UK Nitrogen Dioxide Network 2000

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Executive Summary

This is the eighth annual report of the UK Nitrogen Dioxide Diffusion Tube Network. The network measures nitrogen dioxide (NO_2) in a variety of urban areas throughout the UK, in a collaborative effort between the Department for Environment, Food and Rural Affairs, the Scottish Executive, National Assembly for Wales, the Department of Environment in Northern Ireland and Local/Unitary Authorities. The network has two principal aims:

- to objectively assess the spatial and temporal distribution of NO_2 concentrations in a variety of urban environments in the UK
- to highlight areas where elevated concentrations of NO_2 occur and which may justify more detailed investigation using automatic techniques

Estimates of the overall spatial distribution of NO_2 have been made for 2000 and are consistent with those measured between 1993 - 1999. Areas of the UK with high NO_2 concentrations continue to match the geographical distribution of the major conurbations.

During 2000, UK annual average NO_2 concentrations were 39μg m^{-3} at roadside locations, 27μg m^{-3} at intermediate locations and 22μg m^{-3} at urban background locations. 2000 is the first year in which the average NO_2 concentration at roadside locations has been less than 40 μg m^{-3}. Overall, concentrations at all site types were lower than those recorded in the mid-1990s. This is consistent with automatic measurements of NO_2 undertaken as part of the Automatic Urban Network.

A significant downward trend has now been identified in the annual mean concentrations from 1995 to 2000, in the case of roadside, intermediate and background sites. However, observed year to year variations in national average NO_2 concentrations remain small, and may be affected by factors such as meteorology and variations in analytical performance. Further monitoring is therefore required within the current network for better identification of trends.

2000 was the second year in which no sites in the UK were found to have an annual mean concentration equal to or greater than 91μg m^{-3}. This concentration represents a revised indicator for the EU Directive limit value for NO_2 (EC 85/203), and is useful for highlighting areas that may warrant further investigation with respect to the Directive.

It is estimated that 3 roadside monitoring sites in the UK NO_2 Network may be at risk of exceeding the EU Daughter Directive objective for 2010. This estimate is based on measured concentrations during 2000, and emissions estimates and projections.

A total of 140 roadside sites, and 37 intermediate and urban background sites, measured annual average NO_2 concentrations in excess of 40μg m^{-3} during 2000. This concentration is a National Air Quality objective, to be achieved by the end of 2005, and was adopted as legislation in England, Wales and Scotland by the relevant Air Quality Regulations (2000). Based on current predicted emissions reductions, it is estimated that 29 of the monitoring locations measuring annual average NO_2 concentrations in excess of 40μg m^{-3} during 2000, are at risk of exceeding the objective at the end of 2005.

Contents

1 Introduction

The UK Nitrogen Dioxide Network, which is operated on behalf of the Department for Environment, Food and Rural Affairs (DEFRA), the Scottish Executive, the National Assembly for Wales and the Department of Environment in Northern Ireland, was established in 1993. The objective of this survey is to assess the spatial and temporal distribution of nitrogen dioxide (NO_2) concentrations in a variety of urban areas of the UK, ranging from the major cities to smaller towns.

The current Network and previous more limited surveys[1,2] have acted as screening tools for identification of areas with high NO_2 concentrations. Areas identified in this way have been prioritised for further monitoring, with more sophisticated automatic techniques.

This report is the eighth annual report of the UK Nitrogen Dioxide Diffusion Tube Network. Nitrogen dioxide concentrations observed in urban areas throughout the UK during the 2000 calendar year are detailed. The report follows on from previous annual reports on the survey[3,4,5,6,7,8,9] and briefly documents the organisation and infrastructure of the network, which is more thoroughly covered in the previous reports. A summary paper covering results for the survey over the period 1993-1997 was published last year[10]. Concentrations measured in the UK during 2000 are presented in this report, and have been analysed and interpreted at national and regional levels. A comparison of average concentrations with previous UK datasets is also provided.

In this report, pollutant concentrations are expressed in microgrammes per cubic metre ($\mu g\ m^{-3}$). This is the unit used in the Air Quality Strategy. In reports for years prior to 1999, concentrations were expressed in part per billion by volume (ppb). To convert between these two units, the relationship is as follows:

1ppb = 1.91µg m^{-3} at 20°C and 101.3KPa

During 2000, NO_2 diffusion tube monitoring was performed at total of 1326 locations, operated by 323 Local and Unitary Authorities. Ratification of the network's dataset was based on the performance of the laboratories in the 2000 Field Intercomparison Exercise and the network's Analytical Laboratory Performance Testing Scheme (now part of the Health and Safety Laboratory's WASP programme).

The 2000 Report and full dataset are provided on CD ROM, see insert inside the back cover. To view the report and data, see instructions on insert. Details of this and previous network datasets are also available on the National Air Quality Information Archive via the internet. This can be accessed via DEFRA's Air Quality pages on the World Wide Web, at http://www.aeat.co.uk/netcen/airqual/ .

2 Organisation of the Network

AEA Technology's National Environmental Technology Centre (NETCEN), acts as the co-ordinating body for the UK NO_2 Network and provides the framework under which monitoring of NO_2 by participating Local/Unitary Authorities takes place.

In providing a centrally managed system for the monitoring of NO_2 concentrations at urban locations on a national scale, NETCEN's responsibilities involve the provision of the following services and deliverables:

- A framework for monitoring and instructions to participants in the form of the Site Operator Instruction Manual
- Central collation, checking and processing of data
- Data interpretation, advice and report production
- QA/QC systems for assessment and control of laboratory performance

The information provided in the instruction manual to all network participants is instrumental in assuring the consistency of siting criteria and monitoring protocols for the network. As a consequence, it has been possible to establish a national survey that is optimised for monitoring of NO_2 concentrations in urban areas. Monthly measurements are routinely performed at four locations within each local/unitary authority, in order to estimate the spatial distribution of NO_2 concentrations:

- **Roadside,** 1-5m from the kerb of a busy road.
- **Intermediate,** 20-30m from the same or an equivalent road.
- **Urban Background (2 sampling locations),** >50m from any busy road and typically in a residential area.

Note: "Roadside" sites were formerly known as "Kerbside". The name was changed for better consistency with the "Roadside" site category as defined for automatic monitoring sites by the Local Authority Air Quality Management Technical Guidance Notes LAQM TG1 {00}, "Monitoring Air Quality".

The "Intermediate" category has been discontinued, with effect from the end of December 2000. Intermediate sites have been replaced with additional Roadside sites where possible.

Diffusion tubes exposed by local authorities are analysed by analytical laboratories and the results forwarded to NETCEN for central collation and processing. Further details on network organisation are documented in previous reports on the survey[3,4,5,6,7,8,9] and in the site operators' Instruction Manual, available on the National Air Quality Information Archive on the World Wide Web at http://www.aeat.co.uk/netcen/airqual/

3 Results and Discussion

3.1 DATA QUALITY PROCEDURES

Prior to interpretation of monthly and annual averages, data quality assurance and control procedures were applied to the dataset in order to eliminate data with unsatisfactory accuracy, erroneously low measurements and data from sites with very low data capture. The following data ratification procedures have been applied:

- Data from laboratories whose performance was outside ±25% of the reference concentration in both the Health and Safety Laboratory's WASP programme for diffusion tubes *and* the UK NO_2 Network Field Intercomparison Exercise during 2000 have been omitted from the network dataset.
- All data below 3.82 $\mu g\ m^{-3}$ (2 ppb) have been eliminated. Prior to 1997, a 5 ppb cut-off for the elimination of erroneously low concentration data was applied. A review of this cut-off level indicated that its application may have resulted in the elimination of reliable data from smaller, more remote towns where lower levels of NO_2 may be expected. This is because an overall increase in the accuracy of diffusion tubes has been achieved by laboratories since 1993, which has enabled the lowering of the cut-off level to 2 ppb without the inclusion of erroneous low data in ratified datasets.
- Valid annual averages have only been calculated for sites with at least six months data from any period during a calendar year. (Annual averages of NO_2 calculated from six months of data are likely to be within approximately ± 10% of the annual average for urban and suburban sites and within ± 20% for roadside sites[11] owing to the greater variability shown at these locations).

3.2 FACTORS AFFECTING DIFFUSION TUBE PERFORMANCE

Assuming correct sampling and analysis methodologies, NO_2 measurements made with Palmes type diffusion tubes are traditionally expected to overestimate relative to chemiluminescent analyser measurements by up to around 30%[12,14,15]. This over-read has been attributed to the individual and combined effect of three interfering factors which result in a positive bias; the shortening of the diffusive path length by wind[12,13], the effects of peroxyacetyl nitrate (PAN)[12] and the blocking of UV light resulting in reduced NO_2 photolysis in the tube[14]. The photochemical degradation of triethanolamine-nitrite complex by light has been largely minimised, by the widespread use of opaque diffusive end caps[4].

Extensive validation exercises have been performed on the NO_2 diffusion tube methodology[13,14,15,16], which have shown a good agreement between diffusion tubes and the chemiluminescent technique. However, these exercises have largely been confined to urban background locations and the accuracy of diffusion tube measurements of NO_2 may be expected to be site specific, owing to the interference effect of reduced NO_2 photolysis[14] Further evaluation of the effect of reduced NO_2 photolysis on the Palmes type diffusion tubes used in the UK NO_2 Network has been undertaken[17]. This study concluded that reduced photolysis within acrylic diffusion tubes is likely to lead to an over-read of NO_2 concentrations. However, in practice, the potential impact of other sampling artefacts such as differences in

laboratory preparation and analysis may be as significant as reduced in-tube photolysis. The issue of tube preparation technique is further discussed in Appendix A.

3.3 UK REGIONS

It has become common practice within the UK NO_2 Network to present data from throughout the UK on a regional basis. From 1993 to 1997, this was done using official government statistical regions. However, on the devolution of the Scottish, Welsh and Northern Ireland governments, the statistical regions were superseded by the Government Office and Devolved Administrative Regions. In order to present network data in accordance with the new Government Office Regions, local and unitary authorities were reassigned to one of the new regions. Regional statistics were recalculated from 1993 to 1998 and are presented in Section 3.5.

3.4 DATA CAPTURE

Data capture rates by site location types and all sites returning valid monthly average concentrations are shown in Table 1 below.

Table 1 Percentage of Sites Returning Valid Monthly Measurements from the UK NO_2 Network 2000

	Percentage Data Capture (%)												
	Jan	***Feb***	***Mar***	***Apr***	***May***	***Jun***	***Jul***	***Aug***	***Sep***	***Oct***	***Nov***	***Dec***	***Annual***
All Sites	87	86	91	88	86	84	86	85	84	84	86	83	**94**
Roadside	84	87	91	89	88	85	88	85	86	85	86	85	**95**
Intermediate	90	87	92	88	87	84	88	88	82	84	88	78	**95**
Urban Background	86	86	90	88	84	83	84	83	83	84	86	85	**93**
Intermediate & Urban Background	87	86	91	88	85	84	86	85	83	84	86	83	**94**

6 or more months' valid data are required for a valid annual average.

A total of 1325 sampler sites monitored nitrogen dioxide concentrations during 2000. Following ratification, five months' data from 11 sites were rejected on the grounds of unsatisfactory data quality (see Appendix A). The final number of monitoring sites with sufficient data to produce a valid annual mean was not reduced as a result of this procedure.

3.5 NATIONAL AVERAGE NO_2 CONCENTRATIONS

Overall UK monthly and annual average NO_2 concentrations for all sites reporting valid data between 1993-2000 are shown in Table 2. National annual average concentrations during 2000 were found to be highest at roadside locations (39μg m^{-3}), followed by intermediate locations (27μg m^{-3}) and urban background locations (22μg m^{-3}). This is consistent with observations made between 1993 - 1999, and with the expected urban pollutant distribution assuming road traffic as the major emissions source.

Table 2 National Annual Average NO_2 Concentrations from the UK NO_2 Diffusion Tube Network 1993-2000 ($\mu g\ m^{-3}$)

	Annual Average NO_2 Concentration ($\mu g\ m^{-3}$)							
	1993	***1994***	***1995***	***1996***	***1997***	***1998***	**1999**	**2000**
Roadside	44	46	48	46	44	44	43	**39**
Intermediate	32	32	34	32	31	29	29	**27**
Urban Background	27	27	27	27	25	23	23	**22**
Intermediate & Urban Background	29	29	29	29	27	25	25	**23**

A comparison of the annual average data measured since the survey began is shown in Table 2 above. UK annual average concentrations during 2000 remain broadly similar to, but generally lower than, those measured in previous years. In particular, the mean for roadside sites has fallen below 40 $\mu g\ m^{-3}$ for the first time.

Table 3 presents the ratio of annual average NO_2 concentrations at both roadside and intermediate locations to background locations. This information continues to provide a useful means of describing the relationship between typical roadside, intermediate and urban background concentrations of NO_2.

Table 3 Average NO_2 Concentration Ratios by Location Type from the UK NO_2 Diffusion Tube Network 1993-2000

	1993	***1994***	***1995***	***1996***	***1997***	***1998***	***1999***	***2000***
Roadside : Urban Background	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.8
Intermediate : Urban Background	1.2	1.2	1.2	1.2	1.3	1.2	1.3	1.2

3.6 SEASONAL ANALYSIS

Table 4 presents the seasonal variation in NO_2 concentrations observed at different location types during 2000. Highest concentrations occurred in winter months for all location types. These observations are broadly consistent with results from the urban background, suburban and urban centre sites in the UK Automatic Urban Network (AUN). The winter to summer mean concentration ratios for the last eight years are presented in Table 4b, and those for 2000 are consistent with previous years.

Table 4a Seasonal Variations in National NO_2 Concentrations from the UK NO_2 Network 2000

	NO_2 Concentrations ($\mu g\ m^{-3}$)											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
All sites	35	30	29	27	25	23	22	24	25	28	32	33
Roadside	45	41	40	40	39	36	35	36	37	40	43	43
Intermediate	34	30	28	26	24	22	21	23	25	28	32	34
Urban Background	30	25	22	20	18	16	16	17	19	22	27	28
Intermediate & Urban Background	31	26	24	22	20	18	18	19	21	24	28	30

Table 4b Winter: Summer Ratios of UK Average NO_2 Concentrations 2000

	Winter:Summer Ratio							
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
All sites	1.17	1.20	1.18	1.21	1.28	1.29	1.20	1.28
Roadside	1.05	1.05	1.03	0.99	1.09	1.14	1.06	1.13
Intermediate	1.20	1.23	1.21	1.18	1.30	1.30	1.24	1.31
Urban Background	1.28	1.37	1.33	1.29	1.46	1.45	1.34	1.44
Intermediate & Urban Background	1.25	1.31	1.28	1.25	1.39	1.38	1.30	1.39

3.7 REGIONAL ANALYSIS

Table 5a and 5b present the regional annual average NO_2 concentration for the Government Office and Devolved Administrative Regions in the UK. Variations in average NO_2 concentrations are also presented.

Annual average NO_2 concentrations calculated for each region during 2000 ranged from 29 $\mu g\ m^{-3}$ to 45 $\mu g\ m^{-3}$ at roadside locations. Concentrations at intermediate and urban background locations were found to range from 15 to 32 $\mu g\ m^{-3}$.

The year to year variation in regional average NO_2 concentrations presented in Table 5 show that decreases in annual average NO_2 concentrations at roadside locations can be observed in all of the twelve regions between 1999-2000. This is in contrast to 1999, where the majority of regions showed small increases over the previous year.

Table 5a Summary of Regional Annual Average NO_2 Concentrations in the UK from the UK NO_2 Diffusion Tube Network 1993-2000

i. Roadside

	Annual Average (µg m^{-3})								*% Change*						
	1993	***1994***	***1995***	***1996***	***1997***	***1998***	***1999***	***2000***	***93-94***	***94-95***	***95-96***	***96-97***	***97-98***	***98-99***	***99-00***
The North East	33	24	33	31	34	34	34	**32**	-29	40	-5	11	-2	0	**-6**
The North West & Merseyside	51	47	47	45	45	47	52	**43**	-5	-1	-5	1	4	11	**-17**
Yorkshire & The Humber	43	51	52	47	49	45	45	**43**	16	4	-9	2	-6	0	**-4**
East Midlands	47	49	51	49	47	45	49	**45**	5	2	-4	-2	-4	9	**-8**
West Midlands	31	36	47	47	43	43	44	**43**	21	30	-1	-5	-2	2	**-2**
Eastern	45	49	49	47	42	40	48	**44**	8	-1	-2	-11	-6	20	**-8**
London	47	54	52	54	47	45	50	**45**	14	-1	2	-13	-5	11	**-10**
South East	38	42	43	43	40	40	45	**43**	9	4	-1	-5	0	13	**-4**
South West	40	43	38	40	40	36	37	**35**	6	-12	7	-3	-7	3	**-5**
Wales	36	36	38	36	34	34	37	**32**	3	3	-3	-5	-1	9	**-14**
Scotland	40	40	42	34	34	36	34	**32**	-3	4	-14	-3	4	-6	**-6**
Northern Ireland	36	38	40	38	34	34	33	**29**	7	3	-5	-7	-2	-3	**-12**

Table 5b Summary of Regional Annual Average NO_2 Concentrations in the UK from the UK NO_2 Diffusion Tube Network 1993-2000

ii. Urban Background & Intermediate

	Annual Average (µg m^{-3})								*% Change*						
	1993	***1994***	***1995***	***1996***	***1997***	***1998***	***1999***	***2000***	***93-94***	***94-95***	***95-96***	***96-97***	***97-98***	***98-99***	***99-00***
The North East	22	22	25	22	20	20	20	**20**	0	16	-13	-3	-4	0	**0**
The North West & Merseyside	34	31	29	31	31	29	30	**25**	-9	-5	4	-2	-6	3	**-17**
Yorkshire & The Humber	31	34	34	27	33	27	27	**27**	12	-4	-20	17	-13	0	**0**
East Midlands	33	33	27	33	31	29	29	**28**	2	-16	16	-7	-5	0	**-3**
West Midlands	22	24	27	31	25	25	25	**25**	7	18	12	-16	-1	0	**0**
Eastern	29	33	31	31	27	25	30	**29**	9	-2	-2	-10	-8	20	**-3**
London	34	38	36	36	34	34	35	**32**	13	-3	-2	-6	-1	3	**-9**
South East	25	25	27	24	24	24	26	**25**	3	1	-10	2	0	8	**-4**
South West	22	22	22	22	24	22	20	**19**	1	-4	2	5	-6	-9	**-5**
Wales	22	22	22	29	18	18	18	**16**	0	0	31	-35	-7	0	**-11**
Scotland	24	22	24	20	18	16	16	**16**	-7	7	-12	-12	-9	0	**0**
Northern Ireland	20	20	20	18	16	14	16	**15**	1	-4	-6	-16	-6	14	**-6**

Year to year percentage change between 1993-2000 have been calculated from annual average concentrations to 1 decimal place

3.8 NATIONAL ANALYSIS

Figure 1 presents a plot of annual average NO_2 concentrations at all roadside monitoring locations in the UK during 2000. An analysis of the frequency distribution of roadside annual averages for 1993-2000 is provided in Figure 2. These eight years' data show the following patterns.

- The proportion of roadside sites with annual mean concentrations less than or equal to 38 $\mu g\ m^{-3}$ has increased from around 30% in the mid 1990s to 50% in 2000.
- The proportion of roadside sites with annual mean concentrations in the range 38 to 48 $\mu g\ m^{-3}$ has remained steady at around 30% throughout the duration of the Network.
- The proportion of roadside sites with annual mean concentrations greater than 57 $\mu g\ m^{-3}$, has decreased from around 20% in the mid-1990's to less than 10% during 2000.
- The proportion of roadside sites with annual mean concentrations greater than 76 $\mu g\ m^{-3}$, has remained small but constant at around 1-2% throughout 1993 - 2000.

Figure 2 shows a gradual shift of the frequency distribution of annual average measurements towards lower concentrations, between the mid-1990s and 2000.

Intermediate and urban background concentrations are more representative of urban areas throughout the UK. These data have been used to produce interpolated maps of average urban background NO_2 concentrations for the UK using a simple bilinear interpolation algorithm. Figure 3 presents a 10 km by 10 km interpolated plots of the intermediate and urban background concentrations between 1993 and 2000. It should be noted that these maps are not representative of NO_2 concentrations at roadside locations or rural areas. The NO_2 distribution maps for each year have been produced by the same mapping algorithm.

The areas with higher NO_2 concentrations shown by the 2000 map (Figure 3) are generally consistent with those found between 1993-9, and correlate well with the geographical distribution of the major conurbations within the UK. Noticeably, areas with interpolated intermediate and urban background concentrations in the range above 38$\mu g\ m^{-3}$ throughout the UK have reduced in size between 1993-9.

The changes in pollutant distribution are also reflected in the frequency distribution of annual average intermediate and urban background concentrations for 1993-2000 (Figure 4). This distribution indicates that

- The proportion of intermediate and urban background sites with annual mean concentrations less than or equal to 19 $\mu g\ m^{-3}$, has increased from below 20% during the mid 1990s to around 30%.
- The proportion of intermediate and urban background sites with annual mean concentrations in the range 19 - 29 $\mu g\ m^{-3}$ has remained steady at 35 to 40% of sites throughout the duration of the Network.
- The proportion of intermediate and urban background sites with annual mean concentrations greater than 38$\mu g\ m^{-3}$ has decreased from around 18% in the mid-1990's to 6% during 2000.
- The proportion of intermediate and urban background sites with annual mean concentrations greater than 57$\mu g\ m^{-3}$ has also decreased and there have been no intermediate or background sites in this highest category for the last three years.

Figure 4 shows a marked similarity to the frequency distribution of concentrations at roadside locations, in that it shows a gradual shift of the frequency distribution of annual average measurements towards lower concentrations, between the mid 1990s and 2000.

More detailed pollution climate maps for NO_2 and other pollutants have been developed using empirical models[18]. These have been published on the DEFRA's National Air Quality Information Archive web site, accessed via http://www.aeat.co.uk/netcen/airqual/ .

3.9 IDENTIFICATION OF HIGH CONCENTRATION SITES

Air quality standards relating to NO_2 continue to evolve both in Europe and the UK. In the UK, the Air Quality Regulations (2000) for England[19], Wales[20], and Scotland[21] include standards and objectives for NO_2. These are explained in the Air Quality Strategy (January 2000)[22]. Within Europe, EU Directive 85/203[23] remains in force until 2001, accompanied by the new EU Directive for NO_2 (the 1st Daughter Directive [24]) which came into force on 19 July 2001. Therefore, the following air quality standards for NO_2 were applicable to the UK in 2000:

1. EC 85/203.	Limit Value, 200 μg m^{-3} (105 ppb) as the 98th percentile of hourly averages Guide Value, 135 μg m^{-3} (70.6 ppb) as the 98th percentile of hourly averages Guide Value, 50 μg m^{-3} (26 ppb) as the 50th percentile of hourly averages
2. AQS Objectives	200 μg m^{-3} (105 ppb) as an hourly average not to be exceeded more than 18 times in a calendar year, to be achieved by the end of 2005. 40 μg m^{-3} (21 ppb) or less, when expressed as an annual average to be achieved by the end of 2005
3. Daughter Directive 1999/30/EC	200 μg m^{-3} (105 ppb) as an hourly average not to be exceeded more than 18 times in a calendar year, to be achieved by 2010 40 μg m^{-3} (21 ppb) or less, when expressed as an annual average to be achieved by 2010

In the case of the AQS Objectives and Daughter Directive, "exceedence" is defined as "greater than".

For the purposes of this report, and in keeping with previous reports[3,4,5,6,7,8,9], sites with high annual average concentrations have been defined in relation to the EC NO_2 Directives current for the year of monitoring (EC 85/203 and 1999/30/EC). Both the UK Air Quality Regulations, and the EU Daughter Directive for NO_2 contain an annual average air quality standard, directly comparable with diffusion tube measurement data. Sites with annual average concentrations above this standard are also identified. Appendix B identifies monitoring locations with annual average concentrations greater than the current EU Directive surrogate statistics, and the AQS objective for 2005. The surrogate statistics are explained in the following sections.

3.9.1 Comparison with the EU Directive 85/203 for NO_2

The limit and guide values of the EU Directive 85/203 refer to hourly NO_2 measurements over a calendar year. Diffusion tube data cannot, therefore, be directly compared with these values. In previous reports a scaling factor of 2.5 has been used to derive an annual average surrogate

statistic which is equivalent to the 98th percentile Limit Value of the Directive. This scaling factor had been derived from a large number of automatic monitoring sites throughout Europe[1]. In recent years, the number of automatic monitoring sites within the UK has increased substantially and it is therefore possible to identify an appropriate scaling factor specifically for the UK.

An analysis of automatic monitoring data from all UK urban sites between 1993-2000 indicates that the ratio between the 98th percentile and annual average is approximately 2.2. The ratio between the 50th percentile and annual average is approximately 1.08. For the purposes of comparing the 2000 UK NO_2 Network data with the current EU Directive Limit Value for NO_2 the ratio of 2.2 was used to scale the 98th percentile Limit Value, as defined by the Directive, to produce surrogate statistics for annual average concentrations. This approach produces an EU Directive Limit Value surrogate statistic of approximately 91μg m^{-3}. Tables 6a and 6b present the percentage of sites in the UK, with valid annual averages exceeding the surrogate statistic.

Table 6a Comparison of Annual Average UK NO_2 Diffusion Tube Network Data 1993-99 with the EU Directive Limit Surrogate Statistics: Roadside Sites

EU Directive Values (surrogate statistic in parentheses)	*Number of Roadside Sites ≥ Surrogate Statistic*							
	1993	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Limit Value								
98th %ile ≥ 200μg m^{-3} (ann. mean ≥ 91μg m^{-3})	2	2	1	1	1	1	0	0
Additional sites within 90% of LV (ann. mean ≥ 82 μg m^{-3})	1	2	3	2	1	1	1	0
75% of LV (ann. mean ≥ 68 μg m^{-3})	4	13	16	12	9	8	13	3

Table 6b Comparison of Annual Average UK NO_2 Diffusion Tube Network Data 1993-99 with the EU Directive Limit Surrogate Statistics: Intermediate & Urban Background Sites

EU Directive Values (surrogate statistic in parentheses)	*Number of Intermediate & Background Sites ≥ Surrogate Statistic*							
	1993	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Limit Value								
98th %ile >200μg m^{-3} (ann. mean ≥ 91μg m^{-3})	0	0	0	0	0	0	0	0
Additional sites within 90% of LV (ann. mean ≥ 82μg m^{-3})	0	0	0	0	0	0	0	0
75% of LV (ann. mean ≥ 68μg m^{-3})	1	1	1	1	2	0	0	0

During 2000 no roadside, intermediate or urban background sites measured annual average NO_2 concentrations equal to or greater than 91 $\mu g\ m^{-3}$. This is the second year for which this has been the case. There was also a substantial decrease in the number of Roadside sites exceeding 75% of the Limit Value (68 $\mu g\ m^{-3}$) from 13 sites in 1999 to 3 sites in 2000.

3.9.2 Comparison with the EC Daughter Directive Limit Values for NO_2

The first EU Daughter Directive (1999/30/EC) has set an annual mean Limit Value for NO_2 of 40$\mu g\ m^{-3}$, to be achieved by 2010. Based on 2000 measurement data from the UK NO_2 Network, 140 roadside sites (40% of roadside sites), and 37 intermediate and urban background sites (4% of intermediate and urban background sites) measured annual average concentrations greater than 40$\mu g\ m^{-3}$. The number of sites in both categories exceeding 40$\mu g\ m^{-3}$ are lower than in 1999. It is expected that national emissions abatement strategies will enable a large proportion of these sites to meet this limit value for 2010.

Modelling exercises have been performed on a national scale within the UK to predict urban areas and road links which may exceed the EU Daughter Directive in 2010[24]. These models have been used to derive estimates of roadside and urban background NO_2 concentrations from emissions estimates and projections using simple empirical relationships. This work has recently been updated with revised models and emissions estimates[25] and from these data road links within the UK with estimated NO_2 concentrations greater than or equal to 40$\mu g\ m^{-3}$ in 2010 were identified. Subsequently, the NO_2 concentration for these locations during 2000 was calculated to derive a threshold concentration applicable to the 2000 monitoring year, above which compliance with the EU Directive for 2010 is unlikely to be achieved. Using this method it is estimated that, on average, monitoring sites measuring in excess of 68 $\mu g\ m^{-3}$ during 2000 may be at risk of exceeding the EU Daughter Directive Limit Value of 40$\mu g\ m^{-3}$ in 2010 based on current emissions estimates and projections. Table 7 below lists the 3 sites (all roadside) which have been identified as at risk of exceeding the EU Daughter Directive objective using this method.

Table 7 UK NO_2 Network monitoring sites with annual average concentrations >68$\mu g\ m^{-3}$ during 2000

Site Name	*Location*	*Road*	*AADF*[a]	*NO_x Emission (kg/m of road link)*[b]	*Annual Mean NO_2 2000 ($\mu g\ m^{-3}$)*
MANCHESTER 1N	Roadside	A62	12,389	11.1	**80**
STOCKPORT 14N	Roadside	A6	30,242	30.3	**77**
PORTSMOUTH 1N	Roadside	A2047	17,516	16.6	**72**

[a] – denotes Annual Average Daily Flow derived from the DETR Road Census Database 1996
[b] – denotes NOx Emissions derived from the DETR Road Census Database 1996 and NAEI emissions factors

Table 7 indicates that all sites with annual mean NO_2 in excess of 68 $\mu g\ m^{-3}$ are Roadside sites, i.e. within 1-5m of the kerb The site exhibiting the highest annual mean, MANCHESTER 1N, is located on Newton Street, in the Piccadilly area of Manchester city centre. It is 18m from traffic lights at a junction, and 10m from a bus stop. There are tall buildings on either side of Newton Street, forming a canyon. The street is prone to congestion at rush hours.

3.9.3 Comparison with the Annual Average NO_2 Air Quality Objective

The Air Quality Regulations 2000 for England[19], Wales[20], and Scotland[21] formally prescribe the 40μg m^{-3} annual average air quality objective for the end of 2005, (as set out by the AQS[22]), as part of UK legislation. These regulations trigger the duties of Local Authorities to review and assess the air quality in their locality, both for the present and for the end of 2005. The focus of the review and assessment for the annual average NO_2 standard should be concentrated on non-occupational, near ground level outdoor locations where a person might reasonably be expected to be exposed over the relevant averaging period of the objective. For the annual NO_2 objective this includes background and roadside locations in the vicinity of housing, schools, hospitals, etc. Sites located very close to the kerb of a road are not included in this description of a relevant location. Many of the roadside sites in this network do not strictly conform to these location criteria. Nevertheless, comparisons of annual average concentrations at all sites are included here for completeness. This practice may result in an overestimation of the number of sites exceeding the annual average NO_2 objective.

Annual average NO_2 concentrations from the UK NO_2 Network have been compared directly with the 40μg m^{-3} AQS objective. As this limit value is the same as the Daughter Directive annual mean Limit Value for NO_2 of 40μg m^{-3}, please refer to section 3.9.2 above for a breakdown of the number of sites with concentrations greater than 40μg m^{-3}.

As with the analyses of the sites at risk of exceeding the Daughter Directive in 2010 (see section 3.9.2), updated empirical models and emissions estimates[25] have been used to identify a threshold for the 2000 monitoring year, above which sites may be categorised as at risk of exceeding the 40μg m^{-3} AQS objective for the end of 2005. It is estimated that sites with annual average concentrations greater than 57μg m^{-3} in 2000 may be at risk of exceeding the AQS objective by the end of 2005. Application of these assumptions to the 2000 UK NO_2 Network dataset indicates that 28 roadside sites, and one intermediate site, may be at risk of exceeding AQS annual average objective at the end of 2005. This is a reduction on last year's total of 51 sites.

4 Trends and Comparison With Other Studies

4.1 TRENDS IN NO_2 CONCENTRATIONS

The year-to-year variation in the overall annual average NO_2 concentrations at all location types monitored in the network is shown in Table 8 below. Throughout the operation of the Network, these year-to-year changes have typically been small. However, with eight years' data now available it is possible to identify some trend information. In 1994 and 1995 [4,5] marginal increases in NO_2 concentrations were identified. Table 8 shows that the overall annual average NO_2 concentrations at roadside and intermediate locations decreased for the first time during 1996, although average concentrations at urban background locations remained consistent with previous years. During 1997 - 1999, further small decreases in concentrations were observed at roadside, intermediate and urban background locations. The 2000 data appears to show a further decrease for all site categories. The trends of the past eight years are illustrated in Figure 5. Thiel's linear regression analysis identified a significant downward trend in the annual means from 1995 to 2000, for Roadside, Intermediate and Background sites. In all three cases the downward trend was significant at the 95% confidence level.

Table 8 Variation in Annual Average NO_2 Concentration from the UK NO_2 Diffusion Tube Network by Location

	Annual Average NO_2 Concentration ($\mu g\ m^{-3}$)								*%Change*						
	1993	***1994***	***1995***	***1996***	***1997***	***1998***	***1999***	***2000***	***1993-94***	***1994-95***	***1995-96***	***1996-97***	***1997-98***	***1998-99***	***1999-2000***
Roadside	44	46	48	46	44	44	43	39	4	4	-4	-4	-1	-2	-9
Intermediate	32	32	34	32	31	29	29	27	0	6	-6	-6	-5	0	-7
Urban Background	27	27	27	27	25	23	23	22	-7	0	0	-7	-4	0	-4
Intermediate & Urban Background	29	29	29	29	27	25	25	23	0	0	0	-6	-4	0	-8

Year to year percentage change between 1993-2000 have been calculated from annual average concentrations to 1 decimal place

Further evidence of trends in UK NO_2 concentrations is provided by an analysis of annual average data from long-term operational sites (operational 1994-2000). Table 9 presents the average percentage change in annual average NO_2 concentration at long-term sites between 1994 and 2000 for a number of concentration ranges.

Table 9 Reductions in annual average NO_2 concentration at long-term operational UK NO_2 Network sites 1994-2000

Concentration band based on 1994 measurements	*Average % change in annual average NO_2 concentrations 1994 - 2000*	*Number of sites*
>80 $\mu g\ m^{-3}$	-35	3
60 - 80 $\mu g\ m^{-3}$	-28	33
40 - 60 $\mu g\ m^{-3}$	-19	206
20 - 40 $\mu g\ m^{-3}$	-13	496
< 20 $\mu g\ m^{-3}$	+1	140

Table 9 indicates that, for the small number of sites measuring very high concentrations during 1994 (> 80$\mu g\ m^{-3}$), concentrations were on average 35% lower during 2000. For sites measuring high concentrations (60 - 80 $\mu g\ m^{-3}$), concentrations were on average 28% lower during 2000 than during 1994. Sites measuring annual concentrations in the 40-60 $\mu g\ m^{-3}$and 20-40 $\mu g\ m^{-3}$ ranges have also shown substantial reductions. On average, concentrations at all long-term sites (of which there are a total of 878) have decreased by 13% between 1994 and 2000.

Observed decreases in NO_2 concentrations to 2000 are consistent on a national scale with expected trends. Reductions in urban NO_2 concentrations have been predicted based on reduction in urban NO_x emissions resulting from the introduction, in 1992, of three-way catalyst on new cars. Year to year variations in national average NO_2 concentrations between 1993 and 2000 are still small, and may be affected by factors such as improvements in analytical performance and fluctuations in meteorology.

Overall annual average concentration data from long-term monitoring sites in the Automatic Urban Networks since 1994 continue to agree with the results of the diffusion tube network, in showing marginal decreases in average concentrations for the UK. Between 1994 and 2000, the overall average NO_2 concentrations measured at *automatic* Urban Centre and Urban Background sites were 48.8,47.9, 47.3, 44.9, 40.0, 39.4 and 35.4 $\mu g\ m^{-3}$ (years 1994 to 2000 respectively). Future years' monitoring will establish the overall long-term trend.

4.2 COMPARISON OF EMISSIONS ESTIMATES WITH OBSERVED NO_2 CONCENTRATIONS

Estimates of total NO_x emissions in the UK from National Atmospheric Emissions Inventory[27](NAEI) are given in Table 10 below, and show a decrease of 1031 ktonnes (39%) between 1991-1999. Note: 2000 figures are not available yet. Emissions of NO_x from the major urban sources (road transport) also show a reduction over the same period of approximately 44% for total road transport emissions, 45% for petrol derived road transport emissions and 42% for DERV derived road transport emissions. These reductions may be correlated with estimates of the overall increase in the percentage of the UK car fleet fitted with catalytic converters, over the same period. During 1993, it is estimated that 10% of the total number of miles travelled by all cars (petrol and diesel) in the UK, were travelled by petrol cars fitted with catalytic converters. In 1999 this estimate had risen to 59%[28] .

Table 10 Estimated NO_x Emissions in the UK 1991-99[27]

	Estimated NO_x Emission (ktonnes)								
Source	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*
Total (all sources)	2636	2557	2363	2265	2092	2017	1846	1735	1605
Total Road Transport	1275	1225	1147	1084	997	956	880	786	714
Petrol (only)	806	784	725	672	624	606	553	497	440
Derv (only)	469	441	423	412	372	351	327	289	274

These data are provisional estimates supplied by the National Atmospheric Emissions Inventory[27]

Estimated total NO_x emissions have shown a considerably greater decrease than ambient NO_2 concentrations. The lack of direct correspondence between reductions in NO_x emissions and ambient NO_2 concentration may be explained by the secondary pollutant nature of NO_2; it is formed by oxidation of NO in the atmosphere. Also, at sites with high NO_x concentrations, atmospheric NO_2 concentrations are largely governed by the amount of oxidant available[1,29]. In urban areas the major atmospheric oxidant is ozone. Hence, for a given quantity of atmospheric oxidant, the percentage reduction in NO_2, as a result of a reduction in NO_x emissions, will be less than the percentage reduction in NO_x.

5 Future Initiatives

The UK NO_2 Network continues to provide information on the spatial distribution of NO_2 in a variety of urban areas throughout the UK. Additionally, as the survey's historical dataset increases long-term trends in NO_2 are becoming more identifiable at both local and national levels. During 2000, the following measures were implemented:

- **A further investigation of the effect of tube preparation technique.** This consisted of a laboratory-based investigation of the three main preparation techniques used by participants in the Network. The study has been reported on the world wide web.
- **"Kerbside" site category renamed "Roadside".** In the interests of consistency with LAQM.TG1{00}, the NO_2 Network kerbside site category has been re-named "Roadside". This is a name change only; the specification has not changed.
- **Replacement of "Intermediate" site category.** The Intermediate site category has been found, over the years, to provide little additional data. Nor is it consistent with any of the site classifications specified in the Technical Guidance Note LAQM.TG1{00}. Therefore, as from the end of December 2000, all Intermediate sites were dropped from the Network and replaced with new roadside sites where possible.

The following initiatives are planned for 2001:

- Extended Field Intercomparison. We intend to carry out an extended intercomparison this year, comprising two exposure periods.
- Further investigation of preparation techniques. As part of the field intercomparison, we intend to continue our ongoing investigation of the effects of preparation technique.

6 Conclusions

The main conclusions of the survey, so far, can be summarised as follows:

1. Overall annual average concentrations for 2000 at the sampler locations monitored were as follows: Roadside 39 μg m^{-3}, Intermediate 27 μg m^{-3} and Urban Background 22μg m^{-3}. The average for Roadside sites was less than 40 μg m^{-3} for the first time during the period of operation of the Network. The majority of regions of the UK showed decreases in the NO_2 measured at roadside, intermediate and background locations relative to levels in 1999.

2. Data from the Automatic Urban Network also indicates that average urban NO_2 concentrations in 2000 were slightly lower than in 1999.

3. A statistically significant downward trend has been identified in the annual means from 1995 to 2000, for all site types. A comparison of data from long-term monitoring sites running between 1994 and 2000 indicates decreasing annual mean concentrations at the majority of such long-running sites.

4. The spatial distribution of urban background NO_2 concentrations has been plotted by interpolation of annual average intermediate and urban background data. The pattern remains similar to that found between 1993-9, with highest interpolated concentrations correlating well with the major urban conurbations of the UK.

5. The ratio of roadside to urban background annual average concentrations remains consistent with those found in previous years.

6. No sites in the Network were found to have an annual average NO_2 concentration greater than the revised surrogate statistic for the EU Directive (EC 85/203) Limit Value (91μg m^{-3}) during 2000.

7. Three roadside sites were identified as being at risk of exceeding the EU Daughter Directive objective for 2010 based on current emissions projection scenarios. This is the lowest number identified since the Network began.

8. A total of 29 sites, 28 roadside and one intermediate, were identified as being at risk of exceeding the AQS objective for the end of 2005 based on current emissions projection scenarios. This is a substantial reduction on last year's total of 51.

7 Acknowledgements

All of the measurement data presented in this report have been collected by the participating Local/Unitary Authorities, at their own expense, and supplied to the National Environmental Technology Centre as part of the study. This contribution and co-operation from the Local/Unitary Authorities is gratefully acknowledged.

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Figure 1 Annual Average Roadside NO_2 Concentrations in the UK from the UK NO_2 Network 2000

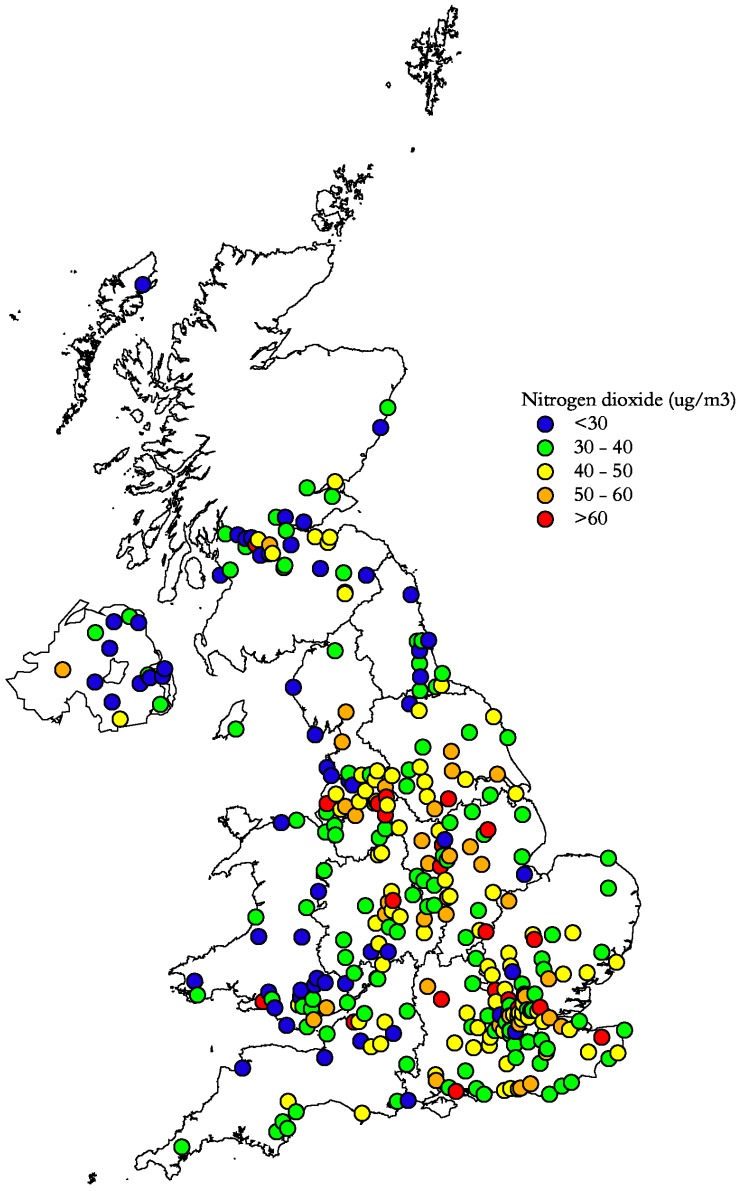


Figure 2. Frequency Distribution of Annual Mean Roadside Nitrogen Dioxide concentration, 1993 - 2000.

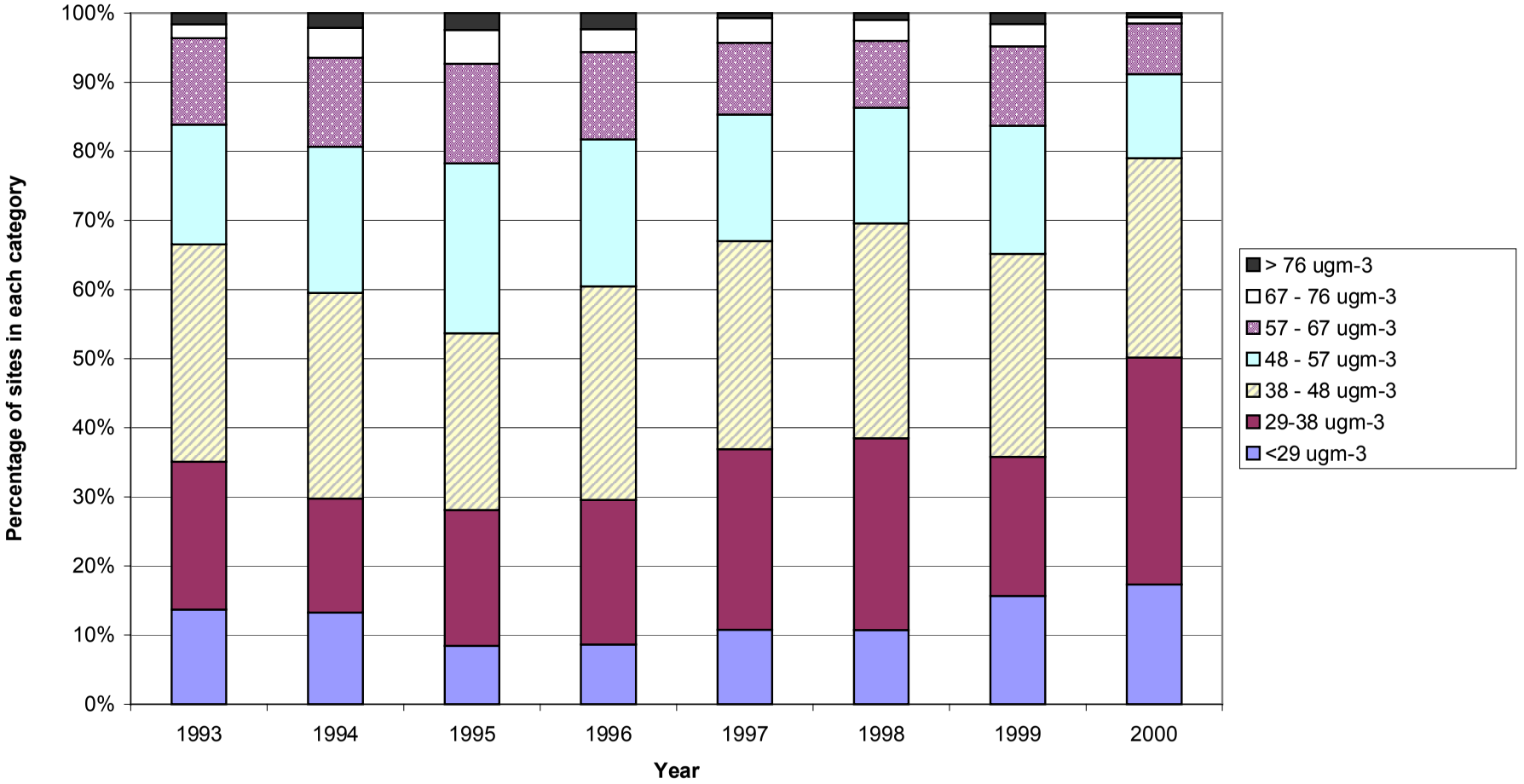


Figure 3 Interpolated plots of annual average intermediate and urban background NO_2 concentrations in the UK NO_2 Network 1993-2000.

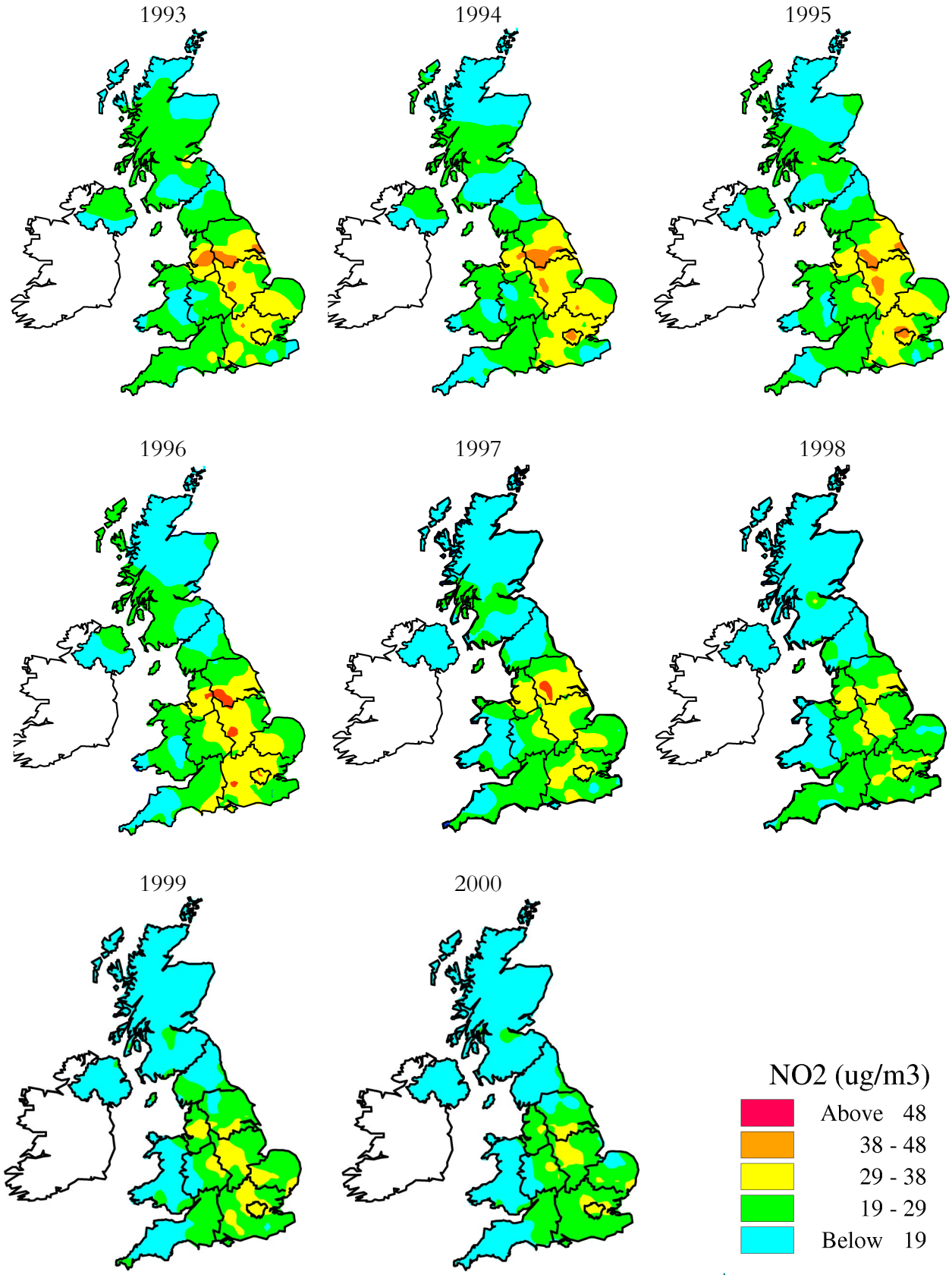


Figure 4. Frequency Distribution of annual Mean Intermediate and Urban Background Nitrogen Dioxide Concentrations 1993 - 2000

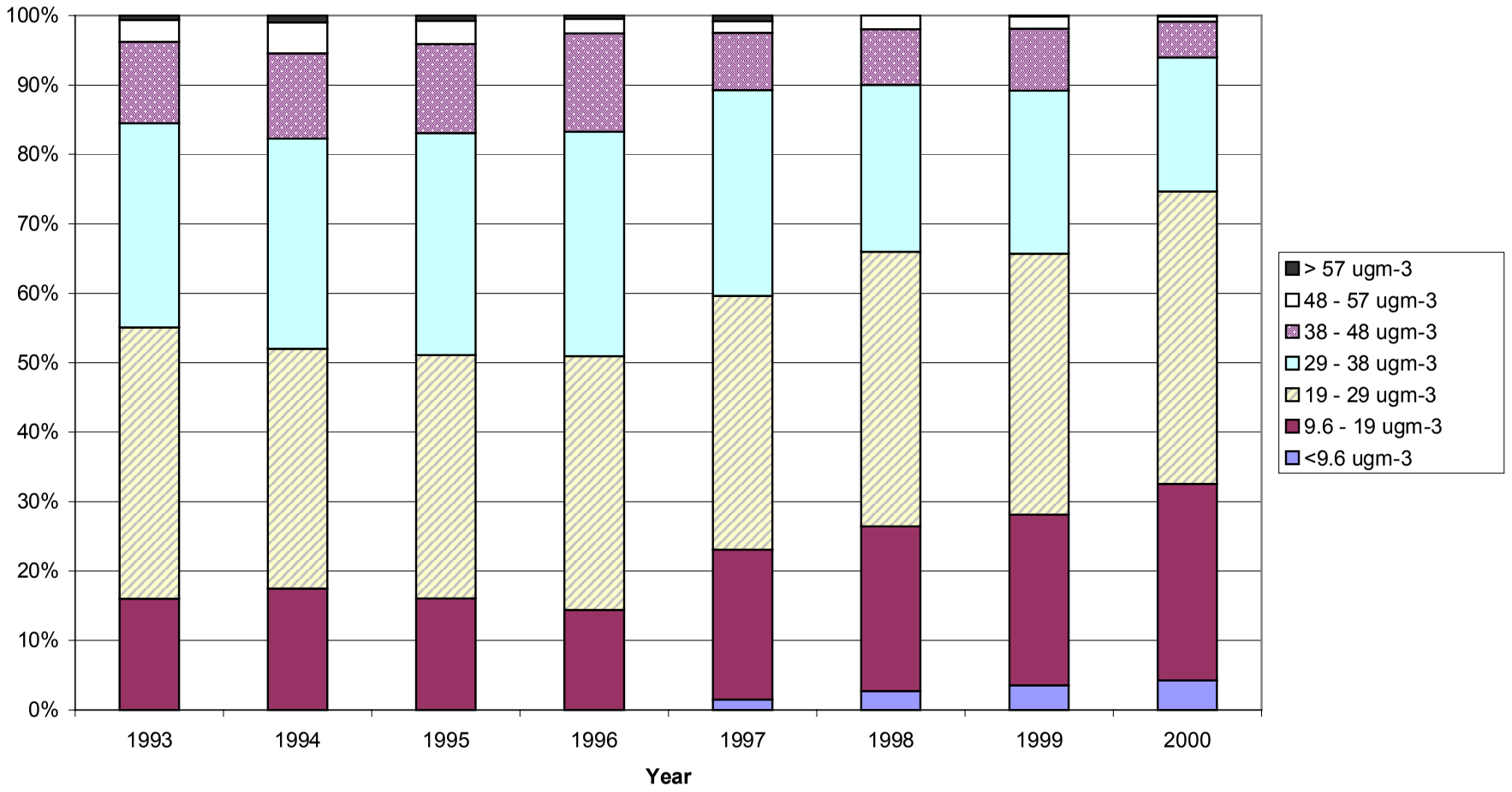
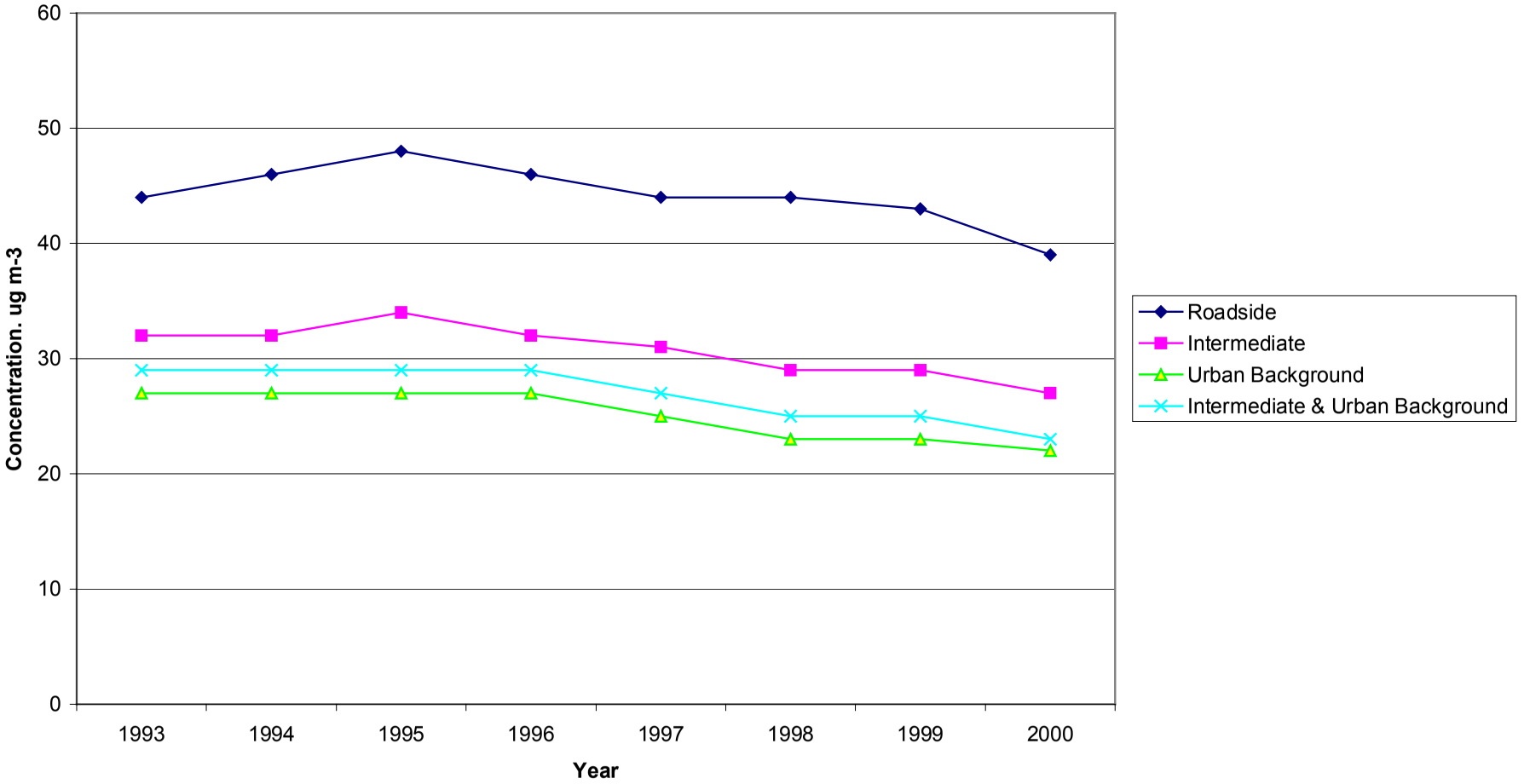


Figure 5. Trends in Annual Mean Nitrogen Dioxide Concentration as Measured by the Diffusion Tube Network, 1993 to 2000



Appendices

CONTENTS

Appendix A
Analytical Laboratory Performance Testing 2000

A1 Analytical Laboratory Performance Testing

The control and minimisation of uncertainty in the data reported by the UK NO_2 Network is an important role of the co-ordinating body. The number of laboratories performing analyses as part of the network also makes this a substantial task. Currently, there are no British or ISO standards for NO_2 diffusion tube analysis. An assessment of uncertainties and variation in analytical performance is therefore important, as variations in laboratory methodologies and performance are likely to be reflected in the final survey dataset.

There are four parts comprising the UK NO_2 Network Quality Assurance/Quality Control programme. These are as follows:

1. **The Workplace Analysis Scheme for Proficiency (WASP) programme for NO_2 diffusion tube analysis.** This is a round robin type performance testing scheme first introduced in 1996, and integrated into the WASP scheme in 1999. This scheme makes use of artificial analytes (doped tubes) to test the quality of laboratory analyses on a monthly basis. The scheme provides excellent tracking of analytical performance throughout the year and minimises the response time between identification and correction of analytical problems. It is operated independently by the Health and Safety Laboratory (HSL).

2. **The Annual Field Intercomparison Exercise.** This is an annual field trial, designed to complement the monthly performance testing scheme described in (1) above by providing information on the uncertainties arising from both the sampling and analysis phases of diffusive sampling in the field.

3. **QC Solution Testing Scheme** This involves the monthly analysis of a nitrite solution of known concentration by all participating laboratories. Every six months approximately 150ml of a stock nitrite solution is distributed to each laboratory. The laboratories analyse a sample of this stock solution on a monthly basis and return the result to NETCEN for checking.

4. **Routine Data Screening.** Experienced operators carefully screen the data supplied by our participating Local Authorities. Suspect values and possible errors are highlighted and checked with the site operators.

Criteria for data acceptance are set on the basis of items 1 and 2 above. Laboratories unable to demonstrate satisfactory performance in these two key quality systems are identified and the measurement data supplied by these laboratories may be excluded from the UK NO_2 Network report.

A1.1 WASP SCHEME FOR NO_2 DIFFUSION TUBES

As from May 1999, the UK NO_2 Network's Laboratory Performance Testing Scheme has been operated independently by Health and Safety Laboratory (HSL) as part of the Workplace Analysis Scheme for Proficiency (WASP). This marks the development from an informal testing scheme, run explicitly for the UK NO_2 Network, to an internationally recognised performance testing programme

(WASP). Contact WASP via Maria Farnell on 0114 289 2501 or email maria.farnell@hsl.gov.uk for details.

A1.1.1 WASP Performance Criteria

The WASP scheme involves the analysis of a Quality Control (QC) analyte of known concentration by each participating analytical laboratory. Each month a solution doped diffusion tube (Doped Tube) is distributed to participants, who analyse the tube and report the results to HSL. Performance scores are assigned to the analyses, based on their deviation from the known mass of nitrite in the analyte, in terms of the standard deviation. Results are classified as follows:

Good	≤ 2 Standard deviations from actual value
Warning	2-3 Standard deviations from actual value
Action	≥ 3 Standard deviations from actual value

Performance test results are normally disseminated to participating laboratories by post, but in order to provide rapid response to potential problems, 'Warning' and 'Action' performances scores are faxed.

Performance for the full year 2000, have been assessed by AEA Technology according to the following criteria, which have been agreed with DEFRA and HSL.

1. Where a laboratory joins or leaves the WASP programme part way through the year, its data are only acceptable to the NO_2 Network for the months during which it was a participant of the WASP programme.
2. Apart from laboratories joining or leaving WASP during the year, participating laboratories will be allowed to miss no more than 2 of the 12 monthly WASP rounds.
3. If a participating laboratory *does* miss more than 2 rounds in the year, results from the preceding or following year may be taken into account.
4. The year's **single** worst result for the laboratory is discarded. This makes some limited allowance for one-off problems with analytical equipment etc.
5. Each laboratory's monthly results is then combined to give a standard uncertainty for the full year, expressed as a relative standard deviation (%RSD) using the following formula:

$$\%RSD = \left(\sqrt{\frac{\sum_{i=1}^{n} \left(\frac{x_i}{\bar{x}} - 1 \right)^2}{n}} \right) \times 100$$

- where x_i are the monthly results obtained by the laboratory, x"bar" is the assigned value and n is the number of results.

6. If the relative standard deviation is greater than ±25%, the laboratory's performance for the year in the WASP scheme is deemed unsatisfactory.

The monthly performance scores for 2000 were assessed according to these criteria.

A1.1.2 WASP Programme Performance Test Results 2000

Table A1 at the end of Appendix A presents the analysis results reported by each participating analytical laboratory, for the doped diffusion tubes analysed under the WASP scheme for the year 2000. Table A2 (also at the end of Appendix A) shows the performance scores assigned to these results.

The monthly average coefficient of variation (CoV) of results from all laboratories has been calculated. An estimate of the variation in laboratory analyses can be derived by further calculating the overall average of the monthly CoVs during 2000. Estimates of analytical variability obtained between 1993-2000 are compared in Table A3 below.

Table A3 Summary of Laboratory Performance in the UK NO_2 Network Analytical Laboratory Performance Testing Scheme 1993-2000

	1993	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Number of Laboratories	38	43	38	38	37	38	37	31
Overall CoV of Doped Tube Analyses	38%	-	24%	24%	21%	23%	17%	20%*

NB. Doped Tube analyses were not performed during 1994.

* CoV is reduced to 14% by discarding one outlying value from Round 17.

Table A3 shows that during 2000 the overall variability of results reported by laboratories in this programme was 20%. This is consistent with previous years, although not as low as in 1999. However, during WASP Round 17, one laboratory reported an extremely high value; if this outlying value is discarded, the overall CoV is reduced to just 14%.

Analysis of the performance scores awarded to reported analyses each month (Table A2) indicates that for doped tube analyses reported, only 2% of all analyses received 'Action' scores and a further 3% received 'Warning' scores during 2000. This reflects continued improvement in analytical control.

A1.2 RESULTS OF QC SOLUTION ANALYSES

The QC Solution Testing Scheme involves the monthly analysis of a nitrite solution of known concentration by all participating laboratories. Every six months approximately 150ml of a stock nitrite solution is distributed to each laboratory. The laboratories analyse a sample of this stock solution on a monthly basis and return the result to NETCEN for checking. Performance scores are assigned to the analyses based on the principles of Shewhart control charts and z-scores[A1], for demonstrating statistical process control. Under this system an estimate of the expected coefficient of variation (CoV) has been established for the QC Solution analyses, according to the empirical formula developed by Horwitz[A2]. Hence, for a QC Solution of concentration range 1500-2000 mg/l (as nitrite) the average expected CoV is approximately 5%. Performance scores are classified as "Good", Warning" or "Action" in the same way as the WASP Doped Tube analysis.

Although the QC solution analyses are not used to assess satisfactory performance, this exercise provides the laboratories with a useful means of checking their analytical procedures. Table A4 (at the end of this Appendix) shows the results of the QC Solution Analyses for 2000, and Table A5 shows the performance scores assigned to them. Table A6 (below) compares overall variability of the results reported by laboratories for QC solution analysis, with results in previous years.

Table A6 Summary of Laboratory Performance in the UK NO_2 Network QC Solution Analysis Exercise 1993-2000

	1993	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Number of Laboratories	38	43	38	38	37	38	37	32
Overall CoV of QC Solution Analyses	9%	-	12%	5%	3%	3%	3%	3%

The overall coefficient of variation obtained in 2000 was consistent with previous years.

A1.3 FIELD INTERCOMPARISON EXERCISE 2000

The objectives of the annual field intercomparison exercise are to estimate bias and precision, under normal field operating conditions, for all laboratories performing analysis in the UK NO_2 Network during 2000. In recent years, the intercomparison has also been used for ongoing investigation into how the method of tube preparation affects performance of diffusion tubes. A report of the 2000 Field Intercomparison is published on the World Wide Web via DEFRA's air quality web site, http://www.aeat.co.uk/netcen/airqual/, but a brief summary is presented here.

Seven nitrogen dioxide diffusion tubes (six exposure tubes and one travel blank) were supplied by each laboratory for exposure over a period of 1 month, (October 2000). Diffusion tubes were exposed simultaneously, upon purpose made exposure racks located adjacent to the automatic chemiluminescent NO_x monitoring equipment installed at DEFRA's Automatic Urban Network (AUN) site at Alumwell School, Walsall. The exposure period was 28 days, 4th October to 1st November 2000.

Upon completion of exposure, the diffusion tubes were returned to the laboratories for analysis, along with the travel blank. Travel blanks accompanied exposure tubes to and from the test site, and were kept in isolation, under refrigerated conditions throughout the duration of the exposure periods. Analysis results were forwarded to AEA Technology for collation. Results were reported in micrograms per cubic metre ($\mu g\ m^{-3}$).

A1.3.1 Results of 2000 Field Intercomparison

As in previous intercomparisons, the intention was to use the average NO_2 concentration measured by the chemiluminescent analyser at Walsall Alumwell over the exposure period (4th October to 1st November 2000) as the reference value with which the diffusion tube results could be compared. However, the automatic analyser was affected by fault, which caused data for 30% of exposure period to be rejected. Therefore, the average NO_2 concentration measured by the chemiluminescent NO_x analyser could not be used as a reliable reference value. Instead, the mean of all diffusion tube results (45.0 $\mu g\ m^{-3}$, with a standard deviation of 4.4 $\mu g\ m^{-3}$), was taken as the reference value. On this basis, 26 of the 30 laboratories in this field intercomparison exercise (87%) were within ±25%, *relative to the mean of all diffusion tubes*. 24 laboratories (70%) showed an average precision within our arbitrary guideline of 6$\mu g\ m^{-3}$.

Results are presented in Table A7. Outlying data were identified using Grubb's Test and removed. Laboratories are listed by code number - full details on laboratory performance in this exercise are available from the laboratories directly, or from NETCEN. Table A7 shows the percentage bias for the averaged measurement by each laboratory relative to (i) the average measurement from the automatic chemiluminescent analyser, and (ii) the average of all diffusion tube results.

Table A7 Average bias and standard deviation of NO_2 diffusion tube measurements, by laboratory

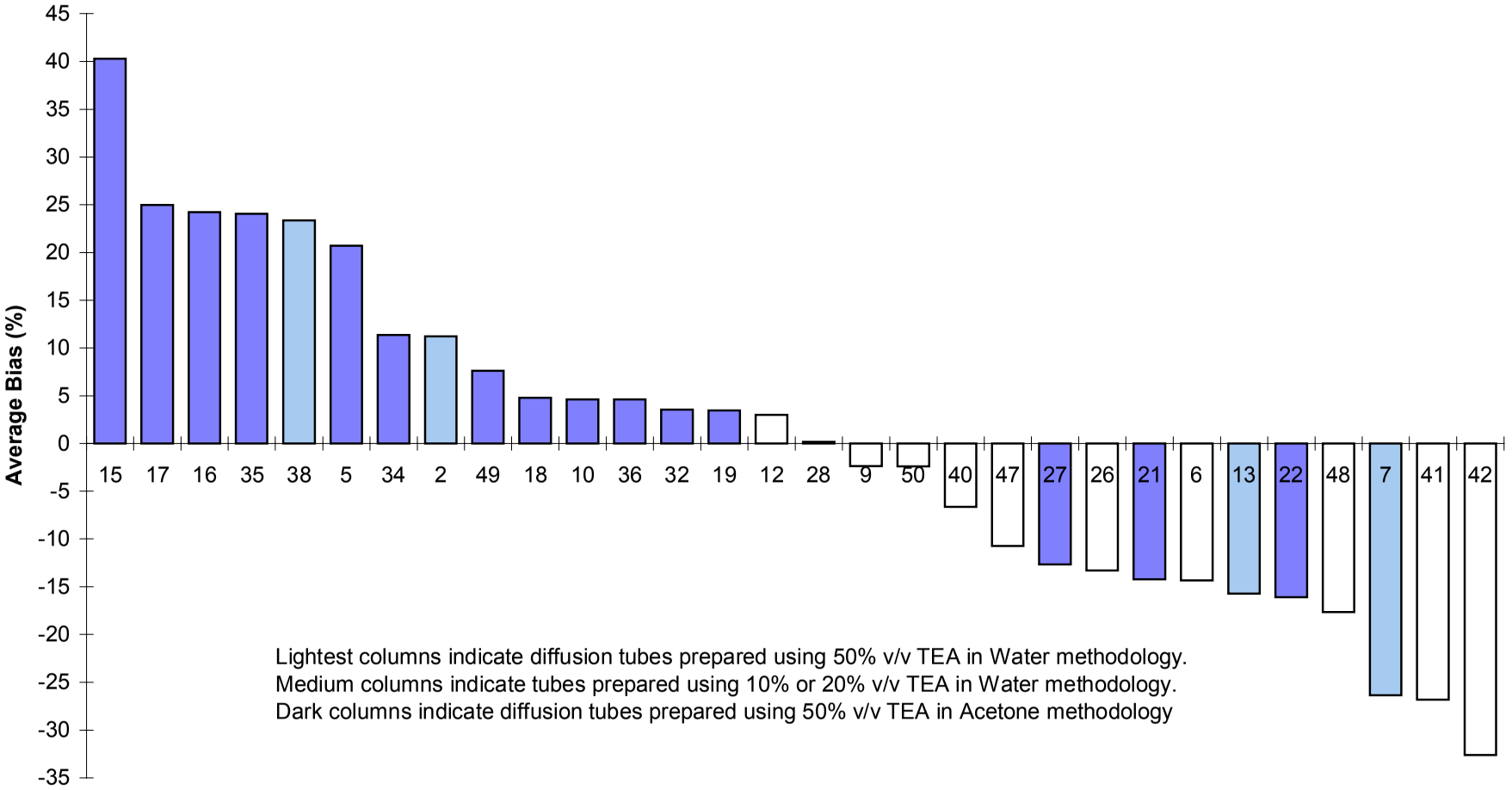
Laboratory code	% Bias relative to automatic analyser 2000	Standard Deviation 2000	% Bias relative to average diffusion tube conc. 2000
2	31.2	5.26	11
5	42.4	1.87	21
6	1.1	1.90	-14
7	-13.1	10.25	-26
9	15.2	2.16	-2
10	23.5	7.25	5
12	21.5	1.56	3
13	-0.5	4.56	-16
15	65.5	1.83	40
16	46.6	5.42	24
17	47.5	4.13	25
18	23.6	5.98	5
19	22.1	7.42	3
21	1.2	4.32	-14
22	-1.0	2.97	-16
26	2.3	5.36	-13
27	3.1	3.06	-13
28	18.2	2.81	0
32	22.2	9.52	3
34	31.4	6.52	11
35	46.4	3.73	24
36	23.5	5.81	5
37	No results		
38	45.6	1.48	23
40	10.2	3.85	-7
41	-13.7	2.92	-27
42	-20.5	7.17	-33
47	5.3	3.66	-11
48	-2.8	1.36	-18
49	27.0	2.59	8
50	15.2	4.20	-2
Average	+18.1	**4.36**	**0**

Average obtained using chemiluminescent analyser (70% data capture only) = 38 $\mu g\ m^{-3}$
Reference value (average diffusion tube measurement) = 45$\mu g\ m^{-3}$

The overall distribution of bias in measurements is presented in Figure A1. The distribution bias in the data for each laboratory for October 2000 was close to normal. However, the laboratories at each end of the range show evidence of extreme outlying performance. The range in bias of measurement data, relative to the average of all the diffusion tube measurements in the study, was -33% to +40%. While the lower end of the range was similar to that measured in 1999, the upper end of the range was considerably higher, due to one laboratory exhibiting unusually high positive bias.

It is intended that future Intercomparisons will comprise multiple exposure periods, and/or the use of more than one automatic analyser, to minimise the impact of technical problems, such as occurred during the 2000 Intercomparison.

Figure A1. Average bias in diffusion tube measurements in the 2000 Field Intercomparison Exercise relative to the average of all diffusion tube measurements (Outliers removed by Grubb's test.)



A1.3.2 Observations on Effects of Preparation Technique

During 2000, there were three main preparation techniques used in the production of NO_2 diffusion tubes used in the UK NO_2 Network.

1. Triethanolamine (TEA) in a 50:50 v/v solution with acetone, or
2. Triethanolamine (TEA) in a 50:50 v/v solution with water and a proprietary surfactant (Brij).
3. Triethanolamine (TEA) in a 10% or 20% v/v solution with water and a proprietary surfactant. This method has grown in popularity in recent years.

The tube preparation method is shown in Figure A1. This clearly shows that diffusion tubes prepared using TEA in a 50:50 v/v solution with acetone (shown by the dark columns), consistently gave higher results during the 2000 Intercomparison, than tubes prepared using TEA in a 50:50 v/v solution with water (shown by the white columns). The diffusion tubes prepared using the "new" method, TEA in a 10% or 20% v/v solution with water (shown by the medium columns) appeared to give results somewhere between the two. This pattern is evident despite the widespread positive bias in the 2000 intercomparison with respect to the chemiluminescent method.

The observed pattern is consistent with both the 1998 and 1999 field intercomparison trials[A3, A4], and with an additional study carried out concurrently with the 1999 intercomparison[A4]. These studies clearly showed that diffusion tubes prepared using a 50% solution of TEA in water exhibited an average negative bias, while diffusion tubes prepared using a 50% solution of TEA in acetone exhibited an average positive bias.

Other workers in this field have identified similar patterns. Recent work by Kirby et al [A5] proposed a mechanism for under-read in the case of tubes prepared by the (specifically) 50% TEA in water method only. This proposed effect[A5]involves the basicity of the 50% TEA solution reducing the uptake of NO_2. Diffusion tubes prepared using a 10% or 20% aqueous solution of TEA are believed to be unaffected by this process.

AEA Technology have recently carried out an investigation of the performance of diffusion tubes of the three types listed above[A6]. This study comprised field exposure and laboratory based trials, and also concluded that diffusion tubes prepared using the 50% TEA in water method under-read with respect to the chemiluminescent analyser, while those prepared using the 20% TEA in water method, or by the 50% TEA in acetone method, typically over-read. In our study, the over-read was greater in the case of the acetone method.

On the basis of the work by Kirby et al, the 1998-2000 Intercomparisons and our recent investigation, there appears to be good evidence that diffusion tubes prepared using the 50% TEA in water method are affected by a mechanism which causes under-read. This appears not to affect tubes prepared using 20% TEA in water.

It is therefore recommended that participating laboratories should use the 20% (or 10%) v/v TEA in water method, in preference to the 50% TEA in water method, for production of NO_2 diffusion tubes used in the Network. This should avoid one source of negative bias, which appears to affect 50% aqueous TEA tubes only. However, we appreciate that in some cases,

circumstances may require the continued use of the "50% TEA in water" technique, at least in the short term. **There remain TWO preferred preparation techniques for use in the NO_2 Network:**

- **Method 1: 50% v/v TEA in acetone, grids dipped into solution, and**
- **Method 2: 20% (or 10%) v/v TEA in deionised water, solution pipetted onto grids.**

They should be considered equally valid pending further investigation.

A1.4 IDENTIFICATION OF LABORATORIES WITH UNSATISFACTORY ANALYTICAL PERFORMANCE

Objectives for overall accuracy of measurement data derived from diffusive samplers are defined by the European Union Daughter Directive (1999/30/EC)[A7]. These objectives recommend that, to enable accurate comparison of long-term average Limit Value with measurement data derived from indicative monitoring (i.e. diffusion measurements), indicative measurement data should have an overall accuracy of ±25% or less. It should be noted however, that there is no recognised method available for determination of accuracy of diffusion tube samplers in accordance with the Daughter Directive. This issue is currently the subject of European Committee for Standardisation Working Group (CEN/TC 246/WG12).

In the absence of a standard method for determining the accuracy of diffusion tube measurements, the results of (i) the NO_2 Network Laboratory Performance Testing Scheme, and (ii) the Field Intercomparison Exercise have been used to determine satisfactory data quality for the network.

This approach has two main benefits:

1. Overall uniformity of data throughout the year is demonstrated by the analysis of the doped tubes from the Laboratory Performance Testing Scheme (now WASP)
2. The bias and precision of the samples under field conditions can be demonstrated for a short period during the monitoring year by the Field Intercomparison Exercise

The relevant performance statistics for each laboratory are presented in Tables A1 (WASP programme) and Table A7 (Field Intercomparison). As in previous years, some laboratories have passed one test but failed the other. This may arise from the fact that these tests investigate different components of uncertainty in the diffusion tube measurement system, which contribute to the overall variability in measurements. The WASP programme tests uncertainty resulting from the analytical phase throughout the year, and the Field Intercomparison provides an annual "snapshot" test of combined uncertainty arising from both analytical and sampling phases.

As in previous years, as a best practicable approach, the following criteria were established to test for satisfactory laboratory performance and therefore data quality. In order to meet the data quality objectives of the UK NO_2 Network during 2000, data from laboratories that failed *both* criteria were eliminated.

(i) WASP Programme 2000.
Laboratories must achieve a relative standard deviation (%RSD) of ± 25% on the basis of the year's performance, having discarded the single worst result. All except one of the participating laboratories met this requirement during 2000.

(ii) Field Intercomparison Exercise 2000.
Laboratories must perform on average to within ± 25% of the reference concentration in this Field Intercomparison. As explained above, the chemiluminescent analyser was affected by a technical fault during the 2000 Field Intercomparison Exercise, so it was necessary to use the mean result from all diffusion tubes as the reference value. On this basis, 26 of the 30 laboratories that completed the field intercomparison exercise (87%) were within ±25% of the mean of all diffusion tubes.

Using these criteria, one laboratory with performance statistics outside the satisfactory bands was identified. Data produced by this laboratory during June to October 2000 were removed from the final UK NO_2 Network dataset. The laboratory identified is listed in Table A11 below.

Table A11. Laboratories in the UK NO_2 Network not performing to the required data quality objectives for accuracy

Laboratory Name	*Number of UK NO_2 Network Customers*
Islington Scientific Services	3

This laboratory ceased to participate in the Network in October 2000 and thus did not complete the Field Intercomparison. Its performance was therefore assessed only upon its WASP results. Although the laboratory's relative standard deviation for the full year was greater than 25%, all the "Warning" and "Action" scores were confined to the period June to October. Therefore, with the agreement of DEFRA, the data for January to May 2000 were retained in the dataset.

A1.5 OBSERVATIONS AND RECOMMENDATIONS

Results from the WASP programme, (operated independently by HSL), and from the 2000 Field Intercomparison Exercise, indicate a continued improvement in overall performance of the participating laboratories. As in 1999, data rejection in 2000 was minimal.

A2 References

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A2. Horwitz, W. Evaluation of Analytical Methods used for Regulation of Food and Drugs. Analytical Chemistry Vol. 54, No 1, January 1986.

A3. Bush, T. Summary Results from the UK NO_2 Network Field Intercomparison Exercise 1998. Available via DEFRA's Air Quality pages on the World Wide Web, at http://www.aeat.co.uk/netcen/airqual/ or from AEA Technology.

A4. Bush, T. Summary Results from the UK NO_2 Network Field Intercomparison Exercise 1999. Available via DEFRA's Air Quality pages on the World Wide Web, at http://www.aeat.co.uk/netcen/airqual/ or from AEA Technology.

A5. C Kirby, M Fox, J Waterhouse. Reliability of nitrogen dioxide passive diffusion tubes for ambient measurement: in situ properties of the triethanolamine absorbent. J. Environ. Monit. , 2000, **2**, 307-312.

A6., A Loader "Investigation of the Effects of Preparation Technique on Performance of Nitrogen Dioxide Diffusion Tubes" AEA Report AEAT/ENV/R/0563. April 2001.

A7. The Council of the European Union Directive relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air, 1999/30/EC. 22 April 1999.

Table A1: UK NO_2 Network Doped Tube Analyses 2000

	Mass of Nitrite Extracted from Doped Tube (ug)											
Laboratory Name	Jan-00 WASP R9	Feb-00 WASP R10	Mar-00 WASP R11	Apr-00 WASP R12	May-00 WASP R13	Jun-00 WASP R14	Jul-00 WASP R15	Aug-00 WASP R16	Sep-00 WASP R17	Oct-00 WASP R18	Nov-00 WASP R19	Dec-00 WASP R20
Bristol City Council Scientific Services	2.98	0.60	1.96	2.42	2.86	0.39	1.07	0.86	no result	0.70	2.19	0.89
Cardiff Scientific Services	2.94	0.60	2.03	2.42	3.03	0.39	1.02	0.88	1.01	0.60	2.40	0.94
Clyde Analytical Ltd	2.94	0.54	1.72	2.41	2.20	0.37	1.01	0.90	0.86	0.61	2.19	0.93
Analytical Services (South Wales)	2.96	0.57	1.96	2.35	2.93	0.38	1.10	no result	0.99	0.55	2.15	0.89
Dundee City Council	3.14	0.63	1.89	2.59	2.69	0.36	1.14	0.89	0.96	0.62	2.30	0.85
City of Edinburgh Council	3.17	0.56	1.85	2.29	2.82	0.41	1.30	1.01	0.99	0.59	2.15	0.89
GRADKO International Ltd	2.57	0.52	1.89	2.24	2.84	0.36	1.01	0.93	0.90	0.58	2.33	0.92
Casella GMSS	2.96	0.57	1.89	2.38	2.58	0.38	0.89	0.81	no result	0.54	2.03	0.70
Rotherham Metropolitan Borough Council	2.68	0.61	1.95	2.43	2.80	0.38	1.03	0.85	0.97	0.62	2.00	0.92
Worcestershire Scientific Services	3.03	0.59	1.29	2.22	2.57	0.25	0.84	0.73	0.69	0.59	2.38	0.90
Humber Authorities Scientific Services	2.91	0.57	1.84	2.36	2.77	no result	0.94	0.95	1.04	0.56	1.87	0.80
Kent Scientific Services	3.00	0.55	1.81	2.11	2.65	0.32	1.01	0.72	0.93	0.63	2.28	0.87
Lambeth Scientific Services Ltd	2.46	no result	1.72	2.16	2.51	no result	0.95	no result	0.82	no result	2.19	no result
Lancashire County Analyst	2.72	0.55	1.83	2.28	0.23	0.34	1.06	0.66	1.11	0.47	2.03	0.78
Glasgow Scientific Services	3.31	0.60	2.28	2.60	2.94	0.70	0.97	0.79	1.00	0.81	2.25	0.87
Stanger Science and Environment	2.92	0.66	1.88	2.29	2.71	0.44	0.94	0.86	1.05	0.69	2.07	0.69
Jesmond Dene Laboratory	2.95	0.62	2.48	2.40	2.83	0.40	1.14	0.75	0.91	0.76	2.15	1.01
Somerset Scientific Services	2.92	0.56	1.65	1.25	3.16	0.23	0.92	0.86	0.97	0.59	1.95	0.86
Walsall Metropolitan Borough Council	2.84	0.59	1.89	2.25	2.77	0.38	1.07	0.78	0.99	0.56	2.26	1.02
West Yorkshire Analytical Services	2.92	0.58	1.76	2.40	2.74	0.37	1.02	no result	0.97	0.59	1.96	0.85
Wolverhampton Metropolitan Borough Council	2.75	0.56	1.87	2.10	2.83	0.38	0.99	0.80	no result	0.63	2.43	2.07
University of Essex	2.80	0.52	1.77	2.23	2.81	0.36	0.99	0.77	0.88	no result	1.75	0.85
London Borough of Islington	2.69	0.49	1.70	1.83	3.22	0.89	1.31	1.04	1.13	0.95	no result	no result
Milton Keynes Borough Council	3.18	0.64	1.86	2.31	2.84	0.34	1.01	0.81	0.96	0.58	2.11	0.91
Staffordshire County Council	2.63	0.60	1.82	2.42	2.95	0.35	0.96	0.78	1.00	0.65	1.85	0.85
Ruddock & Sherrat	2.40	0.43	1.64	1.98	2.53	0.34	0.96	0.71	0.86	0.57	1.97	0.55
Northampton Borough Council	3.06	0.46	1.62	2.05	2.64	0.25	1.04	0.83	5.75	0.54	2.21	0.91
Aberdeen City Council Public Analyst	3.00	0.54	1.79	2.23	2.80	0.38	1.00	0.79	0.92	0.62	2.26	0.92
STL Bridgend	2.85	0.53	1.91	2.37	2.78	0.41	1.06	0.85	1.09	0.60	2.26	0.86
Kirklees Environmental Services	3.12	0.53	2.11	2.54	3.10	0.28	1.15	0.88	1.02	0.64	2.36	0.95
City of Liverpool Public Analyst	3.03	0.49	1.77	2.21	2.62	0.31	0.92	0.68	0.80	0.58	2.14	0.70
Assigned Value	***2.96***	***0.52***	***1.87***	***2.34***	**2.93**	**0.36**	**1.00**	**0.82**	**0.93**	**0.57**	**2.19**	**0.84**

Table A2: Performance Scores Assigned to Doped Tube Analysis, 2000.

	Performance Score											
	Jan-00	Feb-00	Mar-00	Apr-00	May-00	Jun-00	Jul-00	Aug-00	Sep-00	Oct-00	Nov-00	Dec-00
Laboratory Name	WASP R9	WASP R10	WASP R11	WASP R12	WASP R13	WASP R14	WASP R15	WASP R16	WASP R17	WASP R18	WASP R19	WASP R20
Bristol City Council Scientific Services	Good	Good	Good	Good	Good	Good	Good	Good	no result	Good	Good	Good
Cardiff Scientific Services	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Clyde Analytical Ltd	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Analytical Services (South Wales)	Good	Good	Good	Good	Good	Good	Good	no result	Good	Good	Good	Good
Dundee City Council	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
City of Edinburgh Council	Good	Good	Good	Good	Good	Good	Warning	Good	Good	Good	Good	Good
GRADKO International Ltd	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Casella GMSS	Good	Good	Good	Good	Good	Good	Good	Good	no result	Good	Good	Good
Rotherham Metropolitan Borough Council	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Worcestershire Scientific Services	Good	Good	Warning	Good	Good	Warning	Good	Good	Good	Good	Good	Good
Humber Authorities Scientific Services	Good	Good	Good	Good	Good	no result	Good	Good	Good	Good	Good	Good
Kent Scientific Services	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Lambeth Scientific Services Ltd	Good	no result	Good	Good	Good	no result	Good	no result	Good	Good	Good	no result
Lancashire County Analyst	Good	Good	Good	Good	Action	Good	Good	Good	Good	Good	Good	Good
Glasgow Scientific Services	Good	Good	Good	Good	Good	Action	Good	Good	Good	Good	Good	Good
Stanger Science and Environment	Good	Warning	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Jesmond Dene Laboratory	Good	Good	Warning	Good	Good	Good	Good	Good	Good	Warning	Good	Good
Somerset Scientific Services	Good	Good	Good	Action	Good	Warning	Good	Good	Good	Good	Good	Good
Walsall Metropolitan Borough Council	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
West Yorkshire Analytical Services	Good	Good	Good	Good	Good	Good	Good	no result	Good	Good	Good	Good
Wolverhampton Metropolitan Borough Council	Good	Good	Good	Good	Good	Good	Good	Good	no result	Good	Good	Action
University of Essex	Good	Good	Good	Good	Good	Good	Good	Good	Good	no result	Good	Good
London Borough of Islington	Good	Good	Good	Good	Good	Action	Warning	Warning	Good	Action	no result	no result
Milton Keynes Borough Council	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Staffordshire County Council	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Ruddock & Sherrat	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Warning
Northampton Borough Council	Good	Good	Good	Good	Good	Warning	Good	Good	Action	Good	Good	Good
Aberdeen City Council Public Analyst	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
STL Bridgend	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Kirklees Environmental Services	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
City of Liverpool Public Analyst	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

Table A4 UK NO_2 Network Laboratory Performance Testing Scheme QC Solution Analyses 2000

	Concentrations of QC Solution Reported (mg/l)											
Laboratory name	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***	***Jul***	***Aug***	***Sep***	***Oct***	***Nov***	***Dec***
Bristol City Council Scientific Services	1920	1940	1940	1930	1920	1910	1940	1932	1900	1930	1926	1934
Cardiff Scientific Services	1969	1907	1921	1950	1949	1936	1946	1965	2001	1984	2019	1976
Clyde Analytical Ltd	1914	1957	1897	1907	1920	1887	1917	1877	1893	1910	1943	1927
Analytical Services (South Wales)	1941	2020	2030	1982	1987	1981	1996	1967	1966	1956	1961	1984
Dundee City Council	1949	1947	1937	1971	1908	1895	1980	1914	1964	1946	1940	1914
City of Edinburgh Council	1943	1940	1950	1895	1925	1950	1885	1938	1963	1843		1923
GRADKO International Ltd	1943	1929	1923	1926	1932	1950	1833	1914	1932	1977	2094	2078
Casella GMSS	1960	1867	1853	1853	1867	1840	1827	1827	1933	1880	1853	1893
Harwell Scientifics Ltd	1939	1953	1961	1963	1904	1982	1950	1947	1968	1961	1923	1952
Rotherham Metropolitan Borough Council	1940	1930	1942	1926	1932	1933	1938	1938	1940	1931	1932	1939
Worcestershire Scientific Services	1910	1910	1910	1990	2000	2010	1940	1950	1920	1920		1960
Humber Authorities Scientific Services	1866	1924	1848	1898	1878		1858	2008	1880	1873	1960	1964
Kent Scientific Services	1914	1973	1945	1936	1941	1914	1969	1912	1943	1922	1938	1917
Lambeth Scientific Services Ltd	1931	1920	1915	1910	1988	1933	1910	1980		1950	1935	
Lancashire County Analyst	1931	1948	1937	1923	1928	1970	1947	1938	1920	1934	1940	1934
Glasgow Scientific Services	1963	1927	1995	2001	1749	1731	1727	1572	1965	1990	2003	2079
Stanger Science & Environmental	1925	1941	1932	1934	1945	1928	1931	1951	1940	1945	1940	1927
Jesmond Dene Laboratory	1961	1940	1966	1940	1924	1957	1939	1942	1964	1938	1912	1933
Somerset Scientific Services	1970	1956	1919	1919	2104	1982	1946	1986	1996			
Walsall Metropolitan Borough Council	1941	1899	1958	1862	1842	1894	1962	1919	1845	1905	1964	1956
West Yorkshire Analytical Services	1951	1936	1938	1896	1994	2018	1903	1919	1905	1926	2019	1945
Wolverhampton Metropolitan Borough Council	1844	1872	1929	1998	1898	1910	1990	1930	1844	1958	1888	1998
University of Essex	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935	1935
London Borough of Islington	1950	1980	1975	1962	1956	1945	1960	1953	1969	1955		
Milton Keynes Borough Council	1935	1942	1918	1971	1950	1956	1957	1921	1976	1972	1955	1962
Staffordshire County Council	1990	2030	2000	2010	1948	1910	2006	1950	1960	1990	2050	1997
Ruddock and Sherratt	1930	1971	1963	1947	1955	1930	1931	1947	1947	1914	1930	1910
Northampton Borough Council	1886	1861	1891	1891	1912	1879	1990	1896	1924	1967	1961	1941
Aberdeen City Council Public Analyst	1908	1974	1916	1895	1908	1904	1958	1934	1960	1912	1945	1924
STL Bridgend	1965	2008	2044	1955	1968	1962	2103	2054	1912	1962	1994	1929
Kirklees Environmental Services	1920	1870	1950	2060	1880	1910	2010	2030	1890	1940	1990	1950
City of Liverpool Public Analyst									2038	1892	1754	1735
Average	1934	1939	1940	1940	1931	1928	1938	1930	1938	1936	1950	1945
Standard Deviation	30	41	42	45	59	54	66	79	43	35	62	59
Coefficient of Variation (%)	1.6	2.1	2.2	2.3	3.0	2.8	3.4	4.1	2.2	1.8	3.2	3.0

Table A5 Performance Scores Assigned to 2000 QC Solution Analyses

	Assigned Performance Scores											
Laboratory Name	***Jan***	***Feb***	***Mar***	***Apr***	***May***	***Jun***	***Jul***	***Aug***	***Sep***	***Oct***	***Nov***	***Dec***
Bristol City Council Scientific Services	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Cardiff Scientific Services	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Clyde Analytical Ltd	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Analytical Services (South Wales)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Dundee City Council	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
City of Edinburgh Council	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	No Data	Good (0)
GRADKO International Ltd	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (1)	Good (0)	Good (0)	Good (0)	Good (1)	Good (1)
Casella GMSS	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (1)	Good (1)	Good (0)	Good (0)	Good (0)	Good (0)
Harwell Scientifics Ltd	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Rotherham Metropolitan Borough Council	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Worcestershire Scientific Services	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	No Data	Good (0)
Humber Authorities Scientific Services	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	No Data	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Kent Scientific Services	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Lambeth Scientific Services Ltd	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	No Data	Good (0)	Good (0)	No Data
Lancashire County Analyst	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Glasgow Scientific Services	Good (0)	Good (0)	Good (0)	Good (0)	Good (1)	Warning (2)	Warning (2)	Action (3)	Good (0)	Good (0)	Good (0)	Good (1)
Stanger Science & Environmental	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Jesmond Dene Laboratory	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Somerset Scientific Services	Good (0)	Good (0)	Good (0)	Good (0)	Good (1)	Good (0)	Good (0)	Good (0)	Good (0)	No Data	No Data	No Data
Walsall Metropolitan Borough Council	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
West Yorkshire Analytical Services	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Wolverhampton Metropolitan Borough Council	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
University of Essex	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
London Borough of Islington	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	No Data	No Data
Milton Keynes Borough Council	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Staffordshire County Council	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (1)	Good (0)
Ruddock and Sherratt	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Northampton Borough Council	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
Aberdeen City Council Public Analyst	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
STL Bridgend	Good (0)	Good (0)	Good (1)	Good (0)	Good (0)	Good (0)	Good (1)	Good (1)	Good (0)	Good (0)	Good (0)	Good (0)
Kirklees Environmental Services	Good (0)	Good (0)	Good (0)	Good (1)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)	Good (0)
City of Liverpool Public Analyst	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	Good (1)	Good (0)	Good (1)	Warning (2)

Appendix B
Regional Network Data 2000

1 Scotland (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for Scotland are shown in Figure B1.0. The validated 2000 dataset for the region is detailed in Table B1.2. Tables B1.0 and B1.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3}, and greater than 40μgm^{-3}, respectively.

Table B1.0 Roadside Sites in Scotland with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Glasgow 1N (63 μgm^{-3})	*As for 61 μgm^{-3} plus* Coatbridge 1N (58 μgm^{-3}) Edinburgh 5N (49 μgm^{-3})

Table B1.1 Roadside Sites in Scotland with High Concentrations according to the Air Quality Strategy Objectives

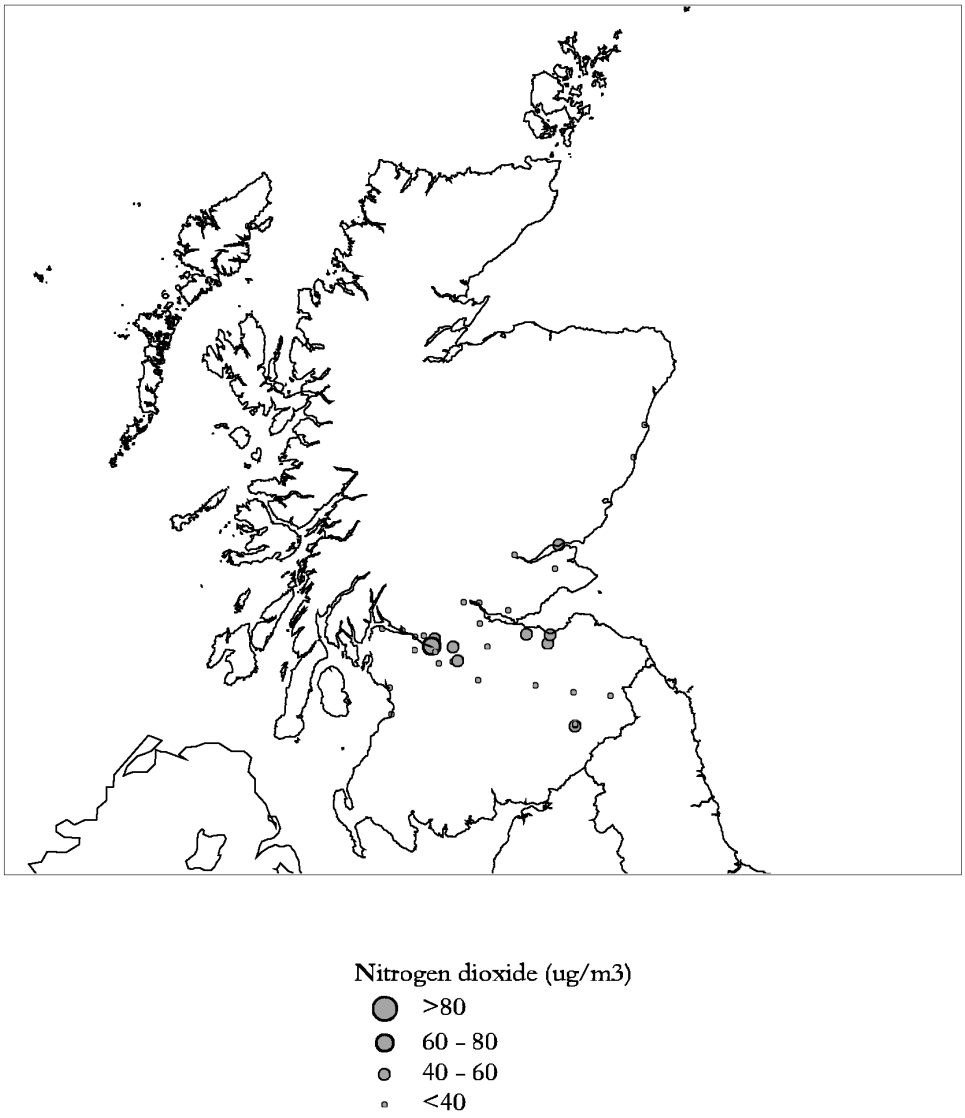
Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*
Glasgow 1N (63 μgm^{-3})
Coatbridge 1N (58 μgm^{-3})
Edinburgh 5N (49 μgm^{-3})
Dalkeith 1N (46 μgm^{-3})
Dundee 7N (46 μgm^{-3})
Motherwell 1N (45 μgm^{-3})
Musselburgh 1N (42 μgm^{-3})
Hawick 2N (41 μgm^{-3})
Bishopbriggs 6N (41 μgm^{-3})

Table 1.2 Roadside Sites in Scotland

				Nitrogen Dioxide Concentrations 2000 (ugm^{-3})														
Site Name	**Local Authority**	**Location**	**Status**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Min**	**Max**	**Mean**
ABERDEEN 1N	Aberdeen City	R	A	34	31	38	36	48	25	34	40	33	38	29	29	**25**	**48**	**35**
STONEHAVEN 1N	Aberdeenshire	R	A	20	7	15	28	16	21	19		22	15	24		**7**	**28**	**19**
DUNDEE 7N	City of Dundee	R	A	69	39	39	30	48	49	32	41		54	52	51	**30**	**69**	**46**
EDINBURGH 5N	City of Edinburgh	R	A	63	70	55	41	42	39	46	44	39	46	46	54	**39**	**70**	**49**
GLASGOW 1N	City of Glasgow	R	A	54	30	87	32	59		53	68			123		**30**	**123**	**63**
ALLOA 1N	Clackmannanshire	R	A			22	17				10	35	32	31		**10**	**35**	**24**
STORNOWAY 1N	Comhairle Nan Eilean Siar	R	A	16		14	11	29	11	8	16	18	24	23	25	**8**	**29**	**18**
BEARSDEN 1N	East Dunbartonshire	R	A	35		16	11	16	16	15	17	25	25	13	46	**11**	**46**	**21**
BISHOPBRIGGS 6N	East Dunbartonshire	R	A	51		15		57	33	31	34	31	43	56	54	**15**	**57**	**41**
MUSSELBURGH 1N	East Lothian	R	A	63	43	41	37	43	38	31	31	42	40	48		**31**	**63**	**42**
THORNLIEBANK 1N	East Renfrewshire	R	A	49												**49**	**49**	
FALKIRK 13N	Falkirk	R	A		31	34	34	38	34	29	23	29	36	12	38	**12**	**38**	**31**
CUPAR 1N	Fife	R	A	36	24	26	24	27	22	29	34	36	37	37	35	**22**	**37**	**31**
DUNFERMLINE 5N	Fife	R	A	34	27		20	20	20	25	19	28	21	33	30	**19**	**34**	**25**
GREENOCK 5N	Inverclyde	R	A	41	48	38	45	36	33	34	20	30	33	34	6	**6**	**48**	**33**
DALKEITH 1N	Midlothian	R	A	43	44	44	49	58	45	41	34			56		**34**	**58**	**46**
IRVINE 1N	North Ayrshire	R	A	54		42	14	25	25	21	35	35	50	50	22	**14**	**54**	**34**
COATBRIDGE 1N	North Lanarkshire	R	A	82		63	42	34	36	27	40	75	75	94	71	**27**	**94**	**58**
MOTHERWELL 1N	North Lanarkshire	R	C	48		44	23	21	54	31	52	63	63	54		**21**	**63**	**45**
PERTH 1N	Perth & Kinross	R	A	41	23	16	45	40	33	30	37	37	33	37	45	**16**	**45**	**35**
PAISLEY 7N	Renfrewshire	R	A	44		34	32	5	27	21	35	38	35	73	50	**5**	**73**	**36**
GALASHIELS 1N	Scottish Borders	R	A	23	24	27	42	35	27	26	26	31	30	37	35	**23**	**42**	**30**
HAWICK 1N	Scottish Borders	R	C		34	24	26		20							**20**	**34**	
HAWICK 2N	Scottish Borders	R	A		39	44	45	39	36	34	39	41	47		46	**34**	**47**	**41**
HAWICK 4N	Scottish Borders	R	A		38	35		38	38	35	36	41		47		**35**	**47**	**39**
HAWICK 5N	Scottish Borders	R	A		7	8	12	7	8	5	9	13	12	18	22	**5**	**22**	**11**
HAWICK 6N	Scottish Borders	R	A					24		18	19	30	29	36		**18**	**36**	**26**
KELSO 1N	Scottish Borders	R	A		20	20	25	20	19	17	19	23	21	28	29	**17**	**29**	**22**
PEEBLES 5N	Scottish Borders	R	A	29	24	25			23	24	23	29	27	35	30	**23**	**35**	**27**
AYR 1N	South Ayrshire	R	A	28		25	19	12	31	17	23	34	31	30	34	**12**	**34**	**26**
EAST KILBRIDE 1N	South Lanarkshire	R	A	4	22	11	10		14	9	10	22	10	32		**4**	**32**	**14**
HAMILTON 1N	South Lanarkshire	R	A			18	19	5	14	11	34	19	19			**5**	**34**	**17**
LANARK 1N	South Lanarkshire	R	A	39			31		36	25	30	41	31	40	36	**25**	**41**	**34**
SOUTH LANARKSHIRE 1N	South Lanarkshire	R	A	34		16	13	10	22	23	23	32	37		78	**10**	**78**	**29**
STIRLING 1N	Stirling	R	A	35	32	36	37	30	36	31	22	36	43	39	29	**22**	**43**	**34**
CLYDEBANK 1N	West Dunbartonshire	R	A	34	9	23			20	19	24	36	34	39	35	**9**	**39**	**27**
DUMBARTON 1N	West Dunbartonshire	R	A	34	13	24			21	17	28	39	32	31	55	**13**	**55**	**29**
WHITBURN 1N	West Lothian	R	A	42	22	32	18	29	12	24	24	21	21	29	27	**12**	**42**	**25**

REGIONAL SUMMARY		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	Regional Monthly Mean	41	29	31	28	30	28	25	29	33	34	41	39
	Regional Monthly Min	4	7	8	10	5	8	5	9	13	10	12	6
	Regional Monthly Max	82	70	87	49	59	54	53	68	75	75	123	78
	Regional Annual Mean	32											
	Regional Annual Min	11											
	Regional Annual Max	63											
	Number of Sites	38											
	% With Valid Data	95											

Figure B1.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in Scotland**



1 Scotland (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for Scotland are shown in Figure B1.1. The validated 2000 dataset for the region is detailed in Table B1.3. No intermediate and urban background sites in Scotland exceeded the EC Directive Limit and Guide Value surrogate statistics, or the Air Quality Strategy Objective of 40μgm^{-3}.

Table B1.3 Intermediate and Urban Background Sites in Scotland

				Nitrogen Dioxide Concentrations 2000 (ugm^{-3})														
Site Name	**Local Authority**	**Location**	**Status**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Min**	**Max**	**Mean**
ABERDEEN 2N	Aberdeen City	I	C	13	8	17	13	84	19	15	8	12	19	17	15	**8**	**84**	**20**
ABERDEEN 3N	Aberdeen City	B	A	23	13	17	15	15	13	12	8	8	13	8	8	**8**	**23**	**13**
ABERDEEN 4N	Aberdeen City	B	A	13	8	10	6	10	6	8	10	8	10	8	8	**6**	**13**	**8**
STONEHAVEN 3N	Aberdeenshire	B	A	14		7	9	5	6			7	11	14		**5**	**14**	**9**
STONEHAVEN 6N	Aberdeenshire	B	A	11			8			6		8	11	11		**6**	**11**	**9**
STONEHAVEN 7N	Aberdeenshire	I	C	14	8	9	8		6	7		8	12	17		**6**	**17**	**10**
DUNDEE 3N	City of Dundee	B	A	15	13	9	6	9	6	8	8	14	20	20	23	**6**	**23**	**13**
DUNDEE 5N	City of Dundee	B	A	21	16	16	10	14	8	9	14	18	22	29	30	**8**	**30**	**17**
DUNDEE 6N	City of Dundee	I	C	35	15	13	10	14	10	9	13	16	29	25	28	**9**	**35**	**18**
EDINBURGH 3N	City of Edinburgh	B	A	33	21	19	19	23	19	18	26		24	16	35	**16**	**35**	**23**
EDINBURGH 4N	City of Edinburgh	B	A	28	17	13	20	21	18	10	20	17	19		23	**10**	**28**	**19**
EDINBURGH 6N	City of Edinburgh	I	C	38	34	38	34	52	42	36	40	40	41			**34**	**52**	**40**
GLASGOW 2N	City of Glasgow	I	C	48	6	34	21	18	31	18	34			29		**6**	**48**	**27**
GLASGOW 4N	City of Glasgow	B	A	22		14	8	6	8		21			46		**6**	**46**	**18**
GLASGOW 5N	City of Glasgow	B	A	23		9	7	7	7	6	14			23		**6**	**23**	**12**
ALLOA 4N	Clackmannanshire	B	A				5				10	13	19	7		**5**	**19**	
ALLOA 6N	Clackmannanshire	B	A				5				6	15	24	21		**5**	**24**	
ALLOA 7N	Clackmannanshire	I	C				5				22	15	27	26		**5**	**27**	
STORNOWAY 2N	Comhairle Nan Eilean Siar	I	C	13		14	9	27	10	5	14	17	25	16	23	**5**	**27**	**16**
STORNOWAY 3N	Comhairle Nan Eilean Siar	B	A					22					7		5	**5**	**22**	
STORNOWAY 4N	Comhairle Nan Eilean Siar	B	A	5				26			4	5	7	12	13	**4**	**26**	**10**
BEARSDEN 2N	East Dunbartonshire	I	C	17		6	8	7	8		12	14	9	20		**6**	**20**	**11**
BEARSDEN 3N	East Dunbartonshire	B	A	24		7	8	7	9	7	11	15	5	21	35	**5**	**35**	**14**
BEARSDEN 4N	East Dunbartonshire	B	A	8				4		4	16	12	11	10	21	**4**	**21**	**11**
BISHOPBRIGGS 5N	East Dunbartonshire	B	A	21		7	6	9	7	5	10	16		27	38	**5**	**38**	**15**
BISHOPBRIGGS 7N	East Dunbartonshire	I	C	8		13	6	10	13	10	15	16	24	30	31	**6**	**31**	**16**
BISHOPBRIGGS 8N	East Dunbartonshire	B	A	22		7	4	6	8	5	10	16	18	28	29	**4**	**29**	**14**
HADDINGTON 5N	East Lothian	B	A		16	12	10	13	11	6	6	12	11	23		**6**	**23**	**12**
MUSSELBURGH 2N	East Lothian	I	C	46	31	29	31	29	23	21	21	23	20	38		**20**	**46**	**28**
GIFFNOCK 1N	East Renfrewshire	B	A	18												**18**	**18**	
GIFFNOCK 2N	East Renfrewshire	I	C	17												**17**	**17**	
NEWTON MEARNS 1N	East Renfrewshire	B	A	17												**17**	**17**	
FALKIRK 14N	Falkirk	I	C		17	23	27	19	17	19	12	21	25	42		**12**	**42**	**22**
FALKIRK 3N	Falkirk	B	A		21				23						29	**21**	**29**	
FALKIRK 4N	Falkirk	B	A		21	25	21	21	13	19	15	15	31		27	**13**	**31**	**21**
CUPAR 2N	Fife	I	C	22	14	16	15	14	15	15	18	19	21	26	25	**14**	**26**	**18**
CUPAR 4N	Fife	B	A	14	15	6	6	6	7	6	9	9	13	19		**6**	**19**	**10**
DUNFERMLINE 2N	Fife	I	C	22	12	16	7	9	9	8	13	14	15	20	22	**7**	**22**	**14**
DUNFERMLINE 6N	Fife	B	A	25	16	14	6	7	9	9	14	16	15	19	23	**6**	**25**	**14**
DUNFERMLINE 8N	Fife	B	A	22	15	14	7		8	5		18	14	22	23	**5**	**23**	**15**
ST ANDREWS 4N	Fife	B	A	8	8	4	5	5			6	7	9	12	14	**4**	**14**	**8**
GREENOCK 2N	Inverclyde	I	C	26	23	19	36	23	26	22	20	30	29	14	38	**14**	**38**	**26**
GREENOCK 3N	Inverclyde	B	A	17	14	14	15	12	14	14	8	16	13	21	21	**8**	**21**	**15**
GREENOCK 6N	Inverclyde	B	A	30	27	29	23	16	22	19	17	20	29	33	34	**16**	**34**	**25**
DALKEITH 2N	Midlothian	B	A	16	22	22		19	16	18	21			21		**16**	**22**	**19**
DALKEITH 3N	Midlothian	I	C	15	11	11	19	18	17	16	16			23		**11**	**23**	**16**
PENICUIK 2N	Midlothian	B	A	25	6	6	12	9	9	11	7			8		**6**	**25**	**10**
IRVINE 2N	North Ayrshire	I	C	16		13		8	7	5	12	12	19	20		**5**	**20**	**13**
IRVINE 3N	North Ayrshire	B	A	16			7	29	6		8	8	11	20	25	**6**	**29**	**15**
IRVINE 4N	North Ayrshire	B	A	15		9		5	6	4	7	7	9	20	26	**4**	**26**	**11**
AIRDRIE 1N	North Lanarkshire	B	A	61		36	33	33	15	10	31	46	46	36	65	**10**	**65**	**37**
AIRDRIE 3N	North Lanarkshire	B	A	44		19	15	13	13	13		34	34		40	**13**	**44**	**25**

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

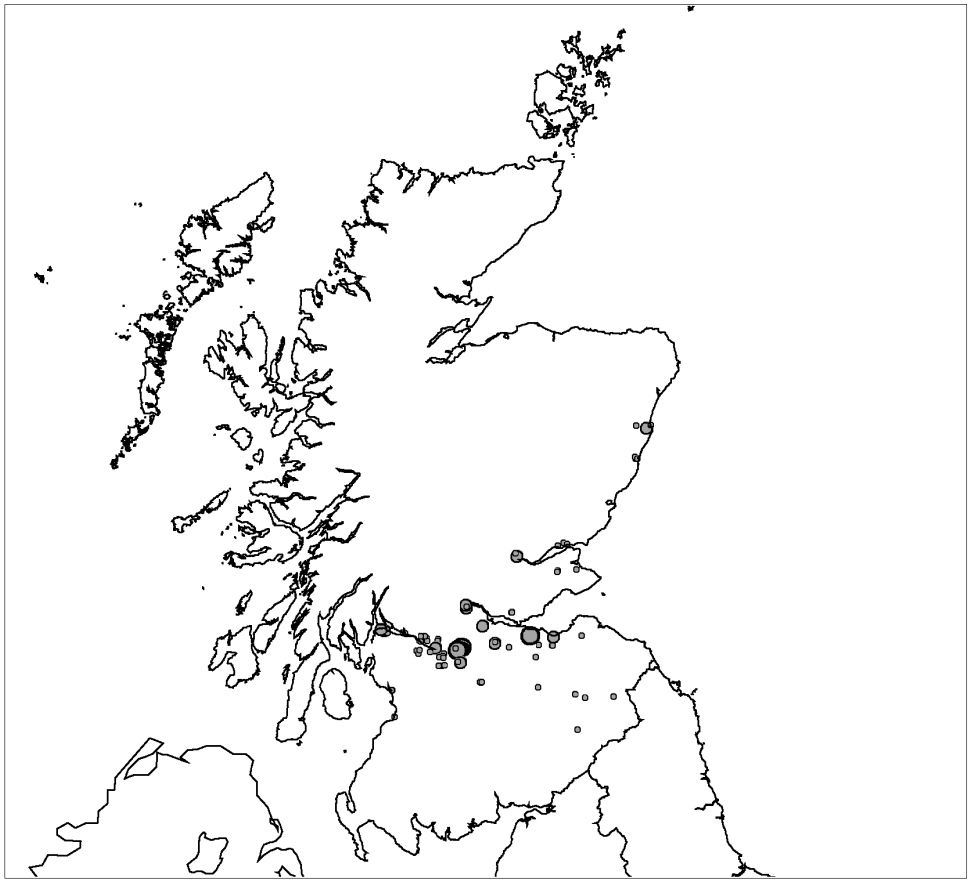
Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
COATBRIDGE 2N	North Lanarkshire	I	C	69		31	15	10	21	17	31	46	46	71		**10**	**71**	**36**
MOTHERWELL 2N	North Lanarkshire	I	C	52		23	21	12	23	15	19	34	34	48		**12**	**52**	**28**
MOTHERWELL 6N	North Lanarkshire	B	A	27		8	10	8	8	6	19	27	27	42	36	**6**	**42**	**20**
MOTHERWELL 7N	North Lanarkshire	B	A	38		8	6	6	10	10	17	23	23	38	40	**6**	**40**	**20**
PERTH 3N	Perth & Kinross	B	A	22	8	9	15	13	9	9	12	18	20	24	28	**8**	**28**	**16**
PERTH 5N	Perth & Kinross	I	C	27	16	21	18	17	15	13	17	20	28	27	28	**13**	**28**	**21**
PERTH 6N	Perth & Kinross	B	A	18	15	9	6	8	5	5	10		13	18	23	**5**	**23**	**12**
PAISLEY 2N	Renfrewshire	I	C	17		10	10	5	5	6	10	13	8	29	28	**5**	**29**	**13**
PAISLEY 3N	Renfrewshire	B	A	8		7				4	6	8	8	21	33	**4**	**33**	**12**
PAISLEY 6N	Renfrewshire	B	A	10		8	8	4	8	5	10	14	10		35	**4**	**35**	**11**
GALASHIELS 2N	Scottish Borders	B	A		12	9	13	6	8	6	7	12	15		17	**6**	**17**	**11**
HAWICK 3N	Scottish Borders	B	A		7	7	12	7	6	5	7	11	10	15	18	**5**	**18**	**10**
KELSO 2N	Scottish Borders	B	A		7	7	10	7	6	5	6	9	11	15	20	**5**	**20**	**9**
MELROSE 1N	Scottish Borders	B	A		9	8	12	9	6	7	7	28	13	16	22	**6**	**28**	**13**
PEEBLES 6N	Scottish Borders	B	A	16	11	9			8	7	9	12	12	18	21	**7**	**21**	**12**
AYR 2N	South Ayrshire	I	C	21		15	7		7	7	8	11	13	20	17	**7**	**21**	**13**
AYR 3N	South Ayrshire	B	A	7								7	6	13	14	**6**	**14**	
AYR 4N	South Ayrshire	B	A	8								5			11	**5**	**11**	
EAST KILBRIDE 2N	South Lanarkshire	I	C	9	16		20		6	8	14	16	4	16		**4**	**20**	**12**
EAST KILBRIDE 3N	South Lanarkshire	B	A		9	9	7		8		12	11	7	8		**7**	**12**	**9**
EAST KILBRIDE 4N	South Lanarkshire	B	A		13	6	4		6	5	16	11	11	10		**4**	**16**	**9**
HAMILTON 5N	South Lanarkshire	I	C			6			6		15	10	11			**6**	**15**	
HAMILTON 6N	South Lanarkshire	B	A				8		4			8	11			**4**	**11**	
HAMILTON 7N	South Lanarkshire	B	A			17	5				20	7				**5**	**20**	
LANARK 2N	South Lanarkshire	I	C	10						5	9	7	11	14	13	**5**	**14**	**10**
LANARK 5N	South Lanarkshire	B	A	9							10	8	13	10	15	**8**	**15**	**11**
LANARK 6N	South Lanarkshire	B	A	9							8	5	11	7	15	**5**	**15**	**9**
SOUTH LANARKSHIRE 2N	South Lanarkshire	I	C	15		5	10	8	12	14	14	17	16	24	34	**5**	**34**	**15**
SOUTH LANARKSHIRE 3N	South Lanarkshire	B	A			11	8	7	8	18	18	15	14	19	20	**7**	**20**	**14**
SOUTH LANARKSHIRE 5N	South Lanarkshire	B	A	12		5			8	16	16	14	7	17	19	**5**	**19**	**13**
STIRLING 3N	Stirling	B	A	20	16	23	30	24	16	18	15	29	18	21	11	**11**	**30**	**20**
STIRLING 5N	Stirling	I	C	19	10	18	13		13	20	17		17	58		**10**	**58**	**21**
STIRLING 6N	Stirling	B	A	18	18	14	17	12	12	15	11	17	18	28	9	**9**	**28**	**16**
CLYDEBANK 2N	West Dunbartonshire	I	C	20		9			8	7	16	19	17	32		**7**	**32**	**16**
CLYDEBANK 3N	West Dunbartonshire	B	A	7		5				5	8	7	16	18	23	**5**	**23**	**11**
CLYDEBANK 4N	West Dunbartonshire	B	A			5			8	8	15	19	18			**5**	**19**	**12**
DUMBARTON 7N	West Dunbartonshire	B	A	9					4	4		11	19	12	18	**4**	**19**	**11**
DUMBARTON 8N	West Dunbartonshire	I	C	17		9			10		15	14	4	26	14	**4**	**26**	**14**
DUMBARTON 9N	West Dunbartonshire	B	A	17					7				10		11	**7**	**17**	
BATHGATE 2N	West Lothian	I	C	42	23	21	12	22	20	27	27	23	19	31	32	**12**	**42**	**25**
BATHGATE 4N	West Lothian	B	A	23	17	20	17	8	11	15	15	15	16	22	20	**8**	**23**	**17**
LIVINGSTON 3N	West Lothian	B	A	29	13	18	16	19		18	18	12	24	19	26	**12**	**29**	**19**

REGIONAL SUMMARY

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regional Monthly Mean	21	15	14	13	15	11	11	14	16	17	22	24
Regional Monthly Min	5	6	4	4	4	4	4	4	5	4	7	5
Regional Monthly Max	69	34	38	36	84	42	36	40	46	46	71	65

Regional Annual Mean	16
Regional Annual Min	8
Regional Annual Max	40
Number of Sites	94
% With Valid Data	85

Figure B1.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in Scotland



2 The North East (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for the North East are shown in Figure B2.0. The validated 2000 dataset for the region is detailed in Table B2.1. No roadside sites in the North East exceeded the EC Directive Limit and Guide Value surrogate statistics. However, Table B2.0 below identifies all sampler locations with annual average NO_2 concentrations greater than 40μgm^{-3}.

Table B2.0 Roadside Sites in the North East with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3}   ***Air Quality Strategy Objective***   ***NO_2 Annual Mean***
Middlesbrough 1N (44μgm^{-3})

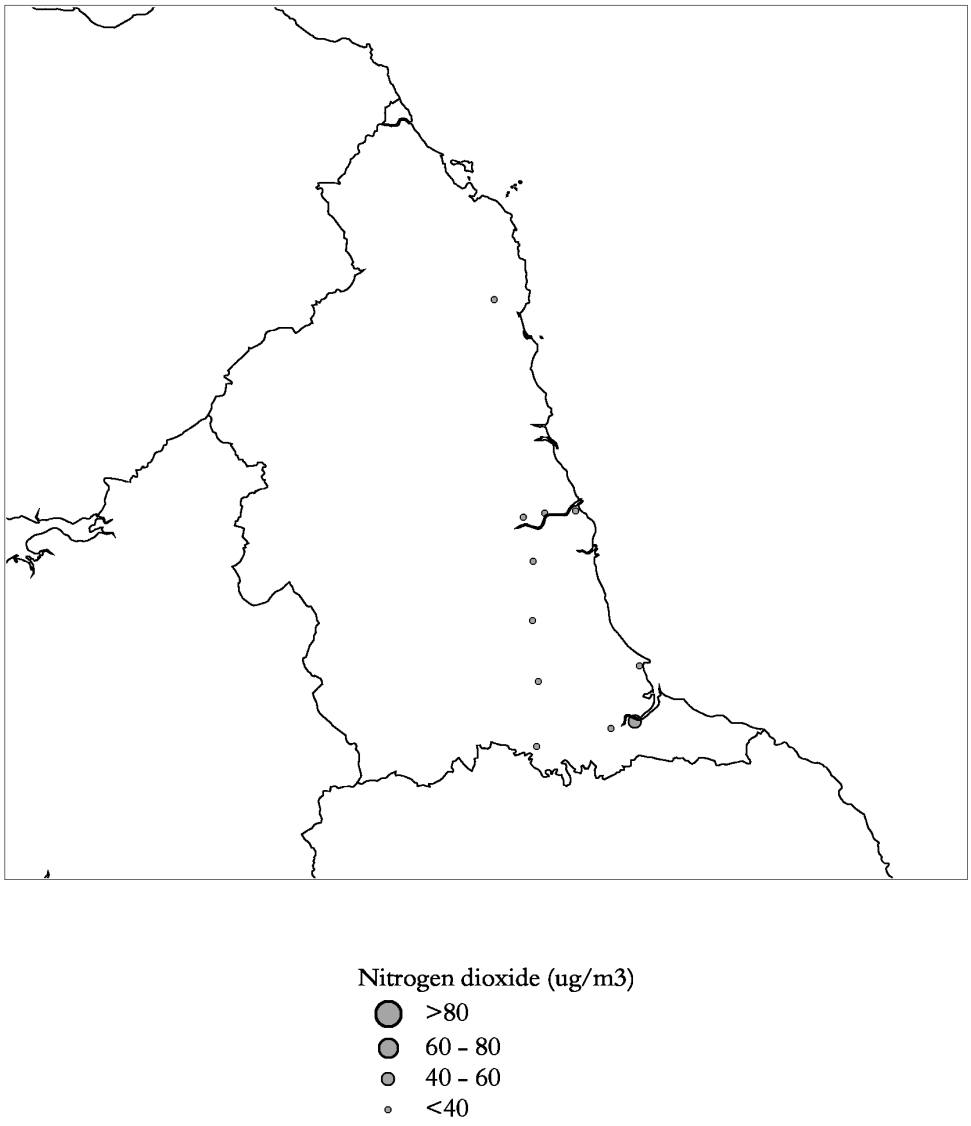
Table B2.1 Roadside Sites in the North East

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
ALNWICK 1N	Alnwick	R	A	16	16	10	19	12	12	14	18	18	16	20	25	**10**	**25**	**16**
BISHOP AUCKLAND 1N	Wear Valley	R	A	21		19	38	26		31	47	46	40	48		**19**	**48**	**35**
DARLINGTON 1N	Darlington	R	A	41	40	33	50	54	31	15	44	26	42	44	38	**15**	**54**	**38**
DURHAM 1N	Durham	R	A	42	19	24	35	16	47	40	33	41	40	47	35	**16**	**47**	**35**
GATESHEAD 5N	Gateshead	R	A	28	9	13	20	18	19	23	23	30	24		34	**9**	**34**	**22**
HARTLEPOOL 1N	Hartlepool	R	A	31	21	21		31	29			41	52	49		**21**	**52**	**34**
MIDDLESBROUGH 1N	Middlesbrough	R	A	46	42	48	46	42	40	42	38	42	40	46	50	**38**	**50**	**44**
NEWCASTLE UPON TYNE 9N	Newcastle Upon Tyne	R	A	32	20	14	49	47	49	31	45	42	36	39	33	**14**	**49**	**36**
SEDGEFIELD 1N	Sedgefield	R	A		14	12	30	13	25	21	25	33		37	31	**12**	**37**	**24**
SOUTH SHIELDS 8N	South Tyneside	R	A	32	36	17	35	24	24	24	29	35	22		7	**7**	**36**	**26**
STOCKTON 4N	Stockton-On-Tees	R	A	41	23	20	33	35	20	37	44	40	36	38		**20**	**44**	**33**
WALLSEND 1N	North Tyneside	R	C	38	84	34	61	17	42	22	10	27	50	44	40	**10**	**84**	**39**

REGIONAL SUMMARY		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Regional Monthly Mean	33	29	22	38	28	31	27	32	35	36	41	33
	Regional Monthly Min	16	9	10	19	12	12	14	10	18	16	20	7
	Regional Monthly Max	46	84	48	61	54	49	42	47	46	52	49	50
	Regional Annual Mean	32											
	Regional Annual Min	16											
	Regional Annual Max	44											
	Number of Sites	12											
	% With Valid Data	100											

Figure B2.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in the North East**



2 The North East (Intermediate and Urban Background Sites)

Intermediate and urban background locations and annual average NO_2 concentrations for the North East are shown in Figure B2.1. The validated 2000 dataset for the region is detailed in Table B2.2. No intermediate and urban background sites in the North East exceeded the EC Directive Limit and Guide Value surrogate statistics or the Air Quality Strategy Objective of 40μgm^{-3}.

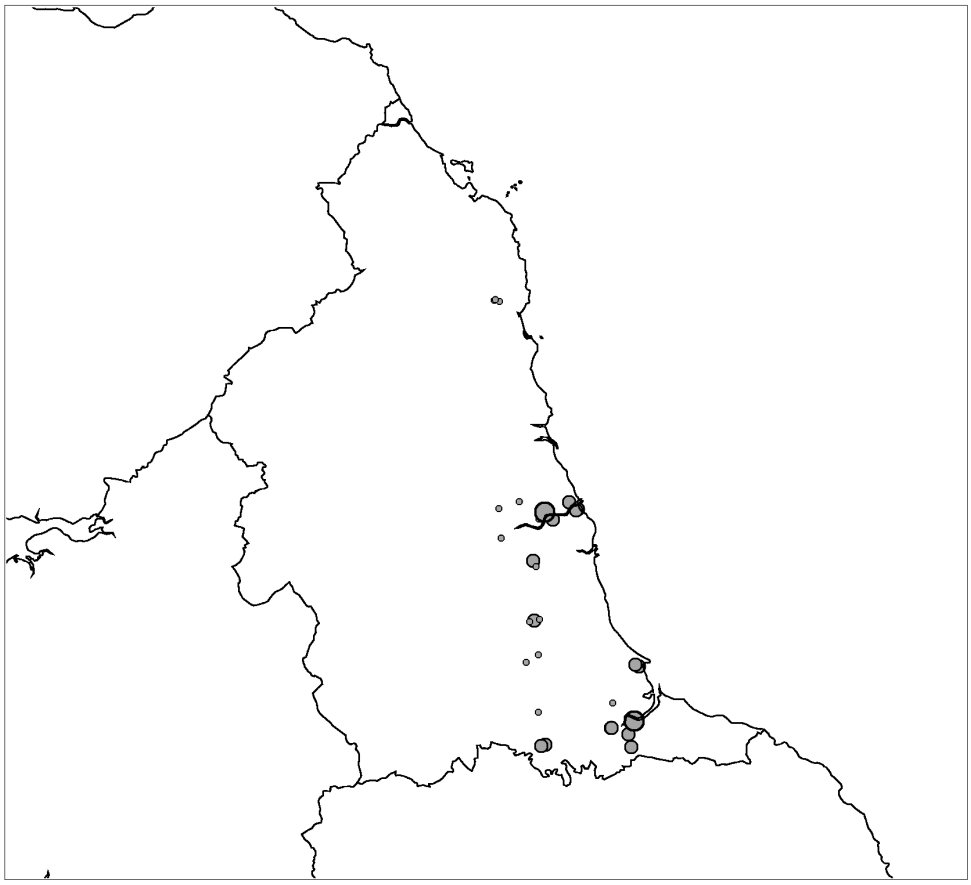
Table B2.2 Intermediate and Urban Background Sites in the North East

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
ALNWICK 3N	Alnwick	B	A	13	11	7	7	7	7	11	7	13	12	13	17	**7**	**17**	**10**
ALNWICK 4N	Alnwick	B	A	12	9	9	7	4	5	19	6	20	12	16	20	**4**	**20**	**11**
ALNWICK 6N	Alnwick	I	C	16	15	13	16	16	15	15	16	23	24	22	26	**13**	**26**	**18**
DARLINGTON 3N	Darlington	B	A	27	21	17	21	18	13	14	20	18	19	26	27	**13**	**27**	**20**
DARLINGTON 4N	Darlington	B	A	19	19	16	20	16	10	11	16	23	24	10	21	**10**	**24**	**17**
DARLINGTON 6N	Darlington	I	C	32	32	29	33	25	23	15	33	23	25	37	35	**15**	**37**	**29**
DURHAM 2N	Durham	I	C	25	7	12	25	12	24	23	25	26	34	34	28	**7**	**34**	**23**
DURHAM 3N	Durham	B	A	18	7	5	10	7	14	14	14	18	16	21	26	**5**	**26**	**14**
DURHAM 4N	Durham	B	A	19	10	9	12	38	14	16	14	21	20	23	27	**9**	**38**	**19**
GATESHEAD 6N	Gateshead	I	C	27	13	12	20	14	17	24	22	29	24		32	**12**	**32**	**21**
GATESHEAD 7N	Gateshead	B	A	23	6	13	17	7	10	17	16	23	29	21	27	**6**	**29**	**17**
GATESHEAD 8N	Gateshead	B	A			10	15	26	12	12	9	15	15	16	26	**9**	**26**	**15**
HARTLEPOOL 2N	Hartlepool	I	C	28	21	21		25	16			20	35	40		**16**	**40**	**26**
HARTLEPOOL 3N	Hartlepool	B	A	19	14	14		23	20			23	29	30		**14**	**30**	**21**
HARTLEPOOL 4N	Hartlepool	B	A	25	25			20								**20**	**25**	
MIDDLESBROUGH 2N	Middlesbrough	I	C	38	29	29	25	19	19	21	21	23	29	34	38	**19**	**38**	**27**
MIDDLESBROUGH 3N	Middlesbrough	B	A	29	19	21	21	17	13	19	15	15	19	25	31	**13**	**31**	**20**
MIDDLESBROUGH 4N	Middlesbrough	B	A	40	36	38	31	31	29	33	33	36	38	42	40	**29**	**42**	**36**
NEWCASTLE UPON TYNE 5N	Newcastle Upon Tyne	B	C	17	16	15	18	13	16	18	15	24	17	20		**13**	**24**	**17**
NEWCASTLE UPON TYNE 6N	Newcastle Upon Tyne	B	A	16	13	9	21	15	11	13	15	21	19	25	14	**9**	**25**	**16**
NEWCASTLE UPON TYNE 8N	Newcastle Upon Tyne	B	C	18	14	6	12	9		17	17	20				**6**	**20**	**14**
NORTH SHIELDS 1N	North Tyneside	B	A	29	42	19	17	8	10	12	36	17			65	**8**	**65**	**25**
WALLSEND 2N	North Tyneside	I	C	34	48	33	29		15	15			27	46	42	**15**	**48**	**32**
SEDGEFIELD 2N	Sedgefield	I	C		7	9	18	8	16	14	20	25	23	24	24	**7**	**25**	**17**
SEDGEFIELD 3N	Sedgefield	B	A		15	12	10	4	12	14	15	23	22	23	24	**4**	**24**	**16**
SEDGEFIELD 4N	Sedgefield	B	A		10	11	12	16	21	12	12	20	17	19	20	**10**	**21**	**15**
HEBBURN 4N	South Tyneside	B	A	31	18	17	31	16	13	15	14	23	21		27	**13**	**31**	**20**
SOUTH SHIELDS 7N	South Tyneside	B	A	27	48	24	9	16	10	12	34	13	35		51	**9**	**51**	**25**
SOUTH SHIELDS 9N	South Tyneside	I	C	30	36	18	18	16	14	16	20	21	34		33	**14**	**36**	**23**
STOCKTON 5N	Stockton-On-Tees	I	C	27	18	12	30	21	41	24	29	29	24	33		**12**	**41**	**26**
STOCKTON 6N	Stockton-On-Tees	B	A	25	11	12	28	23	21	20	26	27	26	30		**11**	**30**	**23**
STOCKTON 7N	Stockton-On-Tees	B	A	20	11	13	12		12	14		18	20	22		**11**	**22**	**16**
BISHOP AUCKLAND 2N	Wear Valley	I	C		7		16	14	14	29	16	31	27	31		**7**	**31**	**21**
BISHOP AUCKLAND 3N	Wear Valley	B	A	16	7	8	13	8	9	8	10	41	21	41	28	**7**	**41**	**18**
CROOK 1N	Wear Valley	B	A	16	7		12	6	8			24		24		**6**	**24**	**14**

REGIONAL SUMMARY		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Regional Monthly Mean	24	18	15	18	16	15	17	19	23	24	27	30
	Regional Monthly Min	12	6	5	7	4	5	8	6	13	12	10	14
	Regional Monthly Max	40	48	38	33	38	41	33	36	41	38	46	65
	Regional Annual Mean	20											
	Regional Annual Min	10											
	Regional Annual Max	36											
	Number of Sites	35											
	% With Valid Data	97											

Figure B2.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in the North East



3 The North West and Merseyside (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for the North West and Merseyside are shown in Figure B3.0. The validated 2000 dataset for the region is detailed in Table B3.2. Tables B3.0 and B3.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3}, and greater than 40μgm^{-3}, respectively.

Table B3.0 Roadside Sites in the North West and Merseyside with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Manchester 1N (80 μgm^{-3})	*As for 61 μgm^{-3} plus*
	Stockport 14N (77 μgm^{-3})	Oldham 1N (60 μgm^{-3})
	Crosby 1N (61 μgm^{-3})	Rochdale 1N (54 μgm^{-3})
		Salford 14N (54 μgm^{-3})
		St. Helens 8N (54 μgm^{-3})
		Warrington 1N (54 μgm^{-3})
		Kendal 1N (52 μgm^{-3})
		Lancaster 1N (51 μgm^{-3})
		Bolton 1N (48 μgm^{-3})
		Leigh 1N (47 μgm^{-3})
		Dukinfield 1N (47 μgm^{-3})

Table B3.1 Roadside Sites in the North West and Merseyside with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*	
Manchester 1N (80 μgm^{-3})	Lancaster 1N (51 μgm^{-3})
Stockport 14N (77 μgm^{-3})	Bolton 1N (48 μgm^{-3})
Crosby 1N (61 μgm^{-3})	Leigh 1N (47 μgm^{-3})
Oldham 1N (60 μgm^{-3})	Dukinfield 1N (47 μgm^{-3})
Rochdale 1N (54 μgm^{-3})	Blackburn 1N (46 μgm^{-3})
Salford 14N (54 μgm^{-3})	Prescot 1N (46 μgm^{-3})
St. Helens 8N (54 μgm^{-3})	Ormskirk 1N (46 μgm^{-3})
Warrington 1N (54 μgm^{-3})	Burnley 1N (43 μgm^{-3})
Kendal 1N (52 μgm^{-3})	Rawtenstall 5N (42 μgm^{-3})

Table B3.2 Roadside Sites in the North West & Merseyside

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BARROW-IN-FURNESS 1N	Barrow in Furness	R	A	9	24	19	17	19	16	16	18	21	22	28	9	**9**	**28**	**18**
BLACKBURN 1N	Blackburn with Darwen	R	A	54	42	33	41	36	44	36	35	43	54	70	67	**33**	**70**	**46**
BLACKPOOL 1N	Blackpool	R	A	43	21	13	24	14	37	26	26	22	22	34	33	**13**	**43**	**26**
BOLTON 1N	Bolton	R	A	34	64		29		51	45	38	57	46	28	83	**28**	**83**	**48**
BURNLEY 1N	Burnley	R	A	55	44	46	35	29	41	39	34	42	51	51	47	**29**	**55**	**43**
CARLISLE 1N	Carlisle	R	A	54	19	34	42	29		29		44	33	50	48	**19**	**54**	**38**
CHESTER 1N	Chester	R	A	41	47	41	41	11		41	22	33	33	39	43	**11**	**47**	**36**
CHORLEY 1N	Chorley	R	C	38	8	20	18	27	24	12	5	18	26	40	47	**5**	**47**	**24**
CONGLETON 1N	Congleton	R	A	36	37	41	37	37	33		33	32	32	34	44	**32**	**44**	**36**
WHITEHAVEN 1N	Copeland	R	A	43	25	31	32	27	13	17	14	24	22	24	35	**13**	**43**	**26**
ELLESMERE PORT 2N	Ellesmere Port	R	A	43	34	39	32	40	37	30	28	29	32	35	41	**28**	**43**	**35**
LYTHAM ST ANNES 1N	Fylde	R	A	25	29	25	40	34	27	34	31	10	21	25	29	**10**	**40**	**27**
ACCRINGTON 1N	Hyndburn	R	A	36		25	19	33	31	29	29	31	44	50	76	**19**	**76**	**37**
DOUGLAS IOM 1N	Isle of Man	R	A	19	34	44	40	36	36	28	34	33	18	40	32	**18**	**44**	**33**
PRESCOT 1N	Knowsley	R	A	55	43	51		47		40	47	52	36	38	47	**36**	**55**	**46**
LANCASTER 1N	Lancaster	R	A	69	44	32	68	59	55	35	41	34	41	59	69	**32**	**69**	**51**
MACCLESFIELD 8N	Macclesfield	R	A		45	46	53	20	21	24	32	50	28	34	53	**20**	**53**	**37**
MANCHESTER 1N	Manchester	R	A	73		63	69	68	46	60	104	112	101	100		**46**	**112**	**80**
OLDHAM 1N	Oldham	R	A	83	59	57	63	69	43	51	56	62				**43**	**83**	**60**
PRESTON 1N	Preston	R	A	37	35	30	30	22	33	28	24	14	41	37	37	**14**	**41**	**31**
ROCHDALE 1N	Rochdale	R	A	71		49	56	54	53		42		56			**42**	**71**	**54**
RAWTENSTALL 5N	Rossendale	R	C	12	55	58	54	50	49	34	32	41	41	45	34	**12**	**58**	**42**
SALFORD 14N	Salford	R	A	78	52	61	55	52	43	38	47				63	**38**	**78**	**54**
CROSBY 1N	Sefton	R	A	70	58	70	65	50	54	54	52	53	65	72	68	**50**	**72**	**61**
KENDAL 1N	South Lakeland	R	A		55	50	57	52	50	36	63		57	46	50	**36**	**63**	**52**
LEYLAND 1N	South Ribble	R	A	42	17	25	34	30	28	14	28				18	**14**	**42**	**26**
ST HELENS 8N	St Helens	R	A	69	63	57	44	44	52	15	44	61	48	69	82	**15**	**82**	**54**
STOCKPORT 14N	Stockport	R	A		92	86	71	87		82	72	32	80	88	82	**32**	**92**	**77**
DUKINFIELD 1N	Tameside	R	A	72	40	50	46	49	42	37			35	55	42	**35**	**72**	**47**
TRAFFORD 1N	Trafford	R	A	37	34	40	33	34	32	22	22				32	**22**	**40**	**32**
WARRINGTON 1N	Warrington	R	A	45	64	66	61	69	27	44	51	62	47	51	61	**27**	**69**	**54**
ORMSKIRK 1N	West Lancashire	R	A	51	40	44	53		40	35	35	43	45	52	66	**35**	**66**	**46**
LEIGH 1N	Wigan	R	A	60	55	45	46	52	37	42		44	49	31	56	**31**	**60**	**47**
BIRKENHEAD 1N	Wirral	R	A	38		44	28	37	31	40	35	35	19	46	49	**19**	**49**	**37**

REGIONAL SUMMARY		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	Regional Monthly Mean	48	43	43	43	41	37	35	38	40	41	47	50
	Regional Monthly Min	9	8	13	17	11	13	12	5	10	18	24	9
	Regional Monthly Max	83	92	86	71	87	55	82	104	112	101	100	83
	Regional Annual Mean	43											
	Regional Annual Min	18											
	Regional Annual Max	80											
	Number of Sites	34											
	% With Valid Data	100											

Figure B3.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in the North West & Merseyside**

3 The North West & Merseyside (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for the North West and Merseyside are shown in Figure B3.1. The validated 2000 dataset for the region is detailed in Table B3.4. No intermediate and urban background sites in the North West and Merseyside exceeded the EC Directive Limit or the Guide Value surrogate statistics. However, Table B3.3 below identifies all sampler locations with annual average NO_2 concentrations greater than 40 μgm^{-3}.

Table B3.3 Intermediate and Urban Background Sites in the North West and Merseyside with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3}
Air Quality Strategy Objective
NO_2 Annual Mean
Manchester 2N (42 μgm^{-3})

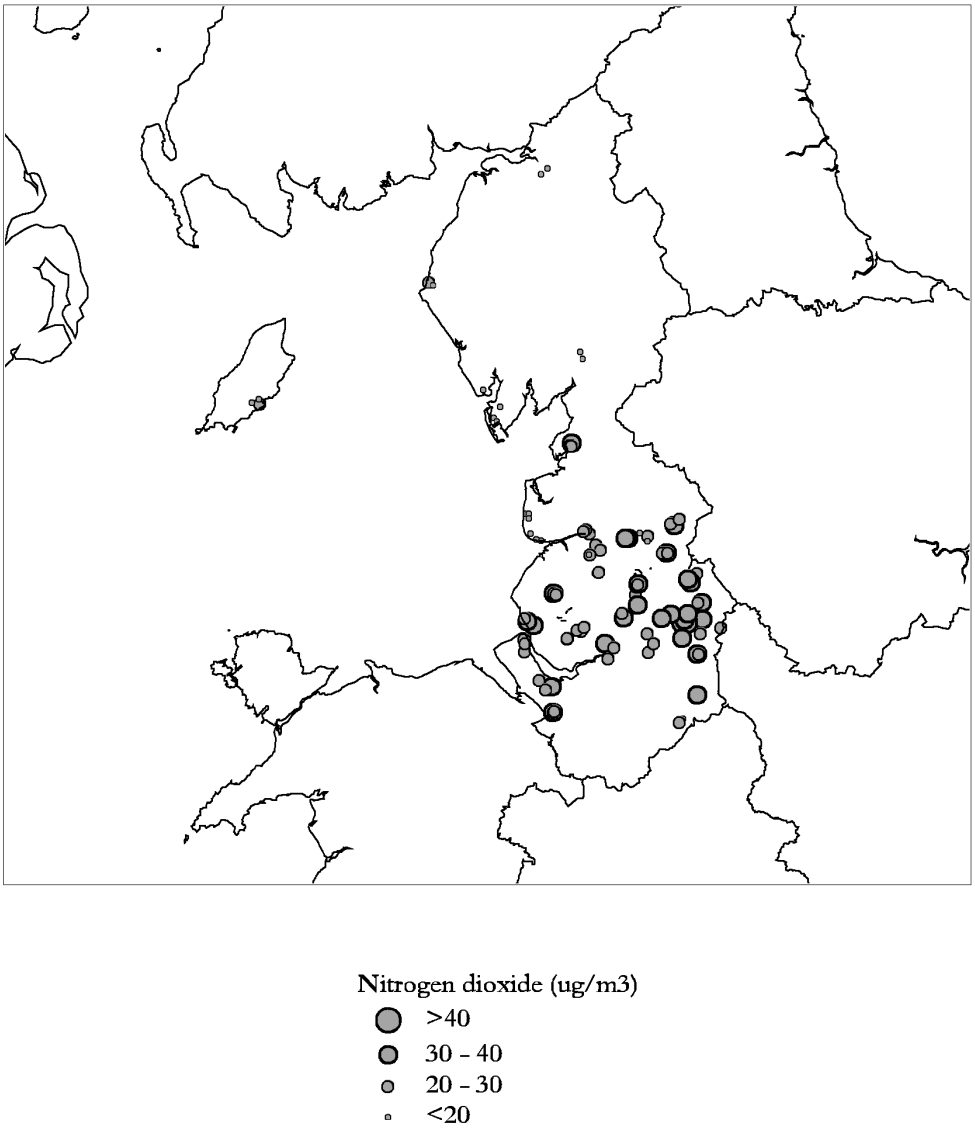
Table B3.4 Intermediate and Urban Background Sites in the North West & Merseyside

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BARROW-IN-FURNESS 2N	Barrow in Furness	I	C	22	21	16		12	15	11	13	18	17	23	30	**11**	**30**	**18**
BARROW-IN-FURNESS 3N	Barrow in Furness	B	A	22	9	12	13		10	10	9	12	16	22	26	**9**	**26**	**15**
BARROW-IN-FURNESS 4N	Barrow in Furness	B	A	15	11	10	11	8	9	7	9	12	12	14	14	**7**	**15**	**11**
BLACKBURN 2N	Blackburn with Darwen	I	C	47	34	32	33	29	27	22	24	25	35	42	49	**22**	**49**	**33**
BLACKBURN 3N	Blackburn with Darwen	B	A	42	33	26	29	26	28		22	31	38	45	47	**22**	**47**	**34**
BLACKBURN 4N	Blackburn with Darwen	B	A	37	27	55	29	21	23	18	21	25	33	40	50	**18**	**55**	**32**
BLACKPOOL 2N	Blackpool	I	C		17	18	19			16	16			21		**16**	**21**	**18**
BLACKPOOL 3N	Blackpool	B	A	51	19	7	16		14	15	15	15	6	21	33	**6**	**51**	**19**
BLACKPOOL 4N	Blackpool	B	A	26	15	17	14		19	12	12	15	22	25	25	**12**	**26**	**18**
BOLTON 6N	Bolton	B	A	28	29		30	23	17			21	21	28	36	**17**	**36**	**26**
BOLTON 7N	Bolton	I	C	33	46		37	27	36	25	25	32		52	58	**25**	**58**	**37**
BOLTON 8N	Bolton	B	A		38		31	20	25			26	32	23	28	**20**	**38**	**28**
BURNLEY 2N	Burnley	I	C	50	37	38	44	36	29	26	24	30	40	46	47	**24**	**50**	**37**
BURNLEY 3N	Burnley	B	A	39	31	26	25	18	22	15	20	20	29	34	34	**15**	**39**	**26**
BURNLEY 4N	Burnley	B	A	39	28	24	19	13	17	13	13	22	29	35	33	**13**	**39**	**24**
CARLISLE 2N	Carlisle	B	C	23	23	10	17	13	10	13	12	15	13	15	25	**10**	**25**	**16**
CARLISLE 3N	Carlisle	B	C	15	15	8	12	6	10	8	8	13	10	13	17	**6**	**17**	**11**
CHESTER 2N	Chester	I	C	43	26	27	27	46	20	49	21	23	19	29		**19**	**49**	**30**
CHESTER 3N	Chester	B	A	37	22	30	30	31	21	22	19	25	22	31	38	**19**	**38**	**27**
CHESTER 4N	Chester	B	A	40	28	26	26	27		19	18	19	22	26	30	**18**	**40**	**26**
CHORLEY 4N	Chorley	B	A	8	24	7	15	27	15	8	17	28	22	32	36	**7**	**36**	**20**
CHORLEY 5N	Chorley	I	C	31	24	18	16	25	23	9	18	21	23	39	62	**9**	**62**	**26**
CHORLEY 6N	Chorley	B	A	37	18	38	39	40	21	10	16	26	32	38	26	**10**	**40**	**28**
CONGLETON 3N	Congleton	B	A	24	21	22	13	17	31	13		17	20			**13**	**31**	**20**
CONGLETON 4N	Congleton	B	A	20	12	15		12	9	10	9		16	20	27	**9**	**27**	**15**
CONGLETON 5N	Congleton	I	C	33	29	40	22	19	19	20	20	23	20	29	35	**19**	**40**	**26**
WHITEHAVEN 2N	Copeland	I	C	31	39	36	35	27	24	17	20	22	23	26	31	**17**	**39**	**28**
WHITEHAVEN 3N	Copeland	B	A		8	15	17	11	11	8	11	13	12	13	20	**8**	**20**	**13**
WHITEHAVEN 4N	Copeland	B	A	12	10	10	12	5	5	4	7	8	11	11	19	**4**	**19**	**10**
ELLESMERE PORT 4N	Ellesmere Port	B	A	63	27	39	27	24	21	21	21	21	23	32	41	**21**	**63**	**30**
ELLESMERE PORT 5N	Ellesmere Port	I	C	34	17	27	31	16	15	26	20	24	22	26	28	**15**	**34**	**24**
ELLESMERE PORT 6N	Ellesmere Port	B	A	22	20	28	24	19	18	14	13	17	4	32	34	**4**	**34**	**20**
LYTHAM ST ANNES 2N	Fylde	I	C	15	19	13	21	15	12	13	13	15	19	27		**12**	**27**	**17**
LYTHAM ST ANNES 3N	Fylde	B	A	13	10	10	10	15	10	10	12	15	17	23	17	**10**	**23**	**13**
LYTHAM ST ANNES 4N	Fylde	B	A	23	19	10	12	17	13	10	13	13	19	23	23	**10**	**23**	**16**
ACCRINGTON 2N	Hyndburn	I	C	36	21	12	21	21	13	19	27	10	23	25	29	**10**	**36**	**21**
ACCRINGTON 4N	Hyndburn	B	A	19		13	12	23	13	10	12	13	13	19	23	**10**	**23**	**16**
RISHTON 3N	Hyndburn	B	A	21	21	12	21	19	17	15	21	19	29	27	10	**10**	**29**	**19**
DOUGLAS IOM 2N	Isle of Man	I	C	11	24	31	33	32	29		42	23	16	27	29	**11**	**42**	**27**
DOUGLAS IOM 3N	Isle of Man	B	A	10	26	15	17	16	19	7	12	18	4	22	23	**4**	**26**	**16**
DOUGLAS IOM 4N	Isle of Man	B	A	8	12	12	15	14	15	9	11	10		10	18	**8**	**18**	**12**
PRESCOT 3N	Knowsley	B	A	35	29	31	30	23	28	19	25	25	24	25	44	**19**	**44**	**28**
PRESCOT 4N	Knowsley	B	A	32	27	32	26	24	19	18	24	30	28	31	33	**18**	**33**	**27**
PRESCOT 5N	Knowsley	I	C	17	20	21	16	17		9	24	19	23	29	40	**9**	**40**	**21**
LANCASTER 2N	Lancaster	B	A	32	26	23	20	12	25	18	21	25	22	37	28	**12**	**37**	**24**
LANCASTER 3N	Lancaster	I	C	28	30	28	43	41		43	33	57	40	48	45	**28**	**57**	**40**
LANCASTER 4N	Lancaster	B	A	31	21	19	26	13	15	18	11	21	30	29	20	**11**	**31**	**21**
MACCLESFIELD 10N	Macclesfield	B	A	13	34	20	19	31	33	33	23	36	28	32	22	**13**	**36**	**27**
MACCLESFIELD 7N	Macclesfield	I	C	51	38	39	28	49	42	47	24	42	29	53	23	**23**	**53**	**39**
MANCHESTER 2N	Manchester	I	C	33		35	32	34	33	39	68	37	51	58	39	**32**	**68**	**42**
MANCHESTER 3N	Manchester	B	A	41		31	30	26	29	27	47	42	27	29	37	**26**	**47**	**33**
MANCHESTER 5N	Manchester	B	A	47		33	29	26	25	27	69	38	34	42	44	**25**	**69**	**38**

				Nitrogen Dioxide Concentrations 2000 (ugm^{-3})														
Site Name	**Local Authority**	**Location**	**Status**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Min**	**Max**	**Mean**
OLDHAM 2N	Oldham	I	C	60	42	45	28	41	5	22	42	52	55			**5**	**60**	**39**
OLDHAM 3N	Oldham	B	A		31	38	30	36	21		41	54	63			**21**	**63**	**39**
OLDHAM 4N	Oldham	B	A		22	26	18	25			30	31				**18**	**31**	**25**
PRESTON 2N	Preston	I	C	29	33	20	30	22	14	24	18	24	30	29	51	**14**	**51**	**27**
PRESTON 5N	Preston	B	A	29	18	18	22	19	15	21	17	24	22	29	29	**15**	**29**	**22**
PRESTON 6N	Preston	B	A			25	27		20	18	19	21	30	30	29	**18**	**30**	**24**
ROCHDALE 2N	Rochdale	I	C	37		26	27	23	24		26		29	35		**23**	**37**	**28**
ROCHDALE 3N	Rochdale	B	A	51		30	32	30	28		25		39			**25**	**51**	**34**
ROCHDALE 4N	Rochdale	B	A	40		30	27	23	25		23		38	41		**23**	**41**	**31**
RAWTENSTALL 6N	Rossendale	I	C	50	44	36	37	28	32	20	20	26	26	35	36	**20**	**50**	**33**
RAWTENSTALL 7N	Rossendale	B	C	29	25	21	22	16	15	11	11	15	15	25	36	**11**	**36**	**20**
RAWTENSTALL 8N	Rossendale	B	C	37	31	27	28	23	21	15	17	21	21	30	33	**15**	**37**	**25**
SALFORD 15N	Salford	I	C	55	41	36	32	31	28	18	28				43	**18**	**55**	**35**
SALFORD 16N	Salford	B	A		28	31	31	20	28						45	**20**	**45**	**31**
SALFORD 17N	Salford	B	A	58	44	18	35	33	24	8	10				52	**8**	**58**	**31**
BOOTLE 2N	Sefton	B	A		46	37	36	25	26	21	27	32	40	55	67	**21**	**67**	**37**
CROSBY 2N	Sefton	I	C	35	33	35		37	31	24	25		35	38	58	**24**	**58**	**35**
CROSBY 3N	Sefton	B	A	27	29	24	28	19	19	16	18	26	28	34		**16**	**34**	**24**
KENDAL 2N	South Lakeland	B	A		17	17	19	15	13	8	15		13	13	25	**8**	**25**	**16**
KENDAL 3N	South Lakeland	B	A			8		10		4	10		17	19	23	**4**	**23**	**13**
BAMBER BRIDGE 4N	South Ribble	B	A	30	23	35	29		13	9	24				17	**9**	**35**	**23**
LEYLAND 2N	South Ribble	I	C	21	25	24	31	24	25	16	25					**16**	**31**	**24**
LEYLAND 3N	South Ribble	B	A	35	20	18			17	9	20				18	**9**	**35**	**20**
ST HELENS 5N	St Helens	I	C	36	34	25	34	34	31	13	15	31	25	19	46	**13**	**46**	**29**
ST HELENS 6N	St Helens	B	A	33	27	27	34	34	29	10	19	25	23	33	46	**10**	**46**	**28**
ST HELENS 7N	St Helens	B	A	40	34	25	31	31	21	10	12	17	19	29	33	**10**	**40**	**25**
STOCKPORT 15N	Stockport	I	C		44	38	24	35	26	34	31	11	33	40	40	**11**	**44**	**32**
STOCKPORT 16N	Stockport	B	A		25	23	15	15	14	24	19	10	20	22	15	**10**	**25**	**18**
STOCKPORT 17N	Stockport	B	A		32	26	10	18	14	27	12	10	25	29	33	**10**	**33**	**21**
ASHTON UNDER LYNE 8N	Tameside	I	C	49	28	36	25	27	31	35			32	40	32	**25**	**49**	**34**
DENTON 9N	Tameside	B	A	50	29	34	23	24	22	26			30	33	26	**22**	**50**	**30**
HOLLINGWORTH 5N	Tameside	B	A	32	14	24	13	19	19	20			21	28	23	**13**	**32**	**21**
TRAFFORD 2N	Trafford	I	C	32	26	29	26	24	22	13	20				24	**13**	**32**	**24**
TRAFFORD 4N	Trafford	B	A	18	23	23	20	17	19		22				21	**17**	**23**	**20**
TRAFFORD 5N	Trafford	B	A	23	25	33	27	23	24	10	18				28	**10**	**33**	**23**
WARRINGTON 2N	Warrington	I	C	22	41	40	38			30	24		22	28	38	**22**	**41**	**32**
WARRINGTON 3N	Warrington	B	A	29	31	35	29	25	19	21	16	24	20	29	33	**16**	**35**	**26**
WARRINGTON 4N	Warrington	B	A	21	28	35	30	28	18	24	22	14	13	31	18	**13**	**35**	**24**
ORMSKIRK 2N	West Lancashire	I	C	35	30	31			30	21	25	29	34	38	54	**21**	**54**	**33**
ORMSKIRK 3N	West Lancashire	B	A	26	23	24	25		23	14	17	27	29	33	51	**14**	**51**	**27**
ORMSKIRK 5N	West Lancashire	B	A	25	23	19	22		23	13	14	22		29	39	**13**	**39**	**23**
LEIGH 2N	Wigan	I	C	51	38	38	33	27	24	23	25	34	39	40	44	**23**	**51**	**35**
LEIGH 4N	Wigan	B	A	40	30	27	26	23	23	19	20	27	35	35	38	**19**	**40**	**29**
LEIGH 6N	Wigan	B	A		33	29	27	21	20	21	18	25	32	38	40	**18**	**40**	**28**
BIRKENHEAD 2N	Wirral	I	C	25		24	31	20	16	21	26	23	19	32	36	**16**	**36**	**25**
LISCARD 4N	Wirral	B	A	23		29			20	20	16	27	21	35	53	**16**	**53**	**27**
WALLASEY 9N	Wirral	B	A	30		32	23		22	23	13	32	22	36	41	**13**	**41**	**27**

Figure B3.1 **Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in the North West & Merseyside**



4 Yorkshire and the Humber (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for Yorkshire and the Humber are shown in Figure B4.0. The validated 2000 dataset for the region is detailed in Table B4.2. Tables B4.0 and B4.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3}, and greater than 40μgm^{-3}, respectively.

Table B4.0 Roadside Sites in Yorkshire and the Humber with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Doncaster 1N (64 μgm^{-3})	*As for 61 μgm^{-3} plus* Rotherham 5N (58 μgm^{-3}) Selby 7N (57 μgm^{-3}) York 1N (54 μgm^{-3}) Hull 1N (50 μgm^{-3})

Table B4.1 Roadside Sites in Yorkshire and the Humber with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*	
Doncaster 1N (64 μgm^{-3})	Wakefield 1N (44 μgm^{-3})
Rotherham 5N (58 μgm^{-3})	Great Grimsby 1N (44 μgm^{-3})
Selby 7N (57 μgm^{-3})	Scarborough 1N (42 μgm^{-3})
York 1N (54 μgm^{-3})	Northallerton 1N (42 μgm^{-3})
Hull 1N (50 μgm^{-3})	Leeds 5N (42 μgm^{-3})
Goole 1N (46 μgm^{-3})	Barnsley 1N (41 μgm^{-3})
Hebden Bridge 1N (44 μgm^{-3})	

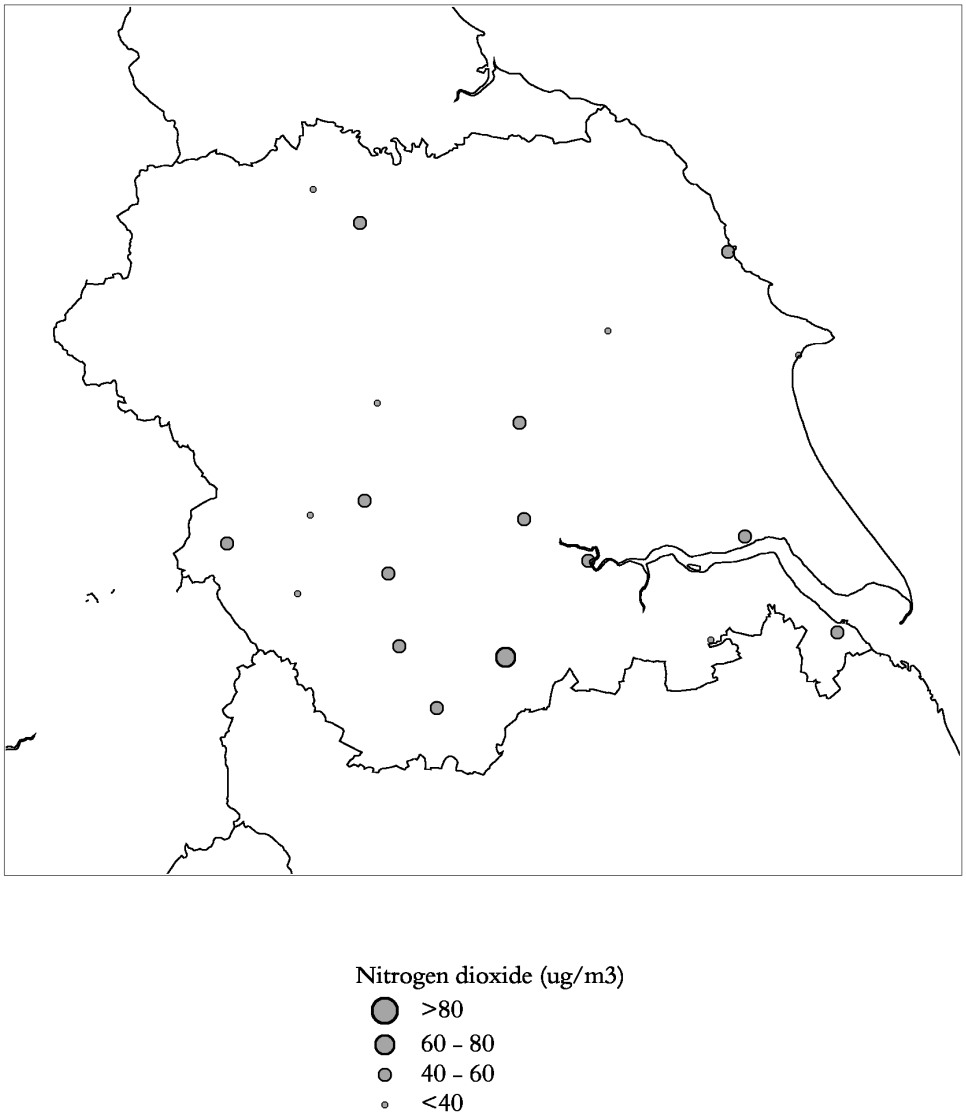
Table B4.2 Roadside Sites in Yorkshire and the Humber

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BARNSLEY 1N	Barnsley	R	A	49	40	43	45	41	35	39	29	36	41	49	45	**29**	**49**	**41**
BRADFORD 1N	Bradford	R	A	42	25	21	34	21	23	23	33	50	55	73	61	**21**	**73**	**38**
HALIFAX 5N	Calderdale	R	A												65	**65**	**65**	
HEBDEN BRIDGE 1N	Calderdale	R	A	57	46	48	44	36	46	33	33	40	46	55	50	**33**	**57**	**44**
YORK 1N	City of York Council	R	A	33	61	55	31	47	50	39	58	62	68	71	70	**31**	**71**	**54**
DONCASTER 1N	Doncaster	R	A	58	55	100	68	63	57	24	60	64	70	71	73	**24**	**100**	**64**
BRIDLINGTON 1N	East Riding of Yorkshire	R	A	42	41	33	40	30	34	36	34	36	40	46	34	**30**	**46**	**37**
GOOLE 1N	East Riding of Yorkshire	R	A	55	53	42	43	42	40	38	33	45	50	55	52	**33**	**55**	**46**
NORTHALLERTON 1N	Hambleton	R	A	46	48	39	43	40	33	36	37	39	46	45	48	**33**	**48**	**42**
HARROGATE 1N	Harrogate	R	A	29	63	40	15	25	34	31	41	29	46	49	35	**15**	**63**	**37**
HULL 1N	Kingston Upon Hull	R	A	73	61	61	50	52	53	49	36	21	58	60	27	**21**	**73**	**50**
HUDDERSFIELD X 1N	Kirklees	R	A	37	41	42	16	18	45		41	15	25	31	32	**15**	**45**	**31**
LEEDS 1N	Leeds	R	C	33												**33**	**33**	
LEEDS 5N	Leeds	R	A		21	25	29	61	50	42		52			54	**21**	**61**	**42**
GREAT GRIMSBY 1N	NE Lincolnshire	R	A	55	50	44	46	42	40	42	36	31	50	52	40	**31**	**55**	**44**
BRIGG 1N	North Lincolnshire	R	A	49	40	39	24	20	18	20	21	22	34	38	36	**18**	**49**	**30**
RICHMOND N.YORKS 2N	Richmondshire	R	A	25	11	19	20	10	13	20	22	28	23	27	29	**10**	**29**	**21**
ROTHERHAM 5N	Rotherham	R	A	62	68	57		59	56	52	42	57	59	65	58	**42**	**68**	**58**
MALTON 1N	Ryedale	R	A	39		37	44	34	41	38	48	26				**26**	**48**	**38**
SCARBOROUGH 1N	Scarborough	R	A	47	46	36	36	35	22	28	27	42	64	67	54	**22**	**67**	**42**
SELBY 7N	Selby	R	A	61	67	67	53	51	55	61	50	47			54	**47**	**67**	**57**
WAKEFIELD 1N	Wakefield	R	A	27	19	15	65	65	36	46	54	48	53	55	50	**15**	**65**	**44**

REGIONAL SUMMARY		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	Regional Monthly Mean	46	45	43	39	40	39	37	39	40	49	53	48
	Regional Monthly Min	25	11	15	15	10	13	20	21	15	23	27	27
	Regional Monthly Max	73	68	100	68	65	57	61	60	64	70	73	73
	Regional Annual Mean	43											
	Regional Annual Min	21											
	Regional Annual Max	64											
	Number of Sites	22											
	% With Valid Data	91											

Figure B4.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in Yorkshire & the Humber**



4 Yorkshire & the Humber (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for Yorkshire and the Humber are shown in Figure B4.1. The validated 2000 dataset for the region is detailed in Table B4.5. Tables B4.3 and B4.4 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3}, and greater than 40μgm^{-3}, respectively.

Table B4.3 Intermediate and Urban Background Sites in Yorkshire and the Humber with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	None	Doncaster 5N (50 μgm^{-3}) Halifax 3N (48 μgm^{-3})

Table B4.4 Intermediate and Urban Background Sites in Yorkshire and the Humber with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective* NO_2 *Annual Mean*
Doncaster 5N (50 μgm^{-3})
Halifax 3N (48 μgm^{-3})
Rotherham 3N (45 μgm^{-3})
Rotherham 2N (44 μgm^{-3})
Doncaster 3N (41 μgm^{-3})
Barnsley 5N (41 μgm^{-3})
Rotherham 6N (41 μgm^{-3})
Hull 2N (41 μgm^{-3})

Table B4.5 Intermediate and Urban Background Sites in Yorkshire and the Humber

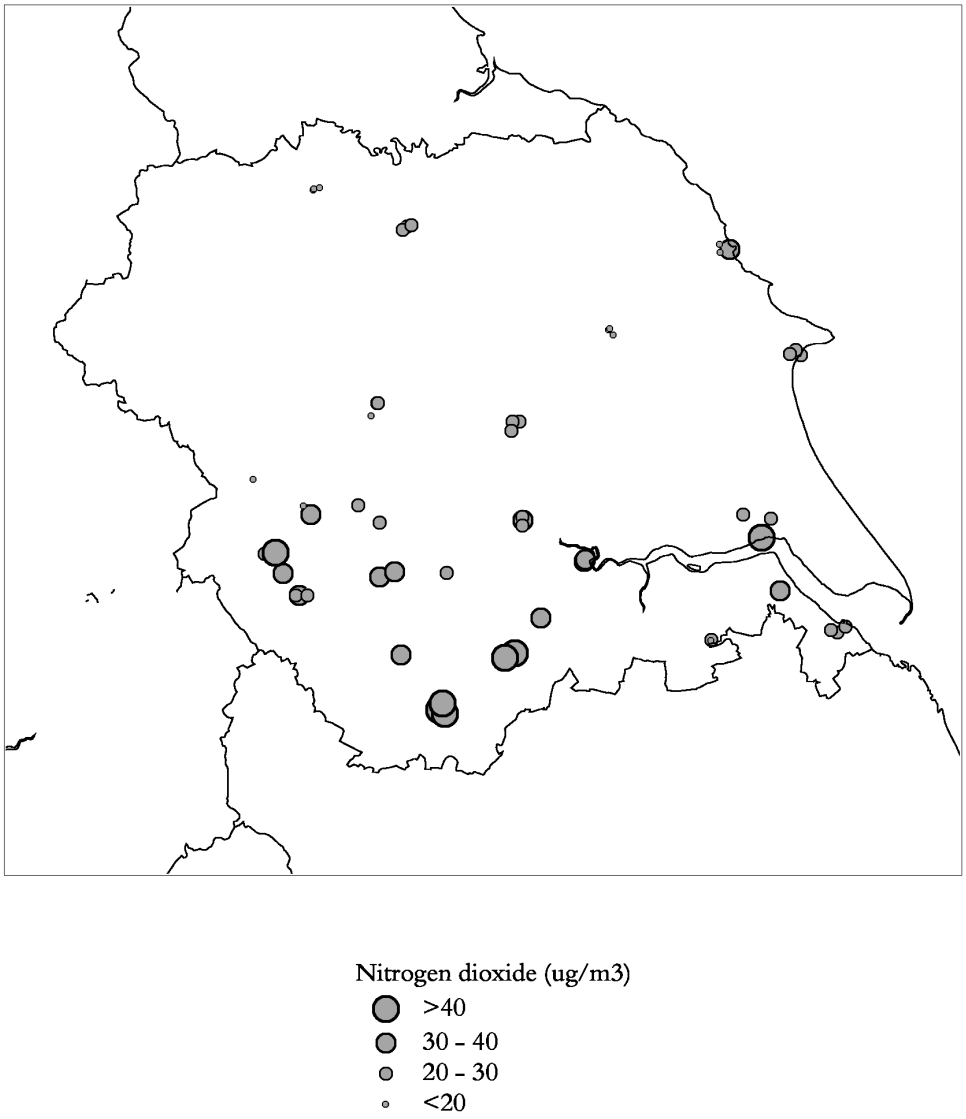
				Nitrogen Dioxide Concentrations 2000 (ugm^{-3})														
Site Name	**Local Authority**	**Location**	**Status**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Min**	**Max**	**Mean**
BARNSLEY 4N	Barnsley	B	A	46	32	35	44	30	30	27	24	33	36	45	45	**24**	**46**	**36**
BARNSLEY 5N	Barnsley	I	C	53	40	41	44	40	30	34	28	42	40	50	48	**28**	**53**	**41**
BARNSLEY 6N	Barnsley	B	A	44	41	37	44	32	35	33	34	37	41	50	50	**32**	**50**	**40**
BRADFORD 2N	Bradford	I	C	27		21	15	23	29	17	23	48	46	50	50	**15**	**50**	**32**
BRADFORD 3N	Bradford	B	A	17	12	12		8	12	12		31	27	25	33	**8**	**33**	**19**
BRADFORD 4N	Bradford	B	A	15	10	8	8	10	10	6	10	21	21	29	36	**6**	**36**	**15**
ELLAND 4N	Calderdale	B	A	40	33	33	40	29	29	27	27	34	33	42	38	**27**	**42**	**34**
HALIFAX 2N	Calderdale	B	A	25	27	29	33	27	29	21	21	31	31	38	38	**21**	**38**	**29**
HALIFAX 3N	Calderdale	I	C	50	50	46	52	52	44	42	42	50	50			**42**	**52**	**48**
YORK 2N	City of York Council	I	C	37	40	22	12	11	16	16	27		42	31	42	**11**	**42**	**27**
YORK 3N	City of York Council	B	A	42	25	20	25	8	12	13	9	31	38	18	36	**8**	**42**	**23**
YORK 5N	City of York Council	B	A	35	22	30	39	20	5	13	12		30	7	30	**5**	**39**	**22**
DONCASTER 3N	Doncaster	B	A	50	45	39	50	28	25	61	31	42	33	48	45	**25**	**61**	**41**
DONCASTER 4N	Doncaster	B	A	37	45	28	25	19	19	43	21	33	41	40	40	**19**	**45**	**33**
DONCASTER 5N	Doncaster	I	C	61	57		47	42	42	19			59	68	57	**19**	**68**	**50**
BRIDLINGTON 2N	East Riding of Yorkshire	I	C	37	33	27			22	15	23	27	34	40	36	**15**	**40**	**29**
BRIDLINGTON 3N	East Riding of Yorkshire	B	A	30	25	23	22	16	14	12	15	22	27	34	34	**12**	**34**	**23**
BRIDLINGTON 4N	East Riding of Yorkshire	B	A	29	21	20	20	15	14	13	14	21	28	34	29	**13**	**34**	**22**
GOOLE 5N	East Riding of Yorkshire	B	A	48	43	33	24	24	23	20	19	32	38	40	36	**19**	**48**	**32**
GOOLE 6N	East Riding of Yorkshire	B	A	44	40	28	24	23	19	19	23	32	43	44	8	**8**	**44**	**29**
GOOLE 7N	East Riding of Yorkshire	I	C	48	43	37	27	26	23	22	24	32	47	44	33	**22**	**48**	**34**
NORTHALLERTON 2N	Hambleton	I	C	35	30	24	24	22	16	19	18	23	29	30	41	**16**	**41**	**26**
NORTHALLERTON 4N	Hambleton	B	A	27	23	20	23	19	14	12	15	24	27	29	30	**12**	**30**	**22**
NORTHALLERTON 5N	Hambleton	B	A	27	24	19	15	19	11	14	12	22	26	28	35	**11**	**35**	**21**
HARROGATE 2N	Harrogate	I	C	32	41	29	11	16	18	19	26	17	27	37	29	**11**	**41**	**25**
HARROGATE 3N	Harrogate	B	A	23	31	19	7	9	16	16	18	25	26	43	26	**7**	**43**	**22**
HARROGATE 5N	Harrogate	B	A	24	23	21	9	9	14	17	16	5	18	16	14	**5**	**24**	**16**
HULL 2N	Kingston Upon Hull	I	C	59	47	51	37	39	32	31	34	33	43	44	36	**31**	**59**	**41**
HULL 5N	Kingston Upon Hull	B	A	37	36	16	20	17	14	14	16	25	34	35	29	**14**	**37**	**24**
HULL 6N	Kingston Upon Hull	B	A		34	17	18	16	12	14	17	25	31	23	29	**12**	**34**	**21**
HUDDERSFIELD X 2N	Kirklees	I	C	50	53	35	14	13	35		33	33	26	24	14	**13**	**53**	**30**
HUDDERSFIELD X 3N	Kirklees	B	A	25	33	32	7	15	17		24	12	12	33	33	**7**	**33**	**22**
HUDDERSFIELD X 4N	Kirklees	B	A	37	41	30	9	15	23		32	26	30	24	23	**9**	**41**	**26**
LEEDS 2N	Leeds	I	C	13	10	17	25	27	40	23	13	31				**10**	**40**	**22**
LEEDS 3N	Leeds	B	A	15	10	10	17	31	29	25	17	31			40	**10**	**40**	**22**
GREAT GRIMSBY 2N	NE Lincolnshire	I	C	33	31	27	21	19	13	19	17	23	19	34	24	**13**	**34**	**23**
GREAT GRIMSBY 3N	NE Lincolnshire	B	A	40	34	31	21	19	15	19	21		19	37	31	**15**	**40**	**26**
GREAT GRIMSBY 4N	NE Lincolnshire	B	A	25	23	23		15	13	17	15	23	24	33	25	**13**	**33**	**22**
BRIGG 2N	North Lincolnshire	I	C	46	31	37	24	19	18	22	23	4		38	28	**4**	**46**	**26**
BRIGG 3N	North Lincolnshire	B	A	39	25	31	10	13	11	16	17	17	23	17	16	**10**	**39**	**20**
KILLINGHOLME 4N	North Lincolnshire	B	A	20	85	69	17	13	26	16	13	22	24			**13**	**85**	**31**
RICHMOND N.YORKS 1N	Richmondshire	I	C	11	7	10	17	18	28	11	11	16	15	7	21	**7**	**28**	**14**
RICHMOND N.YORKS 3N	Richmondshire	B	C	15	7	10	11		13	9	10	10	14	20	26	**7**	**26**	**13**
RICHMOND N.YORKS 6N	Richmondshire	B	A	12	4	7	13	18	9	6	7	13	16	22	22	**4**	**22**	**12**
ROTHERHAM 2N	Rotherham	I	C	51	47	46	45	40			31	44	44	45	45	**31**	**51**	**44**
ROTHERHAM 3N	Rotherham	B	A	53	51	49	51	38		39	31				44	**31**	**53**	**45**
ROTHERHAM 6N	Rotherham	B	A	48	47	45	41	36	32	35	28	39	45	49	42	**28**	**49**	**41**
MALTON 5N	Ryedale	I	C	24	23	15	21	13	16	11	17					**11**	**24**	**18**
MALTON 8N	Ryedale	B	A	20	15	8	18	10	8	5	10	14				**5**	**20**	**12**
MALTON 9N	Ryedale	B	A	25	19	7	14		9	9	13	16				**7**	**25**	**14**
SCARBOROUGH 2N	Scarborough	I	C	39	42	18	25	27	14	19	26	26	40	56	39	**14**	**56**	**31**
SCARBOROUGH 4N	Scarborough	B	A	25	16	15	14	8	6	7	7	16	8	31	24	**6**	**31**	**15**

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
SCARBOROUGH 6N	Scarborough	B	A	28	22	15	13	9		8		9	28	25	26	**8**	**28**	**18**
SELBY 2N	Selby	I	C	42	40	36	30	24	22	23	27	30			42	**22**	**42**	**32**
SELBY 3N	Selby	B	A	40	41	35	28	17	17	14	25	30			46	**14**	**46**	**29**
SELBY 9N	Selby	B	A	33	35	26	22	17	14	13	16	28			41	**13**	**41**	**25**
PONTEFRACT 1N	Wakefield	B	A	21	8	13	27	23		21	17	25	27	34	33	**8**	**34**	**23**
WAKEFIELD 2N	Wakefield	I	C	19	17	13	42	40	27	31	27	33	33	42	40	**13**	**42**	**30**
WAKEFIELD 3N	Wakefield	B	A	34	19	10	34	31	25	27	25	34	40	44	48	**10**	**48**	**31**

REGIONAL SUMMARY		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Regional Monthly Mean	34	31	26	25	22	20	20	21	26	31	35	34
	Regional Monthly Min	11	4	7	7	8	5	5	7	4	8	7	8
	Regional Monthly Max	61	85	69	52	52	44	61	42	50	59	68	57
	Regional Annual Mean	27											
	Regional Annual Min	12											
	Regional Annual Max	50											
	Number of Sites	59											
	% With Valid Data	100											

Figure B4.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in Yorkshire & the Humber



5 The East Midlands (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for the East Midlands are shown in Figure B5.0. The validated 2000 dataset for the region is detailed in Table B5.2. Tables B5.0 and B5.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3}, and greater than 40μgm^{-3}, respectively.

Table B5.0 Roadside Sites in the East Midlands with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Rushden 1N (68 μgm^{-3})	*As for 61 μgm^{-3} plus*
	Long Eaton 1N (62 μgm^{-3})	Grantham 11N (57 μgm^{-3})
	Lincoln 3N (62 μgm^{-3})	Derby 7N (55 μgm^{-3})
	Ashfield 7N (62 μgm^{-3})	Harborough 1N (54 μgm^{-3})
		Blaby 1N (53 μgm^{-3})
		Newark 1N (53 μgm^{-3})
		Arnold 1N (51 μgm^{-3})
		Matlock 5N (51 μgm^{-3})
		Wellingborough 1N (49 μgm^{-3})
		Loughborough 1N (48 μgm^{-3})
		Buxton Derbyshire 1N (48 μgm^{-3})

Table B5.1 Roadside Sites in the East Midlands with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*	
Rushden 1N (68 μgm^{-3})	Arnold 1N (51 μgm^{-3})
Long Eaton 1N (62 μgm^{-3})	Matlock 5N (51 μgm^{-3})
Lincoln 3N (62 μgm^{-3})	Wellingborough 1N (49 μgm^{-3})
Ashfield 7N (62 μgm^{-3})	Loughborough 1N (48 μgm^{-3})
Grantham 11N (57 μgm^{-3})	Buxton Derbyshire 1N (48 μgm^{-3})
Derby 7N (55 μgm^{-3})	Stamford 1N (43 μgm^{-3})
Harborough 1N (54 μgm^{-3})	Bolsover 1N (42 μgm^{-3})
Blaby 1N (53 μgm^{-3})	Leicester 1N (42 μgm^{-3})
Newark 1N (53 μgm^{-3})	

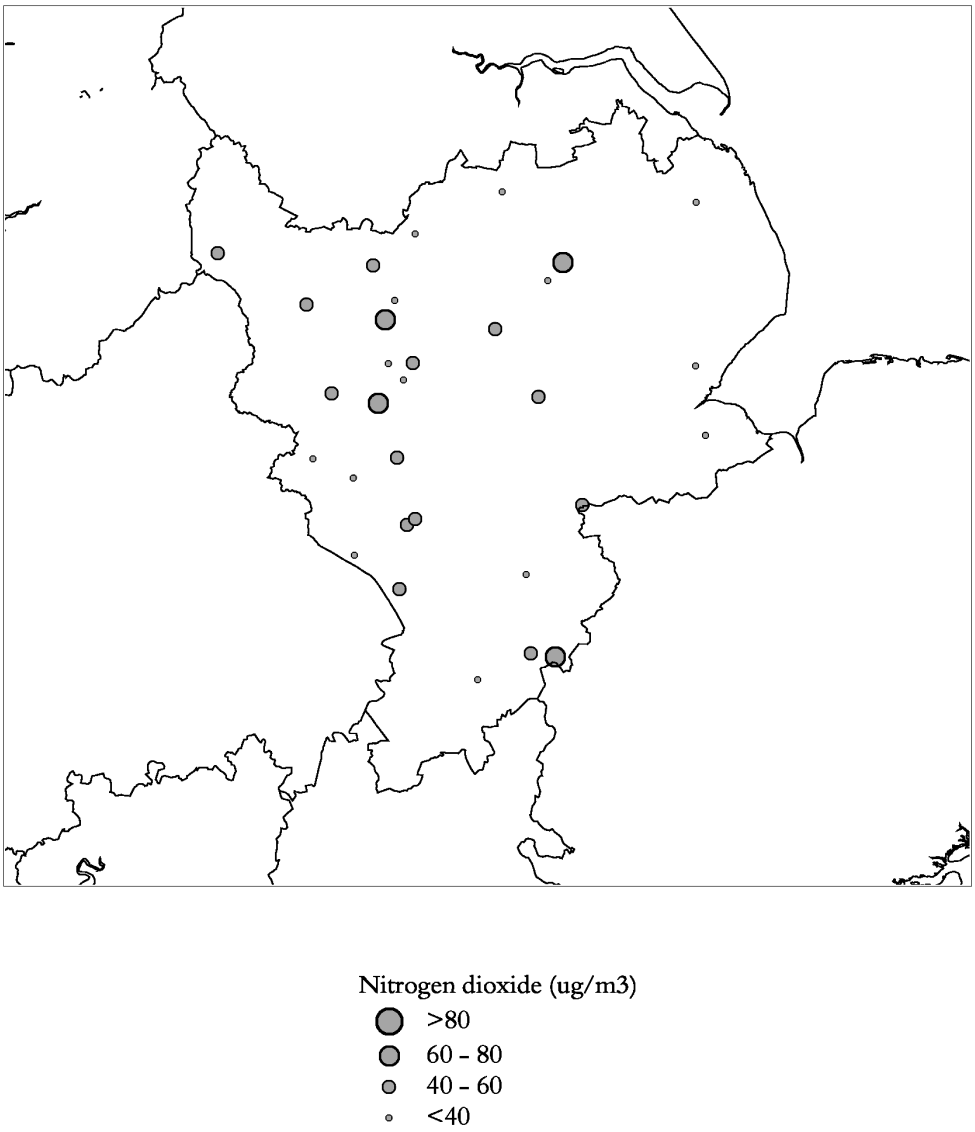
Table B5.2 Roadside Sites in the East Midlands

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
ASHFIELD 7N	Ashfield	R	A	78	60	66	62	52	55	57	56	56	71	72	61	**52**	**78**	**62**
WORKSOP 1N	Bassetlaw	R	C	26	29	26	32	31	37		36	27	45	48	43	**26**	**48**	**35**
BLABY 1N	Blaby	R	A	67	57	53	48				42	45	52	62	51	**42**	**67**	**53**
BOLSOVER 1N	Bolsover	R	C	48	39	42			34	36	35	45	45	50	50	**34**	**50**	**42**
BOSTON 1N	Boston	R	A	40	37	11	31	35	62	33	38	35	33	41	49	**11**	**62**	**37**
BROXTOWE 1N	Broxtowe	R	A	33	27	33	45	41	34	32	34	41	39	39	39	**27**	**45**	**37**
LOUGHBOROUGH 1N	Charnwood	R	A	30	40	42	43	48	52	45	53	61	61	50	50	**30**	**61**	**48**
CORBY 1N	Corby	R	A	45	25	14	38	37	33	31	34	34	34	38	40	**14**	**45**	**34**
DERBY 7N	Derby City	R	A	76	52	62	55	62	40	46	57	42	48	53	63	**40**	**76**	**55**
MATLOCK 5N	Derbyshire Dales	R	A			53	48	43		44		57	52	57	53	**43**	**57**	**51**
LOUTH 5N	East Lindsey	R	A	41	30	26	29	39	31	32		31	37	31	25	**25**	**41**	**32**
RUSHDEN 1N	East Northamptonshire	R	A	84	80	57	62		63	55	56	67	74	76	69	**55**	**84**	**68**
LONG EATON 1N	Erewash	R	A	70	66	63	69	54	63	53	54	51	70	64	74	**51**	**74**	**62**
ARNOLD 1N	Gedling	R	A	64	59	51	64	45	53	40	35	48	46	58	53	**35**	**64**	**51**
HARBOROUGH 1N	Harborough	R	A	65	40	55	57	57	52		42			65	48	**40**	**65**	**54**
BUXTON DERBYSHIRE 1N	High Peak	R	A	52	47	54	28		49	66	40	51	42	38	55	**28**	**66**	**48**
HINCKLEY 1N	Hinckley & Bosworth	R	A	42	25	55	42	44	25	38	40	27	42	42		**25**	**55**	**38**
LEICESTER 1N	Leicester City	R	A	31	63	67	10	44	38			44				**10**	**67**	**42**
LINCOLN 3N	Lincoln	R	A	73	78	67	58	60	59	53	56	56	66	69	54	**53**	**78**	**62**
MANSFIELD 1N	Mansfield	R	A	26	21	18	33	31	29	28	28	32	34	37	33	**18**	**37**	**29**
MANSFIELD 5N	Mansfield	R	A												35	**35**	**35**	
NEWARK 1N	Newark	R	A	71		56	47	44	46		43	49		67	50	**43**	**71**	**53**
NORTH HYKEHAM 1N	North Kesteven	R	A	33	17	19	38	38	36	36	38	44	27	42	50	**17**	**50**	**35**
NORTHAMPTON 1N	Northampton	R	A	15	48	37	47	29	20	32	37	42	36	32	43	**15**	**48**	**35**
NOTTINGHAM 1N	Nottingham	R	A	46	27	42	42	40	33	33	31	40	34	40	38	**27**	**46**	**37**
COALVILLE 1N	NW Leicestershire	R	A		50	68	32	32			25		30	38	21	**21**	**68**	**37**
SWADLINCOTE 2N	South Derbyshire	R	A	45	39	50	46		25		33	42	30	38	41	**25**	**50**	**39**
SPALDING 2N	South Holland	R	A	28	20	23	19	17	8	16	16	19	17	27	29	**8**	**29**	**20**
GRANTHAM 11N	South Kesteven	R	A	57	42	56	54	61	49	51	62	52	75	63	62	**42**	**75**	**57**
STAMFORD 1N	South Kesteven	R	A	43		46	48	41	38	42	42	39	40	46	42	**38**	**48**	**43**
WELLINGBOROUGH 1N	Wellingborough	R	A	58	45	54	49	45		48	47	46	49	52	49	**45**	**58**	**49**
GAINSBOROUGH 1N	West Lindsey	R	A	47	34	42	37	34	33			42	46	42	41	**33**	**47**	**40**

REGIONAL SUMMARY		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Regional Monthly Mean	49	43	45	44	42	41	41	41	44	46	49	47
	Regional Monthly Min	15	17	11	10	17	8	16	16	19	17	27	21
	Regional Monthly Max	84	80	68	69	62	63	66	62	67	75	76	74
	Regional Annual Mean	45											
	Regional Annual Min	20											
	Regional Annual Max	68											
	Number of Sites	32											
	% With Valid Data	97											

Figure B5.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in the East Midlands**



5 The East Midlands (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for the East Midlands are shown in Figure B5.1. The validated 2000 dataset for the region is detailed in Table B5.5. Tables B5.3 and B5.4 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3}, and greater than 40μgm^{-3}, respectively.

Table B5.3 Intermediate and Urban Background Sites in the East Midlands with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	*Sites ≥ 61μgm^{-3}* *EC Directive 98%ile Guide Value Surrogate Statistic*	*Sites ≥ 47 μgm^{-3}* *EC Directive 50%ile Limit Value Surrogate Statistic*
None	None	Matlock 6N (55 μgm^{-3}) Blaby 2N (50 μgm^{-3}) Derby 2N (47 μgm^{-3})

Table B5.4 Intermediate and Urban Background Sites in the East Midlands with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective* *NO_2 Annual Mean*
Matlock 6N (55 μgm^{-3})
Blaby 2N (50 μgm^{-3})
Derby 2N (47 μgm^{-3})
Blaby 3N (44 μgm^{-3})
Blaby 4N (43 μgm^{-3})
Arnold 2N (41 μgm^{-3})
Grantham 12N (41 μgm^{-3})
Nottingham 2N (41 μgm^{-3})

Table B5.5 Intermediate and Urban Background Sites in the East Midlands

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
ASHFIELD 2N	Ashfield	B	A	46	41	37	38	29	29	28	30	36	44	48	46	**28**	**48**	**38**
ASHFIELD 4N	Ashfield	B	A	45	33	36	36	29	30	27	34	39	44	45	45	**27**	**45**	**37**
ASHFIELD 6N	Ashfield	I	C	54	40	37	32	26	25	23	26	34	43	51	48	**23**	**54**	**37**
WORKSOP 2N	Bassetlaw	I	C	27	15	28	23	23	22	26	25	30	35	34	34	**15**	**35**	**27**
WORKSOP 4N	Bassetlaw	B	C	27	29	21	19		20	15	24	25	29	34	37	**15**	**37**	**25**
WORKSOP 5N	Bassetlaw	B	C	14	18	21	13	14	15	21	21	24	33	35	33	**13**	**35**	**22**
BLABY 2N	Blaby	I	C	56	50	52	53				38	48	49	56	52	**38**	**56**	**50**
BLABY 3N	Blaby	B	A	49	52	46	40				51	31	40	49	41	**31**	**52**	**44**
BLABY 4N	Blaby	B	A	48	38	43	48				26	48	43	49	48	**26**	**49**	**43**
BOLSOVER 2N	Bolsover	I	C	45	39	39			32	31	32	40	40	45	39	**31**	**45**	**38**
BOLSOVER 3N	Bolsover	B	A	44	38	39			26	23		34	34	44	40	**23**	**44**	**36**
BOLSOVER 4N	Bolsover	B	A	47	46	39			23	27	25	39	39	46	44	**23**	**47**	**38**
BOSTON 2N	Boston	I	C	35	35	36	17	20	17	21	33		37	23	30	**17**	**37**	**28**
BOSTON 3N	Boston	B	A	34	39	20	18	19	11	19	19	17	27	39	25	**11**	**39**	**24**
BOSTON 5N	Boston	B	A	26	24	23	14	15	10	14	12	21	26	12	24	**10**	**26**	**18**
BROXTOWE 2N	Broxtowe	I	C	27	27	23	22	19	20	17	19	24	24	25	29	**17**	**29**	**23**
BROXTOWE 3N	Broxtowe	B	A	29	13	23	25	28	22	20	24	21	33	32	32	**13**	**33**	**25**
BROXTOWE 4N	Broxtowe	B	C	23	15	24	29	21	25	19	22	24	30	33	36	**15**	**36**	**25**
LOUGHBOROUGH 4N	Charnwood	B	A	22	18	10	15	17	16	13	18	20	25	35	24	**10**	**35**	**20**
LOUGHBOROUGH 5N	Charnwood	B	A				19	17	17	12	16	17	24	38	34	**12**	**38**	**21**
LOUGHBOROUGH 6N	Charnwood	I	C	26	13	17	17		18	13	18		26	21	38	**13**	**38**	**21**
CORBY 2N	Corby	I	C	27	17	9	18	17	16	15	15	20	24	26	25	**9**	**27**	**19**
CORBY 3N	Corby	B	A	32	24	14	20	18	16	16	19	24	31	32	31	**14**	**32**	**23**
CORBY 4N	Corby	B	A	29	21	19	25	20	22	21	22	27	21	37	28	**19**	**37**	**24**
DERBY 2N	Derby City	I	C	68	62	38		32	32	36	37	38	41	61	66	**32**	**68**	**47**
DERBY 5N	Derby City	B	A	48	41	32	26	29	22	19	23	28	29	37	34	**19**	**48**	**31**
DERBY 6N	Derby City	B	A	47		35	27	25		22	22	11	24	37	29	**11**	**47**	**28**
MATLOCK 6N	Derbyshire Dales	I	C	40	39	42	47	28		31			94		115	**28**	**115**	**55**
MATLOCK 7N	Derbyshire Dales	B	A	24	19	23	18	17		15	16	24	21	24	30	**15**	**30**	**21**
MATLOCK 8N	Derbyshire Dales	B	A	30	23	26	18	19		16	15	26	21	26	32	**15**	**32**	**23**
LOUTH 2N	East Lindsey	I	C	29		19	15	11	13	14						**11**	**29**	**17**
LOUTH 3N	East Lindsey	B	A	30	18	17	13	7	9	5		23	21	23	24	**5**	**30**	**17**
LOUTH 4N	East Lindsey	B	C				7									**7**	**7**	
RUSHDEN 2N	East Northamptonshire	I	C	42	29	31	23	16	22	20	22	23	29	34	37	**16**	**42**	**27**
RUSHDEN 3N	East Northamptonshire	B	A	47	32	20		11	16	17	16		33	35	35	**11**	**47**	**26**
RUSHDEN 4N	East Northamptonshire	B	A	37	23	37		12	17	18			25	31	36	**12**	**37**	**26**
LONG EATON 2N	Erewash	I	C	50	43	43	36	31	34	33	32	38	49	41	46	**31**	**50**	**40**
LONG EATON 3N	Erewash	B	A	53	53	44	32	26	24	30	28	30	44	49	50	**24**	**53**	**39**
LONG EATON 4N	Erewash	B	A	46	41	34	29	24	23	24	22	33	41	39	45	**22**	**46**	**33**
ARNOLD 2N	Gedling	I	C	59	47		32	31	31	33	35	34	43	55	52	**31**	**59**	**41**
CARLTON 3N	Gedling	B	A	58	45	36	29	20	27		26	33	38	50	44	**20**	**58**	**37**
CARLTON 4N	Gedling	B	A	54	49	32	24	4	24	19	26	29	34	40	33	**4**	**54**	**31**
HARBOROUGH 2N	Harborough	I	C	34	17	19	19	15	17	25	25	25	18	34	31	**15**	**34**	**23**
HARBOROUGH 3N	Harborough	B	A	29	12	17	17	15	13	12	15	17	18	31	25	**12**	**31**	**18**
HARBOROUGH 4N	Harborough	B	A	31	17	15	13	13	12	27	27	27	15	29	25	**12**	**31**	**21**
BUXTON DERBYSHIRE 2N	High Peak	I	C	27	11	19		23	21	23	16	14	20	25	26	**11**	**27**	**20**
BUXTON DERBYSHIRE 4N	High Peak	B	A	19	20	20	23	19	15	18	13	13	17	23	25	**13**	**25**	**19**
GLOSSOP 3N	High Peak	B	A	27	19	25	17	21	15	14	13	16	18	23	25	**13**	**27**	**19**
HINCKLEY 2N	Hinckley & Bosworth	I	C	29	25	31	29	27	27	31	15	23				**15**	**31**	**26**
HINCKLEY 5N	Hinckley & Bosworth	B	A	29	21	27	19	21	13	21	17	15	25	38		**13**	**38**	**22**
HINCKLEY 6N	Hinckley & Bosworth	B	A	34	19	29	25	17	12	15	21		10	38		**10**	**38**	**22**
LEICESTER 2N	Leicester City	I	C	57	31	31	12	19	12			33				**12**	**57**	**28**

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

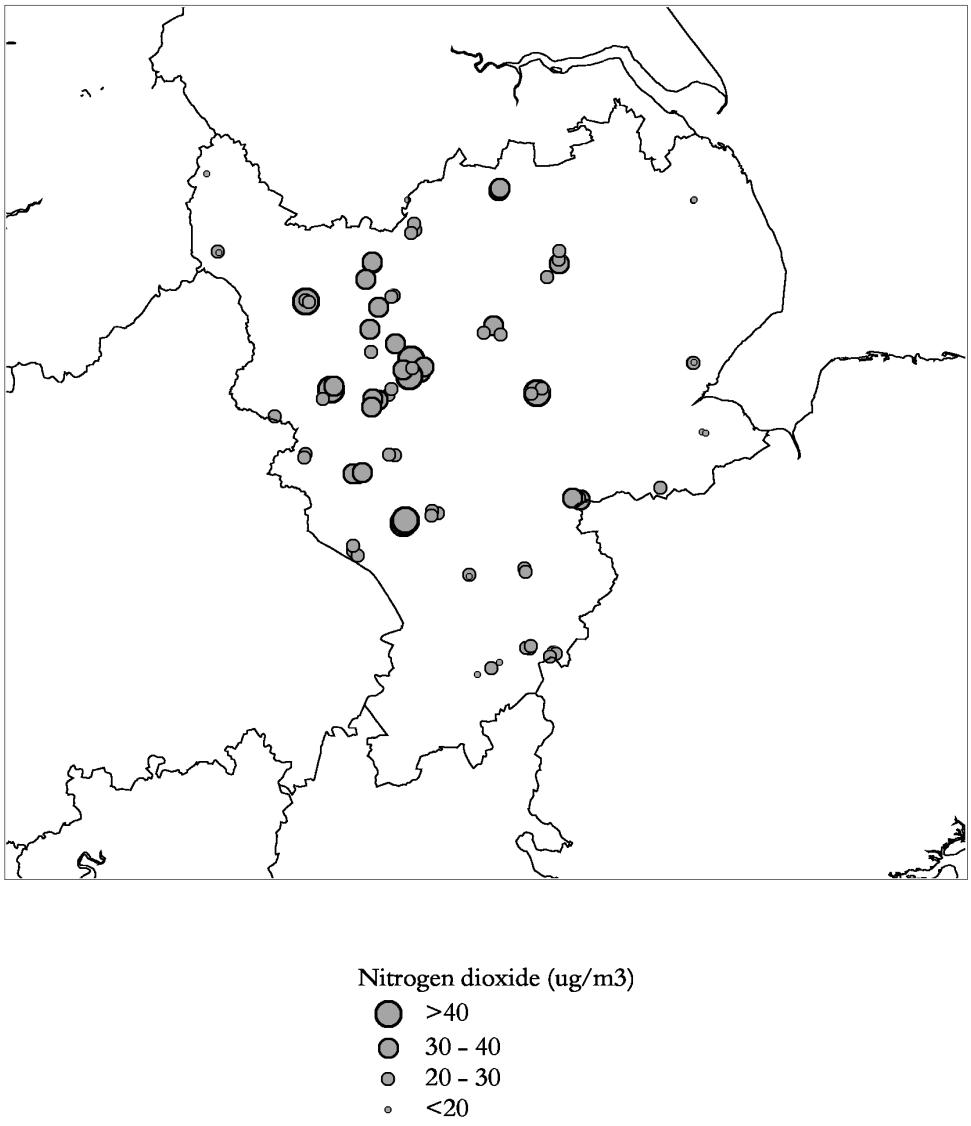
Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
LEICESTER 3N	Leicester City	B	A	44	48				17			15				**15**	**48**	
LEICESTER 5N	Leicester City	B	A	17	61	27	10	10	13			8				**8**	**61**	**21**
LINCOLN 2N	Lincoln	I	C	46	44	40	33	29	28	30	29	30	40	44	40	**28**	**46**	**36**
LINCOLN 4N	Lincoln	B	A	36	33	29	25	20	16	23	20	23	34	44	38	**16**	**44**	**28**
LINCOLN 5N	Lincoln	B	A	37	33	27	19	18	16	20	18	23	30	35	29	**16**	**37**	**25**
MANSFIELD 2N	Mansfield	I	C	17	13	19	24	18	17	20	20	23	28	30		**13**	**30**	**21**
MANSFIELD 3N	Mansfield	B	A	24	16	15	16	15	17	18	18	23	29	29	32	**15**	**32**	**21**
MANSFIELD 4N	Mansfield	B	A	25	12	15	18	14	13	14	14	18	23	26	24	**12**	**26**	**18**
NEWARK 2N	Newark	I	C	55		42	34	32	30	37	32	21		46	42	**21**	**55**	**37**
NEWARK 3N	Newark	B	A	23		26	17	17	13	21	18	25		34	36	**13**	**36**	**23**
NEWARK 4N	Newark	B	A	38		30	27	17	20	17	21	23		37	37	**17**	**38**	**27**
NORTH HYKEHAM 3N	North Kesteven	B	A	25	10	12	19	13	12	13					36	**10**	**36**	**17**
NORTH HYKEHAM 4N	North Kesteven	B	A	21	12	12	19	15	15	13	17	17	19	27	29	**12**	**29**	**18**
NORTH HYKEHAM 5N	North Kesteven	I	C	21	19	13	31	23	19	19	21	33	31	36	36	**13**	**36**	**25**
NORTHAMPTON 3N	Northampton	B	A	11	29	13	24	14	7	10	15	19	24	21	19	**7**	**29**	**17**
NORTHAMPTON 5N	Northampton	B	A	16	28	6	18	20	15	16	18	16	27	16	12	**6**	**28**	**17**
NORTHAMPTON 6N	Northampton	I	C	20	20	27	26	19	22	14	19	26	22	29	12	**12**	**29**	**21**
NOTTINGHAM 2N	Nottingham	I	C	57	50	42	42	36	31	31	31	44	40	48	36	**31**	**57**	**41**
NOTTINGHAM 3N	Nottingham	B	A	44	42	33	34	31	21	25	25	33	36	25	40	**21**	**44**	**32**
NOTTINGHAM 4N	Nottingham	B	A		31	29		21	15	8	13	25	25	25	23	**8**	**31**	**21**
COALVILLE 6N	NW Leicestershire	B	A	50	60	46	18	16	18	20			31	34	23	**16**	**60**	**32**
COALVILLE 8N	NW Leicestershire	I	C	60	38	53		18	26	22	27	26	36	34	35	**18**	**60**	**34**
COALVILLE 9N	NW Leicestershire	B	A	52	37	44	25	18	20	19	36	23	28	38		**18**	**52**	**31**
SWADLINCOTE 1N	South Derbyshire	I	C	32	28	30	39	33	22	25	24	22	25	32	37	**22**	**39**	**29**
SWADLINCOTE 5N	South Derbyshire	B	A	37	27	27	23	20		19	19	25	19	31	32	**19**	**37**	**25**
SWADLINCOTE 6N	South Derbyshire	B	A	37	33	32		31	21	25	22	33	17	26	33	**17**	**37**	**28**
SPALDING 3N	South Holland	I	C	27	16	16	14	11	12	14	14	16	17	11		**11**	**27**	**15**
SPALDING 5N	South Holland	B	A	36	30	20	15	12	8	4	4	17	25	22	29	**4**	**36**	**19**
SPALDING 6N	South Holland	B	A	35	28	20	15	11	10	14	14	21	25	27	31	**10**	**35**	**21**
GRANTHAM 12N	South Kesteven	I	C	55	38	44	36	35	32	36	36	47	38	52	45	**32**	**55**	**41**
GRANTHAM 13N	South Kesteven	B	A	35	25	27	17	15		15	15	22	29	41	34	**15**	**41**	**25**
GRANTHAM 14N	South Kesteven	B	A	38	25	27	20	16	15	16	16	24	30	38	44	**15**	**44**	**26**
STAMFORD 12N	South Kesteven	I	C	40	46	36	39	35	48	50	32	32	37	45	39	**32**	**50**	**40**
STAMFORD 13N	South Kesteven	B	A	36	33	27	20	13	13	14	14	28		38	42	**13**	**42**	**25**
STAMFORD 24N	South Kesteven	B	A	47	38	31	22	20	19	20	20	25	42	50	40	**19**	**50**	**31**
WELLINGBOROUGH 2N	Wellingborough	I	C	35	27	31	30	22	20	25	24	26	28	33	33	**20**	**35**	**28**
WELLINGBOROUGH 3N	Wellingborough	B	A	34	29	28	26	18		18			28	30	28	**18**	**34**	**27**
WELLINGBOROUGH 4N	Wellingborough	B	A	41	32	30	36	17	16	23	20	27	30	35	32	**16**	**41**	**28**
GAINSBOROUGH 2N	West Lindsey	I	C	38	26	33	29	26	27			51	37	51	41	**26**	**51**	**36**
GAINSBOROUGH 4N	West Lindsey	B	A	27	13	19	15	13	14			34	28	34	35	**13**	**35**	**23**
GAINSBOROUGH 5N	West Lindsey	B	A	35		26						33	30	33	33	**26**	**35**	**32**

REGIONAL SUMMARY

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regional Monthly Mean	37	30	28	24	20	19	21	22	26	31	35	36
Regional Monthly Min	11	10	6	7	4	7	4	4	8	10	11	12
Regional Monthly Max	68	62	53	53	36	48	50	51	51	94	61	115

Regional Annual Mean	28
Regional Annual Min	15
Regional Annual Max	55
Number of Sites	93
% With Valid Data	98

Figure B5.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in the East Midlands



6 The West Midlands (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for the West Midlands are shown in Figure B6.0. The validated 2000 dataset for the region is detailed in Table B6.2. Tables B6.0 and B6.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3}, and greater than 40μgm^{-3}, respectively.

Table B6.0 Roadside Sites in the West Midlands with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Walsall 1N (68 μgm^{-3}) Bilston 1N (65 μgm^{-3})	*As for 61 μgm^{-3} plus* Wolverhampton 5N (53 μgm^{-3}) Dudley 5N (52 μgm^{-3}) Coventry 1N (52 μgm^{-3}) Kidderminster 1N (50 μgm^{-3}) Sandwell 5N (49 μgm^{-3}) Worcester 1N (49 μgm^{-3}) Newcastle under Lyme 1N (48 μgm^{-3}) Leamington Spa 1N (48 μgm^{-3}) Stoke on Trent 1N (47 μgm^{-3})

Table B6.1 Roadside Sites in the West Midlands with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*	
Walsall 1N (68 μgm^{-3})	Worcester 1N (49 μgm^{-3})
Bilston 1N (65 μgm^{-3})	Newcastle under Lyme 1N (48 μgm^{-3})
Wolverhampton 5N (53 μgm^{-3})	Leamington Spa 1N (48 μgm^{-3})
Dudley 5N (52 μgm^{-3})	Stoke on Trent 1N (47 μgm^{-3})
Coventry 1N (52 μgm^{-3})	North Warwickshire 1N (45 μgm^{-3})
Kidderminster 1N (50 μgm^{-3})	Birmingham 534N (42 μgm^{-3})
Sandwell 5N (49 μgm^{-3})	

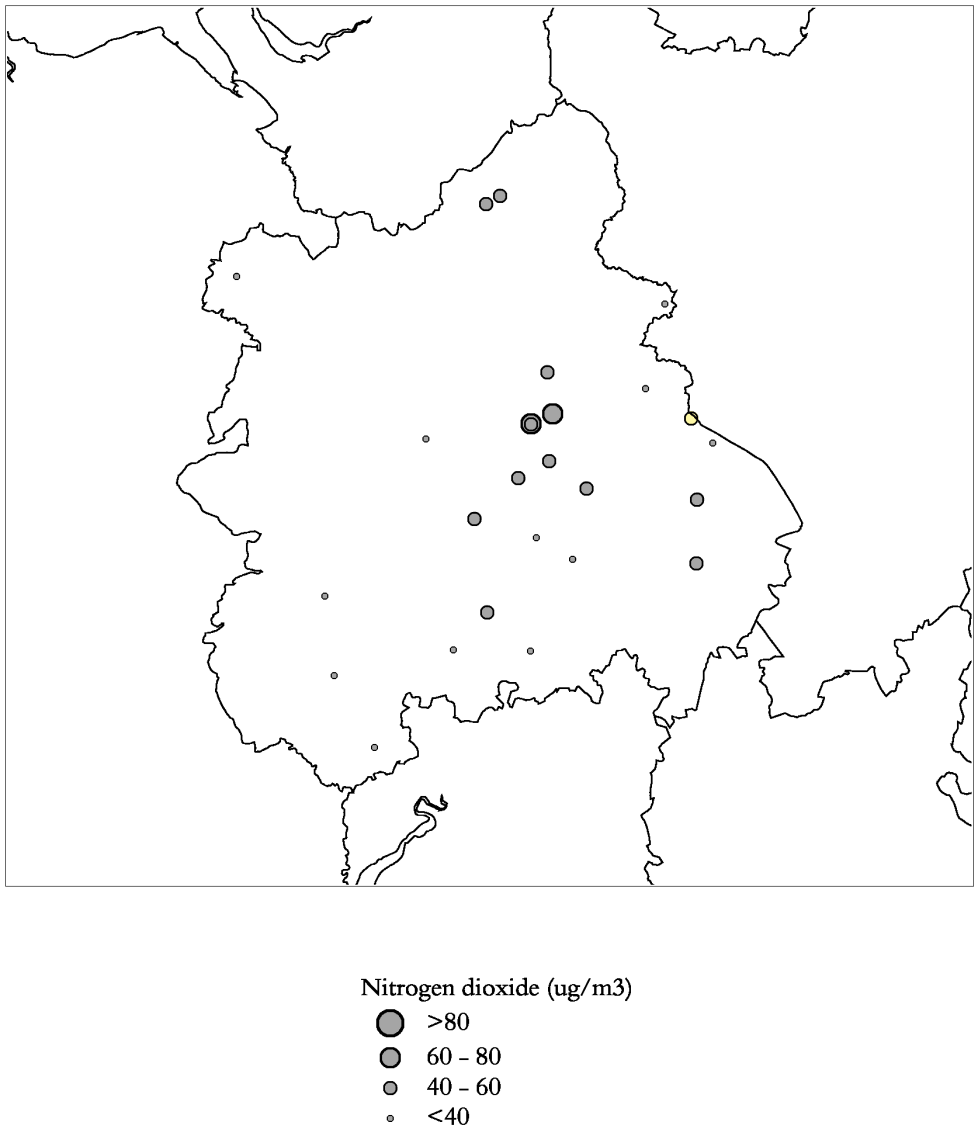
Table B6.2 Roadside Sites in the West Midlands

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BIRMINGHAM 534N	Birmingham	R	A	20	37	32	39	40	48	56	49	45	46	47	44	**20**	**56**	**42**
BRIDGNORTH 1N	Bridgnorth	R	A		49	46	53	22	22	28	28	37	22	53	51	**22**	**53**	**37**
BROMSGROVE 1N	Bromsgrove	R	A	25	10	15	54	38	44	40	40	27	40	6		**6**	**54**	**31**
COVENTRY 1N	Coventry	R	A	43	63	55	46	46	48		49	50	56	71	47	**43**	**71**	**52**
DUDLEY 5N	Dudley	R	A	64	60	64	51	49	44	55	41	50	40	49	61	**40**	**64**	**52**
BURTON 1N	East Staffordshire	R	A	46	29	41	39	34	31	40	36	37	41	42	42	**29**	**46**	**38**
HEREFORD 1N	Herefordshire	R	A	19		17	42	27		44	31	50	50	55	52	**17**	**55**	**39**
LEOMINSTER 5N	Leominster	R	A	21	10	17	52	55		50	25	50	27	34	36	**10**	**55**	**34**
MALVERN 1N	Malvern Hills	R	C	14	10	12		35	20		36	30	30	25	34	**10**	**36**	**25**
NEWCASTLE UNDER LYME 1N	Newcastle Under Lyme	R	A	56	56	64	45	41		53	41	37		48	42	**37**	**64**	**48**
NORTH WARWICKSHIRE 1N	North Warwickshire	R	A	60	57	46	41	32	44	41	32	45	46	53	46	**32**	**60**	**45**
NUNEATON 1N	Nuneaton	R	A	39	24	33	39	39	32	45	28	32	41	49	43	**24**	**49**	**37**
OSWESTRY 1N	Oswestry	R	A	46	39	33	48	48	29	36	22	36	41	45	34	**22**	**48**	**38**
REDDITCH 5N	Redditch	R	A	26	25	26		46	46	50	43			48	45	**25**	**50**	**40**
SANDWELL 5N	Sandwell	R	A	64	58	33	51	44		41			36		66	**33**	**66**	**49**
ROSS-ON-WYE 1N	South Herefordshire	R	A			15	40	31		27	33	38	34	40	31	**15**	**40**	**32**
CODSALL 2N	South Staffordshire	R	A	65	52	60	39	36	30	33	32	32	36	37	33	**30**	**65**	**40**
STAFFORD 7N	Stafford	R	A							28						**28**	**28**	
STOKE ON TRENT 1N	Stoke-On-Trent	R	A	50	44	51	53	44	36	60	38	45	45	45	49	**36**	**60**	**47**
TAMWORTH 1N	Tamworth	R	A	44	33	32	50	29	33	30	26	37	39	38	37	**26**	**50**	**36**
WALSALL 1N	Walsall	R	A	84	66	79	71	70	79	38	61	66	57	75	68	**38**	**84**	**68**
LEAMINGTON SPA 1N	Warwick	R	A	66	50	52	46	66	51	37	33	39	47		44	**33**	**66**	**48**
BILSTON 1N	Wolverhampton	R	A	92	79	74	79	57	69	49	49	55	88	29	67	**29**	**92**	**65**
WOLVERHAMPTON 5N	Wolverhampton	R	A	67	56	30	72	72	64	40	40	41	52	60	38	**30**	**72**	**53**
WORCESTER 1N	Worcester	R	A	24	17	32	69	79	22	22	66	64	66	79	47	**17**	**79**	**49**
PERSHORE 1N	Wychavon	R	A	22	11	17	54	31	26	22	31	42	13	6	30	**6**	**54**	**25**
KIDDERMINSTER 1N	Wyre Forest	R	A	58	60	38	68	50	49	51	33	15	52	72	52	**15**	**72**	**50**

REGIONAL SUMMARY		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	Regional Monthly Mean	46	41	39	52	45	41	41	38	42	44	46	45
	Regional Monthly Min	14	10	12	39	22	20	22	22	15	13	6	30
	Regional Monthly Max	92	79	79	79	79	79	60	66	66	88	79	68
	Regional Annual Mean	43											
	Regional Annual Min	25											
	Regional Annual Max	68											
	Number of Sites	27											
	% With Valid Data	96											

Figure B6.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in the West Midlands**



6 The West Midlands (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for the West Midlands are shown in Figure B6.1. The validated 2000 dataset for the region is detailed in Table B6.4. No intermediate and urban background sites in the West Midlands exceeded the EC Directive Limit and Guide Value surrogate statistics. However, Table B6.3 below identifies all sampler locations with annual average NO_2 concentrations greater than 40 μgm^{-3}.

Table B6.3 Intermediate and Urban Background Sites in the West Midlands with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3}   ***Air Quality Strategy Objective***   ***NO_2 Annual Mean***
Leamington Spa 2N (45 μgm^{-3})
Walsall 7N (44 μgm^{-3})
Walsall 5N (43 μgm^{-3})
Walsall 6N (43 μgm^{-3})
Sandwell 6N (41 μgm^{-3})

Table B6.4 Intermediate and Urban Background Sites in the West Midlands

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BIRMINGHAM 524N	Birmingham	B	A	15	16	27	20	22	22	21	27	27	23	23	34	**15**	**34**	**23**
BIRMINGHAM 528N	Birmingham	B	A	16	12	22	19	24	20	21	23	20	22	27	29	**12**	**29**	**21**
BIRMINGHAM 535N	Birmingham	I	C	15	18	20	23	36	28	26	27	31	30	31	38	**15**	**38**	**27**
BRIDGNORTH 2N	Bridgnorth	I	C	36	28	18	28	18	16	10	10	22	38	32	33	**10**	**38**	**24**
BRIDGNORTH 3N	Bridgnorth	B	A	24	20	13	16	9	12				15	22	28	**9**	**28**	**18**
BRIDGNORTH 4N	Bridgnorth	B	A	22	16	17		11	12	7	7			38	20	**7**	**38**	**17**
BROMSGROVE 2N	Bromsgrove	I	C	29	25	15	38	33	25	27	25	25		21	36	**15**	**38**	**27**
BROMSGROVE 3N	Bromsgrove	B	A	17	12	10	29	23	23	29	23	15		31	19	**10**	**31**	**21**
BROMSGROVE 4N	Bromsgrove	B	A	13	8	13	27	23	19	25	23	13		27	27	**8**	**27**	**20**
COVENTRY 2N	Coventry	I	C	41	39	34	37	33		7	24	25	35	36	40	**7**	**41**	**32**
COVENTRY 3N	Coventry	B	A	54	37	35	31	29	48	32	26	26	26	36	29	**26**	**54**	**34**
COVENTRY 5N	Coventry	B	A		26	18	23	4	24		14	20	15	25	27	**4**	**27**	**20**
DUDLEY 2N	Dudley	I	C	57	45	40	43	37	21	37	27	42	34	51	42	**21**	**57**	**40**
DUDLEY 3N	Dudley	B	A	29	26	19	26	18	16	18	12	16	16	24	29	**12**	**29**	**21**
DUDLEY 6N	Dudley	B	A	38	26	29	26	22	19	20	12	25	21	32	33	**12**	**38**	**25**
BURTON 3N	East Staffordshire	B	A	30	20	24	19	13	15	14	10	20	27	27	28	**10**	**30**	**21**
BURTON 4N	East Staffordshire	B	A	33	19	40	21	16	16	13		30	22	28	32	**13**	**40**	**25**
BURTON 5N	East Staffordshire	I	C	34	27	27	30	22	20	43	19	27	32	39	33	**19**	**43**	**29**
HEREFORD 3N	Herefordshire	B	A	15		8		4		10	10	23	25		31	**4**	**31**	**16**
HEREFORD 5N	Herefordshire	I	C	19		12	23	13		13	17	23	19	31	27	**12**	**31**	**20**
HEREFORD 6N	Herefordshire	B	A	12		4				10	8	13	15	17	23	**4**	**23**	**13**
LEOMINSTER 2N	Leominster	I	C	13		12	17	23		27	21	29	27	31		**12**	**31**	**22**
LEOMINSTER 4N	Leominster	B	A							13	12	17	17	12	23	**12**	**23**	**16**
WEOBLEY 3N	Leominster	B	A	4				4		10	10	12	10	8	19	**4**	**19**	**9**
MALVERN 2N	Malvern Hills	I	C	8	5	4	20	13	7	16	15	12	14	5	5	**4**	**20**	**10**
MALVERN 3N	Malvern Hills	B	A	8		5	13	9	5	7	12	9	14	10	21	**5**	**21**	**10**
MALVERN 4N	Malvern Hills	B	A	8		4	10	9	5		8	10	11	7	19	**4**	**19**	**9**
NEWCASTLE UNDER LYME 4N	Newcastle Under Lyme	B	A	33	33	31	22	17	22	19	17	22		23	32	**17**	**33**	**25**
NEWCASTLE UNDER LYME 5N	Newcastle Under Lyme	I	C	34	34	39	25	23	37	25	23	20		27		**20**	**39**	**29**
NEWCASTLE UNDER LYME 6N	Newcastle Under Lyme	B	C	28	28	33	19	19	24		16					**16**	**33**	**24**
NEWCASTLE UNDER LYME 7N	Newcastle Under Lyme	B	A									22		19	32	**19**	**32**	
NORTH WARWICKSHIRE 2N	North Warwickshire	I	C	28	30	31	25	27	21	27	19	20	25	32	32	**19**	**32**	**26**
NORTH WARWICKSHIRE 3N	North Warwickshire	B	A	35	50	39	27	16	25	30	27	30	40	49	45	**16**	**50**	**34**
NORTH WARWICKSHIRE 4N	North Warwickshire	B	A	40	37	28	17	21	16	18	16	21	24	32	26	**16**	**40**	**25**
NUNEATON 2N	Nuneaton	I	C	23	24	21	22	25	22	20	25	27	38	34	39	**20**	**39**	**27**
NUNEATON 3N	Nuneaton	B	A	25	20	11	32	16	16	13	20	20	24	30	24	**11**	**32**	**21**
NUNEATON 4N	Nuneaton	B	A	15	29	16	19	18	20	15	14	22	31	32	31	**14**	**32**	**22**
OSWESTRY 2N	Oswestry	I	C			21	16	9	5	12		13	16	23	30	**5**	**30**	**16**
OSWESTRY 3N	Oswestry	B	A	15	11	13	12	7	4	9	5		9	17	21	**4**	**21**	**11**
OSWESTRY 5N	Oswestry	B	A	14	12	10	17	8		10	5	12		33	25	**5**	**33**	**15**
REDDITCH 1N	Redditch	B	A	13	7	9	26		11	20	22			19	28	**7**	**28**	**17**
REDDITCH 2N	Redditch	B	A	12	7	7	25	21	5	53	42				28	**5**	**53**	**22**
SANDWELL 3N	Sandwell	B	A	58	60	35	50		24	28	25	34	37	44	42	**24**	**60**	**40**
SANDWELL 6N	Sandwell	I	C		36		42	39				36	41		55	**36**	**55**	**41**
SANDWELL 7N	Sandwell	B	A	33	25	27	27	45	12	21	18	12	17	27		**12**	**45**	**24**
ROSS-ON-WYE 3N	South Herefordshire	B	A			8	12	8		13		17	17	13	12	**8**	**17**	**12**
ROSS-ON-WYE 4N	South Herefordshire	B	A	10		10	12	13		13		15	10	13	19	**10**	**19**	**13**
ROSS-ON-WYE 5N	South Herefordshire	I	C	10		8	10	13		10	15	17	15	12		**8**	**17**	**12**
CODSALL 6N	South Staffordshire	B	A	52	43	33	21	28	20	17	18		22	34	46	**17**	**52**	**30**
CODSALL 7N	South Staffordshire	I	C		46	56	31	38	28	40	33	30	31	39	34	**28**	**56**	**37**
CODSALL 8N	South Staffordshire	B	A	53	37	34	16	26	18	23	20	22	23	29	30	**16**	**53**	**27**
STAFFORD 3N	Stafford	B	A							39						**39**	**39**	

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

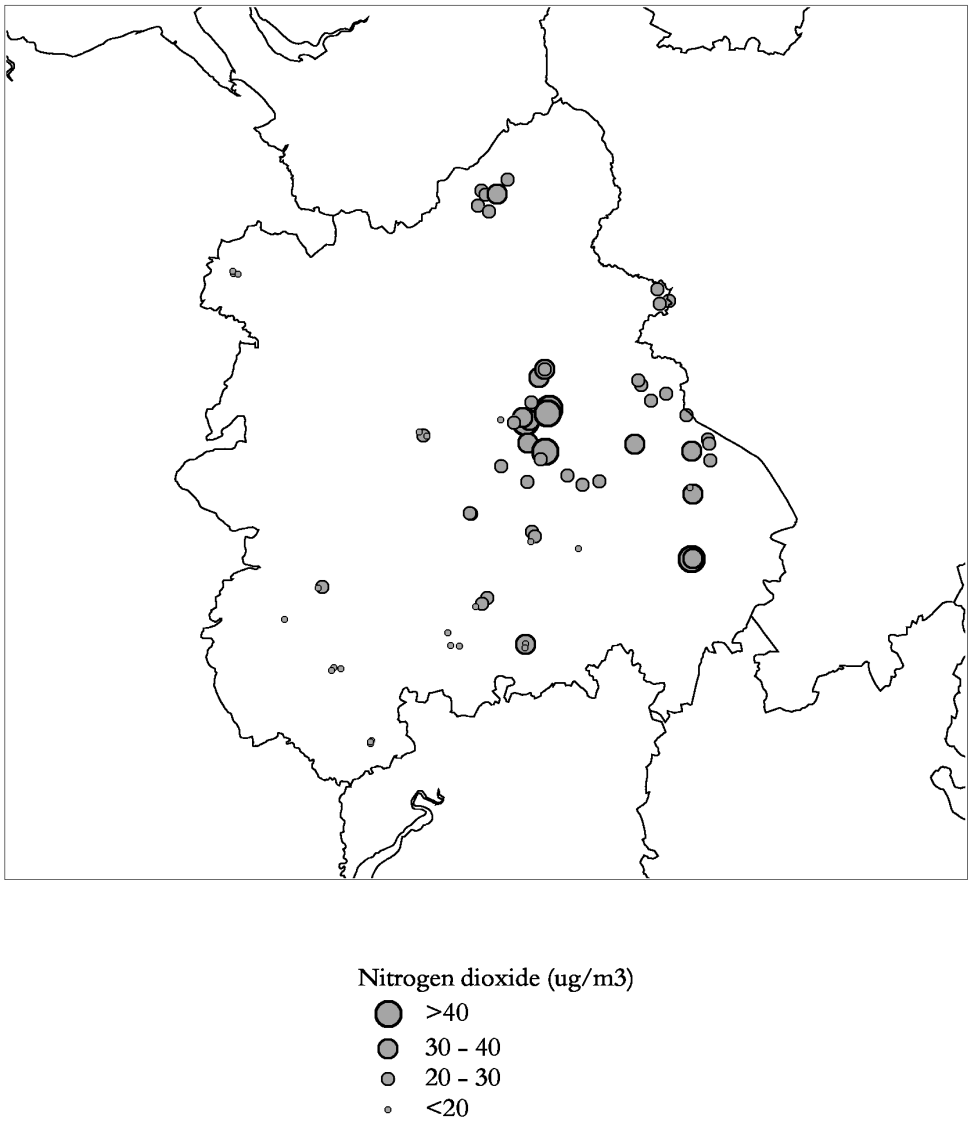
Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
STAFFORD 4N	Stafford	B	A						19	15						**15**	**19**	
STAFFORD 8N	Stafford	I	C						33	29						**29**	**33**	
STOKE ON TRENT 2N	Stoke-On-Trent	I	C	38	38	29	44	41				33	33	46	40	**29**	**46**	**38**
STOKE ON TRENT 4N	Stoke-On-Trent	B	A	33	22	23	31	22	15	32	18	21	21	28	36	**15**	**36**	**25**
STOKE ON TRENT 5N	Stoke-On-Trent	B	A	36	22	18				16	9	21	21			**9**	**36**	**21**
TAMWORTH 2N	Tamworth	I	C	24	27	43	36	23	24	25	27	33	24	34	35	**23**	**43**	**30**
TAMWORTH 3N	Tamworth	B	A	32	25	26	27	17	15	17	18	28	26	43	36	**15**	**43**	**26**
TAMWORTH 6N	Tamworth	B	A	31	29	28	27	18	17	21	18	27	25	40	36	**17**	**40**	**26**
WALSALL 5N	Walsall	I	C	51	52	43	47	39	43	28	33	38	49	49	44	**28**	**52**	**43**
WALSALL 6N	Walsall	B	A	60	53	37	44	42	39	25	21	43	40	59	48	**21**	**60**	**43**
WALSALL 7N	Walsall	B	A	64	59	45	47	37	44	27	38	43	43		39	**27**	**64**	**44**
LEAMINGTON SPA 2N	Warwick	I	C	61			38	64	36	33	37	43	45	50	44	**33**	**64**	**45**
LEAMINGTON SPA 4N	Warwick	B	A	46	30	36	20	36		22		6	25	35		**6**	**46**	**28**
LEAMINGTON SPA 5N	Warwick	B	A	58	47	40	21	50	24	28	25	27	34	48	37	**21**	**58**	**37**
BILSTON 2N	Wolverhampton	I	C	39	39	44	39	35	28						58	**28**	**58**	**40**
BILSTON 3N	Wolverhampton	B	A	49	40	36	42	29	33	31	31	24	37	16	52	**16**	**52**	**35**
BILSTON 4N	Wolverhampton	B	A	49	33	36	35	31	30	30	30	17	31	25	53	**17**	**53**	**33**
WOLVERHAMPTON 3N	Wolverhampton	B	A	28	21	20	22						15	8		**8**	**28**	**19**
WOLVERHAMPTON 6N	Wolverhampton	I	C	38	29	27	29	30		16	16	17		11	26	**11**	**38**	**24**
WOLVERHAMPTON 8N	Wolverhampton	B	A	35	26	20	27			23	23	18	28	12	44	**12**	**44**	**26**
WORCESTER 2N	Worcester	I	C	12	12	7	14	20	28	28	17	22		36	30	**7**	**36**	**21**
WORCESTER 3N	Worcester	B	A	10	5	8	19	24	21	21	15	27	28	45	30	**5**	**45**	**21**
WORCESTER 4N	Worcester	B	A	11		5	17	16	11	11	20	19	15	38	31	**5**	**38**	**18**
PERSHORE 2N	Wychavon	I	C	24	9	23	44	39	30	31	29	34		39	30	**9**	**44**	**30**
PERSHORE 3N	Wychavon	B	A	15	14	13	28	15	13	12	13	28	10	35	30	**10**	**35**	**19**
PERSHORE 4N	Wychavon	B	A	15	6	7	14		9				22		19	**6**	**22**	**13**
KIDDERMINSTER 2N	Wyre Forest	I	C	28	37	16	32	21	23	24	26	25	30	44		**16**	**44**	**28**
KIDDERMINSTER 4N	Wyre Forest	B	A	21	20	18	27	26	7	17	14	16	17	27	36	**7**	**36**	**20**
KIDDERMINSTER 5N	Wyre Forest	B	C	25	24											**24**	**25**	
KIDDERMINSTER 6N	Wyre Forest	B	A			25	18	24	8	14	6	15	23	27	26	**6**	**27**	**19**

REGIONAL SUMMARY

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regional Monthly Mean	29	27	23	26	23	20	21	19	23	25	29	32
Regional Monthly Min	4	5	4	10	4	4	7	5	6	9	5	5
Regional Monthly Max	64	60	56	50	64	48	53	42	43	49	59	58

Regional Annual Mean	25
Regional Annual Min	9
Regional Annual Max	45
Number of Sites	82
% With Valid Data	94

Figure B6.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in the West Midlands



7 Wales (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for Wales are shown in Figure B7.0. The validated 2000 dataset for the region is detailed in Table B7.2. Tables B7.0 and B7.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3}, and greater than 40μgm^{-3}, respectively.

Table B7.0 Roadside Sites in Wales with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Swansea 1N (61 μgm^{-3})	*As for 61 μgm^{-3} plus* Newport Gwent 5N (59 μgm^{-3}) Cardiff 1N (52 μgm^{-3})

Table B7.1 Roadside Sites in Wales with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*
Swansea 1N (61 μgm^{-3})
Newport Gwent 5N (59 μgm^{-3})
Cardiff 1N (52 μgm^{-3})
Porth 1N (41 μgm^{-3})

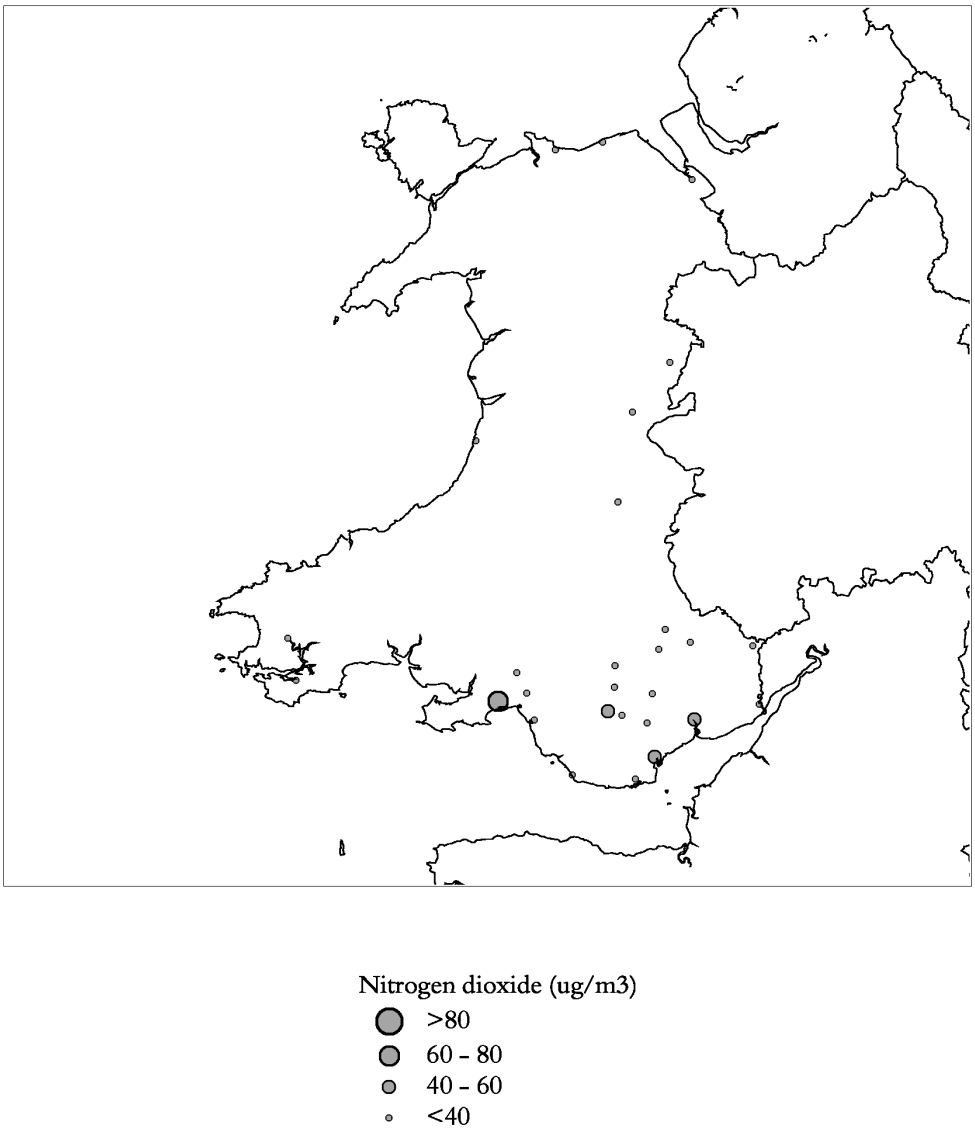
Table B7.2 Roadside Sites in Wales

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BRYNMAWR 2N	Blaenau Gwent	R	A	25	22	23	19	20	12	15	13	14	18	20	24	**12**	**25**	**19**
BRIDGEND 1N	Bridgend	R	A	9	27	29	33	25				21				**9**	**33**	**24**
BLACKWOOD 1N	Caerphilly	R	A	38	21	36	40	38	27	38	36	34	34	42	34	**21**	**42**	**35**
CAERPHILLY 5N	Caerphilly	R	A	38	33	40	48	36	33	38	29	42	36	31	12	**12**	**48**	**35**
CARDIFF 1N	Cardiff County	R	A			75	55		42		44	52	34	59	57	**34**	**75**	**52**
ABERYSTWYTH 1N	Cardiganshire	R	A	36	38	46	39	35	29	36	30	35	36	31	43	**29**	**46**	**36**
AMMANFORD 1N	Carmarthenshire County	R	A	25	18	19	14									**14**	**25**	
LLANELLI 1N	Carmarthenshire County	R	A				37									**37**	**37**	
COLWYN BAY 1N	Conwy	R	A	27	15	26	41	31	25	15	15	20	15	22	26	**15**	**41**	**23**
RHYL 1N	Denbighshire County	R	A	44	26		48	49	42	25	33	43	19	28	37	**19**	**49**	**36**
SHOTTON CLWYD 1N	Flintshire County	R	A	25	25	36	40	45	31	39	30		25	31	38	**25**	**45**	**33**
MERTHYR 1N	Merthyr Tydfil	R	A	26	51	22	44	46	20	16	20	18	20	26	26	**16**	**51**	**28**
ABERGAVENNY 1N	Monmouthshire	R	A	33	25	34	21	27	19	25	21	29	29	29	36	**19**	**36**	**27**
CHEPSTOW 1N	Monmouthshire	R	A		33	42	31	38	23	36	36	34	33	8	40	**8**	**42**	**32**
MONMOUTH 1N	Monmouthshire	R	A	31	29	27	27	25	23	21	31	19	17	34	31	**17**	**34**	**26**
NEATH 1N	Neath & Port Talbot	R	A	14	41	40	30	27	30	28	33	51	32	51	45	**14**	**51**	**35**
PONTARDAWE 1N	Neath & Port Talbot	R	A	9	27	22	21	24	18	19	15	24	19	24	24	**9**	**27**	**21**
PORT TALBOT 1N	Neath & Port Talbot	R	A	7	22	26	25	20	24	18	18	25	6	23	14	**6**	**26**	**19**
NEWPORT GWENT 5N	Newport	R	A	72	73	77	62	20	54	57	51	51	64	66	64	**20**	**77**	**59**
HAVERFORDWEST 1N	Pembrokeshire	R	A	17	24	15	17	27	19	20	23	22	16	19		**15**	**27**	**20**
HAVERFORDWEST 8N	Pembrokeshire	R	A										42	42	33	**33**	**42**	
PEMBROKE 11N	Pembrokeshire	R	A	34	39	23	36	46	42	42	38		32	33	42	**23**	**46**	**37**
CRICKHOWELL 1N	Powys	R	A	5	10	40	31	39	28	22	32	29	27	41	34	**5**	**41**	**28**
LLANDRINDOD WELLS 1N	Powys	R	A	20	19	19	14	21	25	11	18	21	21	20	21	**11**	**25**	**19**
NEWTOWN 1N	Powys	R	A	10	26	34	44	26	34	7	31	32	38	43	43	**7**	**44**	**31**
WELSHPOOL 1N	Powys	R	A	6	9	23	24	19	17	20	23	21	26	28	29	**6**	**29**	**20**
MOUNTAIN ASH 1N	Rhondda Cynon Taff	R	A	23	25	27		58	18	19			15	34	16	**15**	**58**	**26**
PONTYPRIDD 1N	Rhondda Cynon Taff	R	A	30	34	44	53	47	44	32			4	47	60	**4**	**60**	**39**
PORTH 1N	Rhondda Cynon Taff	R	A	34	35	36	40	58	40	36			28	56	48	**28**	**58**	**41**
SWANSEA 1N	Swansea	R	A	75	67	66	59	63	51	52	45	63	62	67	64	**45**	**75**	**61**
BARRY 1N	Vale of Glamorgan	R	A	38		48	23		33	29	33	34	21	40	31	**21**	**48**	**33**

REGIONAL SUMMARY		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Regional Monthly Mean	28	30	36	35	35	30	28	29	32	27	36	36
	Regional Monthly Min	5	9	15	14	19	12	7	13	14	4	8	12
	Regional Monthly Max	75	73	77	62	63	54	57	51	63	64	67	64
	Regional Annual Mean	32											
	Regional Annual Min	19											
	Regional Annual Max	61											
	Number of Sites	31											
	% With Valid Data	90											

Figure B7.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in Wales**



7 Wales (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for Wales are shown in Figure B7.1. The validated 2000 dataset for the region is detailed in Table B7.3. No intermediate and urban background sites in Wales exceeded the EC Directive Limit and Guide Value surrogate statistics or the Air Quality Strategy Objective.

Table B7.3 Intermediate and Urban Background Sites in Wales

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BEAUFORT 1N	Blaenau Gwent	B	A	20	15	14	13	12	8	7	8	11	16	17	21	**7**	**21**	**14**
BRYNMAWR 1N	Blaenau Gwent	B	A	24	17	20	21	17	14	10	14	16	20	24	28	**10**	**28**	**19**
BRYNMAWR 3N	Blaenau Gwent	I	C	27	15	22	21	20	17	15	12	15	20	22	29	**12**	**29**	**20**
BRIDGEND 2N	Bridgend	I	C	8	28	32	30	30				26	30	35	45	**8**	**45**	**29**
BRIDGEND 3N	Bridgend	B	A	6	10	19	16	14				10	11	11	17	**6**	**19**	**13**
BRIDGEND 4N	Bridgend	B	A	6	9	18	20	17				17	14	22	10	**6**	**22**	**15**
BARGOED 3N	Caerphilly	B	A	21	8	13		4	12	10	12	13	15	4	23	**4**	**23**	**12**
BLACKWOOD 2N	Caerphilly	I	C	27	17	12	17		15	15	15	19	19	15	8	**8**	**27**	**16**
CAERPHILLY 6N	Caerphilly	I	C	27	15	19	12	12	10	10	10	13	23	15	23	**10**	**27**	**16**
CAERPHILLY 7N	Caerphilly	B	A	27	31	23	21	12	17				23			**12**	**31**	**22**
CROESPENMAEN 3N	Caerphilly	B	A	19	10	19	10	8	6	12	8	8	8	8		**6**	**19**	**10**
CWMCARN 4N	Caerphilly	B	A	23	10	17	8	6	8	8	12	13	15	19	19	**6**	**23**	**13**
CARDIFF 2N	Cardiff County	I	C	42	27		33	29	17	29	31		36	40	31	**17**	**42**	**31**
CARDIFF 3N	Cardiff County	B	A	48	31	38	25	33	13	23	21	29	23	40	29	**13**	**48**	**29**
CARDIFF 4N	Cardiff County	B	A	36	12	27	19	12	12	17	19	21	15	38	36	**12**	**38**	**22**
ABERYSTWYTH 2N	Cardiganshire	I	C	19	15	20	16	15	12	13	15	11	16	13	17	**11**	**20**	**15**
ABERYSTWYTH 3N	Cardiganshire	B	A	17	14	15	13	10	8	8	10	8	12	11	20	**8**	**20**	**12**
ABERYSTWYTH 5N	Cardiganshire	B	A	23	10	15	15	10	8	9	10	10	12	12	27	**8**	**27**	**13**
AMMANFORD 2N	Carmarthenshire County	I	C	39	27	32	23		26							**23**	**39**	
AMMANFORD 3N	Carmarthenshire County	B	A	28	28	43	22		19							**19**	**43**	
AMMANFORD 4N	Carmarthenshire County	B	A	30			25									**25**	**30**	
LLANELLI 2N	Carmarthenshire County	I	C				16									**16**	**16**	
LLANELLI 4N	Carmarthenshire County	B	A				13									**13**	**13**	
LLANELLI 5N	Carmarthenshire County	B	A				13									**13**	**13**	
COLWYN BAY 2N	Conwy	I	C	19	7		25	19	20	19	19	19	10	11	21	**7**	**25**	**17**
COLWYN BAY 3N	Conwy	B	A	22	13			29				6	15	20	19	**6**	**29**	**18**
COLWYN BAY 4N	Conwy	B	A	13	6		16	19	13	11	11	20	7	12	22	**6**	**22**	**14**
RHYL 2N	Denbighshire County	I	C	22	15	18	26	27	18	19	22	30	14	23	17	**14**	**30**	**21**
RHYL 4N	Denbighshire County	B	A	21	12	19	19	17	14	10	10	13	9	19	19	**9**	**21**	**15**
RHYL 5N	Denbighshire County	B	A	22	13	18	22	17	13	10	6	18	8	19	24	**6**	**24**	**16**
ASTON CLWYD 2N	Flintshire County	B	A	18	25	26	20	21	13	23	15		13	28	26	**13**	**28**	**21**
SHOTTON CLWYD 3N	Flintshire County	I	C	21		24	23	25	12	18			23	31	6	**6**	**31**	**20**
SHOTTON CLWYD 4N	Flintshire County	B	A	16	18	21	18	22	10	9	13		13	22	28	**9**	**28**	**17**
MERTHYR 2N	Merthyr Tydfil	I	C	11	29	23	30	18	17	12	8	20	25	20	24	**8**	**30**	**20**
MERTHYR 3N	Merthyr Tydfil	B	A	7	15	13	19	14	10	6	11	12	14	17	23	**6**	**23**	**13**
MERTHYR 4N	Merthyr Tydfil	B	A	9	19	12	14	12	7	5	12	8	13	17	13	**5**	**19**	**12**
ABERGAVENNY 2N	Monmouthshire	I	C	6	10	13	8	13	8	13	12	10	8	4	12	**4**	**13**	**10**
ABERGAVENNY 3N	Monmouthshire	B	A	15	12	12	12	8	8	10	10	17	15	13	19	**8**	**19**	**12**
CHEPSTOW 2N	Monmouthshire	B	A	25	23	21	19	19	17	17	19	21	21	27	17	**17**	**27**	**21**
MAGOR 1N	Monmouthshire	B	A	29	19	25	17	21	10	13	21	13	13	31	15	**10**	**31**	**19**
MAGOR 2N	Monmouthshire	B	A	29	12	21	8	13	13	12	15	4	17	23	21	**4**	**29**	**16**
MONMOUTH 2N	Monmouthshire	I	C	40	40	36	23	27	21	25	25	15	31	17	6	**6**	**40**	**26**
ROGIET 1N	Monmouthshire	B	A	23	21	15	13	13	15	13	17	21	23	27	23	**13**	**27**	**19**
NEATH 2N	Neath & Port Talbot	I	C	11	41	37	26	26	18	18	20	31	27	31	24	**11**	**41**	**26**
NEATH 3N	Neath & Port Talbot	B	A	7	22	22	19	16	12	12	13	20	18	20	22	**7**	**22**	**17**
NEATH 4N	Neath & Port Talbot	B	A	16	15	12	12		8	5	8	19	12	19	16	**5**	**19**	**13**
PONTARDAWE 3N	Neath & Port Talbot	B	A	6	11	16	12	9	6	7	9	9	22	10	18	**6**	**22**	**11**
PORT TALBOT 2N	Neath & Port Talbot	I	C	10	20	25	20	14	20	12	13	13	19	20	24	**10**	**25**	**18**
PORT TALBOT 3N	Neath & Port Talbot	B	A	4	16	20	19	12	15	10	14	12	16	17	21	**4**	**21**	**15**
PORT TALBOT 4N	Neath & Port Talbot	B	A	6	22	20	19	25	15	13	17	14	12	21	15	**6**	**25**	**17**
NEWPORT GWENT 4N	Newport	B	A	35	24	28	16	17	16	19	13	20	24	31	27	**13**	**35**	**22**
NEWPORT GWENT 6N	Newport	B	A	43	40	31	26	20		20	23	26	33	38	36	**20**	**43**	**31**

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
NEWPORT GWENT 7N	Newport	I	C	52	41	41	29	21	26	27	26	26	43	51	47	**21**	**52**	**36**
FISHGUARD 6N	Pembrokeshire	B	C		5	6	5	5	5	4	7	6	6	7	9	**4**	**9**	**6**
HAVERFORDWEST 3N	Pembrokeshire	B	A	6	9	6	8	10	7	6	9	11	10	11	16	**6**	**16**	**9**
HAVERFORDWEST 7N	Pembrokeshire	I	C	16	14		18	10	7	10	12					**7**	**18**	**12**
PEMBROKE 12N	Pembrokeshire	I	C	4	9	5		11	5	6	9	6	10	10	17	**4**	**17**	**8**
PEMBROKE 13N	Pembrokeshire	B	A	10	6	5	9	8		6	4	6	7	7	13	**4**	**13**	**7**
PEMBROKE 14N	Pembrokeshire	B	A	11	8	8	4	8	7	5	7	7	7	9	12	**4**	**12**	**8**
BRECON 4N	Powys	B	A		4	11	12	11	7	6	8	8	7	8		**4**	**12**	**8**
CRICKHOWELL 2N	Powys	I	C				12	14		7	8	18	11	10		**7**	**18**	**12**
CRICKHOWELL 3N	Powys	B	A			9	15	9	7	7	8	7	10	13	21	**7**	**21**	**11**
LLANDRINDOD WELLS 4N	Powys	B	A	12	6	10	10	8	8	7	7	5	5		13	**5**	**13**	**8**
LLANDRINDOD WELLS 6N	Powys	I	C	4	13	13	15	12		8	11	13	12	12	20	**4**	**20**	**12**
LLANDRINDOD WELLS 7N	Powys	B	A	13	7	10	10	8	5	5	6	6	6	10	16	**5**	**16**	**8**
NEWTOWN 2N	Powys	I	C	5	9	20	16	20	12	8	14	16	16	24	25	**5**	**25**	**15**
NEWTOWN 3N	Powys	B	A	6		11	8		5	6	10	8	7	11	16	**5**	**16**	**9**
NEWTOWN 4N	Powys	B	A	4		13	10		8	6	7	7	8	10	18	**4**	**18**	**9**
WELSHPOOL 2N	Powys	I	C	6	9	22	20	13	22	12	15	16	14	25	25	**6**	**25**	**17**
WELSHPOOL 3N	Powys	B	A		5	9	5		10	5	4	6	8	10	20	**4**	**20**	**8**
WELSHPOOL 4N	Powys	B	A		4	10	10		10	6	5	8	7	11	21	**4**	**21**	**9**
ABERDARE 1N	Rhondda Cynon Taff	I	C	9	12	15	20	11	12	7			11	23	24	**7**	**24**	**14**
MOUNTAIN ASH 2N	Rhondda Cynon Taff	B	A	10	10	9	12	14	10	8				18		**8**	**18**	**12**
PENDERYN 1N	Rhondda Cynon Taff	B	A	7	7	7	7	5	5				7	8	13	**5**	**13**	**7**
PONTYPRIDD 2N	Rhondda Cynon Taff	I	C	16	20	26	22		22	13			30	32	30	**13**	**32**	**24**
PONTYPRIDD 7N	Rhondda Cynon Taff	B	A	19	17	23	28	16	10	11			19	20		**10**	**28**	**18**
PONTYPRIDD 8N	Rhondda Cynon Taff	B	A	17	11	17	15	15	14	8			11	20	9	**8**	**20**	**14**
PORTH 2N	Rhondda Cynon Taff	I	C	13	8	14	17	13	14	10			10		16	**8**	**17**	**13**
TON PENTRE 3N	Rhondda Cynon Taff	B	A	11	6	8		8	6	5			7	12	15	**5**	**15**	**9**
TYNEWYDD 1N	Rhondda Cynon Taff	B	A	8	8	9	9	7	6	4			6	4	13	**4**	**13**	**8**
SWANSEA 2N	Swansea	I	C	38	30	34	25	27	23	20	22	25		32	33	**20**	**38**	**28**
SWANSEA 3N	Swansea	B	A	42	30	33	32	29	24	20	21	28	28	34	35	**20**	**42**	**30**
SWANSEA 4N	Swansea	B	A	22	12	15	12	12	8	8	10		7	13	23	**7**	**23**	**13**
BARRY 2N	Vale of Glamorgan	I	C	23	10	23	17			12	15	10	13	13	27	**10**	**27**	**16**
BARRY 6N	Vale of Glamorgan	B	A	17			13	12	12	12	13	13	13	15	19	**12**	**19**	**14**
BARRY 7N	Vale of Glamorgan	B	A	21	4	15	10		13	10		15	13	19	25	**4**	**25**	**15**

REGIONAL SUMMARY

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regional Monthly Mean	19	16	19	17	15	12	11	13	14	15	19	21
Regional Monthly Min	4	4	5	4	4	5	4	4	4	5	4	6
Regional Monthly Max	52	41	43	33	33	26	29	31	31	43	51	47

Regional Annual Mean	16
Regional Annual Min	6
Regional Annual Max	36
Number of Sites	86
% With Valid Data	93

Figure B7.1 **Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in Wales**

8 Eastern (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for the Eastern region are shown in Figure B8.0. The validated 2000 dataset for the region is detailed in Table B8.2. Tables B8.0 and B8.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3} , and greater than 40μgm^{-3}, respectively.

Table B8.0 Roadside Sites in the Eastern region with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} ***EC Directive 98%ile Limit Value*** ***Surrogate Statistic***	***Sites ≥ 61μgm^{-3}*** ***EC Directive 98%ile Guide Value*** ***Surrogate Statistic***	***Sites ≥ 47 μgm^{-3}*** ***EC Directive 50%ile Limit Value*** ***Surrogate Statistic***
None	Borehamwood 1N (66 μgm^{-3})	*As for 61 μgm^{-3} plus*
	Hemel Hempstead 1N (63 μgm^{-3})	Waltham Cross 1N (54 μgm^{-3})
	Cambridge 1N (61 μgm^{-3})	Grays 1N (54 μgm^{-3})
		Peterborough 1N (53 μgm^{-3})
		St Neots 1N (51 μgm^{-3})
		Bury St Edmunds 1N (48 μgm^{-3})

Table B8.1 Roadside Sites in the Eastern region with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} ***Air Quality Strategy Objective*** ***NO_2 Annual Mean***	
Borehamwood 1N (66 μgm^{-3})	Colchester 5N (44 μgm^{-3})
Hemel Hempstead 1N (63 μgm^{-3})	Felixstowe 1N (44 μgm^{-3})
Cambridge 1N (61 μgm^{-3})	St Albans 1N (44 μgm^{-3})
Waltham Cross 1N (54 μgm^{-3})	Rickmansworth 1N (44 μgm^{-3})
Grays 1N (54 μgm^{-3})	Dunstable 5N (43 μgm^{-3})
Peterborough 1N (53 μgm^{-3})	Biggleswade 1N (43 μgm^{-3})
St Neots 1N (51 μgm^{-3})	Braintree 1N (42 μgm^{-3})
Bury St Edmunds 1N (48 μgm^{-3})	Histon1N (41 μgm^{-3})
Waltham Cross 4N (45 μgm^{-3})	Letchworth 1N (41 μgm^{-3})

Table B8.2 Roadside Sites in the Eastern Region

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
SUDBURY 1N	Babergh	R	A	49	43	41	34	32	31	28	24	33	42	44	41	**24**	**49**	**37**
BRAINTREE 1N	Braintree	R	A	61	54	48	39	34	30	25	33	39	40	51	48	**25**	**61**	**42**
BROADLAND 1N	Broadland	R	A	41	59	40	22	27	30	32	34	37	33	39	27	**22**	**59**	**35**
CHESHUNT 1N	Broxbourne	R	A	33	43	26	32	49	30	29		33	40	38	31	**26**	**49**	**35**
CHESHUNT 5N	Broxbourne	R	A				52	30	43	30	47	25	46	45	4	**4**	**52**	**36**
WALTHAM CROSS 1N	Broxbourne	R	A				46	68	52	41	47	58	60	63	52	**41**	**68**	**54**
WALTHAM CROSS 4N	Broxbourne	R	A		38	46	57	32	37	54	40	38	47	51	50	**32**	**57**	**45**
CAMBRIDGE 1N	Cambridge	R	A	72	63	67	59	55	53	53	56	60	57	75	65	**53**	**75**	**61**
CHELMSFORD 1N	Chelmsford	R	A									27	21	44	25	**21**	**44**	
COLCHESTER 5N	Colchester	R	A	57	26	33	56	52	21	65	65	52		23	39	**21**	**65**	**44**
HEMEL HEMPSTEAD 1N	Dacorum	R	A			69		55		49	55	64	70	70	73	**49**	**73**	**63**
ELY CAMBS 1N	East Cambridgeshire	R	A	48	42	34	34	29	27	30	24	33	39	49	47	**24**	**49**	**36**
HERTFORD 1N	East Hertfordshire	R	A	42	75	33	36	25	17	34	31	31	46	44	34	**17**	**75**	**37**
EPPING 1N	Epping Forest	R	A	32	33	27	38	45	33	31		38	29			**27**	**45**	**34**
NEWMARKET 1N	Forest Heath	R	A	40	65		29	27	38	71	48	29		7	46	**7**	**71**	**40**
BOREHAMWOOD 1N	Hertsmere	R	A	130	73	61	69	40	50	50		57			61	**40**	**130**	**66**
ST NEOTS 1N	Huntingdon	R	A	51	65	53	53	41	49	41	44	50	52	59	59	**41**	**65**	**51**
IPSWICH 1N	Ipswich	R	A	40	25	33	27	21		12	36	50	34	36	37	**12**	**50**	**32**
BIGGLESWADE 1N	Mid Bedfordshire	R	A		46	52	54	48	40	38	38	33	41	38	41	**33**	**54**	**43**
LETCHWORTH 1N	North Hertfordshire	R	A	46	43	43	40	33	38	28	33		45	49	47	**28**	**49**	**41**
CROMER 1N	North Norfolk	R	A	46	46	40	41	37	36	33	33	31	32	38	35	**31**	**46**	**37**
PETERBOROUGH 1N	Peterborough	R	A	59		59	50	50	52	47	44	50	54	56	62	**44**	**62**	**53**
ILFORD 1N	Redbridge	R	A	37	29	44	52	40	34	29	32	21	56	52	36	**21**	**56**	**38**
DUNSTABLE 5N	South Bedfordshire	R	A	48	39	50	53	57	46	46	13	42	42	42	43	**13**	**57**	**43**
HISTON 1N	South Cambridgeshire	R	C	49	44	44	40	37	38	39	34	31	48	48	46	**31**	**49**	**41**
ST ALBANS 1N	St Albans	R	A	58	54	46	43	34	38	39	28	37	41	53	60	**28**	**60**	**44**
BURY ST EDMUNDS 1N	St Edmundsbury	R	A		68	60		45	38	44	44	37	45	48	49	**37**	**68**	**48**
STEVENAGE 1N	Stevenage	R	A	26	19	31	31	24	24	24	25	26	26	32	31	**19**	**32**	**27**
FELIXSTOWE 1N	Suffolk Coastal	R	A	60	53	45	37	30		34	37	39	48	57	48	**30**	**60**	**44**
RICKMANSWORTH 1N	Three Rivers	R	A	55	46	50	40	40	35	36	36	42	44	52	49	**35**	**55**	**44**
GRAYS 1N	Thurrock	R	A	42	56	60	54	51	56	49	50	57	52	62	55	**42**	**62**	**54**
SAFFRON WALDEN 1N	Uttlesford	R	A	35	46	31	30	24	32	32	36	25				**24**	**46**	**32**
WELWYN GARDEN CITY 1N	Welwyn & Hatfield	R	A							34						**34**	**34**	

REGIONAL SUMMARY		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Regional Monthly Mean	50	48	45	43	39	37	38	38	39	44	47	45
	Regional Monthly Min	26	19	26	22	21	17	12	13	21	21	7	4
	Regional Monthly Max	130	75	69	69	68	56	71	65	64	70	75	73
	Regional Annual Mean	44											
	Regional Annual Min	27											
	Regional Annual Max	66											
	Number of Sites	33											
	% With Valid Data	94											

Figure B8.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in the Eastern Region**

8 Eastern (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for the Eastern region are shown in Figure B8.1. The validated 2000 dataset for the region is detailed in Table B8.5. Tables B8.3 and B8.4 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3} , and greater than 40μgm^{-3}, respectively.

Table B8.3 Intermediate and Urban Background Sites in the Eastern region with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	None	Cambridge 2N (58 μgm^{-3})
		Grays 2N (53 μgm^{-3})
		Borehamwood 2N (52 μgm^{-3})
		Borehamwood 3N (49 μgm^{-3})
		Hemel Hempstead 7N (48 μgm^{-3})

Table B8.4 Intermediate and Urban Background Sites in the Eastern region with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*
Cambridge 2N (58 μgm^{-3})
Grays 2N (53 μgm^{-3})
Borehamwood 2N (52 μgm^{-3})
Borehamwood 3N (49 μgm^{-3})
Hemel Hempstead 7N (48 μgm^{-3})
Borehamwood 4N (45 μgm^{-3})
Hemel Hempstead 2N (41 μgm^{-3})

Table B8.5 Intermediate and Urban Backgound Sites in the Eastern Region

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
HADLEIGH 1N	Babergh	B	A	34	28	24	15	12	14	9	15	17	25	30	34	**9**	**34**	**21**
SUDBURY 2N	Babergh	I	C	44	37	34	24	22	27	19	26	26	36	40	39	**19**	**44**	**31**
SUDBURY 3N	Babergh	B	A	39	30	26	19	16	15	14	16	23	32	37	38	**14**	**39**	**25**
BRAINTREE 2N	Braintree	I	C	39	37	33	25	27	30	20	22	22	27			**20**	**39**	**28**
BRAINTREE 3N	Braintree	B	A		26	25	21	16	18	14	21	19				**14**	**26**	**20**
BRAINTREE 4N	Braintree	B	A	49	33	26	21	21	23	13	36	23	29	27	26	**13**	**49**	**27**
BROADLAND 2N	Broadland	I	C	37	34	18	14	16	16	17	16	18	26	26		**14**	**37**	**22**
BROADLAND 3N	Broadland	B	A	29	22	13	15	12	6	12	14	15	20	25	22	**6**	**29**	**17**
BROADLAND 4N	Broadland	B	A	35	20		6		16		11	4	20			**4**	**35**	**16**
CHESHUNT 4N	Broxbourne	I	C		40	23		26	29	16	24	28	43	34	32	**16**	**43**	**30**
HODDESDON 2N	Broxbourne	B	A	22	29				20	14	18	24	26	26	23	**14**	**29**	**22**
HODDESDON 3N	Broxbourne	B	A		29	12	16	16	19	17	14	19	17	28	22	**12**	**29**	**19**
WALTHAM CROSS 3N	Broxbourne	B	A		37	24	24	32	26	23	26	25	49	45	41	**23**	**49**	**32**
CAMBRIDGE 2N	Cambridge	I	C	75	74	53	49	41	45	40	46	55	67	82	64	**40**	**82**	**58**
CAMBRIDGE 3N	Cambridge	B	A	49	40	37	30	23	13	24	23	30	40	46	44	**13**	**49**	**33**
CAMBRIDGE 4N	Cambridge	B	A	48	44	39	31	22	24	24	25	27	41	49	48	**22**	**49**	**35**
CHELMSFORD 2N	Chelmsford	I	C									23	23	34		**23**	**34**	
CHELMSFORD 3N	Chelmsford	B	A									27		36	31	**27**	**36**	
CHELMSFORD 5N	Chelmsford	B	A									25	10	29	27	**10**	**29**	
COLCHESTER 6N	Colchester	I	C	40	37	33	27	23	15	32	32	35	28	25	20	**15**	**40**	**29**
COLCHESTER 7N	Colchester	B	A		24					19	19		15	12	26	**12**	**26**	**19**
COLCHESTER 8N	Colchester	B	A	32	22	26	10	12		21	21	17	14	12	20	**10**	**32**	**19**
HEMEL HEMPSTEAD 2N	Dacorum	I	C			41		36		29	40	39	45	49	49	**29**	**49**	**41**
HEMEL HEMPSTEAD 6N	Dacorum	B	A			39		28		43	31	31	34	39	44	**28**	**44**	**36**
HEMEL HEMPSTEAD 7N	Dacorum	B	A			57		41		39	48	48	48	54	49	**39**	**57**	**48**
ELY CAMBS 2N	East Cambridgeshire	I	C	41	36	27	21	12	16	13	17	25	33	42	41	**12**	**42**	**27**
ELY CAMBS 3N	East Cambridgeshire	B	A	41	32	24	16	14	13	13	12	23	31	41	51	**12**	**51**	**26**
ELY CAMBS 4N	East Cambridgeshire	B	A	36	25	26	19	23	16	16	15	23	30	38	40	**15**	**40**	**26**
HERTFORD 2N	East Hertfordshire	I	C	29	57	36	34	17		13	21	12	27	31	25	**12**	**57**	**27**
HERTFORD 3N	East Hertfordshire	B	A	23	48	13	21	13	31	17	17	17	36	27	33	**13**	**48**	**25**
HERTFORD 4N	East Hertfordshire	B	A	38	48	25	21	21	15	8	25	15	34		12	**8**	**48**	**24**
EPPING 2N	Epping Forest	I	C	35	25	22	29	23	26	15	28	28	22	47	23	**15**	**47**	**27**
EPPING 3N	Epping Forest	B	A	41	35	25	24	21	12	18	31	21	26	38	23	**12**	**41**	**26**
EPPING 4N	Epping Forest	B	A	45	34	11	37	18	25	16	16	24	24	38	38	**11**	**45**	**27**
BRANDON 4N	Forest Heath	B	A	8		27		8	10		13			25	19	**8**	**27**	**16**
NEWMARKET 2N	Forest Heath	I	C	29	36	31	21	13		27	19	25	21	19	19	**13**	**36**	**24**
NEWMARKET 3N	Forest Heath	B	A	19	38	23	17	8	15	29	23	19	29	31	33	**8**	**38**	**24**
BOREHAMWOOD 2N	Hertsmere	I	C	113	52	48	54	25	44	33		52		52	46	**25**	**113**	**52**
BOREHAMWOOD 3N	Hertsmere	B	A	124	52		44	31	38	21		33		54	42	**21**	**124**	**49**
BOREHAMWOOD 4N	Hertsmere	B	A	97	50	42	38	21		23		36		48	46	**21**	**97**	**45**
ST NEOTS 2N	Huntingdon	I	C	49	42	42	32	29	26	28	28		38	48	37	**26**	**49**	**36**
ST NEOTS 3N	Huntingdon	B	A	38	37	34	24	18	20	16	19	28	37	44		**16**	**44**	**29**
ST NEOTS 4N	Huntingdon	B	A	42	34	31	26	15	19	17	19	25	35	42	45	**15**	**45**	**29**
IPSWICH 2N	Ipswich	I	C	33			32	27	23	27	22	17				**17**	**33**	**26**
IPSWICH 3N	Ipswich	B	A	34	34	26	29	24		32	19			30	34	**19**	**34**	**29**
IPSWICH 4N	Ipswich	B	A	23	29		18	18	17	17	24	22	25	26	32	**17**	**32**	**23**
BIGGLESWADE 2N	Mid Bedfordshire	I	C		36	31	27	13	17	19	13	21	30	38	33	**13**	**38**	**25**
BIGGLESWADE 3N	Mid Bedfordshire	B	A		40	33	25	23	15	13	15	19	30	33		**13**	**40**	**25**
BIGGLESWADE 4N	Mid Bedfordshire	B	A		42	33	25	17	15	12	13	19	25	27		**12**	**42**	**23**
HITCHIN 5N	North Hertfordshire	B	A	51	31	31	26	16	18	16	21		33	36	43	**16**	**51**	**29**
LETCHWORTH 2N	North Hertfordshire	I	C		46	46	40	28	26	25	31		43	52	52	**25**	**52**	**39**
LETCHWORTH 6N	North Hertfordshire	B	A	63	30	30	25	13	19	15	19		48	51	51	**13**	**63**	**33**

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

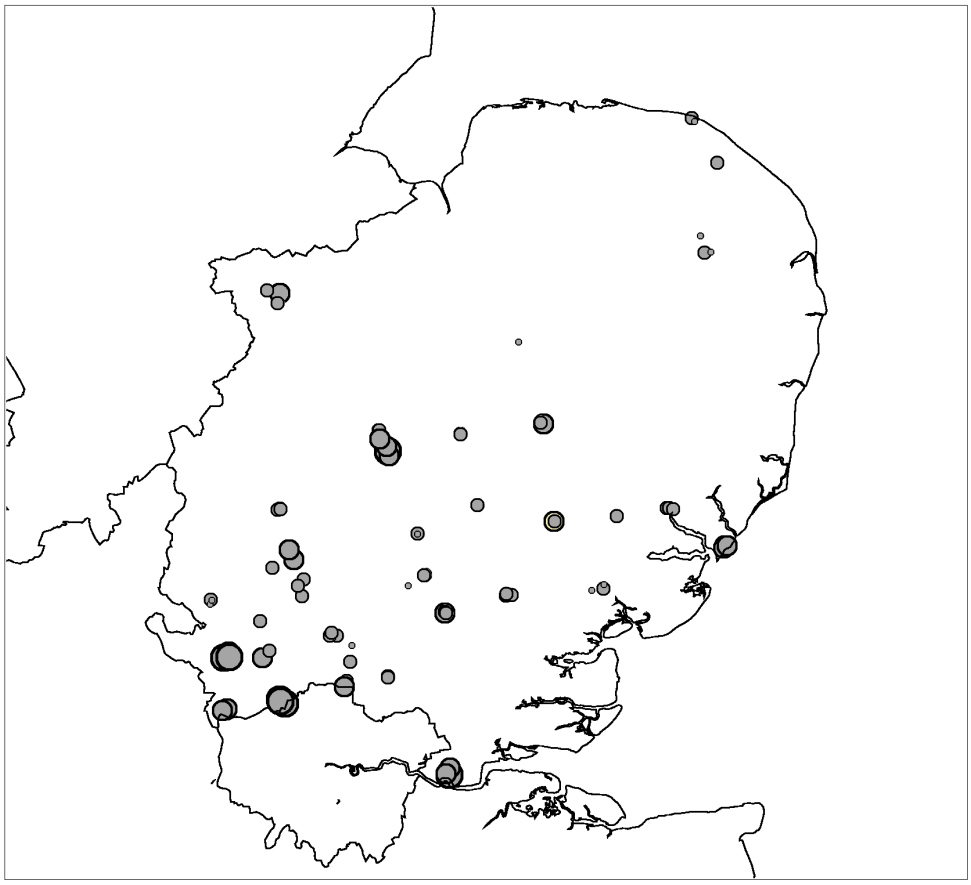
Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
CROMER 2N	North Norfolk	I	C	32	28	28	21	19	19	18	18	22	21	28	30	**18**	**32**	**24**
CROMER 6N	North Norfolk	B	A	32	20	20	16	12	11	12	12	14	21	25	15	**11**	**32**	**18**
NORTH WALSHAM 7N	North Norfolk	B	A	34	31	25	20	14	15	14	14	17	26	37	34	**14**	**37**	**23**
PETERBOROUGH 2N	Peterborough	I	C	50	37	42	30	29	31	33	28	30	42	44	47	**28**	**50**	**37**
PETERBOROUGH 3N	Peterborough	B	A	34	28			16	19	20	18	27	33	39	43	**16**	**43**	**28**
PETERBOROUGH 4N	Peterborough	B	A	34	27	28	22	18	19	19	18	23	30	32	36	**18**	**36**	**26**
ILFORD 2N	Redbridge	I	C	43	40	33	34	33	25	20	28	27	52	42	22	**20**	**52**	**33**
ILFORD 3N	Redbridge	B	A	36	32		34	27	25	19	23	27	22	35	31	**19**	**36**	**28**
ILFORD 4N	Redbridge	B	A	33	42	32	30	29	24	32	24	20	41	38	30	**20**	**42**	**31**
DUNSTABLE 2N	South Bedfordshire	I	C	32	24	27	24	24	22	23	24	21	28	28	27	**21**	**32**	**25**
DUNSTABLE 3N	South Bedfordshire	B	A	22	11	19	10	13	16	9	10	15	20	21	23	**9**	**23**	**16**
DUNSTABLE 4N	South Bedfordshire	B	A	28	15	24	19	10	14	15	13	19	22	24	21	**10**	**28**	**19**
HISTON 2N	South Cambridgeshire	I	C	38	28	29	24	15	19	15	17		34	38	47	**15**	**47**	**28**
HISTON 3N	South Cambridgeshire	B	A	34	32	27	16	15	16	15	16	25	33	39	42	**15**	**42**	**26**
HISTON 4N	South Cambridgeshire	B	C	35	31	28	28	23	28	21	21	35	38	38	46	**21**	**46**	**31**
ST ALBANS 2N	St Albans	I	C	48	44	40	36	24	24	33	27	29	31	48	33	**24**	**48**	**35**
ST ALBANS 5N	St Albans	B	A	40	39	39	24	18	18	22	19	24	27	37	33	**18**	**40**	**28**
ST ALBANS 6N	St Albans	B	A	53	24	28	17	14	13	18	12	12	27	42	37	**12**	**53**	**25**
BURY ST EDMUNDS 2N	St Edmundsbury	I	C	67	30	36		32		28	28	34	36	40		**28**	**67**	**37**
BURY ST EDMUNDS 7N	St Edmundsbury	B	A	37	32	28	23	13	16	18	18	24	35	40	43	**13**	**43**	**27**
HAVERHILL 7N	St Edmundsbury	B	A	39	31	24	13	13	14			25	33	40	47	**13**	**47**	**28**
STEVENAGE 2N	Stevenage	I	C	29	26	33	26	22	22	18	20	23	26	33	28	**18**	**33**	**26**
STEVENAGE 3N	Stevenage	B	A	32	41	21	27	16	16	10	21	23	41	14	25	**10**	**41**	**24**
STEVENAGE 4N	Stevenage	B	A	26		23	28	10	10		20			30	33	**10**	**33**	**22**
FELIXSTOWE 2N	Suffolk Coastal	I	C	51	50	38	28	24	28	25	32	33	43	52	41	**24**	**52**	**37**
FELIXSTOWE 3N	Suffolk Coastal	B	C	50	46	39	27	25	25	34	27	24	38			**24**	**50**	**33**
FELIXSTOWE 5N	Suffolk Coastal	B	A	48	44	33	23	17	21	15	22	23	36	49	44	**15**	**49**	**31**
FELIXSTOWE 7N	Suffolk Coastal	B	A											44	38	**38**	**44**	
RICKMANSWORTH 2N	Three Rivers	I	C	48	39	39	35	35	31	32	32	36	37	44	44	**31**	**48**	**38**
RICKMANSWORTH 3N	Three Rivers	B	A	44	35	42	33	33	31	26	26	32	38	46	47	**26**	**47**	**36**
RICKMANSWORTH 4N	Three Rivers	B	C	47	37	37	35	35	31	33	33	32	38	43	44	**31**	**47**	**37**
GRAYS 2N	Thurrock	I	C	66	59	61	47	46	51	45	45	53	55	59	52	**45**	**66**	**53**
GRAYS 3N	Thurrock	B	A	63	40	46	31	29	31	27	30	28	42	44	29	**27**	**63**	**36**
GRAYS 4N	Thurrock	B	A	46	38	38	26	26	26	24	19	27	32	38	32	**19**	**46**	**31**
SAFFRON WALDEN 2N	Uttlesford	I	C		30	21	25	20	18	14	18	23				**14**	**30**	**21**
SAFFRON WALDEN 3N	Uttlesford	B	A	22	21	19	18	13	9	12	13	18				**9**	**22**	**16**
STANSTED 4N	Uttlesford	B	A	30	20	17	19	16	13	12	17	18				**12**	**30**	**18**
WELWYN GARDEN CITY 3N	Welwyn & Hatfield	B	A							19						**19**	**19**	
WELWYN GARDEN CITY 8N	Welwyn & Hatfield	I	C							24						**24**	**24**	
WELWYN GARDEN CITY 9N	Welwyn & Hatfield	B	A							17						**17**	**17**	

REGIONAL SUMMARY

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regional Monthly Mean	42	35	31	25	21	21	21	22	25	32	37	35
Regional Monthly Min	8	11	11	6	8	6	8	10	4	10	12	12
Regional Monthly Max	124	74	61	54	46	51	45	48	55	67	82	64

Regional Annual Mean	29
Regional Annual Min	16
Regional Annual Max	58
Number of Sites	92
% With Valid Data	92

Figure B8.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in the Eastern Region



9 London (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for London are shown in Figure B9.0. The validated 2000 dataset for the region is detailed in Table B9.2. Tables B9.0 and B9.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3} , and greater than 40μgm^{-3}, respectively.

Table B9.0 Roadside Sites in London with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Haringey 1N (66 μgm^{-3})	*As for 61 μgm^{-3} plus*
	Havering 1N (63 μgm^{-3})	Ealing 1N (59 μgm^{-3})
		Lambeth 1N (55 μgm^{-3})
		Brent 43N (49 μgm^{-3})

Table B9.1 Roadside Sites in London with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*	
Haringey 1N (66 μgm^{-3})	Camden 1N (45 μgm^{-3})
Havering 1N (63 μgm^{-3})	Southwark 5N (45 μgm^{-3})
Ealing 1N (59 μgm^{-3})	Barking 1N (43 μgm^{-3})
Lambeth 1N (55 μgm^{-3})	Greenwich 35N (42 μgm^{-3})
Brent 43N (49 μgm^{-3})	Kensington 1N (42 μgm^{-3})
Westminster 1N (45 μgm^{-3})	Enfield 1N (41 μgm^{-3})

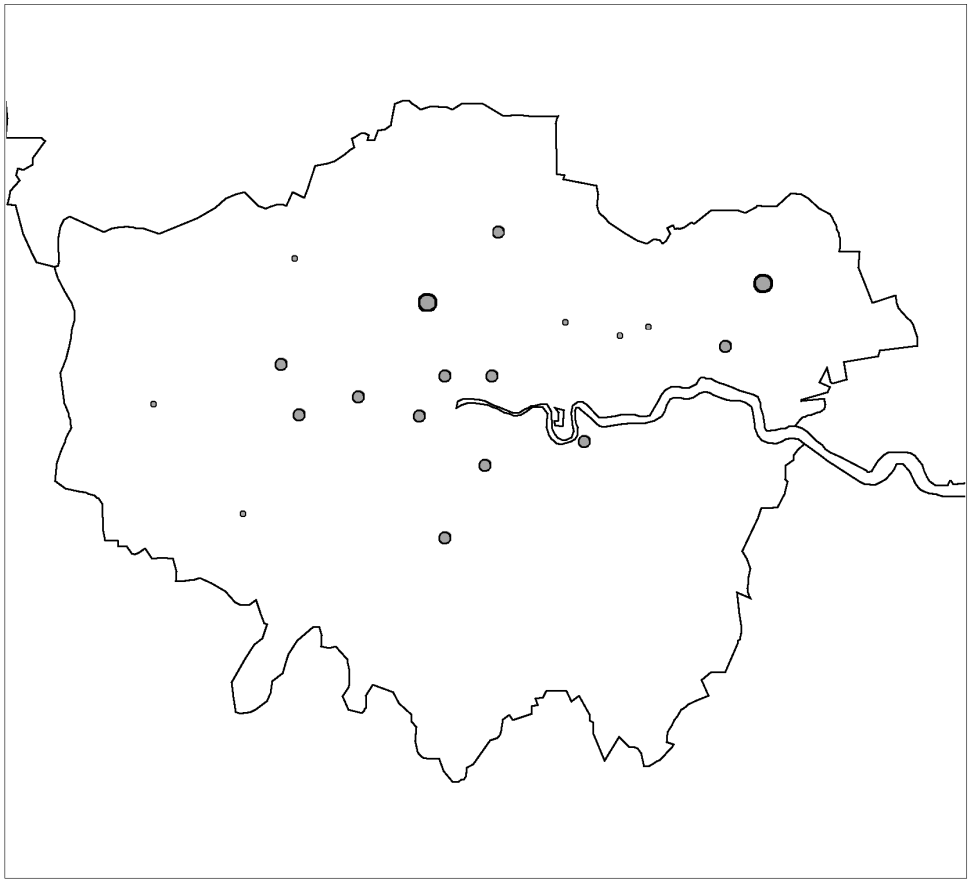
Table B9.2 Roadside Sites in London

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BARKING 1N	Barking	R	A	55	60	44	52	35	36	34	42	26	47	52	31	**26**	**60**	**43**
BARNET 5N	Barnet	R	A	45	37	40	43	24	26	31		29	33	17	31	**17**	**45**	**32**
BARNET 8N	Barnet	R	A												38	**38**	**38**	
BRENT 43N	Brent	R	C	45	50	61	43		61	39	49	43	39	59	51	**39**	**61**	**49**
BROMLEY 5N	Bromley	R	A					62	47	70						**47**	**70**	
CAMDEN 1N	Camden	R	A	38	43	37	57	39		39	51	50	54	43	39	**37**	**57**	**45**
EALING 1N	Ealing	R	A	55	90	68	56	52	41	42	68	67	61	22	86	**22**	**90**	**59**
ENFIELD 1N	Enfield	R	A	44	46	46	33	42	25	33	40	36	52	59	36	**25**	**59**	**41**
GREENWICH 35N	Greenwich	R	A	51			37	52	46	30	35	45	68	33	29	**29**	**68**	**42**
HACKNEY 1N	Hackney	R	A	39	37	29	41	36						36	63	**29**	**63**	**40**
HARINGEY 1N	Haringey	R	A	90	94	71	65	28	70	57	57	54	90	63	48	**28**	**94**	**66**
HAVERING 1N	Havering	R	A	76	65	61	70	62	51	50	40	58	70	84	64	**40**	**84**	**63**
HILLINGDON 1N	Hillingdon	R	A		18	42	33	25	26	30	29			40	20	**18**	**42**	**29**
ISLINGTON 1N	Islington	R	A	35	34	32	33	30								**30**	**35**	
KENSINGTON 1N	Kensington & Chelsea	R	A	96	56	39	40	41	48	32	40	29	24	29	30	**24**	**96**	**42**
LAMBETH 1N	Lambeth	R	A	53	49	58	66	56	46	43	38	42	91	62	61	**38**	**91**	**55**
NEWHAM 1N	Newham	R	A	29	37	32	39	35	33			35		24		**24**	**39**	**33**
RICHMOND UPON THAMES 1N	Richmond Upon Thames	R	A	42	48	31	38	41	38	37	37	27	42	33	26	**26**	**48**	**37**
SOUTHWARK 5N	Southwark	R	A	52	43	66	41	56	28		43	54	34		28	**28**	**66**	**45**
TOWER HAMLETS 1N	Tower Hamlets	R	A	45	37											**37**	**45**	
WALTHAM FOREST 4N	Waltham Forest	R	A	41	42	32	43	42						25	29	**25**	**43**	**36**
WESTMINSTER 1N	Westminster	R	A	43	31	82	44	59		46	45	31	29	50	39	**29**	**82**	**45**

REGIONAL SUMMARY		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	Regional Monthly Mean	51	48	48	46	43	41	41	44	42	52	43	42
	Regional Monthly Min	29	18	29	33	24	25	30	29	26	24	17	20
	Regional Monthly Max	96	94	82	70	62	70	70	68	67	91	84	86
	Regional Annual Mean	45											
	Regional Annual Min	29											
	Regional Annual Max	66											
	Number of Sites	22											
	% With Valid Data	82											

Figure B9.0 **Annual Average Roadside Nitrogen Dioxide Concentrations in London**



9 London (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for London are shown in Figure B9.1. The validated 2000 dataset for the region is detailed in Table B9.5. Tables B9.3 and B9.4 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3} , and greater than 40μgm^{-3}, respectively.

Table B9.3 Intermediate and Urban Background Sites in London with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value* *Surrogate Statistic*	*Sites ≥ 61μgm^{-3}* *EC Directive 98%ile Guide Value* *Surrogate Statistic*	*Sites ≥ 47 μgm^{-3}* *EC Directive 50%ile Limit Value* *Surrogate Statistic*
None	None	Havering 2N (47 μgm^{-3})

Table B9.4 Intermediate and Urban Background Sites in London with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective* *NO_2 Annual Mean*	
Havering 2N (47 μgm^{-3})	Enfield 2N (42 μgm^{-3})
Lambeth 2N (45 μgm^{-3})	Ealing 2N (41 μgm^{-3})
London City 2N (45 μgm^{-3})	Havering 3N (41 μgm^{-3})
Haringey 4N (44 μgm^{-3})	

Table B9.5 Intermediate and Urban Background Sites in London

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

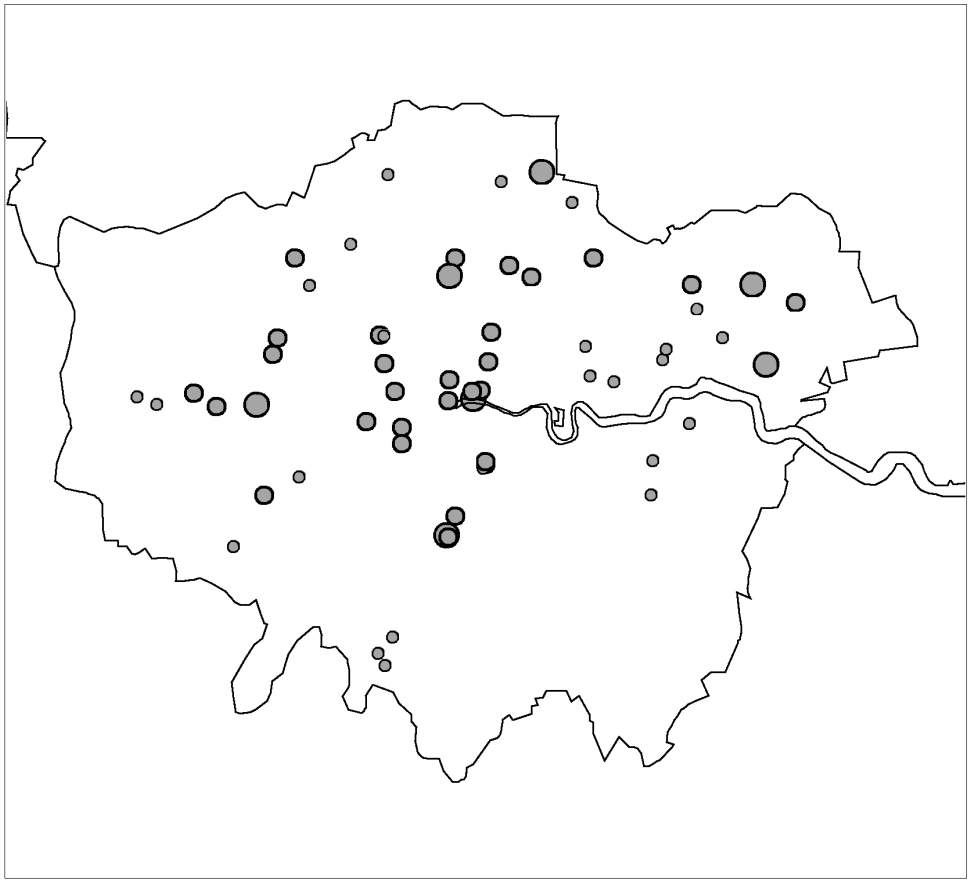
Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
BARKING 2N	Barking	I	C	37	35	22	24	20	26	26	26	16	30	48	30	**16**	**48**	**28**
BARKING 3N	Barking	B	C	41	41	28	23	16	24	26	20	24	36	49	21	**16**	**49**	**29**
BARKING 5N	Barking	B	A	34	33	18	24	29	23	20	27	20	25	37	22	**18**	**37**	**26**
BARNET 4N	Barnet	B	A	36		54	23	16	20	17	16	19	28	38	31	**16**	**54**	**27**
BARNET 6N	Barnet	I	C	40	37	25	42	28	27	21	25			48		**21**	**48**	**33**
BARNET 7N	Barnet	B	A	44	34	20	28	15	16	16	12	20	26	34	24	**12**	**44**	**24**
BRENT 41N	Brent	B	A	37	26	29	28	29	26	21	27	38		48	33	**21**	**48**	**31**
BRENT 51N	Brent	B	C	26	36	38	26	25	21	22	24	27	32	39	30	**21**	**39**	**29**
BRENT 54N	Brent	I	C	30	25	38	36	34	34	21	22	40	34	50	49	**21**	**50**	**34**
BROMLEY 2N	Bromley	I	C					62	76	46						**46**	**76**	
BROMLEY 3N	Bromley	B	A					28	29	26						**26**	**29**	
BROMLEY 4N	Bromley	B	A					59	57	45						**45**	**59**	
CAMDEN 4N	Camden	B	A	46	51	42	42			32	23	31	33	50	31	**23**	**51**	**38**
CAMDEN 5N	Camden	I	C	49	49	41	36	27		24	35	29	32	48	34	**24**	**49**	**37**
CAMDEN 6N	Camden	B	A	40	39	10	45	21		11	25	24	21	37	32	**10**	**45**	**28**
LONDON CITY 2N	City of London	I	C	47	39	67	45	40	36	41	41	39	45	49	48	**36**	**67**	**45**
LONDON CITY 3N	City of London	B	A	39	41	50	39	40	31	19	19	28	31	33	34	**19**	**50**	**34**
LONDON CITY 5N	City of London	B	A	35	39	57	36	28	36	19	19	26	36	43	59	**19**	**59**	**36**
EALING 2N	Ealing	I	C	43	54	50	30	33	36	23	37	36	35	43	72	**23**	**72**	**41**
EALING 3N	Ealing	B	A	48	60	32	33	4		24	29	24	29	45	44	**4**	**60**	**34**
EALING 4N	Ealing	B	A	38	40	28	27	22	21	22	34	26	25	42	36	**21**	**42**	**30**
ENFIELD 2N	Enfield	I	C	50	65	44		10	46	19	25	40	50	63	46	**10**	**65**	**42**
ENFIELD 3N	Enfield	B	A	33	44	21	31		21	19	21	31	38	36	34	**19**	**44**	**30**
ENFIELD 4N	Enfield	B	A										42	50	31	**31**	**50**	
GREENWICH 37N	Greenwich	B	A	41	25	27	22	25	20	25	26	20	20	32	33	**20**	**41**	**26**
GREENWICH 39N	Greenwich	I	C	37	25	37	22	20	20	25	23	24	23	21		**20**	**37**	**25**
GREENWICH 40N	Greenwich	B	A	49	29	30	19	22		20	12	12	28	28	22	**12**	**49**	**25**
HACKNEY 2N	Hackney	I	C	41	34			33						30	46	**30**	**46**	
HACKNEY 3N	Hackney	B	A	48	43	27	38	37						18	38	**18**	**48**	**36**
HACKNEY 4N	Hackney	B	A	30	33	28	37	40						28	47	**28**	**47**	**35**
HARINGEY 2N	Haringey	I	C	58	71	43	39	14	41	27	27	34	43	43	39	**14**	**71**	**40**
HARINGEY 3N	Haringey	B	A	51	46	45	36	23	38	37	37	23	50	26	29	**23**	**51**	**37**
HARINGEY 4N	Haringey	B	A	58	66	41	38	18	28	49	49	26	44	63	47	**18**	**66**	**44**
HAVERING 2N	Havering	I	C	48	58	55	47	39	41	33	33	38	56	63	57	**33**	**63**	**47**
HAVERING 3N	Havering	B	A		48	43	37	33	20	26		33	49	62	56	**20**	**62**	**41**
HAVERING 4N	Havering	B	A	39	40	39	29	24	27	25	25	32	39	42	37	**24**	**42**	**33**
HILLINGDON 3N	Hillingdon	B	A	29	16	40	26	22	19	20	24	34	29	30	27	**16**	**40**	**26**
HILLINGDON 5N	Hillingdon	I	C		23	28	25	21	11	27	31					**11**	**31**	**24**
ISLINGTON 3N	Islington	B	A	24	24	26	26	29								**24**	**29**	
ISLINGTON 4N	Islington	B	A	23	27	24	25	26								**23**	**27**	
ISLINGTON 5N	Islington	I	C	20	25	26	28	28								**20**	**28**	
KENSINGTON 2N	Kensington & Chelsea	I	C	30	44	41	38	38	33	32	36	29	38	29	39	**29**	**44**	**36**
KENSINGTON 3N	Kensington & Chelsea	B	A	50	45	26	45	39	32		18	33	37	33	36	**18**	**50**	**36**
KENSINGTON 4N	Kensington & Chelsea	B	A	43	32	33	28	28	21	19	26	39	31	39	29	**19**	**43**	**31**
LAMBETH 2N	Lambeth	I	C	51	42	50	48	51	26	38	49	35	65	41	48	**26**	**65**	**45**
LAMBETH 3N	Lambeth	B	A	56	28	34	27	46	28	30	30	22	49	32	28	**22**	**56**	**34**
LAMBETH 4N	Lambeth	B	A	54	35	44	37	40	24	30	27	22	41	31	30	**22**	**54**	**35**
NEWHAM 2N	Newham	I	C	26	33	22	26	29	24	32	33	36		38		**22**	**38**	**30**
NEWHAM 3N	Newham	B	A	33	30	9	26	31	22	26	24	18		22		**9**	**33**	**24**
NEWHAM 4N	Newham	B	A	43	23	41	26	29	24	27	27					**23**	**43**	**30**
RICHMOND UPON THAMES 2N	Richmond Upon Thames	I	C	44	56	20	28	26	27	31	27	24	35	24	37	**20**	**56**	**32**
RICHMOND UPON THAMES 3N	Richmond Upon Thames	B	A	32	28	26	24	25	24	26	25	20	27	27	22	**20**	**32**	**25**

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
RICHMOND UPON THAMES 4N	Richmond Upon Thames	B	A	33	27	25	24	28	28	17	24	26	29	28	26	**17**	**33**	**26**
SOUTHWARK 2N	Southwark	I	C	54	31		42	30		37	29	26	29	52	57	**26**	**57**	**39**
SOUTHWARK 6N	Southwark	B	A	36	31	36	25	24	22	31	44	20		31	17	**17**	**44**	**29**
SOUTHWARK 7N	Southwark	B	A	56	31	22	30	26	22		27	26		42	33	**22**	**56**	**32**
SUTTON 4N	Sutton	B	A		23	27	19		17	20		17	33	32	10	**10**	**33**	**22**
SUTTON 6N	Sutton	I	C		22	24	29		25	22		28	28	28	28	**22**	**29**	**26**
SUTTON 7N	Sutton	B	A		22	34	24		16	16		20	23	24	20	**16**	**34**	**22**
TOWER HAMLETS 2N	Tower Hamlets	I	C	47	54											**47**	**54**	
TOWER HAMLETS 3N	Tower Hamlets	B	A	42	32											**32**	**42**	
WALTHAM FOREST 1N	Waltham Forest	B	A	25	26	23	34	30						25		**23**	**34**	**27**
WALTHAM FOREST 5N	Waltham Forest	I	C	44	40	31	37	36						28	30	**28**	**44**	**35**
WESTMINSTER 2N	Westminster	I	C	29	40	32	28	24	33	17	35	37	42	19	27	**17**	**42**	**30**
WESTMINSTER 3N	Westminster	B	A	41	33	28	35	28	34		42	29	45	38	30	**28**	**45**	**35**
WESTMINSTER 5N	Westminster	B	A		31	41	63	37	46	38	37	26	37	47	35	**26**	**63**	**40**

REGIONAL SUMMARY		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	Regional Monthly Mean	40	37	33	32	29	29	26	28	27	35	38	35
	Regional Monthly Min	20	16	9	19	4	11	11	12	12	20	18	10
	Regional Monthly Max	58	71	67	63	62	76	49	49	40	65	63	72
	Regional Annual Mean	32											
	Regional Annual Min	22											
	Regional Annual Max	47											
	Number of Sites	66											
	% With Valid Data	85											

Figure B9.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in London



10 The South East (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for the South East are shown in Figure B10.0. The validated 2000 dataset for the region is detailed in Table B10.2. Tables B10.0 and B10.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3} , and greater than 40μgm^{-3}, respectively.

Table B10.0 Roadside Sites in the South East with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Portsmouth 1N (72 μgm^{-3})	*As for 61 μgm^{-3} plus*
	Canterbury 1N (63 μgm^{-3})	Southampton 5N (60 μgm^{-3})
	Abingdon 1N (63 μgm^{-3})	Rochester 1N (59 μgm^{-3})
		Witney 6N (59 μgm^{-3})
		Brighton 1N (54 μgm^{-3})
		Tunbridge Wells 1N (54 μgm^{-3})
		Staines 4N (51 μgm^{-3})
		Lewes 1N (51 μgm^{-3})
		Eastleigh 1N (49 μgm^{-3})
		Shoreham by Sea 1N (49 μgm^{-3})
		Bracknell 1N (48 μgm^{-3})
		Dover 6N (47 μgm^{-3})
		Henley 1N (47 μgm^{-3})

Table B10.1 Roadside Sites in the South East with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective* ***NO_2 Annual Mean***	
Portsmouth 1N (72 μgm^{-3})	Henley 1N (47 μgm^{-3})
Canterbury 1N (63 μgm^{-3})	Epsom 7N (46 μgm^{-3})
Abingdon 1N (63 μgm^{-3})	Guildford 1N (46 μgm^{-3})
Southampton 5N (60 μgm^{-3})	Worthing 1N (45 μgm^{-3})
Rochester 1N (59 μgm^{-3})	Dartford 1N (44 μgm^{-3})
Witney 6N (59 μgm^{-3})	Farnham 5N (43 μgm^{-3})
Brighton 1N (54 μgm^{-3})	Woking 5N (43 μgm^{-3})
Tunbridge Wells 1N (54 μgm^{-3})	Gillingham Kent 1N (43 μgm^{-3})
Staines 4N (51 μgm^{-3})	Hove 1N (43 μgm^{-3})
Lewes 1N (51 μgm^{-3})	Horsham 1N (43 μgm^{-3})
Eastleigh 1N (49 μgm^{-3})	Basingstoke 1N (42 μgm^{-3})
Shoreham by Sea 1N (49 μgm^{-3})	Ashford 4N (41 μgm^{-3})
Bracknell 1N (48 μgm^{-3})	Esher 1N (41 μgm^{-3})
Dover 6N (47 μgm^{-3})	

Table B10.2 Roadside Sites in the South East

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

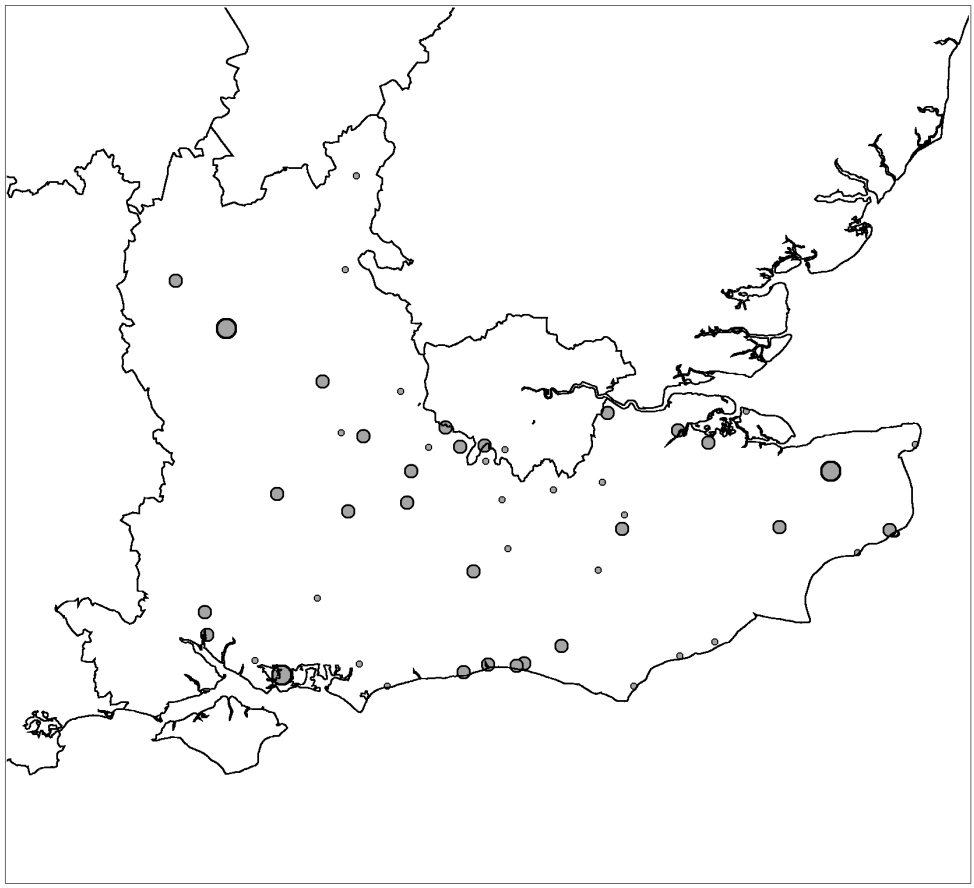
Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
SHOREHAM-BY-SEA 1N	Adur	R	A	55	48	56	56	57	43	48	40	40	47	51	46	**40**	**57**	**49**
BOGNOR REGIS 1N	Arun	R	A	61	37	38	38	34	34	37	32	29	32	33	41	**29**	**61**	**37**
ASHFORD 4N	Ashford	R	A	55	48	40	44	19	37	40		39	33	49	50	**19**	**55**	**41**
AYLESBURY 5N	Aylesbury Vale	R	A	43	29	28	28		28			24	27	36	37	**24**	**43**	**31**
BASINGSTOKE 1N	Basingstoke	R	A	62	51	45	41	48	41	24	31	44	34	37	42	**24**	**62**	**42**
BRACKNELL 1N	Bracknell	R	A	42	30	29	48	45	71	60	44		52	51	53	**29**	**71**	**48**
BRIGHTON 1N	Brighton & Hove	R	A	70	52	61	50	57	49	43	47	53	68	57	46	**43**	**70**	**54**
HOVE 1N	Brighton & Hove	R	A	71	44	46	48	40	28	39	32	30	40	49	47	**28**	**71**	**43**
CANTERBURY 1N	Canterbury	R	A	76	69		70	56	51	47	47	56	75	82	65	**47**	**82**	**63**
BANBURY 1N	Cherwell	R	A							39		46	49	54	31	**31**	**54**	
CHICHESTER 1N	Chichester	R	A	56	48	46	49	51	37	32	31	31	11	26	27	**11**	**56**	**37**
CRAWLEY 1N	Crawley	R	A	48	45	39	36	32		30	34		31	44	41	**30**	**48**	**38**
DARTFORD 1N	Dartford	R	A	27	14	46	49	49	49	58	61				42	**14**	**61**	**44**
DOVER 6N	Dover	R	A	63			57	64	53	41	45	43	30	26	50	**26**	**64**	**47**
ALTON 5N	East Hampshire	R	A	34	32	40	32	29	26	30		30	33	33	32	**26**	**40**	**32**
EASTBOURNE 1N	Eastbourne	R	A	54	37	42				26				29	29	**26**	**54**	**36**
EASTLEIGH 1N	Eastleigh	R	A	59	63	49	51	50	51	42	41	39		48		**39**	**63**	**49**
ESHER 1N	Elmbridge	R	A	70	42	30	42	49		54	54	21	19	49	20	**19**	**70**	**41**
EPSOM 1N	Epsom & Ewell	R	A		51	16	26	30	29	41	41		37		30	**16**	**51**	**34**
EPSOM 6N	Epsom & Ewell	R	A			32		24		41	61		37		12	**12**	**61**	**35**
EPSOM 7N	Epsom & Ewell	R	A		29	57	29	41	46	48	61		69		34	**29**	**69**	**46**
FAREHAM 1N	Fareham	R	A		64	32	29	40	39	26	23	33	36	47	59	**23**	**64**	**39**
GRAVESEND 1N	Gravesham	R	A	76	64	70								84		**64**	**84**	
GUILDFORD 1N	Guildford	R	A	52	42	54	57	47	48	48	46	32		31		**31**	**57**	**46**
HASTINGS 4N	Hastings	R	A	41	42	38	38	39	37	40	31	18	41	44		**18**	**44**	**37**
HORSHAM 1N	Horsham	R	A	38	47	50	46	49	45	39	31	47	33			**31**	**50**	**43**
LEWES 1N	Lewes	R	A	58	53	54	60	50	68	37	43	43	45	54	42	**37**	**68**	**51**
GILLINGHAM KENT 1N	Medway	R	A		47	51	45	38	42	40	35	46				**35**	**51**	**43**
ROCHESTER 1N	Medway	R	A		71	68	65	51	63	63	33	61				**33**	**71**	**59**
MILTON KEYNES 1N	Milton Keynes	R	A	48	35	41	38	27	29	28	36	30	32	35	46	**27**	**48**	**35**
PORTSMOUTH 1N	Portsmouth	R	A	86	79	77	70	65	38	75	60	93	70	81	72	**38**	**93**	**72**
REIGATE 1N	Reigate & Banstead	R	A	25	39	46		40	29	32	24	40	32	37		**24**	**46**	**34**
BEXHILL 5N	Rother	R	A	46	39	44	39	34	37	37	31	24	36	41	45	**24**	**46**	**38**
ADDLESTONE 1N	Runnymede	R	A	31	47	19	32	39	37	42	50	25	47	36	26	**19**	**50**	**36**
SEVENOAKS 1N	Sevenoaks	R	A	53	50		29	30	33	37	17	18	37	36	38	**17**	**53**	**34**
FOLKESTONE 1N	Shepway	R	A	41	25	37	34	29	28	31	26	23	27	31	32	**23**	**41**	**30**
SLOUGH 1N	Slough	R	A	36	45	46	57	27	31	27	34	40	39	38	37	**27**	**57**	**38**
HENLEY 1N	South Oxfordshire	R	A		50	37	50	46	36	39	50	63		63	30	**30**	**63**	**47**
SOUTHAMPTON 5N	Southampton	R	A	77	73	72	84	72	51	64	69	34	41	39	38	**34**	**84**	**60**
STAINES 4N	Spelthorne	R	A	63	51	56	51	27	67	46	62	44	60	20	64	**20**	**67**	**51**
SUTTON 1N	Sutton	R	A		36	34	20		22	33		33	25	30	26	**20**	**36**	**29**
SHEERNESS 1N	Swale	R	A	40	39	36	31	35	28	45	21	26	37	36	34	**21**	**45**	**34**
OXTED 1N	Tandridge	R	A	55	33	45	25	33	34	27	25	10	32	18	28	**10**	**55**	**30**
RAMSGATE 5N	Thanet	R	A	48	37	43	43		35	39	35	21	38	25	46	**21**	**48**	**37**
TONBRIDGE 1N	Tonbridge & Malling	R	A	51	41	37	34	37	33	24	28	33	43	38	28	**24**	**51**	**35**
TUNBRIDGE WELLS 1N	Tunbridge Wells	R	A	66	66	59	51	51	50	53	44	14	67	65	58	**14**	**67**	**54**
ABINGDON 1N	Vale of White Horse	R	A	78	63	72	64	52	60	61	48	63	67	64	61	**48**	**78**	**63**
FARNHAM 5N	Waverley	R	A	44	57	58	39	47	45	37	51	17		39		**17**	**58**	**43**
CROWBOROUGH 1N	Wealden	R	A	38	43	24		34				40	40	33	32	**24**	**43**	**35**
WITNEY 6N	West Oxfordshire	R	A	55	50	52	59	65	44		52				96	**44**	**96**	**59**
MAIDENHEAD 1N	Windsor & Maidenhead	R	A		31										81	**31**	**81**	
WOKING 5N	Woking	R	C	48	55	57	45	48	49	38	35	30	50	43	23	**23**	**57**	**43**

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
WOKINGHAM 1N	Wokingham	R	A	48	36	42	40	46	23	38	25	29	19	33	33	**19**	**48**	**34**
WORTHING 1N	Worthing	R	A	60	45	55	46	44	38	42	40	31	44	51	44	**31**	**60**	**45**

REGIONAL SUMMARY		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Regional Monthly Mean	53	46	46	45	43	41	41	40	36	41	43	42
	Regional Monthly Min	25	14	16	20	19	22	24	17	10	11	18	12
	Regional Monthly Max	86	79	77	84	72	71	75	69	93	75	84	96
	Regional Annual Mean	43											
	Regional Annual Min	29											
	Regional Annual Max	72											
	Number of Sites	54											
	% With Valid Data	94											

Figure B10.0 Annual Average Roadside Nitrogen Dioxide Concentrations in the South East



10 The South East (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for the South East are shown in Figure B10.1. The validated 2000 dataset for the region is detailed in Table B10.4. No intermediate and urban background sites in the South East exceeded the EC Directive Limit and Guide Value surrogate statistics. However, Table B10.3 below identifies all sampler locations with annual average NO_2 concentrations greater than 40 μgm^{-3}.

Table B10.3 Intermediate and Urban Background Sites in the South East with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3}   ***Air Quality Strategy Objective***   ***NO_2 Annual Mean***
Portsmouth 7N (44 μgm^{-3})

Table B10.4 Intermediate and Urban Background Sites in the South East

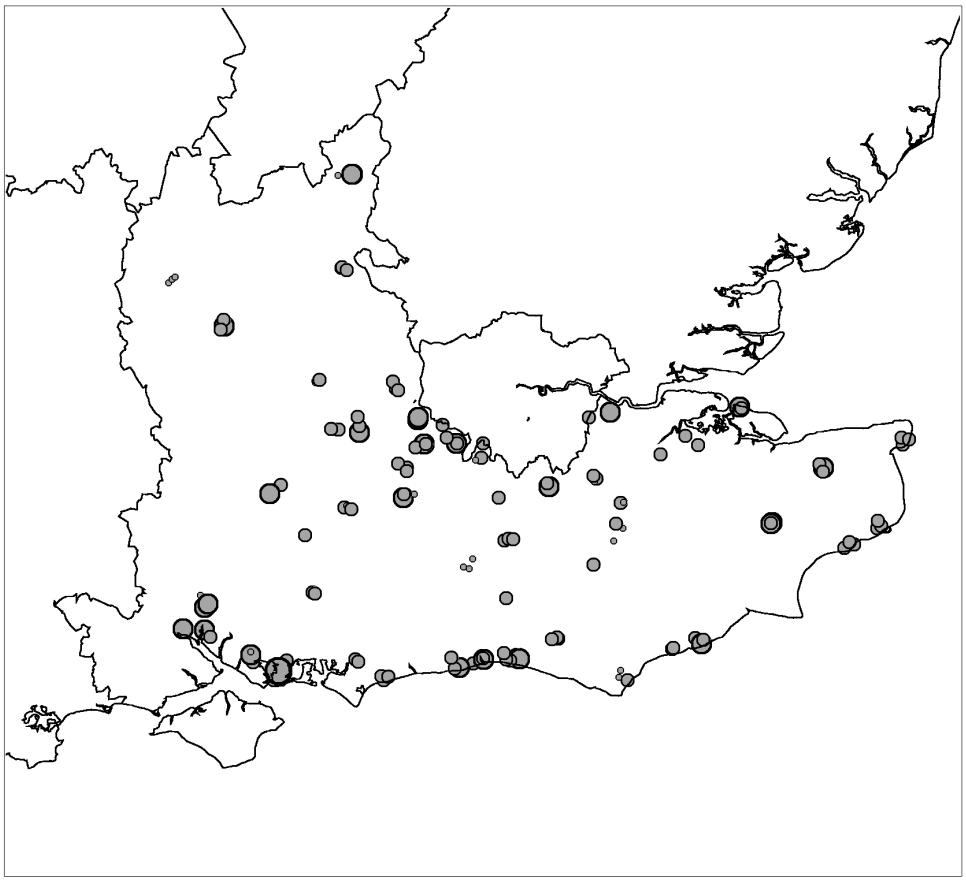
Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
LANCING 4N	Adur	B	A	48	29	33	27	26	22	20	19		26	37	32	**19**	**48**	**29**
SHOREHAM-BY-SEA 2N	Adur	I	C	54	43	46	35	37	32	40	27	26	35	39	38	**26**	**54**	**38**
SHOREHAM-BY-SEA 3N	Adur	B	A	43	25	32	24	23	22	22	21	20	25	33	24	**20**	**43**	**26**
BOGNOR REGIS 2N	Arun	I	C	41	27	25	24	26	20	24	21	19	22	27	29	**19**	**41**	**25**
BOGNOR REGIS 3N	Arun	B	A	39	31	27	25	19	16	20	19	20	27	34	35	**16**	**39**	**26**
BOGNOR REGIS 4N	Arun	B	A	36	25	26	24	18	14	16	16	19	6	27	34	**6**	**36**	**22**
ASHFORD 3N	Ashford	I	C	49	37	32	28	43	25	27	24	22	29	39	37	**22**	**49**	**33**
ASHFORD 5N	Ashford	B	A	44	36	34	29	27	24	20	22	31	26	41	38	**20**	**44**	**31**
ASHFORD 6N	Ashford	B	A	47	31	31	25	24	22	23	17	24	20	20	34	**17**	**47**	**26**
AYLESBURY 6N	Aylesbury Vale	I	C	46	25	28		21	13			32	28	34	34	**13**	**46**	**29**
AYLESBURY 7N	Aylesbury Vale	B	A	38	25	25	25	23	15				18	14	30	**14**	**38**	**24**
AYLESBURY 8N	Aylesbury Vale	B	A	38	23	20	16	18	12			19	26	31	35	**12**	**38**	**24**
BASINGSTOKE 3N	Basingstoke	B	A	44	30	30	25	20	19		21	26	22	33	32	**19**	**44**	**28**
BASINGSTOKE 4N	Basingstoke	B	A	40	28	28	28	24	22	11	24	21	19	25	26	**11**	**40**	**25**
BASINGSTOKE 5N	Basingstoke	I	C	51	39	36	39	33	33	21	27	19	27	39	47	**19**	**51**	**34**
BRACKNELL 2N	Bracknell	I	C	35	30	20	26	27	41	28	26		35	34	35	**20**	**41**	**31**
BRACKNELL 3N	Bracknell	B	A	32	13	18	26	24	30	25	24		25	27	29	**13**	**32**	**25**
BRACKNELL 4N	Bracknell	B	A	29	19	14	19	22	32	18	22		26	28	20	**14**	**32**	**23**
BRIGHTON 3N	Brighton & Hove	I	C	41	41	35	28	25	32	21	26	29	33	39		**21**	**41**	**32**
BRIGHTON 4N	Brighton & Hove	B	A	46	33	37	29	19			19	22	27	35	28	**19**	**46**	**29**
BRIGHTON 9N	Brighton & Hove	B	A		37	43	43	34	32		27	31	34	35		**27**	**43**	**35**
HOVE 2N	Brighton & Hove	I	C	41	31	37	31	20		18	17	17	26	31		**17**	**41**	**27**
HOVE 3N	Brighton & Hove	B	A	43	30				25	10	19	18	22		32	**10**	**43**	**25**
HOVE 4N	Brighton & Hove	B	A	46	32	31	27	26		15	23	24	24	23	32	**15**	**46**	**28**
CANTERBURY 4N	Canterbury	I	C	48	20		33	13	12	12	29	39	47	56	47	**12**	**56**	**32**
CANTERBURY 5N	Canterbury	B	A	37	44		41	33	33	30	9	14		25	31	**9**	**44**	**30**
CANTERBURY 6N	Canterbury	B	A	40	20		17	13	14	12	14	13	23	26	32	**12**	**40**	**20**
BANBURY 6N	Cherwell	B	A				29					23	16	24	30	**16**	**30**	
BANBURY 7N	Cherwell	I	C							23		23	16	26	38	**16**	**38**	
BANBURY 8N	Cherwell	B	A							10		14	12	8	25	**8**	**25**	
CHICHESTER 2N	Chichester	I	C	45	30	32	32	26	22	19	10	26	11	34	31	**10**	**45**	**27**
CHICHESTER 3N	Chichester	B	A	37	31	30	23	23	19	12	15	13	9	32	28	**9**	**37**	**23**
CHICHESTER 4N	Chichester	B	A	42	31	32	27	17	14	16		12	9	33	28	**9**	**42**	**24**
CRAWLEY 2N	Crawley	I	C	46	30	39	26	27	24	24	22	16	22	28	24	**16**	**46**	**27**
CRAWLEY 3N	Crawley	B	A	45	33	33	21	22	21	21	21	19	20	38	29	**19**	**45**	**27**
CRAWLEY 4N	Crawley	B	A	38	31	34	25		41	25	24	23	20	28	27	**20**	**41**	**29**
DARTFORD 2N	Dartford	I	C	35	12	33	29	39	36	25	50				35	**12**	**50**	**33**
DARTFORD 5N	Dartford	B	A	25	11	25	31	34	19	30	29				35	**11**	**35**	**27**
DARTFORD 7N	Dartford	B	A		12	35	21	38	27		26				37	**12**	**38**	**28**
DOVER 3N	Dover	B	A	25		28	24	17	20	9	21	16	13	47	37	**9**	**47**	**23**
DOVER 7N	Dover	I	C	30		29	34	32	32	13	24	25	21	33	35	**13**	**35**	**28**
DOVER 8N	Dover	B	A	34		28	20	24	24	16	21	20	20	31	31	**16**	**34**	**24**
ALTON 3N	East Hampshire	B	A	29	27	28	21	21	13	19	17	17	23	23	29	**13**	**29**	**22**
ALTON 6N	East Hampshire	I	C	33	33	36	29	29	24		23	25	29	29	30	**23**	**36**	**29**
PETERSFIELD 3N	East Hampshire	B	A	20		30	19	18	13	20		18	22	22	25	**13**	**30**	**21**
EASTBOURNE 2N	Eastbourne	I	C	34	27	30	29	22		13	21			28	31	**13**	**34**	**26**
EASTBOURNE 4N	Eastbourne	B	A	21	15	18	18	14		10	12			12	19	**10**	**21**	**15**
EASTBOURNE 5N	Eastbourne	B	A	27	17	25	20			14	16			18	20	**14**	**27**	**20**
EASTLEIGH 2N	Eastleigh	I	C	57	41	42	36	35			26	30	39	42	34	**26**	**57**	**38**
EASTLEIGH 3N	Eastleigh	B	A	24	16	13	16	14	13	11	10	12	19	19	25	**10**	**25**	**16**
EASTLEIGH 4N	Eastleigh	B	A	42	37	29					11	19		36	40	**11**	**42**	**31**
ESHER 2N	Elmbridge	I	C	39	48	30		17		41	41	20	29	30	19	**17**	**48**	**31**

				Nitrogen Dioxide Concentrations 2000 (ugm^{-3})														
Site Name	**Local Authority**	**Location**	**Status**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Min**	**Max**	**Mean**
ESHER 3N	Elmbridge	B	A	39	32	30	21	20		28	28	15	27	18	7	**7**	**39**	**24**
WALTON ON THAMES 1N	Elmbridge	B	A		44	34	31	26		14	14	17	26	28	24	**14**	**44**	**26**
EPSOM 2N	Epsom & Ewell	I	C		46	30	17	13	24	30	30		26		25	**13**	**46**	**27**
EPSOM 3N	Epsom & Ewell	B	A		31	19	4	17	16	18	18		13		13	**4**	**31**	**17**
EPSOM 5N	Epsom & Ewell	B	A		41	23	17	20	23	22	22		21		23	**17**	**41**	**24**
FAREHAM 10N	Fareham	B	A	33	18	21	22		20	19	21	24	25	33	33	**18**	**33**	**24**
FAREHAM 5N	Fareham	I	C	28	15	27	24	37	27	30	27		32	40	46	**15**	**46**	**30**
FAREHAM 7N	Fareham	B	A	26	18	8	21	17	16	14	14	14	21	26	31	**8**	**31**	**19**
GRAVESEND 2N	Gravesham	I	C	56	43	56										**43**	**56**	
GRAVESEND 3N	Gravesham	B	A	43	33	33										**33**	**43**	
GRAVESEND 4N	Gravesham	B	A	52	49	48										**48**	**52**	
GUILDFORD 2N	Guildford	I	C		36	47	45		29	31	38	33		23	47	**23**	**47**	**37**
GUILDFORD 3N	Guildford	B	A	31	21	22	16	22	20	13	18	17			34	**13**	**34**	**21**
GUILDFORD 5N	Guildford	B	A	34	13	18	17	16	16		18	14		21	28	**13**	**34**	**20**
HASTINGS 1N	Hastings	B	A	37	27	30	23	20	20	20	18	20	29	30	24	**18**	**37**	**25**
HASTINGS 2N	Hastings	I	C	38	38	32	33	33	31	37	32	27	36	36	30	**27**	**38**	**34**
HASTINGS 3N	Hastings	B	A	32	25	25	18	14	16	17	18	10	22	26	22	**10**	**32**	**20**
HORSHAM 2N	Horsham	I	C	23	27	32	18	14	14	15	9	16	18			**9**	**32**	**19**
HORSHAM 3N	Horsham	B	A	24	19	27	20	13	13	13	10	11	16			**10**	**27**	**17**
HORSHAM 4N	Horsham	B	A	15	19	25	15	15	10	13	8	10	17			**8**	**25**	**15**
LEWES 2N	Lewes	I	C	36	26	30	18	23	19	14	21	19	24	26	25	**14**	**36**	**24**
LEWES 3N	Lewes	B	A	35	20	23	19	17	18	12	17	18	20	26	27	**12**	**35**	**21**
LEWES 4N	Lewes	B	A	36	25	23	16	16	19	13	19	15	18	23	27	**13**	**36**	**21**
GILLINGHAM KENT 4N	Medway	B	A		30	32	23		40	22	19	22				**19**	**40**	**27**
ROCHESTER 3N	Medway	B	A		31	35	29			24	18	20				**18**	**35**	**26**
MILTON KEYNES 2N	Milton Keynes	I	C	44	33	36	35	18	24	27	31	29	27	40	35	**18**	**44**	**31**
MILTON KEYNES 3N	Milton Keynes	B	A	43	35	36	29	19		25	32	27	24	32	37	**19**	**43**	**31**
MILTON KEYNES 4N	Milton Keynes	B	A	31	22	25	19	14	12	16	17	15	18	19	29	**12**	**31**	**20**
PORTSMOUTH 3N	Portsmouth	B	A	39	28	29	28	22	18	21	19	27	24	27	29	**18**	**39**	**26**
PORTSMOUTH 4N	Portsmouth	B	A	32	32	31	26	26	22	24	21	29	30	36	35	**21**	**36**	**29**
PORTSMOUTH 7N	Portsmouth	I	C	52	42	46	46	37		41	31	43		55	46	**31**	**55**	**44**
REIGATE 3N	Reigate & Banstead	B	A	30	43	24		17	15	9	22			47		**9**	**47**	**26**
REIGATE 4N	Reigate & Banstead	B	A	27	45	35				25	16					**16**	**45**	
BEXHILL 2N	Rother	I	C	26	25	26		18	16	17	16		21	26	31	**16**	**31**	**22**
BEXHILL 6N	Rother	B	A	29	20	23	18	14	15	14	9	12	18	25	29	**9**	**29**	**19**
BEXHILL 7N	Rother	B	A	33	24	21	14	14	17	16		19		33	33	**14**	**33**	**22**
ADDLESTONE 2N	Runnymede	I	C	35	50	40	40	29	32	40	32	12	35	19	26	**12**	**50**	**33**
ADDLESTONE 3N	Runnymede	B	A	25	25	27	30	14	22	20	13	13	16	31	65	**13**	**65**	**25**
ADDLESTONE 5N	Runnymede	B	A	50	21	40	37	19	11	19	14	24	31	11	29	**11**	**50**	**26**
SEVENOAKS 2N	Sevenoaks	I	C	47		32	24	28	22	35	29	20	28	27	30	**20**	**47**	**29**
SEVENOAKS 3N	Sevenoaks	B	A	33	19	21	13		11	19	9	10	20	19	22	**9**	**33**	**18**
SEVENOAKS 9N	Sevenoaks	B	A	35	20	23	15	19	12	19	12		22	22	26	**12**	**35**	**21**
FOLKESTONE 3N	Shepway	B	A	33	19	21	21	24	20	9	18	16	23	22	31	**9**	**33**	**21**
FOLKESTONE 5N	Shepway	B	A	41	31	28	25	24	21	21	20	20	29	31	36	**20**	**41**	**27**
FOLKESTONE 6N	Shepway	I	C	25	22	18	21	21	20		22	13	21	23	29	**13**	**29**	**21**
SLOUGH 2N	Slough	I	C	44	31	28	27		21	25	28		32	30	29	**21**	**44**	**30**
SLOUGH 5N	Slough	B	A	33	25	28	17	16	15	18	18	26	33	25	11	**11**	**33**	**22**
SLOUGH 6N	Slough	B	A	28	29	27	29	27	38	15	15	22	30	28	29	**15**	**38**	**26**
HENLEY 3N	South Oxfordshire	B	A		21	19	20	12	19	7	12	16	17	19	27	**7**	**27**	**17**
HENLEY 7N	South Oxfordshire	B	A		21	19	18	13	17	8	14	25	15	21	21	**8**	**25**	**17**
HENLEY 8N	South Oxfordshire	I	C		26	27	28	23	24	17	20		20	24		**17**	**28**	**23**
SOUTHAMPTON 6N	Southampton	I	C	51	41	39	45	36	34	33	30	19	24	16	24	**16**	**51**	**33**
SOUTHAMPTON 7N	Southampton	B	A	46	50	39	40	32		32	34	21	27	30	23	**21**	**50**	**34**

				Nitrogen Dioxide Concentrations 2000 (ugm^{-3})														
Site Name	**Local Authority**	**Location**	**Status**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Min**	**Max**	**Mean**
SOUTHAMPTON 9N	Southampton	B	A	42	31	28	29	24	16	22	19	10	15	16	19	**10**	**42**	**23**
STAINES 2N	Spelthorne	I	C	41	47	36	22	15	21	25	23	28	34	34	39	**15**	**47**	**30**
STAINES 3N	Spelthorne	B	C	53	36	48	42	20	38	35	38	32	17	30	53	**17**	**53**	**37**
SUNBURY ON THAMES 1N	Spelthorne	B	A	38	34	31	12	14	20	26	39	9	36	30	35	**9**	**39**	**27**
SHEERNESS 2N	Swale	I	C	36	39	39	28	28	25	25	20	23	33	35	33	**20**	**39**	**30**
SHEERNESS 3N	Swale	B	A	37	27	27	21	21	18	21	18	20	28	28	29	**18**	**37**	**25**
SHEERNESS 4N	Swale	B	A	39	34	37	24	24	19	23	20	21	33	35	32	**19**	**39**	**29**
OXTED 2N	Tandridge	I	C	48	46	42	10	33	28	19	27	22	23	30	38	**10**	**48**	**31**
OXTED 3N	Tandridge	B	A	31	42	14	23	28	9	10	5	14	29	24	10	**5**	**42**	**20**
OXTED 9N	Tandridge	B	A	33	39	35	18	13	26	11	20	19	29	26	15	**11**	**39**	**24**
RAMSGATE 2N	Thanet	I	C	29	22	27	27				4	10	24	21	35	**4**	**35**	**22**
RAMSGATE 4N	Thanet	B	A	32	26	29	29		16	14	15	11	27	25	35	**11**	**35**	**24**
RAMSGATE 6N	Thanet	B	A	33	25	21	21				9	9	26	25	37	**9**	**37**	**23**
SNODLAND 3N	Tonbridge & Malling	B	C	44	34	32	27	24	26	23	22		38	33	27	**22**	**44**	**30**
TONBRIDGE 2N	Tonbridge & Malling	I	C	42	26	26		18	18	11	18	17	28	29	22	**11**	**42**	**23**
TONBRIDGE 3N	Tonbridge & Malling	B	A	37	23	25	16		14	5	6	10	24	22	21	**5**	**37**	**18**
TUNBRIDGE WELLS 4N	Tunbridge Wells	B	A	37	24		5	15	12	14	11	11	22	21	27	**5**	**37**	**18**
TUNBRIDGE WELLS 5N	Tunbridge Wells	I	C	35	28	26	18	12	13	13	13	16	27	30	21	**12**	**35**	**21**
TUNBRIDGE WELLS 6N	Tunbridge Wells	B	A	36	16	21	12	12	8	11	8	10	15	14	22	**8**	**36**	**15**
ABINGDON 2N	Vale of White Horse	I	C	46	33	37	27	21			24			38	42	**21**	**46**	**33**
ABINGDON 3N	Vale of White Horse	B	A	44	31	34	20	15	20	18	24	25	30	37	40	**15**	**44**	**28**
ABINGDON 4N	Vale of White Horse	B	A	34	23	26	19	13	15	15	16	19		29	33	**13**	**34**	**22**
FARNHAM 2N	Waverley	I	C	39	40	42	25	22	15	23	11	32	25	16	25	**11**	**42**	**26**
FARNHAM 3N	Waverley	B	A	33	28	21	14	8	9	9	7	8	19	16	10	**7**	**33**	**15**
FARNHAM 4N	Waverley	B	A	17	37	32	29	25	19	21	29	11	20	19	14	**11**	**37**	**23**
CROWBOROUGH 2N	Wealden	I	C	31	22	23			9	16	18			22		**9**	**31**	**20**
CROWBOROUGH 5N	Wealden	B	C	32												**32**	**32**	
CROWBOROUGH 6N	Wealden	B	A		21	20	17	15	12	14	15	12	21	24	26	**12**	**26**	**18**
UCKFIELD 4N	Wealden	B	A	32	22	24	16			14	14	11	23	26	28	**11**	**32**	**21**
WITNEY 4N	West Oxfordshire	B	A	33	29	23	13	8	10	10	12	15		27	29	**8**	**33**	**19**
WITNEY 5N	West Oxfordshire	I	C	29	21	25		15	13	17	13	4	17	27	25	**4**	**29**	**19**
WITNEY 7N	West Oxfordshire	B	A	33	25	21	15	15	12	12	12	21	17	6	29	**6**	**33**	**18**
MAIDENHEAD 2N	Windsor & Maidenhead	I	C		21											**21**	**21**	
MAIDENHEAD 5N	Windsor & Maidenhead	B	A		14											**14**	**14**	
MAIDENHEAD 6N	Windsor & Maidenhead	B	A		15										82	**15**	**82**	
WOKING 6N	Woking	I	C	31	53	42	7		17	24	24	26	32	28	17	**7**	**53**	**27**
WOKING 7N	Woking	B	C	46	49	29	13	13	5	15	20	14	28	21	10	**5**	**49**	**22**
WOKING 8N	Woking	B	C	27	41	28	30	19	12	6	10	7	22	18	22	**6**	**41**	**20**
WOKINGHAM 2N	Wokingham	I	C	52		36	25	25		27	27	25	17	25	31	**17**	**52**	**29**
WOKINGHAM 3N	Wokingham	B	A	48	33	31	27	19	17	15	27	21	15	25	31	**15**	**48**	**26**
WOKINGHAM 4N	Wokingham	B	A	40	23	27	21	17	13	15	15	10	12	23	33	**10**	**40**	**21**
WORTHING 2N	Worthing	I	C	48	33	40	26	31	30	35	26	23	35	43	38	**23**	**48**	**34**
WORTHING 4N	Worthing	B	A	45	29	34	21	17	15	12	17	16	24	32	33	**12**	**45**	**25**
WORTHING 5N	Worthing	B	A	46	27	33	25	21	16	18	18	18	25	32	34	**16**	**46**	**26**

Figure B10.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in the South East



11 The South West (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for the South West are shown in Figure B11.0. The validated 2000 dataset for the region is detailed in Table B11.2. Tables B11.0 and B11.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3} , and greater than 40μgm^{-3}, respectively.

Table B11.0 Roadside Sites in the South West with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	Bristol 1N (61 μgm^{-3})	*As for 61 μgm^{-3} plus* Kingswood 1N (47 μgm^{-3})

Table B11.1 Roadside Sites in the South West with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*
Bristol 1N (61 μgm^{-3})
Kingswood 1N (47 μgm^{-3})
Frome 1N (46 μgm^{-3})
Jersey 6N (46 μgm^{-3})
Westbury 1N (43 μgm^{-3})
Weymouth 8N (42 μgm^{-3})

Table B11.2 Roadside Sites in the South West

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
MIDSOMER NORTON 5N	Bath & NE Somerset	R	A	35	29	35	28	23	22	20	20	25	22		29	**20**	**35**	**26**
BRISTOL 1N	Bristol	R	A	68	75	71	61	86	58	34	55	43	58	64	55	**34**	**86**	**61**
TRURO 1N	Carrick	R	A	40	37	35		39	17	24	29		32	37	39	**17**	**40**	**33**
CHRISTCHURCH 4N	Christchurch	R	A	20	25	14	21		17	21	21	17	30	30	26	**14**	**30**	**22**
EXMOUTH 1N	East Devon	R	A	38	33	33	23	33	35		28	27	29	39	35	**23**	**39**	**32**
EXETER 1N	Exeter	R	A	44	26	39	41	40	38	43	37	39	38	46	51	**26**	**51**	**40**
GLOUCESTER 1N	Gloucester	R	C	33	27	31	26	20	19							**19**	**33**	**26**
GLOUCESTER 5N	Gloucester	R	A							30	37	35	41	44	42	**30**	**44**	**38**
JERSEY 6N	Jersey	R	A	53	55	53	48	41	47	36	46	42	46	40	46	**36**	**55**	**46**
DEVIZES 1N	Kennet	R	A	31	11	19	29	16	16	19	30	27	33	33	19	**11**	**33**	**24**
FROME 1N	Mendip	R	A		41	50	57	46	51	38	43	46	47	45		**38**	**57**	**46**
WESTON-SUPER-MARE 1N	North Somerset	R	A	35	29	37	41	32	26	22		27		20	33	**20**	**41**	**30**
CHIPPENHAM 5N	North Wiltshire	R	A	54	50	44	43	42	42	27	27	29	41			**27**	**54**	**40**
POOLE 3N	Poole	R	A		57		57	39	35	31	31	37	26	47		**26**	**57**	**40**
SALISBURY 6N	Salisbury	R	A	44	39	48	36	40	26	22	25	24	36	33	34	**22**	**48**	**34**
BRIDGWATER 1N	Sedgemoor	R	A	33	9	20	23	27	26	29	27	24	23	30	24	**9**	**33**	**25**
KINGSWOOD 1N	South Gloucestershire	R	A	59	52	62	49	40	39	38	46	42	35	54	45	**35**	**62**	**47**
YATE 1N	South Gloucestershire	R	A	36	41	46	30	33	25	28	34	31	36	23	43	**23**	**46**	**34**
TOTNES 6N	South Hams	R	A	29	33	32	20	24	26	32	39	22	37	37	35	**20**	**39**	**30**
SWINDON 1N	Swindon	R	A	44	37	41	36	20	35	28	26	35	24	39	33	**20**	**44**	**33**
NEWTON ABBOT 1N	Teignbridge	R	A	30	34	30	26	29	41	34	38	36	8	42	42	**8**	**42**	**33**
TEWKESBURY 5N	Tewkesbury	R	A	49	34	49	42	33	38	47		32	37	42	38	**32**	**49**	**40**
TORQUAY 1N	Torbay	R	A	55	34	43	33			23	35	35	44	46		**23**	**55**	**39**
BIDEFORD 6N	Torridge	R	A		8		18	21	18	18		21	20	22	23	**8**	**23**	**19**
WESTBURY 1N	West Wiltshire	R	A	47	47	50	42	31	44	34	43	50	41	41	42	**31**	**50**	**43**
WEYMOUTH 8N	Weymouth & Portland	R	A	45	48	26	41	44	15	31	54	43	48	32	74	**15**	**74**	**42**

REGIONAL SUMMARY		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	Regional Monthly Mean	42	36	39	36	35	31	30	35	33	35	38	38
	Regional Monthly Min	20	8	14	18	16	15	18	20	17	8	20	19
	Regional Monthly Max	68	75	71	61	86	58	47	55	50	58	64	74
	Regional Annual Mean	35											
	Regional Annual Min	19											
	Regional Annual Max	61											
	Number of Sites	26											
	% With Valid Data	100											

Figure B11.0 Annual Average Roadside Nitrogen Dioxide Concentrations in the South West

11 The South West (Intermediate and Urban Background)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for the South West are shown in Figure B11.1. The validated 2000 dataset for the region is detailed in Table B11.3. No intermediate and urban background sites in the South West exceeded the EC Directive Limit and Guide Value surrogate statistics or Air Quality Strategy Objective.

Table B11.3 Intermediate and Urban Background Sites in the South West

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
KEYNSHAM 3N	Bath & NE Somerset	B	A	29	18		14	9				11	13	19	22	**9**	**29**	**17**
MIDSOMER NORTON 2N	Bath & NE Somerset	I	C	27	11	22		17	12	12	12			16	16	**11**	**27**	**16**
MIDSOMER NORTON 4N	Bath & NE Somerset	B	A	24	15	22	14	14	16	13	13	16	13	17	21	**13**	**24**	**17**
BRISTOL 2N	Bristol	I	C	50	32	42	34	30	22	20	20	24	24	35	30	**20**	**50**	**30**
BRISTOL 3N	Bristol	B	A	39	19	26	23	18	23	13	18	22	24	25	30	**13**	**39**	**23**
BRISTOL 4N	Bristol	B	A	29	29	39	25	23	20	12	23	23	17	34	33	**12**	**39**	**26**
TRURO 2N	Carrick	I	C	26	25	20	17	20	28	10	17	33	19	24	31	**10**	**33**	**23**
TRURO 3N	Carrick	B	A	22	19	16	16	12	11	6	13	16	16	19	24	**6**	**24**	**16**
TRURO 4N	Carrick	B	A	26	19	19	16	13	12	11	9	13	17	19	21	**9**	**26**	**16**
CHRISTCHURCH 2N	Christchurch	I	C	14	10	9	7		16	9	96	9	13	13	13	**7**	**96**	**19**
CHRISTCHURCH 3N	Christchurch	B	A	8	7	7	4	7	5	4		4	7	7		**4**	**8**	**6**
CHRISTCHURCH 5N	Christchurch	B	A	5	6	8	5	8	5	7	6	4	7	7	8	**4**	**8**	**6**
EXMOUTH 2N	East Devon	I	C	33	25	22		21	23	14	18	18	20	23	27	**14**	**33**	**22**
EXMOUTH 3N	East Devon	B	A	25	14	17	14	9	9	9	9	11	11	15	20	**9**	**25**	**14**
EXMOUTH 4N	East Devon	B	A	23	14	16	14	12	10	6	10	10	6	16	18	**6**	**23**	**13**
EXETER 2N	Exeter	I	C	27	18	20	27	18	16	13	19	17	23	21	28	**13**	**28**	**20**
EXETER 3N	Exeter	B	A	23	14	18	30	17	10	12	12	18	18	24	27	**10**	**30**	**19**
EXETER 4N	Exeter	B	A	22	11	14	12	18	13	15	14	16	12	20	22	**11**	**22**	**16**
GLOUCESTER 2N	Gloucester	I	C	38	29	31	22	20	20	16	21	16	25	26	21	**16**	**38**	**24**
GLOUCESTER 3N	Gloucester	B	A	36	27	27	20	18	21	11	16	22	23	25	28	**11**	**36**	**23**
GLOUCESTER 4N	Gloucester	B	A	36	31	24	25	24	22	17	19	25	29	33	32	**17**	**36**	**26**
JERSEY 2N	Jersey	I	C	32	25	28	28	27	25	25	25	25	19	22	32	**19**	**32**	**26**
JERSEY 7N	Jersey	B	A	28	22	19	18	14	13	13	12	11	19	21	20	**11**	**28**	**18**
JERSEY 8N	Jersey	B	A	14	12	11	8	8	7	9	9	7	10	11	12	**7**	**14**	**10**
DEVIZES 5N	Kennet	B	A	17	18	20	7	10	10		12	13	8	16	11	**7**	**20**	**13**
DEVIZES 6N	Kennet	I	C	29	37	29	17	15	10	14	21	14	15	21	10	**10**	**37**	**19**
DEVIZES 7N	Kennet	B	A	12	27	12	8	9	7	7	5	9	17	19	9	**5**	**27**	**12**
FROME 3N	Mendip	B	A		17	25	19	29	11	13	26	12	19	22		**11**	**29**	**19**
FROME 5N	Mendip	I	C		31	41	8			52	50	54	33	35		**8**	**54**	**38**
STREET 4N	Mendip	B	A	30	15	22	13	8	7	10	10	12	15	36		**7**	**36**	**16**
WESTON-SUPER-MARE 2N	North Somerset	I	C	20	23	27		23	22	17			18	24	31	**17**	**31**	**23**
WESTON-SUPER-MARE 3N	North Somerset	B	A	35	18	19	20	31	12	9	14	13	16	21	26	**9**	**35**	**20**
WESTON-SUPER-MARE 4N	North Somerset	B	A	29	19	21	20	17	14	10	15	13	15	19		**10**	**29**	**18**
CHIPPENHAM 2N	North Wiltshire	I	C	36	30	33	26	21	21	19	19	25	23			**19**	**36**	**25**
CHIPPENHAM 6N	North Wiltshire	B	A	34	23	25	20	17	16	16	16	13	20			**13**	**34**	**20**
CHIPPENHAM 7N	North Wiltshire	B	A	31	20	23	21	16	15	28	28	16	18			**15**	**31**	**22**
POOLE 2N	Poole	I	C		26	22	22	24	20	10	10	14	29	27	15	**10**	**29**	**20**
POOLE 4N	Poole	B	A	88	14	24	24	14	13	11	11		19	19	15	**11**	**88**	**23**
POOLE 5N	Poole	B	A	100	13	18	18	12	10	34	34	15	17		25	**10**	**100**	**27**
SALISBURY 2N	Salisbury	I	C	42	31	37	31	30	12	19	24	25	22	31	31	**12**	**42**	**28**
SALISBURY 3N	Salisbury	B	A	30	29	27	29	17	25	17	24	24	24	30	32	**17**	**32**	**26**
SALISBURY 4N	Salisbury	B	A	30	26	21		21	19	13	14	21	25	31	27	**13**	**31**	**23**
BRIDGWATER 2N	Sedgemoor	I	C	32	14	21	18	18	22		26	30	27	25	33	**14**	**33**	**24**
BRIDGWATER 3N	Sedgemoor	B	A	20	7	9	8	10	10		11	13	13	12	20	**7**	**20**	**12**
BRIDGWATER 5N	Sedgemoor	B	A	22	12	6	9	12	14	7	12	18	18	21	27	**6**	**27**	**15**
FRAMPTON COTTERELL 1N	South Gloucestershire	B	A	40	26	29	22	13	20	16	22	37	20	32	35	**13**	**40**	**26**
KINGSWOOD 2N	South Gloucestershire	I	C	52	48	47	39	21	29	21	38	27	40	30	45	**21**	**52**	**36**
KINGSWOOD 3N	South Gloucestershire	B	A	30	21	24	20	15	17	12	16	19		25	10	**10**	**30**	**19**
KINGSWOOD 4N	South Gloucestershire	B	A	40	30	41	50	19	16		22	21	26	25	33	**16**	**50**	**29**
YATE 2N	South Gloucestershire	I	C	33	26	29	20	14	20	15	17	21	23	25	26	**14**	**33**	**22**
YATE 3N	South Gloucestershire	B	A	30	25	28	17	14	11	10	19	21	20	29	26	**10**	**30**	**21**
TOTNES 4N	South Hams	B	A	17	9	10	10	11	9	10	13	10	10	16	21	**9**	**21**	**12**

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
TOTNES 5N	South Hams	B	A	17	10	12	6	10	9	9	12	10	14	15	19	**6**	**19**	**12**
TOTNES 7N	South Hams	I	C	17	12	15	5	17	12	13	15	16	18	20		**5**	**20**	**15**
SWINDON 2N	Swindon	I	C	29	25	23	23	23	20	12	20	20	20	22	26	**12**	**29**	**22**
SWINDON 4N	Swindon	B	A	34		23	20	16	18	10	22	20	39	32	27	**10**	**39**	**24**
SWINDON 5N	Swindon	B	A	32	26	26	18	19	16	16	18	22	19	20	30	**16**	**32**	**22**
NEWTON ABBOT 3N	Teignbridge	I	C	24	16	21	12	17	14	14	14	15	38	21	24	**12**	**38**	**19**
NEWTON ABBOT 4N	Teignbridge	B	C	17	7	11	8	10	10	9	8	9	17	10	17	**7**	**17**	**11**
NEWTON ABBOT 5N	Teignbridge	B	A	22		18		13	11	15	11		8	22	21	**8**	**22**	**16**
TEWKESBURY 2N	Tewkesbury	I	C	31	23	25	20	18	17	17		18	20	27	31	**17**	**31**	**22**
TEWKESBURY 3N	Tewkesbury	B	A	30	17	25	22	15	16	15		17	19	21	28	**15**	**30**	**20**
TEWKESBURY 4N	Tewkesbury	B	A	25	18	22	16	11	14	12			20	24	28	**11**	**28**	**19**
BRIXHAM 5N	Torbay	B	A	15	8	12	11			9	7	11	9	9		**7**	**15**	**10**
TORQUAY 2N	Torbay	I	C	22		39					38	35		30		**22**	**39**	
TORQUAY 3N	Torbay	B	A	34	26	30	22			19		26	24	33		**19**	**34**	**27**
BIDEFORD 4N	Torridge	B	A	12	6	8	8	8	7	6		8	6	8	13	**6**	**13**	**8**
BIDEFORD 5N	Torridge	B	A	7	4	10	7	8	5	4		6	4	7	11	**4**	**11**	**7**
BIDEFORD 7N	Torridge	I	C	12	7	14	13	13	11	7		13	10	13	9	**7**	**14**	**11**
WESTBURY 2N	West Wiltshire	I	C	32	28	30	28	26	24	22	27	24	22	20	29	**20**	**32**	**26**
WESTBURY 3N	West Wiltshire	B	A	23	17	20	16	14	12	9	18	12	13	15	18	**9**	**23**	**16**
WESTBURY 5N	West Wiltshire	B	A	27	17	19	16	17	12	8	14		14	19	22	**8**	**27**	**17**
WEYMOUTH 2N	Weymouth & Portland	I	C	43	30	26	25	22	11	17	16	14	17	15	36	**11**	**43**	**23**
WEYMOUTH 4N	Weymouth & Portland	B	A	19	9	10	7	5	13	6	11	6	8	11	19	**5**	**19**	**10**
WEYMOUTH 9N	Weymouth & Portland	B	A	24	30	19	25	20	11	11	17	17	13	25	23	**11**	**30**	**20**

REGIONAL SUMMARY

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regional Monthly Mean	29	20	22	18	16	15	13	19	17	18	21	23
Regional Monthly Min	5	4	6	4	5	5	4	5	4	4	7	8
Regional Monthly Max	100	48	47	50	31	29	52	96	54	40	36	45

Regional Annual Mean	19
Regional Annual Min	6
Regional Annual Max	38
Number of Sites	75
% With Valid Data	99

Figure B11.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in the South West

12 Northern Ireland (Roadside Sites)

Roadside sampler locations and annual average NO_2 concentrations for Northern Ireland are shown in Figure B12.0. The validated 2000 dataset for the region is detailed in Table B12.2. Tables B12.0 and B12.1 identify all sampler locations with annual average NO_2 concentrations equal to or greater than 47 μgm^{-3} , and greater than 40μgm^{-3}, respectively.

Table B12.0 Roadside Sites in Northern Ireland with High Concentrations according to the EC Directive Surrogate Statistics

Sites ≥ 91 μgm^{-3} *EC Directive 98%ile Limit Value Surrogate Statistic*	***Sites ≥ 61μgm^{-3}*** *EC Directive 98%ile Guide Value Surrogate Statistic*	***Sites ≥ 47 μgm^{-3}*** *EC Directive 50%ile Limit Value Surrogate Statistic*
None	None	Omagh 1N (53 μgm^{-3})

Table 12.1 Roadside Sites in Northern Ireland with High Concentrations according to the Air Quality Strategy Objectives

Sites > 40 μgm^{-3} *Air Quality Strategy Objective NO_2 Annual Mean*
Omagh 1N (53 μgm^{-3})
Newry 6N(43 μgm^{-3})

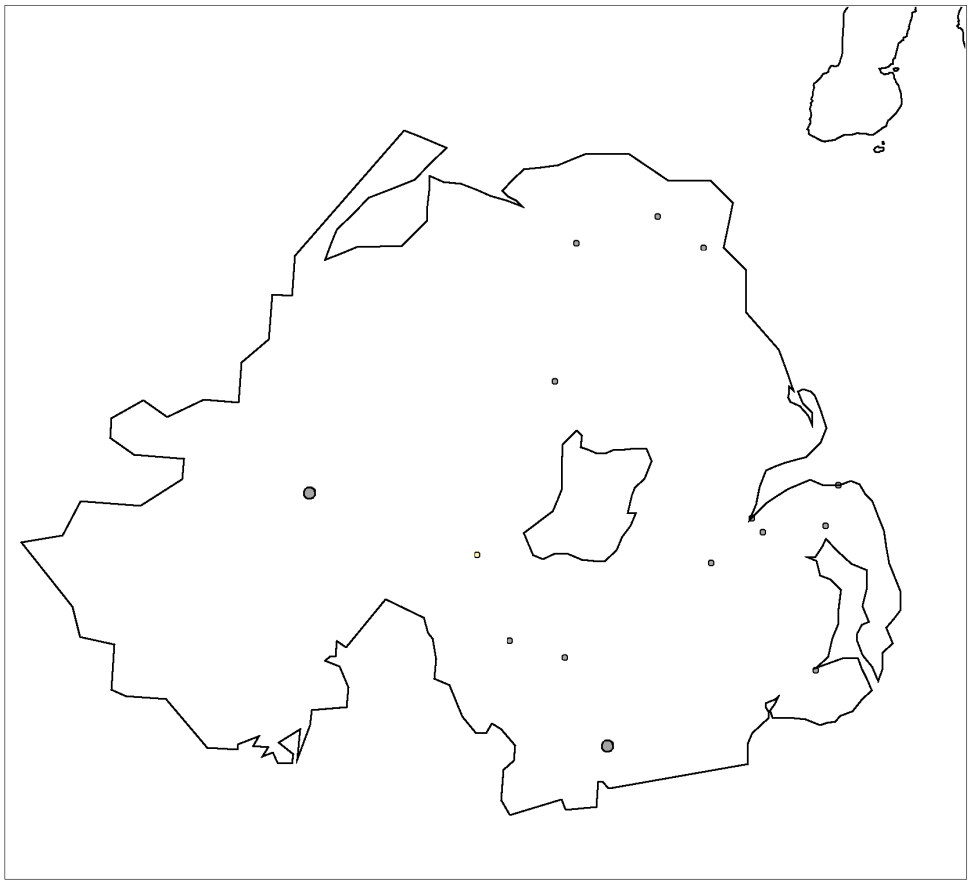
Table B12.2 Roadside Sites in Northern Ireland

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
NEWTOWNARDS 1N	Ards	R	A	24	32	28	28	34	22	27	35	32	32	31	24	**22**	**35**	**29**
ARMAGH 1N	Armagh	R	A	58	32		34		24	24	26	31	43	46	45	**24**	**58**	**36**
BALLYMENA 2N	Ballymena	R	A	34	63	25	23	27	15	29	29	19	36	4	27	**4**	**63**	**28**
BALLYMONEY 1N	Ballymoney	R	A	9	26		23	24	4	22	22	19	18	8	37	**4**	**37**	**19**
BELFAST 1N	Belfast	R	A	42	54	34	21	27	40	42	42	40	42	40	38	**21**	**54**	**39**
CARRICKFERGUS 1N	Carrickfergus	R	A	13	19	13	17		14	13	19	17	20	14	21	**13**	**21**	**16**
CASTLEREAGH 1N	Castlereagh	R	A	25	16	15	18	12	14	15	19	20	21	16	30	**12**	**30**	**18**
CRAIGAVON 5N	Craigavon	R	A		12	17	20	21		15	19	14	15		24	**12**	**24**	**18**
LONDONDERRY 1N	Derry City Council	R	A	68	69	71										**68**	**71**	
DOWNPATRICK 1N	Down	R	A	26	34	21	31	34				38	40	24	24	**21**	**40**	**30**
DUNGANNON 1N	Dungannon	R	A	12	34	17	17	25	10	27	27	12	21	21		**10**	**34**	**20**
LISBURN 1N	Lisburn	R	A	28	25	29	24	22	18	23	24	28	32	26	45	**18**	**45**	**27**
NEWRY 6N	Newry & Mourne	R	A		48	50		55	38	34	34	36	38	57	38	**34**	**57**	**43**
NEWTOWNABBEY 1N	Newtownabbey	R	A	45	48	29	19	39	35		43	36	32	40	62	**19**	**62**	**39**
BANGOR NI 1N	North Down	R	C		24	17	16	23		19	22	22	12	9	9	**9**	**24**	**17**
OMAGH 1N	Omagh	R	A		57	59	50		72	44	45	60	40			**40**	**72**	**53**

REGIONAL SUMMARY		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	Regional Monthly Mean	32	37	30	24	29	25	26	29	28	29	26	33
	Regional Monthly Min	9	12	13	16	12	4	13	19	12	12	4	9
	Regional Monthly Max	68	69	71	50	55	72	44	45	60	43	57	62
	Regional Annual Mean	29											
	Regional Annual Min	16											
	Regional Annual Max	53											
	Number of Sites	16											
	% With Valid Data	94											

Figure B12.0 Annual Average Roadside Nitrogen Dioxide Concentrations in Northern Ireland



12 Northern Ireland (Intermediate and Urban Background Sites)

Intermediate and urban background sampler locations and annual average NO_2 concentrations for Northern Ireland are shown in Figure B12.1. The validated 2000 dataset for the region is detailed in Table B12.3. No intermediate and urban background sites in Northern Ireland exceeded the EC Directive Limit and Guide Value surrogate statistics or the Air Quality Strategy Objective.

Table B12.3 Intermediate and Urban Background Sites in Northern Ireland

Nitrogen Dioxide Concentrations 2000 (ugm^{-3})

Site Name	Local Authority	Location	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min	Max	Mean
NEWTOWNARDS 2N	Ards	I	C	14	8	13	10	10	10	7	12	11	11	8		**7**	**14**	**11**
NEWTOWNARDS 3N	Ards	B	A	15	12	9	7	6	5	6	9	10	12	10	11	**5**	**15**	**9**
NEWTOWNARDS 6N	Ards	B	A	18	13	7	6	6		6	6	10	12	9	11	**6**	**18**	**9**
ARMAGH 2N	Armagh	I	C	25	18	22	14	14	11	10	13	16		24	23	**10**	**25**	**17**
ARMAGH 3N	Armagh	B	A	17	14	15	16	14	13	11	11	15	13	16	23	**11**	**23**	**15**
ARMAGH 4N	Armagh	B	A	24	18	24	17	18	16	13	16	16	19	25	25	**13**	**25**	**19**
BALLYMENA 1N	Ballymena	B	A	15	15	8	15	4	4	8	8	4	4	15	15	**4**	**15**	**10**
BALLYMENA 3N	Ballymena	I	C	36	34	12	23	12	10	19	19	25	21	33	19	**10**	**36**	**22**
BALLYMENA 4N	Ballymena	B	A	13	29	15	8	6	6	10	10	10	13		19	**6**	**29**	**13**
BALLYMONEY 2N	Ballymoney	I	C	11	24		5	16	9	26	26	17	16	22	31	**5**	**31**	**19**
BALLYMONEY 3N	Ballymoney	B	A	11	18		9	6	16	12	12	7	8	4	15	**4**	**18**	**11**
BALLYMONEY 4N	Ballymoney	B	A	15	13		14	6	5	12	12	7	16	7	58	**5**	**58**	**15**
BELFAST 2N	Belfast	I	C	59	54	33	13	19	31	36	36	27	36	29	38	**13**	**59**	**34**
BELFAST 3N	Belfast	B	A	27	42	17	19	15	15	33	33	17	25	23	17	**15**	**42**	**24**
BELFAST 4N	Belfast	B	A	27	54	17	12	15	12	21	21	15	10	10	21	**10**	**54**	**19**
CARRICKFERGUS 2N	Carrickfergus	I	C	12	12	9	10	9		8	10	18	16	9	11	**8**	**18**	**11**
CARRICKFERGUS 3N	Carrickfergus	B	A	8	9	6		5	5	6	7	9	9	7	6	**5**	**9**	**7**
CARRICKFERGUS 4N	Carrickfergus	B	A	11	9	6	12	9	10	12	11	14	12	9	11	**6**	**14**	**11**
CASTLEREAGH 2N	Castlereagh	I	C	19		12	10	12	10	10	12	14	14	10	27	**10**	**27**	**14**
CASTLEREAGH 5N	Castlereagh	B	A	17	13	12	9	11	7	8	10	13	14	10	29	**7**	**29**	**13**
CASTLEREAGH 6N	Castlereagh	B	A	18	13	8	9	4	6	7	10	13	13	14	22	**4**	**22**	**11**
CRAIGAVON 6N	Craigavon	I	C		9	14	22	20	15		19	20	24		89	**9**	**89**	**26**
CRAIGAVON 7N	Craigavon	B	A		21	11	11	6	11	7	9	6	13		25	**6**	**25**	**12**
CRAIGAVON 8N	Craigavon	B	A		19	9	8	6	10	7	9	11	5		14	**5**	**19**	**10**
LONDONDERRY 5N	Derry City Council	B	A	22	16	20										**16**	**22**	
LONDONDERRY 6N	Derry City Council	B	A	26	21	28										**21**	**28**	
LONDONDERRY 7N	Derry City Council	I	C	13	20	18										**13**	**20**	
DOWNPATRICK 2N	Down	I	C	13	10	10	9	7				12	14	11	11	**7**	**14**	**11**
DOWNPATRICK 3N	Down	B	A	12	6	8	5	7				8	9	9	10	**5**	**12**	**8**
DOWNPATRICK 4N	Down	B	A	7	7	6	4	4				7	8	5	7	**4**	**8**	**6**
DUNGANNON 2N	Dungannon	I	C	33	25	15	38	31	10	8	8	17	6	6		**6**	**38**	**18**
DUNGANNON 3N	Dungannon	B	A	19	13	6	10	10	4	12	12	8	13	13	15	**4**	**19**	**11**
DUNGANNON 4N	Dungannon	B	A	17	13	4	10	10	8	13	13	8	17	17	10	**4**	**17**	**12**
LISBURN 3N	Lisburn	B	A	6	11	7	7	9	7	6	8	12	11	5	28	**5**	**28**	**10**
LISBURN 4N	Lisburn	B	C	12												**12**	**12**	
LISBURN 5N	Lisburn	I	C	23	14	15	16	12	9	10	16	21	22	20	31	**9**	**31**	**17**
LISBURN 6N	Lisburn	B	A		10	11	10	8	8	7		12	14	13	22	**7**	**22**	**11**
NEWRY 3N	Newry & Mourne	I	C		36	15	8	10	10	12	12	13	12	21	27	**8**	**36**	**16**
NEWRY 7N	Newry & Mourne	B	C		27	12	12	12	12	8	8	15	17	27	27	**8**	**27**	**16**
NEWRY 9N	Newry & Mourne	B	A		34	13		8	6	10	10	8	17	15	19	**6**	**34**	**14**
NEWTOWNABBEY 3N	Newtownabbey	B	A	28				12	10			11	23	29	21	**10**	**29**	**19**
NEWTOWNABBEY 4N	Newtownabbey	B	A	29	25	20	23	20	12		27	4	30	22	58	**4**	**58**	**25**
NEWTOWNABBEY 5N	Newtownabbey	I	C	45	38	16	27	16	9		33	11	30	28	31	**9**	**45**	**26**
BANGOR NI 2N	North Down	I	C	24	19	19	25	28	20	22	17	22	11	10	10	**10**	**28**	**19**
BANGOR NI 4N	North Down	B	A	11	4	9	8	9	8	8	10	11	6	6	5	**4**	**11**	**8**
BANGOR NI 5N	North Down	B	C	8	9	7	6	8	6			10			5	**5**	**10**	**7**
OMAGH 2N	Omagh	I	C		25	20	12		15	12	14	27	20	23		**12**	**27**	**19**
OMAGH 5N	Omagh	B	A		12	8	11		8	9	9	12	11	16		**8**	**16**	**10**
OMAGH 6N	Omagh	B	A		26	12	13						12	24		**12**	**26**	

Figure B12.1 Annual Average Intermediate and Urban Background Nitrogen Dioxide Concentrations in Northern Ireland