robust assessment of anticipated vehicular demand relating to the operation of the proposal site, for the purposes of this assessment it has been assumed that all staff would access the site using of the private car. No account has therefore been taken for any opportunities to encourage sustainable transport practice to reduce private vehicle demand, such as car sharing or walking / cycling opportunities.

Predicted daily traffic demand levels

- 4.1.8 Application of the 'first principle' traffic generation assumptions over the proposed core delivery period, suggests the following one-way trip demand levels for a typical operational day:

Input Movements:

Straw: 44 HGV movements per day

Output Movements:

Bottom Ash: 4 HGV movements per day;
Fly Ash: 2 HGV movement per day;

Other:

Staff Vehicles 18 staff movements per day

- 4.1.9 Assuming no back-loading of operational vehicles, day to day operation of the Brigg REP facility can therefore be anticipated to generate the following total number of daily vehicle movements (in + out):

- HGV operational movements: 100 trips per day;
- Staff (private car) movements: 36 trips per day

- 4.1.10 Overall two-way trip movements to / from the site for a typical operational day are therefore anticipated to be of the order of 136 vehicle movements per day.

'Worst Case Demand' Sensitivity Test

- 4.1.11 As noted above, typical operation of the site is not anticipated to reach 150 vehicle movements per day.
- 4.1.12 As noted in section 3.1 to this report, straw delivery vehicle unloading would be undertaken at the site by four grab crane facilities which operate with an approximate 30 minute vehicle unloading capacity. Such operation would therefore restrict theoretical maximum site input HGV demand to 96 vehicles per day (assuming 'worst case' 12 hr operation at 8 vehicles per hour) or 192 operational vehicle movements per day (to / from the site). With the addition of the ash export vehicles, maximum 'absolute worst case' HGV operation at the site would be 202 HGV movements (in + out) or 238 all vehicles.
- 4.1.13 The total 12hr demand levels identified above would be spread evenly across the daytime period (due to the operating constraints associated with crane grab capacity), which would further limit the effects of operational traffic demand.
- 4.1.14 It should be noted, however, that the above identified maximum theoretical vehicle demand is considered highly unlikely to ever occur in practice - as the Brigg REP facility is designed to allow for on-site storage of straw input materials to provide up to three days operating supply. Such practice would result in little need for intensive delivery operation. The maximum unloading scenario outlined above has only been included in this assessment in order to provide comfort to highway authority officers re: operational impact - as it

effectively considers the impact of 'absolute worst case' future development demand conditions at the Brigg REP scheme.

- 4.1.15 The above 'worst case' traffic demand conditions have therefore been included within this report to act as a 'sensitivity test' to the base typical demand estimates.

4.2 **Development Trip Distribution and Assignment**

- 4.2.1 The distribution and assignment of traffic over the immediate local highway network to the development site has been estimated via reference to the proposed operational HGV routeing strategy. This strategy proposes that all development traffic, except strictly limited 'local' straw origin traffic from within the immediate catchment would utilise B1206 Scawby Road (N) & A18 to access the strategic access routes of A15 / M180 / A18(W). This routeing strategy is illustrated in Figure 11 to this report.
- 4.2.2 In order to ensure the most robust assessment of overall traffic demand on the suggested routeing corridors, this assessment has also assumed that all staff traffic movements would also utilise these routes. In reality, some staff movements might utilise alternative routes such as B1206(S), Brigg Road (to Scawby village) and B1206 to Brigg Town, therefore reducing impact on the main local access corridor. As identified in para 4.1.8, however, total staff movements to the site would be limited in any event.
- 4.2.3 AM peak, Off Peak, PM peak and anticipated daily development traffic volumes over the immediate highway network to the proposal site under the proposed route assignment are illustrated in Figures 12(a-d) & 13(a-d) to this report (for typical day-to-day and 'absolute worst case' sensitivity scenarios respectively).

5.0 ASSESSMENT OF ANTICIPATED DEVELOPMENT TRAFFIC IMPACT

5.1 Introduction

5.1.1 This section of the report considers the assessment of the operation of the local highway network to the proposed Brigg REP facility and the ability of this network to accommodate the additional development traffic flow movements predicted in Section 4. Impact assessment has been carried out via both:

- Detailed junction capacity tests at B1206 Scawby Road / Site Access / Brigg road, the B1206 / A18 mini-roundabout junction and the A18 / B1208 ghost island;
- Link flow assessments for key sections of the B1206 / A18 route corridor to A15 / M180.

5.1.2 DfT document “Guidance on Transport Assessment” suggests that assessment of network traffic impact should be considered for future year scenarios post development opening year. Paragraph 4.47 of the DfT guidance document states:

“For the local transport network a development should be assessed with regard to the Local Development Framework and for a period of no less than five years after the date of registration of a planning application. Should the development take place over a longer period it would be appropriate to extend the length of the assessment period.”

5.1.3 In order to provide a robust assessment of development impact, operational assessments have therefore been carried out for the future years of 2012 “Opening Year” and 2022 “Design Year”. Such an approach accords with DfT guidance and represents a future design year 14 years post the application date of the scheme proposals.

5.1.4 Assessments have been carried out for the following development scenarios in order to consider development impact under a range of different background demand conditions.

- Traditional AM peak hour (08:00-9:00);
- Lunchtime 'off-peak' demand period (12:00-13:00);
- Traditional PM peak hour (17:00-18:00); and,
- 12 hour core operational day (07:00-19:00)

As noted in section 4 to this report, development operational HGV demand to / from the site can be anticipated to relatively consistent across the day / year due to the nature of the proposed logistics contracts, the need for a constant fuel supply and the practical capacity limitations on vehicle unloading.

5.1.5 2012 / 2022 background traffic demand estimates for the local network have been estimated via application of NRTF(97) medium growth estimates, which have been adjusted to represent local growth patterns identified via TEMPRO growth predictions for North Lincolnshire. The calculation of these growth factors is illustrated in Appendix H to this report and summarised below:

2008 – 2012 Growth factors:

- Weekday AM peak period (07:00-10:00): 1.056
- Weekday inter peak period (10:00-16:00): 1.066
- Weekday PM peak period (16:00-19:00): 1.061
- Weekday factor: 1.061

2008 – 2022 Growth factors:

- Weekday AM peak period (07:00-10:00): 1.206
- Weekday inter peak period (10:00-16:00): 1.230
- Weekday PM peak period (16:00-19:00): 1.221
- Weekday factor: 1.219

- 5.1.6 2012 Opening Year and 2022 Future Year Background traffic flows over the network are illustrated in Figures 14(a-d) and 15(a-d) respectively.
- 5.1.7 2012 Opening Year Background + Development traffic estimates for both typical day to day development traffic demand and the absolute worst case sensitivity demand scenario are illustrated in Figures 16(a-d) and 17(a-d).
- 5.1.8 2022 Future Year Background + Development estimates for the two development scenarios are illustrated in Figures 18(a-d) and 19(a-d). Figure 18 illustrates the scenario including for anticipated typical day to day operational traffic demands to / from the site and Figure 19, 'absolute worst case' sensitivity development demand flows.

5.2 **Link Flow Impact Assessment**

Local Highway Network Impact

- 5.2.1 Link / flow operational assessments have been carried out for key sections of the main identified vehicle routeing corridor to serve the proposed Brigg REP site. In particular assessments have been carried out for:
- B1206 Scawby Road near the site access and in Scawby Brook village;
 - A18 to the south of the junction with B1208;
 - A18 to the north of the junction with B1208.
- 5.2.2 It is considered that these sections of route network would experience the maximum link demand associated with the development scheme - given that they would effectively accommodate all operational HGV movements to / from the Brigg REP proposal site and the vast majority of staff vehicle movements. Should link impact levels on these immediate section of route

prove to lie within acceptable thresholds, it can be reasonably concluded that development traffic at more remote network locations would also be within suitable criteria.

5.2.3 Traditionally, link flow assessment criteria have been based on those percentage impact thresholds identified in 1994 Institution of Highways and Transportation 'Guidelines for Traffic Impact Assessment'. This document suggested that more detailed analysis of highway impact and / or capacity improvements was only likely to be required for situations when either:

- Traffic to / from the development exceeds 10% of existing two way traffic on the adjoining highway; or,
- Where traffic to / from the development exceeds 5% of the existing two way traffic flow on the adjoining highways at locations where traffic congestion exists within the assessment period or in other sensitive locations.

This position has been recently reviewed and updated in March 2007 DfT document "Guidelines for Transport Assessment" which notes:

"If the TA confirms that a development will have material impact on the highway network, the level of impact at all critical locations on the network should be established. A particular example of material impact would be a worsening of congestion. In congested areas, the percentage traffic impact that is considered significant or detrimental to the network may be relatively low (possibly below the average daily variation in flow), and should have been determined in discussions with the relevant highway authorities. For the avoidance of doubt, the 1994 guidance regarding the assessment thresholds of 10 per cent and 5 per cent levels of development traffic relative to background traffic is no longer deemed an acceptable mechanism, since it creates an incentive in favour of locating development where high levels of background traffic already exist."

5.2.4 Notwithstanding these observations, in the case of the local highway network to the Brigg REP site (which has been demonstrated to be operating with spare capacity on key links and limited congestion - see section 2.4 to this report) it is considered that the traditional 5% and 10% thresholds still represent a reasonable starting point 'guide' as to the level / extent of development traffic impact on immediate local routes and the need for any additional assessment / development of mitigation measures.

5.2.5 The tables below demonstrate changes in 2012 Opening Year, background 12 hour two way link flows on the B1206 and A18 corridors as a result of the Brigg REP proposal. This table includes summary results for both the typical site operation demand position identified in this report and the absolute worst case sensitivity scenario based on theoretical maximum operation based on grab crane unloading capacity. Predicted hourly changes in link flow traffic demand on key links is also included as Appendix I to this report. (NB – It should be noted that the B1206 flows west of the mini-roundabout include for the HGV trip movements to / from the adjacent HGV rental / haulage depot.

	B1206 North of site access			B1206 West of mini r'bout		
	Devel trips	B'ground flows	%'tage Increase	Devel. trips	B'ground flows	%'tage Increase
2012 Typical Demand	136	5595	2.43%	136	5980	2.27%
2012 Worst Case Demand	240	5595	4.29%	240	5980	4.01%

2 way flow totals (All vehicles)

	A18 North of mini r'bout			A18 West of B1208 jnt		
	Devel trips	B'ground flows	%'tage Increase	Devel. Trips	B'ground flows	%'tage Increase
2012 Typical Demand	136	13002	1.05%	136	10262	1.33%
2012 Worst Case Demand	240	13002	1.85%	240	10262	2.34%

2 way flow totals (All vehicles)

- 5.2.6 Analysis of link flow impact identifies that typical day-to-day development traffic movements on the main site access corridors for straw vehicle movements are not predicted to be in excess of 8 HGV movements per hour during off peak periods and a maximum of 18 vehicle movements (in + out) during the traditional rush hour periods (including for both operational HGV movements and staff traffic).
- 5.2.7 When considered over the 12hr core weekday delivery period, link flow impact on the immediate B1206 corridor is therefore anticipated to be less than 4.5% (despite the generally low level of base flow) - even including for the 'absolute worst case' sensitivity scenario based on theoretical maximum site operation. Link flow impact on the busier A18 corridor between M180 junction 4 and Brigg Town is anticipated to be very low, being of the order of 1-2% of background flow demand for both the typical day-to-day and absolute worst case demand scenarios respectively. Impact levels on both route corridors are therefore well below traditional IHT guideline thresholds and it is therefore concluded that development of the Brigg REP facility is unlikely to result in a material change in operating conditions over the immediate local highway network.

Trunk Road Impact

- 5.2.8 In order to provide a review of likely impact on immediate sections of the trunk road network, this report has considered development link flow impact on the M180 mainline route to the east and west of junction M180. Due to the fact that straw will be delivered to / from the site from a range of farm origins within the designated catchment area, the trunk road assessments have been carried out on the basis of the 'worst case' modelling assumption of all operational traffic utilising local motorway links. Such an approach is clearly highly robust as it does not include for the alternative routeing options of the

A18 and A15 and considers a scenario where all REP development traffic would utilise each of the motorway approach links.

5.2.9 The table below demonstrate the two-way 12 hour link impact anticipated to take place on the following M180 sections for the Opening Year 2012:

- M180 West of Junction 4 (i.e. between junctions 3 & 4);
- M180 East of Junction 4 (i.e. between junctions 4 & 5).

2012 opening year estimates on the M180 have been estimated via reference to NRTF central growth, with more detailed hourly analysis included as Appendix J to this report.

	M180 West of junction 4			M180 East of junction 4		
	Devel trips	B'ground flows	%'tage Increase	Devel. trips	B'ground flows	%'tage Increase
2012 Typical Demand	136	27170	0.50%	136	35936	0.38%
2012 Worst Case Demand	240	27170	0.88%	240	35936	0.67%

2 way flow totals (All vehicles)

5.2.10 Review of the above trunk road impact assessment identifies that even assuming for the full assignment of 'absolute worst case' development traffic demand movements to the M180 approach links, link flow impact is anticipated to be negligible. Maximum percentage change identified would take place on the M180 between junctions 3 & 4 and would be of the order of less than 1% of existing baseline demand on this section of motorway. Given these results and the worst case methodology on which they have been derived, it is considered that the Brigg REP proposals will not result in a material impact on trunk road operating conditions. No supporting improvement works would therefore be required to accommodate these strictly minimal traffic increases.

5.3 Local Junction Assessment

5.3.1 Notwithstanding the results of the link / flow assessment of anticipated network impact, which demonstrates that local access routes are not anticipated to experience traffic flow increases above 4.5% of background traffic demand, detailed junction operational capacity assessments have been undertaken at the request of the LHA for a number of key local junctions. These junction assessments have been carried out for the robust future design year scenario of 2022 and include for both baseline 'do nothing' assessments (where relevant) and background + development (typical and sensitivity) scenarios at the following locations:

- B1206 Scawby Road / Site Access Junction / Brigg Road;
- B1206 Scawby Road / A18 mini roundabout
- B1208 / A18 ghost island junction.

Junction modelling has been carried out using the DfT standard analysis computer software ARCADY (for mini-roundabout / full standard roundabout junctions) and PICADY (for traditional give-way T-junction / cross roads). The carrying out of future year assessments ensures the consideration of maximum operational demand conditions.

5.3.2 The results of the junction capacity analyses are summarised in the paragraphs below.

B1206 / Site Access Junction

5.3.3 Junction capacity assessments have been undertaken for future year Back + Development 2022 demand conditions for the Site Access / B1206 / Brigg Road staggered cross-roads junction. This junction represents the first point of contact to the public highway network. Capacity tests have been carried

out using the DfT standard analysis PICADY computer software for priority T-junction / cross-road junction layouts and are based on the existing junction layout. The results of the junction capacity analyses are summarised in the paragraphs below, with full model printouts included as Appendix K.

5.3.4 Results of the 2022 'with development' PICADY model runs for the traditional weekday AM & PM 'rush hour' periods and lunchtime off-peak period, (assuming typical day-to-day development operation) are illustrated in the tables below. It should be borne in mind that due to the routeing strategy proposed to be adopted to support the Brigg REP scheme, operational traffic movements at this junction would be restricted to 'left in' movements from B1206 Scawby Road (N) and 'right out' movements in the reverse direction. The Brigg Road / B1206 element of the junction would effectively remain unaffected by development trip movements.

AM Peak Hour 08:00-09:00

Approach Movement:	Flow	Max RFC	Max Queue
Site Exit	27	0.055	1
B1206 S'bnd (Right Turn)	136	0.198	1
Brigg Rd Exit (Left Turn)	307	0.434	1
Brigg Rd Exit (Right Turn)	8	0.018	1
B1206 N'bnd (Right Turn)	34	0.059	1

Lunchtime Off-Peak Hour 12:00-13:00

Approach Movement:	Flow	Max RFC	Max Queue
Site Exit	16	0.045	1
B1206 S'bnd (Right Turn)	116	0.177	1
Brigg Rd Exit (Left Turn)	120	0.165	1
Brigg Rd Exit (Right Turn)	6	0.012	1
B1206 N'bnd (Right Turn)	7	0.012	1

PM Peak Hour 17:00-18:00

Approach Movement:	Flow	Max RFC	Max Queue
Site Exit	37	0.098	1
B1206 S'bnd (Right Turn)	216	0.354	1
Brigg Rd Exit (Left Turn)	134	0.189	1
Brigg Rd Exit (Right Turn)	9	0.022	1
B1206 N'bnd (Right Turn)	0	-	-

5.3.5 Review of the above results demonstrates that the junction is predicted to operate with substantial spare capacity during all assessment time periods. Maximum RFC's are predicted to take place during the AM peak period for the exit arm from Brigg Road (unaffected by operational trip movements to / from the REP site) and would only be of the order of 0.43 - well below critical 0.85 thresholds for the consideration of improvements / further assessment. Queuing levels on all approach arms for all time periods would be negligible.

5.3.6 In order to provide a robust assessment of future operating conditions, additional 2022 assessments have been carried out for the absolute worst case development traffic demand scenario (sensitivity flows). The results of these sensitivity test assessments are summarised in the tables below and provided as full printouts in Appendix K:

AM Peak Hour 08:00-09:00

Approach Movement:	Flow	Max RFC	Max Queue
Site Exit	31	0.066	1
B1206 S'bnd (Right Turn)	136	0.198	1
Brigg Rd Exit (Left Turn)	307	0.434	1
Brigg Rd Exit (Right Turn)	8	0.018	1
B1206 N'bnd (Right Turn)	34	0.059	1

Lunchtime Off-Peak Hour 12:00-13:00

Approach Movement:	Flow	Max RFC	Max Queue
Site Exit	20	0.064	1
B1206 S'bnd (Right Turn)	116	0.177	1
Brigg Rd Exit (Left Turn)	120	0.165	1
Brigg Rd Exit (Right Turn)	6	0.012	1
B1206 N'bnd (Right Turn)	7	0.012	1

PM Peak Hour 17:00-18:00

Approach Movement:	Flow	Max RFC	Max Queue
Site Exit	41	0.120	1
B1206 S'bnd (Right Turn)	216	0.354	1
Brigg Rd Exit (Left Turn)	134	0.189	1
Brigg Rd Exit (Right Turn)	9	0.022	1
B1206 N'bnd (Right Turn)	0	-	-

- 5.3.7 Results of the above sensitivity assessments demonstrate that the impact of the additional worst case development traffic movements would be negligible. The junction is still anticipated to operate efficiently with substantial spare capacity and maximum predicted RFC's are anticipated to remain well within critical ranges.

B1206 / A18 Mini-roundabout Scawby Brook

- 5.3.8 Junction operational assessments have been carried out for the current mini-roundabout layout of A18 / B1206 at Scawby Brook. These assessments have been undertaken based on the existing white line arrangements - which result in restricted junction entry widths and thus slightly reduced capacity operation.
- 5.3.9 The proposed operational vehicle routeing strategy at the site would ensure that no HGV movements would utilise the A18 through Brigg Town Centre - with development traffic restricted to movements between the B1206 Scawby Road and A18 to M180. As identified in Figures 4 & 5 to this report these turning movements currently experience only strictly limited background

traffic demand. Main existing traffic demand at the junction is currently associated with the A18 Brigg Town Centre - A18 (M180) corridor movement.

- 5.3.10 The tables below demonstrate the results of baseline (no Brigg REP) traffic demand assessments at the mini-roundabout junction for the 2022 future design year. These model runs (see Appendix L) illustrate that during the traditional AM & PM peak periods, the current mini-roundabout would suffer from substantial over-capacity for such background demand conditions. RFC's of in excess of 1.0 would be experienced on the A18 (M180) and B1206 junction arms, with significant predicted queuing levels.

AM Peak Hour 08:00-09:00

Approach Movement:	Flow	Max RFC	Max Queue
A18 (M180) Approach	757	1.471	258
A18 (Brigg Town Centre) Approach	977	0.574	3
B1206 (Scawby Brook) Approach	456	2.742	240

Lunchtime Off-Peak Hour 12:00-13:00

Approach Movement:	Flow	Max RFC	Max Queue
A18 (M180) Approach	663	1.377	132
A18 (Brigg Town Centre) Approach	876	0.804	4
B1206 (Scawby Brook) Approach	246	0.911	7

PM Peak Hour 17:00-18:00

Approach Movement:	Flow	Max RFC	Max Queue
A18 (M180) Approach	851	1.601	337
A18 (Brigg Town Centre) Approach	1177	0.824	5
B1206 (Scawby Brook) Approach	317	1.742	82

- 5.3.11 Improved results are predicted for the lunchtime 'off-peak' period considered, however, over-capacity conditions are still in evidence on the A18 (M180) approach for 2022 baseline flows at this time.

- 5.3.12 Results of 2022 'with development' model runs are illustrated in the tables below.

AM Peak Hour 08:00-09:00

Approach Movement:	Flow	Max RFC	Max Queue
A18 (M180) Approach	771	1.503	276
A18 (Brigg Town Centre) Approach	977	0.580	3
B1206 (Scawby Brook) Approach	460	2.789	248

Lunchtime Off-Peak Hour 12:00-13:00

Approach Movement:	Flow	Max RFC	Max Queue
A18 (M180) Approach	667	1.390	138
A18 (Brigg Town Centre) Approach	876	0.816	5
B1206 (Scawby Brook) Approach	246	0.933	8

PM Peak Hour 17:00-18:00

Approach Movement:	Flow	Max RFC	Max Queue
A18 (M180) Approach	855	1.602	338
A18 (Brigg Town Centre) Approach	1177	0.828	5
B1206 (Scawby Brook) Approach	331	1.839	97

5.3.13 The above tables demonstrate that the addition of Brigg REP development traffic would only result in a strictly marginal change in predicted traffic conditions. Such results reflect the conclusions of the link / flow impact assessment (see section 5.2 above), which identified that typical day-to-day operational demand associated with the Brigg REP scheme would only result in a 1-2% increase in traffic movements on the key junction approach arms. It is not considered that such demand increases represent a material change in traffic demand that would require the delivery of comprehensive highway capacity improvements at this junction, particularly as operational problems have been demonstrated to be directly associated with baseline traffic demand levels.

5.3.14 Given the predicted levels of over-capacity associated with the future year operation of the existing mini-roundabout junction under 'do nothing' demand conditions, it is considered likely that the LHA would be required to investigate a capacity improvement to accommodate background traffic demand levels. Preliminary analysis of the predicted baseline demand flows

have identified that a traffic signal junction scheme at this location could deliver sufficient capacity to cater for all future traffic demand scenarios. Any such solution would also be able to accommodate the strictly low levels of Brigg REP traffic demand.

B1208 / A18 Ghost Island Junction

5.3.15 Junction operational assessments have also been undertaken for future year 2022 demand conditions for the A18 / B1208 ghost island junction to the immediate north of Scawby Brook village. Capacity tests at this junction have been carried out using the DfT standard analysis computer software for priority T-junction layouts, PICADY. The results of the junction capacity analyses are summarised in the paragraphs below, with full model printouts included as Appendix M.

5.3.16 Results of the 2022 ‘with development’ PICADY model runs for the traditional weekday AM & PM ‘rush hour’ periods and lunchtime off-peak period are illustrated in the tables below. Traffic demand associated with the Brigg REP scheme is anticipated to be restricted to through traffic movements on the A18 mainline route and is therefore not anticipated to result in a significant impact on critical turning movements at the junction.

AM Peak Hour 08:00-09:00

Approach Movement:	Flow	Max RFC	Max Queue
B1208 Exit (Left Turn)	237	0.446	1
B1208 Exit (Right Turn)	9	0.044	1
A18 Brigg (Right Turn)	147	0.314	1

Lunchtime Off-Peak Hour 12:00-13:00

Approach Movement:	Flow	Max RFC	Max Queue
B1208 Exit (Left Turn)	118	0.206	1
B1208 Exit (Right Turn)	20	0.101	1
A18 Brigg (Right Turn)	147	0.289	1

PM Peak Hour 17:00-18:00

Approach Movement:	Flow	Max RFC	Max Queue
B1208 Exit (Left Turn)	155	0.289	1
B1208 Exit (Right Turn)	8	0.048	1
A18 Brigg (Right Turn)	241	0.491	1

5.3.17 Review of the above results demonstrates that maximum RFC for 2022 Background + Development conditions is predicted to occur during the PM peak hour 17:00-18:00 for the for the right turn entry movement from the A18 to B1208. Maximum RFC predicted during this period would be just 0.491, with an associated queue of just one vehicle. This level of junction operation and queuing is considered to reflect satisfactory conditions, with RFC's well below the critical 0.85 threshold for improvement / further assessment.

5.3.18 In order to provide a robust assessment of future operating conditions, additional 2022 assessments have been carried out for the 'absolute worst case' development traffic demand scenario (sensitivity flows). The results of these sensitivity test assessments are summarised in the tables below and provided as full printouts in Appendix M:

AM Peak Hour 08:00-09:00

Approach Movement:	Flow	Max RFC	Max Queue
B1208 Exit (Left Turn)	237	0.448	1
B1208 Exit (Right Turn)	9	0.044	1
A18 Brigg (Right Turn)	147	0.315	1

Lunchtime Off-Peak Hour 12:00-13:00

Approach Movement:	Flow	Max RFC	Max Queue
B1208 Exit (Left Turn)	118	0.207	1
B1208 Exit (Right Turn)	20	0.102	1
A18 Brigg (Right Turn)	147	0.290	1

PM Peak Hour 17:00-18:00

Approach Movement:	Flow	Max RFC	Max Queue
B1208 Exit (Left Turn)	155	0.290	1
B1208 Exit (Right Turn)	8	0.049	1
A18 Brigg (Right Turn)	241	0.494	1

5.3.19 Results of the above sensitivity assessment demonstrate that the impact of the additional worst case development traffic movements would be negligible. The junction is still anticipated to operate efficiently with substantial spare capacity and maximum predicted RFC's are anticipated to remain well within critical ranges.

5.4 **Review of Traffic Related Environmental Impact**

5.4.1 Reference to Institute of Environmental Assessment (IEA) guidelines for the assessment of road traffic, suggests the following general rule of thumb when considering the need for detailed analysis of environmental effects:

“Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)”

5.4.2 IEA guidance notes that the most discernable environmental impacts of road traffic are considered to be noise, severance and pedestrian delay & intimidation. In terms of these potential impacts, IEA guidance notes the following:

- In general, people are unable to perceive a change in noise nuisance for changes in noise levels of less than 3dB(A), such changes requires a “doubling or halving in the level of traffic”.
- At low flows, increases in traffic of around 30% can double the delay experienced by pedestrians attempting to cross a road.

- Severance and intimidation are much more sensitive to traffic flow and DoT suggest 30%, 60% and 90% changes in traffic levels should be considered as 'sight', 'moderate' and 'substantial' impacts respectively;
- Other environmental impacts (e.g.: pollution, ecology, etc) are less sensitive to traffic flow changes, and it is recommended that, as a starting point, a 30% change in traffic would represent a reasonable threshold for undertaking a detailed highway link assessment.

5.4.3 As noted in section 5.2 to this report, analysis of the 12hr link flow demand on the closest route corridors to the proposal site demonstrates that, in general traffic terms, the development of the Brigg REP facility would not result in a material change in traffic volumes. Even including for 'worst case' sensitivity test scenarios, development traffic impact during key site operating periods (12 hour daytime period) is not anticipated to exceed 4.5% of general background traffic levels on the lightly trafficked B1206 corridor and less than 2.5% on the busier A18 corridor between Brigg and the M180. Such levels are substantially below IEA 30% guideline threshold levels.

5.4.4 In order to ensure the most robust appraisal of environmental impact, however, additional tests have been undertaken to review changes in HGV link flow demand. This appraisal has been carried out on the same basis as that for the assessment of general traffic movements – i.e. based on existing classified background traffic movements, as taken from the baseline 12 hour surveys.

5.4.5 The tables below illustrate the results of HGV link change assessments undertaken:

Proposed Brigg Renewable Energy Plant
Scawby Road, Scawby Brook, North Lincolnshire
Transport Assessment

	B1206 North of site access			B1206 West of mini r'bout		
	Devel trips	B'ground flows	%'tage Increase	Devel. trips	B'ground flows	%'tage Increase
2012 Typical Demand	100	67	149.3%	100	213	46.9%
2012 Worst Case Demand	204	67	304.5%	204	213	95.8%

2 way flow totals (HGV's only)

	A18 North of mini r'bout			A18 West of B1208 jnt		
	Devel trips	B'ground flows	%'tage Increase	Devel. Trips	B'ground flows	%'tage Increase
2012 Typical Demand	100	640	15.6%	100	724	13.8%
2012 Worst Case Demand	204	640	31.9%	204	724	28.2%

2 way flow totals (HGV's only)

5.4.6 The results summarised in the above tables demonstrate that predicted additional development HGV levels on the main A18 corridor would generally be less than the minimum IEA 30% guideline threshold. Indeed, this threshold is only exceeded for the worst case 'sensitivity' scenario on the short section of link between B1206 roundabout and the B1208 ghost island junction. Given that, a) the 'sensitivity' development scenario is unlikely to ever take place in practice, b) that overall changes in traffic demand on this section of link would be low (less than 2% as identified in Section 5.2) and c) that this short section of route has strictly limited frontage properties, it is not considered that operation of the Brigg REP development would result in a material environmental impact on the A18 route corridor.

5.4.7 Review of the results for the B1206 Scawby Road corridor in Scawby Brook, however, identifies that the development of the Brigg REP scheme would result in an increase in HGV movements which exceeds the 30% threshold requiring further examination of key environmental issues. Such additional assessment is set out in Chapters 11 and 12 of the formal Environmental

Statement, which consider noise / vibration and air quality issues respectively. It should be noted however, that such percentage change values reflect the strictly low levels of HGV traffic demand that are currently recorded on this route. Such changes must also be balanced against the fact that the B1206 route through Scawby Brook historically used to experience substantial levels of HGV demand related to the operational of the British Sugar Plant (the site of the REP proposal scheme).

5.4.8 The noise assessment set out in Chapter 11 of the ES concludes Road Traffic Noise & Vibration Issues in detail and concludes the following:

Noise

- The dwelling positions off the B1206 would be the most sensitive receptors to any direct traffic flow increase along the B1206 and the A18 roads.
- DETR 'Guidance on the new approach to appraisal': 1998 for road traffic assessment, paragraph 6.8 notes "*only those properties experiencing changes greater than 3dB(A) should be taken into account.*" November 2006 DfT Transport Analysis Guidance (TAG unit 3.3.2) also states "*It should be recognised that, in many situations, relatively large changes in traffic flows are required to bring about significant changes in the response to noise levels in the longer term. For freely flowing traffic, a difference of about 3dB in noise level is required before there is a statistically significant change in the average assessment of nuisance.*"
- The highest likely impact (for 'typical' peak hour traffic movements) with and without the proposed development shows a small increase of noise level of +0.1dB(A) to +1.4dB(A) on the most sensitive

properties.

- If the highest possible traffic flows are considered (i.e. the worst case 'sensitivity' scenario), the results of the noise prediction calculations show that the maximum increase in noise level associated with road traffic movements would be +1.7dB(A). This increase is not deemed to be significant according to Government guidelines.

Vibration

- Based on studies carried out re: vibration impact from HGV's on access roads, it is concluded that the only situation likely to generate any measurable vibration would be when HGV's travel close to properties (i.e. within 10 metres) and are required to pass over speed 'humps'. The general movement of HGV's on relatively smooth access roads (even at close distance) does not normally give rise to excessive ground borne vibration. Even in situations, where the HGV does pass over a speed 'hump', the level of vibration is still relatively low and experience suggests that according to BS6472:1992 there is that nuisance conditions are unlikely. Given the above review and the fact that no HGV movements over traffic calming features would take place over the proposed HGV haulage route, no material vibration effects are predicted as a consequence of the Brigg REP scheme.

5.4.9 Chapter 12 of the Environmental Statement includes for the detailed review of air quality issues within the vicinity of the proposal site. This appraisal includes for the direct assessment of air quality effects associated with the predicted increases in traffic movements via reference to the screening methodology outlined in Section 3, Volume 11 of Department of Transport document Design Manual for Roads and Bridges. The results of this detailed analysis can be summarised as follows:

- Development traffic demand is very small in the context of local traffic flow. The total traffic flow along the B1206 was measured at around 5595 vehicle movements, so that the plant would only contribute around 4% of this flow
- Predicted development traffic emissions are not predicted to lead to any breaches of air quality standard thresholds.
- Even for large construction projects, it is extremely unusual for properties beyond 250 metres to experience elevated dust deposition levels. Given that the proposed site is located approximately 400 metres from the nearest residential property, and the scheme is considered to only represent a small to medium-sized construction project, no material impacts associated with dust would occur.

5.4.10 Given the above review of anticipated link flow impact, reference to general IEA guidelines and the detailed assessment of key HGV impacts, it can be concluded that the development of the Brigg REP facility would not result in a material change in operational or environmental capacity conditions over the immediate key local highway network. There would be no requirement for major off-site highway improvements to cater for development related highway impacts.

6.0 SUMMARY & CONCLUSIONS

6.1 This Transport Statement has considered the highways and traffic issues associated with the development of a new Renewable Energy Plant near Brigg, North Lincolnshire. The proposal involves the development of an electricity generating facility with an installed capacity of 40MW. Electricity would be generated via a steam turbine which would be driven through the combustion of biomass material (primarily straw) supplied via contracts from farms within a designated local catchment. The site is proposed to operate with an operating capacity of 240,000 tonnes per annum (tpa) of delivered biomass material, with the energy generating process resulting in approximately 25,000 tpa (by weight including moisture) of ash waste material.

Site location and existing available highway connections

6.2 The Brigg REP proposal site comprises circa 5.26 hectares of previously developed land, formerly occupied by British Sugar's Brigg works. The Brigg REP site lies within a defined development area boundary within the North Lincolnshire Local Plan - associated with the Former British Sugar Site. This land is identified as being suitable for industrial / commercial development of a B1 / B2 / B8 nature. Development policy at the site is effectively set out in Local Plan policies IN1 and IN8.

6.3 The proposal site lies approximately 800 metres east of the B1206 Scawby Road (from which the site is accessed) and 500 metres west of the River Ancholme. Most of the buildings that comprised the former British Sugar works have now been demolished to ground level, leaving areas of concrete hard surfacing. To the immediate south of the site is Glanford Brigg Gas Fired Power Station. This facility is currently operational, providing 'on demand' electricity to the National Grid. The Glanford Brigg Power Station shares the

main access road to the Brigg REP proposal site from the B1206, however, existing levels of vehicle movements to / from the existing Power Station facility are strictly limited.

- 6.4 The existing site access road connects to B1206 Scawby Road at an off-set cross-roads layout. The other side road access arm to the junction being Brigg Road, which provides local access to the village of Scawby. This cross-roads junction is of a ghost island layout design to allow for the storage of right turn vehicles 'off-line' from main through movements on the B1206, thereby assisting in managing both highway capacity and safety. The site access road connection and the Scawby Road connection are off-set by approximately 100m (measured centre to centre).
- 6.5 At the connection to B1206 Scawby Road, the existing site access route is of the order of 6.5 – 7.0m in width and is bounded on its immediate northern side by buildings and land associated with an animal kennels business. The existing junction connection provides left turn entry / exit radii of the order of 8.5m. Existing lateral visibility in the critical leading direction is considered to be entirely suitable for observed approach traffic speeds on the B1206 Scawby Road. Available sightlines of 150m in this direction exceed maximum visibility requirements, even including for snow covered road conditions. Existing visibility provision in the non-leading direction is considered suitable for 50-60 mph operation based on typical road surface conditions when measured to the outside of the main approach road. The current good visibility provision at the junction is considered to be reflected by the excellent highway safety record, which has seen no accident incidents at the site access over the past 5 year period.
- 6.6 The B1206 Scawby Road acts as the main local distributor route for the Scawby Brook area and would accommodate all traffic movements to / from the Brigg REP proposal site. B1026 Scawby Road to the north serves the

immediate local settlement of Scawby Brook and onward connections to the town of Brigg and the A18 / M180. Connections to the south and west are considered to provide reduced scope for regular HGV movements to / from the site, particularly the local route corridor through the village of Scawby via Brigg Road.

- 6.7 The B1026 to the north of the site terminates at a mini-roundabout junction with the A18. This junction has been designed to incorporate larger HGV service vehicles and includes for significant hatching / narrowing of approach lanes to the junction to promote safe operation. To the east of this junction the A18 provides local connections to Brigg town centre. To the north / west the A18 route provides district distributor road connections to the A15 main roundabout connection some 3.3km to the west. The A15 provides immediate connections to M180 junction 4 and onward southern links to Lincoln and surrounding settlements. The A18 continues westwards to provide connections to the town of Scunthorpe.

Existing local highway conditions

- 6.8 Review of 2006 traffic flow data for the B1206 route through the village of Scawby Brook demonstrates a generally low level of hourly traffic demand, being of the order of just 350-500 vehicles per hour (2-way). Traffic demand is noted to rise during the traditional weekday AM & PM peak periods, with maximum two-way demand recorded for the hour 16:00 - 17:00, when 607 vehicle movements were recorded.
- 6.9 In general traffic movements on the immediate local network to the proposal site have been noted to be generally free flowing, even during the traditional AM & PM peak periods. Some localised queuing has, however, been observed during peak background demand periods on approaches to the B1206 / A18 mini roundabout at Scawby Brook. On-site observations of local

link operation and the generally free flow nature of the immediate network to the site are supported by a review of formal link capacity assessment via reference to DfT guidance. This analysis demonstrates that the highest recorded hourly vehicle directional demand flow on B1206 Scawby Road during the July 2006 surveys was of the order of only 30% of relevant link capacity thresholds.

- 6.10 An audit of recorded Personal Injury Accident data for the local network to the Brigg REP proposal site was undertaken. This review noted that no recorded accidents took place at the proposed site access connection. Indeed only 8 accidents were recorded over the full survey area, with none involving operational HGV movements. Three accidents were recorded at the B1206 / A18 mini-roundabout junction, however, two of these incidents took place on the A18 Brigg Town approach, which would be unaffected by proposed development traffic movements. It is considered that there are no existing highway safety issues which would call the Brigg REP proposal scheme into question.

Development Scheme

- 6.11 The scheme proposals envisage the construction of a Biomass REP to generate electricity via the combustion of biomass material (primarily straw) supplied from within a local catchment. The site is proposed to process of the order of 240,000 tonnes per annum (tpa) and would generate a 40MW supply. Physical waste arising from the Brigg REP facility would effectively be limited to ash from the burn process which would be quenched (wetted) and sold as an agricultural soil conditioner. Anticipated quantities of derived ash waste would equate to approximately 5.8% of biomass input by weight.
- 6.12 Vehicular access to the proposal site would be taken from Scawby Road via the existing private access road to the former British Sugar facility (now

shared with Glanford Brigg Power Station). This access is part of a staggered ghost island cross-roads layout and provides considerable spare operating capacity to cater for development traffic movements.

- 6.13 Input vehicles to the site would be operated under an appropriate transport logistics contract working to routeing agreements, with materials transported using large HGV vehicles specifically modified in order to maximise straw loads. Such an approach ensures high input tonnages per vehicle and would maximise the delivery performance of the site, therefore reducing overall vehicle demand movements to / from the site. Incoming straw loads to the site would be unloaded on-site by two grab cranes – which operate with a typical crane unloading time of the order of 30 minutes per vehicle.

Site Operating Parameters

- 6.14 The site will operate for 50 weeks of the year (94% - 95% availability during this period) with a 2 week shutdown / maintenance period during the summer. The plant requires an hourly throughput of the order of 30 tonnes per hour of straw, with a further 0.2tph of lime reagent. The on-site storage barns will cater for the storage of up to 3 days straw input - allowing for both uninterrupted operation of the boiler over weekend periods (when product input movements will be restricted) and some site operational flexibility.
- 6.15 It is proposed that the combustion process at the Brigg REP facility would operate on a 24 hour basis, 7 days a week basis. Deliveries of straw / exports of ash waste, however, would be restricted to Monday – Friday, over a 12 hour delivery window (07:00-19:00) and a six hour delivery period on a Saturday (08:00-14:00). No deliveries will take place on a Sunday.
- 6.16 Operational HGV movements to / from the site will be subject to a routeing agreement, restricting traffic to agreed route corridors. This route corridor

approach would restrict traffic to roads suitable to accommodate regular HGV movements and would avoid operational traffic impact on the villages of Scawby and Brigg town centre.

- 6.17 It is anticipated that virtually all REP operational straw delivery traffic would access the site via the key strategic routes of M180 / A15, with the only exceptions being those limited trips from any local straw origins within the immediate locality. HGV delivery movements would therefore access the site from Scawby Road to the north, with operational movements utilising the B1206 / A18 corridor to access the A15 / M180 junction.
- 6.18 A routeing agreement would be rigorously enforced by the site operator who would have direct control over nearly all HGV movements to / from the site. Delivery trips would be managed via the use of:
- HGV units directly owned and operated by the site operator, or;
 - Contracted material providers whose terms of contract would include routeing agreements;
 - Disciplinary procedures for HGV drivers delivery to / from the site
 - A suitable signing strategy on local links and at key junctions.

Anticipated Development Trip Demand

- 6.19 Anticipated demand estimates for trip movements to / from the proposed Brigg REP facility have been calculated via a 'first principles' approach, based on main site operating assumptions such as anticipated site processing capacity, site operating / delivery hours and anticipated input / export vehicle tonnages.
- 6.20 On the basis of a 50 week operational year, it can be anticipated that site average weekly operating capacity will be of the order of 4800t of input

material (based on 94% - 95% availability during operational weeks). Assuming a typical 5.5 day weekly delivery / export window, it can be anticipated that maximum site input demand will be of the order of 867 tonnes per full working day of straw input and 92 tonnes per day ash waste production for export (inc char and moisture content).

6.21 Assuming no back-loading of operational vehicles, day to day operation of the Brigg REP facility can therefore be anticipated to generate the following total number of daily vehicle movements (in + out):

- HGV operational movements: 100 trips per day;
- Staff (private car) movements: 36 trips per day

6.22 In order to provide comfort to North Lincolnshire Council & Highways Agency officers regarding traffic impact levels for the Brigg REP scheme, a sensitivity test has been carried out assuming for 'absolute worst case' theoretical maximum site input capacity. This sensitivity assessment has been based on the vehicle unloading capacity of the four grab crane facilities (30 minutes per vehicle). Such operation would result in a theoretical maximum site input HGV demand of 96 vehicles per day (assuming 12hr operation at 8 vehicles per hour) or 204 movements (in + out) including ash export. Such operating levels are considered highly unlikely to occur in practice, as the operation of the Brigg REP facility is ultimately limited by its capacity to burn fuel, not unload it. To illustrate, assuming the worst possible case where the barns begin empty and lorries come in at the maximum rate possible, the barns would be full after less than 18 hours of such intensive activity. Moreover, thereafter deliveries would have to slow to less than two deliveries per hour until such a time as space became available again for storage.

Development Traffic Distribution & Assignment

- 6.23 The distribution and assignment of traffic over the immediate local highway network to the development site has been predicted via reference to the proposed local routing agreements for the B1206 Scawby Road and the A18. It is anticipated that virtually all Brigg REP operational movements will utilise this proposed route corridor.

Assessment of development traffic operational impact

- 6.24 The assessment of development traffic impact has been carried out through the consideration of a link / flow assessment for the proposed operational route corridor and key junction capacity assessments.

Link Flow Impact:

- 6.25 Analysis of link flow impact on the main B1206 and A18 local route corridors identifies that typical day-to-day development traffic movements are not predicted to be in excess of 8 HGV movements per hour during off peak periods and a maximum of 18 vehicle movements (in + out) during the traditional rush hour periods (including for both operational HGV movements and staff car traffic).
- 6.26 When considered over the 12hr core weekday delivery period, link flow impact on the immediate B1206 corridor is anticipated to be less than 4.5% (despite the generally low level of base flow) - even including for the 'absolute worst case' development scenario based on theoretical maximum site operation. Link flow impact on the busier A18 corridor between M180 junction 4 and Brigg Town is anticipated to be very low, being of the order of 1-2% of background flow demand for both the typical day-to-day and absolute worst case demand scenarios. Impact levels on both route corridors are therefore

well below traditional IHT guideline thresholds and demonstrate a very low level of impact. It is therefore concluded that development of the Brigg REP facility is unlikely to result in a material change in operating conditions over the immediate local highway network.

- 6.27 Review of the immediate sections of the trunk road network identifies that even assuming for the full assignment of 'absolute worst case' development traffic demand movements to each of the M180 approach links, link flow impact would still be negligible. Maximum percentage change identified would be less than 1% of existing baseline demand on key motorway sections. Given these results and the worst case methodology on which they have been derived, it is considered that the Brigg REP proposals will not result in a material impact on trunk road operating conditions. No supporting trunk road improvement works would therefore be required to accommodate these strictly minimal percentage traffic increases.

Junction Capacity Assessment

- 6.28 Notwithstanding the results of the link / flow assessment of anticipated network impact, which demonstrates that local access routes are not anticipated to experience traffic flow increases above 4.5% of background traffic demand, detailed junction operational capacity assessments have been undertaken at the request of the LHA. Junction capacity modelling work has been undertaken at three main locations on the immediate local highway network:

- B1206 Scawby Road / Site Access Junction / Brigg Road: PICADY
- B1206 Scawby Road / A18 mini roundabout: ARCADY
- B1208 / A18 ghost island junction: PICADY

- 6.29 Review of the PICADY modelling for the site access road junction and the A18 / B1208 junction demonstrates that both layouts would operate with substantial levels of spare capacity at the 2022 future design year for both day-to-day and 'absolute worst case' development traffic estimates. All key turning movement RFC's would be at well below critical 0.85 values and with negligible queuing or delay impact on through movements. There is sufficient spare capacity within these assessment results to suggest that both junctions could accommodate further increases in background traffic movements on the main road links without any material impact in operation.
- 6.30 ARCADY assessments were carried out for the current mini-roundabout layout of A18 / B1206 at Scawby Brook. These assessments were undertaken based on the existing white line arrangements, which results in restricted junction entry widths and thus slightly reduced capacity operation. 2022 future design year baseline model runs illustrate that during the traditional AM & PM peak periods, the current mini-roundabout layout would suffer from substantial over-capacity with RFC's of in excess of 1.0 experienced on the A18 (M180) and B1206 junction arms, with significant predicted queuing levels. Improved results are predicted for the lunchtime 'off-peak' period, however, over-capacity conditions are still in evidence on the A18 (M180) approach for 2022 baseline flows at this time.
- 6.31 The modelling of the addition of Brigg REP development traffic to such baseline conditions demonstrates only marginal changes in predicted future junction operation at future year 2022. Such results reflect the conclusions of the link / flow impact assessment, which identified that typical day-to-day operational demand associated with the Brigg REP scheme would only result in a 1-2% increase in traffic movements on the key junction approach arms. It is not considered that such changes represent a material impact that would require the delivery of comprehensive highway capacity improvements at this junction in order to accommodate development traffic - particularly as any

operational problems have been demonstrated to be directly associated with baseline traffic demand levels and would occur in the 'do nothing' scenario.

Traffic Related Environmental Impact

- 6.32 Reference to Institute of Environmental Assessment (IEA) guidelines for the assessment of road traffic, suggests the inclusion of highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%) as a 'general rule of thumb' when assessing the need for detailed analysis of environmental effects.
- 6.33 Analysis of the 12hr link flow demand on the closest route corridors to the Brigg REP proposal site demonstrates that, in general traffic terms, the development of the REP facility would not result in a material change in traffic volumes. Even including for 'worst case' sensitivity test scenarios, development traffic impact during key site operating periods (12 hour daytime period) is not anticipated to exceed 4.5% of general background traffic levels on the lightly trafficked B1206 corridor and less than 2.5% on the busier A18 corridor between Brigg and the M180. Such levels are substantially below IEA 30% guideline threshold levels.
- 6.34 In order to ensure the most robust appraisal of environmental impact, however, additional tests have been undertaken to review changes in HGV link flow demand. These results demonstrate that predicted additional development HGV levels on the main A18 corridor would generally be less than the minimum IEA 30% guideline threshold. Review of the results for the B1206 Scawby Road corridor in Scawby Brook, however, identifies that the development of the Brigg REP scheme would result in an increase in HGV movements which exceeds the 30% threshold requiring further examination of environmental issues.

6.35 Additional assessment of the key traffic related environmental issues of noise / vibration and air quality is considered in detail in Chapters 11 and 12 of the formal Environmental Statement respectively. The conclusions of these detailed assessments are as follows:

- The dwelling positions off the B1206 would be the most sensitive receptors to any direct traffic flow noise increases along the B1206 and the A18 roads. The highest likely impact (for 'typical' peak hour traffic movements) with and without the proposed development shows a small increase of noise level of +0.1dB(A) to +1.4dB(A) on the most sensitive properties. Even if the highest possible development traffic flows are considered (i.e. the worst case 'sensitivity' scenario), the results of the noise prediction calculations show that the maximum increase in noise level associated with road traffic movements would only be +1.7dB(A). This increase is not deemed to be significant according to Government guidelines which note that only those properties experiencing changes greater than 3dB(A) should be considered further.
- The general movement of HGV's on relatively smooth access roads (even at close distance) does not typically give rise to excessive ground borne vibration. No material vibration effects are predicted as a consequence of the Brigg REP scheme.
- Development traffic demand is very small in the context of local traffic flow. Predicted development traffic emissions are not therefore predicted to lead to any breaches of air quality standard thresholds.
- No material impact associated with dust is predicted.

Construction Traffic

- 6.36 Traffic associated with the construction of the Brigg REP project is proposed to be managed via the implementation of a Construction Traffic Management Plan, agreed following consultation with local planning and highway authority officers and the Highways Agency. This would cover a range of issues such as the operational hours of construction, the anticipated levels of staffing and parking provision and the management of construction materials delivery vehicles.
- 6.37 Peak construction traffic demand is anticipated to take place from 2010 through to the final year of completion. Due to the nature of the proposed buildings to be constructed on site (mainly steel framed traditional large industrial units), the limited requirement for construction of heavy masonry / concrete construction and the fact that the site is already predominately cleared and ready for development (thus limiting demolition traffic) it is not anticipated that the construction of the site would generate substantial levels of HGV traffic over the local highway network. Certainly it is not anticipated that construction traffic demand would regularly exceed those predicted traffic movements associated with the typical day to day operation of the REP site.
- 6.38 Given the above review of anticipated future operational highway conditions and reference to appropriate guideline standards, it can be concluded that the development of the Brigg REP facility will not result in a material change in operational or environmental capacity conditions over the local highway network. Development traffic flow increases will generally be low and it is considered that there is no requirement for significant development related off-site highway improvement works to support the scheme.