Ironstone Energy Limited

PROPOSED ANAEROBIC DIGESTION (AD) PLANT, LINCOLNSHIRE

ES Chapter – Offsite Traffic/Air Quality/Noise

Independent, multidisciplinary engineering and environmental consultants

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1.0 INTRODUCTION

Instruction

1.1 Create Consulting Engineers Ltd have been instructed by Ironstone Energy Ltd to prepare an addendum to the Environmental Assessment that has been prepared in support of their proposal to build a new Anaerobic Digestion (AD) Plant to the south east of the Sewstern Industrial Estate, Sewstern, near Grantham.

Scope

1.2 This addendum is intended to build on the earlier work, which was coordinated by Heatons, and supported technically by NTP on transport issues and Sharpes Redmore on Air Quality and Acoustics. The assessment concentrates on the potential impact of any changes in HGV movements that may be caused as a result of the development; in particular, how any changes would impact on the amenity of the residents of the surrounding villages in particular Buckminster, Stainsby, Colsterworth, Gunby and Sewstern.

1.3 The report does not consider the potential impact of the plant itself which has been covered by the Planning and Environmental Statement which has been prepared by Heatons. This report purely concentrates on HGV vehicle movements to and from the site.

1.4 Two operating scenarios have been considered in this report, the first is during the harvest period with October being considered to be the busiest in terms of HGV movements. The second scenario is one outside of the harvest period with March being shown as the busiest of these months in terms of HGV movements. The report also considers the impact of the Construction Stage.

1.5 The report looks at the maximum number of daily HGV movements that is likely to be generated within these periods on various sections of the network. All the various processes that will be undertaken on the site have been considered, along with the potential vehicle movements these are likely to generate. The distribution of these movements has been considered, based on known key destinations. The report also considers how these movements are altered during the harvest period where a large proportion of the AD plant's feedstock will be collected directly from the surrounding Buckminster Farms and other local farms.

1.6 The report then considers the potential impact of the changes in traffic movements on the Air Quality that will be experienced in the surrounding villages, as well as potential increase in noise levels. The assessment of any changes in Noise and Air Quality have been chosen as two of the main characteristics which could impact on the amenity of an area.

1.7 In each section of the report the following scenarios are considered

- Baseline Position
- Construction Phase Effects
- Operational Phase Effects
- Cumulative Effects

1.8 The report then summarises the main impacts and evaluates any mitigation measures that may be introduced.

1.9 This report is to be read in conjunction with Transport Assessment, Reference JPC/VL/P25-3541/01, Acoustic Report, Reference MT/VL/P25-3541/02, and Air Quality Assessment, Reference, TR/VL/P25-3541/03.

Proposed Development

1.10 The proposed AD plant is intended to be constructed just to the south east of the Sewstern Industrial Estate to the south of Gunby Road. The site is located to the east of Sewstern and approximately 2.5 km from Buckminster and 4 km from Colsterworth. The A1 trunk road is located 4 km to the east of the site and Grantham which is the largest nearby town is located 14.2km to the north.

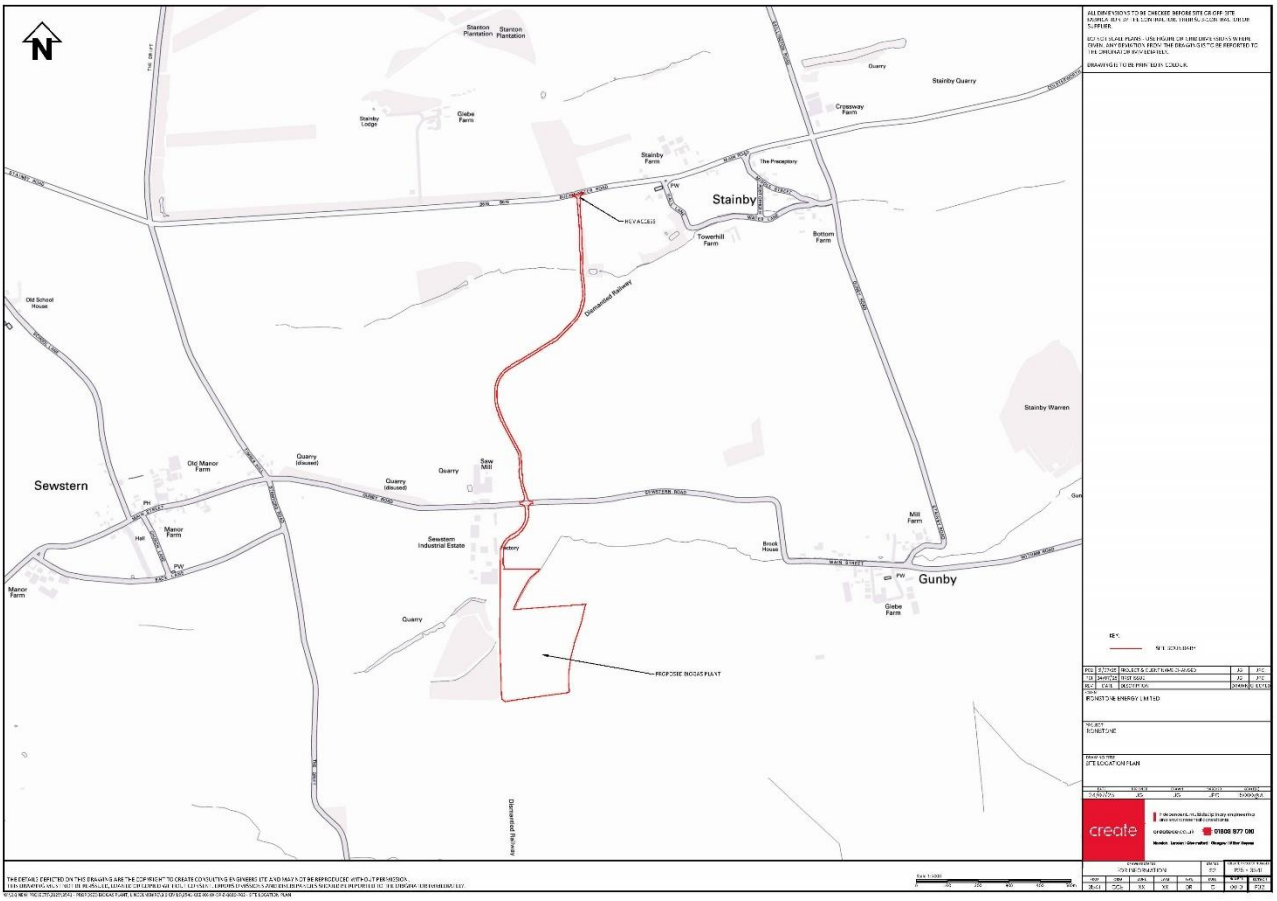

Figure 1.1: Proposed Site Location

1.11 The site currently forms part of the Buckminster Estate, a large agricultural estate which covers an area of land stretching from Wymondham in the south west, up to Stonesby in the Northwest, across to Gunby in the south east and Skillington in the north east.

1.12 The actual area to be developed is currently being used for agricultural purposes.

1.13 The new AD Plant will take the form of digesters, silage clamps and digestate storage, along with associated buildings and hardstanding. A general arrangement of the proposed plant and landscape screening is shown below.

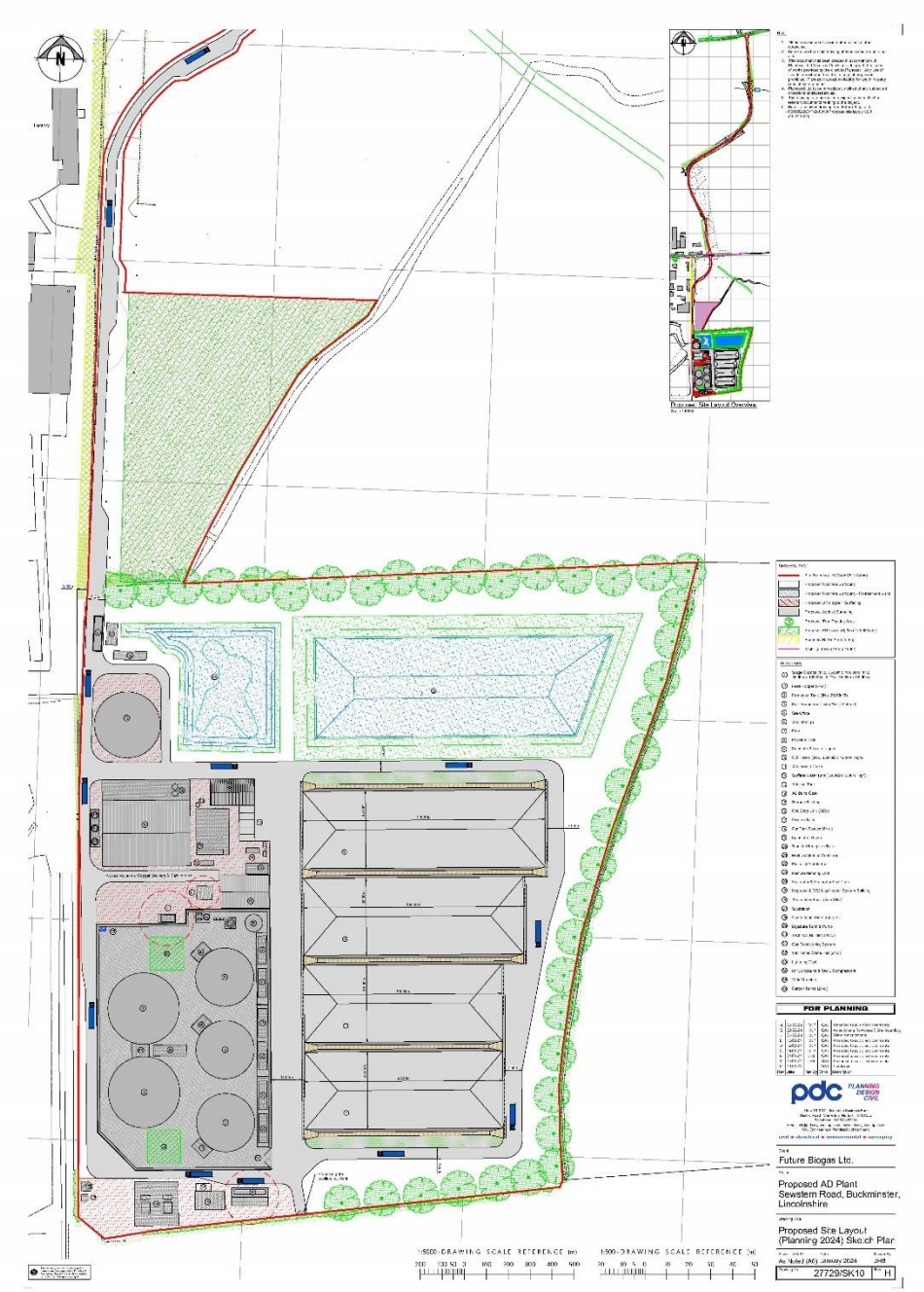

Figure 1.2: Proposed Site Layout

1.14 Access to the site can be currently achieved by linking across through fields from Gunby Road to the north. In addition, there are a series of linked farm tracks which run from the southern boundary of the site in a westerly direction towards the Drift. The Drift is a public highway which runs north/south approximately 0.75 km to the west of the site boundary.

1.15 The AD Plant is intended to use locally grown crops as feedstock to generate biogas which will be injected into the main national gas network. The process is a well-established method of creating green gas for energy production.

1.16 As part of the development proposals, the developer of the new plant intends to create a new access, partially upgrading an existing track to form a dedicated HGV access, linking the site with the B676 Buckminster Road.

2.0 TRANSPORT

Baseline

2.1 To inform the study, a series of new traffic surveys were commissioned. This included the installation of 7 Automatic Traffic Counting ATC Loops. These were located on the B676 within Buckminster, one to the west of the HGV access track, one in Stainby and a further one located in Colsterworth.

2.2 Further ATCs were located on the Drift to the south of the junction with Gunby Road and one on Gunby Road within Sewstern to the west. The final ATC was installed along Main Street in Gunby. See Drawing below showing the location of the various Traffic Surveys.

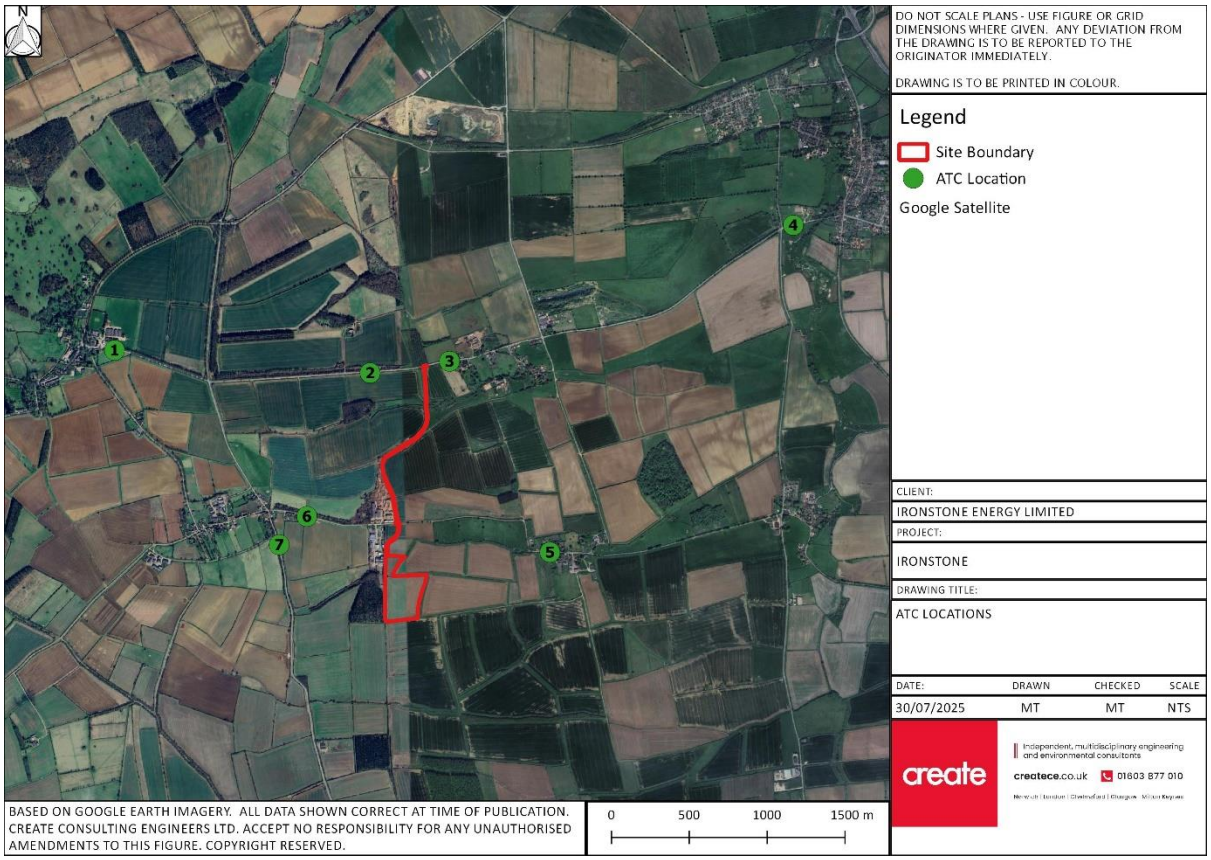

Figure 2.1: ATC Locations

2.3 The ATCs were installed on the 24th June by PCC an independent specialist data collection company, and data was collected up to and including the 30th June 2025. ATCs are excellent ways of obtaining classified traffic data, along with speed surveys at each location.

2.4 In addition to the ATC, a CCTV survey was also undertaken at the junction of the existing Sewstern Industrial Estate, Gunby Road and Brooks Bros Timber Yard. The CCTV survey was undertaken between 23rd June and the 27th June and was again collected by PCC. The CCTV survey was undertaken to get a good understanding of the level of movements undertake by vulnerable users within the vicinity of the site access, along with a detailed understanding of the movements to and from the industrial estate and the Timber Yard.

2.5 The results of the ATC surveys and the CCTV surveys are included in Appendix A and B of the Transport Statement.

2.6 In addition to the Traffic Data collected, baseline Noise and Air Quality Data was also collected at five key locations in Buckminster, Stainby, Gunby, Sewstern and Colsterworth.

Operational

2.7 To inform this study we have discussed the various methods of hauling and distributing both the feedstock to the site and the various by-products with the Feedstock Development Lead (FDL) at Future Biogas who has a wealth of experience in crop management, including haulage and harvesting methods and has a detailed knowledge of how the AD plant will operate.

2.8 The FDL has provided a schedule showing a typical year with anticipated HGV trip movements as a result of the various processes being undertaken at the AD Plant. See Appendix C of the Transport Assessment. This schedule identifies the various trip movements that occur during the harvest and non-harvest periods, with October being identified as being the busiest month during the harvest and March being the busiest period in the non-harvest period.

2.9 We have therefore used both months as our assessment scenarios. It is to be noted that these have been chosen to represent a worst case and the same level of vehicle movements will not be experienced throughout the rest of the year. We have also decided to consider traffic movements on the network over a whole working day from 6am in the morning through to midnight to allow for later vehicle movements during the harvest period. Within this period there will be peak hours on the network, and times where more vehicles will arrive in an hour than others. This period covers the majority of vehicle movements that would be generally experienced within a typical day on the highway network. It is to be noted though that the AD Plant itself will only receive crops and deliveries between the hours of 07:00 and 19:00, with this time extending until 21:00 hrs during harvest period.

2.10 It is proposed that prior to the plant being constructed that the HGV access track will be upgraded to provide access for HGVs for both the construction period as well as during the operation of the plant. All HGV movements to and from the site will be directed to use this route. The following assessment therefore assumes that the HGV access track is available and that no HGVs will use either Gunby Road, the Old Post Lane, The Drift or School Road to access the proposed development.

Harvest Period

Ironstone Traffic Generation/Distribution Harvest Scenario – October (Busiest Month)		
Process	**Movements**	**Distribution**
1. Harvest Movements	26 HGV 43 T/T	100% of HGV traffic from the west, southwest and north. Directed along Buckminster Road B676 towards the HGV access track. Other harvest traffic not using public highway mainly tractor trailer. 40% will be direct to plant off public highways/60% will be as HGV distribution
2. Hub Clamp/Store	10 HGVs	100% of traffic using HGV access track along Buckminster Road B676 to and from the A1
3. CO_2	3.5 HGVs	100% of traffic using HGV access track along Buckminster Road B676 to and from the A1
4. Liquid Digestate	None	n/a
5. Solid Digestate	2.2 T/T	Tractor Trailer distribution same as Harvest HGVs
Changes in daily HGV Traffic Movements in 5 key villages		
Villages	**Movements**	**Total Movements**
Buckminster	26 25.8 (60% of 43)+2.2	26 HGV 28.0 T/T
Stainby	10 + 3.5=	13.5 HGV
Colsterworth	10 + 3.5 =	13.5 HGV
Sewstern	-17.2 (40% of 43)	Minus 17.2 T/T
Gunby	-8.6 (approx. 50%)	Minus 8.6 T/T

Table 2.1: Traffic Generation/Distribution for Ironstone during the harvest period

Note: All movements taken from the FDL Schedule (Appendix C)

All HGVs are based on 26T vehicles and T/T are Tractor Trailer movements based on 16T.

All of the above are based on one-way daily movements

Non-Harvest Period

Ironstone Traffic Generation/Distribution Non-Harvest Period – March (Busiest Month)		
Process	**Movements**	**Distribution**
1. Harvest movements	n/a	None
2. Hub Clamp/Store	10 HGVs	100% of traffic using HGV access track along Buckminster Road to and from the A1.
3. CO_2	3.5 HGVs	100% of traffic using HGV access track along Buckminster Road to and from the A1
4. Liquid Digestate	38.4 HGVs	Spread from site. Assume 40% not using public highway and 60% using HGV access track and Buckminster Road to distribute to the west
5. Solid Digestate	2.2 T/T	Assume distributed to the west along Buckminster Road
Changes in daily HGV Traffic Movements in 5 key villages		
Villages	**Movements**	**Total Movements**
Buckminster	23 (60% of 38.4) 2.2	23 HGV 2.2 T/T
Stainby	10 + 3.5 =	13.5 HGV
Colsterworth	10 + 3.5 =	13.5 HGV
Sewstern	None	n/a
Gunby	None	n/a

Table 2.2: Traffic Generation/Distribution for Ironstone during the non-harvest period

Note: All movements taken from FDL Schedule (Appendix C)
All HGVs are based on 26T vehicles and T/T are tractor trailer movements based on 16T
All of the above are based on one-way movements

2.11 It is to be noted that the movements to and from the Hub Clamp store only take place Monday-Saturday and are significantly reduced during the harvest period, with the number of days the movements are undertaken dropping from 26 days a month down to between 14 to 18 days a month.

2.12 The above movements all represent a worst-case daily change in HGV movements as a result of the development. With the ability for up to 40% of the farm to gain access to the AD plant site without having to use Public Highway, the introduction of the new plant will result in a reduction of HGV movements in both Sewstern and Gunby. In particular, Tractor Trailer movements during the Harvest periods of July/August/September/October.

2.13 At present, these movements track westwards to the grain store at Garthorpe, using public highway. When the AD plant is operational, the crop from these areas will be delivered directly to the plant via the farm track network to the south/east and west of the plant, gaining access to the plant from the south, with only the need to cross public highway in a few isolated places. This should provide a real benefit to the adjoining two villages.

2.14 The site when operational will employ 6 or 7 full time members of staff, who work on rotational basis to fit in with operational requirements of the AD plant. The worst-case scenario would be that all 7 staff members would arrive at site at the same time in separate cars. This would result in the maximum of 14 two-way daily car trips being generated throughout the year. This traffic would be directed to the site from the B676 along Timber Hill then into the site along Gunby Road. This increase in vehicle movements would represent only a 4.6% increase in movement along Gunby Road.

Construction Vehicle Movements

2.15 It has been estimated that during the construction phase of the project that a maximum of 30 HGVs movements a day could be experienced. This is likely to only occur when there is a large concrete pour onsite which is anticipated to only occur once or twice during the construction period. The remainder of the construction period HGV deliveries will be considerably less that this figure, with the average being more around 5 HGVs a day, with many days not receiving any.

2.16 With respect to HGV movements, it has been assumed that 100% of these movements will be directed towards the A1 on the B676 from the existing HGV access track during the construction stage. The HGV access track will be upgraded prior to construction activities on site.

2.17 It has also been estimated that the site will have between 100 to 150 people working there during the peak construction activity. We have assumed that 80% of these will arrive by private car resulting in 240 daily two way movements being estimated to and from the site. This should be considered very much a worst case as it represents the peak period in construction activity on the site. These vehicles will also be directed along the B676 towards the HGV access track.

2.18 It is anticipated that this figure would be considerably lower than this for the majority of the construction period and that the above estimate of movements is considered an absolute worst case.

Operational Impact

2.19 To assess the potential scale of impact of the changes in vehicle movements we have collected new traffic data within the surrounding villages to the plant as outlined in Section 4.0 of this report. The ATCs that were installed in Buckminster, Sewstern, Gunby, Stainby and Colsterworth returned the following average daily movements. Appendix E of the Traffic Assessment has the full set of Traffic Flow Diagrams for the Harvest, Non-Harvest and Construction Stages.

	Surveyed Data		Estimated Changes in Daily HGV Movements		
	General Traffic	HGV	Harvest	Non-Harvest	Construction
Buckminster	1049>	253	+54.0	+25.2	+0
	1048<	231	+54.0	+25.2	+0
Stainby	892>	228	+13.5	+13.5	+30
	962<	222	+13.5	+13.5	+30
Colsterworth	1322>	278	+13.5	+13.5	+30
	1354<	280	+13.5	+13.5	+30
Sewstern	151>	39	-17.2	+0	+0
	155<	44	-17.2	+0	+0
Gunby	72>	15	-8.6	+0	+0
	76<	20	-8.6	+0	+0

Table 2.3: Changes in daily HGV movements

Note: General Traffic includes – LGVs, HGVs, Buses and Coaches
HGV includes – LGVs, HGVs, Buses and Coaches
Changes in Harvest and Non-Harvest Movements have been taken from Table 2.1 and 2.2.

2.20 The above table shows the absolute worst case scenario of predicted changes in two-way HGV movements that will occur as a result of the introduction of the AD Plant. These peak movements will only be for very short period of time.

2.21 All HGV and Tractor & Trailer movements to and from the AD Plant site will be sheeted during both the construction and the operational stage. Thus preventing 'straw drop' and other debris from being an issue as vehicles travel to and from the site. This will provide during harvest period an improvement over the general movement of crops within the area, especially those which will now be directly feeding the plant.

Impact on Gunby and Sewstern

2.22 The analysis shows both Gunby and Sewstern experience no material change in vehicle movements as result of the construction stage and the non-harvest operational stage. However, these two villages would likely experience a reduction in HGV movements during harvest time, in particular tractor trailer movements, since, in the years when the estate is growing feedstock for the AD plant, these would be directed to the plant, avoiding the public highway. This has been estimated as a reduction of 17.2 daily Tractor Trailer movements in Sewstern and 8.6 daily tractor trailer movements in Gunby.

2.23 The introduction of the AD Plant on the villages of Gunby and Sewstern will not cause any detrimental impact on traffic movements, highway safety and overall capacity. There will however be a beneficial impact on the villages during harvest period, with the number of HGV movements actually reducing in the villages which will help improve highway safety and overall general amenity.

Impact on Buckminster

2.24 Buckminster shows the largest increase in movements during the Harvest period of up to an additional 54 HGV movements a day. As these movements relate to crop harvesting then it can be assumed that they would already be on the network during the harvest period, just travelling in a different direction towards the Estates grain store at Garthorpe, rather than to the AD Plant. These movements should therefore not be considered as new vehicle movements just a re-assignment of existing harvest movements on the network. We have however used this increase in the Noise and Air Quality Assessments to make sure that we are considering an absolute worst case scenario.

2.25 During the non-harvest period, March for example, Buckminster is showing an HGV increase of 25.2 movements a day in both directions. This is mainly due to the liquid digestate being delivered to the estate from the AD Plant. These movements would already be on this section of the network as the Estate currently imports Liquid Digestate from a third party source which is delivered from the A1 along the B676 passing through Stainby and Colsterworth. In Buckminster these movements should not be considered as new movements on the network but as a reassignment.

2.26 The operation of the AD Plant would cause no material impact to vehicle movements, highway safety and highway capacity within Buckminster.

Impact on Stainby and Colsterworth

2.27 The introduction of the AD plant will remove the need for the estate to import liquid digestate which should help to reduce vehicle movements through Colsterworth and Stainby.

2.28 The only additional movements that would be experienced because of the development are the movements to and from the Hub Clamp/Store and the CO_2 being removed from site. These flows add 13.5 HGV vehicle movements in both directions through the villages of Stainby and Colsterworth, which represents less than a 5 % increase in maximum daily HGV vehicle movements in these areas. These

movements will only occur between Monday to Saturday and will take place a maximum of 26 days a month during the non-harvest period, dropping down to 14 to 18 days a month during harvest.

2.29 Whilst there is a very small increase in HGV movements in these villages due to the operation of the plant, it is considered that the impact on vehicle movements, highway safety and overall capacity is negligible.

Impact of Construction Vehicle Movements

2.30 As previously stated, the HGV access track will be upgraded prior to construction so that all HGV movements and general construction traffic to and from the site will use this to gain access to the site and will be directed to and from the A1.

2.31 A Construction Traffic Management Plan CTMP will be prepared to support the proposed scheme, and this will identify approved routes to and from the site for various sizes of vehicles. If contractors fail to comply with the routes identified in the plan, there will be penalties that will be secured through the main construction contract. The CTMP will direct all HGVs towards the B676 and the A1, with all HGV and construction traffic accessing the site using the new HGV access track.

2.32 All deliveries and visitors attending the site during the construction period will be informed of the agreed access routes to and from the development in advance of any trip being made. The developer already has experience of operating haulage and delivery protocols during the construction and operational phases of their sites.

2.33 The increase in car movements during the construction phase of the project won't impact on Gunby Road or the adjoining villages of Sewstern and Gunby, as all construction vehicles will be directed along the B676 to the HGV access track away from the villages.

2.34 There will however be an increase in car movements along the B676 and whilst the majority of the construction related traffic will be to and from the A1, there will be a proportion of car/LGV movements which will be from the Buckminster direction. We have therefore assumed that 20% of all general car movements from the site will be to and from the west and the remaining 80 % will be from the east and the A1. Therefore, Buckminster will experience an absolute worst-case percentage increase of 2.3% in two way car movements during the construction stage.

2.35 With Stainby and Colsterworth experiencing an absolute worst-case increase of 7% in two way car movements during the construction stage. See Appendix E of the Transport Assessment for the Construction Vehicle Traffic flows.

2.36 To help reduce these vehicle movements the developer is prepared to operate a mini bus pickup service to bring construction workers to and from the site. In addition, construction workers will be encouraged to car share where possible, which will be promoted as part of the Sustainable Travel Plan.

2.37 With respect to HGV movements, it has been assumed that 100% of these movements will be directed towards the A1 on the B676 from the existing HGV access track during the construction stage. This will result in a relatively small increase of around 11% in HGV movements along the B676, within Stainby and Colsterworth.

2.38 It is to be noted that again this estimate is based on a very much an absolute worst-case scenario during the peak construction period and will probably only occur for one to two days. The majority of

the time during the construction stage the HGV movements will be considerably less with an increase of 1.8% being more likely to be experienced.

2.39 This level of increase is for a finite period of time and even with the very short potential peak increase it is not considered that this will have any detrimental impact on highway safety and general capacity within the villages of Buckminster, Stainby and Colsterworth.

Transport Conclusions

2.40 The main purpose of this chapter is to assess the potential impact of any changes in traffic movements that would occur as a result of the AD Plant during both its construction and operation. The supporting Transport Assessment outlines the process of data collection, a review of existing baseline conditions and the anticipated trip generation that would occur as a result of the development.

2.41 A detailed assessment has been undertaken with input from the Feedstock Development Lead (FDL) and the Buckminster Estate to assess the current cropping patterns for the surrounding area and to estimate where and when most of the HGV movements occur. This was considered for both the harvest and non-harvest scenarios, by looking at the various movements that would be undertaken solely on the farm track network and those which would involve public highway. Each process was considered along with the anticipated direction the various vehicles would travel.

2.42 We then considered how these movements would be distributed and the potential impact on the five villages from which base traffic data was collected.

2.43 It is intended that, as part of the development, the existing HGV access track which connects the Brooks Bros Timber Yard to the B676 will be upgraded and extended down to Gunby Road. This would then be used by all HGV traffic accessing the site, along with all construction traffic. The access design at Gunby Road has been modified to ensure that all HGVs visiting the site use this route, rather than Gunby Road and Sewstern Road.

2.44 In addition, up to 40 % of the existing farm traffic can currently access the proposed AD plant by utilising an existing network of existing farm tracks without having to use Public Highway apart from isolated crossing points. This will result in a significant number of HGVs and Tractor Trailer movements that currently pass through the villages of Gunby and Sewstern being removed.

Buckminster

2.45 The results have shown that for the harvest period the village with potentially the largest increase in HGV movements would be Buckminster, however most of these movements are already on the network just travelling in a different direction and therefore are only a re-assignment rather than an increase.

2.46 There is a similar situation in the non-harvest period where the increase in vehicle movements in Buckminster relates to the spreading of the Liquid Digestate which will now come from the AD Plant. Currently this is imported by the Estate from outside of the area, along the B676 and the A1. Therefore, again this is not an increase in vehicle movements in the Buckminster area and should be considered as a reassignment of movements. The changes in where the Estate source their liquid digestate following the construction of the AD plant will actually reduce the existing HGV movements travelling through Stainby and Colsterworth.

2.47 It can therefore be concluded that the there are no real increases in vehicle movements through Buckminster, with any potential increases being reassignments of existing vehicle movements.

Sewstern and Gunby

2.48 The two smaller settlements immediately adjacent to the site (Sewstern and Gunby) will not be impacted by additional HGV movements from the proposed AD Plant with all HGV movements being directed away from the villages by using the upgraded HGV access track to the B676 Buckminster Road. In fact, during the harvest period there will actually be a reduction in HGV movements as the majority of movements estimated at 17.2 Tractor Trailer movements in Sewstern and 8.6 movements in Gunby will be directed straight to the AD Plant using the network of farm access tracks away from the public highway, whereas currently in harvest period the areas that are cropped around Gunby would transport their crop using HGVs and Tractor Trailers in a westerly direction towards Garthorpe, passing through Sewstern. This reduction in HGV movements should help to improve highway safety in the villages during the harvest period.

Stainby and Colsterworth

2.49 The only real increase in HGV movements that has been caused by the proposed AD Plant is the HGV movements to and from the Hub Clamp/Store located to the east of the A1 and the removal of the CO_2 which is generated on the site. These movements combined generate an additional 13.5 daily HGV movements each way within Stainby and Colsterworth, representing less than a 5% increase over the current level of HGV movements in the area. These movements are only undertaken Monday to Saturday, for a maximum of 26 days a month during the non-harvest period and only 14 -18 days during the harvest month. This would not be classified as a significant level of impact.

Construction Phase

2.50 The absolute worst case construction traffic predictions only show a 11% increase in daily HGV movements in Stainby and Colsterworth, with a more typical level of increase being nearer 1.8% in these villages during the construction stage. No other village would be affected by an increase in HGV movements.

2.51 Buckminster would experience a small increase in car movements during the construction period, with an absolute worst case increase of 2.3% increase in two-way car movements. This would be only for a limited time and for the majority of the construction period the number of car movements would be significantly less.

2.52 The developer is proposing to operate a sustainable travel plan, both for the operational and construction phases with the aim to reduce private car movements to and from the site. This will help significantly reduce the number of vehicle trips to and from the site. The Sustainable Travel Plan will provide information in relation to existing bus services, coordinate a car share scheme, access for permanent staff to a cycle to work scheme, a minibus service during construction stage, washroom facilities, cycle parking and the provision of a new trod (Unsurfaced footway) within public highway to the village of Sewstern.

Overall Conclusion

2.53 With only two of the villages effectively impacted by low increases in HGV movements as a result of the operation and construction stages of the AD Plant and some villages actually benefitting from a reduction in movements. It is considered that the development of the AD Plant at this site will cause negligible impact on the amenity of the surrounding villages.

2.54 The proposed development will not cause any detrimental impact on highway safety and highway capacity and will not cause any significant environmental effects in traffic and transport terms. With the two nearby villages of Gunby or Sewstern actually benefitting from a positive impact as a result of the removal of a fairly large proportion of the farm traffic from their roads during harvest.

3.0 NOISE

Baseline

3.1 A site survey was undertaken on site on 18 June 2025 to support our assessment and five logging sound level meters were installed on site for a period of seven days. In addition, shortened measurements surveys were undertaken in two locations.

3.2 The site is relatively large. However, in all locations the primary source of noise measured at the monitoring locations were from road traffic on the nearby roads.

3.3 The measurement locations used for our survey are shown in the figure below:

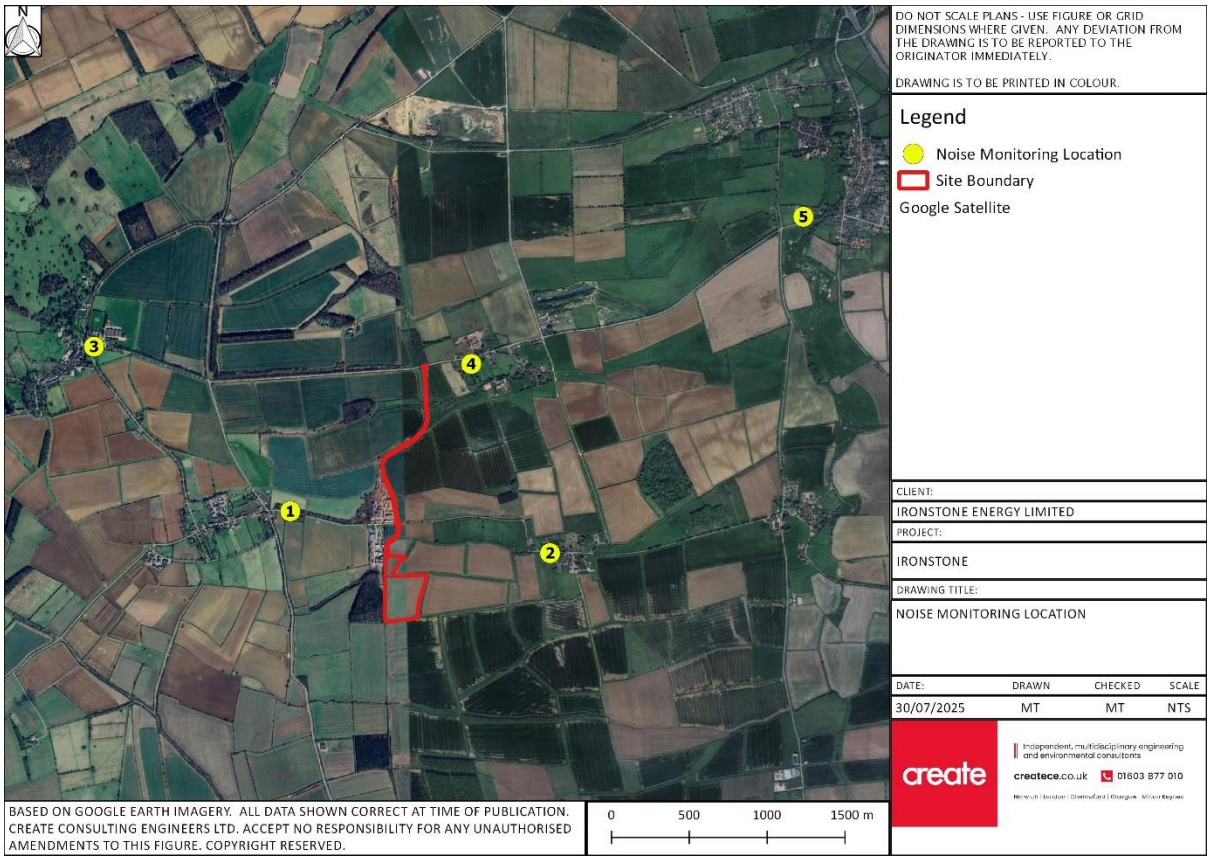

Figure 3.1: Measurement Locations

3.4 Measurements in positions 2, 4 and 5 were taken at a height of 1.5 m above ground. Measurements in positions 1 and 3 were taken at a height of 3 m above ground. All measurements were taken in terms of; L_{eq}, L_{10} and A-weighted levels. The results of our survey are summarised in Section 5.0 of the Acoustic Report.

3.5 The equipment was calibrated at 113.8 dB at 1 kHz before the survey. There was no significant drift noted over the course of the survey. A summary of equipment used, and calibration information is contained in Appendix C of the Acoustic Report.

3.6 Weather over the course of the survey was logged on a CLIMEMET CM2000 weather station. Conditions during the survey were considered favourable for environmental measurements, particularly given

the proximity of the measurement locations to the surrounding roads. Wind speeds remained below 5 m/s throughout the survey period. Short periods of light rain were noted; however, this did not extend over a significant time period and did not impact the measurement data. Temperatures ranged between 12 and 30 degrees Celsius.

3.7 No periods of adverse weather have been excluded from our assessment as the impact would be insignificant to the conclusions drawn in this assessment.

3.8 In addition to the sound level monitoring, we have also been provided with ATC and MCC data at several locations around the site.

3.9 The ATC locations are shown in Figure 3.2 below:

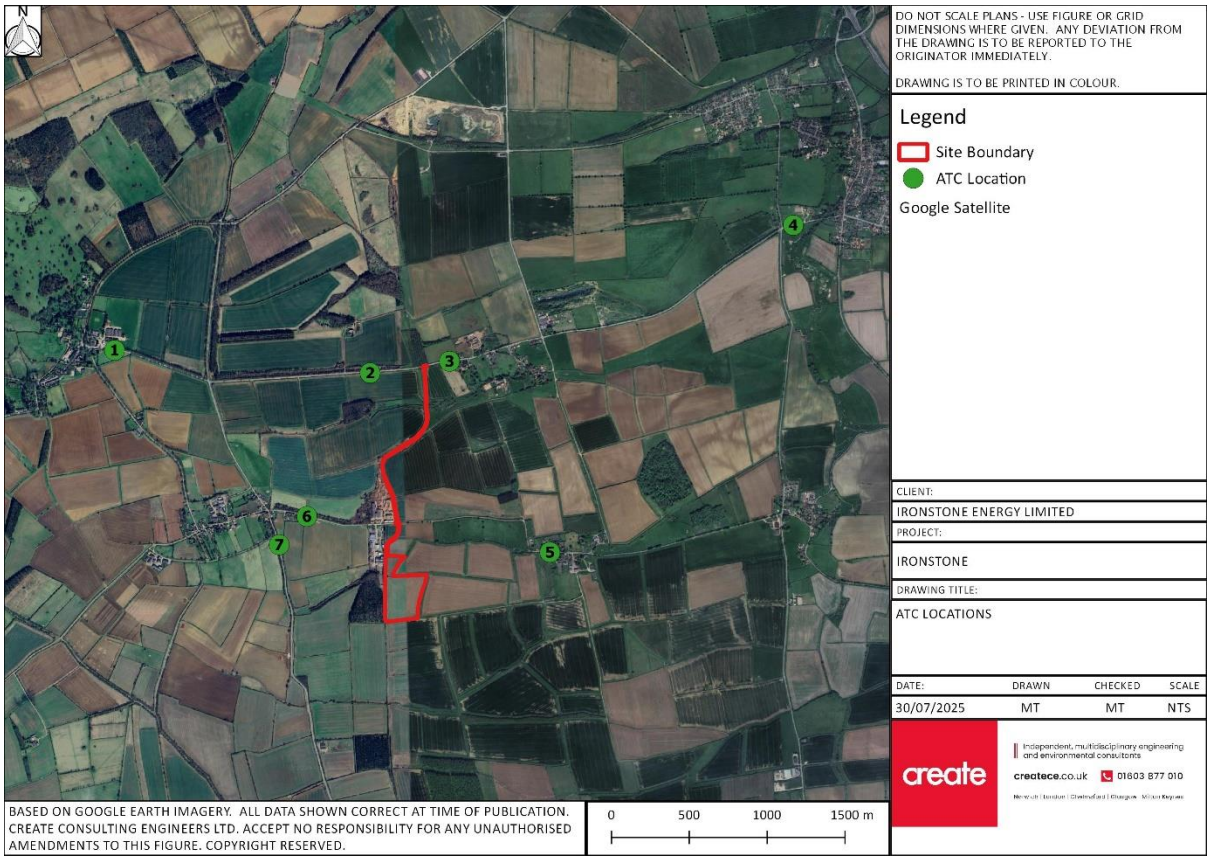

Figure 3.2: ATC Locations

Operational Effects

Standards and Guidance

Design Manual for Roads and Bridges – LA111 Rev 2 (May 2020)

3.10 Guidance for acceptable increases in road traffic noise is contained in the Design Manual for Roads and Bridges (DMRB) Part 7.

3.11 This guidance is given in terms of the $L_{A10\ 18\text{-}hour}$ (06:00h – 00:00h) and $L_{night,outside}$ (00:00h – 06:00h) for the day and night times respectively. The Lowest Observed Adverse Effect Level (LOAEL) is set at

55 dB $L_{A10,18h}$ and 40 dB $L_{night,outside}$. The Significant Observed Adverse Effect Level (SOAEL) is set at 68 dB $L_{A10,18h}$ and 55 dB $L_{night,outside}$.

3.12 We would however consider the principle and guidance based on the Magnitude of Change to be a more useful reference in this case.

3.13 The guidance considering the short-term and long-term impacts are defined in Tables 3.54a and 3.54b in DMRB and has been shown below in Tables 3.1 and 3.2 respectively.

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 -4.9	Moderate
5+	Major

Table 3.1: Classification of magnitude of noise impacts in short term

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 -9.9	Moderate
10+	Major

Table 3.2: Classification of magnitude of noise impacts in long term

3.14 The guidance quantifies the change of impact in terms of $L_{A10,18\ hour}$, however, there is an assumed linier relationship between L_{A10} and L_{Aeq} when considered against the CRTN guidance. This is reflected in the IEMA Guidelines for Environmental Noise Impact Assessment where table 7.14 summarises the same long- and short-term impact magnitude as above but in terms of $L_{pAeq,T}$ for 16-hour daytime periods and 8-hour night-time periods. This effectively demonstrates that over a perceived period of change the above magnitude of change is relevant for both L_{Aeq} and L_{A10}.

The Department of Transport – Calculation of Road Traffic Noise (1988)

3.15 The Calculation of Road Traffic Noise (CRTN) document outlines the procedures for calculation of noise from road traffic, allowing for the environmental appraisal of road schemes, highway design and land use planning.

3.16 The document comprises of three main sections:

- Section 1 outlines a step-by-step method of calculation for predicting noise levels at a distance from a highway, considering different traffic parameters, intervening ground cover, road configuration and site layout.
- Section 2 provides additional procedures that may be taken into consideration when applying the method outlined within section 1. Although calculation will constitute the preferred prediction technique, it is likely that in some cases conditions will fall outside of the scope of the method, and measurement will be required.
- Section 3 details a simplified measurement procedure for instances such as this.

Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping (2002)

3.17 In the UK the environmental assessment of road traffic noise is typically based on the procedures described in the 'Calculation of Road Traffic Noise' document. This index differs greatly to the noise indices proposed by the EU.

3.18 This document provides a means of applying a correction to obtain the relevant EU indices from the calculated values of L_{A10}. Within this document is also a methodology for the conversion between different indices and time weighting, to enable to conversion of calculated and measured levels of road traffic noise into other indices for assessment.

Results

3.19 The measurements in each assessment location are summarised in Table 5.1 below:

Location	Daytime	Night-time	18-hour assessment period
Long Term Measurement Position 1	56 dB $L_{Aeq,16\text{-hour}}$	50 dB $L_{Aeq,8\text{-hour}}$	56 dB $L_{Aeq,18\text{-hour}}$
Long Term Measurement Position 2	52 dB $L_{Aeq,16\text{-hour}}$	48 dB $L_{Aeq,8\text{-hour}}$	52 dB $L_{Aeq,18\text{-hour}}$
Long Term Measurement Position 3	64 dB $L_{Aeq,16\text{-hour}}$	57 dB $L_{Aeq,8\text{-hour}}$	63 dB $L_{Aeq,18\text{-hour}}$
Long Term Measurement Position 4	49 dB $L_{Aeq,16\text{-hour}}$	47 dB $L_{Aeq,8\text{-hour}}$	49 dB $L_{Aeq,18\text{-hour}}$
Long Term Measurement Position 5	54 dB $L_{Aeq,16\text{-hour}}$	49 dB $L_{Aeq,8\text{-hour}}$	54 dB $L_{Aeq,18\text{-hour}}$
Short Term Measurement Position 1	53 dB $L_{A10,3\text{-hour}}$	-	-
Short Term Measurement Position 2	47 dB $L_{A10,3\text{-hour}}$	-	-

Table 3.1: Survey Results

3.20 The existing measured night time sound levels shown in Table 5.1, are above the LOAEL as defined by DMRB and at long term measurement 3 the existing sound level was measured to be above the SOAEL. This further enhances the reasoning for using the Magnitude of Change methodology, which has been defined in Tables 3.1 and 3.2 earlier in this report, as opposed to the compliance with absolute levels.

3.21 The above data along with the ATC results have been used to validate our computer model, which is discussed further in the following section.

3.22 A summary of the baseline ATC counts along with the predicted in operation vehicle counts during harvest periods, during non-harvest and during construction periods are shown in Table 5.2:

ATC Location	Baseline 2025		Harvest		Non-harvest		Construction	
	2 way total	%hgv	2 way total	%hgv	2 way total	%hgv	2 way total	%hgv
Stainby road	2097	5.2	2204	9.8	2148	8.3	2217	4.9
Buckminster road	1844	6.2	1951	11.4	1895	8.7	1964	5.9
Stainby	1854	5.8	1881	7.2	1881	7.2	2034	8.3
Between Stainby and Colsterworth	2676	3.9	2703	4.9	2703	4.9	2856	5.7
Sewstern (the Drift)	933	2.6	933	2.6	933	2.6	1173	2.0
Sewstern road	306	3.6	272	0.0	306	3.6	546	2.0
Gunby Road	148	2.7	132	0.0	148	2.7	148	2.7
Site Access	N/A	N/A	66.9	100.0	38.7	100.0	30	100.0

Table 3.2: Baseline, Operational and Construction Traffic Flow

Assessment

3.23 We have undertaken a computer model of the entire site and used the transport ATC counts as the basis for the baseline and growth conditions.

3.24 The model includes 'soft' acoustically absorbent ground conditions as this is representative of the vast majority of the intervening land.

3.25 The model geometry and calibrated noise model is shown in Figure 3.3 below.

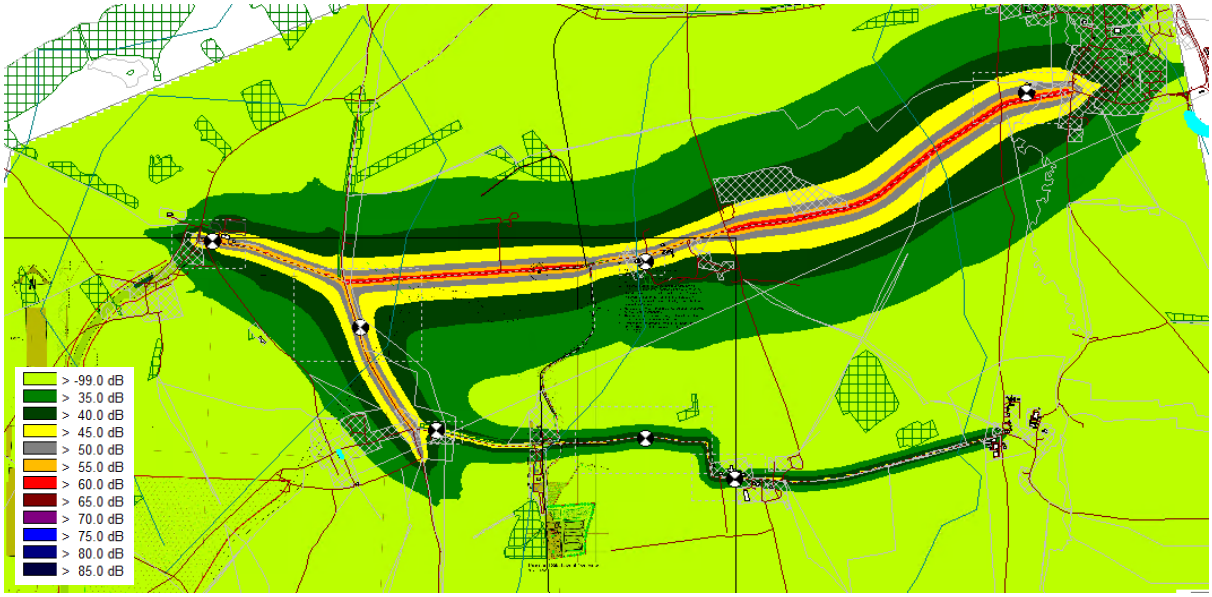

Figure 3.3: Calibrated Acoustic Model

3.26 The model calibrated within 2 dB of our measurements throughout, showing a good representation of the impact of the existing road network. In practice high calibration accuracy is unlikely to alter the conclusions of this assessment, as the difference in vehicle movements is the primary assessment parameter and this can only be derived from the ATC data until such time the development is in operation.

3.27 Two scenarios have been considered, the harvest periods and the non-harvest periods. Each period has been compared against the existing baseline to determine the change in sound levels over the short-term and the long-term.

3.28 Figures 3.4 to 3.7 show the above scenarios over the short and long term in colour banding representative of the DRMB magnitude of impact.

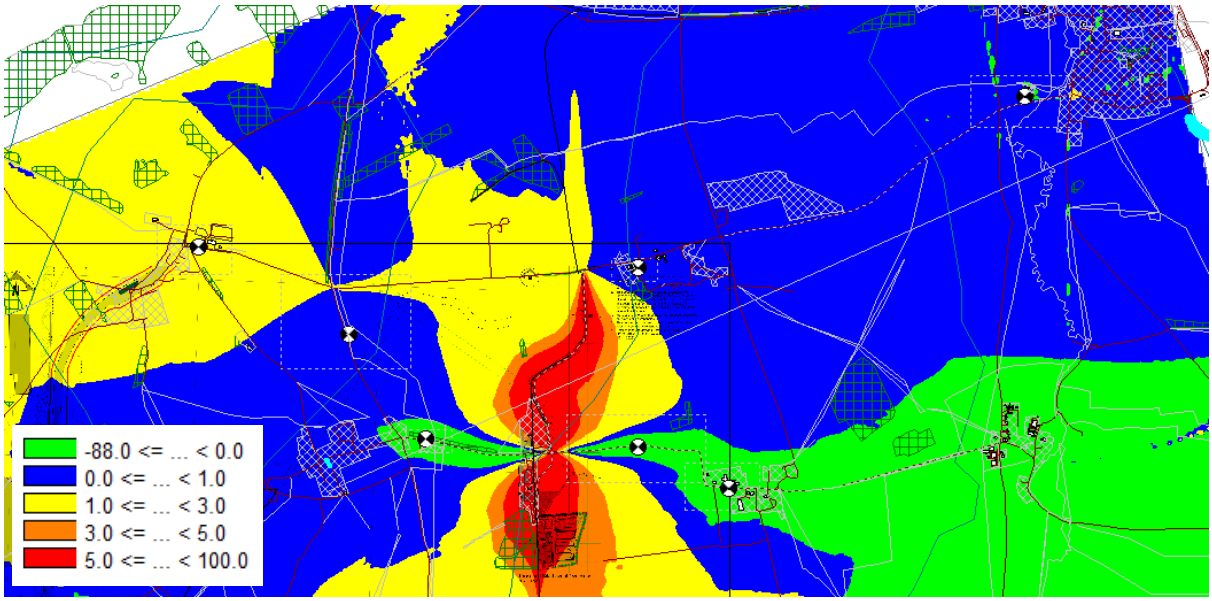

Figure 3.4: Harvest Period – Short Term Impact

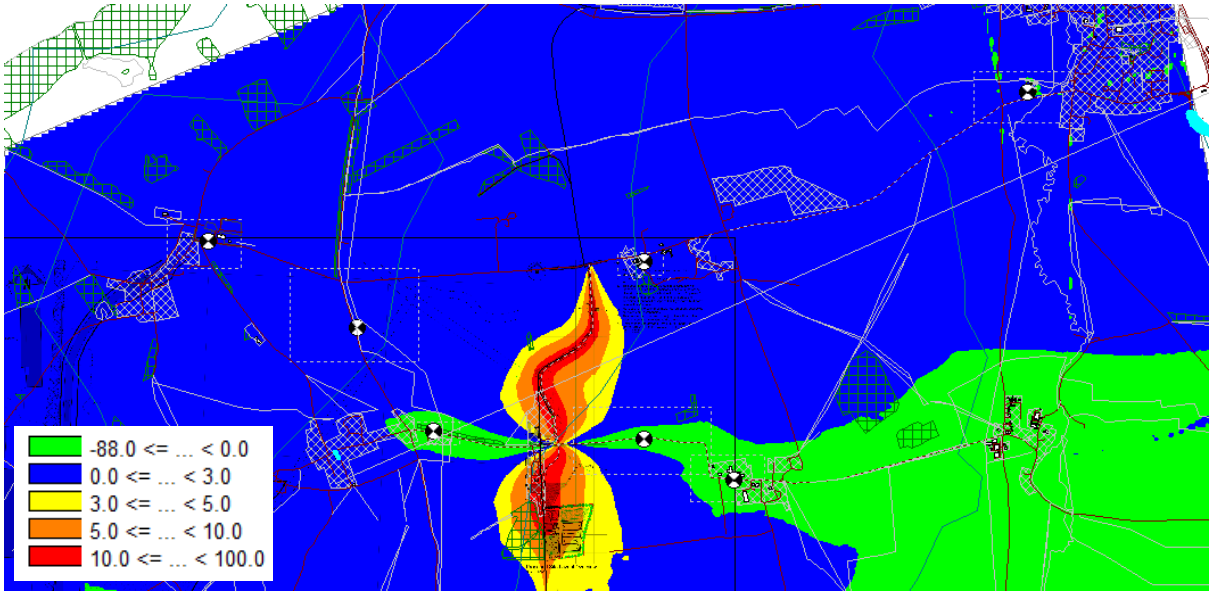

Figure 3.5: Harvest Period – Long Term Impact

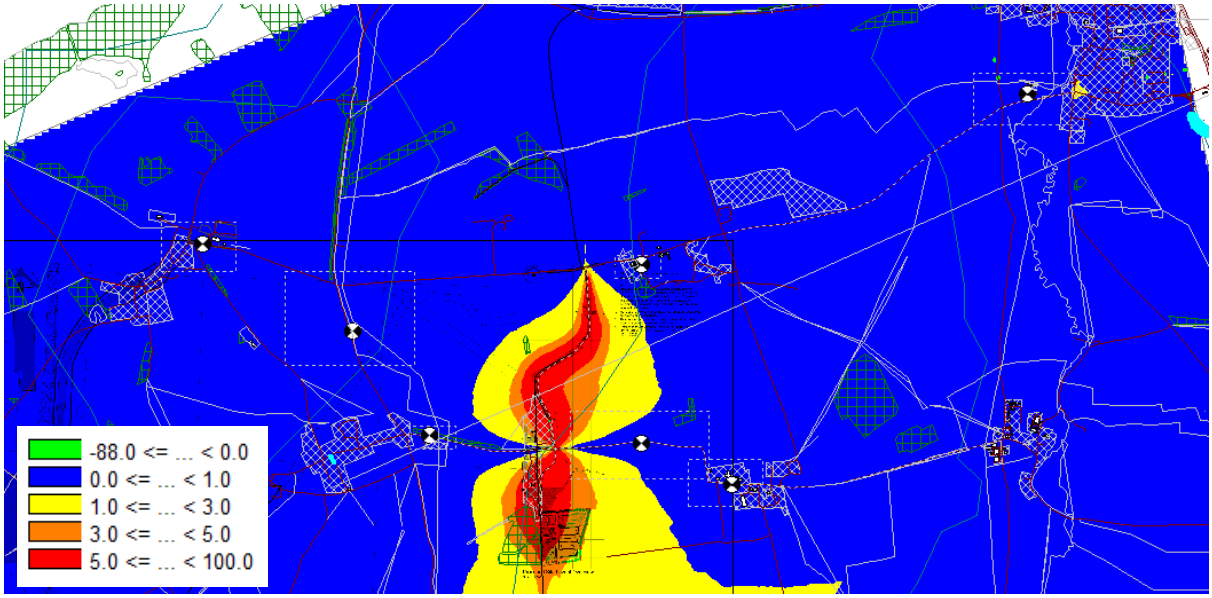

Figure 3.6: Non-Harvest Period – Short Term Impact

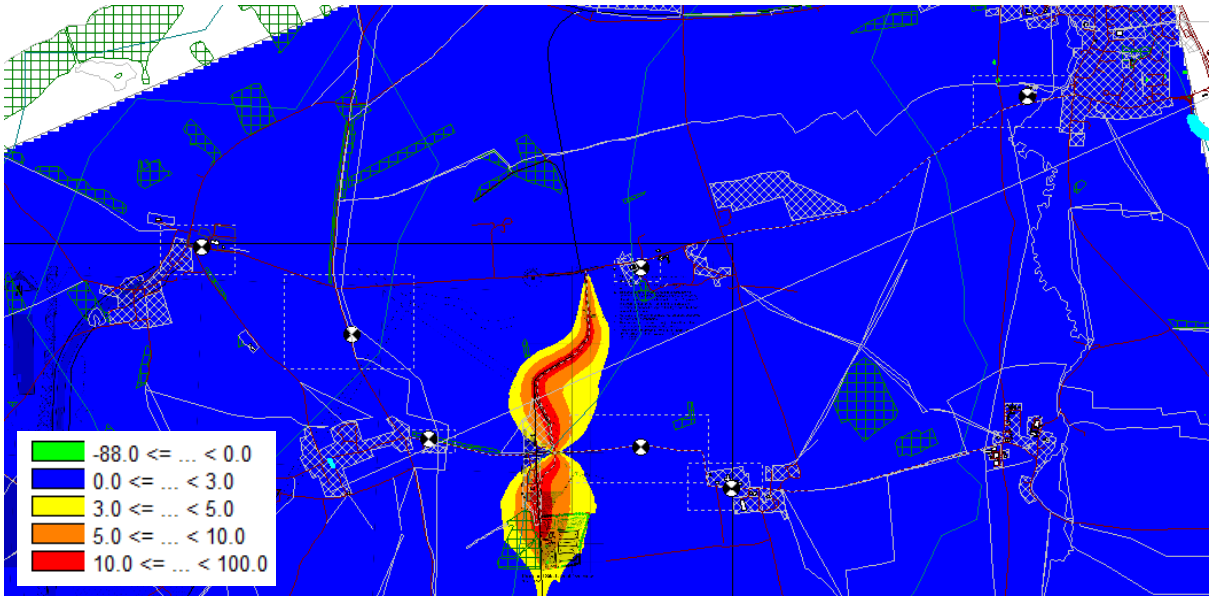

Figure 3.7: Non-Harvest Period – Long Term Impact

3.29 Modelling during the harvest period shows a section of improved sound levels (shown in green) this is due to a decrease in HGV movements along Gunby Road, Sewstern Road and Main Street. HGV movements on the access road has shown that an increase in sound will be present near the road, but all nearby receptors are shown to have a negligible to minor short term and negligible long-term impact.

3.30 During the non-harvest periods the impact to noise sensitive receptors is shown to be negligible over the short term and long-term periods as specified in the DMRB.

3.31 Of course, once the development is operational there will also be the potential for the ongoing seasonal variations to be perceived. We have therefore compared the short-term impact between the harvest season and the non-harvest season as shown in Figures 3.8 to 3.11 below.

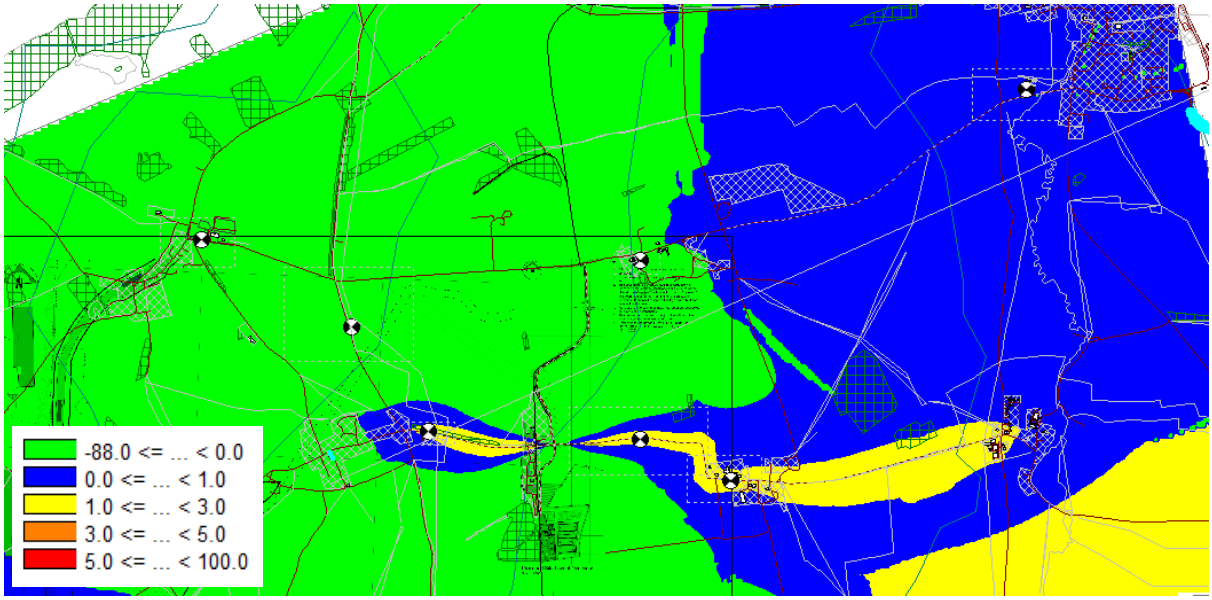

Figure 3.8: Non-Harvest Period – Short Term Impact

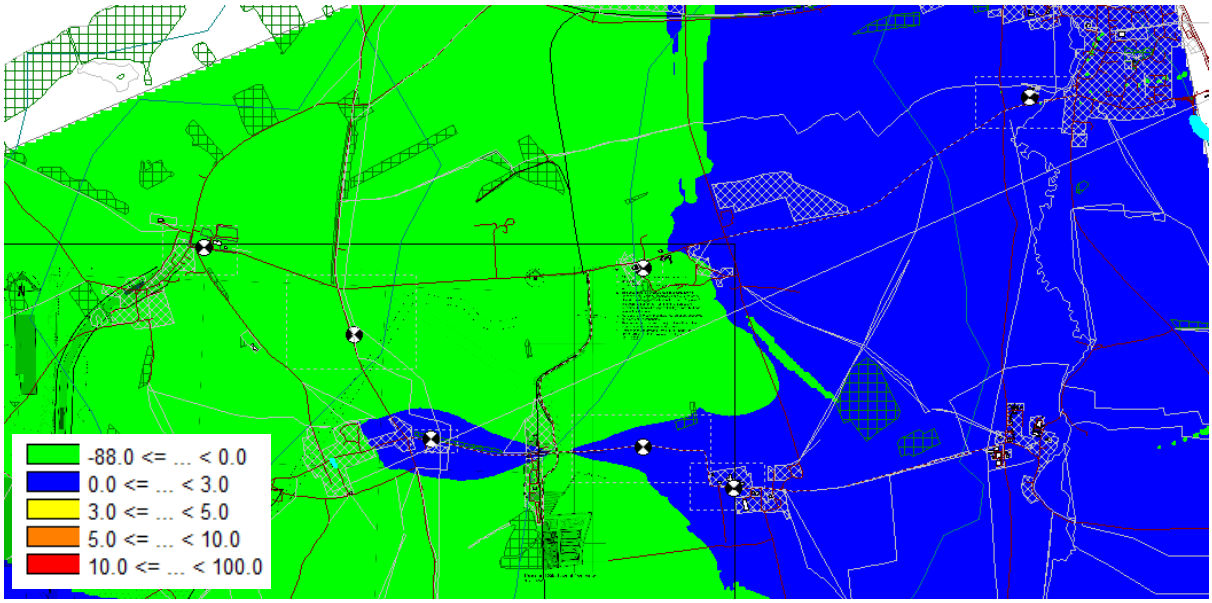

Figure 3.9: Non-Harvest Period – Long Term Impact

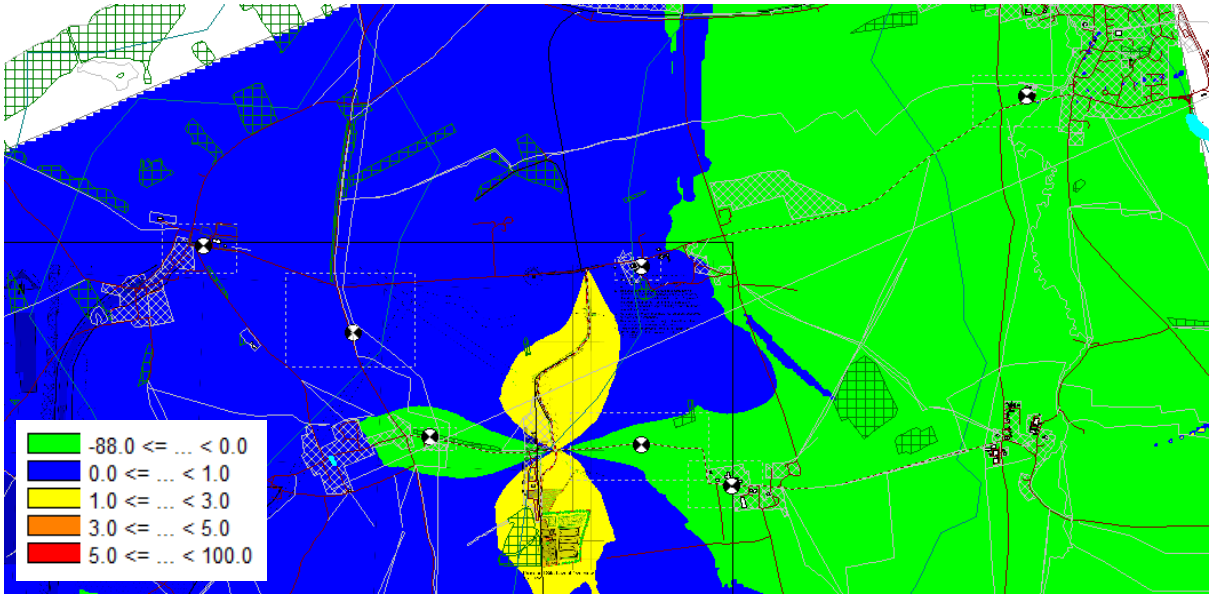

Figure 3.10: Harvest Period – Short Term Impact

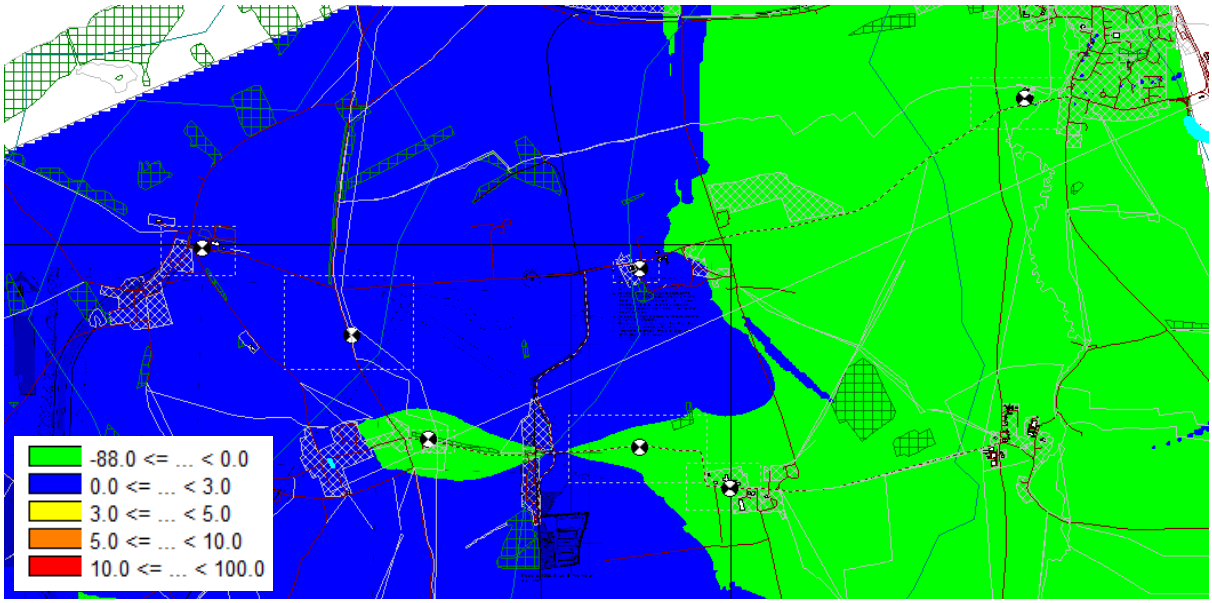

Figure 3.11: Harvest Period – Long Term Impact

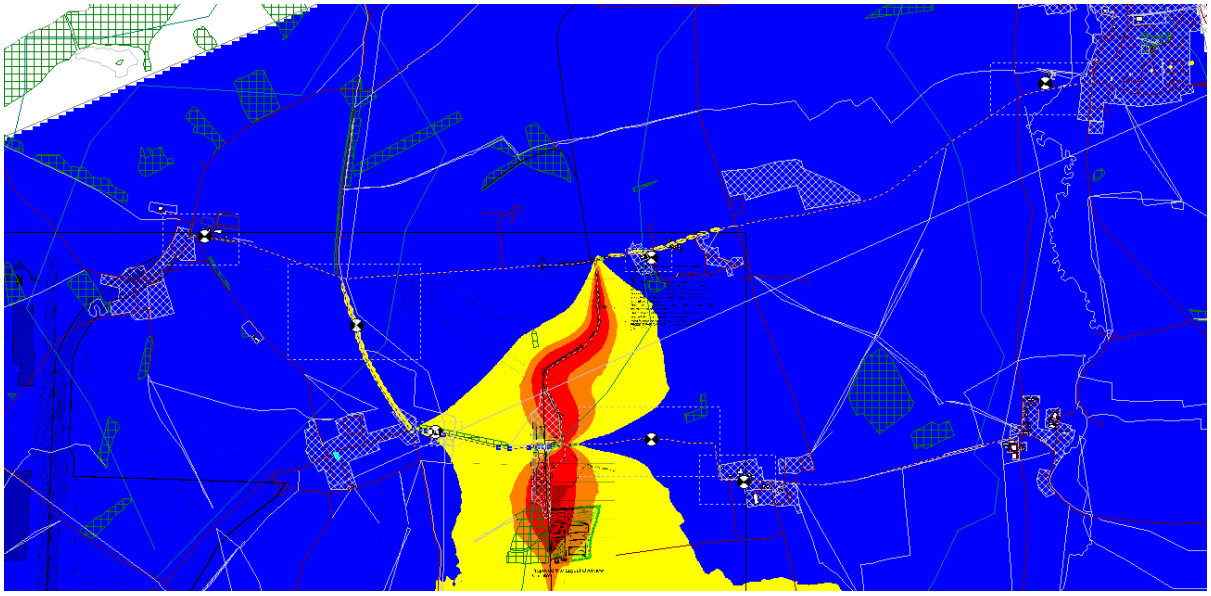

Figure 3.12: Construction Period– Short Term Impact

Noise Conclusions

3.32 When the site is undergoing construction there will also be a degree of site traffic using the surrounding road networks, mainly the B676 between the HGV access road and the A1.. This is generally considered a short-term impact as the construction phase is finite, and the modelling has shown that the impact would be negligible to minor adverse..

3.33 It can therefore be concluded that the introduction of the new AD Plant would not give rise to a significant adverse impact on the surrounding sensitive properties.

3.34 As part of the assessment, we undertook long term noise monitoring at five locations around the site.

3.35 The existing measured night time sound levels were found to be above the LOAEL (40 dB $L_{night,outside}$) and at long term measurement 3 the existing sound level was measured to be above the SOAEL (55 dB $L_{night,outside}$). For this reason, our assessment has focused on the Magnitude of Change methodology, as opposed to absolute sound levels.

3.36 We have reviewed the traffic predictions for the scheme during harvest seasons and non-harvest seasons and compared the increase in sound levels against the guidance contained in DMRB.

3.37 The assessment found negligible to minor adverse impacts to noise sensitive receptors over both the short term and long term as specified by the DMRB.

3.38 Seasonal variations between harvest and non-harvest periods show a moderate short term impact and low long term adverse impact to some noise sensitive receptors. However, this area is already located close to several working farms and given the rural nature of the area, is expected to overestimate the significance of impact to these receptors.

3.39 During the construction phase the assessment found to be negligible to minor adverse impacts to noise sensitive receptors over the short term as specified by the DMRB.

3.40 An acoustic assessment for the operation of the AD plant has been undertaken by Sharps Redmore, which has provided the predicted specific sound level of the operation of the AD plant, along with the noise rating limits in terms of dB $L_{Aeq,1hour}$. The sound pressure levels at the closest sensitive receptors have been predicted to be below the rating levels at all noise sensitive receptors.

3.41 The cumulative effect of the noise levels from the AD plant and the effects of road traffic noise, as a direct result of the additional transportation for supply of biogas material, would be negligible.

3.42 We are therefore of the opinion that the introduction of the new AD plant would not give rise to a significant adverse impact to the surrounding sensitive properties.

4.0 AIR QUALITY

Baseline

4.1 Baseline data was gathered from the following sources:

- UDC's 2024 Air Quality Annual Status (ASR) Report;
- DEFRA's UK AIR website; and
- DEFRA's national air quality background maps 2021.

Local Air Quality Management

Air Quality Management Areas

4.2 As required by the Environment Act (1995), SKDC has undertaken a review and assessment of air quality within their administrative area. This process has indicated that annual mean NO_2 concentrations are above the AQO within the district. One AQMA has therefore been declared. This is described as:

"SKDC AQMA No.6 - Manthorpe Road, Wharf Road, High Street and London Road."

4.3 The development is located approximately 13.5 km southwest of the AQMA and it is unlikely that the proposals would give rise to air quality impacts at this distance. As a result, the AQMA has not been considered further in this assessment.

4.4 SKDC has concluded that concentrations of all other pollutants are currently below the relevant AQOs. As such, no further AQMAs have been designated.

Air Quality Monitoring Data

4.5 Monitoring of pollutant concentrations is carried out by SKDC across its area of jurisdiction. However, the nearest monitoring site to the proposed facility is located approximately 13.5 km northeast of the site, within Grantham. Given the distance and differing surrounding land uses, it is unlikely that pollutant levels at the monitoring location are representative of conditions at the development site. Therefore, this data has not been considered further in the assessment.

Mapped Background Pollution

4.6 Predictions of background pollutant concentrations on a 1km-by-1km grid basis have been produced by DEFRA for the entire of the UK to assist Local Authorities (LAs) in their Review and Assessment of air quality.

4.7 The proposed development site is located in grid squares NGR: 490500, 321500. Predicted background concentrations for the baseline year (2023), the present year (2025), and 2027, when the development is expected to be fully completed, are shown in Table 4.1.

Pollutant	Predicted Background Concentration (µg/m³)		
	2023	2025	2026
NO_X	7.07	6.73	6.36
NO_2	5.62	5.35	5.07
PM_{10}	13.86	13.71	13.56
$PM_{2.5}$	6.34	6.21	6.08

Table 4.1: DEFRA Predicted Background Concentrations

4.8 As shown in Table 4.1, background concentrations do not exceed the relevant AQOs and are predicted to reduce further in the completion year 2027. These predictions are considered to reasonably represent background concentrations in the vicinity of the site.

Monitored NO_2, PM_{10}, and $PM_{2.5}$ Concentrations

4.9 To assess baseline pollutant concentrations, real-time monitoring was carried out from 23 June to 6 July 2025 using AQS1 monitors at three locations: Stainby, Gunby, and Sewstern. The monitoring locations are presented in Table 4.2 and shown in Figure 4.1.

4.10 The AQS1 monitors measures NO_2, PM_{10} and $PM_{2.5}$ concentrations in real time with data available to the consultant instantaneously.

Monitor	Location		
	Address	X	Y
1353	1 Colsterworth Road, Stainby	490679	322886
847	Main Street, Gunby	491315	321600
836	Gunby Road, Sewstern	489409	321869

Table 4.2: Location of the Real Time monitors

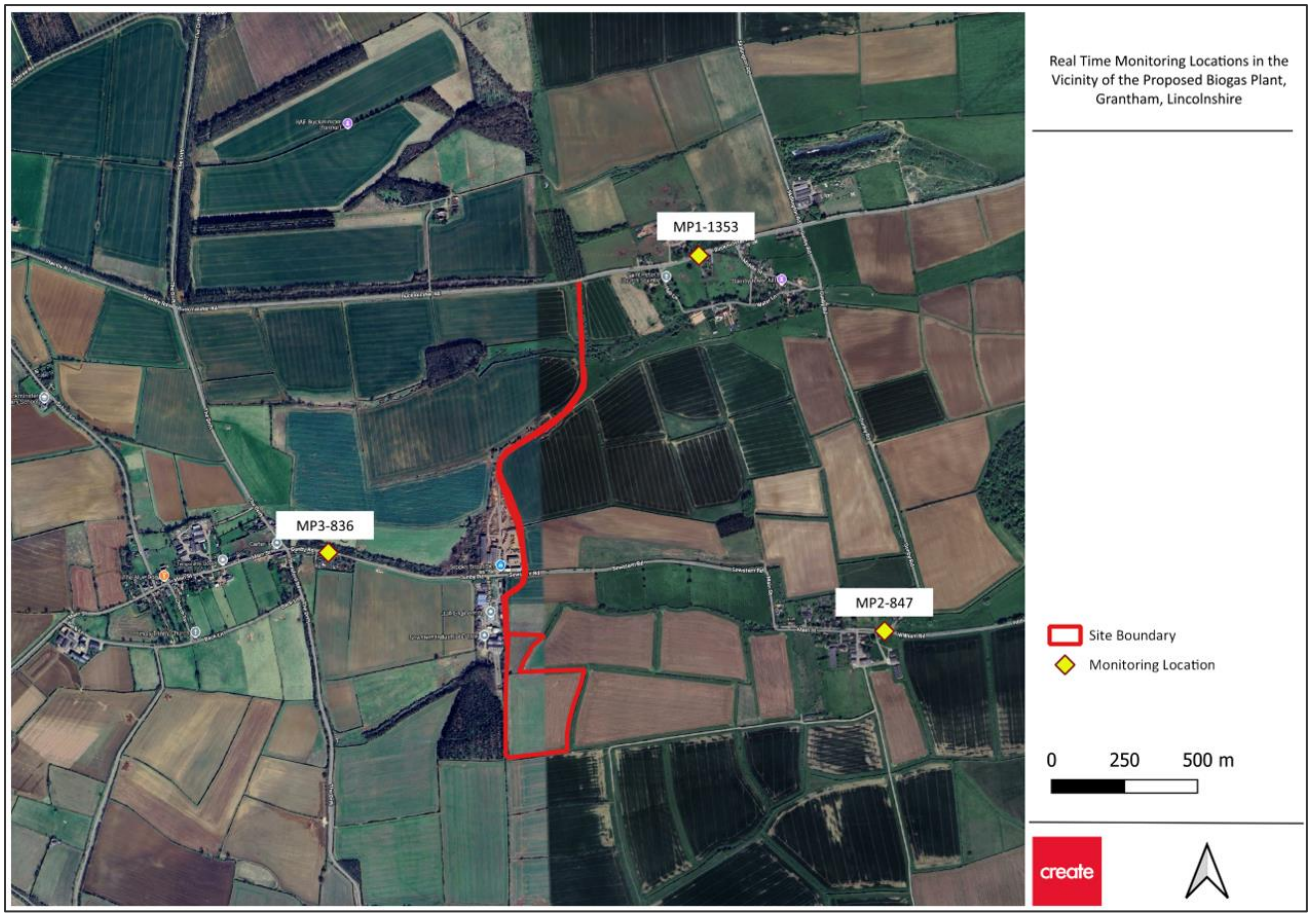

Figure 4.1: Real Time Monitoring Locations

Baseline Monitored Data

4.11 Air quality monitoring was conducted from 23 June to 6 July 2025 at three locations: Stainby, Gunby, and Sewstern, using AQS1 monitors. The results are presented in Figures 3.2 to 3.10.

Hourly Concentrations

4.12 Figure 4.2 presents hourly NO_2 concentrations. The highest levels were recorded by monitor 847 in Gunby, with a peak of 32.58 µg/m³ on 5 July 2025.

4.13 Figure 4.3 shows hourly PM_{10} concentrations. Again, monitor 847 in Gunby recorded the highest values, reaching a maximum of 36.62 µg/m³ on 27 June 2025.

4.14 Figure 4.4 displays hourly $PM_{2.5}$ concentrations. Monitor 847 in Gunby recorded the highest hourly value of 21.15 µg/m³ on 2 July 2025. However, the average $PM_{2.5}$ concentration across the monitoring period remained below 7 µg/m³.

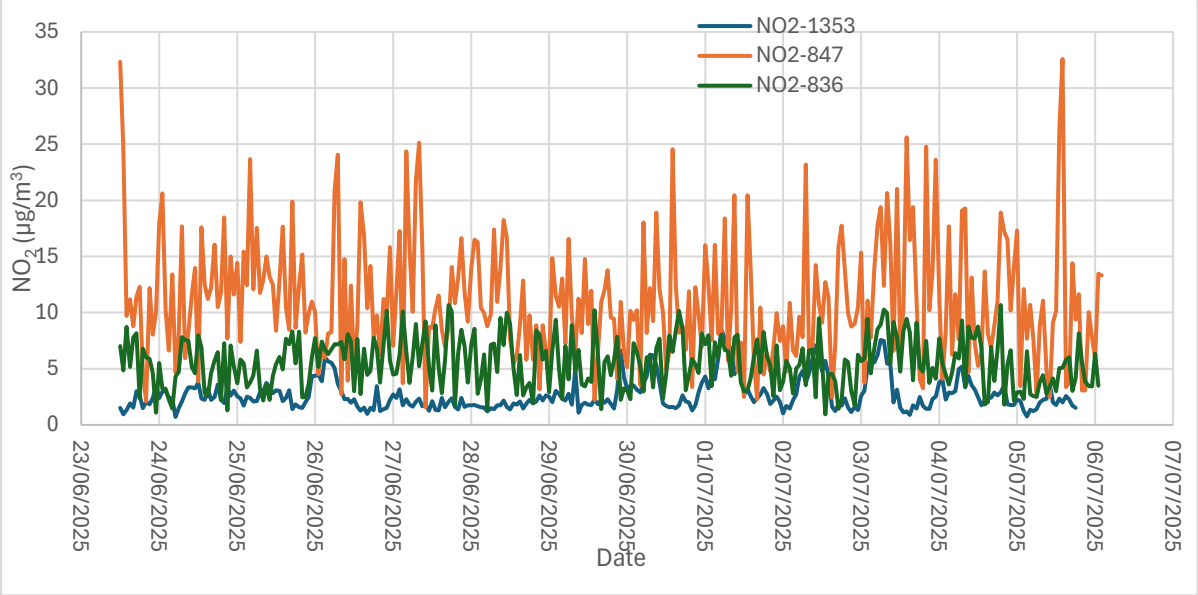

Figure 4.2: Hourly NO_2 Data

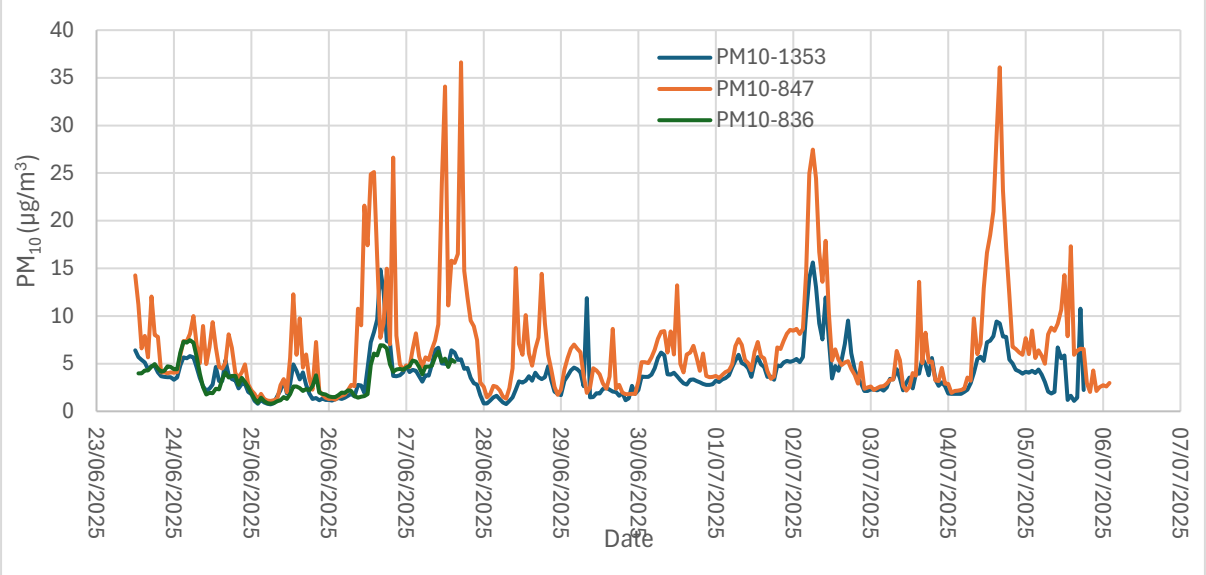

Figure 4.3: Hourly PM_{10} Data

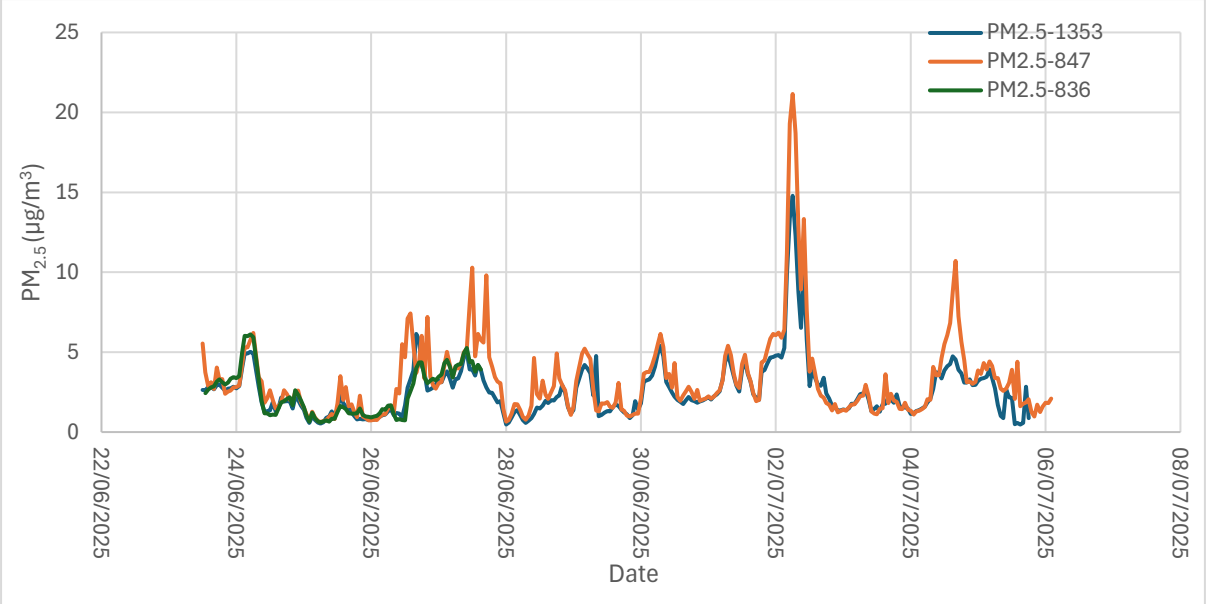

Figure 4.4: Hourly $PM_{2.5}$ Data

24-Hour Mean Concentrations

4.15 Figures 4.5 to 4.7 show 24-hour mean concentrations for NO_2, PM_{10}, and $PM_{2.5}$.

4.16 Figure 4.5: The highest 24-hour mean NO_2 concentration was 13.79 µg/m³ on 3 July 2025, recorded by monitor 847 in Gunby.

4.17 Figure 4.6: The highest 24-hour mean PM_{10} concentration was 11.48 µg/m³ on 27 June 2025, also recorded by monitor 847

4.18 Figure 4.7: The highest 24-hour mean $PM_{2.5}$ concentration was 6.71 µg/m³ on 2 July 2025, with average values remaining below 5 µg/m³ throughout the monitoring period.

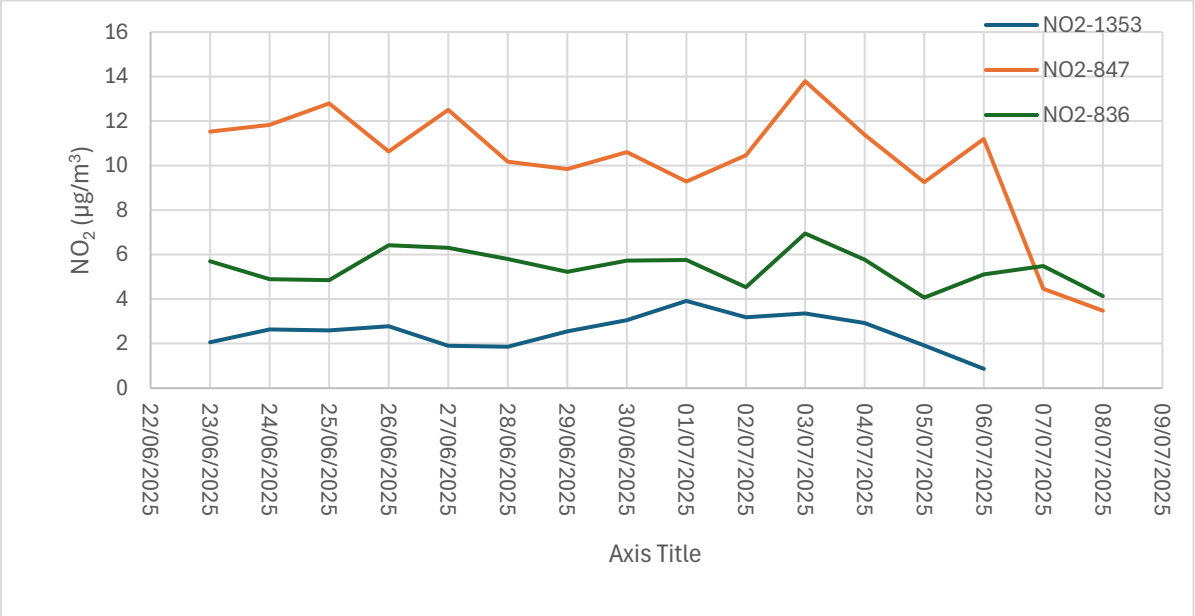

Figure 4.5: 24-Hour NO_2

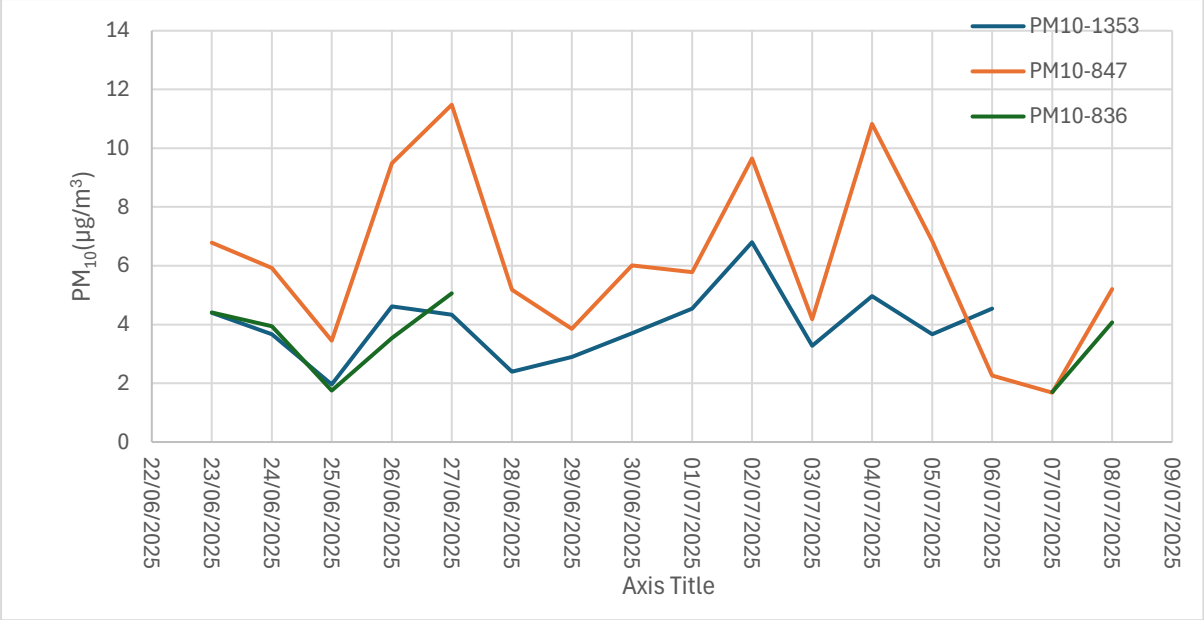

Figure 4.6: 24-Hour PM_{10}

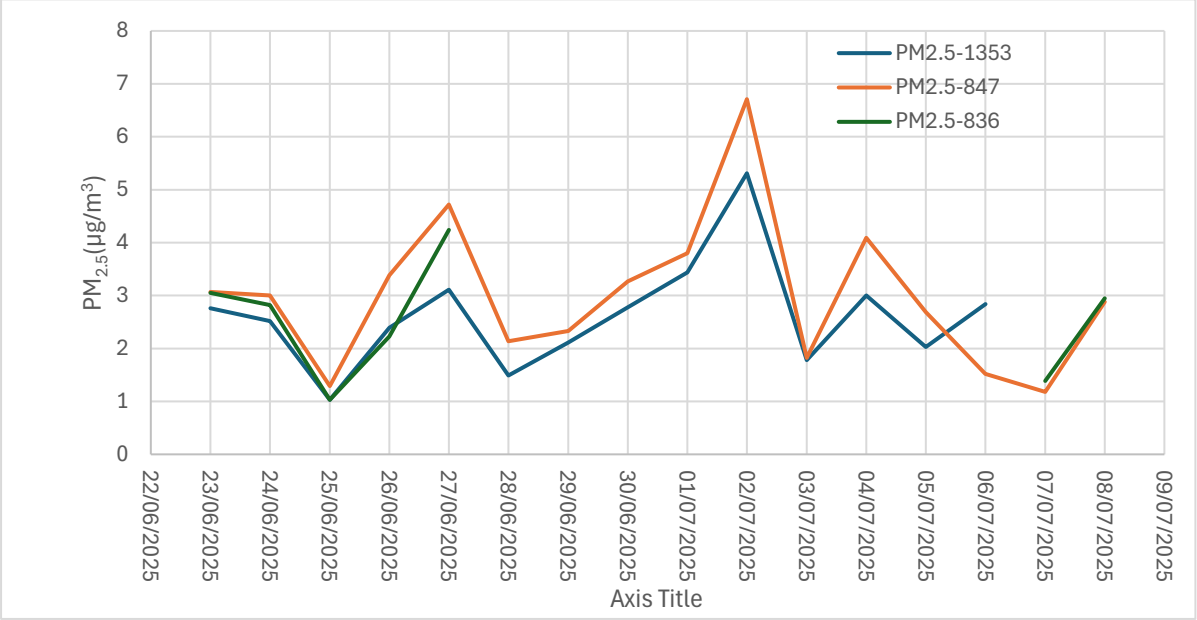

Figure 4.7: 24-Hour $PM_{2.5}$

Summary

4.19 Real-time monitoring was conducted over a two-week period using AQS1 monitors at three locations. As the monitoring duration was less than three months, annualization of the data was not performed, in accordance with LAQM TG22 guidance. Nonetheless, the data provides a useful overview of local air quality.

4.20 The results indicate low pollutant concentrations across all sites, suggesting good air quality in the area:

- The maximum hourly NO_2 concentration was 32.58 µg/m³, well below the AQO of 200 µg/m³.
- The maximum 24-hour PM_{10} concentration was 11.48 µg/m³, significantly below the AQO of 50 µg/m³.

Operational Assessment

Sensitive Receptor Locations

4.21 Sensitive receptors R1–R6 have been modelled at locations along road links potentially affected by traffic generated by the proposed biogas plant, as detailed in Table 4.3 and shown in Figure 4.8. These receptors were modelled at a height of 1.5 m to represent ground-level exposure.

Monitor	Location		
	Name	X	Y
R1	3 Main Street	489258	321868
R2	1 Main St	489263	321863
R3	Middle Street	490951	322966
R4	2 Colsterworth Rd	490699	322880
R5	Buckminster Road	490496	322837
R6	Buckminster Road	488146	322937

Table 4.3: Sensitive Receptor Locations

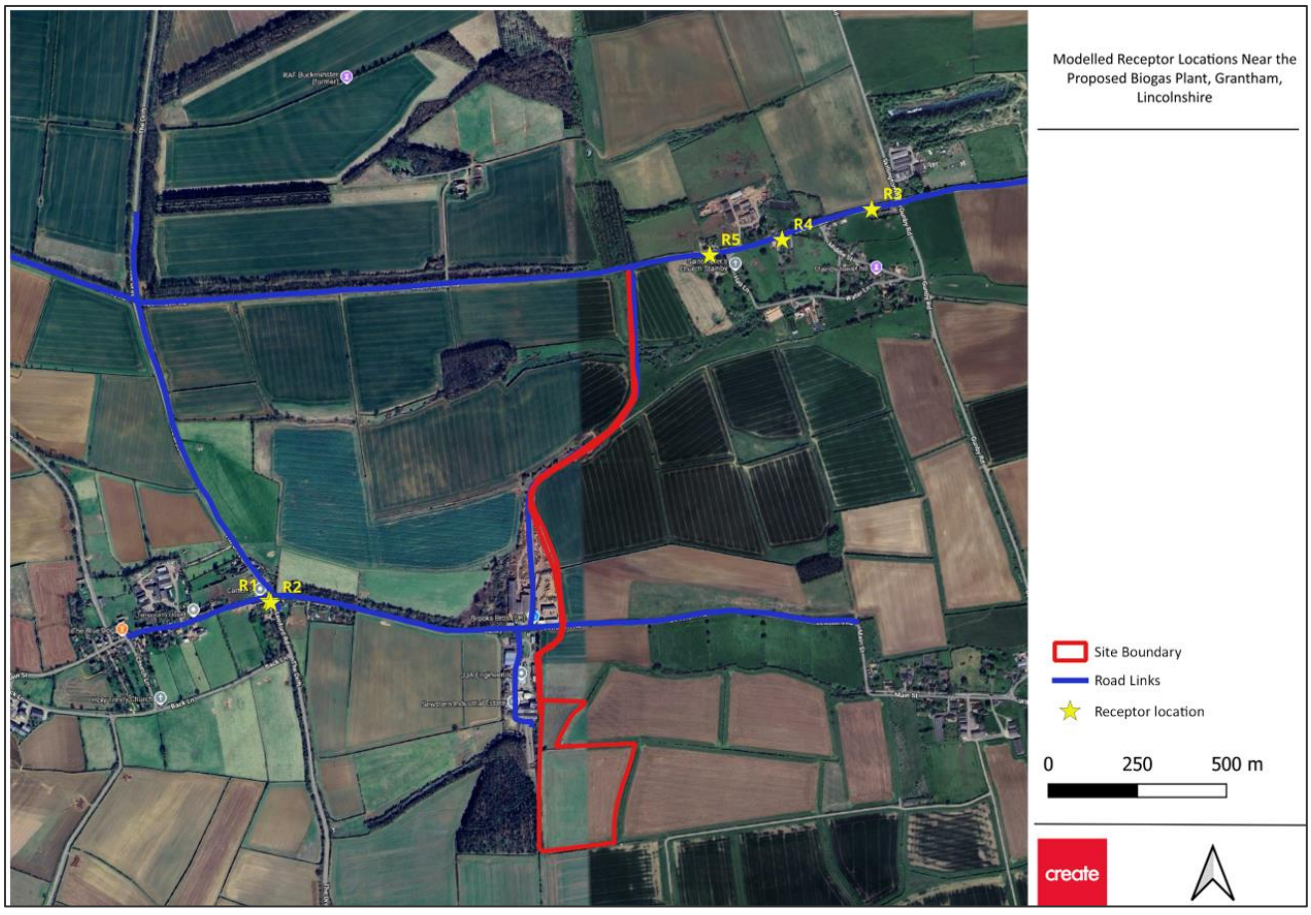

Figure 4.8: Sensitive Receptor Location

4.22 To assess NO_2, PM_{10} and $PM_{2.5}$ concentrations across the site, detailed dispersion modelling was undertaken in accordance with the following methodology.

Dispersion Model

4.23 Dispersion modelling was undertaken using the ADMS-Roads Extra dispersion model (version 5.0.1.3). ADMS-Roads Extra is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

Input Data

4.24 The model requires input data that details the following parameters:

- Emission Factors;
- Traffic Flow Data;
- Diurnal Profiling;
- Energy Inputs;
- Meteorological data;
- Roughness length;
- Monin-Obukhov length;
- Background Concentrations;
- Verification Factor; and
- Sensitive Receptor Locations.

4.25 For details of the various input data as listed below please refer to the Air Quality Assessment, Reference TR/VL/P25-3541/03.

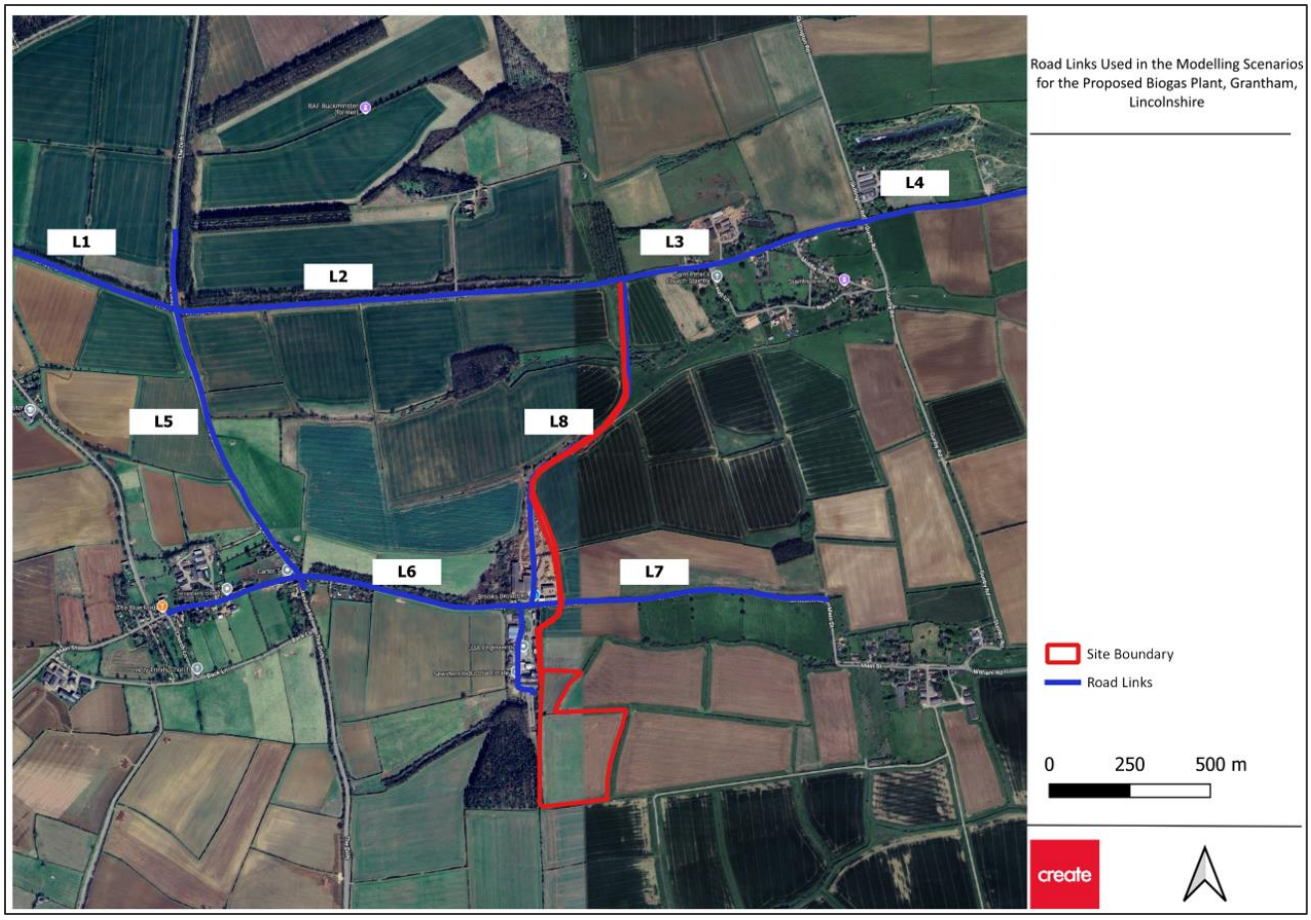

Figure 4.9: Road Links Included in the Modelling Scenarios

4.26 The dispersion modelling assessment has been undertaken to determine annual concentrations of NO_2, PM_{10} and $PM_{2.5}$ at existing sensitive receptors for the expected operational year of 2025.

4.27 Existing receptor locations were modelled along the affected road links associated with the operation of the development, at a height of 1.5 m to represent ground floor level. These receptor locations serve as a robust proxy for user exposure, although in reality, the properties are set back from the road.

4.28 Predicted pollutant concentrations for the proposed opening year of the development, 2027, for both the non-harvest and harvest periods, are presented in Tables 4.6 to 4.11.

Nitrogen Dioxide (NO_2) Impacts

4.29 In accordance with the assessment criteria the NO_2 concentrations were predicted for both non-harvest and harvest scenarios and are summarised in Table 4.6.

Sensitive Receptor	Predicted Annual Mean NO_2 Concentration (µg/m³)		
	Non-Harvest	Harvest	Change
R1	8.52	8.35	-0.1700
R2	8.46	8.33	-0.1300
R3	11.76	11.72	-0.0400
R4	10.28	10.26	-0.0200
R5	13.56	13.53	-0.0300
R6	9.66	9.77	0.1100

Table 4.6: Predicted NO_2 Concentrations for Harvest and Non-Harvest Scenarios

4.30 As indicated in Table 4.6, predicted NO_2 concentrations are below the AQO at all modelled sensitive receptor locations. There are small changes in concentration with the development in place.

4.31 R1 to R5 receptor locations will experience a decrease in annual NO_2 concentrations due to changes in traffic patterns with the operational development in place.

4.32 Impacts on the Air Quality Assessment Level (AQAL) for the predicted annual mean NO_2 concentrations at the human sensitive receptor locations are summarised in Table 4.7.

Sensitive Receptor	% Change in Concentration Relative to AQAL	Long Term Average Concentration	Impact
R1	-2.0359	20.88	Negligible
R2	-1.5606	20.83	Negligible
R3	-0.3413	29.30	Negligible
R4	-0.1949	25.65	Negligible
R5	-0.2217	33.83	Negligible
R6	1.1259	24.43	Negligible

Table 4.7: Predicted NO_2 Impacts as a Result of the Development

4.33 Overall, as indicated in Table 4.7, the significance of impacts of NO_2 concentrations as a result of the development were predicted to be negligible at all receptor locations, in accordance with EPUK-IAQM guidance.

4.34 Predictions of 1-hour NO_2 concentrations were not produced as part of the dispersion modelling assessment. However, as stated in LAQM.TG22, if annual mean NO_2 concentrations are below 60 µg/m³ then it is unlikely that the 1-hour AQO will be exceeded. As such, it is not predicted that concentrations will exceed the 1-hour mean AQO for NO_2 across the modelled site for the development's proposed operational year, 2027.

4.35 It should also be noted that background NO_2 levels are likely to be lower at elevated heights due to increased distance from emission sources, such as the local road network. Therefore, predicted concentrations at heights above ground floor level are considered to be acceptable in regard to pollutant exposure across all receptor locations and have not been assessed further.

Particulate Matter (PM_{10}) Impacts

4.36 In accordance with the assessment criteria the annual mean PM_{10} concentrations were predicted for both non harvest and harvest scenarios and are summarised in Table 4.8.

Sensitive Receptor	Predicted Annual Mean PM_{10} Concentration ($\mu g/m^3$)		
	Non-Harvest	Harvest	Change
R1	14.67	14.61	-0.0600
R2	14.63	14.59	-0.0400
R3	15.32	15.26	-0.0600
R4	14.91	14.86	-0.0500
R5	15.68	15.61	-0.0700
R6	14.73	14.82	0.0900

Table 4.8: Predicted Annual Mean PM_{10} Concentrations for Harvest and Non-Harvest Scenarios

4.37 As indicated in Table 4.8, predicted annual mean PM_{10} concentrations are below the AQO at all the modelled sensitive receptor locations. There are small changes in concentration with the development in place.

4.38 R1 to R5 receptor locations will experience a decrease in PM_{10} concentrations due to changes in traffic patterns with the operational development in place.

4.39 Impacts on the AQAL for the predicted annual mean PM_{10} concentrations at sensitive receptor locations are summarised in Table 4.9.

Sensitive Receptor	% Change in Concentration Relative to AQAL	Long Term Average Concentration	Impact
R1	-0.4107	73.05	Negligible
R2	-0.2742	72.95	Negligible
R3	-0.3932	76.30	Negligible
R4	-0.3365	74.30	Negligible
R5	-0.4484	78.05	Negligible
R6	0.6073	74.10	Negligible

Table 4.9: Predicted PM_{10} Impacts as a Result of the Development

4.40 As indicated in Table 4.9, impacts on annual mean PM_{10} concentrations as a result of the development were predicted to be negligible at all receptor locations, in accordance with EPUK-IAQM guidance.

4.41 The assessment shows a negligible impact with the development in place and predicted annual PM_{10} concentrations below the AQO. Therefore, the site is considered to be suitable for the proposed use without the implementation of mitigation techniques to protect existing receptors from elevated PM_{10} concentrations.

Particulate Matter ($PM_{2.5}$) Impacts

4.42 In accordance with the assessment criteria the annual mean $PM_{2.5}$ concentrations were predicted for both non harvest and harvest scenarios and are summarised in Table 4.10.

Sensitive Receptor	Predicted Annual Mean $PM_{2.5}$ Concentration (µg/m³)		
	Non-Harvest	Harvest	Change
R1	6.76	6.73	-0.0300
R2	6.73	6.71	-0.0200
R3	7.17	7.14	-0.0300
R4	6.95	6.92	-0.0300
R5	7.40	7.35	-0.0500
R6	6.85	6.90	0.0500

Table 4.10: Predicted Annual Mean $PM_{2.5}$ Concentrations for Harvest and Non-Harvest Scenarios

4.43 As indicated in Table 4.10, predicted annual mean $PM_{2.5}$ concentrations are below the legally binding target, 10 µg/m³ AQO at all modelled sensitive receptor locations. There are small changes in concentration with the development in place.

4.44 R1 to R5 receptor locations will experience a decrease in $PM_{2.5}$ concentrations due to changes in traffic patterns with the operational development in place.

4.45 The impacts on the AQAL for predicted annual mean $PM_{2.5}$ concentrations at sensitive receptor locations, with respect to the legally binding target of 10 µg/m³ AQO, are summarised in Table 4.11.

Sensitive Receptor	% Change in Concentration Relative to AQAL	Long Term Average Concentration	Impact
R1	-0.4458	67.30	Negligible
R2	-0.2981	67.10	Negligible
R3	-0.4202	71.40	Negligible
R4	-0.4335	69.20	Negligible
R5	-0.6803	73.50	Negligible
R6	0.7246	69.00	Negligible

Table 4.11: Predicted $PM_{2.5}$ Impacts as a Result of the Development

4.46 As indicated in Table 4.11, impacts on annual mean $PM_{2.5}$ concentrations as a result of the development were predicted to be negligible at all of receptor locations, in accordance with EPUK-IAQM guidance.

4.47 It should also be noted that background NO_2, PM_{10}, and $PM_{2.5}$ levels are likely to be lower at elevated heights due to increased distance from emission sources, such as the local road network. Therefore, predicted concentrations at heights above ground floor level are considered to be acceptable in regard to pollutant exposure across all receptor locations and have not been assessed further.

Air Quality Conclusions

4.48 Create Consulting Engineers Limited (CCE) have been appointed by Ironstone Energy Ltd to undertake an Air Quality Assessment in support of a proposed biogas plant at Land south of Sewstern Industrial Estate on Gunby Road in Grantham, Lincolnshire. This report concentrates on transport-related emissions and is intended to supplement the earlier work by Redmore Environmental Ltd.

4.49 Real-time air quality monitoring was undertaken at three locations—Stainby, Gunby, and Sewstern—over a two-week period in summer 2025 to provide baseline data for the assessment. Although the monitoring period was short and therefore not suitable for annualisation in line with LAQM.TG22 guidance, the results offer a useful indication of prevailing air quality conditions.

4.50 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ remained well below relevant Air Quality Objectives throughout the monitoring period, with the highest hourly and daily values recorded at Gunby. These findings indicate that baseline air quality in the vicinity of the proposed development is generally good, and pollutant levels are unlikely to pose a constraint on the scheme.

4.51 The modelled results show predicted annual mean NO_2, PM_{10}, and $PM_{2.5}$ concentrations across the site boundary were below the relevant AQO in the proposed operational year, 2027. The development is therefore considered suitable for the proposed use without the implementation of mitigation techniques for air quality.

4.52 The modelled results indicate that predicted annual mean NO_2, PM_{10}, and $PM_{2.5}$ concentrations at all receptor locations in the 2027 harvest scenario were below the relevant Air Quality Objectives. For all pollutants assessed, the development is predicted to have a negligible impact on existing receptors, in accordance with EPUK/IAQM guidance.

4.53 The AQA by Redmore Environmental Ltd (Ref: 6863r2) concluded that construction traffic would have a negligible impact. This assessment has found that traffic generated during the plant's operation would also result in a negligible impact on local air quality. As construction traffic is short term, its contribution is limited. When considered cumulatively, the combined effect of emissions from the plant, associated operational traffic, and construction activities is still predicted to be negligible, with no significant change in pollutant concentrations at any sensitive receptor.

5.0 CONCLUSION

5.1 This report has been prepared to consider the potential impact on the amenity of the residents of Buckminster, Stainby, Colsterworth, Sewstern and Gunby as result of the proposed construction of a new AD Plant to the east of Sewstern adjacent to Sewstern Industrial Estate. To inform the review new baseline traffic data has been collected within each of the villages, along with a series of noise surveys and Air Quality monitoring.

5.2 The report focusses purely on the impact of potential changes in vehicle movements to and from the site both in the Construction Stage as well as when the plant is operational. Due to the changes that occur in vehicle movements during the harvest period, over that of the non-harvest period the assessment considers both scenarios. The month of October has been chosen to represent the busiest month during harvest and the month of March for non-harvest.

5.3 For each of the scenarios considered a detailed review of the anticipated vehicle movements was considered, looking at all of the various processes that will be undertaken on the site and determining the likely distribution and direction that vehicles will make as a result. These figures were then compared to the baseline traffic data which had been collected in each of the villages and any potential changes identified.

5.4 These collated traffic figures were then used to form the base data for a Noise Impact Assessment and an Air Quality Assessment.

5.5 From this report which summarises the key findings of each of the assessments it can be seen that the proposed AD plant during the construction stage will cause minimal impact to the surrounding villages, with only relatively small increases in HGV movements being identified in Stainby and Colsterworth, leading to negligible to minor adverse Impact of Noise Levels and negligible Impact on Air Quality.

5.6 With respect to when the AD Plant is operational, the traffic figures actually showed that some of the villages would experience a reduction in HGV vehicle movements during the Harvest Period. Looking at the other scenarios considered a large number of the traffic movements that have been modelled in the Noise and AQ assessments are actually reassignments of existing traffic movements already on the network during these periods. The results therefore of these assessments should be considered as an absolute worst case scenario.

5.7 The Air Quality assessment identified that during both the harvest and the non-harvest stages that the impact was Negligible, and the Noise Assessment identified that any impact was considered negligible to minor adverse.

5.8 Looking at the cumulative impact of the plant itself and the potential traffic movements to and from the site it can be concluded that the impact is negligible for both Noise and Air Quality.

5.9 Considering the above results, it can be concluded that the impact caused by the potential changes in traffic movements, as a result of the proposed AD Plant, on the amenity value of the surrounding villages, is Negligible.

Ironstone Energy Limited

PROPOSED ANAEROBIC DIGESTION (AD) PLANT, LINCOLNSHIRE

ES Chapter – Offsite Traffic/Air Quality/Noise

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