# 2013 Air Quality Progress Report for the London Borough of Camden

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

10 July 2013

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# Executive Summary

The London Borough of Camden has examined the results from monitoring in the borough.

Concentrations within the AQMA still exceed the long term objectives for $NO_2$ at all of our automatic monitoring sites and at the vast majority of our nitrogen dioxide diffusion tube sites, and exceeds the short term objectives at two of four of the automatic monitoring sites, so the AQMA should remain. We continue to meet objectives for all of the pollutants we monitor with the exception of $NO_2$.

There are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

As the whole of the borough has been designated an AQMA there is no need to carry out a Detailed Assessment at this time. We will therefore proceed to the 2014 Progress Report.

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# 1 Introduction

## 1.1 Description of Local Authority Area

The London Borough of Camden is an urban area located in central London, approximately 22km$^2$ in size and is situated north of the River Thames. The main sources of air pollution are road transport, in particular heavy goods vehicle (HGV) and buses, and gas boilers with lesser contributions from diesel trains and small industrial processes. A large proportion of emissions which contribute to poor air quality arise from sources outside of Camden including the heavily trafficked road network surrounding the borough, and from sources much further afield including continental Europe. The south of the borough experiences the highest volumes of traffic and congestion and most intense levels of development. The north of the borough in contrast is generally less congested, and there are more open spaces and parks, of which particular areas have been designated as Sites of Special Scientific Interest (SSSI). Air pollution in these open areas is generally lower. However are a number of busy roads which dissect through the north of the borough are associated with high levels of traffic, especially HGVs, and therefore experience elevated air pollution levels.

## 1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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

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

## 1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre µg/$m^3$ (milligrammes per cubic metre, mg/$m^3$ for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

**Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England**

| Pollutant | Air Quality Objective | | Date to be achieved by |
|---|---|---|---|
| | Concentration | Measured as | |
| **Benzene** | 16.25 µg/m$^3$ | Running annual mean | 31.12.2003 |
| | 5.00 µg/m$^3$ | Annual mean | 31.12.2010 |
| **1,3-Butadiene** | 2.25 µg/m$^3$ | Running annual mean | 31.12.2003 |
| **Carbon monoxide** | 10 mg/m$^3$ | Running 8-hour mean | 31.12.2003 |
| **Lead** | 0.50 µg/m$^3$ | Annual mean | 31.12.2004 |
| | 0.25 µg/m$^3$ | Annual mean | 31.12.2008 |
| **Nitrogen dioxide** | 200 µg/m$^3$ not to be exceeded more than 18 times a year | 1-hour mean | 31.12.2005 |
| | 40 µg/m$^3$ | Annual mean | 31.12.2005 |
| **Particulate Matter ($PM_{10}$) (gravimetric)** | 50 µg/m$^3$, not to be exceeded more than 35 times a year | 24-hour mean | 31.12.2004 |
| | 40 µg/m$^3$ | Annual mean | 31.12.2004 |
| **Sulphur dioxide** | 350 µg/m$^3$, not to be exceeded more than 24 times a year | 1-hour mean | 31.12.2004 |
| | 125 µg/m$^3$, not to be exceeded more than 3 times a year | 24-hour mean | 31.12.2004 |
| | 266 µg/m$^3$, not to be exceeded more than 35 times a year | 15-minute mean | 31.12.2005 |

## 1.4 Summary of Previous Review and Assessments

Previous to this Progress Report an Air Quality Updating and Screening Assessment was completed in 2012. It had the following conclusions.

## 1.1 Conclusions from New Monitoring Data

The concentrations of $NO_2$ continue to exceed short term and long term air quality objectives at all of our automatic monitoring sites and the vast majority of our nitrogen dioxide diffusion tube sites. As a result it would not be appropriate to revoke the AQMA. The air quality objective has been met for all of the other pollutants monitored including $PM_{10}$.

## 1.2 Conclusions from Assessment of Sources

There have been no new or significantly changed sources which have the potential to impact on the air quality objectives. The Council is carefully monitoring the number of biomass boilers and Combined Heat and Power plants in the borough and assessing the impact of $NO_x$ and $PM_{10}$ emissions to avoid any potential negative impacts on air quality.

## 1.3 Proposed Actions

The concentrations of nitrogen dioxide in the London Borough of Camden continue to exceed the long and short term air quality objectives.

As the whole of the borough has been designated an Air Quality Management Area, since 2001, there is no need to carry out a Detailed Assessment at this time. We will therefore proceed to the 2013 Progress Report.

# 2 New Monitoring Data

## 2.1 Summary of Monitoring Undertaken

### 2.1.1 Automatic Monitoring Sites

In 2012, Camden operated four automatic monitoring sites. Their location is shown in Figure 2.1 and the details are described in Table 2.1 The Euston Road monitoring station opposite Euston Station was opened on January 29th 2011 and was not mentioned in the previous Progress Report although is mentioned in the Air Quality Updating and Screening Assessment 2012.

Routine calibrations are carried out on a fortnightly basis by operators from King's College London. These operators are trained to AURN standards and for those operating Swiss cottage have been audited for the AURN.

Audits for the AURN affiliated equipment at Swiss Cottage are carried out every 6 months by AEA-Ricardo on behalf of Defra as part of the affiliation. All other equipment is audited as part of the LAQN by the National Physical Laboratory (NPL). These are the only UKAS accredited bodies for this process in the UK. NPL is also UKAS accredited for the recertification of onsite cylinders.

King's College follow validation procedures which conform to the requirements of the AURN and exceed the requirements of LAQM TG(09). The data ratification procedures also exceed the requirements of TG(09).

**Figure 2.1 Map of Automatic Monitoring Sites**

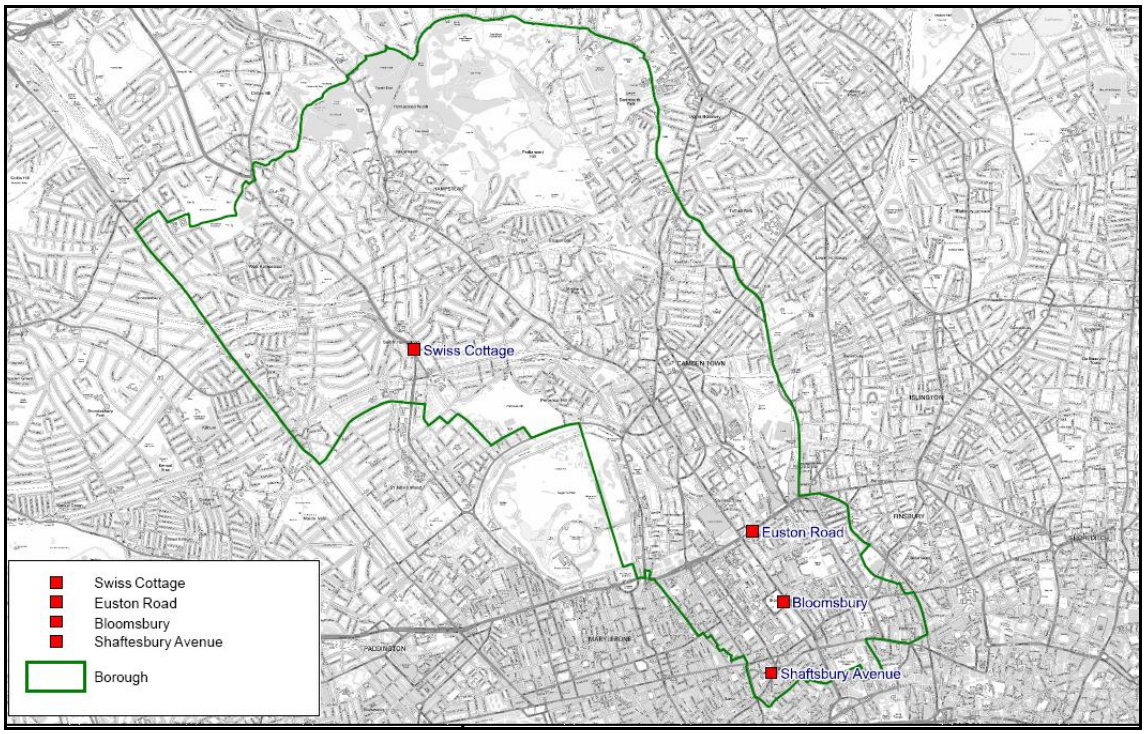


**Table 2.1 Details of Automatic Monitoring Sites**

| Site ID | Site Name | Site Type | X OS Grid Reference | Y OS Grid Reference | Inlet Height (m) | Pollutants Monitored | In AQMA? | Monitoring Technique | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LB | London Bloomsbury | Urban background | X 530120 | Y 182034 | 3 | $NO_2$, $PM_{10}$, $PM_{2.5}$, $SO_2$, CO, $O_3$ | Y | FDMS, API Nox | Y (40m) | 27m | Y |
| CD1 | Swiss Cottage | Kerbside | X 526633 | Y 184392 | 3 | $NO_2$, $PM_{10}$, $PM_{2.5}$, | Y | FDMS, AC31 Nox | Y (7m) | 3m | Y |
| CD3 | Shaftesbury Avenue | Roadside | X 530060 | Y 181290 | 4 | $NO_2$, $PM_{10}$, | Y | TEOM, API Nox | Y (1m) | <1m | Y |
| CD9 | Euston Road | Roadside | X 529878 | Y 182648 | 2.5 | $NO_2$ | Y | API Nox | Y (1m) | 0.5m | Y |

### 2.1.2 Non-Automatic Monitoring Sites

Diffusion tubes are deployed across the borough to monitor nitrogen dioxide concentrations. The 2012 programme consisted of fourteen sites (this was reduced in 2011 from sixteen sites, in order to reduce costs). The fourteen remaining sites were chosen as they were considered the most important sites for monitoring purposes. The location of these sites can be seen in Figure 2.2. Details of all of the non-automatic monitoring sites are presented in Table 2.2.

The diffusion tube results have been bias corrected on the basis of triplicate tubes co-located with a chemi-luminescent analyser at Swiss Cottage. The bias adjustment factor was calculated using a combined bias adjustment factor, based on the result of many co-location studies using the same laboratory and tube preparation method compiled by DEFRA.

Gradko Environmental supplies, prepares (50% TEA and acetone method) and analyses Camden's diffusion tubes. This laboratory participates in the UK National Diffusion Tube Network and the Workplace Analysis Scheme for Efficiency. Gradko currently holds UKAS accreditation for analysis of diffusion tubes and participates in the Health and Safety Laboratory's Workplace Analysis Scheme for Proficiency (WASP).

**Figure 2.2 Map of Non-Automatic Monitoring Sites**

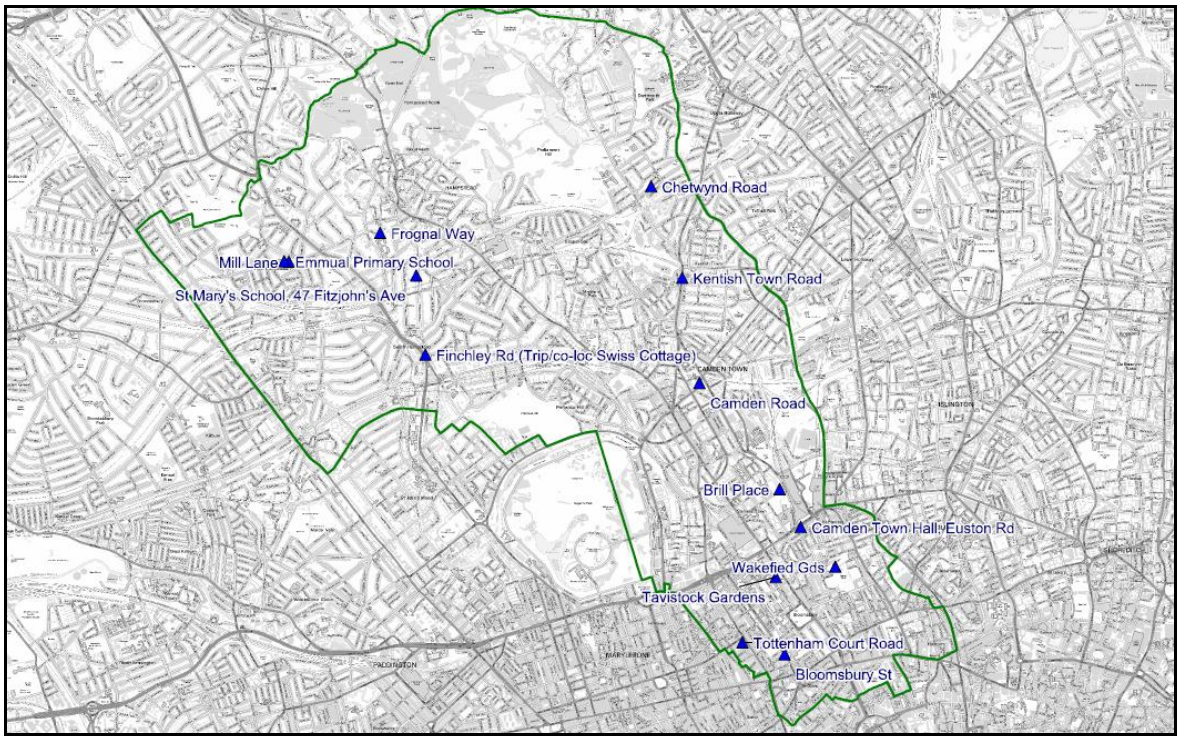


**Table 2.2 Details of Non- Automatic Monitoring Sites**

| Site ID | Site Name | Site Type | X OS Grid Reference | Y OS Grid Reference | Site Heights (m) | Pollutants Monitored | In AQMA? | Is Monitoring Co-located with a Continuous Analyser (Y/N) | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CA4 | Euston Road | Roadside | X 530110 | Y 182795 | 2.5 | $NO_2$ | Y | | Y (1m) | 5m | Y |
| CA6 | Wakefield Gardens | Urban background | X 530430 | Y 182430 | 2.5 | $NO_2$ | Y | | Y (18m) | 30m | Y |
| CA7 | Frognal Way | Urban background | X 526213 | Y 185519 | 2.5 | $NO_2$ | Y | | Y (6m) | 30m | Y |
| CA10 | Tavistock Gardens | Urban background | X 529880 | Y 182334 | 2.5 | $NO_2$ | Y | | Y (35m) | 25m | Y |
| CA11 | Tottenham Court Road | Kerbside | X 529568 | Y 181728 | 2.5 | $NO_2$ | Y | | Y (4m) | <1m | Y |
| CA15 | Swiss Cottage | Kerbside | X 526633 | Y 184392 | 2.5 | $NO_2$ | Y | Y | Y (7m) | <1m | Y |
| CA15 | Kentish Town Road | Roadside | X 529013 | Y 185102 | 2.5 | $NO_2$ | Y | | Y (1m) | 1m | Y |
| CA15 | 47 Fitzjohn's Road | Roadside | X 526547 | Y 185125 | 2.5 | $NO_2$ | Y | | Y (5m) | 5m | Y |
| CA16 | Brill Place | Roadside | X 529914 | Y 183147 | 2.5 | $NO_2$ | Y | | Y (9m) | <5m | Y |
| CA17 | Bloomsbury Street | Roadside | X 529962 | Y 181620 | 2.5 | $NO_2$ | Y | | Y (4m) | <1m | Y |

| Site ID | Site Name | Site Type | X OS Grid Reference | Y OS Grid Reference | Site Heights (m) | Pollutants Monitored | In AQMA? | Is Monitoring Co-located with a Continuous Analyser (Y/N) | Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure) | Distance to Kerb of Nearest Road (m) (N/A if not applicable) | Does this Location Represent Worst-Case Exposure? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CA20 | Camden Road | Roadside | X 529173 | Y 184129 | 2.5 | $NO_2$ | Y | | Y (5m) | <1m | Y |
| CA21 | Chetwynd Road | Roadside | X 528722 | Y 185950 | 2.5 | $NO_2$ | Y | | Y (2m) | 1m | Y |
| CA23 | Emmanuel Primary | Roadside | X 525325 | Y 185255 | 2.5 | $NO_2$ | Y | | Y | 1m | Y |
| CA24 | Mill Lane/West End Lane | Roadside | X 525366 | Y 185253 | 2.5 | $NO_2$ | Y | | Y | 1m | Y |

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### 2.2.1 Nitrogen Dioxide ($NO_2$)

**Automatic Monitoring Data**

The annual $NO_2$ mean objective was exceeded at all of LB Camden's four automatic monitoring sites in 2012 as has been the case in previous years of reporting.

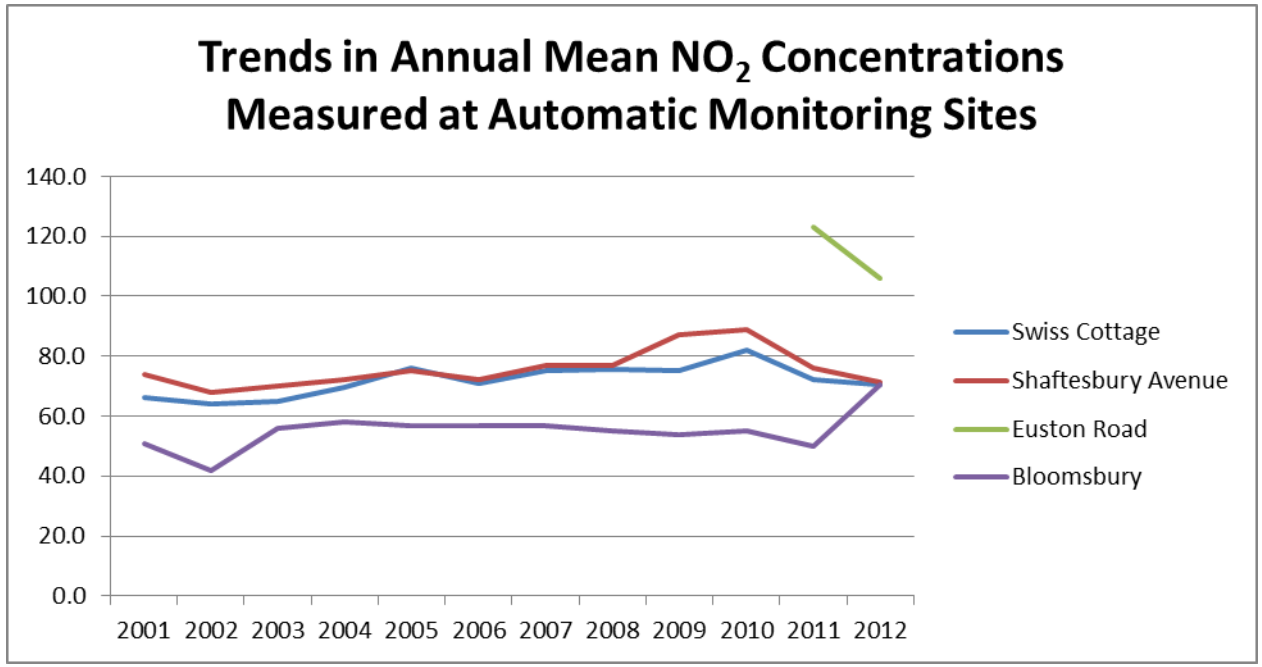
The annual mean concentration of $NO_2$ at the Euston Road site in 2012 was significant. This monitoring began last year and a benchmark of 122$\mu g/m^3$ was created. This year it has reduced to 106$\mu g/m^3$ but this is still far exceeds the objectives.

Table 2.3 below outlines the annual mean concentrations of $NO_2$ for the last six years and the trends are displayed in Figure 2.3. This shows that the annual mean concentrations of $NO_2$ reduced slightly at three of the four monitoring sites from the previous year but rose in London Bloomsbury. This trend is also observed in the number of exceedences of the hourly mean where it reduced at all the sites except Swiss Cottage, as displayed in Table 2.4 below.

**Table 2.3 Results of Automatic Monitoring for $NO_2$: Comparison with Annual Mean Objective**

| Site ID | Site Name | Site Type | Within AQMA? | Valid Data Capture for period of monitoring %[a] | Valid Data Capture 2011 % [b] | Annual Mean Concentration μg/m$^3$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2007* [c] | 2008* [c] | 2009* [c] | 2010* [c] | 2011 [c] | 2012 [c] |
| LB | London Bloomsbury | Urban Background | Y | 97 | 97 | 61 | 55 | 54 | 55 | 50 | **55** |
| CD1 | Swiss Cottage | Kerbside | Y | 97 | 97 | 77 | 76 | 84 | 82 | 71 | **70** |
| CD3 | Shaftesbury Avenue | Roadside | Y | 89 | 89 | 77 | 80 | 88 | 89 | 76 | **71** |
| CD9 | Euston Road | Roadside | Y | 88 | 88 | - | - | - | - | 122* | **106** |

**Figure 2.3 Trends in Annual Mean $NO_2$ Concentrations Measured at Automatic Monitoring Sites**




Bloomsbury provides an urban background and after being steady for almost the whole of the last decade has risen somewhat in 2012. By contrast, Swiss Cottage and Shaftesbury Avenue which are kerbside and roadside respectively, have seen gradual increases followed by a slight decrease since 2010. Euston Road has only been recording for two years, so it is too early to determine trends.

**Table 2.4 Results of Automatic Monitoring for $NO_2$: Comparison with 1-hour Mean Objective**

| Site ID | Site Name | Site Type | Within AQMA? | Valid Data Capture for period of monitoring %[a] | Valid Data Capture 2011 %[b] | Number of Exceedences of Hourly Mean (200 μg/m$^3$) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2007*[c] | 2008*[c] | 2009*[c] | 2010*[c] | 2011[c] | 2012[c] |
| LB | London Bloomsbury | Urban Background | Y | 97 | 97 | 6 | 0 | 2 | 1 | 0 | 1 |
| CD1 | Swiss Cottage | Kerbside | Y | 97 | 97 | 113 | 70 | 217 | 128 | 79 | **43** |
| CD3 | Shaftesbury Avenue | Roadside | Y | 89 | 89 | 22 | 9 | 13 | 21 | 15 | 12 |
| CD9 | Euston Road | Roadside | Y | 88 | 88 | - | - | - | - | 726 | **295** |

The hourly objective was achieved at the Bloomsbury background site and the Shaftesbury Avenue roadside site, but breached at the kerbside sites of Swiss Cottage, and the roadside site of Euston Road in 2012. However, the number of exceedences at these two sites dropped considerably compared with the previous year, although they still exceed the objectives by a significant margin, especially Euston Road which breaches the objective many times over. It is too early to determine any trend in hourly mean exceedences, especially as this downward trend has not necessarily been seen for the same period at other sites in London.

## Diffusion Tube Monitoring Data

$NO_2$ concentrations were measured at fourteen sites in the borough using nitrogen dioxide diffusion tubes. The 2012 results are displayed in Table 2.5 below.

The annual mean concentrations in excess of the 40 µg/$m^3$ objective are highlighted in bold. The objective was exceeded at all sites other than Frognal Way and Wakefield Gardens. The highest diffusion tube $NO_2$ concentrations were measured at the Euston Road (93.12 µg/$m^3$) and Tottenham Court Road sites (91.67µg/$m^3$).

100% data capture was achieved at 11 of the 16 sites. Kentish Town Road, Fitzjohn's Avenue and Camden Road all had one month of incomplete data over the summer. Tavistock Gardens has two months (May and August) with incomplete data and Mill Lane/West End Lane was discontinued from June 2012.

The results have been bias corrected. The full dataset and bias adjustment calculations can be found in Appendix B.

**Table 2.5 Results of $NO_2$ Diffusion Tubes 2012**

| Site ID | Location | Site Type | Within AQMA? | Triplicate or Co-located Tube | Full Calendar Year Data Capture 2012 (months) | 2012 Annual Mean Concentration (µg/m$^3$) - Bias Adjustment factor = 0.96 |
|---|---|---|---|---|---|---|
| CA4 | Euston Road | Roadside | Y | N | 12 | **82.0** |
| **CA6** | Wakefield Gdns | Urban background | Y | N | 12 | 39.3 |
| **CA7** | Frognal Way | Urban background | Y | N | 12 | 28.9 |
| CA10 | Tavistock Gdns | Urban background | Y | N | 11 | **40.19** |
| CA11 | Tottenham Court Road | Kerbside | Y | N | 12 | **83.3** |
| CA15 | Finchley Rd | Kerbside | Y | Triplicate and Co-located | 12 | **72.7** |
| CA15 | Kentish Town Rd | Roadside | Y | N | 12 | **58.9** |
| CA15 | 47 Fitzjohn's Ave | Roadside | Y | N | 11 | **61.2** |
| CA16 | Brill Place | Roadside | Y | N | 12 | **50.0** |
| CA17 | Bloomsbury St | Roadside | Y | N | 12 | **71.6** |
| CA20 | Camden Rd | Roadside | Y | N | 12 | **67.4** |
| CA21 | Chetwynd Rd | Roadside | Y | N | 12 | **43.7** |
| CA23 | Emmanuel Primary School | Roadside | Y | N | 12 | **45.9** |
| CA24 | Mill Lane/West End Lane | Roadside | Y | N | 5 | **52.0** |

In bold, exceedence of the $NO_2$ annual mean AQS objective of 40µg/m$^3$

Underlined, annual mean > 60µg/m$^3$, indicating a potential exceedence of the $NO_2$ hourly mean AQS objective

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

[b] If an exceedence is measured at a monitoring site not representative of public exposure, $NO_2$ concentration at the nearest relevant exposure should be estimated based on the "$NO_2$ fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in Box 2.3 of Technical Guidance LAQM.TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=30).

**Table 2.6 Results of $NO_2$ Diffusion Tubes (2008 to 2012)**

| Site ID | Location | Site Type | Within AQMA? | Annual Mean Concentration (µg/m$^3$) - Adjusted for Bias [a] | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2008 (Bias Adjustment Factor = XX) | 2009 (Bias Adjustment Factor = XX) | 2010 (Bias Adjustment Factor = XX) | 2011 (Bias Adjustment Factor = XX) | 2012 (Bias Adjustment Factor = 0.96) |
| **CA4** | Euston Road | Roadside | Y | 93.3 | 87.1 | 82 | **93.12** | **82.05** |
| **CA6** | Wakefield Gdns | Urban background | Y | 37.8 | 39.4 | 34 | **45.61** | 39.29 |
| **CA7** | Frognal Way | Urban background | Y | 30.5 | 33.9 | 29 | 31.46 | 28.89 |
| **CA10** | Tavistock Gdns | Urban background | Y | **46.8** | **50.1** | **52** | **47.56** | **40.12** |
| **CA11** | Tottenham Court Road | Kerbside | Y | **84.2** | **107.7** | **92** | **91.67** | **83.30** |
| **CA15** | Finchley Rd | Kerbside | Y | **68.1** | **87.5** | **71** | **73.17** | **72.66** |
| **CA15** | Kentish Town Rd | Roadside | Y | **61.8** | **68.3** | **74** | **57.19** | **58.97** |
| **CA15** | 47 Fitzjohn's Ave | Roadside | Y | **55.6** | **62.9** | **73** | **58.39** | **61.20** |
| **CA16** | Brill Place | Roadside | Y | **49.0** | **51.9** | **54** | **50.79** | **50.00** |

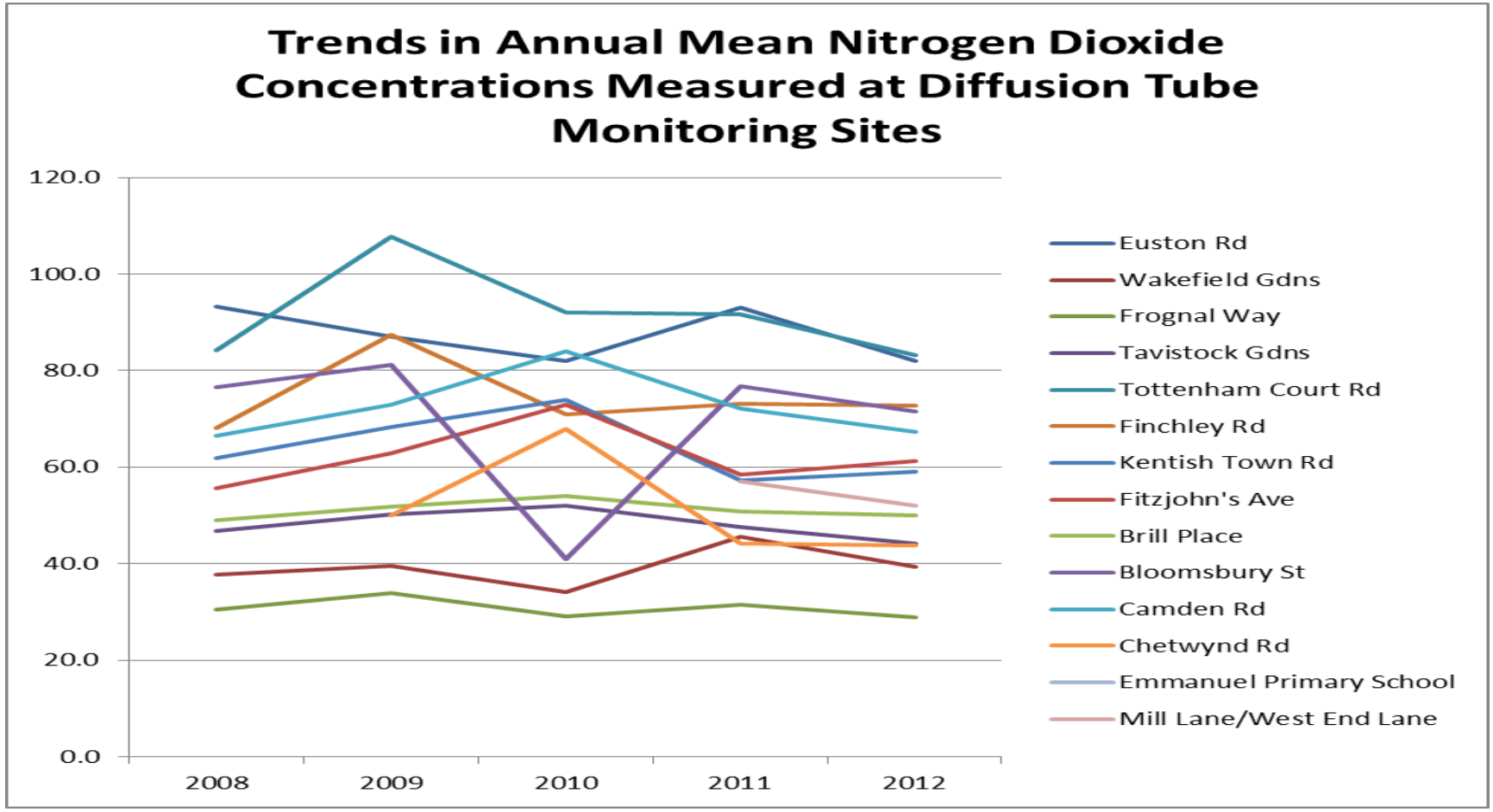
| Site ID | Location | Site Type | Within AQMA? | Annual Mean Concentration (µg/m$^3$) - Adjusted for Bias [a] | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2008 (Bias Adjustment Factor = XX) | 2009 (Bias Adjustment Factor = XX) | 2010 (Bias Adjustment Factor = XX) | 2011 (Bias Adjustment Factor = XX) | 2012 (Bias Adjustment Factor = 0.96) |
| **CA17** | Bloomsbury St | Roadside | Y | **76.5** | **81.3** | **41** | **76.73** | **71.66** |
| **CA20** | Camden Rd | Roadside | Y | **66.5** | **73** | **84** | **72.21** | **67.40** |
| **CA21** | Chetwynd Rd | Roadside | Y | | **50.0** | **68** | **44.12** | **43.67** |
| **CA23** | Emmanuel Primary School | Roadside | Y | | | | **41.5** | **45.94** |
| **CA24** | Mill Lane/West End Lane | Roadside | Y | | | | **57.12** | **52.05** |

In bold, exceedence of the $NO_2$ annual mean AQS objective of 40µg/m$^3$

Underlined, annual mean > 60µg/m$^3$, indicating a potential exceedence of the $NO_2$ hourly mean AQS objective

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

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




These results shows that while there has been sometimes significant variation year to year, almost all the monitoring sites are currently showing very similar levels to in 2008 suggesting there is no significant change.

### 2.2.2 Particulate Matter ($PM_{10}$)

The concentrations of $PM_{10}$ recorded in the Borough at Shaftesbury Avenue, Bloomsbury and Swiss Cottage, continue to meet the objective of less than 40 μg/$m^3$. The annual mean concentrations for the last six years are presented in Table 2.7, while the trends are presented in Figure 2.5. These show that concentrations of $PM_{10}$ decreased marginally at each of the three sites between 2011 and 2012.

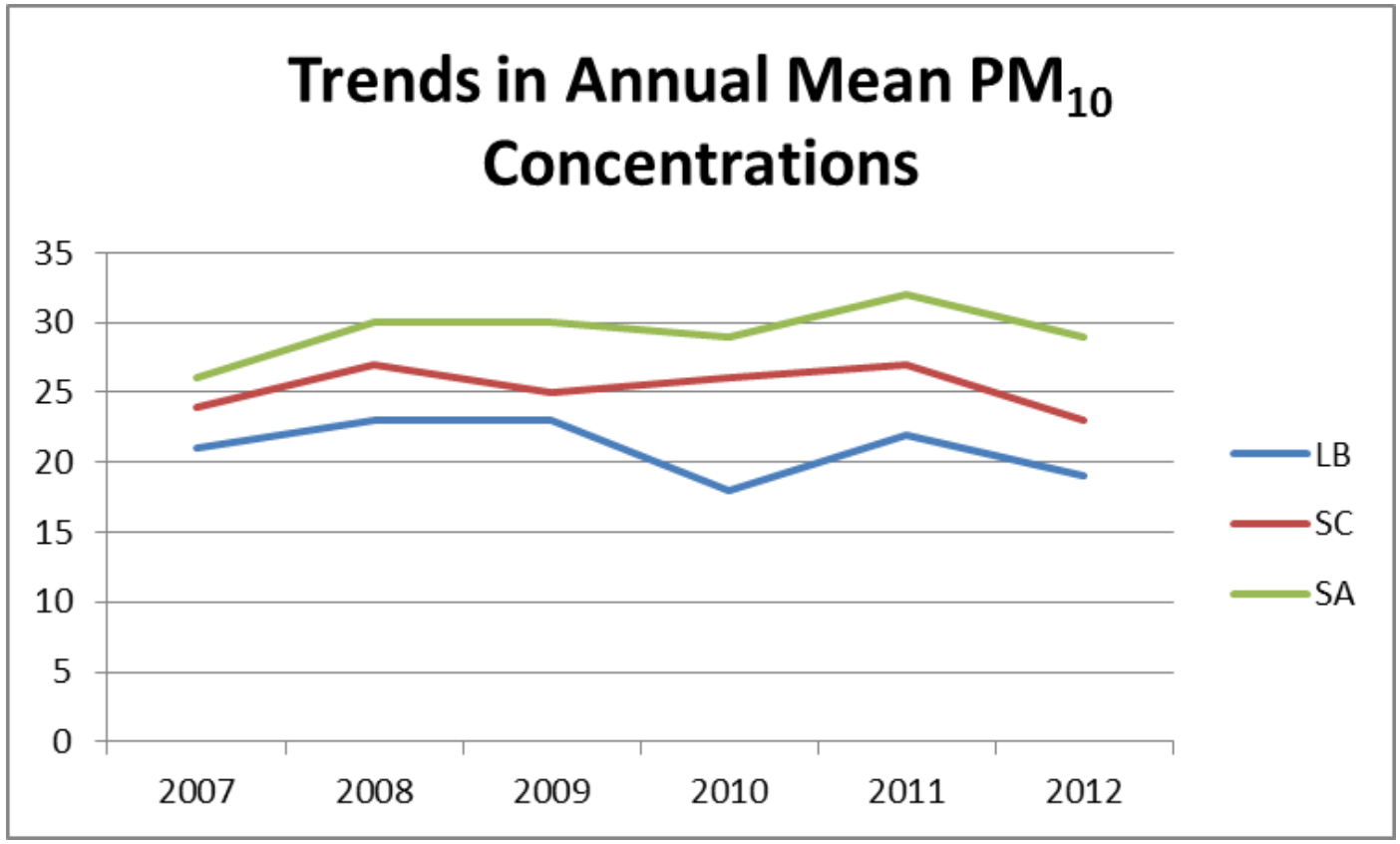
The number of exceedences of 24 hour mean over 50 μg/$m^3$ also meet the objective at LB Camden's three monitoring sites. The number of exceedences decreased between 2011 and 2012 at all three sites.

The monitoring site locations are representative of relevant public exposure and data have been adjusted to gravimetric equivalent.

**Table 2.7 Results of Automatic Monitoring for $PM_{10}$: Comparison with Annual Mean Objective**

| Site ID | Site Type | Within AQMA? | Valid Data Capture for monitoring Period %[a] | Valid Data Capture 2011 %[b] | Confirm Gravimetric Equivalent (Y or NA) | Annual Mean Concentration μg/m$^3$ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2007*[c] | 2008* [c] | 2009* [c] | 2010* [c] | 2011 [c] | 2012 |
| LB | Urban Background | Y | 97 | 97 | Y | 21 | 23 | 23 | 18 | 22 | 19 |
| SC | Kerbside | Y | 94 | 94 | Y | 24 | 27 | 25 | 26 | 27 | 23 |
| SA | Roadside | Y | 92 | 92 | Y | 26 | 30 | 30 | 29 | 32 | 29 |

**Figure 2.5 Trends in Annual Mean $PM_{10}$ Concentrations**




The trends show that PM10 has been consistently meeting objectives with a small drop in concentrations between 2011 and 2012.

**Table 2.8 Results of Automatic Monitoring for $PM_{10}$: Comparison with 24-hour Mean Objective**

| Site ID | Site Type | Within AQMA? | Valid Data Capture for monitoring Period %[a] | Valid Data Capture 2011 %[b] | Confirm Gravimetric Equivalent | Number of Exceedences of 24-Hour Mean (50 μg/m$^3$) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2007* | 2008* | 2009* | 2010* | 2011 | 2012 |
| LB | Urban Background | Y | 97 | 97 | Y | 0 | 13 | 15 | 2 | 17 | 10 |
| SC | Kerbside | Y | 94 | 94 | Y | 24 | 27 | 25 | 26 | 31 | 21 |
| SA | Roadside | Y | 92 | 92 | Y | 26 | 30 | 30 | 29 | 27 | 18 |

There has been a small decrease in PM 24-hour mean exceedence days between 2011 and 2012.

### 2.2.3 Sulphur Dioxide ($SO_2$)

Camden has achieved each of the $SO_2$ objectives for the last fourteen years at London Bloomsbury. Between 1997 and 2012 there has been a downward trend in $SO_2$ concentrations

**Table 2.9 Results of Automatic Monitoring for $SO_2$: Comparison with Objectives**

| Site ID | Site Type | Within AQMA? | Valid Data Capture for Monitoring Period % [a] | Valid Data Capture 2012 % [b] | Number of: [c] | | |
|---|---|---|---|---|---|---|---|
| | | | | | 15-minute Means > 266µg/m$^3$ | 1-hour Means > 350µg/m$^3$ | 24-hour Means > 125µg/m$^3$ |
| LB | Urban Background | Y | 100 | 100 | 0 | 0 | 0 |

### 2.2.4 Benzene

Benzene is not currently monitored in the Borough as historic monitoring has revealed benzene levels to be well below the air quality objective for this pollutant.

### 2.2.5 Other Pollutants Monitored

#### Ozone

Between 2007 and 2012 Camden has achieved the ozone objective at London Bloomsbury. Between 1997 and 2002 annual mean ozone concentrations fluctuated around 23 µg/m3. Over the next six years annual mean ozone concentrations increase by approximately 5%, peaking in 2003, 2006 and 2008. The ozone objective has been breached on two occasions over the twelve year monitoring period, 2003 and 2006 due to particularly hot summers which enhanced the formation of ozone.

#### Carbon Monoxide

Camden has achieved the air quality objective for carbon monoxide since monitoring commenced in 1997. Annual mean CO concentrations display a downward trend over the last fourteen years with concentrations stablising to their lowest long term concentration between 2007 and 2013.

### 2.2.6 Summary of Compliance with AQS Objectives

The London Borough of Camden has examined the results from monitoring in the borough.

Concentrations within the AQMA still exceed the long term objectives for $NO_2$ at all of our automatic monitoring sites and the vast majority of our nitrogen dioxide diffusion tube sites, as well as exceeding the short term objective at two of the automatic monitoring sites, so the AQMA should remain. We continue to meet objectives for all of the pollutants we monitor with the exception of $NO_2$.

As the whole of the borough has been designated an Air Quality Management Area there is no need to carry out a Detailed Assessment at this time. We will therefore proceed to the 2014 Progress Report.

# 3 New Local Developments

## 3.1 Road Traffic Sources

Since the last USA, no new/newly identified road traffic sources have been identified.

## 3.2 Other Transport Sources

Since the last USA, no new/newly identified non-road traffic sources.

## 3.3 Industrial Sources

Since the last USA, there are no new/newly identified industrial sources.

## 3.4 Commercial and Domestic Sources

Information in the LAEI 2008 states that there are no particulate matter emissions from domestic coal burning in Camden, which is likely to be because the whole of the borough is a smoke free zone. Smokeless fuel burning is not included as a source in the LAEI, but there may be a few households burning smokeless fuels on open fireplaces (as a secondary source of heating). However, this does not occur on the significant scale as classed in the guidance, posing no risk to exceeding the $PM_{10}$ objectives.

## 3.5 New Developments with Fugitive or Uncontrolled Sources

Since the last USA no new/newly identified uncontrolled sources have been identified.

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

Camden Council confirms that all the following have been considered –

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**

**New developments with fugitive or uncontrolled sources**

# 4 Local / Regional Air Quality Strategy

London Borough of Camden has developed a new Air Quality Action Plan 2013-2015 which references its links with Local transport plans and strategies and Climate Change Strategies.

# 5 Planning Applications

Planning applications which include the installation of CHP or Biomass are required to complete specific application forms to ensure that they are approved by the air quality officer as part of the planning process. As well as CHP and Biomass, major planning applications are subject to Air Quality Assessments to ensure they comply with air quality planning policies, and well as being subject to scrutiny to ensure they comply with local transport plans and strategies and Climate Change Strategies.

In 2012 Camden's air quality officer assessed in excess of 30 new planning applications, and applied numerous conditions and S106 requirements relating to monitoring construction dust, and CHP emissions.

# 6 Air Quality Planning Policies

Camden's Local Development Framework includes Development Policy 32 Air Quality and Camden's Clear Air Zone.

Camden Planning Guidance document CPG6 Amenity also provides advice and information on how we will apply our air quality planning policies.

# 7 Conclusions and Proposed Actions

## 7.1 Conclusions from New Monitoring Data

Concentrations within the AQMA still exceed the objectives for $NO_2$ at at all of our automatic monitoring sites and the vast majority of our nitrogen dioxide diffusion tube sites and the AQMA should remain. We continue to meet objectives for all of the pollutants we monitor with the exception of $NO_2$.

As the whole of the borough has been designated an Air Quality Management Area there is no need to carry out a Detailed Assessment at this time. We will therefore proceed to the 2014 Progress Report.

## 7.2 Conclusions relating to New Local Developments

No new or newly identified local developments which may have an impact on air quality within the Local Authority area.

## 7.3 Proposed Actions

Due to no significant change in the situation since the completion of the last Air Quality Action Plan, we refer to this document for proposed actions.

# 9 References


- Camden Local Air Quality Action Plan 2013-2015
- 2012 Quality Updating and Screening Assessment for London Borough of Camden
- Camden Planning Guidance (CPG 6) Amenity
- Camden Development Policies Adoption version 2010

# Appendices

## Appendix A: QA:QC Data

**Diffusion Tube Bias Adjustment Factors**
Gradko is the supplier/analyst. Camden's bias adjustment factor for 2012 diffusion tubes was 0.95, This was calculated using a combined bias adjustment factor, based on the result of many co-location studies using the same laboratory and tube preparation method compiled by DEFRA. It used spreadsheet 12/12.

**PM Monitoring Adjustment**
Particulate matter monitoring has taken place on a TEOM and the 1.3 correction factor has been used for data recorded pre 2004. Since 2004 all TEOM data has been corrected using the VCM.

**QA/QC of automatic monitoring**
Routine calibrations are carried out on a fortnightly basis by operators from King's College London. These operators are trained to AURN standards and for those operating Swiss cottage have been audited for the AURN.

Audits for the AURN affiliated equipment at Swiss Cottage are carried out every 6 months by AEA-Ricardo on behalf of Defra as part of the affiliation. All other equipment is audited as part of the LAQN by the National Physical Laboratory (NPL). These are the only UKAS accredited bodies for this process in the UK. NPL is also UKAS accredited for the recertification of onsite cylinders.

King's College follow validation procedures which conform to the requirements of the AURN and exceed the requirements of LAQM TG(09). The data ratification procedures also exceed the requirements of TG(09).

**QA/QC of diffusion tube monitoring**
All of Gradko's were considered to be satisfactory for the whole of 2012 according to the summary of laboratory performance in WASP NO2 proficiency testing scheme for rounds 112-119.

# Appendix B: The full dataset for diffusion tube monitoring.

## Table B1 Unadjusted data for diffusion tube monitoring

| Site ID | Location | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD9 | Euston Road | 72.48 | 45.65 | 86.03 | 80.82 | 83.83 | 80.67 | 94.99 | 104.97 | 86.64 | 96.97 | 102.59 | 100.83 | 86.37 |
| CA6 | Wakefield Gdns | 32.23 | 72.53 | 43.42 | 33.25 | 28.00 | 32.01 | 34.14 | 37.64 | 39.91 | 42.48 | 52.86 | 47.81 | 41.36 |
| CA7 | Kentish Town Road | 50.34 | 59.01 | 74.19 | 64.89 | 76.45 | 58.23 | | 56.80 | 53.36 | 65.30 | 68.87 | 55.38 | 62.07 |
| CA10 | Frognal Way | 31.48 | 35.34 | 36.32 | 28.73 | 21.63 | 18.53 | 22.61 | 25.56 | 29.76 | 29.64 | 44.06 | 41.32 | 30.42 |
| CA11 | 47 Fitzjohn's Ave | 52.58 | 58.48 | 67.15 | 61.74 | 68.76 | | 65.95 | 56.23 | 60.84 | 64.05 | 85.97 | 66.94 | 64.42 |
| CA15 | Swiss Cottage, Finchley Rd | 55.57 | 83.49 | 87.54 | 67.98 | 75.81 | 71.32 | 67.71 | 77.14 | 76.75 | 78.21 | 102.79 | 83.12 | 77.29 |
| CA16 | Swiss Cottage, Finchley Rd | 55.68 | 83.71 | 82.10 | 80.93 | 78.14 | 76.26 | 75.06 | 76.75 | 77.25 | 81.85 | 88.60 | 74.69 | 77.59 |
| CA17 | Swiss Cottage, Finchley Rd | 59.44 | 76.05 | 91.76 | 72.99 | 72.09 | 58.40 | 69.21 | 64.20 | 73.48 | 75.05 | 94.06 | 88.25 | 74.58 |
| CA20 | Brill Place | 48.02 | 54.25 | 71.25 | 50.19 | 58.88 | 42.66 | 42.68 | 43.53 | 44.55 | 52.73 | 63.92 | 59.05 | 52.64 |
| CA21 | Tavistock Gdns | 41.99 | 50.76 | 56.40 | 41.57 | | 36.72 | 36.69 | | 39.34 | 49.33 | 56.20 | 55.51 | 46.45 |
| CA23 | Tottenham Court Road | 70.21 | 84.66 | 86.92 | 83.13 | 76.97 | 82.68 | 85.74 | 97.89 | 96.67 | 94.51 | 104.45 | 88.37 | 87.68 |
| CA24 | Emmanuel Primary School | 48.46 | 49.26 | 61.01 | 45.59 | 40.75 | 36.85 | 43.26 | 41.41 | 44.35 | 49.63 | 62.33 | 57.44 | 48.36 |
| CA25 | Mill Lane/West End Lane | 53.20 | 53.93 | 64.99 | 50.61 | 51.21 | | | | | | | | 54.79 |
| CA26 | Camden Rd | 56.32 | 64.12 | 85.21 | 62.30 | 73.76 | 66.57 | | 85.09 | 66.38 | 82.64 | 70.03 | 68.06 | 70.95 |
| CD9 | Bloomsbury St | 62.88 | 43.08 | 82.29 | 71.70 | 91.06 | 65.45 | 86.57 | 90.15 | 80.19 | 75.12 | 84.10 | 72.05 | 75.39 |
| CA6 | Chetwynd Rd | 47.57 | 48.39 | 60.58 | 46.09 | 38.55 | 34.76 | 37.24 | 36.69 | 45.22 | 48.76 | 58.09 | 49.75 | 45.97 |
| | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |

**Table b2 Adjusted data for diffusion tube monitoring**

| Figures adjusted for Bias (0.96) (Adjustment factor provided by Gradko) |
|---|

| Site ID | Location | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CA4** | Euston Road | 69.58 | 43.82 | 82.59 | 77.59 | 80.47 | 77.44 | 91.19 | 100.77 | 83.17 | 93.00 | 98.48 | 96.80 | | 82.92 |
| **CA6** | Wakefield Gdns | 30.94 | 69.63 | 41.69 | 31.92 | 26.88 | 30.73 | 32.77 | 36.13 | 38.31 | 40.78 | 50.75 | 45.90 | | 39.70 |
| **CA16** | Kentish Town Road | 48.33 | 56.65 | 71.22 | 62.29 | 73.39 | 55.90 | 0.00 | 54.53 | 51.23 | 62.69 | 66.11 | 53.16 | | 54.62 |
| **CA7** | Frognal Way | 30.22 | 33.93 | 34.87 | 27.58 | 20.76 | 17.79 | 21.70 | 24.54 | 28.57 | 28.46 | 42.30 | 39.66 | | 29.20 |
| **CA17** | 47 Fitzjohn's Ave | 50.48 | 56.14 | 64.47 | 59.27 | 66.01 | | 63.31 | 53.98 | 58.40 | 61.48 | 82.53 | 64.26 | | 61.85 |
| **CA15** | Swiss Cottage, Finchley Rd | 53.35 | 80.15 | 84.04 | 65.26 | 72.78 | 68.47 | 65.00 | 74.06 | 73.68 | 75.08 | 98.68 | 79.79 | | 74.19 |
| **CA15** | Swiss Cottage, Finchley Rd | 53.45 | 80.36 | 78.81 | 77.70 | 75.02 | 73.21 | 72.06 | 73.68 | 74.16 | 78.58 | 85.06 | 71.71 | | 74.48 |
| **CA15** | Swiss Cottage, Finchley Rd | 57.06 | 73.01 | 88.09 | 70.07 | 69.21 | 56.07 | 66.44 | 61.64 | 70.54 | 72.04 | 90.29 | 84.72 | | 71.60 |
| **CA20** | Brill  Place | 46.10 | 52.08 | 68.40 | 48.18 | 56.53 | 40.95 | 40.97 | 41.78 | 42.77 | 50.62 | 61.36 | 56.69 | | 50.54 |
| **CA10** | Tavistock Gdns | 40.31 | 48.73 | 54.14 | 39.90 | | 35.25 | 35.22 | | 37.77 | 47.36 | 53.96 | 53.29 | | 44.59 |
| **CA11** | Tottenham Court Road | 67.40 | 81.27 | 83.44 | 79.80 | 73.89 | 79.37 | 82.31 | 93.98 | 92.81 | 90.73 | 100.28 | 84.84 | | 84.18 |
| **CA25** | Emmanuel Primary School | 46.52 | 47.29 | 58.57 | 43.76 | 39.12 | 35.37 | 41.53 | 39.75 | 42.57 | 47.65 | 59.83 | 55.14 | | 46.43 |
| **CA26** | Mill Lane/West End Lane | 51.07 | 51.77 | 62.39 | 48.59 | 49.16 | | | | | | | | | 52.60 |
| **CA23** | Camden Rd | 54.07 | 61.56 | 81.81 | 59.81 | 70.81 | 63.91 | | 81.69 | 63.72 | 79.34 | 67.23 | 65.33 | | 68.11 |
| **CA21** | Bloomsbury St | 60.36 | 41.36 | 79.00 | 68.83 | 87.41 | 62.84 | 83.11 | 86.54 | 76.98 | 72.11 | 80.73 | 69.16 | | 72.37 |
| **CA24** | Chetwynd Rd | 45.67 | 46.45 | 58.16 | 44.25 | 37.01 | 33.37 | 35.75 | 35.22 | 43.41 | 46.81 | 55.77 | 47.76 | | 44.13 |