



South Holland District Council LAQM Progress Report 2013

Bureau Veritas Air Quality

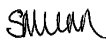



May 2013



Move Forward with Confidence



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Executive Summary

Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work. This Annual Progress Report is a requirement of the Fifth Round of Review and Assessment and is a requirement for all local authorities. The Report has been undertaken in accordance with Technical Guidance LAQM.TG (09) and associated tools (as updated in 2010).

This Annual Progress Report considers all new monitoring data and assesses the data against the Air Quality Strategy (AQS) objectives. It also considers any changes that may have an impact on air quality.

Updated monitoring showed that there were no exceedences of the AQS objectives at any of the monitoring locations within South Holland District Council. Annual mean concentrations of NO₂ have decreased across all diffusion tube monitoring locations and the Westmere continuous monitoring location.

With regards to PM₁₀, the annual mean concentrations at both monitoring sites has shown a decrease from the results in previous years.

Proposed actions arising from the Progress Report are as follows:

- Continue NO₂ diffusion tube and continuous monitoring in the district to identify future changes in pollutant concentrations;
- Continue to monitor the biomass installations at Lambs Flowers Ltd and Oppermans Plants Ltd to ensure they remain within the permitted limits; and
- Proceed to a Progress Report in 2014.

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1 Introduction

1.1 Description of Local Authority Area

The district of South Holland comprises the principal town of Spalding surrounded by the small towns of Holbeach, Long Sutton, Sutton Bridge and Crowland. The rest of the district is rural in character.

The main source of air pollution in the district is road traffic emissions from major roads, notably the A16, A17 and A151 which connect South Holland with North Lincolnshire and the Humber estuary, and south west Lincolnshire. There are currently no Air Quality Management Areas (AQMAS) declared in South Holland.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an AQMA and prepare an AQAP setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an AQS Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in **England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu\text{g}/\text{m}^3$ (milligrams per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1-1 Air Quality Objective included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m ³	Running annual mean	31.12.2003
	5.00 µg/m ³	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m ³	Annual mean	31.12.2004
	0.25 µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀) (gravimetric)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

South Holland District Council undertook the First Round of Review and Assessment of air quality between 1998 and 2001 (Stages 1, 2 and 3). The Stage 2 report recommended further assessment of NO₂ and PM₁₀ emissions in the Port Sutton Bridge Area and NO₂ emissions along the A17 at Holbeach and Sutton Bridge. The Stage 3 report concluded that predicted concentrations of NO₂ and PM₁₀ would be met at these locations and no AQMA was required. The conclusions of the First Round were that all AQS objectives were expected to be met by the target dates based on the available information at that time.

The first phase of the Second Round of Review and Assessment, the USA, was completed in August 2003 and this provided an update with respect to air quality issues in the District. The USA 2003 concluded that no Detailed Assessment of air quality was required. The Progress

Reports 2004 and 2005 similarly concluded that all AQS objectives were expected to be met. A new continuous monitoring site was established in 2003 at Monkhouse School in Spalding to monitor PM₁₀ and NO₂ concentrations, and assess emissions from Spalding Power Station.

The first phase of the Third Round of Review and Assessment, the USA, was completed in June 2006 and this provided a further update with respect to air quality issues in the District. The USA 2006 concluded that all objectives were expected to be met and no Detailed Assessment was required. In 2007 and 2008 the Council submitted annual Progress Reports for air quality. The reports considered the latest monitoring data and concluded that no significant changes in pollutant concentrations had occurred and there were no predicted exceedences of the AQS objectives.

The Fourth Round 2009 USA provided a further update on local air quality and concluded that the objectives for benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide and sulphur dioxide would be met and that there was no requirement to undertake a Detailed Assessment for these pollutants. However, the Council confirmed that there were two poultry farms in Spalding that met the relevant assessment criteria and had nearby relevant exposure with respect to the PM₁₀ objectives. It was therefore proposed that the Council progress to a Detailed Assessment for PM₁₀ at these two poultry farm locations (Fleet Fen Farm Poultry Unit and Chapel Road Poultry Unit) in addition to the 2010 Annual Progress Report.

The Detailed Assessment, which was completed in May 2011, focused on Fleet Fen Farm, near Holbeach, which was considered to be the worst-case scenario due to the farm capacity and proximity of sensitive properties downwind. The report concluded that emissions of PM₁₀ from the turkey-rearing units at Fleet Fen Farm did not present a significant risk of breaching the PM₁₀ AQS objectives, and that there was no need to declare an AQMA.

The Progress Reports 2010 and 2011 concluded that results at all monitoring sites still complied with the AQS objectives, apart from one kerbside site which, in 2009, exceeded the annual mean NO₂ objective. However, there was no relevant exposure near the site to warrant further consideration and this site met the objective in 2010. Both LAQM Progress Reports recommended the continued monitoring at existing sites.

The 2012 Updating and Screening Assessment (USA) concluded that all monitoring sites complied with the AQS objectives. The USA detailed the new Spalding to Eye link road and the Wygate Park to Bourne End link road and recommended that a new diffusion tube monitoring location be installed along the Spalding the Eye link road to monitor the impact that the new road is having upon local air quality.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There is currently automatic monitoring of NO₂ undertaken by South Holland District Council at two locations in the area using chemiluminescence analysers:

- Spalding Monkhouse; and
- Westmere School.

Continuous monitoring of PM₁₀ is also undertaken at these sites using a Tapered Element Oscillating Microbalance (TEOM).

There is additionally monitoring of ozone (O₃) measured by ultra violet absorption at the Westmere School site. Ozone is a trans-boundary pollutant; the sources of ozone are frequently spatially distant from the measured site of the concentrations. Ozone is not prescribed in the Regulations for LAQM and is therefore reported here for information only.

Further details of these monitoring stations are provided in Table 2.1.

Figure 2-1 Map of Continuous Monitoring Sites

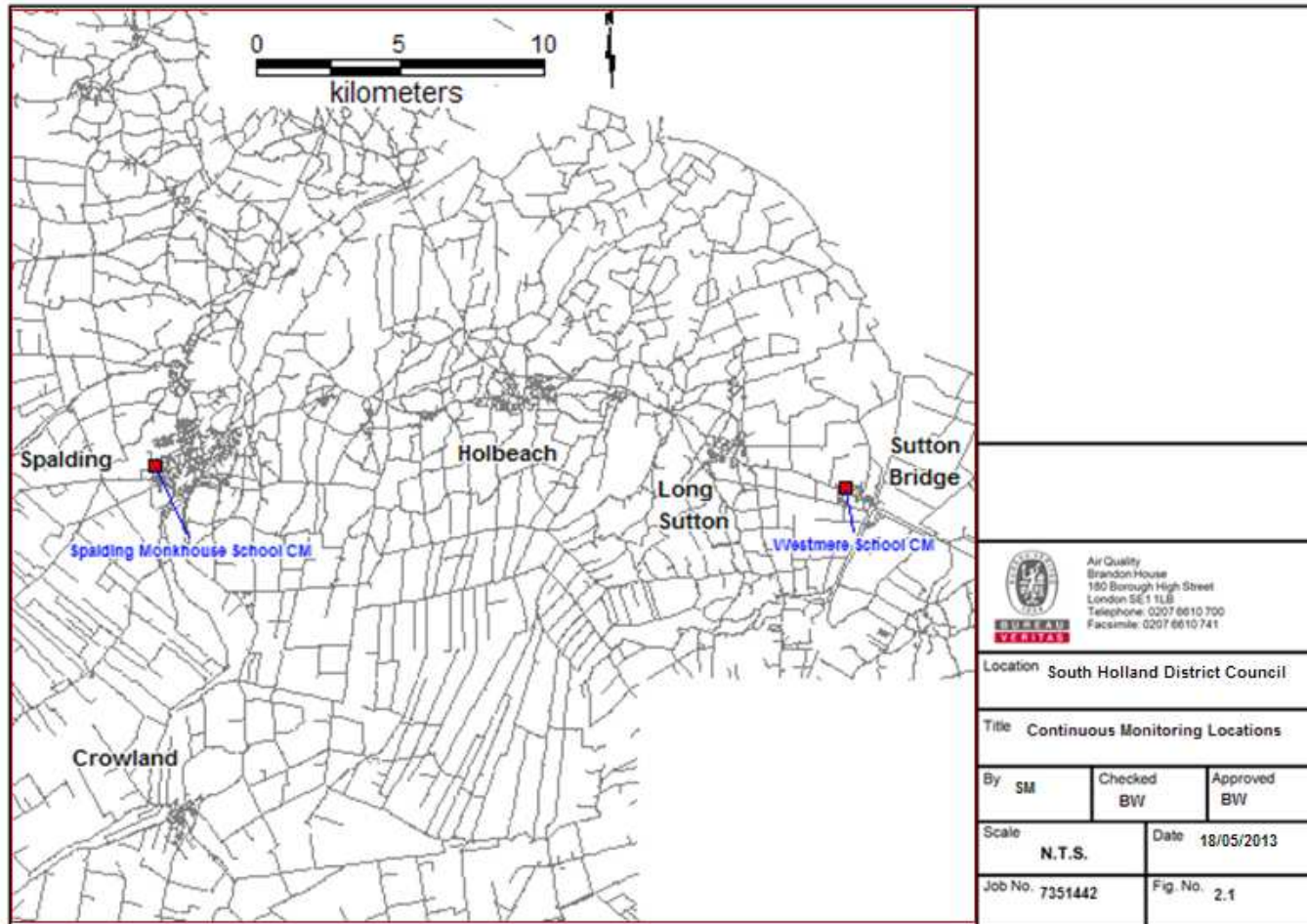


Table 2-1 Details of Automatic Monitoring Sites

Site ID	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
SH1: Spalding Monkhouse School	Urban Background	523168	322454	NO ₂ , PM ₁₀	No	Chemiluminescence, TEOM	Y (1m)	25m	N
SH2: Westmere School	Urban Background	547264	321709	NO ₂ , O ₃ , PM ₁₀	No	Chemiluminescence, UV Absorption, TEOM	Y (14m)	190	N

2.1.2 Non-Automatic Monitoring Sites

South Holland District Council undertook monitoring using passive NO₂ diffusion tubes at 15 sites in 2012. There has been no change in diffusion tube locations from monitoring in previous years.

Diffusion tubes in 2012 were prepared and analysed by Gradko International Limited. The tube preparation method is 50% TEA in acetone. Gradko International participates in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis. This provides strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. In WASP data rounds 118 through to 119 (January to December 2012) Gradko International have scored 100%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Data have been corrected using a bias adjustment factor, which is an estimate of the difference between diffusion tube concentrations and continuous monitoring, the latter assumed to be a more accurate method of monitoring. The technical guidance LAQM.TG (09) provides guidance with regard to the application of a bias adjustment factor to correct diffusion tubes. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data from NO_x / NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

South Holland has a set of diffusion tubes co-located with the continuous analyser at Westmere School. Data capture in 2012 was limited for three periods in the year, June, August and September, as such the survey has poor data capture overall. For this reason the national bias adjustment factor has been used, for the laboratory and tube preparation method it was 1.01 based on 18 studies.

For previous year's data 2008 to 2011, the bias adjustment factors have been taken from the Council's previous LAQM annual reports. The factors used were 1.13 (2008), 1.33 (2009), 0.99 (2010) and 1.28 (2011).

The details of the NO₂ monitoring network are shown in table 2.2 and Figure 2.2.

Figure 2-2 Map of Non-Automatic Monitoring Sites

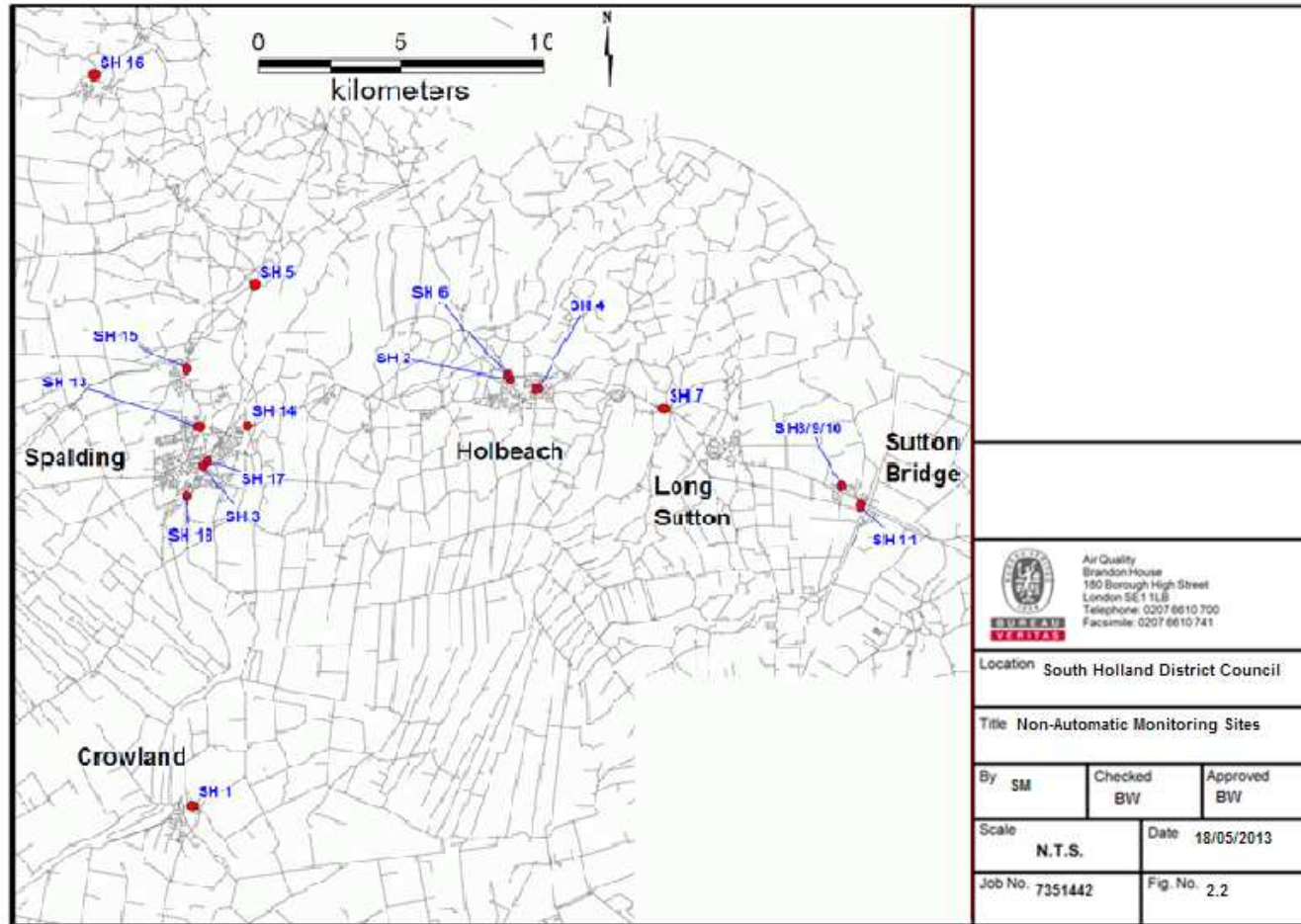


Table 2-2 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure?	Distance to Kerb of Nearest Road (m)	Does this Location Represent Worst-Case Exposure?
21 Millfield Gardens	Background	524388	310520	NO ₂	N	N	Y (6.8m)	2.9m	N
Nutten Stoven	Kerbside	535595	325453	NO ₂	N	N	Y (5.6m)	21.8m	Y
Priory Road	Background	524734	322403	NO ₂	N	N	N (38.4m)	<2m	N
46 The Hollies	Background	536523	325078	NO ₂	N	N	Y (8.4m)	0.2m	N
Station Road	Roadside	526585	328726	NO ₂	N	N	Y (24.9m)	1.5m	Y
103 Boston Road	Kerbside	535525	325589	NO ₂	N	Y	Y (25.7m)	9.5m	Y
Field End	Roadside	541013	324393	NO ₂	N	N	Y (5.9m)	<2m	Y
Westmere (TriPLICATE)	Background	547264	321709	NO ₂	N	Y	N (69.4m)	61.2m	N
Metalair Site	Roadside	547957	321013	NO ₂	N	N	N	<2m	Y
Pinchbeck Road	Kerbside	524595	323793	NO ₂	N	N	Y (20.7m)	0.7m	Y
Springfields Roundabout	Kerbside	526309	323820	NO ₂	N	N	N (54.2m)	11m	Y
Church Street, Pinchbeck	Roadside	524182	325804	NO ₂	N	N	Y (0m)	1.5m	Y
Bicker Road, Donington	Roadside	520917	336064	NO ₂	N	N	Y (7.5m)	16.5m	Y
High Road, Spalding	Roadside	524892	322571	NO ₂	N	N	Y (0m)	1.5m	Y
Hawthorn Bank, Spalding	Roadside	524191	321328	NO ₂	N	N	Y (1.5m)	3m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

There are two Air Quality Objectives for NO₂, namely:

- the annual mean of 40µg/m³, and
- the 1-hour mean of 200µg/m³ not to be exceeded more than 18 times a year.

Automatic Monitoring Data

The Council monitored NO₂ at two locations during 2012. These were the background sites, Spalding Monkhouse and Westmere. Data capture was less than 90% at both sites during 2012; as such the 99.8th percentiles have also been reported for the hourly objective.

The monitoring data can be seen in Table 2.3 and 2.4 below.

Results for 2012 indicate that both the annual mean objective and the 1-hour objective were met at both monitoring locations.

Figure 2.3 shows the trend in NO₂ concentration from 2008 through to 2012 at both monitoring locations. This shows that concentrations peaked in 2009, following this, the annual mean decreased in 2010 and 2011, before increasing once again in 2012.

Table 2-3 Results of Automatic Monitoring for NO₂: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Annual Mean Concentration (µg/m ³)				
					2008	2009	2010	2011	2012
SH1	Background	N	80.3	80.3	15.7	9.9	11.3	11.9	15.3
SH2	Background	N	81.7	81.7	16.2	18.0	18.6	16.2	13.9

Figure 2-3 Trends in Annual Mean NO₂ Concentrations Measured at Automatic Monitoring Sites

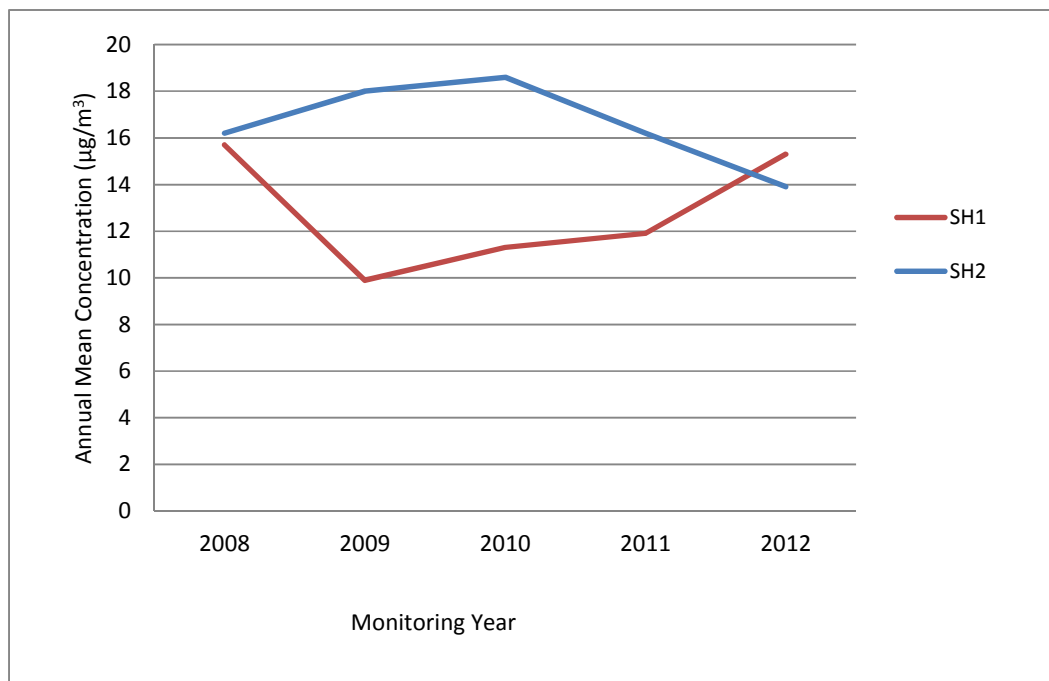


Figure 2.3 shows the trend in annual mean concentration at the continuous monitoring locations. This shows that whilst both sites have remained below the annual mean objective across the monitoring period, they have shown very different trends. The Spalding Monkhouse monitoring location showed a large decrease in annual mean concentration between 2008 and 2009, since then there has been an increasing trend, with the 2012 annual mean concentration close to the peak concentration observed in 2008. The Westmere site showed an increasing trend from 2008 to 2010. From 2010 onwards annual mean concentrations have shown a decreasing trend, this continues with the 2012 result.

Table 2-4 Results of Automatic Monitoring for NO₂: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Number of Hourly Means > 200µg/m ³				
					2008	2009	2010	2011	2012
SH1	Background	N	80.3	80.3	0	0	0 (63)	0	0 (84)
SH2	Background	N	81.7	81.7	0	0	0 (156.5)	0	0 (67)

If the period of valid data is less than 90%, the 99.8th percentile of hourly means is included in brackets

Diffusion Tube Monitoring Data

The NO₂ diffusion tube data are summarised in Table 2.5. The full dataset (monthly mean values) are included in Appendix A.

Data capture for 2012 was good, with annualisation required for one site only. Full details regarding the annualisation can be found in Appendix A.

For the 2012 data set there were no sites where the annual mean AQS objective was exceeded.

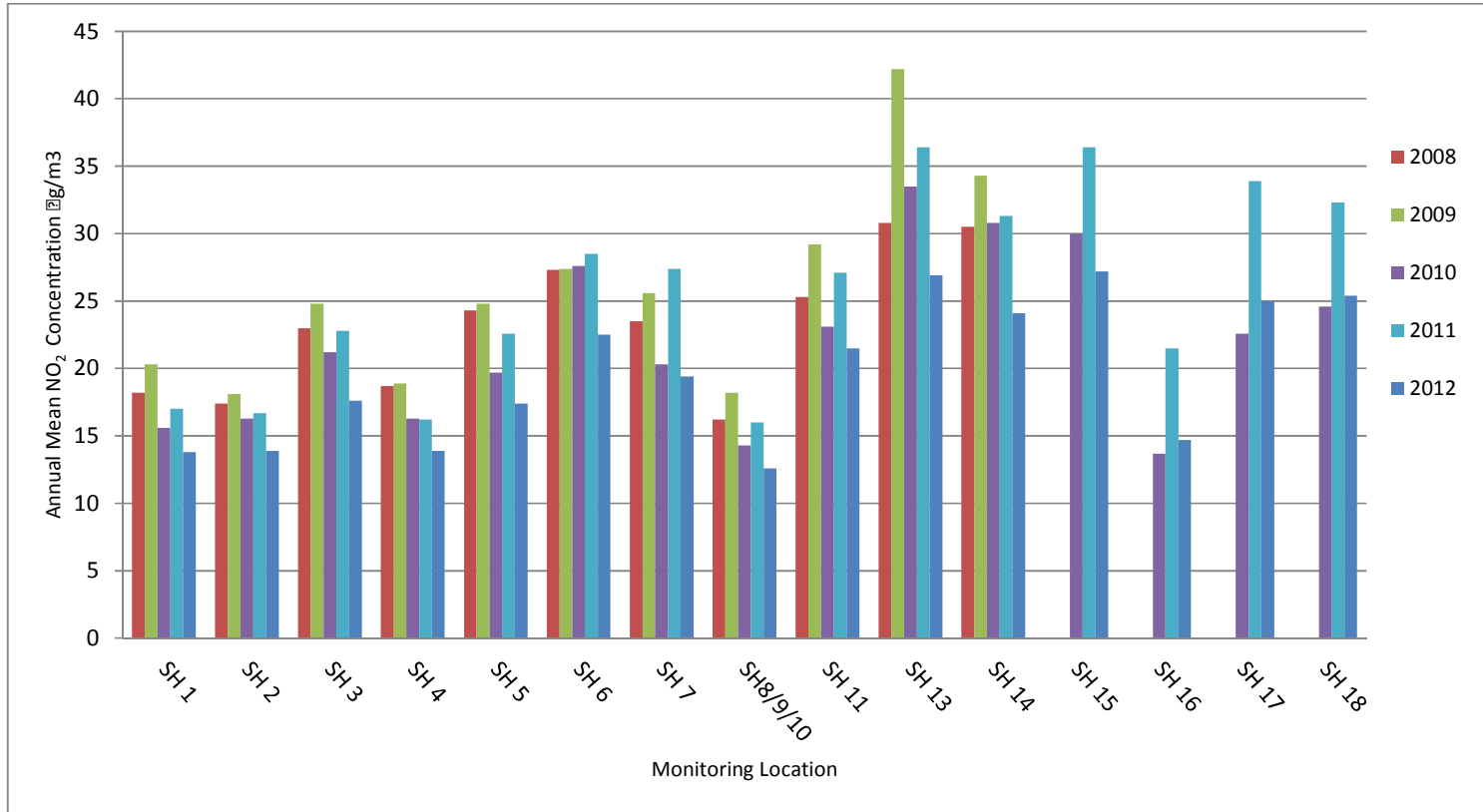
Table 2-5 Results of NO₂ Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months)	2012 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Bias Adjustment factor = 1.01
SH 1	21 Millfield Gardens	Background	N	N	12	13.8
SH 2	Nutten Stoven	Kerbside	N	N	12	13.9
SH 3	Priory Road	Background	N	N	5	17.6
SH 4	46 The Hollies	Background	N	N	12	13.9
SH 5	Station Road	Roadside	N	N	12	17.4
SH 6	103 Boston Road	Kerbside	N	N	12	22.5
SH 7	Field End	Roadside	N	N	12	19.4
SH8/9/10	Westmere (Triplicate)	Background	N	Triplicate and Collocated	12	12.6
SH 11	Metalair Site	Roadside	N	N	12	21.5
SH 13	Pinchbeck Road	Kerbside	N	N	12	26.9
SH 14	Springfields Roundabout	Kerbside	N	N	12	24.1
SH 15	Church Street, Pinchbeck	Roadside	N	N	12	27.2
SH 16	Bicker Road, Donington	Roadside	N	N	12	14.7
SH 17	High Road, Spalding	Roadside	N	N	12	25.0
SH 18	Hawthorn Bank, Spalding	Roadside	N	N	12	25.4

Table 2-6 Results of NO₂ Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias				
			2008 (Bias Adjustment Factor = 1.13)	2009 (Bias Adjustment Factor = 1.33)	2010 (Bias Adjustment Factor = 0.99)	2011 (Bias Adjustment Factor = 1.28)	2012 (Bias Adjustment Factor = 1.01)
SH 1	21 Millfield Gardens	N	18.2	20.3	15.6	17.0	13.8
SH 2	Nutten Stoven	N	17.4	18.1	16.3	16.7	13.9
SH 3	Priory Road	N	23	24.8	21.2	22.8	17.6
SH 4	46 The Hollies	N	18.7	18.9	16.3	16.2	13.9
SH 5	Station Road	N	24.3	24.8	19.7	22.6	17.4
SH 6	103 Boston Road	N	27.3	27.4	27.6	28.5	22.5
SH 7	Field End	N	23.5	25.6	20.3	27.4	19.4
SH8/9/10	Westmere (Triplicate)	N	16.2	18.2	14.3	16.0	12.6
SH 11	Metalair Site	N	25.3	29.2	23.1	27.1	21.5
SH 13	Pinchbeck Road	N	30.8	42.2	33.5	36.4	26.9
SH 14	Springfields Roundabout	N	30.5	34.3	30.8	31.3	24.1
SH 15	Church Street, Pinchbeck	N	-	-	30.0	36.4	27.2
SH 16	Bicker Road, Donington	N	-	-	13.7	21.5	14.7
SH 17	High Road, Spalding	N	-	-	22.6	33.9	25.0
SH 18	Hawthorn Bank, Spalding	N	-	-	24.6	32.3	25.4

Figure 2-4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



The above figure shows the trend in NO₂ concentration for those sites located in South Holland District Council. All monitoring locations have shown a decrease from the 2010 annual mean concentrations. The decrease in concentrations has been significant at a number of sites. There were no monitoring locations where the annual mean objective was exceeded in 2012.

2.2.2 Particulate Matter (PM₁₀)

There are two Air Quality Objectives for PM₁₀, namely:

- the annual mean of 40µg/m³; and
- the 24-hour mean of 50µg/m³ not to be exceeded more than 35 times a year.

The Council undertook monitoring of PM₁₀ using TEOM analysers at two locations during 2012. Results for the TEOMs have been VCM¹ corrected by Ricardo-AEA who undertake the AQ/QC and data management for the council.

The 2012 results show that the annual mean and the 24-hour mean continue to be met at both monitoring locations within the district. The 2012 pollutant levels show a decrease in concentration at both monitoring locations.

¹ Volatile Correction Model – Used to correct TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument

Table 2-7 Results of Automatic Monitoring for PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % ^a	Valid Data Capture 2012 % ^b	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m ³)				
						2008	2009	2010	2011	2012
SH1	Background	N	97.1	97.1	Y	19.0	16.5	17.3	20.4	16.9
SH2	Background	N	96.0	96.0	Y	16.8	16.0	16.9	19.7	16.4

Figure 2-5 Trends in Annual Mean PM₁₀ Concentrations

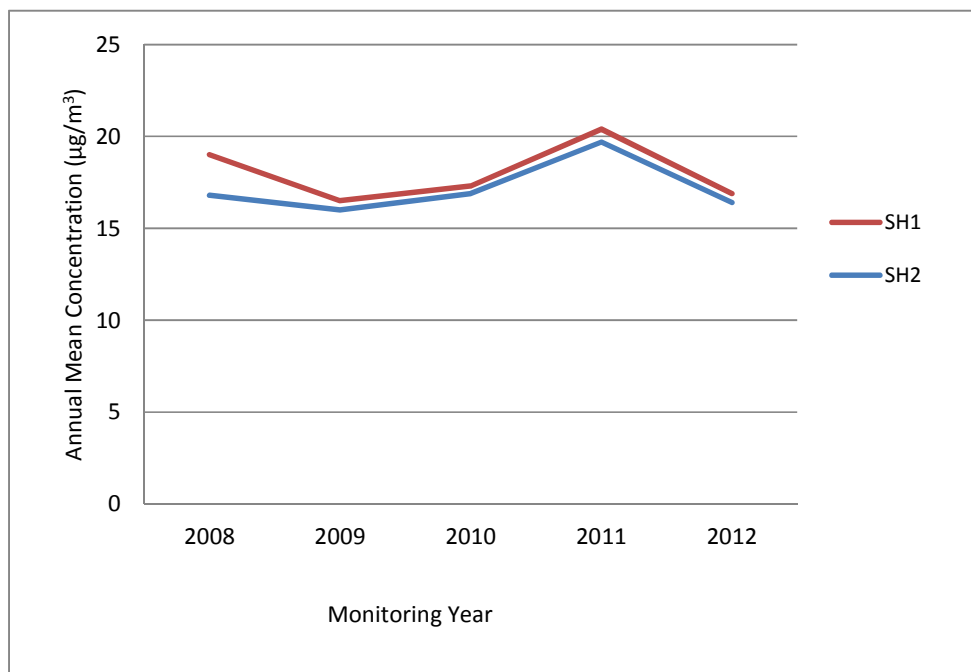


Figure 2.5 shows the trend in PM₁₀ concentrations at the monitoring locations. The graph shows that very similar concentrations of annual mean PM₁₀ and concentration trends are observed at both locations. Both sites showed a decrease in annual mean between 2008 and 2009, before beginning an increasing trend to 2011. The 2012 results show that the annual mean concentration at both sites has decreased.

Table 2-8 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % ^a	Valid Data Capture 2012 % ^b	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m ³				
						2008	2009	2010	2011	2012
SH1	Background	N	97.1	97.1	Y	1	1 (22.4)	0	7	1
SH2	Background	N	96.0	96.0	Y	1	0	0 (39.4)	8	0

^a if data capture is less than 90%, include the 90th percentile of 24-hour means in brackets

2.2.3 Sulphur Dioxide (SO₂)

There is currently no Sulphur Dioxide monitoring undertaken by South Holland District Council.

2.2.4 Benzene

There is currently no Benzene monitoring undertaken by South Holland District Council.

2.2.5 Other Pollutants Monitored

In addition to the PM₁₀ and NO₂ automatic analysers, South Holland District Council also monitors ozone at the Westmere School.

Ozone is a trans-boundary pollutant; the sources of ozone are frequently spatially distant from the measured site of the concentrations. This pollutant is not a prescribed air quality objective for LAQM and therefore, results are provided for information only.

Table 2-9 Results of Automatic Ozone Monitoring

Location	Within AQMA?	Description	% Data capture 2012	Number of Exceedences in 2012
SH2	No	Maximum 8-hour running mean > 100 µg/m ³	85.2	7

2.2.6 Summary of Compliance with AQS Objectives

South Holland District Council has examined the results from monitoring in the district. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

LAQM requires local authorities to consider the following:

- Narrow congested streets with residential properties close to the kerb;
- Busy streets where people may spend one hour or more close to traffic;
- Roads with a high flow of buses and/or HGVs;
- Junctions;
- New roads constructed since the last Updating and Screening Assessment;
- Roads with significantly changed traffic flows; and
- Bus or coach stations.

South Holland District Council confirms that of the above categories there have been no new or newly identified which have not previously been considered in previous rounds of review and assessment.

3.2 Other Transport Sources

LAQM requires local authorities to consider the following:

- Airports;
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with relevant exposure within 15m;
- Locations with a large number of movements of diesel locomotives and long term relevant exposure within 30m; and
- Shipping ports.

South Holland District Council confirms that of the above categories there have been no new or newly identified sources which have not been considered in previous rounds of review and assessment.

3.3 Industrial Sources

LAQM requires local authorities to consider the following:

- Industrial Installations: new or proposed;
- Industrial installations: existing where emissions have increased substantially or relevant exposure introduced;
- Major fuel storage depots;
- Petrol stations; and
- Poultry farms.

Planning permission has been granted for a new Crematorium on the land at Gosberton Road, Spalding. The land was previously agricultural land. The development will consist of 475m² of crematorium development with 60 associated on-site parking spaces and associated vehicle access routes.

The Highways team have assessed the application and found that the development was not expected to have any material impact upon the traffic volume on the road network.

The development will require a Pollution Prevent Control Permit to be issued and monitored by the Environmental Health team at South Holland District Council.

3.4 Commercial and Domestic Sources

LAQM requires local authorities to consider the following:

- Biomass combustion plant – individual installations;
- Areas where the combined impact of several biomass combustion sources may be relevant; and
- Areas where domestic solid fuel burning may be relevant.

Individual Installations

South Holland District Council have identified the following biomass installations which have not previously been assessed and are over 50KW in output.

- Lambs Flowers Ltd, Pinchbeck, Spalding; and
- Opperman Plants Ltd, Low Fulney Spalding

Both applications are for the same type of boiler and fuel. The fuel to be burned in the installations is clean waste wood Grade A/B, with ash content expected to be 1-2%.

The boilers installed at both these locations have abatement equipment fitted in the form of a multi cyclone design which collects ash and discharges it into a sealed holding bin. The system also includes flu-gas recirculation where the flue gas is taken out and recirculated back into the combustion chamber to manage the NO_x emissions.

Both installations are under operating under a Permit as part of the Pollution Prevention and Control Act, 1999. The permits granted by South Holland District Council for the installations include emission limits for both total particulates and NO_x emissions together with requirements for continuous monitoring, details regarding the management of fugitive emissions and maintenance requirements to ensure that air quality is maintained.

As yet there is no monitoring data available and an air quality assessment has not been undertaken as part of the planning application for either installation. Therefore the installations have been screened using the Biomass Calculator Tool available on the LAQM website. The below data have been used as the input parameters:

Table 3-1 Lambs Flowers Ltd Biomass Data

Required Parameter	Input
Building Height (Tallest building within 5 x stack height)	10m
Stack Diameter	0.45m
Stack Height	10.6m
PM ₁₀ Annual Mean Background	18.4µg/m ³
NO ₂ Annual Mean Background	10.8µg/m ³
Target Emission Rate PM ₁₀ (g/s)	0.0095
Target Emission Rate Annual NO _x (g/s)	0.0545
Target Emission Rate Hourly NO _x (g/s)	0.0319

The emission rates for the Lambs Flowers Ltd installation are 0.019 g/s for total particulates and 0.10 g/s for NO_x. It is noted that these are above the target emission rates in the biomass calculator, however these are based on total particulates, rather than PM₁₀. The installation is located in a largely agricultural setting, with a number of single farmhouse buildings approximately 400m from the installation.

It is considered unlikely that the installation will result in any exceedences of the air quality objectives at relevant receptor locations, as they are located some distance from the installation. In addition to this the installation will be operating within a permit, which ensures that continuous monitoring is undertaken. South Holland District Council will monitor the emissions to ensure they remain within the permitted limits.

Table 3-2 Opperman Plants Ltd Biomass Data

Required Parameter	Input
Building Height (Tallest building within 5 x stack height)	8m
Stack Diameter	0.45m
Stack Height	10.1m
PM₁₀ Annual Mean Background	17.2µg/m ³
NO₂ Annual Mean Background	11.7µg/m ³
Target Emission Rate PM₁₀ (g/s)	0.0269
Target Emission Rate Annual NO_x (g/s)	0.0528
Target Emission Rate Hourly NO_x (g/s)	0.0316

The emission rates for the Opperman Plants Ltd installation are 0.019 g/s for total particulates and 0.10 g/s for NO_x emissions. It is noted this is within the target emissions for PM₁₀, but outside that for NO_x emissions. The area is largely industrial/agricultural in nature, however there are private residential properties in the area, the closest located approximately 50m from the stack of the installation.

It is considered unlikely that the installation will result in any exceedences of the air quality objectives at any relevant receptor locations. In addition to this, the installation will be operating within a permit, which ensures that continuous monitoring is undertaken and ensures that the abatement measures are in place. For NO_x this is the gas recirculation system. South Holland District Council will monitor the emissions to ensure they remain within the permitted limits.

South Holland District Council have also received an application for installation of 5 packaged plant rooms operating on biomass on the land at Pinchbeck Farm, Spalding, which is currently used as a Turkey Farm owned by Bernard Matthews. The turkey houses are currently heated by LPG; the intention is to replace the LPG with the multi-fuelled biomass

boilers. Further details on the installations are not currently available to South Holland District Council and the development it yet to be granted planning permission.

It is understood that it is Bernard Matthews intention to become a carbon neutral company. The biomass heating project for the turnkey sheds which this application is part of is seen as crucial to achieve this objective, and as such there are likely to be other similar applications.

An air quality assessment has not been undertaken for the application; however the site which is permitted under the Environment Agency will need to seek a variation on the existing permit in should the installation be approved. South Holland District Council will monitor emissions monitoring from this installation should planning permission be granted.

3.5 New Developments with Fugitive or Uncontrolled Sources

LAQM requires local authorities to consider the following:

- Landfill sites;
- Quarries;
- Unmade haulage roads on industrial sites;
- Waste transfer stations; and
- Any other potential sources of fugitive particulate emissions.

South Holland District Council confirms that of the above categories there have been no new or newly identified sources which have not been considered in previous rounds of review and assessment.

South Holland District Council has identified the following local developments which may impact on air quality in the Local Authority area.

Biomass Installations:

- Lambs Flowers Ltd, Pinchbeck, Spalding; and
Opperman Plants Ltd, Low Fulney Spalding

South Holland District Council will monitor the emissions from these two installations through the issued Pollution Prevention Control Permit.

4 Local / Regional Air Quality Strategy

South Holland District Council has not produced a local air quality strategy. Details of the East Midlands Regional Strategy were discussed in the Progress Report 2010. The core objectives with regards to air quality is Policy 36 which requires Local Development Framework and strategic public bodies to:

- Contribute to the reduction of air pollution;
- Consider the potential impacts of development and increased traffic levels on air quality; and
- Consider the impacts of developments and increased traffic levels on nature conservation sites in the region and adopt mitigation measures to address these impacts.

The East Midlands Regional Plan was formally revoked by the Regional Strategy for the East Midlands (Revocation) Order on the 12th April 2013.

South Holland District Council are working to produce a joint Local Plan for South East Lincolnshire with Boston Borough Council, which was informed by the contents of the East Midlands Regional Plan. The Local Plan for South East Lincolnshire is discussed in further detail in Section 6.

5 Planning Applications

South Holland District Council has identified the following planning application which may impact upon air quality. The application is a development of a renewable energy park to include the process building, fuel storage facilities, vehicle stores, visitor centre, tank farm zones and associated roads, parking and landscaping.

As part of the planning application an air quality assessment was undertaken. The assessment involved atmospheric dispersion modelling using ADMS, with the impact upon traffic modelled using the Highways Agency Design Manual for Roads and Bridges (DMRB) screening method. In addition to these a screening assessment was undertaken with regards to the dust and fugitive emissions from construction activities.

The conclusions from the assessments were as follows:

- Increases in traffic movement associated with the operation of the proposed development will have an insignificant impact upon local air quality at nearby residential receptors;
- The impact from the biomass gasification units upon NO₂ concentrations was predicted to be a small increase with a negligible impact, there was predicted to be an increase in annual NO₂ concentrations of 0.5µg/m³ at the nearest receptor;
- The assessment concluded that for all other pollutants the biomass gasification units would have a negligible impact upon local air quality;
- The risk of adverse dust impacts during the construction phase was found to be 'high' however will be temporary in nature and can be effectively controlled through mitigation measures; and
- The dust emissions from the operational phase of the development are considered to be low risk due to the composition of the material and lack of receptors in the predominant downwind location.

As part of the assessment, the cumulative impacts of this and other large developments in the area were assessed, including the Sutton Power Stations A&B and the Willows EfW Facility on the outskirts of King's Lynn. This assessment found that the cumulative process contribution values for NO₂ were 10-20% of the hourly NO₂ objective and therefore unlikely to be a cause for concern to the health of the local population.

6 Air Quality Planning Policies

The South Holland District Council Local Plan (adopted July 2006) set out the planning policies to guide and control new development in the District until 2021. The Local Plan contains the following policy in relation to air pollution.

Policy SG13 - Pollution and Contamination

“Planning permission will only be permitted for development proposals which:

- 1) do not cause unacceptable levels of pollution of the surrounding area by noise, light, toxic or offensive odour, airborne pollutants or by the release of waste products;*
- 2) provide, as necessary, appropriate treatment of land to clean up pollution and contamination.”*

Over the past years there have been revisions to the planning process and approach to development plans. South Holland District Council are currently progressing with the Local Plan under transitional arrangements and plan to re-deposit the entire plan. Re-depositing the plan in its entirety provides opportunities for representations to be made on all aspects of the plan which would then be considered at inquiry.

In addition to the South Holland District Council Local Plan, the council are participating in producing the South East Lincolnshire Local Plan in conjunction with Boston Borough and Lincolnshire County Councils. The aim is to produce a single Local Plan for the area of South Holland and Boston Borough.

The Local Plan will guide development in South East Lincolnshire over the next twenty years, and will assist in shaping how the area changes over this period. It will identify opportunities for growth and will set out clear guidance on what planning applications will be permitted, and where.

The South East Lincolnshire Local Plan currently has 12 Strategic Priorities for South East Lincolnshire, including:

- Sustainable Development;
- Housing;
- Economy;
- Communities, Health and Well-Being;

- Environment;
- Transport; and
- Delivery

The document assesses each option from the strategic priorities against fourteen criteria including air quality, climate change, housing and transport.

The Preferred Options and the Sustainability Appraisal for the first part of the Local Plan are currently open for consultation until the end of June 2013

7 Local Transport Plans and Strategies

South Holland District Council works together with Lincolnshire County Council on local transport issues including the implementation of Local Transport Plan (LTP) measures in the district.

The 4th LTP (2013/14 to 2022/23) was adopted in April 2013. The 4th LTP builds on the strategies and policies adopted during the first 3 LTPs with the implementation plan covering the period 2013/14 and 2014/15 for which firm funding allocations have been received from the Department for Transport. It is planned that the implementation plan will be updated once the impact of future funding is known.

The 4th LTP Objectives are as follows:

- To assist the sustainable economic growth of Lincolnshire, and the wider region, through improvements to the transport network;
- To improve access to employment and key services by widening travel choices, especially for those without access to a car;
- To make travel for all modes safer and, in particular, reduce the number and severity of road casualties;
- To maintain the transport system to standards which allow safe and efficient movement of people and goods;
- To protect and enhance the built and natural environment of the county by reducing the adverse impacts of traffic, including HGVs;
- To improve the quality of public spaces for residents, workers and visitors by creating a safe, attractive and accessible environment;
- To improve the quality of life and health of residents and visitors by encouraging active travel and tackling air quality and noise problems; and
- To minimise carbon emissions from transport across the county.

To tackle congestion and to support growth the Council has identified the following schemes:

Major Transport Schemes – Lincoln Eastern Bypass, Lincoln East-West Link, Grantham East-West Relief Road and the Spalding Western Relief Road

Traffic Management – implementation of the CONFIRM integrated highways management system, reviewing of speed limits, establishment of the new Highways Alliance between Lincolnshire County Council and traffic contractors to improve delivery of highway services

Public Transport – Into Town bus services for larger urban areas, bus stop improvements

Walking and Cycling – working with Sustrans Links2School and Connect2 for schemes to improve facilities for cyclists and pedestrians

Travel Planning – large developments developing framework travel plans, allowing Section 106 funds for capital works and car sharing initiatives

Sustainable Travel to School – 100% of schools in Lincolnshire having a nationally accredited School Travel Plan in place, investment during the LTP3 allowed for increased cycle storage facilities, footpath enhancements and parent waiting shelters.

Parking – Implementation of Civil Parking Enforcement in December 2012, it is anticipated that this will reduce congestion in urban areas.

Intelligent Transport Systems – updating signal control systems and real time passenger information

8 Climate Change Strategies

Lincolnshire County Council is working in collaboration with other local authorities in the east Midlands on the 'Planning to Adapt Project'. This project followed the guidelines set out by National Indicator 188 and all local authorities have been working towards level 3.

Lincolnshire County Council declared that it had reached level 3 March 2011. The continuous process of embedding and monitor and review will continue into 2012. The Project has 3 distinct steps that it has taken to reach level 3, these are;

1. Produced a Local Climate Impacts Profile;
2. Carried out comprehensive risk assessments across council services. A report was produced outlining the results of these risk assessments; and
3. Production of an Adaptation Action Plan, prioritising risks that the council need to embed within current work streams.

The 4th Local Transport Plan has a section addressing Transport and the Environment. The following measures are being pursued in Lincolnshire to address CO₂ emissions.

Encouraging sustainable travel – greater use of walking, cycling and public transport through initiative such as Community Travel Zones and the 'Smarter choices' initiatives such as travel information, travel planning and marketing and promotion.

Alternative Fuels – promotion of alternative fuels such as bio-diesel and ethanol under the Carbon Management Plan, with the use of natural gas and biomethane either as a dual fuel or dedicated basis being the most appropriate technology at the current time. During LTP3 in partnership with Stagecoach East Midlands a pilot scheme was run for biomethane/diesel buses which proved to be successful for bus operations

Reducing Energy Use – more efficient technologies in street lighting, low energy LED signal heads at new traffic light installations, solar powered LED lights at rural bus stops

9 Implementation of Action Plans

South Holland District Council has not declared any AQMAs; therefore no action plans have been required.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The review of 2012 monitoring data has identified no exceedences of the AQS Objectives at any of the South Holland District Council's diffusion tube or continuous monitoring locations.

The diffusion tube network showed a decreasing trend in NO₂ concentrations compared with monitoring in previous years. With regards to continuous NO₂, the Spalding Monkhouse site has shown an increase in annual mean concentrations with those at Westmere showing a decrease.

A decrease in PM₁₀ annual mean concentrations was observed at both monitoring locations. On the basis of the 2012 monitoring data there is no requirement to proceed to a Detailed Assessment.

10.2 Conclusions relating to New Local Developments

South Holland District Council has identified a new industrial development, the Crematorium located in Spalding. The development has been approved and will require a Pollution Prevention Control Permit for operation and as such will be monitored by the Environmental Health team at South Holland District Council. The Highways team stated that the development was unlikely to have any material impact upon the traffic capacity of the surrounding road network.

South Holland District Council have also identified two biomass installations which have been approved permission and have been issued with a Pollution Prevention Control Permit. The biomass calculator tool showed that there could be an issue with regards to NO₂ and PM₁₀ emissions from the installations. It is considered unlikely that there will be any exceedences of the Air Quality Objectives at relevant receptor locations. It is recommended that South Holland District Council continue to monitor these installations through the permitting process.

South Holland District Council have also received a further two planning applications which may impact upon air quality. These are a biomass installation at the Bernard Matthew's Turkey farm in Spalding and an application for a renewable energy park.

An air quality assessment has not been undertaken for the Bernard Matthews application, however should permission be granted the process will be monitored under the Environment Agency permitting system.

An air quality and odour and dust assessment has been carried out for the renewable energy park application. This concluded that the impacts of the development would be negligible, with the adverse dust impacts being temporary in nature and could be effectively controlled through mitigation measures.

10.3 Proposed Actions

Proposed actions arising from the 2013 Annual Progress Report are as follows:

- Continue NO₂ diffusion tube and continuous monitoring in the district to identify future changes in pollutant concentrations;
- Continue to monitor the biomass installations at Lambs Flowers Ltd and Oppermans Plants Ltd to ensure they remain within the permitted limits; and
- Proceed to a Progress Report in 2014.

11 References

- Local Air Quality Management Technical Guidance LAQM.TG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland
- South Holland District Council 2012 Updating and Screening Assessment
- South Holland District Council 2011 Annual Progress Report
- Design, Access and Planning Statement for Development of Land at Pinchbeck Farm, Spalding on Behalf of Bernard Matthews Ltd, Lumicity Ltd, 2013
- Lambs Flowers Ltd Biomass Application, eco-link power, 2012
- Oppermans Plants Ltd Biomass Application, eco-link power, 2012
- South Holland District Council. Application for Planning Permission, South Lincolnshire Crematorium 2011
- Air Quality Assessment for Energypark – Sutton Bridge, GF Environmental Ltd
- Dust and Odour Assessment for Energypark – Sutton Bridge, AECOM
- 4th Lincolnshire Local Transport Plan 2013/14 – 2022/23, Lincolnshire County Council, April 2013
- Strategy and Policies DPD, South East Lincolnshire Local Plan, South East Lincolnshire Joint Strategic Planning Committee, May 2013

12 Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Factor from Local Co-location Studies

There is a co-located triplicate of diffusion tubes installed at the urban background Westmere School monitoring site. The local bias correction factor is presented below.

Location	Diffusion Tube Data capture	Continuous Monitor Data Capture	Diffusion Tube Annual Mean ($\mu\text{g}/\text{m}^3$)	Continuous Monitor Annual Mean ($\mu\text{g}/\text{m}^3$)	Ratio
Westmere	100%	81%	13	12.9	1.09

Diffusion Tube Bias Adjustment Factors

The diffusion tubes are supplied and analysed by Gradko International Ltd utilising the 50% Triethanolamine (TEA) in acetone preparation method. The bias adjustment factor for 2012 is 1.01 (based on 18 studies, version 03_13) as derived from the national bias adjustment calculator.

Discussion of Choice of Factor to Use

There were three periods where data capture from the continuous monitor was considered to be 'poor', therefore the data capture for the study is poor overall and as such the national bias adjustment factor has been used in this report.

PM Monitoring Adjustment

The PM_{10} results have been gravimetrically corrected by Ricardo-AEA who undertake the data management of the two continuous monitoring locations.

Short to Long Term Adjustment

Annualisation was required at one site as detailed in the below table.

Site	Annualisation Factor
Market Harborough	0.774
Wicken Fen	0.864
Northampton	0.985
Spalding Monkhouse	0.970
Westmere School	0.858
Average Annualisation Factor	0.890

QA/QC of Automatic Monitoring

South Holland District Council contracts data management for their continuous analysers to Ricardo-AEA. The Quality Assurance/Quality Control (QA/QC) procedures employed by Ricardo-AEA are equivalent to the UK Automatic Urban and Rural Network (AURN) procedures.

QA/QC of Diffusion Tube Monitoring

Gradko International Ltd is a UKAS accredited laboratory and participates in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the latest available WASP results, rounds 116 through to 119 (January to December 2012) Gradko International have scored 100%. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$. The tube precision for the NO₂ Annual Field Inter-comparison at Marylebone Road was rated as 'Good'.

Bureau Veritas Air Quality

South Holland District Council

Monthly Diffusion Tube Results

Site Ref	NO ₂ Concentrations µg/m ³											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SH1	17.2	17.9	16.8	9.8	7.9	6.9	8.3	11.1	11.3	13.4	22.3	21.5
SH2	17.5	19.8	20.3	12.4	10.8	7.9	8.5	9.6	9.6	15.0	16.2	16.9
SH3	23.1						12.2	14.2			24.5	23.7
SH4	19.7	20.0	19.2	9.3	7.9	7.1	8.3	9.2	10.5	13.7	18.3	22.5
SH5	20.6	19.6	25.0	13.6	13.2	10.9	13.3	14.5	17.2	16.3	20.7	21.2
SH6	29.0	24.4	28.6	21.5	25.6	16.0	15.8	18.4	16.1	23.1	23.0	26.2
SH7	24.7	22.7	24.0	15.0	11.8	12.6	14.8	19.4	18.6	17.2	28.6	21.3
SH8	18.7	17.1	16.6	11.7	6.4	6.0	6.3	9.4	10.5	11.0	19.3	16.8
SH9	18.1	16.0	17.9	9.0	6.1	5.6	7.4	9.3	9.6	11.4	19.8	19.2
SH10	18.2	17.4	17.6	10.3	5.4	6.1	6.5	8.9	10.9	11.2	18.9	19.6
SH11	27.7	22.4	27.6	15.8	16.8	15.9	15.7	20.1	17.6	21.7	26.8	26.7
SH13	33.5	30.9	28.7	21.3	18.8	18.0	19.7	25.6	21.0	27.1	38.0	37.6
SH14	28.5	36.1	34.4	18.9	23.4	19.0	18.4	22.2	22.2	3.5	29.9	30.5
SH15	31.5	34.6	32.4	28.6	27.3	2.3	27.1	27.6	22.5	28.5	31.0	30.4
SH16	18.6	19.9	20.3	9.5	9.1	8.2	9.6	11.9	12.7	14.4	20.5	20.5
SH17	30.8	29.4	31.1	18.9	19.4	18.6	20.4	24.4	17.6	23.2	33.9	29.6
SH18	31.0	28.7	32.6	21.9	19.3	18.1	20.0	21.2	22.8	24.2	32.2	30.1