TOWER HAMLETS

Fourth Round Updating and Screening Assessment
for
London Borough of Tower Hamlets

Mile End Ecology Park

October 2009

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Contact at Tower Hamlets Council for enquiries regarding this report

Deshni Nadar
Environmental Protection
Mulberry Place (AH)
PO Box 55739
5 Clove Crescent
London E14 2BG
Tel: 020 7364 5008

E-mail: deshni.nadar@towerhamlets.gov.uk

Executive Summary

The Council is required to review and assess air quality against the objectives in the Air Quality Regulations 2000 and amendment regulations as part of a rolling three-year cycle ending in 2017. The air quality objectives to be assessed are for the following seven pollutants: carbon monoxide, benzene, 1,3-butadiene, lead, nitrogen dioxide, sulphur dioxide and particles (PM_{10}).

The role of the local authority Review and Assessment process is to identify any relevant areas where it is considered that the government's air quality objectives for the above air pollutants will be exceeded. The London Borough of Tower Hamlets has previously undertaken the earlier rounds of Review and Assessment of local air quality management and identified areas where some of the objectives are exceeded and where there is relevant public exposure.

This report concerns the fourth round Updating and Screening Assessment of air quality in the London Borough of Tower Hamlets area. It has re-examined pollution sources and air quality monitoring in its area in accordance with Defra LAQM guidance (released February 2009).

The report identifies that:

For carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide there is not a significant risk of the objectives being exceeded in the Council's area.

For nitrogen dioxide and particles PM_{10} the Council has previously designated an AQMA across the Borough. The findings from this report indicate that the AQMA should be maintained.

In view of the findings from the report the Council will undertake the following actions:

1. Undertake consultation with the statutory and other consultees as required.

2. Maintain the existing and proposed monitoring.

3. Continue with the implementation of its Air Quality Action Plan in pursuit of the AQS objectives.

4. Prepare for the submission of its 2010 Progress Report.

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1. Introduction

1.1 Brief description of the London Borough of Tower Hamlets area

The London Borough of Tower Hamlets is situated in east London. It is a compact an inner London Borough comprising a densely populated area with a population of around 215,000 and an area of approximately 20km^2. The Borough includes the districts of Poplar, Stepney and Bethnal Green. Much of the redeveloped Docklands region of London, including West India Docks and Canary Wharf is also located in the Borough. Formerly there were major industrial areas along the river however industry has declined, mostly replaced by housing and commercial development. The Borough has a broad socio-economic range, but includes socially deprived areas. The main roads that run through the Borough include A13 starting at Aldgate and heading east. The A12 also starts at Aldgate and crosses the river Lea at Bow. Roads are busy at all times, particularly during the rush hours; and much of the Borough is a controlled parking zone, to prevent commuter parking. The principal rail services commence at Fenchurch Street, with one stop at Limehouse; and Liverpool Street, with stops at Bethnal Green and Cambridge Heath. The Docklands Light Railway was built to serve the Docklands areas of the Borough, and the interchange at Poplar allows trains to proceed north to Stratford and south via Canary Wharf towards Lewisham. London Underground services also cross the district, including the District, Metropolitan Central and Jubilee Lines.

The main sources of air pollutants are the busy and congested roads. There is also one Part A2 and just over 40 smaller Part B industrial and other minor installations in the Borough that are regulated by the Council. The Environment Agency has also received an application for a Part A installation at the Energy Centre in Riverside South.

1.2 Purpose of report

This report provides the 2009 Updating and Screening Assessment of air quality for the London Borough of Tower Hamlets. The purpose of the report is to fulfil the Council's initial obligation under the fourth round review and assessment of air quality. In so doing it will determine whether or not a there is a risk that an air quality objective will be exceeded in the Borough and therefore whether or not the Council needs to undertake a Detailed Assessment of air quality.

Part IV of the Environment Act 1995 introduced new responsibilities to both national and local government throughout the UK. These responsibilities included the requirement upon the national government and devolved administrations to develop an Air Quality Strategy (AQS) for England, Wales, Scotland and Northern Ireland. The overall purpose of the AQS is to seek improvements in air quality for the benefit of public health. The most recent AQS was produced in 2007.

Local air quality management (LAQM) was also introduced by the Environment Act 1995. Under this local authorities are required to periodically review and assess air quality across their areas. The AQS confirms that LAQM provides a major component of the government's plan for air quality improvement across the UK.

Air quality objectives have been set for those air pollutants deemed to be of most concern and relevance by the AQS. Seven of these pollutants are included under the LAQM regime and regulations for these were introduced. The applicable air quality objectives for the relevant pollutants are given in Table 1. Additional objectives have been set for ozone, polyaromatic hydrocarbons (PAHs) and $PM_{2.5}$, although these have been deemed the responsibility of national government and therefore not applicable to the LAQM process.

The objectives are all based on health-related standards, using current scientific advice and taking into account the likely cost and benefits, as well as the feasibility and practicality in meeting the objectives. The objectives are mostly in line with limit values prescribed by EU Directive, although additional objectives (including bringing forward the date for compliance) were included for some pollutants.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928) and The Air Quality (England) (Amendment) Regulations 2002 (SI 3043) (see Table 1). This table shows the objectives in units of micrograms per cubic metre $\mu g\ m^{-3}$ (and milligrammes per cubic metre, $mg\ m^{-3}$ for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1 Air quality objectives (from the Air Quality Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002) applicable to the London Borough of Tower Hamlets area

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu g\ m^{-3}$	Running annual mean	31.12.2003
	5.00 $\mu g\ m^{-3}$	Annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 $mg\ m^{-3}$	Maximum daily running 8-hour mean	31.12.2003
Lead	0.5 $\mu g\ m^{-3}$ 0.25 $\mu g\ m^{-3}$	Annual mean Annual mean	31.12.2004 31.12.2008
Nitrogen dioxide (NO_2)	200 $\mu g\ m^{-3}$ not to be exceeded more than 18 times a year 40 $\mu g\ m^{-3}$	1-hour mean Annual mean	31.12.2005 31.12.2005
Particles (gravimetric)	50 $\mu g\ m^{-3}$, not to be exceeded more than 35 times a year 40 $\mu g\ m^{-3}$	24-hour mean Annual mean	31.12.2004 31.12.2004
Sulphur dioxide (SO_2)	350 $\mu g\ m^{-3}$, not to be exceeded more than 24 times a year 125 $\mu g\ m^{-3}$, not to be exceeded more than 3 times a year 266 $\mu g\ m^{-3}$, not to be exceeded more than 35 times a year	1-hour mean 24-hour mean 15-minute mean	31.12.2004 31.12.2004 31.12.2005

(Note – the provisional PM_{10} objectives were not adopted in England as part of the revised 2007 AQS).

1.4 Summary of previous Reviews and Assessments of Air Quality in Tower Hamlets Borough

The Council completed its first round review and assessment of air quality during 2000. This found that the main issue with respect to local air quality was emissions emanating from road vehicles, specifically leading to predictions that the NO_2 and PM_{10} AQS objectives would be exceeded. As a result of these findings the Council designated an Air Quality Management Area (AQMA) across the Borough for both NO_2 and PM_{10} in December 2000. The findings for the other five LAQM pollutants were that the relevant AQS objectives were likely to be met and therefore an AQMA for these pollutants was not needed.

As a result of designating its area an AQMA the Council then undertook a further assessment to refine understanding and inform its proposed air quality actions. These were set out in the Council's Air Quality Action Plan, which was produced in December 2003.

The Council has also undertaken subsequent review and assessments of air quality. The third round of review and assessment, which started in 2006, confirmed that the air quality objectives for NO_2 and PM_{10} were exceeded in the Borough (based on the Council's monitoring results). As a result of the findings from these assessments the Council has maintained its AQMA as originally designated and continues to update and implement its Action Plan in pursuit of the AQS objectives.

1.5 Fourth Round Review and Assessment

This report concerns the fourth round of LAQM review and assessment (R & A), which is part of a three yearly cycle for review and assessment ending in 2017. It follows the new prescribed guidance given in Technical Guidance LAQM: TG (09) (Defra, 2009a), supported where necessary by new LAQM Tools. The guidance is designed to help local authorities undertake their duties under the Environment Act 1995 to review and assess air quality in their area from time to time.

It is recognised that most of the original TG03 guidance is still relevant, although some parts required revision to reflect the most up-to-date understanding, and to draw upon experience gained during the third round of Review and Assessment.

Updated guidance has been prepared to cover the following issues:

Background pollution concentrations and future year adjustments

New emission tools

Monitoring of PM_{10} and use the volatile correction model

Emissions from narrow roads, railways, poultry farms, biomass combustion

Data ratification procedures

NO_x:NO_2 relationships

In addition, the Updating and Screening Assessment (USA) checklists provided in TG09 have been revised and re-issued to take account of all necessary changes.

The guidance requires a phased approach, as with the previous guidance and is undertaken source by source rather than using pollutant specific assessment. This however still requires local authorities to undertake a level of assessment that is commensurate with the risk of an air quality objective being exceeded. It is not considered that every authority will need to proceed beyond the first step of the fourth round of review and assessment.

The findings from the USA determine the need for the Council to undertake the next steps of local air quality management *i.e.* a Detailed Assessment and then potentially progressing to the declaration of an air quality management area (AQMA) with a need for an air quality action plan (AQAP) or a revocation/ amendment of an existing AQMA.

1.6 Updating Screening and Assessment – important considerations

As with the previous USAs, relevant considerations and sources of data include the following:

Monitoring Data

The Council's monitoring of air quality in its area provides an important source of information for understanding air quality in its area. This benefit is further enhanced as the monitoring is undertaken as part of the UK national or LAQN regional networks. It is however important to ensure that there is

confidence in the data being produced and used. Hence QA/QC issues are considered and the data produced also need to be properly validated and preferably ratified.

Background Pollutant Concentrations

These are produced nationally for all local authorities in the UK and provide the estimated background annual mean air pollutant concentrations at a 1 km x 1 km grid resolution. For NO_x, NO_2, PM_{10} and $PM_{2.5}$ for the 2006 base year with projections for all years to 2020. The data are available from http://www.airquality.co.uk/archive/laqm/tools.php

Industrial Sources

Both the Environment Agency and the Council regulate industrial sources under the Environmental Permitting Regulations 2007. The Environment Agency is responsible for the largest industrial processes (Part A1 installations), whilst the Council is mainly responsible for smaller Part B and A2 processes. Those small industrial processes that fall outside of Part B/A2 regulation can also be of interest to LAQM. Details of the processes and installations are available from the Council's Public Register (see tables in the Appendix). An application for a new Part A combustion plant (greater than 50MWth input) has been submitted to the Environment Agency; the proposed Energy Centre, located at Riverside South, is a CHP plant burning gas which will produce district heat and power.

There are no other Part A processes in the Borough with emissions to air. Since the previous USA, 24 Part B installations no longer require permits or have closed in the Borough. One additional batching plant has been permitted, plus permits have also been issued for 20 dry cleaners. None of these changes however are considered to be important for the purposes of this USA.

Road Traffic

Updated details of road traffic movements across the Borough have been made available from the London Atmospheric Emissions Inventory (2006) and the Council itself to check for significant changes from the previous USA.

1.7 Relevant exposure

The objectives relate to public exposure to the pollutants. More specifically any areas that may exceed the objectives should relate to "the quality of air at locations which are situated outside of buildings or other manmade structures above or below ground, and where members of the public are regularly present" (from the Air Quality regulations). TG09 advises further that the assessment should focus on those locations where members of the public are likely to be regularly present and are likely to be exposed over the period of the objective.

2. New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic monitoring

The Council undertakes continuous monitoring at the following long-term sites:

- Tower Hamlets 1 (Poplar) - an urban background site in Poplar towards the southeast of the Borough. This site has been operating since January 1994 and operates to London Air Quality Network (LAQN) standards. The site monitors nitrogen dioxide, PM_{10} (by TEOM), sulphur dioxide and ozone.

- Tower Hamlets 2 (Mile End Road) - a roadside site on Mile End Road in the centre of the Borough (this site started operating since March 1994). The sample inlet is located 4.2m from the road. The site monitors nitrogen dioxide, benzene and carbon monoxide.

- Tower Hamlets 3 (Bethnal Green) - an urban background in Bethnal Green towards the west of the Borough (monitoring at this site commenced in October 1999). The site monitors nitrogen dioxide, PM_{10} (by TEOM) and sulphur dioxide.

- Tower Hamlets 4 (Blackwall) - a roadside site close to the Blackwall Tunnel towards the south of the Borough. This site has been operating since September 2006. The sample inlet is located 4m from the road. The site monitors nitrogen dioxide, PM_{10} (by TEOM), $PM_{2.5}$ (by FDMS) and ozone. (This site is operated by Transport for London (TfL)).

The sites represent relevant exposure within the Borough. 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

2.1.2 Non automatic monitoring for nitrogen dioxide

The Council has monitored nitrogen dioxide in its area, using passive diffusion tubes, since the 1990's. The monitoring survey for 2008 was based on 80 locations, including co-located sites at three Tower Hamlets continuous sites (as shown in Table 2). The co-located sites enable a comparison between the two methods of monitoring so that local bias adjustment factors for the diffusion tubes can be calculated.

Table 2 Details of co-located sites

Diffusion tube site	Continuous site	Location
TH88	Tower Hamlets 1	Poplar
TH87	Tower Hamlets 2	Mile End Road
TH89/ 90	Tower Hamlets 3	Bethnal Green

The details of the sites are given in the appendix (Table 15). The diffusion tubes are exposed at 72 roadside and 8 background locations across the Borough. The site locations are all considered to represent relevant public exposure. Figure 9 in the appendix shows the location of the diffusion tube monitoring sites.

The diffusion tubes used were analysed by Casella CRE using a preparation method of 10% TEA in water. The 2008 unbiased results of the diffusion tube monitoring in the Borough are given in the Appendix (see Table 10).

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

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

A default bias adjustment factor for 2008 has been obtained from the government's Review and Assessment website (based on the March 2009 spreadsheet). The default factor is based on statistical analyses of reported data provided by other local authorities. The factor for 2008, based on 13 studies, indicates that the diffusion tube results over estimate continuously monitored concentrations.

From the default spreadsheet, the precision for the 2008 studies indicates good performance from the 11 of the co-location studies that are included. The term "precision" indicates how well the diffusion tubes produce similar results from the duplicate and triplicate studies undertaken. The criterion is somewhat arbitrary and it reflects both the laboratory's performance in preparing and analysing the tubes, plus the handling of the tubes in the field. The precision is based on an assessment of the coefficient of variation. "Good" precision is defined as achieving a coefficient of variation less than 20% for eight or more periods in a year and the average is less than 10%.

The local co-location studies were undertaken over 12 months at the Tower Hamlets 2 and 3 sites listed earlier. The Tower Hamlets 3 co-location study was based on duplicate tubes; the Tower Hamlets 2 roadside site study was based on a single tube. (Note – there was insufficient diffusion tube data capture at the Tower Hamlets 1 site so this site was not used). The diffusion tubes were all located within 0.5m of the inlet sampler of the chemiluminescent analysers at the continuous sites. The precision for the duplicate tubes was good for all months, bar one. The studies compared equivalent exposure periods, although the continuous results are provisional. The bias adjustment factors are as follows:

2008	Bias adjustment factor
Mean Tower Hamlets	0.85
Roadside Tower Hamlets	0.93
Default	0.83

The results of a nation-wide survey of nitrogen dioxide diffusion tube co-location studies were further used to improve current understanding of diffusion tube bias (AQC, 2006). The data suggested that tubes close to a road were more likely to underestimate concentrations, once they have been adjusted for laboratory bias, and conversely tubes further away from roads were more likely to overestimate concentrations. (Note this is similar to the above local findings reported here).

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

A relationship was identified between diffusion tube bias and the measured annual mean nitrogen dioxide concentration that can be used to further adjust the diffusion tube result. The effect of this 'tube-chemistry' adjustment depends on the measured concentration: thus a laboratory bias adjusted result of 20.0 would become 18.1 µg m^{-3} after adjustment for bias due to tube chemistry. A value of 40.0 µg m^{-3} would remain at 40.0 µg m^{-3} and 60.0 µg m^{-3} would become 65.1 µg m^{-3}. As shown the

effect of this adjustment is minimal at concentrations close to the objective of 40.0 µg m^{-3} and so it will not have a material effect on exceedences of the objective identified using diffusion tubes. Although adjusting for tube chemistry can reduce the uncertainty of diffusion tube results, it was not however recommended that this adjustment be applied routinely for the reporting of results.

The comparison of the mean local and default bias factors shows that they are both similar and therefore the 2008 local factor has been used for this report. Comment has also been made for the local roadside factor below.

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

a) Continuous monitoring

The results for the continuous sites operated in the Borough of Tower Hamlets are shown in Table 3 (for the years 2003 to 2008 inclusive). The results include details relating to the annual mean and hourly mean objectives, as well as data capture. All the data reported are fully ratified apart from 2008, part of which is still provisional.

Data capture exceeded 85% for all years reported at Tower Hamlets 1 and 2 sites. There was reduced data capture for the Tower Hamlets 4 in 2007 when the site opened and Tower Hamlets 3 when there were sample inlet problems between 2004 and 2008.

Table 3 NO_2 continuous monitoring in Tower Hamlets (2003–2008)

LAQN site		2003	2004	2005	2006	2007	2008*
Tower Hamlets 1	Annual mean	**42**	35	38	*40*	37	38
(Urban background)	No of hours >200 µg m^{-3}	0	0	0	*0*	8	0
	Data capture %	99	92	99	*85*	100	99
Tower Hamlets 2	Annual mean	**67**	**60**	**61**	**60**	*67*	**63**
(Roadside)	No of hours >200 µg m^{-3}	6	3	1	7	***38***	0
	Data capture %	98	96	99	100	*85*	99
Tower Hamlets 3	Annual mean	**44**	*43*	*41*			*39*
(Urban Background)	No of hours >200 µg m^{-3}	0	*0*	*0*			*0*
	Data capture %	94	*63*	*34*			*57*
Tower Hamlets 4	Annual mean					*73*	**63**
(Roadside)	No of hours >200 µg m^{-3}					*8*	3
	Data capture %					*22*	91

(Note – italics indicates < 90% data capture; * includes provisional data))

The results indicate that the annual mean objective was easily exceeded at both roadside monitoring sites for all years monitored. Based on these data the highest concentrations of NO_2 arose in 2003 and 2007 (based on reduced data capture) at Tower Hamlets 2 site. At the Tower Hamlets 1 background site, 2003 remains the year with highest concentration, when the site exceeded the annual mean objective. The other background site (Tower Hamlets 3) in Bethnal Green also exceeded the annual mean objective in 2003.

The hourly objective was exceeded in 2007 at the Tower Hamlets 2 roadside site (despite reduced data capture). There were also periods that exceeded the hourly standard of 200 µg m^{-3} at the Tower Hamlets 1 background site in 2007, Tower Hamlets 2 in all years other than 2008 and Tower Hamlets 4 in both years where data were reported (i.e. 2007 and 2008). The highest number of occurrences arose during 2007. The results provide some evidence to confirm that emissions of NO_2 directly emitted from road vehicles have increased (Carslaw D.C and Beevers, S. D, 2005 and AQEG, 2007).

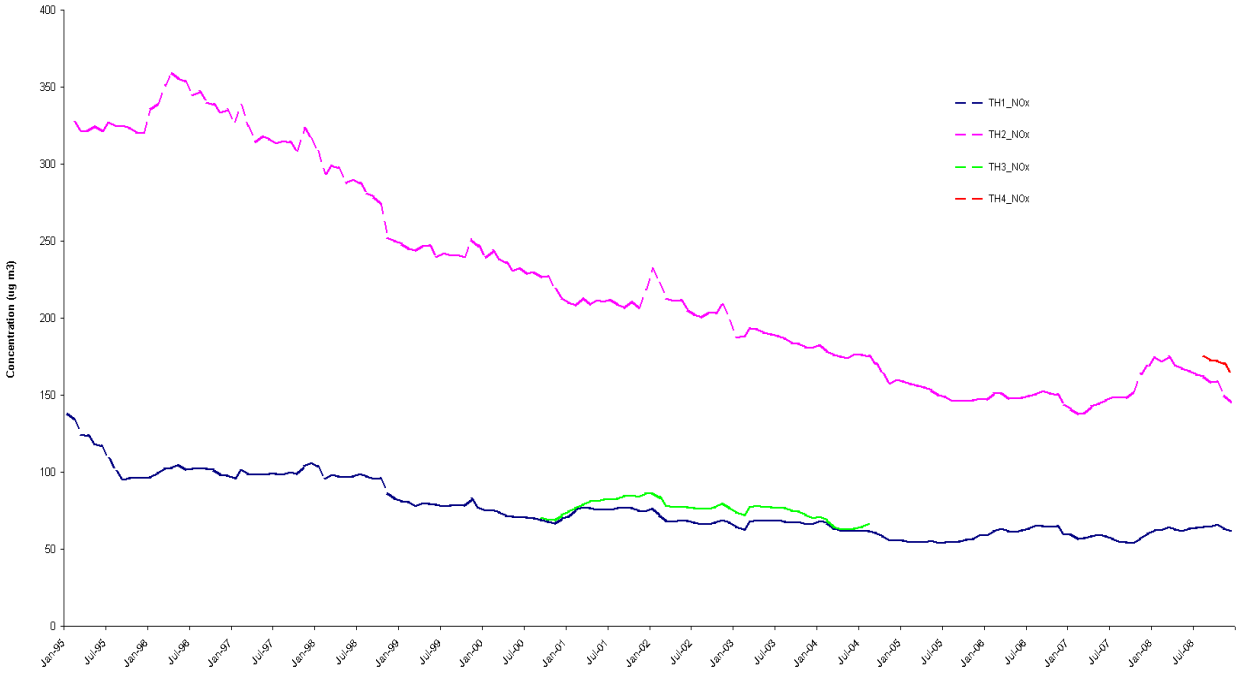
In addition a widespread primary pollution episode arose in December 2007. At this time weather conditions were cold and calm, with very light winds. An initial analysis suggests that this was the

most significant nitrogen dioxide incident for 10 years, when NO_2 was elevated across the region, The hourly mean AQS of not more than 18 hours per year above 200 µg m^{-3} was breached at 9 sites across London, and equalled at 2 sites, on the basis of measurements during this episode alone. The west and central areas of London however saw the most elevated levels.

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

The rolling annual mean plots of both NO_x and NO_2 concentrations of the Tower Hamlets sites are shown in Figures 1 and 2 respectively. This analysis is for the period from 1994 through to 2008 (including some provisional data for the latter period).

Figure 1 Rolling annual mean NO_x trends for Tower Hamlets sites (1995 to 2008)



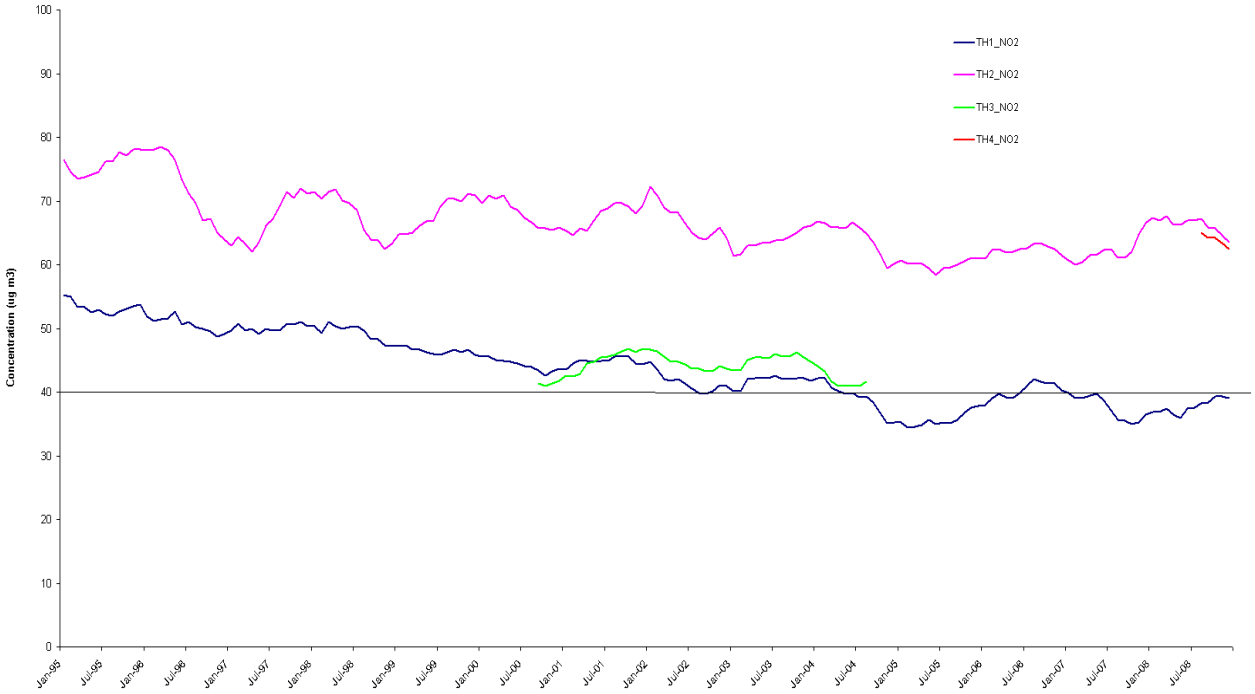
The Tower Hamlets 1 background and Tower Hamlets 2 roadside sites provide the longest datasets. Data capture for the Tower Hamlets 3 background site was interrupted for a period from 2004 due to sample inlet problems. The Tower Hamlets 4 roadside site provides the shortest dataset. The rolling annual mean concentration of NO_x for the Tower Hamlets 2 site has the largest reduction in concentrations over time from around 300 µg m^{-3} to half that (158 µg m^{-3}) in 2008, this in line with expected reductions in emissions. However there has been almost no reduction of NO_x at Tower Hamlets 2 since 2004.

The Tower Hamlets 1 site is located at a background location and therefore has monitored lower concentrations throughout the period of operation. This site has also shown a reduction over time, which was steep at first in 1995. There has however been almost no reduction since 2000 and annual mean concentrations remain around 65 µg m^{-3}. The Tower Hamlets 3 background site for the period shown follows a similar path to the Tower Hamlets 1 site.

The Tower Hamlets 4 roadside site only has a very small dataset and early indications are downward, but this may fluctuate as a result of future interannual variations.

The rolling annual mean NO_2 results for the same period are shown in Figure 2. The trend for NO_2 is less clear as these results fluctuate over time highlighting interannual and seasonal differences more. Concentrations at the Tower Hamlets 2 site have overall changed little since 1997, with levels at the site remaining around 60 µg m^{-3}. More recently there has been a slight increase, probably due to the episodes in 2007.

Figure 2 Rolling annual mean NO_2 trends for Tower Hamlets sites (1994 to 2008)



The Tower Hamlets 1 background site, reduced from around 55 µg m^{-3} to just over 40 µg m^{-3} in 2000, however since that time concentrations are little changed, apart from small fluctuations.

The Tower Hamlets 3 background site has not decreased over time for the period shown and has consistently exceeded the annual mean objective. The Tower Hamlets 4 roadside also easily exceeds the objective over the short period shown.

The two figures illustrate the difference between the two pollutants and the difficulty in reducing NO_2, which is mostly a secondary pollutant that is largely determined by the oxidising capacity of the atmosphere. In addition it again highlights the recent research, which indicates that direct NO_2 emissions may also be increasing.

b) Diffusion tube monitoring

The data capture for the 2008 diffusion tube survey was very good exceeding 91% for the whole survey. These include the 6 background and 72 roadside sites (including the two co-located sites referred to earlier). However three other sites had 6 months or less data and therefore have been excluded (sites TH 66, 82 and the co-located site 88).

Small adjustments were made to represent a full year where sites had less than full data capture but more than 50%. This adjustment was made using a ratio of annual mean to period mean using continuously monitored data derived from three nearby LAQN background sites in Tower Hamlets 1, Waltham forest 5 and Hackney 4. All three of these sites had greater than 90% data capture for 2008 and the adjustments made were mostly small, i.e. less than 5%. (Note the results for the co-located sites are not included in the tables of results). As reported above the default value of 0.85 was used for the bias correction. Those 2008 concentrations exceeding the annual mean objective are shown in **bold**.

Table 4 Bias adjusted annual mean NO_2 concentrations (µg m^{-3}) for Tower Hamlets sites (2005 - 2008)

Site	Biased 2005	Biased 2006	Biased 2006	Biased 2007	Biased 2008
1	33.5	40.3	46.1	49.5	**43.1**
3	58.0	68.5	78.3	79.6	**70.1**
5	79.4	84.7	96.8	116.3	**68.7**
6	72.8	89.3	102.1	99.7	**86.2**
7	40.7	44.8	57.6	*57.1*	**48.3**
8	34.6	38.5	44.0	55.4	**43.2**
9	47.6	53.5	61.2	70.1	**59.5**
10	53.1	56.8	64.9	77.1	**58.9**
11	42.1	47.1	53.9	59.5	**48.5**
12	38.8	48.1	54.9	61.9	**49.9**
13	39.5	44.7	51.1	59.5	**49.2**
14	42.8	47.5	54.3	64.8	**55.1**
15	47.6	55.5	63.5	74.9	**43.0**
17	33.3	39.3	44.9	51.3	**42.8**
18	48.1	54.7	62.6	77.1	**73.8**
19	42.2	48.9	55.9	62.4	**47.1**
20	53.6	65.8	75.3	81.1	**78.3**
21	51.2	*62.9*	*71.9*	99.1	**83.5**
22	*35.1*	*41.2*	*47.1*	48.9	**41.4**
23	41.7	47.1	53.8	60.4	**49.2**
24	52.1	52.2	59.7	65.0	**59.1**
25	43.5	48.8	55.8	61.5	**48.5**
26	43.1	55.8	63.8	79.3	**60.4**
28	67.4	68.9	78.8	80.8	**75.9**
29	46.9	47.3	54.0	63.7	**57.7**
30	52.6	60.3	68.9	77.8	**68.3**
32	53.7	60.0	68.6	75.3	**62.0**
34	48.7	50.5	57.8	60.0	**52.2**
35	*53.6*	*102.1*	*116.7*	163.2	**144.1**
36	*38.8*	44.5	50.9	57.2	**46.6**
37	37.1	42.9	49.1	54.4	**48.0**
39	43.6	51.8	59.3	67.2	**55.5**
40	*47.2*	53.2	60.8	67.1	**59.1**
41	43.1	52.1	59.6	57.2	**52.3**
42	29.8	35.4	45.5	46.1	38.5
43	31.3	35.4	45.5	42.1	38.1
44	45.7	52.9	60.5	60.1	**58.1**
45	48.1	51.1	58.4	83.4	**60.3**
46	37.7	43.5	49.7	*59.9*	**48.2**
48	39.8	43.8	50.1	50.6	**50.1**
49	42.0	48.4	55.3	63.1	**55.8**
50	49.7	57.8	66.1	78.0	**65.2**

51	42.3	40.2	51.8	54.2	36.1
52	45.2	53.1	60.8	64.1	**53.1**
53	*47.7*	*73.7*	*84.3*	97.4	**65.6**
54	47.6	62.9	71.9	*78.4*	**63.4**
55	28.5	30.3	39.0	43.6	34.3
56	39.0	44.5	50.9	57.0	**44.0**
57	32.1	44.1	50.4	44.5	38.7
58	36.9	38.7	44.3	53.9	**42.9**
59	47.3	45.6	52.1	55.4	**51.1**
60	35.7	49.8	56.9	65.6	**58.4**
61	*42.7*	50.0	*57.2*	59.4	**48.6**
62	40.3	40.5	46.3	54.1	**49.9**
63	33.5	33.8	43.5	*39.4*	22.2
64	42.6	45.3	51.8	58.7	**47.2**
65	36.2	42.1	48.1	56.4	**52.8**
66	*38.0*	*34.6*	*44.5*	*43.6*	
67	37.0	38.0	43.5	47.5	**44.0**
69	41.3	43.4	49.6	54.7	**46.0**
70	39.9	46.1	52.7	60.8	**44.8**
71	48.5	53.5	61.2	73.8	**60.5**
72	41.5	43.5	49.7	59.0	**40.9**
73	*42.5*	33.8	38.6	54.9	**46.2**
74	60.6	62.9	71.9	73.9	**51.7**
75	35.1	37.6	42.9	49.2	**41.8**
76	52.8	*62.1*	*71.0*	76.0	**71.7**
77	43.6	44.6	51.0	58.5	**50.2**
78	45.4	49.2	56.3	61.4	**44.9**
79	34.5	44.0	50.3	50.9	**44.9**
80	41.0	54.3	62.1	61.5	**55.9**
81	46.1	93.2	106.6	113.5	**107.7**
82	52.5	57.2	65.4	*63.2*	
83	*54.1*	94.8	108.3	119.7	**93.4**
84	47.5	50.1	57.3	68.8	**50.6**
85	55.8	*50.0*	*57.2*	52.8	**47.8**
86	40.9	43.4	49.6	51.0	38.0
87	52.1	53.4	61.0	62.6	**63.1**
88	28.1	*32.3*	*41.6*	*78.0*	
89	33.7	38.9	*50.1*	49.2	28.9
90	30.2	38.8	*49.9*	47.4	31.3

(Note – bold indicates 2008 results that exceed the AQS objective; italics less than 75% data capture)

The bias adjusted annual mean concentrations for four of the Tower Hamlets background sites indicate that the government's air quality objective of 40 µg m^{-3} was met in 2008; however concentrations at the TH7 background site at the St. Katherine's Way exceeded the objective. In previous years all the other sites also exceeded the objective, but for 2008 concentrations reduced below 40 µg m^{-3}.

The other Tower Hamlets sites are all sited at roadside locations and all of them, bar two (TH57 and 86), recorded bias adjusted concentrations that exceeded the objective, ranging from 40.9 µg m^{-3} to 144.1 µg m^{-3}. The TH35 site, which is located on the Limehouse Link, recorded the highest 2008 concentration of all the roadside sites, in previous years the site has also recorded the highest concentrations. It was one of the two sites recording annual mean concentrations greater than 100 µg m^{-3} (the other site is TH81 in Bromley High Street).

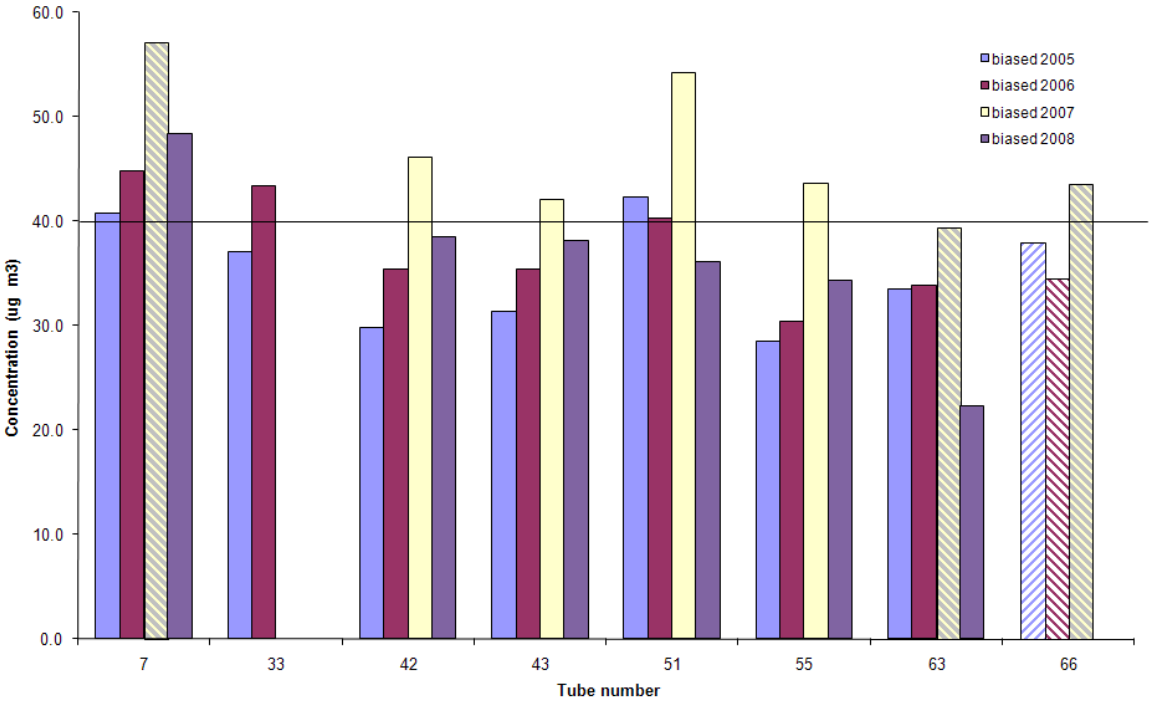
Over half of the sites monitored concentrations greater than 50 µg m^{-3}. Eleven other sites recorded concentrations less than 45 µg m^{-3} (but more than the objective). Of these the TH72 site recorded concentrations only slightly more than the objective, around 41 µg m^{-3}.

The results for all of the background sites are also shown in Figure 3, with the roadside tubes (sites 1 to 37) shown in Figure 4 and sites 46 to 86 in Figure 5. The figures show the results for the period from 2005 to 2008.

The figures shows that bias adjusted concentrations in 2008 were lower than 2007, This reduction in concentrations is mainly consistent with the results from the continuous sites, however the reduction is likely to be due to inter annual variation in meteorological conditions rather than any overall reduction in emissions.

From Figure 3, all the background sites, other than the TH7 site, met the AQS objective.

Figure 3 Chart of bias adjusted annual mean NO_2 concentrations (µg m^{-3}) for Tower Hamlets sites (2005-2008)



Figures 4 and 5 confirm that the roadside sites all exceeded the objective other than sites TH 57 and 86. However if the local roadside bias factor was used (0.93) then all roadside sites would have exceeded the objective in 2008.

Figure 4 Chart of bias adjusted annual mean NO_2 concentrations (µg m^{-3}) for Tower Hamlets sites (2005-2008)

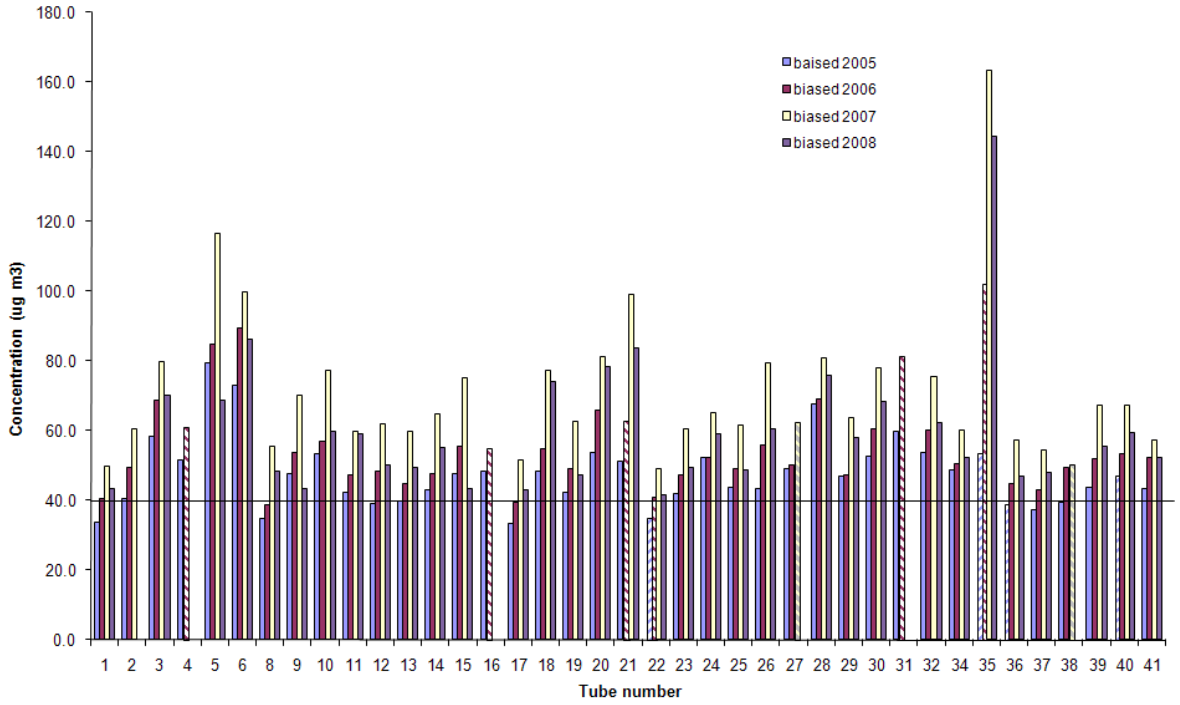
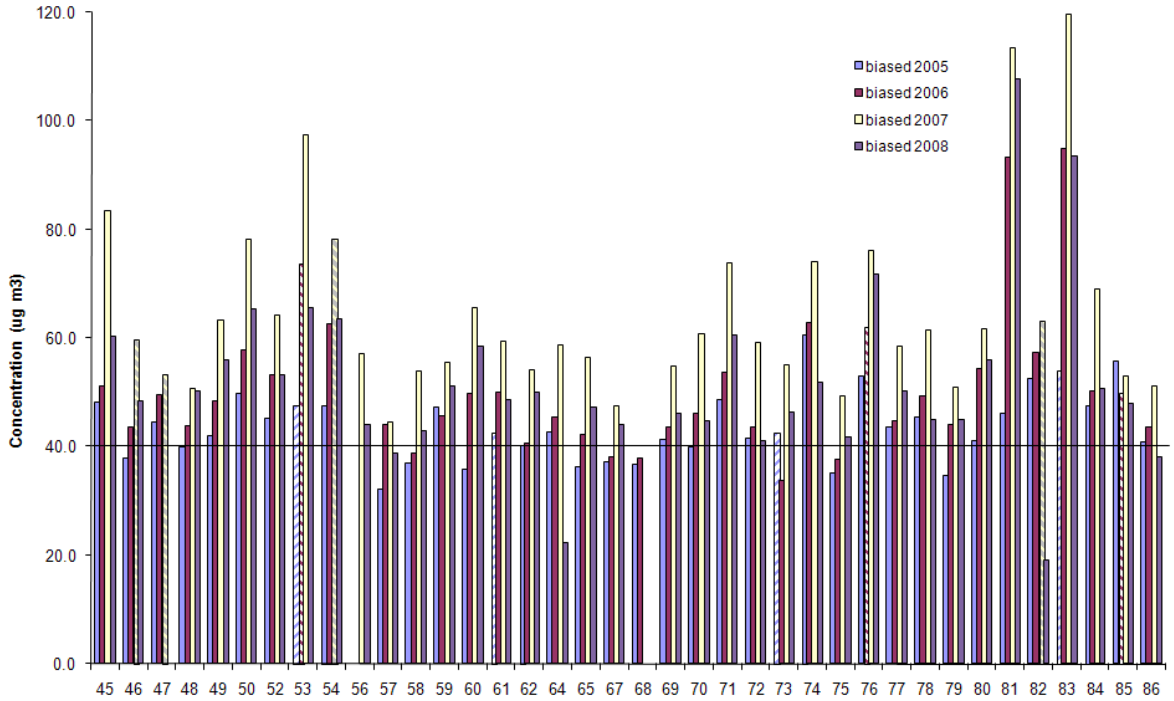


Figure 5 Chart of bias adjusted annual mean NO_2 concentrations (µg m^{-3}) for Tower Hamlets sites (2005-2008)



The main overall conclusion is that the majority of monitoring sites throughout the Borough (including sites with relevant exposure) continued to record annual mean concentrations in excess of the air quality objective.

2.2.2 Sulphur dioxide

The Council monitors SO_2 at its Tower Hamlets 1 and 3 urban background sites in Poplar and Bethnal Green. The sites opened in 1994 and are located towards the south and west of the Borough.

The maximum 15-minute concentrations for each year at the sites are given in Table 5, along with details of data capture. In all cases the data are fully ratified, apart from the 2008, which include some provisional data.

These results indicate that the 15-minute standard of 266 µg m^{-3} was not exceeded at any time during the period reported.

Table 5 SO_2 monitoring in Tower Hamlets (2003 to 2008)

Site	Data reported	2003	2004	2005	2006	2007	2008
Tower Hamlets 1	Maximum 15 minute µg m^{-3}	207.7	179.9	148.8	161.8	79.4	77.8
	Data capture %	99	99	99	99	99	99
Tower Hamlets 3	Maximum 15 minute µg m^{-3}	155.3	108.6	231.3	95.4	54.6	99.7
	Data capture %	86	91	78	98	95	98

Consequently the 15-minute objective of more than 35 such periods was not exceeded. Hence these results also confirm that the hourly and daily SO_2 objectives also were not exceeded. These results are considered representative of the entire Borough.

2.2.3 Carbon monoxide

The Council also undertook the continuous monitoring of CO at its Tower Hamlets 2 roadside site, on Mile End Road in 2008. As in previous years, data capture exceeded 80% for 2008, although the data include provisional data. There were no periods that exceeded the CO objective (i.e. a maximum rolling daily 8 hour mean of 10 mg m^{-3}) in 2008 or in the previous years reported.

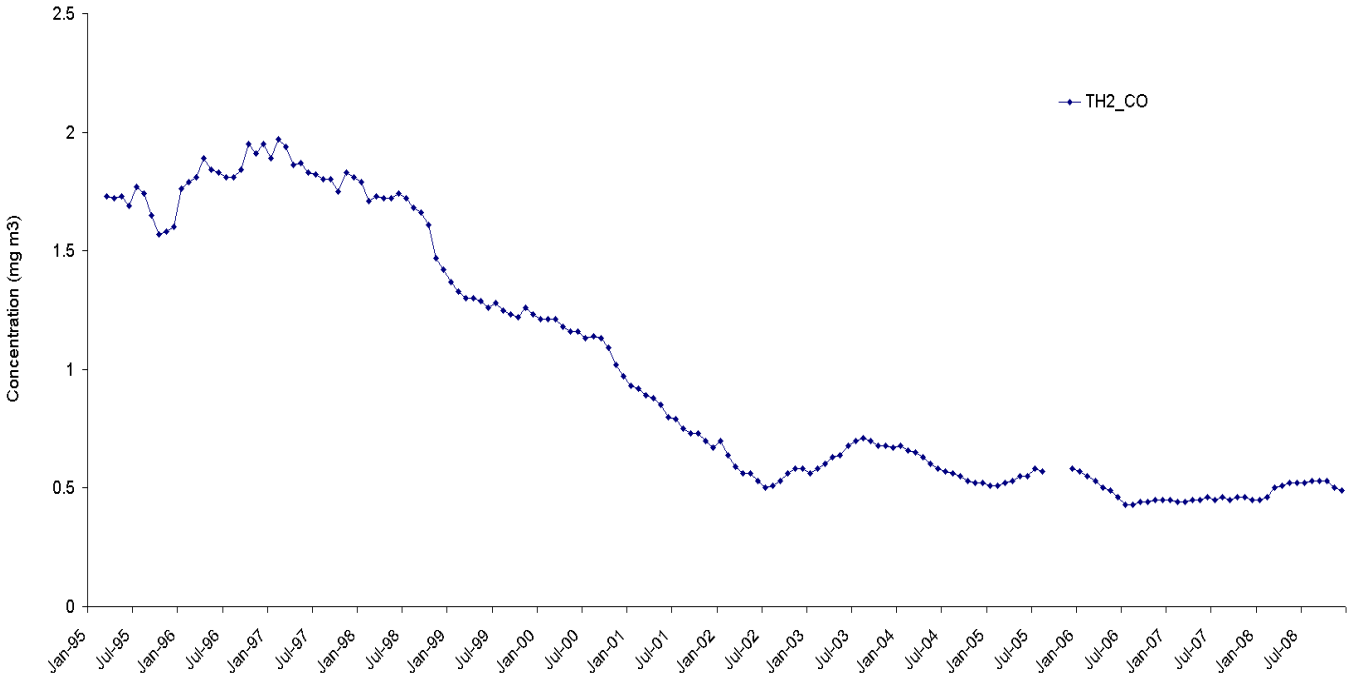
The maximum 8-hour rolling mean results for 2008 are shown in Table 6 along with previous years since 2003. Annual mean concentrations for this period are also shown.

Table 6 CO monitoring (mg m^{-3}) in Tower Hamlets (2003 to 2008 inclusive)

	2003	2004	2005	2006	2007	2008
Max 8 Hour	2.1	1.6	6.5	1.5	1.4	1.7
Annual mean	0.7	0.5	0.6	0.4	0.5	0.5
Data capture (%)	98	84	88	88	85	85

As with benzene above, CO concentrations have decreased over time as a result of stricter emission controls on road vehicles, as can be seen in the following figure of rolling annual mean concentrations. This shows that annual mean concentrations reduced from 1995 to 2002 but have hardly changed since then.

Figure 6 Rolling annual mean CO trends for Tower Hamlets 2 site (1995 to 2008)



2.2.4 PM_{10}

Continuous PM_{10} analysers are operated at three Tower Hamlets monitoring sites, located in Poplar (TH1), Bethnal Green (TH3) and Blackwall (TH4). The Tower Hamlets 1 site first monitored PM_{10} in 1994 and is located at an urban background site. The Tower Hamlets 3 site opened in 1999 and is sited at an urban background location near the west of the Borough. The Tower Hamlets 4 site is a roadside site, in the east bordering Newham. 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, with subsequent data ratification undertaken by the ERG at King's College London. The Tower Hamlets 1 and 3 sites each use a TEOM instrument and the Tower Hamlets 4 site uses a FDMS (Filter Dynamics Measurement System) TEOM. In all cases the data are fully ratified, apart from the 2008, which include provisional data.

The TG09 guidance highlights that the TEOM instruments cannot be strictly used to measure PM_{10} concentrations for comparison with the air quality objectives, as the instrument was not found to conform to the equivalence criteria relating to the gravimetric European reference method, whereas the FDMS analyser was found to be equivalent. Previously for the TEOM a correction using a factor of 1.3 was accepted; now however the VCM (Volatile Correction Model) has been adopted. This method is based on the assumption that the volatile component of PM_{10} lost during the heated sampling of PM with the standard TEOM is consistent across a defined geographical area. The model uses the FDMS purge measurement as an indicator of this volatile component. As FDMS instruments have met the equivalence criteria, the VCM correction is also considered equivalent to the European reference method.

The results for the Tower Hamlets sites are reported below as reference equivalent, these represent either FDMS measurements (where no correction has been made) or TEOM measurements that were corrected using the VCM.

Table 7 Reference equivalent PM_{10} monitoring in Tower Hamlets using VCM/ FDMS (2004 to 2008)

Site		2004	2005	2006	2007	2008
Tower Hamlets 1	Annual mean	23	23	23	*23*	22
(VCM)	No of days > 50 µg m^{-3}	11	16	12	*18*	16
	Data capture	98	90	93	*89*	99
Tower Hamlets 3	Annual mean	*24*	*24*	23	23	21
(VCM)	No of days > 50 µg m^{-3}	*8*	*16*	15	22	11
	Data capture	*84*	*81*	97	94	95
Tower Hamlets 4	Annual mean			*34*	35	36
(FDMS)	No of days > 50 µg m^{-3}			*16*	**61**	**60**
	Data capture			*23*	98	95

(Note – bold indicates objective exceeded; italics < 90% data capture)

The results indicate that the 2004 daily mean objective of more than 50 µg m^{-3} was easily exceeded for all full years of monitoring at the Tower Hamlets 4 site only. The Tower Hamlets 1 and 3 sites however both monitored days when the standard of 50 µg m^{-3} was exceeded in all years reported.

The annual mean objective was not exceeded at any of the Tower Hamlets sites, although it was approached at the Tower Hamlets 4 roadside site. The results for Tower Hamlets sites are consistent with the monitoring elsewhere in London for this period (ERG, 2009), with the sites along major roads exceeding (or approaching) the objectives. In both 2006 and 2007 there were wintertime episodes, although the summertime for 2007 was noted as being particularly wet and hence there were no episodes.

For comparison purposes the PM_{10} results using TEOM measurements corrected using the previous Defra recommended 1.3 factor are shown in Table 8. These results are for the period from 2003 to 2008.

Table 8 PM_{10} monitoring in Tower Hamlets using TEOMs (2003 to 2008)

Site		2003	2004	2005	2006	2007	2008
	Annual mean	31	25	24	25	25	26
Tower Hamlets 1	No of days > 50 µg m^{-3}	**43**	8	7	16	12	16
	Data capture	96	98	95	95	89	99
	Annual mean	29	25	25	26	26	23
Tower Hamlets 3	No of days > 50 µg m^{-3}	27	2	5	15	18	8
	Data capture	93	84	85	99	97	95

(Note – bold indicates objective exceeded; italics < 90% data capture)

The above results show that the highest annual mean concentration arose during 2003, but the results did not exceed the objective. The daily mean objective also recorded the greatest number of days exceeding the 50 µg m^{-3} standard in 2003, with the Tower Hamlets 1 background site in Poplar exceeding the objective and the Tower Hamlets 3 (in Bethnal Green) approaching it. It should be noted that 2003 was a year with high pollutant concentrations in many areas of the UK, due to the long periods of high pressure that arose during the hot summer months. Such periods are conducive to secondary particle formation over wide areas.

The main difference between the sets of results is that use of the VCM tends to produce lower concentrations than that of the 1.3 factor. It was always known that 1.3 factor was precautionary and was not fully representative of site and seasonal variation. The reduced concentrations however are not consistent for every year and application of the VCM to 2003 results in the number of days exceeding the standard increasing above the objective at all roadside sites in London (ERG, 2009).

An analysis of rolling annual mean PM_{10} concentrations and daily mean PM_{10} exceedences is provided for the Tower Hamlets sites to indicate any trend over time. The analysis is for the period from 1994 through to 2008.

Figure 7 illustrates changing concentrations over time, based on changing rolling annual mean PM_{10} concentrations and Figure 8 the rolling daily mean PM_{10} exceedences. The use of rolling data in this way largely removes seasonal influences and thus provides a guide to changing trends over time.

The rolling annual mean trend for the Tower Hamlets 1 site provides the longest dataset. The site shows a downward trend from 1994 to 2000, other than the increases as a result of the summertime episodes in 1996. From 2000 however concentrations increased slightly, excepting the episodes during 2003, when concentrations rose and then declined more sharply. Annual mean concentrations are around 26 µg m^{-3} in 2008 compared to 23 µg m^{-3} in 2000.

The data for the Tower Hamlets 3 site shows a similar pattern to that of the Tower Hamlets 1 site for the period where the sites overlap, albeit concentrations in 2000 were slightly higher. The Tower Hamlets 4 site has only been operating for a short period. In comparison to the other two sites, concentrations at this site are higher as it is close to a busy road and have also increased slightly since the start of monitoring in 2006.

The use of trends in this way highlights that although concentrations dropped in 2004 at the Tower Hamlets sites and elsewhere across London, this was mainly as a result of the pollution incidents in 2003 not being repeated in 2004. Levels have since dropped just below pre 2003 levels and do not appear to be further reducing; indeed for some sites in London there may be a slight increase, possibly as a result of increasing primary PM_{10} emissions (ERG, 2008) rather than the predicted decrease in emissions.

Figure 7 Rolling annual mean PM_{10} trends for Tower Hamlets sites (1994 to 2008)

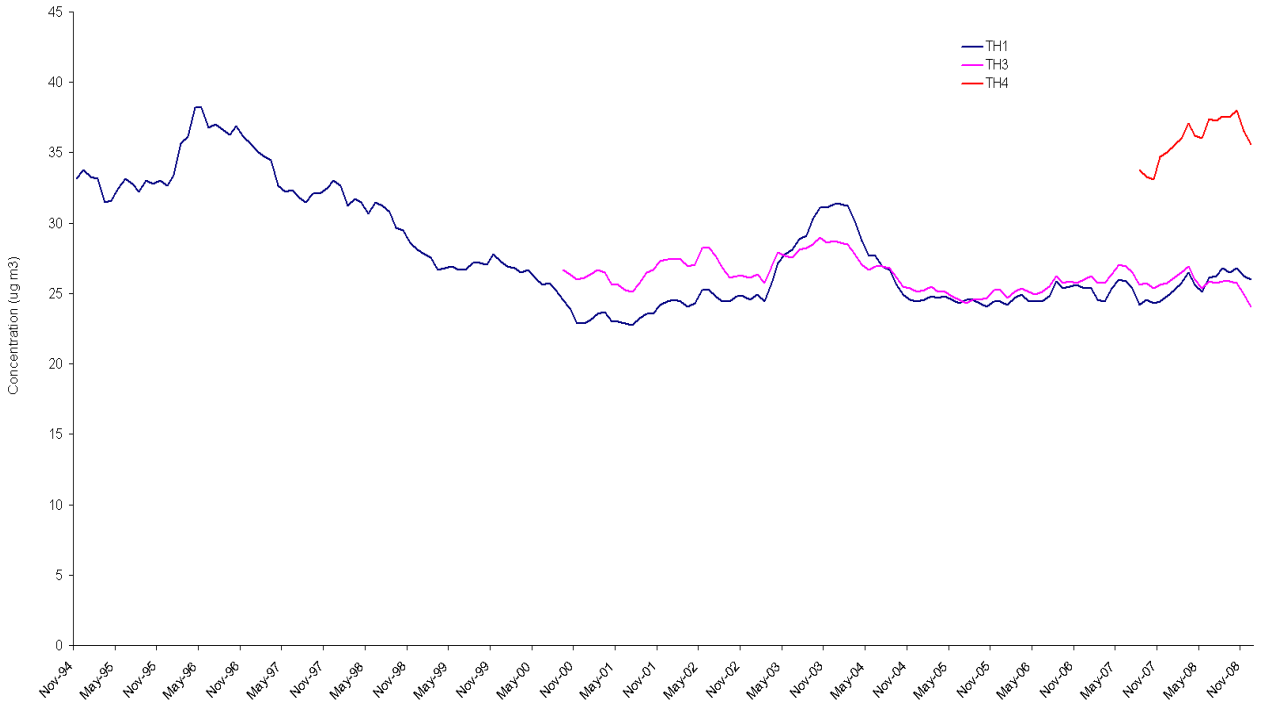
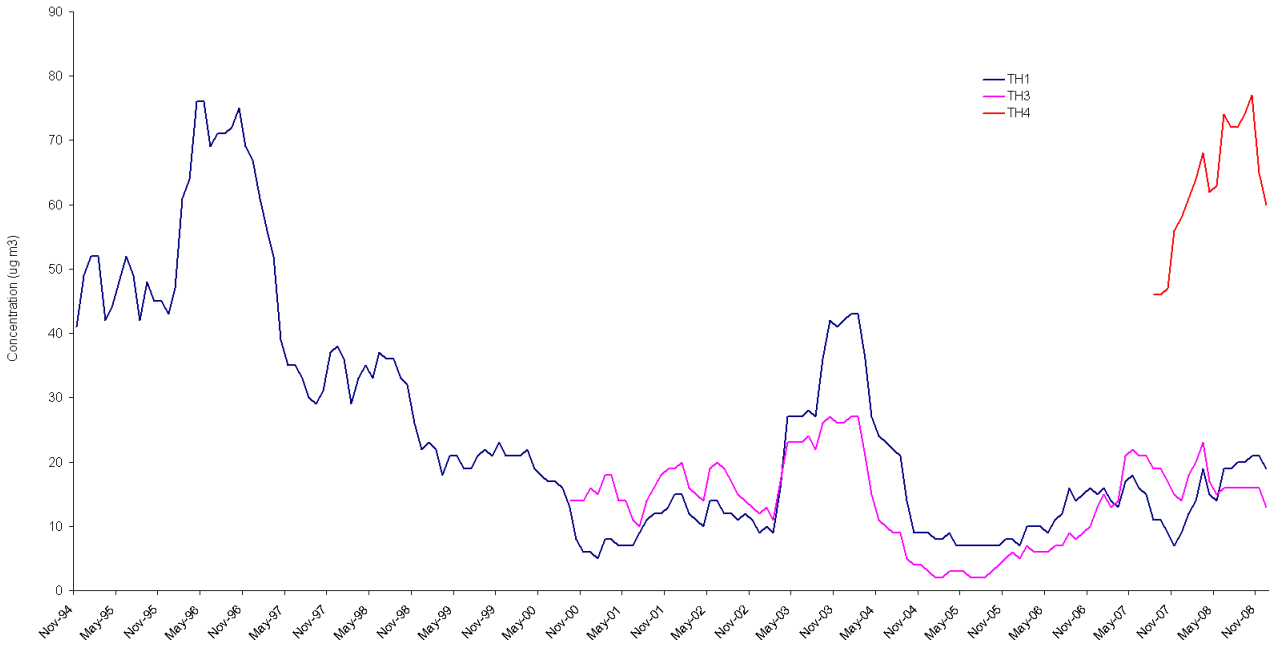


Figure 8 Rolling number of days PM_{10} > 50 µg m^{-3} for Tower Hamlets sites (1994 to 2008)



The rolling trend of PM_{10} exceedences highlights the effect of the pollution episodes in 1996 and 2003 for the Tower Hamlets sites. The effect for the Tower Hamlets 4 site is more pronounced, as concentrations at the roadside site are higher. This site shows that, despite fluctuating, levels appear not to have decreased markedly over this period from 2000.

Averages based on selected 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. This did not change during 2005 and levels increased during 2006. In 2006 mainly roadside sites were affected and it has been suggested that this has been due to an increase in PM_{10} from primary sources (ERG, 2008).

2.2.5 Benzene

The Council undertook continuous monitoring at its Tower Hamlets 2 site, which is located at the roadside of Mile End Road. The results of this monitoring for the period from 2003 to 2008 inclusive are shown in Table 9. The results indicate, despite reduced data capture for most years, that the 2003 and stricter 2010 AQS objectives were not exceeded during the period of monitoring. The Council's monitoring results also reflected the national picture, i.e. that concentrations of benzene decreased over time as a result of stricter emission controls, particularly with regard to road transport sources.

The data capture for 2008 was less than 75% for the year; however there was sufficient data to indicate that concentrations remained low at the site.

Table 9 Benzene monitoring (µg m^{-3}) in Tower Hamlets (2003 to 2008)

	2003	2004	2005	2006	2007	2008
Annual mean (µg m^{-3})	2.97	2.23	1.93	1.95	1.79	1.85
Data capture (%)	39	77	79	81	61	56

3. Road Traffic Sources

The focus of attention for road traffic sources is on those relevant locations close to busy roads, especially in congested areas and near to junctions, where traffic emissions are higher, and in built up areas where the road is canyon like and buildings restrict the dispersion and dilution of pollutants. Only those locations, which have not been assessed during the earlier rounds or where there has been a change or new development, are assessed.

The new 2006 London Atmospheric Emissions Inventory (LAEI) has been used to identify changed flows and as reported earlier the Council previously designated the whole of the Borough as an AQMA.

3.1 Narrow congested streets with residential properties close to the kerb

Concentrations are often higher where traffic is slow moving, with stop/start driving, and where buildings on either side reduce dispersion. Screening models so far have not proved helpful at identifying potential exceedences, which have only been identified by monitoring. This assessment is for NO_2 only.

Previous Review and Assessments undertaken by the Council (Tower Hamlets, 2004 and 2006) investigated the presence of narrow roads with residential properties close to the kerb. The revised TG09 guidance requires the identification of residential properties within 2 m of the kerb. The roads previously identified are all within the Council's AQMA and this situation has not changed.

The Council's AQMA is Borough wide and it is confirmed that there are no new or newly identified congested streets with a flow above 5,000 vehicles per day with residential properties close to the kerb that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy streets where people may spend 1 hour or more close to traffic

These include some street locations where individuals may regularly spend 1-hour or more, for example, streets with many shops and streets with outdoor cafes and bars, close to road traffic where there may be high concentrations of NO_2. (Note – that those people that are occupationally exposed are not included, as they are not covered by the regulations). This assessment is for NO_2 only.

Busy streets where people may spend an hour or more close to traffic were examined in the second round USA. There has been no change to the previous findings since then and no new roads have been constructed with traffic flows greater than 10,000 vpd in the Council's area since the first round of R & A where there is relevant exposure arising.

The Council confirms that there are no new or newly identified busy streets where people may spend 1 hour or more close to traffic in the Borough.

3.3 Roads with high flow of buses and/or HGVs

These include street locations in the Borough where traffic flows are not necessarily high (i.e. fewer than 20,000 vehicles per day) but where there are an unusually high proportion of buses and/or HGVs. The assessment is for both NO_2 and PM_{10} and is dependent on the proximity of relevant exposure within 10 m of the kerbside. Those roads within the Borough with high flows of heavy duty vehicles were previously identified by the Council in earlier Review and Assessments. No new roads relevant to this section have been identified in the Borough.

The Council confirms that there are no new or newly identified roads with high flows of buses or HGVs in the Borough that have not been adequately considered in previous rounds of Review and Assessment.

3.4 Junctions

Air pollutant concentrations are usually higher close to junctions, due to the combined impact of traffic emissions on roads forming the junction, and to the higher emissions due to stop start driving. The assessment is for both NO_2 and PM_{10} and is dependent on the proximity of relevant exposure within 10 m of the kerbside.

There is no change to the previously reported situation concerning junctions and no new or newly identified junctions with relevant exposure within 10 m.

The Council confirms that there are no new or newly identified busy junctions in the Borough that have not been adequately considered in previous rounds of Review and Assessment.

3.5 New roads constructed or proposed since the last round of review and assessment

The approach to considering new roads depends on whether or not an assessment was carried out in advance of building the new road. The assessment is for both NO_2 and PM_{10} and is dependent on the proximity of relevant exposure within 10 m of the kerbside.

There have been no new or proposed roads in the Borough where an air quality assessment was required.

The Council confirms that there are no relevant new or proposed roads in the Borough.

3.6 All roads with significantly changed traffic flows

Only roads with significantly changed traffic flows that have not already been considered above were investigated. The assessment is for both NO_2 and PM_{10}.

A comparison of traffic flows from the latest version of the London Atmospheric Emissions Inventory confirms that there are no new roads with significantly changed traffic flows.

The Council confirms that there are no new or newly identified roads not considered previously with significantly changed traffic flows in the Borough.

3.7 Bus and coach stations

This section only applies to bus stations or sections of bus stations that are not enclosed, and where there is relevant exposure, including at nearby residential properties. The assessment is for both the annual mean and the 1-hour NO_2 objectives. (Note - the term “bus” in this instance is used to signify both buses and coaches).

Bus stations in Tower Hamlets were examined in previous USAs and found not to require further investigation. Based on the TG09 guidance if such sources were previously considered and are within an existing AQMA there is no need to proceed further.

The Council confirms that bus stations in Tower Hamlets were assessed in previous rounds of review and assessment. These found that there are no relevant bus stations in the Borough requiring a Detailed Assessment.

4. Other Transport Sources

4.1 Airports

Aircraft are potentially significant sources of nitrogen oxides (NO_X) emissions, especially during takeoff. The revised guidance has used new information, which has resulted in the criteria to trigger a Detailed Assessment being relaxed, while the requirement to assess PM_{10} has been removed. Thus this section only applies to NO_2. (Note – any road traffic using airports was considered in the previous section.)

In the Council's previous rounds of Review and Assessment it was confirmed that the nearest airport, London City Airport, is outside the Borough, and just sufficiently distant as not to be relevant. Furthermore passenger numbers, although increased in 2008 to a record 3.3 million (see http://www.londoncityairport.com/AboutUs/ViewRelease.aspx?id=1122) are still below the threshold of 10 million passengers per annum as given in the TG09 guidance.

The Council confirms that there are no relevant airports in the Borough.

4.2 Railways (diesel and steam trains)

Stationary locomotives, both diesel and coal fired, can give rise to high levels of sulphur dioxide (SO_2) close to the point of emission. Recent evidence also suggests that moving diesel locomotives, in sufficient numbers, can also give rise to high NO_2 concentrations close to the track where, along busy lines, emissions can be equivalent to those from a busy road.

Diesel locomotives use rail lines that run through Tower Hamlets, however these are not included within the list of lines (from Table 5.1 of TG09), which identify those with a "high" usage of diesel locomotives. Previous rounds of Review and Assessment also found that there are no areas within the Borough where diesel or steam locomotives are stationary for periods of 15 minutes or more and within 15 m of locations where regular outdoor exposure arises. This situation has not changed.

4.2.1 Stationary Trains

The Council confirms that there are no locations where relevant exposure to emissions from steam or diesel trains arises within the Borough.

4.2.2 Moving Trains

The Council confirms that there are no relevant locations where there are large movements of diesel locomotives and potential long-term relevant exposure within 30 m.

4.3 Ports (shipping)

The assessment for shipping needs to consider SO_2 only. The southern Borough boundary aligns the river Thames and although there are some ship movements in this area they are not sufficient to require further investigation based on the TG09 guidance.

The Council confirms that there is no port or any shipping that meet the specified criteria within the Borough.

5. Industrial sources

The Council and the Environment Agency (EA) control industrial sources within the Borough under the Environmental Permitting Regulations (England and Wales) 2007, as amended. The Council also has control over some smaller industrial and commercial sources, largely through the Clean Air Act, with its associated control of the stack heights. As a result of these controls, there are relatively few sources that may be relevant under the Local Air Quality Management (LAQM) regime. Many of these sources were also addressed during previous rounds of Review and Assessment. The focus is thus on new installations and those with significantly changed emissions.

5.1 New or Proposed Industrial Processes

Industrial sources are considered unlikely to make a significant local contribution to annual mean concentrations, but could be significant in terms of the short-term objectives in the Borough. Sources in neighbouring authorities and the combined impact of several sources are considered. The approach used is based on use of the planning and permitting processes. The assessment considers all the LAQM pollutants, including those most at risk of requiring further work (SO_2, NO_2, PM_{10} and benzene).

5.1.1 New or Proposed Processes for which an Air Quality Assessment has been carried out

Since the last round of Review and Assessment an application for a Part A permit for an Energy Centre at Riverside South has been submitted. The development at Riverside South is for three connected office blocks: it was previously granted planning permission in 2007 by the Council. The Part A application is for CCHP plant comprising compression six duel fuel gas engine generators, plus ten gas fired hot water boilers, all with a rated thermal input of greater than 50MW. The plant includes overcapacity for typical use and standby power provision.

The air quality assessment submitted to the Environment Agency is based on a series of typical and potential operating scenarios for the Energy Centre. Emissions from the combustion plant are dispersed from stacks at the top of the main buildings (230m and 180m above ground level). The assessment, based on dispersion modelling, concludes that ground level concentrations of all pollutants are predicted to be insignificant in all locations using the Environment Agency's H1 assessment criteria during typical operations. Similarly pollutant concentrations from the standby operation of the gas boilers are predicted to be insignificant. The report however confirms, "Existing air quality in the vicinity of the site is either close to or exceeds the annual mean nitrogen dioxide objective. Therefore any increase in the annual mean, as a result of the installation that cannot be ruled out as insignificant, cannot be discounted." The assessment also includes a consideration of the short-term objectives based on the H1 guidance and it concludes that the additional contribution from the installation should not result in an exceedence of the short term NO_2 objective.

The Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.2 Existing Processes where emissions have increased substantially or new relevant exposure has been introduced

The lists of existing Part B processes that are regulated under the Environmental Permitting regime are provided in the Appendix. These are all processes with low emissions of LAQM pollutants. None of these have increased emissions by greater than 30% and no new relevant exposure has been introduced nearby.

The Council confirms that there are no existing processes with substantially increased emissions or new relevant exposure.

5.1.3 New or significantly changed processes with no previous Air Quality Assessment

Since the last round of Review and Assessment the Council has received applications for twenty dry installations. None of these however has required an air quality assessment.

No other applications have been received for new or proposed sources where it has been determined that the installation is likely to give rise significant pollutant emissions.

The Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.2 Major fuel (petrol) storage depots

This was previously assessed in earlier rounds of Review and Assessment and it was found that there are no major petrol storage depots in the Borough. This situation has not changed.

There are no major fuel (petrol) storage depots within the Council's area.

5.3 Petrol stations

There is some evidence that petrol stations could emit sufficient benzene to put the 2010 objective at risk of being exceeded, especially if combined with higher levels from nearby busy roads. Some sites in the Borough have however already incorporated petrol vapour recovery (PVR) systems when undergoing refurbishment, furthermore those service stations with petrol sales above 3.5 million litres per annum are installing PVR before the 1st January 2010 deadline to comply with UK legislation to reduce petrol vapour (and benzene) from vehicles.

The previous round of Review and Assessment assessed all petrol stations for a throughput of more than 2000 m^3 of petrol, and a busy road nearby. Of these none were found to have relevant exposure within 10m of the pumps and therefore it was not necessary to go to a Detailed Assessment. There has been no change in this situation for this round.

The Council confirms that there are no petrol stations meeting the specified criteria in the Borough.

5.4 Poultry farms

Some local authorities in England have identified potential exceedences of the PM_{10} objectives associated with emissions from poultry farms (defined as chickens (laying hens and broilers), turkeys, ducks and guinea fowl). These relate to large farms (> 100,000 birds) that are regulated by the EA. None however exist within the Council's area.

The Council confirms that there are no poultry farms meeting the specified criteria in the Borough.

6. Commercial and Domestic Sources

6.1 Biomass combustion – Individual Installations

Biomass burning can lead to an increase in PM_{10} emissions, from the combustion process itself and also by aerosol formation from the volatile materials distilled from the wood. Compared to conventional gas burning, biomass burning can also result in an increase in NO_X emissions due to the fuel-derived portion that is not present in gas combustion.

The whole borough however is a Smoke Control Area, meaning that the emission of smoke from chimneys of domestic premises and other buildings is not permitted. Furthermore furnaces, chimneys and industrial processes are monitored carefully and only authorised appliances (as listed under the Smoke Control Area Orders) can be used to burn solid fuels such as coal, coke and wood.

6.1.1 Individual installations

The use of biomass to generate energy has potentially significant benefits for the reduction of greenhouse gas emissions. However there are concerns that an increase in biomass combustion in highly urbanised areas such as Tower Hamlets could be detrimental to air quality, particularly with respect to PM_{10} and NO_2. The TG09 guidance includes a procedure to determine the impact of biomass combustion plant to see if there is the potential for the air quality objectives to be exceeded.

Following this the Council has assessed for individual combustion plant burning biomass ranging from 20 MW down to 50 kW units. Existing biomass combustion plant was found in the Borough at one site at Bishop Challoner Catholic School near Whitechapel. The plant combusts wood pellets with a 240kW rated boiler.

Based on the procedure described in the TG09 guidance, the effective stack height for the discharge at Bishop Challoner School should be greater than 10m for the NO_2 objectives and 7m for the PM_{10} daily mean objective. The effective stack height is 14m, which indicates that these criteria have been met. The details used for the assessment are shown in Table 14. Based on this information the boiler will not need any further assessment.

The potential for combined impacts will be assessed should future plant be proposed. Currently there is considered to be minimal domestic solid fuel burning as discussed in the next section.

The Council has assessed for the combined impact of biomass combustion and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.1.2 Combined impacts

As already outlined the Council is a Smoke Control Area and therefore any biomass burning using non-authorised appliances is considered minimal. There is however the potential that many small biomass combustion installations (including domestic solid-fuel burning), whilst individually acceptable, could in combination lead to unacceptably high PM_{10} concentrations, particularly in areas where PM_{10} concentrations are close to or above the objectives. The impact of domestic biomass combustion in most areas is thought to be small at the time of writing, but could become more important in future. The potential for combined impacts, other than that discussed above, will be assessed should future plant be proposed. Currently there is minimal domestic solid fuel burning as discussed in the next section.

The Council has assessed for the combined impact of biomass combustion and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Domestic Solid-Fuel Burning

The previous rounds of Review and Assessment identified areas where domestic solid fuel burning gives rise to exceedences of the objective for SO_2. PM_{10} from domestic solid fuel burning was also covered above (6.1.2 Biomass combustion – combined impacts).

The whole of the Borough is designated a Smoke Control Area and there are no areas of significant domestic solid fuel use in the Borough. This position has not changed from the previous USA in 2006, which confirmed that no areas of significant domestic solid fuel burning were identified. Gas is widely available across the Borough and it remains the predominant fuel used for domestic water and space heating.

The Council confirms that there are no areas of significant domestic solid fuel use in the Borough.

7. Fugitive or Uncontrolled Sources

Dust emissions from uncontrolled and fugitive sources can give rise to elevated PM_{10} concentrations. These sources can include, but are not limited to the following sites: quarrying and mineral extraction sites, landfill sites, coal and material stockyards, or materials handling, major construction works and waste management sites. Dust can arise from the passage of vehicles over unpaved ground and along public roads that have been affected by dust and dirt tracked out from dusty sites. Other sources of dust are from the handling of dusty materials, the cutting of concrete, etc and wind-blown dust from stockpiles and dusty surfaces.

No fugitive and uncontrolled particulate matter emissions have been identified based on local professional knowledge, recent air quality assessments or recent complaints to the Council.

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The Council confirms that there are no new or potential sources of fugitive particulate matter emissions in the Borough that have not been previously investigated.

8. Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Monitoring within the Borough confirmed that the annual mean nitrogen dioxide objective has recently been widely exceeded at roadside and background locations. The Council monitors 3 locations continuously (plus monitoring is also undertaken near Blackwall) and 78 other locations across the Borough using diffusion tubes. Most of the sites monitored are considered to represent relevant exposure. Of these the continuous background sites in the Borough just met the relevant annual mean objectives (based on 2008 results only) for nitrogen dioxide, as did the four of the background diffusion tube sites, plus two roadside sites only.

An analysis of trends from continuous monitoring sites in Tower Hamlets however indicates that there have been no significant reductions to NO_2 concentrations since the previous round of Review and Assessment.

The Council's most recent PM_{10} monitoring indicates that the daily and annual mean objectives have been exceeded recently within the Borough at the Tower Hamlets 4 site. Other sites within the Borough have met the objectives. An analysis of trends however confirms that concentrations do not appear to be reducing and there is also evidence indicating that close to roadsides PM_{10} from primary sources may be increasing. The 2008 monitoring of sulphur dioxide, carbon monoxide and benzene confirms that the objectives for these pollutants have been met.

Based on these findings from monitoring in the Borough, the Council does not need to undertake a Detailed Assessment as no new potential or actual exceedences at relevant locations were established.

8.2 Conclusions from Assessment of Sources

The Council has assessed the likely impacts of local developments for road transport, other transport, industrial processes, commercial/domestic, fugitive emissions, residential and commercial sources. The findings have indicated that there are no new changes that require the Council to undertake a Detailed Assessment.

8.3 Proposed Actions

This report follows the technical guidance (TG09) produced for this part of the third round of Review and Assessment. It therefore fulfils this part of the continuing LAQM process.

The results, from following this methodology, are that the Council has not identified an additional risk of the air quality objectives for the LAQM pollutants: carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide, being exceeded anywhere in the Council's area. Thus the Council need not proceed beyond the updating and screening assessment for these pollutants. For nitrogen dioxide and particles (PM_{10}) the Council has previously designated the Borough as an AQMA. The findings from this report indicate that the AQMA should be maintained.

The Council will therefore undertake the following actions:

1. Undertake consultation on the findings arising from this report with the statutory and other consultees as required.

2. Maintain the existing and proposed monitoring.

3. Continue with the implementation of its Air Quality Action Plan in pursuit of the AQS objectives.

4. Prepare for the submission of its 2010 Progress Report.

9. References

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Appendices

Table 10 2008 Unadjusted NO_2 diffusion tube results for Tower Hamlets

Tube No	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1	60	71	A	89	36	45	41	30	48	91	65	35
3	90	102	82	93	79	75	66	51	75	140	81	55
5	128	110	A	119	102	A	90	A	62	A	314	75
6	A	133	91	114	107	131	100	71	106	183	108	73
7	65	72	54	52	51	40	40	30	47	110	74	47
8	55	66	48	55	46	39	33	28	48	96	54	42
9	76	85	78	72	45	64	57	26	48	124	118	47
10	88	89	76	80	76	77	57	33	59	114	38	45
11	68	A	60	60	48	56	49	38	50	112	74	44
12	69	74	57	56	46	60	41	32	56	105	61	47
13	67	76	51	57	49	51	49	34	51	105	64	40
14	76	84	63	66	60	64	47	40	52	114	57	55
15	A	87	61	81	40	55	40	A	A	130	83	51
17	59	67	48	53	47	37	36	25	44	95	55	38
18	100	87	76	83	87	104	74	55	71	151	94	60
19	79	A	57	70	52	58	56	39	A	112	68	46
20	111	103	85	91	68	87	88	65	75	165	85	82
21	101	131	81	96	92	118	77	58	93	164	100	68
22	65	65	A	54	46	45	42	25	49	92	61	43
23	74	74	A	60	48	75	63	42	56	108	60	38
24	91	80	67	73	41	77	64	47	58	120	73	43
25	88	78	61	70	48	70	55	33	58	A	71	46
26	76	78	73	71	82	75	58	33	56	122	78	51
28	99	110	82	100	79	102	52	61	73	146	95	72
29	93	89	62	63	65	61	63	32	68	101	62	56
30	104	102	81	86	94	80	59	46	76	110	73	53
32	109	95	83	90	71	78	57	A	59	123	81	53
34	66	74	59	58	58	66	52	33	58	99	69	45
35	172	191	154	180	176	200	146	97	147	280	172	120
36	67	74	45	50	51	58	16	29	53	100	70	45
37	58	68	46	54	52	60	46	32	57	102	60	43
39	76	82	62	47	65	70	45	45	59	117	67	49
40	90	81	63	71	41	74	60	31	69	117	81	57
41	69	90	47	57	77	54	55	24	65	88	55	57
42	55	67	35	45	39	45	28	17	45	72	50	45
43	57	65	36	42	37	36	39	16	45	70	53	42
44	88	90	55	64	56	61	69	34	74	115	60	54
45	91	90	A	102	66	90	69	34	81	114	57	61
46	71	80	49	58	36	50	34	45	48	105	63	42

48	55	67	45	66	36	75	52	30	63	103	63	52
49	79	96	60	84	39	57	62	32	59	104	66	50
50	69	86	70	92	44	99	83	37	82	125	84	50
51	57	60	46	44	44	52	36	27	40	A	62	37
52	81	75	58	78	61	68	64	32	A	101	80	51
53	116	117	73	108	94	119	106	45	113	A	A	A
54	97	82	69	64	62	72	95	43	60	119	69	63
55	51	51	36	36	A	72	21	26	35	73	50	33
56	65	72	50	68	45	58	A	27	41	104	55	48
57	52	56	37	51	39	34	40	19	52	70	51	45
58	55	62	47	55	30	44	49	26	50	87	55	45
59	56	73	53	69	53	59	47	27	65	100	55	64
60	74	89	64	65	39	71	80	40	79	99	66	59
61	91	84	57	61	46	70	62	31	75	95	A	A
62	58	71	50	62	46	58	58	27	72	87	64	52
63	47	66	32	A	A	A	A	A	43	68	48	41
64	57	73	47	59	53	59	50	26	62	83	53	45
65	51	79	48	69	50	68	64	29	74	94	64	56
66	59	63	39	A	A	A	A	A	A	A	A	A
67	49	64	45	48	37	55	53	27	61	79	57	46
68	A	A	A	A	A	A	A	A	A	A	A	A
69	61	74	42	59	35	60	57	A	59	92	60	51
70	54	69	49	56	45	48	45	25	68	80	44	49
71	73	92	64	69	65	84	61	40	59	122	74	51
72	58	75	A	A	39	56	57	31	68	90	53	51
73	62	78	56	54	6	57	47	26	50	94	71	51
74	74	99	78	110	71	A	A	A	77	128	82	70
75	51	63	39	57	29	39	50	24	64	79	51	44
76	97	99	71	102	65	87	80	48	98	121	80	64
77	87	71	57	63	33	41	52	31	70	90	63	50
78	65	81	A	79	40	A	63	31	68	104	64	57
79	62	65	39	58	57	50	45	21	62	82	48	45
80	67	77	53	68	74	57	61	24	84	102	63	59
81	135	140	116	143	75	135	143	64	130	207	131	101
82	A	A	A	A	103	164	A	A	A	A	A	A
83	110	132	105	152	A	A	153	85	163	211	127	111
84	91	74	72	A	A	59	77	38	68	113	69	50
85	65	93	60	A	74	66	C	32	72	107	67	50
86	52	72	58	60	45	70	50	22	A	93	A	A
87	72	85	60	67	66	81	53	47	69	85	77	52
88	49	58	35	54	A	A	A	A	47	A	A	164
89	46	66	A	87	A	A	A	23	43	68	55	45
90	44	66	A	86	A	A	A	21	55	81	56	61

Table 11 List of permitted petrol stations in the Council's area

Company Name	Site Address
Star The Highway	Star Service Stations Ltd, 102-106 The Highway, London E1 9BU
Star St Katherines	Star Service Stations Ltd, 77-101 The Highway, London E1 9BN
Star Cotton Street	Star Service Stations Ltd, 40 Cotton Street, London E14 0AJ
Star Bow Road	Star Service Stations Ltd, 127-139 Bow Road, London E3 2AN
Orchard Wharf S/ Station	Orchard Wharf Service Station, Leamouth Road, London E14 0JG
Shell Whitechapel	Shell UK Ltd, 139-149 Whitechapel Road, London E1 1DT
Shell Old Ford	Shell UK Ltd, 445-453 Wick Lane, London E3 2TB
Tesco Filling Station	Tesco Petrol Filling Station, Hancock Road, London E3 3DA
Vallance Self S/Station	Vallance Self S/Station, 112 Vallance Road, Bethnal Green, London E1 5BW
Asda Petrol Station	Asda Petrol Station, 151 East Ferry Road, London E14 3BT
Sainsbury Petrol Garage	Sainsbury's Petrol Garage, 1 Cambridge Heath Road, London E1 5SD
Grove Road Filling Station	Grove Road Filling Station, 51-53 Grove Road, London E3 4PE
Museum Service Station	Museum Service Station, 319-329 Cambridge Heath Road, London E2 9LH
Burdett Road F/ Station	Burdett Road Filling Station, 222 St Pauls Way, London E3 4AR

Table 12 Part A2/ B installations in the Council's area

PG Note	Company Name	Site Address/ Home Address of Mobile Plant
PG2/2(04) Hot Dip Galvanising Process	J Ash & Sons (Part A2)	London Galvanisers, Leven Road, London, E14 0LP
PG6/34(04) Respraying of Road Vehicles	KPM Taxis	Hemming House, Hemming Street, London, E1 5BL
PG3/16(04) Mobile Crushing and Screening	Clifford Devlin Ltd	Clifford House, Towcester Road, London, E3
PG3/1(04) Bulk Cement	London Concrete Ltd	Bow Plant, Wick Lane, Bow, London, E3
PG3/1(04) Bulk Cement	Hanson	Wood Wharf, Prestons Road, London
PG3/16(04) Mobile Crushing and Screening	McGrath Bros (mobile)	Wansbeck Road, London, E9 5HW
PG3/16(04) Mobile Crushing and Screening	McGrath Bros (own site)	Wansbeck Road, London, E9 5HW
PG3/1(04) Bulk Cement	Modern Mix Concrete (Jim'll Mix It)	Unit 1, Lusty Industrial Estate, Empson Street, London, E3 3LT
PG6/34(04) Respraying of Road Vehicles	Renault London City	585- 593 Commercial Road, London, E1 0HJ
PG3/1(04) Bulk Cement	CEMEX South East	477 The Highway, Stepney, London, E1 9HN
PG6/16(04) Printworks	Westferry Printers Ltd	235 West Ferry Road, London, E14 8NX

Table 13 List of permitted dry cleaners in the Council's area

Company Name	Site address
Goldstar Dry Cleaners	330 Burdett Road
Milligan Street Trading Ltd	112 Milligan Street
B&S Drycleaning	537 Roman Road
Royal Deluxe Dry Cleaners	418 Roman Road
Bright Clean Dry Cleaners	7 Vesey Path
Dry Cleaning by Sandringham	21 Watney Market
Champers Dry Cleaners	528 Roman Road
Professionals Dry Cleaners	21 Market Way
Spitalfields Dry Cleaners & Shirt Service	12 Whites Row
Reliable Dry Cleaners	5a Castalia Square
Five Star Dry Cleaners	256 Cambridge Heath Road
Ace Suede & Leather Cleaning Ltd	39-41 Eleanor Street
Spotless Clean	51 Old Bethnal Green Road
Bow Dry Cleaners	22 Bromley High Street
Brayford Dry Cleaners	1a Brayford Square
Nazal Dry Cleaners	180 Hackney Road
Soleil Dry Cleaners	45 Narrow Street
Goldstar Dry Cleaners	330 Burdett Road
Milligan Street Trading Ltd	112 Milligan Street
B&S Drycleaning	537 Roman Road

Table 14 Details of biomass combustion plant in Tower Hamlets

PM_{10} daily mean objective		**Max thermal capacity**	**Emission rate**	**Background**	**Ea adj emission**	**U eff stack height***	**Diameter (m)**
Bishop Challenor School	Wood pellet	240	0.01824	25.5	0.0028	14	0.3
NO_2 annual mean							
Bishop Challenor School	Wood pellet	240	0.0216	44	0.0216	14	0.3
NO_2 hourly mean							
Bishop Challenor School	Wood pellet	240	0.0216	44	0.077	14	0.3

(Note - * assumes that building height <5.6m)

Figure 9 Map showing location of Tower Hamlets diffusion tube sites
(Tube ID marked)

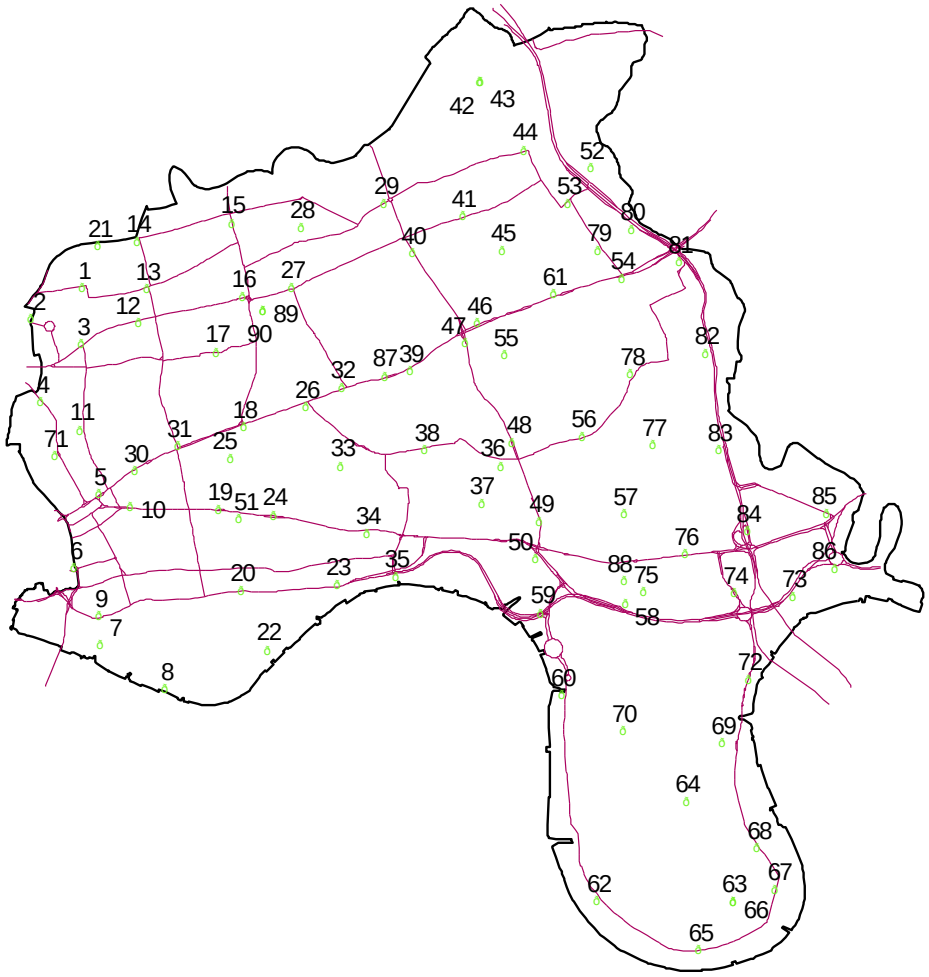

Table 15 Details of diffusion tube sites in Tower Hamlets

Tube ID	Street location	Easting	Northing	TYPE
1	Gosset Street	533884	182815	Roadside
2	Boundary Street	533535	182606	Roadside
3	Bethnal Green Road	533875	182437	Roadside
4	Commercial Road	533603	182049	Roadside
5	Whitechapel High Street	533992	181431	Roadside
6	Mansell Street	533829	180929	Roadside
7	St Katharines Dock	534001	180415	Background
8	Wapping High Street	534441	180117	Roadside
9	Cartwright Street	533999	180608	Roadside
10	Adler Street	534208	181341	Roadside
11	Princelet Street	533869	181861	Roadside
12	Bethnal Green Road	534259	182580	Roadside
13	Squirries Street	534316	182806	Roadside
14	Warner Place	534255	183130	Roadside
15	Parmiter Street	534889	183254	Roadside
16	Paradise Row	534959	182757	Roadside

17	Finnis Street	534783	182385	Roadside
18	Sidney Street	534968	181878	Roadside
19	Philpot Street	534803	181325	Roadside
20	Dellow Street	534951	180779	Roadside
21	Horatio Street	533990	183095	Roadside
22	Wapping Wall	535132	180377	Roadside
23	Brodlove Lane	535598	180819	Roadside
24	Jubilee Street	535174	181288	Roadside
25	Cavell Street	534884	181667	Roadside
26	Stepney Way	535388	182017	Roadside
27	Globe Road	535295	182820	Roadside
28	Bonner Road	535356	183223	Roadside
29	Old Ford Road	535917	183384	Roadside
30	Whitechapel Road	534237	181581	Roadside
31	Whitechapel Road	534527	181752	Roadside
32	Mile End Road	535633	182147	Roadside
33	Stepney Way	535627	181618	Background
34	Pitsea Street	535798	181160	Roadside
35	Narrow Street	535990	180874	Roadside
36	Locksley Street	536703	181619	Roadside
37	Rodeswell Road	536578	181366	Roadside
38	Ben Jonson Road	536191	181725	Roadside
39	Harford Street	536089	182258	Roadside
40	Thoydon Road	536109	183050	Roadside
41	Ford Close	536447	183301	Roadside
42	Victoria Park	536558	184206	Background
43	Victoria Park	536565	184202	Background
44	Parnell Road	536858	183747	Roadside
45	St Stephen's Road	536713	183070	Roadside
46	Mile End Road	536546	182580	Roadside
47	Wentworth Mews	536465	182444	Roadside
48	Acroyd Drive	536777	181775	Roadside
49	Dod Street	536964	181245	Roadside
50	West India Dock Road	536940	180992	Roadside
51	Watney Market	534938	181257	Background
52	Wick Lane	537304	183619	Roadside
53	Fairfield Road	537156	183384	Roadside
54	Glebe Terrace	537514	182877	Roadside
55	Southern Grove	536725	182361	Background
56	Bow Common Lane	537248	181815	Roadside
57	Augusta Street	537532	181290	Roadside
58	Dolphin Lane	537539	180688	Roadside
59	Westferry Road	536973	180628	Roadside
60	Westferry Road	537115	180074	Roadside
61	Alfred Street	537056	182773	Roadside
62	Mast House Terrace	537352	178686	Roadside
63	Globe Road Walk	538263	178685	Background
64	Limeharbour	537953	179357	Roadside
65	East Ferry Road	538037	178357	Roadside
66	Globe Road Walk	538270	178685	Background
67	Seyssel Street	538552	178766	Roadside

68	Manchester Road	538432	179044	Roadside
69	Lawn House Close	538191	179750	Roadside
70	Admirals Way	537523	179835	Roadside
71	Toynbee Street	533695	181689	Roadside
72	Prestons Road	538369	180182	Roadside
73	John Smith Mews	538672	180739	Roadside
74	Poplar High Street	538271	180760	Roadside
75	Hale Street	537661	180768	Roadside
76	East India Dock Road	537942	181027	Roadside
77	Morris Road	537728	181758	Roadside
78	Devons Road	537577	182232	Roadside
79	Hartfield Terrace	537356	183068	Roadside
80	Wrexham Road	537581	183208	Roadside
81	Bromley High Street	537903	182994	Roadside
82	Devas Street	538081	182376	Roadside
83	Zetland Street	538170	181729	Roadside
84	Blair Street	538366	181180	Roadside
85	Portree Street	538895	181296	Roadside
86	Newport Avenue	538955	180925	Roadside
87	Mile End Road	535922	182223	Roadside
88	Wades Place	537530	180839	Background
89	Roman Road	535102	182666	Control
90	Roman Road	535102	182666	Control

Table 16 Sites no longer monitored

Calvert Ave/Boundary Street	2
Commercial St/Calvin St	4
Paradise Row/Bethnal Green Rd	16
Globe Road	27
Whitechapel Market	31
Stepney Green	33
Aston St/Ben Jonson Rd	38
Wentworth Mews	47
Manchester Road/Ollife Street - Outside Cubitt Arms	68