Air Quality and Action Plan Progress Report for the Greenwich Council

***** Amendments have been made to data in Table 6, Page 20. Amendments are for GW55, GW56, GW57, GW58 and GW59. This is due to incorrect figures being added at time of document's completion. Correct amendments completed by Chris Banks (03/02/09).**

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Executive Summary

This is the Air Quality and Action Plan Progress Report 2008 for the London Borough of Greenwich ("the Council"). This report fulfils this part of the Council's commitment to the continuing Local Air Quality Management (LAQM) process. This Report provides an annual update of recent air quality issues in Greenwich, including an update on recent air quality in the Borough, obtained from its monitoring results as well as a focus on the Council's progress on reducing air pollution through its Air Quality Action Plan.

The Council's earlier Review and Assessments of air quality confirmed that there were locations across the Borough with relevant public exposure where the Government's air quality objectives might be exceeded.

The more up to date monitoring of nitrogen dioxide and PM_{10} in this report confirms that the Government's air quality objectives are still being exceeded widely at locations with relevant public exposure. The Council will therefore maintain its AQMA for these two pollutants.

The Council's monitoring results for benzene and sulphur dioxide indicate that the objectives for these pollutants are not being exceeded. The report also includes a section on the Council's ozone and $PM_{2.5}$ monitoring. The monitored results confirm that the ozone objective has been exceeded in the Borough. The Government's "backstop" objective for $PM_{2.5}$ however has not been exceeded.

The purpose of the Council's Air Quality Action Plan is to ensure that air quality is considered corporately and to seek to reduce air pollution within the Borough, in pursuit of the Government's air quality objectives. The Council is however limited in its abilities to influence local air quality, firstly as a result of pollution arising elsewhere in London (and beyond) and secondly because it has limited responsibility for the main sources of emissions within the Borough. Major roads in the Borough are not the responsibility of the Council. The plan however includes measures to seek to reduce traffic flow and vehicle emissions that are consistent with other Council policies.

The Council's progress on the individual actions is given in Table 12 within the report. The Council is maintaining, as well as seeking to enhance, both its monitoring and dissemination of data for planning and assessment purposes. The Action Plan originally included 62 actions. This report confirms that a 13 were completed. The remaining actions are all on going.

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1 Introduction to Air Quality and Action Plan Progress Report

1.1 Overview

This is the Air Quality and Action Plan Progress Report 2008 for the London Borough of Greenwich. This report fulfils this part of the Council's continuing commitment towards the Local Air Quality Management (LAQM) process.

1.2 Background – national level

The LAQM process forms a key part of the Government's Air Quality Strategy to achieve the air quality objectives prescribed in the Air Quality (England) Regulations 2000 and 2002. Air quality progress reports were introduced following a detailed evaluation of the first round of local authority Review and Assessment. This evaluation identified a need both to develop a longer-term vision for LAQM and encourage the integration of air quality into the routine work of local authorities.

Local Authorities are required by section 88 (2) of the Environment Act 1995 to have regard to the Government's guidance documents when carrying out their LAQM duties. To assist local authorities and provide guidance for the overall LAQM process, the Department for Environment, Food and Rural Affairs (Defra) issued the following policy and technical guidance documents: LAQM PG (03), LAQM PG (S) (03), LAQM TG (03) and LAQM.PGA (05). It is expected that the new guidance will be released during late 2008.

The Government published a revised Air Quality Strategy for England, Scotland, Wales and Northern Ireland in July 2007. In formulating the new strategy a review was undertaken which included comprehensive environmental studies. The review also proposed potential new policy measures to improve air quality, and examined their costs and benefits, impact on exceedences of the strategy's air quality objectives, effect on ecosystems and qualitative impacts.

The new strategy affirms that the quality of air has improved and that despite this there is still more to do as objectives on some pollutants are still exceeded. The areas of exceedence are relatively small, although significant numbers of people are likely to be exposed, as the exceedences tend to be in highly populated areas. The updated strategy provides a long-term vision for improving air quality in the UK and offers options for further consideration to reduce the risk to health and the environment from air pollution. The strategy retains the existing air quality objectives and includes a new objective for $PM_{2.5}$ in recognition of recent reviews by the WHO and the Committee on the Medical Effects of Air Pollutants (COMEAP) who that suggested exposure to $PM_{2.5}$ gives a stronger association with the observed ill-health effects of particles.

1.3 Background – local level

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In earlier rounds of review and assessment (R&A) of local air quality management, the Council identified areas where the objectives were exceeded and where there was relevant public exposure. As a consequence, it designated its area an Air Quality Management Area (AQMA) for the annual mean nitrogen dioxide objective and daily mean PM_{10} objective and produced an Air Quality Action Plan.

The Council also completed the third round of review and assessment. The conclusion of that work was that the Council did not need to undertake a Detailed Assessment and should maintain its AQMA.

LAQM PRG (03) supplemented the above guidance and assists in the production of air quality progress reports. Based on this, local authorities are required to produce Progress Reports in those years when they are not carrying out an Updating and Screening Assessment (USA) or a Detailed Assessment of air quality.

The guidance also advises that the Progress Report is not designed to represent a further USA, although it states that, if at any time a risk is identified that an air quality objective might be exceeded, a Detailed Assessment should be carried out without delay.

The overall aim of the Progress report is to report on progress on implementing LAQM and report progress in achieving, or maintaining concentrations below the air quality objectives. The guidance considers that these aims can be best achieved by reporting on new results and on progress with implementation of the Action Plan. This, the 2008 progress report, provides the latest update for the London Borough of Greenwich.

The guidance further suggests that those local authorities monitoring ozone use this report to outline the results. (Note – ozone is not one of the identified seven LAQM pollutants, although it is included within the Government's Air Quality Strategy).

2 New monitoring results in the LB of Greenwich

2.1 Outline of monitoring undertaken

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The Council continued monitoring benzene, nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particles (PM_{10}), fine particles ($PM_{2.5}$) and ozone in its area. The Government's adopted air quality objectives for each of these pollutants as shown in Table 1 below.

Table 1 Air quality strategy objectives for benzene, NO_2, SO_2, PM_{10} and ozone

Pollutant	Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg m^{-3}	Running Annual Mean	31 Dec 2003
	5 µg m^{-3}	Annual Mean	31 Dec 2010
Nitrogen Dioxide (provisional)	200 µg m^{-3} not to be exceeded more than 18 times a year	1 hour mean	31 Dec 2005
	40 µg m^{-3}	Annual Mean	31 Dec 2005
Sulphur Dioxide (SO_2)	350 µg m^{-3} not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 µg m^{-3} not to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004
	266 µg m^{-3} not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
Particles (PM_{10})	50 µg m^{-3} not to be exceeded more than 35 times a year	Daily Mean	31 Dec 2004
	40 µg m^{-3}	Annual Mean	31 Dec 2004
Ozone (O_3)	100 µg m^{-3} not to be exceeded more than 10 times a year	Daily maximum of 8 hour running mean	31 Dec 2005

Note – $PM_{2.5}$ was included in the revision of the Government's Air Quality Strategy in July 2007 and a reduction exposure approach was adopted; based on an objective of 25 µg m^{-3} as an annual mean to be achieved by 2010 and a target reduction of 15% in concentrations at urban background locations between 2010 and 2020.

2.2 Summary of automatic monitoring in Greenwich

Site	NOx*	PM_{10}	$PM_{2.5}$	SO_2	Ozone
Greenwich 4	√	√		√	√
Greenwich 5	√	√			
Greenwich – Bexley 6	√	√	√		√
Greenwich 7	√	√			
Greenwich 8	√	√	√		√
Greenwich 9	√	√	√		√
Greenwich 10	√	√			
Greenwich 12	√				
Greenwich 13	√	√	√		√
Bexley 3			√		

(* Includes NO_2)

The Council undertakes continuous monitoring at nine fixed long-term sites in the Borough, plus the Bexley 3 site:

- Greenwich 4 - a suburban background site in Eltham towards the southeast of the Borough. This site has been operating since January 1994 and is affiliated to the government's Automated Urban Rural Network (AURN)

- Greenwich 5 - a roadside site on Trafalgar Road in Greenwich in the west of the Borough (this site started operating since November 1996). The sample inlet is located 5m from the road

- Greenwich 7 - a roadside site in Blackheath in the west of the Borough (monitoring at this site commenced in March 2002). The sample inlet is located 9m from the road

- Greenwich 8 - a roadside site close to the Woolwich Flyover towards the north of the Borough. This site has been operating since July 2004. The sample inlet is located 3m from the road

- Greenwich 9 - a roadside site in Westhorne Avenue towards the south of the Borough. This site opened in October 2004 and the sample inlet is located 5m from the road

- Greenwich 10 - a roadside site on the A206 at Burrage Grove in Thamesmead West towards the north east of the Borough (this site opened in October 2004)

- Greenwich 12 – a background site close to the Millennium Village on Greenwich Peninsula in the north of the Borough (monitoring at this site commenced in August 2004)

- Greenwich 13 - a roadside site on Plumstead High Street in the east of the Borough (monitoring at this site commenced in January 2006)

- Greenwich Bexley 6 - a roadside site on the A2 close to the Borough boundary at Falconwood in the southeast (it is shared with the LB of Bexley and has been operating since October 2000). The sample inlet is located 12m from the road.

- Bexley 3 – this is a suburban background site, located in Thamesmead, very close to the Bexley/ Greenwich boundary.

The above sites are also representative of relevant exposure. All the sites are part of the London Air Quality Network and therefore the standards of QA/QC are similar to those of the Government's AURN sites. Regular calibrations are carried out, with subsequent data ratification undertaken by the ERG at King's College London. In all cases the data are fully ratified unless reported otherwise. Details of the sites can be found at www.londonair.org.uk

The Council also undertakes non-continuous monitoring at numerous sites across its area.

2.3 Benzene Monitoring

The Council undertook the monitoring of benzene during 2007. The diffusion tubes were exposed at eleven sites in its area. These included ten roadside sites and a background site; with four tubes exposed. The sites annual mean results for the period 2002 to 2007 inclusive are given in Table 2. (Note – not all sites are reported for 2002 and 2003 as some sites were only started in 2004).

As expected the highest concentrations were observed at the roadside sites, with lower concentrations monitored at the background site. The results however indicated for all sites that the 2003 AQS objectives were not exceeded during the period of monitoring. The benzene monitoring also confirmed that the stricter 2010 annual mean objective (of 5 µg m^{-3}) was also not exceeded, apart from the GW35 site (in the Greenwich town centre) during 2002. However since that time concentrations decreased. The average concentration at the roadside sites for 2007 was 2.2 µg m^{-3} and at the background site was 1.4 µg m^{-3}. The highest monitored concentrations for each year since 2003 were recorded at the busy roadside site (GW33) on Blackheath Hill.

The situation in Greenwich reflects the national picture, in that concentrations of benzene have been decreasing over time as a result of stricter emission controls, particularly with regard to road transport sources.

Table 2 Benzene monitoring (µg m^{-3}) in the LB of Greenwich (2002 to 2007)

Site	Type	2002	2003	2004	2005	2006	2007
GW29	Roadside	4.3	3.9	2.4	2.4	2.8	2.0
GW33	Roadside	2.6	4.3	2.9	2.7	3.6	2.9
GW34	Roadside	2.9	3.2	1.6	1.7	1.9	1.9
GW35	Roadside	5.3	4.2	2.8	2.6	2.6	2.5
GW39A	Background	1.7	2.7	1.2	1.1	1.5	1.3
GW39B	Background	-	-	1.0	1.3	1.7	1.3
GW39C	Background	-	-	1.0	1.2	1.7	1.4
GW39D	Background	-	-	0.9	1.2	1.1	1.4
GW41	Roadside	2.9	3.2	1.7	1.8	1.9	2.0
GW42	Roadside	4.4	3.6	2.1	2.1	2.4	2.3
GW50	Roadside	4.6	4	2.6	2.7	2.8	2.8
GW51	Roadside	2.2	2.6	1.4	1.6	1.7	1.7
GW54	Roadside	-	3.4	1.9	2.1	2.2	2.2
GW55	Roadside	2.2	2.5	1.5	1.5	1.6	1.7

2.4 NO_2 Monitoring

The Council monitors NO_2 in its area using both continuous chemiluminescence analysers and diffusion tubes.

2.4.1 Continuous NO_2 and NOx monitoring in LB of Greenwich

The annual mean results for the continuous sites are presented in Table 3 and Figure 1. The data capture exceeded 90% during 2007 at all sites (see Appendix 1), other than at Greenwich 5 (27) and Greenwich 10 (88%). In all cases the data were fully ratified, apart from the 2007, which included some provisional data.

Table 3 Annual mean NO_2 concentrations for the LB of Greenwich (2002 – 2007 inclusive) (µg m^{-3})

LAQN site	2002	2003	2004	2005	2006	2007*
Greenwich 4 (suburban)	29	38	31	*29*	30	30
Greenwich 5 (roadside)	**54**	**50**	**47**	**48**	*56*	*65*
Greenwich 7 (roadside)		**59**	*50*	**47**	**47**	**49**
Greenwich 8 (roadside)			*78*	**75**	**71**	**71**
Greenwich 9 (roadside)			*51*	**44**	*43*	45
Greenwich 10 (roadside)			*54*	**51**	**52**	58
Greenwich 12 (background)			*38*	34	*35*	*38*
Greenwich 13 (roadside)					**43**	**45**
Greenwich Bexley 6 (roadside)	**48**	**55**	**44**	**41**	**44**	**48**

(Note - italics indicates < 90% data capture; bold indicates > objective;
* includes some provisional data)

The monitoring results for the long-term sites have consistently been above the annual mean objective, for all years at all sites, other than the two background sites in Eltham (GR4) and the Millennium village (GR12).

Figure 1 highlights inter annual variability for the sites arising as a result of the varying meteorological conditions, as well as the release of atmospheric emissions. The results confirm that the annual mean objective continued to be exceeded close to roads where there is relevant exposure in the Borough.

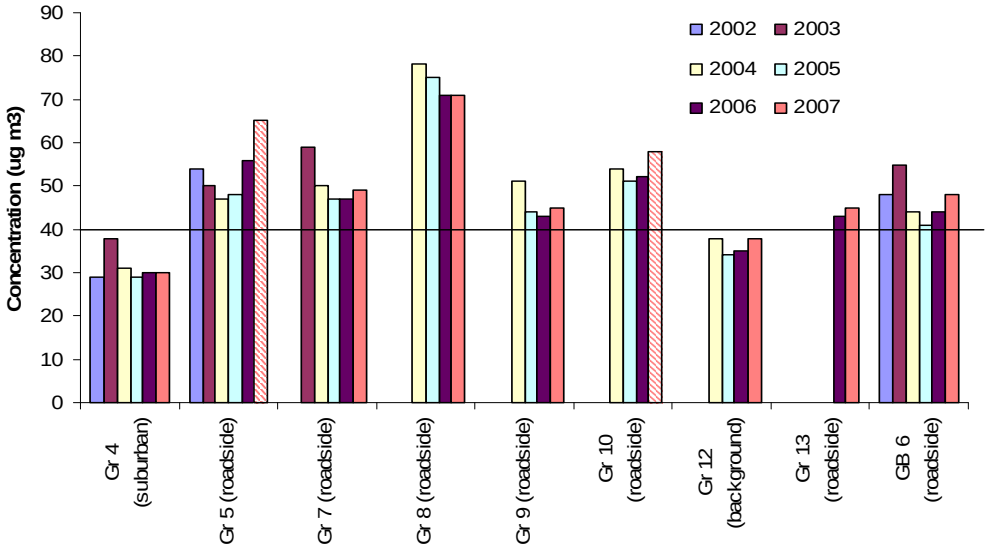

Figure 1 Annual mean NO_2 concentrations in the LB of Greenwich (2002 – 2007)

The number of periods that the hourly standard of 200 µg m^{-3} was exceeded at the Greenwich sites is given in Table 4. The only sites in 2007 not to exceed the 200 µg m^{-3} standard were the Greenwich 4 and Greenwich Bexley 6. All other sites recorded periods when this standard was exceeded. For the Greenwich 5, 7 and 9 sites this was the first year that the standard had been exceeded. The highest number of periods exceeding this standard also arose during 2007 for all sites.

The Greenwich 8 roadside site close to the Woolwich flyover was the only site to exceed the Government's hourly objective of not more than 18 such periods, for the period of monitoring reported, with 58 periods exceeding the 200 µg m^{-3} standard. This is compared to the objective of not more than 18 periods. The Greenwich 5 site also recorded 6 periods that exceeded despite only achieving 27% data capture for the year. With greater data capture the objective might have been further approached or exceeded.

There was also an increase in the number of sites exceeding this objective elsewhere in London during 2005 - 2006, compared to 2002, when there was only one London site that exceeded. (ERG, 2006). Eleven sites exceeded in 2005 and 14 exceeded in 2006, these included sites at both kerbside and roadside locations. No background locations exceeded in either year, although a number of sites exceeded the 200 µg m^{-3} standard. This situation changed in 2007 however with urban background sites exceeding. The rises in direct emissions of NO_2 are thought to be implicated in this, as indicated by recent research (Carslaw D.C and Beevers, S. D, 2005 and AQEG, 2007).

In addition a widespread primary pollution episode arose in December 2007. At this time weather conditions were cold and calm, with very light winds. Initial analysis suggests that this is the most significant NO_2 incident for 10 years, when NO_2 was elevated across the region, The hourly mean AQS objective of not more than 18 hours per year above 200 µg m^{-3} was breached at 9 sites, and equalled at 2 sites, on the basis of measurements during this episode alone. West and central London saw the most elevated levels of pollution.

Table 4 Hourly mean NO_2 periods > 200µg m^{-3} for the LB of Greenwich (2002 – 2007 inclusive)

LAQN site	2002	2003	2004	2005	2006	2007*
Greenwich 4 (suburban)	0	0	0	*0*	0	0
Greenwich 5 (roadside)	0	0	0	*0*	0	*6*
Greenwich 7 (roadside)		0	0	*0*	0	5
Greenwich 8 (roadside)			*12*	**42**	14	**58**
Greenwich 9 (roadside)			*0*	0	*0*	3
Greenwich 10 (roadside)			*3*	2	2	*7*
Greenwich 12 (background)			*0*	0	*2*	5
Greenwich 13 (roadside)					2	4
Greenwich Bexley 6 (roadside)	0	2	0	0	1	0

(Note - italics indicates < 90% data capture; bold indicates > hourly mean objective; * includes some provisional data)

2.4.2 NO_2 and NOx trends in the LB of Greenwich

Rolling annual mean plots can be used to indicate changing concentrations over time. The use of rolling annual mean concentrations, based on averaged hourly means, largely removes seasonal influences and provides a guide to changing trends. The plots have been produced for both NO_2 and NOx. NO_2 is a mainly secondary pollutant formed by chemical reactions in the atmosphere from NOx emissions produced by combustion sources. These reactions also involve ozone, which is scavenged by NO. The relationship between NOx and NO_2 is non linear and it is also further complicated by changes in direct emissions of NO_2 from some road vehicles.

The rolling annual mean plots of both NOx and NO_2 concentrations at the Greenwich sites are shown in Figure 2 for NOx and Figure 3 for NO_2. This analysis is for the period from 1994 through to the beginning of 2008 (including some provisional data for the latter period).

For all roadside sites, rolling mean concentrations of NOx were higher than those at the background sites (Greenwich 4 and 12). The rolling annual mean concentrations of NOx indicate a steady downward trend at the Greenwich 4 suburban background site over time in line with reductions in emissions since the site opened in 1994. The reduction of NOx as the primary emission was approximately 40 µg m^{-3}, down from 80 µg m^{-3} over the period from 1995 to 2007, with no change in the past year.

None of the other Greenwich sites have operated as long as Greenwich 4. Of those that have been open the longest, the Greenwich 5 and 7 sites show differing reductions of NOx over the periods of site operation. Greenwich 5 showed a slight increase between 2000 and 2003, before reducing to its lowest concentration in June 2005. From this time however rolling mean concentrations increased again, with concentrations rising during 2007 to reach their highest level since the site opened. Similarly concentrations at Greenwich 7 increased during 2007 to similar levels to those that arose during 2005. These levels were slightly higher than those recorded when the site was first reported in 2002.

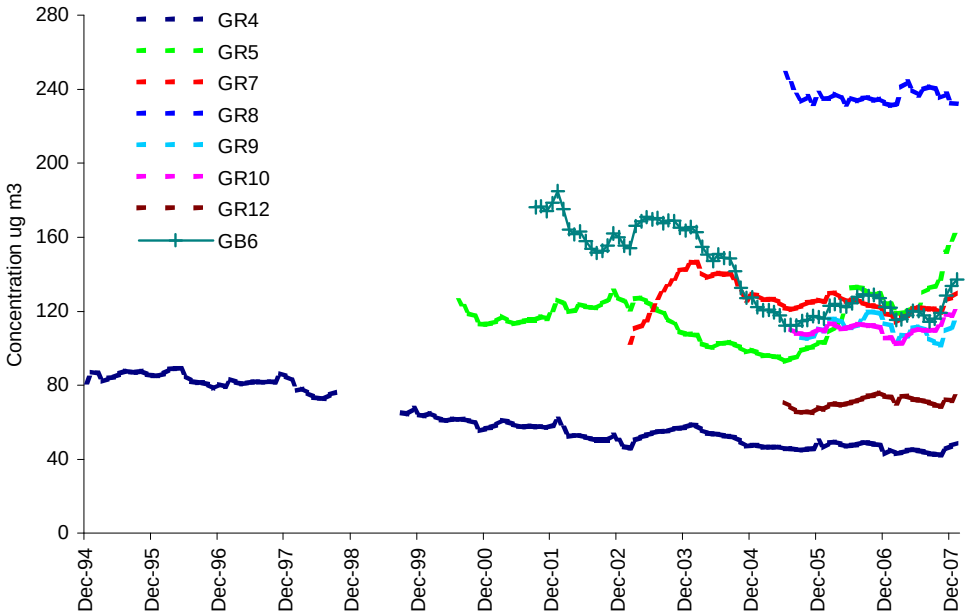

Figure 2 Rolling annual mean NO_x concentrations for continuous monitoring sites in LB of Greenwich

Other sites that had increases in rolling mean concentration during 2007 included the Greenwich Bexley 6 site and the Greenwich 10 site. Both of these sites ended 2007 with higher concentrations than at the start of 2006 (although it should be noted that the data include provisional data and therefore concentrations may change). The Greenwich Bexley 6 site concentrations were however reduced from their peak close to the start of the monitoring in 2001. The rolling mean concentrations at the Greenwich 9 site were similar to Greenwich 10, although the variation during 2007 was slightly changed, with Greenwich 9 concentrations being slightly lower than those at Greenwich 10 at the end of 2007. In addition 2007 concentrations at Greenwich 9 were very slightly higher at the end of 2007 than when the site started in 2004.

The Greenwich 8 roadside and Greenwich 12 background sites both ended 2006 with similar rolling mean concentrations to those at the start of 2006, although the roadside site concentrations were much higher (greater than 200µg m^{-3}) with a greater variation during the year.

The rolling annual mean plots of NO_2 concentrations of the Greenwich sites are shown in Figure 3 for the period from 1994 through to the end of 2007 (including some provisional data for part of 2007).

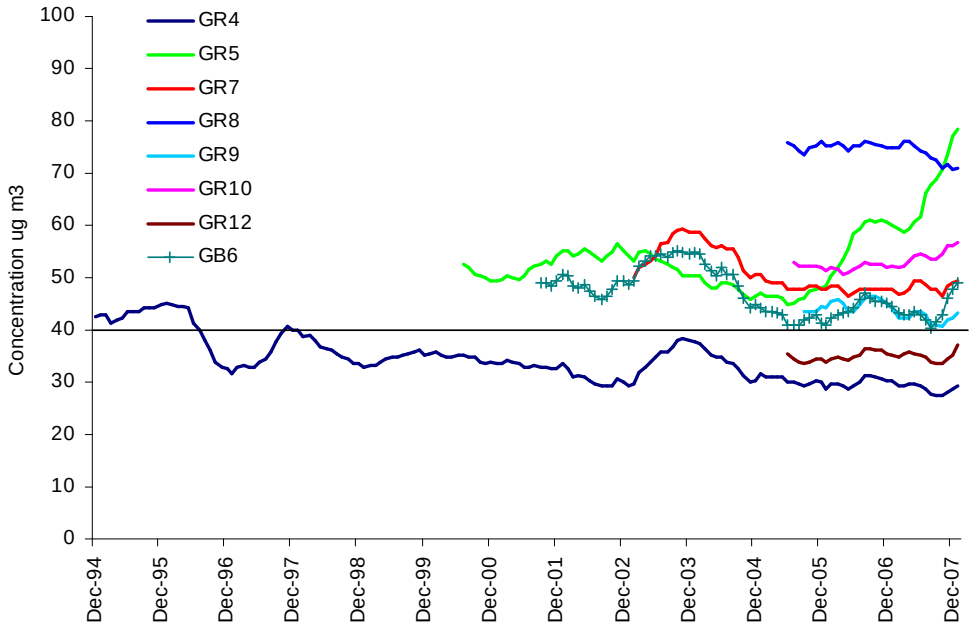

Figure 3 Rolling annual mean NO_2 concentrations for continuous monitoring sites in LB of Greenwich

The changes in rolling annual mean concentrations of NO_2 are, as expected for the secondary pollutant less than for NOx as the main primary pollutant. The rolling annual mean concentrations of NO_2 largely indicate a downward trend at the Greenwich 4 suburban background site over time, with reductions in concentration over the period from 1994 approximately 14 µg m^{-3}. The reduction of NO_2 was not even over time and most recently for the period since 2004 there has been little change. The concentration at the end of 2007 was just over 1 µg m^{-3} lower from that a year earlier (and therefore it was easily within the range of inter year variability that might be expected). The equivalent rolling mean concentration at the other background site, Greenwich 12 was almost the same for both years.

The Greenwich roadside sites were all greater than the objective for all of the period shown. Concentrations at the Greenwich 5 site decreased post 2003, but subsequently increased in 2005 and this continued markedly during 2007. This increase may have arisen as a result of increased emissions, possibly direct NO_2. Increases also arose at the Greenwich Bexley 6 and Greenwich 10 but to a lesser extent.

The rolling mean concentrations at the Greenwich 9 and Greenwich Bexley 6 sites decreased for part of 2007 before rising towards the end of the year. Concentrations of NO_2 at the Greenwich 9 site were more than 10 µg m^{-3} lower than equivalent concentrations at Greenwich 10, despite having similar NOx concentrations as noted above. This further highlights the complexity and non-linear nature of the relationship between NOx and NO_2.

Rolling mean concentrations at the Greenwich 8 roadside site dropped approximately 5 µg m^{-3} during 2007, although overall concentrations easily exceeded the objective at more than 70 µg m^{-3} during 2007. The concentrations at the Greenwich 7 site however were little changed between years although there was some variation through 2007. The concentrations at this site were little changed from those of 2004, although this was still lower than when the site opened in 2001.

These changes illustrate the difficulty in reducing NO_2 concentrations, which is mostly a secondary pollutant that is largely determined by the oxidising capacity of the atmosphere. The effect of the increased direct NO_2 emissions was also more pronounced at the roadside sites and consequently any reduction was reduced.

As reported previously (Greenwich, 2007) the graphs indicate that the annual mean objective is likely to continue to be exceeded into the near future at roadside sites in the Borough unless additional actions are undertaken.

2.4.3 Diffusion tube monitoring of NO_2 in LB of Greenwich

The Council also undertakes the monitoring of nitrogen dioxide using diffusion tubes at selected sites across the Borough. The diffusion tubes are exposed at roadside and background locations. For many of the sites monitoring started before 2000, although only results since 2002 are reported here. The site locations are all considered to represent relevant public exposure (apart from GW41, 49 and 53). One additional site was installed in the Borough during 2007; this site (GW61) was a triplicate site near the Millennium Village co-located with the Greenwich 12 background site.

The diffusion tubes used were supplied by Bureau Veritas and analysed by Gradko using a preparation method of 50% TEA in acetone. Details of the sites monitored are given in Appendix 1. The locations of the sites are also shown in Figure 4.

There was more than 75% data capture for all the sites reported. The biased results of diffusion tube monitoring for 2007 are given below.

The unbiased 2007 results of the diffusion tube monitoring monitored in the Borough, with the details of the site location and reference number are given in Appendix 1 (see Table 19).

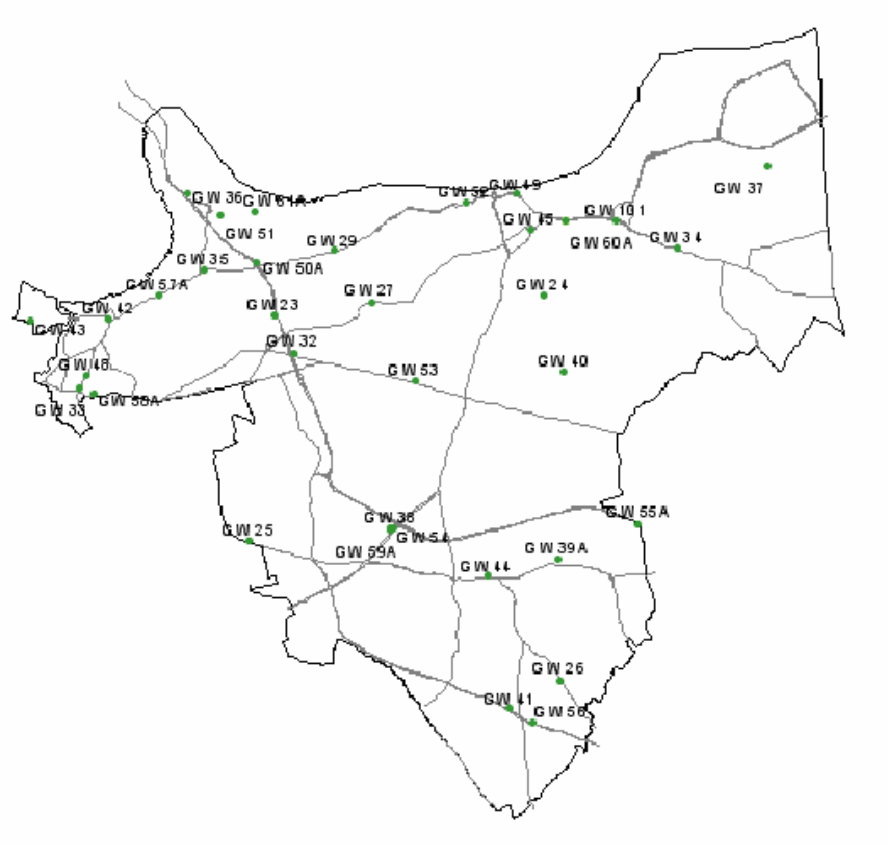

Figure 4 2007 Diffusion tube sites in LB Greenwich

Since 2003 local co-location studies using triplicate tubes were undertaken in the Borough, prior to this time correction factors were derived from the London Wide Environment Programme (LWEP) programme. The factors from these sources are shown in Table 5. The LWEP factors were derived from a series of co-location studies undertaken across London, including the Greenwich sites. The local bias factors are based on an average of the co-location studies within Greenwich only (apart from Greenwich 5 site which only limited data capture). It should also be noted that as a result of the use of the averaged bias factors there is some discrepancy between the measured continuous concentrations and biased results at the co-located sites. The bias factors are as follows:

Table 5 Local bias factors used with the Greenwich diffusion tube monitoring

Year	Local Bias factor
2002	1.37*
2003	1.28
2004	1.06
2005	1.04
2006	1.08
2007	0.97

(* Indicates LWEP factor used)

The factors indicate that the diffusion tube results over read slightly in comparison with continuous monitoring in 2007, previously the factor indicated that the readings under read slightly. A comparison between sets of local and LWEP factors shows a reasonable agreement for all years, other than 2003. The 2007 bias adjusted results are shown in Figure 5 and are based on the local bias factor.

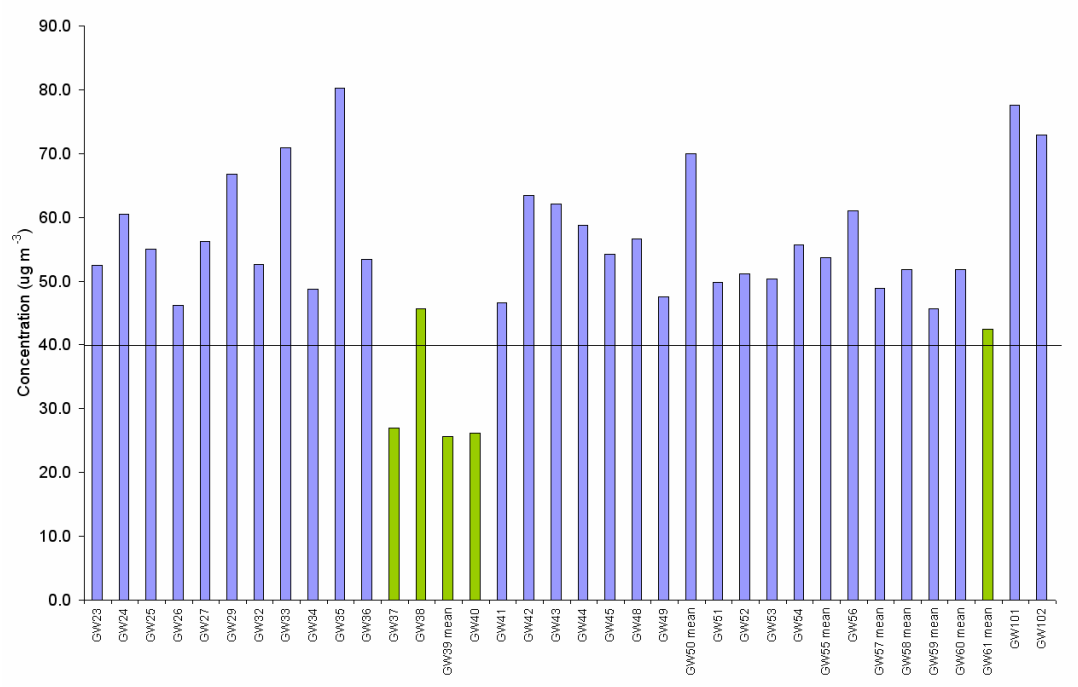

Figure 5 2007 NO_2 bias adjusted diffusion tube results for sites in LB of Greenwich

The results indicated that all the roadside sites (shown in blue) exceeded the 40 μg m^{-3} standard. The 2007 bias adjusted results for background sites (shown in green) meet the objective. The only exception was the GW 38 site, which was sited 30m from the A205 Westhorne Avenue and the GW61 site. (The latter is due to the use of the average bias factor as explained earlier).

The bias adjusted results for all years from 2002 to 2007 are shown in Table 6, with the mean concentrations provided for those sites with triplicate tubes exposed. The bias adjustment factors used were from the local Greenwich studies, apart from 2002, which used the LWEP factor as a default.

Table 6 Bias adjusted results for all Greenwich site 2002 to 2007 (µg m^{-3})

Site	Type	2002	2003	2004	2005	2006	2007
GW23	Roadside		57.6	46.6	48.9	47.5	**52.5**
GW24	Roadside	47.6	66.6	59.4	56.2	61.6	**60.4**
GW25	Roadside	49.0	65.3	55.1	54.1	56.2	**55.0**
GW26	Roadside		56.3	47.7	47.8	49.7	**46.2**
GW27	Roadside		69.1	58.3	60.3	61.6	**56.3**
GW29	Roadside	58.5	74.2	60.4	67.6	72.4	**66.7**
GW32	Roadside	42.2	62.7	55.1	53.0	51.8	**52.7**
GW33	Roadside	40.8	66.6	63.6	65.5	67.0	**70.9**
GW34	Roadside	44.9	57.6	54.1	49.9	54.0	**48.7**
GW35	Roadside	62.6	93.4	86.9	78.0	96.1	**80.3**
GW36	Roadside	43.5	66.6	59.4	56.2	59.4	**53.4**
GW37	Background	29.9	35.8	29.7	30.2	29.2	27.0
GW38	Background	44.9	56.3	37.1	41.6	41.0	**45.7**
GW39 mean	Background	28.6	32.0	27.6	26.3	27.0	25.7
GW40	Background	27.2	32.0	25.4	25.0	29.2	26.2
GW41	Roadside	39.4	61.4	47.7	47.8	47.5	**46.7**
GW42	Roadside	51.7	75.5	58.3	63.4	63.7	**63.4**
GW43	Roadside	47.6	73.0	63.6	61.4	65.9	**62.1**
GW44	Roadside		61.4	45.6	48.9	51.8	**58.8**
GW45	Roadside			57.2	54.1	55.1	**54.2**
GW48	Roadside	51.7	65.3	54.1	52.0	54.0	**56.6**
GW49	Roadside	66.6	65.3	50.9	52.0	55.1	**47.5**
GW50 mean	Roadside	44.9	64.0	62.5	70.0	79.2	**69.9**
GW51	Roadside	46.2	56.3	47.7	48.9	50.8	**49.8**
GW52	Roadside	44.9	69.1	50.9	45.8	51.8	**51.1**
GW53	Roadside	38.1	57.6	47.7	45.8	49.7	**50.3**
GW54	Roadside	57.1	67.8	57.2	57.2	59.4	**55.7**
GW55 mean	Roadside	46.2	64.9	53.0	51.3	52.9	**53.7**
GW56	Roadside	58.5	55.0	45.6	44.7	54.0	**61.0**
GW57 mean	Roadside		48.6	47.7	45.1	48.6	**49.0**
GW58 mean	Roadside		63.1	49.5	53.4	54.4	**51.7**
GW59 mean	Roadside				45.4	49.0	**45.3**
GW60 mean	Roadside				45.4	48.6	**51.8**
GW61 mean	Background						**42.5**
GW101	Roadside	68.0	61.4	66.8	65.5	84.2	**77.6**
GW102	Roadside	68.0	66.6	67.8	66.6	70.2	**72.9**

The predictions of concentrations in 2010 were made using the Defra year adjustment factors, and based on 2007 measurements. These estimates shown in Figure 6 indicate that despite the predicted reduction in emissions all of the roadside locations will still exceed the objective in the Borough, apart from the new site at GW61 which is estimated meet the objective. The background sites however will all meet the objective, apart from the site at GW38.

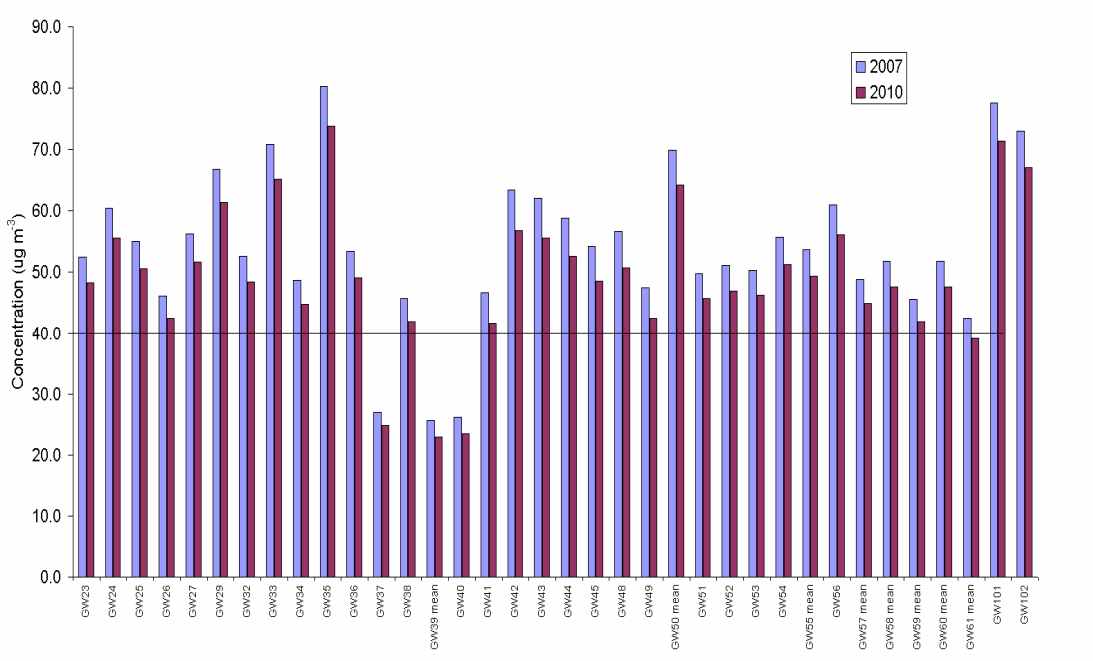

Figure 6 Estimated 2010 and 2007 NO_2 bias adjusted diffusion tube results for sites in LB of Greenwich

2.5 PM_{10} monitoring

The Council has undertaken continuous monitoring of PM_{10}. These include the roadside sites (Greenwich 5, 7, 8, 9, 10 and Greenwich Bexley 6) plus the background locations (Greenwich 4). The sites however were not all operational for all years. The Council uses TEOM instruments for monitoring PM_{10}; the results are therefore presented as a gravimetric equivalent, i.e. times 1.3 (in accordance with TG03 guidance). The Council also monitored PM_{10} using FDMS (Filter Dynamics Measurement System) TEOMs at its Greenwich 9, 12, 13 and Bexley 3 sites. This is a relatively new automatic monitoring technique that will improve understanding of PM_{10}. It has also proved equivalent to the reference method for PM_{10} and therefore the results were not factored. Monitoring is not reported for the Greenwich 12 and 13 sites during 2007 due to instrument problems. It is hoped that data for these years will be retrieved and reported in the Council's subsequent reports.

The monitoring results for the sites are given in Table 7. Full details of data capture are given in Appendix 1.

Table 7 PM_{10} monitoring at the long-term LB of Greenwich sites (2002 - 2007)

Site		2002	2003	2004	2005	2006	2007
Greenwich 4 (suburban)	No. of days	5	26	5	*4*	12	*5*
Greenwich 5 (roadside)		13	*33*	11	8	16	17
Greenwich 7 (roadside)		***43***	**55**	25	22	30	24
Greenwich 8 (roadside)				***69***	**120**	**110**	**90**
Greenwich 9 (roadside)				*0*		*34*	*10*
Greenwich 10 (roadside)				*1*	9	18	14
Greenwich 12 (background)				*26*			
Greenwich 13 (roadside)						*22*	
Greenwich Bexley 6 (roadside)		19	**47**	21	31	33	31
Greenwich 4 (suburban)	Annual mean	23	27	22	*23*	24	*21*
Greenwich 5 (roadside)		27	29	26	26	28	27
Greenwich 7 (roadside)		*35*	35	31	30	32	30
Greenwich 8 (roadside)				*47*	**45**	**47**	**43**
Greenwich 9 (roadside)				*17*		34	*25*
Greenwich 10 (roadside)				*25*	26	28	27
Greenwich 12 (background)				*8*			
Greenwich 13 (roadside)						*26*	
Greenwich Bexley 6 (roadside)		28	32	28	30	31	30

(Note - italics indicates < 90% data capture)

The results confirmed for each year of monitoring that there were days when the daily mean standard of 50 µg m^{-3} was exceeded. The 2004 daily mean objective was exceeded at the Greenwich 8 site only, as it had for all previous years of operation. The number of days that exceeded was less in 2007 than both 2005 and 2006, although the objective of not more than 35 days was easily exceeded. The Greenwich 5 and 9 sites had previously approached the 35 day threshold in 2003 and 2006 respectively, despite less than 90% data capture for the year at both sites. This suggests that the objective might have been exceeded with greater data capture. The results are also shown in Figure 7 and Figure 8.

The 2004 annual mean objective was exceeded at the Greenwich 8 site for the third year running, although the concentration was slightly less in 2007 (based on greater than 90% data capture). In line with other LAQN monitoring sites the highest annual mean concentrations arose during 2003, although concentrations in 2006 were also high in the Borough, which was consistent with monitoring elsewhere across London where 28 sites had increased 2006 annual mean concentrations when compared to 2005 (Fuller G. and Green D., 2006).

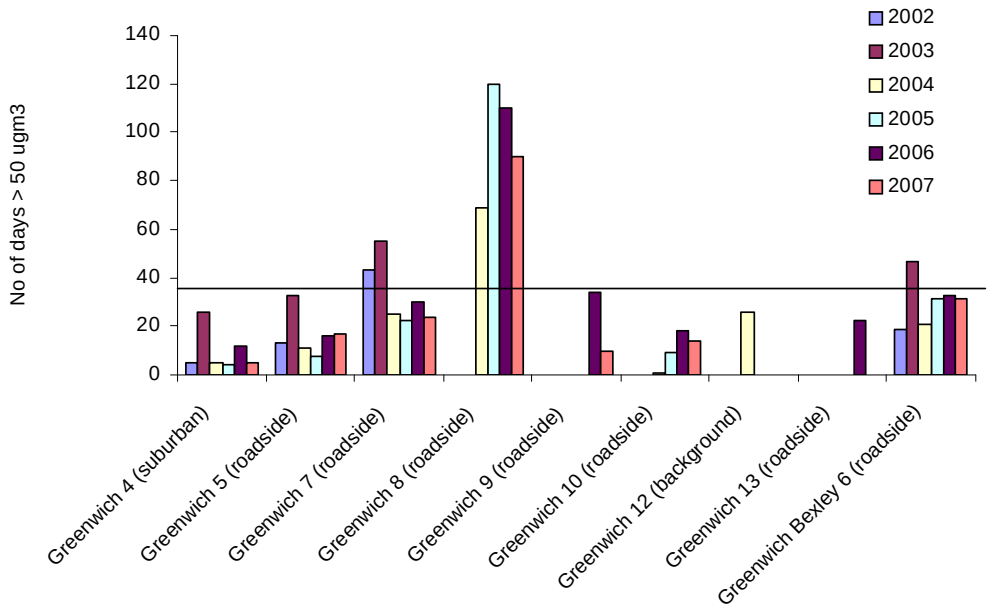

Figure 7 Number of days PM_{10} greater than 50 µg m^{-3} at the LB of Greenwich sites (2002 to 2007)

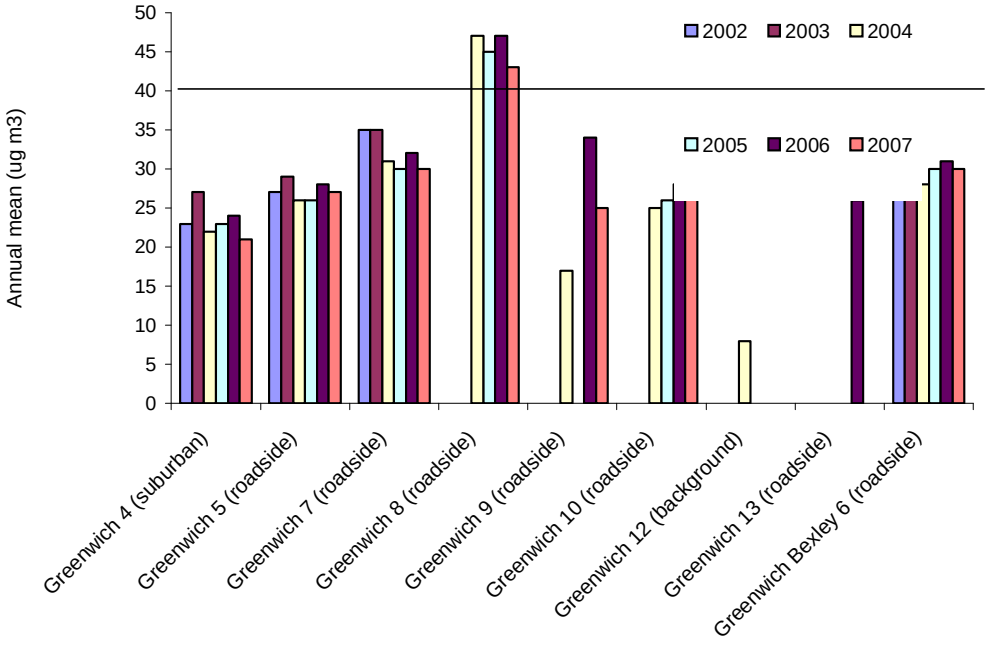

Figure 8 Annual mean PM_{10} (µg m^{-3}) at the LB of Greenwich sites (2002 to 2007)

An analysis of rolling annual mean PM_{10} concentrations and daily mean PM_{10} exceedences is provided for the Greenwich monitoring sites to indicate possible trends over time. The analysis is for the period from 1994 through to 2007 (and includes some provisional data for 2007). Figure 9 illustrates changing concentrations over time of rolling daily mean PM_{10} exceedences and Figure 10 changing rolling annual mean PM_{10} concentrations. The use of rolling data in this way largely removes seasonal influences and thus provides a guide to changing trends over time.

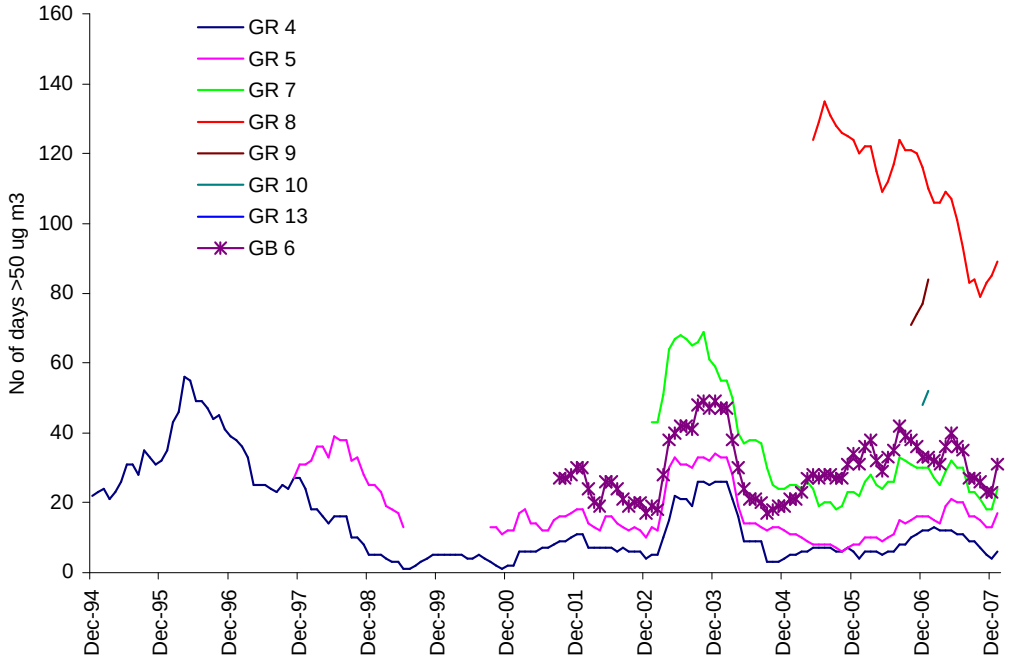

Figure 9 Rolling number of days PM_{10} > 50 µg m^{-3} for Greenwich monitoring sites (1994 to 2007)

The data for the Greenwich 4 background site represent the longest period and there was a reduction in the number of days exceeding, from around 23 days in 1995 to the around 5 days at the end of 2006, although the effect of 2006 meant that the number of days was reached 12 days earlier in the year. This reduction from 1994 also was not even and there were two notable years with episodes having high levels of particles, namely during 1996 and 2003. For both these years the number of days exceeding the standard rose to over 20 days. Concentrations at the end of 2007 however were similar to 2002 levels.

Averages based on London sites for the period from 1995 to 2000 show a downward trend from around 50 days above 50 µg m^{-3} to 10 days in 2002. By the end of 2004 the number of days exceeding the standard at background sites was comparable to that measured at the start of 2001, whereas inner London roadside sites had a higher number of days exceeding in 2004 than 2001 (ERG, 2006).

The datasets for the other sites represented a shorter period than that for the Greenwich 4 site. The roadside sites at Greenwich 5, Greenwich Bexley 6 and Greenwich 7 sites showed similar fluctuations to Greenwich 4, albeit with greater numbers of days exceeding due to their locations close to roads. The episodes during 2003 are also clearly seen. As with Greenwich 4 there was

an increase in the number of days increasing in 2006 from 2004 / 2005 levels, although this fell back during 2007 at the Greenwich 7 and Greenwich Bexley 6 sites. The data for the Greenwich 5 sites also indicated a break in data capture during 1999 and 2000.

The results for the Greenwich 8 roadside site near the Woolwich flyover showed a reduction in the number of days exceeding, between the start of data reporting in 2004 and the end of 2007, of approximately 40 days. Despite this the results for 2007 indicated that the site continued to easily exceed the objective with consistently more than 80 days exceeding in 2007.

The data for the other sites were all short term and reflected the start of operations of the sites post 2004, as a result it is too early to discern any trend.

The rolling annual mean trends for the Greenwich sites are shown in Figure 10.

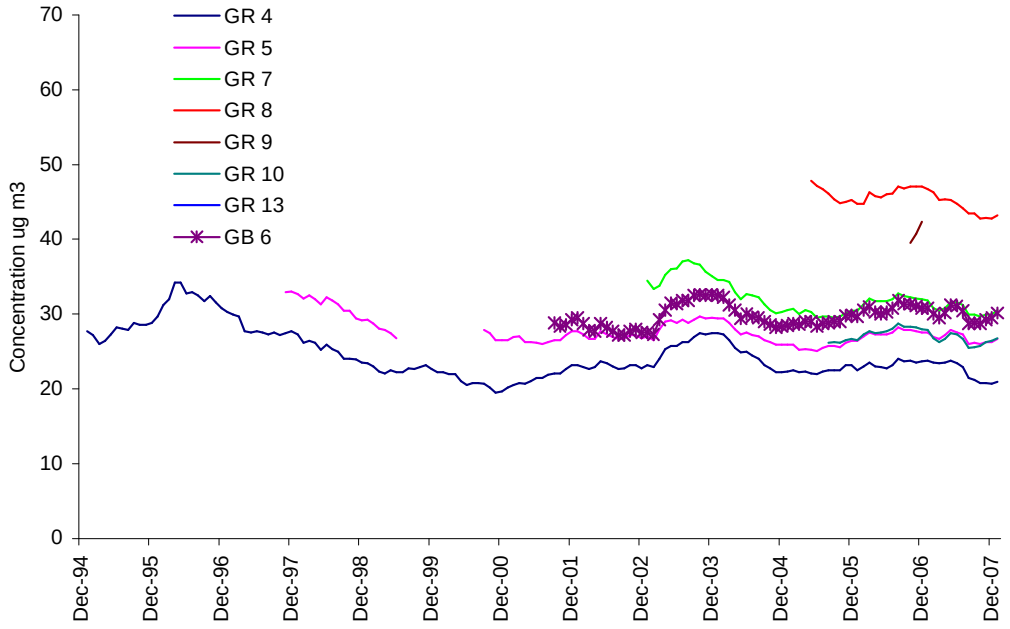

Figure 10 Rolling annual mean PM_{10} trends for Greenwich monitoring sites (1995 to 2007)

The rolling annual mean trends for the Greenwich sites all showed similar trends for the periods that overlapped. Concentrations at the Greenwich 4 were lower due to its location at a suburban background in Eltham, whereas concentrations at the Greenwich 8 roadside site near the Woolwich flyover remained greater than the annual mean objective. The trend for this site although over a shorter period indicated that rolling mean concentrations deceased slightly, but not below the annual mean objective.

The use of trends in this way highlights that although concentrations dropped to the year 2000, there has been an increase since. Post this period concentrations peaked as a result of the pollution incidents in 2003. However levels since dropped to pre 2003 levels and did not appear to be reducing further; indeed for the Greenwich sites overall there may have been a slight increase, possibly as a result of increasing primary PM_{10} emissions (ERG, 2006) rather than the predicted decrease in emissions.

A source apportionment of annual mean concentrations of PM_{10} in London was carried out by Fuller and Green (2006b). This analysis showed increases in the concentration of primary PM_{10} in London between 1999 and 2003 and that it was highly likely that these increases were due to increases in road transport emissions. It was less clear however if these increases are due to increases in tail pipe or non-tail pipe emissions.

2.6 $PM_{2.5}$ monitoring

The Council undertook the continuous measurement of $PM_{2.5}$ at its Greenwich 8, 9, 13 and Greenwich Bexley 6 and Bexley 3 sites in 2007. The Greenwich Bexley 6 site opened first in 2000. The Greenwich 9 and 12 sites opened in 2004, Greenwich 8 and 13 sites in 2006 and Bexley 3 in 2005. The Greenwich Bexley 6, Greenwich 8 and Bexley 3 sites use TEOM instruments, whereas the other three sites use FDMS instruments.

The unadjusted annual mean results for the monitoring sites are given in Table 8.

Table 8 $PM_{2.5}$ annual mean results ($\mu g\ m^{-3}$) at the long-term LB of Greenwich sites (2002 - 2007)

Site	2002	2003	2004	2005	2006	2007
Greenwich 12			*13*	19.2	*20.8*	
Greenwich 8					*20.5*	19.3
Greenwich 9			*9.8*	*18*	*18.4*	18.9
Greenwich Bexley 6	14.2	15.6	13.5	13.5	13.8	13.7
Greenwich 13					*14.3*	*15.8*
Bexley 3				*11.8*	12.3	12

(Note - italics indicates < 90% data capture)

It is recognised in recent reviews by WHO and the Committee on the Medical Effects of Air Pollutants (COMEAP) that suggested exposure to $PM_{2.5}$ gives a stronger association with the observed ill-health effects of particles. It is also noted that there is evidence that the coarse fraction between (PM_{10} – $PM_{2.5}$) has some effects on health (Defra, 2007).

As a consequence a new objective was included in the 2007 Air Quality Strategy. This is based on the health advice for $PM_{2.5}$, which shows that there is no accepted threshold effect, i.e. there is no recognised safe level for exposure to fine particles. As a result in its strategy, the Government adopted an 'exposure reduction' approach for $PM_{2.5}$ to seek a more efficient way of achieving further reductions in the health effects of air pollution. This is intended to provide a driver to improve air quality everywhere in the UK rather than just in a small number of localised hotspot areas.

The exposure reduction approach is based on the principle that for a pollutant with a low or zero threshold for adverse effects, it will generally be more beneficial to public health, and potentially more cost-effective to reduce pollutant levels across the whole population of an urban area or region rather than in a small area or "hotspot". The framework of delivering this approach contains two inseparable parts:

• Air quality objectives/limit values (often called "backstop objective" or "concentration cap") to ensure some basic level or quality of air which all citizens should experience, embodying the "environmental justice" concept

• An objective based on reducing average exposures across the most heavily populated areas of the country (often called "percentage reduction" or "exposure reduction" objective), to generate further cost effective public health improvements over and above the basic level of protection generated by the objective above.

While the percentage reduction objective is a relative measure of improvement (in this strategy, it is a 15 per cent reduction in average concentrations in urban background areas across the UK between 2010 and 2020), the backstop objective (or concentration cap) is designed to deliver a minimum level of protection applicable to all areas i.e. 25µg m^{-3} as an annual mean.

The above results for the Greenwich sites include results from both TEOM and FDMS instruments. As there is currently no agreed scaling factor for $PM_{2.5}$, the $PM_{2.5}$ data are reported without adjustment to a gravimetric equivalent (Defra 2007).

Based on this proviso, the results for all years and sites indicate that the backstop objective was not exceeded.

2.7 SO_2 monitoring

The Council undertakes SO_2 monitoring using a continuous analyser at its Greenwich 4 suburban background site in Eltham. Details of data capture for the period 2002 to 2007 are given in Appendix 1. The results indicate that the 15-minute mean standard of 266 µg m^{-3} was not exceeded at the site over this period, although this standard was approached in 2004. The maximum 15-minute mean for each year of monitoring is shown in Table 9.

Table 9 Maximum 15 minute mean concentrations of SO_2 monitoring (µg m^{-3}) (2002-2007)

LAQN Site	2002	2003	2004	2005	2006	2007
GR4	173.5	192.2	251	162.9	186.9	116.8

(Note - italics indicates < 90% data capture)

The 15-minute mean objective is the most stringent of the three SO_2 objectives; accordingly there were no recorded periods where the hourly and daily mean standards were exceeded.

The results confirm that the SO_2 objectives were met at the Greenwich 4 monitoring site in the Borough.

The SO_2 objectives and standards relate to short periods of high concentrations based on the impact of episodes of high pollution on human health. The relationship between annual mean concentrations and the standards however is not straightforward, but examination of annual mean concentrations over time can provide an insight to changes that are taking place. Figure 11 shows that annual mean concentrations have reduced over the past 9 years as a result of reductions in SO_2 emissions. This has arisen from the burning of gas rather than oil in industrial/ commercial and domestic settings, as well as reductions in S levels in the petrol and diesel fuels used by road vehicles.

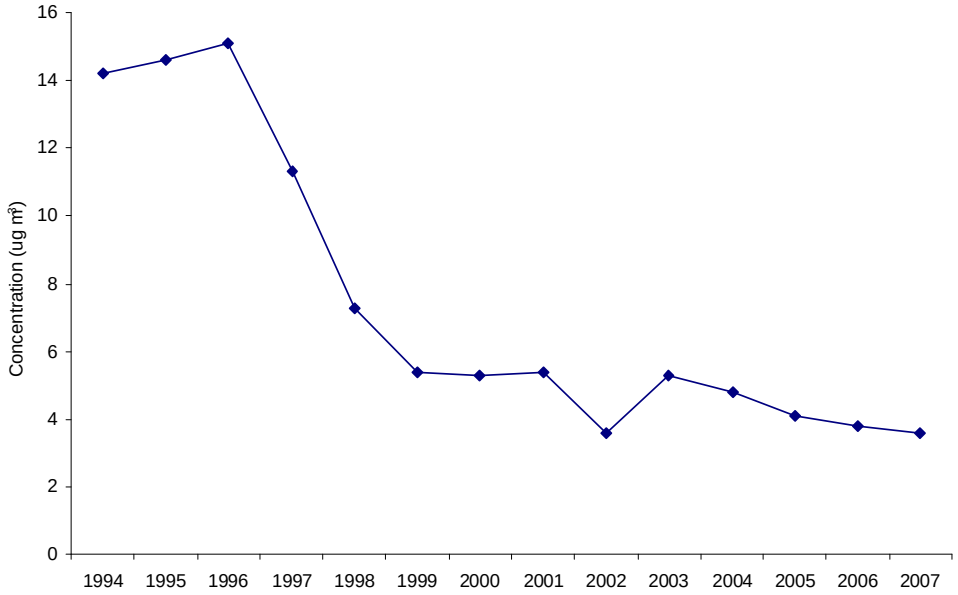

Figure 11 Annual mean SO_2 concentrations monitored at the Greenwich 4 site (1994 – 2007)

2.8 Ozone monitoring

The Council undertook the continuous measurement of ozone at its Greenwich 4 site in Eltham, Greenwich Bexley 6 roadside site at Falconwood, Greenwich 8 site near the Woolwich Flyover, Greenwich 9 at Westhorne Avenue and Greenwich 13 in Plumstead High Street. The Greenwich 8 and 9 sites opened in 2007. All sites are located at roadsides other than the Greenwich 4 site

The results for the period 2002 – 2007 are given in Table 10. The data capture for all years exceeded 90%; except 2004 for the Greenwich Bexley 6 site. This site opened in October of that year. Full details for the site are given in Table 16 in Appendix 1.

Table 10 Number of daily maxima exceeding 100 µg m^{-3} based on 8-hour running mean (2002-2007)

Objective	2002	2003	2004	2005	2006	2007
GR4	**11**	**31**	**11**	**15**	**33**	**15**
GB6			*0*	**11**	**14**	3
GR8						4
GR9						2
GR13					**26**	10

The Government's air quality objective, not to exceed 10 periods in a calendar year, was exceeded for all years in Greenwich. The year 2003 was most notable for having a very hot dry summer conducive to the formation of ozone; hence the much higher of periods during this particular year. In 2004 the weather was less conducive to the formation of ozone as was 2005. The 2003 total

was exceeded however during 2006 at Greenwich 4. In 2007 the summer was notable for being very wet and again these conditions were not conducive to the formation of ozone.

The LAQN annual mean index for ozone (which is based on an average of selected sites dependant on type and availability of data) has also shown that since 1996 through to the end of 2005 a 37% increase in levels, with further increases in 2006 (ERG, 2008). Thus this shows that concentrations of ozone have increased across London.

Conversely the roadside sites did not record any periods exceeding the objective. Lower ozone concentrations are to be expected at these sites in view of its location very close to a busy road. The sites however provide an understanding of oxidation close to polluted areas and possible future changes over time.

2 New local developments

This section outlines those local developments that have taken place that may affect air quality. These are not for consideration now but are listed for a more thorough assessment during the next round of Review and Assessment. The guidance identifies the following developments that should be considered:

- New industrial processes included in the list of Appendix 2 of LAQM. TG 03.
- New developments with an impact on air quality, especially those that will significantly change traffic flows. Only those developments with planning permission granted are included.
- New landfill sites, quarries, etc with planning permission granted and nearby relevant exposure.

Table 11 New Local Developments since 2007

Development	Location
New Part A or B industrial processes	See below
New retail or mixed residential/ commercial development	See below
New road scheme	None
New mineral or landfill development	None

3.1 New Part A/ B industrial processes

The Council permitted applications for dry cleaning establishments in 2007. In addition an application for a permit for a mobile crusher was received. These installations however are not considered to warrant further investigation under the LAQM regime however. (Details of the Part B installations permitted by the Council are given in Table 21). There has been no change to the Part A installations in the Borough.

3.2 Greenwich beacon status

Greenwich Council is committed to improving air quality. This has led to the Council becoming one of only four Beacon Authorities for air quality in the country. The Borough has been at the forefront of air pollution control for many years. Some programmes implemented include:

Smoke Control Area in the 1950s
Research into the accumulation of lead in children in the 1980s (leading to government action to introduce lead-free petrol).

The Council achieved Beacon status 2007 for its work on Section 106 agreements. As apart of its beacon status the Council un a very successful seminar on planning and air quality for other local authorities and produced a video that can be viewed at the following website (http://www.greenwich.gov.uk/Greenwich/YourEnvironment/Pollution/AirQuality/CleanerAirGreener Greenwich.htm)

3.3 Greenwich Local Development Framework (LDF)

The Planning & Compulsory Purchase Act 2004 introduced a new development plan system. This is intended to streamline the local planning process and enable a Local Development Framework (LDF) to replace previous Unitary Development Plans (UDP).

The 2006 Greenwich Unitary Development Plan (UDP) is the key document in the current Greenwich Local Development Framework (LDF). It was adopted on 20 July 2006 and comprises a collection of planning documents that together provide the land development strategy, policies and site proposals for Greenwich. Together with the London Plan, which provides strategic policies, it forms the development plan for the Borough. The UDP sets out the Council's vision for providing

new homes, jobs, transport and local services, while also protecting the environment. The 2006 Adopted UDP will itself be replaced by mid 2011.

The Local Development Documents that will comprise the Greenwich LDF are:

- The Local Development Scheme;
- Development Plan Documents;
- Supplementary Planning Documents;
- The Statement of Community Involvement; and
- The Annual Monitoring Report.

The Local Development Scheme (LDS) is a work programme for the production of a range of new planning policy documents about the use of land in the Borough. The latest Greenwich LDS was published in March 2008; it updated the previous Greenwich LDS from 2007. The Scheme sets out the planning policy documents that the Council will produce in the three-year period from 2008 to 2011 and an indication of the LDF work programme for the three years following to 2013. This period covers completion of the Unitary Development Plan, and commencement of a new Local Development Framework to replace it.

The Development Plan Documents that form the main basis of the LDF are the:

Core (Spatial) Strategy DPD
Development Control Policies DPD
Site Allocations DPD
Proposals Map
Area Action Plans

The Development Plan Documents (DPDs), starting with the Core Strategy, are to be assessed in an Examination by an independent Inspector, appointed by the Secretary of State.

The Supplementary Planning Documents do not form part of the statutory development plan but will provide further detail on the implementation of particular policies and proposals contained in a Development Plan Document. Supplementary Planning Documents must relate to policies or proposals in a development plan document.

The Statement of Community Involvement outlines how the Council intends to involve the public and other stakeholders in the preparation, alteration and continuing review of all Local Development Documents. It will also set out the Council's arrangements for consultation on planning applications for major development proposals. A draft was produced in September 2007 for consultation.

The role of Annual Monitoring Reports is to assess the major effects of planning policies in Local Development Documents (including the UDP), their effectiveness in achieving key national and local planning policy objectives such as housing provision, and to assess progress with the production of planning documents against milestones in the LDS. The Annual Monitoring Reports are submitted to the Secretary of State. The third AMR was submitted on time to Government Office for London in December 2007, and published online January 2008. Work on the fourth will commenced in July 2008. The key AMR finding is that the revised UDP was adopted on schedule.

3.4 Key development sites in Greenwich

The key development sites in the Borough include:

1) The Greenwich Peninsula/ Millennium Village. The peninsula area lies to the north of Greenwich and consists of a 121 hectare site, which is one of the UK's largest development sites of its type in recent years. A major landmark is the Millennium Dome, which is central to

regeneration of the area. As well as the 26,000-capacity arena, there are new homes, leisure, retail, and office developments. The development will also provide 24,000 jobs over the next fifteen years.

2) Woolwich regeneration which includes the DLR extension, which is due to open in 2009, and major private sector investment in Woolwich town centre, creating 46,450 square metres of new retail floor space, 1,500 new homes and over 1,000 new jobs in the next five years. These will be supplemented by a further 2,700 homes, shops and leisure areas on the Royal Arsenal, plus a rapid bus-based transit system linking Abbey Wood, Thamesmead, Woolwich, the Peninsula and Greenwich by 2010.
3) Tripcock Point/ Thamesmead, which will be a mixed-use development that will include: 2,000 new homes, live work units, offices, shops, hotel, community facilities and a new school. There is an emphasis on regenerating the area by including new public transport, environmental improvements and community facilities.
4) White Hart Triangle, the Borough's biggest industrial development, that is being transformed with the help of European funding and will, when completed, create about 2,000 new jobs. The site will provide space for various types of business on 161,900 square metres of formerly derelict land between Thamesmead and Woolwich. A new infrastructure has been developed to include a new access road and bridge, and the land has been decontaminated.
5) Thames Gateway Bridge which was provisionally given the go-ahead by the Council late in 2004 and subject to legal permissions; the bridge was expected to open in 2012. It was expected to stretch across the River Thames from Beckton in Newham to Thamesmead. In July 2007, however the Government announced they were deferring their decision on the construction of the bridge.

3.5 New developments and the use of biomass

The Revised London Plan, which is the capital's spatial strategy produced by the Mayor Of London requires greener development. Policy 4A.7 Renewable energy advices that “the Mayor will and Boroughs should in their DPDs adopt a presumption that developments will achieve a reduction in carbon dioxide emissions of 20% from onsite renewable energy generation (which can include sources of decentralised renewable energy) unless it can be demonstrated that such provision is not feasible. This will support the Mayor’s Climate Change Mitigation and Energy Strategy and its objectives of increasing the proportion of energy used generated from renewable sources by:

Requiring the inclusion of renewable energy technology and design, including: biomass fuelled heating, cooling and electricity generating plant, biomass heating, combined heat, power and cooling, communal heating, cooling and power, renewable energy from waste (Policy 4A.21), photovoltaic cells, solar water heating, wind, hydrogen fuel cells, and ground-coupled heating and cooling in new developments wherever feasible

Facilitating and encouraging the use of all forms of renewable energy where appropriate, and giving consideration to the impact of new development on existing renewable energy schemes.”

The London Boroughs are assessing the impact of this policy on local air quality, particularly regarding the use of biomass. A report was produced in 2008 by London Councils to assess the potential impact of widespread wood-fuelled biomass use across London and to provide guidance for dealing with applications from developers to install biomass burners. One specific concern to Boroughs has been that although many biomass burners will meet Clean Air Act requirements, the switch to gas over the last few decades has meant from an air quality perspective, boiler emissions have been significantly lower than the Act's requirements. Therefore although biomass boilers meet Clean Air Act standards, in many circumstances they still have the potential to produce emissions that are worse than the current gas equivalent.

Greenwich Council as a result of the regeneration in its area has received many applications for biomass plant and is considering its position on these proposals.

4 Action Plan Progress Report

4.1 Introduction

The LB of Greenwich Air Quality Action Plan was published in 2002. The Air Quality Action Plan sets out what the Council will be doing to improve air quality over the next few years. The plan focuses on measures to reduce traffic flow and vehicle emissions that are consistent with other Council wide policies, principally in relation to both transport and planning. The main aim is to reduce NO_X and PM_{10} emissions. Other actions include reducing emissions from buildings and industry, measures to raise public awareness of air pollution and greener travel. The Council through its Action Plan, and other policies, will also support other initiatives proposed and undertaken by other authorities to reduce emissions in the Borough.

4.2 Achievement of objectives

Greenwich Council is committed to improving air quality. This has led to the Council becoming one of only four Beacon Authorities for air quality in the country.

The Council's Action Plan applies to the Air Quality Management Area, which covers the whole of Greenwich. This recognises that, although not everyone in the Borough will be exposed to concentrations that exceed the air quality objectives, it is the intention of the Action Plan is to reduce pollution levels, wherever possible, in pursuit of the achievement of the objectives.

4.3 Summary of key measures

This section provides a brief summary of some of the key measures included in the Action Plan and also the Council's progress on these actions. An Action Plan Status table of the actions listed in the plan is provided in Appendix 1 (see Table 12).

4.3.1 Monitoring air quality

The Council has maintained its commitment to monitoring air quality in the Borough and reporting to other bodies, including Defra and GLA since release of its plan. As reported earlier the Council monitors air quality using 9 real-time monitoring stations, as well as with passive diffusion tubes which are located around the Borough. It is leading the use of new PM gravimetric equivalent monitoring instruments in its area. The Council is therefore a key part of the London Air Quality Network and current monitoring data and historic data for the sites can be viewed on the www.londonair.org.uk site.

4.3.2 Planning Policy and Control

The Council is using the planning system to bring air quality benefits, through imposing planning conditions and through using section 106 agreements for new developments, which are car free developments and demonstrate other air quality improvements.

The Council also supports the APPLE working group (Air Pollution Planning and the Local Environment) that is producing guidance to be used across London.

4.3.3 Traffic control and management

Actions undertaken and proposed include: reducing speed limits and the introduction of Home Zones and 20mph areas, maintaining the Lorry Ban in Trafalgar Road/ Romney Road and working with Transport for London (TfL).

£3.6m of funding was awarded to Greenwich in November 2007 to spend on local transport improvements to make the Borough safer, greener and more accessible. The Council allocated

funding in its Local Implementation Programme (LIP) towards highways and transport improvements, including bus priority, support for road renewal, bus priority, safer routes to schools, walking, cycling and the London Cycle Network and other improvements to support the Mayor's Transport Strategy.

Greenwich Council continues to promote Car Free Day, now in its seventh year, in Greenwich town centre to emphasise greener and sustainable travel, with a strong focus on cycling.

4.3.4 Travel Plans in Greenwich

Major travel plan initiatives include a community bus, funded from S106 money, servicing Greenwich Blackheath and the Herbert Hospital Site, and a car club using Government grants, situated in the Greenwich CPZ area. The Council produced a School Travel Plan Toolkit for schools and gives advice and information specifically on travel plans for larger employers.

4.3.5 Greenwich fleet

The Council promotes and encourages the uptake of cleaner fuels and technologies in its fleet and in other fleets operating in Greenwich. The Council has been greening its own vehicle fleet and many vehicles now run on a bio-diesel fuel mixture, which reduces carbon dioxide emissions.

4.3.6 Low Emission Zone

The Council in its Action Plan recognised that the London-wide Low Emission Zone (LEZ) would play an important part in benefiting air quality in the Borough. The Mayor of London has now introduced the LEZ, to cut harmful emissions from the most polluting lorries, coaches and buses. It was launched in February 2008, with the aim of improving air quality across the capital. From February 2008 the LEZ applied to lorries over 12 tonnes. Since the beginning of July 2008 the LEZ also applied to lighter lorries, buses and coaches.

4.3.7 Greenwich Council actions

These are shown in Table 12.

Table 12 Air Quality Action Status Table

No.	Action	Status	Follow – up Action
1	Greenwich Council will continue to implement all measures required of London Boroughs in the Mayor's Air Quality Strategy	On-going	Agreed
2	Greenwich Council fully supports the Low Emission Zone Study.	Completed	The LEZ was introduced in February 2008 by the GLA. The LEZ includes the phased implementation for different category vehicles
3	Should a Low Emission Zone for London prove viable, Greenwich Council will work with Transport for London and the London Boroughs in implementing appropriate schemes	On-going	As above
4	Greenwich Council will promote and encourage the uptake of cleaner fuels and technologies.	On-going	ULS diesel requirement on construction sites. Council vehicles currently run on ULS diesel. All Council vehicles to be Euro III compliant by 2010.
5	Greenwich Council will encourage the 'greening' of commercial vehicles through the promotion of funding available from the Energy Savings Trust	Completed	Grants ended March 2005
6	Greenwich Council will implement the Mayor's Transport Strategy at a local level through the Local Implementation Plan.	On-going	Agreed
7	Greenwich Council will work with Transport for London and The Highways Agency in seeking significant reductions in vehicle emissions on the A102 and the Transport for London Road Network (TLRN)	On-going	Now only TfL. Anticipated that Mayor's LEZ will assist + TfL. Anticipated that Mayor's LEZ which is supported by the Council will assist + Working towards demand management in Greenwich Town Centre
8	Greenwich Council will continue to work within SELTRANS to secure improvements in public transport so as to reduce car dependency.	On-going	A public transport accessibility programme is in progress. This has resulted in improved access to stations and bus stops using funding provided by TfL under the BSP and LIPRAF process
9	Greenwich Council will support Thames Gateway London Partnership measures that will improve air quality in and around Greenwich.	On-going	Greenwich is a member of TGLP

10	Greenwich Council promotes walking as a healthy and viable alternative to car transport.	On-going	Walking strategy implemented under LIP Including improved crossings/riverside footpaths/signage The programme aims to improve the walking experience by improving lighting and surfacing and therefore usage on all new developments and existing walking routes We have supported the good going campaign (now DIY Planet Repairs) to promote alternatives to single occupancy car use
11	Greenwich Council will promote cycling as a viable alternative to the car, including the provision of appropriate routes and facilities.	On-going	The Council supports and participates in the LCN and LCN+ programmes. Improvements to cycle parking facilities are also being made. The Council runs a cycle training programme part funded by TfL.
12	Greenwich Council will seek to reduce the number of car trips made during the school term by encouraging alternative modes of transport, through the Safer Routes to School Programme	On-going	The Council has a successful programme that will be complete by 2010.
13	Greenwich Council will continue to implement Home Zones and 20 mph areas, both as a traffic restraint to prevent 'rat running' and to put the needs of the pedestrian, mobility impaired, cyclists and children before those of the motorist.	On-going	Successful grant for one installed Home Zone. Now only 20 mph zones. The Council has an ongoing programme of 20 mph zones in existing residential areas. Opportunities are taken on new developments to introduce the Home Zone concept – the Millennium Village for example being pursued as best value for money. Home Zones on new schemes are being pursued
14	Greenwich Council will develop and implement a Green Transport Plan for the Borough.	On-going	Brochure "Green Transport Plan for Greenwich" produced in 2003 Greenwich Council Travel Plan being developed
15	Greenwich Council will work in developing and implementing Green Transport Plans for large employers in the Borough.	On-going	All major planning approvals include the provision of a green travel plan incorporating issues such as travel planning, car clubs and monitoring.

16	Greenwich Council will hold a Car Free Day each year to promote alternative forms of transport to the car.	On-going	Two awards received. Successful Festivals have been held annually. The 2005 festival won the event of the year category at the London Sustainable Transport Awards 2006 and the 2003 event won the TfL Travel Plan Award for 'Event of the Year', demonstrating the successful nature of the festivals.
17	Greenwich Council will continue to work with Transport for London and the London Boroughs in promoting and expanding the London Bus Priority Network.	On-going	Successful implementation of bus priority and bus accessibility schemes continues.
18	Greenwich Council will continue to work in partnership to promote bus travel as part of the London Bus Initiative	Completed	See above.
19	Greenwich Council will seek the further promotion of bus travel through Bus Quality Partnerships	On-going	The Council works closely with TfL on the provision of bus services
20	Greenwich Council will continue to work with Railtrack and rail operators to secure continuing improvements of the rail service provided to the Borough, including the development of a Metro Service.	On-going	Lobbying e.g. includes Integrated Kent Franchise East London Line Thames Link 2000 and Crossrail. The Council supports the aspirations in the TfL document T2025
21	Greenwich Council believes that the River Thames is an under used sustainable transport resources and will continue to promote the transport of people and goods by the river.	On-going	Pier at Woolwich (LIP) working - and the Council have facilitated the only commuter boat service on the river from Woolwich to Central London.
22	Greenwich Council is committed to the development of the Greenwich Waterfront Transit system and will continue to work with Transport for London towards the ultimate development of a tram system.	On-going	Tram-like low-emission hybrid bus will be operating by 2011
23	Greenwich Council will work with Docklands Light Railway Ltd in securing Ministerial approval for the development of the DLR extension to Woolwich Arsenal Station.	On-going	Due to open in 2009
24	Greenwich Council fully supports the Cross Rail Scheme and will lobby the Government to choose the Charlton line option to Woolwich Arsenal.	Completed.	Lobbying for station at Woolwich has succeeded, but subject to funding of Crossrail project. The Crossrail Bill was given Royal Assent and became the Crossrail Act 2008.

25	Greenwich Council will seek to meet the requirements of the Road Traffic Reduction Act in the Borough through the variety of measures discussed in the Council Local Implementation Plan.	On-going	The Council is liaising with TfL to look at the feasibility of introducing congestion charging in Greenwich. To date traffic and travel pattern surveys have been carried out and more analysis is needed before a decision on feasibility work can be made
26	Greenwich Council will use its Parking Strategy to control parking on new developments whilst also discouraging commuter parking and other less essential trips.	On-going	The Council's Parking Enforcement Plan contained in the LIP sets policies to control commuter parking, limit onsite parking on new developments thus discouraging car use. The Council has also kick started a successful car club in the West of the Borough and has investigated how this can be extended to give social inclusion benefits. Consider limiting resident parking to one per household
27	Greenwich Council will maintain the Trafalgar Road/Romney Road 7.5 tonne Lorry Ban in order to protect Greenwich Town Centre from air pollution and vibration.	On-going	Continuous AQ monitoring station installed since 1997
28	Greenwich Council will continue to implement traffic restraint measures to help create optimum driving conditions for the prevention of air pollution.	On-going	The Council is ensuring that road space is maximised for the benefit of all road users i.e. pedestrians, cyclists, public transport freight as well as private motor vehicles.
29	Greenwich Council will continue to use traffic restraint measures to direct heavy goods vehicles away from residential areas and onto the main primary and secondary roads.	On-going	An ongoing programme of restrictions is in place
30	Greenwich Council will seek to develop Freight Quality Partnerships in line with guidance produced by the Mayor for London.	On-going	The Council supports the Mayor's Freight Plan.
31	Greenwich Council will seek to work with Transport for London, London Councils and the London Boroughs in reviewing the London Night Time Lorry Ban, looking at the possibility of alleviating day time road congestion whilst avoiding night time sleep disturbance.	On-going	Review now 2 years old Still in force. The Council is participating in TfL reviews.
32	Greenwich Council will continue to protect river wharves, where viable, for the shipment of freight.	On-going	Current part of planning process included in the UDP
33	Greenwich Council will seek to significantly reduce traffic levels in Greenwich Town Centre with the aim of a part-pedestrian only Town Centre	On-going	Planned long-term. The Council is examining the feasibility of demand management.

34	Greenwich Council will continue to consult widely on significant transport schemes and measures	On-going	
35	Greenwich Council will continue to monitor transport schemes for their impact on air quality.	On-going	City Airport & TGB AQ stations planned
36	Greenwich Council will enforce the new powers laid down in The Road Traffic (Vehicle Emissions)(Fixed Penalty)(England) Regulations 2002, in conjunction with the Vehicle Inspectorate, Association of London Government and the London Boroughs	On-going	Designation has not been sought
37	Greenwich Council will continue to work with the Vehicle Inspectorate in vehicle emissions testing and awareness programmes carried out in the Borough. The Council will also work in conjunction with the Mayor for London in implementing vehicle maintenance awareness schemes	Completed	In 1998/1999 Fleet Management worked collaboratively with the Vehicle Inspectorate. This could be repeated if necessary.
38	Greenwich Council will work with the Vehicle Inspectorate, London Councils and the London Boroughs in publicising roadside emissions testing powers.	Completed	See 37
39	Greenwich Council will enforce powers to prevent motorists from leaving their engines running unnecessarily whilst stationary	Completed	Not pursued as problems with enforcement role
40	Greenwich Council will continue to regularly service and maintain all fleet vehicles to a high standard	On-going	Vehicles are subject to service schedules that comply with Operators Licence requirements and also some manufacturers recommendations
41	Greenwich Council will replace all pre-Euro II vehicles by 2005, with all Euro II heavy diesel vehicles fitted with particulate abatement technology, where possible, ensuring Euro III classification for these vehicles.	Completed	
42	Greenwich Council will purchase LPG powered vehicles and examine the potential for providing a LPG fuelling facility at Birchmere.	Completed	Not pursued at this time
43	Greenwich Council will use a non-metallic fuel additive with Ultra Low Sulphur Diesel to improve fuel efficiency and reduce emissions of PM_{10} and NO_2.	Completed	Implemented in 2003
44	Greenwich Council will continue to clean Borough roads which will help to remove dirt with the potential for re-suspension	On-going	
45	Greenwich Council will continue to operate a free-collection, community composting scheme which has the potential for reducing the level of garden bonfires in the Borough	On-going	Partial (6000) properties to extend to 70,000 with anaerobic digestion proposal. Otherwise taken in general collection to incineration. Fee disposal at C.A. site.

46	Greenwich Council will examine the viability of potential schemes to remove older, more polluting vehicles from the road	Completed	The Council has a successful programme of removal of abandoned vehicles and disposals of unwanted vehicles free on request.
47	Greenwich Council will continue to prevent air pollution and seek more sustainable forms of development through policies and measures contained in the Unitary Development Plan.	On-going	UDP published in 2006 which has specific references to air quality issues
48	Greenwich Council will continue to require ameliorating measures such as Green Transport Plans and vehicle fleet improvements via section 106 planning agreements.	On-going	Council achieved Beacon status 2007 for its work on Section 106 agreements
49	Greenwich Council will continue to seek financial contributions for air quality monitoring in the Borough via section 106 planning agreements, in line with the revised draft PPG 23.	On-going	See 48 above
50	Greenwich Council will continue to implement the Housing Energy Conservation Act thus improving energy efficiency in the Council's housing stock.	On-going	15 year programme. Currently in eleventh year of the strategy. The target is to achieve a 30% improvement in the overall energy efficiency of the housing stock. Our ten year report to DEFRA showed a 22.75% improvement and letters from GoL have accredited the Council with Good performance.
51	Greenwich Council is implementing an Energy Strategy that will reduce the overall emissions of nitrogen dioxide and PM_{10} particulates by using non-fossil fuel energy sources.	On-going	6^{th} largest non-fossil energy user in London. 65% electricity is "new" renewable energy 5% biodiesel fleet. PM_{10} & NO_2 emissions reduction concomitant with a reduction of 19000t of CO_2
52	Greenwich Council will implement a Corporate Procurement Strategy that will seek to reduce transport related emissions by using the influence of the Council's purchasing procedures.	Completed	Not vigorously pursued. To be re-examined. Since October 2006, all vehicles purchased for the Council's fleet are Euro IV compliant
53	Greenwich Council will continue to enforce Clean Air Act legislation	On-going	
54	Greenwich Council will continue to support the Environment Agency in ensuring that all Part A Processes in the Borough utilise the Best Available Techniques in controlling polluting emissions.	On-going	
55	Greenwich Council will continue to ensure that all Part B Processes in the Borough utilise the Best Available Techniques Not Entailing Excessive Cost and also meet emission limits that are tighter than guidance values, wherever possible.	On-going	

56	Greenwich Council will continue to enforce the Statutory Nuisance provisions under the Environmental Protection Act 1990, particularly where there is a risk due to emissions of dust.	On-going	
57	Greenwich Council will control dust emissions from large scale development sites by ensuring that our Protocol on Dust is followed	On-going	Now use GLA/London Councils "the control of dust and emissions from construction and demolition"
58	Greenwich and Lewisham Councils will continue to work closely in controlling dust emissions from large scale developments affecting both Boroughs	On-going	
59	Greenwich Council will monitor nitrogen dioxide and PM_{10} particulate levels throughout the Borough and especially in areas of concern	On-going	NO_2 diffusion tube survey. PM_{10} and NO_2 at nine sites
60	Greenwich Council will continue to expand the automatic monitoring network to 7 stations by 2004	Completed	4 stations at end of 2002. 8 stations at end of 2004.
61	Greenwich Council continues to fully support and participate in the London Air Quality Network and National Automatic Urban and Rural Network of air quality monitoring stations	On-going	Funding has been made available via Defra/Greenwich and TfL to run stations until April 2009
62	Greenwich Council will work in partnership with the Greenwich Primary Care Trust in sharing information, cutting inequalities and improving health	On-going	

5 Conclusion

This Air Quality and Action Plan Progress Report for 2007 fulfils the requirements of the Defra PRG 03 guidance and has updated monitoring results in the Borough and noted new relevant local developments and other initiatives.

The up to date monitoring results continue to indicate that the Government's current air quality objectives for NO_2 and PM_{10} are being exceeded widely at locations across the Borough where there is relevant public exposure. Based on the findings in this report there is no need to progress to a Detailed Assessment either to revoke its existing AQMA or determine whether any new AQMAs are required.

The purpose of the Council's Air Quality Action Plan is to ensure that air quality is considered corporately and to seek to reduce air pollution within the Borough, in pursuit of the Government's air quality objectives. The Council is however limited in its abilities to influence local air quality directly as outlined in its Stage 4 Further Assessment report, partly as a result of pollution arising elsewhere in London (and beyond) and also because it has limited responsibility for the main sources of emissions within the Borough. The major roads in the Borough are the responsibility of Transport for London and the Highways Agency, rather than the Council. The Action Plan does however include measures to seek to reduce traffic flow and vehicle emissions that are consistent with other Council policies.

The Council's progress on the individual actions was given in Table 12. The Action Plan originally included 62 actions. The report confirms that 13 were completed. The remaining actions are all on going.

The Council will continue its air quality monitoring programme and prepare for the next round of review and assessment, including the next Updating and Screening Assessment in 2009.

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Appendix 1

Table 13 NO_2 data capture for year (%)

LAQN site	Type	2002	2003	2004	2005	2006	2007
Greenwich 4	S	98	97	97	84	93	96
Greenwich 5	R	99	99	99	95	76	27
Greenwich 7	R		90	88	92	96	98
Greenwich 8	R			45	96	96	99
Greenwich 9	R			11	97	81	95
Greenwich 10	R			28	98	98	99
Greenwich 12	U			41	99	89	88
Greenwich 13	R					92	98
Greenwich Bexley 6	R	98	92	100	99	97	98

Table 14 SO_2 data capture for year (%)

LAQN site	Type	2002	2003	2004	2005	2006	2006
Greenwich 4	S	95	98	99	94	93	92

Table 15 PM_{10} data capture for year (%)

LAQN site	Type	2002	2003	2004	2005	2006	2007
Greenwich 4	S	94	99	91	78	96	77
Greenwich 5	R	95	98	99	97	99	99
Greenwich 7	R	92	92	90	98	99	99
Greenwich 8	R			47	98	98	98
Greenwich 9	R			3		77	36
Greenwich 10	R			23	97	99	94
Greenwich 12	U			36			
Greenwich 13	R					87	
Greenwich Bexley 6	R	94	94	99	98	95	94

Table 16 Ozone data capture rate for year (%)

LAQN site	Type	2002	2003	2004	2005	2006	2007
Greenwich 4	S	97	91	96	98	93	98
Greenwich Bexley 6	R			25	99	96	95
Greenwich 8	R						86
Greenwich 9	R						99
Greenwich 13	R					92	99

Table 17 Benzene diffusion tube sites in LB of Greenwich

Code	Site	Type	Road /Area
GW29	Woolwich Road	Roadside	A206 / SE7
GW33	Blackheath Hill (9)	Roadside	A2 / SE10
GW34	Bannockburn School	Roadside	A206 / SE18
GW35	Greenwich Mini Town Hall	Roadside	A206 / SE10
GW36	Blackwall Lane Lorry Park	Roadside	A102 (M) / SE10
GW38	Westhorne Avenue (579)	Intermediate	A205 / SE9
GW39	Bexley Road (ECC) (Triplicate)	Background	A210 / SE9
GW41	Sidcup Road (691)	Roadside	A20 / SE9
GW42	Greenwich Church Street (46)	Roadside	A200/6 / SE10
GW43	Creek Road / McMillan St	Roadside	A200 / SE8
GW50	Peartree Way (Triplicate)	Roadside	A102 (M) / SE10
GW51	Bugsby's Way	Roadside	A2211 / SE10
GW54	Westhorne Avenue (579)	Intermediate	A205 / SE9
GW55	Crown Woods Way (Triplicate)	Roadside	A2 / SE9

Table 18 $PM_{2.5}$ data capture for year (%)

Site	2002	2003	2004	2005	2006	2007
Greenwich 12			31	96	83	0
Greenwich 8					64	98.8
Greenwich 9			3	68	79	98.1
Greenwich Bexley 6	100	99	99	99	97	95.2
Greenwich 13					87	67.5
Bexley 3				31	100	100

Table 19 2007 uncorrected annual mean NO_2 diffusion tube results for LB of Greenwich (µg m^{-3})

	2002	2003	2004	2005	2006	2007
GW23		45	44	47	44	54
GW24	35	52	56	54	57	62
GW25	36	51	52	52	52	57
GW26		44	45	46	46	48
GW27		54	55	58	57	58
GW29	43	58	57	65	67	69
GW32	31	49	52	51	48	54
GW33	30	52	60	63	62	73
GW34	33	45	51	48	50	50
GW35	46	73	82	75	89	83
GW36	32	52	56	54	55	55
GW37	22	28	28	29	27	28
GW38	33	44	35	40	38	47
GW39 mean	21.0	25.0	26.0	25.3	25.0	26.5
GW40	20	25	24	24	27	27
GW41	29	48	45	46	44	48
GW42	38	59	55	61	59	65
GW43	35	57	60	59	61	64
GW44		48	43	47	48	61
GW45			54	52	51	56
GW48	38	51	51	50	50	58
GW49	49	51	48	50	51	49
GW50 mean	33.0	50.0	59.0	67.3	73.3	72.1
GW51	34	44	45	47	47	51
GW52	33	54	48	44	48	53
GW53	28	45	45	44	46	52
GW54	42	53	54	55	55	57
GW55 mean	34.0	50.7	50.0	49.3	49.0	55.4
GW56	43	43	43	43	50	63
GW57 mean		38.0	45.0	43.3	45.0	50.4
GW58 mean		49.3	46.7	51.3	50.3	53.5
GW59 mean				43.7	45.3	47.0
GW60 mean				43.7	45.0	53.4
GW61 mean						43.8
GW101	50	48	63	63	78	80
GW102	50	52	64	64	65	75

Table 20 NO_2 diffusion tube site locations and distance to kerb

Code	Site	Type	OS Grid Ref. TQ	Kerb dist. (m)	Road/Area
GW23	Siebert Road	Roadside	540420-177706	17.2	A102/SE3
GW24	Plumstead Common Road	Roadside	543806-177951	3	SE18
GW25	Eltham Road	Roadside	540099-174881	3	A20 / SE12
GW26	Footscray Road	Roadside	544015-173139	0.5	A211/SE9
GW27	The Village	Roadside	541645-177874	0.5	B210/SE7
GW29	Woolwich Road	Roadside	541167-178512	1	A206 / SE7
GW32	Old Dover Road	Roadside	540664-177235	17.1	A102/SE3
GW33	Blackheath Hill (9)	Roadside	537971-176776	1.5	A2 / SE10
GW34	Bannockburn School	Roadside	545490-178543	3	A206 / SE18
GW35	Greenwich Mini Town Hall	Roadside	539529-178280	1.5	A206 / SE10
GW36	Blackwall Lane Lorry Park	Roadside	539322-179235	30	A102/ SE10
GW37	De Lucy School, Cookhill Rd	Background	546630-179557	215	A2016 / SE2
GW38	Westhorne Avenue (579)	Intermediate	541885-175045	30	A205 / SE9
GW39	Bexley Road (ECC) (Triplicate)	Background	543986-174660	30	A210 / SE9
GW40	Shrewsbury House	Background	544065-176996	575	A207 / SE18
GW41	Sidcup Road (691)	Roadside	543384-172773	3	A20 / SE9
GW42	Greenwich Church Street (46)	Roadside	538329-177651	2	A200/6 / SE10
GW43	Creek Road / McMillan St	Roadside	537353-177632	6	A200 / SE8
GW44	Eltham High Street (Library)	Roadside	543096-174439	3.6	A210/SE9
GW45	General Gordon Place	Roadside	543641-178781	5	A205/SE18
GW48	Greenwich South Street (60)	Roadside	538044-176960	2.5	A2211 / SE10
GW49	Woolwich High Street (RSH)	Roadside	543472-179217	1	A206 / SE18
GW50	Peartree Way (Triplicate)	Roadside	540203-178367	3.5	A102/ SE10
GW51	Bugsby's Way	Roadside	539730-178948	2	A2211 / SE10
GW52	Woolwich Road	Roadside	542842-179108	1.5	A206 / SE18
GW53	Shooters' Hill Road	Roadside	542181-176878	1.5	A207 / SE3
GW54	Westhorne Avenue (579)	Roadside	541915-175039	2.5	A205 / SE9
GW55	Crown Woods Way (Triplicate)	Roadside	545005-175097	1.5	A2 / SE9
GW56	Felhampton Road	Roadside	543679-172598	1.5	A20 / SE9
GW57	Trafalgar Road (Triplicate)	Roadside	538965-177952	7	A206 / SE10
GW58	Maidenstone Hill	Roadside	538143-176710	4	A2 / SE3
GW59	Westhorne Avenue (Triplicate)	Roadside	541883-175016	13	A205 / SE9
GW60	Burrage Grove AEI (Triplicate)	Roadside	544086-178882	17	A206 / SE18
GW61	Millennium Village (Triplicate)	Background	540175-17900		A102 / SE10
GW101	Plumstead Road (136)	Roadside	544727-178884	1	A206 / SE18
GW102	Burrage Grove AEI	Roadside	544075-178898	1	A206 / SE18

Table 21 Part B installations in LB Greenwich

Ref	Reg. Category	Name	Address	Postcode	Status
102	Cremation of Human Remains	Eltham Crematorium	Crown Woods Way, Eltham	SE9 2RF	Permitted
110	Concrete Batching	Tarmac	Murphy's Wharf, Lombard Wall, Charlton	SE7 7SH	Permitted
112	Roadstone Coating	Aggregate Industries (UK) Ltd	Angerstein Wharf, Horn Lane, Greenwich	SE100RT	Permitted
126	Ferrous and Non- Ferrous Metal Processing	Essex Replica Castings (Basildon) Ltd	108-112 Westmoor Street, Charlton	SE7 8NQ	Permitted
127	Vehicle Respraying	WJ King (Garages) Ltd	40 Artillery Place, Woolwich	SE181SF	Permitted
130	Ferrous and Non- Ferrous Metal Processing	Stone Foundries	Woolwich Road, Woolwich	SE7 8SL	Permitted
138	Roadstone Coating	Tarmac	Riverside Wharf, Herringham Road, Charlton	SE7 8SJ	Permitted
140	Manufacture of Printing Inks	Apollo Colours Ltd	127 Nathan Way, West Thamesmead Business Park, London	SE28	Permitted
141	Concrete Batching	London Concrete	Angerstein Wharf, Horn Lane, Greenwich	SE10	Permitted
144	Fixed Concrete Crusher	Day Aggregates	Murphy's Wharf, Lombard Wall, Charlton	SE7 7SH	Permitted
145	Concrete Batching	Hanson Premix	303 Tunnel Avenue, Greenwich	SE100QE	Permitted
147	Fixed Concrete Crusher	Murphy's (Waste) Ltd	Transfer Station, Horn Lane, Greenwich	SE100RT	Permitted
148	Concrete Batching	CEMEX	Angerstein Wharf, Horn Link Way, Greenwich	SE100RT	Permitted
149	Mobile Concrete Crusher	Toulouse Plant Hire Ltd	55-71 Norman Road, Greenwich	SE109QF	Application
150	Concrete Batching	Euromix Concrete Ltd	Brewery Wharf, Norman Road, Greenwich	SE109QZ	Permitted
152	Vehicle Respraying	Southside Accident Repair centre	123/125 Nathan Way, Thamesmead	SE280AB	Permitted
153	Mobile Concrete Crusher	O'Keefe Construction Greenwich) Ltd	St. Andrew's House, 1 Dreadnought Street, Greenwich	SE10 0PU	Permitted
201	Petrol Station	Asda Petrol Station	Bugsby Way, Charlton	SE7 7ST	Permitted
202	Petrol Station	Total Fina	176 Footscray Road, New Eltham	SE9	Permitted
203	Petrol Station	Morrison Petrol Station	Thamesmere Drive, Thamesmead	SE288RE	Permitted
204	Petrol Station	J Sainsbury plc	Messeter Place, Eltham	SE9	Permitted
205	Petrol Station	Star Lee Service Station	1 Sidcup Road, Lee	SE128BL	Permitted
206	Petrol Station	Snax 24 Ltd PFS	79 Kidbrooke Park Road, Blackheath	SE3	Permitted
208	Petrol Station	JET Service Station	177-189 Creek Road, Deptford	SE8 3OU	Permitted
210	Petrol Station	Trafalgar Filling Station	43-45 Trafalgar Road, Greenwich	SE109TT	Permitted
211	Petrol Station	Hexagon Service Station	340 Woolwich Road, Charlton	SE7	Permitted
213	Petrol Station	Thamesmead Service Station	1-3 Bostall Hill, Abbey Wood	SE2 0RB	Permitted
215	Petrol Station	Eltham Service Station	39-41 Eltham High Street, Eltham	SE9 1DH	Permitted
216	Petrol Station	Shell Service Station	160-168 Plumstead Common Road, Plumstead	SE18 2UL	Permitted
217	Petrol Station	Lakedale Service Station	190-214 Plumstead High Street, Plumstead	SE18 1JH	Permitted

218 Petrol Station	Blackheath Service Station	37A Shooters Hill Road, Blackheath	SE3 7HS	Permitted
219 Petrol Station	Shell Service Station	165 Shooters Hill Road, Blackheath	SE3	Permitted
220 Petrol Station	Shell Service Station	Next to 551 Sidcup Road, Eltham	SE9 3AF	Permitted
221 Petrol Station	Shell Service Station	728 Sidcup Road, Eltham SE9	SE9	Permitted
223 Petrol Station	Shell Service Station	7-9 Tudor Parade, Well Hall Road, Eltham	SE9 5SX	Permitted
224 Petrol Station	Clifton Service Station	59 Sidcup Road, Lee	SE12 8BL	Permitted
230 Petrol Station	WJ King (Garages) Ltd	40 Artillery Place, Woolwich	SE184AE	Permitted
231 Petrol Station	J Sainsbury plc	Bugsby Way, Charlton	SE10	Permitted
301 Dry Cleaners	The Village Dry Cleaners	135 Lee Road	SE3 9DS	Permitted
302 Dry Cleaners	Panache Dry Cleaners	192 Court Road, Eltham	SE9 4EW	Permitted
303 Dry Cleaners	Westmount Dry Cleaners	146 Westmount Road, Eltham	SE9 1XA	Permitted
304 Dry Cleaners	Greenwich Dry Cleaners	25 Woolwich Road, Greenwich	SE10 0RA	Permitted
305 Dry Cleaners	Taylor's Cleaners	68 Herbert Road, Plumstead	SE18 3SH	Permitted
306 Dry Cleaners	Westcombe Dry Cleaners	74 Westcombe Hill	SE3 7DY	Permitted
307 Dry Cleaners	Morrisons Supermarket	2 Twin Tumps Way	SE28 8RD	Permitted
308 Dry Cleaners	Cleantech Dry Cleaners	213 Eltham High Street	SE9 1TX	Permitted
309 Dry Cleaners	Elegance Dry Cleaners	172 Westcombe Hill	SE3 7DH	Permitted
310 Dry Cleaners	Collins Cleaners	3 Stratheden Parade	SE3 7SX	Permitted
311 Dry Cleaners	Well Hall Express	18 Well Hall Parade, Eltham	SE9 6SP	Permitted
312 Dry Cleaners	Woolwich Express	59 Woolwich New Road	SE18 6ED	Permitted
313 Dry Cleaners	Cleaners of Eltham	10 Well hall Road, Eltham	SE9 6SF	Permitted
314 Dry Cleaners	Tailored Press	130 Plumstead Common Road	SE18 2UL	Permitted
315 Dry Cleaners	Soma Dry Cleaners	237 Greenwich High Road	SE10 8NB	Permitted
316 Dry Cleaners	Collins Dry Cleaners	168 Trafalgar Road, Greenwich	SE10 9TZ	Permitted
318 Dry Cleaners	Spotless Dry Cleaners	168 Shooters Hill Road	SE3 8RP	Permitted
319 Dry Cleaners	Early Bird Dry Cleaners	139 Plumstead High Street	SE18 1SE	Permitted
320 Dry Cleaners	Sew Clean	252 Plumstead High Street	SE18 1JN	Permitted
321 Dry Cleaners	Rosam Dry Cleaners	173 Trafalgar Road	SE10 9TX	Permitted
322 Dry Cleaners	Unique Dry Cleaners	6 Frances Street, Woolwich	SE18 5EF	Permitted
323 Dry Cleaners	Court Yard Dry Cleaners	29 Court Yard, Eltham	SE9 5PR	Permitted
324 Dry Cleaners	Victory Dry Cleaners	196 Bexley Road	SE9 2PH	Permitted
325 Dry Cleaners	Asik Dry Cleaners	88 Plumstead High Street	SE18 1SL	Permitted
326 Dry Cleaners	Attrill's	413, Footscray Road	SE9 3UL	Permitted
327 Dry Cleaners	Village Dry Cleaners	I The Village, Charlton	SE7 8UG	Permitted
328 Dry Cleaners	Royal Dry Cleaners	27 Lewisham Road	SE13 7QS	Permitted