



2012 Air Quality Updating and Screening Assessment for Milton Keynes Council

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

April, 2012

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Executive Summary

1. This Updating and Screening Assessment (USA) 2012 has looked at changes that have occurred since the last review and assessment was undertaken in 2009, which may have a significant effect on local air quality.
2. The USA contains a summary of new air quality monitoring data collected during the years 2009-2011. Data from previous years have been included for comparison to enable any trends to be identified.
3. There is no requirement to proceed to a Detailed Assessment for any of the pollutants investigated.
4. With the exception of the Air Quality Management Area in Olney, air quality objectives are being achieved throughout the Borough of Milton Keynes.
5. The draft Air Quality Action Plan for Olney will be finalised in summer 2012.
6. A Progress Report will be submitted to Defra by the end of April 2013.

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1 Introduction

1.1 Description of Local Authority Area

The Borough of Milton Keynes covers an area of 30,869 hectares in north Buckinghamshire. Its boundary forms the county boundary with Northamptonshire to the north and west and with Bedfordshire to the east. To the south of the Borough is the Aylesbury Vale District of Buckinghamshire.

The “new city” or Designated Area of Milton Keynes accounts for about one third of the Borough and contains about 80% of the total population of approximately 246,000. Outside the Designated Area the Borough is rural in character with a number of small towns and attractive villages. Milton Keynes is expanding rapidly particularly with major housing developments on the eastern and western flanks of the city.

The major pollution source is from road traffic emissions. The M1 motorway, A5 trunk road and the west coast mainline electrified railway from London Euston to Glasgow run through the Borough.

1.2 Purpose of Report

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

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report

should provide an update of any outstanding information requested previously in review and assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre, $\mu\text{g}/\text{m}^3$ with the number of exceedences in each year that are permitted (where applicable). For carbon monoxide the objective is in milligrammes per cubic metre, mg/m^3 .

Table 1.1 Air Quality Objectives Included in Regulations for the Purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Table 1.2 below summarises all previous local air quality management reports, which can be viewed and downloaded from the following web address;

<http://www.milton-keynes.gov.uk/environmental-health/DisplayArticle.asp?ID=17335>

Table 1.2 Summary of Previous Review and Assessments

Report	Date	Description/Outcome
Review and Assessment	2000	The first round of review and assessment of air quality. A third stage assessment for nitrogen dioxide, PM ₁₀ and carbon monoxide concluded that all objectives would be achieved by the relevant date.
Updating and Screening Assessment	2003	Second round of review and assessment. All objectives were predicted to be achieved by the relevant date.
Progress Report	2004	Summary report of new monitoring data, new local developments and other air quality related information.
Progress Report	2005	Summary report of new monitoring data, new local developments and other air quality related information.
Updating and Screening Assessment	2006	Third round of review and assessment. Concluded that a Detailed Assessment was not required for any pollutant.
Progress Report	2007	New monitoring data identified the need for a Detailed Assessment of NO ₂ in Olney
Detailed Assessment	2008	A Detailed Assessment of nitrogen dioxide concentration in Olney. Concluded that an Air Quality Management Area (AQMA) should be declared.
Progress Report	2008	Additional report to complement the Detailed Assessment and provide Borough-wide air quality information.
Updating and Screening Assessment	2009	Fourth round of review and assessment. All objectives were predicted to be achieved by the relevant date with the exception of NO ₂ within the AQMA in Olney.
Progress Report	2009	Additional report to complement the Updating and Screening Assessment and provide Borough-wide air quality information.
Further Assessment	2009	A Further Assessment of nitrogen dioxide concentration in Olney confirmed the exceedence and looked at source contributions.
Progress Report	2010	Summary report of new monitoring data, new local developments and other air quality related information.
Progress Report	2011	Summary report of new monitoring data, new local developments and other air quality related information.
Draft Action Plan	2012	This was appraised by Defra in March and the final Action Plan will be produced in summer 2012

In the earlier review and assessments of air quality, heavily trafficked roads such as the M1 motorway were targeted as locations where exceedences of air quality objectives might be expected. This proved not to be the case as residential

properties (and relevant public exposure) are usually at a sufficient distance from the major roads to allow dispersion and dilution of pollutants to a level below the objective. More recently monitoring has concentrated on narrow congested streets where people live in very close proximity to the roads.

In 2007, Milton Keynes Council identified the need for a Detailed Assessment of the nitrogen dioxide concentration in Olney, which is a busy market town with relatively high vehicle flows. Monitoring data showed that relevant locations on Bridge Street and High Street South were exceeding the annual nitrogen dioxide objective. An Air Quality Management Area was declared and came into force on 1st December 2008 (see Figure 1.1). A Further Assessment carried out by the Transport Research Laboratory on behalf of the Council looked at source contributions and modelled possible Action Plan measures including a total ban and restricted access of heavy goods vehicles.

A draft Air Quality Action Plan (AQAP) was submitted to Defra in January 2012 and the appraisal report was received in March 2012. The minor comments listed in the appraisal will be considered in preparing the final version of the Action Plan in the summer of 2012. This will contain the preferred options designed to bring about air quality improvements in the AQMA.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Up to 18th July 2011 the Environmental Protection Team operated four continuous automatic air quality monitoring stations; a fixed monitoring station located within the walled garden at the rear of the Civic Offices; two small semi-permanent monitoring stations known as "roadboxes", located on Wolverton Road, Newport Pagnell near the M1 bridge and on High Street South, Olney within the Air Quality Management Area; and one mobile air quality station which can be towed to various locations throughout Milton Keynes. On 18th July 2011 the mobile station was moved from Sorrell Drive, Newport Pagnell and decommissioned to reduce operating costs.

The automatic monitoring stations contain National Environmental Technology Centre (NETCEN) type-tested and approved analysers, as used in national networks, housed in secure air-conditioned containers to maintain the correct operating temperature range. Most functions of the air quality stations are automatic or can be operated by remote communication via modem, usually from the air quality monitoring computer at the Civic Offices. Data are downloaded daily, and gas analysers are checked calibrated automatically every 3 days using a gas mixture of known concentration to ensure accuracy of data.

A full service by the manufacturer is undertaken every 6 months and the service includes a verification of the calibration gas concentration using a traceable standard. After correction has been made to the data set for any calibration errors, and other relevant factors, the data are usable for comparison with the objectives of the Strategy. The Site Operator's Manual for the Automatic Urban and Rural Network, produced by NETCEN is used as an operational guide for the automatic monitoring stations.

Table 2.1a below shows the current monitoring locations, and Table 2.1b shows previously monitored locations.

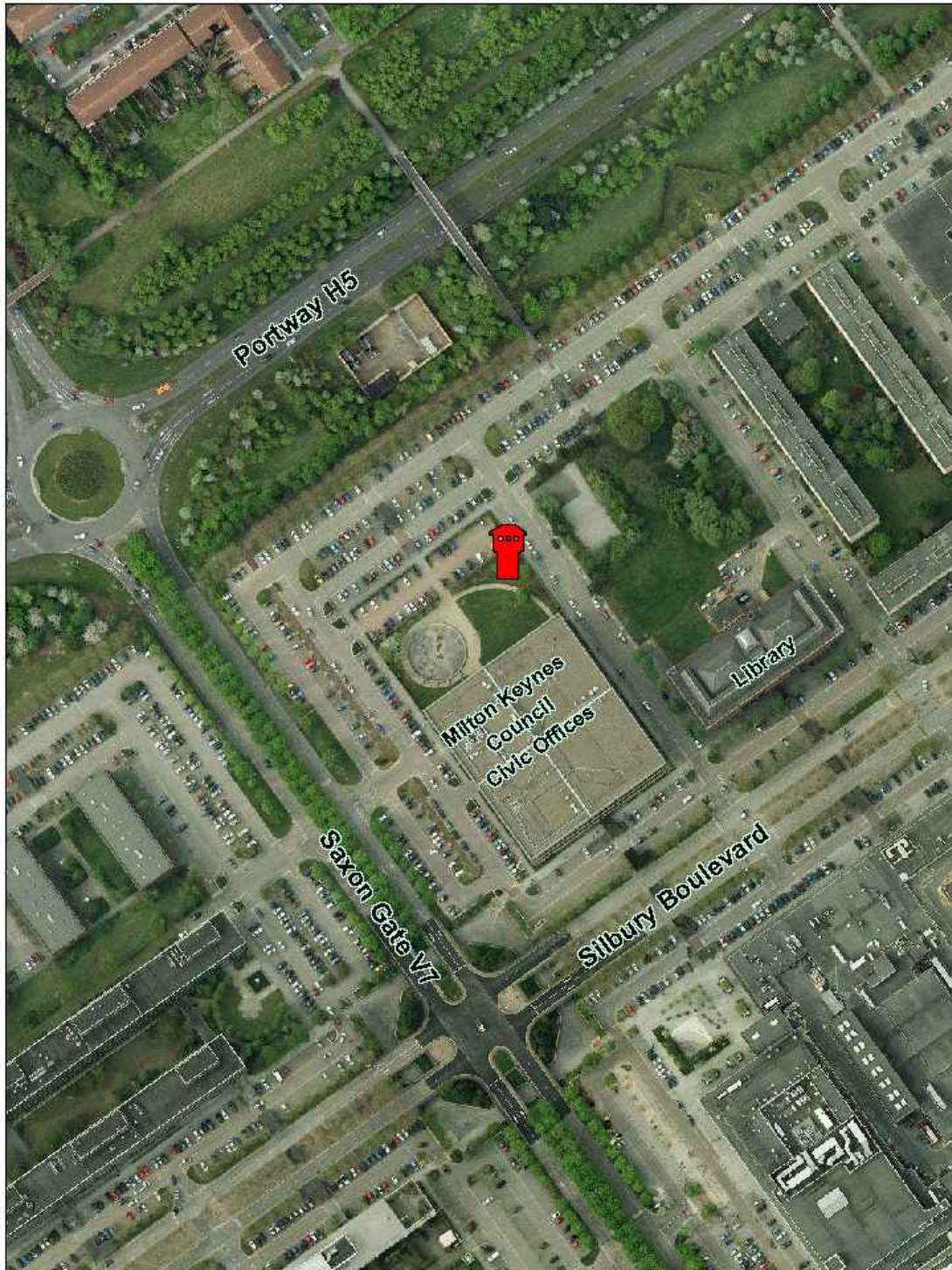
Table 2.1a Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Monitoring technique	In AQMA?	Relevant exposure?	Distance to kerb of nearest road (m)	Worst-case location?
Civic Offices, CMK	Urban Centre	485070 239131	PM ₁₀	TEOM 1400AB	N	N	4.8	N
			NO ₂	Horiba APNA 360CE (chemiluminescence)				
			SO ₂	Horiba APSA 360CE (uv-fluorescence)				
			O ₃	Horiba APOA 360 (uv absorption)				
Wolverton Road, Newport Pagnell	Roadside	486290 243344	PM ₁₀	Eberline β-gauge	N	N	3.4 (150 to M1)	Y
			NO ₂	Horiba APNA 360CE (chemiluminescence)				
High Street South, Olney	Roadside	488922 251157	PM ₁₀	TEOM 1400AB	Y	Y	2	Y
			NO ₂	Horiba APNA 360CE (chemiluminescence)				

Table 2.1b Previously Monitored Locations

Location	Site Type	Grid Reference	Monitoring dates	Comments
Sorrell Drive, Newport Pagnell	Other	485618 243916	16-Feb-10 18-Jul-11	38 m from edge of M1 motorway
Station Rd Car Park, Newport Pagnell	Roadside	487222 243733	30-Jun-08 16-Feb-10	5.5 m from junction of 2 main roads
Church Street Olney	Roadside	488937 251128	22-May-07 18-Jun-08	5.9 m from High Street South, a narrow canyon effect road
Newport Road New Bradwell	Roadside	482579 241466	23-Aug-05 22-Dec-08	6 m from Newport Road. Houses 28 m from AQ station
Burgess Gardens Newport Pagnell	Suburban	486942 242677	14-Nov-00 14-Aug-02 24-Jun-05 15-May-07	Residential area 85 metres from edge of M1
Selbourne Avenue Bletchley	Urban Background	485722 232957	09-Oct-02 03-May-05	Mobile station in residential area. Landfill site 330m
Linceslade Grove Loughton	Suburban	483757 238140	18-Feb-04 26-Jul-05	Mobile station in residential area 56m from edge of A5
Western Road Bletchley	Urban Background	487360 234012	07-July-00 14-Nov-00	Residential area in Central Bletchley
High Street Olney	Kerbside	488919 251452	11-Nov-98* 11-Feb-99 14-Aug-02 11-Dec-03	Main street in busy market town *(monitored on 2 occasions)
Lovat School, Newport Pagnell	Urban Background	487996 243400	29-Nov-99 22-Mar-00	School in residential area
Miles Close, Blakelands	Suburban	486149 243127	11-Feb-99 05-May-99	Residential area 65 metres from edge of M1

Figure 2.1.1 Fixed Air Quality Station, Civic Offices, Central Milton Keynes



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Air Quality Monitoring Station - Civic Offices, Central Milton Keynes

Figure 2.1.2 Mobile Air Quality Station, Sorrell Drive, Newport Pagnell

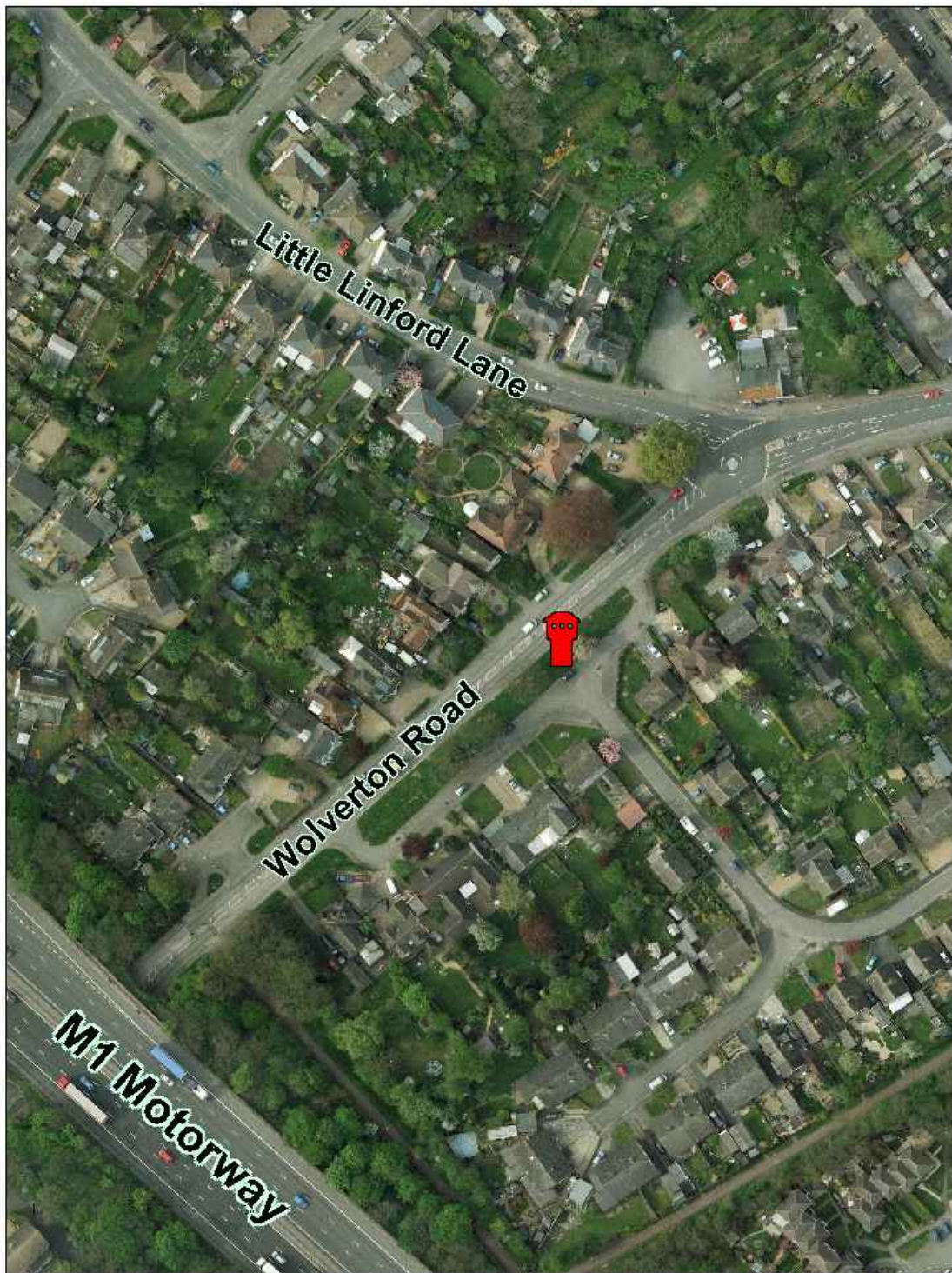


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Air Quality Station - Mobile, Sorrell Drive, Newport Pagnell

Figure 2.1.3 Roadbox Air Quality Station, Wolverton Road, Newport Pagnell

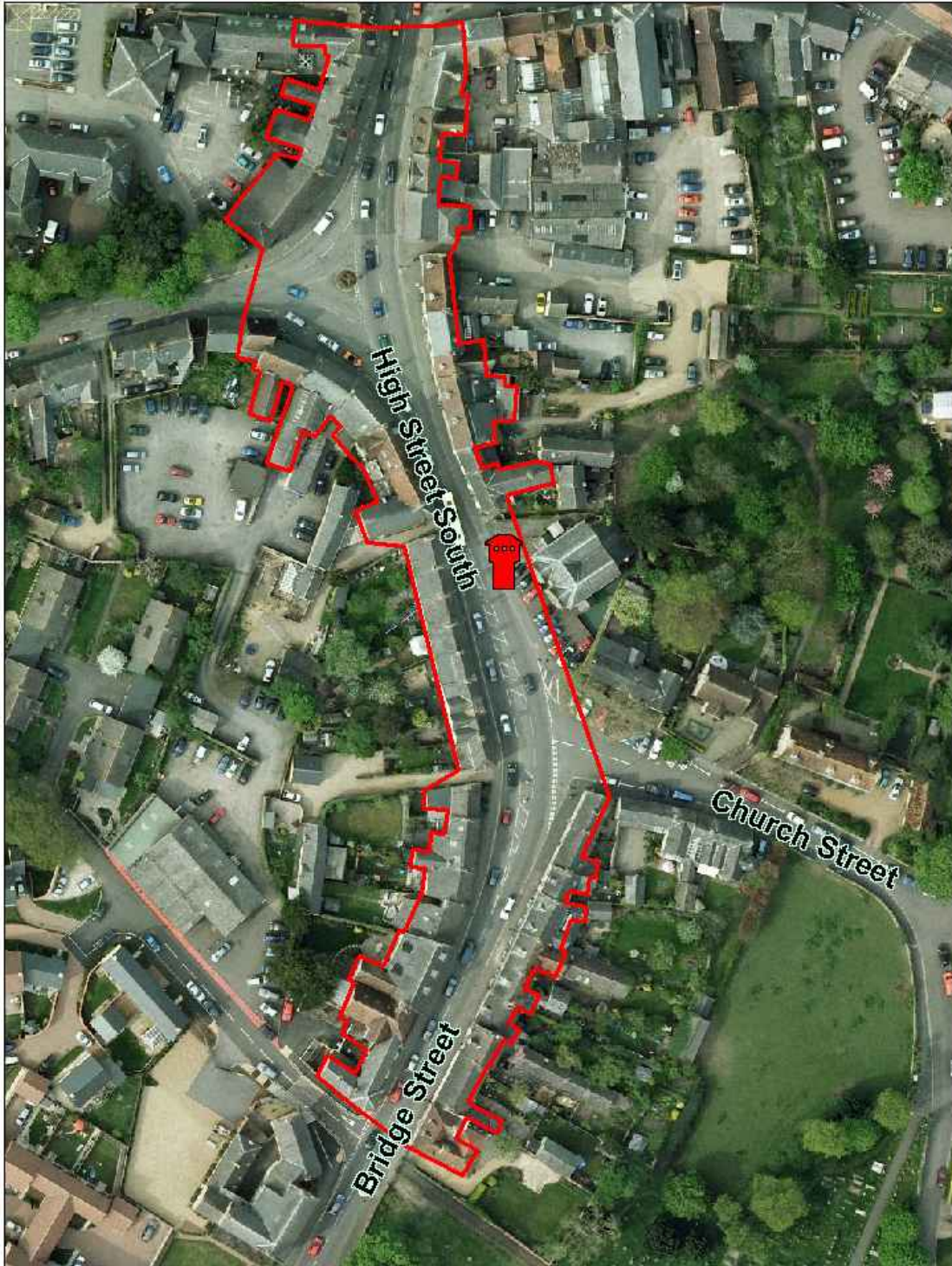


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Air Quality Monitoring Station - Roadbox 1, Wolverton Road, Newport Pagnell

Figure 2.1.4 Roadbox Air Quality Station, High Street South, Olney
(Within designated Air Quality Management Area)



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Air Quality Monitoring Station - Roadbox 2, High Street South, Olney
(Air Quality Management Area boundary in red)

Figure 2.1.5 Automatic Air Quality Monitoring Station Photographs



Static Monitoring Station – Civic Offices, CMK
(View from North Eighth Street towards
Silbury Boulevard)



Mobile Monitoring Station - Sorrell Drive, Newport
Pagnell (38m from M1 Motorway)
Decommissioned 18th July 2011.



Roadbox 1 Monitoring Station
Wolverton Road, Newport Pagnell
(M1 bridge in background)



Roadbox 2 Monitoring Station
High Street, Olney
(Within Air Quality Management Area)

2.1.2 Non-Automatic Monitoring Sites

Nitrogen dioxide is the only pollutant that is routinely monitored using a non-automatic method. Milton Keynes Council operates an extensive network of diffusion tubes as listed in Table 2.2. Diffusion tubes are prepared 'in-house' using 20% triethanolamine (TEA) in water and are analysed following the procedures set out in the AEA Practical Guidance document. The Council participates in the WASP scheme for quality assurance of diffusion tube analysis and the monthly NO₂ Network Field Intercomparison Exercise.

The diffusion tube results are corrected by applying a bias correction factor. This factor is derived using data from local co-location sites. Appendix A has details of all Quality Assurance/Quality Control (QA/QC) for diffusion tubes including bias adjustment factors.

Figure 2.2 Map of Non-Automatic Monitoring Sites

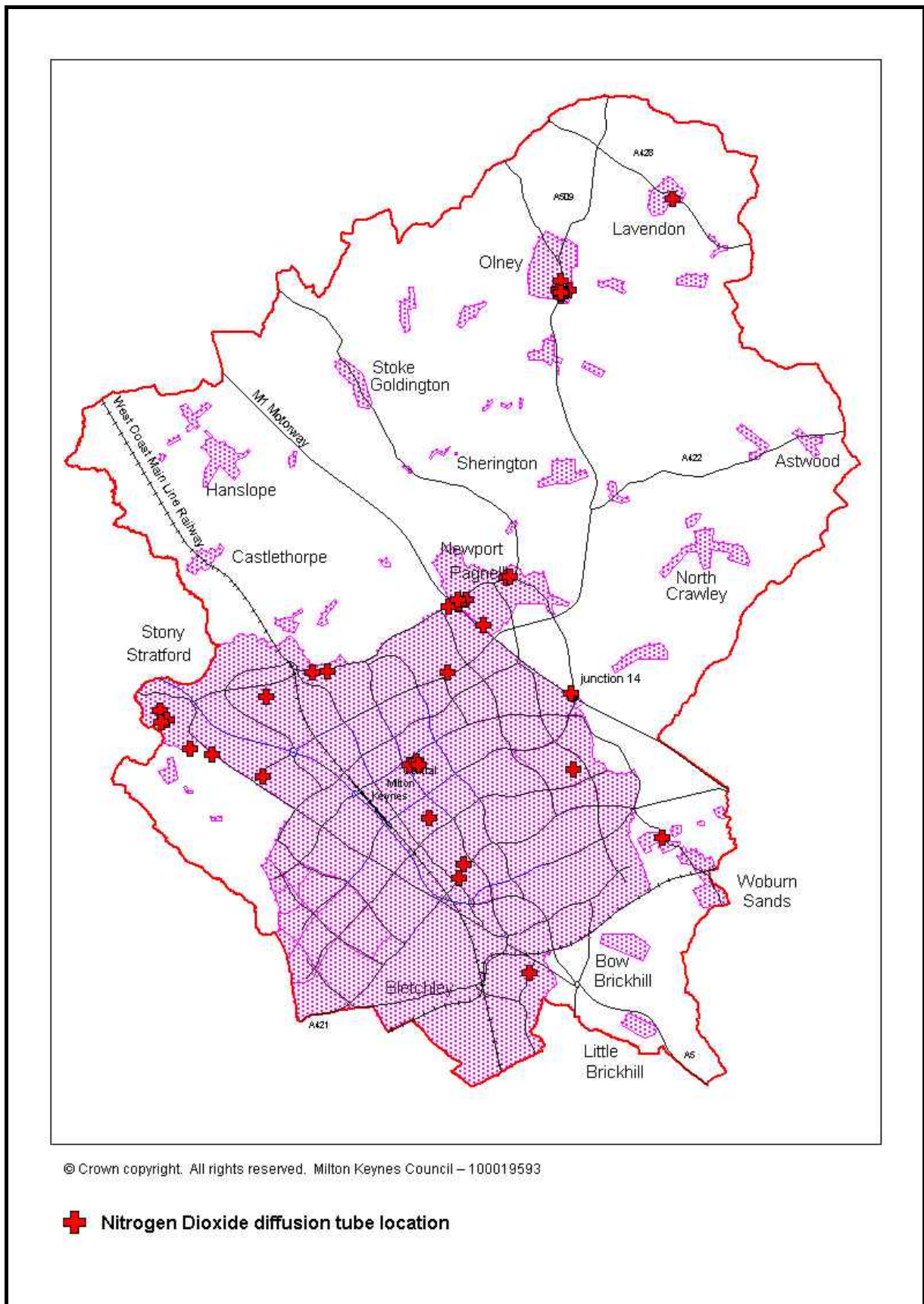


Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	In AQMA?	Relevant exposure	Distance to kerb of nearest road (m)	Worst-case location?
10 High St South, Olney (Cowper School House)	Urban Roadside	488914 251173	Y	Y	1.8	Y
9 High St South, Olney (Olney Wine Bar)	Urban Roadside	488904 251177	Y	Y	1.7	Y
20 High St, Olney	Urban Roadside	488926 251455	N	Y	7.6	N
17 High St, Olney (Opp. No.20 High St)	Urban Roadside	488905 251456	N	Y	7.2	N
76 High St, Newport Pagnell	Urban Roadside	487514 243901	N	Y	2.2	N
63 High St, Newport Pagnell	Urban Roadside	487588 243912	N	Y	0.4	Y
57 High St, Newport Pagnell (The Plough PH)	Urban Roadside	487620 243922	N	Y	0.4	Y
Corner of Coneygere and Palmers Rd, Olney	Urban Roadside	489108 251213	N	Y	1.7	Y
63 Windsor St, Wolverton	Urban Roadside	481412 240860	N	Y	1.1	Y
222 Wolverton Rd, Blakelands	Urban Roadside	486069 243149	N	N	1.6	Y
Aylesbury St, Fenny Stratford (Bracknell House)	Urban Roadside	488118 233814	N	N	4.5	Y
Silbury Boulevard, CMK (corner of North Tenth St)	Urban Roadside	485298 239126	N	N	0.9	Y
52-100 North Tenth Street, Central Milton Keynes	Urban Roadside	485229 239223	N	Y	6.1	N
Silver Street, Stony Stratford	Urban Roadside	478740 240217	N	Y	0.9	Y
Horsefair Green, Stony Stratford	Urban Roadside	478882 240265	N	Y	2.6	Y
130 Newport Rd, New Bradwell	Urban Roadside	482965 241515	N	Y	1.6	Y
64 Nicholas Mead, Great Linford	Urban Roadside	486039 241484	N	Y	4.0	N
Cross Keys Office, High St South, Olney	Urban Roadside	488898 251186	Y	Y	1.6	Y
22 High St South, Olney	Urban Roadside	488901 251231	Y	Y	1.8	Y
33 High Street South, Olney (Art Smart)	Urban Roadside	488891 251248	Y	Y	2.0	Y
Opposite 9 Weston Road, Olney	Urban Roadside	488840 251212	N	N	1.6	Y
18/20 Bridge St, Olney	Urban Roadside	488917 251068	Y	Y	2.2	Y
Courtney House, Bridge St, Olney	Urban Roadside	488909 251077	Y	Y	1.7	Y
Watling Street, Fullers Slade	Urban Roadside	480015 239400	N	N	7.6	Y

Table 2.2 Continued

Site Name	Site Type	OS Grid Ref	In AQMA?	Relevant exposure	Distance to kerb of nearest road	Worst-case location?
Northampton Rd, Lavendon (Horseshoe PH)	Rural Roadside	491769 253542	N	Y	3.0	Y
14-16 Newport Rd, Wavendon	Rural Roadside	491498 237284	N	Y	7.2	N
Brook Farm, Broughton Rd, Middleton	Rural Roadside	489237 239016	N	Y	1.0	Y
16-17 Greenlands, Newport Pagnell	Urban Garden	486296 243208	N	Y	1.6	Y
5-7 Greenlands, Newport Pagnell	Urban Garden	486345 243230	N	Y	1.4	Y
42-44 Walnut Close, Newport Pagnell	Urban Garden	486495 243345	N	Y	1.5	Y
6 Atherstone Court, Two Mile Ash	Urban Garden	481331 238825	N	Y	0.4	Y
1 Tudor Gardens, Stony Stratford	Urban Garden	479459 239536	N	Y	2.3	Y
18 Wheatcroft Close, Beanhill	Urban Garden	486332 236228	N	Y	0.3	Y
Static Air Quality Station (Civic Offices)	Co-location	485070 239131	N	N	4.8	N
Mobile Air Quality Station (Sorrell Drive, Newport Pagnell)	Co-location	485618 243916	N	Y	38	Y
Roadbox 1 (Newport Pagnell)	Co-location	486290 243344	N	N	1.8	Y
Roadbox 2 (Olney)	Co-location	488922 251157	Y	Y	2.0	Y

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

There have been no recorded exceedences of the annual objective at automatic monitoring locations since data were reported in the USA 2009 (Table 2.3a).

There have been no recorded exceedences of the hourly objective at the automatic monitoring sites (Table 2.3b). Table 2.3c includes data from previously monitored locations.

There is a slight downward trend recorded at the fixed site at the Civic Offices in Central Milton Keynes over the last 12 years. The annual mean in 2011 ($20.9 \mu\text{g}/\text{m}^3$) was the lowest recorded over this period and the highest was in 2002 ($24.6 \mu\text{g}/\text{m}^3$). Milton Keynes has grown considerably and traffic flows have increased since monitoring began so it is encouraging that NO_2 levels have fallen slightly.

The situation is less clear at the other long term monitoring station on Wolverton Road. As this is a roadside site the annual mean is much higher, peaking in 2006 ($41.3 \mu\text{g}/\text{m}^3$) and recording its lowest annual mean in 2007 ($31.9 \mu\text{g}/\text{m}^3$). The 2011 mean was ($34.8 \mu\text{g}/\text{m}^3$).

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA ?	Data Capture over monitoring period %	Data Capture for the full calendar year %	Annual mean concentrations $\mu\text{g}/\text{m}^3$						
					2005	2006	2007	2008	2009	2010	2011
Fixed	Civic Offices, CMK	N	98.0	98.0	22.8	22.0	21.6	23.4	22.5	23.0	20.9
Roadbox 1	Wolverton Road, Newport Pagnell	N	98.4	98.4	38.4	41.3 [#]	31.9	37.6	35.5	38.6	34.8
Roadbox 2	High Street South, Olney	Y	98.6	98.6	-	-	-	-	35.2 [*]	34.2	26.9
Mobile	Sorrell Drive, Newport Pagnell	N	97.9	53.1	-	-	-	-	-	31.8 [*]	29.4 [*]

* : Estimate of annual mean (Box 3.2 of LAQM.TG(09))
: Predicted concentration at nearest receptor is $32.1 \mu\text{g}/\text{m}^3$

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA ?	Data Capture over monitoring period %	Data Capture for the full calendar year %	No. of exceedences of hourly mean objective						
					2005	2006	2007	2008	2009	2010	2011
Fixed	Civic Offices, CMK	N	98.0	98.0	0	0	0	0	0	0	0
Roadbox 1	Wolverton Road, Newport Pagnell	N	98.4	98.4	0	0	0	0	2	0	0
Roadbox 2	High Street South, Olney	Y	98.6	98.6	-	-	-	-	0 (120.7)	0	0
Mobile	Sorrell Drive, Newport Pagnell	N	97.9	53.1	-	-	-	-	-	0 (103.2)	0 (102.2)
Figures in brackets are 99.8 th percentiles of hourly mean concentrations											

Table 2.3c Results of Automatic Monitoring for Nitrogen Dioxide: Previously Monitored Locations

Location	Monitoring Period	Annual mean											99.8 th percentile of hourly means										
		Objective 40 µg/m ³											Objective 200 µg/m ³ (18 exceedences allowed)										
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Civic Offices	21-May-98 31-Dec-11	24.2	24.6	24.0	21.3	22.8	22.0	21.6	23.4	22.5	23.0	20.9	76.8	104.2	94.1	74.2	83.9	140.2	101.4	87.7	101.6	94.9	86.1
Wolverton Road, Newport Pagnell	23-Aug-00 31-Dec-11	36.9	36.8	39.7	38.6	38.4	41.3	31.9	37.6	35.5	38.6	34.8	97.3	98.2	134.2	118	145.7	171.3	107.9	174.6	146.4	128.8	110.3
Burgess Gardens, Newport Pagnell	14-Nov-00 14-Aug-02																						
	12-Aug-05 15-May-07	27.4	27.3	-	-	28.1*	26.2	27.9*	-	-	-	-	103.1	88.9	-	-	96.9	139.4	121.9	-	-	-	-
Selbourne Ave, Bletchley	09-Oct-02 3-May-05	-	-	18.4	17.3	15.4*	-	-	-	-	-	-	-	-	70.8	63.3	64.1	-	-	-	-	-	-
High Street, Olney	14-Aug-02 11-Dec-03	-	-	31.2	-	-	-	-	-	-	-	-	-	-	86.9	-	-	-	-	-	-	-	-
Linceslade Grove, Loughton	18-Feb-04 26-Jul-05	-	-	-	22.7	21.8*	-	-	-	-	-	-	-	-	-	90.7	86.7	-	-	-	-	-	-
Newport Road, New Bradwell	23-Aug-05 22-Dec-08	-	-	-	-	21.1*	21.9	22.5	22.0	-	-	-	-	-	-	-	74.5	121.5	103.4	85.6	-	-	-
Church Street, Olney	22-May-07 18-Jun-08	-	-	-	-	-	-	24.5*	23.6*	-	-	-	-	-	-	-	-	-	85.8	77.4	-	-	-
Station Rd Car Park, Newport Pagnell	30-Jun-08 31-Dec-09	-	-	-	-	-	-	-	24.8*	28.6*	-	-	-	-	-	-	-	-	-	97.4	96.1	-	-
Sorrell Dr, Newport P	16-Feb-10 18-Jul-11	-	-	-	-	-	-	-	-	-	31.8*	29.4*	-	-	-	-	-	-	-	-	-	103.2	102.2
High Street South, Olney	17-Mar-09 31-Dec-11	-	-	-	-	-	-	-	-	35.2*	34.2	26.9	-	-	-	-	-	-	-	-	120.7	120.2	101.9

* : Estimate of annual mean (Box 3.2 of LA QM.TG(09))

Figure 2.3a Trends in Annual Mean Nitrogen Dioxide Concentrations measures at Automatic Monitoring Sites

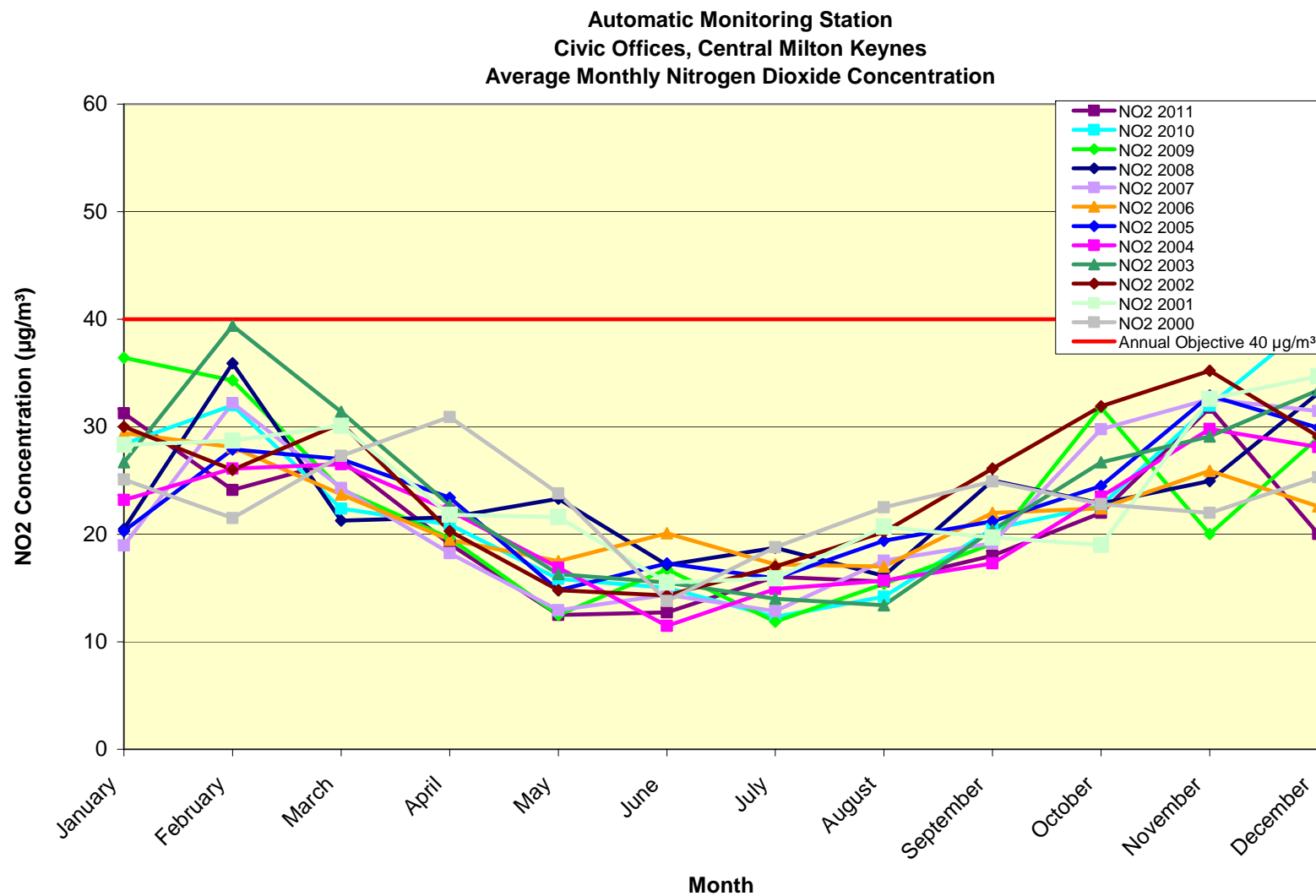
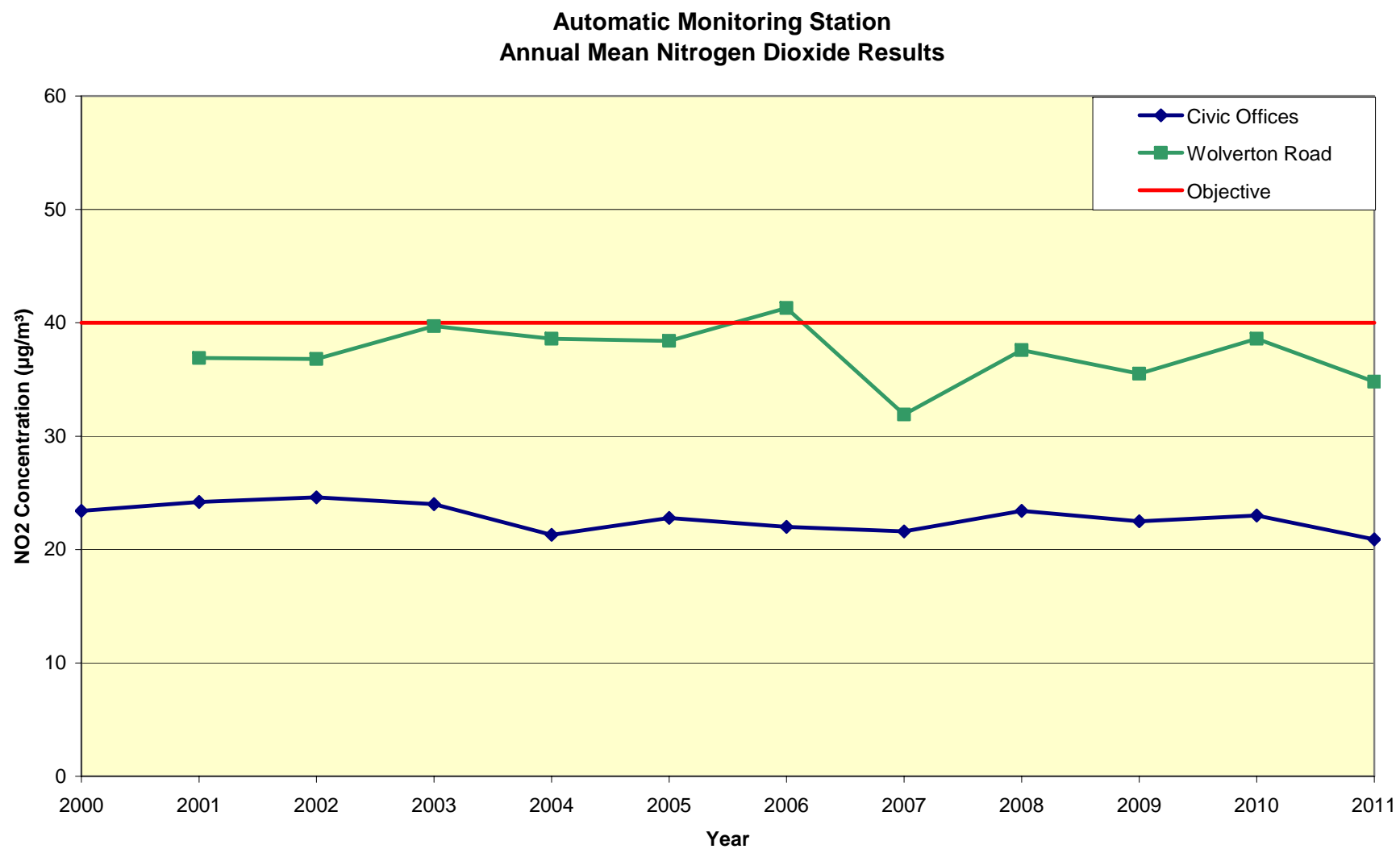


Figure 2.3b Trends in Monthly Mean Nitrogen Dioxide Concentration Measured at Civic Offices



Non-Automatic Diffusion Tube Monitoring Data

Table 2.4 below lists all diffusion tube results. The only recorded exceedences of the annual mean objective were within the AQMA in Bridge Street and High Street South, Olney.

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Location	Within AQMA?	Data Capture 2011%	Annual Mean Concentrations Adjusted for bias		
			2009	2010	2011
10 High St South, Olney (Cowper School House)	Y	100	43.8	46.8	43.8
9 High St South, Olney (Olney Wine Bar)	Y	100	37.0	41.8	40.4
20 High St, Olney	N	100	22.5	25.6	24.7
17 High St, Olney (Opp No.20 High St)	N	100	28.7	30.7	29.0
76 High St, Newport Pagnell	N	100	26.9	30.4	26.3
63 High St, Newport Pagnell	N	100	36.0	33.6*	31.1
High St, Newport Pagnell (Plough PH)	N	100	34.9	37.4	34.8
Corner of Coneygere and Palmers Rd, Olney	N	100	12.4	13.7	14.1
63 Windsor St, Wolverton	N	100	17.6	18.1	17.3
222 Wolverton Rd, Blakelands	N	100	25.5	30.3	27.4
Aylesbury St, Fenny Stratford (Bracknell House)	N	100	23.5*	23.9	22.7
Silbury Boulevard, CMK (corner of North Tenth St)	N	100	24.4	23.6	22.6
52-100 North Tenth Street, Central Milton Keynes	N	100	21.2	21.6	20.1
Silver Street, Stony Stratford	N	100	21.2	23.8	21.1
Horsefair Green, Stony Stratford	N	91.7	22.2	25.7	22.2
130 Newport Rd, New Bradwell	N	100	21.6*	21.9	21.4
64 Nicholas Mead, Great Linford	N	91.7	20.1	17.9	19.1
Cross Keys Office, High St South, Olney	Y	100	42.8	44.4	42.2
Art Mart, 33 High Street South, Olney	Y	100	35.8	38.9	35.1
Opposite 9 Weston Road, Olney	N	75	23.2*	26.3*	25.2*
18/20 Bridge St, Olney	Y	100	46.1	46.5	43.1
Courtney House, Bridge St, Olney	Y	91.7	40.0*	39.6	39.6
Watling Street, Fullers Slade	N	100	18.8	19.9	18.8
Northampton Rd, Lavendon (Horseshoe PH)	N	100	19.7	22.3	20.9
14-16 Newport Rd, Wavendon	N	100	21.4	22.8	24.4
Brook Farm, Broughton Rd, Middleton	N	100	17.2	18.3	17.8
16-17 Greenlands, Newport Pagnell	N	100	32.3	29.7	26.7
5-7 Greenlands, Newport Pagnell	N	100	29.2	27.9	24.3
42-44 Walnut Close, Newport Pagnell	N	100	23.6	21.5	19.7
6 Atherstone Court, Two Mile Ash	N	100	13.2	13.8	12.6
1 Tudor Gardens, Stony Stratford	N	100	11.6	13.0	12.3
18 Wheatcroft Close, Beanhill	N	91.7	22.3	23.4	21.9
Static Air Quality Station (Civic Offices)	N	100	24.2	24.1	19.9
Roadbox (Newport Pagnell)	N	100	35.6	37.7	35.0
Roadbox 2 (Olney)	N	100	31.3	32.4	27.8
Mobile (Newport Pagnell)	Y	58.3	n/a	32.6*	29.7*

* : Estimate of annual mean (Box 3.2 of LAQM.TG(09))

2.2.2 Particulate Matter, PM₁₀

Automatic monitoring results have been adjusted using the Volatile Correction Method (VCM) as developed by ERG at King's College, London for TEOM analysers (Tables 2.5a and 2.5b). Results from the beta attenuation monitor (BAM) used in Roadbox 1 monitoring station have been multiplied by the standard correction factor of 1.3. The BAM has a heated inlet at 45°C but was not tested in the equivalence study therefore the advice is that results should continue to be adjusted using this factor.

The results are all well within the annual and 24-hour mean objectives. The highest annual mean recorded in 2011 was at the Roadbox 2 on High Street South, Olney (21.3 µg/m³). The number of daily exceedences increased in 2011 at all monitoring sites and this appears to be a function of the VCM calculation.

There is no apparent trend at the fixed site since the VCM was introduced in 2006. On Wolverton Road (Roadbox 1) there was a downward trend between 2006 and 2010 rising slightly in 2011 (Figure 2.4).

Table 2.5a Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

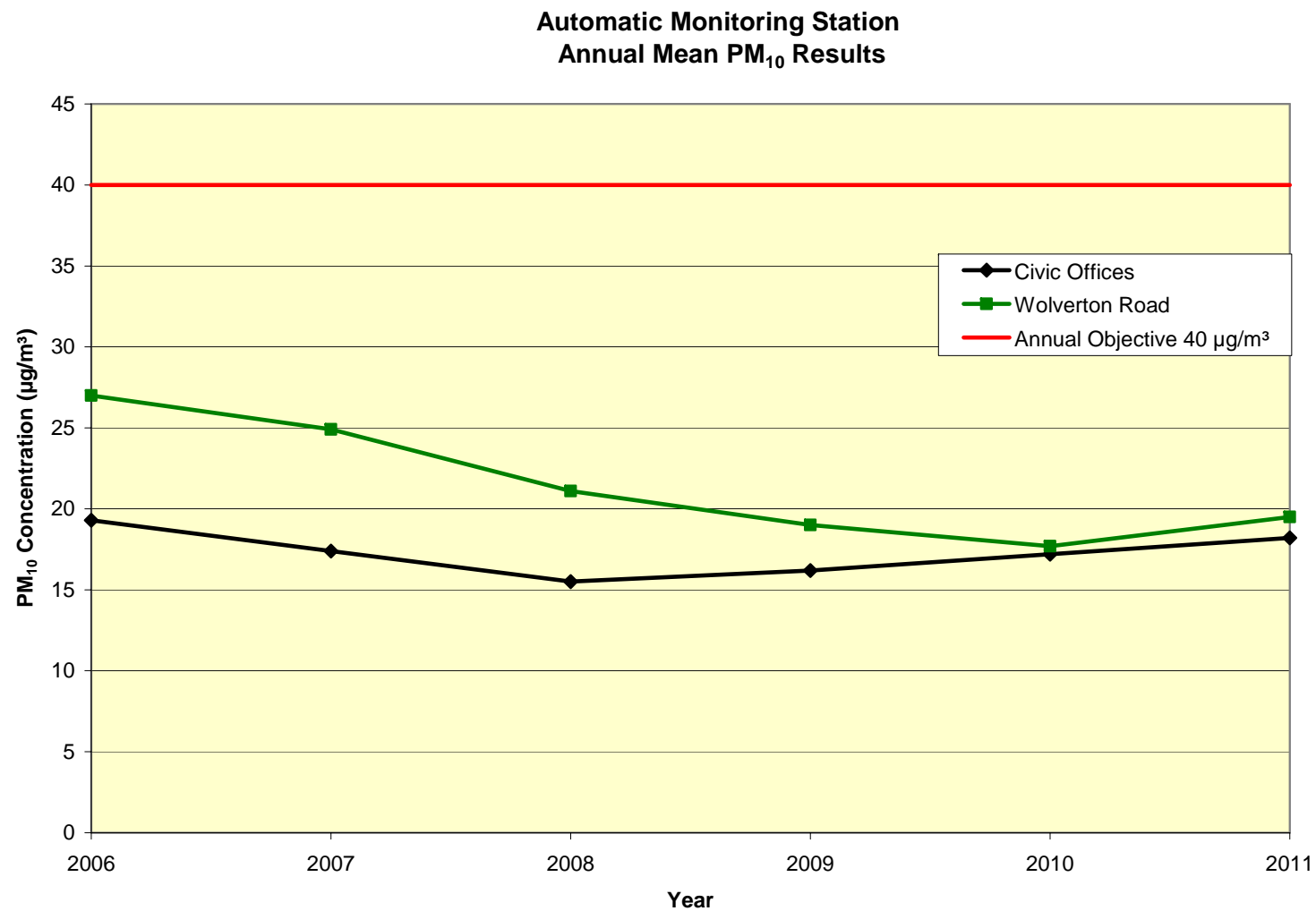
Site ID	Location	Site Type	Within AQMA?	Data Capture over monitoring period %	Proportion of year with valid data 2011 %	Annual Mean Concentration $\mu\text{g}/\text{m}^3$					
						2006 VCM	2007 VCM	2008 VCM	2009 VCM	2010 VCM	2011 VCM
Fixed	Civic Offices, CMK		N	97.4	97.4	19.3	17.4	15.5	16.2	17.2	18.2
Roadbox 1 [#]	Wolverton Road, Newport Pagnell		N	98.8	98.8	27.0	24.9	21.1	19.0	17.7	19.5
Roadbox 2	High Street South, Olney		N	96.1	96.1	-	-	-	20.8*	22.0	21.2
Mobile	Sorrell Drive, Newport Pagnell		N	99.5	54.0	-	-	-	-	18.4*	19.2*
* : Estimate of annual mean (Box 3.2 of LAQM.TG(09))											
# : The Roadbox Station has a heated inlet beta attenuation monitor therefore uses 1.3 correction factor											

Table 2.5b Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour mean Objective

Site ID	Location	Site Type	Within AQMA?	Data Capture over monitoring period %	Proportion of year with valid data 2011 %	Number of Exceedences of daily mean (50 µg/m ³)					
						2006 VCM	2007 VCM	2008 VCM	2009 VCM	2010 VCM	2011 VCM
Fixed	Civic Offices, CMK		N	97.4	97.4	6	6	3	1	0	6
Roadbox 1 [#]	Wolverton Road, Newport Pagnell		N	98.8	98.8	17	19	13	1	1	5
Roadbox 2	High Street South, Olney		N	96.1	96.1		0	-	4	1	13
Mobile	Sorrell Drive, Newport Pagnell		N	99.5	54.0		-	0	2	0	7

[#] : The Roadbox Station has a heated inlet beta attenuation monitor therefore uses 1.3 correction

Figure 2.4 Trends in Annual Mean PM₁₀ Concentrations



2.2.3 Sulphur Dioxide (SO₂)

There have been no exceedences of the sulphur dioxide objectives at any of the monitored sites since automatic monitoring began in 1999. Closure of Stewartby brickworks in February 2008 has reduced local emission sources of sulphur dioxide (see Table 2.6 and Figure 2.5).

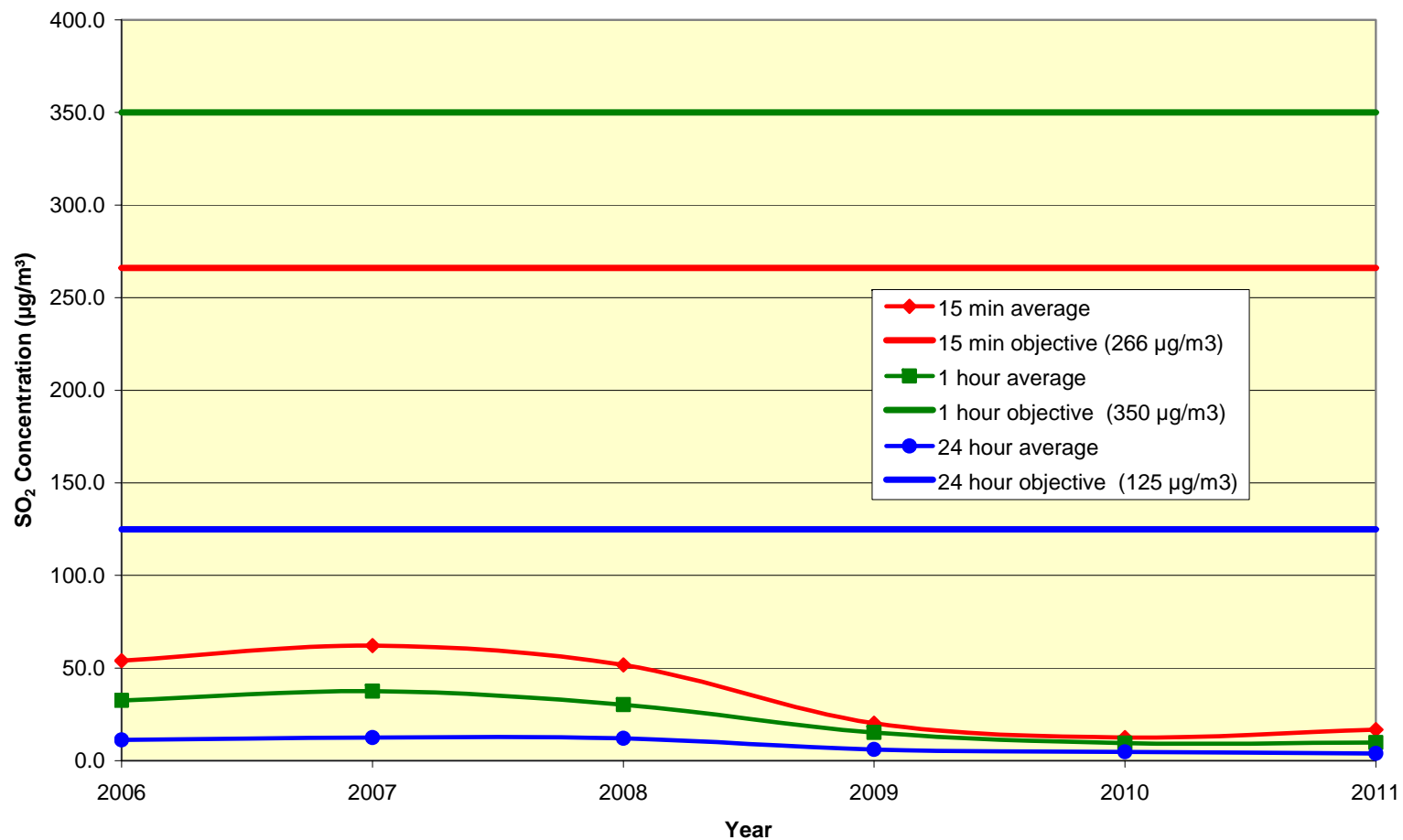
Since the mobile air quality station was decommissioned in July 2011, the network has only one sulphur dioxide analyser housed in the fixed station at the Civic Offices. Consideration may be given to dispensing with SO₂ monitoring entirely, subject to funding levels in future years.

Table 2.6 Results of Automatic Monitoring of SO₂: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Data Capture over monitoring period %	Proportion of year with valid data 2010 %	Objective	Percentile Concentration µg/m ³			
						2008	2009	2010	2011
Fixed	Civic Offices, CMK	N	99.1	99.1	15 min (99.9 th %)	51.6	20.2	12.4	16.8
					1 hour (99.7 th %)	30.2	15.1	9.5	9.7
					24 hour (99 th %)	12.0	6.0	4.7	3.8
Mobile 2	Sorrell Drive, Newport Pagnell	N	99.2	53.8	15 min (99.9 th %)	-	-	11.1	13.9
					1 hour (99.7 th %)	-	-	8.4	8.6
					24 hour (99 th %)	-	-	4.7	4.1

Figure 2.5 Trends in SO₂ Concentrations

Automatic Monitoring Station, Civic Offices
Annual Mean SO₂ Concentration



2.2.4 Benzene

Benzene is not monitored at any location within the Borough.

2.2.5 Ozone

Ground level ozone is monitored in Milton Keynes at the automatic air quality station at the Civic Offices. Although it is included in the National Air Quality Strategy it is not included in the local air quality management regime due to its trans-boundary nature and its origin as a 'secondary pollutant'.

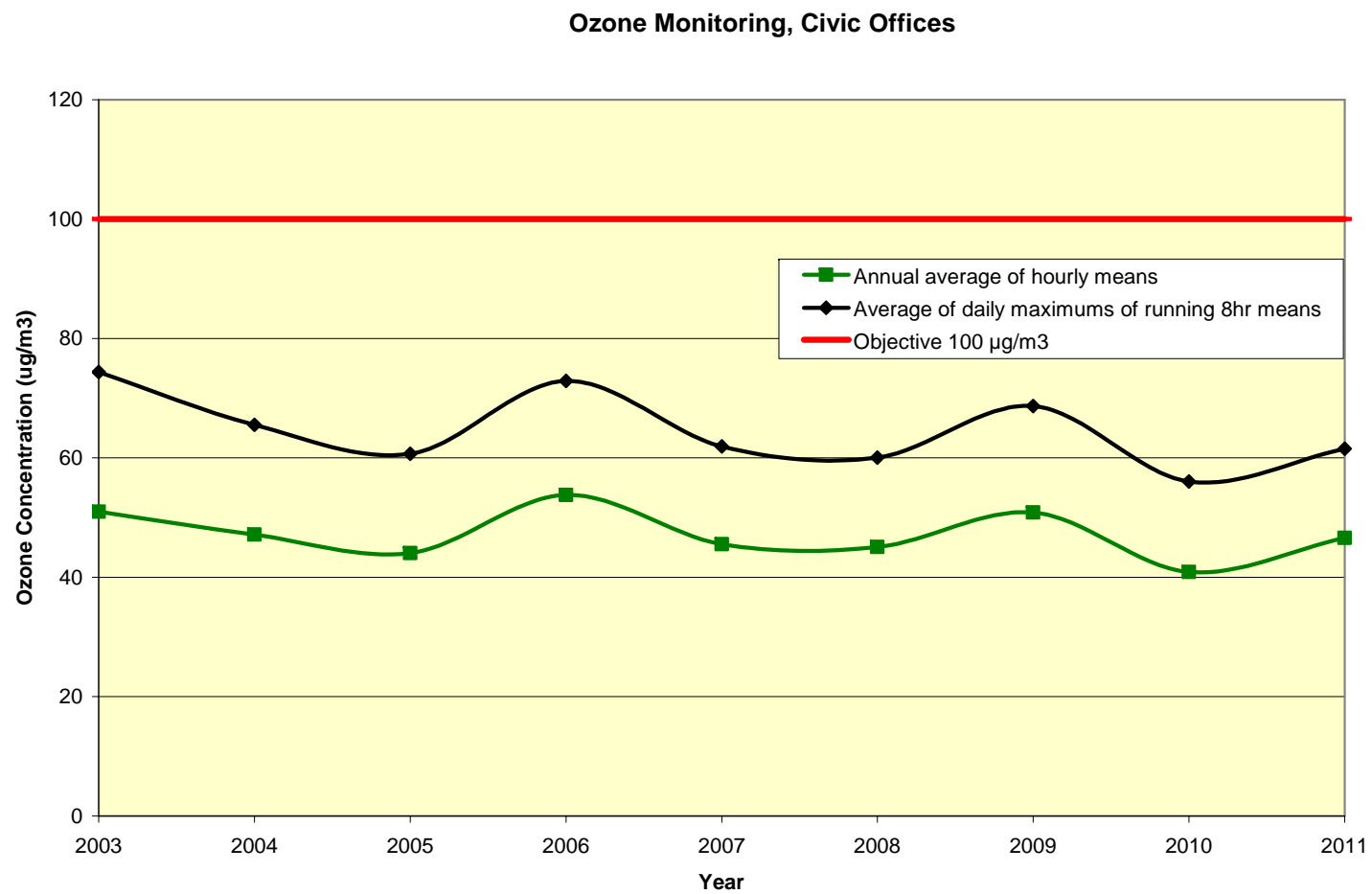
Table 2.7 Results of Ozone Automatic Monitoring

Year	Annual average of hourly means	Average of daily maximums of running 8hr means	No. of exceedences of running 8hr mean	No. of exceedences of High Pollution Banding
		<i>Objective 100 $\mu\text{g}/\text{m}^3$</i>	<i>Max 10 exceedences</i>	<i>Objective 180 $\mu\text{g}/\text{m}^3$</i>
2003	50.96*	74.40*	21*	2*
2004	47.15	65.55	22	0
2005	44.05	60.66	13	0
2006	53.79	72.88	50	10
2007	45.54	61.90	34	0
2008	45.07	60.03	10	0
2009	50.83	68.66	40	0
2010	40.89	56.04	14	0
2011	46.59	61.55	9	0

Note: * monitoring began August 1st 2003

There appears to be a slight overall downward trend since 2003 although peaks were evident in 2006 and 2009 (Figure 2.6).

Figure 2.6 Trends in Ozone Concentration



2.2.6 Summary of Compliance with AQS Objectives

Milton Keynes Council has examined the results from monitoring in the borough. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow congested streets with residential properties close to the kerb

Milton Keynes Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and 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

Milton Keynes Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a high flow of buses and/or HGVs.

Milton Keynes Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Milton Keynes Council confirms that there are no new/newly identified busy junctions/busy roads.

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

Milton Keynes Council confirms that there are no new/proposed roads.

3.6 Roads with significantly changed traffic flows

Milton Keynes Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and coach stations

Milton Keynes Council has assessed new/newly identified bus stations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

The new Milton Keynes Coachway, located at junction 14 of the M1 motorway, was opened in December 2011. This replaced an outdated Coachway with a modern facility, increased parking provision and revised entrance and exit routes. There are approximately 600 vehicle movements per day. Further assessment is required if there are 2,500 or more bus/coach movements per day.

4 Other Transport Sources

4.1 Airports

Milton Keynes Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary trains

Milton Keynes Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving trains

Milton Keynes Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Milton Keynes Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or proposed installations for which an Air Quality Assessment has been carried out

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

Milton Keynes Council has permitted 5 installations operating small waste oil burners and 3 dry cleaning activities during the period April 2009 - March 2012. There were no permits issued by the Environment Agency for Part A1 activities.

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

Milton Keynes Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

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

Milton Keynes Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Milton Keynes Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Milton Keynes Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Milton Keynes Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

Biomass boilers burning wood as fuel are used for heating the Ikea store in Milton Keynes. This activity no longer requires a permit under the Environmental Permitting (England and Wales) Regulations 2010 because it falls below the permitting threshold. Wood fired biomass boilers operating at Bletchley Leisure Centre, Milton Keynes Academy and Chicheley Hall and other smaller installations have been assessed for air quality impact and the need for chimney height approval under the Clean Air Act 2003.

6.2 Biomass Combustion – Combined Impacts

Milton Keynes Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

Milton Keynes Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

All construction sites, mineral extraction quarries and waste management sites have been suitably assessed either through the planning system or permit application consultations from the Environment Agency.

Milton Keynes Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

All new automatic monitoring data are within the relevant air quality objective.

Diffusion tube data collected during 2009 - 2011 confirmed that the annual mean nitrogen dioxide objective is still being exceeded within the AQMA in Olney.

No new exceedences were identified outside of the AQMA in Olney.

8.2 Conclusions from Assessment of Sources

None of the pollution sources assessed has identified any potential exceedences of air quality objectives outside of the existing AQMA.

8.3 Proposed Actions

This Updating and Screening Assessment 2012 has not identified the need to proceed to a Detailed Assessment for any pollutant at any location.

No additional monitoring or relocation of sites is necessary.

The AQMA in Olney is still required and the geographical boundary does not need to be changed.

The next course of action is to finalise the Air Quality Action Plan for the AQMA in Olney by summer 2012 and to submit a Progress Report to Defra in April 2013.

9 References

1. Department of the Environment, Food and Rural Affairs, The Air Quality (England) Regulations 2000, The Stationery Office.
2. Department for Environment, Food and Rural Affairs, Local Air Quality Management, Technical Guidance LAQM.TG(09), DEFRA Publications.
3. Department for Environment, Food and Rural Affairs, Local Air Quality Management, Policy Guidance LAQM.PG(09), DEFRA Publications.
4. Milton Keynes Council, Updating and Screening Assessment 2009.
5. Milton Keynes Council, Progress Reports 2010 and 2011.
6. Milton Keynes Council, Draft Air Quality Action Plan, Jan 2012.
7. Local Air Quality Management Tools, NETCEN, on behalf of Department of the Environment, Food and Rural Affairs, available from web site:
<http://www.airquality.co.uk/archive/laqm/tools.php>.

Appendices

Appendix A: QA/QC Data

Appendix B: Road Traffic Count Data

Appendix A: QA/QC Data

Diffusion Tube Bias Adjustment Factors

The nitrogen dioxide diffusion are prepared 'in-house' by Milton Keynes Council using 20% triethanolamine (TEA) in water and are analysed following the procedures set out in the AEA Practical Guidance document produced by the Defra Working Group on Harmonisation of NO₂ Diffusion Tubes that was released early in 2008. The Council participates in the WASP scheme for quality assurance of diffusion tube analysis and the monthly NO₂ Network Field Intercomparison Exercise.

Factors from Local Co-location Studies

Local co-location studies are carried out at all the automatic monitoring stations. Tubes are sited in triplicate near the air intake. Data can only be included in the bias adjustment factor calculation if there are more than 9 months data at each of the locations.

The co-location bias adjustment results for 2011 were 0.89, 0.84, and 0.81. The average for the three stations was 0.85.

Table A1.1 Co-location Study at Fixed Station, Civic Offices

Month	Start Date	End Date	Diffusion Tube µg/m ³				Auto Average µg/m ³	
			1	2	3	Average		
Jan	05-Jan-11	02-Feb-11	32.12	35.22		33.67	30.84	
Feb	02-Feb-11	02-Mar-11	32.31	29.15	32.20	31.22	24.56	
Mar	02-Mar-11	30-Mar-11	32.26	32.12	30.27	31.55	27.64	
Apr	30-Mar-11	27-Apr-11	21.52	19.66	19.75	20.31	19.31	
May	27-Apr-11	01-Jun-11	12.21	12.56	11.53	12.10	12.54	
Jun	01-Jun-11	29-Jun-11	16.91	16.25	17.63	16.93	13.23	
Jul	29-Jun-11	03-Aug-11	17.47	15.13	16.93	16.51	16.14	
Aug	03-Aug-11	31-Aug-11	12.32	12.83	12.51	12.56	15.86	
Sep	31-Aug-11	28-Sep-11	20.39	19.23	21.71	20.45	16.89	
Oct	28-Sep-11	02-Nov-11	25.09	24.34	24.73	24.72	23.69	
Nov	02-Nov-11	30-Nov-11	32.91	32.01	33.35	32.76	31.70	
Dec	30-Nov-11	04-Jan-12	28.60	27.98	27.07	27.88	18.44	
Annual average:						23.39	20.90	0.8938


Table A1.2 Co-location Study at Roadbox Station, Wolverton Road

Month	Start Date	End Date	Diffusion Tube $\mu\text{g}/\text{m}^3$				Auto Average $\mu\text{g}/\text{m}^3$	
			1	2	3	Average		
Jan	05-Jan-11	02-Feb-11	49.98	50.41	55.57	51.99	41.31	
Feb	02-Feb-11	02-Mar-11	49.66	51.26	48.73	49.88	33.27	
Mar	02-Mar-11	30-Mar-11	46.55	45.34	44.18	45.36	35.53	
Apr	30-Mar-11	27-Apr-11	43.34	41.71	40.18	41.75	31.70	
May	27-Apr-11	01-Jun-11	36.72	35.43	34.32	35.49	31.65	
Jun	01-Jun-11	29-Jun-11	35.48	36.95	35.05	35.83	35.48	
Jul	29-Jun-11	03-Aug-11	40.12	43.19	37.37	40.23	35.50	
Aug	03-Aug-11	31-Aug-11	33.50	34.56	33.49	33.85	32.75	
Sep	31-Aug-11	28-Sep-11	35.82	35.57	33.83	35.07	30.10	
Oct	28-Sep-11	02-Nov-11	39.63	40.23	39.82	39.89	35.86	
Nov	02-Nov-11	30-Nov-11	42.26	39.26	43.30	41.61	36.42	
Dec	30-Nov-11	04-Jan-12	41.32	43.08	41.22	41.87	35.93	Adjustment Factor
Annual average:						41.07	34.63	0.8431

Table A1.3 Co-location Study at Roadbox Station 2, Olney

Month	Start Date	End Date	Diffusion Tube $\mu\text{g}/\text{m}^3$				Auto Average $\mu\text{g}/\text{m}^3$	
			1	2	3	Average		
Jan	05-Jan-11	02-Feb-11	43.58	42.56	45.22	43.79	37.30	
Feb	02-Feb-11	02-Mar-11	37.86	39.25	37.62	38.24	31.55	
Mar	02-Mar-11	30-Mar-11	36.65	34.98	36.34	35.99	29.37	
Apr	30-Mar-11	27-Apr-11	31.67	30.06	30.29	30.67	21.30	
May	27-Apr-11	01-Jun-11	26.95	26.70	27.41	27.02	20.55	
Jun	01-Jun-11	29-Jun-11	27.31	27.71	29.15	28.06	19.69	
Jul	29-Jun-11	03-Aug-11	22.87	25.38	26.05	24.77	24.69	
Aug	03-Aug-11	31-Aug-11	24.28	23.41	26.45	24.71	23.68	
Sep	31-Aug-11	28-Sep-11	30.00	29.74	27.09	28.94	23.16	
Oct	28-Sep-11	02-Nov-11	35.24	34.18	35.23	34.88	31.25	
Nov	02-Nov-11	30-Nov-11	41.71	41.11	41.49	41.43	35.17	
Dec	30-Nov-11	04-Jan-12	38.70	36.86	39.30	38.28	24.29	Adjustment Factor
Annual average:						33.07	26.84	0.8116

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AEA Energy & Environment
From the AEA group

Checking Precision and Accuracy of Triplicate Tubes

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation	95% CI of mean
1	05/01/2011	02/02/2011	107.3	107.2	106.8	107	0.3	0	0.7
2	02/02/2011	02/03/2011	119.1	121.9	123.6	122	2.3	2	5.6
3	02/03/2011	30/03/2011	125.9	123.6	120.5	123	2.7	2	6.7
4	30/03/2011	27/04/2011	118.8	119.5	120.6	120	0.9	1	2.3
5	27/04/2011	01/06/2011	111.4	112.0	110.6	111	0.7	1	1.7
6	01/06/2011	29/06/2011	136.0	137.4	134.9	136	1.3	1	3.1
7	29/06/2011	03/08/2011	102.8	104.8	105.8	104	1.5	1	3.8
8	03/08/2011	31/08/2011	95.5	98.2	98.0	97	1.5	2	3.7
9	31/08/2011	28/09/2011	132.4	130.6	132.6	132	1.1	1	2.7
10	28/09/2011	31/10/2011	125.4	127.7	122.1	125	2.8	2	7.0
11	18/11/2011	14/12/2011	142.5	148.5	138.3	143	5.1	4	12.7
12	30/11/2011	04/01/2012	144.1	134.5	134.0	138	5.7	4	14.1
13									

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

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor
91.2	93.3	Good	Good
111.7	93.3	Good	Good
95.7	96.8	Good	Good
106.4	97.5	Good	Good
99.9	97.4	Good	Good
93.1	90.8	Good	Good
86.1	91.1	Good	Good
82.2	97.7	Good	Good
108.5	96.1	Good	Good
108.2	96.5	Good	Good
110.2	97.4	Good	Good
105.4	96.6	Good	Good

Overall survey -->

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

(Check average CV & DC from Accuracy calculations)

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

Bias calculated using 12 periods of data

Bias factor A **0.82 (0.78 - 0.87)**

Bias B **22% (15% - 28%)**

Diffusion Tubes Mean: **122 μgm^{-3}**

Mean CV (Precision): **2**

Automatic Mean: **100 μgm^{-3}**

Data Capture for periods used: **95%**

Adjusted Tubes Mean: **100 (95 - 106) μgm^{-3}**

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 12 periods of data

Bias factor A **0.82 (0.78 - 0.87)**

Bias B **22% (15% - 28%)**

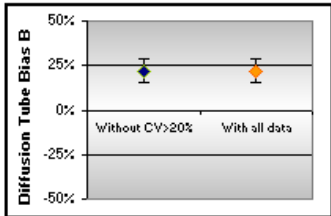
Diffusion Tubes Mean: **122 μgm^{-3}**

Mean CV (Precision): **2**

Automatic Mean: **100 μgm^{-3}**

Data Capture for periods used: **95%**

Adjusted Tubes Mean: **100 (95 - 106) μgm^{-3}**



Diffusion Tube Bias B

Jaume Targa, for AEA
Version 04 - February 2011

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

LAQM USA 2012

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PM Monitoring Adjustment

The Fixed Station, Roadbox 2 and the Mobile monitoring station contain Tapered Element Oscillating Microbalance (TEOM) continuous PM₁₀ analysers. These instruments all have heated manifolds to prevent condensation of water vapour, but this may lead to a loss of volatile particles. The measured concentrations of these analysers have been corrected using the Volatile Correction Model (VCM).

Roadbox 1, Wolverton Road, contains a beta-attenuation monitor (BAM) continuous PM₁₀ analyser. It has a heated inlet at 45°C but these analysers were not tested in the equivalence tests so measured concentrations from this analyser are multiplied by the recommended factor of 1.3 for comparison with the European transfer reference sampler upon which the UK objectives are based.

Short-term to Long-term Data adjustment

Where only short-term periods of monitoring data are available, the results may be adjusted to estimate an annual mean concentration using Box 3.2 of Technical Guidance.

The Mobile station was located at Sorrell Drive, Newport Pagnell and was decommissioned on the 18th July 2011.

Table A1.4 Mobile Sorrell Drive NO₂ 1st Jan 11 – 18th Jul 11

Long Term Site	Pollutant	Annual Mean 2011 (AM)	Period Mean 2011 (PM)	Ratio (AM/PM)
Fixed	NO ₂	20.90	20.70	1.01
Roadbox 1	NO ₂	34.80	34.96	1.00
Roadbox 2	NO ₂	26.90	26.19	1.03
Average (Ra)				1.01

Sorrell Drive estimated mean $30.60 \times 1.04 = 31.78 \mu\text{g}/\text{m}^3$

Table A1.5 Mobile Sorrell Drive PM₁₀ 1st Jan 11 – 18th Jul 11

Long Term Site	Pollutant	Annual Mean 2011 (AM)	Period Mean 2011 (PM)	Ratio (AM/PM)
Fixed	PM ₁₀	18.17	19.40	0.94
Roadbox 1	PM ₁₀	19.46	21.42	0.91
Roadbox 2	PM ₁₀	21.33	24.50	0.87
Average (Ra)				0.91

Sorrell Drive estimated mean $21.16 \times 0.91 = 19.15 \mu\text{g}/\text{m}^3$

QA/QC of automatic monitoring

The stations contain National Environmental Technology Centre (NETCEN) type-tested and approved analysers, as used in national networks, housed in secure air-conditioned containers to maintain the correct operating temperature range. Gas analysers are checked and calibrated automatically every 3 days using a gas mixture of known concentration to ensure accuracy of data. A full service by Horiba Instruments Ltd, the manufacturer, is undertaken every 6 months and the service includes a verification of the calibration gas concentration using a traceable standard. After correction has been made to the data set for any calibration errors, and other relevant factors, the data are usable for comparison with the objectives of the Strategy.

QA/QC of diffusion tube monitoring

Analysis of the nitrogen dioxide diffusion tubes is carried out according to the Practical Guidance document produced by the Defra Working Group on Harmonisation of NO₂ Diffusion Tubes. Several measures are taken to ensure tube precision including deploying multiple tubes, analysis of blanks and the use of quality control solution. The Council participates in the WASP scheme for quality assurance of diffusion tube analysis and the monthly NO₂ Network Field Intercomparison Exercise.

Appendix B: Road Traffic Count Data

Table B1.1 Traffic Flows above 10,000 Vehicles per Day and Close to Residential Properties

Location	Detail	Count date	AADT
Bletchley	JUNCTIONS		
Buckingham Rd	junction with Newton Rd	2008	10,500
Buckingham Rd	junction with Church Green Rd	2002	12,090
Buckingham Rd	junction with Sherwood Drive	2011	16,200
Victoria Rd	junction with Tavistock St	2008	8,000
Water Eaton Rd	junction with Manor Rd	2001	17,300
Bletchley	ROADS		
Aylesbury St	between Vicarage Rd & Sycamore Ave	2009	14,100
Buckingham Rd	between Shenley Rd & Sherwood Drive west of Shenley Road	2011 2010	13,300 8,300
Drayton Rd	south of Buttermere Close	2009	10,600
Manor Road	between Pinewood & Water Eaton Rd between Plough roundabouts	2003 2011	12,500 18,500
Watling St, V4	between Aylesbury St & Penn Rd	2004	11,560
Watling St, V4	SE of Penn Rd	2011	12,500
Shenley Rd	between Tweed St & A421	2002	10,400
Shenley Rd	NW of Humber Way	2008	8,500
Giffard Park			
Wolverton Rd	between Marsh Dr & V10	2011	8,400
Newport Pagnell			
Marsh End Road	south of Green Park Drive	2002	11,700
London Road	between Cranfield Rd & A422/A509	2010	11,500
Tickford St	between The Canons & Ivy Close	2007	10,800
Wolverton Road	between Manor Rd & Westbury Lane	2011	9,200
Wolverton Road	between Little Linford Lane & V10	2011	12,000
High St	between Union St & St Johns St	2002	8,800
High St	Between Station Rd & Bury Ave	2007	*15,400
St Johns St	between Priory St & Silver St	2002	10,050
A509	between A422 & M1 J14	2011	20,700

*Data from a 5 day (weekday) survey

Appendix B continued

Location	Detail	Count date	AADT
New Bradwell			
Newport Road	between St Peters & Guest Gardens	2011	10,800
Newport Road	between St James & Clock Tower	2005	11,000
Olney			
A509	between Olney & Emberton	2012	15,300
	Bridge Street, Olney	2010	17,600
Stony Stratford			
London Rd	junction with Wolverton Rd	2000	9,800
	between Clarence Rd. & Horsefair Green	2010	6,800
	between Hale Ave & Queen Eleanor Street	2009	7,900
Wolverton			
Stratford Road	between Old Wolverton Rd & Anson Rd	2011	10,700
Stratford Road	between Creed St & Rail Station	2011	12,000