



2014 Air Quality Progress Report for **Waveney District Council**

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

November 2014

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Report Reference number	DP/AQ/PR/14
Date	November 2014

Executive Summary

This Progress Screening report has been produced as part of Waveney District Council's requirement to assess present and predicted future air quality against the objectives prescribed by the Air Quality Regulations 2000 (as amended). If an exceedence of any objective is considered likely, there is a requirement to proceed to a detailed assessment of that pollutant and to declare an Air Quality Management Area (AQMA), if the exceedence is confirmed. The Local Air Quality Management process set out in the 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 have all been followed.

In order to assess air quality in Waveney District, this report considers new monitoring data as well as assessing the impact of new development on air quality in the district.

Air quality data is available in Waveney, via a network of 9 passive diffusion tube sites measuring NO₂ at relevant roadside locations on the A146, A1117 and A12, the major A-roads which pass through Lowestoft. An additional tube has been used to measure urban background concentrations of NO₂ at a central location in Lowestoft. Air quality is also monitored in Beccles, using two tubes situated in the Ingate area, which is close to the town centre. A further 7 diffusion tubes have been stationed in Trinity Street, Bungay, assessing the impact on air quality of a new one-way road scheme which has been designed to ease traffic pressure in the town centre.

The annual mean concentrations of NO₂ obtained from the diffusion tube survey at the monitoring sites indicate that the national air quality objectives are unlikely to be exceeded anywhere in the Waveney District in 2014.

Monitoring should continue at the locations close to the Town Bridge in 2014, because there was a noticeable increase of about 5µg/m³ in the nitrogen dioxide concentration annual mean measured at the Pier Terrace and London Road South

Junction (PN12), which is difficult to account for. The second tube at the location, PN13, which measured the concentration directly on the façade of the nearest relevant receptor did not show a similar increase. In fact, the annual mean concentration was very similar to the result obtained in the previous year, 2012.

The monitoring continued in Ingate, because of the relatively high levels of NO₂ measured at the location in 2011. The second diffusion tube located close to the Ingate/St Mary's Road junction has confirmed that an exceedence of the national air quality for nitrogen dioxide was unlikely in the area in 2014. The annual mean concentration of 32.30µg/m³ obtained from the Ingate number 1 tube, indicates that it would be prudent to continue monitoring in the area for a while longer, although there is a significant headroom when compared to the national air quality objective of 40µg/m³.

The diffusion tube study monitoring undertaken in Trinity Street, Bungay indicated that the nitrogen dioxide concentration was greatest at the façade of the property closest to the entry point to the street, with an annual mean concentration of 30.38µg/m³. Although monitoring results suggest that an exceedence of the national air quality objectives is unlikely in 2014, it seems sensible to continue monitoring at this point with a single tube for a longer period.

There are no newly identified, or proposed point and diffuse sources that are likely to have a significant impact on air quality in the Waveney District in 2014.

The conclusion and the recommendation is that there is no need for Waveney District Council to proceed to a Detailed Assessment at any location in 2014 for any of the pollutants considered in this assessment.

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1 Introduction

1.1 Description of Local Authority Area

Population 117,700 (2009)

Situated in the northeast corner of Suffolk, Waveney District is bordered by the River Waveney in the north and the River Blyth in the south. The main urban conurbation is Lowestoft, which is a North Sea port and the second largest town in Suffolk.

Lowestoft sustains a variety of industries including food processing and engineering. The Port handles general cargo and is a base for servicing off-shore oil and wind energy installations.

Apart from Lowestoft the main urban centres are Beccles and Bungay situated on the River Waveney adjacent to the Norfolk border and Southwold and Halesworth, both on the River Blyth. The centre of the district is agricultural and is sparsely populated. The whole district has a steadily developing holiday trade.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy 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.

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of 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 µg/m ³	Running annual mean	31.12.2003
	5.00 µg/m ³	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m ³	Annual mean	31.12.2004
	0.25 µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀) (gravimetric)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Detailed reviews of air quality within the Waveney District have concluded that the standards and objectives contained within the National Air Quality Strategy would be achieved by the relevant dates and accordingly it has not been necessary to declare any Air Quality Management Areas within the District at any time.

1.4.1 First Round of Review and Assessment

Waveney District Council completed the first round of air quality review and assessment in 2000, concluding that the risk of any of the UK air quality objectives being exceeded was negligible.

1.4.2 Second Round Review and Assessment

The Second Round Updating and Screening Assessment for Waveney District Council was published in May 2003. This assessment indicated that three specific and very localised areas (all associated with busy road junctions) needed a more detailed assessment to be sure that air quality in the Waveney District was still on target to meet the relevant criteria. However, further assessment determined that concentrations did not exceed 2004 objectives. The report recommended that a detailed survey of traffic flow at all three locations be commissioned when the South Lowestoft Relief Road bypass was opened.

In 2005, the Progress Report commissioned by Waveney District Council recommended that although there had been no exceedences of the air quality objectives in 2004, significant developments in Lowestoft town centre warranted monitoring of NO₂ and traffic flow to assess the effects on air quality.

1.4.3 Third Round of Review and Assessment

The Updating and Screening Assessment completed for Waveney District Council in May 2006 predicted that no exceedences of the air quality objectives for the UK

would occur in Waveney. The review concluded that whilst there were no areas of the District exposed to levels of pollution exceeding national guidelines, it was necessary to keep the situation under review to monitor the effects of the new South Lowestoft Relief Road. In particular, an “Urban Traffic Management and Control” system was proposed, to improve traffic flow and a real time pollution monitor to be installed at a key point in Belvedere Road. The area in close proximity to the Port was identified as requiring further monitoring and as a consequence a new diffusion tube survey at Mill Road was established in 2007, which did show concentrations of NO₂ close to the objectives albeit with small data sets

1.4.4 The Fourth Round of Review and Assessment

The 2009 Air Quality Updating and Screening Assessment commissioned by Waveney District Council concluded that there was no need to proceed to a Detailed Assessment in 2009 for any of the pollutants considered in the assessment. However it was recommended that monitoring should continue in the Mill Road area due to possible exceedence of air quality objectives in the area of the Port. There were no new developments nor existing sources identified in Waveney District that were likely to significantly affect air quality at locations with relevant public exposure.

In 2010, the Progress Report prepared by Waveney District Council recommended that although there had been no exceedences of the air quality objectives in 2009, monitoring of NO₂ and traffic flow to assess the effects on air quality should continue in the area of the Port. It was also recommended that the location of diffusion tube monitoring stations should be reviewed to ensure that the relevant public exposure to NO₂ concentrations are measured with more confidence.

The 2011 Progress Report prepared by Waveney District Council recommended that monitoring of NO₂ should continue in the Port area. There were no exceedences of the air quality objectives in 2010 for any of the pollutants considered in the report. Larger data sets confirmed that an exceedence of the national air quality objectives was unlikely in Mill Road.

1.4.5 The Fifth Round of Review and Assessment

The 2012 Air Quality Updating and Screening Assessment prepared by Waveney District Council concluded that there was no need to proceed to a Detailed Assessment in 2012 for any of the pollutants considered in the assessment. However, it was recommended that monitoring for nitrogen oxides should continue in the Port area, as the area is subject to traffic congestion. There were no new developments nor existing sources identified in Waveney District that were likely to significantly affect air quality at locations with relevant public exposure. Diffusion tube monitoring of nitrogen oxides should also continue in the Ingate area of Beccles. to provide a more accurate picture of air quality in the town centre area.

The 2013 Air Quality Progress Report prepared by Waveney District Council concluded that there was unlikely to be an exceedence of the air quality objectives. It was recommended that monitoring should continue in both the busy Port area and in the centre of Beccles.

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2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automatic continuous air quality monitor sites in the Waveney Council District. Previously, there was a monitor operated by Suffolk County Council and it measured the concentration of NO₂ and oxides of nitrogen at the roadside in Belvedere Road, Lowestoft, in close proximity to the Port. Routine calibrations and periodic site audits were carried out every two weeks by Waveney District Council. Unfortunately, the monitor has not been operational since August 2012 and before that time operation was spasmodic and problematic. Suffolk County Council reviewed the funding for the automatic air monitor in 2013 and decided not to continue with the funding for the equipment, therefore, no recent data is available for analysis from this source.

The historical data obtained by the automatic air quality is still a useful source of informative data and it has been included in this report.

Figure 2.1 Map of the Automatic Monitoring Site in Belvedere Road, Lowestoft



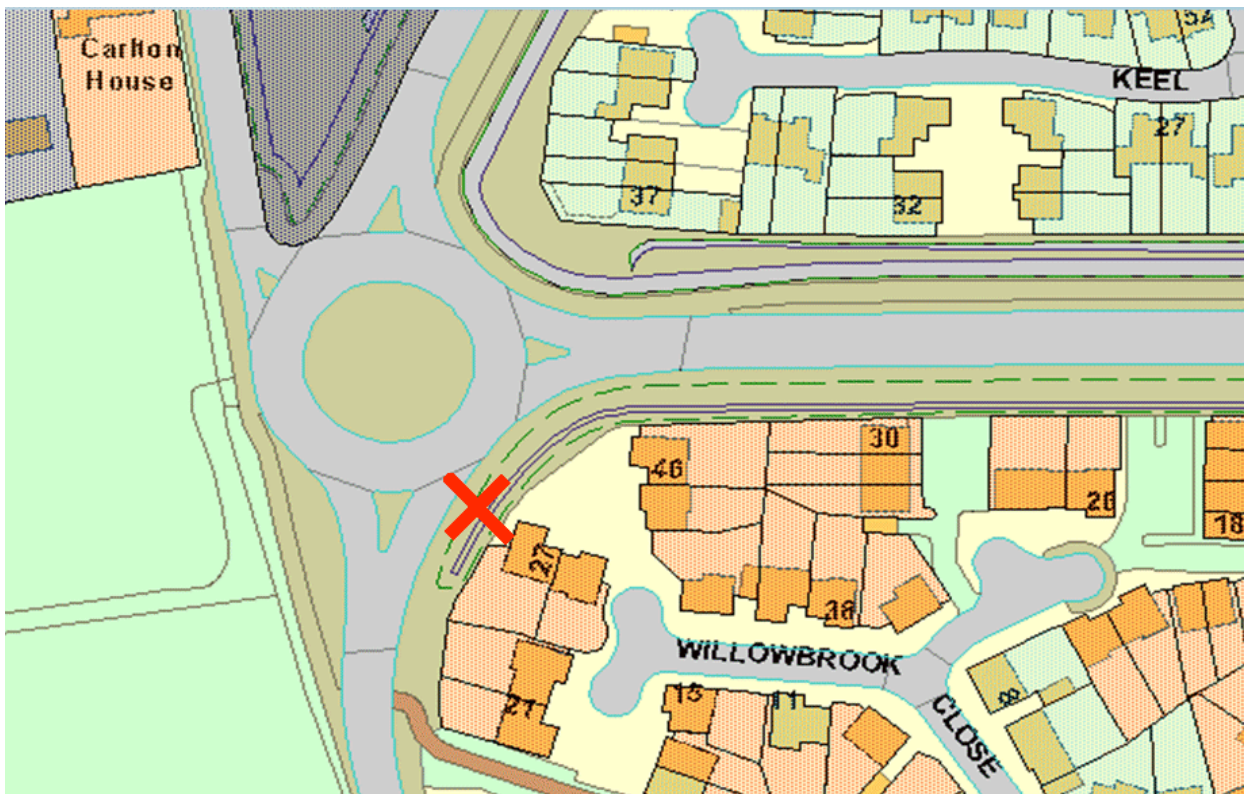
Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
AN1	Belvedere Road	Roadside	654651	392651	2.0	NO ₂	n	Chemiluminescent	N (1m)	1.8	Y

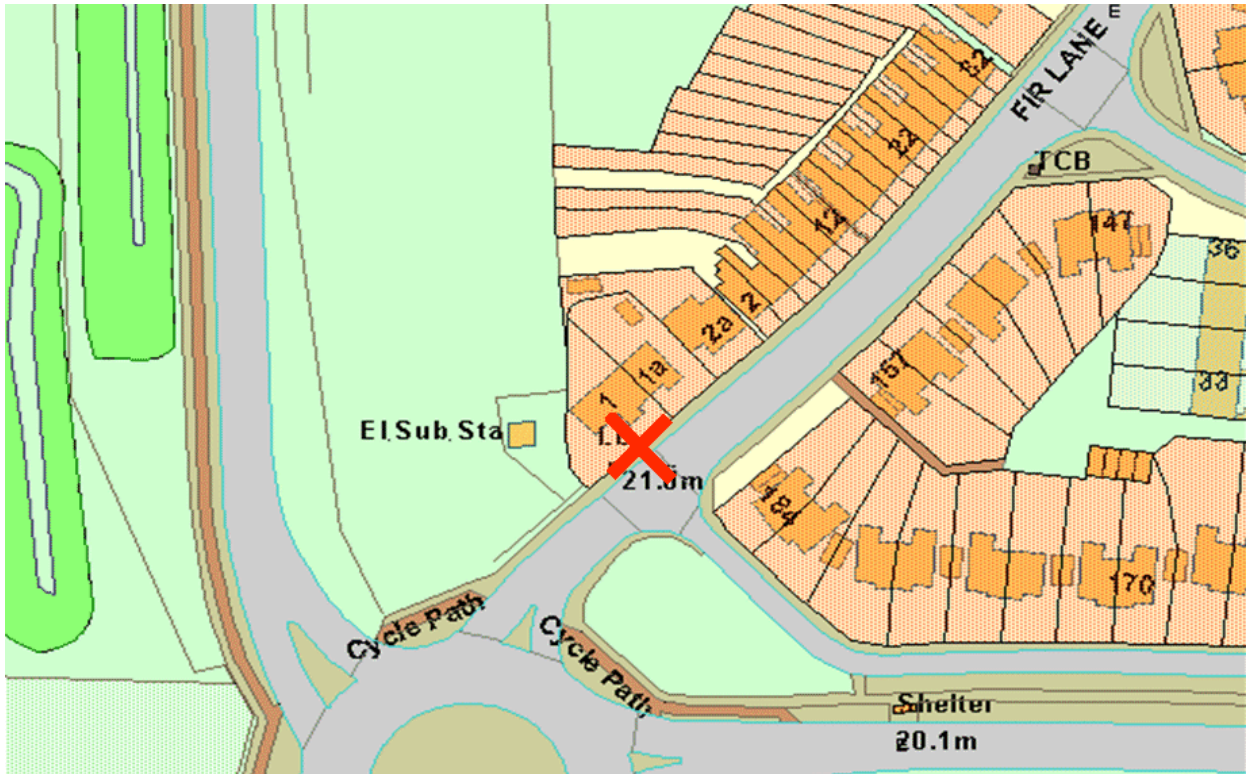
2.1.2 Non-Automatic Monitoring Sites

There is a number of diffusion tube monitoring sites in the Waveney District and these are located in Lowestoft, Beccles and Bungay. All of the tubes are situated by the roadside, apart from a single tube located in the St Margarets churchyard, which monitors urban background concentration levels of nitrogen dioxide. A number of the tubes were relocated a while ago to ensure that the results were representative of relevant public exposure.

Figure 2.2 Map(s) of Non-Automatic Monitoring Sites



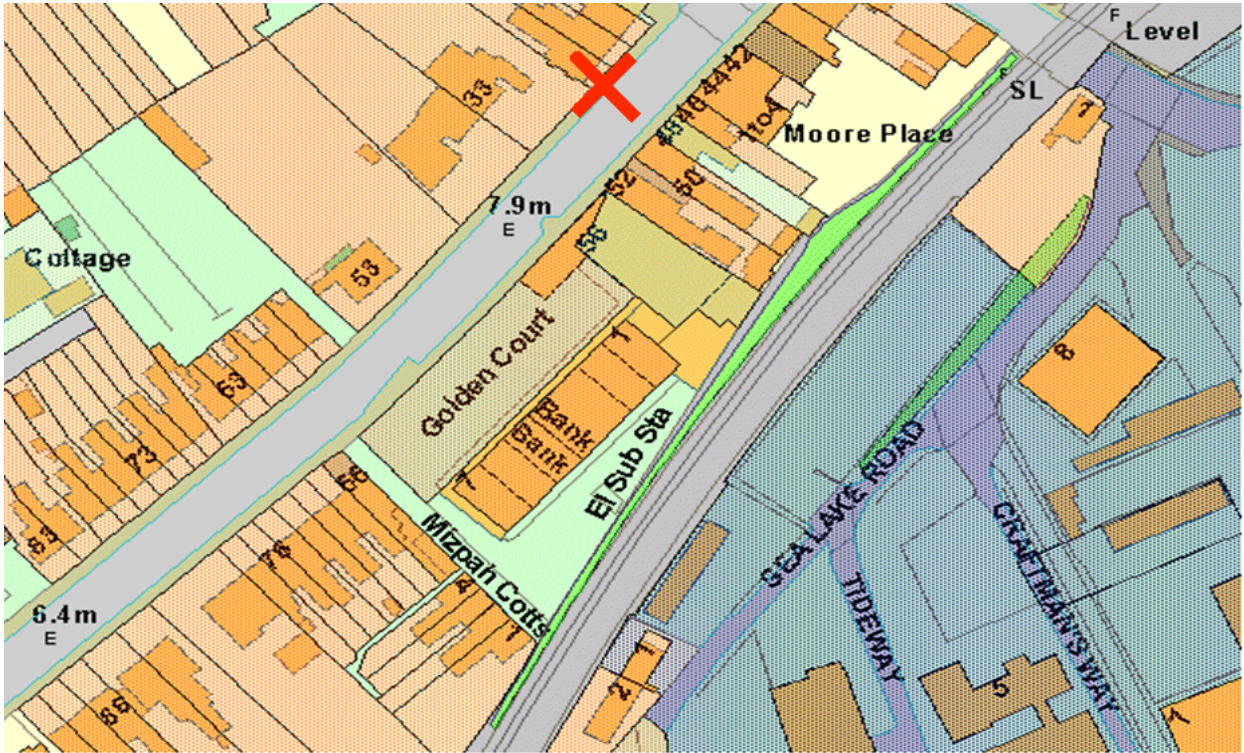
Diffusion Tube Site PN1: Castleton Avenue, Carlton Colville



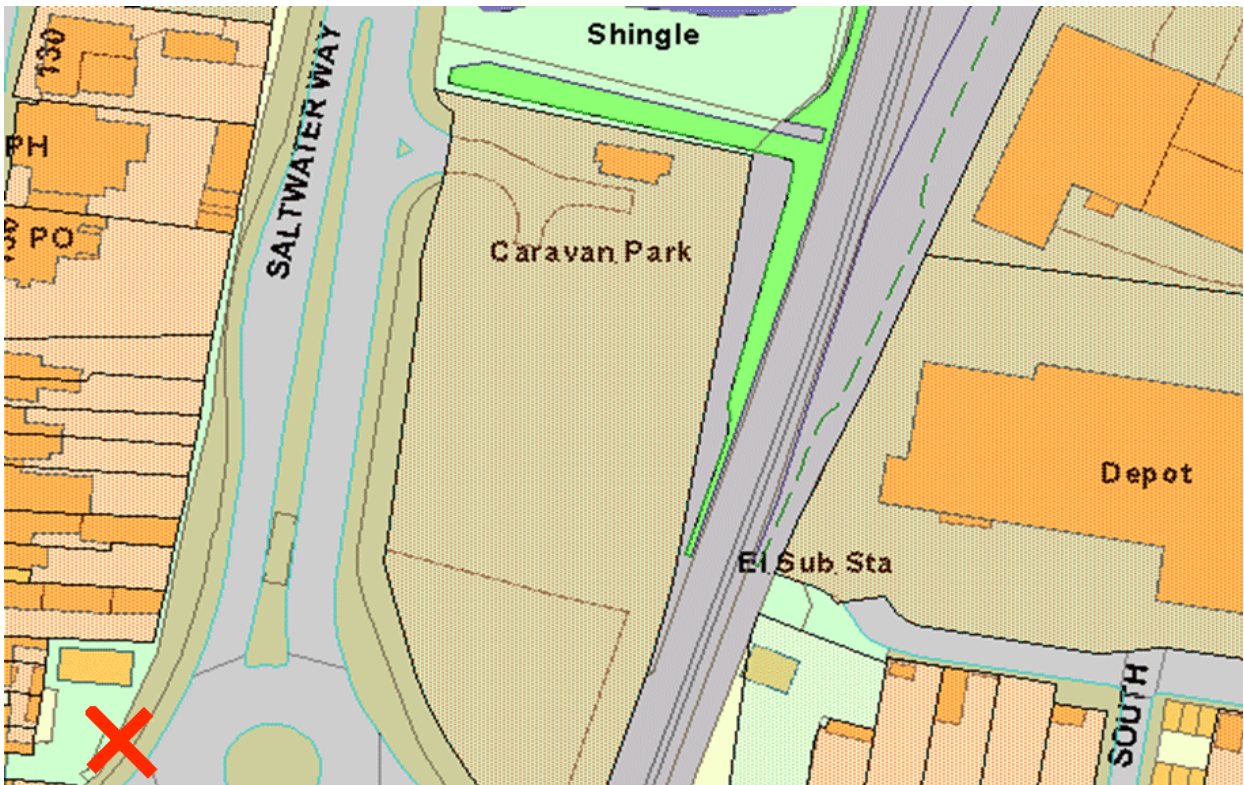
Diffusion Tube Site PN2: Fir Lane, Lowestoft



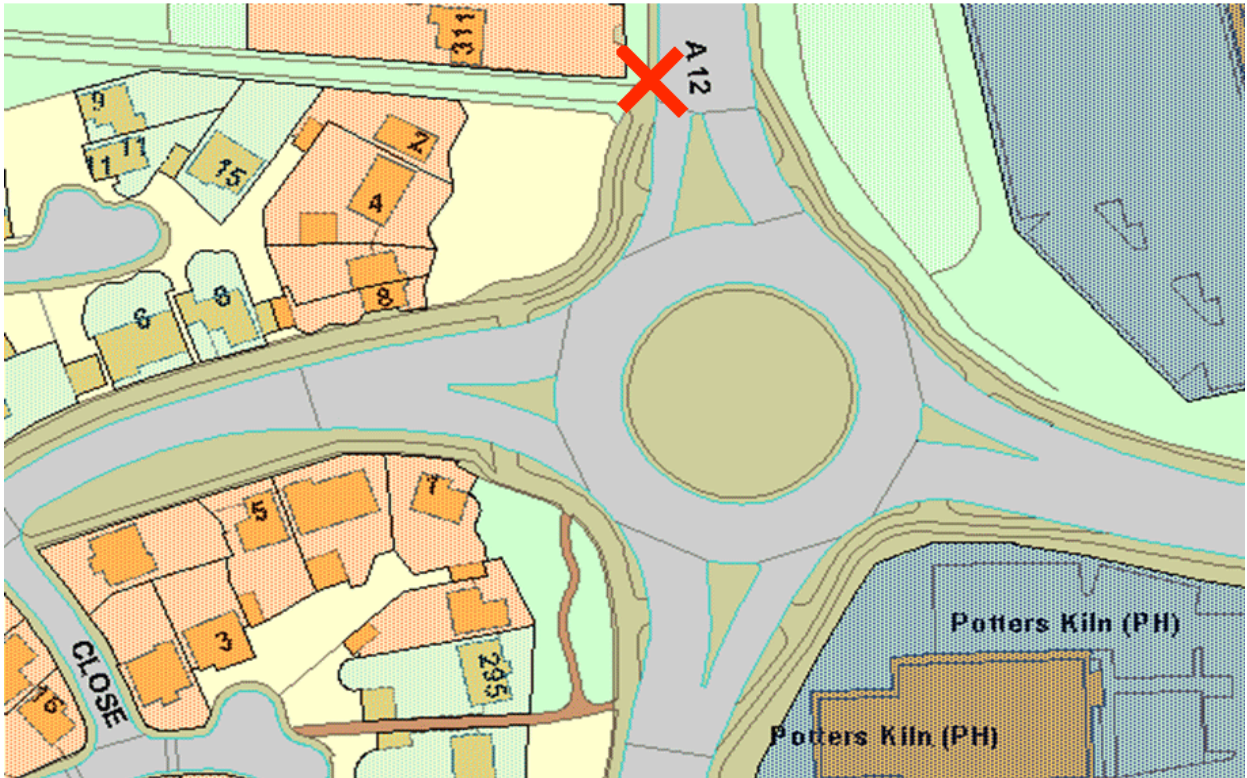
Diffusion tube site PN3 :The Flying Dutchman, Cotmer Road, Oulton Broad



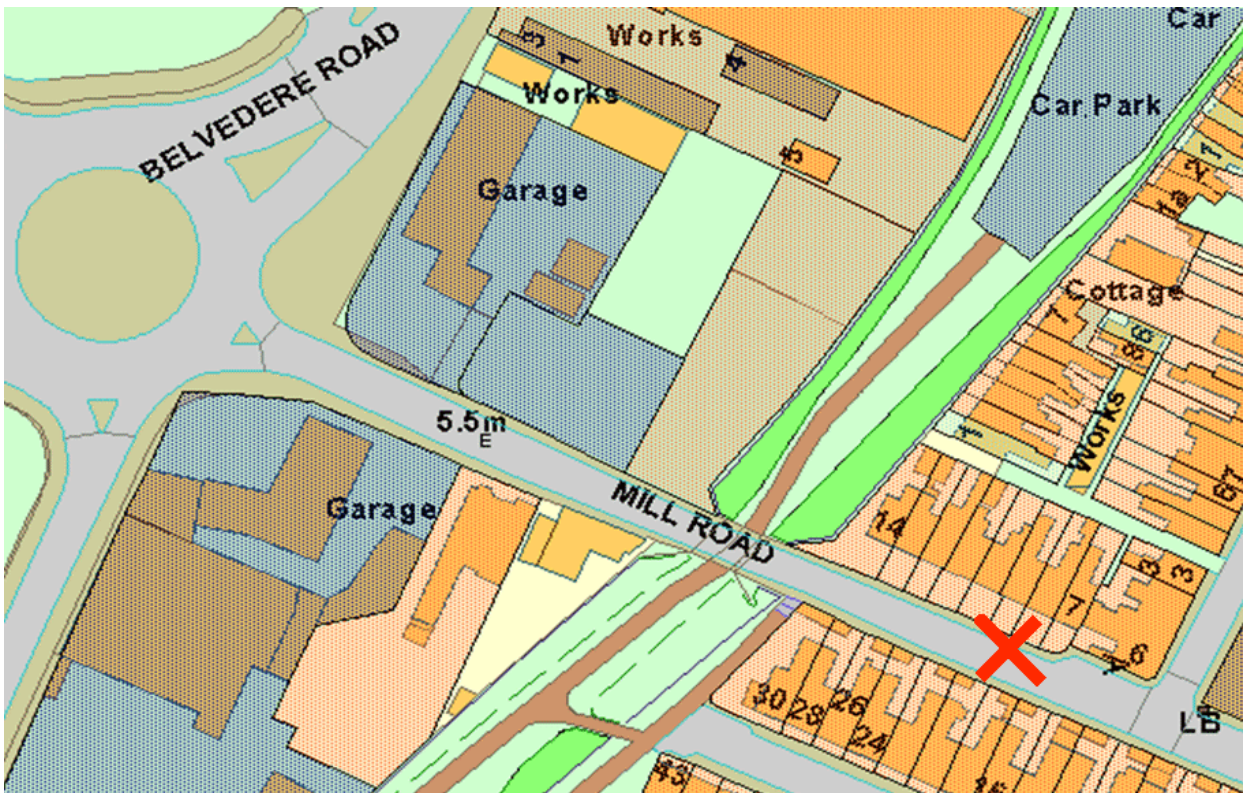
Diffusion Tube Site PN4 : Golden Court, Bridge Road, Oulton Broad



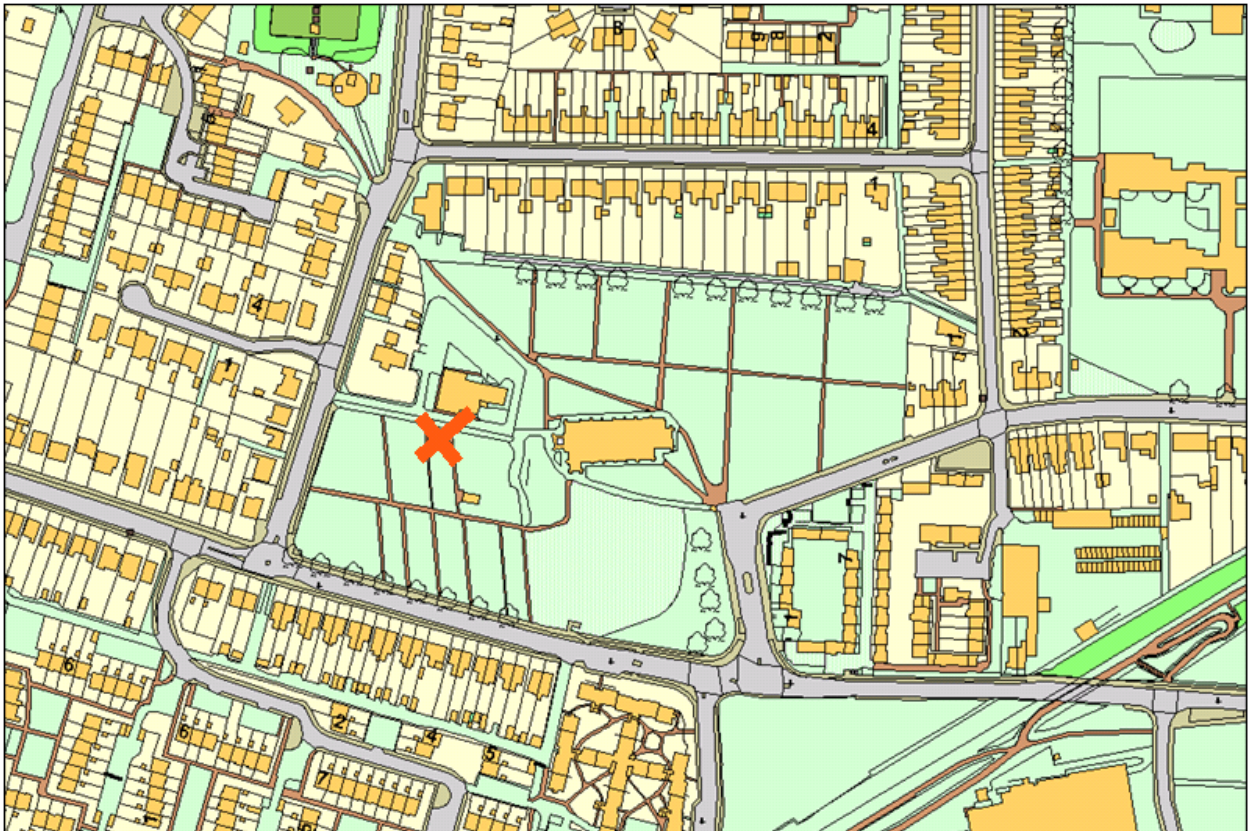
Diffusion Tube Site PN5 : Saltwater Way, Oulton Broad



Diffusion Tube Site PN6 : Yarmouth Road, Lowestoft



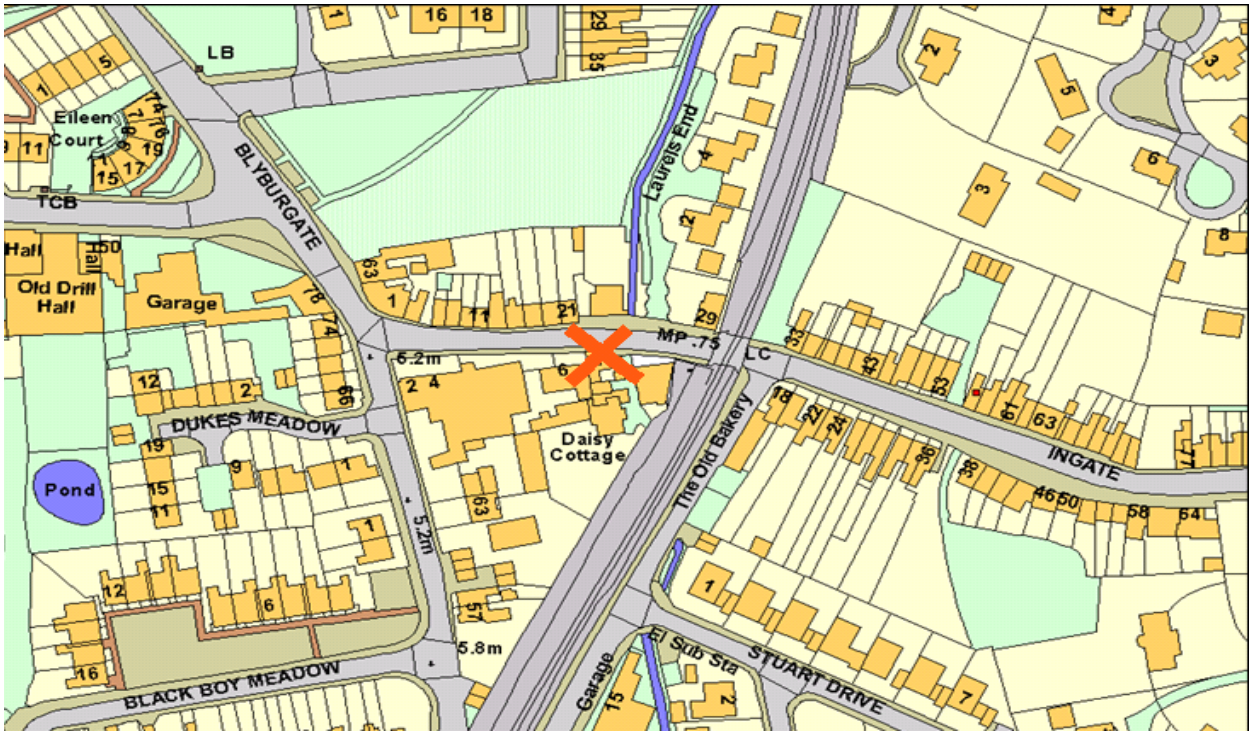
Diffusion Tube Site PN7 : Mill Road, Lowestoft



Diffusion Tube Monitoring Site PN8 St Margaret's Churchyard



Diffusion Tube Site PN9/10/11/12/13 : Pier Terrace/Belvedere Road, Lowestoft



Diffusion Tube Site PN14/15 : Ingate, Beccles



Diffusion tube sites TN1- TN7 – Trinity Street, Bungay.

Table 2.2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
PN1	Castleton Avenue	Roadside	650608	290476	2.5	NO ₂	N	N	Y (17m)	1.9	Y
PN2	Fir Lane	Roadside	653220	293794	2.5	NO ₂	N	N	Y(6m)	0.5m	Y
PN3	Dutchmans Court	Roadside	651889	292099	3.0	NO ₂	N	N	Y(5m)	2.4m	Y
PN4	Golden Court	Roadside	652301	293016	2.5	NO ₂	N	N	Y(4m)	2.0m	Y
PN5	Saltwater Way	Roadside	652498	292751	3.0	NO ₂	N	N	Y(6m)	3.0	Y
PN6	Yarmouth Road	Roadside	653049	295534	3.0	NO ₂	N	N	Y(8.5m)	0.5m	Y
PN7	Mill Road	Roadside	654470	292395	2.5	NO ₂	N	N	Y(6.8M)	1.2m	Y

Waveney District Council

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
PN8	St Margarets Churchyard	Urban Background	654305	293914	2.5	NO ₂	N	N	N	n/a	N
PN9	Belvedere Road Co-location	Roadside	654651	292619	2.0	NO ₂	N	Y	N	n/a	Y
PN10	Belvedere Road Co-location	Roadside	654651	292619	2.0	NO ₂	N	Y	N	n/a	Y
PN11	Belvedere Road Co-location	Roadside	654651	292619	2.0	NO ₂	N	y	N	n/a	Y
PN12	Pier Terrace 1	Roadside	654658	292598	2.5	NO ₂	N	N	Y(7m)	3.0m	Y
PN13	Pier Terrace 2	Roadside	654658	292598	2.5	NO ₂	N	N	Y(façade)	n/a	Y

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Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
PN14	Ingate Beccles 1	Roadside	642614	289906	2.5	NO ₂	N	N	Y(façade)	n/a	Y
PN15	Ingate Beccles 2	Roadside	642614	289906	2.5	NO ₂	N	N	Y(2m)	2.0m	Y
TN1	Trinity Street, Bungay	Roadside	633661	289813	2,0	NO ₂	N	N	Y(façade)	1.0m	Y
TN2	Trinity Street, Bungay	Roadside	633661	289813	2.0	NO ₂	N	N	Y(façade)	1.0m	Y
TN3	Trinity Street, Bungay	Roadside	633661	289813	2.0	NO ₂	N	N	Y(façade)	1.0m	Y
TN4	Trinity Street, .Bungay	Roadside	633661	289813	2.0	NO ₂	N	N	Y(façade)	1.0m	Y

Waveney District Council

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
TN5	Trinity Street. Bungay	Roadside	633661	289813	2.0	NO ₂	N	N	Y(façade)	1.0m	Y
TN6	Trinity Street, Bungay	Roadside	633661	289813	2.0	NO ₂	N	N	Y(façade)	1.0m	Y
TN7	Trinity Street, Bungay	Roadside	633661	289813	2.0	NO ₂	N	N	Y(façade)	1.0m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

Waveney District Council has considered only Nitrogen Dioxide in this report,

No sites exceeded Air Quality Standards in 2013 and there no borderline sites where the Air Quality Standards was close to being exceeded in 2013.

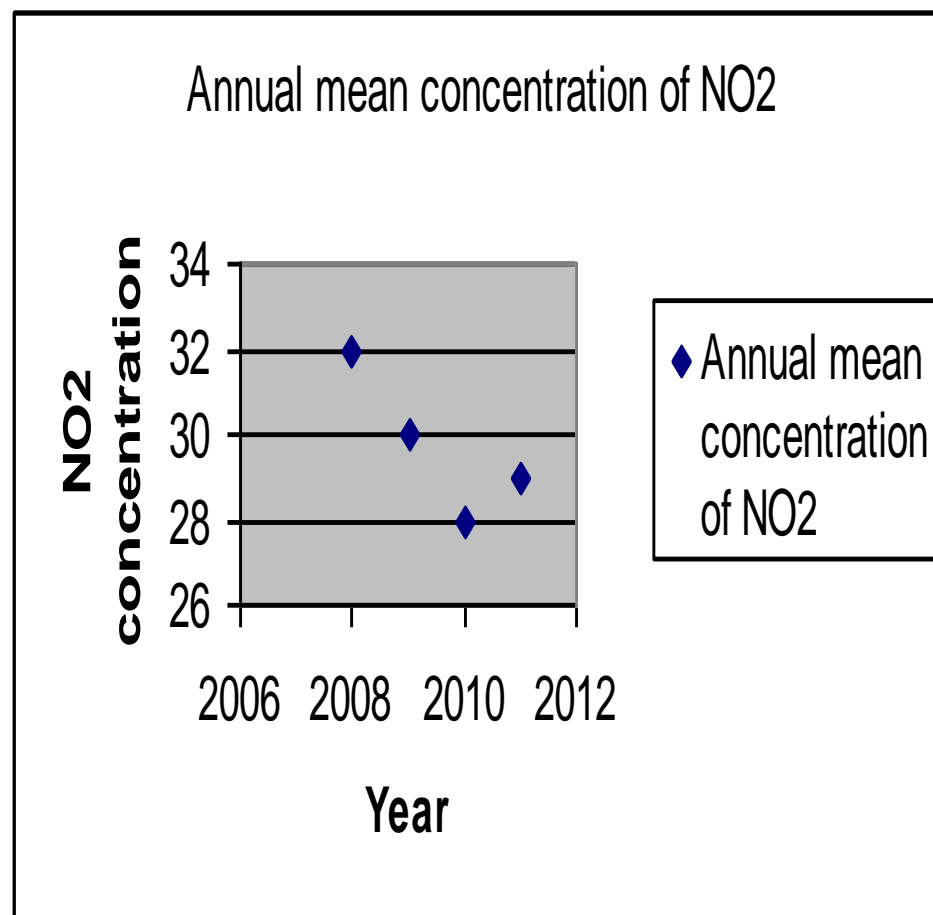
No automatic monitoring data was captured in 2013 because of serious monitor malfunction .and Suffolk County Council have made a decision not to continue to fund a replacement monitor..

2.2.1 Nitrogen Dioxide (NO₂)

Automatic Monitoring Data

Data and trends obtained during the previous periods of review have been included in this Progress Report. Data capture had often been problematic and on occasion results have been annualised using the methodology in LAQM TG(09).

figure 2.3 Trends in Annual Mean NO₂ Concentrations Measured at Automatic Monitoring Sites



Trends in the measured concentration of nitrogen dioxide captured by the automatic monitor during a four year period (2008-2011) show a reduction for three years and then a small rise in 2011. The average mean values in 2008, 2009 and 2011 were all annualised because of poor data capture and in contrast the greatest reduction of nitrogen dioxide occurred in 2010 when data capture was good. It should be noted that the mean values are well below the national air quality objective standards. Although the annualised results should be treated with caution when attempting to identify trends, it is encouraging to find that the annualised mean concentrations do not vary much from annual mean concentration calculated during a year of good data capture. Although the automatic monitor remained in situ until the middle of 2013 no worthwhile data was obtained because of malfunctions. The monitor has not shown an exceedance of the national air quality standards objectives at the Belvedere Road location during periods of successful data capture.

Diffusion Tube Monitoring Data

The diffusion tubes were exposed according to the calendar of suggested exposure periods for 2013 and the monitoring period at most diffusion tube sites was twelve months,

Diffusion tube data capture was 100% in Trinity Street, Bungay (TN1-TN7).

Diffusion tube data capture was 83% at most other sites (PN1-PN8 and PN12-15).

Diffusion tube data capture was 58% at the Belvedere Road Site. These tubes (PN9,10 and 11) were co-located with the air monitor and when the equipment was removed it left the tubes without a home, so only 7 months data was captured.

A full dataset of monthly mean values is included as an appendix.

As in previous years, results have been distance adjusted to predict the NO₂ concentration at the nearest relevant receptor and the methodology for this calculation is included as an appendix. The locations where the results have been adjusted for distance are PN1,2,3,4,5,6,7,12 and 15. The adjusted values are highlighted in the table.

Results have also been bias adjusted using the national bias adjustment factor (version 19/14) of **0.81** because no colocation study data was available.

Table 2.5 Results of NO₂ Diffusion Tubes 2013

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months or %) ^a	2013 Annual Mean Concentration (µg/m ³) - Bias Adjustment factor = 0.81 ^b
PN1	Castleton Avenue	Roadside	N	N	10	16.2
PN2	Fir Lane	Roadside	N	N	10	19.5
PN3	Dutchmans Court	Roadside	N	N	10	21.7
PN4	Golden Court	Roadside	N	N	10	29.4
PN5	Saltwater Way	Roadside	N	N	10	25.6
PN6	Yarmouth Road	Roadside	N	N	10	17.8
PN7	Mill Road	Roadside	N	N	10	19.6
PN8	St Margarets Churchyard	Urban Background	N	N	10	16.5
PN9	Belvedere Road co-location	Roadside	N	y	7	24
PN10	Belvedere Road co-location	Roadside	N	y	7	25.7
PN11	Belvedere Road co-location	Roadside	N	y	7	27.2

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months or %) ^a	2013 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Bias Adjustment factor = 0.81 ^b
PN12	Pier Terrace 1	Roadside	N	N	10	35.3
PN13	Pier Terrace 2	Roadside	N	N	10	26.0
PN14	Ingate Beccles 1	Roadside	N	N	10	32.3
PN15	Ingate Beccles 2	Roadside	N	N	10	33.2
TN1	Trinity Street 1	Roadside	N	Y	12	31.41
TN2	Trinity Street 1	Roadside	N	Y	12	29.55
TN3	Trinity Street 1	Roadside	N	Y	12	30.2
TN4	Trinity Street 2	Roadside	N	Y	12	29.38
TN5	Trinity Street 2	Roadside	N	Y	12	27.57
TN6	Trinity Street 2	Roadside	N	Y	12	25.52
TN7	Trinity Street 3	Roadside	N	N	12	26.34

^a Means should be “annualised” [as in Box 3.2 of TG\(09\)](http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), if full calendar year data capture is less than 75%. The annual means for the Belvedere Road Sites have been annualised, using an adjustment factor of 0.95. The calculation and detail of how the adjustment factor was obtained is explained in the Appendix 6.

^b If an exceedance is measured at a monitoring site not representative of public exposure, NO₂ concentration at the nearest relevant exposure should be estimated based on the “[NO₂ fall-off with distance](http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html)” calculator (<http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>), and results should be discussed in a specific section. The procedure is also explained [in Box 2.3 of Technical Guidance LAQM.TG\(09\)](#) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=30>).

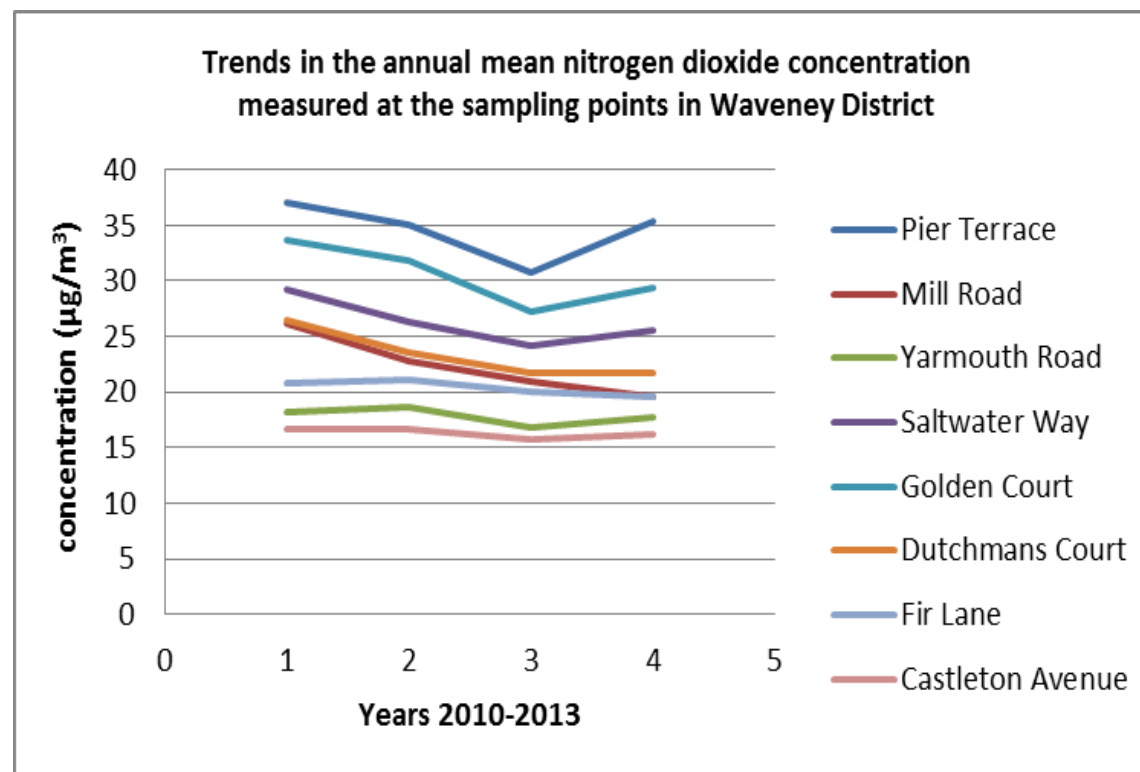
Table 2.6 Results of NO₂ Diffusion Tubes (2009 to 2013)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias ^a				
			2009 (Bias Adjustment Factor = XX)	2010 (Bias Adjustment Factor = 0.82)	2011 (Bias Adjustment Factor = 0.84)	2012 (Bias Adjustment Factor = 0.79)	2013 (Bias Adjustment Factor = 0.81)
PN1	Roadside	N	15.4	16.7	16.7	15.7	16.2
PN2	Roadside	N	n/a	20.8	21.1	20.1	19.5
PN3	Roadside	N	24.4	26.5	23.5	21.7	21.7
PN4	Roadside	N	n/a	33.6	31.9	27.3	29.4
PN5	Roadside	N	n/a	29.3	26.3	24.2	25.6
PN6	Roadside	N	n/a	18.2	18.6	16.8	17.8
PN7	Roadside	N	25.0	26.1	22.8	20.9	19.6
PN8	Urban background	N	n/a	n/a	17.8	16.28	16.5
PN9	Roadside	N	n/a	34.0	32.8	29.2	24
PN10	Roadside	N	n/a	34.8	32.8	30.0	26.7
PN11	Roadside	N	n/a	34.8	33.0	28.8	27.2
PN12	Roadside	N	n/a	37.1	35.1	30.8	35.3
PN13	Roadside	N	n/a	n/a	n/a	25.8	26.9
PN14	Roadside	N	n/a	n/a	35.4	31.2	32.3
PN15	Roadside	N	n/a	n/a	n/a	25.1	33.2
TN1	Roadside	N	n/a	n/a	n/a	n/a	31.4
TN2	Roadside	N	n/a	n/a	n/a	n/a	29.6
TN3	Roadside	N	n/a	n/a	n/a	n/a	30.2
TN4	Roadside	N	n/a	n/a	n/a	n/a	29.4
TN5	Roadside	N	n/a	n/a	n/a	n/a	27.6
TN6	Roadside	N	n/a	n/a	n/a	n/a	25.5
TN6	Roadside	N	n/a	n/a	n/a	n/a	26.34

^a Means should be “annualised” as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), if full calendar year data capture is less than 75%

Please note that the 2013 values highlighted in the results tables are those where an estimate has been made to assess relevant public exposure using the [“NO₂ fall-off with distance” calculator](#).

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



The trend at all locations in the 3 year period between 2010 and 2012 has been one of a reduction in nitrogen dioxide concentration at all sampling points. In 2013 there was a marked increase in the concentration measured at the Pier Terrace (PN12) and Golden Court (PN4) locations. The remaining locations exhibit a flattening out trend, or a very small increase or decrease.

The most marked increase was at the Pier Terrace location, which is a kerbside site situated a distance away from the nearest relevant receptor at Levington Court. A second tube is fixed directly at the façade of this building, but only two years of data is available. The second tube (PN13) showed a much smaller increase in the annual mean of just over $1\mu\text{g}/\text{m}^3$. The much larger increase by the kerbside is difficult to account for, but scrutiny and a comparison with the raw data for 2012, clearly indicate that the measured concentrations without any form of adjustment were greater in the autumn of 2013. A calculated average concentration for the period 9 to 11 in 2013 was $64.3\mu\text{g}/\text{m}^3$ and this can be compared to the similar period in 2012 where the average was $44.6\mu\text{g}/\text{m}^3$.

The autumn period data has been checked with background concentration data obtained during 2012 and 2013 by Suffolk Coastal District Council and the results there did not indicate that a similar increase had occurred in that district. The tube situated in St Margarets Churchyard in central Lowestoft used to measure background concentration levels in the Waveney District did not show a similar increase also, so it is probably safe to assume that the weather did not play a great part in elevating pollutant levels, because the background concentration levels remained stable elsewhere. The trend data seems to suggest that the average mean obtained in 2012 was unusually low and this could be confirmed with more monitoring.

2.2.2 Particulate Matter (PM₁₀)

No monitoring of PM₁₀ has been undertaken by Waveney District Council in 2013, as the 2012 Updating and Screening Assessment concluded that it was not necessary. There are no newly identified sources in the Waveney District.

2.2.3 Sulphur Dioxide (SO₂)

No monitoring of SO₂ has been undertaken by Waveney District Council in 2013, as the 2012 Updating and Screening Report concluded that none was necessary. There are no newly identified sources in the Waveney District.

2.2.4 Benzene

No monitoring of C₆H₆ has been undertaken by Waveney District Council in 2012, as the Updating and Screening Report of 2012 concluded it was not necessary. There are no newly identified sources in the Waveney District.

2.2.5 Other Pollutants Monitored

No monitoring of other pollutants named in the AQS objectives has been undertaken by Waveney District Council in 2012 as the Updating and Screening Assessment Report 2012 concluded that none was necessary. There are no newly identified sources of pollutants in the Waveney District.

2.2.6 Summary of Compliance with AQS Objectives

Waveney District Council has examined the results from monitoring in the district. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment at any of the sites considered in this Progress Report..

3 New Local Developments

A number of new local developments have been considered, including a number of biomass combustion installations. As part of the planning application consultation process all of the following developments have been screened for air quality impacts with appropriate advice given to the planning officer.

3.1 Road Traffic Sources

All the following have been considered in the compiling of this report

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

Two new developments, which were not previously covered in the last Updating and Screening report have been identified and are discussed below

Trinity Street, Bungay – new one way system

Waveney District Council received a request from Suffolk County Council to include this location as part of the Waveney District Council diffusion tube monitoring programme, following complaints from local residents concerned about air quality. Rather than delay the process it was considered appropriate to undertake a screening assessment straight away and not wait until the next Updating and Screening Report

A new one-way road scheme was introduced in the centre of Bungay, which had the result of re-routing traffic through Trinity Street.

The entrance to Trinity Street is very narrow and the width at the entrance: from building facade to facade is approximately 6 metres. The layout at the entrance comprises of a 1 metre footpath, a 3 metre wide single lane road and a 2 metre wide loading bay to the side of a large 3 storey department store. The building heights are in the region of 5 - 7 metres either side of the road. There appears to be two occupied relevant receptors opposite the store,, numbers 1 and 5 Trinity Street. Both residential properties have direct access onto the pavement via the front door.

A brief road traffic count (the Local Air Quality Management Guidance (LAQM) guidance. TG (09) recommends, a 5 minute count) and from a sample of four 5 minute counts a average mean of 41 vehicles was obtained. The maximum count gave a figure of 49 vehicles.

The LAQM Screening and Updating Assessment (USA) was used to assess the area in terms of a potential area of poor air quality.

The best description of Trinity Street, as a potential area of poor quality due to road traffic emissions of NOX, appears in TG(09). on page 5 - 10, in Box 3, where there is the A 1 category which is used to describe ' Narrow congested streets with residential properties close to the kerb'.

TG(09) outlines A1 criteria:

If there is an approximated AADT traffic flow of around 5000 vehicles per day or more (this can be obtained from a single 5 minute count which indicates a traffic flow of 35 vehicles).

A narrow street is defined as one with residential properties within 2 metres 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 metres and in this case it is about 2 metres).

A congested street will be one with slow moving traffic that is frequently stopping and starting due to pedestrian crossings , parked vehicles, throughout much of the day (not just during rush hours) The average speed is likely to be less than about 25kph (15mph). In the case of Trinity Street, the traffic is quite free flowing, but traffic entering the street is travelling at low speed and accelerating from the square and up a gradient, which means that NOX emissions will be enhanced for a short period until the speed limit is achieved. As vehicles start to climb a gradient, the power demanded from the vehicle engine will increase, although the speed of the vehicles may remain similar. As the power demand increases, the emissions will also increase.

TG(09) concludes that if the relevant criteria above are met then it will be necessary to proceed to a Detailed Assessment. A Detailed Assessment should initially comprise of diffusion tube monitoring at relevant locations.

The LAQM helpdesk at DEFRA confirmed that the area required a more detailed assessment and that a diffusion tube study would be appropriate.

2 triplicate sets of tubes were installed at the front facades of the relevant receptors at 1 and 5 Trinity Street. An additional single tube was installed away from the entrance at the point where Trinity Street opens out in the vicinity of a Churchyard.

Air quality sampling began in March 2013 and was concluded in March 2014. The results confirmed that an exceedance of the National Air Quality Objectives was unlikely.

Suffolk County Council have decided not to fund air quality sampling for a second year, so Waveney District Council will include this location in its sampling programme with a single tube located at the entrance of the Street, during 2014, where the NO₂ concentration has shown to be at its greatest.

The Northern Spine Road, Lowestoft – Planning Application Reference

PL\0320\13

The change in air quality at 36 receptor locations was considered.

Construction impacts including demolition, earthwork, construction and trackout activities are expected to have a negligible impact on local receptors.

A net beneficial impact in air quality has been determined. Whilst properties adjacent to the proposed new route would experience deterioration in air quality, when compared to the existing situation, however, this would be relatively small. Nowhere would the national objective limit levels for either nitrogen dioxide or particulate matter be exceeded with the new route in place. Small benefits in air quality would occur for residents adjacent to Bentley Drive, where traffic flows are expected to reduce and also, to a lesser extent, along Yarmouth Road. Waveney District Council currently monitors air quality in this area.

The air quality assessment reports can be viewed in full on line at WWW.suffolk.gov.uk/environment.

3.2 Other Transport Sources

There are no new/newly identified non-road traffic sources to report since the last Updating and Screening Assessment.

The Waveney District has no airport.

There are no Locations in the Waveney District where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

There are no locations in the Waveney District⁶, with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

The procedure set out in Section B.3 of Box 5.4 of TG(09) has been used to assess the emissions of sulphur dioxide released by shipping sources.

The Port of Lowestoft does not receive the large ships defined in 8.3 of LAQM. TG(09), which are described as Ro-Ro, container ships, cruise liners and cross channel ferries. Vessel movements to service the offshore wind farms have increased, but the number of movements is still below the threshold of 5000 and the size of the vessels is small. The conclusion is that no further action is needed as the total vessel movements are below the threshold (greater than 5000) and below the size criteria requiring a Detailed Assessment.

3.3 Industrial Sources

The following industrial sources have been considered in the compiling of this report.

- **Industrial installations:** new or proposed installations for which an air quality assessment has been carried out.
- **Industrial installations:** existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- **Industrial installations:** new or significantly changed installations with no previous air quality assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.
- Poultry farms.

One new development has been identified, that was not considered in the most recent Updating and Screening Assessment Report..

Proposed CHP installation at the Birds Eye Factory, Whapload Road, Lowestoft.- Planning Application Reference DC/13/0435/VOC

The proposed development comprises of the installation of a 3.3MW CHP gas fired turbine.

A ADMS air quality screening assessment prepared by the Air Quality Consultants confirmed that the air quality objectives for NO₂ and particulate's would not be exceeded and that the air quality impacts would not be significant at the location.

Comments made in respect of the air quality impact and the air quality assessment can be viewed on the Waveney District Council planning portal, quoting the application reference.

3.4 Commercial and Domestic Sources

A number of individual commercial biomass installations have received planning permission and are considered in this report. All of the installations have been assessed using the methodology outlined in the technical guidance, Technical Guidance: 'Screening assessment for biomass boilers', and the Technical Guidance LAQM. TG(09).

Ilketshall Hall, Ilketshall St Lawrence, Beccles – Planning Application Reference. DC/12/1453/FUL

Screening indicated that the emissions from the boiler installation were likely to be well below the pollutant concentration level where a detailed assessment would be required. Comments made in respect of the air quality impact can be viewed on the Waveney District Council planning portal, quoting the application reference.

Oakland Farm, Flixton –Planning Application Reference DC/13/0350/FUL

Screening indicated that the emissions from the boiler installation were likely to be well below the pollutant concentration level where a detailed assessment would be required. Comments made in respect of the air quality impact can be viewed on the Waveney District Council planning portal, quoting the application reference.

Carlton Hall, Carlton Colville – Planning Application Reference DC/13/2005/FUL

Installation of a biomass boiler with a thermal capacity of 199Kw.

Screening indicated that the emissions from the boiler installation were likely to be well below the pollutant concentration level where a detailed assessment would be required. and the Technical Guidance LAQM. TG(09). Comments made in respect of the air quality impact can be viewed on the Waveney District Council planning portal, quoting the application reference.

Redisham Hall -- Planning Application Reference DC/13/2234/FUL

Installation of a biomass boiler with a thermal capacity of 195kW

Screening indicated that the emissions from the boiler installation were likely to be well below the pollutant concentration level where a detailed assessment would be required. Comments made in respect of the air quality impact and the air quality assessment can be viewed on the Waveney District Council planning portal, quoting the application reference.

Benjamin Britten High School, Blyford Road, Lowestoft – Planning Application Reference PL/0149/13.

An air quality assessment was produced by Pick Everard for Coffey Technical services (Report reference 130614/R001/Issue2 dated 13 June 2013)

The ADMS screening confirmed that the air quality objectives for both No₂ and particulates were unlikely to be exceeded and that there was considerable headroom .Comments made in respect of the air quality impact and the air quality assessment can be viewed on the Suffolk County Council planning portal, quoting the application reference.

Bernard Matthews, Ellough Farm, Warrens Lane Ellough, Beccles – Planning Application Reference DC/13/2571/FUL

The development comprised of six biomass packaged plant room heating systems – each boiler has a maximum thermal capacity of 201kW.

The ADMS screening confirmed that the air quality objectives for NO₂ and particulates would not be exceeded and that there was considerable headroom when the comparatively low background concentration levels were taken into account. Comments made in respect of the air quality impact and the air quality assessment can be viewed on the Waveney District County Council planning portal, quoting the application reference.

Church Farm, London Road, Shadingfield – Planning Application Reference DC/13/0169/FUL

A biomass boiler installation with a thermal capacity of 456kW
Screening indicated that the emissions from the boiler installation were likely to be well below the pollutant concentration level where a detailed assessment would be required. Comments made in respect of the air quality impact can be viewed on the Waveney District Council planning portal, quoting the application reference.

3.5 New Developments with Fugitive or Uncontrolled Sources

Flixton Quarry, Flixton Park, Bungay, Suffolk – Planning Application Reference PL/0125/12

Planning permission has been granted to Cemex allowing the additional extraction of 671,000 tonnes of sand and gravel with restoration to agriculture via inert filling. The air quality assessment concluded that the impact from dust emissions will be low, as the site has been operating for a number of years without giving rise to complaints of nuisance. The air quality assessment can be viewed on the Suffolk County Council planning portal, quoting the application reference.

Waveney District Council

An assessment has been undertaken using the procedure outlined in Box E of chapter 5, TG(09). The nearest relevant receptor is located approximately 300m away and the estimated background PM10 concentration obtained from the national background maps is 16.7µg/m³. No further assessment is necessary.

In Waveney District there are no other new fugitive sources of PM₁₀ that have not been covered by previous rounds of review, There is also no other new relevant exposure which has not been covered by previous rounds of review and assessment, No further assessment is necessary.

Waveney District Council confirms that there are no new or newly identified local developments which may have a significant impact on air quality within the Local Authority area and result in an exceedance of the national air quality objectives.

Waveney District Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

Waveney District Council has identified the following new or previously unidentified

local developments in the Local Authority area.

Trinity Street, Bungay – new one way system

The Northern Spine Road, Lowestoft – Planning Application Reference

PL\0320\13

Proposed CHP installation at the Birds Eye Factory, Whapload Road,

Lowestoft.- Planning Application Reference DC/13/0435/VOC

Ilketshall Hall, Ilketshall St Lawrence, Beccles – Planning Application

Reference. DC/12/1453/FUL

Oakland Farm, Flixton –Planning Application Reference DC/13/0350/FUL

Carlton Hall, Carlton Colville – Planning Application Reference DC/13/2005/FUL

Redisham Hall -- Planning Application Reference DC/13/2234/FUL

Benjamin Britten High School, Blyford Road, Lowestoft.

Bernard Matthews, Ellough Farm, Warrens Lane Ellough, Beccles – Planning

Application Reference

Church Farm, London Road, Shadingfield – Planning Application Reference

DC/13/0169/FUL

Flixton Quarry, Flixton Park, Bungay, Suffolk

These will be taken into consideration in the next Updating and Screening Assessment. All of the above have been screened and assessed during the planning application stage and none of them are at risk of exceeding the objectives for nitrogen dioxide and particulates (PM10 and PM2.5).

There will not be a need for Waveney District Council to proceed to a Detailed Assessment for any of the Developments listed above.

4 Planning Applications

The following planning application is currently being considered that may have an impact on local air quality. The development will be considered in detail in the next Updating and Screening Assessment Report.

The Brooke Peninsula Development-Planning Application Reference

DC/13/3482/OUT

5 Air Quality Planning Policies

The Local Development Order's (LDO), adopted on 24th March , 2012, by Waveney District Council, introduced permitted development rights for specific types of development.

These rights apply to businesses operating in the Energy, Offshore Engineering and Ports & Logistics sectors and for other businesses which provide a demonstrable supporting role to businesses operating in those sectors thereby helping to facilitate wider economic growth in the area.

The existence of this Local Development Order does not necessarily preclude alternative development to that permitted by the Order. Those proposals would however, continue to require planning permission.

The areas covered by the simplified planning arrangements permitted in an LDO are:

Benacre Road, Ellough, Beccles

Mobbs Way, Oulton Broad

PowerPark, Lowestoft

Riverside Road, Lowestoft

South Lowestoft Industrial Estate

Although simplified planning arrangements are permitted, air quality is a consideration in planning applications for developments within area's with designated LDO status. Large developments may still require the submission of a transport assessment, environmental impact assessment (EIA) and an air quality assessment. Detailed information is provided for developers in a General Information Guide.

Outside of the LDO's, the Planning Officer will consult and seek advice in respect of developments which may impact on local air quality.

6 Local Transport Plans and Strategies

The following commentary is taken from the Suffolk County Council local Transport Plan for Waveney and it covers the period 2011 to 2031.

It is likely that there will be growth of around 3,000 new dwellings and 5,000 new jobs in Waveney. Most of this development is planned for Lowestoft as part of a jobs-led regeneration project for the town. Some growth is also likely within the market towns. Growth in these areas will place additional demand onto the transport networks and, if no measures are put in place, will result in greater levels of congestion and delays to journeys, particularly in Lowestoft. Housing and jobs growth within Lowestoft and the market towns will, however make it possible to build upon existing sustainable transport networks and reduce the impact of potential traffic growth arising from the new developments

Throughout the wider district access to services by public transport can be difficult, particularly in the more remote parts of the district. Conditions are better in the market towns and a commercially viable bus service operates within Lowestoft. The East Suffolk line provides a rail service between Ipswich, Halesworth and Lowestoft at a two-hourly frequency. From the end of 2012 an improved service frequency will make this service more useful for many journeys. Trains connect Lowestoft and Norwich about once an hour.

In Lowestoft, as with most urban centres, there is a high dependency on cars for many short trips. This highlights the opportunity that exists to promote and improve cycling and walking for many trips within the town, particularly the peak hour trips to work that take place at the busiest times.

There are a number of long standing aspirations for highway improvements in Lowestoft that the county council is actively promoting. These include: completion of the northern spine road that will allow the re-routing of the A12 in North Lowestoft, and the improvement of Denmark road; a new access road south of Lake Lothing to unlock development sites in this regeneration area; additional pedestrian/cycle

bridges across Lake Lothing; and, in the longer term a third vehicular bridge across Lake Lothing. Improvements to the Commercial Road junction would also unlock development sites on the northern side of the regeneration area.

The A12 between Lowestoft and Ipswich is an important route for both freight and people accessing Lowestoft, and the resilience of this road especially with regards to flooding is critical. For much of the district the A12 provides a key north/south route and a link for the market towns and villages in the district and to the north in Waveney.

The impact of climate change (increased flooding, sea level rise) is likely to affect the A12 at Lattymere Dam, the A1095 at Wolsey Bridge and the B1127 at Potters Bridge. It will also impact on the alignment of the Suffolk coast and could significantly affect Lowestoft and Corton.

The East Suffolk railway line between Ipswich and Lowestoft currently has limitations as to the level of service that is able to be provided. However, the service does provide connections to the centre of Ipswich and London, so there is an opportunity to encourage greater use of the service with or without any improvements. The current frequency is a train every two hours, however improvement works at Beccles to provide a passing loop is a key priority for the county council and it is anticipated that this work can be completed by Network Rail by the end of 2012, paving the way for a full hourly service between Ipswich and Lowestoft. This is a viable alternative to commuting by car using the A12.

There is also scope to improve integrated transport links at the East Suffolk Line Stations to improve north/south access. Reinstatement of a passenger line to Leiston is a long-term aspiration.

The following have been identified as the key transport issues for Waveney;

- Lack of bus connections to/from Lowestoft, market towns and rural areas.
- Access to development sites south of Lake Lothing in Lowestoft.
- Impact of traffic in north Lowestoft.
- Impact of lorries in Beccles.
- Impact of lorries in Bungay Town Centre.

- Poor frequency of service on the East Suffolk line.
- Traffic congestion at Oulton Broad Rail Station.
- Poor transport connections at rail stations on the East Suffolk Line
- Lack of pedestrian /cycle bridges over Lake Lothing
- Pinch points for north/south traffic in Lowestoft
- Sea level change and coastal erosion

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

There were no exceedences of the National Air Quality Objectives in 2013 at any location where air quality sampling takes place in the Waveney District and none are expected in 2014.

Diffusion tube monitoring data obtained near the Port of Lowestoft shows that nitrogen dioxide concentrations at Belvedere Road, Mill Road and Pier Terrace are below the National Air Quality Strategy Objectives and are unlikely to exceed the Objectives in 2014. One of the tubes located at the Pier Terrace, PN12, showed a significant increase in the nitrogen dioxide concentration level when compared to the results obtained in 2012, whereas the second tube which is directly fixed on the façade of the nearest relevant receptor, PN13, remained at a similar level to that obtained in 2012. It is difficult to account for the differences, but the area has been subject to a number of road works schemes. Monitoring should continue at these locations, so that new trends in the local air quality can be identified and confirmed..

The results of the diffusion tube study in Ingate, Beccles, indicate that the annual mean Nitrogen Dioxide concentration is in the region of the low 30's ($\mu\text{g}/\text{m}^3$), and this suggests that monitoring of the air quality in the town centre should continue in 2014.

7.2 Conclusions relating to New Local Developments

There are no new developments in the Waveney District that will impact on local air quality significantly, therefore, there is no need to proceed to a Detailed Assessment, as exceedences of the National Air Quality Strategy Objectives are unlikely.

The Trinity Street diffusion tube survey indicated that the air quality standard objectives are unlikely to be exceeded 2014

7.3 Other Conclusions

There are a number of large brownfield developments proposed on the quayside, including the, Brooke Peninsula Development and the redevelopment of the former Sanyo factory site. These may impact significantly on local air quality and these can be considered in the next updating and screening report..

7.4 Proposed Actions

Monitoring should continue at the present locations and this should include a continuation of the diffusion tube air quality survey at Trinity Street in Bungay, albeit with a single tube. Monitoring should continue close to the location of the former co-location study and air quality monitor in Belvedere Road, using two tubes, which will enable new trends to be identified as the quayside is redeveloped. Belvedere Road is likely to be one of the main road routes into the town centre for most of the quayside developments. The Belvedere Road monitoring results can also be assessed against the historical data captured by the automatic air quality monitor.

The next course of action is to submit the 2014 Air Quality Progress Report.

8 References

Air Quality Consultants Ltd, Nitrogen Dioxide fall off with Distance Calculator accessed on the Air Quality Archive website (hppt://www.airquality.co.uk/archive/aqm/tools/NO2withDistancefromRoadscalculator Issue2.xls)

Air Quality Consultants Ltd Spreadsheet of Bias Adjustment Factors (v.02/10) accessed on the Review @ Assessment Helpdesk website (hppt://www.uwe.ac.uk/aqm/review/R@Asupport/diffusiontube31009.xls)

Air Quality Review and Assessment Progress Report (2007), AEA Technology plc., Report AEAT/ENV/R/2562

Air Quality Review and Assessment Progress Report (2008), AEA Technology plc., Report AEAT/ENV/R/2645

Air Quality Review and Assessment Detailed Assessment Report (2009), AEA Technology plc., Report AEAT/ENV/R/2805.

Department for Environment, Food and Rural Affairs (2007)The Air Quality Strategy for England , Scotland, Wales and Northern Ireland. Department of the Environment, Transport and the Regions. Cm 7169, NIA 61/06-07

Department for Environment, Food and Rural Affairs, (2009) Part IV of the Environment Act 1995. Local Air Quality Management Technical Guidance LAQM. TG (09), February 2009.

The 2012 Air Quality Updating and Screening Assessment For Waveney District Council

Progress Report on Air Quality in Waveney District (2005)

Progress Report on Air Quality in Waveney District (2010)

Progress Report on Air Quality in Waveney District (2011)

Progress Report on Air Quality in Waveney District (2013)

The Review and Assessment of Air Quality within Waveney District 2006

The Review and Assessment of Air Quality within Waveney District 2012

The Air Quality (England)Regulations 2000(SI 928, The Air Quality (England) (Amendment)Regulations 2002 (SI3043).

The Stationary Office (1995) The Environment Act1995:Part IV

UK National Air Quality Information Archive, accessed at www.airquality.co.uk

Local Air Quality Management: Note on Predicting NO₂ Concentrations, April 2012, prepared for DEFRA by Bureau Veritas (laqm.defra.gov.uk/review and [assessment/tools/background-maps](http://laqm.defra.gov.uk/assessment/tools/background-maps))

Local Air Quality Management 2010 NO_x NO₂ PM₁₀ CSV Format Background Maps (laqm.defra.gov.uk/review and [assessment/tools/background-maps](http://laqm.defra.gov.uk/assessment/tools/background-maps)).

UK National Air Quality Information Archive (2009) Monitoring data from AURN Sites (www.airquality.co.uk).

NO₂ Diffusion Tubes for LAQM: Guidance Note for Local Authorities, Prepared for Defra and the Devolved Administrations, AEAT/env/r/2140/Issue 1, March 2006.

NO₂ Concentrations and Distance from Roads, prepared by Professor Duncan Laxen and Dr Ben Marner of Air Quality Consultants Ltd

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Appendices

Appendix A: Appendix 1: Quality Assurance / Quality Control (QA/QC) Data

Appendix 2 Poultry plants in Waveney with Environmental Permits from the Environment Agency

Appendix 3 Environmental Permitting Regulations, Public Register of "Permitted Processes"

Appendix 4 Raw Diffusion tube results

Appendix 5: Method used to Predict NO₂ Concentrations at Different Distances from Road

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

QA/QC of Diffusion Tube Monitoring

The diffusion tubes used in Waveney District Council are supplied and analysed by ESG Scientifics. The tubes were prepared by spiking acetone:triethanolamine (50:50) into the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow auto-analyser with ultraviolet detection. The samples were analysed in accordance with ESG Scientifics standard operating procedure ANU/SOP/1015 issue 1, which meets the guidelines set out in DEFRA's 'Diffusion Tubes For Ambient no2 Monitoring practical Guidance'

The results were initially calculated assuming an ambient temperature of 11°C, and the reported values adjusted to 20 °C to allow for direct comparison with EU limits.

Please note that the reported results were not bias adjusted by ESG Scientifics.

The diffusion tubes are stored and installed by Waveney District Council in accordance with "NO₂ Diffusion Tubes for LAQM:Guidance Note for Local Authorities"

The national bias adjustment factor was used and this was obtained from the National Diffusion Tube bias adjustment factor spreadsheet version number 09/14.

A factor of 0.81 was obtained from a sample of 34 separate studies of ESG Scientifics..

Factor from Local Co-location Studies (if available)

Waveney District Council did not undertake a local co-location study....

Discussion of Choice of Factor to Use

Waveney District Council has used the national bias adjustment factor, version 09/14, available on the LAQM website.

QA/QC of Automatic Monitoring

Waveney district Council has no automatic monitoring facility....

QA/QC of Diffusion Tube Monitoring

The diffusion tubes used in Waveney District Council are supplied and analysed by ESG Scientifics, which is currently ranked as a Category **Satisfactory** laboratory in the WASP inter-comparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes.

Results from tubes that are giving "good" precision will improve the overall reliability of the annual mean concentrations derived from diffusion tubes. Precision will reflect the laboratory's performance/consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field. Any laboratory can show "poor" precision for a particular period/collocation study, if this is due to poor handling of the tubes in the field.

For the purposes of Local Air Quality Management, tube precision is separated into two categories, "Good" or "Poor", as follows: tubes are considered to have "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is less than 10%. Tubes are considered to have "poor" precision where the CV of four or more periods is greater than 20% and/or the average CV is greater than 10%.

A summary of precision results for 44 Nitrogen Dioxide diffusion tube studies by laboratory show that the ESG laboratory (formerly Harwell Scientifics) achieved a **good for precision** in 37 studies and **poor for precision** in 7 studies in 2013.

Appendix 2: Poultry plants in Waveney with Environmental Permits from the Environment Agency

RP3934LN	Bernard Matthews	Ellough Poultry Farm
GP3631MV	Vion Agriculture Ltd	Frostenden Poultry Farm & Wangford Farm Poultry Unit
HP3034MF	Moy Park Ltd	Westhall Poultry Unit
QP3331MD	St Lawrence Hall Farms Ltd	Ilketshall Hall Farm
QP3033US	Hook 2 Sisters Ltd	Flixton Site
LP3333UL	Crown Chicken Ltd.	Hill Farm, Brampton, Beccles
MP3933UV	Crown Chicken Ltd.	Becks Farm, Ilketshall St Andrews, Beccles

Appendix 3: Environmental Permitting Regulations, Public Register of

"Permitted Processes"

(as at: 11/04/2012)

Reference	Trading name/Address	Processes	Granted Date	Map Reference
07/00011/B	P W Waters Ltd Unit 6 P Waters Ltd Harbour Road Lowestoft Suffolk NR32 3LX	PG3_1: Cement and lime Processes	06-Sep- 2007	652538 292967
07/00007/B	The Concrete Company Ltd. Street Record Sandpit Lane Worlingham Suffolk	PG3_1: Cement and lime Processes	06-Sep- 2007	644785 288756
07/00005/B	Cemex Eastern Flixton Gravel Pit Homersfield Road Flixton Bungay Suffolk NR35 1NN	PG3_1: Cement and lime Processes	06-Sep- 2007	629961 286662
07/00010/B	Dudman (Lowestoft) Ltd The Dudman Group Of Companies Commercial Road Lowestoft Suffolk NR32 2TE	PG3_1: Cement and lime Processes	30-Nov- 2005	654178 292777
07/00009/B	C&H Quickmix Ltd Quickmix Sandpit Lane Worlingham Beccles Suffolk NR34 7TH	PG3_1: Cement and lime Processes	06-Sep- 2007	644860 288471
07/00014/B	William Clowes Ltd William Clowes Ltd	PG6_16: Coating	27-May- 2003	645234 288540

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	Copland Way Worlingham Beccles Suffolk NR34 7TL	activities, printing & textile		
07/00016/B	Clays Ltd Clays Ltd Popson Street Bungay Suffolk NR35 1EB	PG6_16: Coating activities, printing & textile	02-Nov- 2007	633377 289987
07/00017/B	Supersine Duramark Ltd Supersine Duramark Ltd Freemantle Road Lowestoft Suffolk NR33 0EA	PG6_23: Coating activities, printing & textile	02-Nov- 2007	654392 292192
08/00018/B	Automotive Cleaning Chemicals Ltd. 4 Hadenham Road Gisleham Lowestoft Suffolk NR33 7NF	PG6_44: Coating manufacture	08-Feb- 2008	652968 289524
08/00019/B	Gardwell Coatings Ltd Unit 4c6 Site 3 Ellough Industrial Estate Ellough Airfield Ellough Suffolk	PG6_23: Coating, SED Activities (not dry clean)	08-Feb- 2008	644566 288397
11/00005/B	Gardwell Coatings Limited Germans Yard Hamilton Road Lowestoft Suffolk NR32 1XF	PG6_23: Coating, SED Activities (not dry clean)	16-May- 2011	655361 293190
08/00019/B	Gardwell Coatings Ltd Unit 4c6 Site 3 Ellough Industrial Estate Ellough Airfield Ellough Suffolk	PG6_31: Coating - Polymer, IsoCyan & Dry Powder	08-Feb- 2008	644566 288397
06/00003/B	Wm Morrison Supermarkets Ltd 18 Tower Road Gisleham Lowestoft Suffolk NR33 7NG	PG6_46: Dry cleaners	28-Oct- 2006	652979 289260

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08/00008/B	Fashion Clean 140 London Road South Lowestoft Suffolk NR33 0AZ	PG6_46: Dry cleaners	06-Jun- 2008	654519 292238
11/00002/B	Linen Press 21B New Market Beccles Suffolk NR34 9HA	PG6_46: Dry cleaners	21-Apr- 2011	642123 290356
03/00022/B	Lafarge Aggregates Ltd Flixton Gravel Pit Homersfield Road Flixton Bungay Suffolk NR35 1NN	PG315A: Roadstone coating burning waste oil	06-Sep- 2007	629961 286662
10/00001/B	Asda Asda Stores Limited Belvedere Road Lowestoft Suffolk NR33 0PX	PG1_14: Service Stations	29-Sep- 2010	654189 292547
03/00020/B	R Charlsh Ltd St Johns Garage Bardolph Road Bungay Suffolk NR35 1BN	PG1_14: Service Stations	01-Apr- 2003	633922 289286
03/00018/B	Carlton Colville Service Station Carlton Colville Service Station The Street Carlton Colville Lowestoft Suffolk	PG1_14: Service Stations	01-Apr- 2003	651196 289812
03/00016/B	Oulton Broad Express Broadlands Filling Station 122 Beccles Road Lowestoft Suffolk NR33 8QY	PG1_14: Service Stations	01-Apr- 2003	651406 291804
03/00007/B	Anglia Regional Co- operative Society Rainbow Filling Station Saxons Way Halesworth Suffolk IP19 8LU	PG1_14: Service Stations	01-Apr- 2003	638636 277147
03/00005/B	AW&D Hammond	PG1_14:	01-Apr-	638767

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	A W And D Hammond Ltd Norwich Road Halesworth Suffolk IP19 8BU	Service Stations	2003	277886
08/00007/B	Morrisons 18 Tower Road Gisleham Lowestoft Suffolk NR33 7NG	PG1_14: Service Stations	18-Jan-2008	652979 289260
03/00014/B	Shell Oulton Broad (262) Travellers Check Garage Normanston Drive Lowestoft Suffolk NR32 2PY	PG1_14: Service Stations	01-Apr-2003	652453 293178
03/00012/B	Malthurst Ltd Mill Road Service Station Mill Road Lowestoft Suffolk NR33 0PP	PG1_14: Service Stations	01-Apr-2003	654361 292419
07/00008/B	Jubilee Filling Station Jubilee Filling Station High Street Lowestoft Suffolk NR32 1HU	PG1_14: Service Stations	14-Dec-2007	655111 294050
05/00001/B	Anglia Regional Co-op Rainbow Foodstore Hillside Road East Bungay Suffolk NR35 1RX	PG1_14: Service Stations	10-Nov-2005	634512 289226
07/00018/B	Morrisons Morrisons George Westwood Way Beccles Suffolk NR34 9EJ	PG1_14: Service Stations	14-Dec-2007	642725 291090
02/00001/B	Tesco Stores Ltd Tesco Superstore Leisure Way Lowestoft Suffolk NR32 4TZ	PG1_14: Service Stations	01-Apr-2003	653597 296081
06/00005/B	Tesco Stores Ltd Tesco Gresham Road	PG1_14: Service Stations	16-Jan-2006	642340 290556

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	Beccles Suffolk NR34 9QH			
03/00009/B	Pageant Garage Pageant Garage Gosford Road Beccles Suffolk NR34 9QP	PG1_14: Service Stations	01-Apr- 2003	642660 290216
03/00003/B	Kirkley Run Service Station 99 Kirkley Run Lowestoft Suffolk NR33 0NH	PG1_14: Service Stations	27-May- 2003	653240 291975
03/00001/B	Gunton Garage Gunton Garage 265-271 Yarmouth Road Lowestoft Suffolk NR32 4AA	PG1_14: Service Stations	29-Jun- 2009	653448 295716
07/00002/B	Hammonds Accident Repair Unit 6 Blyth Road Industrial Estate Blyth Road Halesworth Suffolk IP19 8EN	PG6_34: Vehicle re-finishing	06-Sep- 2007	639021 276820
07/00003/B	Belle Coach Works Ltd 28 Pinbush Road Gisleham Lowestoft Suffolk NR33 7NL	PG6_34: Vehicle re-finishing	06-Sep- 2007	652666 289953
07/00004/B	John Grose Group Ltd 2 Barley Way Gisleham Lowestoft Suffolk NR33 7NH	PG6_34: Vehicle re-finishing	06-Sep- 2007	652982 289786
07/00001/B	Robinsons Accident Repair Centre 2 Cooke Road Gisleham Lowestoft Suffolk NR33 7NA	PG6_34: Vehicle re-finishing	06-Sep- 2007	653067 289754
11/00007/B	Wrights Street Record	PG1_1: Waste oil	05-Dec- 2011	642398 290913

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	Common Lane North Beccles Suffolk	burners (under 0.4MW)		
10/00003/B	Emerald Auto Services Ltd. Unit 2 Ellough Industrial Estate Ellough Airfield Worlingham Beccles Suffolk	PG1_1: Waste oil burners (under 0.4MW)	18-Nov- 2010	644637 288414

Appendix 4 : Raw Diffusion tube results

Location	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9	Period 10	Period 11	Period 12	Annual Mean ($\mu\text{g}/\text{m}^3$)	Bias correction Factor Used	Bias corrected Annual Mean ($\mu\text{g}/\text{m}^3$)
Castleton Avenue	34.7	31.7	35.8	20.9	21.6	20.2	22.0		26.1	27.4	30.7		27.11	0.81	21.96
Ingate	47.4	36.4	55.4	38.4	35.9	28.8	36.6		38.7	40.9	40.1		39.86	0.81	32.29
Saltwater Way	45.1	34.6	52.6	30.9	22.7	28.8	31.6		27.3	35.3	37.9		34.68	0.81	28.09
Fir Lane	42.2	26.4	30.2	26.9	25.5	24.5	23.1		29.6	35.4	32.7		29.65	0.81	24.02
Mill Road	33.9	21.7	39.9	23.5	26.1	20.9	22.8		21.8	28.7	30.7		27.00	0.81	21.87
Golden Court	41.3	44.4	48.4	39.0	36.5	38.4	41.7		34.5	39.6	36.1		39.99	0.81	32.39
Yarmouth Road	33.7	31.0	39.2	23.8	19.8	22.7	23.9		26.2	30.0	24.5		27.48	0.81	22.26
Pier Terrace 1	55.5	31.9	58.0	39.8	45.6	36.3	44.8		65.4	60.6	67.0		50.49	0.81	40.90
St Margarets	30.6	22.5	24.3	18.2	12.9	14.4	16.0		18.0	30.3	16.7		20.39	0.81	16.52
Belvedere Road	37.6	34.0	41.9	28.5	25.8	22.5	30.2						31.50	0.81	25.52
Belvedere Road	44.7	34.1	43.7	30.7	23.9	26.3	30.2						33.37	0.81	27.03
Belvedere Road	42.1	41.2	47.0	34.3	26.9	25.1	30.9						35.36	0.81	28.64
Dutchmans Court	33.6	32.3	40.5	26.9	24.5	23.4	27.3		27.7	31.4	30.6		29.82	0.81	24.15
Pier Terrace 2	38.7	35.4	38.8	29.2	27.6	27.2	29.6		30.2	32.3	43.2		33.22	0.81	26.91
Ingate 2	53.4	47.6	48.6	26.7	35.5	31.9	33.6		52.0	36.9	43.2		40.94	0.81	33.16
Trinity Street, Bungay															
Tube 1	40.3	38.1	34.1	33.1	32.4	53.9	40.4	48.0	28.6	37.7	34.6	44.1	38.78	0.81	31.41
Tube 2	41.4	35.1	32.5	33.3	30.3	50.0	42.8	26.1	36.8	33.8	33.6	42.1	36.48	0.81	29.55
Tube 3	38.2	37.7	35.1	38.3	32.1	58.6	37.1	24.9	32.0	38.5	35.2	39.6	37.28	0.81	30.19
Tube 4	36.9	35.4	30.6	32.5	28.2	51.5	36.3	22.6	37.9	36.4	33.4	41.5	35.27	0.81	28.57
Tube 5	33.0	36.6	27.0	33.5	27.0	52.0	39.1	21.5	34.0	35.2	33.1	36.5	34.04	0.81	27.57
Tube 6	35.5	37.2	30.0	33.3	30.8	52.8	33.3	23.0	37.5	35.3	33.1	40.7	35.21	0.81	28.52
Tube 7	23.1	29.4	21.5	28.2	29.1	52.2	37.6	23.9	37.2	35.6	36.7	35.7	32.52	0.81	26.34

Location	Mean	Bias adjusted
Trinity Street 1	37.51	30.38
Trinity Street 2	36.34	29.44
Trinity Street 3	35.53	28.78

Note that period one in Trinity Street started in March

Appendix 5

Method used to Predict NO₂ Concentrations at Different Distances from Road

The monitoring sites are located in the areas of concern to represent the worst-case public exposure, but it is not always possible to measure concentrations at the desired location because of practical reasons and in most cases the relevant public exposure is located a short distance away. The calculator described in LAQM. TG(09) has been used to predict concentrations at the nearest point of relevant public exposure. Results derived in this way will have a greater uncertainty than measured data and this uncertainty increases as the distance between the measuring location and relevant receptor grows larger.

The calculator as a spreadsheet is available on www.laqm.defra.gov.uk, and it can be viewed below.

The local background concentration in µg/m³ of the appropriate year (2012) has been obtained from the national maps published at www.laqm.defra.gov.uk.

The influence of the 2010 high NO₂ pollution year has been accounted for and the estimates for 2012 have been scaled down, using the NO₂ Background Sector Removal tool, which is again available at www.laqm.defra.gov.uk.

<p>This calculator allows you to predict the annual mean NO₂ concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.</p>					
<p><u>Enter data into the yellow cells</u></p>					
Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	0	2.4	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	0	5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	(Note 2)	0	12.13	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	(Note 2)	0	26.4	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	(Note 3)		23.8	µg/m ³
<p>Note 1: This should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.</p>					
<p>Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.</p>					
<p>Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.</p>					
<p>Issue 2: 16/03/09. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk</p>					

Appendix 6

The estimation of annual mean concentrations from short-term monitoring data.

The process outlined in box 3.2 of TG(09) was followed and data from two AURN (Background/Urban) sites in the Eastern zone were chosen.

Site	Annual mean 2013(AM)	Period mean 2013(PM)	Ratio (AM/PM)
Lakensfield (Norwich)	15	15.6	0.96
Southend	20	21.49660	0.9303

The average ratio is 0.947