

SOUTH HOLLAND DISTRICT COUNCIL



LOCAL AIR QUALITY MANAGEMENT UPDATING AND SCREENING  
ASSESSMENT 2009

***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.

The Updating and Screening Assessment provides an update with respect to air quality issues within the local authority area. There have been a number of changes since the last (third) round of review and assessments which have been taken into account in this assessment; including revised Local Air Quality Management Guidance, modelled background concentration maps, updated NO<sub>x</sub>:NO<sub>2</sub> conversion calculator, updated future year calculation tools and updates on specific sources (rail, poultry farms, biomass). The Updating and Screening Assessment has included consideration of new monitoring data and emissions sources, in addition to any significant changes to existing emission sources identified in the previous rounds. The Updating and Screening Assessment considers the seven priority health based air quality objectives as laid down in Regulations and assesses the likelihood that the air quality objectives will be met by their target dates. If the air quality objectives are unlikely to be met, a detailed assessment will be required.

Having considered each emission source, and evidence to support the assessment of each, it is concluded that the air quality objectives for benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide and sulphur dioxide will be met. There is no requirement to undertake a detailed assessment for these pollutants. However, South Holland District Council confirms that there are two poultry farms in the local authority area with relevant exposure for annual mean PM<sub>10</sub>.

It is proposed that South Holland District Council progress to a Detailed Assessment (for annual mean PM<sub>10</sub> at two poultry farm locations; Fleet Fen Farm Poultry Unit and Chapel Road Poultry Unit) in addition to the 2010 Annual Progress Report whilst also continuing diffusion tube monitoring in the district to identify future changes in pollutant concentrations.

### Summary Table

Pollutant	Detailed Assessment Required?	Sources/Location
Benzene	No	
1, 3 - butadiene	No	
Carbon monoxide	No	
Lead	No	
Nitrogen dioxide	No	
PM <sub>10</sub>	Yes	Fleet Fen Farm and Chapel Road Poultry Units
Sulphur dioxide	No	



## 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, Little 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 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 for England, Scotland, Wales and Northern Ireland 2007; and the relevant Policy and Technical Guidance documents. LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether air quality objectives are likely to be met. Where exceedances are identified the local authority must declare an AQMA, the extent of which can be no smaller than the geographic extent of exceedance, and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Bureau Veritas has been commissioned by South Holland District Council to undertake the Updating and Screening Assessment (USA) 2009, as part of the fourth round of LAQM Review and Assessment.

The following information has been considered within this assessment:

- Relevant legislative background
- South Holland District Council Review and Assessment of air quality under the LAQM regime
- Traffic data provided by Lincolnshire County Council; For the purposes of the USA, the Highways Agency's DMRB<sup>1</sup> model has been used to assess traffic data
- Industrial, domestic and other non-traffic related source data provided by South Holland District Council
- Monitoring data for 2008 provided by South Holland District Council
- Defra maps of modelled background pollutant concentrations
- Technical guidance and tools provided by Defra<sup>2</sup>

This report sets out the relevant air quality legislation for air quality, provides a review of LAQM within the administrative area, assesses the air quality for all relevant sources and then summarises the findings of the assessment and potential need for further detailed assessment work.

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<sup>1</sup> Highways Agency's Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 Air Quality, May 2007, and accompanying spreadsheet DMRB Screening Method V1,03.xls. July 2007

<sup>2</sup> 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

### 1.3 Air Quality Objectives

The significance of existing and future pollutant levels are assessed in relation to the national air quality standards and objectives, established by Government. The revised Air Quality Strategy (AQS)<sup>3</sup> for the UK (released in July 2007) provides the over-arching strategic framework for air quality in the UK and contains national air quality standards and objectives established by the UK Government and devolved administrations to protect human health. The air quality objectives incorporated in the AQS and the UK Legislation are derived from the Limit Values prescribed in the EU Directives transposed into national legislation by member states.

The Clean Air for Europe (CAFE) programme was initiated in the late 1990s to draw together previous directives into a single EU Directive on air quality. The Directive 2008/50/EC<sup>4</sup> introduces new obligatory standards for PM<sub>2.5</sub> for Government but places no statutory duty on local Government to work towards achievement of these standards.

The Air Quality Standards (England) Regulations 2007<sup>5</sup> came into force on 15<sup>th</sup> February 2007 in order to align and bring together in one statutory instrument the Governments obligations to fulfil the requirements of the CAFE Directive.

The objectives for ten pollutants (benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), particulates (PM<sub>10</sub> and PM<sub>2.5</sub>), ozone and Polycyclic Aromatic Hydrocarbons (PAHs)) have been prescribed within the AQS based on The Air Quality (England) (Amendment) Regulations 2002.

This assessment focuses on those pollutants included in Air Quality Regulations for the purpose of LAQM, in respect of pollutant sources affecting air quality within the Council's administrative area. The objectives set out in the AQS for these pollutants are presented in the table below.

The UK Government and the Devolved Administrations have also set new national air quality objectives for PM<sub>2.5</sub>. These objectives have not been incorporated into LAQM Regulations, and authorities have no statutory obligation to review and assess air quality against them.

The locations where the AQS objectives apply are defined in the AQS as locations outside buildings or other natural or man-made structures above or below ground where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period of the AQS objective. Typically these include residential properties and schools/care homes for longer period (i.e. annual mean) pollutant objectives and high streets for short-term (i.e. 1-hour) pollutant objectives.

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<sup>3</sup> The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007), Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland

<sup>4</sup> Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

<sup>5</sup> The Air Quality Standards Regulations 2007, Statutory Instrument No 64, The Stationary Office Limited

**Table 1– Air Quality Objectives Included in the Air Quality Regulations for the Purpose of Local Air Quality Management**

Pollutant	Objective	Concentration Measured As	Date to be Achieved by and Maintained Thereafter
<b>Benzene</b> All authorities	16.25 µg/m <sup>3</sup>	running annual mean	31.12.2003
Authorities in England and Wales only	5.00 µg/m <sup>3</sup>	annual mean	31.12.2010
<b>1,3 Butadiene</b> All authorities	2.25 µg/m <sup>3</sup>	running annual mean	31.12.2003
<b>Carbon monoxide</b> Authorities in England, Wales and Northern Ireland only	10.0 µg/m <sup>3</sup>	maximum daily running 8-hour mean	31.12.2003
<b>Lead</b> All authorities	0.5 µg/m <sup>3</sup>	annual mean	31.12.2004
	0.25 µg/m <sup>3</sup>	annual mean	31.12.2008
<b>Nitrogen dioxide</b> <sup>a</sup> All authorities	200 µg/m <sup>3</sup> , not to be exceeded more than 18 times a year	hourly mean	31.12.2005
	40 µg/m <sup>3</sup>	annual mean	31.12.2005
<b>Particles (PM<sub>10</sub>) (gravimetric)</b> <sup>b</sup> All authorities	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 µg/m <sup>3</sup>	annual mean	31.12.2004
<b>Sulphur dioxide</b> All authorities	350 µg/m <sup>3</sup> not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
	125 µg/m <sup>3</sup> not to be exceeded more than 3 times a year	24 hour mean	31.12.2004
	266 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	15 minute mean	31.12.2005

<sup>a</sup> EU Limit values in respect of nitrogen dioxide to be achieved by 1st January 2010. There are, in addition, separate EU limit values for carbon monoxide, sulphur dioxide, lead and PM<sub>10</sub>, to be achieved by 2005, and benzene by 2010.

<sup>b</sup> Measured using the European gravimetric transfer sampler or equivalent.

## 1.4 Local Air Quality Management

As established by the Environment Act 1995 Part IV, all local authorities in the UK are under a statutory duty to undertake an air quality assessment within their area and determine whether they are likely to meet the air quality objectives set down by Government for a number of pollutants. The process of review and assessment of air quality undertaken by local authorities is set out under the LAQM regime and involves a phased three yearly assessment of local air quality. Where the results of the review and assessment process highlight that problems in the attainment of health-based objectives for air quality will arise, the authority is required to declare an AQMA – a geographic area defined by high levels of pollution and exceedances of health-based standards.

The LAQM regime was first set down in the 1997 National Air Quality Strategy (NAQS)<sup>6</sup> and introduced the idea of local authority 'Review and Assessment'. The Government subsequently published policy and technical guidance related to the review and assessment processes in 1998. This guidance has since been reviewed and the latest documents include Policy Guidance (LAQM.PG (09))<sup>7</sup> and Technical Guidance (LAQM.TG (09))<sup>8</sup>. The guidance lays down a progressive, but continuous, framework for the local authorities to carry out their statutory duties to monitor, assess and review air quality in their area and produce action plans to meet the air quality objectives.

Defra and the Devolved Administrations released the latest Policy and Technical Guidance in February 2009, in anticipation of the fourth round of review and assessment. The fourth round begins with this USA, required to be completed by local authorities by the end of April 2009, and builds upon the Council's previous work in the first three rounds.

## 1.5 Summary of Review and Assessment Undertaken by South Holland Council

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 NO<sub>2</sub> and PM<sub>10</sub> emissions in the Port Sutton Bridge Area and NO<sub>2</sub> emissions along the A17 at Holbeach and Sutton Bridge. The Stage 3 report concluded that predicted concentrations of NO<sub>2</sub> and PM<sub>10</sub> would be met at these locations and no AQMA was declared. The conclusions of the First Round were that all Air Quality 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 within South Holland. The USA 2003 concluded that no Detailed Assessment of air quality was required. All Air Quality Objectives were expected to be met. The Progress Reports 2004 and 2005 similarly concluded that all Objectives were expected to be met. A new continuous monitoring site was established in 2003 at Monks House School in Spalding to monitor PM<sub>10</sub> and NO<sub>2</sub> 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 within South Holland. The USA 2006 concluded that all objectives were expected to be met and no Detailed Assessment was required.

In 2007 and 2008 South Holland District 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 exceedances of air quality objectives.

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<sup>6</sup> DoE, 1997, 'The United Kingdom National Air Quality Strategy', The Stationery Office

<sup>7</sup> Policy Guidance LAQM.PG(09) (2009), Part IV of the Environment Act 1995, Local Air Quality Management, Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland, The Stationery Office

<sup>8</sup> Technical Guidance LAQM.TG (09) (2009), Part IV of the Environment Act 1995, Local Air Quality Management, Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland, The Stationery Office

## 2 Updating and Screening Assessment Methodology

The USA is intended to identify any significant changes that may have occurred since the previous rounds of Review and Assessment were completed. This includes new monitoring data, new or changed emissions sources (either locally or in neighbouring authorities), or any other local changes that might affect air quality e.g. new relevant exposure. The assessment builds on the previous Review and Assessment work undertaken by local authorities.

The USA involves a checklist approach that considers all significant emissions sources relevant to the Air Quality Objectives. The checklists are broadly the same as in the previous rounds, but have been re-ordered so that they follow a source-by-source rather than pollutant-by-pollutant approach. This is to reduce repetition within the screening process for those local authorities that do not have all the listed sources within their area. These can more easily be discounted at an early stage.

A summary of the emission source categories for the Updating and Screening checklists is provided below. The detailed checklists for each source type are then set out in the following sections, as per the methodology provided in Chapter 5 of the LAQM.TG (09).

The air quality assessment for road traffic emissions sources has been undertaken using the Highways Agency's DMRB<sup>1</sup> Air Quality model. NO<sub>2</sub> concentrations have been calculated based on the updated NO<sub>x</sub>:NO<sub>2</sub> conversion method provided on behalf of Defra as part of the LAQM.TG(09) tools.

For other sources, the checklist approach to screening and relevant LAQM.TG(09) nomograms have been utilised.

**Table 2– Summary of Emission Sources and Relevant Pollutants to be Considered as Part of the Updating and Screening Assessment**

Reference No.	Emission Sources to be Assessed	Relevant Pollutants
<b>A. Road Transport Sources</b>		
A.1	Narrow congested streets with residential properties close to the kerb	Nitrogen dioxide
A.2	Busy streets where people may spend 1-hour or more close to traffic	Nitrogen dioxide
A.3	Roads with a high flow of buses and/or HGVs.	Nitrogen dioxide, PM <sub>10</sub>
A.4	Junctions (including busy roads and junctions in Scotland and Northern Ireland)	Nitrogen dioxide, PM <sub>10</sub>
A.5	New roads constructed since the last round of review and assessment	Nitrogen dioxide, PM <sub>10</sub>
A.6	Roads/junctions identified as being close to the objective during the previous round of review and assessment	Nitrogen dioxide, PM <sub>10</sub>
A.7	Roads with significantly changed traffic flows	Nitrogen dioxide, PM <sub>10</sub>
A.8	Bus and coach stations	Nitrogen dioxide
<b>B: Other Transport Sources</b>		
B.1	Airports	Nitrogen dioxide
B.2	Railway (diesel and steam trains)	Sulphur dioxide, nitrogen dioxide
B.3	Ports (shipping)	Sulphur dioxide
<b>C: Industrial Sources</b>		
C.1	Industrial processes (new processes and those with significantly increased emissions)	Benzene, 1,3-butadiene, lead, nitrogen dioxide, sulphur dioxide, PM <sub>10</sub>
C.2	Major petrol storage depots	Benzene
C.3	Petrol Stations	Benzene
C.4	Poultry farms	PM <sub>10</sub>
<b>D: Commercial and Domestic Sources</b>		
D.1	Biomass combustion	Nitrogen dioxide, PM <sub>10</sub>
D.2	Domestic solid-fuel burning	Sulphur dioxide
<b>E: Fugitive or Uncontrolled Sources</b>		
E.1	Quarries, landfill sites, opencast coal mining, waste transfer sites, materials handling (i.e. ports, major construction sites)	PM <sub>10</sub>

## 2.1 Input Data

### 2.1.1 Traffic Data

Lincolnshire County Council, through their traffic consultants Jacobs, provided the annual average daily traffic flows (AADT) and speed data used in this assessment, including relevant projection factors to the baseline year 2008 and EU limit year 2010.

Where speed data has not been available, speeds have been based on speed limits, modified according to local conditions to take account of congestion and stop/start vehicle movements at junctions. Speeds were reduced at busy junctions to 20kph to reflect the higher emissions of queuing traffic.

Appendix 1 contains the tabular summary of traffic data provided for the USA for use in the DMRB Air Quality model.

### 2.1.2 Background Concentrations

The DMRB Air Quality model calculates the pollutant concentrations due to road traffic emissions only. The user must then add the background concentrations (arising from sources other than traffic) to derive the total pollutant concentrations at the relevant receptors modelled.

The background concentrations can be obtained either from appropriate monitoring stations or from Defra maps of modelled background pollutant concentrations. These maps are available at a resolution of 1x1 km for the entire UK. Maps are provided for future years' background pollutant concentrations. The maps can be obtained from the UK Air Quality Information Archive<sup>9</sup>. The maps have been updated from the previous round of review and assessment as part of the LAQM.TG (09) tools released in February 2009. Background concentrations used in the DMRB Air Quality model runs are shown in Appendix 4.

### **3 New Monitoring Data**

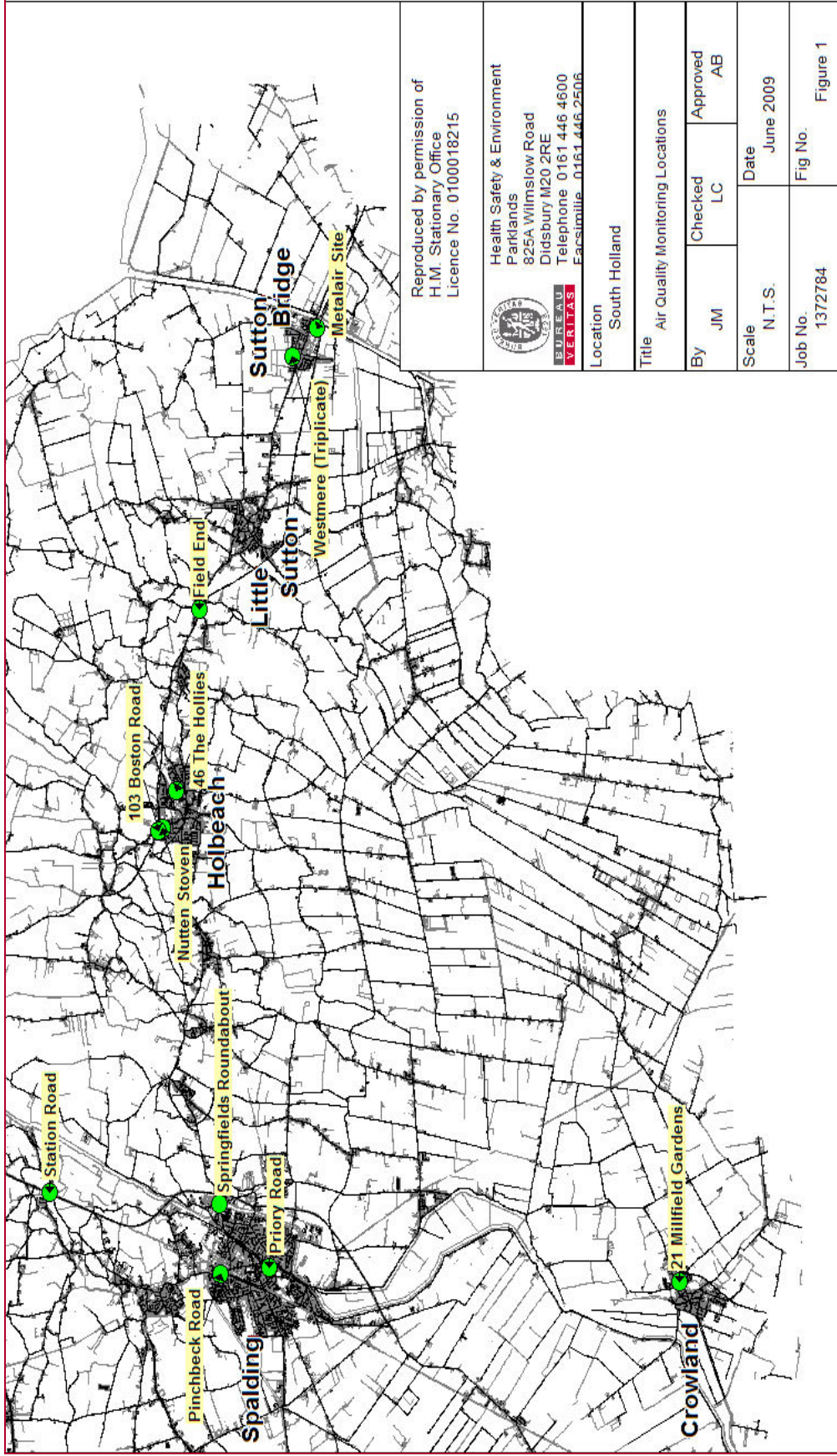
Section 3 reviews and assesses all new monitoring data in order to determine whether the air quality objectives are at risk of exceedance.

#### **3.1 Summary of Monitoring Undertaken**

Maps showing the location of air quality monitoring undertaken by South Holland District Council in 2008 is displayed in Figure 1.



Figure 1 Map of Air Quality Monitoring Undertaken by South Holland District Council in 2008



### 3.1.1 Automatic Monitoring Sites

This section provides details of automatic monitoring carried out in 2008, the year covered by this report.

**Table 3– Details of Automatic Monitoring Sites**

Site Name	Site Type	OS Grid Ref (x,y)	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)
Spalding Monkhouse School	Urban Background	523168, 322454	NO <sub>2</sub> , PM <sub>10</sub>	No	Y – 1	25
Westmere School	Urban Background	547264, 321709	NO <sub>2</sub> , PM <sub>10</sub>	No	Y - 14	190

There is currently automatic monitoring of NO<sub>2</sub> undertaken by South Holland District Council at two locations in the area, Spalding Monkhouse School and Westmeer School. South Holland District Council contract data management for their continuous analysers to AEA. The Quality Assurance/Quality Control (QA/QC) procedures employed by AEA are equivalent to the UK Automatic Urban and Rural Network (AURN) procedures. The ratified monitoring results for 2006 - 2008 for these sites are shown in Table 5.

There is currently continuous monitoring of PM<sub>10</sub> undertaken by South Holland District Council at two locations in the area, Spalding Monkhouse School and Westmeer School. The QA/QC procedures for the sites are equivalent to the AURN procedures. Monitoring results of PM<sub>10</sub> for 2006 – 2008 are displayed in Table 7.

### 3.1.2 Non-Automatic Monitoring Data

Details of the non-automatic monitoring undertaken in the district are presented in Table 4.

**Table 4– Details of Non- Automatic Monitoring Sites**

Site No.	Location	Site Type	X	Y	Pollutant monitored	In AQMA ?	Relevant Exposure ? (Y/N with distance (m) to relevant exposure)	Distance to Kerb of Nearest Road (N/A if not applicable)
SH 1	21 Millfield Gardens	Background	524388	310520	NO <sub>2</sub>	N	Y - 6.8	2.9
SH 2	Nutten Stoven	Kerbside	535595	325453	NO <sub>2</sub>	N	Y - 5.6	21.8
SH 3	Priory Road	Background	524734	322403	NO <sub>2</sub>	N	Y - 38.4	92.2
SH 4	46 The Hollies	Background	536523	325078	NO <sub>2</sub>	N	Y - 8.4	0.2
SH 5	Station Road	Roadside	526585	328726	NO <sub>2</sub>	N	Y - 24.9	1.5
SH 6	103 Boston Road	Kerbside	535525	325589	NO <sub>2</sub>	N	Y - 25.7	9.5
SH 7	Field End	Roadside	541013	324393	NO <sub>2</sub>	N	Y - 5.9	25.6

SH8/9/10	Westmere (TriPLICATE)	Background	547264	321709	NO <sub>2</sub>	N	Y - 69.4	61.2
SH 11	Metalair Site	Roadside	547957	321013	NO <sub>2</sub>	N	N	116
SH 13	Pinchbeck Road	Kerbside	524595	323793	NO <sub>2</sub>	N	Y - 20.7	0.7
SH 14	Springfields Roundabout	Kerbside	526309	323820	NO <sub>2</sub>	N	Y - 54.2	11

South Holland District Council undertook monitoring at 11 NO<sub>2</sub> diffusion tubes sites in 2008. The diffusion tubes are supplied and analysed by Gradko International Ltd utilising the 50% Triethanolamine (TEA) in acetone preparation method.

With regard to the application of a bias adjustment factor for the diffusion tubes, the LAQM.TG (09) and Review and Assessment Helpdesk recommends use of a local bias adjustment factor where available and relevant to diffusion tube sites. South Holland District Council has a triplicate diffusion tube collocation at their continuous NO<sub>2</sub> analyser at Westmere School in Sutton Bridge. A local bias adjustment factor for 2008 of 1.13 has been calculated from this collocation and applied to South Holland District Council's diffusion tube results.

## 3.2 Comparison of Monitoring Results with AQ Objectives

### 3.2.1 Nitrogen Dioxide

#### 3.2.1.1 Automatic Monitoring Data

The 2008 monitoring data does not indicate any exceedances of the annual mean NO<sub>2</sub> objective at the Monkhouse School or Westmere School sites.

**Table 5 – Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective**

Location	Within AQMA?	Description	Annual Mean Concentrations (µg/m <sup>3</sup> )		
			2006	2007	2008
Spalding Monkhouse School	No	Annual Mean NO <sub>2</sub> > 40 µg/m <sup>3</sup>	13.8	8.4	15.7
		NO <sub>2</sub> Hourly Mean > 200 µg/m <sup>3</sup> for more than 18 times per year	0	0	0
		% Data Capture	97.0	77.0	59.0
Westmere	No	Annual Mean NO <sub>2</sub> > 40 µg/m <sup>3</sup>	14.8	14.5	16.2

School		NO <sub>2</sub> Hourly Mean > 200 µg/m <sup>3</sup> for more than 18 times per year	0	0	4
		% Data Capture	98.0	96.0	81.0

### 3.2.1.2 Diffusion Tube Monitoring Data

The NO<sub>2</sub> diffusion tube data are summarised in Table 6. The full dataset (monthly mean values) are included in Appendix 3.

The 2008 diffusion tube results do not identify any exceedances of the AQS annual mean objective for NO<sub>2</sub>.

With respect to the hourly NO<sub>2</sub> objective, there are no sites at risk of exceedance of the hourly NO<sub>2</sub> AQS objective in 2008.

**Table 6 – Results of Nitrogen Dioxide Diffusion Tubes (µg/m<sup>3</sup>)**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual Mean Concentrations (µg/m <sup>3</sup> ) Adjusted for Bias		
				2006 (Bias Factor: 1.1)	2007 (Bias Factor: 0.99)	2008 (Bias Factor: 1.13)
SH1	21 Millfield	N	92	15.9	13.5	18.2
SH2	Nutten Stoven	N	92	16.4	16.3	17.4
SH3	Priory Road	N	83	20.4	19.9	23.0
SH4	46 Hollies	N	92	15.6	16.1	18.7
SH5	Station Road	N	83	18.6	19.4	24.3
SH6	103 Boston Road	N	83	36.2	31.9	27.3

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual Mean Concentrations (µg/m <sup>3</sup> ) Adjusted for Bias		
				2006 (Bias Factor: 1.1)	2007 (Bias Factor: 0.99)	2008 (Bias Factor: 1.13)
SH7	Field End	N	83	21.9	22.7	23.5
SH8/9/10	Westmere	N	92	14.9	14.5	16.2
SH11	Metalair	N	92	25.8	20.6	25.3
SH13	Pinchbeck Road	N	83	32.4	30.6	30.8
SH14	Springfields	N	92	27.5	28.5	30.5

### 3.2.2 Particles

There is currently continuous monitoring of PM<sub>10</sub> undertaken by South Holland County Council at two locations in the area, Spalding Monkhouse School and Westmeer School. The Quality Assurance/Quality Control (QA/QC) procedures for the site are equivalent to the UK AURN procedures.

The 2008 results show that the PM<sub>10</sub> objectives are continuing to be met at the Monkhouse School and Westmere School sites.

**Table 7 – Results of PM<sub>10</sub> Automatic Monitoring: Comparison with Annual Mean Objective**

Location	Within AQMA?	Data Capture 2008 %	Annual Mean Concentrations (µg/m <sup>3</sup> )		
			2006	2007	2008
Spalding Monkhouse School	No	98.6	16.4	20.4	19.0
Westmere School	No	96.7	14.8	18.8	16.8

**Table 8 – Results of PM<sub>10</sub> Automatic Monitoring: Comparison with 24-hour Mean Objective**

Location	Within AQMA?	Data Capture 2008 %	Number of Exceedances of Daily Mean (50 µg/m <sup>3</sup> )		
			2006	2007	2008
Spalding Monkhouse School	No	98.6	0	7	1
Westmere School	No	96.7	0	3	1

## 4 Road Traffic Sources

The air quality assessment for road traffic emissions sources has been undertaken using the Highways Agency's DMRB<sup>1</sup> Air Quality model. The DMRB Air Quality inputs and results are shown in Appendices 3 and 4.

### 4.1 Narrow Congested Streets with Residential Properties Close to the Kerb

The criteria for assessment has changed since the previous round of Review and Assessment, this source has been reassessed. The criteria are listed below:

- Daily traffic flow (AADT) should be around 5,000 vehicles/day or more.
- A congested street will be one with slow moving traffic that is frequently stopping and starting due to pedestrian crossings, parked vehicles etc throughout much of the day (not just during rush hours). The average speed is likely to be less than about 25 kph (15 mph).
- A narrow street will be one with residential properties within 2 m of the kerb, and buildings on both sides of the road (the buildings on the other side of the road can be further from the road than 2 m).

There are no identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb identified by South Holland District Council.

South Holland District Council confirms that there are no identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb.

### 4.2 Busy Streets Where People May Spend 1-Hour or More Close to Traffic

South Holland District Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

### 4.3 Roads with a High Flow of Buses and/or Heavy Goods Vehicles

Traffic data assessed for the USA show no roads with high flows of buses and heavy goods vehicles >20%.

South Holland District Council confirms that there are no new/newly identified roads with high flows of buses and/or heavy goods vehicles.

## 4.4 Junctions

South Holland District Council have identified 24 junctions that were not assessed in previous rounds of review and assessment. DMRB Air Quality modelling of these junctions has been undertaken. Results suggest that NO<sub>2</sub> and PM<sub>10</sub> concentrations at nearby receptors are well below their AQS objectives and EU Limit Values for these pollutants.

The following 24 junctions have been assessed in light of new traffic data, not available at the time of the previous USA:

- B1357 Bell Lane/High Road
- Stone Gate/Barrier Bank
- Drain Bank/A16
- Glenside South/Dozens Bank
- Hannam Boulevard/Bourne Road
- Winsover Road/Carrington Road
- Hawthorn Bank/Bourne Road
- Hereward Road/Winsover Road
- West Parade/Winsover Road
- Winsover Road/St. Johns Road
- Winsover Road/Park Road
- St. Thomas Road/Winsover Road
- Pinchbeck Road/Kings Road
- Albion Street/West Elloe Avenue
- Spalding Road/Wardentree Lane
- Fern Drive/Pinchbeck Road
- Albion Street/Westlode Street
- London Road/Hawthorn Bank
- Hawthorn Bank/St. Johns Road
- Halmer Gate/Stone Gate
- Holland Road/Halmer Gate
- Halmer Gate/Albert Street
- Spring Gardens/St. Thomas Road
- Priory Road/St. Thomas Road

Results of DMRB Air Quality modelling of these junctions is shown in Appendix 5. No exceedances of the AQS objectives are predicted and therefore there is no requirement to proceed to a Detailed Assessment.

#### **4.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment**

South Holland District Council confirms that there are no new/proposed roads.

#### **4.6 Roads with Significantly Changed Traffic**

Traffic data assessed for the USA show no roads with significantly changed traffic flows of more than 25%.

South Holland District Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

#### **4.7 Bus and Coach Stations**

The assessment considers both NO<sub>2</sub> and PM<sub>10</sub> emissions at bus stations that are not enclosed with >2500 movements per day.

South Holland District Council confirms that there are no relevant bus stations in the Local Authority area.



## 5 Other Transport Sources

### 5.1 Airports

The assessment for airports considers NO<sub>2</sub>. If there are no airports in the Local Authority area, there is no need to proceed further with this part.

South Holland District Council confirms that there are no airports in the Local Authority area.

### 5.2 Railways (Diesel and Steam Trains)

The assessment for stationary trains considers SO<sub>2</sub> emissions, while the assessment for moving diesel trains considers NO<sub>2</sub> emissions. If there are no railways carrying diesel or steam trains in the Local Authority area, there is no need to proceed further with this part.

#### 5.2.1 Stationary Trains

South Holland District Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15 m.

#### 5.2.2 Moving Trains

South Holland District Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30 m.

### 5.3 Ports (Shipping)

The assessment for shipping considers SO<sub>2</sub> emissions at busy ports with 5,000 and 15,000 movements per year and relevant exposure within 250 m. If there are no ports or shipping, there is no need to proceed further with this part.

South Holland District Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

## 6 Industrial Sources

### 6.1 Industrial Installations

The assessment of industrial installations considers all of the regulated pollutants, although those most at risk of requiring further work are SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> and benzene. A list of industrial processes in the district is provided in Appendix 6.

#### 6.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

There are no new permitted processes for which an Air Quality Assessment has been carried out in South Holland since the previous USA in 2006.

South Holland District Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

#### 6.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

South Holland District Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

#### 6.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

There are two new Part B processes permitted by South Holland District Council since the last round of review and assessment. These include two dry cleaning processes. There are no significant emission releases from these processes relevant to the AQS objectives.

South Holland District Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

## 6.2 Major Fuel (Petrol) Storage Depots

The assessment considers benzene, with respect to the 2010 objective.

There are no major fuel (petrol) storage depots within the Local Authority area.

## 6.3 Petrol Stations

The assessment considers benzene, with respect to the 2010 objective. Large petrol stations, where annual throughput is more than 2000 m<sup>3</sup> of petrol (2 million litres per annum), and with a busy road nearby of >30000 annual average daily traffic flows, require consideration with respect to relevant exposure.

South Holland District Council highlighted 4 petrol stations with a throughput in excess of 2 million litres per annum. However, these stations were found to be located adjacent to roads with an AADT of less than 30000 and there was no relevant exposure identified close to any of these petrol stations.

South Holland District Council confirms that there are no petrol stations meeting the specified criteria.

## 6.4 Poultry Farms

Farms housing in excess of: 400,000 birds if mechanically ventilated, 200,000 birds if naturally ventilated, and 100,000 birds for any turkey unit, require consideration in this assessment, to establish whether there is relevant exposure within 100 m of the poultry units. The assessment needs to consider only PM<sub>10</sub>.

South Holland District Council has identified two poultry farms that exceed the 100,000 bird capacity for turkey units. The two farms in question are Bernhard Matthews sites at Fleet Fen Farm, Spalding and Chapel Road Farm, Spalding. These farms have been subject to assessment and it has been established that there is relevant exposure at both farms within 100 m of the poultry units, within 43 m of the nearest Fleet Fen Farm unit and 16 m of the nearest Chapel Road Farm unit.

South Holland District Council confirms that there are two turkey units in the local authority area meeting the specified criteria. These farms include:

- Bernard Matthews Fleet Fen Farm
- Bernard Matthews Chapel Road Farm

It has been established that there is relevant exposure within 100 m of these farms and therefore these sites should now be subject to Detailed Assessment.

## 7 Commercial and Domestic Sources

### 7.1 Biomass Combustion

#### 7.1.1 Biomass Combustion - Individual Installations

The assessment considers both PM<sub>10</sub> and NO<sub>2</sub> objectives.

South Holland District Council confirm that there are no biomass boilers currently operational in the district.

South Holland District Council confirms that there are no biomass combustion processes operating in the Local Authority area.

#### 7.1.2 Biomass Combustion – Combined Impacts (PM<sub>10</sub> Emissions)

South Holland District Council confirms that there are no biomass combustion plants in the Local Authority area which meet this criteria.

### 7.2 Domestic Solid-Fuel Burning (Sulphur Dioxide Emissions)

The assessment considers SO<sub>2</sub> emissions (only) from significant areas of residential properties that use solid fuel to heat their houses. ‘Significant’ areas are those of about 500 x 500 m with more than 50 houses burning coal/smokeless fuel as their primary source of heating. PM<sub>10</sub> from domestic solid fuel burning is covered under the Biomass combustion – combined impacts section above.

South Holland District Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

## 8 Fugitive or Uncontrolled Sources

The assessment of fugitive and uncontrolled sources considers the PM<sub>10</sub> objectives. This included consideration to quarries, landfill sites, opencast coal mining, waste transfer sites, and materials handling (i.e. ports, major construction sites). Only locations not covered by previous rounds of review and assessment, or where there is new relevant exposure, require consideration. In the case of proposed new sources, these are only required to be considered if planning approval has been granted.

South Holland District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

## 9 Conclusions and Proposed Actions

### 9.1 Conclusions from New Monitoring Data

The review of new monitoring data has identified no exceedances of the AQS objectives at any of South Holland District Council's diffusion tube or continuous monitoring sites.

On the basis of the 2008 monitoring data there is no need to progress to a Detailed Assessment for any pollutant.

### 9.2 Conclusions from Assessment of Sources

The USA has reviewed new and significantly changed sources in the district.

#### 9.2.1 Road Sources

South Holland District Council has identified 28 locations which were not assessed in previous rounds of Review and Assessment or where NO<sub>2</sub> concentrations were previously predicted to be within 10% of the AQS objective.

DMRB Air Quality modelling of these roads and junctions, displayed in Appendix 4 and Appendix 5, suggests no exceedances of the AQS objectives for NO<sub>2</sub> or PM<sub>10</sub>.

No Detailed Assessment is required for any road sources in South Holland.

#### 9.2.2 Other Sources

There are two new Part B processes permitted South Holland District Council since the last round of review and assessment. The Part B processes are two dry cleaning processes which have been assessed and are not considered to be of concern with respect to the AQS objectives. As such, no Detailed Assessment is required.

In addition, South Holland District Council confirms that there are two poultry farms in the local authority area meeting the specified criteria. The two Bernard Matthews farms are the Fleet Fen Farm, Spalding and Chapel Road Farm, Spalding. These farms have been subject to assessment and it has been established that there is relevant exposure within 100 m of these farms and therefore these poultry units should now be subject to Detailed Assessment.

### 9.3 Proposed Actions

Proposed actions arising from the USA are as follows:

- Progress to a Detailed Assessment (for annual mean PM<sub>10</sub> at two poultry farm locations; Fleet Fen Farm Poultry Unit and Chapel Road Poultry Unit) in addition to the 2010 Annual Progress Report;
- Continue diffusion tube and continuous monitoring in the district to identify future changes in pollutant concentrations .

## 10 References

- Highways Agency's Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 Air Quality, May 2007, and accompanying spreadsheet DMRB Screening Method V1,03.xls. July 2007
- 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
- Local Air Quality Management Policy Guidance LAQM.PG(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 2008 Local Air Quality Management Annual Progress Report
- South Holland District Council 2007 Local Air Quality Management Annual Progress Report
- South Holland District Council 2006 Local Air Quality Management Updating and Screening Assessment



**APPENDICES**

**Appendix 1 - Traffic Data**

Data Source	Road Name	%HDV *	AAADT 2008	AAADT 2010	Previously Assessed?	Assessed in USA 2009 Using DMRB?	Reason for Assessment
Jacobs	B1357 Bell Lane	5	620	649	N	Y	New traffic data
Jacobs	High Road	5	17033	17436	N	Y	New traffic data
Jacobs	Stone Gate	2	1322	1364	N	Y	New traffic data
Jacobs	Barrier Bank	2	11306	11565	N	Y	New traffic data
Jacobs	Drain Bank	13	825	853	N	Y	New traffic data
Jacobs	A16	13	10310	10586	N	Y	New traffic data
Jacobs	Glenside South	2	3194	3273	N	Y	New traffic data
Jacobs	Dozens Bank	2	7208	7351	N	Y	New traffic data
Jacobs	Hannam Boulevard	2	3638	3822	N	Y	New traffic data
Jacobs	Bourne Road	2	9779	9808	N	Y	New traffic data
Jacobs	Winsover Road	2	8785	9134	N	Y	New traffic data
Jacobs	Carrington Road	2	3046	3071	N	Y	New traffic data
Jacobs	Hawthorn Bank	2	7212	7244	N	Y	New traffic data
Jacobs	Bourne Road	2	10342	10499	N	Y	New traffic data
Jacobs	Hereward Road	2	564	598	N	Y	New traffic data
Jacobs	Winsover Road	2	9022	9459	N	Y	New traffic data
Jacobs	West Parade	2	1089	1321	N	Y	New traffic data
Jacobs	Winsover Road	2	9671	10269	N	Y	New traffic data
Jacobs	Winsover Road	2	13089	13807	N	Y	New traffic data
Jacobs	St. Johns Road	2	3457	3577	N	Y	New traffic data
Jacobs	Winsover Road	2	14411	14944	N	Y	New traffic data
Jacobs	Park Road	2	4466	4216	N	Y	New traffic data
Jacobs	St Thomas Road	2	10156	10243	N	Y	New traffic data
Jacobs	Winsover Road	2	14411	14944	N	Y	New traffic data
Jacobs	Pinchbeck Road	2	11130	12102	N	Y	New traffic data

\*Heavy duty vehicles (HDV) >20% is considered as an unusually high proportion, which would warrant assessment if not previously considered.





**Appendix 1 (Continued) - Traffic Data**

Data Source	Road Name	%HDV *	AADT 2008	AADT 2010	Previously Assessed?	Assessed in USA 2009 Using DMRB?	Reason for Assessment
Jacobs	Kings Road	2	8126	8965	N	Y	New traffic data
Jacobs	Albion Street	2	8826	8963	N	Y	New traffic data
Jacobs	West Elloe Avenue	2	14184	14866	N	Y	New traffic data
Jacobs	Spalding Road	2	14525	14873	N	Y	New traffic data
Jacobs	Wardentree Lane	2	3532	3674	N	Y	New traffic data
Jacobs	Fern Drive	2	537	549	N	Y	New traffic data
Jacobs	Pinchbeck Road	2	15943	16309	N	Y	New traffic data
Jacobs	Albion Street	2	9178	9347	N	Y	New traffic data
Jacobs	Westflood Street	2	8215	8251	N	Y	New traffic data
Jacobs	London Road	2	6364	6538	N	Y	New traffic data
Jacobs	Hawthorn Bank	2	8747	8966	N	Y	New traffic data
Jacobs	Hawthorn Bank	2	9397	9604	N	Y	New traffic data
Jacobs	St Johns Road	2	7966	8042	N	Y	New traffic data
Jacobs	Halmer Gate	2	9725	9943	N	Y	New traffic data
Jacobs	Stone Gate	2	4836	4941	N	Y	New traffic data
Jacobs	Holland Road	2	598	607	N	Y	New traffic data
Jacobs	Halmer Gate	2	9725	9943	N	Y	New traffic data
Jacobs	Halmer Gate	2	8953	9165	N	Y	New traffic data
Jacobs	Albert Street	2	7521	7804	N	Y	New traffic data
Jacobs	Spring Gardens	2	1642	1795	N	Y	New traffic data
Jacobs	St Thomas Road	2	9051	9192	N	Y	New traffic data
Jacobs	Priory Road	2	6093	6241	N	Y	New traffic data
Jacobs	St Thomas Road	2	9004	9141	N	Y	New traffic data

\*Heavy duty vehicles (HDV) >20% is considered as an unusually high proportion, which would warrant assessment if not previously considered.



**Appendix 1 (Continued) - Traffic Data**

Data Source	Road Name	%HDV *	AA DT 2008	AA DT 2010	Previously Assessed?	Assessed in USA 2009 Using DMRB?	Reason for Assessment
Jacobs	A17 / Long Sutton	12	4230	4319	Y	Y	New traffic data
Jacobs	A17 / Fleet Hargate	15	18780	19174	Y	Y	New traffic data
Jacobs	A17 / Three Bridges	16	14300	14600	Y	Y	New traffic data
Jacobs	A17	12	13678	13815	Y	Y	New traffic data
Jacobs	B1168 / Boston Road	3	6650	6790	Y	Y	New traffic data

\*Heavy duty vehicles (HDV) >20% is considered as an unusually high proportion, which would warrant assessment if not previously considered.



**Appendix 2 - Bias Adjustment Factor Calculations**

Westmere School Background	
Bias factor A	1.13 +/- 0.17
Bias B	-8 +/- 15%
Diffusion Tubes Mean:	15µg/m <sup>3</sup>
Mean CV (Precision):	5
Automatic Mean:	17ug/m <sup>3</sup>
Data Capture for periods used:	95%
Adjusted Tubes Mean:	17 +/- 3µg/m <sup>3</sup>



**Appendix 3 - Nitrogen Dioxide Diffusion Tube Results 2008**

Site Ref	Location	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Average	Bias Corrected Annual Mean 2008
SH1	21 Millfield	16.0	29.9	14.1	11.7	9.0	9.7	-	12.4	14.6	18.1	18.1	23.4	16.1	18.2
SH2	Nutten Stoven	15.3	22.3	12.3	13.3	13.1	10.2	-	16.3	12.7	14.0	17.1	22.1	15.3	17.4
SH3	Priory Road	18.3	28.1	16.9	18.6	16.9		-	11.6	18.7	21.1	24.1	29.2	20.3	23.0
SH4	46 Hollies	19.6	23.6	12.6	14.2	10.0	9.1	-	14.2	13.1	14.9	23.8	26.6	16.5	18.7
SH5	Station Road	20.8	23.5	13.0	18.5	-	17.0	-	20.2	19.1	23.3	32.7	26.8	21.5	24.3
SH6	103 Boston Road	18.9	29.6	15.7	23.2	-	23.0	-	27.3	26.1	19.6	26.8	30.7	24.1	27.3
SH7	Field End	21.4	26.2	16.7	21.1	13.4	17.4	-	21.2	19.8	25.5	24.8		20.7	23.5
SH8	Westmere 1	16.5	20.3	11.4	13.5	9.3	7.6	-	13.0	12.7	16.5	16.7	21.0	14.4	16.3
SH9	Westmere 2	16.9	22.0	10.9	11.6	9.2	7.2	-	13.0	12.0	15.9	16.3	21.3	14.2	16.1
SH10	Westmere 3	18.3	19.9	11.3	13.4	8.5	7.6	-	12.4	12.7	18.1	18.2	17.5	14.4	16.3
SH11	Metalair	18.7	25.0	17.3	20.5	27.4	19.2	-	23.7	21.1	23.7	19.9	29.3	22.3	25.3
SH13	Pinchbeck Road	31.5	33.8	23.6		17.3	27.8	-	28.7	17.1	19.4	32.1	41.1	27.3	30.8
SH14	Springfields	26.8	31.8	19.6	27.3	26.7	22.1	-	28.8	25.0	23.4	29.5	35.1	26.9	30.5



**Appendix 4 - DMRB Air Quality Assessment Inputs**

Receptor	Road Affecting Receptor	Distance to Receptor (m)	AADT (2008)	% HDV	Speed (kph)	Background Concentrations	
						2008 NO <sub>2</sub> Annual Mean (µg/m <sup>3</sup> )	2008 PM <sub>10</sub> Annual Mean (µg/m <sup>3</sup> )
62 Bell Lane	B1357 Bell Lane	12.8	620	5	20	16.2	16.8
	High Road	11.4	17033	5	20	16.2	16.8
2 Stone Gate	Stone Gate	4.5	1322	2	20	16.2	16.8
	Barrier Bank	24.6	11306	2	20	16.2	16.8
Hillside, Drain Bank	Drain Bank	10.3	825	13	20	16.2	16.8
	A16	20	10310	13	20	16.2	16.8
Corner House, Glenside South	Glenside South	6.2	3194	2	20	16.2	16.8
	Dozens Bank	15.3	7208	2	20	16.2	16.8
72 Bourne Road	Hannam Boulevard	7.5	3638	2	20	16.2	16.8
	Bourne Road	17.9	9779	2	20	16.2	16.8
208 Winsover Road	Winsover Road	11.8	8785	2	20	16.2	16.8
	Carrington Road	12.9	3046	2	20	16.2	16.8
253 Winsover Road/Bourne Road	Hawthorn Bank	7.7	7212	2	20	16.2	16.8
	Bourne Road	8.9	10342	2	20	16.2	16.8
136 Winsover Road	Hereward Road	9.5	564	2	20	16.2	16.8
	Winsover Road	12.3	9022	2	20	16.2	16.8
112 Winsover Road	West Parade	6	1089	2	20	16.2	16.8
	Winsover Road	10.4	9671	2	20	16.2	16.8
81 Winsover Road	Winsover Road	11.1	13089	2	20	16.2	16.8
	St. Johns Road	4.1	3457	2	20	16.2	16.8
58 Winsover Road	Winsover Road	10	14411	2	20	16.2	16.8
	Park Road	6.6	4466	2	20	16.2	16.8
57 Winsover Road	St Thomas Road	7.4	10156	2	20	16.2	16.8
	Winsover Road	8.7	14411	2	20	16.2	16.8
47 Pinchbeck Road	Pinchbeck Road	8.3	11130	2	20	16.2	16.8
	Kings Road	7.2	8126	2	20	16.2	16.8

**Appendix 4 (Continued) – DMRB Air Quality Assessment Inputs**

Receptor	Road Affecting Receptor	Distance to Receptor (m)	AADT (2008)	% HDV	Speed (kph)	Background Concentrations	
						2008 NO <sub>2</sub> Annual Mean (µg/m <sup>3</sup> )	2008 PM <sub>10</sub> Annual Mean (µg/m <sup>3</sup> )
129 Albion Street	Albion Street	9	8825	2		16.2	16.8
	West Elloe Avenue	26.9	14184	2	20	16.2	16.8
104 Spalding Road	Spalding Road	22.7	14525	2	20	16.2	16.8
	Wardenfree Lane	13.5	3532	2	20	16.2	16.8
1 Roman Way	Fern Drive	8.2	537	2	20	16.2	16.8
	Pinchbeck Road	27.7	15943	2	20	16.2	16.8
1 Albion Street	Albion Street	8.6	9178	2	20	16.2	16.8
	Westlode Street	12.3	8215	2	20	16.2	16.8
91 London Road	London Road	12.6	6364	2	20	16.2	16.8
	Hawthorn Bank	11.7	8747	2	20	16.2	16.8
Church, Hawthorn Bank	Hawthorn Bank	8.7	9397	2	20	16.2	16.8
	St Johns Road	8.2	7966	2	20	16.2	16.8
2 Halmer Gate	Halmer Gate	9.4	9725	2	20	16.2	16.8
	Stone Gate	20.9	4836	2	20	16.2	16.8
34 Holland Road	Holland Road	11.6	598	2	20	16.2	16.8
	Halmer Gate	7.9	9725	2	20	16.2	16.8
89 Halmer Gate	Halmer Gate	12.4	8953	2	20	16.2	16.8
	Albert Street	16.1	7521	2	20	16.2	16.8
35 Spring Gardens	Spring Gardens	5.5	1642	2	20	16.2	16.8
	St Thomas Road	9.1	9051	2	20	16.2	16.8
17 Priory Road	Priory Road	10.7	6093	2	20	16.2	16.8
	St Thomas Road	8.4	9004	2	20	16.2	16.8
Bridge House West	A17 / Long Sutton	16.5	4230	12	48	16.2	16.8
	Vine Cottage	11.6	18780	15	48	16.2	16.8
Receptor 1	A17 / Three Bridges	10.6	14300	16	48	16.2	16.8

**Appendix 4 (Continued) – DMRB Air Quality Assessment Inputs**

Receptor	Road Affecting Receptor	Distance to Receptor (m)	AADT (2008)	% HDV	Speed (kph)	Background Concentrations	
						2008 NO <sub>2</sub> Annual Mean (µg/m <sup>3</sup> )	2008 PM <sub>10</sub> Annual Mean (µg/m <sup>3</sup> )
103 Boston Road	A17	21	13678	12	20	16.2	16.8
	B1168 / Boston Road	61	6650	3	20	16.2	16.8

**Appendix 5 - DMRB Air Quality Assessment Results**

Receptor	Road Affecting Receptor	DMRB Assessment Results				Detailed Assessment Required?
		2008 Road NO <sub>x</sub> Annual Mean (µg/m <sup>3</sup> )	2008 NO <sub>2</sub> * Annual Mean (µg/m <sup>3</sup> )	2008 PM <sub>10</sub> Annual Mean (µg/m <sup>3</sup> )	2008 Number of Exceedances of 24 Hour PM <sub>10</sub>	
62 Bell Lane	B1357 Bell Lane	26.5	27.2	20.2	4	N
	High Road					
2 Stone Gate	Stone Gate	9.6	20.5	18.2	2	N
	Barrier Bank					
Hillside, Drain Bank	Drain Bank	28.5	28.0	20.0	3	N
	A16					
Corner House, Glenside South	Glenside South	10.3	20.8	18.4	2	N
	Dozens Bank					
72 Bourne Road	Hannam Boulevard	12.5	21.7	18.7	2	N
	Bourne Road					
208 Winsover Road	Winsover Road	11.9	21.5	18.6	2	N
	Carrington Road					
253 Winsover Road/Bourne Road	Hawthorn Bank	19.5	24.6	19.7	3	N
	Bourne Road					
136 Winsover Road	Hereward Road	9.6	20.5	18.2	2	N
	Winsover Road					
112 Winsover Road	West Parade	11.5	21.3	18.5	2	N
	Winsover Road					
81 Winsover Road	Winsover Road	17.6	23.8	19.5	3	N
	St. Johns Road					

\* NO<sub>2</sub> concentrations calculated from NO<sub>x</sub> using the LAQM.TG (09) NO<sub>x</sub>:NO<sub>2</sub> conversion calculator.



**Appendix 5 (Continued) – DMRB Air Quality Assessment Results**

Receptor	Road Affecting Receptor	DMRB Assessment Results				Detailed Assessment Required?
		2008 Road NO <sub>x</sub> Annual Mean (µg/m <sup>3</sup> )	2008 NO <sub>2</sub> * Annual Mean (µg/m <sup>3</sup> )	2008 PM <sub>10</sub> Annual Mean (µg/m <sup>3</sup> )	2008 Number of Exceedances of 24 hour PM <sub>10</sub>	
58 Winsover Road	Winsover Road	20.5	25.0	19.9	3	N
	Park Road					
57 Winsover Road	St Thomas Road	27.4	27.6	20.9	5	N
	Winsover Road					
47 Pinchbeck Road	Pinchbeck Road	21.7	25.4	20.1	3	N
	Kings Road					
129 Albion Street	Albion Street	19.2	24.4	19.7	3	N
	West Elloe Avenue					
104 Spalding Road	Spalding Road	14.3	22.5	19.0	2	N
	Wardentree Lane					
1 Roman Way	Fern Drive	10.7	21.0	18.4	2	N
	Pinchbeck Road					
1 Albion Street	Albion Street	18.4	24.1	19.6	3	N
	Westlode Street					
91 London Road	London Road	15.2	22.8	19.1	2	N
	Hawthorn Bank					
Church, Hawthorn Bank	Hawthorn Bank	19.3	24.5	19.7	3	N
	St Johns Road					
2 Halmer Gate	Halmer Gate	14.3	22.5	19.0	2	N
	Stone Gate					
34 Holland Road	Holland Road	11.5	21.3	18.5	2	N
	Halmer Gate					

\* NO<sub>2</sub> concentrations calculated from NO<sub>x</sub> using the LAQM.TG (09) NO<sub>x</sub>:NO<sub>2</sub> conversion calculator.

**Appendix 5 (Continued) – DMRB Air Quality Assessment Results**

Receptor	Road Affecting Receptor	DMRB Assessment Results				Detailed Assessment Required?
		2008 Road NO <sub>x</sub> Annual Mean (µg/m <sup>3</sup> )	2008 NO <sub>2</sub> * Annual Mean (µg/m <sup>3</sup> )	2008 PM <sub>10</sub> Annual Mean (µg/m <sup>3</sup> )	2008 Number of Exceedances of 24 hour PM <sub>10</sub>	
89 Halmer Gate	Halmer Gate	15.7	23.0	19.2	2	N
	Albert Street					
35 Spring Gardens	Spring Gardens	11.8	21.4	18.6	2	N
	St Thomas Road					
17 Priory Road	Priory Road	16.4	23.3	19.3	3	N
	St Thomas Road					
Bridge House West	A17 / Long Sutton	7.9	19.7	17.5	1	N
Vine Cottage	A17 / Fleet Hargate	41.6	32.5	20.6	4	N
Receptor 1	A17 / Three Bridges	39.2	31.7	20.4	4	N
103 Boston Road	A17					
	B1168 / Boston Road	33.6	29.8	20.7	4	N

\* NO<sub>2</sub> concentrations calculated from NO<sub>x</sub> using the LAQM.TG (09) NO<sub>x</sub>:NO<sub>2</sub> conversion calculator.



**Appendix 6 - List of Industrial Processes**

Process Name	Process Type	PG Note	X	Y	New Source Since USA 2006?	Existing Process with New Exposure?	Substantial Change >30%?	Potentially Significant Release with Respect to AQOs?	Complaints?	Nomogram Screening Assessment Required?	Detailed Assessment Required?
B P Service Station	Petrol Station	1/14	544088	321817	N	N	N	N	N	N	N
Donington Service Station	Petrol Station	1/14	520512	335555	N	N	N	N	N	N	N
Lincs Co-op	Petrol Station	1/14	526638	323977	N	N	N	N	N	N	N
Lincs Co-op	Petrol Station	1/14	532741	324305	N	N	N	N	N	N	N
Little London Service Station	Petrol Station	1/14	524224	321301	N	N	N	N	N	N	N
Morrisons Supermarket	Petrol Station	1/14	525327	325056	N	N	N	N	N	N	N
Crowland Service Station	Petrol Station	1/14	523941	309147	N	N	N	N	N	N	N
Sainsburys Stores	Petrol Station	1/14	524471	322982	N	N	N	N	N	N	N
Whaplode Service Station	Petrol Station	1/14	532767	324355	N	N	N	N	N	N	N
Roffes	Waste Oil Burners	1/1	548200	321500	N	N	N	N	N	N	N
Gist	Waste Oil Burners	1/1	525301	325100	N	N	N	N	N	N	N
A Culpin & Son	Waste Oil Burners	1/1	523021	326009	N	N	N	N	N	N	N
Proctor Bros	Waste Oil Burners	1/1	523820	329866	N	N	N	N	N	N	N



**Appendix 6 (Continued) - List of Industrial Processes**

Process Name	Process Type	PG Note	X	Y	New Source Since USA 2006?	Existing Process with New Exposure?	Substantial Change >30%?	Potentially Significant Release with respect to AQOs?	Complaints?	Nomogram Screening Assessment required?	Detailed Assessment Required?
Select Timber Products	Timber	6/2	521000	335700	N	N	N	N	N	N	N
Port Sutton Bridge	Coal	3/5	548300	322200	N	N	N	N	N	N	N
Transco	Odourising Natural Gas		545553	322171	N	N	N	N	N	N	N
South Lincs Patterns	Foundry	2/1	523256	320373	N	N	N	N	N	N	N
N W Smith	Vehicle Refinishers	6/34	535100	309300	N	N	N	N	N	N	N
Frosts Commercial Refinishes (Crowland)	Vehicle Refinishers	6/34	523542	309453	N	N	N	N	N	N	N
Lovells	Vehicle Refinishers	6/34	524100	322400	N	N	N	N	N	N	N
A S Whitaker & Sons	Vehicle Refinishers	6/34	523900	322400	N	N	N	N	N	N	N
D A Green & Sons	Coating Processes	6/31	532300	324100	N	N	N	N	N	N	N
MJL Welding & Fabrication	Coating processes	6/31	521828	322019	N	N	N	N	N	N	N
Coles Dry Cleaners	Dry Cleaners	6/46	536001	324827	Y	N	N	N	N	N	N
Geoff Neal & Son	Dry Cleaners	6/46	524870	322566	Y	N	N	N	N	N	N
C & G Concrete Ltd	Cement	3/1	541200	323700	N	N	N	N	N	N	N



**Appendix 6 (Continued) - List of Industrial Processes**

Process Name	Process Type	PG Note	X	Y	New Source Since USA 2006?	Existing Process with New Exposure?	Substantial Change >30%?	Potentially Significant Release with respect to AQOs?	Complaints?	Nomogram Screening Assessment Required?	Detailed Assessment Required?
Cemex	Cement	3/1	523500	325600	N	N	N	N	N	N	N
Lafarge Redland Ready mix Ltd	Cement	3/1	523893	321086	N	N	N	N	N	N	N
C Warwick & Son Ltd	Cement	3/1	543400	322400	N	N	N	N	N	N	N









