



Draft

2012 Air Quality Updating and
Screening Assessment for
North Lincolnshire Council

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

July 2012

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Executive Summary

This report considers all potential sources of air pollution within North Lincolnshire which are made up primarily of industrial and traffic sources. The main purpose of the report is to identify those aspects that have changed since completion of the 2009 Updating & Screening Assessment, 2010 Progress Report and 2011 Progress Report.

Continuing problems have been highlighted within the local area relating to PM₁₀ which has previously resulted in the declaration of two Air Quality Management Areas; (AQMA)

- 2005 Scunthorpe AQMA for breaches of PM₁₀ Daily Mean Objective.
- 2008 Low Santon AQMA for breaches of the PM₁₀ Annual Mean Objective.

PM₁₀ data for 2011 has shown an overall increase in the number of exceedance days across the network. This may be due to a higher than average regional event count and unusual met conditions throughout the year. It should be noted that 2010 saw a reduced number of exceedance days due to unusual ground and met conditions which were not been replicated in 2011.

A potential new exceedance of the air quality objective for NO₂ was identified at South Killingholme in the 2011 Progress Report. A Detailed Assessment of this location is currently being prepared and will be sent to DEFRA when finalised.

All other sources assessed have not met the criteria required to proceed to a Detailed Assessment. These will be assessed again in the 2013 Progress Report to ensure that they do not have a detrimental effect on air quality within North Lincolnshire.

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1 Introduction

1.1 Description of Local Authority Area

North Lincolnshire is an area of around 85,000 hectares located on the southern side of the Humber estuary and occupying tracts of land on either side of the River Trent. Parliamentary Order created the administrative area of North Lincolnshire in March 1995 and on 1st April 1996 the new Unitary Authority area of North Lincolnshire came into being. North Lincolnshire covers a large, mainly agricultural area. The pattern of settlements in the area reflects this with market towns surrounded by many small villages. An important exception to this is the substantial urban area of Scunthorpe and the adjoining town of Bottesford. Almost half of North Lincolnshire's population, approximately 73,250 people, live in Scunthorpe and the adjacent town of Bottesford. Overall, 71 percent of the population live in this main urban area and other towns. The local economy of North Lincolnshire was built on traditional industries such as steel manufacturing and related industries and agriculture. More recently there has been the establishment of two oil refineries and the introduction of several gas fired power stations. The M180 motorway and several primary and strategic routes, including the A18 and A15, are located within North Lincolnshire. By rail there are regular freight movements to and from Scunthorpe Steelworks and Humber port related industries. With several wharf facilities along the banks of the Humber and the Trent, North Lincolnshire is well positioned to take advantage of water transport.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management 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. 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 Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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 microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes 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 Objectives 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 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Previous rounds of review and assessment have led to a number of focused assessments of different pollutants and sources. Summaries of the assessment findings are as follows:

Updating & Screening Assessment 2003

Results of monitoring and the screening exercises in this Review & Assessment, proposed that a detailed assessment of PM₁₀ would be conducted in relation to the following: -

- Industrial emissions of PM₁₀ in Scunthorpe.
- Emissions of PM₁₀ from quarries and landfills in Barnetby.
- Emissions of PM₁₀ and SO₂ from domestic solid fuel burning in Keadby.
- Industrial emissions of SO₂ in Killingholme
- Industrial emissions of Benzene in Killingholme and Scunthorpe

Detailed Assessment 2004

Continuing on from the 2003 USA, recommendations for each pollutant were as follows;

Benzene

To gather further data in both Scunthorpe and Killingholme and review and report findings in the next annual Progress Report.

Sulphur Dioxide

To gather further data at Keadby and review and report findings in the next annual Progress Report. No further action was required in respect of sulphur dioxide at Killingholme. No further action was required in connection with stationary railway locomotives at Scunthorpe Station.

PM₁₀

An Air Quality Management Area or Areas shall be defined and then designated for the Scunthorpe area where there is likely exceedence of the Air Quality Objectives. Gather additional PM₁₀ data at Keadby and subsequently review and report conclusions in the next annual Progress Report. No further action is required in respect of PM₁₀ in Croxton/Barnetby.

Benzene Detailed Assessment 2005

The annual mean of benzene concentrations at relevant locations did not exceed the 2010 objective, although at one location at Santon, Scunthorpe some monthly concentrations did exceed 5µg/m³ and consequently further investigations were required. The monthly concentrations at certain boundary locations were greater than 5µg/m³ at installations in Scunthorpe and Killingholme, however where there were no relevant receptors and exposure is unlikely to effect human health, no further investigation was required in relation to air quality assessment.

Progress Report 2005

From the results of the monitoring data in this Progress Report, it was proposed that the following actions be implemented; A benzene diffusion tube survey would continue for a further 12-month period commencing March 2005 at two sites in Scunthorpe identified as having the potential to breach the 2010 annual mean objective of $5\mu\text{g}/\text{m}^3$.

The two locations identified in Scunthorpe as likely to breach the annual mean air quality objective for nitrogen dioxide of $40\mu\text{g}/\text{m}^3$, a chemiluminescence NO_x analyser was installed.

The council will declare an Air Quality Management Area for PM_{10} in Scunthorpe, in relation to the 24 hour mean objective of $50\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year, and continue with the further assessment work to determine the relative contributions of different sources of PM_{10} .

Updating & Screening Assessment 2006

From the results of the monitoring and the screening exercises in this Review & Assessment, it was proposed that detailed assessments would be conducted in relation to the following: -

- Industrial emissions of 1,3-Butadiene in the vicinity of the Conoco Phillips Ltd and Total UK Ltd Oil Ltd Refineries, North Killingholme.
- Industrial emissions of Lead in the vicinity of the Corus (UK) Ltd Integrated Steelworks, Scunthorpe.
- Emissions of Nitrogen Dioxide in the vicinity of Doncaster Rd / Hilton Avenue, Scunthorpe, Junction of Brigg Road and A18, Mortal Ash, Scunthorpe

Detailed Assessment PM_{10} in Scunthorpe 2008

The results presented indicate that the annual PM_{10} objective has been breached in the vicinity of the Low Santon TEOM monitoring station in 2006 and 2007. The mean concentration recorded between October and December 2005 was also greater than $40\mu\text{g}/\text{m}^3$.

Further Assessment of PM_{10} in Scunthorpe 2008

Further assessment of past monitoring data recorded at continuous sites within the AQMA Scunthorpe shows levels remain non-compliant with the short-term objective. The Council has no current plans to move the monitors within the AQMA.

Progress Report 2008

The progress report concluded that NO_2 concentrations within Killingholme had decreased and there had been no significant changes to road traffic flows or other transportation.

Updating & Screening Assessment 2009

The Updating & Screening Assessment 2009 highlighted no new areas of non-compliance. Existing problems such as the ongoing issues with the Integrated Steel Works were again noted and are due to be addressed within forthcoming Further Assessments and Action Plans.

Progress Report 2010

The 2010 Progress Report did not highlight any new exceedances of the air quality objectives. The report reconsidered all potential sources of pollution (primarily industry and traffic related sources) with respect to PM₁₀ (particulate matter), nitrogen dioxide, sulphur dioxide & benzene.

Continuing problems have been highlighted within the local area relating to PM₁₀ and at present have resulted in the declaration of two Air Quality Management Areas; (AQMA)

- 2005 Scunthorpe AQMA for breaches of PM₁₀ daily mean objective.
- 2008 Low Santon AQMA for breaches of the PM₁₀ annual mean objective.

Problems persisted at both of these locations although improvements are beginning to show. Daily objective breaches are becoming less frequent throughout the AQMA although East Common Lane and Santon, which surround the Integrated Steelworks site, still exceed the objective. The annual mean objective at Santon has also seen a decrease since 2006 and the application of the Volatile Correction Model in 2008 has resulted in the site being compliant. These results should be treated with caution due to the downturn in the manufacturing industry and the relevance of the VCM FDMS correction which up until 2010 was taken from over 100km away.

Further Assessment of PM₁₀ at Low Santon

This Further Assessment was undertaken because of continued exceedances of the Annual Mean Objective of 40µg/m³ at Low Santon, Scunthorpe. Because of this an Air Quality Management Area was declared on the 10th December 2008.

The study looked at a number of factors likely to influence the elevated concentrations being recorded at Low Santon including:

- Location of the monitoring stations
- Method of measurement
- Historical MET data
- Particle size fractions
- Relationships with other pollutants
- Triangulation with other monitoring stations
- Directional analysis

The study also reviewed ongoing work designed to inform interested parties of exceedance risk and ongoing area contributions including:

- North Lincolnshire Council Tea Break Report
- North Lincolnshire Council Daily Review Analysis
- North Lincolnshire Council PM₁₀ Alert System
- North Lincolnshire Council Low Santon PM₁₀ Risk Assessment
- AEA Low Santon Modelling Report
- Environment Agency PM₁₀ Action Plan

Progress Report 2011

The 2011 Progress Report highlighted a new exceedance of the air quality objectives. The report reconsidered all potential sources of pollution (primarily industry and traffic related sources) with respect to PM₁₀ (particulate matter), nitrogen dioxide, sulphur dioxide & benzene. Additional NO₂ tubes identified a potential exceedance along the A160 Road in South Killingholme. This is currently being investigated. Problems persisted within the two declared AQMA's:

- 2005 Scunthorpe AQMA for breaches of PM₁₀ daily mean objective.
- 2008 Low Santon AQMA for breaches of the PM₁₀ annual mean objective.

Low Santon demonstrated an improvement on previous years but was still well in excess of the Daily Mean Objective. Sites within Scunthorpe recorded compliant results for both Objectives.

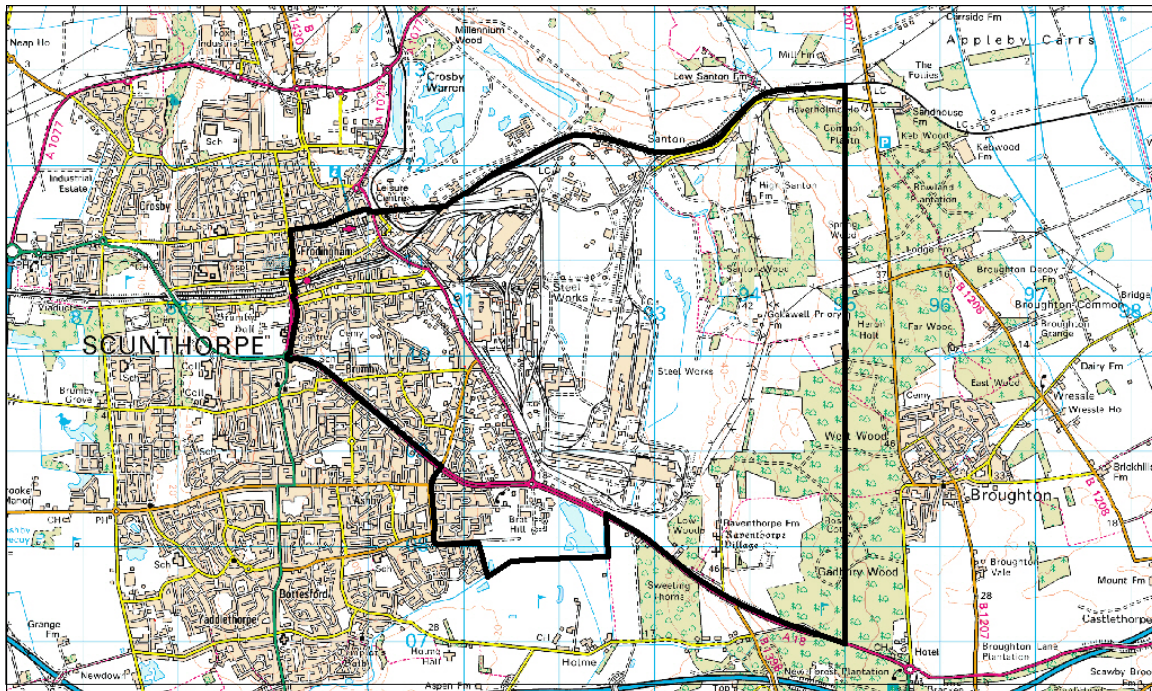


Figure 1.1 2005 Scunthorpe Town AQMA Boundary

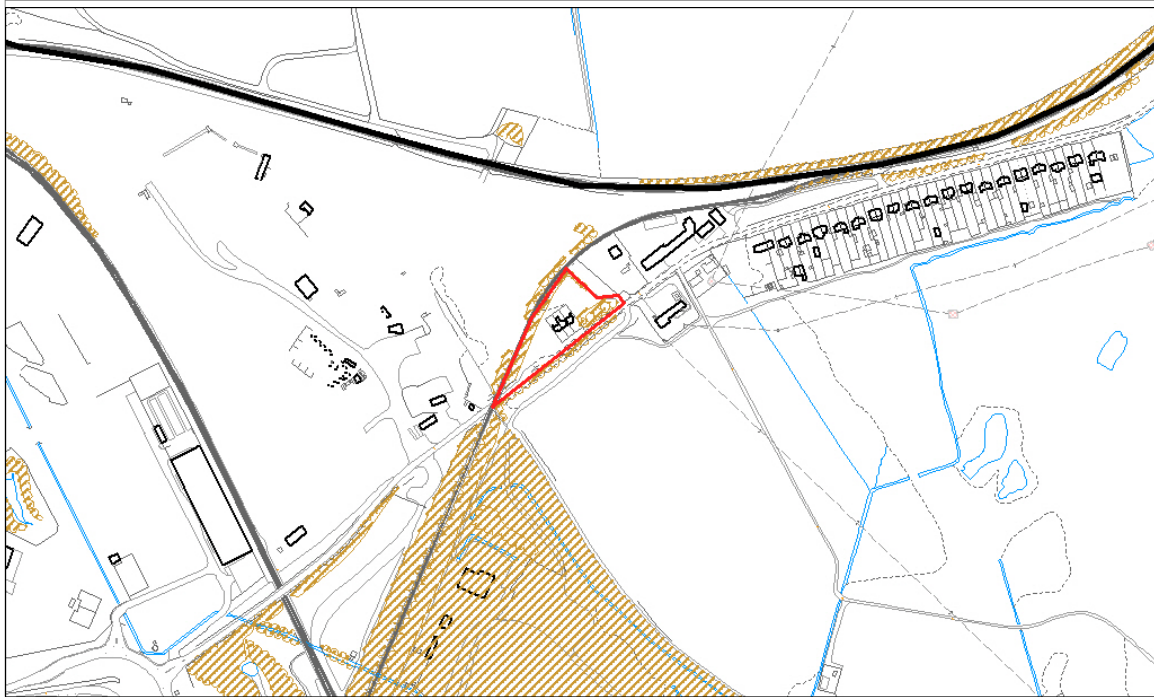


Figure 1.2 2008 Low Santon AQMA Boundary

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

1. Scunthorpe Town AURN (Rowland Road)

This monitoring station is housed within an enclosed air-conditioned unit in the northeast of Scunthorpe approximately 10 metres to the north of Rowland Road. The nearest busy road is Brigg Road (A1029), at its closest point it is 124 metres to the northeast of the monitoring site. The monitoring equipment at the station consists of an Enviro-Technology Services model 100A Fluorescent sulphur dioxide (SO₂) analyser, a Monitor Labs Inc ML9841B oxides of nitrogen chemi-luminescence analyser and a Rupprecht & Patterschnick TEOM 1400a PM₁₀ monitor. The logging system used is an Odessa DSM3260. In addition wind direction and wind speed are measured at this site. The PM₁₀, NO_x and SO₂ analysers are affiliate members of the AURN (Automatic and Urban Rural Network). The site also comprises of an equivalent Partisol Particulate Monitor (Now Suspended 31/03/2010), a National Physics Laboratory funded Heavy Metals sampler and a Digitel DHA-80 High volume PAH sampler An FDMS C was installed in the Monitoring Station in January 2010 designed to increase confidence in the Volatile Correction Model currently used to correct the TEOM network.

2. East Common Lane

PM₁₀ is monitored at this site using a TEOM 1400a. This site is located behind a block of flats, 34m south of East Common Lane, to the west of the site is a residential area; whilst to the northeast and southeast are several industrial estates. The site is approximately 500 m west of the steelworks site boundary.

3. Low Santon

This monitoring station is housed within an enclosed air-conditioned unit to the north east of Scunthorpe on the eastern boundary of the steelworks. Dawes Lane is 5m to the south of the station, running from a rural location in the east through the steelworks and into Scunthorpe. A raised embankment 5m north of the site carries freight traffic along one of the major rail lines into the steelworks. The surrounding area consists of arable fields with a number of trees and to the east, a small residential area. The monitoring equipment at this station consists of a Signal Ambitech Ambirak analyser, monitoring sulphur dioxide and oxides of nitrogen, and a Rupprecht & Patterschnick TEOM 1400a monitoring PM₁₀. In addition, a Digitel DHA-80 High volume PAH sampler began operation at the site in September 2007. A Partisol 2000 was installed in April 2008 to measure concentrations of heavy metals. Further to this an additional Rupprecht & Patterschnick TEOM 1400a was installed in June 2008 to monitor PM_{2.5}. An FDMS C was installed in the Monitoring Station in March 2010 designed to increase confidence in the Volatile Correction Model currently used to correct the TEOM network and to aid the Further Assessment at Low Santon.

4. High Santon

This monitoring station is located in a domestic garden 400m from the Low Santon monitoring station. The site comprises of a Partisol 2000 equivalent particulate monitor and was installed in January 2008.



Figure 1.3 Location of Monitoring Sites in Scunthorpe

5. Redbourn Club

PM₁₀ is monitored at this site using a TEOM 1400a. Redbourn Club is a sports and social club situated 1km from the boundary of the local Integrated Steelworks. The monitoring station is sited away from buildings and trees close to the boundary of the clubs cricket pitch.

6. Lakeside

The Lakeside monitoring station sits within a newly built housing development 600m to the South of the local Integrated Steelworks. Its placement was due to the introduction of receptors close to the boundary of the steel making facility. It is sited within the front garden of a house.

7. Appleby Village

This site is located on a playing field in the village of Appleby, see figure 1.4; the village is surrounded by arable fields and open fields and is 6 km northeast of Scunthorpe. PM₁₀ is monitored at this site using a TEOM 1400a.



Figure 1.4 Location of Appleby Site

8. Killingholme

The site is located within the grounds of South Killingholme Primary School and is approximately 200 m north of the dual-carriage A160; see figure 1.6. Two refineries are located to the northeast and east of the site. The site is approximately 4 km west of the River Humber and the Immingham docks. The site is approximately 20 km east of the Air Quality Management Area in Scunthorpe. Sulphur dioxide, oxides of nitrogen and PM₁₀ are the three pollutants measured at this site. In addition wind direction and speed, relative humidity, pressure and temperature are also measured. A pumped Benzene Tube was installed in September 2008 as part of the National Hydrocarbon Network.

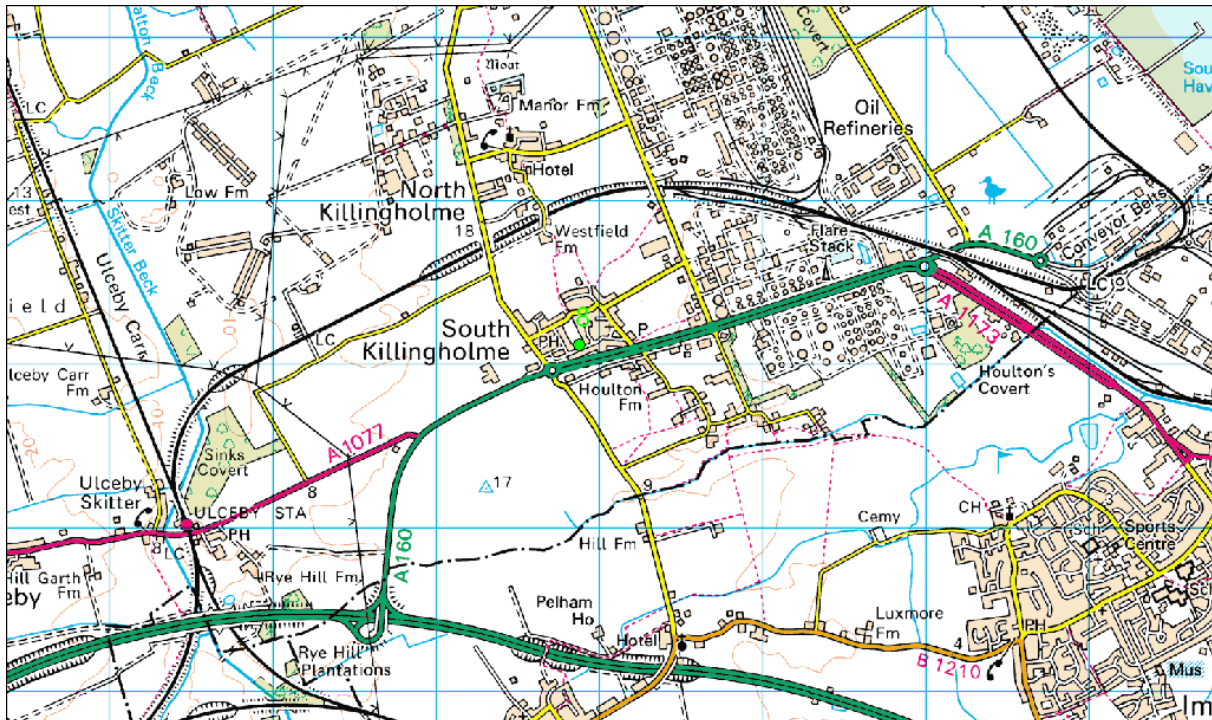


Figure 1.5 Location of Killingholme Monitoring Site

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS GridRef	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
1. Scunthorpe Town (AURN)	Urban Industrial	490320	410831	PM10, SO2, NO2	Yes	FDMS, TEOM, Gas	Y (21m)	7m	N
2. East Common Lane	Urban Industrial	490663	409789	PM10	Yes	TEOM	Y (3m)	28m	N
3. Low Santon	Industrial	492945	411931	PM10, SO2, NO2	Yes	FDMS, TEOM, Gas	Y (41m)	5m	N
4. High Santon	Industrial	492945	411931	PM10	Yes	Partisol	Y (8m)	5m	N
5. Redbourn Club	Urban	490002	410069	PM10	Yes	TEOM	Y (15m)	N/A	N
6. Lakeside	Urban Industrial	491750	408127	PM10	No	TEOM	Y (4m)	8m	N
7. Appleby	Rural	495075	414767	PM10	No	TEOM	Y (17m)	N/A	N
8. Killingholme	Urban Industrial	514880	416133	PM10, SO2, NO2	No	TEOM, Gas	Y (9m)	N/A	N

2.1.2 Non-Automatic Monitoring Sites

North Lincolnshire Council operated a nitrogen dioxide diffusion tube network consisting of 36 sites in 2011. The number of tubes has been reduced in 2012 to 23; the tubes which have been removed have demonstrated compliance over a number of years. The diffusion tubes are supplied and analysed by Environmental Scientifics Group (ESG), the tubes were prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. North Lincolnshire Council has followed the guidance in relation to applying a bias adjustment calculation. Only one collocation study was conducted within North Lincolnshire in 2011.

The 2011 bias adjustment was calculated using data from Scunthorpe Town NO₂ triplicate study and the collocated AURN chemiluminescence NO_x analyser. Data capture for the AURN site over the period was good for both the automatic and non-automatic methods allowing for the local bias to be applied.

A summary of precision results for nitrogen dioxide diffusion tube collocation studies indicates that Environmental Scientific Group operates to a high level of precision in accordance with the Laboratory Workplace Analysis Scheme for Proficiency, (WASP) scheme. This can be viewed in the appendix of this document.

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	In AQMA ?	Is monitoring collocated with a Cont Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure ?
Tube 1	Urban Kerbside	X489099 Y411723	N	N	3m	1m	N
Tube 2	Urban Roadside	X489394 Y411927	N	N	18m	1m	N
Tube 3	Rural Roadside	X486618 Y412252	N	N	N/a	12m	N
Tube 4	Suburban Kerbside	X478038 Y403957	N	N	1m	1m	N
Tube 5	Suburban Roadside	X483642 Y410643	N	N	20m	2m	N
Tube 6	Suburban Roadside	X486928 Y411156	N	N	12m	3m	N
Tube 7	Suburban Kerbside	X487239 Y411259	N	N	9m	2m	N
Tube 8	Urban Roadside	X488547 Y411249	N	N	30m	2m	N
Tube 9	Urban Roadside	X489190 Y411285	N	N	4m	2m	N
Tube 10	Urban Kerbside	X489209 Y411118	N	N	4m	3m	N
Tube 11	Urban Kerbside	X489247 Y410355	N	N	20m	3m	N
Tube 12	Urban Kerbside	X489777 Y409702	N	N	20m	5m	N
Tube 13	Urban Kerbside	X488490 Y409963	N	N	8m	1m	N
Tube 14	Urban Kerbside	X489172 Y409926	N	N	20m	2m	N
Tube 15	Urban Kerbside	X489112 Y409463	N	N	15m	1m	N
Tube 16	Urban Kerbside	X489242 Y408695	N	N	3m	1m	N
Tube 17	Suburban Kerbside	X489735 Y407880	N	N	9m	4m	N
Tube 18	Suburban Kerbside	X409638 Y408632	N	N	9m	4m	N
Tube 19	Urban Roadside	X491628 Y408658	N	N	N/a	2m	N
Tube 20	Suburban Roadside	X491737 Y408378	N	N	N/a	2m	N
Tube 21	Industrial Roadside	X491838 Y408641	N	N	N/a	9m	N
Tube 22	Industrial Roadside	X491859 Y408645	N	N	N/a	9m	N
Tube 23	Urban Kerbside	X499975 Y407421	N	N	60m	3m	N
Tube 24	Suburban Kerbside	X500430 Y407270	N	N	N	2m	N
Tube 25	Industrial Roadside	X515363 Y416085	N	N	N	5m	N
Tube 26	Industrial Kerbside	X515280 Y416085	N	N	N	2m	N
Tube 27	Industrial Roadside	X514645 Y417363	N	N	N	3m	N
Tube 28	Suburban Kerbside	X503048 Y421907	N	N	N	1m	N

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Site Name	Site Type	OS Grid Ref	In AQMA ?	Is monitoring collocated with a Cont Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure ?
Tube 29	Suburban Kerbside	X497833 Y421043	N	N	N	1m	N
Tube 30	Industrial Roadside	X490316 Y410837	N	Y	N	6m	N
Tube 31	Industrial Roadside	X490316 Y410837	N	Y	N	6m	N
Tube 32	Industrial Roadside	X490316 Y410837	N	Y	N	6m	N
Tube 33	Industrial Roadside	X490080 Y411258	N	N	N	2m	N
Tube 34	Urban Roadside	Y514321 X415987	N	N	N	6m	N
Tube 35	Urban Roadside	Y514564 X415900	N	N	N	2m	N
Tube 36	Urban Roadside	Y515159 X416194	N	N	N	2m	N

2.2 Comparison of Monitoring Results with AQ Objectives

The North Lincolnshire Council monitoring network remained virtually unchanged in 2011 with only the Lakeside Monitoring Station installed within the calendar year. This section will outline the ratified monitoring results from 2011. North Lincolnshire Council continue to facilitate a number of external networks within its boundary such as the PAH network and Heavy Metals network. The most recent results available will also be presented within this section.

For the first time since their installation, FDMS data will be submitted as the actual PM₁₀ concentrations where relevant. North Lincolnshire Council successfully operated 2 FDMS sites achieving a higher than average data capture for these instruments. This is in comparison to 2010 where the FDMS' were installed but could not be used due to the initial commissioning problems and the resulting poor data capture.

A number of Osiris particulate monitors are still in operation within North Lincolnshire and are being used as a screening tool in order to assess the relative concentrations at critical locations within Scunthorpe. The use of Osiris monitors allows a higher spatial resolution with the collection of monitoring data at sites with no previous data. Although these sites are not permanent they are a valuable tool in assessing the scale of exceedances and the identification of pollution sources. Data from these sites will also be presented within this section of the report.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Table 2.3 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2011 % ^b	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2007* ^c	2008* ^c	2009* ^c	2010* ^c	2011 ^c
1. Scunthorpe Town	Urban Industrial	N	N/A	98.9%	17.8	18.7	17.9	19.8	19.7
2. Low Santon	Industrial	N	N/A	94.9%	22.8	20.3	18.6	18.9	19.1
3. Killingholme	Urban Industrial	N	N/A	95.3%	21.9	21.9	18.7	21	21.4

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c Means should be “annualised” as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

*Annual mean concentrations for previous years are optional.

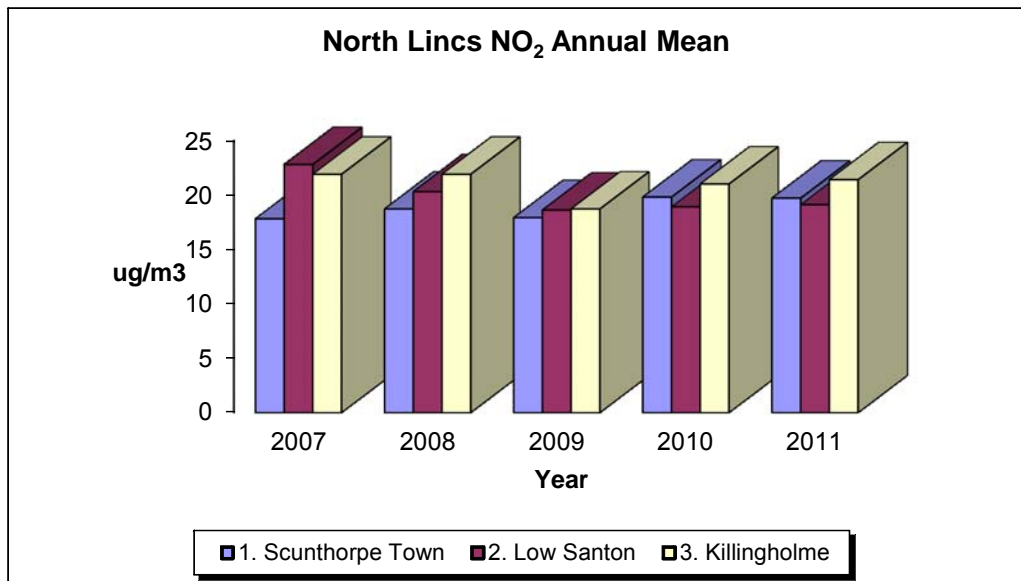


Figure 2.1 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Automatic Monitoring Sites

There have been no exceedances of the Annual Mean Objective at the North Lincolnshire Council Automatic NO₂ Sites since monitoring began. All sites are well within the relevant Objective. North Lincolnshire Council does not anticipate any change in these results in the near future. A further automatic NO₂ site will be added to the network later this year. The analyser will measure NO₂ concentrations at properties adjacent to the A160 in Killingholme. Indications from NO₂ diffusion tubes suggest there may be elevated concentrations in this area.

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2011 % ^b	Number of Exceedences of Hourly Mean (200 µg/m ³)				
					2007* ^c	2008* ^c	2009* ^c	2010* ^c	2011 ^c
1. Scunthorpe Town	Urban Industrial	N	N/A	98.9%	0	0	0	0	0
2. Low Santon	Industrial	N	N/A	94.9%	1	0	0	0	0
3. Killingholme	Urban Industrial	N	N/A	95.3%	0	0	0	0	0

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

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

*Number of exceedences for previous years are optional.

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There have been no exceedances of the Hourly Mean Objective at the North Lincolnshire Council Automatic NO₂ Sites since monitoring began with the exception of 1 hour at Low Santon in 2007. All sites are well within the relevant objective. North Lincolnshire Council does not anticipate any change in these results in the near future. A further automatic NO₂ site will be added to the network later this year. This will measure NO₂ concentrations at properties adjacent to the A160 in Killingholme. Indications from NO₂ diffusion tubes suggest there may be elevated concentrations in this area.

Diffusion Tube Monitoring Data

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.68)
								2011 ($\mu\text{g}/\text{m}^3$)
1	Frodingham Road	Urban Kerbside	N	Single	92	N/A	Y	25
2	Normanby Road	Urban Roadside	N	Single	83	N/A	Y	21
3	A1077	Rural Roadside	N	Single	100	N/A	Y	19
4	Epworth	Suburban Kerbside	N	Single	83	N/A	Y	28
5	Keadby Bridge	Suburban Roadside	N	Single	92	N/A	Y	25
6	Doncaster Rd Hilton Avenue	Suburban Roadside	N	Single	100	N/A	Y	26
7	Scotter Road	Suburban Kerbside	N	Single	41	N/A	Y	30
8	Doncaster Road / Royal	Urban Roadside	N	Single	100	N/A	Y	21
9	Brittannia Corner	Urban Roadside	N	Single	100	N/A	Y	30
10	Oswald Road	Urban Kerbside	N	Single	92	N/A	Y	27
11	Ashby Road	Urban Kerbside	N	Single	92	N/A	Y	24

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.68)
								2011 (µg/m ³)
12	Old Brumby / East Common	Urban Kerbside	N	Single	92	N/A	Y	27
13	Lloyds Avenue	Urban Kerbside	N	Single	100	N/A	Y	24
14	A18 / Ashby Road	Urban Kerbside	N	Single	100	N/A	Y	26
15	Ashby Road / Brumby St	Urban Kerbside	N	Single	100	N/A	Y	28
16	Ashby Road / Burringham	Urban Kerbside	N	Single	100	N/A	Y	26
17	Chancel Road	Suburban Kerbside	N	Single	75	N/A	Y	28
18	Ashby High St Grange Lane	Suburban Kerbside	N	Single	92	N/A	Y	23
19	Dudley Road	Urban Roadside	N	Single	92	N/A	Y	21
20	Lakeside Parkway	Suburban Roadside	N	Single	83	N/A	Y	20
21	Brigg Road / A18	Industrial Roadside	N	Single	92	N/A	Y	44
22	Ashby Lodge Pub	Industrial Roadside	N	Single	100	N/A	Y	26
23	Barnard Avenue	Urban Kerbside	N	Single	83	N/A	Y	22
24	Wrawby Road	Suburban Kerbside	N	Single	100	N/A	Y	24

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.68)
								2011 (µg/m ³)
25	Humber Road Chippy	Industrial Roadside	N	Single	100	N/A	Y	19
26	Humber Road LP695	Industrial Kerbside	N	Single	100	N/A	Y	30
27	St Crispins Close	Industrial Roadside	N	Single	92	N/A	Y	17
28	Holydyke Barton	Suburban Kerbside	N	Single	75	N/A	Y	22
29	Ferriby Main Road	Suburban Kerbside	N	Single	100	N/A	Y	15
30	Rowland Road	Industrial Roadside	N	Triplicate & Colocated	100	N/A	Y	19
31	Rowland Road	Industrial Roadside	N	Triplicate & Colocated	100	N/A	Y	20
32	Rowland Road	Industrial Roadside	N	Triplicate & Colocated	100	N/A	Y	20
33	Station Road (Asda)	Industrial Roadside	N	Single	75	N/A	Y	22
34	Killingholme 4	Suburban Roadside	N	Single	100	N/A	Y	44
35	Killingholme 5	Suburban Roadside	N	Single	100	N/A	Y	40
36	Killingholme 6	Suburban Roadside	N	Single	92	N/A	Y	24

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^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c Means should be “annualised” as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

*Annual mean concentrations for previous years are optional.

Three sites recorded NO₂ levels above the Annual Mean Objective within the North Lincolnshire Council diffusion tube network. These sites included the consistently non-compliant junction of Brigg Road/A18 and two new sites at Killingholme. The two sites at Killingholme will be the subject of a Detailed Assessment currently underway. No further assessment will be required at Brigg Road/A18 as a tube 22 located at the nearest sensitive receptor confirms compliance.

2.2.2 PM₁₀

Table 2.6 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration µg/m ³				
						2007* ^c	2008* ^c	2009* ^c	2010* ^c	2011 ^c
1. Scunthorpe Town (FDMS)	Urban Industrial	Y	N/A	95.1	Y					22.1
1. Scunthorpe Town (TEOM)	Urban Industrial	Y	N/A	95.7	Y	25.1	21.2	21.4	22.3	22.3
2. East Common Lane	Urban Industrial	Y	N/A	96.1	Y	27.1	25.3	21.9	23.1	25.6
3. Low Santon (FDMS)	Industrial	Y	N/A	92.4	Y					34.9
3. Low Santon (TEOM)	Industrial	Y	N/A	90.2	Y	51.3	38.9	39.1	33.4	38.9

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
						2007* ^c	2008* ^c	2009* ^c	2010* ^c	2011 ^c
4. High Santon	Industrial	Y	N/A	96.4	Y	31.4	30.8	27.3	22.9	30.1
5. Redbourn Club	Urban	Y	N/A	97.6	Y				20.4	22.1
6. Lakeside	Urban Industrial	N	N/A	99.1	Y					23.3
7. Appleby	Rural	N	N/A	90.2	Y	23.9	22.3	20.3	18.7	21.1
8. Killingholme	Urban Industrial	N	N/A	95.2	Y	22.6	21.2	22.4	21.1	21.1

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

Table 2.7 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 2011 % ^b	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 µg/m ³)				
						2007*	2008*	2009*	2010*	2011
1. Scunthorpe Town (FDMS)	Urban Industrial	Y	N/A	95.1	Y					21
1. Scunthorpe Town (TEOM)	Urban Industrial	Y	N/A	95.7	Y	18	22	11	16	24
2. East Common Lane	Urban Industrial	Y	N/A	96.1	Y	34	40	17	11	30
3. Low Santon (FDMS)	Industrial	Y	N/A	92.4	Y					57
3. Low Santon (TEOM)	Industrial	Y	N/A	90.2	Y	133	73	78	52	77
4. High Santon	Industrial	Y	N/A	96.4	Y	36	34	27	8	34

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 µg/m ³)				
						2007*	2008*	2009*	2010*	2011
5. Redbourn Club	Urban	Y	N/A	97.6	Y				6	18
6. Lakeside	Urban Industrial	N	N/A	99.1	Y					16
7. Appleby	Rural	N	N/A	90.2	Y	8	5	5	2	9
8. Killingholme	Urban Industrial	N	N/A	95.2	Y	6	11	4	3	9

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

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

* Optional

There are no annual means that exceed the 40ug/m³ objective within the North Lincolnshire Council network. Low Santon was subject to an annual mean exceedance in 2007 and was the trigger for the 2008 Low Santon AQMA. Subsequent years have measured compliant concentrations due in part to changes in correction to VCM, changes in measurement with the FDMS and the focused efforts of operators on the Integrated Steelworks site in reducing PM₁₀ concentrations within the area.

Low Santon is still the subject of a daily mean exceedance for PM₁₀ and has been the focus of recent Detailed and Further Assessment reports. An Action Plan is now in place designed to engage all interested parties in reducing the number of daily exceedances within the area. The Low Santon site still operates a TEOM as well as an FDMS. This is the first full year in which the FDMS has met the data capture requirements to be used as the official exceedance count. The Low Santon TEOM will remain in place for data continuity and as a useful tool in source identification.

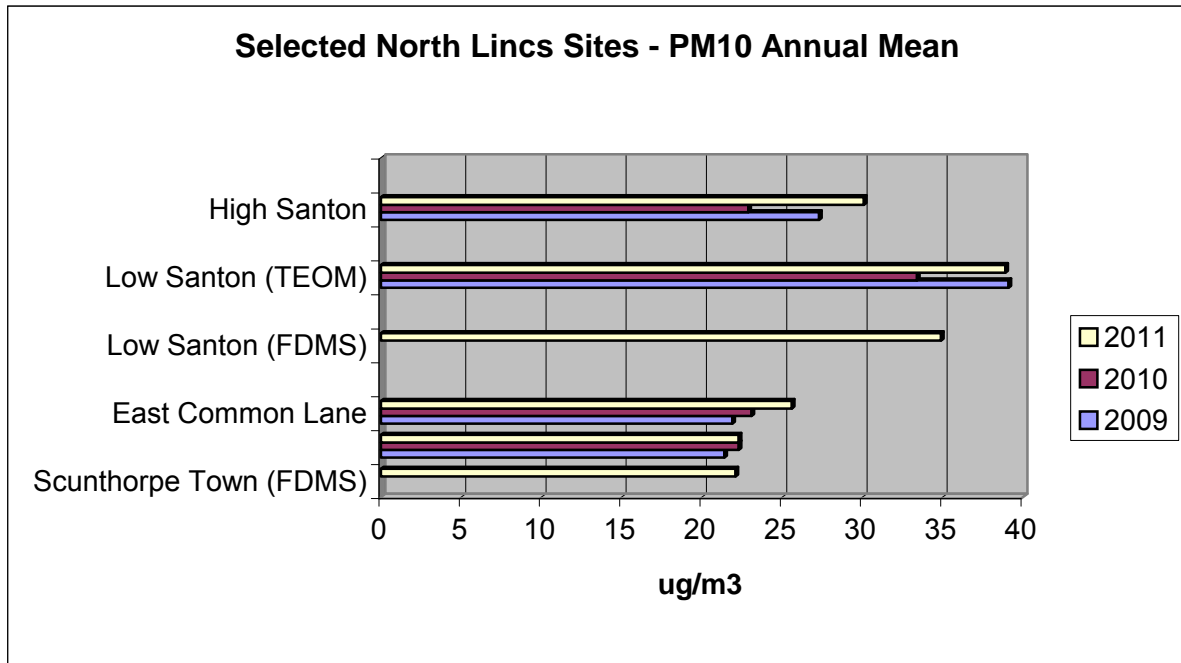


Figure 2.2 Trends in Annual Mean PM₁₀ Concentrations

2.2.3 Sulphur Dioxide

Table 2.8 2011 Results of Automatic Monitoring of SO₂: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Number of Exceedences (percentile in bracket µg/m ³) ^c		
					15-minute Objective (266 µg/m ³)	1-hour Objective (350 µg/m ³)	24-hour Objective (125 µg/m ³)
1. Scunthorpe Town	Urban Industrial	N	N/A	95.7	0	0	0
3. Low Santon	Industrial	N	N/A	90.2	0	0	0
8. Killingholme	Urban Industrial	N	N/A	95.2	0	0	0

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c if data capture is less than 90%, include the relevant percentile in brackets

* Optional

North Lincolnshire Council has not recorded any exceedences of an SO₂ objective in 2011. This mirrors previous years in which no exceedences were recorded. Although SO₂ levels in North Lincolnshire are very low the monitors will remain in place for 2012/13.

2.2.4 Benzene

North Lincolnshire Council ceased the measurement of Benzene at Killingholme Primary School in 2009 after 18 months of compliant monitoring. There are no plans at this time to carry out further benzene monitoring

2.2.5 Other pollutants monitored

In addition to the pollutants presented above North Lincolnshire Council also operate two heavy metals monitors and two PAH monitors at Scunthorpe Town and Low Santon. These are operated for NPL on behalf of DEFRA. The latest results are as follows:

Table 2.10 Heavy Metals

Heavy Metal	Scunthorpe Town 2011 ng/m ³	Low Santon 2011 ng/m ³
Arsenic (As)	0.8	0.9
Cadmium (Cd)	0.2	0.2
Chromium (Cr)	5.1	5.2
Copper (Cu)	6.1	5.6
Iron (Fe)	678.2	1743.3
Manganese (Mn)	26.5	86.3
Nickel (Ni)	1.4	1.5
Lead (Pb)	20.4	38.3
Platinum (Pt)	<0.001	<0.001
Vanadium (V)	1.6	5.2
Zinc (Zn)	26.5	33.4
Mercury (Hg)	0.02	0.02

Table 2.11 PAH Results

PAH Compound	2011 Low Santon ng/m ³	2011 Scunthorpe Town ng/m ³
Benzo(a)pyrene	2.98	1.36

North Lincolnshire records some of the highest specific heavy metal compounds and PAHs in the UK. These have previously been highlighted in all our review and assessment reports. PAH concentrations are influenced by coke processing on the Integrated Works, the Environment Agency are working with Tata Steel to reduce PAHs in the Scunthorpe area. Low Santon records the highest concentrations of the two sites and has not achieved compliance in any of the years in which the monitoring station has been in place.

Summary of Compliance with AQS Objectives

No new areas of concern have been highlighted by new monitoring data within North Lincolnshire. Previously highlighted issues remain a concern but are showing signs of improvement. It is hoped that the introduction of an Action Plan and the focused efforts of a number of parties will bring about reductions of PM₁₀ in Low Santon. Early indications for 2012 are positive and that compliance with the Daily Mean PM₁₀ Objective can be achieved within the next couple of years.

The only other outstanding issue is the elevated concentrations of NO₂ in Killingholme on the A160 and the elevated concentrations of PAH, discussed in the previous paragraph. NO₂ is currently being monitored with the completion of a Detailed Assessment within the next few months.

North Lincolnshire Council has examined results and concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

North Lincolnshire Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

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

3.3 Roads with a High Flow of Buses and/or HGVs.

North Lincolnshire Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

North Lincolnshire Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

North Lincolnshire Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with Significantly Changed Traffic Flows

North Lincolnshire Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

North Lincolnshire Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

North Lincolnshire Council confirms that there are no airports in the Local Authority area that meet the criteria as set out in TG (09).

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

North Lincolnshire 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 15m.

4.2.2 Moving Trains

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

4.3 Ports (Shipping)

North Lincolnshire Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

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

North Lincolnshire Council has received a number of planning applications for major developments in which air quality assessments have been carried out. The Port of Immingham is currently undergoing major growth with a number of port related activities under application. Projects within this development include a wind turbine manufacturing facility (Able Marine Energy Park, AMEP) and a gas fired power station (C.Gen).

These developments are subject to national infrastructure planning regulations and have been assessed accordingly. The Able Marine Energy Park is a large project with a large potential environmental impact. The construction and operation of the AMEP has the potential to result in impacts on air quality. The key issues of interest are:

construction phase:

- road traffic;
- shipping; and
- construction dust.

operational phase:

- road traffic;
- shipping; and
- emissions from paint spraying of products.

In addition, for the operational phase of the AMEP, consideration was given to train locomotive emissions. These were assessed as unlikely to result in significant emissions in isolation, but in order to capture emissions from all site activities these were included in the assessment. There is also the potential for emissions of odour in the form of VOCs from the paint spraying activities.

Other potential sources of emissions were considered to be insignificant. Sources of emissions that were considered to be insignificant included the use of mobile and non-mobile machinery on site during the construction phase and mobile machinery/welding activities on site during the operational phase.

North Lincolnshire Council Environmental Protection Team provided their response in the Local Impact Report and a Statement of Common Ground. A number of impacts were highlighted within these reports where it was considered that an impact was not fully assessed or not raised at all. The issues raised within these documents included:

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- The use of mobile machinery on site during the construction phase of this project and its significance
- The use of workshops and maintenance bays during the operational phase of this project and their significance
- Critical locations within the local area where the Annual Mean Nitrogen Dioxide (NO₂) level is close to or above the EU Air Quality Objective and any increases in road traffic
- The introduction of more shipping movements to an already busy port
- Rail traffic emissions from stationary engines
- The release of VOCs through paint
- The cumulative impact of the development as a whole
- The dust management plan and its critical role in preventing nuisance dust issues.

C.GEN Killingholme Ltd also propose to make an application to construct a new 470 megawatt electrical thermal generating power station. This development is also a nationally Significant Infrastructure project (NSIP). The generating station is intended to operate either as a Combined Gas Cycle Turbine plant or as an Integrated Gasification Combined Cycle plant. The Generation Station will be designed to provide a total generation capacity of up to 470 Mwe under normal operating conditions.

The proposed Impact Assessment investigated activities on site likely to have an adverse effect in local ambient air quality. These were split in to the construction phase and the operational phase. The process of identifying the relevant sources and the methodology in which they are to be assessed was acceptable. Comments were made to ensure that the Impact Assessment is robust covering all concerns prior to submission:

- Critical locations within the local area where the Annual Mean Nitrogen Dioxide (NO₂) level is close to or above the EU Air Quality Objective and any increases in road traffic
- The cumulative impact of the development as a whole
- The dust management plan and its critical role in preventing nuisance dust issues due to the storage of coal on site.

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

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

North Lincolnshire Council previously assessed the impact of existing installations using the Environment Agency Pollution Inventory. This method has been used again focusing on the same sites as previously assessed. All these sites are Part A1 Processes; no new operational sites have been identified. Due to the timescales of this report data from the pollution inventory is only available for 2010. When 2011 data is available this will be assessed and considered. No new receptors have moved closer to the boundary of any of these sites. Applications for such movements have been considered and refused if necessary.

Table 5.1 1,3 Butadiene (tonnes per annum)

Installation	2008	2009	2010	% Change
Total Lindsey Oil Refinery	12	11	12	8
Conoco Phillips	12	12	12	0

Table 5.2 Benzene (tonnes per annum)

Installation	2008	2009	2010	% Change
Tata Steel UK Ltd	33	26	29	-12%
Koppers UK Ltd	153	157	56	-63%
National Grid Gas Plc	BRT	BRT	BRT	-
Cemex	BRT	BRT	BRT	-
Fibrogen Ltd	BRT	BRT	BRT	-
Total Lindsey Oil Refinery	126	97	76	-39%
Conoco Philips	302	252	235	-22%

* BRT denotes below recordable threshold

Table 5.3 Carbon Monoxide (tonnes per annum)

Installation	2008	2009	2010	% Change
Tata Steel UK Ltd	112	75	85	-24%
Centrica Brigg Ltd	BRT	BRT	BRT	-
National Grid Gas Plc	BRT	BRT	BRT	-
Cemex	647	317	255	-60%
Europa Oil & Gas	BRT	BRT	BRT	-
Keadby Power	BRT	BRT	BRT	-
Singleton Birch	BRT	BRT	BRT	-
Fibrogen Ltd	BRT	BRT	BRT	-
Total Lindsey Oil Refinery	BRT	BRT	BRT	-
Conoco	408	367	390	-4%
E.ON	605	554	296	-51%
Immingham CHP	267	160	200	-25%
Centrica KPS	463	324	103	-77%

Table 5.4 Lead (tonnes per annum)

Installation	2008	2009	2010	% Change
Tata Steel UK Ltd	11	8	9	-18%
Centrica Brigg Ltd	BRT	BRT	BRT	-
National Grid Gas Plc	BRT	BRT	BRT	-
Cemex	BRT	BRT	BRT	-
Total Lindsey Oil Refinery	BRT	BRT	BRT	-
Conoco	BRT	BRT	BRT	-
Immingham CHP	BRT	BRT	BRT	-

Table 5.5 Nitrogen Dioxide (tonnes per annum)

Installation	2008	2009	2010	% Change
Tata Steel UK Ltd	6110	5245	5025	-17%
Koppers UK Ltd	BRT	BRT	BRT	-
Centrica Brigg Ltd	591	690	239	-59%
National Grid Gas Plc	BRT	BRT	BRT	-
Cemex	895	533	570	-36%
Europa Oil & Gas	BRT	BRT	BRT	-
Keadby Power	BRT	BRT	BRT	-
Caparo Merchant Bar	BRT	BRT	BRT	-
Singleton Birch	BRT	BRT	BRT	-
Fibrogen Ltd	BRT	BRT	BRT	-
Total Lindsey Oil Refinery	1905	13610	1093	-42%
Conoco	2723	BRT	BRT	-
E.ON	2391	2983	1400	-41%
Immingham CHP	1097	1322	1335	21%
Centrica KPS	2388	1872	671	-71%

Table 5.6 PM₁₀ (tonnes per annum)

Installation	2008	2009	2010	% Change
Tata Steel UK Ltd	3170	2750	2613	-17%
Centrica Brigg Ltd	BRT	BRT	BRT	-
National Grid Gas Plc	BRT	BRT	BRT	-
Cemex	78	52	20	-74%
Keadby Power	BRT	BRT	BRT	-
Singleton Birch	78	BRT	8	-89%
Fibrogen Ltd	BRT	BRT	BRT	-
Total Lindsey Oil Refinery	158	115	81	-48%
Conoco	208	BRT	BRT	-
E.ON	37	34	18	-51%
Immingham CHP	BRT	BRT	BRT	-

Table 5.7 Sulphur Dioxide (tonnes per annum)

Installation	2008	2009	2010	% Change
Tata Steel UK Ltd	9200	8156	9576	4%
Koppers UK Ltd	BRT	BRT	BRT	-
Centrica Brigg Ltd	BRT	BRT	BRT	-
National Grid Gas Plc	BRT	BRT	BRT	-
Cemex	1112	BRT	304	-72%
Keadby Power	BRT	BRT	BRT	-
Caparo Merchant Bar	BRT	BRT	BRT	-
Singleton Birch	BRT	BRT	BRT	-
Fibrogen Ltd	BRT	BRT	BRT	-
Total Lindsey Oil Refinery	9326	6457	5227	-43%
Conoco	5089	BRT	BRT	-
E.ON	BRT	BRT	BRT	-
Immingham CHP	BRT	BRT	BRT	-
Centrica KPS	BRT	BRT	BRT	-

North Lincolnshire 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.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

North Lincolnshire Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are major fuel (petrol) storage depots within the Local Authority area, but these have been considered in previous reports.

5.3 Petrol Stations

North Lincolnshire Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

North Lincolnshire Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

North Lincolnshire Council confirms that there are no biomass combustion plants in the Local Authority area that meet the criteria set out in TG (09).

6.2 Biomass Combustion – Combined Impacts

North Lincolnshire Council confirms that there are no biomass combustion plants in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

North Lincolnshire confirms that there are no areas of significant domestic fuel use in the Local Authority area that have not been previously assessed.

7 Fugitive or Uncontrolled Sources

North Lincolnshire Council previously assessed a number of fugitive and uncontrolled sources and did not identify any potential exceedances. Many of the sources are still in operation yet continue to be adequately controlled via dust management plans. There has been an application to extend a quarry at a local limestone works which has been the subject of an air quality assessment. North Lincolnshire Council are satisfied that the measures in place will be adequate to control the extended working area.

A complaint was received in early 2012 regarding dust from a quarry in Gainsthorpe, North Lincolnshire. A site visit confirmed visible dust and led to the installation of an Osiris Particulate Unit for 3 months. During this period no exceedances of the PM₁₀ objectives were recorded. The quarry was proactive in rectifying problem and quickly identified a faulty wheel wash leading to trackout on to a nearby residential street. This has now been repaired and has significantly reduced the dust leaving site. The road is now more frequently swept by a road sweeper. We are currently satisfied that there are no air quality issues at this location but will continue to monitor the situation.

North Lincolnshire Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

North Lincolnshire Council has continued to operate an extensive air quality monitoring network. The data captured from this network has not identified any new areas of exceedance and has continued to identify known areas of poor air quality. These areas include the area immediately around the Scunthorpe Integrated Steelworks including Low Santon for PM₁₀ and the A160 (Humber Road) in Killingholme for NO₂ which is to be the subject of a Detailed Assessment.

8.2 Conclusions from Assessment of Sources

North Lincolnshire Council has not identified any new sources that require further investigation. A large number of sources were considered in the 2009 USA and have not been reconsidered due to a continuation of inputs/outputs from the individual sources. Of the new sources that have been considered no issues have been raised and therefore there is no requirement to undertake any further assessment.

8.3 Proposed Actions

There are no new actions as a result of new monitoring data or the assessment of sources. There are ongoing actions that will need to continue. North Lincolnshire Council has proceeded to a Detailed Assessment for NO₂ in South Killingholme and are currently preparing the report. North Lincolnshire Council submitted an Action Plan for Low Santon in 2011 and will continue to deliver this plan assessing the improvements within the data. Further actions for the air quality network include the ongoing refining of the existing AQMA's and the upgrading of air quality monitoring stations as and when required.

Appendices

Appendix A: QA/QC Data

Appendix B: Bias Adjustment Calculation

Appendix C: 2005 Scunthorpe AQMA Boundary

Appendix D: 2008 Low Santon AQMA Boundary

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

North Lincolnshire Council currently uses ESG for both supply and analysis of its Nitrogen Dioxide Diffusion Tubes. The Bias Adjustment factor for ESG in 2011 was 0.88.

Factor from Local Co-location Studies (if available)

North Lincolnshire Council had only 1 ongoing co location study as discussed in the monitoring data section of this report in 2011, Scunthorpe Town an urban industrial site:

Site	Analyser Annual Mean	Tube Annual Means	Bias Adjustment Factor
Scunthorpe Town	20	30	0.68

Discussion of Choice of Factor to Use

The decision to use a Bias Adjustment Factor generated from our own co location study was reached due to the complexity of the issues within North Lincolnshire. As the AQMA's declared within North Lincolnshire are predominantly industry related it was felt that using an average of other authority figures would be unsuitable.

Our NO₂ analysers suffered major faults in 2009 falling in to 2010. The Gallagher Retail Park & Kingsway House analysers suffered major reductions in data capture, consequently neither site could be used for the bias adjustment. This left Rowland Road.

Although the tube network is spread over a wide area of North Lincolnshire the tubes are situated in relatively similar situations, all at the same height and if the tubes are not co located most are held on roadside lampposts. This study has been ongoing since 2006 and has presented different adjustment factors each year. We have confidence within our AURN continuous monitor at this location due to its strict calibration programme and ratification procedures carried out by AEA.

PM Monitoring Adjustment

Particulate matter within North Lincolnshire is currently measured using TEOM. The sites at Santon and Scunthorpe Town have co located Partisols as discussed in the monitoring data section of this report. Numbers reported with results from a TEOM have had a factor of 1.3 applied and then corrected using the Volatile Correction Model as recommended by the Technical Guidance 2009.

QA/QC of automatic monitoring

AEA Technology currently carry out the QA/QC amendments to our data via their Calibration Club service. Each of the gas analysers is calibrated every 2 weeks with the TEOMs calibrated fortnightly and filter changed every 4 weeks.

QA/QC of diffusion tube monitoring

WASP Round	WASP R108	WASP R109	WASP R110	WASP R111	WASP R112	WASP R113	WASP R114	WASP R115
Round conducted in the period	Jan – March 2010	April – June 2010	June – August 2010	Oct – Dec 2010	Jan -March 2011	April - June 2011	July - Sept 2011	October - December 2011
Aberdeen Public Analysts	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Bristol City Council	75 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Cardiff Scientific Services	100 %	50 %	100 %	75 %	100 %	100 %	100 %	75 %
Edinburgh City Council	100 %	100 %	75 %	100 %	100 %	100 %	100 %	0 %
Environmental Services Group, Didcot (formerly Bureau Veritas Laboratories, Glasgow and Harwell Scientifics) [1] [2]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Exova (formerly Clyde Analytical)	100 %	50 %	50 %	100 %	100 %	100 %	0 %	75 %
Glasgow Scientific Services	50 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Gradko International [2]	100 %	87.5 %	100 %	100 %	100 %	100 %	100 %	37.5 %
Kent Scientific Services	100 %	100 %	100 %	100 %	50 %	100 %	100 %	75 %
Kirklees MBC	100 %	100 %	100 %	0 %	100 %	0 %	0 %	50 %
Lambeth Scientific Services	50 %	100 %	100 %	100 %	50 %	25 %	100 %	25 %
Lancashire County Analysts [3]	100 %	75 %	50 %	100 %	75 %	-	-	-
Milton Keynes Council	100 %	25 %	50 %	100 %	100 %	75 %	100 %	100 %
Northampton Borough Council	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Somerset Council [4]	-	-	-	-	-	-	-	100 %
South Yorkshire Council Laboratory [5]	25 %	-	-	-	-	-	-	-
South Yorkshire Air Quality Samplers [6]	-	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Staffordshire County Council	100 %	100 %	50 %	100 %	100 %	100 %	100 %	100 %
Tayside (formerly Dundee CC)	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Walsall MBC [7]	-	100 %	100 %	100 %	-	-	-	-
West Yorkshire Analytical Services	100 %	100 %	100 %	100 %	75 %	75 %	100 %	100 %

Appendix B: QA:QC Data

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	05/01/2011	02/02/2011	45	52	47	48	3.4	7	8.4
2	02/02/2011	02/03/2011	32	35	33	33	1.7	5	4.3
3	02/03/2011	30/03/2011	32	34	31	32	1.7	5	4.1
4	30/03/2011	27/04/2011	22	25	26	25	2.1	9	5.3
5	27/04/2011	01/06/2011	17	16	25	20	4.8	24	11.8
6	01/06/2011	29/06/2011	22	20	27	23	3.7	16	9.2
7	29/06/2011	03/08/2011	17	15	16	16	0.7	4	1.6
8	03/08/2011	31/08/2011	22	20	27	23	3.9	17	9.6
9	31/08/2011	28/09/2011	22	23	28	25	3.3	13	8.1
10	28/09/2011	02/11/2011	29	36	29	31	4.2	13	10.4
11	02/11/2011	30/11/2011	38	42	33	37	4.3	11	10.7
12	30/11/2011	06/01/2012	34	35	32	34	1.4	4	3.5
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check		
Period	Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	27.9	97.3	Good	Good
2	20.4	98.2	Good	Good
3	22.4	85.1	Good	Good
4	17.1	95.8	Good	Good
5	15	91.1	Poor Precision	Good
6	15	98.8	Good	Good
7	15	99.4	Good	Good
8	17	99.1	Good	Good
9	16	98.8	Good	Good
10	24	99.6	Good	Good
11	23.3	99.7	Good	Good
12	24.8	80.3	Good	Good
13				

Overall survey --> Good precision Good Overall DC (Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Rowland Road
Accuracy (with 95% confidence interval)	
without periods with CV larger than 20%	
Bias calculated using 11 periods of data	
Bias factor A	0.68 (0.63 - 0.74)
Bias B	47% (35% - 59%)
Diffusion Tubes Mean:	30 μgm^{-3}
Mean CV (Precision):	10
Automatic Mean:	20 μgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	20 (19 - 22) μgm^{-3}

Precision 11 out of 12 periods have a CV smaller than 20%	
Accuracy (with 95% confidence interval)	
WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.68 (0.64 - 0.74)
Bias B	46% (35% - 57%)
Diffusion Tubes Mean:	29 μgm^{-3}
Mean CV (Precision):	11 caution
Automatic Mean:	20 μgm^{-3}
Data Capture for periods used:	95%
Adjusted Tubes Mean:	20 (19 - 21) μgm^{-3}

Jaume Targa, for AEA
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