AIR QUALITY

Fifth round of Review and Assessment of Air Quality:

Progress Report 2014

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

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Executive Summary

The role of the local authority review and assessment process is to identify the areas where it is considered that the government's air quality objectives will be exceeded. The Council has previously undertaken the first, second and third and fourth rounds of review and assessment.

This report concerns the Progress Report 2014 under the fifth round of review and assessment. Local authorities are required to review and assess air quality against the objectives in the Air Quality Regulations 2000 and the amendment regulations. The air quality objectives to be assessed are for the following seven pollutants: carbon monoxide, benzene, 1,3-butadiene, lead, nitrogen dioxide, sulphur dioxide and particles (PM_{10}). This report details progress on air quality management and identifies those matters that have changed since the last review and assessment, and which might lead to a risk of an objective being exceeded.

The report follows the latest prescribed guidance given in Technical guidance LAQM. TG (09), which replaced that produced for the previous round of review and assessment. It also follows guidance on the national air quality archive website, and in particular the LAQM (Local Air Quality Management) tools provided, http://www.airquality.co.uk/laqm/tools.php The technical guidance and the website provide guidance on the use of background pollutant concentrations, monitoring results, industrial sources, and road traffic. Technical guidance LAQM. TG (09) also requires both a phased approach and that local authorities only undertake a level of assessment that is commensurate with the risk of an air quality objective being exceeded.

The main findings of this Progress Report are that there have been very few changes in Wandsworth's area since the last round of review and assessments. Objectives for carbon monoxide, benzene, 1,3-butadeine, sulphur dioxide and lead will all be met. However, PM_{10} and NO_2 objectives are unlikely to be met in some parts of the borough, but these exceedences have been identified since the first round of assessment. Therefore, no further detailed assessment is required.

Glossary

ANPR	Automatic Number Plate Recognition [camera]
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
ATC	Automatic Traffic Counter
CO	Carbon Monoxide
Defra	Department for the Environment, Rood and Rural Affairs
ERG	Environmental Research Group
EU	European Union
FDMS	Filter Dynamic Measurement System
HGV	Heavy Goods Vehicle
KCL	King's College London
LAQN	London Air Quality Network
LEZ	Low Emission Zone
LAQM	Local Air Quality Management
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
O_3	Ozone
PM_{10}	Particulate Matter with an approximate diameter of 10 µm
QA/QC	Quality Assurance / Quality Control
SCR	Selective Catalytic Reduction
SO_2	Sulphur Dioxide
TEOM	Tapered Element Oscillating Microbalance
TfL	Transport for London
VCM	Volatile Correction Model

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1 Introduction

This report is the London Borough of Wandsworth's Progress Report 2014, which forms part of the fifth round of review and assessment of Air Quality. This report gives information on progress with air quality management since the last review and assessments undertaken (Updating and Screening Assessment 2012 and the Progress Report 2013).

This Progress Report forms part of the local air quality management (LAQM) system introduced in the Environment Act 1995 and subsequent regulations. It follows the latest prescribed guidance given in Technical Guidance LAQM.TG (09).

The report is divided in to two parts, as it provides progress in terms of the review and assessment system and in terms of the implementation of the measures within Wandsworth's air quality action plan (AQAP).

1.1 Description of Local Authority Area

Wandsworth is an inner London borough of approximately 34 square kilometres bounded by the River Thames to the North, urban Vauxhall to the east, Richmond Park in the west and Wimbledon to the south. Its population is in the region of 307,000 (2011 census data). The 5 major town centres within the borough are Balham, Clapham Junction, Putney, Tooting and Wandsworth.

Wandsworth has many parks and open spaces; within our borough, 670 hectares (1600 acres) is covered by parks, commons, allotments, and cemetery land - the largest proportion for any inner London authority. The borough is now predominantly a residential area. At the present time there is a relatively small amount of industry in the borough and this is predominantly small scale. There are no current waste disposal sites situated in the borough; however there are a number of waste transfer sites.

An updated list of Part B Industrial installations and mobile plant regulated under the Environmental Permitting (England and Wales) Regulations 2010 of potential concern in the borough is given in Appendix 2. The Industrial Installations consist of cement batchers, crematoria, concrete crushers, vehicle re-finishers, petrol stations, dry cleaners, and waste oil burners. There are currently no A1 or A2 installations within the London Borough of Wandsworth's area.

The major source of pollution within the borough is therefore road traffic. There is a dense network of busy roads within the borough. These include the A205 South circular road, the A3 Kingston Road/ West Hill/ Wandsworth High Street, the A3205 York Road/ Battersea Park Road and the A214 Trinity Road. There are also busy shopping streets located within the borough where individuals could potentially be exposed to high levels of air pollution, such as Putney High Street and Tooting High Street.

1.2 Purpose of Progress Report

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

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

Progress Reports are not intended to be as detailed as Updating and Screening Assessment Reports. 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.

Progress Reports are intended to assist local authorities by:

- Helping retain a profile for LAQM within the authority, including the retention of staff with a knowledge of air quality issues
- Providing a means for communicating air quality information to members and the public
- Maximising the usefulness and interpretation of the monitoring effort being carried out by the local authority
- Maximising the value of the investment in monitoring equipment
- Making the next round of review and assessment that much easier, as there will be a readily available up to date source of information
- Helping local authorities respond to requests for up to date information on air quality
- Providing information to assist in other policy areas, such as transport and land use planning
- Providing a necessary source of information on air quality for developers carrying out environmental assessments for new schemes
- Demonstrating progress with implementation of Air Quality Action Plans and/or air quality strategies
- Providing a timely indication of the need for further measures to improve air quality, rather than delaying until the next full round of review and assessment

1.2.1 Review and Assessment Progress

The Council published a detailed Updating and Screening Assessment (USA) of local air quality in 2012 and then an Air Quality Progress report in 2013.

The main findings of the Updating and Screening Assessment and the subsequent Progress Report were that there have been very few changes in Wandsworth's area since the previous round of review and assessments. Objectives for carbon monoxide, benzene, 1,3-butadeine, sulphur dioxide and lead will all be met. However, PM_{10} and NO_2 objectives are unlikely to be met in some parts of the borough, but these exceedences have been identified since the first round of assessments. Therefore, no further detailed assessment is required.

The monitoring data from nitrogen dioxide diffusion tube surveys in Putney High Street indicate that the annual mean Nitrogen Dioxide (NO_2) concentrations are exceeding 60 µg/m^3 (140 µg/m^3 in the centre of the pavement in 2012). The guidance advises that where annual mean concentrations are 60 µg/m^3 or above, exceedences of the one hour NO_2 objective are likely to occur. The real-time monitoring data from Putney High Street kerbside and roadside also shows that the hourly NO_2 objective is not being met at these locations and in fact is being exceeded many times over.

Nitrogen dioxide diffusion tubes located in Mitcham Road, Tooting were also exceeding 60 µg/m^3 thus indicating that the hourly objective may also be exceeded, but promisingly there was a downward trend in 2010 and 2011, however this was not sustained in 2012. The real-time monitoring undertaken at a different location in Mitcham Road, Tooting shows that the hourly NO_2 objective is being met at this location.

The assessment of sources under as part of the Updating and screening Assessment concluded that no local committed development was predicted to increase the concentration levels of any pollutant listed in the Regulations that would cause an exceedence of any National Air Quality Objective. The whole of the borough has already been declared an Air Quality Management Area (AQMA) on the basis of exceedences of the fine particles (PM_{10}) and nitrogen dioxide (NO_2) objectives. No new or significantly changed sources were identified.

The guidance further advises that if there is an existing AQMA in respect of the annual mean objective for NO_2, the local authority may assume there is an exceedence of the 1-hour mean objective in addition to the annual mean objective within the AQMA. There is however no requirement to proceed to a Detailed Assessment in this case. The advice confirms that the AQMA order should be amended and that the Air Quality Action Plan be reviewed. However as the AQMA for Wandsworth was declared on the basis of nitrogen dioxide and fine particles as a whole, rather than the individual objectives, the AQMA order does not require amendment. Specific actions are being implemented to address the high one hour mean concentrations in Putney High Street.

The real-time monitoring data undertaken at the kerbside and roadside (façade) in Putney High Street has been continued. The data from these monitoring stations indicates that the one hour NO_2 objective is being significantly exceeded. The continuation of these monitoring stations is dependant upon the availability of external funding.

An urban background air quality monitoring station is located in one of the roads leading off Putney High Street (Felsham Road, Putney) this monitoring station measures NO_2 and PM_{10}. Subject to funding, this monitoring will be continued to help provide a more complete picture of exposure to air pollutants in Putney.

A SCOOT (Split Cycle Offset Optimisation Technique) traffic light control system has been installed in Putney High Street by Transport for London, and is being refined to smooth traffic flow in the high street and potentially reduce emissions. SCOOT is a tool for managing and controlling traffic signals in urban areas. It is an adaptive system that responds automatically to fluctuations in traffic flow through the use of on-street detectors embedded in the road. This system will continue to be used but in order for it to be effective other measures are needed to help improve traffic flow and emissions.

In the autumn of 2011 a study was undertaken to determine the vehicle emission sources in Putney High Street. A combination of automatic number plate recognition (ANPR) cameras and video traffic counts were used to provide information on the numbers and types of vehicles travelling along the high street and this information was used to determine emissions from each vehicle type for each hour of the day. The report was published in February 2012 by the Transport Research Laboratory. The report is available on the Council website at the following location: http://www.wandsworth.gov.uk/info/200075/pollution/110/air_quality/4

The study concluded that buses are responsible for 68% of NOx emissions in the high street whilst only accounting for 10% of the vehicle fleet. The results from the study provided the evidence to lobby Transport for London (TfL) for improvements to be made to the bus fleet travelling along Putney High Street. As a result 46 new buses were provided, including 10 hybrids, and a further 95 buses were retrofitted with selective catalytic reduction (SCR) to reduce NOx emissions, ten more than originally planned.

A further in-depth study was then undertaken using ANPR cameras and automatic monitoring in the high street (funded via Defra Air Quality Grants in 2011/12 and 2012/13). This study will assess the impact of the changes to the bus fleet and other measures being undertaken to improve local air quality in Putney High Street on ambient concentrations.

Putney High Street is a very congested road with stop-start traffic flow, which is affected by vehicles delivering to businesses. To minimise the congestion caused by deliveries, business engagement is being undertaken to enable businesses to identify and implement transportation and supply chain solutions.

Engagement with business and community groups will continue with the aim of raising awareness and support of air quality actions. The initial phase of this work was funded via Local Implementation Plan (LIP) funding and the next phases will be funded via a Defra air quality grant awarded in 2012/13.

Further work is proposed to be undertaken in Mitcham Road, Tooting High Street, Upper Tooting Road, Tooting to further assess ambient NO_2 concentrations and exceedences of the hourly objective. This will depend upon the data received from nitrogen dioxide diffusion tubes in 2013 and the availability of funding.

1.2.2 Action Plan progress

At present, this local authority is in the process of implementing the actions designated within the action plan to achieve air quality improvements within the borough. This Progress Report provides information on the progress towards the completion of these actions. The action plan is currently being reviewed and a new plan should be in place in 2015.

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre [$\mu g/m^3$] (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005

Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Wandsworth has undertaken the first, second, third and fourth rounds of the review and assessments of air quality, and begun the fifth round of review and assessment of air quality under the LAQM process within its area (see the individual stage 1 and stage 2/3, reports prepared between 1998 and 2003, together with further reports under stages 4 and 5, i.e. the Updating and Screening Assessments for 2004, 2006, 2009 and 2012 and Progress Reports for 2005, 2007, 2008, 2010, 2011 and 2013). These reports present the staged approach whereby the seven air pollutants in the Government's National Air Quality Strategy, were assessed and screened as to their relative importance to air quality within the borough. All of these reports are available Wandsworth's website at www.wandsworth.gov.uk/airquality

The stage 3 report assessed air quality across the whole of the borough in accordance with Defra (formerly DETR) guidance. The findings of the stage 3 report were that the statutory objectives for NO_2 and PM_{10} only were exceeded, specifically the annual mean objective for NO_2 and the 24-hour mean objective for PM_{10}. The area predicted to exceed relates mainly to those areas that are adjacent to major roads. A decision was made to designate the whole borough an AQMA as when looking at the worst case scenario these roads were spread across the entire borough.

In 2003, Wandsworth completed its further assessment of air quality as required by the Environment Act 1995 for those authorities that declared an AQMA; now termed the stage 4 assessment. The purpose of this assessment was to confirm the original assessment of air quality against the objectives, and to ensure that Wandsworth was right to designate an AQMA in the first place. In addition, it was also to calculate more accurately how much of an improvement in air quality would be needed to deliver the air quality objectives within the AQMA. In January 2004 Wandsworth completed an air quality action plan (AQAP) to explain what actions would be taken in order to try and meet the air quality objectives.

The findings of the last Updating and Screening Assessment, produced in 2012 and the subsequent Progress Report 2013 were that Wandsworth did not need to proceed to a detailed assessment for carbon monoxide, benzene, 1,3 butadiene, lead or sulphur dioxide.

PM_{10}

Monitored PM_{10} annual mean concentrations were below the relative air quality objective between 2003 and 2012 where monitored. However, the 24-hour standard was exceeded a number of times at the **Wandsworth 4** roadside monitoring location (South Thames College, Wandsworth), but the monitoring showed that this did not occur on enough occasions to fail the objective of 35 exceedences per year, in all years from 1998 to 2012, apart from 2003. Nevertheless, the stage 4 modelling indicates that there was no reason to withdraw the AQMA on this basis.

Monitoring data from the **Wandsworth 6** roadside monitoring location (Mitcham Road, Tooting) from 1 April 2008 to 31 March 2009 indicated that the annual mean PM_{10} objective and the 24-hour mean PM_{10} objective (the standard of 50 $\mu g/m^3$ was exceeded on 6 occasions therefore achieving the objective of less than 35 days) was being met.

The annual mean PM_{10} objective was also met at the **Wandsworth 7** kerbside monitoring location (Putney High Street, Putney) for the calendar years 2010, 2011 and 2012. The number of 24-hour exceedences of 50 $\mu g/m^3$ at **Wandsworth 7** for the calendar year 2010 was 4, for the calendar year 2011 was 29 and for the following calendar year, 2012, was 10, therefore also achieving the objective of less than 35 days in all 3 years.

The annual mean PM_{10} objective was also met at the **Wandsworth 9** monitoring location (Felsham Road, Putney). The number of 24-hour exceedences of 50 $\mu g/m^3$ at the **Wandsworth 9** for the calendar year 2011 was 13, and for the calendar year 2012 was 11, therefore achieving the objective of less than 35 days. [It should be noted that the data capture for 2011 was 79% and for 2012 was

75%. Therefore, the results may not be representative of the full calendar years and should be used for guidance only.]

NO_2

NO_2 concentrations were consistently shown to be well above the annual average objective of 40 $\mu g/m^3$ which was to be achieved by the 31 December 2005. However, the air quality objective of 18 exceedences of the hourly standard was not exceeded at any time between 2002 and 2012 at either the Town Hall (**Wandsworth 2**), Urban Background or the Thames College (**Wandsworth 4**), Roadside monitoring station. It should be noted that the **Wandsworth 4** monitoring station finished operating in 2007.

Passive diffusion tube results have also demonstrated that the annual average NO_2 objective is unlikely to be met at roadside locations, but positively will be met at the majority of background locations. The monitoring undertaken showed that at some roadside locations, in Tooting and Putney, very high annual mean concentrations were being recorded; far higher than the 60 $\mu g/m^3$ indicator value for the possible exceedence of the hourly NO_2 objective. Therefore continuous real-time monitoring was and continues to be undertaken in these areas of the borough.

Data for 2008 from a temporary site located in Tooting (1 April 2008 – 31 March 2009) showed that the objective of no more than 18 exceedences of hourly NO_2 objective of 200 $\mu g/m^3$ was met (there were 6 occasions that exceeded the hourly objective).

The hourly mean NO_2 objective was exceeded at the **Wandsworth 7** kerbside monitoring location (Putney High Street, Putney) in the calendar years 2010, 2011 and 2012. The number of exceedences of the hourly mean in 2010 was 2480, in 2011 was 2768, and in 2012 was 2740 therefore failing to meet the objective of no more than 18 occurrences of the hourly mean. [It should be noted that the data capture for 2010 was 85%. Therefore, as the data capture was less than 90% the results may not be representative of the full year and should be used for guidance only.] The data for the 2010-2012 periods has now been ratified.

The hourly mean NO_2 objective was exceeded at the **Wandsworth 8** roadside monitoring location (Putney High Street, Putney [façade]) in the calendar years 2011 and 2012. The number of exceedences of the hourly mean in 2011 was 1662 and in 2012 1726, again this fails to meet the objective of no more than 18 occurrences of the hourly mean. The data for the 2011-2012 periods has now been ratified.

The hourly mean NO_2 concentration ($200\mu g/m^3$) was exceeded on 10 occasions at the **Wandsworth 9** monitoring station (Felsham road [urban background]) for the calendar year 2011 (the first year of operation), therefore meeting the objective of no more than 18 occurrences of the hourly mean > $200\mu g/m^3$. There were no exceedences of the hourly mean NO_2 concentration ($200\mu g/m^3$) at the **Wandsworth 9** monitoring station in the calendar year 2012 [It should be noted that the data capture for 2011 was 88%, and for 2012 was 85%. Therefore, as the data capture was less than 90% the results may not be representative of the full year and should be used for guidance only.] The data for the 2011-2012 periods has now been ratified.

CO

Data between 2006 and 2012 (inclusive) indicates that the Carbon Monoxide 8 hour rolling mean objective of 10 mg/m^3, which was to be achieved by 31 December 2003, was still being achieved.

SO_2

Between 1995 and 2012 (inclusive) there were no exceedences of the 15-minute SO_2 objective or other relevant objectives. The data capture rate for 2008, 2009 and 2011 was less than 90% and therefore the results may not be representative of the whole year and should be used for guidance only.

Benzene

The Benzene diffusion tube monitoring in a representative/worst-case location between 2005 and 2012 indicated that the running annual mean objective of 16.25 $\mu g/m^3$ to be achieved by 31 December 2003 was still being met. In addition, the annual means between 2005 and 2012 were below the objective of 5 $\mu g/m^3$ to be achieved by 31 December 2010.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Up until August 2007, two continuous air pollution monitoring stations (**Wandsworth 2** and **Wandsworth 4**) were operated in the borough. The local site operator duties for both sites, data ratification and display of results to a publicly accessible website were carried out by the Environmental Research Group (ERG) at King's College London on behalf of the London Borough of Wandsworth.

Wandsworth 2 is still operational and is based at the Town Hall, Wandsworth High Street, and is defined as an Urban background site. This monitoring station contains analysers to monitor: Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Ozone (O_3) and Sulphur Dioxide (SO_2).

However Wandsworth 4 was closed on 30 August 2007 due to planned development taking place at that location. The site was based at South Thames College, Wandsworth High Street, and was defined as a roadside site. This monitoring station contained analysers to monitor the following pollutants: CO, NO_2, PM_{10} Particulate (by TEOM). The TEOM was upgraded to FDMS in January 2007.

In April 2008 a temporary monitoring station (Wandsworth 6) was installed in Tooting for 1 year. This monitoring station was funded via an air quality grant from Defra for 2007/08.

Funding for a further temporary monitoring station was also received via an air quality grant from Defra for 2008/09. This monitoring station (Wandsworth 7) was installed in Putney High Street on 9 July 2009, and will remain in place for the foreseeable future.

The reason for installation of Wandsworth 6 and 7 is that nitrogen dioxide diffusion tubes located in both vicinities have shown very high annual mean readings; in excess of 60 µg/m^3. In addition a further real-time NO_2 analyser (Wandsworth 8) was installed in April 2010 above a retail premises in Putney High Street (adjacent to the Wandsworth 7) following additional funding through a Defra air quality grant. NO_2 diffusion tubes are located at the roadside monitoring station, in the centre of the pavement and at first, second and third floor levels above the retail premises. This extended monitoring is helping to provide a fuller picture of NO_2 concentrations in Putney and relevant exposure of individuals.

A permanent urban background monitoring station (Wandsworth 9) was installed at Felsham Road in January 2011. This site monitors both NO_2 and PM_{10} (by FDMS).

A temporary monitoring station (Wandsworth 10) began operating in Thessaly Road, Battersea, at the junction with Battersea Park Road, in July 2012. This site monitors for both NO_2 and PM_{10} (by TEOM).

Table 2.1 provides further details on all automatic monitoring stations. In addition, maps detailing the locations of all of these monitoring stations are provided in Appendix 3.

The most recent year for which there is ratified air pollution data is 2012 or 2013 depending upon the monitoring site. Provisional data for 2013 is used where ratified data for this year is not available. This latest ratified data is highlighted in blue text in the results tables to follow and the provisional data is highlighted in orange text. The data for 2007 for Wandsworth 4 includes data from the FDMS.

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS GridRef	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Wandsworth -, Town Hall, High Street, Wandsworth	Urban Background	X 525779 Y 174662	CO, NO_2, O_3, SO_2	Y	N	22m	N
Wandsworth – High Street, South Thames College, **CLOSED AUGUST 2007**	Urban Roadside	X 525777 Y 174622	CO, NO_2, PM_{10}	Y	Y (1m)	7m	Y
Tooting, Joshua Oldfield House, 116 Mitcham Road, Tooting **CLOSED JULY 2009**	Urban Roadside	X 527715 Y 171181	NO_2, PM_{10}	Y	Y (1m) Inlet height 1m 75	4m	Y
Putney High Street 94a Putney High Street	Urban Kerbside	X 524035 Y 175334	NO_2, PM_{10}	Y	Y (1 m) Inlet height 1m 75	0.85 m	Y
Putney High Street 94a Putney High Street	Urban Roadside	X 524032 Y 175335	NO_2	Y	Y (1m) Inlet height 4m 85	4.5 m	Y
Felsham Road, Putney	Urban Background	X 524044 Y 175495	NO_2, PM_{10}	Y	Y (3m) Inlet height 3m 35	4.8m from Felsham Road kerb; 46m from Putney High Street kerb	N
Thessaly Road, Battersea	Urban Roadside	X 529137 Y 177249	NO_2, PM_{10}	Y	Y (1 m) Inlet height 1m 75	7.5m from Battersea Park Road kerb	Y

2.1.2 Non-Automatic Monitoring

NO_2 monitoring by means of passive diffusion tubes has been undertaken within the borough since 2004. Monitoring using diffusion tubes has advantages over continuous monitoring in that it is far cheaper and therefore more sites can be established and assessed. The main disadvantage is that the method is less precise and accurate than continuous monitoring. The recommended methods to reduce these errors include the use of good QA/QC practices and bias adjustment factors that are derived from co-location studies between continuous analysers and diffusion tubes.

The bias adjustment factors are specific to each year, analysing laboratory, method of analysis and location. The factors are therefore also limited to the data supplied. The Review and Assessment website advises that "in many cases, using an overall correction factor derived from as many co-location studies as possible will provide the 'best estimate' of the 'true' annual mean concentration, it is important to recognise that there will still be uncertainty associated with this bias adjusted annual mean. One analysis has shown that the uncertainty for tubes bias adjusted in this way is ± 20% (at 95% confidence level). This compares with a typical value of ± 10% for chemiluminescence monitors subject to appropriate QA/QC procedures."

In addition, one benzene diffusion tube was included in the monthly programme. Lambeth Scientific Services carried out the analysis of all the diffusion tubes used by the Wandsworth up until the end of December 2006. From the beginning of January 2007 the supply and analysis of all diffusion tubes has been undertaken by Gradko International.

NO_2 diffusion tubes are located in the grid reference locations given in Table 2.2. A location map illustrating the distribution of sites across the borough is provided in Appendix 4. The diffusion tubes were either located at kerbside sites, roadside sites or urban background sites, as described in Table 2.2 A. The diffusion tubes have been located in accordance with the siting criteria in the UK NO_2 Diffusion Tube Network Instruction Manual, and the AEA Energy & Environment guidance entitled "Diffusion tubes for ambient NO_2 monitoring: Practical Guidance".

Up until 2006 a bias adjustment, as specified on the Review and Assessment website, of 1.28 was applied to the diffusion tubes analysed by Lambeth Scientific Services. (based on 10 co-location studies).

The diffusion tubes exposed from the beginning of the calendar year 2007 onwards were supplied and analysed by Gradko. They participate in the Workplace Analysis Scheme for Proficiency (WASP), which is an independent analytical performance testing scheme. The scheme is an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). The Health and Safety Laboratory (HSL) operate the WASP scheme independently and the cost of operation is borne by the laboratories, which pay an annual fee to HSL. In the quarterly rounds R120 to R123 (from February to November 2013) the laboratory demonstrated a satisfactory performance in a QA/QC scheme for analysis of NO_2 diffusion tubes.

According to the Review and Assessment website the adjustment bias for this laboratory for the year 2007, for the preparation method used for the NO_2 diffusion tubes, i.e. 20 % TEA in water, is 0.89 (based on 17 co-location studies). For the year 2008 the adjustment bias was 0.92 (based on 21 co-location studies). For the year 2009 the adjustment bias was 0.90 (based on 33 co-location studies) and for the year 2010 the adjustment bias was 0.92 (based 39 co-location studies). For the year 2011 the adjustment bias was 0.89 (based on 26 co-location studies) and for the year 2012 the adjustment bias was 0.97 (based 34 co-location studies). For the year 2013 the adjustment bias was 0.95 (based on 24 co-location studies). Co-location studies with continuous monitors located within the borough have been undertaken using tubes from both laboratories in order to establish local diffusion tube bias. Triplicate diffusion tubes are co-located with the Wandsworth 7, Putney High Street Kerbside, monitoring station for the purposes of establishing the adjustment bias for the specific Putney High Street diffusion tube study. Also, triplicate diffusion tubes are co-located with the Wandsworth 9, Felsham Road, Putney, Background monitoring station for the purposes of establishing the adjustment bias for the across borough diffusion tube study.

From the default spreadsheets, the precision for the 2013 studies also indicates mostly good performance, from the co-location studies that are included. The term "precision" indicates how well

the diffusion tubes produce similar results from the duplicate and triplicate studies undertaken. The criterion is somewhat arbitrary and it reflects both the laboratory's performance in preparing and analysing the tubes, plus the handling of the tubes in the field. The precision is based on an assessment of the coefficient of variation. "Good" precision is defined as achieving a coefficient of variation less than 20% for eight or more periods in a year and the average is less than 10%.

The choice of which bias factor to use is not straightforward; hence the two factors (local and default) are reported above to provide context. Box 3.3 of the TG 09 guidance provides some suggestions as to which factor might be the most appropriate.

The results of a nation-wide survey of NO_2 diffusion tube co-location studies were further used to improve current understanding of diffusion tube bias (AQC, 2006). The data suggested that tubes close to a road were more likely to underestimate concentrations, once they have been adjusted for laboratory bias, and conversely tubes further away from roads were more likely to overestimate concentrations.

Further analysis of the results suggested that it was not the distance from roads that mattered; rather it was the different concentrations of nitric oxide, nitrogen dioxide and ozone in the atmosphere. The different concentrations influenced the chemistry taking place within the diffusion tube, in particular the formation of additional nitrogen dioxide from a reaction of ozone with nitric oxide.

A relationship was identified between diffusion tube bias and the measured annual mean NO_2 concentration that can be used to further adjust the diffusion tube result. The effect of this 'tube-chemistry' adjustment depends on the measured concentration: thus a laboratory bias adjusted result of 20.0 would become 18.1 µg m^{-3} after adjustment for bias due to tube chemistry. A value of 40.0 µg/m^3 would remain at 40.0 µg/m^3 and 60.0 µg m^{-3} would become 65.1 µg/m^3. As shown the effect of this adjustment is minimal at concentrations close to the objective of 40.0 µg m^{-3} and so it will not have a material effect on exceedences of the objective that are identified using diffusion tubes. Although adjusting for tube chemistry can reduce the uncertainty of diffusion tube results, it was not however recommended that this adjustment be applied routinely for the reporting of results.

Details of Non- Automatic Monitoring Sites – Across borough survey

All the following NO_2 diffusion tubes are located within the AQMA and located within 1 metre of relevant exposure. They all represent worst-case locations. A BTEX (Benzene, Toluene, Ethyl Benzene, Xylene) diffusion tube, supplied by Gradko, is also located at the same location as W7, with reference W14. This diffusion tube is sited at that location for the purpose of monitoring benzene. The analysis of this tube was carried out in accordance with Gradko's in-house method GLM4.

Table 2.2 Details of Non- Automatic Monitoring Sites – Across borough survey

Site Name	Site Type	Distance from kerb	Status in 2012	Grid reference
Town Hall, Wandsworth (3 tubes)	Urban Background	22 m	closed	525779, 174662
Newton Preparatory School, 149 Battersea Park Road	Kerbside	0.75 m	open	528866, 177024
86 Mitcham Road	Kerbside	0.6 m	closed	527631, 171253
108 Mitcham Road	Roadside	0.6 m	open	527688, 171204
Upper Richmond Road	Roadside	1.05 m	open	522265, 175470

Adjacent to Co-op Petrol station, Roehampton Vale, SW15	Kerbside (NO2 & Benzene)	1 m	Closed	522064, 172726
Adjacent to Co-op Petrol station, Roehampton Vale, SW15	Roadside (NO2 site)	3 m	open	522031, 172699
Adjacent to Co-op Petrol station, Roehampton Vale, SW15	Roadside (Benzene site)	5.5 m	open	522058, 172715
Putney High Street, Putney	Kerbside	1 m	open	524021, 175258
Wandsworth Plain, Wandsworth (2 tubes)	Roadside	2.1 m	open	525493, 174809
Daylesford Avenue, Putney SW15	Urban Background	2.4 m	open	522270, 175307
Bickley Street, Tooting	Urban Background	1.85 m	open	527524, 171239
Werter Road, Putney	Urban Background	0.8 m	open	524156, 175173
Este Road, SW11	Urban Background	0.5 m	open	527307, 175848
St Johns Hill/ Falcon Road, SW11	Roadside	3.5 m	open	527347, 175452
Totterdown Street SW17	Roadside	6 m	open	527588, 171670
Felsham Road SW15 (3 tubes)	Urban Background	4.8m (46m from Putney High Street)	open	524044, 175495

Details of Non- Automatic Monitoring Sites – Putney High Street

As part of the Putney real-time monitoring study, NO_2 diffusion tubes have been co-located at the air quality monitoring station and in other areas of potential exposure, i.e in the centre of the pavement and at first, second and third floor levels at the façade of flats above the high street. These are shown in Table 2.3 below

All the following NO_2 diffusion tubes are located within an AQMA and are located between 0.9m and 4.6m from roadside. These positions represent worst-case locations.

The Putney High Street NO_2 diffusion tube study has been undertaken to better understand the potential exposure to individuals from NO_2 concentrations. As the area in question is a high street, with four story buildings creating a canyon effect the study has been conducted with co-located NO_2 tubes on one building with first, second and third floor levels all being included. In addition the study has included NO_2 tubes located on the kerbside air quality monitoring station and on signage which represents the pavement and natural footfall of the public. As such table 2.3 also details not only the distance from kerbside but also elevation of the diffusion tube locations.

Table 2.3 Details of Non- Automatic Monitoring Sites – Putney High Street survey

	Façade First Floor	Façade Second Floor	Façade Third Floor	Kerbside monitoring station	Sign in centre of Pavement
Grid reference	524032, 175335	524032, 175335	524032, 175335	524036, 175336	524044, 175363
Distance from kerb	4.6 m	4.6 m	4.6 m	0.9 m	2.35 m
Height from ground	4.7 m	8.1 m	12.05 m	1.77m	2.3 m

2.2 Comparison of Monitoring Results with Air Quality Objectives

The pollutants that are routinely monitored within the borough are Nitrogen Dioxide (NO_2), fine particles (PM_{10}), Sulphur Dioxide (SO_2), Benzene and Carbon Monoxide (CO). The monitoring results are compared with the air quality objectives for each pollutant.

2.2.1 Nitrogen Dioxide

Introduction

The current air quality objectives for NO_2 are 40 $\mu g/m^3$ as an annual mean concentration, and a one hour mean concentration of 200 $\mu g/m^3$ not be exceeded more than 18 times per year. Both objectives were to be achieved by the end of 2005.

NO_2 and nitric oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NO_x). All combustion processes produce NO_x emissions, largely in the form of NO, which is then converted to NO_2, mainly as a result of reaction with ozone in the atmosphere. It is NO_2 that is associated with adverse effects upon human health.

Exposure to NO_2 can irritate the lungs and lower resistance to respiratory infections such as influenza. Continued or frequent exposure to concentrations that are typically much higher than those normally found in the ambient air may cause increased incidence of acute respiratory illness in children (from TG09).

The principal source of NO_x emissions is road transport, which accounted for about 49% of total UK emissions in 2000 (from TG03). Major roads carrying large volumes of high-speed traffic (such as motorways and other primary routes) are a predominant source, as are conurbations and city centres with congested traffic. Road transport is estimated to account for more than 75% of NO_x emissions in London.

According to LAQM.TG (09), the contribution of road transport to NO_x emissions has declined significantly in recent years as a result of various policy measures, and further reductions are expected up until 2015 and beyond.

More than 100 Air Quality Management Areas (AQMAs) were declared in the first round of review and assessment across the country. The vast majority of those declared related specifically to road transport emissions, where the attainment of the annual mean objective is considered unlikely. The annual mean objective is more demanding than the one-hour mean objective and areas predicted to exceed include parts of major conurbations, town centres with congested traffic and dual carriageways and motorways.

The first round of review and assessment stage 4 further assessment work showed that the annual average NO_2 objective is likely to be exceeded across most of the borough, as a result of road transport emissions. As a result the whole borough was declared an AQMA in 2001. The Updating and Screening assessment under the second, third, fourth and fifth rounds of review and assessment of air quality indicated that there had been very little changes in NO_2 sources and concentrations. However, passive diffusion tube monitoring depicted in the Updating and Screening assessment under the fourth round of review and assessment (Updating and screening Assessment 2009) illustrated that hourly NO_2 maybe being exceeded at some roadside locations in areas of potential exposure, busy shopping streets. Previously exceedences of the hourly objective had not been identified. Further data from real-time monitoring undertaken at roadside locations in Tooting and Putney were documented in subsequent reports including the Updating and Screening Assessment 2012, and the Progress Report 2013.

Automatic Monitoring Data

NO_2 concentrations are currently well above the annual average objective of 40 μg/m^3 which was to be achieved by the 31 December 2005. However, the air quality objective of 18 exceedences of the hourly standard was not exceeded at any time at any of the monitoring sites between 1999 and 2010, apart from Putney High Street. Locations where the annual mean objective may be exceeded have been identified under previous rounds of review and assessment. As comprehensive detailed monitoring and modelling work has already been carried out for the Stage 4 review and assessment in 2002, no further detailed assessment is required. Also, as the borough was declared on the basis of NO_2 as a whole further statutory detailed assessment is not required although further work is being undertaken to fully assess this pollutant against this objective and assess potential exposure and its causes and methods to reduce concentrations and exposure.

Annual Mean Objective

Table 2.4 shows the annual average NO_2 concentrations (μg/m^3) measured at the urban background and roadside monitoring sites in Wandsworth High Street between 1999 and 2013. The annual average objective of 40 μg/m^3 was not met at Wandsworth 2 between 2011 and 2013, as in previous years. It should be noted that Wandsworth 4 achieved a data capture of less than 90% for the year 2007 (65%) because the monitoring station was closed on 30 August 2007. Therefore results may not be representative of the full year and should be used for guidance only. It is likely that the figure for Wandsworth 4 would have been slightly higher if the monitoring station had been in operation for the full calendar year, in line with the 2005 and 2006 results. The percentage data capture for Wandsworth 2 for 2007 was 94%, for 2008 was 99%, for 2009 was 97%, for 2010 was 98%, for 2011 was 70%, for 2012 was 96% and for 2013 was 95%. As the data capture for 2011 was less than 90% the results may not be representative of the full year and should be used for guidance only. All data, including that for 2013, is full ratified.

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective – Wandsworth High Street

Year	Town Hall (Wandsworth 2), Urban background	South Thames College Site (Wandsworth 4), Roadside
1999	**52**	**50**
2000	**50**	**46**
2001	**52**	**53**
2002	**51**	**44**
2003	**62**	**52**
2004	**54**	**47**
2005	**54**	**46**
2006	**51**	**47**
2007	**53**	**40**
2008	**48**	Site Closed
2009	**48**	
2010	**53**	
2011	**46**	
2012	**48**	
2013	**48**	

The annual mean concentration measured at the **Wandsworth 6** monitoring station (Mitcham Road,Tooting) from 1 April 2008 to 31 March 2009 was 50 μg/m^3, therefore exceeding the annual mean objective of 40 μg/m^3. The data capture for this period was 91%.

Table 2.5 shows the annual average NO_2 concentrations ($\mu g/m^3$) measured at the air quality monitoring stations in Putney, i.e. Putney High Street kerbside and roadside (Façade) sites and the Felsham Road urban background site for the years 2010, 2011, 2012 and 2013. The annual average objective of 40 $\mu g/m^3$ was significantly exceeded at the kerbside and roadside sites and marginally exceeded at the urban background site in 2011 and met in 2012 and 2013. All data is fully ratified apart from 2013 data for the Putney High Street kerbside and roadside (Façade) sites. The annual mean measured at the Putney High Street kerbside and roadside (Façade) monitoring sites was noticeably lower in 2013 than the preceding years.

Table 2.5 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective – Putney High Street

Year	Putney High Street kerbside (Wandsworth 7)	Putney High Street Roadside (Façade) (Wandsworth 8)	Felsham Road Urban Background (Wandsworth 9)
2010	168	-	-
2011	154	128	43
2012	155	129	40
2013	124	106	40

The data capture for each site is given in table 2.6 below. It should be noted that where the data capture was less than 90% the results may not be representative of the full year and should be used for guidance only.

Table 2.6 Data Capture for Automatic Monitoring for Nitrogen Dioxide in Putney

Year	Putney High Street kerbside (Wandsworth 7)	Putney High Street Roadside (Façade) (Wandsworth 8)	Felsham Road Urban Background (Wandsworth 9)
2010	85%	-	-
2011	99%	100%	88%
2012	96%	99%	85%
2013	99%	99%	90%

The annual mean concentration measured at the **Wandsworth 10** monitoring station (Thessaly Road, Battersea - urban roadside location adjacent to Battersea Park Road) from 1 July 2012 to 30 June 2013 (the first year of operation) was 42 $\mu g/m^3$, therefore marginally exceeding the annual mean objective of 40 $\mu g/m^3$. It should be noted that the calculation for this period included provisional data and therefore has not been fully ratified. The data capture for this period was 93%.

The annual mean concentration measured at the **Wandsworth 10** monitoring station from 1 January 2013 to 31 December 2013 (the first calendar year of operation) was 45 $\mu g/m^3$, therefore exceeding the annual mean objective of 40 $\mu g/m^3$. It should be noted that the calculation for this period included provisional data and therefore has not been fully ratified. The data capture for this period was 88%. As the data capture for 2013 was less than 90% the results may not be representative of the full year and should be used for guidance only.

Hourly Mean Objective

Table 2.7 below shows the exceedences of the hourly NO_2 standard of 200 $\mu g/m^3$ set for 31 December 2005 between 1999 and 2013 in Wandsworth High Street. The air quality objective is for the hourly objective not to be exceeded more than 18 times a year. The objective was met from 1999 through to 2013 at **Wandsworth 2** with no exceedences noted in 2011, 2012 or 2013. As previously stated, the percentage data capture for Wandsworth 2 for 2011 was 70% and therefore results may not be representative of the full year and should be used for guidance only. In addition, it should be noted that **Wandsworth 4** achieved a data capture of less than 90% for the year 2007 (65%) because the monitoring station was closed on 30 August 2007 and therefore results may not be representative of the full year and should be used for guidance only. All data, including that for 2013, is full ratified.

Table 2.7 Results of Automatic Monitoring for Nitrogen Dioxide: Number of exceedences of 200$\mu g/m^3$ as a 1 hour Mean – Wandsworth High Street

Year	Town Hall (Wandsworth 2), Urban background	South Thames College Site (Wandsworth 4), Roadside
1999	0	0
2000	0	0
2001	0	5
2002	0	0
2003	8	0
2004	2	0
2005	10	2
2006	0	3
2007	4	0
2008	1	Site Closed
2009	4	
2010	3	
2011	0	
2012	0	
2013	0	

The hourly mean standard (200$\mu g/m^3$) was exceeded on 6 occasions at the **Wandsworth 6** monitoring station (Mitcham Road, Tooting [façade]) from 1 April 2008 to 31 March 2009, therefore meeting the objective of no more than 18 occurrences of the hourly mean > 200$\mu g/m^3$. The data capture for this period was 91%.

Table 2.8 below shows the exceedences of 200 $\mu g/m^3$ as a 1 hour mean NO_2 concentration between 1999 and 2013 in Putney High Street. The objective of more than 18 exceedences in a year was significantly exceeded at the kerbside and roadside sites in all years but met at the urban background site, with no exceedences in 2012. As previously stated (Table 2.6) the data capture at the kerbside site in 2010 and the urban background site in 2011 and 2012 were below 90% and therefore results may not be representative of the full year and should be used for guidance only.

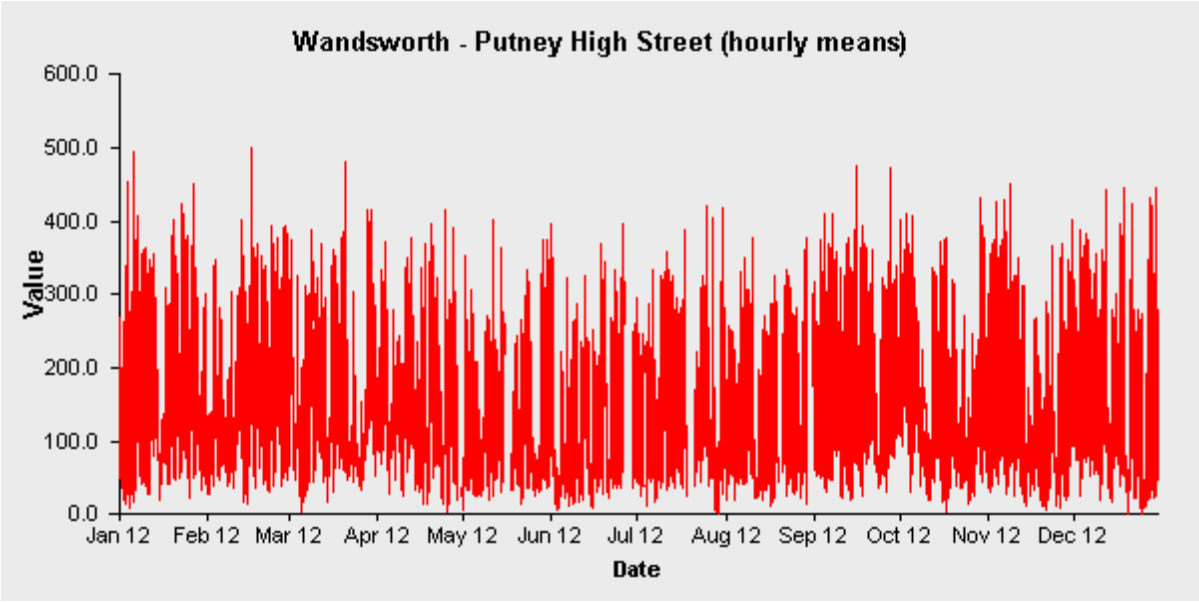
Table 2.8 highlights that there is a significant reduction in the number of exceedences of the hourly objective in 2013 (based on provisional data) compared to 2012, equating to a 42% reduction in the number of exceedences at the kerbside and a 62% reduction in the number of exceedences at the roadside (façade).

Table 2.8 Results of Automatic Monitoring for Nitrogen Dioxide: Number of exceedences of 200µg/m^3 as a 1 hour Mean – Putney

Year	Putney High Street kerbside (Wandsworth 7)	Putney High Street Roadside (façade) (Wandsworth 8)	Felsham Road Urban Background (Wandsworth 9)
2010	2480	-	-
2011	2768	1662	10
2012	2740	1726	0
2013	1588	657	2

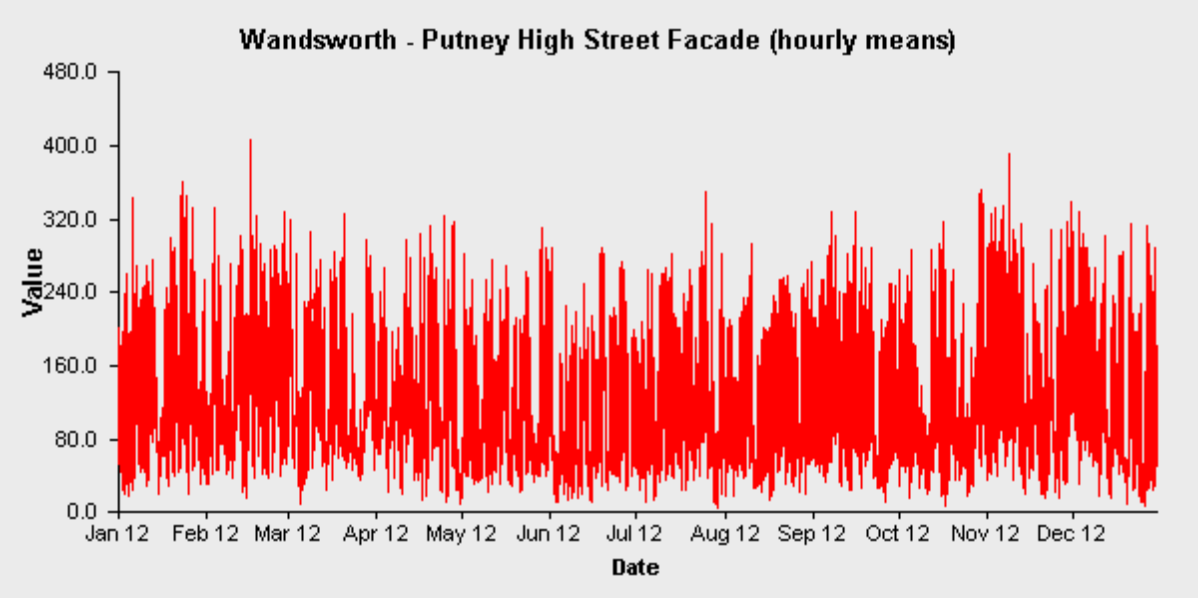
Figures 1 and 2 below further illustrate the NO_2 concentrations at the roadside and kerbside sites and the exceedences of the hourly NO_2 objective. Figure 3 illustrates the hourly NO_2 concentrations at the urban background site and is included for comparison purposes. 2012 data has been used as 2013 data for the two monitoring stations in Putney High Street is still provisional and may be subject to change during the ratification process.

Figure 1 Hourly Nitrogen Dioxide Concentrations in Putney High Street (kerbside, Wandsworth 7) 2012



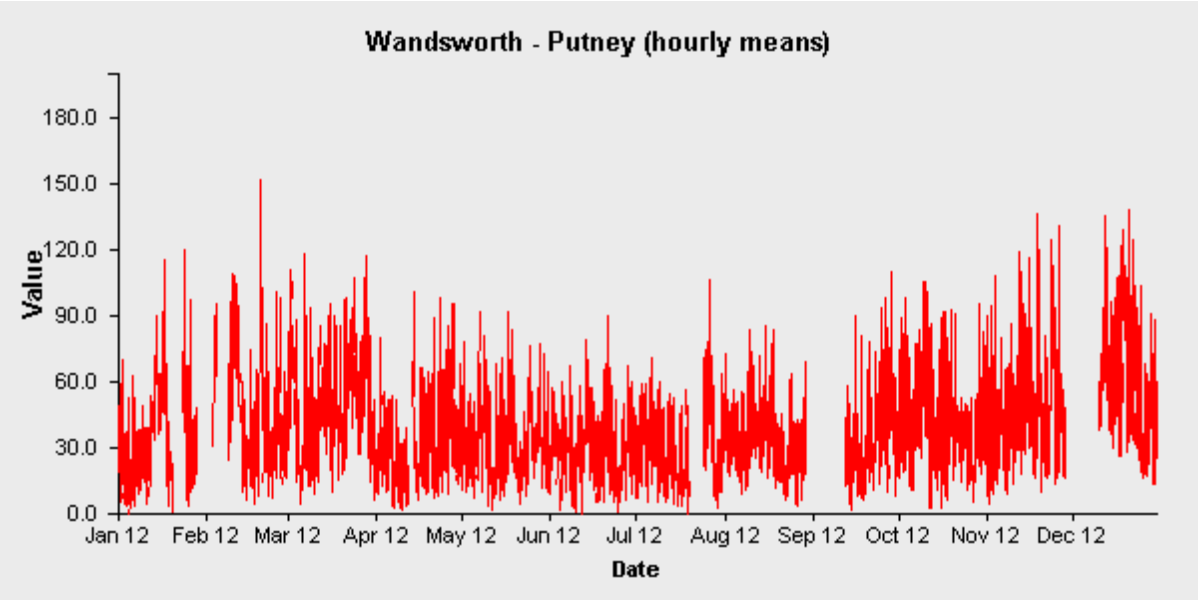
Key: Nitrogen Dioxide (µg/m^3)

Figure 2 Hourly Nitrogen Dioxide Concentrations in Putney High Street (Façade, Wandsworth 8) 2012



Key: Nitrogen Dioxide (µg/m^3)

Figure 3 Hourly Nitrogen Dioxide Concentrations at Felsham Road, Putney [urban background] (Wandsworth 9) 2012



Key: Nitrogen Dioxide (µg/m^3)

The hourly mean standard (200µg/m^3) was not exceeded on any occasions at the **Wandsworth 10** monitoring station (Thessaly Road, Battersea - urban roadside location adjacent to Battersea Park Road) from 1 July 2012 to 30 June 2013, therefore meeting the 1-hour objective. It should be noted that the calculation for this period included provisional data and therefore has not been fully ratified. The data capture for this period was 93%.

The hourly mean standard (200μg/m^3) was not exceeded on any occasions at the **Wandsworth 10** monitoring station from 1 January 2013 to 31 December 2013, therefore also meeting the 1-hour objective. It should be noted that the calculation for this period included provisional data and therefore has not been fully ratified. The data capture for this period was 88%. As the data capture for 2013 was less than 90% the results may not be representative of the full year and should be used for guidance only.

Non- automatic Monitoring Data – Diffusion tube monitoring

The results of the across borough survey for 2012 are given in Table 2.9a below. The tube results have been bias adjusted using the 0.95 bias adjustment factor obtained from the review and assessment website. A decision was taken to use this factor rather than a locally derived one as this was based upon 24 different co-location studies in a variety of locations. Part of the reason for this decision is that the data capture for the Felsham Road monitoring station was just on the margin of acceptability of 90% and therefore it was felt that an adjustment factor based on a larger number of studies would be more robust. The locally derived bias adjustment factor calculated was 0.84 and therefore the decision of using the 0.95 bias adjustment factor gives a worst case scenario, and is a consistent approach with previous years.

Table 2.9a Results of Nitrogen Dioxide Diffusion Tubes – across borough survey

Site ID	Location	Site Type	Data Capture 2013 %	Annual mean concentrations 2013 (µg/m^3) Adjusted for bias
W3	Newton Preparatory School, 149 Battersea Park Road	R	100%	**65**
W4	108 Mitcham Road, Tooting	R	100%	**97**
W5	411 Upper Richmond Road	R	92%	**60**
W7	Adjacent to Co-op petrol station, Roehampton Vale, SW15	R	75%	**53**
W9	Putney High Street, Putney	R	100%	**116**
W12, W13	Wandsworth Plain, Wandsworth	R	100%	**71.5**
W16, W17	St Johns Hill/ Falcon Rd, SW11	R	100%*	**95.5**
W18, W19	Totterdown Street, Tooting SW17	R	100%*	**75.5**
W6	21 Daylesford Avenue, Putney SW15	UB	92%*	26
W8	50 Bickley Street, Tooting	UB	92%	**41**
W10	Werter Road, Putney	UB	100%	36
W14, W15	Este Rd, SW11	UB	100%	**41.5**
W20, W21, W22	Felsham Road, Air Quality Monitoring Station	UB	100%*	**44.3**

Key: R = Roadside, UB = Urban Background
(Note – bold indicates > 40 µg m^{-3})

*These are co-located sites and it should be noted that in 1 – 3 instances there was only one valid tube reading from the 2 available for a particular month.

It can be seen from Table 2.9a that the annual mean NO_2 objective of 40 µg/m^3 was exceeded at all roadside sites (R) and met at two urban background sites (UB), and exceeded at the other three locations, marginally in the case of Bickley Street and Este Road and more substantially in the case of Felsham Road. However the far more accurate automatic monitoring undertaken at this latter location shows that the annual mean objective is being met. At the majority of the roadside sites, i.e. 7 out of the 8 sites, the annual mean concentrations were greater than or equal to 60 µg/m^3. The TG09 guidance advises that exceedences of the one hour NO_2 objective are only likely to occur where annual mean concentrations are 60 µg/m^3 or above. As a result further monitoring, assessments of

potential exposure and/or actions to attempt to reduce concentrations are proposed to be undertaken in these areas where individuals may spend an hour or more. This work will form part of the extension to the "Putney Model" for which a successful bid was made to the Mayor's Air Quality Grant Fund in 2013. Wandsworth Plain (W12, W13) is not a location where individuals are likely to be exposed for an hour or more, although it is adjacent to a bus stand. In addition, individuals are unlikely to be exposed for an hour or more where the W3 and W5 tubes are located.

It should be noted that the choice of bias correction factor is very significant in terms of the data that is published and it's comparison with the annual mean air quality objective (40 µg/m^3) and the indicator value for exceedence of the hourly mean objective (60 µg/m^3). Table 2.9b is given below as a supplementary table to compare the results obtained using the bias adjustment factor derived from the review and assessment website with what they would have been if a local correction factor would have been chosen. The data which is exceeding the annual mean objective is depicted in bold and also in green where the hourly mean objective indicator value of 60 µg/m^3 is exceeded.

Table 2.9b Comparison between chosen bias correction factor (based on studies) and the use of a local bias correction factor

Site ID	Location	Annual mean concentrations	
		based on studies	using local bias
W3	Newton Preparatory School, 149 Battersea Park Road	**65**	**58**
W4	108 Mitcham Road, Tooting	**97**	**86**
W5	411 Upper Richmond Road	**60**	**53**
W7	Adjacent to Co-op petrol station, Roehampton Vale, SW15	**53**	**47**
W9	Putney High Street, Putney	**116**	**102**
W12, W13	Wandsworth Plain, Wandsworth	**71.5**	**63.5**
W16, W17	St Johns Hill/ Falcon Rd, SW11	**95.5**	**84**
W18, W19	Totterdown Street, Tooting SW17	**75.5**	**67**
W6	21 Daylesford Avenue, Putney SW15	26	23
W8	50 Bickley Street, Tooting	**41**	36
W10	Werter Road, Putney	36	32
W14, W15	Este Rd, SW11	**41.5**	36.5
W20, W21, W22	Felsham Road, Air Quality Monitoring Station	**44.3**	39.3

Table 2.10 compares the 2013 results with those for the previous eight years where data is available. This is further illustrated by Figure 4. The data for 2006 to 2007 was bias adjusted via the use of collocation studies at the South Thames College continuous monitoring station on Wandsworth High Street (**Wandsworth 4**). The methodology used for this was detailed in the spreadsheet available on the internet at the following location **http://www.airquality.co.uk/archive/laqm/tools.php** The raw results and adjustment factors can be seen in the Progress Report 2011 and Updating and Screening Assessment 2009 for the borough. The data for years 2008 to 2013 was bias adjusted using national bias adjustment factors obtained from a number of separate collocation studies. The data across the nine years is quite consistent; the concentrations do not appear to be falling overall at all sites. In fact, at the majority of sites value were higher in 2013 than in the previous year.

For the W4, Mitcham Road, Tooting and the W12, W13 Wandsworth Plain, Wandsworth sites there was a continuous reduction in concentrations over the three years of monitoring 2009 to 2010 which was initially promising, but this was not sustained in 2012 and 2013.

At all roadside sites, the annual mean NO_2 objective of 40 µg/m^3 is being exceeded in all years. At four out of the five urban background sites the results were close to the objective in all years either narrowly meeting it or exceeding it. At the other site, W6, Daylesford Avenue, the objective was met with some ease in all years.

In addition, at all roadside locations the annual mean has exceeded 60 µg/m^3 in at least one calendar year. As explained previously this is an indicator that the hourly NO_2 objective of 200µg/m^3 will be exceeded.

It should be noted that the data capture for the Este Road site was below 75% in 2012 and therefore technical guidance LAQM.TG(09) states that it should not be used without an adjustment being made to estimate the annual mean following the procedure in box 3.2 of LAQM.TG(09). A period mean from June to October 2012 (5 consecutive months) was therefore used to calculate an estimate of the annual mean using a ratio obtained from monitoring data for the calendar year 2012 and the period mean for 2 urban background automatic monitoring sites (Wandsworth – Felsham Road, Putney and Westminster - Horseferry Road) . This calculation is given in Appendix 1. The estimated annual mean is given in Table 2.10 below.

Table 2.10 Results of Nitrogen Dioxide Diffusion Tubes – year on year comparison

Site ID	Location	Annual mean concentrations (mg/m3) Adjusted for bias								
		2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
W1,W2,W11	Wandsworth High Street, Wandsworth	**47**	**47**	**48**	*	**44**	**44**	38	Closed	
W3	Newton Preparatory School, 149 Battersea Park Road, Battersea	**50**	**64**	**64**	**67**	**59**	**53**	**63**	**54**	**65**
W4	Mitcham Road, Tooting	**72**	**103**	**94**	**100**	**100**	**88**	**80#**	**91**	**97**
W5	411 Upper Richmond Road	**51**	**53**	**56**	**54**	**49**	**49**	39	**55**	**60**
W7	Adjacent to Co-op Petrol station, Roehampton Vale, SW15	**55**	**63**	**62**	**60**	**52**	**56**	**53**	**57**	**53+**
W9	Putney High Street, Putney	no data	**69**	**114**	**119**	**103**	**101**	**105**	**113**	**116**
W12, W13	Wandsworth Plain, Wandsworth	no data	no data	**72.5**	**73**	**69**	**63**	**60**	**73**	**71.5**
W16, W17	St Johns Hill/ Falcon Road SW11	Site not in operation							**83.5**	**95.5**
W18, W19	Totterdown Street, Tooting	Site not in operation							**67.5**	**75.5**
W6	Daylesford Avenue, Putney	31	31	35	32	28	29	30	28	26
W8	Bickley Street, Tooting	**45**	39	40	**42**	37	**43**	33	38	**41**
W10	Werter Road, Putney	No Data	**43**	37	**44**	38	38	31 X	38	36
W14, W15	Este Road, SW11	Site not in operation							27	**41.5**
W20, W21, W22	Felsham Road, Putney (AQMS)	Site not in operation							**42**	**44.3**

(Note – bold indicates > 40 µg m^{-3})

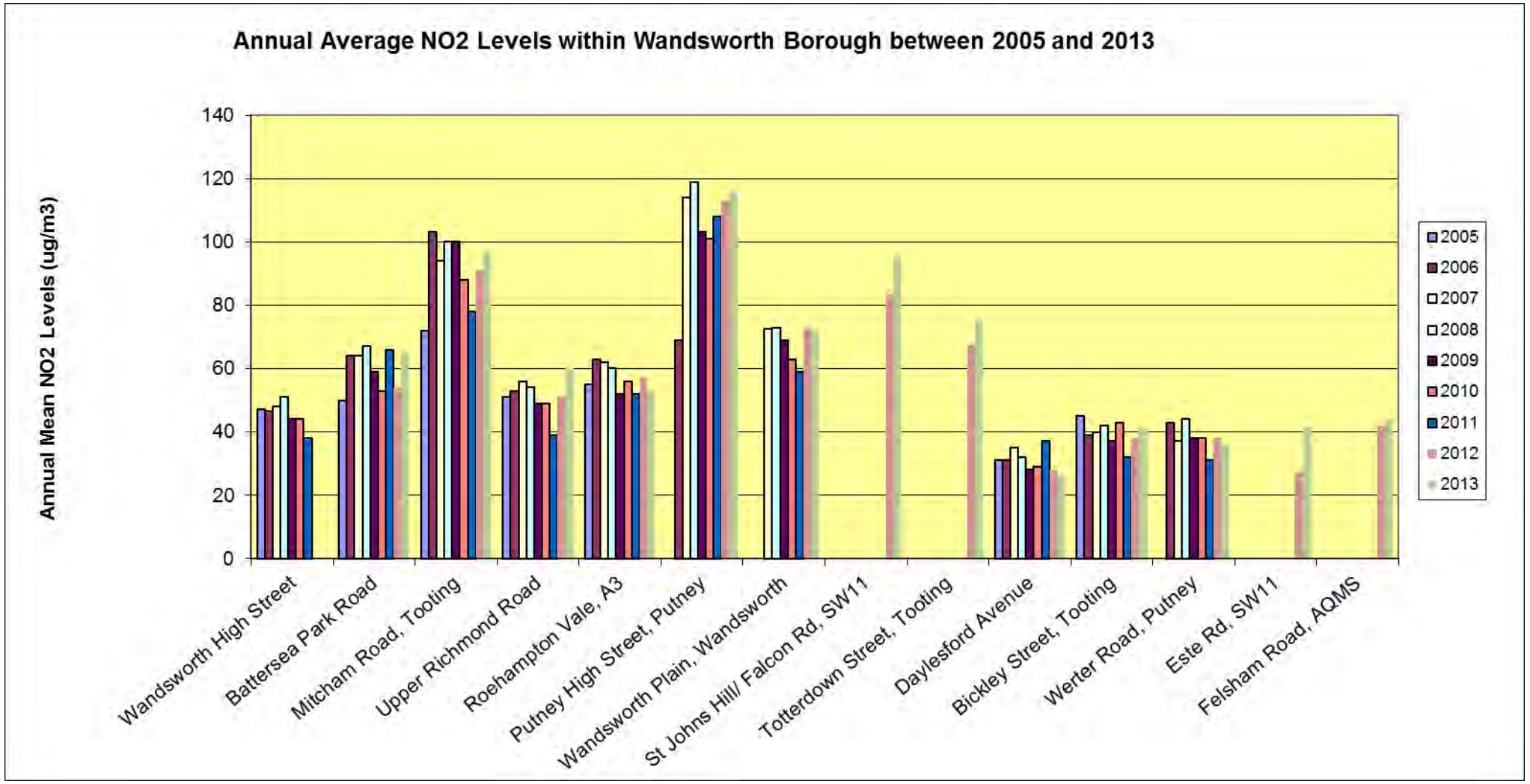
+ This tube was moved to a slightly different location due to the lamp column it was on being knocked down, see table 2.2 for further details. It is now set further back from the kerb.

* diffusion tubes relocated to Town Hall monitoring station due to South Thames College monitoring station closing

[X] It should be noted that the data capture for the Werter Road site was below 75% (i.e. 67%) and therefore technical guidance LAQM.TG(09) states that it should not be used without an adjustment being made to estimate the annual mean following the procedure in box 3.2 of LAQM.TG(09). A period mean from June to December 2011 (7 consecutive months) was therefore used to calculate an estimate of the annual mean using a ratio obtained from monitoring data for the calendar year 2011 and the period mean for 2 urban background automatic monitoring sites (Wandsworth – Felsham Road, Putney and Westminster - Horseferry Road) . This calculation is given in Appendix 1. The estimated annual mean is given in Table 2.10 above.

diffusion tube relocated from 86 Mitcham Road and is now located on same side of road at 108 Mitcham Road (similar location to previous site)

Figure 4 Annual Average NO2 Levels



As part of the Putney real-time monitoring study, NO_2 diffusion tubes are being co-located at the air quality monitoring station and in other areas of potential exposure, i.e in the centre of the pavement and at first, second and third floor levels at the façade of flats above the high street. The results for the calendar year 2013 are detailed in Table 2.11 below. A local bias correction factor of 0.88 derived from the co-location study was used to bias adjust the results. The details of this local adjustment are given in Appendix 6.

Table 2.11 Results of Nitrogen Dioxide Diffusion Tubes located in Putney High Street 2013

	Façade First Floor		Façade Second Floor		Façade Third Floor		Kerbside monitoring station			Sign in centre of Pavement	
	Tube 1	Tube 2	Tube 1	Tube 2	Tube 1	Tube 2	Tube 1	Tube 2	Tube 3	Tube 1	Tube 2
Adjusted mean for individual tubes	97	97	89	91	74	66	122	124	124	106	105
Adjusted mean for co-located tubes	97		90		70		124			106	

The results illustrate that the annual mean NO_2 objective is being exceeded by a significant amount at each location where monitored. The results are as expected, indicating that the highest concentrations are nearest to the kerb and reduce with increasing distance from the kerbside and height from the ground. However even where monitored at the third floor at the façade of the building adjacent to the monitoring station the annual mean measured 70 $\mu g/m^3$, still significantly exceeding the objective of 40 $\mu g/m^3$. However, concentrations measured in 2013 are considerably less than in previous years, with the greatest reductions in the centre of the pavement and at first floor level. This mirrors the automatic monitoring data where the greatest reductions were at the façade as opposed to the kerbside.

The 2013 results from the diffusion tubes located at various heights are illustrated pictorially at the end of Appendix 4.

Table 2.12 below compares concentrations across the Putney sites between 2010 and 2013. The data from 2010 to 2012 appears to show a reduction in concentrations over the three years at some of the sites but it is not significant. However, there was a significant reduction in concentrations in 2013 compared to previous years that can be seen at all monitoring locations.

Table 2.12 Results of Nitrogen Dioxide Diffusion Tubes in Putney High Street – year on year comparison

Location	Annual mean concentrations (µg/m3) Adjusted for bias			
	2010	**2011**	**2012**	**2013**
Façade First Floor	136	128	129	97
Façade Second Floor	118	115	110	90
Façade Third Floor	107	110	99	70
Kerbside monitoring station	163	161	155	124
Sign in centre of Pavement	142	150	140	106

2.2.2 Fine Particles (PM_{10})

Introduction

The air quality objectives for PM_{10} are an annual mean concentration of 40 $\mu g/m^3$ and a 24-hour mean concentration of 50 $\mu g/m^3$ not to be exceeded more than 35 times per year. Both of these objectives are to be achieved by the end of 2004 and are based upon measurements by the European gravimetric transfer reference sampler or equivalent.

One of the main sources of the primary component of PM_{10}, (i.e. that component that is directly emitted), is road traffic, and in particular diesel fuelled vehicles especially HGVs and buses.

Unlike individual gases, airborne particulate matter is a very diverse material in terms of its physical and chemical properties and there are many sources that contribute to atmospheric concentrations. Particulate air pollution episodes are responsible for causing premature deaths among those with pre-existing lung and heart disease.

Fine particles are composed of a wide range of materials arising from a variety of sources including: *combustion sources* (such as road traffic); *secondary particles*, mainly sulphate and nitrate formed by chemical reactions in the atmosphere, and often transported from far across Europe; *coarse particles*, suspended soils and dusts (e.g. from the Sahara), sea salt, biological particles and particles from construction work. Particles are measured in a number of size fractions according to their aerodynamic diameter. PM_{10} particles are those less than 10 microns in diameter. PM_{10} therefore includes smaller size fractions such as $PM_{2.5}$ and PM_1. Fine particles can be carried deep into the lungs where they can cause inflammation and a worsening of the condition of people with heart and lung diseases. In addition, they can carry surface-absorbed carcinogenic compounds into the lungs.

The first round of review and assessment stage 3 and stage 4 work predicted that the 24-hour objective is likely to be exceeded at busy roads and junctions throughout the borough, although the extent of exceedence areas is not as large as that predicted for NO_2.

According to the Updating and Screening Assessment 2012, monitored PM_{10} annual mean concentrations were still below the relevant air quality objective in 2006 and 2007 at a roadside monitoring location in Wandsworth, and from 1 April 2008 to 31 March 2009 (based data from a temporary monitoring station located in Mitcham Road, Tooting). In addition, the annual mean objective was met at a roadside site in 2010 and 2011 in Putney High Street and at an urban background site in Putney in 2011.

However, the 24-hour objective of 50 $\mu g/m^3$ not to be exceeded more than 35 times per year was exceeded in 2003 (Wandsworth roadside site), but met in all other years (i.e. the 50 $\mu g/m^3$ standard was exceeded but not on sufficient occasions to fail to meet the objective). Nevertheless, the stage 4 modelling indicated that there was no reason to withdraw the AQMA on this basis at present. This decision was verified by 2011 data from the Putney High Street roadside monitoring site where the 50 $\mu g/m^3$ concentration was exceeded on 29 days, thus meeting the objective but being close to it.

Comparison with the annual mean objective

Table 2.13 below shows PM_{10} (gravimetric equivalent) annual mean concentrations at the roadside monitoring location in Wandsworth High Street from 1998 to 2007, when monitoring ceased at this location. The 2007 data is FDMS data, and is not based upon a full calendar year (8 months, 1 January 2007 to 30 August 2007). It should also be noted that the capture rate was very low at just 38% and therefore these results may not be representative of the full year and should be used for guidance only. The data capture for the previous year 2006 was 100%.

The 90^{th} percentile for the period 1 January 2007 to 30 August 2007 was 46.7 $\mu g/m^3$, therefore not exceeding the objective of 50$\mu g/m^3$. The table illustrates that there was a rise in PM_{10} levels in 2003,

but between 2004 and 2007 levels were similar to those in 2002. However, during all years, the levels remained below the air quality annual mean objective of 40 μg/m^3.

Table 2.13 Results of PM_{10} Automatic Monitoring in Wandsworth: Comparison with Annual Mean Objective

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thames College Site (Wandsworth 4), Roadside	25	26	27	28	27	32	28	27	29	27

The annual mean concentration measured at the **Wandsworth 6** monitoring station (Mitcham Road, Tooting) from 1 April 2008 to 31 March 2009 was 22 μg/m^3, therefore achieving the annual mean objective . The Volatile Correction Method (VCM) has been used to correct this data. The data capture for this period was 93%, and data is fully ratified.

Table 2.14 below shows PM_{10} (gravimetric equivalent) annual mean concentrations at the kerbside monitoring location in Putney High Street and the urban background location in Felsham Road, Putney. The annual mean objective of less than 40 μg/m^3 is achieved in each year at both sites. The VCM was used to correct the Putney High Street data. The Felsham Road, Putney data is from an FDMS (Filter dynamic measurement system). All data is for the Felsham Road site is fully ratified, but the 2013 data from the Putney High Street kerbside site is still provisional and may be subject to change during the ratification process.

Table 2.14 Results of PM_{10} Automatic Monitoring in Putney: Comparison with Annual Mean Objective

	2010	2011	2012	2013
Putney High Street, kerbside (Wandsworth 7)	29	32	29	32
Felsham Road, Putney, Urban Background (Wandsworth 9)	n/a	22	24	24

However, it should be noted that for all but one of the periods the data capture was below 90% and therefore the results may not be representative of the full calendar year and should be used for guidance only. The data capture for **Wandsworth 7** was only 50% in 2012 and for **Wandsworth 9** was only 42% in 2013 and therefore the use of this data should be treated with caution. Table 2.15 below shows the data capture rates.

Table 2.15 Annual mean PM_{10} Automatic Monitoring in Putney: data capture rates

	2010	2011	2012	2013
Putney High Street, kerbside (Wandsworth 7)	88%	99%	50%	95%
Felsham Road, Putney, Urban Background (Wandsworth 9)	n/a	79%	75%	42%

The annual mean concentration measured at the **Wandsworth 10** monitoring station (Thessaly Road, Battersea - urban roadside location adjacent to Battersea Park Road) from 1 July 2012 to 30 June 2013 was 27 μg/m^3, therefore achieving the annual mean objective. The VCM has been used to correct this data. The data capture for this period was 96%. It should be noted that the calculation for this period included provisional data and therefore has not been fully ratified.

The annual mean concentration measured at the **Wandsworth 10** monitoring station (Thessaly Road, Battersea - urban roadside location adjacent to Battersea Park Road) from 1 January 2013 to 31 December 2013 was 31 μg/m^3, therefore achieving the annual mean objective. The VCM has been used to correct this data. The data capture for this period was 98%. It should be noted that the calculation for this period included provisional data and therefore has not been fully ratified.

Comparison with the 24-hour mean objective

Table 2.16 shows the number of 24-hour exceedences of 50 μg/m^3 at the roadside monitoring location in Wandsworth High Street from 1998 to 2007. In 2003 the objective of 35 exceedences of the 50 μg/m^3 standard was not met. However, the 2004 data showed that the objective was met for the year for which it was set. The latest full year of ratified data, 2006 also showed the objective was being met in Wandsworth. The data capture for the year 2006 was 100%. The 2007 data also proved compliance with the objective.

Table 2.16 Results of PM_{10} Automatic Monitoring in Wandsworth: Comparison with 24-hour Mean Objective

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thames College Site (Wandsworth 4), Roadside	12	17	19	28	17	46	21	16	28	13

The number of 24-hour exceedences of 50 μg/m^3 at the **Wandsworth 6** roadside monitoring location (Mitcham Road, Tooting) from 1 April 2008 to 31 March 2009 was 6, therefore achieving the objective The VCM was used to correct this data. The data capture for this period was 93%.

Table 2.17 shows the number of 24-hour exceedences of 50 μg/m^3 at the kerbside monitoring location in Putney High Street and the urban background air quality monitoring station in Felsham Road, Putney from 2010 to 2013. The VCM was used to correct the Putney High Street data. The Felsham Road, Putney data is from an FDMS.

Table 2.17 Results of PM_{10} Automatic Monitoring in Putney: Comparison with 24-hour Mean Objective

	2010	2011	2012	2013
Putney High Street, kerbside (Wandsworth 7)	4	29	10	16
Felsham Road, Putney, Urban Background (Wandsworth 9)	n/a	13	11	3

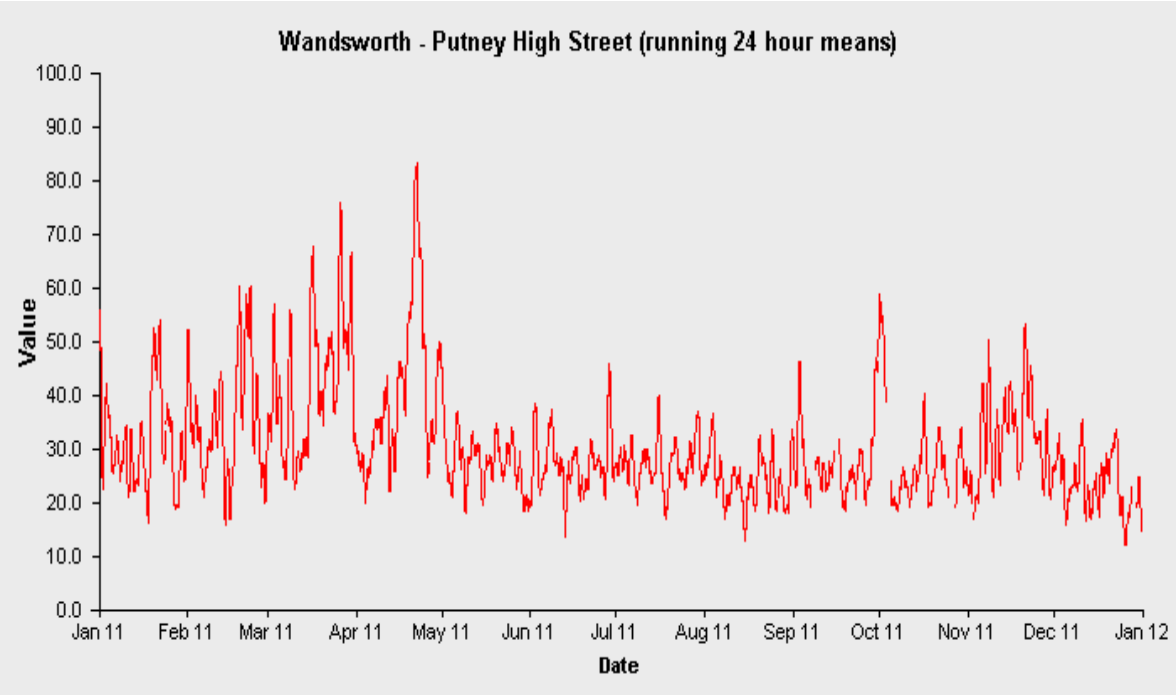
As shown in table 2.15 the data capture was below 90% in all but one case and so the data in these cases may not be representative of the full calendar year and should be used for guidance only. The data capture for Putney High Street in 2012 was only 50% and for Felsham Road in 2013 was only 42% so should be treated with caution. The true results may have been at least double that stated or greater.

Figure 5 illustrates the seasonal trend in PM_{10} concentrations at the kerbside monitoring station in Putney High Street for the year 2011 when compared with the 24-hour mean objective of 50 $\mu g/m^3$ (the year in which the data capture was 99%).

The number of 24-hour exceedences of 50 $\mu g/m^3$ at the **Wandsworth 10** monitoring station (Thessaly Road, Battersea - urban roadside location adjacent to Battersea Park Road) from 1 July 2012 to 30 June 2013 (the first full year of operation) was 18, therefore achieving the objective of less than 35 days. The VCM was used to correct this data. The data capture for this period was 96%. It should be noted that the calculation for this period included provisional data and therefore has not been fully ratified.

The number of 24-hour exceedences of 50 $\mu g/m^3$ at the **Wandsworth 10** monitoring station (Thessaly Road, Battersea - urban roadside location adjacent to Battersea Park Road) from 1 January 2013 to 31 December 2013 (the first calendar year of operation) was 43, therefore failing to meet the objective of less than 35 days. This monitoring station is located in an area of intense construction activity which may have accounted for the number of exceedences of the 24-hour mean. A Mayors Air Quality Fund application has been made for a project to encourage best practice to reduce fine particles emissions from the construction sites within the area. Construction Management Plans are conditioned under the planning system to reduce emissions from the major construction sites. The VCM was used to correct this data. The data capture for this period was 96%. It should be noted that the calculation for this period included provisional data and therefore has not been fully ratified.

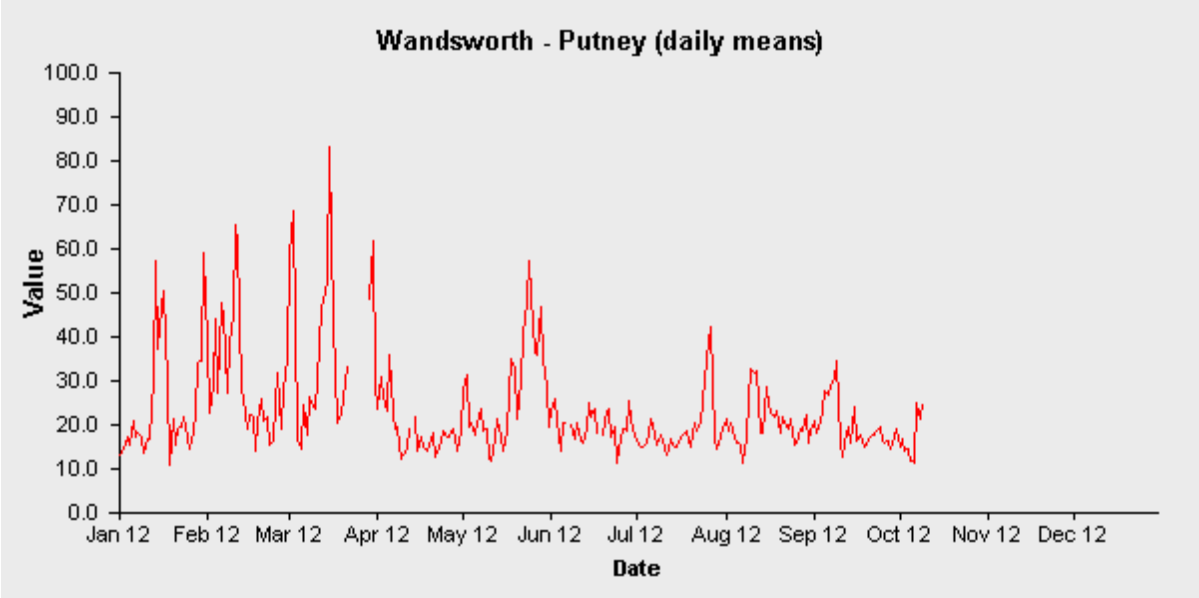
Figure 5 PM_{10} 24 hour Mean Putney High Street 2011



Key: PM_{10} Particulates

The following graph (Figure 6) illustrates the seasonal trend in PM_{10} concentrations at the background monitoring station in Felsham Road, Putney for the year 2012 when compared with the 24-hour mean objective of 50 $\mu g/m^3$. This data is from an FDMS. This data is illustrated rather than 2013 data due to the low data capture for the later year.

Figure 6 PM10 24 hour Hourly Mean Felsham Road, Putney 2012



Key: PM10 Particulates (reference equivalent)

2.2.3 Sulphur Dioxide

Introduction

The current air quality objective for sulphur dioxide is 266 μg/m^3 as a 15-minute mean concentration, not to be exceeded more than 35 times per year, to be achieved by the end of 2005. In addition, two other objectives have been set which are equivalent to the EU limit values specified in the First Air Quality Daughter Directive. These are a one hour mean objective of 350 μg/m^3 not be exceeded more than 24 times per year, and a 24-hour objective of 125 μg/m^3, to be exceeded no more than 3 times per year. Both of these objectives are to be achieved by the end of 2004.

The main source of sulphur dioxide in the United Kingdom is power stations, which accounted for 71% of emissions in 2000. There are also significant emissions from industrial combustion sources. Domestic sources now only account for 4% of emissions, but can be much more significant locally. Road transport currently accounts for less than 1% of emissions. Measured concentrations have reduced at most sites within the United Kingdom in recent years. The objectives were only exceeded at one site, in Belfast, during the period 1999 to 2001 (Technical Guidance LAQM. TG(03)). This exceedence was due to domestic coal burning which was still widespread in that area. Local exceedences of the objectives may occur in areas where there are small combustion plant burning oil or coal, where solid fuels are the main form of domestic heating, and in the vicinity of major ports.

Sulphur dioxide (SO_2) is a colourless gas with a pungent odour. High exposure to SO_2 irritates the eyes, the respiratory tract and mucous membranes. Low concentrations of only a few parts per billion can cause symptoms such as shortage of breath and wheezing. These symptoms present themselves within minutes of the initial exposure. However, prolonged exposure does not compound the effects. Generally the effects are transient and reversible in healthy people. For those with existing cardio-vascular or respiratory conditions there can be more serious consequences to exposure even at low concentrations. The national objectives include a significant margin of safety in order to safeguard the most vulnerable members of the community.

It was predicted by stage 1 of the first round of review and assessment that the likelihood that the objectives would not be met in 2005 was minimal. The 15–minute objective of 266 μg/m^3 was not exceeded between 1995 and 1997. However, further modelling by SEIPH Environmental Research Group, Kings College London was carried out under the stage 3 review and assessment process that indicated that there may be areas of exceedence within Wandsworth's area. This led to more detailed modelling work being undertaken by SEIPH and the Environment Agency. Also, the Environment Agency tightened their SO_2 emissions limits in authorisations given under the Environmental Protection Act 1990 for certain power stations operating in the East Thames corridor (the principal source of the SO_2 emissions). The result of this further work was that it was unlikely that there would be exceedences within Wandsworth's area.

Monitoring results

SO_2 is monitored at the Town Hall monitoring station on Wandsworth High Street (**Wandsworth 2**). This continuous monitoring station is in an urban background location. Between 1995 and 2012 (inclusive) there were no exceedences of the 15-minute SO_2 objective or other relevant objectives. The data capture rate for 2007 was 94%, for 2010 was 91%, for 2012 was 98% and for 2013 was 95%, but in 2008 was only 73%, and in 2009 was only 84% and in 2011 was 82% due to problems with the analyser. As the capture rate for 2008, 2009 and 2011 was less than 90% for the year the results may not be representative of the full year and should be used for guidance only. There is no relevant public exposure to this pollutant and no significant local sources of SO_2.

2.2.4 Benzene

Introduction

The air quality objective for benzene is 16.25 μg/m^3 as a running mean which was to be achieved by the end of 2003. Following advice from EPAQS (Expert Panel on Air Quality Standards), the 2002 strategy review set an additional tighter objective of 5 μg/m^3 as an annual mean to be achieved by the end of 2010. This is in line with the second air quality daughter directive limit value.

The main sources of benzene emissions in the UK are petrol–engined vehicles, petrol refining, and the distribution and uncontrolled emissions from petrol station forecourts without vapour recovery systems.

Benzene is considered to be a genotoxic carcinogen, in particular leading to certain leukaemias when heavy exposure has occurred (largely in industrial workplaces). Also, benzene is a non-methane volatile organic compound and as such can be involved in photochemical smog production.

Current monitoring indicates that all of the UK national network sites were significantly below the 2003 objective during the period between 1999 and 2009. Since 2001 the concentrations were also below the 2010 objective, with kerbside/roadside sites having higher concentrations than urban background sites.

The first round of review and assessment predicted that there were unlikely to be any exceedences of the 2003 objective for benzene within Wandsworth. The second round of review and assessment (Updating and Screening Assessment 2004), the third round of review and assessment (Updating and Screening Assessment 2006), and the fourth round of review and assessment so far (Updating and Screening Assessment 2009) did not identify a risk of the 2003 and 2010 objectives being exceeded in the borough.

Monitoring Results

Benzene monitoring commenced in August 2004 on Roehampton Vale, A3 by means of a passive diffusion tube positioned on a lamp post. There is now 8 years worth of data available from this site. The site was chosen due to its close proximity to a busy road, with an annual average daily traffic flow in excess of 80,000 vehicles per day, and its location adjacent to a petrol station. The annual means for the calendar years 2005 to 2012 are given in Table 2.18 below. The annual means for 2005 and 2006 are based upon 12 full months of data, the annual means for 2007, 2008, 2011, 2012 and 2013 are based upon 11 months worth of data, and the annual means for 2009 and 2010 are based upon 10 months of data. There appears to be a general downward trend in the results over the 7 year period, with 2012 giving the lowest result so far and 2013 being only marginally higher. It should be noted that the location of the benzene tube was moved at the beginning of 2013 due to the lamp column on which it was sited being knocked down. The new location is further from the kerbside but closer to a petrol station forecourt. Further details are provided in table 2.2.

Table 2.18 Results of benzene automatic monitoring: Comparison with annual mean objective

	Year								
	2005	2006	2007	2008	2009	2010	2011	2012	2013
Annual Mean (ug/m3)	3.9	4.2	2.9	2.9	1.9	2	1.6	1.3	1.4

The running annual mean over the whole time period (2005 to 2013) was 2.5μg/m^3 (0.8 ppb). The maximum monthly value measured was 8 μg/m^3. These results show that the running annual mean is

well below the running annual mean objective of 16.25 μg/m^3 which was to be achieved by 31 December 2003. In addition, the annual means for each year from 2005 to 2013 were also below the annual mean objective of 5 μg/m^3 to be achieved by 31 December 2010.

2.2.5 Carbon Monoxide

Introduction

The air quality objective for carbon monoxide (CO) is 10 mg/m^3 (set as a maximum daily running 8-hour mean which was to be met by the end of 2003).

The main source of CO in the United Kingdom is road transport, through incomplete combustion of fuel, which accounted for 67% of total releases in 2000. In London this figure is much higher. Annual emissions of carbon monoxide have been falling steadily since the 1970's, and are expected to continue to do so.

Carbon monoxide (CO) can interfere with the carriage of oxygen around the body by the haemoglobin in blood, and can block certain chemical reactions within cells. Exposure to high concentrations can lead to unconsciousness or death. Such high concentrations are unlikely to occur in open environmental conditions. However exposure to lower concentrations can lead to adverse effects on the heart, brain and central nervous system, leading to negative impacts on mental activity. Some people may be more sensitive to carbon monoxide such as those with coronary arterial diseases.

For the first round of review and assessment predictions of 8-hour rolling concentrations of CO were made for all significant road links within the borough. None of the road links were predicted to exceed the NAQS objective in 2005. The highest kerbside concentrations were approximately 8 ppm (9.28 mg/m^3) along Wandsworth High Street, Kingston Road and Roehampton Vale. It was therefore considered unlikely that the NAQS objective for CO would be exceeded in the borough in 2005.

The second round of review and assessment verified these predictions. Between 1995 and 2002 monitoring data showed that there were no exceedences of this Air Quality Objective at either of the monitoring sites within the borough. Carbon monoxide is still monitored at the Town Hall monitoring station (**Wandsworth 2**), and was measured at the South Thames College monitoring station (**Wandsworth 4**) until it closed in August 2007 and at the Felsham road, Putney monitoring station (**Wandsworth 9**) in 2011 and 2012, until it closed in August 2012.

Monitoring Results

As can be seen in Table 2.19 the maximum CO 8-hour rolling mean between 2006 and 2013 were well within the air quality objective of 10 mg/m^3 which was to be achieved by 31 December 2003. However, levels were higher at **Wandsworth 2** in 2010 than the preceding 2 years, but still lower than 2001 and 2005. Data between 2006 and 2012 shows that CO concentrations are currently well below 2003 objective levels, and were falling year on year up to 2009. Since then they have remained consistently low apart from in 2010 when they were slightly elevated. The Town Hall monitoring station (**Wandsworth 2**) recorded the lowest maximum CO 8-hour rolling mean since monitoring began in 1999 of just 1.8 mg/m^3. All data is now fully ratified.

Table 2.19 also shows that the maximum CO 8-hour rolling mean (mg/m^3) measured in 2011 and 2012 at the Felsham Road urban background monitoring station were also well within the air quality objective. All data is now fully ratified. CO was monitored at this site between January 2011 and August 2012 before the analyser stopped working and could not be repaired. CO is no longer monitored at this site as concentrations are well below the air quality objective and discussions with King's College London, who operate the London Air Quality Network, have indicated that there is little benefit in continuing to monitor CO at this location.

The 2005 and 2006 data recorded at **Wandsworth 2**, the 1999 and 2007 data recorded at **Wandsworth 4** and the 2011 and 2012 data recorded at **Wandsworth 9** achieved a data capture rate of less than 90%. Therefore, these results may not be representative of the full calendar years and should be used for guidance only.

Table 2.19 Results of CO automatic monitoring: Comparison with the running 8 hour mean objective

Site	Year	Data Capture	Maximum CO 8 hour rolling mean (mg/m^3)	Objective achieved
Town Hall (Wandsworth 2)	1999	95%	5	YES
	2000	92%	4.5	YES
	2001	95%	5.6	YES
	2002	95%	4.1	YES
	2003	91%	3.5	YES
	2004	91%	3.5	YES
	2005	86%	4.9	YES
	2006	66%	2.9	YES
	2007	95%	2.8	YES
	2008	98%	1.9	YES
	2009	99%	1.8	YES
	2010	99%	2.7	YES
	2011	98%	1.9	YES
	2012	100%	1.9	YES
	2013	99%	2.3	YES
Site	Year	Data Capture	Maximum CO 8 hour rolling mean (mg/m^3)	Objective achieved
Thames College (Wandsworth 4)	1999	83%	5.2	YES
	2000	93%	4.6	YES
	2001	97%	5.5	YES
	2002	92%	4.1	YES
	2003	96%	2.8	YES
	2004	98%	3.1	YES
	2005	98%	4.4	YES
	2006	96%	2	YES
	2007	63%	2.7	YES

Site	Year	Data Capture	Maximum CO 8 hour rolling mean (mg/m^3)	Objective achieved
Felsham Road (Wandsworth 9)	2011	88%	1.4	YES
	2012	70%	1.6	YES

3 New Local Developments

3.1 Road Traffic Sources

The London Borough of Wandsworth confirms that there are no new/newly identified road traffic sources that have not been adequately considered in previous rounds of Review and Assessment.

The Wandsworth Updating and Screening Assessment 2012 gave updated details of a number of larger scale developments that had been assessed in terms of air quality impacts and their potential to come within the category of narrow congested streets with residential properties close to the kerb, in particular the possibility for unacceptable exposure to NO_2 and PM_{10}. None of the sites required further assessment.

It explained that there had been pre-application discussions with developers, that preliminary assessments had been undertaken and planning applications for a number of large scale redevelopment sites in the Nine Elms area in the north east of the borough. The area incorporating these has been categorised by the Greater London Authority as the 'Vauxhall Nine Elms Battersea Opportunity Area Planning Framework' and includes Covent Garden Market, Southbank Business Centre (including the new American Embassy site), Battersea Power Station, and Tideway Industrial Estate. The framework proposals amount to 1.7million square metres of new built area, including over 16,000 new homes and 25,000 new jobs.

It further explained that planning permission has been given for the a number of large scale developments in the Nine Elms area including: Battersea Power Station and Tideway Industrial Estate, South London Mail Centre, Market Towers, Marco Polo House, Embassy Gardens and for the American Embassy. Applications are pending or under discussion for the redevelopment of New Covent Garden Market (3000 residential units); the main drive site for Thames Tideway Tunnel; the Northern Line extension, Battersea Gasholders site, Sleaford Street dairy (294 residential units).

The Progress Report 2013 then explained that since that time construction and/or demolition works have commenced on the following sites: Tideway Industrial Estate, Embassy Gardens, American Embassy site, and South London Mail Centre.

During 2013 a number of major planning applications, particularly in the Nine Elms opportunity area, were assessed for their impact on air quality and the potential for introducing new receptors in areas of poor air quality. Planning permission has now been given for a number of large scale developments in the Nine Elms area including: Battersea Power Station and Tideway Industrial Estate, South London Mail Centre, Market Towers, Marco Polo House, New Covent Garden Market site [3000 residential units plus new market site, offices etc.]; Sleaford street Industrial Estate, SW8 [294 residential units plus commercial space]; Battersea Gas Holders site [large scale demolition and infill of four gasometers]; Northern Line Extension [very large station excavation and build and tunnelling work]; Embassy Gardens and for the American Embassy.

In addition large scale developments have been given permission in other parts of the borough, including: Two office sites at 84-88 & 131 Upper Richmond Road, SW15 [approx 400 residential units]; Roehampton Town Centre, SW15 [Shops, amenities, utilities, etc], Ransomes Wharf, SW8 [approx 130 residential units, shops, entertainment, etc]; Ram Brewery & Cockpen House, SW18; enterprise way industrial estate, SW18; 'Battersea Park Village', Queenstown Road, SW8 [325 residential units plus commercial space]; Ark Academy site, SW15 [155 residential units plus new school buildings]; John Paul II School site, SW19 [122 residential units plus commercial space]; Thames Tideway Tunnel [7 storm sewer interception sites plus main drive site for the whole tunnel project]

Air quality assessments have been required for these sites to assess the impact of the development upon air quality and the potential exposure of the residents of the development to air pollution. Air Quality is a material planning consideration. Air Quality assessments are required to be undertaken as part of Environmental Impact Assessments and for other sites where there is a concern regarding the effect of the development on air quality or exposure of individuals to poor air quality. Mitigation

measures may be required as planning conditions or as obligations within a Section 106 planning agreement.

None of the sites given consideration, whether pre-application, awaiting planning approval, or having approvals fall into the category of *narrow congested streets*. i.e. low traffic speed (average speed is 50 kph or less), carriageway of less than 10m wide and the façade of the building being within 5 metres of the road. Therefore, no sites required a screening assessment to be carried out using the DMRB (Design Manual for Roads and Bridges).

3.2 Other Transport Sources

The London Borough of Wandsworth confirms that there are no new/newly identified other transport sources that have not been adequately considered in previous rounds of Review and Assessment.

3.3 Industrial Sources

The number of industrial installations regulated under the Local Authority Pollution Prevention and Control (LAPPC) regime has remained reasonably constant, although some installations have closed and others have opened. At the time of writing there are 94 Part B installations operating within the borough. A list of Part B Installations and mobile plant is in Appendix 2. No new industry sectors are regulated as a result of the new premises opening. There were no new installations for which an air quality assessment was carried out in 2013. Also, there are no existing installations where emissions have increased substantially or new relevant exposure has been introduced.

3.4 Commercial and Domestic Sources

The London Borough of Wandsworth has not identified any commercial sources, such as Biomass combustion and domestic solid fuel burning that were not assessed as part of the Updating and Screening Assessment 2012. However, planning permission has been given for a small number of developments to use Biomass plant. Air quality assessments are undertaken as part of the planning process and mitigation recommended. The use of biomass plant within the borough will be assessed further as part of the next Updating and Screening Assessment.

The whole of the borough is designated a smoke control area. This means that burning of unauthorised fuels in unauthorised fireplaces is not permitted. In some locations in the borough smokeless fuels are burnt, although this is not considered to be the primary source of heating of these properties and therefore does not occur at levels that are significant, according to the Technical Guidance LAQM. TG(09). The density of coal burning premises will not exceed 100 per 500m x 500m area, and therefore it will not be necessary to proceed to a Detailed Assessment for SO_2 at these locations.

The London Borough of Wandsworth Smoke Control Order 2012 came into force on 1st November 2012 at which time all the previous smoke control orders for the borough were revoked. The new order covers the whole of the borough.

The new order was made so that anomalies arising in the older orders as a result of the boundary changes and the large-scale area redevelopments that have occurred since the original orders were made. It is also at a time when an increasing use of solid fuels is giving rise to additional and unacceptable air pollution from the smoke particles emitted, despite the existing orders. The new order re-affirmed the Council's commitment to promoting good air quality and, thereby, to protect the health of its residents.

3.5 New Developments with Fugitive or Uncontrolled Sources

The London Borough of Wandsworth confirms that there are no new potential sources of fugitive particulate matter emissions in the borough.

The London Borough of Wandsworth confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

4 Implementation of actions in Air Quality Action Plan

A description of the actions to implement the plan, together with progress on the measures within the plan, is set out in Appendix 7.

The Air Quality Action Plan (AQAP) contains 32 separate actions to improve local air quality under the following 7 subject areas:-

(a) measures aimed at reducing the use of cars;

(b) measures aimed at reducing emissions from vehicles;

(c) development control;

(d) enforcement of regulatory powers;

(e) energy use and heating;

(f) education and promotional initiatives; and

(g) encouraging businesses to have regard to air quality.

In order to provide a qualitative assessment of the costs and benefits of the actions a matrix was developed as part of the AQAP. Each action is rated as being high, medium or low by assessing their costs and air quality impacts against definitions in Table 1 and Table 2 respectively.

Table 1. Cost rating definitions

Cost Rating	Definition
Low	Cost is covered by existing budget or by fees from polluter.
Medium	Additional funding is required, but can be incorporated with forward planning
High	Additional funding is required that cannot be incorporated into existing budget.

Table 2. Air Quality impact rating definitions

Air Quality Rating	Definition
Low	Impact is small and localised. Will be beneficial as part of wider package of measures
Medium	Impact is borough-wide
High	Impact is city-wide in partnership with other organisations

These ratings were used to determine the cost/impact shown in the air quality action plan table as detailed in Appendix 7. The existing Council budgets are able to meet the costs of most of the actions defined within the low cost rating definition. Those actions categorised as medium or high required additional funding. The action plan implementation table confirms whether additional funding has been identified and secured. A traffic light analysis system has been applied to the action plan measures so that the costs and benefits can be easily seen.

The wide variety of measures in the Plan depends on implementation by a number of Council services. The Environmental Services and Community Safety Division co-ordinates and monitors progress of the measures in the Plan. The implementation of the actions in the plan will benefit local

air quality, and will also contribute to tackling climate change by reducing carbon dioxide (CO_2) and volatile organic compound (VOC) emissions.

A summary of progress with actions within the separate subject areas is given below:

1. **Measures aimed at reducing the use of cars**

(a) The Staff Bicycle Users Group has continued to meet and help encourage cycling to work. The pool bike scheme continues.

(b) 17 travel plans required at developments through planning conditions or Section 106 agreements in the year Jan-Dec 2013.

(c) Walking is promoted through travel plans, school travel plans and travel awareness campaigns. Specific walking infrastructure improvements have been delivered at Clapham Junction SW11 (Latchmere, Northcote, Shaftesbury). "Legible London" pedestrian Wayfinding scheme has been implemented in developments for Clapham Junction SW11 (Latchmere, Northcote, Shaftesbury) and Balham SW12 (Balham, Bedford, Nightingale) town centres. Approved Local Implementation Plan (LIP) includes policies and actions to promote and encourage walking and a target to increase the proportion of trips made on foot in the borough.

(d) Out of 114 schools in the Borough, 99 (87%) had approved travel plans by the end of 2013. The Council continues to offer support to all schools running sustainable travel initiatives. In June 2013, 18 schools achieved TfL's Bronze accreditation for their travel plan, 2 schools had Silver accreditation and 1 school had Gold.

(e) The Council is continuing to lobby for the relief of overcrowding on local trains and at local stations through engagement with train operators, Network Rail and the Department for Transport (DfT) for congestion relief at Clapham Junction, increasing capacity on all railway services and the bringing back into use of Waterloo International since its closure to Eurostar services. Consequently, there has been a lengthening of some Southern trains from December to 5 and 10 cars, and by an announcement of a further lengthening of Overground trains from Clapham Junction to 5 car from December 2014 onwards. In addition many platforms have been lengthened this year to take longer trains. The Council has also continued to lobby for an increase in train services stopping at Clapham Junction, and for improvements to London Underground services. Again the latter has been rewarded by confirmation of Government backing for an extension of the Northern Line to Battersea Power Station.

(f) Lobbying continues for improved rail access to Heathrow and Gatwick Airports, with development of the South London-Heathrow Railink project using a route options and feasibility study, which demonstrated that a direct rail route is achievable and could deliver a strong return on investment. A stakeholder group has been formed to assist in developing the case further.

(g) Improvement works are well advanced at Putney Station to provide new lifts, stairs and an extended booking hall, and the Council has completed a feasibility study which demonstrated that there was a good business case for a secondary entrance from Oxford Road from the station. The Council has also worked with TfL and the rail industry to develop plans for major improvements to Battersea Park Station.

(h) The Council continues to assist bus operators, particularly to make as many bus stops fully accessible as practicable for those with mobility difficulties. The Council has also negotiated funding from local developments to secure improvements to bus services and infrastructure.

(i) Cycling continues to be promoted through travel plans, school travel plans and travel awareness campaigns. Specific cycling projects funded through the LIP include a programme of public cycle parking provision; cycle training for children and adults; cycle route improvements including missing links on the local cycle network; and bicycle maintenance classes.

(j) Significant LIP and Council investment brought the Mayor's Cycle Hire Scheme to the borough in 2013. In December 2013, 52 docking stations comprising 1,434 docking points became operational in the north and east of the borough.

(k) Requests continue to be received from residents who would like parking controls introduced in their area to remedy their reported parking difficulties. New Controlled Parking Zones (CPZs) were introduced on the 28th January 2013 in Queensmere Road, Bathgate Road, 1-7 Thursley Gardens, Boddicott Close and Gonston Close (West Hill CPZ) and on the 30th September 2013 in Longwood Drive, Westmead (West of Dover House Road) and Coppice Drive (a new sub-zone (R2) to the Roehampton CPZ).

(2) Measures aimed at reducing emissions from vehicles

2.1 The Council's vehicle fleet and drivers

(a) Actions are taking place to reduce emissions from the Council's vehicle fleet. These include driver training and the trial of in-cab telematics. The records from the telematics equipment provide information about how a vehicle is being driven. The information can immediately be displayed to the driver (to encourage appropriate modification to driving behaviour) and can also be used as a management tool to monitor driving style and identify training needs. Three different systems have been piloted to date with a view to expand their use further across the fleet.

(b) In the summer of 2013 the Council were able to commence the lease of two Nissan Leaf electric cars through the Low Carbon London Programme, led by UK Power Networks, bringing new Nissan LEAF electric vehicles to London for 2 years. The cars are now being used within Environmental Services and On-street services of the Council and will also be used to promote the use of electric vehicles, and charging points that are part of the Source London network, such as the ones within Wandsworth. The lease of these vehicles is funded via a Defra Air Quality Grant.

(c) During 2013, 90 drivers were assessed and 10 drivers needed additional tuition over and above the basic instruction given to all drivers being tested.

(d) All contract vehicles comply with the Euro 3 standard. The minimum requirement for new vehicle lease contracts is LPG or a minimum of EURO IV, with some at EURO V

2.2 Reducing emissions from vehicles

(a) The Mayor announced on 13 February 2013 that the next phase of the LEZ will only apply to TfL operated buses in 2015. Operators of diesel lorries and coaches do not need to take any action. Previously it was proposed that all buses, coaches and lorries would need to meet a London-wide standard for emissions of oxides of nitrogen (NOx) in 2015. Applying this standard to TfL buses only will still deliver 75% of the benefits of the original proposal while saving operators £350m in avoided costs which would have been required to clean up their vehicles under the original proposal.

(b) In March 2013 free emissions checks were carried out on 70 vehicles owned by members of the public, who attended two testing sessions in the car park of Asda in Clapham Junction (Shaftesbury). The owners of the small number of vehicles with emissions failing the test were advised to have their cars serviced by a reputable mechanic and to have the underlying problems cleared up before they developed into a more serious fault.

(c) These free testing sessions are carried out on a regular basis to help raise awareness of air pollution and the steps drivers can take to reduce their emissions. Council officers spoke to hundreds of motorists and handed out the Council's "Smarter Driving Tips" leaflet which contains practical information on how to cut local air pollution while saving money on fuel. Measures include removing unnecessary weight, switching off air conditioning and pumping

tyres to the correct pressure. Free tyre pressure gauges were also handed out so motorists can ensure they keep tyres at the correct level.

(d) The Council is committed to providing an electric vehicle recharging infrastructure within the Borough and has obtained grant funding to install electric vehicle charging points. Two electric vehicle charging points have been installed off-street (and are available for public use), in the Wandle Leisure Centre Car park (Southfields) and the Putney Leisure Centre Car Park (West Putney). Four electric vehicle charging points have been installed off-street (and are available for public use). The 4 locations are in town centres within areas of low parking pressure within controlled parking zones in St Johns Avenue (East Putney), Coverton Road (Tooting), Grant Road (Latchmere) and Spencer Park (Wandsworth Common).

(e) All of the charging points are part of the "Source London" charging network run by Transport for London, https://www.sourcelondon.net/ This enables all electric vehicle owners across London to have access to the electric vehicle charging points operated by the Council and our residents to have access to all those within London that are part of the scheme via a secure card. The annual membership cost for the scheme is £10 for each vehicle (with no charge for electricity used). Users can then use any Source London charging points across the city (parking charges may apply). Information regarding electric charging points is available via the Council's website at: http://www.wandsworth.gov.uk/driveelectric

(f) Information on cleaner fuels and cleaner fuels refuelling sites within the borough is included on the Council website (http://www.wandsworth.gov.uk/info/200334/air_quality/1586/vehicle_fumes/2), together with specific information on electric vehicles and charging points (www.wandsworth.gov.uk/driveelectric). General information explaining that on average diesel vehicles emit more local air pollutants, NO_2 and PM_{10}, than petrol vehicles is also included on the website.

(3) Development control

(a) All adopted Local Plan documents are currently being reviewed - consultation took place May/June 2013 with submission expected March 2014.

(b) Car parking at a number of residential and mixed-use developments has been permitted below the maximum standards in an attempt to reduce the use of the private car by residents. This is often permitted in association with exclusion of the development from the adjacent controlled parking zone and provision of car club parking to help residents forego car ownership. Air Quality assessments are required to be undertaken as part of Environmental Impact Assessments and for other sites where there is a concern regarding the effect of the development on air quality or exposure of individuals to poor air quality. Mitigation measures may be required as planning conditions or as obligations within a Section 106 planning agreement.

(c) During 2013 a number of major planning applications, particularly in the Nine Elms opportunity area, were assessed for their impact on air quality and the potential for introducing new receptors in areas of poor air quality. Planning permission has been given for a number of large scale developments in the Nine Elms area including: Battersea Power Station and Tideway Industrial Estate, South London Mail Centre, Market Towers, Marco Polo House, New Covent Garden Market site [3000 residential units plus new market site, offices etc.]; Sleaford street Industrial Estate, SW8 [294 residential units plus commercial space]; Battersea Gas Holders site [large scale demolition and infill of four gasometers]; Northern Line Extension [very large station excavation and build and tunnelling work]; Embassy Gardens and for the American Embassy.

(d) In addition large scale developments have been given permission in other parts of the borough, including: Two office sites at 84-88 & 131 Upper Richmond Road, SW15 [approx 400 residential units]; Roehampton Town Centre, SW15 [Shops, amenities, utilities, etc], Ransomes Wharf, SW8 [approx 130 residential units, shops, entertainment, etc]; Ram

Brewery & Cockpen House, SW18; enterprise way industrial estate, SW18; 'Battersea Park Village', Queenstown Road, SW8 [325 residential units plus commercial space]; Ark Academy site, SW15 [155 residential units plus new school buildings]; John Paul II School site, SW19 [122 residential units plus commercial space]; Thames tideway Tunnel [7 storm sewer interception sites plus main drive site for the whole tunnel project]

(e) The need for supplementary planning guidance has been reviewed further as a result of the Local Development Framework and Low Emission Strategy Work via the Low Emission Strategy Development Programme. However, a specific supplementary planning document will not now be produced as in 2013 the Mayor of London consulted on his draft supplementary planning guidance (SPG) on Sustainable Design and Construction. This document provides further guidance on what constitutes an air quality neutral development. It is proposed to adopt the provisions of this document so that a consistent approach with other London Boroughs is adopted.

(4) Enforcement of Regulatory Powers

(a) Certain industrial activities are regulated by the Council through Environmental Permits. During 2013, all required inspections were carried out to ensure that the installations were complying with their permits. In 2013, some permits were subject to variations to take account of changes to the activities, statutory guidance documents, and/or upgrading requirements.

(b) Complaints about bonfires, dust and fumes require a same day response which was achieved in 99% of cases in 2013.

(c) The Best Practice Guidance 'The Control of Dust and Emissions from Construction and Demolition', produced in partnership with the Greater London Authority and London Councils, is aimed at major construction sites such as the large developments taking place in the Nine Elms Opportunity Area. Developers are advised to follow this guidance, with the level of action required dependent on the result of specific risk assessment. For the highest risk-assessed sites, monitoring of fine particles (PM_{10}) is required.

(d) Information on smoke control is on the Council's website, including an electronic version of the advice leaflet available for downloading from the website. A link to the UK Smoke Control areas website is also available on the Council's website. This contains updated lists of exempt appliances and smokeless fuels. A new smoke control order covering the whole Borough came into operation on the 1st November 2012. This was publicised via press releases and the Council website.

(e) Complaints of idling engines are investigated and action taken to resolve the problem. A warning notice has been produced to hand to people who are unnecessarily leaving their engines idling. If vehicles are found idling unnecessarily, fixed penalty notices for non-compliance may be served. A fixed penalty notice will only be served if a driver refuses to turn off their engine when asked to do so.

(5) Energy Use and Heating

(a) A number of projects identified in the Carbon Management Plan have been implemented with further ongoing or identified as pipeline projects. Salix funded projects valued in excess of £32,560 were committed during 2012/13 to fully utilise available funds. The regeneration of the fund will achieve £72,000 by March 2014 for new projects.

(b) Replacement of heating and domestic hot water boilers and controls to reduce energy usage is being implemented in Council housing stock. There is also an ongoing energy efficiency programme including cavity wall insulation.

(c) The Home Energy Conservation Act 1996 report required for March 2013 has now been published.

(d) The Mayor of London's office provided further funding for the RE:NEW project to retro-fit energy efficient measures in domestic properties across the Borough.

(e) 100 homes visited before March 2013 under Warmer Homes Healthy People fund.

(6) Education and Promotional Initiatives

(a) The background air quality monitoring station at the Town Hall, Wandsworth High Street, Wandsworth 2 (SW18, Fairfield) continues to operate and measure CO, NO_2, O_3 and SO_2. A further background air quality monitoring station in Felsham Road, Putney (Thamesfield) began operation in January 2011 and continues to operate and measure NO_2 and PM_{10}. CO was monitored at this site between January 2011 and August 2012 before the analyser stopped working and could not be repaired. CO is no longer monitored at this site as concentrations are a long way below the air quality objective and discussions with King's College, London who operate the London air quality network, have indicated that there is little benefit in continuing to monitor CO at this location.

(b) A temporary Air Quality monitoring station began operation in Putney initially for one year on 1 August 2009. This monitoring station is located on Putney High Street at the kerbside and measures nitrogen dioxide and fine particles (PM_{10}). A second temporary Air Quality monitoring station began operation in Putney High Street at the building facade initially for one year on 1 May 2010. This monitoring station measures nitrogen dioxide. These two monitoring stations will continue to operate until 30 June 2014, via funding from TfL (Local Implementation Plan funding). It is hoped that their operation will continue until the end of 2014 although the funding for this has yet to be confirmed.

(c) A further temporary air quality monitoring station (initially installed for 1 year) began operation in the Nine Elms area (in Thessaly Road at the junction with Battersea Park Road, Queenstown) in June 2012 and measures nitrogen dioxide and fine particles (PM_{10}). This monitoring station will continue operating until July 2014 so that 2 full years of monitoring data are achieved.

(d) NO_2 is also measured using passive diffusion tubes at 13 locations within the Borough; and benzene is measured using a diffusion tube at one site within the Borough. In 2012 additional sites were added in Clapham Junction and Tooting. A further 11 passive diffusion tubes measure NO_2 in the vicinity of the temporary real-time air quality monitoring stations in Putney High Street to give a more informed picture of air pollution levels at this location. Diffusion tubes are located in the centre of the pavement and at first, second and third floors of a building adjacent to the pavement.

(e) Cycling promotion events held in summer 2013 in Balham Town Centre (Balham), Putney Town Centre (Thamesfield) and Battersea Park (Queenstown), attracted hundreds of visitors. More than 140 bikes were security marked and safety checked by "Dr Bike". Public bike maintenance classes held in Battersea (Latchmere) were attended by 43 members of the public.

(f) In May 2013, 33 schools took part in Walk to School Week. In October 2013, 24 schools took part in Walk to School Month. There are 22 schools taking part in the WoW (Walk Once a Week) campaign.

(g) Environmental Services has arranged for an environmental theatre company to tour primary schools in the Borough each year since 2006; in total 59 performances have been provided in primary schools (82% of primary schools have been visited). In 2013, schools were visited in March. The Big Wheel Theatre company gave a further ten performances to primary schools across the Borough showing children what they can do to help prevent air pollution. The children were encouraged to think about all the benefits of walking to school, including improvements to air quality. This programme was funded by Local Implementation Plan allocation from Transport for London

(h) 81 home composting containers were supplied to residents during 2013 via the Council's special discount offer, down from 121 during 2012. This brings the total number of containers supplied to residents under various Wandsworth Council offers over the last 16 years to 10,826.

(i) During 2013 work was undertaken to develop an air quality website for South London to provide consistent information on air quality across South London with the intention of raising awareness of air quality and the actions that are being taken to improve air quality. This website will be sign posted from the Council website. The website will be interactive and will have information targeted at different age ranges and in particular children (including an educational game). The website will be launched in February/ March 2014 with associated publicity including sending out press releases from all participating boroughs.

(j) Approximately 300 individuals have signed up to airTEXT to date and further publicity initiatives are scheduled. As of the end of December 2013 there were 7,183 users signed up to the service within the London boroughs and Slough. This figure includes people that have signed up to the service via text message, whose address is not known to the airTEXT consortium, and therefore these users have not been attributed to any particular borough.

(7) Encouraging Businesses

(a) In 2012 a project of business engagement in Putney High Street commenced. To date over 50 businesses have been contacted and potential actions to improve air quality have been recommended by the consultant undertaking the work. Following on from this a piece of work, in 2013 further engagement was undertaken with business premises on Putney High Street relating to supply chains and deliveries. The findings of this report are being considered.

(b) As part of the Greener Borough initiative, small businesses based in Wandsworth have had access to free support and information from the Greening Business Programme to become more sustainable and save money. Greening Business Advisers have been working with businesses by undertaking environmental audits of their premises followed by the completion and implementation of an action plan which would reduce costs associated with energy, water and/or waste. The Greening Business Programme is a free service (funded from the European Regional Development Fund) that offers companies an intense support, mentoring and advice service focused on the six essentials to "Greening": Energy, Waste, Recycling, Transport, Water and Purchasing. Information on the service was promoted on the Council website via the sustainability pages. By the end of December 2013, detailed one-to-one reviews and action plans have been developed for 24 companies in Wandsworth. (1st May 2012 to 31st December 2013).

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

The current whole borough Air Quality Management Area (AQMA) was designated as a result of predicted exceedences of the 24-hour mean PM_{10} objective and predicted exceedences of the annual mean nitrogen dioxide objectives. The conclusions from the latest monitoring data is that the annual mean NO_2 objective is still being exceeded, but, where monitored (on the basis of ratified data), the 24-hour mean PM_{10} objective is being met.

Provisional data from the most recent monitoring station to be installed at the roadside in Battersea (**Wandsworth 10**) also demonstrates these conclusions in relation to the annual mean NO_2 objective although the predicted exceedences are significantly lower than those recorded at the roadside site in Putney (**Wandsworth 8**) and also lower than the Town Hall, Wandsworth (**Wandsworth 2**) Urban Background site.

Modelling has predicted exceedences of the 24-hour mean PM_{10} objective at roadside locations and consequently real-time monitoring of this pollutant continues to be undertaken in worst-case locations.

New provisional data from the Battersea roadside site (**Wandsworth 10**) also indicates the number of 24-hour exceedences of the 50 $\mu g/m^3$ for PM_{10} from 1 January 2013 to 31 December 2013 (the first calendar year of operation to be 43, therefore failing to meet the objective of 35 days.

Therefore the existing AQMA will not be amended in relation to these objectives.

The new monitoring data shows that all air quality objectives for the other pollutants monitored, i.e. Sulphur Dioxide, Benzene and Carbon Monoxide, are still being met.

The new monitoring data (including data from the Battersea roadside site, **Wandsworth 10**) also shows that the annual mean PM_{10} objective is still being met. However some of the data does need to be treated with caution in some cases due to low capture rates. In particular the comparison against the annual mean and number of exceedences of the 24 hour mean PM_{10} objectives in Putney High Street in 2012 is unreliable due to a very low capture rate (50%) caused by problems with the analyser. There same issue also exists with the use of data from the Felsham Road, Putney (Urban Background) site in 2013 where the data capture was 42%.

The new monitoring data from the recent NO_2 diffusion tube surveys in Putney High Street does continue to indicate that the annual mean NO_2 concentrations are exceeding 60 $\mu g/m^3$ (105 $\mu g/m^3$ in the centre of the pavement in 2013). The TG09 guidance advises that where annual mean concentrations are 60 $\mu g/m^3$ or above, exceedences of the one hour NO_2 objective are likely to occur. The real-time monitoring data from Putney High Street and Putney Façade also shows that the hourly NO_2 objective is not being met at these locations and in fact is being exceeded many times over.

However, there was a significant reduction in the number of exceedences of the one hour NO_2 objective at both the roadside and kerbside monitoring stations in 2013 when compared to previous years. If the 2013 data (based on provisional data) is compared to 2012 data, this equates to a 42% reduction in the number of exceedences at the kerbside and a 62% reduction in the number of exceedences at the roadside (façade). In 2013 there were 1,588 exceedences at the kerbside and 657 at the building façade of the one hour mean concentration of 200 $\mu g/m^3$ that should not be exceeded more than 18 times per year compared to 2,740 at the kerbside and 1726 at the roadside (façade) in 2012.

In addition there were reductions in the annual mean NO_2 concentrations. These reductions are also reflected in the diffusion tube data.

However, Felsham Road, Putney data for 2013 does show that the annual mean NO_2 objective was met at this urban background location (46 metres from the Putney High Street kerb), measuring 40 $\mu g/m^3$ and that there were 2 exceedences of the one hour mean of 200 $\mu g/m^3$ therefore meeting the one-hour NO_2 objective of no more than 18 exceedences in a year.

Data from 2013 shows that NO_2 diffusion tubes located in Mitcham Road SW17; Totterdown Street SW17; St Johns Hill/ Falcon Road SW11, Wandsworth Plain, Wandsworth; Battersea Park Road (adjacent to Newton Preparatory School); and Upper Richmond Road are also still exceeding 60 $\mu g/m^3$ thus indicating that the hourly objective may be being exceeded.

Further monitoring, assessments of potential exposure and/or actions to attempt to reduce concentrations is proposed to be undertaken in these areas where individuals may spend an hour or more. This work will form part of the extension to the "Putney Model" for which a successful bid was made to the Mayor's Air Quality Grant Fund in 2013. Wandsworth Plain (W12, W13) is not a location where individuals are likely to be exposed for an hour or more, although it is adjacent to a bus stand. In addition Battersea Park Road (W3) and Upper Richmond Road (W5) are also not locations where individuals are likely to be exposed for an hour or more.

5.2 Conclusions relating to New Local Developments

The London Borough of Wandsworth can confirm that no local committed development is predicted to increase the concentration levels of any pollutant listed in the regulation that would cause an exceedence of any National Air Quality Objective. The whole of the borough has already been declared an AQMA on the basis of exceedences of PM_{10} and NO_2 objectives. The assessment of new or significantly changed sources did not identify any potential exceedences outside of the existing AQMA.

5.3 Conclusions relating to the Implementation of the Air Quality Action Plan

Wandsworth is in the process of implementing the actions designated within the action plan to achieve air quality improvements within the borough. Progress has been made in implementing the various measures within the AQAP, a number of actions have been completed and more are planned. There are 32 actions within the action plan. The vast majority of these actions are not time limited and by their nature are continuous actions. Progress with these actions is reviewed annually and good progress continues to be made on the 10 actions that were assessed as having a **High** benefit for local air quality not only within the borough, but across South London or London as a whole. Also good progress has been made on the eight actions were identified as having a **Medium** benefit for local air quality, i.e. borough wide.

Actions of particular note in 2013 related to the assessment of the causes of high NO_2 concentrations and actions being undertaken to attempt to improve air quality in Putney High Street; measures aimed at reducing the use of cars; and educational and promotional initiatives including the development of an Air Quality website for South London.

Air Quality in Putney

In the autumn of 2011 a study was undertaken to determine the vehicle emission sources in Putney High Street. A combination of automatic number plate recognition (ANPR) cameras and video traffic counts were used to provide information on the numbers and types of vehicles travelling along the high street and this information was used to determine emissions from each vehicle type for each hour of the day. The report was published in February 2012 by the Transport Research Laboratory. The report is available on the Council website at the following location:
http://www.wandsworth.gov.uk/info/200075/pollution/110/air_quality/4

The study showed that buses are responsible for 68% of NOx emissions in the high street whilst only accounting for 10% of the vehicle fleet. The results from the study provided the evidence to lobby Transport for London for improvements to be made to the bus fleet travelling along Putney High Street. As a result 46 new buses were provided, including 10 hybrids, and a further 95 buses were retrofitted with selective catalytic reduction (SCR) to reduce NOx emissions (10 more than planned).

An in-depth study has been undertaken using ANPR cameras and automatic monitoring in the high street (funded via Defra Air Quality Grants in 2011/12 and 2012/13). This study will assess the impact of the changes to the bus fleet and other measures being undertaken to improve local air quality in Putney High Street on ambient concentrations. The results of this study are expected by the summer of 2014. This detailed analysis will also ratify the raw data and identify any other factors, like the weather or road closures, which could account for potential reductions in nitrogen dioxide.

New provisional data from the real-time monitoring being undertaken at the kerbside and building façade in Putney High Street is promising, suggesting that average NO_2 levels are lower than they have been since recording started in 2009. The provisional data from the kerbside monitor shows a 42% decrease in the number of times the NO_2 levels exceeded the hourly NO_2 objective last year compared to the previous 12 months. There was also a 62% year-on-year decrease at the building façade monitor. However, the numbers of exceedences are still in excess of the hourly objective (in 2013, based on provisional data, there were 1,588 exceedences at the kerbside and 657 at the building façade of the one hour mean concentration of 200 $\mu g/m^3$ that should not be exceeded more than 18 times per year).

This provisional data has not been ratified and therefore care should be taken before drawing any significant conclusions. The reasons for the reductions will be assessed by the in-depth study detailed above but it is likely that at least part of the reductions will be attributable to the improvements being made to the bus fleet by Transport for London.

However, it is clear that improvements to the bus fleet in isolation will not result in the achievement of the one hour NO_2 objective. Putney High Street remains a very congested road with a stop-start traffic flow, which is affected by vehicles delivering to businesses in the High Street. This pattern of traffic movement exacerbates the emissions in the High Street. Business engagement (funded by Local Implementation Plan and Defra Air Quality Grant in 2012/13) has and continues to be undertaken to enable businesses to identify and implement solutions through transportation and across the supply chain.

In 2013, further stakeholder engagement into deliveries in the High Street was undertaken with the aim to improving traffic flow and consequently air quality in the area. The work took into consideration the findings and recommendations contained in research undertaken by Transport and Travel Research Limited in 2011. The study identified delivery patterns of businesses in the area, aimed to encourage businesses to adopt delivery patterns that occur outside of 7am and 7pm and where this was not possible whether an 'off high street' loading/delivery bay could be used.

Educational, promotional activities and actions to reduce emissions and use of cars

Cycling promotional events were held in the summer of 2013 and bike maintenance courses were attended by members of the public. In May of 2013 33 schools took part in walk to school week and in October 2013 24 schools took part in walk to school month. 24 schools also take part in the walk once a week (WoW) campaign. Environmental Services arranged for an Environmental Theatre company to provide a further ten performances in primary schools within the borough showing children what they can do to reduce air pollution. A bid made to the Mayors Air Quality Fund during 2013 to undertake a campaign to raise awareness of air quality in schools. This was successful.

Cycling is promoted through travel plans. 17 travel plans were required at new developments during 2013.

Significant LIP and Council investment brought the Mayor's Cycle Hire scheme to the borough in 2013, with 52 docking stations in the north and east of the borough becoming operational in December 2013 comprising 1,434 docking points.

In additional free vehicle emission checks were undertaken on 70 vehicles owned by members of the public. Smarter driving tips leaflets and free tyre pressure gauges were handed out at the event.

During 2013 work was undertaken to develop an air quality website for South London so that consistent information can be provided across the area with the aim of raising awareness of air quality and the actions that are being taken to improve it. The website will be interactive and will have elements targeted towards school children. The website will be launched in June 2014.

5.4 Proposed Actions

The London Borough of Wandsworth can confirm that this Progress Report has not identified a need for any Detailed Assessment of any pollutant that is covered by this report. The AQMA was declared on the basis of exceedences of NO_2 and PM_{10} objectives as a whole rather than on the basis of individual objectives that were predicted to be exceeded, i.e. 24-hour mean PM_{10} objective and the annual mean NO_2 objective. The reasons for the declaration of the whole borough on the basis of NO_2 and PM_{10} still hold true.

The real-time monitoring being undertaken at the kerbside and roadside (façade) in Putney high Street has confirmed that the hourly NO_2 objective is being significantly exceeded although the number of exceedences reduced in 2013 compared to 2012. Funding to continue this monitoring in Putney High Street was awarded through the Local Implementation Plan for 2014. In addition the urban background air quality monitoring station in Felsham Road, Putney (one of the roads leading off the high street) will continue to help to provide a more complete picture of exposure to air pollutants in Putney through its measurements of NO_2 and PM_{10}.

The guidance further advises that if there is an existing AQMA in respect of the annual mean objective for NO_2, the local authority may assume there is an exceedence of the 1-hour mean objective in addition to the annual mean objective within the AQMA. There is however no requirement to proceed to a Detailed Assessment in this case. The advice confirms that the AQMA order should be amended and that the AQAP be reviewed. However, as the AQMA for Wandsworth was declared on the basis of NO_2 and PM_{10} as a whole, rather than the individual objectives, the AQMA order does not require amendment. Specific actions are being implemented to address the high one hour mean concentrations in Putney High Street.

It is proposed that work to improve air quality in Putney High Street will continue through a combination of engagement with interested parties and monitoring. External funding has already been secured to extend the monitoring period of the permanent air quality stations along the High Street and to continue a programme of business engagement.

In addition, NO_2 diffusion tubes located in Mitcham Road SW17; Totterdown Street SW17; St Johns Hill/ Falcon Road SW11, Wandsworth Plain, Wandsworth; Battersea Park Road (adjacent to Newton Preparatory School); and Upper Richmond Road are also still exceeding 60 $\mu g/m^3$ thus indicating that the hourly objective may be being exceeded.

Further monitoring, assessments of potential exposure and/or actions to attempt to reduce concentrations is proposed to be undertaken in these areas where individuals may spend an hour or more. This work will form part of the extension to the “Putney Model” for which a successful bid was made to the Mayor’s Air Quality Grant Fund in 2013. Wandsworth Plain (W12, W13) is not a location where individuals are likely to be exposed for an hour or more, although it is adjacent to a bus stand. In addition Battersea Park Road (W3) and Upper Richmond Road (W5) are also not locations where individuals are likely to be exposed for an hour or more.

Provisional data from the Battersea roadside site (**Wandsworth 10**) indicates the number of 24-hour exceedences of the 50 $\mu g/m^3$ for PM_{10} from 1 January 2013 to 31 December 2013 (the first calendar year of operation to be 43, therefore failing to meet the objective of 35 days. This monitoring station is located in an area of intense construction activity which may have accounted for the number of exceedences of the 24-hour mean. Construction Management Plans are conditioned under the planning system to reduce emissions from the major construction sites. A Mayors Air Quality Fund application has been made for a project to encourage best practice to reduce fine particles emissions from the construction sites within the area.

Finally, the London Borough of Wandsworth's next course of action will be to submit an Updating and Screening Assessment in 2015. The Air Quality Action Plan is also to be reviewed in 2014/15. Preparatory work has commenced on this process, which will involve a public consultation on proposed actions.

6 References

1. Technical Guidance LAQM.TG(09), published by DEFRA (Department for Environment, Food and Rural Affairs)
2. The London Air Quality network website at: http://www.londonair.org.uk/
3. The UK National Air Quality Information Archive website at: http://www.airquality.co.uk/
4. The Review and Assessment Helpdesk website at: http://www.uwe.ac.uk/aqm/review/
5. AIR QUALITY Fourth round of Review and Assessment of Air Quality: Progress Report 2011, Wandsworth Borough Council
6. AIR QUALITY Fifth round of Review and Assessment of Air Quality: Updating and Screening Assessment 2012, Wandsworth Borough Council
7. AIR QUALITY Fifth round of Review and Assessment of Air Quality: Progress Report 2013, Wandsworth Borough Council
8. Air Quality Action Plan, January 2004, Wandsworth Borough Council
9. Diffusion Tubes for ambient NO2 Monitoring: Practical Guidance for Laboratories and Users. AEAT, February 2008.

Appendices

Appendix 1

QA:QC Data

Diffusion Tube Bias Adjustment Factors

The diffusion tube suppliers/ analysts, preparation methods used and bias adjustment factors chosen from the Review and Assessment Database are detailed in section 2.1.2 entitled "Non-automatic monitoring".

Discussion of Choice of Factor to Use

National Bias adjustment factors were used for the nitrogen dioxide diffusion tube across borough survey (Table 2.2a). The reason for this is that there are no locations where nitrogen dioxide diffusion tubes are co-located at a monitoring station in a representative location so that a local adjustment factor could be derived. The reasons for the co-location studies not being suitable are as follows. The nitrogen dioxide diffusion tubes that were co-located at the Mitcham road, Tooting (Wandsworth 6) automatic monitoring station were located there spread over two calendar years from 1 April 2008 to 31 March 2009 and therefore not co-located for the majority of 2009 (the year in question). The nitrogen dioxide diffusion tubes that were co-located at the Town Hall, Wandsworth High Street (Wandsworth 2) automatic monitoring station are at a distance of 22 metres from a busy road and at first floor window height. This location is not representative of the typical locations of the other roadside or urban background locations across the borough.

The co-location study with the kerbside automatic monitoring station in Putney High Street, Putney (Wandsworth 7) began in August 2009. Therefore there was not enough data for the calendar year 2009 in order to determine a representative local bias adjustment factor. The data from the co-location study at this monitoring station between 2010 and 2013 were not considered suitable to use to derive a local adjustment factor for the across borough survey as monitoring station is not considered to be in a representative location, due to its close proximity to the kerb and the high results being received. Therefore, it is more applicable to use the national bias adjustment factor where the factor has been obtained from a number of co-location studies. However, this co-location data was used to derive a local adjustment factor for the diffusion tubes located as part of the specific survey where diffusion tubes were located in close proximity to the real-time monitoring station, i.e. in the centre of the pavement and at varying heights on the façade of the adjacent building, 94a Putney High Street. The details of this local adjustment are given in Appendix 6.

Diffusion tubes are now also co-located at the Felsham Road, Putney (Wandsworth 9) air quality monitoring station in triplicate. A decision was taken not to use the 2012 data from this study as the data capture for the monitoring station was below 90%. Therefore it was felt that a national bias adjustment factor based on a large number of sites would be more robust. A decision was also taken not to use the 2013 data from this study. Part of the reason for this decision is that the data capture for the Felsham Road monitoring station was just on the margin of acceptability of 90% and therefore it was felt that an adjustment factor based on a larger number of studies would be more robust. The locally derived bias adjustment factor calculated was 0.84 and therefore the decision of using the 0.95 bias adjustment factor gives a worst case scenario, and is a consistent approach with previous years. Further details for this decision and the figures that would have been obtained if the local bias correction factor was used are provided on pages 29 and 30 of this report.

PM Monitoring Adjustment

The Particulate Matter monitoring data collected from the TEOMs being used within the borough was adjusted to gravimetric equivalent using the 1.3 correction factor for all data collected up until the end of January 2006. From 1 January 2007 to 30 August 2007 an FDMS was installed at the South Thames College monitoring station (Wandsworth 4). For the monitoring data for the period 1 April 2008 to 31 March 2009 collected from the Mitcham Road, Tooting monitoring station (Wandsworth 6) and for the monitoring data collected from the two monitoring stations located in Putney High Street

(i.e. kerbside, Wandsworth 7; roadside, Wandsworth 8;) the volatile Correction Method (VCM) has been used to correct the data. An FDMS is installed at the Felsham Road, Putney background monitoring station, Wandsworth 9.

Short-term to Long-term Data adjustment

The methodology in LAQM.TG(09), box 3.2 was followed in respect of the nitrogen dioxide diffusion tube located at Werter Road Putney as the data capture for the site was only 67%, i.e. less than 75% and there were only 7 months of consecutive data (June – December 2011). Two urban background monitoring stations were used to calculate an adjustment ratio as given below. The ratio was used to provide an estimate of an annual mean (31) from the period mean for the tube (37).

Long term site	Annual mean 2011 (Am)	Period mean June - Dec 2012 (pm)	Ratio (Am/Pm)
Westminster - Horseferry Road	41.3	34.5	0.835
Wandsworth - Putney (Felsham Road)	46	40	0.869
		Average (Ra)	0.852

The methodology in LAQM.TG(09), box 3.2 was followed in respect of the co-located nitrogen dioxide diffusion tubes located at Este Road Battersea as the data capture for the site was only 67%, i.e. less than 75% and there were only 5 months of consecutive data (June – October 2012). Two urban background monitoring stations were used to calculate an adjustment ratio as given below. The ratio was used to provide an estimate of an annual mean (27) from the period mean for the two co-located tubes (32).

Long term site	Annual mean 2012 (Am)	Period mean June - Oct 2012 (pm)	Ratio (Am/Pm)
Westminster - Horseferry Road	39	32.9	0.844
Wandsworth - Putney (Felsham Road)	40	34.7	0.868
		Average (Ra)	0.856

QA/QC of automatic monitoring

The fortnightly local site operator duties and associated calibrations for the Wandsworth 2 and Wandsworth 9 and previously the Wandsworth 4 site, data ratification, QA/QC and display of results to a publicly accessible website are carried out by the Environmental Research Group (ERG) at King's College London on behalf of the London Borough of Wandsworth.

The fortnightly local site operator duties and associated calibrations for Wandsworth 6, Wandsworth 7 and Wandsworth 8 were/ are conducted by TRL (Transport Research Laboratories). Once again the data ratification and display of results to a publicly accessible website for this site were carried out by the Environmental Research Group (ERG) at King's College London on behalf of the London Borough of Wandsworth. All sites are classified as LAQN standards sites and therefore the data have traceability to national standards and operational procedures defined for the London Air Quality Network (LAQN).

The fortnightly local site operator duties and associated calibrations for the Wandsworth 10 (Battersea) site were carried out by SupportingU on behalf of the London Borough of Wandsworth

from July 2012 to June 2013. From July 2013 to December 2013 the fortnightly local site operator duties and associated calibrations were carried out by Environmental Research Group (ERG) at King's College London on behalf of the London Borough of Wandsworth. The data ratification, QA/QC and display of results to a publicly accessible website are carried out by the Environmental Research Group (ERG) at King's College London on behalf of the London Borough of Wandsworth.

QA/QC of diffusion tube monitoring

In the most recent round of Annual Performance Criteria for NO_2 Diffusion Tubes used in LAQM, the Gradko Environmental laboratory demonstrated good performance in a QA/QC scheme for analysis of NO_2 diffusion tubes. Gradko International also participates in the Workplace Analysis Scheme for Proficiency (WASP), which is an independent analytical performance testing scheme. The scheme is an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). The Health and Safety Laboratory (HSL) operate the WASP scheme independently and the cost of operation is borne by the laboratories, which pay an annual fee to HSL. Their NO2 diffusion tube procedures have been amended to follow the guidelines of the DEFRA Harmonisation document related to the preparation, extraction, analysis and calculation procedures for NO2 passive diffusion tubes. As most of the procedures were already carried the out before the introduction of the Guidelines, the amendments are minimal. Their internal analysis procedures are assessed by U.K.A.S. on an annual basis for compliance to ISO17025.

GRADKO Environmental Laboratory; Nitrogen Dioxide (NO_2) WASP Results.

Gradko's WASP results for January 2008 to January 2010 were as follows:

Jan08 Round 100 Ref Value: 1.36ugNO2; Measured Value : 1.34 ugNO2 Z score -0.1 **Satisfactory.**

Ref Value: 1.47ugNO2; Measured Value : 1.50 ugNO2 Z score 0.2 **Satisfactory.**

Mar 08 Round 101 Ref Value: 0.92ug NO2; Measured Value : 0.95ugNO2 Z Score 0.2 **Satisfactory.**

Ref Value: 1.86ugNO2; Measured Value : 1.85ugNO2 Z Score 0 **Satisfactory.**

July 08 Round 102 Ref Value: 1.37ugNO2 Measured Value : 1.42ugNO2 Z Score 0.3 **Satisfactory.**

Ref value: 2.28ugNO2; Measured Value : 2.21ugNO2 Z score -0.2 **Satisfactory.**

Jan 09 Round 104 Ref Value: 2.02ugNO2; Measured Value : 1.85ugNO2 Z Score -0.7 **Satisfactory.**

Ref Value: 1.22ug NO2; Measured Value : 1.21ugNO2 Z Score - 0.1 **Satisfactory.**

Apr 09 Round 105 Ref Value: 1.68ugNO2; Measured Value : 1.63ugNO2 Z Score -0.4 **Satisfactory.**

Ref Value: 0.96ug NO2; Measured Value : 0.92ugNO2 Z Score - 0.5 **Satisfactory.**

July 09 Round 106 Ref Value: 1.84ugNO2; Measured Value : 1.88ugNO2 Z Score 0.3 **Satisfactory.**

Ref Value: 1.42ug NO2; Measured Value : 1.34ugNO2 Z Score - 0.8 **Satisfactory.**

Oct 09 Round 107 Ref Value : 2.03ugNO2; Measured Value : 1.87ugNO2 Z Score –1.1 **Satisfactory.**

Ref Value : 2.20ug NO2; Measured Value : 1.96ugNO2 Z Score -1.4 **Satisfactory.**

Jan 10 Round 108 Ref Value : 1.92ugNO2; Measured Value : 1.87ugNO2 Z Score - 0.3 **Satisfactory.**

Ref Value : 1.47ug NO2; Measured Value : 1.45ugNO2 Z Score -0.2 **Satisfactory.**

The criteria for Z-scores are: Z score of < +/- 2 Satisfactory Result

Z score of < +/- 2 and <+/- 3 Questionable (Warning) Result

Z score of > +/- 3 Unsatisfactory Result

The above criteria has been set by HSL and AEA, and as from April 2010 the performance scores are be based on Rolling Performance Index (RPI) and not Z-scores.

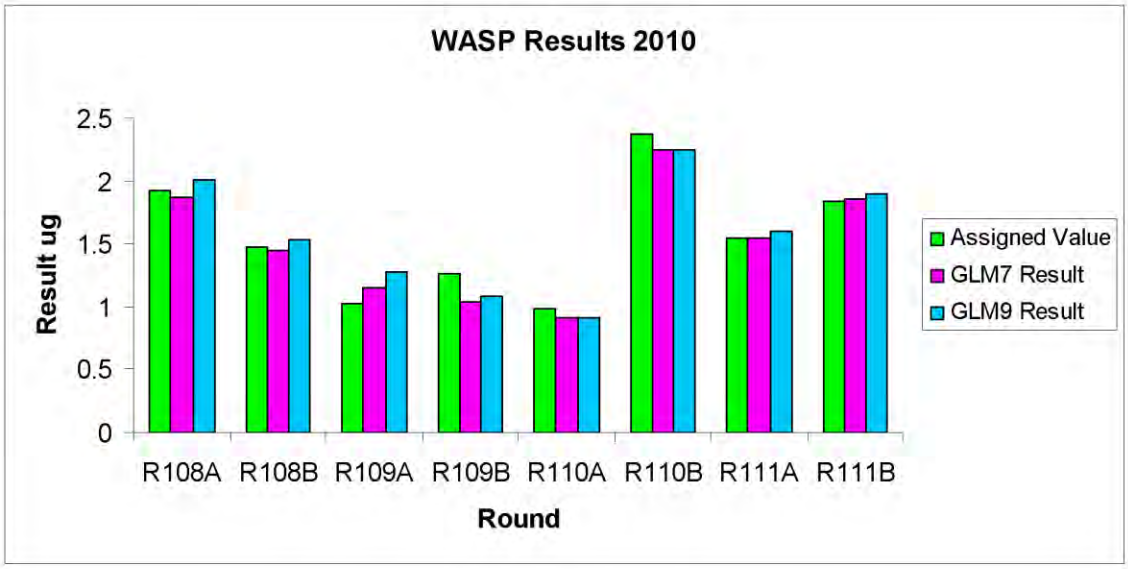
For the precision (bias+) data: AEAT (NETCEN) have advised that Local Authorities requiring bias adjustment factors should refer the Review and Assessment website;

The WASP results for 2010, 2011 and 2012 are given below:

Nitrogen Dioxide WASP Results 2010

Analysis by UV/Vis spectrophotometry (GLM7) and continuous flow analysis (GLM9)

WASP Round No:-	R108A	R108B	R109A	R109B	R110A	R110B	R111A	R111B
Assigned Value	**1.92**	**1.47**	**1.03**	**1.27**	**0.99**	**2.37**	**1.54**	**1.84**
GLM7	1.862	1.443	1.074	1.022	0.891	2.245	1.57	1.851
GLM7	1.872	1.462	1.236	1.065	0.930	2.240	1.532	1.864
Average	**1.867**	**1.453**	**1.155**	**1.044**	**0.911**	**2.243**	**1.551**	**1.858**
Z Score	-0.3	-0.2	0.2	-1.2	-0.9	-0.7	0.1	0.1
GLM9	1.978	1.521	1.299	1.076	0.901	2.264	1 .590	1.896
GLM9	2.028	1.536	1.252	1.075	0.934	2.243	1.599	1.9
Average	**2.003**	**1.529**	**1.276**	**1.076**	**0.918**	**2.254**	**1.599**	**1.898**
Z Score	0.6	0.5	0.6	0.1	-0.8	-0.6	0.5	0.4
Analyst	E. Bancerz B. Le Ber	S. Facey B. Le Ber	S. Facey B. Le Ber	S. Facey B. Le Ber	L. Dafter B. Le Ber	L. Dafter B. Le Ber	A. Ratcliffe A. Le Ber	A. Ratcliffe A. Le Ber

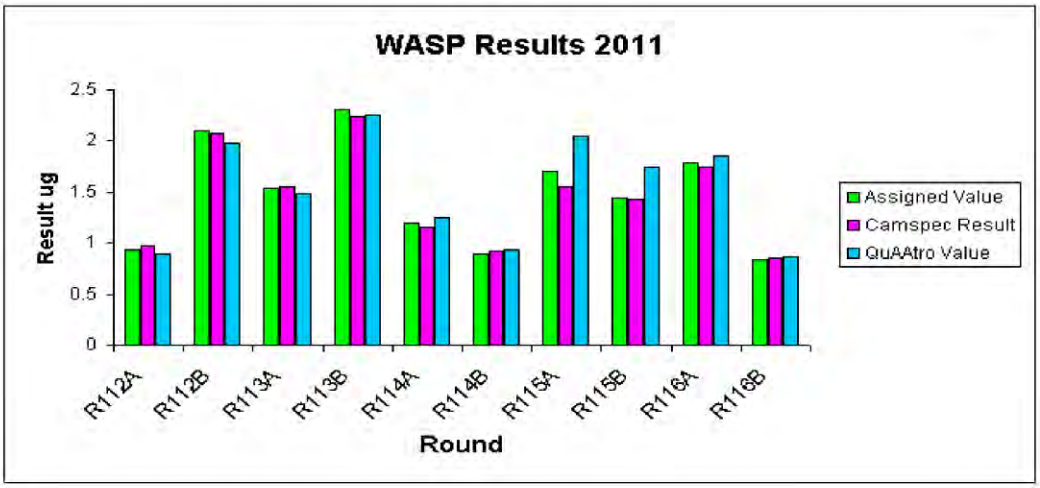


Nitrogen Dioxide WASP Results 2011 - 2012

Camspec M550 & QuAAtro

WASP Round No:-	R112A Feb-11	R112B Feb-11	R113A May-11	R113B May-11	R114A Aug-11	R114B Aug-11	R115A Nov-11	R115B Nov-11	R116A Feb-12	R116B Feb-12
Assigned Value	**0.94**	**2.10**	**1.532**	**2.304**	**1.20**	**0.89**	**1.70**	**1.44**	**1.79**	**0.84**
Camspec Value	0.977	2.100	1.525	2.196	1.113	0.917	1.667	1.415	1.779	0.858
Camspec Value	0.969	2.049	1.586	2.288	1.202	0.918	1.424	1.448	1.708	0.841
Average	**0.973**	**2.075**	**1.556**	**2.242**	**1.158**	**0.918**	**1.546**	**1.432**	**1.744**	**0.850**
Z Score	0.5	-0.2	0.2	-0.3	0.4	-0.5	-0.3,-2.2	-0.2, 0.1	-0.1, -0.6	0.3, 0
QuAAtro Value	0.901	1.926	1.503	2.229	1.247	0.939	1.957	1.812	1.854	0.872
QuAAtro Value	0.890	2.018	1.471	2.277	1.244	0.937	2.141	1.675	1.846	0.868
Average	**0.896**	**1.972**	**1.487**	**2.253**	**1.246**	**0.938**	**2.049**	**1.744**	**1.850**	**0.870**
Z Score	-0.6	-0.8	-0.4	-0.3	0.7	0.5	2.0 , 3.4	3.4, 2.1	0.5, 0.4	0.5, 0.5

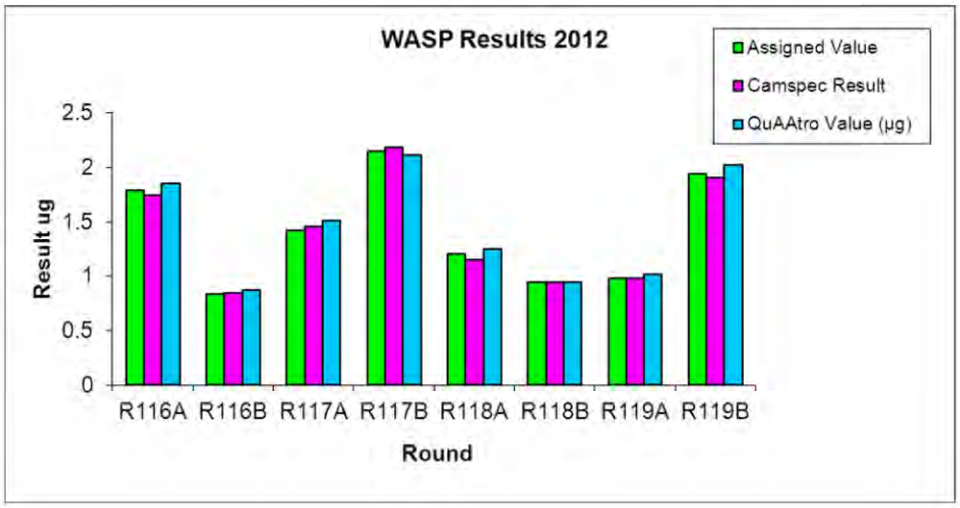
Note: Round 115 QuAAtro results were poor due to contamination of samples during analysis. This was an isolated incident. No other samples were affected.



Nitrogen Dioxide WASP Results 2012

Analysis carried out using UKAS accredited methods GLM 7 (Camspec) and GLM 9 (QuAAtro)

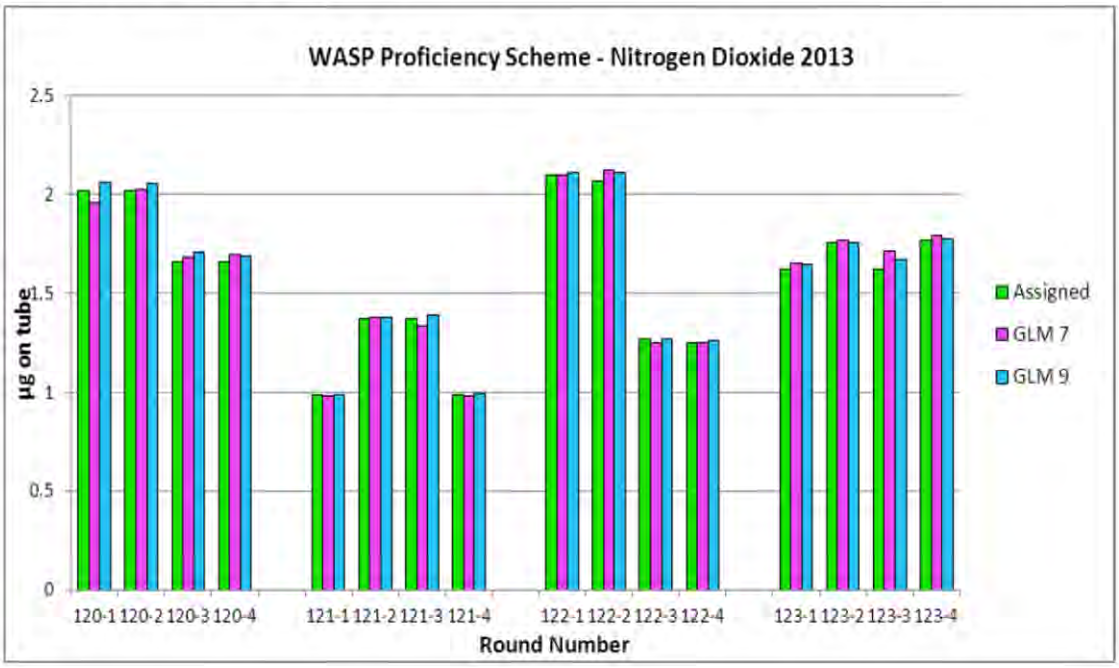
WASP Round No:-	R116A Feb-12	R116B Feb-12	R117A May-12	R117B May-12	R118A Aug-12	R118B Aug-12	R119A Nov-12	R119B Nov-12
Assigned Value (µg)	**1.79**	**0.84**	**1.42**	**2.15**	**1.203**	**0.940**	**0.98**	**1.94**
Camspec Value (µg)	1.779	0.858	1.477	2.180	1.142	0.940	1.012	1.921
Camspec Value (µg)	1.708	0.841	1.443	2.191	1.156	0.946	0.944	1.884
Average (µg)	**1.744**	**0.850**	**1.460**	**2.186**	**1.149**	**0.943**	**0.978**	**1.903**
Z Scores	**-0.1, -0.6**	**0.3, 0.0**	**0.5, 0.2**	**0.2, 0.3**	**-0.8, -0.6**	**0.0, 0.1**	**0.4, -0.5**	**-0.1, -0.4**
% Bias	-0.6, -4.6	2.1, 0.1	4.0, 1.6	1.4, 1.9	-5.1, -3.9	0.0, 0.6	3.3, -3.7	-1.1, -2.9
QuAAtro Value (µg)	1.854	0.872	1.516	2.209	1.250	0.934	1.023	2.030
QuAAtro Value (µg)	1.846	0.868	1.499	2.01	1.257	0.954	1.001	2.012
Average (µg)	**1.850**	**0.870**	**1.508**	**2.110**	**1.254**	**0.944**	**1.012**	**2.021**
Z Scores	**0.5, 0.4**	**0.5, 0.5**	**0.9, 0.7**	**0.4, -0.9**	**0.4, 0.5**	**-0.1, 0.2**	**0.6, 0.3**	**0.6, 0.5**
% Bias	3.6, 3.2	3.8, 3.3	6.8, 5.4	2.7, -6.4	3.9, 4.5	-0.6, 1.5	4.4, 2.1	4.6, 3.7



Nitrogen Dioxide WASP Results

Methods: GLM 7 – Camspec M550 Spectrophotometer, GLM 9 – QuAAtro Continuous Flow analyser

WASP Proficiency Scheme - Nitrogen Dioxide 2013								
Date	Round	Assigned value	Camspec M550 - GLM 7			QuAAtro - GLM 9		
			Measured concentration	z-Score	% Bias	Measured concentration	z-Score	% Bias
Feb-13	120-1	2.02	1.956	-0.4	-3.2%	2.063	0.3	2.1%
Feb-13	120-2	2.02	2.026	0	0.3%	2.059	0.3	1.9%
Feb-13	120-3	1.66	1.681	0.2	1.3%	1.711	0.4	3.1%
Feb-13	120-4	1.66	1.698	0.3	2.3%	1.692	0.3	1.9%
May-13	121-1	0.99	0.984	-0.1	-0.6%	0.988	0	-0.2%
May-13	121-2	1.37	1.379	0.1	0.7%	1.380	0.1	0.7%
May-13	121-3	1.37	1.339	-0.3	-2.3%	1.392	0.2	1.6%
May-13	121-4	0.99	0.980	-0.1	-1.0%	0.995	0.1	0.5%
Aug-13	122-1	2.10	2.098	-0.01	-0.1%	2.113	0.19	0.6%
Aug-13	122-2	2.07	2.125	0.35	2.7%	2.108	0.24	1.8%
Aug-13	122-3	1.27	1.253	-0.19	-1.3%	1.269	-0.02	-0.1%
Aug-13	122-4	1.25	1.249	-0.05	-0.1%	1.263	0.10	1.0%
Nov-13	123-1	1.62	1.656	0.32	2.2%	1.649	0.26	1.8%
Nov-13	123-2	1.76	1.770	0.1	0.6%	1.760	0.02	0.0%
Nov-13	123-3	1.62	1.717	0.78	6.0%	1.672	0.41	3.2%
Nov-13	123-4	1.77	1.796	0.2	1.5%	1.777	0.06	0.4%



Appendix 2

List of Part B Installations and mobile plant

Wandsworth Council list of companies with Installations and Mobile Plant permitted activities							
Reference	**Operator Name**	**Description of Process**	**Address 1**	**Address 2**	**Address 3**	**Postcode**	**Grid Reference**
LAPPC 1	London Concrete Limited	Blending etc Bulk Cement	London Concrete Limited	Stewarts Lane	Battersea	SW8 3HE	529018, 176633
LAPPC 2	Hanson Premix	Blending etc Bulk Cement	Hanson Premix	Pier Terrace	Jews Row	SW18 1TB	525989, 175420
EP/LAPPC 4	CEMEX UK Materials Ltd	Blending etc Bulk Cement	CEMEX UK Materials Ltd	Cringle Street	Battersea	SW8 5BU	529214, 177554
LAPPC 5	Tarmac Ltd	Blending etc Bulk Cement	Tarmac Ltd	Silverthorne Road	Battersea	SW8 3HE	528764, 176515
LAPPC 6	Cappagh Construction (London) Ltd	Concrete Crusher - Permanent	Cappagh Construction (London) Ltd	The Willows	Riverside Road	SW17 0BA	525921, 171882
LAPPC 10	Sloane Demolition	Mobile Concrete Crushers	Sloane Demolition	84 Mendip Court, Chatfield Road	London	SW11 3UZ	526302, 175649
LAPPC 11	Cappagh Public Works Ltd	Mobile Concrete Crushers	Cappagh Public Works Ltd	The Willows	Riverside Road	SW17 0BA	525921, 171882
LAPPC 12	Cappagh Public Works Ltd	Mobile Concrete Crushers	Cappagh Public Works Ltd	The Willows	Riverside Road	SW17 0BA	525921, 171882
LAPPC 13	Cappagh Public Works Ltd	Mobile Concrete Crushers	Cappagh Public Works Ltd	The Willows	Riverside Road	SW17 0BA	525921, 171882
EP/LAPPC 16	Springbok Garage Ltd	Respraying of Road Vehicles	Springbok Garage Ltd	110 Totterdown Street	Tooting	SW17 8TA	527714, 171482
LAPPC 20	D&M Coachworks	Respraying of Road Vehicles	D&M Coachworks	40/42 Lydden Road	Wandsworth	SW18 4LR	525753, 173572

EP/LAPPC 22	Mayday Motors	Waste Oil burner < 0.4MW	Mayday Motors	228 Roehampton Lane	Roehampton	SW15 4LE	522442, 173683
EP/LAPPC 23	Carpenters Garage	Waste Oil burner < 0.4MW	Carpenters Garage	69-71 Bickersteth Road	Tooting	SW17 9SH	527757, 170951
EP/LAPPC 25	Lambeth Crematorium	Crematorium	Lambeth Crematorium	Blackshaw Road	Tooting	SW17 0BY	526376, 171693
EP/LAPPC 26	Putney Vale Cemetery & Crematorium	Crematorium	Putney Vale Cemetery & Crematorium	Stag Lane	Putney	SW18 3SB	522470, 172790
EP/LAPPC 27	Sainsburys Supermarkets Ltd	Vapour Recovery	Sainsburys Petrol Station	39 Nightingale Lane	Balham	SW12 8SY	528434, 174164
EP/LAPPC 31	BP Oil UK Ltd	Vapour Recovery	BP Nightingale Service Station	262-266 Balham High Road	Balham	SW17 7AN	528240, 172782
EP/LAPPC 32	BP Oil UK Ltd	Vapour Recovery	BP Wandsworth Service Station	11 Swandon Way	Wandsworth	SW18 1EW	525946, 175226
EP/LAPPC 33	BP Oil UK Ltd	Vapour Recovery	BP Clapham Common Filling Station	105 Clapham Common North Side		SW4 9SH	528102, 175218
EP/LAPPC 34	BP Oil UK Ltd	Vapour Recovery	BP Tooting Service Station	62 Trinity Road	Tooting	SW17 7RH	527893, 172515
EP/LAPPC 35	Tesco Stores Ltd	Vapour Recovery	Tesco Service station	219 Balham High Road	Balham	SW17 7BQ	528273, 172713
LAPPC 39	Malthurst Retail Limited	Vapour Recovery	Malthurst Putney	134 West Hill	Putney	SW15 2UE	524392, 174315
EP/LAPPC 40	The Co-operative Group Limited	Vapour Recovery	Co-operative Petrol Roehampton Vale	29 Roehampton Vale	Roehampton	SW15 3DX	522073, 172705
EP/LAPPC 41	The Co-operative Group Limited	Vapour Recovery	Co-operative Petrol Garratt Lane	666 Garratt Lane	Tooting	SW18 0NP	526289, 172034
EP/LAPPC 42	Shell UK Limited	Vapour Recovery	Shell Savoy	262 York Road	Wandsworth	SW18 1TP	526359, 175496

EP/LAPPC 43	Sainsburys Supermarkets Ltd	Vapour Recovery	Sainsburys Petrol Station	105 Lower Richmond Road	Putney	SW15 1EU	523687, 175768
EP/LAPPC 44	Shell UK Limited	Vapour Recovery	Shell Battersea	326 Queenstown Road	Battersea	SW8 4LT	528684, 177125
EP/LAPPC 45	Shell UK Limited	Vapour Recovery	Shell Roehampton	237 Roehampton Lane	Roehampton	SW15 4LB	522524, 173734
EP/LAPPC 46	Shell UK Limited	Vapour Recovery	Shell Riversdale	289 Merton Road	Southfields	SW18 5JS	525295, 173500
EP/LAPPC 47	Shell UK Limited	Vapour Recovery	Shell Balham	75 Balham Hill	Balham	SW12 9DP	528821, 174042
EP/LAPPC 48	Murco Petroleum Ltd	Vapour Recovery	Battersea Park Service Station	15-25 Parkgate Road	Battersea Park	SW11 4NP	527265, 177117
EP/LAPPC 49	Nosheen Malik	Dry Cleaning	Battersea Dry Cleaners	62 Battersea Park Road	Battersea	SW11 4JP	528476, 176786
EP/LAPPC 50	Breezyway Dry Cleaners Ltd	Dry Cleaning	Spotless	723 Garratt Lane	London	SW17 0PD	526233, 172210
EP/LAPPC 52	M Khimji	Dry Cleaning	Pret a Porter Dry Cleaners	244 Battersea Park Road	London	SW11 3BP	527488, 176407
EP/LAPPC 54	Mehmet Abdi	Dry Cleaning	Tuxedo Express	44 Tooting High Street	Tooting	SW17 0RG	527459, 171513
EP/LAPPC 55	Masood I Sherwani	Dry Cleaning	Quality Dry Cleaners	559 Garratt Lane	Earlsfield	SW18 4SR	526121, 172856
EP/LAPPC 56	Valtina's Limited	Dry Cleaning	Valtina's Dry Cleaners	260 Upper Richmond Road	Putney	SW15 6TQ	523737, 175140
EP/LAPPC 57	Chandrakant Patel	Dry Cleaning	John Archers Executive Dry Cleaners	316 Trinity Road	London	SW18 3RS	527038, 173870
EP/LAPPC 58	Javed Iqbal Khan	Dry Cleaning	Hazle Dry Cleaners	44 Battersea Park Road	London	SW11 4JP	528532, 176814
EP/LAPPC 59	Paullam Patel	Dry Cleaning	Humberts Dry Cleaners	7 Putney Hill	London	SW15 6BA	523960, 174988

EP/LAPPC 60	Shekofe Znozi	Dry Cleaning	Posh Wash	62 Battersea Rise	London	SW11 1EG	527511, 175149
EP/LAPPC 61	M Neophytou	Dry Cleaning	Bubbles	41 Webbs Road	London	SW11 6RX	527720, 174767
EP/LAPPC 63	Mohammed Nassir Poupal	Dry Cleaning	Professional Dry Cleaning & Laundrette	1 Granville Road	London	SW18 5SB	525162, 173842
EP/LAPPC 64	Bul Uk Ltd	Dry Cleaning	Bellevue	12 Northcote Road	London	SW11 1NX	527439, 175067
EP/LAPPC 65	Rizwan Asghar	Dry Cleaning	Ducane Quality Cleaner	193A Balham High Road	London	SW12 9BE	528,393,173,025
EP/LAPPC 66	Dudley Dry Cleaners Ltd	Dry Cleaning	Dudley Dry Cleaners	195 Merton Road	London	SW18 5EF	525215, 173878
EP/LAPPC 67	Mrs L Holdcroft	Dry Cleaning	Bridge Dry Cleaners	61 Battersea Bridge Road	London	SW11 3AU	527210, 177059
EP/LAPPC 68	Moham Dhamar	Dry Cleaning	Radiant Dry Cleaners	342 Garratt Lane	Wandsworth	SW18 4EL	525973, 173063
EP/LAPPC 69	Woodlake Ltd	Dry Cleaning	Belldetta Dry Cleaners	80 Battersea Rise	London	SW11 1EH	527376, 175134
EP/LAPPC 70	Ibrahim Ahmet	Dry Cleaning	Aquarius	21 Thrale Road	London	SW16 INS	529233, 171152
EP/LAPPC 71	Vio Ltd	Dry Cleaning	The Commons	29 Balham Hill	London	SW12 9DX	528816, 174194
EP/LAPPC 72	Mr M A Shamsi	Dry Cleaning	Zenith Dry Cleaners	203 Replingham Road	London	SW18 5LY	525205, 173433
EP/LAPPC 73	Bemrose Ltd	Dry Cleaning	Bemrose	60 Lower Richmond Road	London	SW15 1JT	523725, 175797
EP/LAPPC 74	Vitesse Dry Cleaners Ltd	Dry Cleaning	Mr Steeds Dry Cleaners	71 Mitcham Lane	Streatham	SW16 6LY	529409, 171204
EP/LAPPC 75	Mr Paresh Patel	Dry Cleaning	D I Hamiltons Dry Cleaners	165-167 Lavender Hill	London	SW11 5QH	527983, 175588
EP/LAPPC 77	Mr Abdul Salik	Dry Cleaning	Smartway Cleaners	100 Tooting High Street	Tooting	SW17 0RR	527342, 171317

EP/LAPPC 78	Mr S A Gulrez	Dry Cleaning	Park View Dry Cleaners	259 Putney Bridge Road	London	SW15 2PU	524387, 175301
EP/LAPPC 79	Smart Set Cleaners Ltd	Dry Cleaning	Smart Set Cleaners Ltd	215 Garratt Lane	Wandsworth	SW18 4DS	525900, 173860
EP/LAPPC 80	Spectrum Clothes Care Ltd	Dry Cleaning	Spectrum	340 Battersea Park Road	London	SW11 3BY	527149, 176211
EP/LAPPC 81	Kamlesh Rathod	Dry Cleaning	Pearl Dry Cleaners	135 Wandsworth High Street	London	SW18 4JB	525466, 174682
EP/LAPPC 82	Mr A Abolghassem Etemadi	Dry Cleaning	Battersea Dry Cleaning & Laundrette	188 Battersea Park Road	London	SW11 4ND	527833, 176562
EP/LAPPC 83	Mr Syed Mohammed	Dry Cleaning	Evershine Dry Cleaners	123 Mitcham Road	Tooting	SW17 9PE	527737, 171197
EP/LAPPC 84	Mr Abdurahim Mohamed	Dry Cleaning	Starlite Dry Cleaners	4 Bank Building Mitcham Lane	London	SW16 6NQ	529280, 171043
EP/LAPPC 85	Jayprina Ltd	Dry Cleaning	Dukes Dry Cleaners	34 Lavender Hill	Battersea	SW11 5RL	528426, 175767
EP/LAPPC 86	Run Clean Ltd	Dry Cleaning	Universal Dry Cleaning	138 Putney High Street	London	SW15 1RR	523979, 175195
EP/LAPPC 87	Mr G Clarke	Dry Cleaning	Jubilee Dry Cleaners	51 East Hill	Wandsworth	SW18 2QE	526238, 174745
EP/LAPPC 88	Mr M S Mahdi	Dry Cleaning	Executive Cleaners	116 Upper Richmond Road	London	SW15 2SP	524319, 174951
EP/LAPPC 90	Syeda Rizui	Dry Cleaning	Professional Dry Cleaners	3 Upper Tooting Road	London	SW17 7TS	528010, 172319
EP/LAPPC 91	Mr Mosadiq Rehman	Dry Cleaning	Viking Dry Cleaners	74 Bedford Hill	London	SW12 9HR	528703, 173092
EP/LAPPC 92	Fatima Baiza	Dry Cleaning	Baiza Quality Dry Cleaners	1A Totterdown Street	Tooting	SW17 8TB	527679, 171618
EP/LAPPC 93	Byblos Services Ltd	Dry Cleaning	Martinizing Exclusive Dry Cleaners	363 Upper Richmond	London	SW15 5QJ	522532, 175408

				Road			
EP/ LAPPC 95	Mr Muhammed Burhan	Dry Cleaning	AZ Prestige Cleaners	207 Lower Richmond Road	London	SW15 1HJ	523286, 175861
EP/LAPPC 96	Mr Biren Patel	Dry Cleaning	Image Dry Cleaners	259 Lavender Hill	Battersea	SW11 1JD	527647, 175501
EP/LAPPC 98	Yusuf Kazi	Dry Cleaning	LA Dry Cleaners	33 Roehampton High Street	London	SW15 4HL	522466, 173875
EP/LAPPC 99	Ahmet Ummak	Dry Cleaning	A Star Dry Cleaners	919 Garratt Lane	London	SW17	526912, 171849
EP/LAPPC 100	Village Klean Limited	Dry Cleaning	VKL	56 - 66 Gwynne Road	London	SW11 3UW	526798, 176324
EP/LAPPC 102	Mr Zafar Iqbal Raja	Dry Cleaning	Smart Set Dry Cleaners	143 Mitcham Road	Tooting	SW17 9PE	527780, 171139
EP/LAPPC 104	DCS Limited	Dry Cleaning	Scobies Valet service	5 Bellevue Parade, Wiseton Road	London	SW17 7EQ	527484, 173297
EP/LAPPC 106	Sloane Demolition	Mobile Concrete Crushers	Sloane Demolition	84 Mendip Court, Chatfield Road	London	SW11 2LW	526302, 175649
EP/LAPPC 107	Suzan Yosma	Dry Cleaning	Kaptan Dry Cleaners	78 Moyser Road	Streatham	SW16 6SQ	528897, 171093
EP/LAPPC 109	Mr Abram Lyle & Mr Dominic Gold	Dry Cleaning	Fantasy Dry Cleaners	17 - 23 Linford Street	London	SW8 4UP	529202, 176735
EP 110	2G Environmental Ltd	Mobile Concrete Crushers	2G Environmental Ltd	2 Exeter House	London	SW15 3SU	523104, 174156
EP111	2G Environmental Ltd	Mobile Concrete Crushers	2G Environmental Ltd	2 Exeter House	London	SW15 3SU	523104, 174156
EP/LAPPC 113	Muizz Shivji	Dry Cleaning	Trinity Cleaners	26 Trinity Road	London	SW17 7RE	527961, 172408

EP/LAPPC 114	Ahmad Farahani	Dry Cleaning	Beaumont Dry Cleaners	133 Beaumont Road	London	SW19 6RY	524096, 173639
EP/LAPPC 115	Donovan Dunne & Co Ltd	Dry Cleaning	Donovan Dunne & Co Ltd	Unit 3 Glenville Mews, Kimber Road	London	SW18 4NR	525497, 173744
EP/LAPPC 116	Tanwir Quayyum	Dry Cleaning	Falcon Laundrette & Dry Cleaners	86 Falcon Road	Battersea	SW11 2LH	527135, 175966
EP/LAPPC 117	Techno Dry Cleaners Ltd	Dry Cleaning	Techno Dry Cleaners	55 Nightingale Lane	Balham	SW12 8ST	528296, 174035
EP/LAPPC 118	Macrose Ltd	Dry Cleaning	Greenfield Dry Cleaners	4 westbury Parade, Balham Hill	London	SW12 9DZ	528797, 174258
EP/LAPPC 119	Jack Barclay Ltd	Respraying of Road Vehicles	Jack Barclay Ltd	65 Burr Road	London	SW18 4SQ	525429, 173549
EP/LAPPC120	S & W Laundry Service Limited	Dry Cleaning	Heritage Dry Cleaners	78 Plough Road	London	SW11 2AR	526729, 175474
EP/LAPPC121	Pure Dry Clean Ltd	Dry Cleaning	Pure Stich Dry Cleaners	282 Battersea Park Road	London	SW11 3BS	527382, 176355
EP/LAPPC122	Fallsbrook Motors Ltd	Waste Oil burner < 0.4MW	Fallsbrook Motors	163 Fallsbrook Road	London	SW16 6DY	529028, 170468
EP/LAPPC123	Mahmoud Reza Afzalalghom	Dry Cleaning	RMS Tailors	7 Granville Road	London	SW18 5SB	525146, 173841

Appendix 3
Continuous monitors locations

Reference	ADDRESS 1	Roadside or Background	Easting	Northing
WA2	Town Hall, High Street, Wandsworth	Background	525779	174662
WA4	South Thames College, High Street, Wandsworth	Roadside	525777	174622
WA6	Joshua Oldfield House, Mitcham Road, Tooting	Roadside	527715	171181
WA7	Air quality Monitoring station adjacent to 94a Putney High Street, Putney	Kerbside	524035	175334
WA8	94a Putney High Street, Putney	Roadside	524032	175335
WA9	Felsham Road, Putney	Background	524044	175495
WA10	Thessaly Road, Battersea	Roadside	529137	177 249

Location map for Wandsworth 2 and Wandsworth 4

Location map for Wandsworth 6

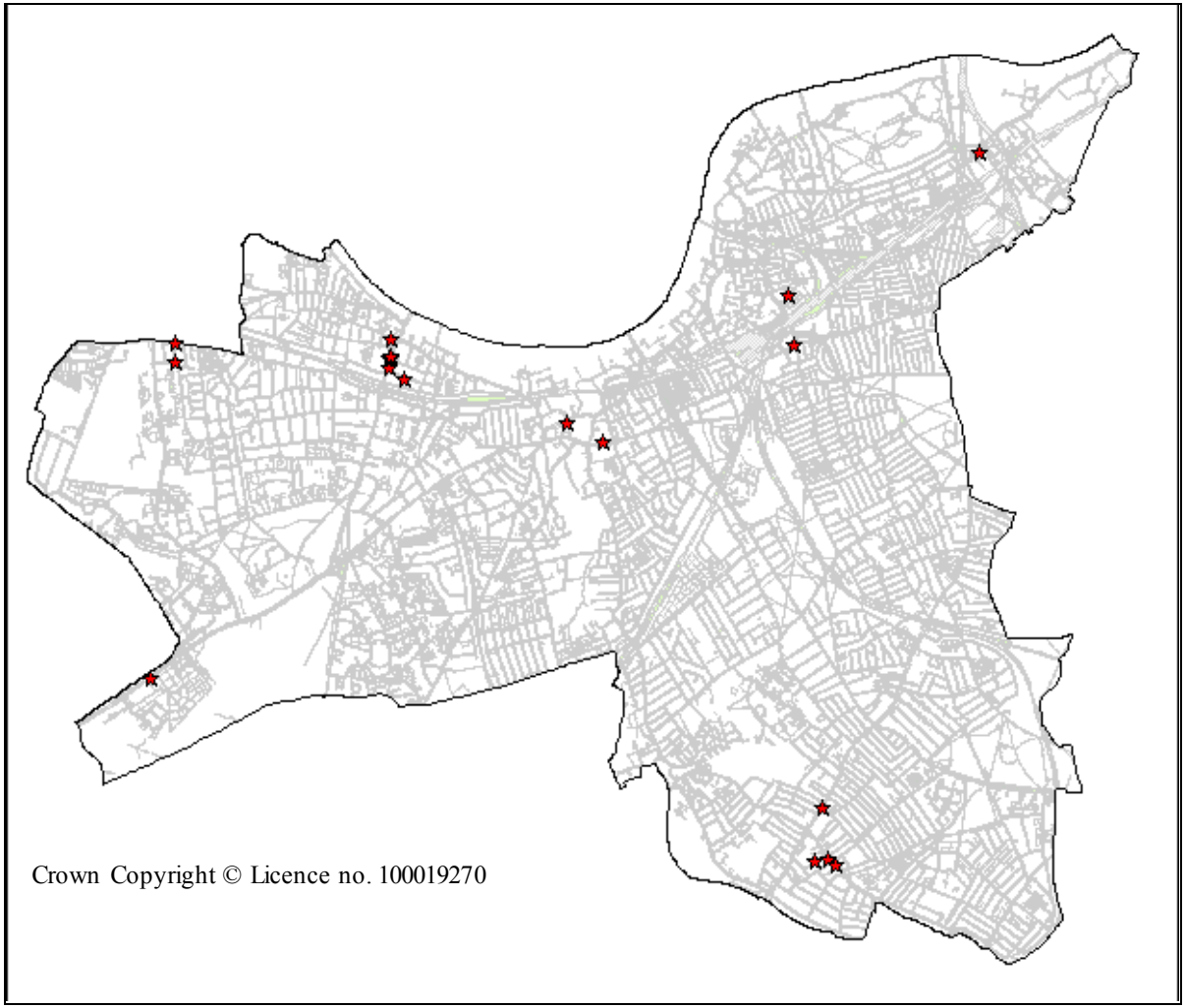
Location map for Wandsworth 7 and Wandsworth 8

Location map for Wandsworth 9

Location map for Wandsworth 10

Appendix 4

Nitrogen dioxide diffusion tube locations




70
90
97
vodafone
124

Appendix 5

Monthly unbiased results – Across borough survey (refer to tables 2.2, 2.9 and 2.10 for further details on which site each reference number refers to in each year; note that the diffusion tube with reference W4 was relocated from 86 Mitcham Road to 108 Mitcham Road as of 2011; and the diffusion tube with reference W7 was relocated to a location further from the kerb as of 2013.)

Ref	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
W 1	72	79	39	67	49	50	33	30	43	44	47	13
W 2	74	72	47	64	43	48	32	31	46	49	49	72
W 3	71	80	62	82	86	61	39	48	30		65	91
W 4	121	147	75	120	107	101	126	86		100	126	111
W 5	72	68	51	67	59	57	46	41	27	55	48	60
W 6	48	42	31	36	27	23	19	21	14	34	30	49
W 7	76		54	79	59		30	65	26	64		70
W 8	50	64	30	52	36	37	25	26		40	40	58
W 9	196	94	88	123	111	89	113	120	56	125	140	123
W 10	65	53	43	51	36	32	30		17	45	43	54
W 11	70	62	36	58	41	54	32	30	45	49	35	
W 12	85	97	70	81			54		71	64	68	84
W 13	78	92	83	83			57		80	66	77	94

Ref	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
W 1	15		51	38	50	58	23	45	48	57	41	47
W 2	67	46	50	45	53	53	24	45	53	61	38	49
W 3	47	59	57	56	67	65	43	61	63	52	51	65
W 4	131	95	47	76	109	87	92	111	121	105	74	94
W 5	63	44	49	54	66	70	45	44	40	48	55	57
W 6	49	32	28	30	28	21	19	23	31	28	35	49
W 7	76	63	50	56	67			61	61	64	57	55
W 8	75	52	36	45	65	35	22	38	42	46	56	50
W 9	165	117	58	118	122	111	126	130	74	111	76	110
W 10	65	37	41	42	37	32	27	36	42	43	40	52
W 11	78	53	52	38	51	53	28	44	49	49	50	56
W 12	75	61	32	97	66	48	71	62	77	44	58	96
W 13	75	70	61	97	42	51	67	63	83	65	79	97

Ref	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11
W 1	55	50	50	51		43	41	37	38	46	49	39
W 2	48	50	54	37		40	23	34	40	23	50	39
W 3	56	53	82	53		43	61	102	87	117	68	58
W 4	86	81	117	100		112	114	49	52	67	97	117
W 5	56	53	68	55		38	45	20	23	33	59	37
W 6	35	29	39	22		22	45	45			36	28
W 7	55	61	73			61	66	30	71	65	59	55
W 8	42			32		31	33	32	33	40	47	39
W 9	113	61		115		111	129	98	141	187	128	99
W 10	43					30	32	25	35	52	47	36
W 11	50	43	55	37		35	46	33	53	48	47	32
W 12	66	56	94	43		63	94	56	65	74	32	81
W 13	73	49	85	61		62	88	62	64	79		

Ref	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
W 3	73	58	66	52	53	50	46	57	40	61	52	62
W 4	105	96	105	86	82	85	81	131	51	97	96	113
W 5	63	68	70		60	51	50	41	49	58	54	58
W 6		44	37	28	25	18	19	18	25	32	34	37
W 7	72	70	64	55	54	55	46	53	46	62	59	74
W 8	55	50	51	39	38		25	31	17	38	36	48
W 9	115	46			129	134	64	132	103	146	159	137
W 10	50	71	49	38	31	26	24	26	31	39	41	48
W 12	94	96	96	45	34	65	65	93		88	50	85
W 13	89	119	89	49	69	65	63	88		84	60	80
W 14				42		24	31	41	28	45		52
W 15		47		44		31	25	30	24	41		
W 16		106	108	115		75	82	74		81	30	49
W 17		114	118	91		71	73	75				97
W 18		67		91	52	58	67	98	32	69	80	95
W 19				66			40	89	36	71	81	92
W 20	50	49	54	35	36	41	33	31	38	46	52	59
W 21	51	55	53	41	37	40	33	32	34	47	50	55
W22	42	44	55	36	36	41	34	33	36	48	50	58

Ref	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
W 3	58	70	80	64	63	64	71	60	69	72	83	69
W 4	84	102	93	93	96	93	101	109	109	102	125	119
W 5	77	74	83	56	42		71	56	64	56	61	50
W 6	41	35	43	27	26	22	12	21		26	39	4
W 7		68	67	58	53	48	54			47	54	57
W 8	45	48	56	41	38	36	36		41	38	52	43
W 9	125	117	195	58	112	107	136	117	125	125	117	129
W 10	41	50	49	31	34	29	19	32	43	38	49	40
W 12	99	41	105	74	44	93	62	73	80	64	91	73
W 13	100	40	109	81	41	84	62	79	80	72	83	78
W 14	55	51	57	37	34	33	36	37	43	41	54	50
W 15	49		54	39	35	36	31	37	47	44	50	52
W 16				97	108	107	120	97	107	97	110	93
W 17	85	112	100	79	90	97	104	88	111	99	111	85
W 18	98	76	78	73	71	76	84	82	69	83	86	87
W 19	86	85	82	68	73	75			81	84	80	80
W 20	53	46	58	46	39	40	42	40	39	49	49	53
W 21	61	49	65	46	36	36	42	39	42	48	50	45
W22	60	52	60	44	38	40	43	42		44	47	54

Monthly unbiased results – Putney High Street survey

		Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
Façade First Floor	Tube 1	115	85	134	111	92	114	114	111	118	117	119	115
	Tube 2	112	103	117	116	96	99	116	107	178	106	109	109
Façade Second Floor	Tube 1	110	87	107	107	82	105	110	89	119	94	93	100
	Tube 2	108	87	97	105	81	82	109	91	116	103	89	94
Façade Third Floor	Tube 1	100	79	87	100	80	87	102	90	101	90	83	85
	Tube 2	85	86	83	110	83	83	84	88	104	95	81	69
Kerbside Monitoring Station	Tube 1	147	126	142	129	117	108	161	154		121	113	138
	Tube 2	155	134	140	136	121	131	163	135	181	130	116	141
	Tube 3	132	138	134	135	117	123	143	142	186	141	121	114
Sign in centre of Pavement	Tube 1	109	103	105	122	113	124	114	120	166	133	108	117
	Tube 2	127	98	122	115	102	115	146	113	107	127	112	118

		Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11
Façade First Floor	Tube 1	93	111	81		93	102	160		134	74	97	84
	Tube 2	111	110	86		74	82	140		140	83	77	76
Façade Second Floor	Tube 1	79	99	84		102	78	105		126	86	93	56
	Tube 2	79	105	80		94	73	83		139	82	85	75
Façade Third Floor	Tube 1	69	91	82			82	93		153	70	71	50
	Tube 2	81	87	95			66	88		160	71	71	62
Kerbside Monitoring Station	Tube 1	142	153	122	120	78	100	287		121	105	108	96
	Tube 2	129	153	100	162	107	104	216		64	112	124	85
	Tube 3	111	155	133	132	104	102	207		114	114	98	101
Sign in centre of Pavement	Tube 1	112	115	151	108	100	65	297		150	87	71	81
	Tube 2	105	137	146	109	112	61	195		131	96	87	72

		Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
Façade First Floor	Tube 1	50	117	103	101	75	90	78	153	64	119	123	157
	Tube 2	144	133	97	89	77	88	81	157	136	109	111	159
Façade Second Floor	Tube 1	103	97	89	84	71	87	74	147	125	117	105	24
	Tube 2	54	118	88	107	78	77	86	121	123	122	107	26
Façade Third Floor	Tube 1	55	91	89	89	71	65	62	96	92	100	90	108
	Tube 2	74	108		64	54	60	62	106	88	97	85	112
Kerbside Monitoring Station	Tube 1	92	158	105	126	113	118	160	92	168	153	158	183
	Tube 2	54	122	97	136	122	64	144	77	174	162	134	186
	Tube 3	74	139	124	140	115	112	150	89	183	160	105	195
Sign in centre of Pavement	Tube 1	62	98	123	110	91	111	127	120	141	133	154	141
	Tube 2	57	136	113	110	88	88	125	139	146	134	117	155

		Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
Façade First Floor	Tube 1	133	117	103	93	123	90	103	117	114	105	108	119
	Tube 2	133	116	101	95	125	99	108	110	119	105	110	103
Façade Second Floor	Tube 1	117	103	94	85	108	85	100	104	102	103	113	100
	Tube 2	117	98	98	85	109	90	99	110	108	99	121	105
Façade Third Floor	Tube 1	100	81	85	76	92	68	72	87	90	78	94	
	Tube 2	95	79	81	71	94	72	31	86	90	71	87	49
Kerbside Monitoring Station	Tube 1	130	144	125	127	145	108	119	151	161	135	156	161
	Tube 2	130	147	129	122	157	108	132	162	155		152	162
	Tube 3	159	136	131	125	153	107	129	148	156	130	157	163
Sign in centre of Pavement	Tube 1	153	114	108	101	130	105	113	132	123	106	141	124
	Tube 2	140	123	111	98	129	101	124	126	124	112	115	126

Appendix 6

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	07/01/2010	12/02/2010	147	155	132	145	11.3	8	28.0
2	12/02/2010	10/03/2010	126	134	138	133	6.0	5	15.0
3	10/03/2010	07/04/2010	142	140	134	139	4.5	3	11.1
4	07/04/2010	05/05/2010	129	136	135	134	3.6	3	9.1
5	05/05/2010	02/06/2010	117	121	117	118	2.5	2	6.3
6	02/06/2010	01/07/2010	108	131	123	121	11.5	10	28.6
7	01/07/2010	03/08/2010	161	163	143	156	11.0	7	27.3
8	03/08/2010	07/09/2010	154	135	142	144	9.5	7	23.5
9	06/09/2010	05/10/2010		181	186	183	3.1	2	28.1
10	05/10/2010	05/11/2010	121	130	141	130	10.2	8	25.3
11	05/11/2010	02/12/2010	113	116	121	117	4.1	4	10.2
12	06/12/2010	05/01/2011	138	141	114	131	14.6	11	36.2
13									

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

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
164.5	96	Good	Good
167	100	Good	Good
182.1	100	Good	Good
157.3	81	Good	Good
131.8	76	Good	Good
165.8	100	Good	Good
197	70	Good	or Data Capture
151.3	98	Good	Good
189	92	Good	Good
164.5	98	Good	Good
153.2	98	Good	Good
159.2	78	Good	Good
Overall survey -->		Good precision	Good Overall DC

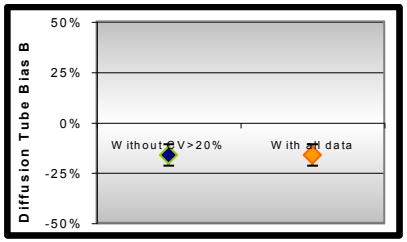
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 11 periods of data	
Bias factor A	1.2 (1.12 - 1.28)
Bias B	-16% (-22% - -11%)
Diffusion Tubes Mean:	136 µgm^{-3}
Mean CV (Precision):	6
Automatic Mean:	162 µgm^{-3}
Data Capture for periods used:	92%
Adjusted Tubes Mean:	163 (152 - 174) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 11 periods of data	
Bias factor A	1.2 (1.12 - 1.28)
Bias B	-16% (-22% - -11%)
Diffusion Tubes Mean:	136 µgm^{-3}
Mean CV (Precision):	6
Automatic Mean:	162 µgm^{-3}
Data Capture for periods used:	92%
Adjusted Tubes Mean:	163 (152 - 174) µgm^{-3}



Jaume Targa, for AEA

Version 04 - February 2011

Adjustment of SINGLE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tube Measurements

Site Name/ID	Periods													Raw Mean	Valid periods
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Site 1 Façade Putney High Street First Floor	115	84.6	134	111	91.7	114	114	111	118	117	119	115		112.0	12
Site 2 Façade Putney High Street First Floor	112	103	117	116	96.1	99.4	116	107	178	106	109	109		114.1	12
Site 3 Façade Putney High Street Second Floor	110	86.6	107	107	82.2	105	110	89.4	119	94.5	92.5	99.5		100.2	12
Site 4 Façade Putney High Street Second Floor	108	87.3	97.2	105	80.6	82.4	109	90.8	116	103	89.4	93.8		97.0	12
Site 5 Façade Putney High Street Third Floor	100	78.8	87.3	100	80.3	87.3	102	90	101	89.5	82.5	84.9		90.3	12
Site 6 Façade Putney High Street Third Floor	84.7	85.6	82.9	110	83.1	82.6	83.9	88.2	104	94.9	81	69.4		87.6	12
Site 7 Kerbside Putney High Street AQMS 1	147	126	142	129	117	108	161	154		121	113	138		132.3	11
Site 8 Kerbside Putney High Street AQMS 2	155	134	140	136	121	131	163	135	181	130	116	141		140.2	12
Site 9 Kerbside Putney High Street AQMS 3	132	138	134	135	117	123	143	142	186	141	121	114		135.5	12
Site 10 Pavement Sign 1	109	103	105	122	113	124	114	120	166	133	108	117		119.6	12
Site 11 Pavement Sign 2	127	97.8	122	115	102	115	146	113	107	127	112	118		117.0	12

Adjusted measurement (95% confidence interval)
with all the data
11 periods used in this calcuations

Bias Factor A 1.2 (1.12 - 1.28)
Bias B -16% (-22% - -11%)
Tube Precision: 6 Automatic DC: 92%

Adjusted with 95% CI	134	(125 - 143)
Adjusted with 95% CI	137	(128 - 146)
Adjusted with 95% CI	120	(112 - 128)
Adjusted with 95% CI	116	(109 - 124)
Adjusted with 95% CI	108	(101 - 116)
Adjusted with 95% CI	105	(98 - 112)
Adjusted with 95% CI	159	(148 - 169)
Adjusted with 95% CI	168	(157 - 179)
Adjusted with 95% CI	163	(152 - 173)
Adjusted with 95% CI	143	(134 - 153)
Adjusted with 95% CI	140	(131 - 150)

The bias adjustment factor used in these calculations include all the data and no screening of data due to poor precision has been applied.

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	05/01/2011	04/02/2011	142.0	129.0	111.0	127	15.6	12	38.7
2	04/02/2011	04/03/2011	153.0	153.0	155.0	154	1.2	1	2.9
3	04/03/2011	12/04/2011	122.0	100.0	133.0	118	16.8	14	41.7
4	12/04/2011	26/04/2011	120.0	162.0	132.0	138	21.6	16	53.7
5	26/04/2011	24/05/2011	78.0	107.0	104.0	96	15.9	17	39.6
6	24/05/2011	27/06/2011	100.0	104.0	102.0	102	2.0	2	5.0
7									
8									
9	01/09/2011	14/10/2011	121.0		114.0	118	4.9	4	44.5
10	14/10/2011	04/11/2011	105.0	112.0	114.0	110	4.7	4	11.7
11	04/11/2011	30/11/2011	108.0	124.0	98.0	110	13.1	12	32.6
12	30/11/2011	05/01/2012	96.0	85.0	101.0	94	8.2	9	20.3
13									

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

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
172.9	100	Good	Good
143.4	100	Good	Good
150	100	Good	Good
158.2	99	Good	Good
138	100	Good	Good
153	100	Good	Good
167	98	Good	Good
127	100	Good	Good
114.2	100	Good	Good
175.5	100	Good	Good
Overall survey -->		Good precision	Good Overall DC

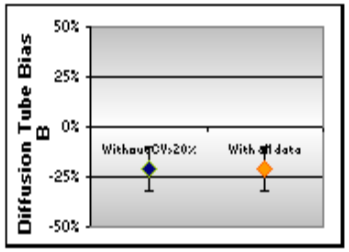
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 10 out of 10 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 10 periods of data
Bias factor A: 1.28 (1.12 - 1.5)
Bias B: -22% (-33% - -11%)
Diffusion Tubes Mean: 117 μgm^{-3}
Mean CV (Precision): 9
Automatic Mean: 150 μgm^{-3}
Data Capture for periods used: 100%
Adjusted Tubes Mean: 149 (131 - 175) μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 10 periods of data
Bias factor A: 1.28 (1.12 - 1.5)
Bias B: -22% (-33% - -11%)
Diffusion Tubes Mean: 117 μgm^{-3}
Mean CV (Precision): 9
Automatic Mean: 150 μgm^{-3}
Data Capture for periods used: 100%
Adjusted Tubes Mean: 149 (131 - 175) μgm^{-3}



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Version 04 - February 2011

Adjustment of SINGLE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tube Measurements

Site Name/ID	Periods													Raw Mean	Valid periods
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Site 1 Façade Putney High Street First Floor	93.0	111.0	81.0		93.0	102.0			134.0	74.0	97.0	84.0		96.6	9
Site 2 Façade Putney High Street First Floor	111.0	110.0	86.0		74.0	82.0			140.0	83.0	77.0	76.0		93.2	9
Site 3 Façade Putney High Street Second Floor	79.0	99.0	84.0		102.0	78.0			126.0	86.0	93.0	56.0		89.2	9
Site 4 Façade Putney High Street Second Floor	79.0	105.0	80.0		94.0	73.0			139.0	82.0	85.0	75.0		90.2	9
Site 5 Façade Putney High Street Third Floor	69.0	91.0	82.0			82.0			153.0	70.0	71.0	50.0		83.5	8
Site 6 Façade Putney High Street Third Floor	81.0	87.0	95.0			66.0			160.0	71.0	71.0	62.0		86.6	8
Site 7 Kerbside Putney High Street AQMS 1	142.0	153.0	122.0	120.0	78.0	100.0			121.0	105.0	108.0	96.0		114.5	10
Site 8 Kerbside Putney High Street AQMS 2	129.0	153.0	100.0	162.0	107.0	104.0				112.0	124.0	85.0		119.6	9
Site 9 Kerbside Putney High Street AQMS 3	111.0	155.0	133.0	132.0	104.0	102.0			114.0	114.0	98.0	101.0		116.4	10
Site 10 Pavement Sign 1	112.0	115.0	151.0	108.0	100.0	65.0			150.0	87.0	71.0	81.0		104.0	10
Site 11 Pavement Sign 2	105.0	137.0	146.0	109.0	112.0	61.0			131.0	96.0	87.0	72.0		105.6	10

Adjusted measurement (95% confidence interval)
with all the data
10 periods used in this calcuations

Bias Factor A 1.28 (1.12 - 1.5)
Bias B -22% (-33% - -11%)
Tube Precision: 9 Automatic DC: 100%

Adjusted with 95% CI	**124 (108 - 145**
Adjusted with 95% CI	**119 (104 - 140**
Adjusted with 95% CI	**114 (100 - 134**
Adjusted with 95% CI	**115 (101 - 135**
Adjusted with 95% CI	**107 (94 - 125**
Adjusted with 95% CI	**111 (97 - 130**
Adjusted with 95% CI	**147 (128 - 172**
Adjusted with 95% CI	**153 (134 - 179**
Adjusted with 95% CI	**149 (130 - 175**
Adjusted with 95% CI	**133 (116 - 156**
Adjusted with 95% CI	**135 (118 - 158**

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	05/01/2012	02/02/2012	92	54	74	73	19.0	26	47.2	169.7	99	Poor Precision	Good
2	02/02/2012	02/03/2012	158	122	139	140	18.0	13	44.7	173.4	100	Good	Good
3	02/03/2012	27/03/2012	105	97	124	109	13.9	13	34.5	145.6	100	Good	Good
4	27/03/2012	25/04/2012	126	136	140	134	7.2	5	17.9	166	100	Good	Good
5	25/04/2012	30/05/2012	113	122	115	117	4.7	4	11.7	129	90	Good	Good
6	30/05/2012	28/06/2012	118	64	112	98	29.6	30	73.5	130	94	Poor Precision	Good
7	28/06/2012	01/08/2012	160	144	150	151	8.1	5	20.1	149	87	Good	Good
8	01/08/2012	29/08/2012	92	77	89	86	7.9	9	19.7	137	94	Good	Good
9	29/08/2012	28/09/2012	168	174	183	175	7.5	4	18.8	187	93	Good	Good
10	28/09/2012	31/10/2012	153	162	160	158	4.7	3	11.7	163	100	Good	Good
11	31/10/2012	28/11/2012	158	134	105	132	26.5	20	65.9	152.1	100	Poor Precision	Good
12	28/11/2012	03/01/2013	183	186	195	188	6.2	3	15.5	161	100	Good	Good
13													
										Overall survey -->		Poor precision	Good Overall DC

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

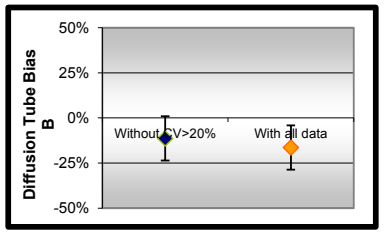
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Wandsworth 7

Precision	9 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 9 periods of data	
Bias factor A	1.12 (0.99 - 1.3)
Bias B	-11% (-23% - 1%)
Diffusion Tubes Mean:	140 µgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	157 µgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	157 (138 - 182) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	1.19 (1.04 - 1.4)
Bias B	-16% (-28% - -4%)
Diffusion Tubes Mean:	130 µgm^{-3}
Mean CV (Precision):	11 caution
Automatic Mean:	155 µgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	155 (135 - 182) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

Adjustment of SINGLE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tube Measurements

Site Name/ID	Periods													Raw Mean	Valid periods
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Site 1 Façade Putney High Street First Floor	50.0	117.0	103.0	101.0	75.0	90.0	78.0	153.0	64.0	119.0	123.0	157.0		102.5	12
Site 2 Façade Putney High Street First Floor	144.0	133.0	97.0	89.0	77.0	88.0	81.0	157.0	136.0	109.0	111.0	159.0		115.1	12
Site 3 Façade Putney High Street Second Floor	103.0	97.0	89.0	84.0	71.0	87.0	74.0	147.0	125.0	117.0	105.0	24.0		93.6	12
Site 4 Façade Putney High Street Second Floor	54.0	118.0	88.0	107.0	78.0	77.0	86.0	121.0	123.0	122.0	107.0	26.0		92.3	12
Site 5 Façade Putney High Street Third Floor	55.0	91.0	89.0	89.0	71.0	65.0	62.0	96.0	92.0	100.0	90.0	108.0		84.0	12
Site 6 Façade Putney High Street Third Floor	74.0	108.0		64.0	54.0	60.0	62.0	106.0	88.0	97.0	85.0	112.0		82.7	11
Site 7 Kerbside Putney High Street AQMS 1	92.0	158.0	105.0	126.0	113.0	118.0	160.0	92.0	168.0	153.0	158.0	183.0		135.5	12
Site 8 Kerbside Putney High Street AQMS 2	54.0	122.0	97.0	136.0	122.0	64.0	144.0	77.0	174.0	162.0	134.0	186.0		122.7	12
Site 9 Kerbside Putney High Street AQMS 3	74.0	139.0	124.0	140.0	115.0	112.0	150.0	89.0	183.0	160.0	105.0	195.0		132.2	12
Site 10 Pavement Sign 1	62.0	98.0	123.0	110.0	91.0	111.0	127.0	120.0	141.0	133.0	154.0	141.0		117.6	12
Site 11 Pavement Sign 2	57.0	136.0	113.0	110.0	88.0	88.0	125.0	139.0	146.0	134.0	117.0	155.0		117.3	12

Adjusted measurement (95% confidence interval)
with all the data
12 periods used in this calcuations

Bias Factor A 1.19 (1.04 - 1.4)
Bias B -16% (-28% - -4%)
Tube Precision: 11 Automatic DC: 96%

Adjusted with 95% CI	**122 (107 - 144)**
Adjusted with 95% CI	**137 (120 - 161)**
Adjusted with 95% CI	**111 (97 - 131)**
Adjusted with 95% CI	**110 (96 - 129)**
Adjusted with 95% CI	**100 (87 - 118)**
Adjusted with 95% CI	**98 (86 - 116)**
Adjusted with 95% CI	**161 (141 - 190)**
Adjusted with 95% CI	**146 (128 - 172)**
Adjusted with 95% CI	**157 (137 - 185)**
Adjusted with 95% CI	**140 (122 - 165)**
Adjusted with 95% CI	**140 (122 - 164)**

The bias adjustment factor used in these calculations include all the data and no screening of data due to poor precision has been applied.

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/01/2013	29/01/2013	129.8	129.6	159.4	140	17.1	12	42.6	137.1	97	Good	Good
2	29/01/2013	27/02/2013	144.3	146.6	136.2	142	5.5	4	13.6	135.2	100	Good	Good
3	27/02/2013	25/03/2013	124.6	128.9	131.0	128	3.3	3	8.1	101	100	Good	Good
4	25/03/2013	24/04/2013	127.0	121.5	124.6	124	2.8	2	6.8	109.3	100	Good	Good
5	24/04/2013	29/05/2013	145.4	156.7	153.3	152	5.8	4	14.4	127	100	Good	Good
6	29/05/2013	26/06/2013	108.3	108.1	106.7	108	0.9	1	2.2	89	100	Good	Good
7	26/06/2013	29/07/2013	118.7	132.1	129.3	127	7.1	6	17.6	100	96	Good	Good
8	29/07/2013	29/08/2013	151.1	162.0	147.7	154	7.5	5	18.6	136	100	Good	Good
9	29/08/2013	26/09/2013	161.4	154.9	156.4	158	3.4	2	8.5	140	100	Good	Good
10	26/09/2013	30/10/2013	134.9		130.3	133	3.3	2	29.2	105	100	Good	Good
11	30/10/2013	28/11/2013	155.8	151.6	157.3	155	3.0	2	7.3	140.9	100	Good	Good
12	28/11/2013	03/01/2014	161.2	162.2	163.5	162	1.2	1	2.9	154.5	100	Good	Good
13													

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

Overall survey --> Good precision | Good Overall DC

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Wandsworth 7

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

Bias calculated using 12 periods of data

Bias factor A: 0.88 (0.84 - 0.92)

Bias B: 14% (8% - 20%)

Diffusion Tubes Mean: 140 μgm^{-3}

Mean CV (**Precision**): 4

Automatic Mean: 123 μgm^{-3}

Data Capture for periods used: 99%

Adjusted Tubes Mean: 123 (118 - 129) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 12 periods of data

Bias factor A: 0.88 (0.84 - 0.92)

Bias B: 14% (8% - 20%)

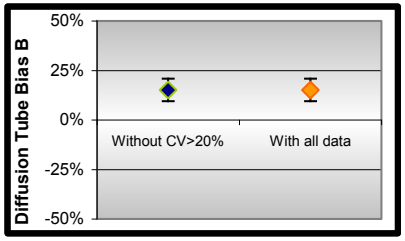
Diffusion Tubes Mean: 140 μgm^{-3}

Mean CV (**Precision**): 4

Automatic Mean: 123 μgm^{-3}

Data Capture for periods used: 99%

Adjusted Tubes Mean: 123 (118 - 129) μgm^{-3}



Jaume Targa, for AEA

Version 04 - February 2011

Adjustment of SINGLE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tube Measurements

Site Name/ID	Periods													Raw Mean	Valid periods	Adjusted measurement (95% confidence interval) with all the data 12 periods used in this calcuations
	1	2	3	4	5	6	7	8	9	10	11	12	13			
Site 1 Façade Putney High Street First Floor	133	117	103	93	123	90	103	117	114	105	108	119		110.5	12	Bias Factor A 0.88 (0.84 - 0.92) Bias B 14% (8% - 20%) Tube Precision: 4 Automatic DC: 99%
Site 2 Façade Putney High Street First Floor	133	116	101	95	125	99	108	110	119	105	110	103		110.4	12	Adjusted with 95% CI 97 (93 - 102)
Site 3 Façade Putney High Street Second Floor	117	103	94	85	108	85	100	104	102	103	113	100		101.2	12	Adjusted with 95% CI 97 (93 - 102)
Site 4 Façade Putney High Street Second Floor	117	98	98	85	109	90	99	110	108	99	121	105		103.1	12	Adjusted with 95% CI 89 (85 - 93)
Site 5 Façade Putney High Street Third Floor	100	81	85	76	92	68	72	87	90	78	94			83.9	11	Adjusted with 95% CI 91 (87 - 95)
Site 6 Façade Putney High Street Third Floor	95	79	81	71	94	72	31	86	90	71	87	49		75.6	12	Adjusted with 95% CI 74 (70 - 77)
Site 7 Kerbside Putney High Street AQMS 1	130	144	125	127	145	108	119	151	161	135	156	161		138.5	12	Adjusted with 95% CI 66 (63 - 70)
Site 8 Kerbside Putney High Street AQMS 2	130	147	129	122	157	108	132	162	155		152	162		141.3	11	Adjusted with 95% CI 122 (116 - 127)
Site 9 Kerbside Putney High Street AQMS 3	159	136	131	125	153	107	129	148	156	130	157	163		141.3	12	Adjusted with 95% CI 124 (119 - 130)
Site 10 Pavement Sign 1	153	114	108	101	130	105	113	132	123	106	141	124		120.8	12	Adjusted with 95% CI 124 (119 - 130)
Site 11 Pavement Sign 2	140	123	111	98	129	101	124	126	124	112	115	126		119.1	12	Adjusted with 95% CI 106 (101 - 111)
																Adjusted with 95% CI 105 (100 - 110)

The bias adjustment factor used in these calculations include all the data and no screening of data due to poor precision has been applied.

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/01/2013	30/01/2013	52.5	61.4	59.7	58	4.7	8	11.7	58.2	99	Good	Good
2	30/01/2013	27/02/2013	46.5	49.3	52.1	49	2.8	6	7.0	39.7	99	Good	Good
3	27/02/2013	25/03/2013	58.1	64.9	59.9	61	3.5	6	8.8	46.3	100	Good	Good
4	25/03/2013	24/04/2013	45.8	46.2	43.8	45	1.3	3	3.2	34.8	100	Good	Good
5	24/04/2013	29/05/2013	38.8	36.4	37.7	38	1.2	3	3.0	34	100	Good	Good
6	29/05/2013	26/06/2013	40.2	36.5	40.4	39	2.2	6	5.5	30	100	Good	Good
7	26/06/2013	29/07/2013	42.1	42.1	43.1	42	0.6	1	1.4	31	98	Good	Good
8	29/07/2013	29/08/2013	39.6	39.1	42.5	40	1.8	5	4.6	33	91	Good	Good
9	29/08/2013	26/09/2013	39.5	42.5		41	2.1	5	19.1	49	21	Good	or Data Capture
10	26/09/2013	30/10/2013	48.6	47.8	43.5	47	2.7	6	6.8	37	98	Good	Good
11	30/10/2013	28/11/2013	49.3	49.8	47.3	49	1.3	3	3.3	46.2	74	Good	or Data Capture
12	28/11/2013	03/01/2014	52.9	44.8	53.7	50	4.9	10	12.2	49.5	100	Good	Good
13													
											Overall survey -->	Good precision	Good Overall DC

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

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Wandsworth 9

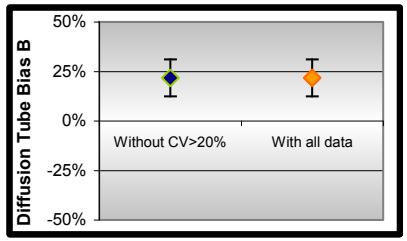
Precision 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 10 periods of data

Bias factor A	0.84 (0.77 - 0.91)
Bias B	20% (10% - 29%)
Diffusion Tubes Mean:	47 μgm^{-3}
Mean CV (**Precision**):	5
Automatic Mean:	39 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	39 (36 - 43) μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 10 periods of data

Bias factor A	0.84 (0.77 - 0.91)
Bias B	20% (10% - 29%)
Diffusion Tubes Mean:	47 μgm^{-3}
Mean CV (**Precision**):	5
Automatic Mean:	39 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	39 (36 - 43) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Adjustment of SINGLE Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tube Measurements															
Site Name/ID	Periods													Raw Mean	Valid periods
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Site 1, AQMS, Felsham Road	53	46	58	46	39	40	42	40	39	49	49	53		46.2	12
Site 2, AQMS, Felsham Road	61	49	65	46	36	36	42	39	42	48	50	45		46.7	12
Site 3, Battersea Park Road	58	70	80	64	63	64	71	60	69	72	83	69		68.5	12
Site 4, Mitcham Road, Tooting	84	102	93	93	96	93	101	109	109	102	125	119		102.2	12
Site 5, Upper Richmond Road	77	74	83	56	42		71	56	64	56	61	50		62.8	11
Site 6, Daylesford Avenue	41	35	43	27	26	22	12	21		26	39	4		27.0	11
Site 7, Roehampton Lane, A3		68	67	58	53	48	54			47	54	57		56.2	9
Site 8, Bickley Street, Tooting	45	48	56	41	38	36	36		41	38	52	43		43.1	11
Site 9, Putney High Street, Putney	125	117	195	58	112	107	136	117	125	125	117	129		121.7	12
Site 10, Werter Road	41	50	49	31	34	29	19	32	43	38	49	40		38.0	12
Site11, AQMS, Felsham Road	60	52	60	44	38	40	43	42		44	47	54		47.6	11
Site 12, Wandsworth Plain	99	41	105	74	44	93	62	73	80	64	91	73		75.0	12
Site 13, Wandsworth Plain	100	40	109	81	41	84	62	79	80	72	83	78		75.7	12
Site 14, Este Road	55	51	57	37	34	33	36	37	43	41	54	50		44.1	12
Site 15, Este Road	49		54	39	35	36	31	37	47	44	50	52		43.1	11
Site 16, Falcon Rd				97	108	107	120	97	107	97	110	93		104.1	9
Site 17, Falcon Rd	85	112	100	79	90	97	104	88	111	99	111	85		96.8	12
Site 18, Totterdown Street	98	76	78	73	71	76	84	82	69	83	86	87		80.2	12
Site 19, Totterdown Street	86	85	82	68	73	75			81	84	80	80		79.4	10

Adjusted measurement (95% confidence interval)
with all the data
10 periods used in this calcuations

Bias Factor A 0.84 (0.77 - 0.91)
Bias B 20% (10% - 29%)
Tube Precision: 5 Automatic DC: 99%

Adjusted with 95% CI	**39 (36 - 42)**
Adjusted with 95% CI	**39 (36 - 43)**
Adjusted with 95% CI	**58 (53 - 62)**
Adjusted with 95% CI	**86 (79 - 93)**
Adjusted with 95% CI	**53 (48 - 57)**
Adjusted with 95% CI	**23 (21 - 25)**
Adjusted with 95% CI	**47 (43 - 51)**
Adjusted with 95% CI	**36 (33 - 39)**
Adjusted with 95% CI	**102 (94 - 111)**
Adjusted with 95% CI	**32 (29 - 35)**
Adjusted with 95% CI	**40 (37 - 43)**
Adjusted with 95% CI	**63 (58 - 68)**
Adjusted with 95% CI	**64 (58 - 69)**
Adjusted with 95% CI	**37 (34 - 40)**
Adjusted with 95% CI	**36 (33 - 39)**
Adjusted with 95% CI	**87 (80 - 95)**
Adjusted with 95% CI	**81 (75 - 88)**
Adjusted with 95% CI	**67 (62 - 73)**
Adjusted with 95% CI	**67 (61 - 72)**

The bias adjustment factor used in these calculations include all the data and no screening of data due to poor precision has been applied.

Appendix 7

AIR QUALITY ACTION PLAN

PROGRESS ON IMPLEMENTING MEASURES
2013

1 MEASURES AIMED AT REDUCING THE USE OF CARS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
1.1 Continue to implement and review the Council Services Transport Plan (CSTP) - promoting alternative modes of transport to the car, for both journeys to work and business related journeys.	Re-launched in summer of 2003 with new staff information booklet and regular newsletter.	*Completed.* To be reviewed annually.	Most recent staff travel survey (autumn 2010) shows driving to work has fallen since the previous survey in 2006 (34% from 40%). Bicycle use was up from 7% to 10%. Pool bike scheme continues. Staff travel intranet pages and travel plan promoted via staff Green Champions network. Discounts for Council staff at bike shops updated. Winter cycling gear giveaway – Staff Bicycle Users Group (BUG) members given reflective gear, puncture repair kits, bells etc. Coincided with end of British Summertime	**SECTION /DEPT RESPONSIBLE** Transport Planning, Environment and Community Services (ECS) **COST/IMPACT** **Low / Medium** **FUNDING** Using existing staff resources
1.2 Encourage and provide support to other major employers in the Borough to develop their own Transport Plans.	Travel Plans are requested for appropriate sites through the development control process. Voluntary travel plans encouraged through dissemination of information etc (e.g.	*Ongoing.* Implementation of Travel Plans Number of employer Travel Plans developed	17 travel plans required at developments through planning conditions or Section 106 agreements in the year Jan-Dec 2013. Regular liaison with St George's Hospital through officer membership of "Transport for George's" working group.	**SECTION /DEPT RESPONSIBLE** Transport Planning, ECS **COST/IMPACT** **Low / Medium** **FUNDING** Using existing staff resources

1 MEASURES AIMED AT REDUCING THE USE OF CARS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
	St George's Hospital).			
1.3 Provide public transport information on the Council website.	Travel planner available on Council website allowing routes to be planned by train and Underground	Travel planner implemented, further improvements ongoing. Number of website visits to the travel planner	Provision of separate travel planner on Wandsworth Council website discontinued in 2007 – licence fee not considered justified in the light of improvements to other generally available travel planners (e.g. TfL Journey Planner). Links to other travel planners given on Council website instead. Number of website visits to page providing travel planner links is monitored by website manager. The number of visits in 2013 was 279. These figures are for public users only and exclude visits by Council staff.	**SECTION /DEPT RESPONSIBLE** Transport Planning, ECS **COST/IMPACT** **Low / Low** **FUNDING** Using existing staff resources
1.4 Use transport and planning policies to promote and encourage walking.	Promotion of walking and provision of better on-street conditions for walking Local Implementation Plan (LIP) to include	Walking scheme bids/implemented via Local Implementation Plan (LIP) submission to TfL Second LIP approved-Mayor	Walking promoted through travel plans, school travel plans and travel awareness campaigns. Specific walking infrastructure improvements delivered at Clapham Junction SW11 (Latchmere, Northcote, Shaftesbury). "Legible London" pedestrian Wayfinding scheme in development for Clapham Junction SW11 (Latchmere, Northcote, Shaftesbury) and Balham SW12 (Balham, Bedford, Nightingale) town centres. [see Action 1.6 for promotion of walking through school travel plans] Approved LIP includes policies and actions to promote and encourage walking and a target to increase the proportion of trips made on foot in the borough. London	**SECTION /DEPT RESPONSIBLE** Transport Planning, ECS **COST/IMPACT** **Low / Medium** **FUNDING** LIP, TFL revenue budget

1 MEASURES AIMED AT REDUCING THE USE OF CARS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
	policies and projects to increase walking.	of London Oct 2011. Revised LIP Delivery Plan and interim targets approved Dec 2013.	Travel Demand Survey data collected by TfL shows walking mode share has increased from 31.2% of all trips starting in the borough in 2006/07-2008/09 to 31.8% in 2010/11-2012/13.	
1.5 On-street parking controls to reduce the number of people driving to stations in this Borough to continue their journey by rail into central London.	Following the result of an assessment of the council's GIS system and highway layers, it has been accurately determined that controlled parking zones (CPZs) are in operation throughout more than 72.4 % of the Borough, where such CPZs could be introduced. Generally the areas outside this network are those furthest away from stations. There is a process of continual evaluation and consultation where	Reviewed annually.	Requests continue to be received from residents who would like parking controls introduced in their area to remedy their reported parking difficulties. New CPZs were introduced on 28 January 2013 in Queensmere Road, Bathgate Road, 1-7 Thursley Gardens, Boddicott Close and Gonston Close (West Hill CPZ) and on 30th September 2013 in Longwood Drive, Westmead (West of Dover House Road) and Coppice Drive (a new sub-zone (R2) to the Roehampton CPZ). A paper including proposals to regulate parking for the businesses along Roehampton High Street, as the High Street is not part of this new zone, is programmed to be reported to the Strategic Planning Overview and Scrutiny Committee (SPTOSC) in January 2014. Residents in a number of roads in the south of the West Hill ward, from Albert Drive to Kingsmere Road, were consulted about the possibility of introducing a CPZ in their roads by letter and questionnaire in March / April 2013. Proposals to introduce a CPZ in this area were not progressed. However, following decision by	**SECTION /DEPT RESPONSIBLE** Engineering Services, ECS **COST/IMPACT** **Low / Low** **FUNDING** Using existing staff resources

1 MEASURES AIMED AT REDUCING THE USE OF CARS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
	there is evidence of support for CPZs.		Committee/Executive residents were consulted again in November/December 2013 on proposals to introduce a CPZ in Albert Drive and Kingsmere Road alone. The outcome will be reported to a future meeting of the SPTOSC.	
1.6 Continue the School Travel Strategy – working with schools to implement packages of measures	All schools invited to develop travel plans. Participating schools carry out surveys to identify travel habits and to inform proposals for improvement	Programme on-going. Number of surveys conducted, development of school policy, facilities provided within schools, incorporation of school travel into the curriculum, number of 'walking buses'	Out of 114 schools in the Borough, 99 (87%) had approved travel plans by the end of 2013. The Council continues to offer support to all schools running sustainable travel initiatives. In June 2013, 18 schools achieved TfL's Bronze accreditation for their travel plan, 2 schools had Silver accreditation and 1 school had Gold.	**SECTION /DEPT RESPONSIBLE** Transport Planning, ECS **COST/IMPACT** **Medium / Low** **FUNDING** Existing staff resources + funding from TFL

1 MEASURES AIMED AT REDUCING THE USE OF CARS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
1.7 Promote the use of public transport. The Council will continue to work with public transport undertakers (as listed below) to facilitate improvements to both the quantity and quality of public transport. This will include working with TfL London Buses, the bus operators, London Underground, London Overground, Network Rail and railway operators, and with sub-regional partnerships such as South London Partnership.	Work with TfL, the bus operators and adjoining boroughs to identify and promote additional or enhanced bus services and implement further bus measures. This will include: • new or extended bus routes • additional or enhanced bus priority • improved facilities at bus stops including timetables, Countdown, etc. • increased service frequencies and hours of operation • improved buses • enforcement of bus lanes using both CCTV and bus cameras	Ongoing.	The Council is continuing to lobby for the relief of overcrowding on local trains and at local stations through engagement with train operators, Network Rail and the Department for Transport (DfT). This includes lobbying for congestion relief at Clapham Junction, increasing capacity on all railway services and the bringing back into use of Waterloo International since its closure to Eurostar services. Consequently, there has been a lengthening of some Southern trains in December to 5 and 10 cars, and by an announcement of a further lengthening of overground trains from Clapham Junction to 5 cars from December 2014 onwards. In addition many platforms have been lengthened this year to take longer trains. The Council has also continued to lobby for an increase in train services stopping at Clapham Junction, and for improvements to London Underground services. Again the latter has been rewarded by confirmation of Government's backing for an extension of the Northern Line to Battersea Power Station. Lobbying continues for improved rail access to Heathrow and Gatwick Airports, with development of the South London-Heathrow Railink project using a route options & feasibility study, which demonstrated that a direct rail route is achievable and could deliver a strong return on investment. A stakeholder group has been formed to assist in developing the case further.	**SECTION /DEPT RESPONSIBLE** Transport Planning, ECS **COST/IMPACT** **Low / High** **FUNDING** Existing staff resources + funding from TFL (Transport for London)

1 MEASURES AIMED AT REDUCING THE USE OF CARS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
1.7 Promote the use of public transport (continued). The Council will continue to work with public transport undertakers (as listed below) to facilitate improvements to both the quantity and quality of public transport. This will include working with TfL London Buses, the bus operators, London Underground, Network Rail and railway operators, and with sub-regional partnerships such as SWELTRAC	Also working with train operators, Network Rail, TfL & London Underground to secure improvements to railway stations and access to stations	Ongoing.	Improvement works are well advanced at Putney Station to provide new lifts, stairs and extended booking hall, and the Council has completed a feasibility study into a proposed secondary entrance from Oxford Road which demonstrated that there is a good business case. The Council has also worked with TfL and the rail industry to develop plans for major improvements to Battersea Park Station. The Council continues to assist bus operators, particularly to make as many bus stops fully accessible as practicable for those with mobility difficulties. The Council has also negotiated funding from local developments to secure improvements to bus services and infrastructure.	**SECTION /DEPT RESPONSIBLE** Transport Planning, ECS **COST/IMPACT** **Low / High** **FUNDING** Existing staff resources + funding from TFL (Transport for London)

1 MEASURES AIMED AT REDUCING THE USE OF CARS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
1.8 Use transport and planning policies to promote and encourage cycling.	Promotion of cycling and provision of better on-street conditions for cycling	Cycling scheme bids/implemented via Local Implementation Plan (LIP) submission to TfL	Cycling promoted through travel plans, school travel plans and travel awareness campaigns. Specific cycling projects funded through the LIP include a programme of public cycle parking provision; cycle training for children and adults; cycle route improvements including missing links on the local cycle network; and bicycle maintenance classes. Significant LIP and Council investment brought the Mayor's Cycle Hire Scheme to the borough in 2013. In December 2013, 52 docking stations comprising 1,434 docking points became operational in the north and east of the borough,	**SECTION /DEPT RESPONSIBLE** Transport Planning, ECS **COST/IMPACT** **Low / Medium** **FUNDING** LIP, TFL revenue budget
	Local Implementation Plan (LIP) to include policies and projects to increase cycling.	Second LIP approved-Mayor of London Oct 2011. Revised LIP Delivery Plan and interim targets approved Dec 2013.	Approved LIP includes policies and actions to promote and encourage cycling and a target to increase the proportion of trips made by bicycle in the borough. London Travel Demand Survey data collected by TfL shows cycling mode share has increased from 2.7% of all trips starting in the borough in 2006/07-2008/09 to 4.2% in 2010/11-2012/13.	

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.1 With other London Borough Councils, implement a London-wide low emission zone (LEZ).	Members were informed of the latest proposals with regards to the LEZ in Paper No. 07-13 (January 2007). The Council supports detailed consultation on the proposals.	Earliest implementation of LEZ February 2008	The scheme began operation on 4th February 2008 for heavy diesel-engined vehicles over 12 tonnes Gross Vehicle Weight. The LEZ emissions standard is Euro III for PM. Heavy diesel-engined vehicles between 3.5 and 12 tonnes Gross Vehicle Weight and buses and coaches were required to meet the Euro III standard by July 2008. Large vans and minibuses must now comply with the Euro III standard (as of 3 January 2012). All lorries over 3.5 tonnes Gross Vehicle Weight and buses and coaches must now meet a Euro IV standard for PM, as of January 2012. These standards will apply to all Council Fleet vehicles within the stipulated categories. In 2011 an awareness raising campaign explaining the forthcoming next phase of the LEZ was undertaken by TfL. Environmental Services helped make borough residents aware of the changes through speaking to individuals when undertaking vehicle emissions testing. See also Action 2.4. Information was also displayed on the air quality pages of the Council website explaining the changes. The Mayor announced on 13 February 2013 that the next phase of the LEZ will only apply to TfL-operated buses in 2015. Operators of diesel lorries and coaches do not need to take any action. Previously it was proposed that all buses, coaches and lorries would need to meet a London-wide standard for emissions of oxides of nitrogen (NOx) in 2015. Applying this standard to TfL buses only will still deliver 75% of the benefits of the original proposal while saving operators £350m in avoided costs which would have been required to clean up their vehicles under the original proposal.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **High / High** **FUNDING** Not applicable

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.2 Continue to pursue Council fleet 'greening' strategy.	Maintain and monitor the register of fleet vehicles including emissions information. Continue acquisition and replacement programme for Council vehicles to maximise use of 'green' fuels.	Ongoing Fleet vehicle register updated and monitored regularly.	The database is updated and monitored regularly. Due to the financial restrictions, investment is also restricted in the acquisition of highly costly technology without significant financial rewards, however new developments in production of lower emitting fossil fuel engines have allowed us to achieve emission benefits within our financial constraints. Actions are taking place to reduce emissions from the vehicle fleet. These include driver training and the trial of in-cab telematics. The records from the telematics equipment provide information about how a vehicle is being driven. The information can immediately be displayed to the driver (to encourage appropriate modification to driving behaviour) and can also be used as a management tool to monitor driving style and identify training needs. Three different systems have been piloted to date with a view to expand their use further across the fleet.	**SECTION /DEPT RESPONSIBLE** Fleet Management, ECS **COST/IMPACT** **Medium / Low** **FUNDING** Using existing staff resources and some funding from Defra for actions to reduce emissions from the vehicle fleet.

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.2 Continue to pursue Council fleet 'greening' strategy. (Continued)	Continue acquisition and replacement programme for Council vehicles to maximise use of 'green' fuels.	% vehicles using green fuels	There are very few alternatively fuelled vehicles used within the Fleet but all vehicles are LEZ compliant. There are 6 battery buggy vehicles used in Battersea Park and 3 battery buggy vehicles used at Bradstow School (2.75 %). The LPG vehicles have been replaced with new diesel vehicles running on a 5% biodiesel blend. In the summer of 2013 the Council were able to commence the lease of two Nissan Leaf electric cars through the Low Carbon London Programme, led by UK Power Networks, bringing new Nissan LEAF electric vehicles to London for 2 years. The cars are now being used within Environmental Services and On-street services of the Council and will also be used to promote the use of electric vehicles, and charging points that are part of the Source London network, such as the ones within Wandsworth. The lease of these vehicles was funded via a Defra Air Quality Grant.	
	Continue driver education and training to discourage drivers from revving/idling engines.	% drivers trained	100% of drivers have had 2 hours of initial vehicle training regarding Eco methods of driving including discouraging unnecessary mileage. Education of drivers on environmental issues and monitoring of the results is ongoing. Excessive fuel usage is a good indicator for effectiveness of training.	

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.2 Continue to pursue Council fleet 'greening' strategy. (Continued)	Continue driver education and training to discourage drivers from revving/idling engines.	% drivers trained	During 2013, 90 drivers were assessed and 10 drivers needed additional tuition over and above the basic instruction given to all drivers being tested. The introduction of the Certificate of Professional Competence (CPC) will improve driver awareness. All drivers of vehicles over 3.5 tonnes, (buses and trucks) will undertake the CPC programme. Wandsworth have 80 such drivers who will take advantage of the programme. All drivers will receive instruction regarding fuel economy, environmental objectives and vehicle care. All passenger transport drivers have completed their CPC qualification, HGV drivers are finalising their training which is to be completed by September 2014. This training will be an ongoing programme 38 Euro 4-5 vans were purchased for Building Works in 2010, adding to the fleet purchase of 10 HGVs (Euro 4) in 2008-9. Considerable fuel savings have been noted by the use of the new vans.	**SECTION /DEPT RESPONSIBLE** Fleet Management, ECS **COST/IMPACT** **Medium / Low** **FUNDING** Using existing staff resources
	All waste and recycling contract vehicles to comply with minimum of Euro 3 standard.	Completed	All contract vehicles comply with the Euro 3 standard. The minimum requirement for new vehicle lease contracts is LPG or a minimum of EURO IV, with some at EURO V.	

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.3 Lobby Government to bring about improvements in fuel composition, e.g. further reduction of sulphur level in fuel to 10mg/l from 50mg/l.	To support proposals in Mayor's Strategy encouraging the Government to provide incentives for cleaner fuels and follow up with representation to Government from Wandsworth Council.	Completed.	On 1st September 2004, the Government introduced a new rate of duty for sulphur-free petrol and diesel, set at 0.5 pence per litre relative to the rate for ultra-low sulphur fuels. This will encourage the early introduction and take up of these fuels.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / High** **FUNDING** Using existing staff resources

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.4 Continue to support the Vehicle Emission Testing Group.	Continue to participate in the London-wide programme of vehicle emission testing in 2003/4. Consider further action when evaluation of the 2003/4 programme completed.	Completed.	The London-wide emissions testing programme has been completed and the testing programme evaluated. Individual formal testing by the Council would be prohibitively expensive but funding to carry out voluntary testing continues through Local Implementation Plan funding. In March 2013 free emissions checks were carried out on 70 vehicles owned by members of the public, who attended two testing sessions in the car park of Asda in Clapham Junction (Shaftesbury). The owners of the small number of vehicles with emissions failing the test were advised to have their cars serviced by a reputable mechanic and to have the underlying problems cleared up before they developed into a more serious fault. These free testing sessions are carried out on a regular basis to help raise awareness of air pollution and the steps drivers can take to reduce their emissions. Council officers spoke to hundreds of motorists and handed out the Council's "Smarter Driving Tips" leaflet which contains practical information on how to cut local air pollution while saving money on fuel. Measures include removing unnecessary weight, switching off air conditioning and pumping tyres to the correct pressure. Free tyre pressure gauges were also handed out so motorists can ensure they keep tyres at the correct level.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **High / High** **FUNDING** Existing staff resources + funding from TFL (Transport for London)

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.5 Investigate the use of water-diesel emulsion instead of conventional diesel for the Council's vehicles Investigate the use of cleaner fuel options for the Council's vehicle fleet.	Awaiting sample requested from manufacturer for trial in Council vehicles. Investigate the potential of biodiesel and compressed natural gas (CNG) fuels.	Ongoing – initially dependent on supply of sample by manufacturer; number of vehicles successfully using water-diesel emulsion	The water-diesel emulsion option is no longer being progressed by Fleet Management, ECS, as cost/benefit analysis indicates it is not a viable option. One minibus currently operates on CNG. 5% bio-diesel is being used across the fleet. There are no plans to use CNG further at present. Actions are taking place to reduce emissions from the vehicle fleet. These include driver training and the trial of in-cab telematics.	**SECTION /DEPT RESPONSIBLE** Fleet Management, ECS **COST/IMPACT** **Low / Medium** **FUNDING** Using existing staff resources
2.7 Promote and encourage the development of a 'green fuelling' infrastructure within the Borough. (existing)	Review the potential for the installation of cleaner fuel refuelling sites, including natural gas, and the provision of electric vehicle charging points throughout the Borough.	Number of cleaner fuel refuelling sites (EVC) Ongoing.	The Council is committed to providing an electric vehicle recharging infrastructure within the Borough and has obtained grant funding to install electric vehicle charging points. Two electric vehicle charging points have been installed off-street (and are available for public use), in the Wandle Leisure Centre Car park (Southfields) and the Putney Leisure Centre Car Park (West Putney).	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / Medium**

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.7 Promote and encourage the development of a 'green fuelling' infrastructure within the Borough. (existing) (Cont)			In 2010 suitable locations for 4 on-street electric vehicle charging points were identified. Works to install the points were undertaken in 2010 and 2011 and they began operation in 2012. The 4 locations are in town centres within areas of low parking pressure within controlled parking zones in St Johns Avenue (East Putney), Coverton Road (Tooting), Grant Road (Latchmere) and Spencer Park (Wandsworth Common). In February 2012 Wandsworth became a member of "Source London" charging network run by Transport for London, https://www.sourcelondon.net/ This will enable all electric vehicle owners across London to have access to the electric vehicle charging points operated by the Council and our residents to have access to all those within London that are part of the scheme via a secure card. The annual membership cost for the scheme is £10 for each vehicle (with no charge for electricity used). Users can then use any Source London charging points across the city (parking charges may apply).	**FUNDING** Existing staff resources + funding from TFL (Transport for London), SWELTRAC & Defra
	Publicise cleaner fuel refuelling sites within the Borough	March 2004 on Council website	Information regarding electric charging points is available via the Council's website at: http://www.wandsworth.gov.uk/driveelectric	

2. MEASURES AIMED AT REDUCING EMISSIONS FROM VEHICLES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
2.7 Promote and encourage the development of a 'green fuelling' infrastructure within the Borough. (continued)	Review the potential for the installation of cleaner fuel refuelling sites, including natural gas, and the provision of electric vehicle charging points throughout the Borough. Publicise cleaner fuel refuelling sites within the Borough.	Number of cleaner fuel refuelling sites (LPG) March 2004 on Council website	There are 2 liquefied petroleum gas (LPG) refuelling sites within the Borough. The locations of these are provided on the Council website. Electric charging points are proposed to be made available on a number of new sustainable developments within the borough. The provision of electric vehicle charging points will be an important part of the low emission strategies proposed for new major developments. See actions 3.2 and 3.3 Information on cleaner fuels and cleaner fuels refuelling sites within the borough is included on the Council website (http://www.wandsworth.gov.uk/info/200334/air_quality/1586/vehicle_fumes/2), together with specific information on electric vehicles and charging points (www.wandsworth.gov.uk/driveelectric). General information explaining that, on average, diesel vehicles emit more local air pollutants, NO_2 and PM_{10}, than petrol vehicles is also included on the website.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / Medium** **FUNDING** Existing staff resources + funding from TFL (Transport for London), SWELTRAC & Defra

3. DEVELOPMENT CONTROL				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
3.1 The Local Plan (formerly Local Development Framework (LDF) includes policies to promote a sustainable relationship between development and transport and includes maximum parking levels. Policies will be implemented largely through the consideration of planning applications.	The Council will support development proposals that contribute to a safe, accessible and integrated transport system, improve facilities that encourage greater use of public transport, cycling and walking, and enable bulk freight to be moved by water or rail rather than by road.	Core Strategy Adopted 2010 Development Management Policies Document (DMPD) Adopted 2012 Site Specific Allocations Document (SSAD) Adopted 2012	All adopted Local Plan documents are currently being reviewed - consultation took place in May/June 2013, with submission expected March 2014. Car parking at a number of residential and mixed-use developments has been permitted below the maximum standards in an attempt to reduce the use of the private car by residents. This is often permitted in association with exclusion of the development from the adjacent controlled parking zone and provision of car club parking to help residents forego car ownership.	**SECTION /DEPT RESPONSIBLE** Planning, ECS **COST/IMPACT** **Low / Medium** **FUNDING** Using existing staff resources

3. DEVELOPMENT CONTROL				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
3.2 In dealing with planning applications, the Council will take into account a proposed development's likely effect on air quality, both in terms of any air pollution it may cause directly and in terms of traffic generation.	Implementation arises in response to the submission of planning applications. The Council will require the submission of an environmental impact assessment for developments which may give rise to air pollution. Where a development is likely to generate a significant level of traffic, a Transport Assessment is required. Mitigation measures may be required as planning conditions or as obligations within a Section 106 planning agreement.	Ongoing	Being implemented as stated. Air Quality assessments are required to be undertaken as part of Environmental Impact Assessments and for other sites where there is a concern regarding the effect of the development on air quality or exposure of individuals to poor air quality. Mitigation measures may be required as planning conditions or as obligations within a Section 106 planning agreement. During 2013 a number of major planning applications, particularly in the Nine Elms opportunity area, were assessed for their impact on air quality and the potential for introducing exposure in areas of poor air quality. Planning permission has been given for a number of large scale developments in the Nine Elms area including: Battersea Power Station and Tideway Industrial Estate, South London Mail Centre, Market Towers, Marco Polo House, New Covent Garden Market site [3000 residential units plus new market site, offices etc.]; Sleaford street Industrial Estate, SW8 [294 residential units plus commercial space]; Battersea Gas Holders site [large scale demolition and infill of four gasometers]; Northern Line Extension [very large station excavation and build and tunnelling work]; Embassy Gardens and for the American Embassy.	**SECTION /DEPT RESPONSIBLE** Planning, ECS **COST/IMPACT** **Low / Low** **FUNDING** Using existing staff resources

3. DEVELOPMENT CONTROL				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
3.2 In dealing with planning applications, the Council will take into account a proposed development's likely effect on air quality, both in terms of any air pollution it may cause directly and in terms of traffic generation. (continued)	Implementation arises in response to the submission of planning applications. The Council will require the submission of an environmental impact assessment for developments which may give rise to air pollution. Where a development is likely to generate a significant level of traffic, a Transport Assessment is required. Mitigation measures may be required as planning conditions or as obligations within a Section 106 planning agreement.	Ongoing	In addition large scale developments have been given permission in other parts of the borough, including: Two office sites at 84-88 & 131 Upper Richmond Road, SW15 [approx 400 residential units]; Roehampton Town Centre, SW15 [Shops, amenities, utilities, etc], Ransomes Wharf, SW8 [approx 130 residential units, shops, entertainment, etc]; Ram Brewery & Cockpen House, SW18; enterprise way industrial estate, SW18; 'Battersea Park Village', Queenstown Road, SW8 [325 residential units plus commercial space]; Ark Academy site, SW15 [155 residential units plus new school buildings]; John Paul II School site, SW19 [122 residential units plus commercial space]; Thames tideway Tunnel [7 storm sewer interception sites plus main drive site for the whole tunnel project]	**SECTION /DEPT RESPONSIBLE** Planning, ECS **COST/IMPACT** **Low / Low** **FUNDING** Using existing staff resources

3. DEVELOPMENT CONTROL				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
3.3 UDP supplementary planning guidance on air quality.	Consider the need to produce supplementary planning guidance.	Original target date June 2004, revised target date April 2014	Officers contributed to the London Councils' guidance on Air Quality and Planning through membership and participation in the London working group on Air Pollution, Planning and the Environment (APPLE). This guidance is issued to developers of large sites as guidance to follow within the Borough. This guidance provides sufficient advice on air quality and planning for developers to follow. The need for supplementary planning guidance has been reviewed further as a result of the Local Development Framework and Low Emission Strategy Work via the Low Emission Strategy Development Programme. However, a specific supplementary planning document will not now be produced as in 2013 the Mayor of London consulted on his draft supplementary planning guidance (SPG) on Sustainable Design and Construction. This document provides further guidance on what constitutes an air quality neutral development. It is proposed to adopt the provisions of this document so that a consistent approach with other London Boroughs is adopted.	**SECTION /DEPT RESPONSIBLE** Planning, ECS **COST/IMPACT** **Medium / Low** **FUNDING** Using existing staff resources + funding from Defra for LES development programme work

4. ENFORCEMENT OF REGULATORY POWERS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
4.1 Continue to enforce the Pollution Prevention and Control Act, and regulations made under it, in relation to Part B and part A(2) processes.	Inspect all prescribed processes in accordance with Defra's guidance to ensure compliance with the conditions of the permit, and act upon complaints and suspected or actual breaches of conditions in a timely manner. Monitor the Borough to ensure that all prescribed processes are permitted and take action where such processes are not permitted.	Ongoing Compliance with legal requirements	Implementation as stated. Certain industrial activities are regulated by the Council through Environmental Permits. During 2013, all required inspections were carried out to ensure that the installations were complying with their permits. In 2013, some permits were subject to variations to take account of changes to the activities, statutory guidance documents, and/or upgrading requirements. Permits are reviewed periodically in line with statutory guidance and varied as necessary. The activities that are currently regulated are concrete batchers, mobile concrete crushers, crematoria, dry cleaners, vehicle re-sprayers, petrol stations and waste oil burners.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / Low** **FUNDING** Using existing staff resources
4.2 Continue the thorough investigation and resolution of nuisance complaints with an air pollution component, such as bonfires and from demolition and building works dust	Investigate and resolve complaints, where necessary, by the enforcement of Section 80 of the Environment Protection Act 1990. Give advice and distribute leaflets on request.	Ongoing Compliance with response targets	Being implemented as stated. Response target requires same day response for complaints of bonfires, dust and fumes - achieved in 99% of cases in 2013.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / Low** **FUNDING** Using existing staff resources

4. ENFORCEMENT OF REGULATORY POWERS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
4.3 Develop a proactive response to demolition and construction work.	Develop an Environmental Construction Code of Practice that will contain advice to developers on how dust, particle emissions and other environmental impacts can be kept to a minimum.	March 2005 Code produced and ongoing review	A Code of Practice for the Control of Pollution and Noise from Demolition and Construction Sites is produced and distributed to developers within the Borough, the Housing Department and Business Development team. The document was updated in May in 2008 and copies are regularly distributed to developers and contractors within the Borough and its provisions are explained. This Code of Practice is also available on the Council's website. In addition, the Best Practice Guidance 'The Control of Dust and Emissions from Construction and Demolition', produced in partnership with the Greater London Authority and London Councils, is aimed at major construction sites such as the large developments taking place in the Nine Elms Opportunity Area. Developers are advised to follow this guidance, with the level of action required dependent on the result of specific risk assessment. For the highest risk-assessed sites, monitoring of fine particles (PM_{10}) is required.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / High** **FUNDING** Using existing staff resources
	Work with other departments towards developing a Considerate Contractor Scheme to encourage best practice.	March 2005 Scheme adopted	Replaced by the national Considerate Constructors Scheme, an independent organisation founded by the industry, with a Code of Considerate Practice which commits contractors in the Scheme to be considerate and good neighbours, as well as clean, respectful, safe, environmentally conscious, responsible and accountable.	

4. ENFORCEMENT OF REGULATORY POWERS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
4.5 Promote a greater awareness that the whole Borough is covered by Smoke Control Orders, and that the use of some solid fuels is prohibited to prevent emission of dark smoke.	Produce advice leaflet on smoke control for new and existing residents. Enhance the information on the Council's website.	June 2004 Advice leaflet produced. March 2004 Website updated	Completed Advice leaflet produced. Information on smoke control is on the Council's website, including an electronic version of the advice leaflet available for downloading from the website. A link to the UK Smoke Control areas website is available on the Council's website. This contains updated lists of exempt appliances and smokeless fuels. In 2011 work was undertaken to identify the existing smoke control orders (21 were identified in total) so that they could be replaced with a single order covering the whole of the Borough which takes into account boundary changes and consolidates the somewhat patchwork approach of the existing orders into one single order that is more transparent and simple to enforce. The draft order and publication notice was approved by the Executive in January 2012 and was subsequently been approved by Defra. The new smoke control order covering the whole Borough came into operation on 1st November 2012. This was publicised via press releases and the council website.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / Medium** **FUNDING** Using existing staff resources

4. ENFORCEMENT OF REGULATORY POWERS				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
4.6 Consider how best to utilise the powers under the Road Transport (Vehicle Emissions) (Fixed Penalty) (England) Regulations 2002 to require drivers to switch off their engines when parked.	Investigate the most appropriate way to implement the regulations to control idling engines. Work with transport operators and companies to educate their drivers and ensure they are aware of the enforcement powers.	March 2004 Ongoing	Complaints of idling engines are investigated and action taken to resolve the problem. A warning notice has been produced to hand to people who are unnecessarily leaving their engines idling to warn them of the existence of the regulations. If vehicles are found idling unnecessarily, fixed penalty notices for non-compliance may be served. A fixed penalty notice will only be served if a driver refuses to turn off their engine when asked to do so. An initiative to raise awareness of the air quality impacts of engine idling aimed specifically at primary schools in the Borough was undertaken in 2009. All primary schools (except those on red routes) now have signage asking drivers to turn off their engines when dropping off or collecting children from school. This was followed up by a lesson plan aimed at key stage 2 pupils (in particular eight and nine year olds) that was very well received by teachers and pupils alike. A smarter driving tips leaflet was also produced for wider dissemination, providing advice on simple steps that can be taken to reduce emissions. This initiative was cited as an excellent example of a Borough campaign encouraging the general public to take action to improve air quality in the Mayor of London's Air Quality Strategy. See also Action 7.3	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **High / Low** **TARGETED PROJECT COST/IMPACT** **Medium/Medium** **FUNDING** External funding, Defra

5. ENERGY USE AND HEATING				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
5.1 In 2009 the Council agreed two new targets: a 10% Carbon reduction by 2015 and 20% by 2025 compared to a new base year of 2008/09. **Original target**: The Council will reduce carbon dioxide emissions from Council premises by **10%** below the 1990 level. **Revised 2006 to 18% below the 1990 level, and then revised 2008 to 25% below the 1990 level.** The Council is committed to increase the proportion of energy generated from renewables to 10% The Governments CRC Energy Efficiency Scheme requires the Council to purchase allowances for each tonne of Carbon emitted.	A Carbon Management Plan and governance was developed out of the Council's participation of the Carbon Trust's Local Authority Carbon Management Programme. Governance is provided through the workings of the Carbon Reduction Team and Board. Compliant with the requirements of the CRC, the Council's submitted annual report and footprint report for 2011/12 represents emissions of 25,683 tonnes of CO2. The Councils adopted spatial planning policy supports measures to improve energy conservation & efficiency & contribution to renewable energy generation.	Targets to reduce Carbon emissions by 10% by 2015 and by 20% by 2025 from a 2008/09 baseline. Commitment to increase the proportion of energy generated from renewables to 10% First purchase of allowances was in 2012 for the 2011/12 period equated to a cost of £308,196.	Carbon emissions: A reduction of 2.94% towards the target of 10% by the end of 2014/15. A number of projects identified in the Carbon Management Plan have been implemented with further ongoing or identified as pipeline projects. Salix funded projects valued in excess of £32,560 were committed during 2012/13 to fully utilise available funds. The regeneration of the fund will achieve £72,000 by March 2014 for new projects. The potential use of renewable energy sources by the Council has been reported and the promotion of awareness of renewables to residents is ongoing. The application of renewables is being considered on an individual project/building basis. Photovoltaic Panels were installed on Reed House and the Town Hall and received £39,440 in Feed-in-tariffs during 2012/2013. Green Champion scheme continues to operate. Carbon emissions: A reduction of 8.22% towards the target of 10% by the end of 2014/15. A number of projects identified in the Carbon Management Plan have been implemented with further ongoing or identified as pipeline projects. Salix funded projects valued in excess of £30,000 were committed during 2012/13 to fully utilise available funds. The regeneration of the fund will achieve £55,000 by March 2014 for new projects. The potential use of renewable energy sources by the Council has been reported and the promotion of	**SECTION /DEPT RESPONSIBLE** Energy Management, ECS **COST/IMPACT** **Low / Low** **FUNDING** Using existing staff resources

5. ENERGY USE AND HEATING				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
5.2 The Council will encourage energy efficiency measures and insulation in domestic dwellings to reduce energy use, including use of standard assessment procedures (SAP), the Government's recommended method for home energy rating.	Assistance for low income householders for energy efficient measures including advice and referral system for renewable energy sources Funding available from under various schemes RE:NEW project from the Mayor of London where energy efficient measures are retro-fitted into domestic premises. Warmer Homes Healthy People Fund from Department of Health available for energy efficient measures in residential properties, and energy advice visits.	2011 Home Energy Conservation Act target to improve energy efficiency of residential housing stock by 30% over 15 year period from 1996. Annual report to Government. Comparison of SAP from House Condition Surveys.	Replacement of heating and domestic hot water boilers and controls to reduce energy usage being implemented in Council housing stock. Ongoing programme including cavity wall insulation. Home Energy Conservation Act 1996 report required for March 2013 now published. The Mayor of London's office provided further funding for the RE:NEW project to retro-fit energy efficient measures in domestic properties across the Borough. 100 homes visited before March 2013 under Warmer Homes Healthy People fund. Coldbusters Affordable Warmth mailing to all eligible households regarding funding and measures available under affordable warmth element of ECO.	**SECTION /DEPT RESPONSIBLE** Private Housing and Disability Adaptations Team, Housing Department **COST/IMPACT** **Medium / Low** **FUNDING** Using existing staff resources + funding from central government for energy efficient measures for householders

5. ENERGY USE AND HEATING				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
(5.2 Cont) The Council will encourage energy efficiency measures and insulation in domestic dwellings to reduce energy use, including use of standard assessment procedures (SAP), the Government's recommended method for home energy rating	Green Deal implemented nationally to enable households to obtain funding for energy efficient and insulation works. ECO (Energy Company's Obligation) funding available for families on low incomes via Coldbusters Affordable Warmth.	SAP rating in public sector housing targeted at 60 by 2006.	SAP rating of 74 already achieved in public sector housing as of November 2007.	**SECTION /DEPT RESPONSIBLE** Private Housing and Disability Adaptations Team, Housing Department **COST/IMPACT** **Medium / Low** **FUNDING** Using existing staff resources /funding from central government for energy efficient measures for householders

5. ENERGY USE AND HEATING				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
5.3 The Council will encourage energy efficient measures and energy efficient design in new buildings and redevelopment within the Borough.	UDP objectives can be encouraged through the development control process. Implementation and control relies on the Building Regulations	Ongoing Report on inclusion of energy efficient design and measures in planning approvals and construction.	Ongoing process. Part L of the Building Regulations was updated and extended in October 2010 and covers the efficiency of heating installations and minimisation of heat loss, including insulation requirements. Standards of insulation in new build and alterations were strengthened. The 2010 requirements were around 25% higher than the 2006 standards. Consequential improvements to properties that are being altered are also required. Consultations on further changes to the regulations have now ended and standards will be raised again in order to reduce carbon emissions. These come into effect in 2014 and will require a 6% improvement on the 2010 standard for domestic and 9% for non domestic properties.	**SECTION /DEPT RESPONSIBLE** Planning and Building Control ECS **COST/IMPACT** **Low / Medium** **FUNDING** Using existing staff resources

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.1 Continue to monitor air quality and maintain air quality monitoring sites in association with the Environment Research Group, Kings College London.	Measure nitrogen dioxide (NO_2), particles (PM_{10}) and other pollutants including sulphur dioxide (SO_2,), carbon monoxide (CO) ozone (O_3) and benzene.	Ongoing Annual report to Committee	The following pollutants are monitored using automatic continuous monitors within the Borough: Nitrogen Dioxide (NO_2), Fine Particles (PM_{10}), Sulphur Dioxide (SO_2), Carbon Monoxide (CO), and Ozone (O_3). The background air quality monitoring station at the Town Hall, Wandsworth High Street, Wandsworth 2 (SW18, Fairfield) continues to operate and measure CO, NO_2, O_3 and SO_2. A further background air quality monitoring station in Felsham Road, Putney (Thamesfield) began operation in January 2011 and continues to operate and measure NO_2 and PM_{10}. CO was monitored at this site between January 2011 and August 2012 before the analyser stopped working and could not be repaired. CO is no longer monitored at this site as concentrations are well below the air quality objective and discussions with King's College, London, who operate the London air quality network, have indicated that there is little benefit in continuing to monitor CO at this location. A temporary air quality monitoring station began operation in Putney initially for one year on 1 August 2009. This monitoring station is located on Putney High Street at the kerbside and measures nitrogen dioxide and fine particles (PM_{10}). A second temporary air quality monitoring station began operation in Putney High Street at the roadside initially for one year on 1 May 2010. This monitoring station measures nitrogen dioxide. These two monitoring stations will continue to operate until 30 June 2014, via funding from TfL (Local Implementation Plan funding). It is hoped that their operation will continue until the end of 2014 although the funding for this has yet to be confirmed.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / Low** **FUNDING** Through divisional budget and grant funding

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.1 Continue to monitor air quality and maintain air quality monitoring sites in association with the Environment Research Group, Kings College London (continued)	Measure nitrogen dioxide (NO_2), particles (PM_{10}) and other pollutants including sulphur dioxide (SO_2,) ozone and benzene. Disseminate information through the Council Website and the Air Quality hotline. Continue to support London's Air Quality Network.	Ongoing Annual report to Committee	A further temporary air quality monitoring station (initially for 1 year) began operation in the Nine Elms area (in Thessaly Road at the junction with Battersea Park Road, Queenstown) in June 2012 and measures nitrogen dioxide and fine particles (PM_{10}). This monitoring station will continue operating until July 2014 so that 2 full years of monitoring data are achieved. NO_2 is also measured using passive diffusion tubes at 13 locations within the Borough; and benzene is measured using a diffusion tube at one site within the Borough. In 2012 additional sites were added in Clapham Junction and Tooting. A further 11 passive diffusion tubes measure NO_2 in the vicinity of the temporary real-time air quality monitoring stations in Putney High Street to give a more informed picture of air pollution levels in this location. Diffusion tubes are located in the centre of the pavement and at first, second and third floors of a building adjacent to the pavement. Air quality information on the Council's website has been updated in 2013 and further information is available to individuals who sign up to the free airTEXT service. The air quality hotline has been maintained. Data continues to be provided on the London Air Quality Network operated by King's College London and this service is supported.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / Low** **FUNDING** Through divisional budget and using existing staff resources

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.2 Promote travel awareness campaigns, including initiatives with TfL	Bike Week Walk to School Week Other transport campaigns/events	Annual campaigns Number of people participating in and/or reached by campaigns. Number of leaflets distributed. Number of schools and children participating in May and October Walk to School Weeks.	Cycling promotion events held in summer 2013 in Balham Town Centre (Balham), Putney Town Centre (Thamesfield) and Battersea Park (Queenstown), attracted hundreds of visitors. More than 140 bikes were security marked and safety checked by "Dr Bike". Public bike maintenance classes held in Battersea (Latchmere) were attended by 43 members of the public. In May 2013, 33 schools took part in Walk to School Week. In October 2013, 24 schools took part in Walk to School Month. There are 22 schools taking part in the WoW (Walk Once a Week) campaign. Also see initiative in 6.3	**SECTION /DEPT RESPONSIBLE** Transport Planning, ECS **COST/IMPACT** **Low / Low** **FUNDING** Using existing staff resources

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.3 Encourage and promote the benefits of cleaner road vehicles. (existing)	School programme of visits promoting environmentally friendly vehicles and alternative fuels	2005 % schools visited	Fleet Management is no longer carrying out this programme. However, Environmental Services has arranged for an environmental theatre company to tour primary schools in the Borough each year since 2006; in total 59 performances have been provided in primary schools (82% of primary schools have been visited). In 2013, schools were visited in March. The Big Wheel Theatre company gave a further ten performances to primary schools across the Borough showing children what they can do to help prevent air pollution. The children were encouraged to think about all the benefits of walking to school, including improvements to air quality. This programme was funded by Local Implementation Plan allocation from Transport for London .	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / Low** **TARGETED PROJECT COST/IMPACT** **Medium/Medium** **FUNDING** Using existing staff resources + funding from LIP (from TfL)

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.4 Promote the collection and composting of garden refuse to reduce the incidence of garden bonfires. Promote home composting (existing)	Regular garden waste collection Distribute home composting units	Implemented Ongoing Number of units distributed	Completed Composting units are available at a discounted price via the website: http://www.wandsworth.getcomposting.com/ 81 home composting containers were supplied to residents during 2013 via the Council's special discount offer, down from 121 during 2012. This brings the total number of containers supplied to residents under various Wandsworth Council offers over the last 16 years to 10,826. The sales during 2013 included 28 x 220 litre Compost Converters, 40 x 330 litre Compost Converters, 3 Kitchen Composter kits, 3 wormeries and 2 x 200 litre "Hotbins".	**SECTION /DEPT RESPONSIBLE** Waste Management, ECS **COST/IMPACT** **Low / High** **FUNDING** Using existing staff resources

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.5 Promote a greater awareness of air quality issues, including air quality data, the sources of pollution, its effects and how individuals and organisations can bring about improvements.	Develop a strategy to raise awareness of air quality issues: work with local environmental groups to raise awareness of air quality issues among schools, businesses , health authorities and the public;	June 2004 Meet with local environmental groups December 2004 Awareness Strategy produced March 2004	Completed An awareness strategy has been produced and is used as an active working document to work towards raising awareness among stakeholder groups. Grant funding is applied for every year via many sources to help to fund the development and awareness of air quality issues and help to improve the air quality within the borough through community involvement. In 2012 a project of business engagement in Putney High Street commenced. To date over 50 businesses have been contacted and potential actions to improve air quality have been recommended by the consultant undertaking the work. Following on from this a piece of work was undertaken in 2013 relating to supply chains and deliveries taking place to premises on Putney High Street. The findings of this report are being considered. During 2013 work was undertaken to develop an air quality website for South London to provide consistent information on air quality across South London with the intention of raising awareness of air quality and the actions that are being taken to improve air quality. This website will be sign posted from the Council website. The website will be interactive and will have information targeted at different age ranges and in particular children (including an educational game). The website will be launched in February/ March 2014 with associated publicity including sending out press releases from all participating boroughs.	**SECTION /DEPT RESPONSIBLE** Environmental Services, Transport Planning, ECS **COST/IMPACT** **Low / High** **FUNDING** Some internal, some external e.g. Defra, Transport for London

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.5 Promote a greater awareness of air quality issues, including air quality data, the sources of pollution, its effects and how individuals and organisations can bring about improvements. (continued)	Officer group to consider recommendations from the London Sustainable Distribution Partnership; Consider developing Freight Quality Partnerships; assess the scope for the use of priority lanes by freight vehicles and the implications for other road users;	Officer monitoring group formed and objectives set for next 2 years	The London Sustainable Distribution Partnership initiatives are being taken forward via the Local Implementation Plan (LIP). Many initiatives have been being carried out through the South London Freight Quality Partnership (SLFQP).The South London Freight Quality Partnership (SLFQP) was set up in the autumn of 2005, covering the Boroughs of Croydon, Merton, Bromley, Sutton, Lewisham and Wandsworth. The SLFQP is funded by Transport for London and is a delivery arm of the London Freight Plan. The main aims of this freight quality partnership are to improve air quality, safety, reduce noise and increase operational efficiency of the freight transport industry. In November 2010 Freight observation studies were undertaken in Putney High Street via the SLFQP as part of our research in to the factors that may be influencing pollution levels in Putney High Street. The report was published in February 2011.More information on these activities is available on the website at http://www.southlondonfqp.com/Events.htm	

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.5 Promote a greater awareness of air quality issues, including air quality data, the sources of pollution, its effects and how individuals and organisations can bring about improvements. (continued)	Consider developing Freight Quality Partnerships; assess the scope for the use of priority lanes by freight vehicles and the implications for other road users;		In the autumn of 2011 a study was undertaken to determine the vehicle emission sources in Putney High Street. The report is available on the Council website at the following location: http://www.wandsworth.gov.uk/airquality, and showed that buses are responsible for 68% of NOx emissions in the high street whilst only accounting for 10% of the vehicle fleet. The results from the study provided the evidence to lobby TfL for improvements to be made to the bus fleet travelling along Putney High Street. As a result 46 new buses have been provided, including 10 hybrids, and a further 85 buses are being retrofitted with selective catalytic reduction (SCR) to reduce NOx emissions. The retrofit programme was completed in 2013 and resulted in a further 10 buses being fitted with SCR than originally planned. An in-depth study is now being undertaken using ANPR cameras and automatic monitoring in the high street. This study will assess the impact of the changes to the bus fleet and other air quality measures on ambient concentrations. The results of this study are expected in April 2014.	**SECTION /DEPT RESPONSIBLE** Environmental Services, Transport Planning, ECS **COST/IMPACT** **Low / High** **FUNDING** Some internal, some external e.g. Defra, Transport for London

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.5 Promote a greater awareness of air quality issues, including air quality data, the sources of pollution, its effects and how individuals and organisations can bring about improvements. (continued)	Consider clear zones; Consider the contribution made by trees to reducing air pollution. Provision of an Air Quality alert service to inform residents of the borough when there are raised levels of air pollution	Launch service by March 2007 Number of subscribers Variety of media used to promote the service.	No further progress has been made in considering Clear Zones - Completed The evidence relating to the contribution made by trees to reducing air pollution is inconclusive. However, it is considered that trees have benefits in reducing certain pollutants and the Council, through the Arboricultural Section, continues its annual tree planting programme. The number planted depends upon time, funding and the allocation of green space for tree planting. In 2012 a further 5 trees were planted in Putney High Street. The AirTEXT messaging service was launched on 28 March 2007 at a GLA press event. Wandsworth was a founder member of the AirTEXT consortium. The AirTEXT messaging service provides free pollution alerts and health advice by text message, voice message or e-mail. People with asthma, emphysema, bronchitis and other chronic breathing problems, as well as people with heart disease and angina are more at risk from high levels of air pollution and are encouraged to join although the service is freely available to all. Approximately 300 individuals have signed up to airTEXT to date and further publicity initiatives are scheduled.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / High** **FUNDING** Some internal, some external i.e. Defra

6. EDUCATION AND PROMOTIONAL INITIATIVES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2013**	**RESOURCE & IMPACT**
6.5 Promote a greater awareness of air quality issues, including air quality data, the sources of pollution, its effects and how individuals and organisations can bring about improvements. (continued)	Provision of an Air Quality alert service to inform residents of the borough when there are raised levels of air pollution	Launch service by March 2007 Number of subscribers Variety of media used to promote the service.	As of the end of December 2013 there were 7,183 users signed up to the service within the London boroughs and Slough. This figure includes people that have signed up to the service via text message, whose address is not known to the airTEXT consortium, and therefore these users have not been attributed to any particular borough. There is no way of obtaining the number of subscribers receiving text alerts through the twitter delivery channel. The service is publicised on the Council website, Awareness of airTEXT was also raised at the vehicle emissions testing days in March 2013.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / High** **FUNDING** Some internal, some external i.e. Defra

7. ENCOURAGING BUSINESSES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2012**	**RESOURCE & IMPACT**
7.1 Encourage businesses to switch to the most efficient vehicles and encourage companies to make use of funds available through Powershift, Clean-up and Motorvate schemes.	Develop information and education programmes for businesses	December 2004 Number of businesses contacted	Information on cleaner fuels and cleaner vehicles and electric vehicles is available on the Council's website and has been updated in 2012 (www.wandsworth.gov.uk/airquality). Information on electric vehicles is available via the following link: http://www.wandsworth.gov.uk/driveelectric Advice and information for businesses is also provided through the work of the South London Freight Quality Partnership. See also action 6.5. As part of the Greener Borough initiative, small businesses based in Wandsworth have had access to free support and information from the Greening Business Programme to become more sustainable and save money. Greening Business Advisers have been working with businesses by undertaking environmental audits of their premises followed by the completion and implementation of an action plan which would reduce costs associated with energy, water and/or waste. The Greening Business Programme is a free service (funded from the European Regional Development Fund) that offers companies an intense support, mentoring and advice service focused on the six essentials to "Greening": Energy, Waste, Recycling, Transport, Water and Purchasing. Information on the service was promoted on the Council website via the sustainability pages. By the end of December 2013, detailed one-to-one reviews and action plans have been developed for 24 companies in Wandsworth. (1st May 2012 to 31st December 2013).	**SECTION /DEPT RESPONSIBLE** Environmental Service, ECS **COST/IMPACT** **Low / High** **FUNDING** Using existing staff resources

7. ENCOURAGING BUSINESSES				
ACTION	**IMPLEMENTATION**	***TARGET DATE* & INDICATORS**	**PROGRESS DECEMBER 2012**	**RESOURCE & IMPACT**
7.2 Provide advice to businesses in the Borough on energy use, reducing emissions, improving indoor air quality and environmental management schemes	Develop information and education programmes for businesses	Number of businesses contacted	Information on cleaner fuels and cleaner vehicles and electric vehicles is available on the Council's website. Information on electric vehicles is available via the following link: http://www.wandsworth.gov.uk/driveelectric Advice and information for businesses is provided through the work of the South London Freight Quality Partnership. See also action 6.5 There is also further advice and information on the website on reducing energy use and environmental management schemes (accessed via the sustainability pages). Also see Action 7.1	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / High** **FUNDING** Using existing staff resources
7.3 Work with businesses to discourage unnecessary idling of vehicles, for example, delivery vehicles. (existing)	Develop information and education programmes for businesses	December 2004 Number of businesses contacted and implementing driver programmes	Completed. Publicity was produced in 2004, including an article for the Wandsworth Business magazine encouraging businesses to contact the Council for further advice. We have also responded to complaints regarding vehicle idling from commercial vehicles and worked with the business to help them reduce the problem. We are also working with TfL and the GLA on this issue.	**SECTION /DEPT RESPONSIBLE** Environmental Services, ECS **COST/IMPACT** **Low / High** **FUNDING** Using existing staff resources