



# 2014 Air Quality Progress Report for Basingstoke and Deane Borough Council

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

April 2014

Basingstoke and Deane Borough Council

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## Executive Summary

Under the Environment Act 1995, Local Authorities are required to undertake regular review and assessment of air quality. Local Authorities are currently undertaking the fifth round of the review and assessment process. Basingstoke and Deane Borough Council last conducted a Progress Report in 2013. The Progress Report concluded that there were no exceedences of the AQS annual mean objective in the Borough.

Concentrations of NO<sub>2</sub> are measured throughout the Borough through non-automatic diffusion tube sampling at 22 sites. Concentrations of NO<sub>2</sub> have slightly increased since 2011 within the Borough. The monitoring data collected in 2013 noted exceedences of the AQS annual mean objective at site 12, Winton Square and site 20, Winchester Road. On further analysis site 12 is not in exceedence as there is no relevant exposure at the site. Site 20 however is in exceedence of the annual mean objective and therefore Basingstoke and Deane Borough Council are required to undertake a Detailed Assessment of the area.

A detailed assessment of the Winton Square and Winchester Street area was conducted in 2005 using DMRB. The assessment indicated that exceedences of the annual mean objective were likely, although at this time there was only 1 residential property identified in the area. Due to the limitations of the DMRB assessment and the possibility of increased residential properties within the area, the council will need to proceed to a Detailed Assessment of the Winchester Street and Winton Square area around site 20.

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# **1 Introduction**

## **1.1 Description of Local Authority Area**

The borough of Basingstoke and Deane covers over 630 km<sup>2</sup> of Hampshire, in South-East England, around 90% of which is rural. The borough has a residential population of over 160,000, around half of whom live in the town of Basingstoke. Over the last 70 years Basingstoke has grown from a small market town with a population of around 14,000, to be the borough's principle settlement, with a population of nearly 83,000.

The strategic location of Basingstoke on national road and rail transport networks has contributed a great deal to its success as a centre of employment in the area. In addition to which, the relative proximity of major transport hubs in London, Southampton and Portsmouth has aided the town's commercial success. Strategic transport routes in the borough include the M3, and nearby rail line, linking Basingstoke to London and Southampton, and the A303, A339 and A33 linking Basingstoke to Andover, Newbury and Reading respectively.

Other notable conurbations in the borough include Bramley, Tadley, Kingsclere, Overton, Oakley, and Whitchurch. However, the borough is otherwise characterised by its numerous small hamlets and villages, such as the hamlet of Deane. These lie mostly to the west of Basingstoke, particularly on the periphery of the North Wessex Downs Area of Outstanding Natural Beauty, a large part of which lies in the western part of the borough.

## **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.

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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,  $\text{mg}/\text{m}^3$  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 <sup>3</sup>	Running annual mean	31.12.2003
	5.00 µg/m <sup>3</sup>	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m <sup>3</sup>	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m <sup>3</sup>	Annual mean	31.12.2004
	0.25 µg/m <sup>3</sup>	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m <sup>3</sup>	Annual mean	31.12.2005
Particulate Matter (PM <sub>10</sub> ) (gravimetric)	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m <sup>3</sup>	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005



## **1.4 Summary of Previous Review and Assessments**

### **1.4.1 First Round of Review and Assessment**

Basingstoke and Deane Borough Council completed all stages of the first round of Review and Assessment by 2000, concluding that the Air Quality Strategy objectives were likely to be met for all pollutants by the required dates.

### **1.4.2 Second Round of Review and Assessment**

#### *Air Quality Updating and Screening Assessment (USA), 2003*

The assessment carried out by Basingstoke and Deane Borough Council in 2003 concluded that, since no exceedences of the Air Quality Strategy objectives were predicted at locations of relevant exposure in the borough, a Detailed Assessment was not required.

#### *Progress Report, 2004*

By considering diffusion tube monitoring data from sites in the borough, a potential exceedence of the annual mean objective for nitrogen dioxide was identified at the Winchester Street junction with Winton Square. A Detailed Assessment was therefore deemed to be required, considering concentrations of NO<sub>2</sub> at locations of relevant exposure in the vicinity of the junction. As a precursor to this assessment, additional diffusion tube monitoring was undertaken at four locations from May 2004.

#### *Detailed Assessment, 2005*

The assessment of concentrations of NO<sub>2</sub> around the Winchester Street junction with Winton Square concluded that there was no relevant exposure, therefore an AQMA was not required. It was however recommended that additional monitoring of nitrogen dioxide be implemented in the area. Monitoring by use of diffusion tubes was subsequently implemented at seven additional sites close to Winton Square.

### **1.4.3 Third Round of Review and Assessment**

#### *Air Quality Updating and Screening Assessment (USA), 2006*

The third round Updating and Screening Assessment, completed in June 2006, identified likely exceedences of the Air Quality Strategy annual mean objective for NO<sub>2</sub> from the additional monitoring implemented in December 2005. However it was concluded that there was no requirement to proceed to a Detailed Assessment for any pollutant.

*Progress Report, 2007*

In July 2007 Basingstoke and Deane Borough Council produced a Progress Report considering NO<sub>2</sub> monitoring data which concluded that there were no likely exceedences at locations of relevant exposure in the borough.

*Progress Report, 2008*

The final Stage 3 Progress Report, published in April 2008, concluded from NO<sub>2</sub> monitoring data that there were no likely exceedences of the Air Quality Strategy objective at locations with relevant exposure. It was noted that several new housing developments were underway in the borough, but Basingstoke and Deane Borough Council were not required to conduct a Detail Assessment for any of the pollutants covered by the Air Quality Strategy.

#### **1.4.4 Fourth Round of Review and Assessment**

*Air Quality Updating and Screening Assessment (USA), 2008*

Monitoring data from eight diffusion tube sites in the district recorded annual mean NO<sub>2</sub> concentrations exceeding the Air Quality Strategy objective. Seven of these sites are located in the vicinity of Winton Square, and had therefore been considered in the 2005 Detailed Assessment, however data from site 15 indicated possible exceedences at locations of relevant exposure at The Old Plough on Newbury Road near Headley. Concentrations of NO<sub>2</sub> at the roadside façade of the building were estimated to be 45 µg/m<sup>3</sup>.

Basingstoke and Deane Borough Council undertook a Detailed Assessment of Air Quality in the locale of The Old Plough, located alongside the A339 near the junction with Ashford Hill Road, in accordance with the requirements of the Environment Act 1995.

*Detailed Assessment of Air Quality, 2010*

Data from new monitoring locations at Beech House and The Old Plough indicated concentrations of NO<sub>2</sub> significantly below the AQS annual mean objective limit at locations of relevant exposure. Although kerbside monitoring at The Old Plough indicated NO<sub>2</sub> concentrations above the objective limit, the sites were found to have no relevant exposure and it was therefore concluded that there was no need to declare an AQMA for NO<sub>2</sub> in the area. It was however recommended that Basingstoke and Deane Borough Council should continue, and possibly expand, monitoring of NO<sub>2</sub> at locations of relevant exposure in the area.

### **1.4.5 Fifth Round of Review and Assessment**

#### *Updating and Screening Assessment (USA), 2012*

This Updating and Screening Assessment began the fifth round of Review and Assessment carried out by the Borough. Previous rounds had not identified the need for any Air Quality Management Areas in the Borough of Basingstoke and Deane.

Indicative monitoring of NO<sub>2</sub> was carried out using diffusion tubes at 20 locations. After application of the appropriate bias adjustment factor, no diffusion tube sites recorded annual mean concentrations in excess of the Air Quality Strategy objective of 40µg/m<sup>3</sup> in 2011. No Detailed Assessment was required on the basis of the 2011 diffusion tube monitoring dataset.

A new biomass-fuelled power generation plant was identified as being constructed in Basingstoke. This was originally intended to operate as a Part A process, burning waste wood and meeting the provisions of the Waste Incineration Directive. However, it was unable to meet the conditions of this Directive and therefore burns virgin wood rather than waste, operating without an Environmental Permit, as an exempt process. It was briefly started up in January 2012 and closed down (temporarily) a month later due to problems in meeting its conditions of operation regarding noise.

Emissions tests were carried out in April: total NO<sub>x</sub> emission rates were found to be higher than those originally predicted before the plant's construction. On the basis of calculations carried out using the Biomass Combustion calculation tool, the plant's emissions may contribute to an exceedence of the hourly mean and annual mean NO<sub>2</sub> objectives. Therefore it has been recommended that a Detailed Assessment be carried out with respect to NO<sub>2</sub>. The Council began monitoring at the closest points of relevant exposure in 2012 and results of this survey will be reported in a Detailed Assessment.

#### *Progress Report, 2013*

In April 2013 Basingstoke and Deane Borough Council produced a Progress Report containing monitoring data from non-automatic sites measuring NO<sub>2</sub>. Concentrations exceeded the AQS annual mean objective in the Winton Square area in 2012. The data suggested that exceedences had occurred at sites 9, 10 and 20 however the exceedences were not representative of relevant exposure, therefore a detailed assessment was not required.

The progress report included the previously mentioned Biomass Facility, which has been subject to diffusion tube monitoring at sites 27, 28 and 29.

## **2 New Monitoring Data**

The Progress Report utilises data collected throughout 2013 from non-automatic monitoring sites. Non-automatic monitoring data has been supplied by Basingstoke and Deane Borough Council.

### **2.1 Summary of Monitoring Undertaken**

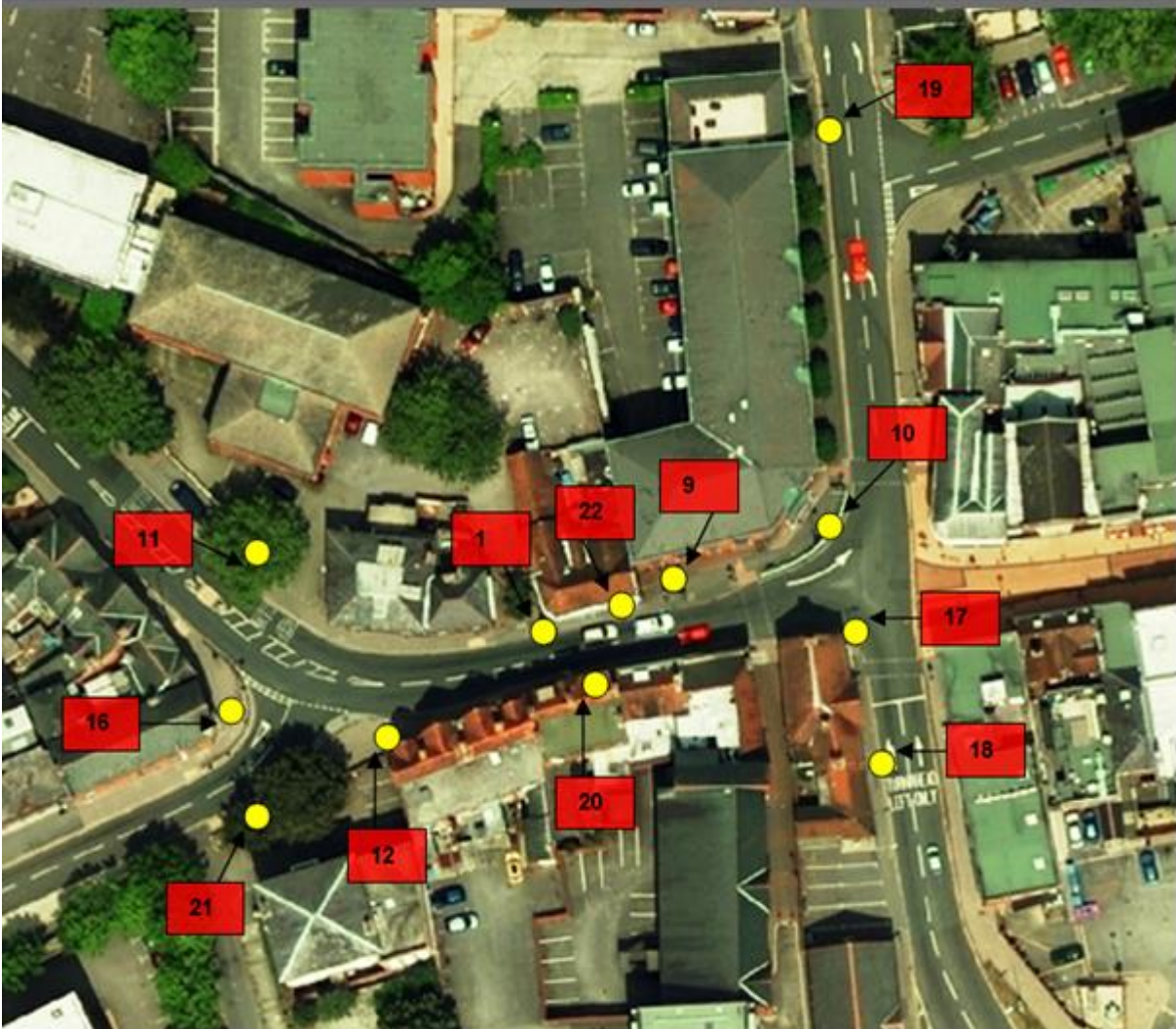
#### **2.1.1 Automatic Monitoring Sites**

Basingstoke and Deane Borough Council do not operate automatic monitoring within the borough. The nearest automatic monitoring site to the borough is located in Harwell, at the Harwell Business Park.

#### **2.1.2 Non-Automatic Monitoring Sites**

Basingstoke and Deane Borough Council operate non-automatic monitoring of NO<sub>2</sub> at 22 sites. Site 3 at 17 Winchester Rd, Basingstoke ceased operation in 2013. Monitoring sites 27, 28 and 29 were located near to a Biomass plant also ceased monitoring in July 2013 due to the Biomass facility no longer being operational.

Figure 2.1: Map of Non-Automatic Monitoring Sites around Winton Square



**Table 2.1 Details of non-automatic monitoring sites**

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?
Site 1	Roadside	463600	151800	4	NO <sub>2</sub>	N	N	N - 1 (shop)	1.7	Y
Site 2	Roadside	462300	150700	4	NO <sub>2</sub>	N	N	Y - on façade of residential building	2.3	Y
Site 4	Urban Background	463500	150700	4	NO <sub>2</sub>	N	N	N - 11	1.6	N
Site 7	Urban Background	451783	16234	4	NO <sub>2</sub>	N	N	N - 5	1.2	N

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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?
Site 9	Roadside	463640	151857	4	NO <sub>2</sub>	N	N	N - 4 (office building)	1.4	Y
Site 10	Roadside	463586	151862	4	NO <sub>2</sub>	N	N	N - 5 (office building)	1.1	Y
Site 11	Roadside	463586	151862	4	NO <sub>2</sub>	N	N	N - 12 (office building)	1.6	Y
Site 12	Kerbside	463607	151840	4	NO <sub>2</sub>	N	N	N - 6 (office building)	0.9	Y
Site13	Roadside	463982	152014	4	NO <sub>2</sub>	N	N	Y - On façade	4.8	Y
Site 16	Roadside	463587	151845	4	NO <sub>2</sub>	N	N	N - 5 (takeaway)	1.1	Y
Site 17	Kerbside	463662	151852	4	NO <sub>2</sub>	N	N	N - 1 (office building)	0.4	Y
Site 18	Roadside	463664	151836	4	NO <sub>2</sub>	N	N	N - 1 (office building)	1.7	Y

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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?
Site 19	Kerbside	463658	151912	4	NO <sub>2</sub>	N	N	N - 3 (office building)	0.5	Y
Site 20	Kerbside	463625	151846	3	NO <sub>2</sub>	N	N	N - 1 (office building)	0.5	Y
Site 21	Kerbside	463586	151830	4	NO <sub>2</sub>	N	N	N - 10 (office building)	0.6	Y
Site 22	Roadside	463636	151856	4	NO <sub>2</sub>	N	N	N - On façade of restaurant	1.3	Y
Site 24	Roadside	451367	162731	4	NO <sub>2</sub>	N	N	Y - on façade of residential building	5.5	Y



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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?
Site 25	Roadside	451367	162731	4	NO <sub>2</sub>	N	N	Y - on façade of residential building	5.5	Y
Site 26	Roadside	451367	162731	4	NO <sub>2</sub>	N	N	Y - on façade of residential building	5.5	Y
Site 27	Special *	465569	153183	-	NO <sub>2</sub>	N	N	Y – 14	59	Y
Site 28	Special*	465646	153223	-	NO <sub>2</sub>	N	N	Y – 13	29	Y
Site 29	Special*	465486	153287	-	NO <sub>2</sub>	N	N	Y – 20	13	Y
* Special site for monitoring NO <sub>2</sub> concentrations from Biomass plant.										

## **2.2 Comparison of Monitoring Results with Air Quality Objectives**

### **2.2.1 Nitrogen Dioxide (NO<sub>2</sub>)**

Basingstoke and Deane Borough Council undertake non-automatic monitoring of NO<sub>2</sub> at 22 sites within the borough. The rationale for this focus on NO<sub>2</sub> stems from the high road transport emissions in the borough, due to traffic in Basingstoke and on the borough's numerous trunk roads such as the M3 and A34.

Of the 22 sites, 3 sites (27, 28 and 29) monitor NO<sub>2</sub> close to a Biomass facility, further site information is provided in Table 2.1. Data capture at all diffusion tube monitoring sites was above 75% with the exception of sites 27, 28 and 29. Monitoring at sites 27, 28 was carried out in 2013 between January and July, providing an annual data capture of 58% .Site 29 carried out monitoring between January and August, providing an annual data capture of 67%. As the data capture for these sites is less than 75% the data was annualised in accordance with LAQM.TG (09). Further details are provided in Appendix A.

**Table 2.2: Results of NO<sub>2</sub> Diffusion Tubes 2013**

Site ID.	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%) <sup>a</sup>	2013 Annual Mean Concentration (µg/m <sup>3</sup> ) - Bias Adjustment factor = 0.95 <sup>b</sup>
1	Winton Sq, Basingstoke	Roadside	N	N	100%	28.8
2	front façade, 279 Winchester Rd, Basingstoke	Roadside	N	N	100%	32.5
4	Stocker Close, Basingstoke	Roadside	N	N	92%	19.2
7	bus stop by "The Guru" Newbury Rd	Urban Background	N	N	92%	35.8
9	traffic lights at Winton Sq.	Urban Background	N	N	100%	39.9
10	Corner of New St./Winton Square jnctn.	Roadside	N	N	100%	38.6
11	Corner of Winton Square/Sarum Hill jnctn	Roadside	N	N	83%	30.0
12	4 Winton Square	Kerbside	N	N	92%	<b>40.7</b>
13	Adjacent 52 New Road, B'Stoke	Roadside	N	N	92%	36.6

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Site ID.	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%) <sup>a</sup>	2013 Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Bias Adjustment factor = 0.95 <sup>b</sup>
16	junct. Winton Square/Winchester R'd.	Roadside	N	N	92%	34.7
17	o/s 37 Winchester St.	Kerbside	N	N	100%	37.1
18	adjacent 37 Winchester St.	Roadside	N	N	100%	37.7
19	Adjacent Copenhagen Hse, New St.	Kerbside	N	N	100%	33.7
20	o/s 45 Winchester Rd.	Kerbside	N	N	92%	<b>46.7</b>
21	Winchester R'd/Winton Square junct.	Kerbside	N	N	100%	35.1
22	façade of Agra Balti, 34 Winchester Rd	Roadside	N	N	100%	38.7
24	IT services, front façade, the Old Plough, Newbury Rd	Roadside	N	N	100%	32.5

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Site ID.	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%) <sup>a</sup>	2013 Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Bias Adjustment factor = 0.95 <sup>b</sup>
25	IT services, front façade, the Old Plough, Newbury	Roadside	N	N	100%	33.1
26	IT services, front façade, the Old Plough, Newbury Road	Roadside	N	N	92%	31.7
27	Site 27	Special*	N	N	58.3%	21.0 (Annualised)
28	Site 28	Special*	N	N	58.3%	20.1 (Annualised)
29	Site 29	Special*	N	N	66.7%	18.2 (Annualised)

In bold, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

Underlined, annual mean > 60 $\mu\text{g}/\text{m}^3$ , indicating a potential exceedence of the NO<sub>2</sub> hourly mean AQS objective

<sup>a</sup> 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%

<sup>b</sup> If an exceedence is measured at a monitoring site not representative of public exposure, NO<sub>2</sub> concentration at the nearest relevant exposure should be estimated based on the "NO<sub>2</sub> fall-off with distance" 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>).

\* Special site for monitoring NO<sub>2</sub> concentrations from Biomass plant.

### **2.2.1 Nitrogen Dioxide Monitoring Results in Accordance with Objective**

Exceedences of the AQS annual mean objective have been recorded at site 12, Winton Square and site 20, Winchester Rd. However previous assessments have noted that there is no relevant exposure at these sites. Although below the AQS Annual Mean objective sites 9, 10 and 22 measured annual mean concentrations of  $>38\mu\text{g}/\text{m}^3$ .

#### ***Distance Correction for Exceeding Sites:***

The two monitoring locations which are in excess of the annual mean objective are not at locations of relevant exposure and have been adjusted. The recommended distance correction DEFRA tool <sup>1</sup> has been used to estimate concentrations of  $\text{NO}_2$  at the location of nearest relevant exposure. Full details of the distance correction are provided in Appendix B.

Site 12 has an adjusted annual mean  $\text{NO}_2$  concentration of  $32.9\mu\text{g}/\text{m}^3$ . This is below the annual mean objective therefore no further action is required.

Site 20 has an adjusted annual mean  $\text{NO}_2$  concentration of  $41.8\mu\text{g}/\text{m}^3$  which is above the  $\text{NO}_2$  annual mean objective. Therefore a Detailed Assessment may be required for this site.

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<sup>1</sup> <http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

**Table 2.3: Results of NO<sub>2</sub> Diffusion Tubes 2009 to 2013**

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m <sup>3</sup> ) - Adjusted for Bias <sup>a</sup>				
			2009 (Bias Adjustment Factor = 0.82)	2010 (Bias Adjustment Factor = 0.84)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.97)	2013 (Bias Adjustment Factor = 0.95)
1	Roadside	N	31.8	29.9	26.3	30.1	28.8
2	Roadside	N	37.3	37.4	29.2	28.8	32.5
3	Roadside	N	-	-	21.9	24.6	-
4	Urban Background	N	19.8	20.1	14.1	18.0	19.2
7	Urban Background	N	24.7	37.0	33.3	37.1	35.8
9	Roadside	N	<b>43.2</b>	<b>41.7</b>	35.0	<b>40.7*</b>	39.9
10	Roadside	N	<b>44.4</b>	<b>41.6</b>	34.7	<b>40.7*</b>	38.6
11	Roadside	N	30.6	30.2	24.1	22.2	30.0
12	Kerbside	N	<b>42.9</b>	<b>40.6</b>	35.1	39.8	<b>40.7*</b>
13	Roadside	N	38.4	36.4	31.1	35.7	36.6
16	Roadside	N	38.7	36.2	31.8	33.9	34.7
17	Kerbside	N	<b>43.0</b>	39.0	34.4	39.5	37.1
18	Roadside	N	<b>43.3</b>	<b>42.1</b>	33.1	36.4	37.7
19	Kerbside	N	38.2	36.2	32.1	36.4	33.7
20	Kerbside	N	<b>50.8</b>	<b>46.5</b>	38.6	<b>42.6*</b>	<b>46.7*</b>
21	Kerbside	N	39.7	<b>40.1</b>	30.1	33.5	35.1

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Site ID	Site Type	Within AQMA?	Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Adjusted for Bias <sup>a</sup>				
			2009 (Bias Adjustment Factor = 0.82)	2010 (Bias Adjustment Factor = 0.84)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.97)	2013 (Bias Adjustment Factor = 0.95)
22	Roadside	N	<b>45.0</b>	<b>42.6</b>	35.7	37.9	38.7
24	Roadside	N	22.1	34.2	33.0	34.5	32.5
25	Roadside	N	24.1	34.1	34.1	34.1	33.1
26	Roadside	N	-	-	36.4	35.8	31.7
27	Next to footpath	N	-	-	-	-	21.0
28	Next to footpath	N	-	-	-	-	20.1
29	Next to footpath	N	-	-	-	-	18.2

In bold, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

Underlined, annual mean > 60 $\mu\text{g}/\text{m}^3$ , indicating a potential exceedence of the NO<sub>2</sub> hourly mean AQS objective

<sup>a</sup> 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%



Figure 2.2: Trends in Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) Measured at Roadside Diffusion Tube Monitoring Sites

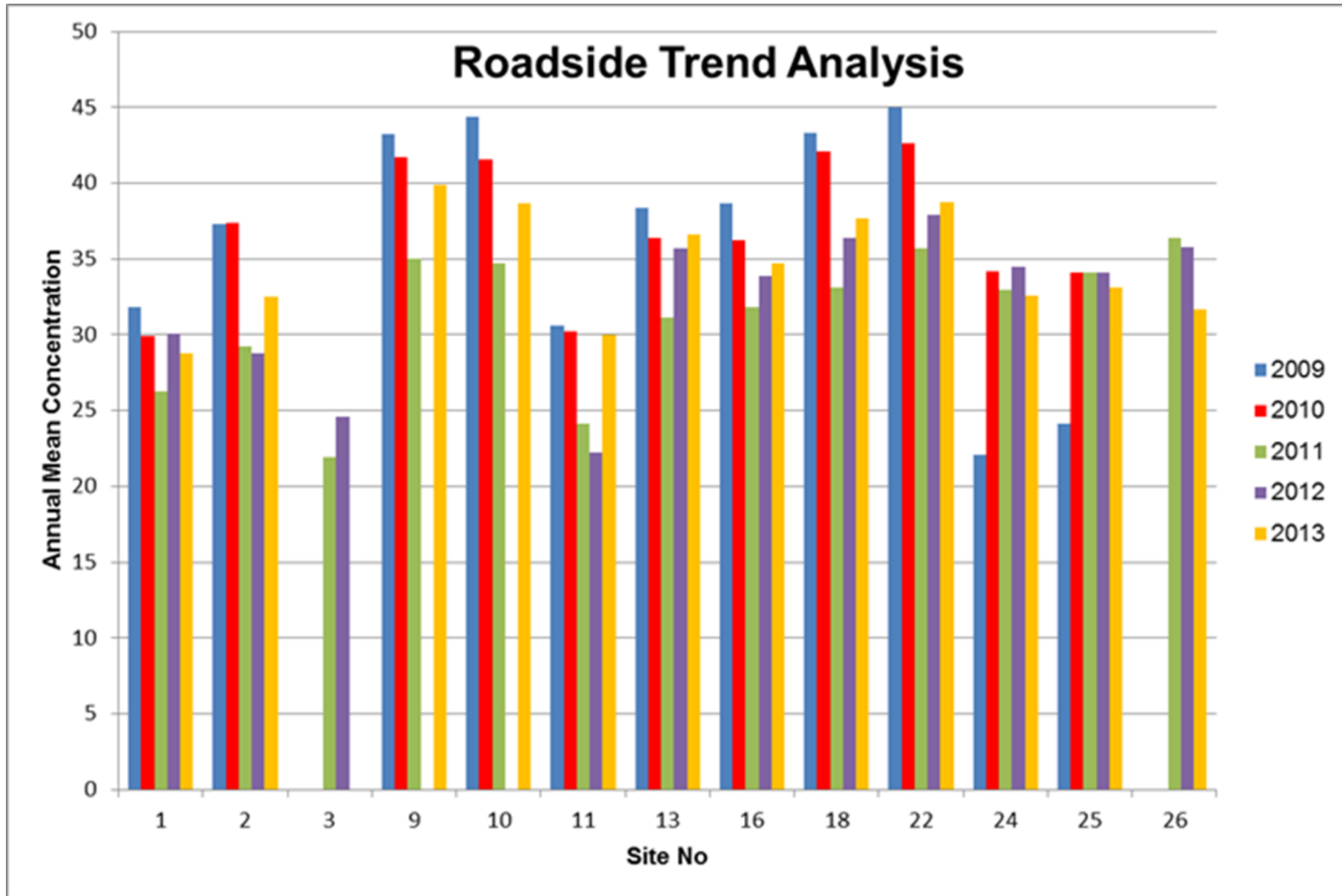


Figure 2.3: Trends in Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) Measured at Kerbside Diffusion Tube Monitoring Sites

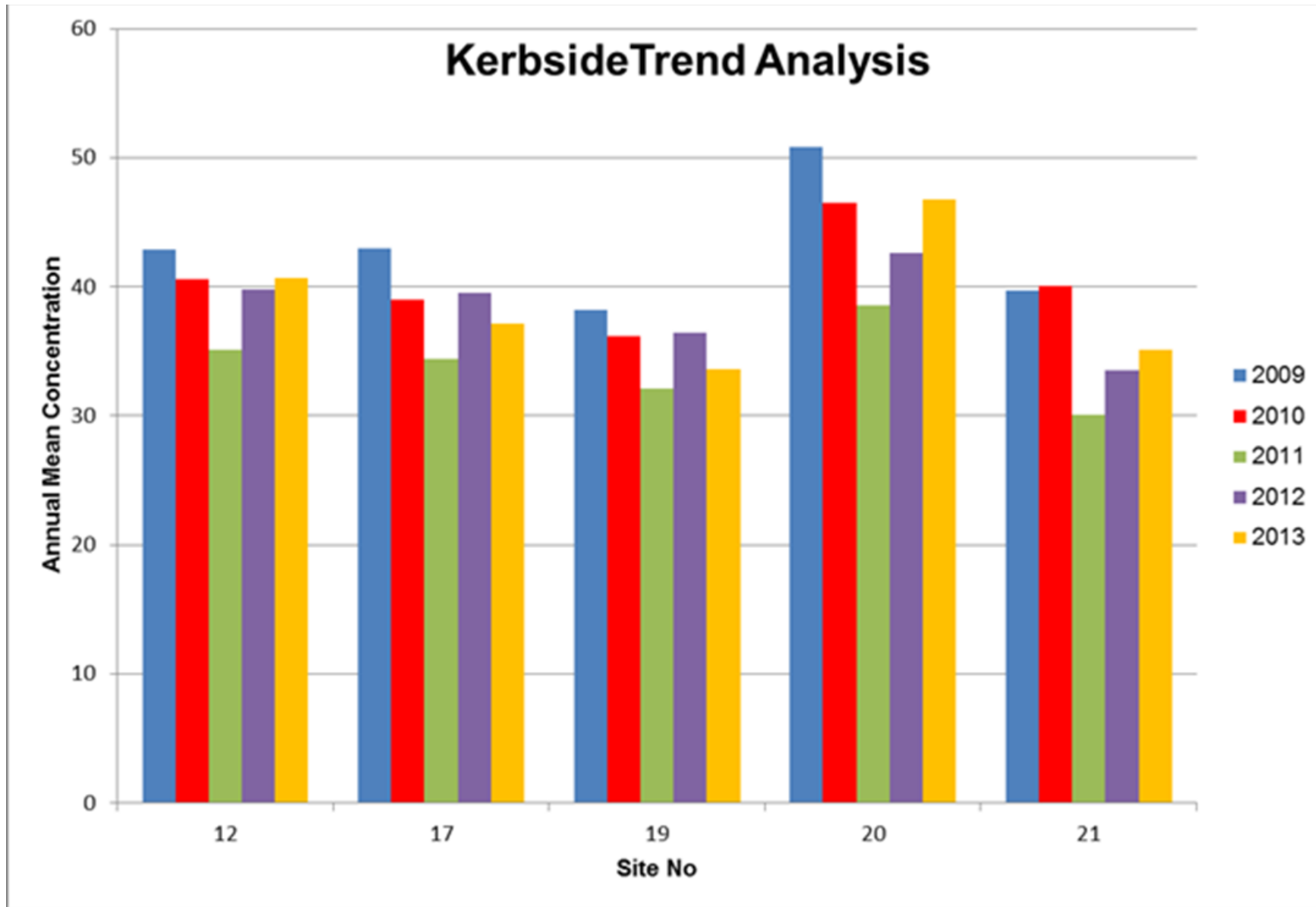
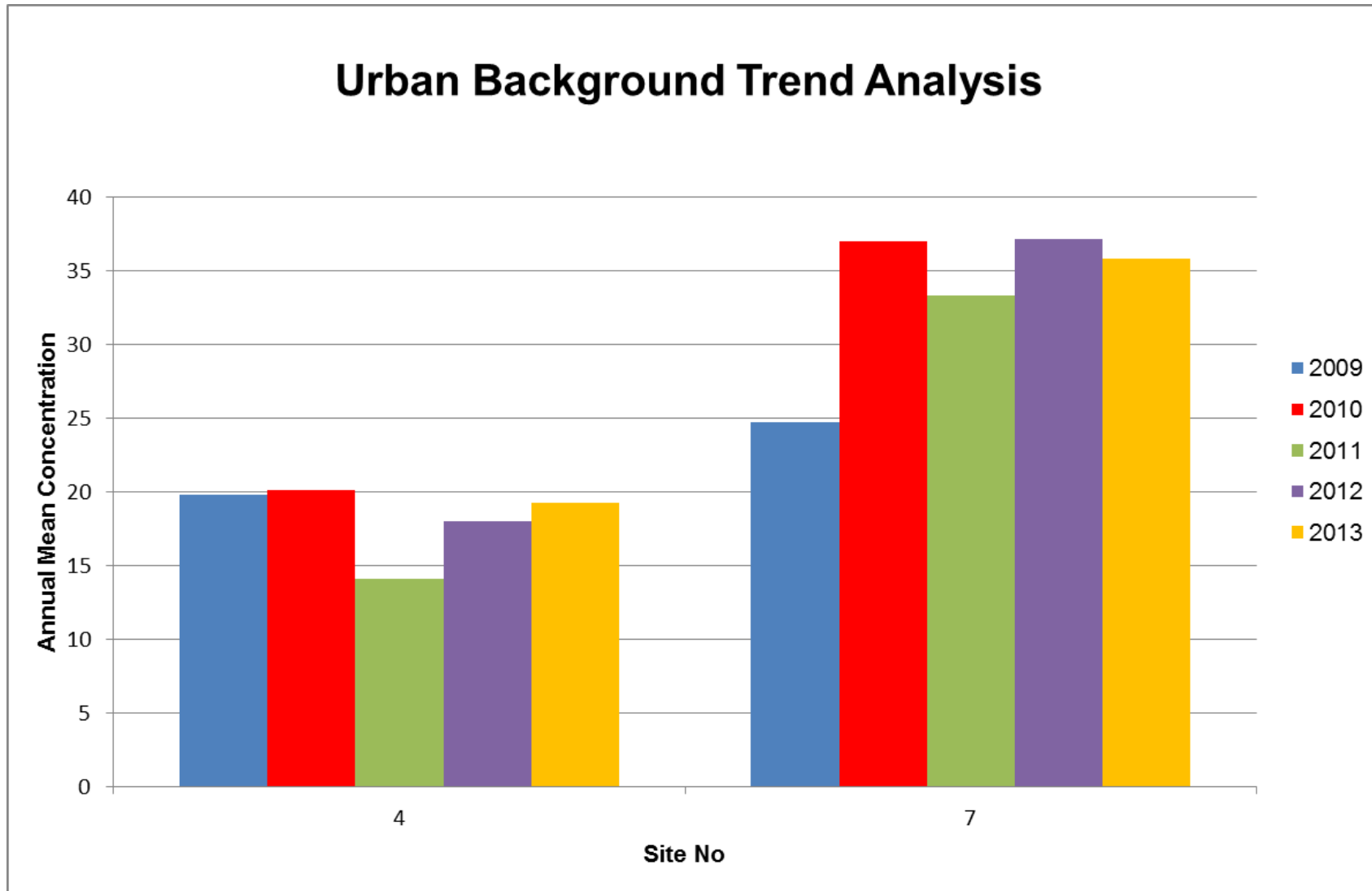


Figure 2.4: Trends in Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) Measured at Urban Background Diffusion Tube Monitoring Sites



### **2.2.2 Annual Mean Trend Analysis**

At Roadside sites, concentrations have generally increased since 2011 as shown in Figure 2.2. Kerbside sites have seen an increase in annual mean concentrations since 2011 as shown in Figure 2.3.

Urban Background NO<sub>2</sub> concentrations, presented in Figure 2.4 do not show a clear increase or decrease between 2009-2013 with background concentrations remaining relatively unchanged since 2012.

### **2.2.3 Summary of Compliance with AQS Objectives**

Measured annual mean concentrations during 2013 were below the annual mean objective at all locations with the exception of two monitoring locations, namely sites 12 and 20. Following distance correction of both sites, monitoring site 12 is now below the AQS objective. Monitoring site 20 remains in excess of the annual mean NO<sub>2</sub> objective, with an adjusted annual mean concentration of 41.8µg/m<sup>3</sup>.

Monitoring site 20 is located within the Winton Square area. This site was the subject of a Detailed Assessment in 2005. The Detailed Assessment was undertaken using DMRB the results of which indicated that exceedences of the annual mean NO<sub>2</sub> objective were likely to occur at the central part of Winchester Road. At the time of undertaking this assessment only one property was identified as being residential.

The Detailed Assessment used traffic data based on the best available data at the time. However there were a number of limitations of this data:

1. 12 hour traffic count data from 2001 which were factored to 2005 equivalent using national growth factors.
2. No speed data were available therefore the effect of queuing and congestion could not be assessed.
3. The DMRB does not take account of the effect of street canyons.
4. Changes to emission factors since 2005.

Due to the limitations of the previous assessment and the possible changes to the number of residential properties and the traffic flow and fleet composition within the area, the Council will need to proceed to a Detailed Assessment.

Basingstoke and Deane Borough Council has measured concentrations of NO<sub>2</sub> above the annual mean objective at relevant locations and **will need to proceed to a Detailed Assessment**, for the Winton Square and Winchester Road area around Site 20.

## **3 New Local Developments**

### **3.1 Road Traffic Sources**

Basingstoke and Deane Borough Council have not identified any new or sufficiently changed road sources in 2013 to warrant further investigation.

### **3.2 Other Transport Sources**

Basingstoke and Deane Borough Council have not identified any new or sufficiently changed transport sources in 2013 to warrant further investigation.

### **3.3 Industrial Sources**

Basingstoke and Deane Borough Council have not identified any new or sufficiently changed industrial sources in 2013 to warrant further investigation.

#### **3.3.1 Closure of Part B Processes**

Basingstoke and Deane Borough Council have not identified any new or sufficiently changed Part B Processes in 2013 to warrant further investigation.

### **3.4 Commercial and Domestic Sources**

In April 2013 the previously mentioned biomass plant temporarily ceased operation. Monitoring which was undertaken at sites 27, 28 and 29 near to the facility ceased monitoring in July 2013. In February 2014 the biomass facility recommenced operation under new management. The monitoring undertaken at the facility will recommence in June 2014.

In the 2012 Updating and Screening Assessment it was identified that there was a need to proceed to a detailed assessment for the biomass facility. It is the council's intention to proceed to a Detailed Assessment for the biomass facility after obtaining 6 months of monitoring data at the site. The results of the detailed assessment will be included in the 2015 Updating and Screening Assessment.

### 3.5 New Developments with Fugitive or Uncontrolled Sources

Basingstoke and Deane Borough Council have not identified any new fugitive sources in 2013 to warrant further investigation.

**Basingstoke and Deane Borough Council** confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Basingstoke and Deane Borough 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.

## **4 Local / Regional Air Quality Strategy**

Basingstoke and Deane Borough Council do not currently have an Air Quality Strategy in place.



## 5 Planning Applications

A review of planning applications received by Basingstoke and Deane Borough Council which could impact air quality has been undertaken, the findings are presented in Table 5.1.

**Table 5.1: Review of Planning Applications**

Planning Application No	Description	Further Action
BDB/75928	A planning application has been submitted for the construction and operation of a materials recycling facility and transfer station for construction and demolition waste at Kingsclere Lime Quarry Wolverton, Tadley, Hampshire. No environmental assessment has been undertaken.	No further action required

## 6 Air Quality Planning Policies

The Air Quality Strategy (AQS) identifies the planning system as one of the key mechanisms for achieving improvements in UK air quality. The land use planning system regulates the development of land. Through determining the location and design of new developments it can lead to long-term improvements in air quality.

Basingstoke and Deane Borough Council has in place a Local Plan for the area. The Local Plan sets out the policies concerning what facilities and operations are permitted, setting out how the environment will be protected in relation to planning. Air Quality and Planning guidance published by Basingstoke and Deane Borough Council outlines how air quality issues will be addressed through the planning system<sup>2</sup>.

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<sup>2</sup> <http://www.basingstoke.gov.uk/browse/environment-and-planning/planning/emerging-local-plan/pre-submission-local-plan-2011-to-2029.htm>

## **7 Local Transport Plans and Strategies**

In 1999, in partnership with Hampshire County Council and key stakeholders in the local community, Basingstoke and Deane Borough Council produced an Environmental Strategy for Transport (BEST).

The document provides a framework to address the future transport needs of Basingstoke and the surrounding area in a sustainable way, taking a long-term view up to 25 years ahead. This document has been supplemented and updated through the HCC Transport Plan LTP3 2011-31 including a North Hampshire Transport Strategy (NHTS). Together, these documents explain how transport and access will be improved to match today's demand for movement around the borough.

New housing and commercial development in the borough will impose additional demands on the highway and public transport networks. New developments will be required to make a contribution towards improvements. The current policy for establishing the levels of such highway (BEST or NHTS highway contributions) is the HCC Transport Contributions Policy, which was adopted in September 2007.

The Strategic Approach to Parking was adopted by the council on 9 October 2008 as the basis for developing future policies and making decisions with respect to parking and related matters. In 2010 a review of the parking provisions within Basingstoke was carried out as ease of access was identified as a key factor in supporting the vitality and economic viability of the borough.

## **8 Climate Change Strategies**

In May 2007 the Council Leader and Chief Executive signed The Nottingham Declaration on Climate Change and acknowledged that evidence showed that climate change is occurring and that this will have far reaching effects on people, places, economy, society and the environment.

The Climate Change Strategy for Basingstoke and Deane commits the council to contribute, at a local level, to the delivery of the UK Climate Change Programme, the Kyoto Protocol and the target for carbon dioxide reduction of 12.5% reduction by 2012.

The Strategy further commits the council to participate in local and regional networks, make a significant reduction of greenhouse gas emissions from its own operations, to encourage all sectors of the community to reduce their greenhouse gas emissions, assess the risks associated with a changing climate and to produce a climate change strategy for the borough.

The Climate Change Strategy is currently being reviewed and a revised strategy setting out the council's aims and ambitions on climate change will be published early in 2014.

## **9 Conclusions and Proposed Actions**

### **9.1 Conclusions from New Monitoring Data**

Measured annual mean concentrations during 2013 were below the annual mean objective at all location with the exception of two monitoring locations namely sites 12 and 20. Following distance correction of both monitoring sites, site 12 is now below the AQS objective. However, site 20 remains in excess of the annual mean NO<sub>2</sub> objective with an adjusted annual mean concentration of 41.8µg/m<sup>3</sup>.

Therefore the Council will be required to proceed to a Detailed Assessment of annual mean NO<sub>2</sub> concentrations at this location.

### **9.2 Conclusions relating to New Local Developments**

A review of new local developments within Basingstoke and Deane Borough Council has been undertaken and it was concluded that there was no need to proceed to a Detailed Assessment.

### **9.3 Proposed Actions**

The next LAQM requirement for the Council will be to undertake a Detailed Assessment of annual mean NO<sub>2</sub> concentrations within the Winton Square and Winchester Road area around site 20.

## 10 References

All Council reports can be found here:

<http://www.basingstoke.gov.uk/browse/environment-and-planning/pollution/air-quality/Air+Quality+Reports.htm>

## Appendix A: QA: QC Data

### Diffusion Tube Bias Adjustment Factors

Diffusion tubes may systematically under or over-read NO<sub>2</sub> concentrations when compared to the reference chemiluminescence analyser. This is described as bias and can be corrected for to improve the accuracy of the diffusion tube results, using a suitable bias adjustment factor.

Basingstoke and Deane Borough Council's diffusion tubes are prepared and analysed by Gradko using the 20% TEA in water method. This laboratory takes part in the QA/QC Field Intercomparison, operated on behalf of DEFRA as part of their Support to Local Authorities for LAQM contract.

No automatic monitoring was undertaken in the Basingstoke and Deane Borough during 2013, the bias adjustment factors used within this Progress Report were derived from the national database of collocation studies and are presented in Figure A1. Results from this spreadsheet provided national bias adjustment factors of 0.95 for 2013, which has been used to adjust data throughout this report.

Figure A1- Diffusion Tube Bias Correction Adjustment Factor for 2013

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 03/14				
Follow the steps below in the correct order to show the results of relevant co-location studies						This spreadsheet will be updated at the end of June 2014				
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods						Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet				
This spreadsheet will be updated every few months, the factors may therefore be subject to change. This should not discourage their immediate use.						Do not adjust your data				
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.						Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.				
Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Step 2: Select Preparation Method from the Drop-Down List		Step 3: Select Year from the Drop-Down List		Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor <sup>1</sup> shown in blue at the foot of the final column.				
If a laboratory is not shown, you have no data for that laboratory.		If a preparation method is not shown, you have no data for that method at that laboratory.		If a year is not shown, you have no data.		If you have your own co-location study then see footnote <sup>1</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMhelpdesk@uk.bureauveritas.com or 0800 0327953				
Analysed By <sup>2</sup>	Method <sup>3</sup>	Year <sup>4</sup>	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )	Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> )	Bias (B)	Tube Precision <sup>5</sup>	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2013	R	Gedling Borough Council	10	37	35	7.2%	G	0.93
Gradko	20% TEA in water	2013	R	The Highland Council	12	24	21	14.1%	G	0.88
Gradko	20% TEA in water	2013	R	Dudley MBC	12	62	59	-12.0%	P	1.14
Gradko	20% TEA in water	2013	R	NOTTINGHAM CITY COUNCIL	12	43	44	-2.2%	G	1.02
Gradko	20% TEA in water	2013	R	NOTTINGHAM CITY COUNCIL	10	41	39	6.4%	G	0.94
Gradko	20% TEA in water	2013	R	NOTTINGHAM CITY COUNCIL	11	43	42	1.9%	G	0.98
Gradko	20% TEA in water	2013	R	Brighton & Hove City Council	11	62	60	1.9%	G	0.98
Gradko	20% TEA in water	2013	R	Brighton & Hove City Council	11	41	39	37.5%	G	0.73
Gradko	20% TEA in water	2013	KS	Margate Road Intercomparison	12	101	81	25.8%	G	0.80
Gradko	20% TEA in water	2013	R	Brighton & Hove City Council	9	54	45	19.6%	G	0.84
Gradko	20% TEA in water	2013	R	Wiltshire Council	12	40	36	10.1%	G	0.91
Gradko	20% TEA in water	2013	R	Wiltshire Council	11	41	37	11.6%	G	0.90
Gradko	20% TEA in water	2013	R	Wiltshire Council	12	39	49	-20.0%	G	1.25
<b>Overall Factor<sup>1</sup> (24 studies)</b>									<b>Use</b>	<b>0.95</b>

## QA/QC of Diffusion Tube Monitoring

The Workplace Analysis Scheme for Proficiency (WASP) is an independent analytical proficiency-testing (PT) scheme, operated by the Health and Safety Laboratory (HSL). WASP offers a number of test samples designed to test the proficiency of laboratories undertaking analysis of chemical pollutants in workplace and ambient air. WASP NO<sub>2</sub> PT forms an integral part of the UK NO<sub>2</sub> Network's QA/QC, and is a useful tool in assessing the analytical performance of laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM).

HSL assign a performance score to each laboratory's result, based on their deviation from the known mass of nitrite. The WASP – Annual Performance Criteria, for NO<sub>2</sub> Diffusion Tubes used in Local Air Quality Management (LAQM), indicate that Gradko demonstrated 'Good' precision in most of the results in 2013<sup>3</sup> (WASP rounds 116-123)

### Short-term to Long-term Data adjustment

Annualisation was carried out for sites 27, 28 and 29. Sites 27 and 28 has an annual data capture of 58%, details of data annualisation for these sites is presented in Table A.1.

Data annualisation for site 29, which had an annual data capture of 67% is presented in Table A.2.

Table A.1 Short-Term to Long-Term Monitoring Data Adjustment 7 months

Site	Site Type	Annual Mean (µg/m <sup>3</sup> )	Period Mean (µg/m <sup>3</sup> )	Ratio
Site 1	Roadside	15.9	16.6	0.96
Site 2	Roadside	17.9	18.0	0.99
Site 7	Urban Background	19.7	20.3	0.97
Site 9	Roadside	22.0	21.5	1.03
Site 10	Roadside	21.3	21.7	0.98
Site 17	Kerbside	20.5	20.8	0.98
Site 18	Roadside	20.8	20.3	1.02

<sup>3</sup> [http://laqm.defra.gov.uk/documents/LAQM-WASP-Rounds-116-123-\(January-2012--December-2013\)-NO2-report.pdf](http://laqm.defra.gov.uk/documents/LAQM-WASP-Rounds-116-123-(January-2012--December-2013)-NO2-report.pdf)



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Site	Site Type	Annual Mean ( $\mu\text{g}/\text{m}^3$ )	Period Mean ( $\mu\text{g}/\text{m}^3$ )	Ratio
Site 19	Kerbside	18.5	18.1	1.03
Site 21	Kerbside	19.4	20.0	0.97
Site 22	Roadside	21.3	21.2	1.01
Site 24	Roadside	17.9	17.9	1.00
Site 25	Roadside	18.2	17.6	1.04
Average				1.00


Table A.2 Short-Term to Long-Term Monitoring Data Adjustment 8 months

Site	Site Type	Annual Mean ( $\mu\text{g}/\text{m}^3$ )	Period Mean ( $\mu\text{g}/\text{m}^3$ )	Ratio
Site 1	Roadside	15.9	16.3	0.97
Site 2	Roadside	17.9	17.8	1.00
Site 7	Urban Background	19.7	20.0	0.99
Site 9	Roadside	22.0	21.3	1.03
Site 10	Roadside	21.3	20.9	1.02
Site 17	Kerbside	20.5	20.2	1.01
Site 18	Roadside	20.8	20.1	1.03
Site 19	Kerbside	18.5	17.9	1.03
Site 21	Kerbside	19.4	19.7	0.98
Site 22	Roadside	21.3	21.0	1.02
Site 24	Roadside	17.9	17.7	1.01
Site 25	Roadside	18.2	17.5	1.04
Average				1.01

## Appendix B: Data Distance Correction

This appendix presents the results of the application of the Defra “NO<sub>2</sub> with Distance from Roads” calculator at sites with a numerical exceedence of the annual mean NO<sub>2</sub> objective. Distances were measured by the Council in GIS and background values are taken from the 2013 background maps.

### Site 12:

This calculator allows you to predict the annual mean NO<sub>2</sub> 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. 

**Enter data into the yellow cells**

<b>Step 1</b>	How far from the KERB was your measurement made (in metres)?	(Note 1)	<b>0.9</b>	metres
<b>Step 2</b>	How far from the KERB is your receptor (in metres)?	(Note 1)	<b>6.9</b>	metres
<b>Step 3</b>	What is the local annual mean background NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	(Note 2)	<b>21.3</b>	µg/m <sup>3</sup>
<b>Step 4</b>	What is your measured annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	(Note 2)	<b>40.7</b>	µg/m <sup>3</sup>
<b>Result</b>	The predicted annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> ) at your receptor	(Note 3)	<b>32.9</b>	µg/m <sup>3</sup>


Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances 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.

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](http://www.airquality.co.uk), or alternatively from a nearby monitor in a background location.

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.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

### Site 20:

This calculator allows you to predict the annual mean NO<sub>2</sub> 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. 

**Enter data into the yellow cells**

<b>Step 1</b>	How far from the KERB was your measurement made (in metres)?	(Note 1)	<b>0.5</b>	metres
<b>Step 2</b>	How far from the KERB is your receptor (in metres)?	(Note 1)	<b>1.5</b>	metres
<b>Step 3</b>	What is the local annual mean background NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	(Note 2)	<b>21.3</b>	µg/m <sup>3</sup>
<b>Step 4</b>	What is your measured annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	(Note 2)	<b>46.7</b>	µg/m <sup>3</sup>
<b>Result</b>	The predicted annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> ) at your receptor	(Note 3)	<b>41.8</b>	µg/m <sup>3</sup>

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances 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.

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](http://www.airquality.co.uk), or alternatively from a nearby monitor in a background location.

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.

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