



2012 Air Quality Updating and Screening Assessment for Greater Manchester

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

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<p>Katherine King Bolton Metropolitan Borough Council Town Hall, Victoria Square, Bolton BL1 1RU Tel: 01204 333333 katherine.king@bolton.gov.uk</p>	<p>Chris Horth Bury Metropolitan Borough Council 3 Knowsley Street Bury, BL9 0EJ Tel: 0161 253 5000 c.horth@bury.gov.uk</p>
<p>Rebecca Twigg Manchester City Council Town Hall Manchester M60 2LA Tel: 0161 234 1368 R.Twigg@manchester.gov.uk</p>	<p>Caroline Greenen Public Protection Oldham Council Chadderton Town Hall Middleton Road, Chadderton Oldham, OL9 6PD Tel: 0161 770 2244 Caroline.Greenen@oldham.gov.uk</p>
<p>Laura Hulse Rochdale MBC Number One Riverside, Smith Street, Rochdale, OL16 1XU Tel: 01706 924136 laura.hulse@rochdale.gov.uk</p>	<p>Gerard Steadman Salford City Council Environment Directorate Turnpike House, 631 Eccles New Road Salford, M50 1SW Tel: 0161 686 6204 ged.steadman@salford.gov.uk</p>
<p>Stephen Brown Stockport MBC Stopford House Piccadilly Stockport SK1 3XE Tel: 0161 474 4284 Stephen.brown@stockport.gov.uk</p>	<p>Gary Mongan Tameside MBC Environmental Services Council Offices Wellington Road, Ashton-Under-Lyne Lancashire, OL6 6DL Tel: 0161 342 3941 gary.mongan@tameside.gov.uk</p>
<p>Nasreen Ali Trafford Metropolitan Borough Council Trafford Town Hall, Talbot Road, Stretford Manchester, M32 0YJ Tel: 0161 912 4026 nasreen.ali@trafford.gov.uk</p>	<p>Diana Bell Wigan Council Environmental Protection PO Box 100 Wigan WN1 3DS Tel: 01942 244991 D.Bell@wigan.gov.uk</p>

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Executive Summary

This is the first Updating and Screening Assessment for the Greater Manchester Combined Authority, which covers the following councils: Bolton, Bury, Rochdale, Oldham, Tameside, Stockport, Trafford and Wigan, and the cities of Manchester and Salford. It is the first report of the Combined Authority following its inception in 2011. All previous reports were prepared and submitted separately by the constituent authorities, although these authorities have successfully worked closely together throughout the history of Local Air Quality Management. All 10 Greater Manchester councils have existing AQMAs where modelled annual mean concentrations of nitrogen dioxide were likely to exceed $35 \mu\text{g}/\text{m}^3$.

This document presents a screening assessment of recent monitoring data and also potentially significant sources of air pollution that have not previously been assessed.

The assessment of monitoring data shows that real time monitoring data for the nitrogen dioxide annual mean objective broadly confirms the existing AQMA boundaries. The exceptions were at the Stockport and Oldham stations (both now closed) which, although in AQMAs, recorded annual mean measurements of less than $35 \mu\text{g}/\text{m}^3$.

Measurements from the Greater Manchester network of 300 diffusion tubes showed that approximately 25% of tubes marked as being inside the AQMA were measuring less than $35 \mu\text{g}/\text{m}^3$. Around 5% of tubes measuring annual mean concentrations greater than or equal to $35 \mu\text{g}/\text{m}^3$ are located outside the AQMA.

Real time monitoring data for particulate matter (less than 10 microns) shows that annual average objectives are not exceeded and are following a downward trend. No sites had more than 35 occurrences of the daily mean particulate objective and therefore this objective was met.

As with previous assessments, there were no exceedences for sulphur dioxide, carbon monoxide and benzene.

The assessment of sources indicated that there were a number road traffic links that could be significant and would require screening. However it was decided not to screen road links at this stage as Greater Manchester is currently carrying out Detailed Assessment modelling of all significant roads using the latest emissions factors and inventories. This exercise will provide information on concentrations of nitrogen dioxide and particulate matter at roadside locations for assessment against the air quality objectives.

Assessment of all other sources showed that there are no new or significantly changed sources that could lead to potential exceedences.

The conclusions of this report are that the monitoring data indicates that the existing boundaries of the AQMA may need adjustment and therefore Greater Manchester will complete a Detailed Assessment to identify likely exceedences of nitrogen dioxide objectives.

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1 Introduction

1.1 Description of Regional Pollution Group

The air quality working group works in partnership to co-ordinate local air quality management for the 10 districts, Association of Greater Manchester Authorities (AGMA) and the Combined Authority (CA).

AGMA consist of 10 districts and work together over a range of statutory and non-statutory duties where there is an opportunity to improve services across the region. The ten districts are Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford, and Wigan. These are the main members of the Association of Greater Manchester Authorities (AGMA).

The Greater Manchester Combined Authority consists of the 10 AQMA authorities, with statutory powers for transport, regeneration and economic development across the city region. These powers include among other Local Air Quality Management (LAQM) under Sections 82 to 84 of the Environment Act 1995.

1.2 Description of Local Authority Areas

Greater Manchester has a population of over 2.5 million residents over an area of approximately 500 square miles. Within the conurbation there is a mix of high-density urban areas, suburbs, semi-rural and rural locations, and the area is characterised by the strong regional centre of Manchester, The Quays and Trafford Park.

Greater Manchester is the largest and strongest economic area in the North of the country, with over 40% of the North West's total productivity. However despite this, it contains some of the most deprived areas in the country.

There are over 9,000 km of roads, carrying annual traffic of 13,000 vehicle kilometres¹ on the motorways and A and B roads. Manchester Airport is the largest regional centre outside London. The M62 sits on the edge of the conurbation as it forms the East – West main serving Liverpool and Hull. The M60 orbital route

¹ GMTU Transport Statistics, 2009

encompasses Greater Manchester is over 36 miles in length, annual average weekday traffic flows are over 200,000 and the network is often congested at peak times. Other major motorways include M6, M56, M61, and M66.

1.3 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.

1.4 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 $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running mean annual	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running mean annual	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running mean annual	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running mean 8-hour	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 (PM₁₀) (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

1.5 Summary of Previous Review and Assessments

This is the first single report for the ten Greater Manchester districts; previously the local authorities submitted individual reports to DEFRA to fulfil their duties under the Environment Act 1995. However much of the underlying data used in our reports is held at the regional level by Transport for Greater Manchester (TfGM) and it therefore makes sense to write a joint report. This is consistent with the ethos and duties held by the Combined Authority and AGMA. TfGM² undertake transport statistics for the region, manage the **Emissions Inventory for Greater Manchester (EMIGMA)** and the regional model for the ten districts.

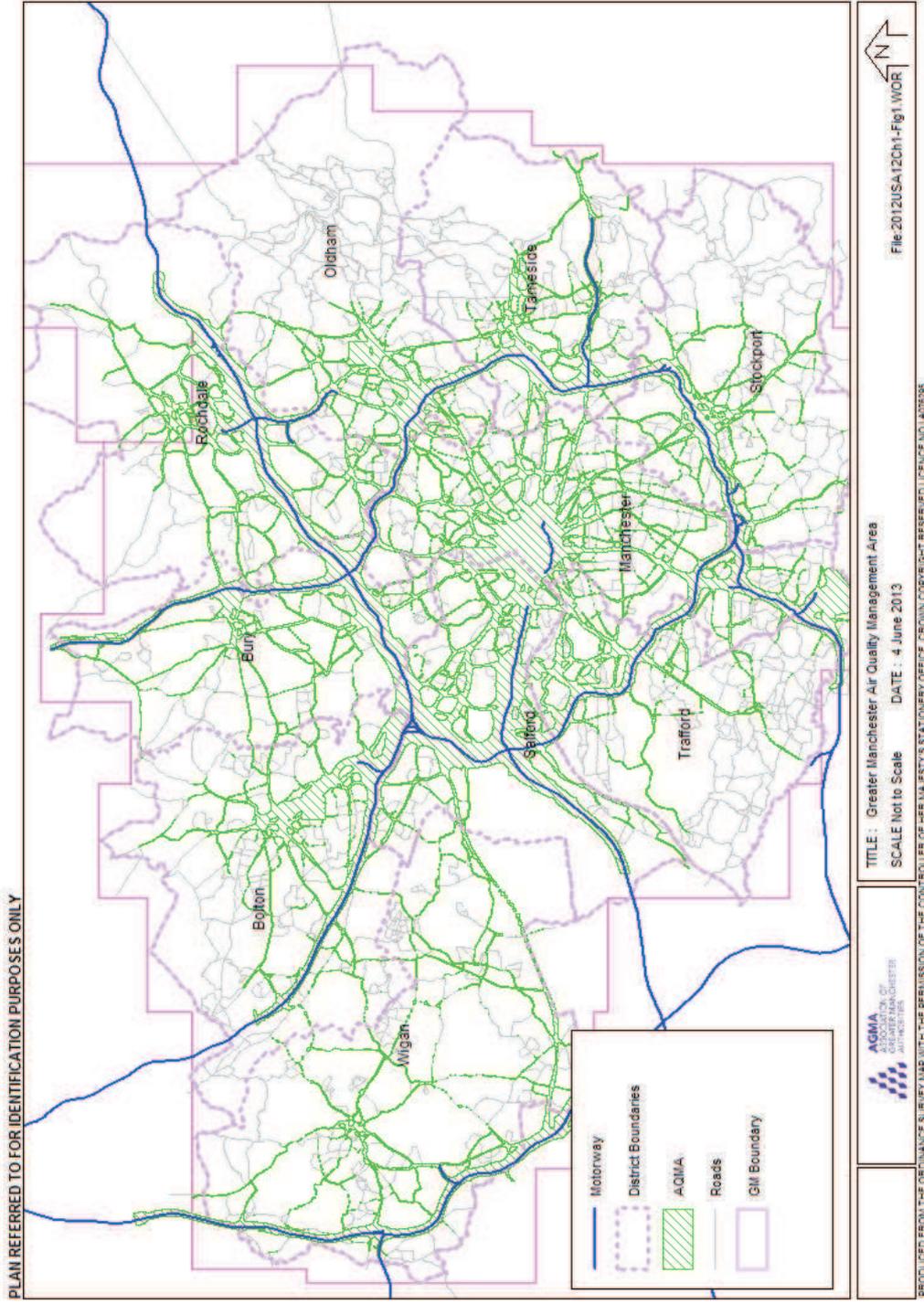
As this is the first report of this kind an overall summary of previous air quality work in Greater Manchester is provided as it is not possible to provide detailed information on individual local authority reports. Greater Manchester has undertaken two previous county wide modelling studies and is currently undertaking its third study and the results were used to define the air quality management areas. At the time no mechanism existed for declaration of Greater Manchester AQMA, and local authorities declared separate AQMA for their areas. Figure 1.1 indicates the Greater Manchester AQMA Boundaries.

A summary of Greater Manchester work is provided in the table below:

Date	Report / Stage	Outcome
	1 st Detailed Assessment Modelling Round 2	Emissions inventory 1997. Declared AQMA for annual mean NO ₂ including areas for daily PM10. AQMAs declared: 2001-2002.
2004	2 nd Detailed assessment Modelling Round 2	Modelling Round 2 Base on emissions inventory for: 2001. AQMA NO2 annual mean declared: 2005-2006. PM10 revoked.
2005-6		All LAs re-declared NO2 AQMA @ 35 µg/m ³ and revoked PM10.
2009	USA 2	Most districts recommended modelling work due to traffic emissions. Salford progressed to detailed assessment for railways, by monitoring and found to be below air quality standard.

² Previously now as Greater Manchester Transportation Unit (GMTU)

Figure 1.1 Greater Manchester AQMA Boundaries (nitrogen dioxide, annual mean)



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Local Authorities carry out air quality monitoring programmes as part of their local air quality management responsibilities under the Environment Act 1995. In addition DEFRA funds a network of air quality monitors as part of the Automatic and Urban Rural Network (AURN) and also partially funds some of the local authority sites by providing calibration and auditing services.

The Greater Manchester authorities have reviewed the automatic monitoring program to provide best value and help maintain key sites in the network. The review resulted in the decommissioning of a number of sulphur dioxide and carbon monoxide instruments.

DEFRA, as part of their services, provide QA/QC checks and data validation for full and partially affiliated sites. Local authority sites, except Bury Radcliffe and Bury Prestwich, have data management services provided by AEA's calibration club. The AEA cal club sites are regular audited to the same or similar standard as the national network and all published data undergoes a similar validation process. Casella have collected and scaled the data from the Bury's Radcliffe and Prestwich stations. The results for the automatic sites are based on the AEA's spreadsheet supplemented with Radcliffe and Prestwich data; a copy of the spreadsheet is available on our website: www.greatairmanchester.org.uk. Details of data management are provided in the QA/QC Appendix.

Table 2.1 and Figure 2.1 list the sites and locations in Greater Manchester. Figure 2.1 maps the automatic sites. Table 2.2 details closed monitoring sites.

Figure 2.1 Map of Automatic Monitoring Sites

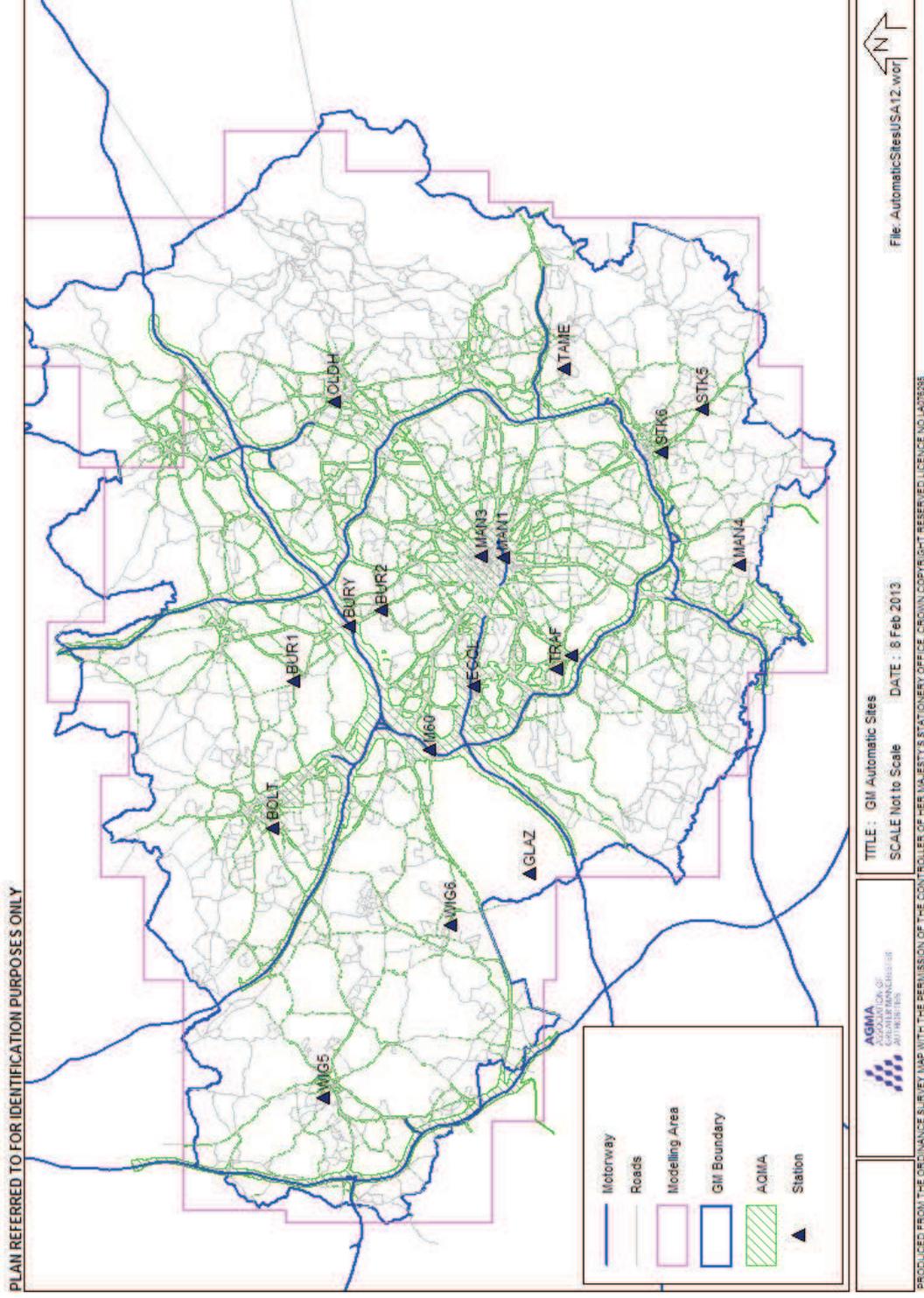


Table 2.1 Details of Automatic Monitoring Sites – operating to 2011

LA	Site Code	Site Name	Pollutants	Type	X(TFG M)	Y(tfgm)	AQMA
BO	BOLT	Bolton College*	CO NO2 O3 PM10 SO2	UB	371000	408496	
BU	BURY	Bury Roadside	CO NO2 PM10 PM25	RO	380906	404757	Y
BU	BUR2	Bury Prestwich	NO2 PM10	RO	381650	403222	Y
BU	BUR1	Bury Radcliffe	NO2 PM10	RO	378190	407480	Y
SA	GLAZ	Glazebury	NO2 O3	RU	368759	396028	
MA	MAN3 MAN7*	Manchester Piccadilly	NO2 O3 PM25 SO2 PM10*	UC	384310	398337	Y
MA	MAN4 MAN8	Manchester South	NO2 O3	SU	383904	385818	
			SO2	SU	383904	385818	
SA	ECCL	Salford Eccles	CO NO2 O3 PM10 PM25 SO2	UI	377926	398728	Y
WI	WIG5 WIG7	Wigan Centre Wigan Centre	NO2 O3 PM25, PM10	UB	357815	406022	
MA	MAN1	Manchester Oxford Road	NO2 PM10	KE	384233	397287	Y
OL	OLDH	Oldham West End House*	CO NO2 O3 PM10 SO2	UC	391860	405514	Y
SA	M60	Salford M60	CO NO2 O3 PM10	RO	374810	400855	Y
ST	STK5	Stockport Hazel Grove	NO2 PM10	RO	391481	387637	Y
ST	STK5	Stockport Shaw Heath*	NO2 PM10	UB	389384	389605	Y
Ta	TAME	Tameside Two Trees School	NO2 O3 PM10	UB	393454	394330	
TR	TRAF	Trafford	NO2 PM10 SO2	UB	378783	394726	
TR	TRF2	Trafford A56	NO2 PM10	RO	379413	394014	Y
WI	WIG6	Wigan Leigh 2	NO2 PM10	UB	366290	399861	

UB: Urban Background; RO: Roadside; KE: Kerbside; UC Urban Centre; SU: Suburban; RU: Rural
 Bu:Bury;Sa:Salford,Ma:Manchester;Wi:Wigan;St:Stockport;TR:Trafford; * Closed during 2011
 Source: Based on: Gtr Manchester Summary_DM_May 2012_V2.xlsm (Site info)

Table 2.2 Details of Automatic Monitoring Sites – Closed

LA	NAME	Type	Monitored	Start- End
BO	Bolton College	UB	CO NO2 O3 PM10 SO2	Oct07 -- Mar11
OL	Oldham West End House	#N/A	CO NO2 O3 PM10 SO2	Dec98 -- Jul11
ST	Stockport Shaw Heath 2	UB	CO NO2 PM10 SO2	Oct07 -- Feb11
BO	Bolton	UB	CO NO2 O3 PM10 SO2	Feb97 -- Jun08
BU	Bury Town Centre	UC	CO NO2 O3 PM10 SO2	Jun03 -- Nov04
ST	Stockport Bredbury		NO2 PM10	Nov00 -- Nov07
WI	Wigan Deanery School	#N/A	CO NO2 O3 PM10 SO2	May04 -- Oct04
WI	Wigan Leigh (Cal Club)	UB	NO2 PM10 SO2	Dec98 -- Feb01

2.1.2 Non-Automatic Monitoring Sites

Details of Non-Automatic Monitoring Sites are listed in the following tables in this section and Appendix 1. Non automatic monitoring network consist of around 300 nitrogen dioxide tubes, 17 benzene diffusion tubes and other monitoring. The following information has been collated from the 10 districts using previous reports from their own data sets. Not all the results are reported for each monitoring type and therefore if required please contact the local authority directly for the information.

The site classification types are summarised using the DEFRA site criteria Roadside (Rs), Kerbside (Ks), Rural (RU), Urban Background (UB), Suburban (Su), and Urban Central (UC). This classification is very specific and some sites may not fully meet a particular criteria, for example a tube 20 m away from a motorway is not strictly a roadside site but neither does it meet other types e.g. suburban and is therefore assigned to a site that best matches the local environment i.e. roadside. Some local authority district sites use an older site classification system, U1-4 from LAQM TG.03 and these have been reassigned to the current system using a cross reference table to automatic re-assigned the sites. Further details are included in Appendix 1.

The location of diffusion tubes in 2011 are shown in Figure 2.2.

Table 2.3 Summary of Non-Automatic Diffusion Monitoring by Site Type & District

District	Site Type							Total
	Ks	Rs	Ru	Su	UB	UC	NA	
Bolton	2	8			16	2	1	29
Bury	2	2			3			7
MCC	9	6		2	9	4		30
Oldham	2	3			6			11
Rochdale		8	1		5	3		17
Salford	1	17			8			26
Stockport		8	2		16	1		27
Tameside MBC		24		3	6			33
Trafford	1	3	1		3	6		14
Wigan	1	90	1		3	3		98
Grand Total	18	169	5	5	75	19	1	292

Notes

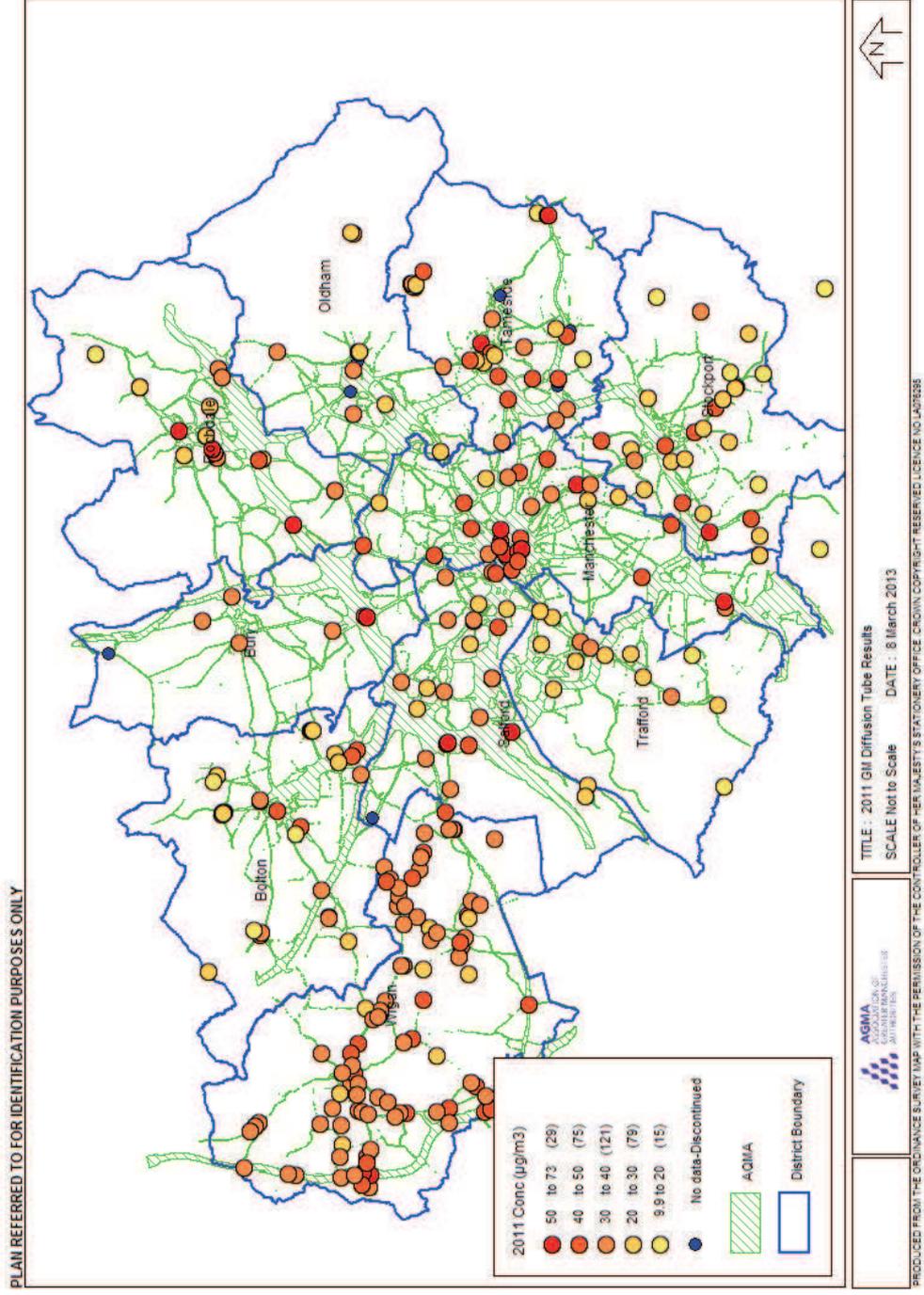
UB: Urban Background; Rs: Roadside; Ks: Kerbside; UC Urban Centre; Su: Suburban; Ru: Rural
 NA: Not available

Source: T26Grp.xlsm

Table 2.4 Summary of Non-Automatic Other Monitoring

District	Benzene	Lead	TSP1	Total
Bolton	4	2		6
Bury	1			1
Manchester CC	4		4	8
Oldham	4			4
Rochdale	4			4
Grand Total	17	2	4	23
TSP: Total suspended particulates				

Figure 2.2 Map of Nitrogen Dioxide Diffusion Tube Monitoring Sites



2.2 Comparison of Monitoring Results with AQ Objectives

The following sections provide information on the results and key statistics.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

A network of 16 monitoring stations is operated by the Greater Manchester authorities with DEFRA support on some sites. In 2011 (see Table 2.6), there were 14 sites with data capture above 50 %. Bolton, Stockport and Oldham sites closed in 2011. Table 2.5 shows the annual and range of concentrations at different site types in Greater Manchester. The automatic data is provided by AEA for all sites as part of Greater Manchester's membership of the calibration club. A copy of this spreadsheet is available on our GreatAir Manchester website:

<http://www.greatairmanchester.org.uk/TellMeMore/history.aspx>

Table 2.5 Summary of Automatic Monitoring Nitrogen Dioxide – annual mean ($\mu\text{g}/\text{m}^3$) and (Min – Max) Concentrations by Site type

Site Type	2007	2008	2009	2010	2011
Roadside (RO)	57 (42-65)	53 (30-69)	54 (31-72)	55 (36-69)	53 (24-71)
Rural (RU)	18 (18.3-18.3)	17 (17.3-17.3)	16 (16-16)	19 (19.4-19.4)	18 (18.3-18.3)
Suburban (SU)	21 (21-21)	24 (24-24)	24 (24-24)	28 (28-28)	23 (23-23)
Urban Background (UB)	27 (19-39)	26 (19-32)	26 (19-34)	29 (24-33)	28 (21-44)
Urban Central (UC)	36 (31-44)	37 (32-43)	37 (30-42)	40 (33-45)	37 (33-44)

Figure 2.3 shows the average trend by site and clearly shows that all site types have remained relative stable over the period 2007 to 2011. Overall concentrations have fallen compared to the slightly higher values seen in 2010. This is more evident at Eccles which dropped from 42 to 33 $\mu\text{g}/\text{m}^3$ and Trafford A56 from 46 to 41 $\mu\text{g}/\text{m}^3$. Roadside levels are the highest with consistent exceedences of the annual average at three roadside sites Bury (M60), Salford (M60), Manchester Oxford Road where concentrations are above 60 $\mu\text{g}/\text{m}^3$ in 2011. Manchester Piccadilly and Trafford A56 were slightly above the annual mean air quality objective. 10 sites in the suburban, urban background, urban centre and rural categories are below the air quality objective with concentration ranges from 18 to 33 $\mu\text{g}/\text{m}^3$.

The air quality management area was declared where modelled concentrations exceeded $35 \mu\text{g}/\text{m}^3$. Eccles and Stockport's STK6 and STK5 have recorded one year between 2007 and 2011 where the concentrations are above the $35 \mu\text{g}/\text{m}^3$. The Oldham site is in the AQMA with a concentrations range of $31 - 33 \mu\text{g}/\text{m}^3$ over the period 2007-11, but previous results from 2001 to 2003 were $34-35 \mu\text{g}/\text{m}^3$ indicating that it was consistent with the for the declaration of the AQMA in 2005.

The NO_2 hourly objective is exceeded if there are more than 18 periods above the $200 \mu\text{g}/\text{m}^3$. In 2011 (see Table 2.7), no sites exceeded the air quality objective. 2010, was an usually year, as nine sites had 2 or more periods above $200 \mu\text{g}/\text{m}^3$ hourly limit with 23 at Bury. Other than Bury, no other site exceeded the hourly objective in 2010. The only sites with consistent periods over the hourly limit are the two motorway stations (Bury, M60) located on the M60.

The figures included in Section 2.2.1 illustrate the trends in annual mean NO_2 diffusion tube concentrations across the AQMA.

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

LA	AURN Site Code	Site ID	Site Type	In AQMA	Annual Mean Concentration ^a µg/m ³ Data Capture (%)											
					2007		2008		2009		2010		2011			
					Conc	%	Conc	%	Conc	%	Conc	%	Conc	%		
Bolton	BOLT	Bolton College	UB		-	-	25	75	27	84	28	91	40	23		
Bury	BURY	Bury Roadside	RO	Y	65	81	69	96	72	83	69	99	71	89		
Salford	GLAZ	Glazebury	SU		18	97	17	49	16	94	19	99	18	97		
Manchester	MAN1	Manchester Oxford Rd	KE	Y	-	-	-	-	-	-	64	77	66	94		
Manchester	MAN3	Manchester Piccadilly	UC	Y	44	96	43	78	42	92	45	95	44	97		
Manchester	MAN8	Manchester South	SU		21	86	24	92	24	96	28	99	23	99		
Oldham	OLDH	Oldham West Endhouse	UC	Y	31	99	32	89	30	98	33	89	33	50		
Salford	ECCL	Salford Eccles	UI	Y	34	91	36	92	39	65	42	86	33	87		
Salford	M60	Salford M60	RO	Y	63	96	68	70	70	97	60	98	64	99		
Stockport	STK5	Stockport Hazel Grove	RO	Y	29	61	30	46	31	78	36	55	24	79		
Stockport	STK6	Stockport Shaw Heath 2	UB	Y	39	24	28	98	27	99	31	93	44	10		
Tameside	TAME	Tameside Two Trees	UB		19	94	19	95	19	89	24	68	21	90		
Trafford	TRAF	Trafford	UB		30	100	32	81	34	98	33	99	26	99		
Trafford	TRF2	Trafford A56	RO	Y	42	89	46	93	44	96	46	99	41	90		
Wigan	WIG6	Wigan Leigh 2	UB		27	93	26	100	25	95	29	92	25	96		
Wigan	WIG5	Wigan Centre	UB		22	96	24	99	24	99	26	99	23	98		

Notes

a. The annual means have not been annualised where data capture falls below 50% see Box 3.2 TG(09). Closures :

Stockport Shaw Health 6/2/11; Oldham 5/7/11

UB: Urban Background; Rs: Roadside; Ks: Kerbside; UC Urban Centre; Sb: Suburban; Ru: Rural

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

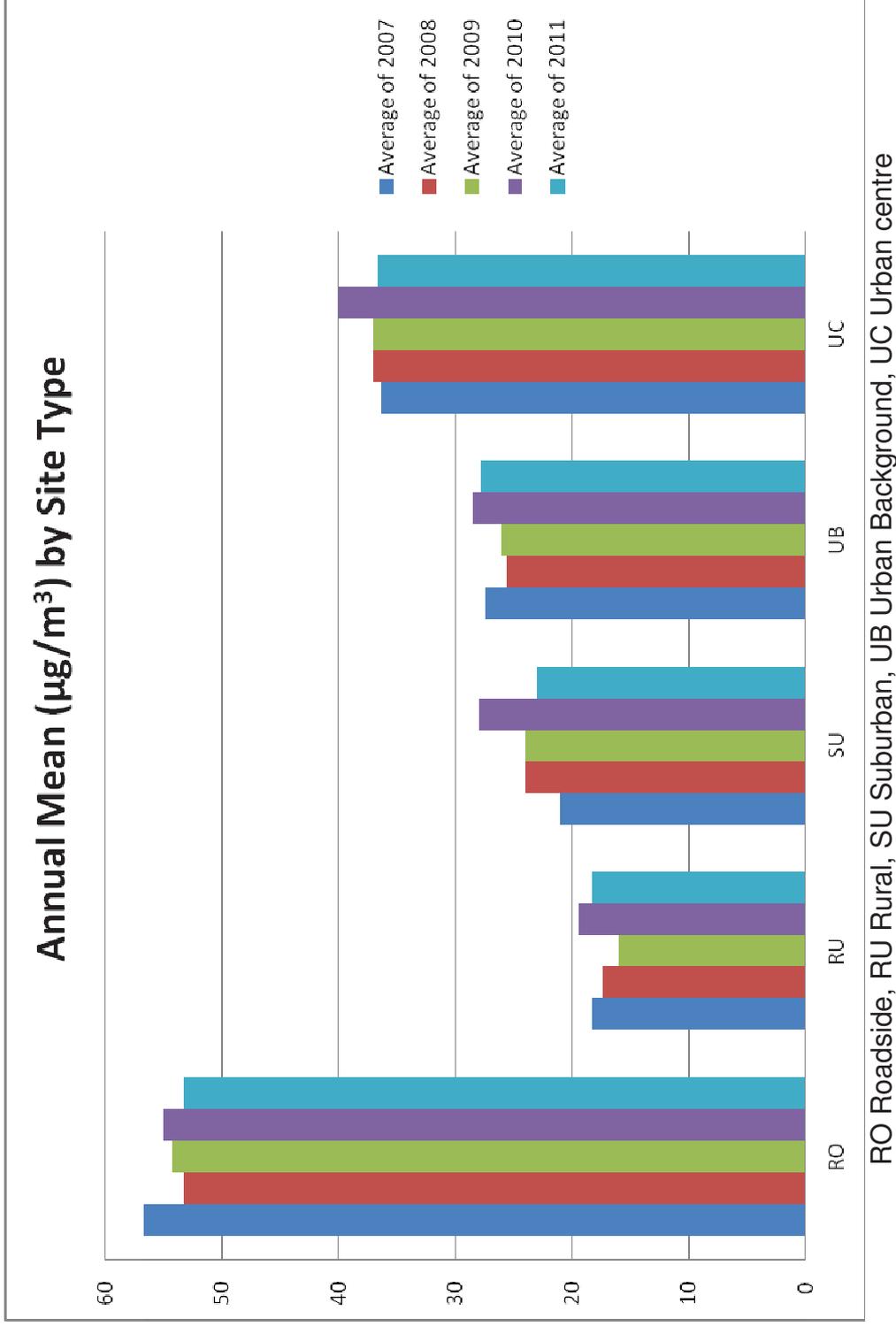


Table 2.7 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

LA	AURN Site Code	Site ID	Site Type	In AQMA	Valid Data Capture 2011 % ^{ab}	Number of Exceedences of Hourly Mean (200 µg/m ³) ^{*c}				
						2007	2008	2009	2010	2011
Bolton	BOLT	Bolton College	UB		23	-	0	0	0	
Bury	BURY	Bury Roadside	RO	Y	89	3	4	11	23	7
Salford	GLAZ	Glazebury	RU		97	0	0	0	0	0
Manchester	MAN1	Manchester Oxford Rd	KE	Y	94	-	-	-	2	5
Manchester	MAN3	Manchester Piccadilly	UC	Y	97	0	12	0	0	0
Manchester	MAN8	Manchester South	SU		99	0	0	0	7	0
Oldham	OLDH	Oldham West Endhouse	UC	Y	50	0	0	0	0	0
Salford	ECCL	Salford Eccles	UI	Y	87	0	3	0	15	0
Salford	M60	Salford M60	RO	Y	99	47	65	106	13	13
Stockport	STK5	Stockport Hazel Grove	RO	Y	79	1	0	0	4	0
Stockport	STK6	Stockport Shaw Heath 2	UB	Y	10	0	1	0	5	
Tameside	TAME	Tameside Two Trees	UB		90	0	0	0	0	0
Trafford	TRAF	Trafford	UB		99	0	2	0	18	0
Trafford	TRF2	Trafford A56	RO	Y	90	0	2	0	12	0
Wigan	WIG6	Wigan Leigh 2	UB		96	0	0	0	0	0
Wigan	WIG5	Wigan Centre	UB		98	0	0	0	0	0

^a i.e. data capture for other monitoring periods in annual results table.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

^c If valid data is less than 90%, result not reported

UB: Urban Background; Rs: Roadside; Ks: Kerbside; UC Urban Centre; Su: Suburban; Ru: Rural

Diffusion Tube Data

This is the first report where all of Greater Manchester's diffusion tube results are collated and reported together. The following tables list results for the years 2007 to 2011. A full copy of the data is provided in the appendices. Some site classifications were based on a previous system (U1 Kerbside, U2 Roadside etc) have been remapped to align the current national system used on LAQMTG(09). The new site classifications were automatic assigned using a lookup table in Appendix 1.

Full results of nitrogen dioxide diffusion tubes in 2011 are provided in Appendix 1. There over 300 tubes located at 292 locations in Greater Manchester representing a range of environments from rural to kerbside locations. The following tables show the average results for years' 2007 to 2011 by site type (Table 2.8 and Figure 2.5) and by district (Table 2.9 / Figure 2.6). A GM bias factor of 0.883, calculated from the national database spreadsheet V(3/12) was used to adjust all diffusion tubes. See Appendices for details of the bias factor.

2011 results show a similar pattern to the real time sites with a fall from the slightly higher concentrations experienced 2010, with average concentrations similar to those of 2009.

Table 2.8 Summary Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011) – annual mean ($\mu\text{g}/\text{m}^3$) and (Min – Max) Concentrations by Site type

Site Type	2007	2008	2009	2010	2011
Kerbside (Ks)	52 (81-31)	49 (79-30)	47 (71-31)	47 (72-30.5)	45 (70-27.6)
Roadside (RO)	41 (74-22.3)	42 (87-23)	38 (73.3-24)	40 (83-23.9)	39 (73-24.5)
Rural (RU)	18 (27-9)	17 (27-8)	13 (16.6-9)	19 (30-11)	20 (39-9.9)
Suburban (SU)	23 (26.9-18.9)	23 (29.1-15)	24 (28.8-17)	22 (27-19)	23 (29-17)
Urban Background (UB)	28 (50-14.9)	27 (45-13)	29 (66.4-15)	30 (53-16.5)	27 (43-15.1)
Urban Central (UC)	42 (53-28)	40 (51-30)	38 (48-27.1)	41 (52-31)	36 (47-23.9)

Source: T26Grp.xlsm

Overall kerbside sites show the largest fall in the average concentrations from 52 $\mu\text{g}/\text{m}^3$ in 2007 to 45 $\mu\text{g}/\text{m}^3$ in 2011, with the maximum concentration decreasing from 81 $\mu\text{g}/\text{m}^3$ to 70 $\mu\text{g}/\text{m}^3$ over the same period. There is a smaller decline in minimum concentration for kerbside sites. Sites located further away from kerb show a smaller decrease in concentration from 2007 to 2011.

Of the 18 kerbside sites all except one have recorded exceedences of the annual mean objective in the period to 2007-2011. All are in the AQMA except OL 19 (High Street Upper Mill) which is a town\ village at the periphery of the GM conurbation, results typically range from 27 – 32 $\mu\text{g}/\text{m}^3$, and is therefore unlikely to be in AQMA.

Table 2.9 Summary Results of Annual Mean ($\mu\text{g}/\text{m}^3$) Nitrogen Dioxide Diffusion Tubes (2007 to 2011) by District

Annual Mean Diffusion Tube Results 2007 – 2011 ($\mu\text{g}/\text{m}^3$)					
District	2007	2008	2009	2010	2011
Bolton	39	41	42	39	41
Bury		51	53	59	47
MCC	60	54	49	53	49
Oldham	44	47	49	35	34
Rochdale		45	42	43	45
Salford	40	43	46	45	39
Stockport	43	39	41	46	42
Tameside MBC	38	41	40	37	41
Trafford	32	37	33	38	29
Wigan	41	41	33	38	38
Average (GM)	42	43	39	41	40

Source : USA_2012\GMDATA\Monitoring Data_files\Non automatic data_files\Tables\T26Grp.xlsm

The following analysis uses a three year average from 2008 to 2011 to study long term trends to reduce year to year variances. There are 185³ roadside and kerbside sites, 79 have a three year annual average over 40 $\mu\text{g}/\text{m}^3$, and 77 of these are located in the AQMA. 106 tubes are less than or equal to 40 $\mu\text{g}/\text{m}^3$, 78 are in the AQMA and 28 outside.

The AQMA was declared where modelled concentrations exceeded 35 $\mu\text{g}/\text{m}^3$. There are 155 tubes with a concentration exceeding 35 $\mu\text{g}/\text{m}^3$; 142 are in the AQMA and 13 outside the AQMA.

Figure 2.4 shows the distribution of the 3 year average concentration for the datasets in the AQMA (Yes) and outside (Out). The vertical line the indicates AQMA declaration value of 35 $\mu\text{g}/\text{m}^3$. It clearly shows that tubes outside the AQMA tend to have a concentration less that 35 $\mu\text{g}/\text{m}^3$. For the tubes in the AQMA, 142 are over

³ Two sites had no results for 2009 to 2011

and 64 are less than the AQMA threshold of $35 \mu\text{g}/\text{m}^3$. The mode (most frequently occurring values) falls near the AQMA threshold.

Studies have shown that where diffusion tubes are above $60 \mu\text{g}/\text{m}^3$, the 1-hour objective may be exceeded. There were five locations, Bury Roadside* (BU3a), Oxford Street* (29 A/B & 82), M60* (SA20/21/21), Kingsway (SK12) and Market Street Hollingworth (T 11), with a 3 year average exceeding $60 \mu\text{g}/\text{m}^3$. Automatic monitoring stations are at or close to some of the sites (marked with *) and are discussed above. A station is proposed for the A34 Kingsway.

The top ten sites are located in Manchester City Centre (Newton Street, $58 \mu\text{g}/\text{m}^3$, Princess Street $56 \mu\text{g}/\text{m}^3$), Oxford Street, Salford and Bury by the M60 ($59\text{-}73 \mu\text{g}/\text{m}^3$), A34 Kingsway and Market Street Hollinworth. These locations are in central Manchester, or along the major arterial roads in the region.

Figure 2.4 Histogram of Annual Mean Nitrogen Dioxide diffusion Tube Concentrations ($\mu\text{g}/\text{m}^3$)

3 Year Average (2009-2012) concentration $\mu\text{g}/\text{m}^3$ Vertical line AQMA Threshold $34\mu\text{g}/\text{m}^3$

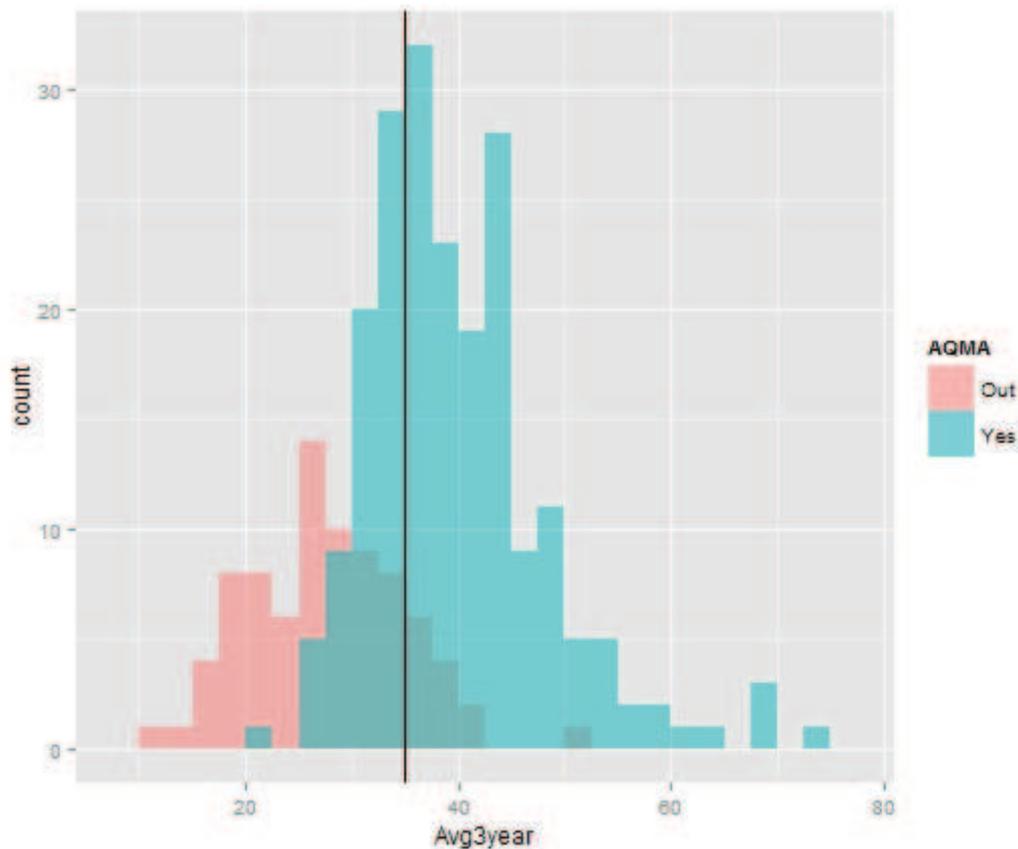


Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Diffusion Tube Concentrations ($\mu\text{g}/\text{m}^3$) by Site Type

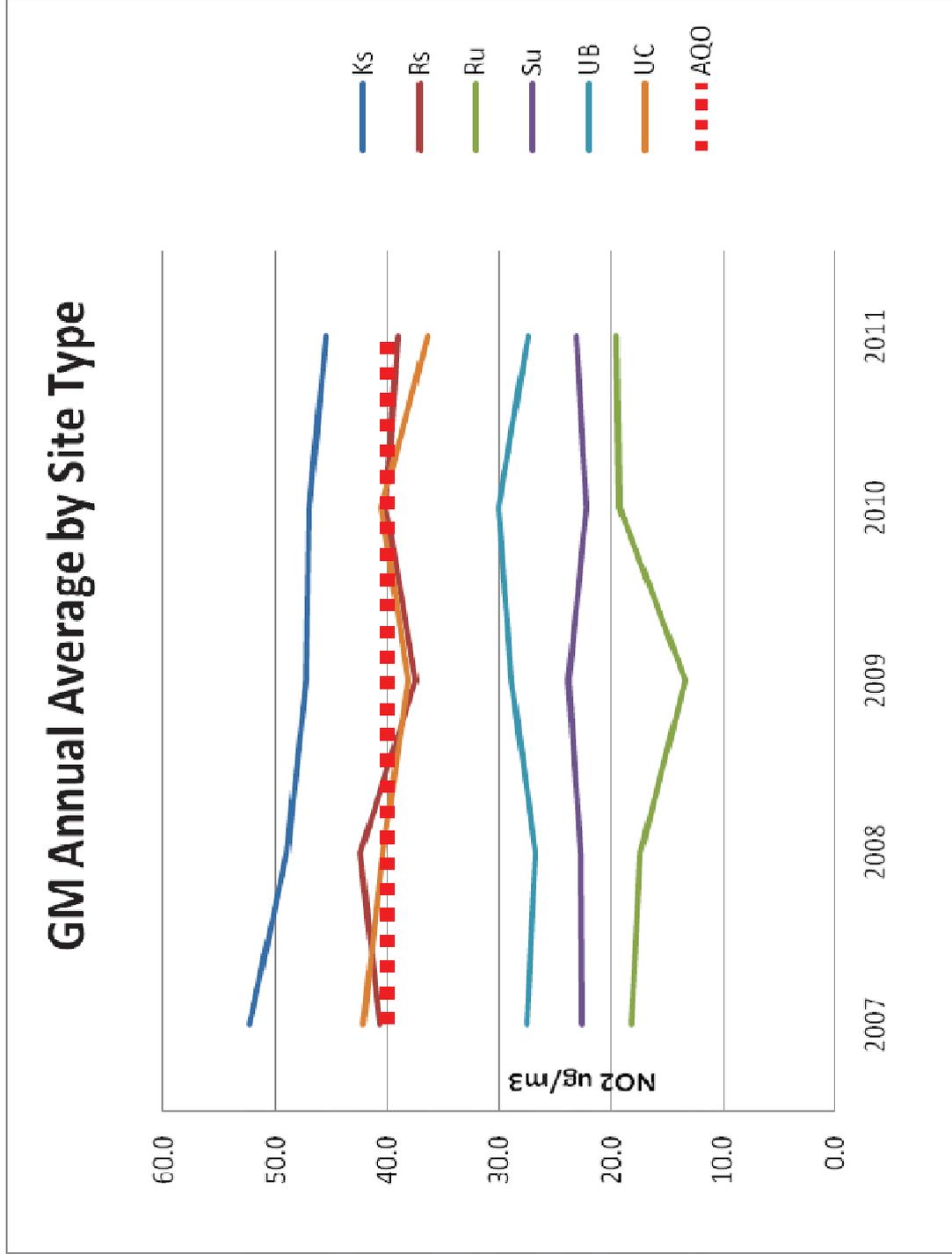
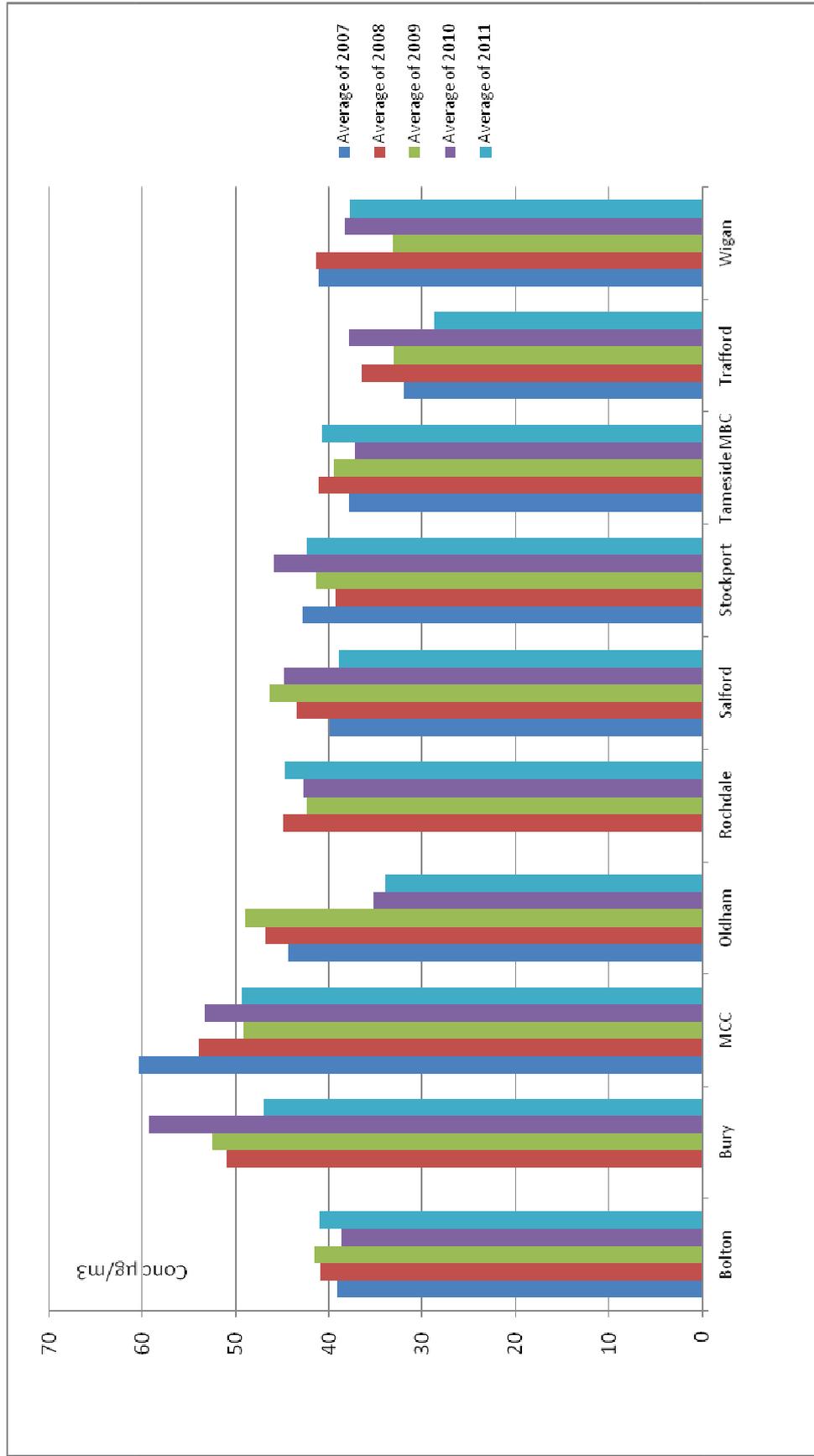


Figure 2.6 GM Trends in Annual Mean Nitrogen Dioxide Diffusion Tube Concentrations ($\mu\text{g}/\text{m}^3$) by Site Type

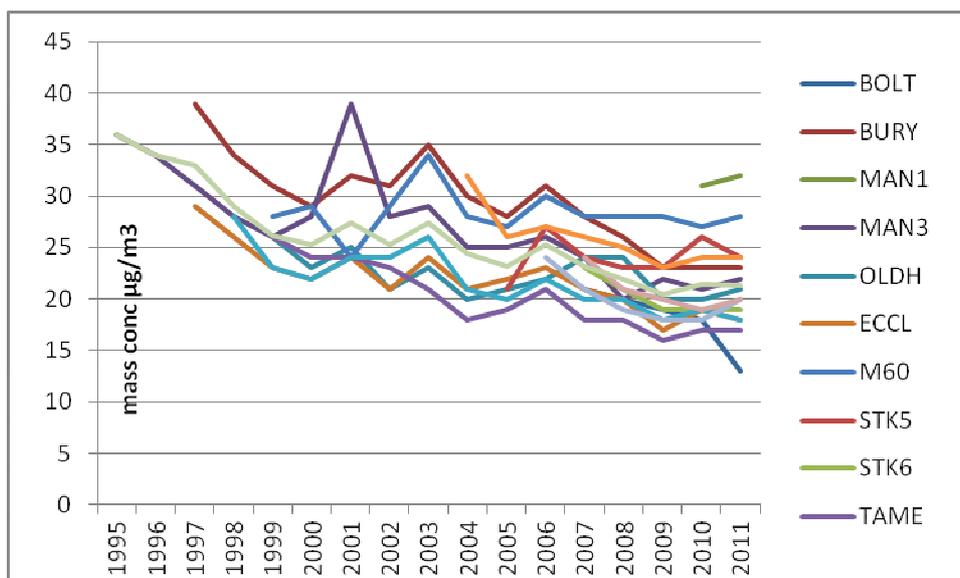


2.2.2 PM₁₀

The annual mean air quality objective for PM₁₀ has not been exceeded at any of the GM stations since monitoring commenced in 1995, at the first station in Piccadilly Manchester. However medical evidence links higher PM₁₀ concentrations with increased hospital admission and other respiratory illness, therefore reducing exposure with lower ambient concentrations is beneficial to securing a healthier environment. PM₁₀ data is reported in gravimetric units, by applying 1.3 factor to Teom data. Manchester Oxford Rd and Piccadilly PM₁₀ analysers are BAM 1020 with unheated inlets so the data has been corrected to gravimetric by a factor of 0.83333. The following tables 2.10, 2.11 and 2.12, and charts 2.7 and 2.8 provide information on PM₁₀ concentrations and trends.

In 2011 the average PM₁₀ concentration is 21 µg/m³, marginally lower than the 2010. Average PM₁₀ concentrations in Greater Manchester have decreased steady from the higher concentration of 35 – 40 µg/m³ in 1995, however these have started to level off as can be seen from Figure 2.7.

Figure 2.7 GM Long Term Trend Annual Mean Objective



The highest concentrations are experienced at roadside locations with the station at Oxford Road in Manchester measuring an annual mean of 32 µg/m³, which also has

the highest number of daily exceedences at 33 in 2011. Oxford road is widely credited with the title of “the busiest bus route in Europe” and is heavily congested during peak hours. The average roadside concentration is 26 $\mu\text{g}/\text{m}^3$.

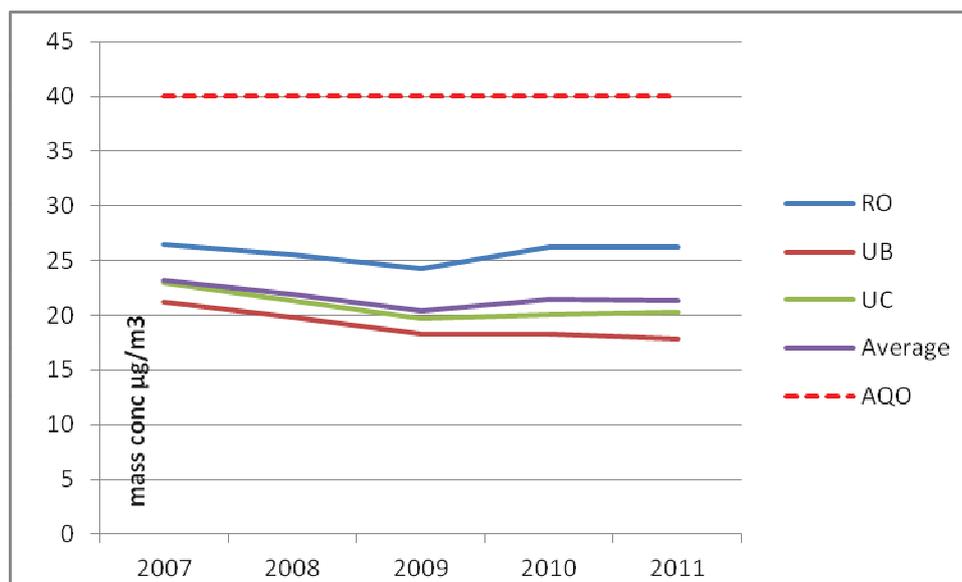
Table 2.10 Summary of Automatic Monitoring of PM₁₀: by site Type Comparison with Annual Mean Objective ($\mu\text{g}/\text{m}^3$)

	2007	2008	2009	2010	2011
RO	27	26	24	26	26
UB	21	20	18	18	18
UC	23	21	20	20	20
Average (all)	23	22	20	22	21

UB: Urban Background; Rs: Roadside; Ks: Kerbside; UC Urban Centre; Su: Suburban; Ru: Rural

Source: \Gtr Manchester Summary_DM_May_2012_V2_tcom.xlsx Tab:PM Summ

Figure 2.8 GM Trends in Annual Mean Objective Concentrations ($\mu\text{g}/\text{m}^3$) by Site Type



Urban background particulate pollution mean concentration in 2011 was 18 $\mu\text{g}/\text{m}^3$ slightly lower than the national concentration of 20 $\mu\text{g}/\text{m}^3$. Urban Centre Sites in 2011 were 20 $\mu\text{g}/\text{m}^3$.

In GM and the UK the predominant method of measurement is the TEOM which does not meet the EU reference method for particulate measure. A model developed by Kings College London (KCL) and approved by DEFRA is available to convert TEOM data to meet the standard.

Use of the new volatile correction model (VCM), instead of the current 1.3 factor, to 'correct' TEOM measurements to gravimetric equivalent decreased the average annual mean by 4% but increased the number of daily exceedences at Trafford A56 (6 to 12), Salford M60 (12 to 16), Trafford cal club (6 to 11). Overall there was no change and no locations exceeded the air quality objective after applying the VCM factor.

Table 2.11 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective ($\mu\text{g}/\text{m}^3$ / % Data Capture)

LA	AURN Code	Site ID	Type	X(TFGM)	Y(TFGM)	AQMA	Method	2007	2008	2009	2010	2011	End Date
Bolton	BOLT	Bolton College	UB	371000	408496		T	21 (79.2%)	20 (67.1%)	19 (70.9%)	18 (91.1%)	13 (19%)	Mar-11
Bury	BURY	Bury Roadside	RO	380906	404757	Y	T/F	28 (77.7%)	26 (96.2%)	23 (95.9%)	23 (97.9%)	23 (92.8%)	
Manchester	MAN1	Manchester Oxford Rd	RO	384233	397287	Y	B				31 (81.2%)	32 (99.2%)	
Manchester	MAN3	Manchester Piccadilly	UC	384310	398337	Y	T\F	24 (97.9%)	20 (99.1%)	22 (3.7%)	21 (92.8%)	22 (97.8%)	
Oldham	OLDH	Oldham West Endhouse	UC	391860	405514	Y	T	24 (89.9%)	24 (90.7%)	20 (98.4%)	20 (88.3%)	21 (27.5%)	Jul-11
Salford	ECCL	Salford Eccles	UC	377926	398728	Y	T\F	21 (90.1%)	20 (90.6%)	17 (97.6%)	19 (98.6%)	18 (93.6%)	
Salford	M60	Salford M60	RO	374810	400855	Y	T	28 (97%)	28 (89%)	28 (96.9%)	27 (98%)	28 (98.9%)	
Stockport	STK5	Stockport Hazel Grove	RO	391481	387637	Y	T	24 (79.7%)	23 (97.5%)	23 (94.7%)	26 (99.3%)	24 (97.8%)	
Stockport	STK6	Stockport Shaw Heath 2	UB	389384	389605	Y	T	23 (25%)	21 (99.4%)	19 (99.3%)	19 (97.3%)	19 (9.3%)	Feb-11
Tameside	TAME	Tameside Two Trees	UB	393454	394330		T	18 (91.4%)	18 (94.7%)	16 (88.2%)	17 (81.1%)	17 (96.2%)	
Trafford	TRAF	Trafford	UB	378783	394726		T	20 (96.2%)	20 (97.7%)	18 (99.3%)	19 (97.4%)	18 (98.1%)	
Trafford	TRF2	Trafford A56	RO	379413	394014	Y	T	26 (98.6%)	25 (98.2%)	23 (98.6%)	24 (97.4%)	24 (98.9%)	
Wigan	WIG6	Wigan Leigh 2	UB	366290	399861		T	21 (90.4%)	19 (92.1%)	18 (92.6%)	18 (87.8%)	20 (99.2%)	
Wigan	WIG5	Wigan Centre	UB	357815	406022		T	24 (24.3%)	21 (96.9%)	20 (89.3%)	19 (97.2%)	20 (92.1%)	
Bury: T (upto 6/5/09) F (from 7/5/09), MAN1 T (up to 14/3/07) F (from 15/3/07) F (from 15/3/07), Eccles: T (up to 25/2/09) F (from 26/2/09)													
F: FDMS; T: TEOM, B: BAM													
Source: \\ \Gitr Manchester Summary_DM_May 2012_V2_teom.xlsm													

**Table 2.12 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour mean Objective
Number of Exceedences of 24-Hour Mean (50 µg/m³)**

LA	AURN Code	Site ID	Site Type	AQMA	Method	2007	2008	2009	2010	2011
Bolton	BOLT	Bolton College	UB		T	6	0	0	0	0
Bury	BURY	Bury Roadside	RO	Y	T/F	18	6	7	2	14
Manchester	MAN1	Manchester Oxford Rd	RO	Y	B				17	33
Manchester	MAN3	Manchester Piccadilly	UC	Y	T/F	20	9	5	1	8
Oldham	OLDH	Oldham West Endhouse	UC	Y	T/F	7	3	1	1	0
Salford	ECCL	Salford Eccles	UC	Y	T/F	9	2	6	3	13
Salford	M60	Salford M60	RO	Y	T	21	11	10	8	12
Stockport	STK5	Stockport Hazel Grove	RO	Y	T	10	7	9	15	23
Stockport	STK6	Stockport Shaw Heath 2	UB	Y	T	2	7	3	0	0
Tameside	TAME	Tameside Two Trees	UB		T	4	1	1	0	2
Trafford	TRAF	Trafford	UB		T	8	4	2	3	2
Trafford	TRF2	Trafford A56	RO	Y	T	11	8	3	3	6
Wigan	WIG6	Wigan Leigh 2	UB		T	3	4	0	2	4
Wigan	WIG5	Wigan Centre	UB		T	0	5	1	2	3
Bury: T (upto 6/5/09) F (from 7/5/09); MAN1 T (up to 14/3/07) F (from 15/3/07); Eccles: T (up to 25/2/09) F (from 26/2/09)										

2.2.3 Sulphur Dioxide

The results presented here are results provided from the GM network stations and compiled by AEA. AEA at our request compiled the annual mean, data capture to compare against the UK air quality objectives.

For GM the annual average in 2011 was $2.4 \mu\text{g}/\text{m}^3$, with an average data capture of 64%. Manchester Piccadilly, Manchester South, Salford Eccles and Trafford had data capture rates over 80%.

There were no exceedences of the three UK air quality objectives; annual mean, 15 minute not to exceed $266 \mu\text{g}/\text{m}^3$ and one daily not to exceed $125 \mu\text{g}/\text{m}^3$.

2.2.4 Benzene

Benzene is found in petrol and in vehicle emissions, therefore elevated levels may be expected at roadside locations. Background concentrations are less than $0.5 \mu\text{g}/\text{m}^3$ over much of the UK with slightly higher concentrations in urban areas.

Benzene is a recognised human genotoxic and therefore there is no absolutely safe threshold below which no adverse health effects are anticipated. A European limit value has been set, of $5 \mu\text{g}/\text{m}^3$ as an annual mean, below this value, the risk of health effects is very small.

The 2011 average for roadside sites is $0.75 \mu\text{g}/\text{m}^3$. There is a general decrease from 2009 to 2011 across of the 4 sites. GM is compliant with this limit value for roadside sites. Princess Parade is a service station where high level would be expected but as the limit value is set for non- occupational locations it does not apply here.

Results from the last 3 years for the network of benzene diffusion tubes across the city are shown in Table 2.13

Table 2.13 Results of Benzene Diffusion Tube Monitoring: Comparison with Annual Objectives

Monitoring site name	Site type	Within AQMA?	Annual mean benzene concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias*		
			<i>Data capture for the year is included in brackets</i>		
			2009	2010	2011
(M) Piccadilly Gardens	Urban Centre	Y	0.86 (100%)	0.89 (100%)	0.69 (100%)
(M) Cheetham Hill Road	Kerbside	Y	1.07 (100%)	1.14 (92%)	0.94 (100%)
(M) Princess Road	Roadside	Y	0.96 (100%)	1.10 (92%)	0.55 (92%)
(M) Princess Parade Service Station	Urban Industrial/ Roadside	Y	8.34 (100%)	6.63 (92%)	5.43 (92%)
Bury (AURN)	Roadside	Y			0.78 (100%)
Notes M= Manchester					

2.2.5 Other pollutants monitored (Carbon Monoxide and Ozone)

Analysis of automatic site data for carbon monoxide shows no exceedences of the air quality objective.

The UK Air Quality Strategy (Defra, 2007) confirmed an ozone air quality objective, which applied from the end of 2005, of $100 \mu\text{g}/\text{m}^3$, measured as the daily maximum of a running 8-hour mean ozone concentration, not to be exceeded more than 10 times a year. The standard applies to UK and is not the responsibility of local authorities so is reported for information only. There were exceedences in Tameside and Manchester South, results are given in Table 2.14.

Table 2.14 Results Ozone, for daily maximum 8-hour running average > 100.0 $\mu\text{g m}^{-3}$ (20°C 1013mb)

Site	Site Type	Number of exceedences	2011 $\mu\text{g/m}^3$	Data Capture (%)
Bolton College	UB	0	36	*22
Glazebury	SU	8	42	99
Manchester Piccadilly	UC	1	30	99.1
Manchester South	SU	11	46	99.4
Oldham West End House		6	44	*50.3
Salford Eccles	UI	3	34	94
Salford M60	RO	0	28	*52.8
Tameside Two Trees School	U	12	46	99.7
Wigan Centre	UB	8	43	92.9
Wirral Tranmere	UB	9	46	99.4
*Sites closed or decommissioned Produced by AEA on: 27/07/2012 Automatic\Exceedance_Summay_for_1_1 - Summary list.xls Annual Average (mg m^{-3} (20°C 1013mb) 01/01/2011 to 31/12/2011)				

2.2.6 Summary of Compliance with AQS Objectives

Greater Manchester modelled air quality concentration in 2004\5 and each of the 10 districts declared air quality management areas shortly after that. The modelling was based on the 2001 inventory. Year to year changes in air quality concentration are monitored by our monitoring programme and the emissions inventory.

The automatic sites show good agreement with the air quality management area. Stockport Hazel Grove site, which is the AQMA, records the lowest concentration in the AQMA with a range of 24-31 $\mu\text{g}/\text{m}^3$, however the other sites are consistent with the AQMA boundary. The Hazel Grove site is currently part of a larger study to collect evidence relating traffic composition and flow using a matrix of remote sensors (emotes). Results from the study are due in 2013 and this will be used to improve future modelling

At roadside locations in Greater Manchester and in the built areas with a high density of roads, annual concentrations do exceed the UK air quality objective of 40 $\mu\text{g}/\text{m}^3$.

Away from busy roads (urban, suburban and rural), annual mean NO_2 concentrations are lower, typically 80% of diffusion tubes concentrations fall in the range 19-37 $\mu\text{g}/\text{m}^3$.

Analysis of tubes within the air quality management area show reasonable good statistical agreement with the 2004 modelling results, nonetheless over 30 % of tubes located in the AQMA are less than 35 $\mu\text{g}/\text{m}^3$ and over 25% are in the range 35-40 $\mu\text{g}/\text{m}^3$. Technical Guidance (LAQM TG (09)) states that overall uncertainty of diffusion tubes is +/- 20% and therefore overall the results support the current AQMA but there are some small changes consistent with new developments and or changes in traffic patterns have occurred.

There are a number of tube sites that require further investigation by the local authorities as regards to location and other site interferences. As discussed previously a large number of tubes while agreeing with the model are located in the

AQMA with concentrations less $40 \mu\text{g}/\text{m}^3$. Broadly the monitoring results for NO_2 are consistent with current AQMA, however the diffusion tube data suggests that there are locations where the AQMA has changed and it should be revised. Air quality modelling is currently in progress which will use the latest emissions factors released in July 2012. The new vehicle emissions are more realistic at estimating the emissions under urban conditions.

Table 2.15 and the box below summarise Greater Manchester's outcomes against the AQS Objectives.

The Greater Manchester Combined Authority has reviewed the measurement data from NO_2 automatic and non automatic sites and diffusion tube data indicates minor changes in the air quality management area. Greater Manchester is currently modelling air quality with revised emissions factors and inventory will remodel the area for NO_2 to update the AQMA.

Table 2.15 Summary of Compliance with AQS Objectives

Pollutant	General	New Exceedences identified?	Detailed Assessment Required	Objective	Comment \Description of Area
10 Greater Manchester Authorities.					
NO ₂	Monitoring outside AQMAs	No	No	Annual Mean	No Detailed assessment required
	Monitoring inside AQMAs	No	No	Annual Mean	To revise the AQMA using the current modelling
	Monitoring inside \ outside AQMAs	No	No	Hourly Mean	
PM ₁₀	monitoring outside \inside AQMAs	No	No	Annual Mean	No Detailed assessment required
	Monitoring inside AQMAs	No	No	Daily Mean	
Benzene, SO ₂ ,	Monitoring outside/inside AQMAs	No	No		No Detailed assessment required
	New monitoring inside AQMAs	N/A	N/A		

3 Road Traffic Sources

Each of the 10 Greater Manchester authorities committed to undertaking a detailed air quality review and assessment in relation to road traffic following the last updating and screening assessment in 2009. The dispersion modelling has been delayed due to difficulties in obtaining accurate emissions data, particularly for some point sources and also because new road transport emission factors were due to be published, which are expected to be more representative of the real world.

The last detailed dispersion modelling exercise was carried out in 2002 and used the emissions 2001 emissions inventory as summarised in section 1.5. Since that time there have been significant improvements to the Greater Manchester emissions inventory, including the traffic model changes described above as well as improvements in the collection of point and area source data. Transport for Greater Manchester (formerly the Greater Manchester Transportation Unit) has been commissioned to undertake dispersion modelling for the whole of Greater Manchester. The modelling will cover almost the whole of the conurbation, with the exception of some very limited outlying areas and will use intelligent gridding to ensure there is good coverage around roads and busy junctions.

Transport for Greater Manchester (TfGM) have used their transport model, the results of which have been considered by districts to identify locations which:

- have not been assessed during the earlier rounds,
- have experienced a significant change in traffic flows
- have a new development, or
- have new exposure that has not been assessed previously.

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Air quality is often higher in locations where there is congestion along narrow streets, where there are buildings to reduce dispersion. Council's are asked to identify roads where the daily traffic Annual Average Daily Traffic (AADT) flow is greater than 5,000

vehicles per day and the average speed is less than about 25 kph (15 mph). Where these conditions exist and there are residential properties within 2 metres away from the edge of the kerb, with buildings both side of the road to reduce dispersion, a detailed assessment should be carried out for nitrogen dioxide unless the road has been considered previously.

Transport for Greater Manchester identified any roads with AADT flows greater than 5,000 and average speeds less than 25 kph. In total 1,243 links were found, of which 197 were outside the AQMA. The numbers of links identified in each district are shown in Table 3.1.

Table 3.1 Narrow congested streets outside the AQMA

District	Number of links
Bolton	22
Bury	3
Manchester	32
Oldham	22
Rochdale	1
Salford	10
Stockport	27
Tameside	24
Trafford	27
Wigan	32
Total	200
Note: Some links may lie in more than one district	

The roads are shown on a map in Figure 3.1 at the end of this chapter. Not all the roads identified will have residential properties close to the kerb and buildings either side of the road, which could restrict dispersion. There are a large number of roads that have been identified in the Greater Manchester area that would require a manual review to determine whether all the relevant criteria are met. This is considered an unnecessary step as county-wide dispersion modelling is currently being progressed that will take into account whether the relevant objectives are likely to be met.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

An assessment should be made to identify any new areas where individuals may spend 1-hour or more, for example streets with many shops and streets with outdoor

cafes and bars. This does not include locations where people would only be occupationally exposed as the air quality regulations only apply to non-residential exposure. The assessment only needs to consider nitrogen dioxide.

A busy street is regarded as one where the flow of traffic is greater than 10,000 vehicles per day, where individuals may be exposed within 5 metres of the kerb for 1-hour or more.

Transport for Greater Manchester has identified roads with two-way 2011 AADT flows greater than 10,000 vehicles per day. 4,855 links were found in total, of which 1,135 were outside the AQMA. Many of these links were identified in the 2009 USA, and have been previously assessed. However there may have been changes in traffic flows and other changes in respect to potential exposure such as new shops or increased population since then. Table 3.2 shows the number of identified road links outside the AQMA.

Table 3.2 Roads with two-way 2011 AADT flows greater than 10,000 vpd outside the AQMA

District	Number of links
Bolton	142
Bury	43
Manchester	200
Oldham	93
Rochdale	21
Salford	35
Stockport	199
Tameside	112
Trafford	146
Wigan	178
Total	1169
Note: Some links may lie in more than one district	

The roads are shown on a map in Figure 3.2 at the end of this chapter. It is not expected that many of the roads will have relevant exposure of people close to the road for an hour or more, however there are a large number of roads that have been identified in the Greater Manchester area that would require a manual review to determine whether all the relevant criteria is met. This is considered an unnecessary step as county-wide dispersion modelling is currently being progressed.

The dispersion modelling will be undertaken using ADMS and will identify annual mean NO₂ concentrations. Following this work any busy streets outside the AQMA falling within the 60 µg/m³ annual mean contour line will be looked at to determine whether there is any relevant exposure, and therefore whether any additional work is required.

3.3 Roads with a High Flow of Buses and/or HGVs

There is a possibility that some street locations where traffic flows are not necessarily high (fewer than 20,000 vehicles per day), but there is an usually high proportion (greater than 20%) of buses and/or HGVs. If the flow of HDV vehicles is greater than 2,500 a detailed assessment should be completed. Where these conditions exist, an assessment for both NO₂ and PM₁₀ should be carried out.

Transport for Greater Manchester identified 507 roads with a two-way AADT flow less than 20,000 vpd and an HDV proportion greater than 20 percent. Of these, 27 links have an HDV flow greater than 2,500 vpd. All of these links are within the current AQMA and have been previously assessed. There is therefore no need to carry out any additional work in relation to roads with a high flow or buses and/or HGVs.

Figure 3.3, at the end of this chapter, shows the location of roads in Greater Manchester that meet the relevant criteria. Although these roads have already been assessed previously and there is therefore no need for a detailed assessment, they will be included in the county-wide dispersion modelling exercise.

3.4 Junctions

Concentrations are usually higher close to junctions, due to the combined impact of traffic emissions on two roads and to the higher emissions due to stop start driving. Any new junctions with flows greater than 10,000 vehicles per day where there is relevant exposure within 20 metres of the kerb should be assessed for both nitrogen dioxide and PM₁₀.

Transport for Greater Manchester have identified a total of 62 junctions in Greater Manchester that have flows greater than 10,000 vpd and have not been assessed in previous years. Table 3.3 shows the number of identified junctions in each district.

Table 3.3 Junctions with AADT flows in 2011 greater than 10,000 vpd not previously assessed and outside the AQMA.

District	Number of junctions
Bolton	5
Bury	4
Manchester	6
Oldham	11
Rochdale	2
Salford	5
Stockport	1
Tameside	11
Trafford	11
Wigan	6
Total	62

The locations of the identified junctions are shown in Figure 3.4 at the end of this chapter. All the identified junctions are included in the county-wide dispersion modelling area, therefore DMRB assessments have not been undertaken as the work already underway will identify whether the relevant objectives will be met.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Any new roads constructed or proposed since the last review and assessment should be assessed for nitrogen dioxide and PM10.

There are three new relevant roads in Greater Manchester that have been completed since the last air quality assessment. These are:

- Derby Way Link Road (Bury)
- Gibfield Park Avenue (Atherton, Wigan)
- Broadway Link Road (Coronet Way, Salford)

These roads are shown on Figure 3.5 at the end of this chapter. All the roads are included in the county-wide dispersion modelling exercise, which will identify whether the air quality objectives will be met in these areas. Salford City Council assessed the

Broadway link (Coronet Way) in their 2009 USA and found no new areas of exposure or exceedances of the NO₂ and PM₁₀ objectives.

3.6 Roads with Significantly Changed Traffic Flows

An assessment is required for both nitrogen dioxide and PM₁₀ to identify roads with significantly changed traffic flows. Roads with flows over 10,000 vehicles per day, where there has been an increase in traffic greater than 25% should be assessed.

Transport for Greater Manchester have identified road links with a two-way 2011 AADT flow greater than 10,000 vpd, where there has been an increase in traffic flow between 2008 and 2011 greater than 25%. A total of 365 links have been found, of which 157 are either partly or entirely outside the AQMA. The number of roads in each district are shown in Table 3.4.

Table 3.4 Roads with a two way 2011 AADT greater than 10,000 with an increase in traffic greater than 25%

District	Number of links
Bolton	19 (8)
Bury	31 (18)
Manchester	59 (19)
Oldham	36 (12)
Rochdale	14 (4)
Salford	21 (7)
Stockport	31 (17)
Tameside	59 (31)
Trafford	66 (29)
Wigan	36 (21)
Total	371 (163)
Notes: Some links may lie in more than one district. The number in brackets is the number of links outside the AQMA.	

The roads with significantly changed traffic flows are shown in Figure 3.6 at the end of this chapter. All the identified roads, whether they are inside or outside of the AQMA are included in the county-wide dispersion modelling area. There is therefore no need to carry out DMRB assessments for these roads.

3.7 Bus and Coach Stations

Locations near to bus and/or coach stations that have not previously been considered in earlier air quality reviews should be assessed against the annual mean and the 1-hour NO₂ objectives.

Each district in Greater Manchester has reviewed their area and have not identified any new bus or coach stations.

3.8 Summary

Table 3.5 below presents a summary of each identified road traffic source and any actions.

Table 3.5 Road Traffic Source Summary

Source Type	Local Authority	New or previously not assessed sources identified ?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Narrow congested Streets with Residential Properties Close to the Kerb	All 10 Greater Manchester authorities	Yes	Yes	See Figure 3.1	NO ₂

Source Type	Local Authority	New or previously not assessed sources identified ?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Busy Streets Where People May Spend 1 hour or More Close to Traffic	All 10 Greater Manchester authorities	Yes	Dispersion modelling using ADMS urban is to be carried out to identify annual mean NO ₂ concentrations . Following this work any busy streets outside the AQMA falling within the 60 ug/m ³ annual mean contour line will be looked at to determine whether there is any relevant exposure.	See Figure 3.2	NO ₂ - hourly
Roads with a High Flow of Buses and/or HGVs	All 10 Greater Manchester Authorities	No	No	N/A	N/A
Junctions	All 10 Greater Manchester Authorities	Yes	Yes	See Figure 3.4	NO ₂ - annual average and PM ₁₀ - annual average
New Roads Constructed or Proposed Since the Last Round of Review and Assessment	Bolton, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified ?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Bury, , Wigan	Yes	Yes	See Figure 3.5	NO ₂ – annual average and PM ₁₀ – annual average
Roads with Significantly Changed Traffic Flows	All 10 Greater Manchester authorities	Yes	Yes	See Figure 3.6	NO ₂ – annual mean and hourly
Bus and Coach Stations	All 10 Greater Manchester authorities	No	No	N/A	N/A

N/A: not applicable

Figure 3.1 Roads with two-way flows greater than 5,000 vehicles per day (vpd) and speeds less than 25 kph

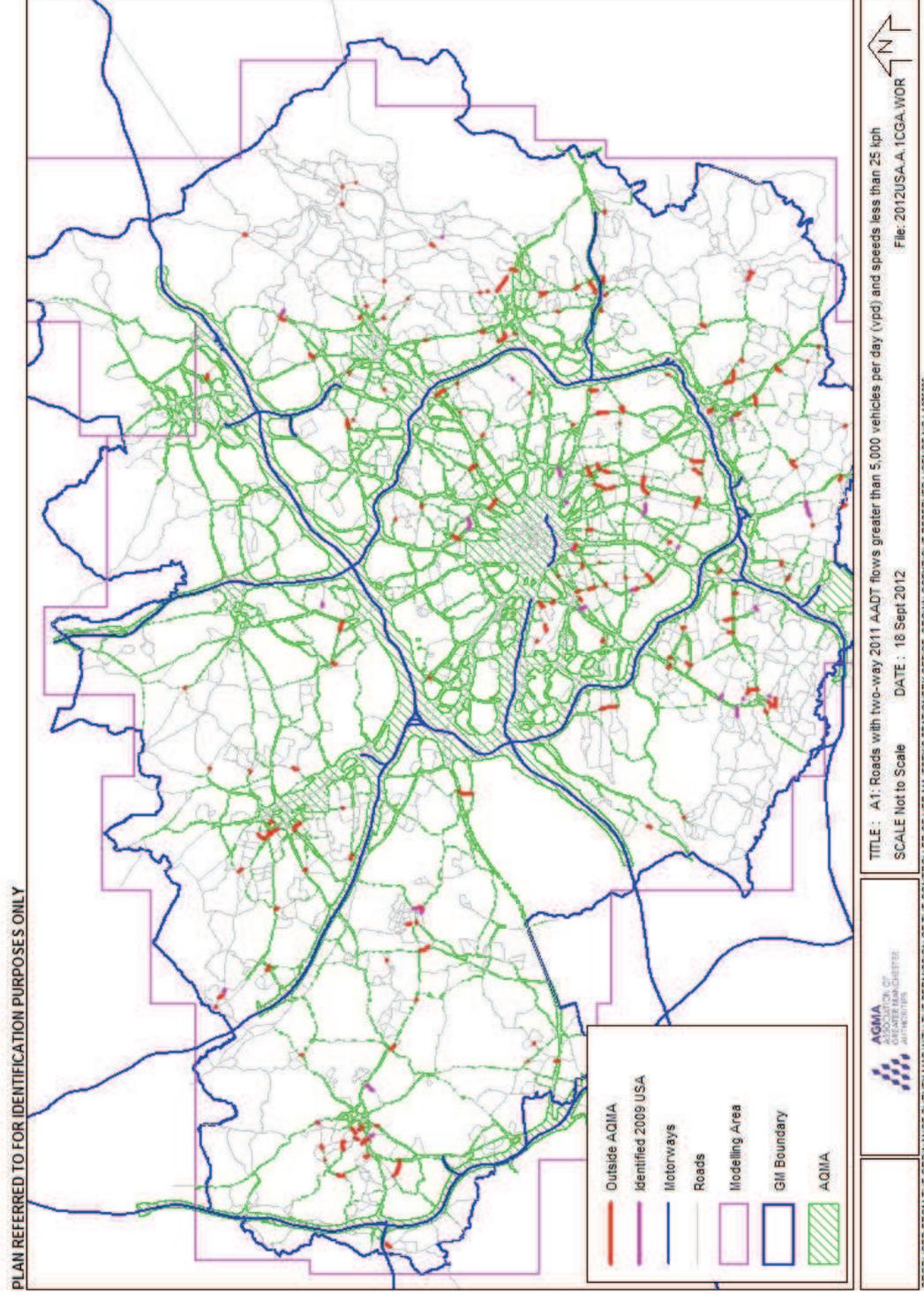


Figure 3.2 Roads with two-way AADT flows of greater than 10,000 vpd

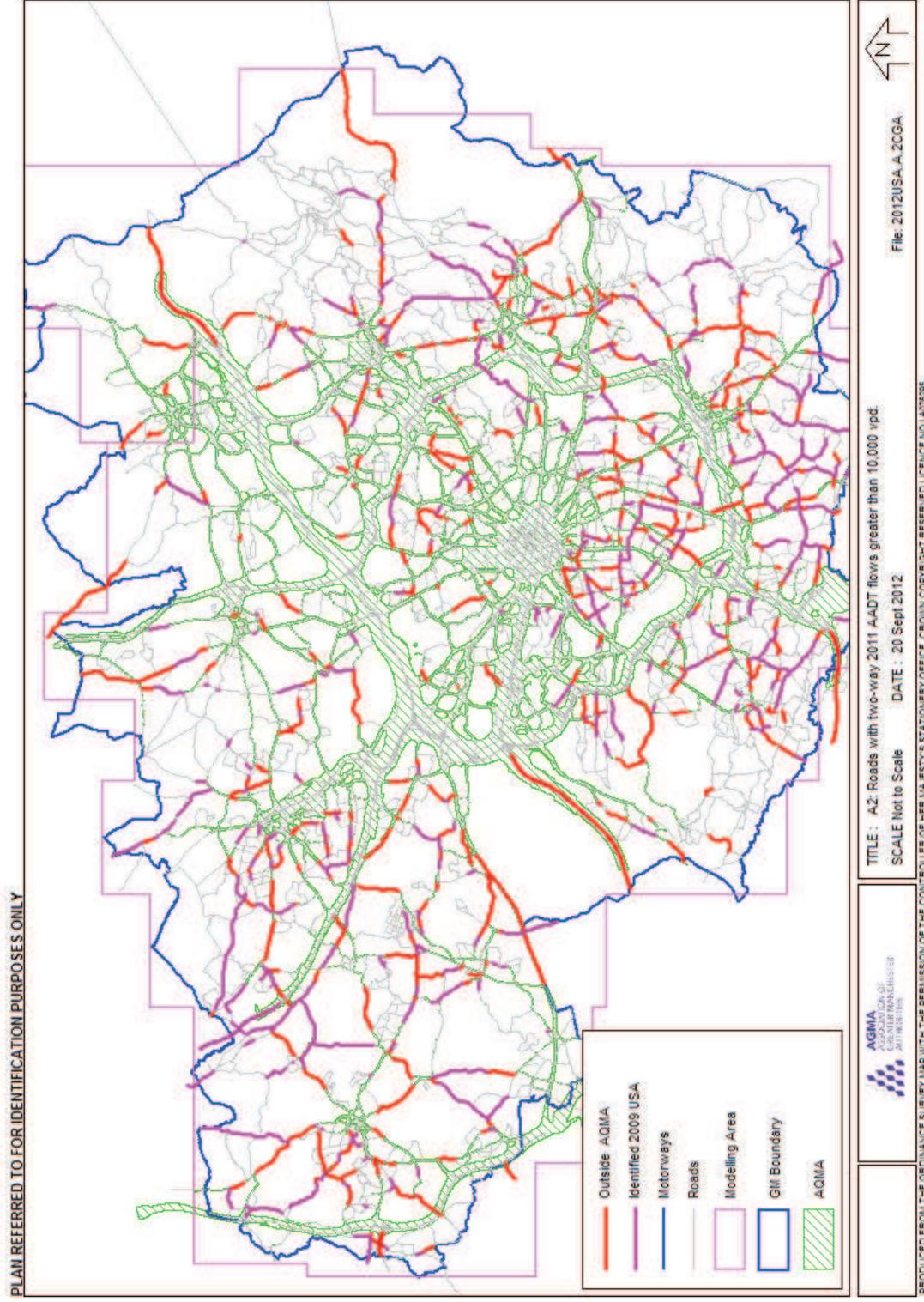


Figure 3.3 Roads with a two-way AADT flow less than 20,000 vpd and a HDV proportion greater than 20%

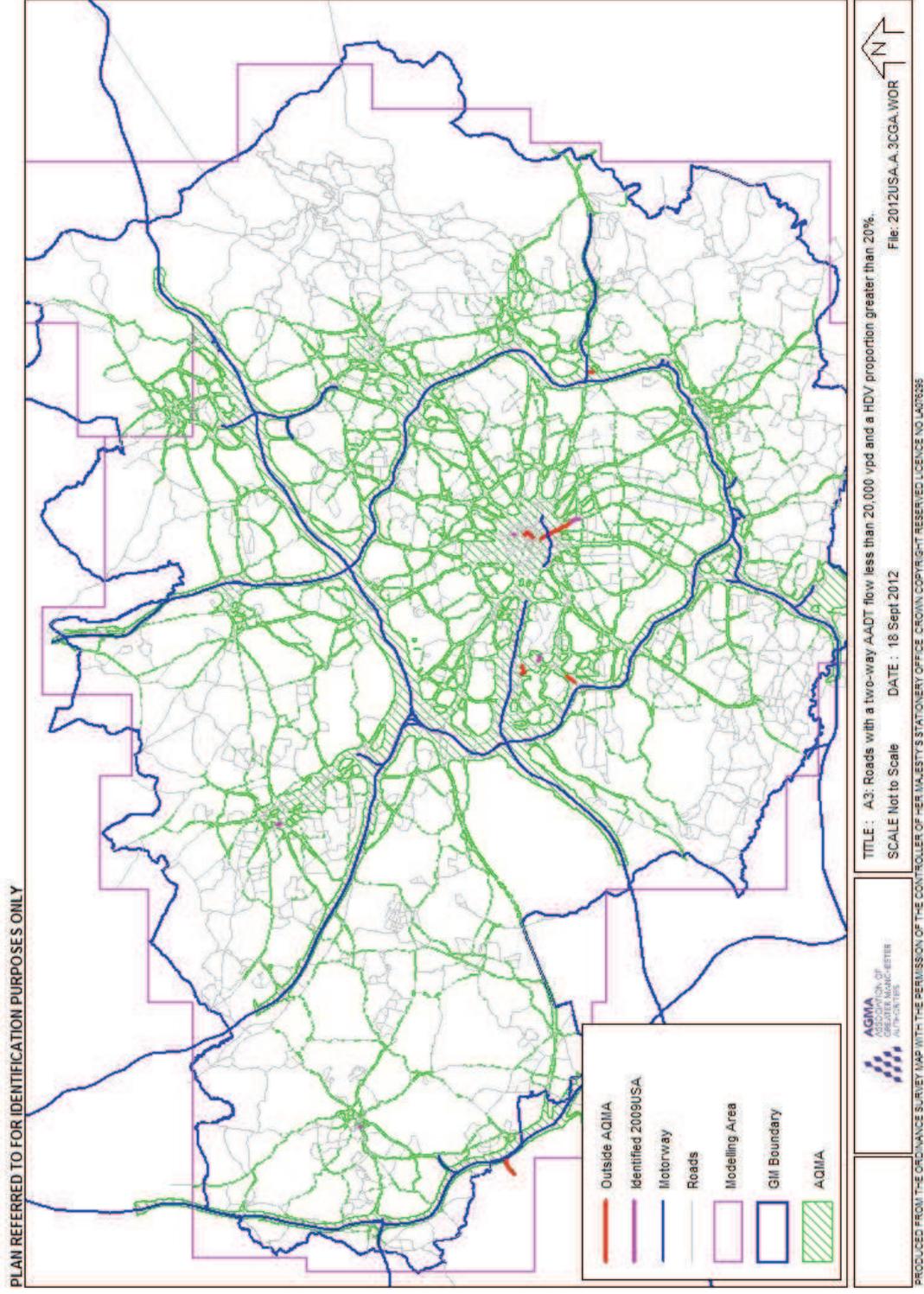


Figure 3.4 Junctions with 2011 AADT flows greater than 10,000 vpd

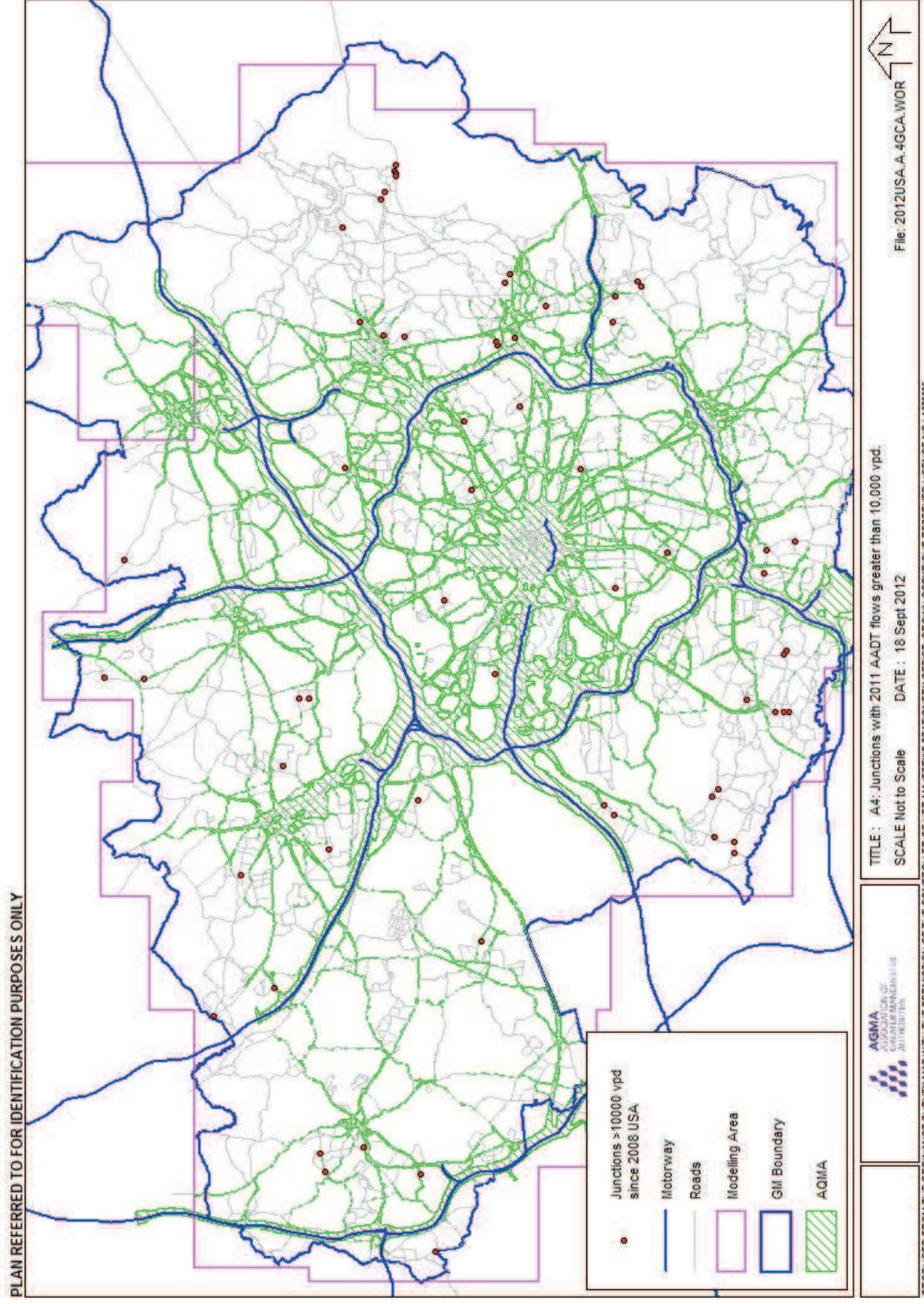


Figure 3.5 New Roads

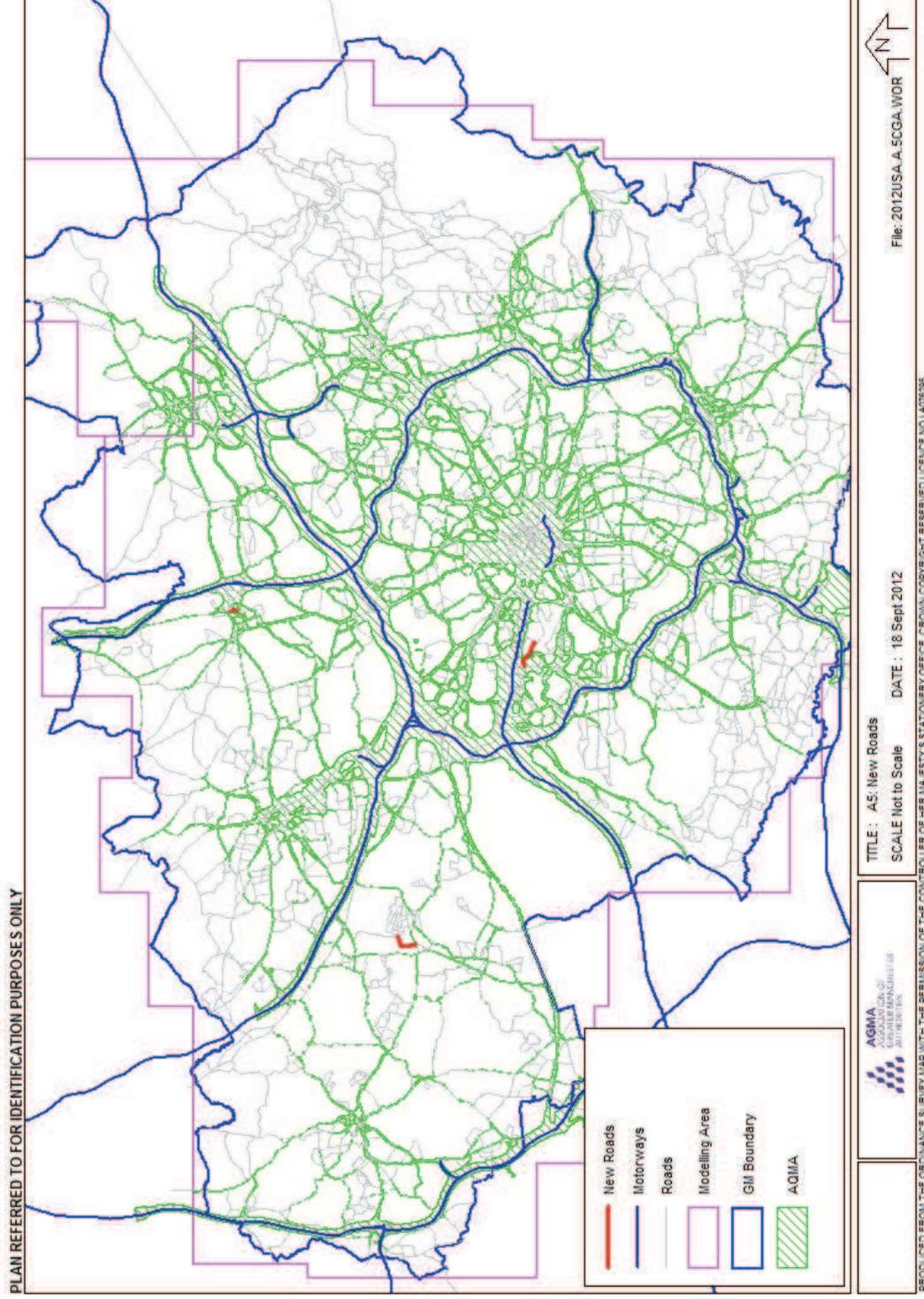
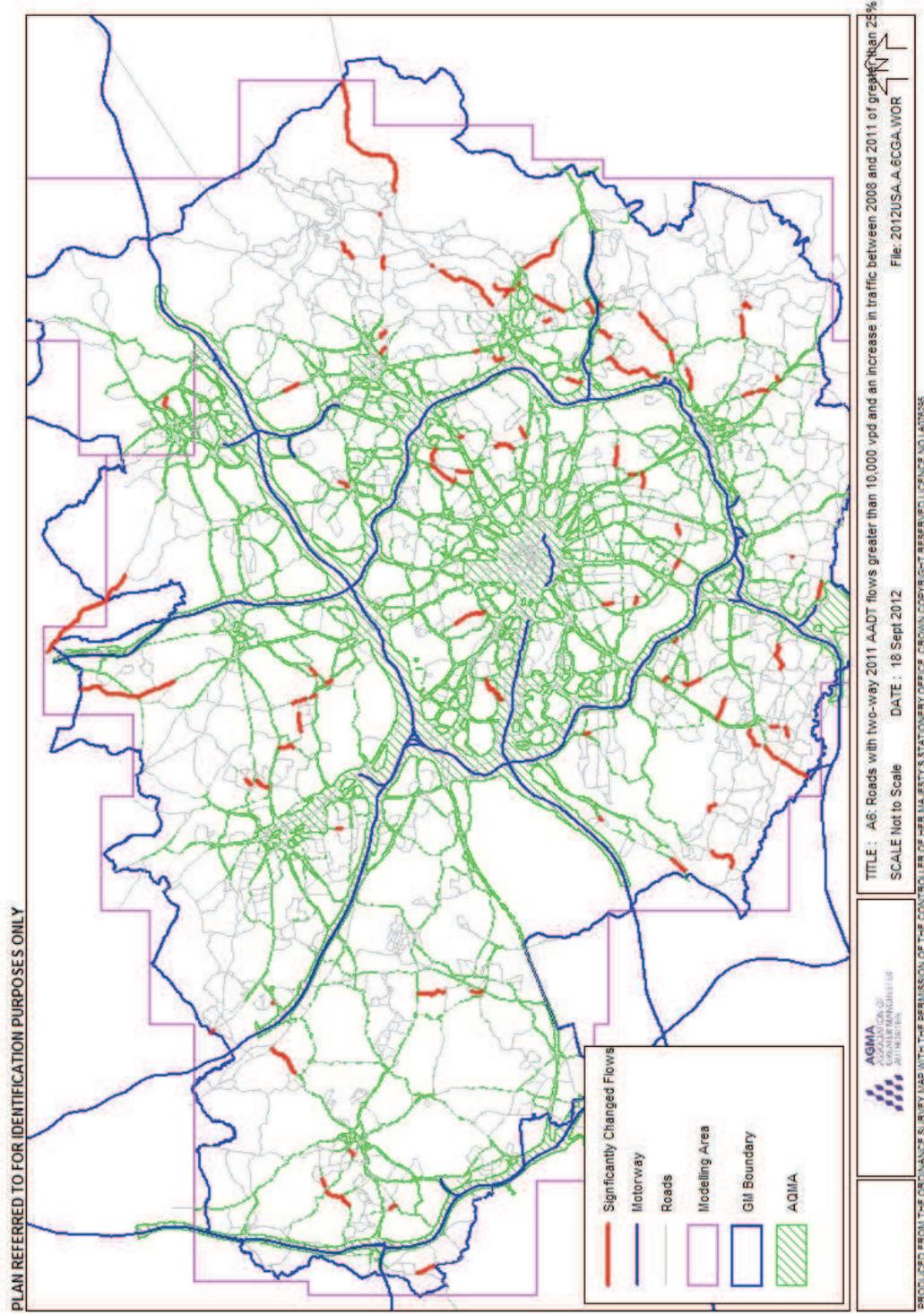


Figure 3.6 Roads with a two way 2011 AADT flows greater than 10,000 vpd and an increase in traffic between 2008 and 2011 greater than 25%



4 Other Transport Sources

4.1 Airports

Aircraft are potentially significant sources of nitrogen oxides (NOX) emissions, especially during takeoff. Airports should be considered in the review and assessment process to determine the likelihood of exceedances of the NO₂ objectives.

Technical Guidance LAQM.TG (09) recommends using the following criteria:

- Relevant exposure within 1000 metres of the airport boundary.
- An equivalent passenger throughput greater than 10 million passengers per annum (mppa).
- An existing background NOX concentration of above 25 ug/m³.

If these criteria are met, it is necessary to proceed to a Detailed Assessment for nitrogen dioxide.

An assessment to identify airports within Greater Manchester has produced the results presented in the following table:

Table 4.1 Airports

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Airport	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms that there are no airports in the regional area that constitute new or previously not assessed sources.

4.2 Railways (Diesel and Steam Trains)

A requirement of the review and assessment process is to consider diesel and steam locomotives, mainly in stations and depots, and also alongside some busy lines that have high numbers of these types of train movements.

4.2.1 Stationary Trains

A Stationary locomotives (both diesel and coal fired), can give rise to high levels of SO₂ close to the point of emission.

Technical Guidance LAQM.TG (09) recommends using the following criteria to determine if it will be necessary to proceed to a Detailed Assessment for SO₂ for certain locations (e.g. signals, goods loops, depots or stations):

- 3 or more occasions per day when there might be a diesel or coal fired locomotive stationary with its engine running for 15 minutes or more; and
- Potential for exposure of individuals for periods of 15-minutes or more within 15 metres of the stationary locomotives. The exposure needs to be 'outdoors' in the general sense of the word.

An assessment to identify stationary trains within Greater Manchester has produced the results presented in the following table:

Table 4.2 Stationary Trains

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Railways – Stationary Trains	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
Wigan	No	No	N/A	N/A	

N/A: Not Applicable

The **Greater Manchester Combined Authority** 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

Recent evidence suggests that moving diesel locomotives in sufficient numbers can give rise to high NO₂ concentrations close to the track, and the emissions can be equivalent to those from a busy road.

Technical Guidance LAQM.TG (09), Table 5.1, lists both the Manchester Piccadilly to Wigan and Manchester to Crewe lines as having a substantial number of diesel passenger trains per day, and recommends using the following criteria to determine if it will be necessary to proceed to a Detailed Assessment for NO₂ for certain locations:

- A background mean NO₂ concentration of greater than 25 ug/m³; and
- Potential for long-term exposure (e.g. residential accommodation) within 30 metres of the edge of the track.

An assessment to identify moving trains within Greater Manchester has produced the results presented in the following table:

Table 4.3 Moving Trains

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Railways – Moving Trains	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** 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)

If there are significant movements of large ships that burn oils with a high sulphur content in a port, then there is a risk of exceedances of the 15-minute sulphur dioxide objective.

An assessment to identify shipping ports within Greater Manchester has produced the results presented in the following table:

Table 4.4 Shipping Ports

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Port	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms that there are no ports or shipping that meet the specified criteria within the regional area.

5 Industrial Sources

Industrial sources in England are controlled by the Environment Agency (EA) and by local authorities under the Pollution Prevention and Control regulations. Local authorities also have controls over 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 to local authorities under the Local Air Quality Management (LAQM) regime. Many of these sources will have been addressed during previous rounds of Review and Assessment. The focus should thus be on new installations and those with significantly changed emissions.

While the number of sources that may be significant is limited, there is a wider range of pollutants to be considered.

For the purpose of this Review and Assessment we will divide industrial sources into four sections:

- Industrial installations;
- Major fuel (petrol) storage depots;
- Petrol stations; and
- Poultry farms.

The latter is a new area for consideration which was introduced as a result of a small number of local authorities identifying potential exceedances of the PM10 objectives associated with emissions from poultry farms (defined as chickens (laying hens and broilers), turkeys, ducks and guinea fowl).

5.1 Industrial Installations

Industrial sources are unlikely to make a significant local contribution to annual mean concentrations, but could be significant in terms of the short-term objectives. The approach to the assessment will depend on whether an assessment has been carried out as part of the planning or permitting process. The assessment should consider all of the regulated pollutants although those most at risk of requiring further work are SO₂, NO₂, PM₁₀ and benzene.

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

A review of industrial processes in Greater Manchester has produced the results presented in the following table:

Table 5.1 New or Proposed Installations

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Industrial (New / Proposed Installations with Air Quality Assessment)	Bury	No	No	N/A	N/A
	Bolton	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No (see below)	No	N/A	N/A
	Stockport	Yes (see below)	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No (see below)	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

Some GM local authorities identified new or previously not assessed sources but none of these sources are likely to release significant quantities of relevant pollutants to air and therefore a Detailed Assessment is not required.

Stockport, Salford and Trafford identified specific sources for which they provided further information which is relevant to this part of the report.

Stockport

Two household waste treatment plants both containing biodigesters have been commissioned in Stockport at Bredbury Parkway. They are both A2 processes. These will take waste from all over Greater Manchester. Air quality assessments were carried out at the time of planning application and in both cases it was not necessary to do detailed assessment, however detail of the processes has been inputted into the modelling currently being carried out by the Greater Manchester authorities.

Salford

There have been no major new industrial processes, granted a permit or planning permission in 2011. The following planning applications / environmental permit consultations remain in progress from previous years, having been assessed and objections raised.

Peel Energy have Barton Biomass while in Trafford MBC is located on the boundary with Salford and with the prevailing wind, Salford is downwind of the plume. The operator has applied for a permit to the Environment Agency application number EPR/SP23HY. A draft permit and decision document is currently being consulted on in Salford and Trafford. Salford will be submitting comments on the decision.

Site Name/ Address	Planning App Number / Permit No *	Fuel	Size	Approval Date
Peel Energy Barton Biomass 20 MW in Trafford	10/59758/ART10 Trafford Planning documents	Wood Waste	20MW	Refused, subject to appeal.
Worsley Eco Park Green Lane Salford	10/59093/OUTEIA	Food Waste	9 MW	Refused, subject to appeal

Trafford

Trafford Council included the following significant industrial sources in their previous Updating and Screening Assessment 2009. These sources have also been considered in the subsequent Progress report submitted to DEFRA. Both processes are in the process of being built.

SAICA Paper Mill in Partington

Trafford Council received a planning application for a Paper Mill in Partington. The application was for a plant producing 400,000 tonnes per annum of high quality, lightweight recycled paper for use in corrugated board manufacture. The application also included a CHP plant capable of generating 37MW of electrical power for use on site and for export to the national grid and a energy recovery boiler utilizing processing residues (with both boilers utilizing heating capacity in the paper process).

An assessment of the air quality impacts associated with the proposed Recycled Paper Mill has been undertaken. The assessment focused on the principal emissions to air, including:

- Dust emissions during the construction and operational phase;
- Odour emissions during the operational phase;
- Air Quality Strategy Pollutants from vehicles; and
- Air Quality Strategy and WID Pollutants from combustion point sources.

The assessment showed that there would not be any exceedances of the air quality objectives at relevant locations. As a result, the planning application was granted for the Paper Mill in Partington in December 2008.

Carrington Power Station

Carrington Power Station has been granted planning permission. Dispersion modelling was undertaken as part of the air quality assessment, which formed part of the EIA submitted in support of the planning application. The air quality assessment indicated that predicted process contributions of NO₂ within the Air Quality Management Areas of Greater Manchester are not considered to cause an unacceptable impact.

Barton Biomass Power Station

Trafford Council refused planning permission for the erection of a 20MW biomass fuelled renewable energy plant on the land to the south of the Manchester Ship

Canal and west of Barton Bridge, Davyhulme. The Council's decision is currently being appealed by the applicant.

The **Greater Manchester Combined Authority** has assessed any new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

The review and assessment process recommends that Local Authorities determine whether any industrial sources identified during previous rounds of review and assessment have either:

- a) experienced substantially increased emissions (greater than 30%); or
- b) received new relevant exposure in their vicinity.

A review of industrial process in Greater Manchester has produced the following table:

Table 5.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required ?	Reason	Description of Area to be assessed	Pollutants and objectives to be assessed
Industrial where Emissions have Increased Substantially or New Relevant Exposure has been	Bury	No	No	N/A	N/A	N/A
	Bolton	No	No	N/A	N/A	N/A
	Manchester	No	No	N/A	N/A	N/A
	Oldham	No	No	N/A	N/A	N/A
	Rochdale	No	No	N/A	N/A	N/A
	Salford	No	No	N/A	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Reason	Description of Area to be assessed	Pollutants and objectives to be assessed
Introduced	Stockport	No	No	N/A	N/A	N/A
	Tameside	No	No	N/A	N/A	N/A
	Trafford	No	No	N/A	N/A	N/A
	Wigan	No	No	N/A	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within their area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

A review of new or significantly changed installations in Greater Manchester with no previous air quality assessment has produced the results presented in the following table:

Table 5.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Industrial (New Installation / Increased Emissions without Air Quality)	Bury	No	No	N/A	N/A
	Bolton	Yes (see below)	No	N/A	N/A
	Manchester	Yes (see below)	No	N/A	N/A
	Oldham	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Assessment)	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	Yes (See below)	No	N/A	N/A

N/A: Not Applicable

Some local authorities identified new or previously not assessed sources but none of these sources are likely to release significant quantities of relevant pollutants to air and therefore a Detailed Assessment is not required.

The **Greater Manchester Combined Authority** has assessed any 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

There is evidence to suggest that major fuel depots could emit benzene which may give rise to a local exceedence of the 2010 UK Air Quality Objective.

An assessment to identify any fuel depots within Greater Manchester has produced the results presented in the following table:

Table 5.4 Fuel Depots

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Major Fuel Storage Depot	Bury	No	No	N/A	N/A
	Bolton	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms there are no major fuel (petrol) storage depots within their areas or new major fuel (petrol) petrol storage depots that have not been considered in previous reports.

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. To ascertain if a detailed Assessment is required local authorities are required to identify petrol stations with:-

- an annual throughput of more than 2000 m³ (2 million litres) of petrol.
- a nearby busy road that has traffic flows of greater than 30,000 vehicles per day.

- relevant exposure within 10 metres of the petrol pumps that have not been covered by previous review and assessments.

An assessment of appropriate petrol stations in Greater Manchester has produced the results presented in the following table:

Table 5.5 Petrol Stations

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Petrol Stations	Bury	No	No	N/A	N/a
	Bolton	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	Yes (see below)	No	N/A	N/A

N/A: Not Applicable

Wigan

Two new petrol stations have opened since 2009 and have been issued with Environmental Permits.

The **Greater Manchester Combined Authority** confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

A small number of local authorities have identified potential exceedances of the PM10 objectives associated with emissions from poultry farms.

Technical Guidance LAQM.TG (09) recommends using the following criteria to determine if it will be necessary to proceed to a Detailed Assessment for PM10 for certain locations:

- Farms housing in excess of:
 - a) 400,000 birds if mechanically ventilated; or
 - b) 200,000 birds if naturally ventilated; or
 - c) 100,000 birds for any turkey unit; and
- Relevant exposure within 100 metres of the poultry units.
- Farms not covered by previous review and assessments

An assessment of poultry farms in Greater Manchester has produced the results presented in the following table:

Table 5.6 Poultry farms

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Poultry Farms	Bury	No	No	N/A	N/a
	Bolton	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Trafford	No	No	N/A	N/A
	Wigan	Yes (see below)	No	N/A	N/A

N/A: Not Applicable

Wigan

New poultry farms have opened since 2009 but are relatively small scale and have not required Environmental Permits.

The **Greater Manchester Combined Authority** confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Biomass combustion is increasing across the Greater Manchester conurbation however this is from a very low base and many of the installations are in public buildings often providing only part of the heating load. It is normal practice in Greater Manchester that chimney height approval is sought and air quality issues are considered at that time, hence there is no need for further detailed assessment.

Tables 6.1 to 6.3 below set out the findings for Commercial and Domestic sources in Greater Manchester against the air quality objectives.

Table 6.1 Biomass Combustion - Individual

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Biomass Combustion (Individual)	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	NA
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

While there has been an increase in the use of Biomass across the whole of the Greater Manchester conurbation, this is from a very low base and at the present time there is not an issue with regards the combined effects of such appliances as they tend to be in separate locations. Work undertaken by Manchester City Council (district with highest concentration of commercial buildings) for previous assessments indicates that is unlikely to exceed the threshold emission density set out the monograph in Figure 5.22 of TG(09). Furthermore the Emissions Inventory for Greater Manchester (EMIGMA) records all points sources over 2 MW, aggregating emissions to a 1 km by 1 km grid and along with other emissions data is used in GMEDIS (the Greater Manchester Emission Dispersion model). It is therefore highly unlikely that accidents from biomass combustion are likely to occur.

Table 6.2 Biomass Combustion - Combined

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Biomass Combustion (Combined)	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** has assessed the biomass combustion plant within its area, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

The use of solid fuels for domestic heating declined significantly with the introduction of the Clean Air Act in the 1950's, alternative fuels such as gas and electricity are now most commonly used. Almost all of Greater Manchester is now covered by smoke control areas, the only exceptions being some sparsely populated areas in the moorlands and rural areas on the periphery of the conurbation.

While there has been an increase in the use of solid fuel across the whole of the conurbation over recent times, due to the increasing popularity of 'real fires' in the majority of properties this is as a secondary source of heating, the increase is from a very low base and is more prevalent in the semi rural areas with less dense housing. Previous assessments have concluded that there is not an issue.

Table 6.3 Domestic Solid Fuel Burning

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Domestic Solid Fuel Burning	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

The **Greater Manchester Combined Authority** confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Dust emissions from a range of fugitive and uncontrolled sources can result in elevated PM10 concentrations. Such sources may include quarrying and mineral extraction, landfill sites, major construction works and waste management sites.

One potential fugitive dust source has been identified within the area. The source was assessed in accordance with the screening criteria detailed in LAQM.TG(09), Box 5.10, the results of which are presented in Table 7.1.

Table 7.1 Potential Fugitive Dust Sources

Local Authority	Source Location (grid ref)	Source Type	Relevant Exposure	Recent Complaints	Dust Emissions/dust tracked out of site onto public roads	Detailed Assessment Needed
Bolton	Armstrongs (364055, 410718)	Waste	yes	yes	yes	yes

Results of the screening exercise indicate potential for relevant exposure at the residential properties near to the source of the dust emissions. Additionally there have been recent dust complaints and there is evidence of dust tracked out onto the roads.

This process is no longer exempted from the requirement to have a permit under Environmental Permitting (England and Wales) Regulations 2010. The Environment Agency is currently processing the application to consolidate this activity into an environmental permit. The Environment Agency have carried out monitoring in the past and the need for future monitoring will be considered as part the permit conditions therefore a detailed assessment is not needed at this time.

Table 7.2 below presents Greater Manchester local authorities with no potential fugitive dust emissions.

Table 7.2 No Potential Fugitive Dust Emissions

Local Authority	Statement
Bury	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.
Manchester	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Oldham	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Rochdale	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Stockport	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Salford	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Tameside	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Trafford	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Wigan	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area

The **Greater Manchester Combined Authority** 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

There are nearly 300 nitrogen dioxide diffusion tubes sites in the Greater Manchester diffusion tube network that have been operating over a long period of time. Approximately 25% of tubes marked as being inside the AQMA are less than 35 $\mu\text{g}/\text{m}^3$, (the threshold for the AQMA). Around 5% of tubes greater than or equal to 35 $\mu\text{g}/\text{m}^3$ are located outside the AQMA.

Nitrogen dioxide measurements from the automatic stations broadly agree with their respective AQMA designation. Stockport and Oldham (now closed) stations are in the AQMA but had results less than 35 $\mu\text{g}/\text{m}^3$.

Diffusion tube data suggests that the current AQMA requires reviewing and Greater Manchester is undertaking dispersion modelling.

Particulate matter (less than 10 microns) annual averages are not exceeded and have a downward trend. No sites had more than 35 occurrences of the daily mean and therefore the air quality objective was met.

8.2 Conclusions from Assessment of Sources

Automatic assessment of roads by TfGM identified a large number potential links requiring assessment by DMRB. Many of these would have been previously assessed and eliminated in earlier reports, identifying these links is difficult and as dispersion modelling was in progress, deferred until then. Detailed dispersion modelling of Greater Manchester will provide information on concentrations of nitrogen dioxide and particulate matter at roadside locations for assessment against the air quality objectives.

There are no new or significantly changed sources that could lead to potential exceedences have been identified within Greater Manchester for Chapter 4: Other transport sources, Chapter 5: Industrial Sources, Chapter 6: Commercial and Industrial Sources, and Chapter7: Fugitive Sources. A detailed assessment for these is not required.

8.3 Proposed Actions

Greater Manchester will complete the air quality modelling to assess for exceedences nitrogen dioxide against the annual average and hourly air quality objectives. A Detailed Assessment will be submitted in April 2014.

9 References

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Appendix 1: Monitoring Data

Table	Defra Table No	Title
Table A1.1	Table 2.2	Details of Non Automatic Monitoring Sites
Table A1.2	Table 2.5	Table A1.2 Results of Nitrogen Dioxide Diffusion Tubes in 2011 (Table 2.5)
Table A1.3	Table 2.6	Table A1.3 2007- 2011 Diffusion Tube Results. (Table 2.6.)
Table A1.4		Data Capture Summary (in months) count of tubes vs number of months exposed for 2011.

Abbreviations

UB: Urban Background

Rs: Roadside

Ks: Kerbside

UC: Urban Centre

Su: Suburban

Ru: Rural

Appendix 1 Monitoring Data

Table A1.1 Details of Non Automatic Monitoring Sites. (Table 2.2)

Local Authority	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Bolton	48 Ainsworth Road, Little Lever	UB	375397	407457	NO ₂	Y	N			
Bolton	49 Council area office little lever	UB	375420	407386	NO ₂	N	N			
Bolton	50 Council area office little lever	UB	375420	407386	NO ₂	N	N			
Bolton	51 Council area office little lever	UB	375412	407365	NO ₂	N	N			
Bolton	52 Front 3 Turton Rd Bromley X	Rs	373251	411970	NO ₂	Y	N	N		
Bolton	53 Rear 3 Turton Rd Bromley X	UB	373236	411968	NO ₂	Y	N			
Bolton	54 20 Laburnam Pk Bromley X	UB	372908	412120	NO ₂	N	N			
Bolton	43 Beehive PH Chorley New Rd, Horwich	Rs	365501	409887	NO ₂	Y	N	N		
Bolton	44 1007 Chorley New Rd, Horwich	UB	365599	409845	NO ₂	Y	N			
Bolton	45 1007Chorley New Rd, Horwich	UB	365599	409845	NO ₂	Y	N			
Bolton	46 5 Crowborough Close Horwich	UB	365694	410166	NO ₂	N	N			
Bolton	40 Bolton Rd/Manchester Rd, W/H	Rs	366341	406571	NO ₂	Y	N	N		

Bolton	41 White Horse Tavern Bolton Rd W/H	UB	366286	406561	NO ₂	N	N	N	
Bolton	3 Quintins 329 Derby St	Rs	370763	407929	NO ₂	Y	N	Y	
Bolton	60 134 Buckley Lane	Ks	373287	405061	NO ₂	Y	N		
Bolton	61 Primrose St	Rs	374450	405207	NO ₂	Y	N	Y	
Bolton	62 72/74 Hr Market St	UC	374194	405460	NO ₂	Y	N	Y	
Bolton	63 2 Fern St	UB	374282	406257	NO ₂	Y	N		
Bolton	64 Bolton Gate	Rs	371965	409907	NO ₂	Y	N		
Bolton	65 2 Phoenix St	UB	372059	409877	NO ₂	Y	N		
Bolton	66 505 Blackburn Rd	Ks	371442	411599	NO ₂	Y	N	Y	
Bolton	67 3 the Welland	UB	365163	405640	NO ₂	N	N		
Bolton	68 24 Winslow rd	UB	367672	406910	NO ₂	Y	N		
Bolton	4 Manley Terrace	UB	371394	411718	NO ₂	Y	N		
Bolton	8 Le Mans Crescent	UC	371537	409091	NO ₂	Y	N	Y	
Bolton	10 63 Bankfield St	UB	370374	408178	NO ₂	N	N		
Bolton	11 Allotments Lever Park Ave Horwich	UB	363730	412388	NO ₂	N	N		
Bolton	14 Town Hall, Market St	Rs	373864	406117	NO ₂	Y	N		
Bolton	15 Astley Bridge Clinic, Moss Bank Way	Rs	371435	411690	NO ₂	Y	N	N	
Bolton	16 Drummond St, Astley Bridge	UB	371304	411748	NO ₂	N	N		
Bolton	18 Astley Bridge				NO ₂		N		

Bury	Bolton.	UB	384375	404917	NO ₂	Y	N	Y(6m)	3m	N
Bury	BU1 Baguley Crescent	UB	384375	404917	NO ₂	Y	N	Y(6m)	3m	N
Bury	BU3a Bury Roadside (AURN)	Rs	380907	404754	NO ₂	Y	Y	N (98m)	30m	Y
Bury	BU3b Bury Roadside (AURN)	Rs	380907	404754	NO ₂	Y	Y	N (98m)	30m	Y
Bury	BU3c Bury Roadside (AURN)	Rs	380907	404754	NO ₂	Y	Y	N (98m)	30m	Y
Bury	BU4 10 Hardmans Rd Whitefield	UB	380974	404839	NO ₂	Y	N	Y(0m)	32m (from M60 slip road)	N
Bury	BU5 Radcliffe New Rd. Whitefield	Ks	380236	406427	NO ₂	Y	N	Y(10m)	1m	N
Bury	BU6 5 Bolton RdBury	Rs	379659	410881	NO ₂	Y	N	Y(0m)	0.5m	N
Bury	BU7Energy Show HouseWillow St Bury	UB	381887	411223	NO ₂	Y	N	Y(0m)	8m	N
Bury	BU8Walmersley RdBury	Ks	380756	412695	NO ₂	Y	N	Y(6m)	0m	N
MCC	Burnage Community Centre	UB	386780	392651	NO ₂	N	N	Y (4m) for NO ₂ objectives	37m (Burnage Lane)	N/A
MCC	Styal	Su	384200	382958	NO ₂	N	N	N (75m)	80m (Styal Rd)	N/A
MCC	St Pauls School	UB	381384	387484	NO ₂	N	N	Y (10m) for NO ₂ objectives	2m (Firbank Road)	N/A
MCC	Manchester Town Hall	UB	383860	398025	NO ₂	Y	N	N (45m)	35m (Mount St)	N/A
MCC	M56	Rs	381650	387520	NO ₂	Y	N	N (78m)	2m (M56 hard shoulder)	Y
MCC	Newton Street	Ks	384601	398303	NO ₂	Y	N	Y (1m) for hourly objective	1m (Newton St)	Y
MCC	Clayton Day Nursery	UB	387656	399016	NO ₂	N	N	Y (9m) for NO ₂ objectives	7m (Pioneer St)	N/A
MCC	Cheetham Hill Road	Ks	383948	401515	NO ₂	Y	N	Y (1m)	1m (Cheetham Hill Rd)	Y
MCC	Oldham Road	Ks	386459	400090	NO ₂	Y	N	N (103m)	1m (Oldham Rd)	N

MCC	Princess Street	Ks	383954	398060	NO2	Y	N	Y (18m) for NO2 objectives	1m (Princes St)	Y
MCC	Chethams School	UC	383971	398876	NO2	Y	N	Y (5m) for NO2 objectives	59m (Station Approach)	N
MCC	Ashton Old Road	Ks	387951	397430	NO2	Y	N	Y (22m) for NO2 objectives	1m (Ashton Old Rd)	Y
MCC	Oxford Street	Ks	384117	397505	NO2	Y	N	Y (2m) for NO2 objectives	1m (Oxford St)	Y
MCC	Rochdale Road	Ks	385205	399750	NO2	Y	N	Y (7m) for NO2 objectives	1m (Rochdale Rd)	N
MCC	Princess Road	Rs	382829	391493	NO2	Y	N	Y (10m) for annual and hourly objectives	3m (Princess Rd)	Y
MCC	Liverpool Road	UC	383218	397770	NO2	Y	N	Y (12m) for NO2 objectives	1m (Liverpool Rd)	N
MCC	Great Ancoats Street	Rs	385161	398290	NO2	Y	N	Y (10m) for hourly NO2 objective	2m (Great Ancoats St)	Y
MCC	Lockton Close	UB	384761	397384	NO2	Y	N	Y (7m) for NO2 objectives	46m (Mancunian Way)	N/A
MCC	Hyde Road	Rs	388601	396048	NO2	Y	N	Y (1m) for hourly NO2 objective	2m (Hyde Road)	Y
MCC	Kingsway	Rs	385399	390093	NO2	Y	N	Y (7m) for NO2 objectives	6m (Kingsway)	N
MCC	Stockport Road	Ks	387363	394617	NO2	Y	N	Y (1m) for hourly objective	1m (Stockport Rd)	Y
MCC	Clayton Lane	UB	387724	397967	NO2	Y	N	N (90m)	1m (Clayton Lane)	N/A
MCC	Hewitt Street	UC	383602	397488	NO2	Y	N	Y (2m) for NO2 objectives	8m to edge of Piccadilly to Wigan railway line track	Y

MCC	Rostron Avenue	UB	386289	396828	NO2	Y	N	Y (7.5m) for NO2 objectives	23m to edge of Piccadilly to Crewe (via Stockport) railway line track	Y
MCC	Victoria Terrace	UB	386875	395861	NO2	N	N	Y (3m) for NO2 objectives	5m to edge of Piccadilly to Crewe (via Stockport) railway line track	N
MCC	Alma Road	Rs	387358	393990	NO2	N	N	Y (3m) for NO2 objectives	7m to edge of Piccadilly to Crewe (via Stockport) railway line track	N
MCC	Peaceville Road	UB	386589	394083	NO2	N	N	Y (10m) for NO2 objectives	18m to edge of Piccadilly to Crewe (via airport) railway line track	N
MCC	Piccadilly Gardens	UC	384310	398337	NO2	Y	Y	Y (5m) for hourly objective	56m (Piccadilly)	N
MCC	Manchester South	Su	383904	385818	NO2	N	Y	N (102m)	64m (Styal Rd)	N/A
MCC	Manchester Oxford Road	Ks	384233	397287	NO2	Y	Y	Y (1m) for short term objectives	0.5m (Oxford Road)	Yes
Oldham	OL3 Mumps roundabout, Oldham	Ks	393326	405146	NO ₂	Y	N (250m to nearest exposure)	0.5m	Y	
Oldham	OL5Terrace Street Oldham	UB	393792	405166	NO ₂	Y	Y (20m to nearest exposure)	100m to nearest major road	N	
Oldham	OL7Kershaw Street, Shaw	Rs	393766	409052	NO ₂	N	Y (5 m to nearest exposure)	4m to nearest major road	Y	

Oldham	OL9Mumps roundabout, Oldham	Ks	393326	405146	NO ₂	Y	N (250m to nearest exposure)	0.5m	Y	
Oldham	OL10Terrace, Oldham	UB	393792	405116	NO ₂	Y	Y (20m to nearest exposure)	100m (to nearest major road)	N	
Oldham	OL11Mellor Street, Falsworth	UB	388958	401182	NO ₂	Y	Y (15m)	60m to nearest major road	N	
Oldham	OL12Bluecoats School, Egerton Street, Oldham	UB	392902	405410	NO ₂	N	Y (40m)	225m to nearest major road	N	
Oldham	OL13Yorkshire Street, Oldham	Rs	392973	405073	NO ₂	Y	Y (50m)	2m	N	
Oldham	OL14Middleton Road, Chadderton	Ks	390795	405378	NO ₂	Y	Y (1-hour objective)	1.5m	Y	
Oldham	OL15Market Street, Shaw	Ks	393915	408997	NO ₂	N	N (8 m – 1 hr objective)	1.5m	Y	
Oldham	OL16West End Street, Oldham	UB	391860	405513	NO ₂	Y	Y (20m to nearest exposure)	30m to nearest major road	N	
Oldham	OL17Norfolk Street, Oldham	UB	391224	403857	NO ₂	Y	Y (2m)	40m to nearest major road	N	
Oldham	OL18Oldham Road, Uppermill	Rs	399510	405382	NO ₂	N	Y (5m)	3m	Y	
Oldham	OL19High Street, Uppermill	Rs	399597	405525	NO ₂	N	Y (20 m – 1 hr objective, 40 m annual mean)	2m	Y	
Rochdale	Mere Lane Rochdale	UB	389740	412501	NO ₂	N	N			
Rochdale	Mere Lane Rochdale	UB	389740	412501	NO ₂	N	N			
Rochdale	Trows Lane Caslleton	Rs	388527	409942	NO ₂	Y	N			

Rochdale	Trows Lane Casiteton	Rs	388527	409942	NO2	Y	N		
Rochdale	52 Cherrington Drive Casiteton	Rs	388581	409797	NO2	Y	N		
Rochdale	52 Cherrington Drive Casiteton	Rs	388581	409797	NO2	Y	N		
Rochdale	Middleton Library	UC	387083	406258	NO2	Y	N		
Rochdale	Middleton Library	UC	387083	406258	NO2	Y	N		
Rochdale	Mossway Middleton	Rs	386447	404167	NO2	Y	N		
Rochdale	Mossway Middleton	Rs	386447	404167	NO2	Y	N		
Rochdale	Heywood Old Rd Birch	Rs	385412	408306	NO2	Y	N		
Rochdale	Heywood Old Rd Birch	Rs	385412	408306	NO2	Y	N		
Rochdale	Edinburgh Way Rochdale	UC	388628	411950	NO2	Y	N		
Rochdale	Edinburgh Way Rochdale	UC	388628	411950	NO2	Y	N		
Rochdale	Manchester Old Rd Rochdale	Rs	388914	412083	NO2	Y	N		
Rochdale	Manchester Old Rd Rochdale	Rs	388914	412083	NO2	Y	N		
Rochdale	Manchester Rd Rochdale	Rs	389055	412217	NO2	Y	N		
Rochdale	Manchester Rd Rochdale	Rs	389055	412217	NO2	Y	N		
Rochdale	Holmes Street Rochdale	UB	388789	413573	NO2	Y	N		
Rochdale	Holmes Street Rochdale	UB	388789	413573	NO2	Y	N		
Rochdale	Whitworth Road Rochdale	Rs	389954	413797	NO2	Y	N		
Rochdale	Whitworth Road Rochdale	Rs	389954	413797	NO2	Y	N		
Rochdale	Halifax Road Wardle	Rs	392061	415678	NO2	Y	N		
Rochdale	Halifax Road Wardle	Rs	392061	415678	NO2	Y	N		
Rochdale	725 Halifax Road	UB	392061	415679	NO2	N	N		

Salford	SA25 16 Wyn Gdns	Rs	381297	398032	NO2	Y		Y(44)	44	By M602 /Trafford Rd
Salford	SA26 A580 Elect sub stn	Rs	380719	399599	NO2	Y		Y(18)	15	East Lancs Road
Salford	SA27 Trinity Way	Rs	383076	398738	NO2	Y		Y(18)	16	Inner City Relief Route
Salford	SA28 Harroby, Swinton	Rs	377289	401009	NO2	Y		Y(27)	27	Worsley Rd / A580
Salford	SA31 Walkden Road	Rs	374025	401905	NO2	Y		Y(5)	4	Walkden Rd / A580
Salford	SA32/40/41 Edenfield Drive	Rs	374712	399829	NO2	Y		Y(13)	22	By M60 Jt 13 anticlockwise
Salford	SA33 Armfield Drive, Boothstown	Rs	372597	400728	NO2	Y		Y(7.4)	11	By Leigh Road
Salford	SA34 673 Liverpool Road	Rs	375367	397799	NO2	Y		Y(9/45)	8.2	By M60 Jt 11
Salford	SA35 50 Trevor Road	Rs	376043	399295	NO2	Y		Y(30)	30	By M602
Salford	SA36 2 Pembroke St	Rs	380401	398442	NO2	Y		Y(15)	14	By M602
Salford	SA37 61 Maurice Drive	Rs	380800	399633	NO2	Y		Y(28)	28	By A580
Salford	SA38 Clifton Primary School	Rs	377782	403097	NO2	Y		Y(28/4)	28	Manchester Rd
Salford	SA39 Trinity Way /Chapel Street	Rs	383040	398563	NO2	Y		Y(8)	8	Junction Trinity Way/ Chapel Street
Salford	SA42 44 Edenfield	Rs	374698	399848	NO2	Y		Y()	18	As SA32
Salford	SA17 Langley Road	Ks	380775	400837	NO2	Y		Y(3)	2	
Salford	SA43 4 Nathan Drive	UB	383104	398804	NO2	Y		Y()	18	(4)
Salford	SA44 Pembroke (No2)	Rs	380412.1	398439.4	NO2	Y		Y(60)???	52	By M62 west bound
Salford	SA45 Rail No1 (strawberry)	UB	381542	399378	NO2	Y		Y	20	Man-Wigan Rail line
Salford	SA46 Rail No 2 Longfield Crt	UB	376451	402318	NO2	Y		Y	24	Man-Wigan Rail line

Stockport	Whitehill Firestation	UB	389077	392012	NO ₂	Y	N	N	N/A	
Stockport	HealdGreen Health Cen.	UB	384889	385846	NO ₂	N	N	N	N/A	
Stockport	Denby Lane	UB	388558	391852	NO ₂	Y	N	Y(8m)	39m	
Stockport	Compstall Library	Ru	396468	390801	NO ₂	N	N	N	N/A	
Stockport	Lyme Farm	Ru	396873	382687	NO ₂	N	N	Y(8m)	N/A	
Stockport	Cheadle Library	UB	385953	388534	NO ₂	N	N	N	N/A	
Stockport	Civicentre Hazel Grove	Rs	392062	386970	NO ₂	Y	N	Y(3m)	1m	Y
Stockport	Marshalls Yard Hazel Grove	UB	392017	387043	NO ₂	Y	N	N	N/A	
Stockport	Alderley Close Hazel Grove	UB	392743	385680	NO ₂	N	N	Y(1m)	N/A	
Stockport	Deneside Cres. Hazel Grove	UB	392781	387272	NO ₂	N	N	Y(2m)	N/A	
Stockport	Norwood Road	Rs	391082	387938	NO ₂	Y	N	Y(3m)	3m	Y
Stockport	A34 Kingsway	Rs	385028	388278	NO ₂	Y	N	Y(2m)	3m	Y
Stockport	Prospect Vale	UB	394679	386365	NO ₂	N	N	Y(2m)	N/A	
Stockport	Upton Ave.	UB	387362	385910	NO ₂	N	N	Y(4m)		
Stockport	Bramhall Lane	Rs	389887	388958	NO ₂	Y	N	Y(4m)	2m	Y
Stockport	Stockport Rd. Bredbury	Rs	391563	391223	NO ₂	Y	N	Y(2m)	3m	
Stockport	Yew Street	UB	388471	390093	NO ₂	Y	N	N		
Stockport	Debenhams	UC	389260	390407	NO ₂	Y	N	N	3m	Y
Stockport	Gorton Road	Rs	389481	393470	NO ₂	Y	N	Y(2m)	3m	Y
Stockport	Kennilworth Road	UB	386481	389530	NO ₂	Y	N	Y(3m)	N/A	

Stockport	Carmichael Street	UB	3885599	389412	NO2	N	N	Y(3m)	N/a	
Stockport	A6 Hazel Grove	Rs	391480	387633	NO2	Y	Y	Y(5m)	5m	Y
Stockport	A6 Hazel Grove	Rs	391480	387633	NO2	Y	Y	Y(5m)	5m	Y
Stockport	A6 Hazel Grove	Rs	391480	387633	NO2	Y	Y	Y(5m)	5m	Y
Stockport	Central Marple	Rs	395767	388653	NO2	N	N	N	3m	
Stockport	Midland Road	UB	389405	387339	NO2	N	N	Y(2m)	N/A	
Stockport	Pinewood Close	UB	387099	391385	NO2	N	N	Y(1m)	N/A	
Stockport	Finney Lane	Rs	385702	386226	NO2	Y	N	Y(2m)	3m	
Stockport	Russell Street	UB	390085	388547	NO2	N	N	Y(1m)	N/A	
Tameside MBC	King Street Dukinfield	Rs	394050	397190	NO ₂	Yes	N	Yes	2m	Yes
Tameside MBC	Hyde Town Hall Hyde	UB	394770	394930	NO ₂	No	N	Yes	2m	
Tameside MBC	Thompson Road Denton	UB	391000	395130	NO ₂	Yes	N	Yes	2m	
Tameside MBC	Penny Meadow Ashton	Rs	394200	399260	NO ₂	Yes	N	Yes	2m	Yes
Tameside MBC	Green Lane Hollingworth	UB	400510	396520	NO ₂	No	N	Yes	2m	
Tameside MBC	Two Trees School Denton	UB	393440	394330	NO ₂	No	N	Yes		
Tameside MBC	Guide Lane Audenshaw	Rs	392520	396760	NO ₂	Yes	N	Yes	1m	Yes
Tameside MBC	Market Street Hollingworth	Rs	400410	396060	NO ₂	Yes	N	Yes	2m	Yes
Tameside MBC	Manchester Road Ashton	Rs	392590	398430	NO ₂	Yes	N	Yes	2m	Yes
Tameside MBC	Park Parade Ashton	Rs	393710	398790	NO ₂	Yes	N	Yes		Yes
Tameside MBC	Stamford Street Stalybridge	Rs	395410	398730	NO ₂	Yes	N	Yes		Yes

Tameside MBC	Manchester Road Audenshaw	Rs	391470	397930	NO ₂	Yes	N	Yes	2m	Yes
Tameside MBC	Manchester Road Droylsden	Rs	389400	398220	NO ₂	Yes	N	Yes	2m	Yes
Tameside MBC	Manchester Road Denton	Rs	392120	395510	NO ₂	Yes	N	Yes	2m	Yes
Tameside MBC	Manchester Road Crown Point	Rs	392490	395500	NO ₂	Yes	N	2m	Yes	
Tameside MBC	B&Q Hyde	Rs	394540	395110	NO ₂	Yes	N	2m		
Tameside MBC	Woolley Lane Hollingworth	Rs	400400	395980	NO ₂	Yes	N	Yes		
Tameside MBC	Dean Street Ashton	UB	393250	399160	NO ₂	No	N	Yes		
Tameside MBC	Cavendish Mill Ashton	UB	393620	398590	NO ₂	No	N	N/A		
Tameside MBC	Manchester Road Denton (Golf Course)	Rs	390490	395630	NO ₂	Yes	N	2m	Yes	
Tameside MBC	Oldham Road Ashton	Rs	393060	401060	NO ₂	Yes	N	2m	Yes	
Tameside MBC	Lees Road Ashton	Rs	394940	395630	NO ₂	no	N	2m	Yes	
Tameside MBC	Acres Lane Stalybridge	Rs	396520	398310	NO ₂	Yes	N	2m	Yes	
Tameside MBC	George Lawton Hall Mossley	Rs	397040	402440	NO ₂	No	N	2m		
Tameside MBC	Keane Street Ashton	Su	393370	399493	NO ₂	No	N	N/A		
Tameside MBC	Oldham Road Ashton	Rs	393380	399810	NO ₂	Yes	N	2m	Yes	
Tameside MBC	Waterton Lane Mossley	Su	396900	402450	NO ₂	No	N	2m		
Tameside MBC	Arundel Street Mossley	Rs	396982	402437	NO ₂	No	N	2m	Yes	
Tameside MBC	Lees Road Mossley	Rs	397010	402560	NO ₂	No	N	2m	Yes	
Tameside MBC	Stockport Road Mossley	Rs	397090	402620	NO ₂	No	N	2m	Yes	

Tameside MBC	Stamford Road Mossley	Rs	397080	402540	NO ₂	No	N	2m	Yes	
Tameside MBC	Argyle Street Mossley	Su	397060	402390	NO ₂	No	N	2m		
Tameside MBC	Stamford Street Mossley	Rs	397720	402050	NO ₂	No	N	2m	Yes	
Trafford	1 Dunham Sewage Works	Ru	372680	387541	NO ₂	N		N	N/A	N
Trafford	2 Altrincham General Hospital	UC	376650	387831	NO ₂	N		Y (0m)	5m	N
Trafford	3 Sale Leisure Centre	UC	379119	392033	NO ₂	N		Y (10m)	5m	N
Trafford	4 Trafford, Town Hall 12 (m)	UB	380904	395817	NO ₂	N		Y (20m)	100m	N
Trafford	5 A56 White City	UC	381221	396441	NO ₂	Y		N	5m	N
Trafford	6 A56 Junction, Edge Lane	UC	379699	394452	NO ₂	Y		Y (10m)	7m	N
Trafford	7 A56 Junction, M60	UC	379083	393283	NO ₂	Y		N	0m	N
Trafford	8 M60 Junction Parkway	UC	377447	395749	NO ₂	Y		Y (0m)	23m	N
Trafford	9 Stockport Road, Timperley	UB	379073	389099	NO ₂	Y		Y (0m)	12m	N
Trafford	10 A56 Marsland Road	Rs	378004	391466	NO ₂	Y		Y (5m)	5m	N
Trafford	19w Moss Park School (AQMA)	UB	378780	394687	NO ₂	N		Y (65m)	100m	N
Trafford	20w A56 Chester Road AQMA	Rs	379418	394009	NO ₂	Y		Y (42m)	5m	N
Trafford	21w Cleansing Depot	Rs	379619	396371	NO ₂	N		N	5m	N
Trafford	22w A56 corner of De Quincey Road	Ks	377061	390086	NO ₂	Y		Y	0m	Y
Wigan	Ashwood Avenue 2, Ashton (M6)	RS	357045	398774	NO ₂	Y		Yes	24	No
Wigan	Shevington Moor, Standish	RS	354199	410631	NO ₂	Y		Yes	23	Yes
Wigan	Linden Court, Orrell	RS	353271	404657	NO ₂	Y		Yes	20	Yes

Wigan	Orrell Road 3, Orrell (M6)	RS	354114	404803	NO ₂	Y		Yes	7	No
Wigan	Parkside Crescent, Orrell (M6)	RS	353827	404570	NO ₂	Y		Yes	13	No
Wigan	Twist Lane, Leigh	RS	364956	400208	NO ₂	Y		Yes	6	No
Wigan	Old Hall Drive 2, Ashton (M6)	RS	357198	398588	NO ₂	Y		No	33	Yes
Wigan	Queens Arms Hotel, Astley (A580 Junction)	RS	371452	400960	NO ₂	Y		Yes	3	No
Wigan	Warrington Road, Hawley, Wigan	RS	356857	402846	NO ₂	Y		Yes	9	No
Wigan	Dobson Parkway, Ince	RS	360233	405170	NO ₂	N		Yes	10	No
Wigan	Leigh Road, Hindley Green	RS	364029	402961	NO ₂	N		Yes	5	No
Wigan	Atherton Road, Hindley+C89	RS	361702	404113	NO ₂	N		Yes	5	No
Wigan	Wigan Road, Atherton	RS	366880	403254	NO ₂	Y		Yes	7	Yes
Wigan	Atherton Road, Hindley	RS	362290	403878	NO ₂	N		Yes	4	No
Wigan	Manchester Road, Tyldesley 3	RS	369528	402023	NO ₂	Y		Yes	4	No
Wigan	East Lincs. Road, Astley 1 (A580)	RS	370622	400574	NO ₂	Y		No	5	Yes
Wigan	Lower Green Lane, Astley	RU	370173	398600	NO ₂	N		Yes	N/A	No
Wigan	Fletcher Street, Atherton	RS	367357	403206	NO ₂	Y		Yes	5	No
Wigan	Car Street, Platt Bridge	KS	360438	402556	NO ₂	Y		Yes	5	No
Wigan	Fire Station, Newtown	RS	356973	405147	NO ₂	Y		No	9	No
Wigan	Atherton Road, Hindley	RS	361834	404089	NO ₂	Y		Yes	3	Yes
Wigan	Wigan Town Hall 2, Wigan	RS	358342	405539	NO ₂	Y		Yes	8	Yes
Wigan	Walthew Lane, Platt	RS	360291	402963	NO ₂	Y		Yes	5	Yes

Wigan	Scholes Church Lane, Lowton (A580)	RS	362137	396947	NO ₂	Y		Yes	3	Yes
Wigan	New Miles Lane, Shevington (M6)	RS	353896	408519	NO ₂	Y		Yes	30	Yes
Wigan	East Lancs. Road, Astley 2 (A580)	RS	370613	400583	NO ₂	Y		Yes	17	Yes
Wigan	Orrell Road 3, Orrell (M6 Junction)	RS	353931	404899	NO ₂	Y		No	2	Yes
Wigan	Standish Centre 2, Standish	RS	356228	411014	NO ₂	Y		Yes	3	No
Wigan	Pottery Road, Wigan	RS	357742	405208	NO ₂	Y		Yes	4	Yes
Wigan	Poolstock 1, Wigan	RS	357624	404201	NO ₂	Y		Yes	5	No
Wigan	Poolstock 2, Wigan	RS	357373	403744	NO ₂	Y		Yes	6	No
Wigan	Ormskirk Road, Pemberton	RS	355103	404558	NO ₂	Y		Yes	6	No
Wigan	Atherton Road, Hindley Green	RS	364025	403079	NO ₂	Y		Yes	3	Yes
Wigan	Orrell Road 2, Orrell (M6)	RS	354411	404728	NO ₂	Y		Yes	4	No
Wigan	Newtown, Wigan	RS	356930	404984	NO ₂	Y		Yes	6	No
Wigan	Cross Street, Hindley	RS	356228	410104	NO ₂	Y		Yes	5	No
Wigan	Liverpool Road, Hindley	RS	361517	404242	NO ₂	Y		Yes	5	No
Wigan	Leigh Road, Howe Bridge	RS	366347	402353	NO ₂	Y		Yes	5	No
Wigan	Warrington Road Newtown	RS	356820	404663	NO ₂	Y		Yes	5	No
Wigan	Westleigh Lane, Leigh	RS	365221	401688	NO ₂	N		Yes	5	No
Wigan	Scot Lane, Wigan	RS	356257	405960	NO ₂	Y		Yes	5	No
Wigan	Bickershaw Lane, Bickershaw	RS	362329	402037	NO ₂	N		Yes	6	No
Wigan	Tydesley Road, Tydesley	RS	368244	402562	NO ₂	Y		Yes	5	No
Wigan	Beech Hill Avenue,	RS	356322	407002	NO ₂	Y		Yes	9	No

Table A1.2 Results of Nitrogen Dioxide Diffusion Tubes in 2011 (Table 2.5)

LA	Site id	Site Name	In AQMA?	Triplicate or co located tube	Data Capture 2011 (No. Months or %)	Data less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual Mean Concentration (Bias Adjustment factor = 0.883, Wigan)2011(m/m3)	Site Type Code	XY
Bolton	48	Ainsworth Road, Little Lever	Y	N	11	N	N	33	UB	X:375397 Y:407457
Bolton	49	Council area office little lever	N	N	11	N	N	24	UB	X:375420 Y:407386
Bolton	50	Council area office little lever	N	N	11	N	N	24	UB	X:375420 Y:407386
Bolton	51	Council area office little lever	N	N	9	N	N	22	UB	X:375412 Y:407365
Bolton	52	Front 3 Turton Rd Bromley X	Y	N	11	N	N	43	Rs	X:373251 Y:411970
Bolton	53	Rear 3 Turton Rd Bromley X	Y	N	12	N	N	22	UB	X:373236 Y:411968
Bolton	54	20 Laburnam Pk Bromley X	N	N	12	N	N	19	UB	X:372908 Y:412120
Bolton	43	Beehive PH Chorley New Rd, Horwich	Y	N	12	N	N	42	Rs	X:365501 Y:409887
Bolton	44	1007 Chorley New Rd, Horwich	Y	N	12	N	N	32	UB	X:365599 Y:409845
Bolton	45	1007Chorley New Rd, Horwich	Y	N	12	N	N	32	UB	X:365599 Y:409845

Bolton	46	5 Crowborough Close Horwich	N	N	12	N	N	N	19	UB	X:365694 Y:410166
Bolton	40	Bolton Rd/Manchester Rd, W/H	Y	N	10	N	N	N	39	Rs	X:366341 Y:406571
Bolton	41	White Horse Tavern Bolton Rd W/H	N	N	6	N	N	N	39	UB	X:366286 Y:406561
Bolton	3	Quintins 329 Derby St	Y	N	12	N	N	N	45	Rs	X:370763 Y:407929
Bolton	60	134 Buckley Lane	Y	N	12	N	N	N	38	Ks	X:373287 Y:405061
Bolton	61	Primrose St kearsley	Y	N	11	N	N	N	44	Rs	X:374450 Y:405207
Bolton	62	72/74 Hr Market St	Y	N	6	N	N	N	46	UC	X:374194 Y:405460
Bolton	63	2 Fern St	Y	N	12	N	N	N	28	UB	X:374282 Y:406257
Bolton	64	Bolton Gate	Y	N	12	N	N	N	36	Rs	X:371965 Y:409907
Bolton	65	2 Phoenix StBolton	Y	N	12	N	N	N	35	UB	X:372059 Y:409877
Bolton	66	505 Blackburn Rd	Y	N	12	N	N	N	49	Ks	X:371442 Y:411599
Bolton	67	3 the Welland	N	N	12	N	N	N	26	UB	X:365163 Y:405640
Bolton	68	24 Winslow rd	Y	N	9	N	N	N	38	UB	X:367672 Y:406910
Bolton	4	Manley Terrace	Y	N	12	N	N	N	33	UB	X:371394 Y:411718
Bolton	8	Le Mans Crescent	Y	N	11	N	N	N	42	UC	X:371537 Y:409091
Bolton	10	63 Bankfield St	N	N	10	N	N	N	19	UB	X:370374 Y:408178
Bolton	11	Allotments Lever Park Ave Horwich	N	N	12	N	N	N	25	UB	X:363730 Y:412388
Bolton	14	Town Hall, Market St Fwth	Y	N	12	N	N	N	28	Rs	X:373864 Y:406117

Bolton	15	Astley Bridge Clinic, Moss Bank Way	Y	N	12	N	N	45	0	X:371435 Y:411690
Bolton	16	Drummond St, Astley Bridge	N	N	12	N	N	24	UB	X:371304 Y:411748
Bolton	18	Astley Bridge Bolton.		N	12	N	N	27	0	X: Y:
Bury	BU1	Baguley CrescentNr to A576 & 5 M60	Y	N	12	N	N	40	UB	X:384375 Y:404917
Bury	BU3a	Bury Roadside J17 M60 (AURN)	Y	Y	12	N	N	65	Rs	X:380907 Y:404754
Bury	BU3b	Bury RoadsideJ17 M60(AURN)	Y	Y	12	N	N	63	Rs	X:380907 Y:404754
Bury	BU3c	Bury RoadsideJ17 M60(AURN)	Y	Y	12	N	N	63	Rs	X:380907 Y:404754
Bury	BU4	Hardmans Road Whitefield(32m from East Bound M60 slip road)	Y	N	12	N	N	43	UB	X:380974 Y:404839
Bury	BU5	Radcliffe New Rd A665	Y	N	11	N	N	37	Ks	X:380236 Y:406427
Bury	BU6	Bolton RdBury BridgeA58	Y	N	11	N	N	39	Rs	X:379659 Y:410881
Bury	BU7	Energy Show HouseWillow St BuryResidential Area	Y	N	9	N	N	31	UB	X:381887 Y:411223
Bury	BU8	Walmersley RdBury A56Residential Area	Y	N	12	N	N	34	Ks	X:380756 Y:412695
MCC	3A	Burnage	N	N	12	N/A	N	23	UB	X:386780 Y:392651
MCC	5A	Styal	N	N	12	N/A	N	17	Sb	X:384200 Y:382958
MCC	8A	St Pauls School	N	N	12	N/A	N	32	UB	X:381384 Y:387484
MCC	12	Town Hall	Y	N	12	N/A	N	37	UB	X:383860 Y:398025
MCC	13	M56	Y	N	12	N/A	N	55	Rs	X:381650 Y:387520

MCC	9A/B	Newton Street	Y	N	12	N/A	N	58	Ks	X:384601 Y:398303
MCC	14	Clayton Day Nursery	N	N	12	N/A	N	26	UB	X:387656 Y:399016
MCC	22	Cheetham Hill Road	Y	N	11	N/A	N	46	Ks	X:383948 Y:401515
MCC	23	Oldham Road	Y	N	11	N/A	N	41	Ks	X:386459 Y:400090
MCC	24	Princess Street	Y	N	11	N/A	N	53	Ks	X:383954 Y:398060
MCC	26A/B	Chethams School	Y	N	11	N/A	N	37	UC	X:383971 Y:398876
MCC	28	Ashton Old Road	Y	N	12	N/A	N	41	Ks	X:387951 Y:397430
MCC	29A/B	Oxford Street	Y	N	12	N/A	N	66	Ks	X:384117 Y:397505
MCC	36	Rochdale Road	Y	N	12	N/A	N	43	Ks	X:385205 Y:399750
MCC	37	Princess Road	Y	N	11	N/A	N	45	Rs	X:382829 Y:391493
MCC	70	Liverpool Road	Y	N	11	N/A	N	45	UC	X:383218 Y:397770
MCC	71	Great Ancoats Street	Y	N	12	N/A	N	53	Rs	X:385161 Y:398290
MCC	72	Lockton Close	Y	N	11	N/A	N	41	UB	X:384761 Y:397384
MCC	73	Hyde Road	Y	N	12	N/A	N	42	Rs	X:388601 Y:396048
MCC	74	Kingsway	Y	N	12	N/A	N	40	Rs	X:385399 Y:390093
MCC	75	Stockport Road	Y	N	12	N/A	N	52	Ks	X:387363 Y:394617
MCC	76	Clayton Lane	Y	N	12	N/A	N	36	UB	X:387724 Y:397967
MCC	77	Hewitt Street	Y	N	12	N/A	N	42	UC	X:383602 Y:397488

MCC	78	Rostron Avenue	Y	N	12	N/A	N	37	UB	X:386289 Y:396828
MCC	79	Victoria Terrace	N	N	12	N/A	N	34	UB	X:386875 Y:395861
MCC	80	Alma Road	N	N	12	N/A	N	35	Rs	X:387358 Y:393990
MCC	81	Peaceville Road	N	N	12	N/A	N	28	UB	X:386589 Y:394083
MCC	59	Piccadilly Gardens	Y	Y	12	N/A	N	43	UC	X:384310 Y:398337
MCC	60	Piccadilly Gardens	Y	Y	12	N/A	N	43	UC	X:384310 Y:398337
MCC	61	Piccadilly Gardens	Y	Y	9	N/A	N	41	UC	X:384310 Y:398337
MCC	62	Manchester South	N	Y	12	N/A	N	27	Sb	X:383904 Y:385818
MCC	63	Manchester South	N	Y	12	N/A	N	27	Sb	X:383904 Y:385818
MCC	64	Manchester South	N	Y	12	N/A	N	27	Sb	X:383904 Y:385818
MCC	82	Manchester Oxford Road	Y	Y	12	N/A	N	70	Ks	X:384233 Y:397287
MCC	83	Manchester Oxford Road	Y	Y	12	N/A	N	69	Ks	X:384233 Y:397287
MCC	84	Manchester Oxford Road	Y	Y	12	N/A	N	66	Ks	X:384233 Y:397287
Oldham	OL10	Terrace St	N	N	10	N	N	26	UB	X:393792 Y:405116
Oldham	OL11	Mellor St	Y	N	9	N	N	29	UB	X:388958 Y:401182
Oldham	OL12	Edgerton St	N	N	6	N	N	36	UB	X:392902 Y:405410
Oldham	OL14	Middleton Rd	Y	N	10	N	N	30	Ks	X:390795 Y:405378
Oldham	OL16	West End House	Y	N	1	N	N		UB	X:391860 Y:405513

Oldham	OL17	Norfolk St	Y	N	9	N	N	25	UB	X:391224 Y:403857
Oldham	OL18	Oldham Rd, Uppermill	N	N	10	N	N	33	Rs	X:399510 Y:405382
Oldham	OL19	High St Uppermill	N	N	9	N	N	28	Ks	X:399597 Y:405525
Oldham	OL7	Terrace St (W)		N	12	N	N	39	UB	X:393766 Y:409052
Oldham	OL5	Kershaw St (W)	N	N	12	N	N	45	Rs	X:393792 Y:405166
Rochdale	1A	Mere Lane Rochdale	N	Y	10	N	N	23	UB	X:389740 Y:412501
Rochdale	1B	Mere Lane Rochdale	N	Y	10	N	N	28	UB	X:389740 Y:412501
Rochdale	2A	Trows Lane Caslleton	Y	Y	11	N	N	47	Rs	X:388527 Y:409942
Rochdale	2B	Trows Lane Caslleton	Y	Y	12	N	N	44	Rs	X:388527 Y:409942
Rochdale	3A	52 Cherrington Dr Caslleton	Y	Y	9	N	N	27	Rs	X:388581 Y:409797
Rochdale	3B	52 Cherrington Dr Caslleton	Y	Y	11	N	N	28	Rs	X:387083 Y:406258
Rochdale	4A	Middleton Library	Y	Y	11	N	N	35	UC	X:387083 Y:406258
Rochdale	4B	Middleton Library	Y	Y	12	N	N	36	UC	X:387083 Y:406258
Rochdale	5A	Mossway Middleton	Y	Y	12	N	N	28	Rs	X:386447 Y:404167
Rochdale	5B	Mossway Middleton	Y	Y	12	N	N	28	Rs	X:386447 Y:404167
Rochdale	6A	Heywood Old Rd Birch	Y	Y	12	N	N	50	Rs	X:385412 Y:408306
Rochdale	6B	Heywood Old Rd Birch	Y	Y	12	N	N	50	Rs	X:385412 Y:408306
Rochdale	7A	Edinburgh Way Rochdale	Y	Y	11	N	N	40	UC	X:388628 Y:411950

Rochdale	7B	Edinburgh Way Rochdale	Y	Y	11		N	39	UC	X:388628 Y:411950
Rochdale	8A	Manchester Old Rd Rochdale	Y	Y	11		N	50	Rs	X:388914 Y:412083
Rochdale	8B	Manchester Old Rd Rochdale	Y	Y	11		N	49	Rs	X:388914 Y:412083
Rochdale	9A	Manchester Rd Rochdale	Y	Y	11		N	58	Rs	X:389055 Y:412217
Rochdale	9B	Manchester Rd Rochdale	Y	Y	11		N	54	Rs	X:389055 Y:412217
Rochdale	10A	Holmes Street Rochdale	N	Y	12		N	21	UB	X:388789 Y:413573
Rochdale	10B	Holmes Street Rochdale	N	Y	11		N	22	UB	X:388789 Y:413573
Rochdale	11A	Whitworth Rd Rochdale	Y	Y	11		N	52	Rs	X:389954 Y:413797
Rochdale	11B	Whitworth Rd Rochdale	Y	Y	12		N	51	Rs	X:389954 Y:413797
Rochdale	12A	Halifax Rd Wardle	Y	Y	11		N	46	Rs	X:392061 Y:415678
Rochdale	12B	Halifax Rd Wardle	Y	Y	11		N	46	Rs	X:392061 Y:415678
Rochdale	13A	725 Halifax Rd Wardle	Y	Y	12		N	23	UB	X:392061 Y:415679
Rochdale	13B	725 Halifax Rd Wardle	Y	Y	12		N	23	UB	X:392061 Y:415679
Rochdale	14A	Hey Bottom Littleborough	N	Y	11		N	16	Ru	X:393666 Y:417812
Rochdale	14B	Hey Bottom Littleborough	N	Y	12		N	16	Ru	X:393666 Y:417812
Rochdale	15A	M62 Depot Milnrow	Y	Y	12		N	36	Rs	X:392963 Y:411889
Rochdale	15B	M62 Depot Milnrow	Y	Y	12		N	37	Rs	X:392963 Y:411889
Rochdale	16A	Ashfield Lane Milnrow	Y	Y	11		N	32	UB	X:392531 Y:411700

Rochdale	16B	Ashfield Lane Milnrow	Y	Y	12		N	33	UB	X:392531 Y:411700
Rochdale	17A	Kingsway Rochdale	Y	Y	12		N	28	UB	X:391106 Y:412288
Rochdale	17B	Kingsway Rochdale	Y	Y	12		N	29	UB	X:391106 Y:412288
Salford	SA1	Irlam Locks	Y		12			22	UB	X:372766 Y:394105
Salford	SA2b	Irlam Police Rear (Princess Nursery)	N		11		N	25	UB	X:372201 Y:394205
Salford	SA4	Crompton	Y		10		N	29	Rs	X:377452 Y:401829
Salford	SA9	St Marks	Y		10		N	28	UB	X:374733 Y:400935
Salford	SA23	Aurn Eccles	Y	T	12		N	32	UB	X:377925 Y:398729
Salford	SA24	Aurn Eccles	Y	T	12		N	32	UB	X:377925 Y:398729
Salford	SA29	Aurn Eccles	Y	T	12		N	32	Rs	X:377925 Y:398729
Salford	SA20	M60 St Marks	Y	T	11		N	59	Rs	X:374810 Y:400856
Salford	SA21	M60 St Marks	Y	T	11		N	57	Rs	X:374810 Y:400856
Salford	SA22	M60 St Marks	Y	T	11		N	56	Rs	X:374810 Y:400856
Salford	SA14	Broughton Lib	Y		11		N	39	Ks	X:382851 Y:400987
Salford	SA16	Wharton School	Y		7	Y	N		UB	X:371154 Y:404456
Salford	SA13	Buckland Road	Y		11		N	27	UB	X:379613 Y:399783
Salford	SA25	16 Wynn Gdns	Y		10		N	29	Rs	X:381297 Y:398032
Salford	SA26	A580 Elect sub stn	Y		12		N	38	Rs	X:380719 Y:399599

Salford	SA27	Trinity Way	Y	12	N	37	Rs	X:383076 Y:398738
Salford	SA28	Harroby, Swinton	Y	12	N	37	Rs	X:377289 Y:401009
Salford	SA31	Walkden Road	Y	11	N	32	Rs	X:374025 Y:401905
Salford	SA32	Edenfield lab	Y	12	N	45	Rs	X:374712 Y:399829
Salford	SA40	Edenfield lab	Y	12	N	46	Rs	X:374712 Y:399829
Salford	SA41	Edenfield lab	Y	12	N	44	Rs	X:374712 Y:399829
Salford	SA33	Arnfield Drive, Boothstown	Y	12	N	33	Rs	X:372597 Y:400728
Salford	SA34	673 Liverpool Road	Y	12	N	52	Rs	X:375367 Y:397799
Salford	SA35	50 Trevor Road	Y	12	N	37	Rs	X:376043 Y:399295
Salford	SA37	61 Maurice Drive	Y	11	N	32	Rs	X:380800 Y:399633
Salford	SA38	Clifton Primary School	Y	11	N	32	Rs	X:377782 Y:403097
Salford	SA39	Trinity Way /Chapel Street	Y	12	N	41	Rs	X:383040 Y:398563
Salford	SA42	44 Edenfield	Y	12	N	47	Rs	X:374698 Y:399848
Salford	SA17	Langley Road	Y	12	N	38	Rs	X:380775 Y:400837
Salford	SA44	SA44 Pembroke (No2)	Y	11	N	44	Rs	X: Y:
Salford	SA45	Rail No1 (strawberry)	Y	12	N	30	UB	X:381542 Y:399378
Salford	SA46	Rail No 2 Longfield Crt of Longview Dr	Y	12	N	28	UB	X:376451 Y:402318
Stockport	SK 1	Whitehill Fire Station	N	10	N	25	UB	X:389077 Y:392012

Stockport	SK 2	Heald Green Health Cent.	N		12		N	25	UB	X:384889 Y:385846
Stockport	SK 3	Denby Lane	Y		12		N	30	UB	X:388558 Y:391852
Stockport	SK 4	Compstall Library	N		12		N	15	Ru	X:396468 Y:390801
Stockport	SK 5	Lyme Farm	N		12		N	10	Ru	X:396873 Y:382687
Stockport	SK 6	Cheadle Library	N		12		N	22	UB	X:385953 Y:388534
Stockport	SK 7	Civic Cent. Hazel Grove	Y		12		N	48	Rs	X:392062 Y:386970
Stockport	Sk 8	Marshalls Yard H. Grove	Y		11		N	30	UB	X:392017 Y:387043
Stockport	Sk 9	Alderley Close	N		12		N	15	UB	X:392743 Y:385680
Stockport	SK10	Deneside Crescent	N		12		N	18	UB	X:392781 Y:387272
Stockport	SK11	Norwood Road	Y		11		N	47	Rs	X:391082 Y:387938
Stockport	SK12	Kingsway	Y		12		N	56	Rs	X:385028 Y:388278
Stockport	SK13	Prospect Vale	N		12		N	21	UB	X:394679 Y:386365
Stockport	SK14	Upton Avenue	N		12		N	19	UB	X:387362 Y:385910
Stockport	SK15	Bramhall Lane	Y		12		N	41	Rs	X:389887 Y:388958
Stockport	SK16	Stockport Rd. West Bredbury	Y		12		N	28	Rs	X:391563 Y:391223
Stockport	SK17	Yew Street	Y		12		N	30	UB	X:388471 Y:390093
Stockport	SK18	Debenhams	Y		11		N	47	UC	X:389260 Y:390407
Stockport	SK19	Gorton Road	Y		12		N	47	Rs	X:389481 Y:393470

Stockport	SK20	Kennilworth Road	Y		12			N	42	UB	X:386481 Y:389530
Stockport	SK21	Carmichael Street	N		11			N	28	UB	X:388599 Y:389412
Stockport	SK22	A6 Hazel Grove	Y	Triplicate and Collocated	12			N	27	UB	X:391480 Y:387633
Stockport	SK23	A6 Hazel Grove	Y	Triplicate and Collocated	11			N	27	UB	X:391480 Y:387633
Stockport	SK24	A6 Hazel Grove	Y	Triplicate and Collocated	12			N	27	UB	X:391480 Y:387633
Stockport	SK25	Central Marple	N		12			N	31	Rs	X:395767 Y:388653
Stockport	SK26	Midland Road	N		12			N	21	UB	X:389405 Y:387339
Stockport	SK27	Pinewood Close	N		12			N	21	UB	X:387099 Y:391385
Stockport	SK28	Finney Lane	Y		11			N	42	Rs	X:385702 Y:386226
Stockport	SK29	Russell St	N		11			N	21	UB	X:390085 Y:388547
Tameside MBC	T 1	King Street Dukinfield	Yes	N	8	N		N	36	Rs	X:394050 Y:397190
Tameside MBC	T 2	Hyde Town Hall Hyde	No	N		N		N	-	UB	X:394770 Y:394930
Tameside MBC	T 3	Thompson Road Denton	Yes	N	12	N		N	31	UB	X:391000 Y:395130
Tameside MBC	T SPEC	Penny Meadow Ashton	Yes	N	10	N		N	53	Rs	X:394200 Y:399260
Tameside MBC	T 5	Green Lane Hollingworth	No	N	12	N		N	17	UB	X:400510 Y:396520

Tameside MBC	T 9	Two Trees School Denton	No	Colocated	12	N	N	20	UB	X:393440 Y:394330
Tameside MBC	T 10	Guide Lane Audenshaw	Yes	N	12	N	N	44	Rs	X:392520 Y:396760
Tameside MBC	T 11	Market Street Hollingworth	No	N	12	N	N	72	Rs	X:400410 Y:396060
Tameside MBC	T 13	Manchester Road Ashton	Yes	N	12	N	N	45	Rs	X:392590 Y:398430
Tameside MBC	T 14	Park Parade Ashton	Yes	N	12	N	N	41	Rs	X:393710 Y:398790
Tameside MBC	T 15	Stamford Street Stalybridge	Yes	N	10	N	N	31	Rs	X:395410 Y:398730
Tameside MBC	T 16	Manchester Road Audenshaw	Yes	N	9	N	N	42	Rs	X:391470 Y:397930
Tameside MBC	T 17	Manchester Road Droylsden	Yes	N	12	N	N	36	Rs	X:389400 Y:398220
Tameside MBC	T 18	Manchester Road Denton	Yes	N		N	N	-	Rs	X:392120 Y:395510
Tameside MBC	T 19	Manchester Road Crown Point	Yes	N	12	N	N	44	Rs	X:392490 Y:395500
Tameside MBC	T 20	B&Q Hyde	Yes	N	3	N	N	43	Rs	X:394540 Y:395110
Tameside MBC	T 21	Woolley Lane Hollingworth	Yes	N	12	N	N	53	Rs	X:400400 Y:395980
Tameside MBC	T 22	Dean Street Ashton	No	N	12	N	N	25	UB	X:393250 Y:399160
Tameside MBC	T 23	Cavendish Mill Ashton	No	N	7	N	N	24	UB	X:393620 Y:398590
Tameside MBC	T 24	Manchester Road Denton (Golf Course)	Yes	N	11	N	N	39	Rs	X:390490 Y:395630
Tameside MBC	T 25	Oldham Road Ashton	Yes	N	12	N	N	32	Rs	X:393060 Y:401060
Tameside MBC	T 26	Lees Road Ashton	Yes	N	7	N	N	28	Rs	X:394940 Y:395630
Tameside MBC	T 27	Acres Lane Stalybridge	Yes	N		N	N	-	Rs	X:396520 Y:398310

Tameside MBC	T 28	George Lawton Hall	Mossley	No	N		N	N	-	Rs	X:397040 Y:402440
Tameside MBC	T 29	Keane Street	Ashton	No	N	12	N	N	29	Sb	X:393370 Y:399493
Tameside MBC	T 30	Oldham Road	Ashton	Yes	N	12	N	N	45	Rs	X:393380 Y:399810
Tameside MBC	T 31	Waterton Lane	Mossley	No	N	11	N	N	22	Sb	X:396900 Y:402450
Tameside MBC	T 32	Arundel Street	Mossley	No	N	11	N	N	29	Rs	X:396982 Y:402437
Tameside MBC	T 33	Lees Road	Mossley	No	N	12	N	N	29	Rs	X:397010 Y:402560
Tameside MBC	T 34	Stockport Road	Mossley	No	N	12	N	N	34	Rs	X:397090 Y:402620
Tameside MBC	T 35	Stamford Road	Mossley	No	N	12	N	N	40	Rs	X:397080 Y:402540
Tameside MBC	T 36	Argyle Street	Mossley	No	N	3	N	N	24	Sb	X:397060 Y:402390
Tameside MBC	T 37	Stamford Street	Mossley	No	N	9	N	N	41	Rs	X:397720 Y:402050
Trafford	1	Dunham Sewage Works		N	n/a	11	n/a	N	17	Ru	X:372680 Y:387541
Trafford	2	Altrincham General Hospital		N	n/a	9	n/a	N	24	UC	X:376650 Y:387831
Trafford	3	Sale Leisure Centre		N	n/a	12	n/a	N	24	UC	X:379119 Y:392033
Trafford	4	Trafford, Town Hall 12 (m)		N	n/a	12	n/a	N	23	UB	X:380904 Y:395817
Trafford	5	A56 White City		Y	n/a	12	n/a	N	29	UC	X:381221 Y:396441
Trafford	6	A56 Junction, Edge Lane		Y	n/a	12	n/a	N	31	UC	X:379699 Y:394452
Trafford	7	A56 Junction, M60		Y	n/a	12	n/a	N	29	UC	X:379083 Y:393283
Trafford	8	M60 Junction Parkway		Y	n/a	9	n/a	N	29	UC	X:377447 Y:395749

Trafford	9	Stockport Road, Timperley	Y	n/a	11	n/a	N	19	UB	X:379073 Y:389099
Trafford	10	A56 Marsland Road	Y	n/a	12	n/a	N	25	Rs	X:378004 Y:391466
Trafford	19	Moss Park School (AQMA)	Y	n/a	12	n/a	N	20	UB	X:378780 Y:394687
Trafford	20	A56 Chester Road AQMA	Y	n/a	12	n/a	N	32	Rs	X:379418 Y:394009
Trafford	21	Cleansing Depot	N	n/a	12	n/a	N	25	Rs	X:379619 Y:396371
Trafford	22	A56 corner of De Quincey Road	Y	n/a	11	n/a	N	33	Ks	X:377061 Y:390086
Wigan	1	Ashwood Avenue 2, Ashton (M6)	Y		12			44		X:357045 Y:398774
Wigan	2	Shevington Moor, Standish	Y		12			34		X:354199 Y:410631
Wigan	3	Linden Court, Orrell	Y		12			37		X:353271 Y:404657
Wigan	4	Orrell Road 3, Orrell (M6)	Y		12			34		X:354114 Y:404803
Wigan	5	Parkside Crescent, Orrell (M6)	Y		5			54		X:353827 Y:404570
Wigan	6	Twist Lane, Leigh	Y		11			37		X:364956 Y:400208
Wigan	7	Old Hall Drive 2, Ashton (M6)	Y		12			42		X:357198 Y:398588
Wigan	8	Queens Arms Hotel, Astley (A580 Junction)	Y		12			42		X:371452 Y:400960
Wigan	9	Warrington Road, Hawley, Wigan	Y		8			45		X:356857 Y:402846
Wigan	11	Dobson Parkway, Ince	N		12			48		X:360233 Y:405170
Wigan	12	Leigh Road, Hindley Green	N		12			34		X:364029 Y:402961
Wigan	13	Atherton Road, Hindley+C89	N		12			39		X:361702 Y:404113

Wigan	14	Wigan Road, Atherton	Y		12			36	X:366880 Y:403254
Wigan	15	Atherton Road, Hindley	N		12			37	X:362290 Y:403878
Wigan	16	Manchester Road, Tyldesley 3	Y		11			44	X:369528 Y:402023
Wigan	17	East Lancs. Road, Astley 1 (A580)	Y		8			73	X:370622 Y:400574
Wigan	18	Lower Green Lane, Astley	N		8			39	X:370173 Y:398600
Wigan	20	Fletcher Street , Atherton	Y		12			32	X:367357 Y:403206
Wigan	21	Car Street, Platt Bridge	Y		8			49	X:360438 Y:402556
Wigan	22	Fire Station, Newtown	Y		12			33	X:356973 Y:405147
Wigan	23	Atherton Road, Hindley	Y		12			36	X:362290 Y:403878
Wigan	24	Wigan Town Hall 2, Wigan	Y		11			35	X:358342 Y:405539
Wigan	25	Walthew Lane, Platt Bridge	Y		12			37	X:360291 Y:402963
Wigan	26	Bolton Road Atherton	Y		12			33	X:368201 Y:403595
Wigan	27	Ladies Lane, Hindley	Y		12			29	X:361916 Y:404822
Wigan	28	Turner Street, Leigh	Y		10			42	X:366423 Y:399893
Wigan	29	Walmsley Street, Wigan	Y		12			40	X:358741 Y:405336
Wigan	30	Smiths Lane, Hindley Green	N		12			28	X:363828 Y:402032
Wigan	31	Manchester Road, Tyldesley 2	Y		12			37	X:370440 Y:401959
Wigan	32	The Oval 2, Shevington (M6)	Y		11			34	X:353832 Y:408190

Wigan	33	Rose Court, Ince	Y		10				42	X:359726 Y:405534
Wigan	34	Rydal Street, Leigh	Y		11				39	X:365381 Y:399990
Wigan	35	Woodfield Crescent, Ashton (M6)	Y		12				48	X:357130 Y:398668
Wigan	36	Smallshaw Crescent, Ashton	Y		0					X:357368 Y:398952
Wigan	37	Satinwood Close 2, Ashton (M6)	Y		12				41	X:356913 Y:399045
Wigan	38	Ashwood Avenue 3, Ashton (M6)	Y		8				58	X:357045 Y:398755
Wigan	39	Ashwood Avenue 1, Ashton (M6)	Y		9				48	X:357053 Y:398794
Wigan	40	Whelley 2, Wigan	Y		12				34	X:359776 Y:406905
Wigan	41	Darlington Street East, Wigan	Y		11				38	X:359161 Y:405460
Wigan	42	Bolton Road, Ashton	Y		12				41	X:358141 Y:399515
Wigan	43	Marus Bridge Roundabout, Wigan	Y		11				39	X:356833 Y:403150
Wigan	44	Wigan Road, Hindley	Y		12				33	X:361423 Y:404476
Wigan	45	Queen Street, Wigan	Y		12				33	X:358257 Y:405160
Wigan	46	Standish Centre 1, Standish	Y		11				32	X:356398 Y:409973
Wigan	51	Nu Nu Nursery, Scholes	Y		11				30	X:358789 Y:405933
Wigan	52	Church Lane, Lowton (A580)	Y		11				48	X:362137 Y:396947
Wigan	53	New Miles Lane, Shevington (M6)	Y		10				33	X:353896 Y:408519
Wigan	54	East Lancs. Road, Astley 2 (A580)	Y		11				34	X:370613 Y:400583

Wigan	55	Orrell Road 3 , Orrell (M6 Junction)	Y		8					53	X:353931 Y:404899
Wigan	56	Standish Centre 2, Standish	Y		12					36	X:356228 Y:410104
Wigan	57	Pottery Road, Wigan	Y		10					37	X:357742 Y:405208
Wigan	58	Poolstock 1, Wigan	Y		12					37	X:357624 Y:404201
Wigan	59	Poolstock 2, Wigan	Y		8					38	X:357373 Y:403744
Wigan	60	Ormskirk Road, Pemberton	Y		12					37	X:355103 Y:404558
Wigan	61	Atherton Road, Hindley Green	Y		12					36	X:364025 Y:403079
Wigan	62	Orrell Road 2, Orrell (M6)	Y		12					47	X:354411 Y:404728
Wigan	63	Newtown, Wigan	Y		12					33	X:356930 Y:404984
Wigan	64	Cross Street, Hindley	Y		12					36	X:356228 Y:410104
Wigan	65	Liverpool Road, Hindley	Y		11					37	X:361517 Y:404242
Wigan	66	Leigh Road, Howe Bridge	Y		11					35	X:366347 Y:402353
Wigan	67	Warrington Road Newtown	Y		11					35	X:356820 Y:404663
Wigan	68	Westleigh Lane, Leigh	N		11					34	X:365221 Y:401688
Wigan	69	Scot Lane, Wigan	Y		12					36	X:356257 Y:405960
Wigan	70	Bickershaw Lane, Bickershaw	N		8					42	X:362329 Y:402037
Wigan	71	Tyldesley Road, Tyldesley	Y		12					42	X:368244 Y:402562
Wigan	72	Beech Hill Avenue, Beech Hill	Y		11					33	X:356322 Y:407002

Wigan	73	Bolton Road, Atherton 2	Y	8				32	X:368769 Y:403913
Wigan	74	Plank Lane, Leigh	N	12				26	X:363606 Y:399851
Wigan	75	Woodhouse Lane, Wigan	N	12				34	X:357093 Y:406378
Wigan	76	Fleet Street, Pemberton	N	8				47	X:354724 Y:404742
Wigan	77	Lily Lane, Bamfurlong	N	12				29	X:359616 Y:401373
Wigan	78	Castle Street Tyldesley	Y	12				37	X:368675 Y:402235
Wigan	79	KittGreen Road, Kitt Green	Y	11				28	X:355291 Y:405930
Wigan	80	Leigh Road, Atherton	Y	12				31	X:366907 Y:402905
Wigan	81	Preston Road Standish	N	12				34	X:355978 Y:410362
Wigan	82	Bryn Road, Ashton	Y	12				31	X:358339 Y:399752
Wigan	83	Wigan Road Bryn	Y	10				40	X:357100 Y:400795
Wigan	84	Westbourne Avenue, Leigh	Y	12				34	X:365587 Y:401359
Wigan	85	Chaddock Lane, Astley	Y	12				34	X:370608 Y:400786
Wigan	86	Firs Lane, Leigh	N	12				34	X:364427 Y:400291
Wigan	87	Manchester Road, Leigh	Y	12				35	X:367128 Y:399718
Wigan	88	Warrington Road, Leigh	Y	12				36	X:366959 Y:399312
Wigan	89	Spring Road, Orrell (M6)	Y	12				34	X:353721 Y:405968
Wigan	90	Moor Road, Orrell	N	12				40	X:353381 Y:405004

Wigan	91	Wigan Road Bryn	Y		12			38	X:357100 Y:400795
Wigan	92	High Street Hindsford	N		12			34	X:367807 Y:403196
Wigan	93	Wigan Road Atherton	N		11			32	X:366020 Y:402974
Wigan	94	Greendale, Hag Fold (Railway)	N		8			43	X:368059 Y:403805
Wigan	95	Prescott Lane, Kitt Green	N		12			31	X:354716 Y:406032
Wigan	96	Shuttle Street, Tyldesley	Y		10			38	X:369246 Y:402142
Wigan	97	Warrington Road Ashton	Y		10			35	X:357673 Y:398999
Wigan	98	Downall Green Road Ashton	Y		10			37	X:356377 Y:400792
Wigan	10, 19, 50	Kennedy house, Leigh	N		12			26	X:366290 Y:399861
Wigan	47,48, 49	Wigan Station, Wigan	N		11			27	X:357815 Y:406022
Wigan	113	500 Warrington Road, Marus Bridge	Y		12			35	X:356693 Y:403389
Wigan	114	Atherleigh Way, Leigh	Y		11			43	X:365116 Y:400260
Wigan	115	Winchester Close, Orrell	Y		12			32	X:353845 Y:405360
Wigan	116	Hendon Road, Leigh	N		12			25	X:365846 Y:401719

Table A1.3 2007- 2011 Diffusion Tube Results. (Table 2.6.)

No	LA (ID)	LA	LA Site id	Site Name	Site Type	2007	2008	2009	2010	2011	Ave (09-11)	In AQMA ?	Distance	XY
1	Bolton48	Bolton	48	48 Ainsworth Road, Little Lever	UB	35.7	33.9	34.5	31.4	33.4	33.1	Y	0	X:375397 Y:407457
2	Bolton49	Bolton	49	49 Council area office little lever	UB	26.8	25.2	24.6	25.5	24.2	24.8	N	4	X:375420 Y:407386
4	Bolton51	Bolton	51	51 Council area office little lever	UB	22.5	23.4	24	26.3	21.5	23.9	N	24	X:375412 Y:407365
5	Bolton52	Bolton	52	52 Front 3 Turton Rd Bromley X	Rs	36	40.4	42.2	40.8	43.1	42.0	Y	0	X:373251 Y:411970
6	Bolton53	Bolton	53	53 Rear 3 Turton Rd Bromley X	UB	22.5	21.7	21.7	21.9	22.4	22.0	Y	0	X:373236 Y:411968
7	Bolton54	Bolton	54	54 20 Laburnam Pk Bromley X	UB	17.7	19.7	18.8	17.7	19.4	18.6	N	266	X:372908 Y:412120
8	Bolton43	Bolton	43	43 Beehive PH Chorley New Rd, Horwich	Rs	42	45.7	45.7	40.2	41.9	42.6	Y	0	X:365501 Y:409887
9	Bolton44	Bolton	44	44 1007 Chorley New Rd, Horwich	UB	33.8	30.9	29.6	27.8	31.7	29.7	Y	0	X:365599 Y:409845
11	Bolton46	Bolton	46	46 5 Crowborough Close Horwich	UB	18.8	16.7	16.9	16.5	18.9	17.4	N	284	X:365694 Y:410166
12	Bolton40	Bolton	40	40 Bolton Rd/Manchester Rd, W/H	Rs	39.4	38.1	43.1	38.1	39.2	40.1	Y	0	X:366341 Y:406571
13	Bolton41	Bolton	41	41 White Horse Tavern Bolton Rd W/H	UB	33.1	29.1	30.5	33.1	39.2	34.3	N	0	X:366286 Y:406561
14	Bolton3	Bolton	3	3 Quintins 329 Derby St	Rs	45.4	53.1	52	46	45.2	47.7	Y	0	X:370763 Y:407929
15	Bolton60	Bolton	60	60 134 Buckley Lane	Ks			37.3	34.6	37.8	36.6	Y	0	X:373287 Y:405061
16	Bolton61	Bolton	61	61 Primrose St kearsley	Rs			42	43.3	43.7	43.0	Y	0	X:374450 Y:405207

56	MCC37	MCC	37	Princess Road	Rs	48	45	43	54	45	47.3	Y	0	X:382829 Y:391493
57	MCC59	MCC	59	Manchester Piccadilly	UC		42	43	45	43	43.7	Y	0	X:384310 Y:398337
60	MCC62	MCC	62	Manchester South	Su		26	24	28	27	26.3	N	291	X:383904 Y:385818
63	MCC70	MCC	70	Liverpool Road	UC		51	48	52	45	48.3	Y	0	X:383218 Y:397770
64	MCC71	MCC	71	Great Ancoats Street	Rs		54	51	50	53	51.3	Y	0	X:385161 Y:398290
65	MCC72	MCC	72	Lockton Close	UB		45	40	45	41	42.0	Y	0	X:384761 Y:397384
66	MCC73	MCC	73	Hyde Road	Rs		51	42	49	42	44.3	Y	0	X:388601 Y:396048
67	MCC74	MCC	74	Kingsway	Rs		41	39	45	40	41.3	Y	0	X:385399 Y:390093
68	MCC75	MCC	75	Stockport Road	Ks		56	52	56	52	53.3	Y	0	X:387363 Y:394617
69	MCC76	MCC	76	Clayton Lane	UB		36	36	38	36	36.7	Y	0	X:387724 Y:397967
70	MCC77	MCC	77	Hewitt Street	UC			43	49	42	44.7	Y	0	X:383602 Y:397488
71	MCC78	MCC	78	Rostron Avenue	UB			38	42	37	39.0	Y	0	X:386289 Y:396828
72	MCC79	MCC	79	Victoria Terrace	UB			33	38	34	35.0	N	19	X:386875 Y:395861
73	MCC80	MCC	80	Alma Road	Rs			40	40	35	38.3	N	48	X:387358 Y:393990
74	MCC81	MCC	81	Peaceville Road	UB			31	33	28	30.7	N	26	X:386589 Y:394083
75	MCC82	MCC	82	Manchester Oxford Road	Ks				69	70	69.5	Y	0	X:384233 Y:397287
78	OldhamOL3	Oldham	OL3	OL3 Mumps roundabout, Oldham	Rs		74	87				Y	0	X:393326 Y:405146
80	OldhamOL1 4	Oldham	OL14	OL14Middleton Road, Chadderton	Ks		38	50.7	33	30.3	38.0	Y	0	X:390795 Y:405378

81	OldhamOL7	Oldham	OL7	OL7Kershaw Street, Shaw	UB	50	45	66.4	50	38.8	51.7	N	0	X:393766 Y:409052
82	OldhamOL5	Oldham	OL5	OL5Terrace Street Oldham	Rs	37	40	47.6	37	45	43.2	Y	0	X:393792 Y:405166
83	OldhamOL1 0	Oldham	OL10	OL10Terrace, Oldham	UB	36	34	47.4	30	26.3	34.6	Y	0	X:393792 Y:405116
84	OldhamOL1 7	Oldham	OL17	OL17Norfolk Street, Oldham	UB	32	35	47	31	24.8	34.3		0	X:391224 Y:403857
85	OldhamOL1 1	Oldham	OL11	OL11Mellor Street, Failsworth	UB	33	31	39.1	29	29.4	32.5	Y	5	X:388958 Y:401182
86	OldhamOL1 2	Oldham	OL12	OL12Bluecoats School, Egerton Street, Oldham	UB	20	21	28.5	21	36	28.5	N	0	X:392902 Y:405410
87	OldhamOL1 6	Oldham	OL16	OL16West End Street, Oldham	UB	32	29	40.9	31		36.0	Y	0	X:391860 Y:405513
88	OldhamOL1 8	Oldham	OL18	OL18Oldham Road, Uppermill	Rs	42	39	51.1	39	32.8	41.0	N	4756	X:399510 Y:405382
89	OldhamOL1 9	Oldham	OL19	OL19High Street, Uppermill	kS	31	30	46.3	32	27.6	35.3	N	4832	X:399597 Y:405525
90	Rochdale1A	Rochdale	1A	Mere Lane Rochdale	UB		27.3	22.7	29	28.6	26.8	Y	77	X:389740 Y:412501
92	Rochdale2A	Rochdale	2A	Trows Lane Caslleton	Rs		40.7	42.1	39.5	46.6	42.7	Y	0	X:388527 Y:409942
94	Rochdale3A	Rochdale	3A	52 Cherrington Drive Caslleton	Rs		31.4	27.9	31.7	27.4	29.0	Y	0	X:388581 Y:409797
96	Rochdale4A	Rochdale	4A	Middleton Library	UC		34.8	34	34.6	35.4	34.7	Y	0	X:387083 Y:406258
98	Rochdale5A	Rochdale	5A	Mossway Middleton	Rs		29.5	31.2	28.4	28.3	29.3	Y	0	X:386447 Y:404167
100	Rochdale6A	Rochdale	6A	Heywood Old Rd Birch	Rs		53.2	51	47	49.5	49.2	Y	0	X:385412 Y:408306
102	Rochdale7A	Rochdale	7A	Edinburgh Way Rochdale	UC		45.3	34.1	40.1	39.8	38.0	Y	0	X:388628 Y:411950
104	Rochdale8A	Rochdale	8A	Manchester Old Rd Rochdale	Rs		49.7	43.3	50.2	49.8	47.8	Y	0	X:388914 Y:412083
106	Rochdale9A	Rochdale	9A	Manchester Rd Rochdale	Rs		58.2	47.2	53.4	57.6	52.7	Y	0	X:389055 Y:412217

108	Rochdale10 A	Rochdale	10A	Holmes Street Rochdale	UB	19.3	21.1	21.4	21.5	21.3	N	87	X:388789 Y:413573
110	Rochdale11 A	Rochdale	11A	Whitworth Road Rochdale	Rs	52.1	51.4	49.1	51.7	50.7	Y	0	X:389954 Y:413797
112	Rochdale12 A	Rochdale	12A	Halifax Road Wardle	Rs	44.8	44.6	42.2	46.4	44.4	Y	0	X:392061 Y:415678
114	Rochdale13 A	Rochdale	13A	725 Halifax Road Wardle	UB	20.5	20.3	20.4	22.7	21.1	N	0	X:392061 Y:415679
116	Rochdale14 A	Rochdale	14A	Hey Bottom Calderbrook	Ru	18.9	11.3	14.8	16.3	14.1	N	736	X:393666 Y:417812
118	Rochdale15 A	Rochdale	15A	M62 Depot Millnrow	UC	36.6	35.6	33.6	36.4	35.2	Y	0	X:392963 Y:411889
120	Rochdale16 A	Rochdale	16A	Ashfield Road Millnrow	UB	30.8	32.4	31.9	31.9	32.1	Y	0	X:392531 Y:411700
122	Rochdale17 A	Rochdale	17A	Kingsway Rochdale	UB	29.1	25.9	26	27.8	26.6	Y	0	X:391106 Y:412288
124	SalfordSA1	Salford	SA1	SA1 Irlam Locks	UB	24.8	26.8	32.2	21.8	26.9	Y	0	X:372766 Y:394105
125	SalfordSA2 b	Salford	SA2b	SA2b Irlam Police (Princess Nursery)	UB	30.1	30.9	32.3	25.4	29.5	N	117	X:372201 Y:394205
126	SalfordSA4	Salford	SA4	SA4 Crompton	Rs	31.8	33.4	35.9	29.5	32.9	Y	0	X:377452 Y:401829
127	SalfordSA9	Salford	SA9	SA9 St Marks	UB	34.8	41.5	41	27.7	36.7	Y	0	X:374733 Y:400935
128	SalfordSA2 3	Salford	SA23	SA22/23/28 Aurn Eccles	UB	38.4	38.2	41.5	31.6	37.1	Y	0	X:377925 Y:398729
131	SalfordSA2 0	Salford	SA20	SA20/21/22 M60 St Marks	Rs	67.1	72	59.3	58.8	63.4	Y	0	X:374810 Y:400856
134	SalfordSA1 4	Salford	SA14	SA14 Broughton Lib	Ks	44	42.8	40.5	39.3	40.9	Y	0	X:382851 Y:400987
135	SalfordSA1 6	Salford	SA16	SA16 Wharton School	UB	28.2	29.3	32.1		30.7	Y	0	X:371154 Y:404456
136	SalfordSA1 3	Salford	SA13	SA13 Buckland Road	UB	29.4	31.2	32.4	27.4	30.3	N	146	X:379613 Y:399783
137	SalfordSA2 5	Salford	SA25	SA25 16 Wyn Gdns	Rs	34.8	37.2	36.2	28.6	34.0	Y	0	X:381297 Y:398032

138	SalfordSA26	Salford	SA26	SA26 A580 Elect sub stn	Rs	43.3	45	46.3	49.6	37.8	44.6	Y	0	X:380719 Y:399599
139	SalfordSA27	Salford	SA27	SA27 Trinity Way	Rs	39.4	40.9	45.5	45.7	36.7	42.6	Y	0	X:383076 Y:398738
140	SalfordSA28	Salford	SA28	SA28 Harroby, Swinton	Rs	35.2	39.1	42.3	41.2	36.9	40.1	Y	0	X:377289 Y:401009
141	SalfordSA31	Salford	SA31	SA31 Walkden Road	Rs	34.4	36.8	39.7	39.5	32.2	37.1	Y	0	X:374025 Y:401905
142	SalfordSA32	Salford	SA32	SA32/40/41 Edenfield Drive	Rs	47.8	52.6	54.8	47.4	44.8	49.0	Y	0	X:374712 Y:399829
145	SalfordSA33	Salford	SA33	SA33 Arnfield Drive, Boothstown	Rs	35.1	35.9	37.6	36.9	33.4	36.0	Y	0	X:372597 Y:400728
146	SalfordSA34	Salford	SA34	SA34 673 Liverpool Road	Rs	58.3	61.5	62.2	63.6	52.1	59.3	Y	0	X:375367 Y:397799
147	SalfordSA35	Salford	SA35	SA35 50 Trevor Road	Rs	33	39.8	41.4	42.8	36.9	40.4	Y	0	X:376043 Y:399295
148	SalfordSA37	Salford	SA37	SA37 61 Maurice Drive	Rs	30.1	31.1	35.7	36.2	32.3	34.7	Y	0	X:380800 Y:399633
149	SalfordSA38	Salford	SA38	SA38 Clifton Primary School	Rs	35.3	35.5	40.2	41.2	32	37.8	Y	0	X:377782 Y:403097
150	SalfordSA39	Salford	SA39	SA39 Trinity Way /Chapel Street	Rs	48.8	51.7	53.4	47.6	40.9	47.3	Y	0	X:383040 Y:398563
151	SalfordSA42	Salford	SA42	SA42 44 Edenfield	Rs	45.2	50.1	52.9	51.1	46.7	50.2	Y	0	X:374698 Y:399848
152	SalfordSA17	Salford	SA17	SA17 Langley Road	Rs	39.9	41.1	42.9	42.9	38	41.3	Y	0	X:380775 Y:400837
153	SalfordSA44	Salford	SA44	SA44 Pembroke (No2)	Rs			53.1	48.5	43.5	48.4	Y	0	X:380412. 05 Y:398439. 43
154	SalfordSA45	Salford	SA45	SA45 Rail No1 (strawberry)	UB				34.4	29.7	32.1	Y	0	X:381542 Y:399378
155	SalfordSA46	Salford	SA46	SA46 Rail No 2 Longfield Crt	UB				32.5	28	30.3	Y	0	X:376451 Y:402318
156	StockportSK 1	Stockport	SK 1	Whitehill Firestation	UB	21	22	22	26	25	24.3	N	181	X:389077 Y:392012

15 7	StockportS K 2	Stockport	SK 2	HealdGreen Health Cen.	UB	24	21	24	29	25	26.0	N	122	X:384889 Y:385846
15 8	StockportS K 3	Stockport	SK 3	Denby Lane	UB	29	27	28	31	30	29.7	Y	0	X:388558 Y:391852
15 9	StockportS K 4	Stockport	SK 4	Compstall Library	Ru	16	13	14	18	15.3	15.8	N	2075	X:396468 Y:390801
16 0	StockportS K 5	Stockport	SK 5	Lyme Farm	Ru	9	8	9	11	9.9	10.0	N	3474	X:396873 Y:382687
16 1	StockportS K 6	Stockport	SK 6	Cheadle Library	UB	21	17	19	23	21.5	21.2	N	166	X:385953 Y:388534
16 2	StockportS K 7	Stockport	SK 7	Civiccentre Hazel Grove	Rs	53	42	46	52	47.6	48.5	Y	0	X:392062 Y:386970
16 3	StockportSk 8	Stockport	Sk 8	Marshalls Yard Hazel Grove	UB	26	22	24	27	29.8	26.9	Y	0	X:392017 Y:387043
16 4	StockportSk 9	Stockport	Sk 9	Alderley Close Hazel Grove	UB	16	13	15	18	15.1	16.0	N	167	X:392743 Y:385680
16 5	StockportS K10	Stockport	SK10	Deneside Cres. Hazel Grove	UB	18	15	17	20	18.4	18.5	N	296	X:392781 Y:387272
16 6	StockportS K11	Stockport	SK11	Norwood Road	Rs	43	46	40	45	47.4	44.1	Y	0	X:391082 Y:387938
16 7	StockportS K12	Stockport	SK12	A34 Kingsway	Rs	60	55	63	66	56.1	61.7	Y	0	X:385028 Y:388278
16 8	StockportS K13	Stockport	SK13	Prospect Vale	UB	18	17	18	22	20.6	20.2	N	812	X:394679 Y:386365
16 9	StockportS K14	Stockport	SK14	Upton Ave.	UB	18	17	19	20	19.1	19.4	N	508	X:387362 Y:385910
17 0	StockportS K15	Stockport	SK15	Bramhall Lane	Rs	42	37	40	42	41	41.0	Y	0	X:389887 Y:388958
17 1	StockportS K16	Stockport	SK16	Stockport Rd. Bredbury	Rs	30	23	26	34	27.8	29.3	Y	0	X:391563 Y:391223
17 2	StockportS K17	Stockport	SK17	Yew Street	UB	34	29	29	34	29.8	30.9	Y	0	X:388471 Y:390093
17 3	StockportS K18	Stockport	SK18	Debenhams	UC	53	41	48	46	47	47.0	Y	0	X:389260 Y:390407
17 4	StockportS K19	Stockport	SK19	Gorton Road	Rs	46	43	47	47	46.5	46.8	Y	0	X:389481 Y:393470

17 5	StockportS K20	Stockport	SK20	Kennilworth Road	UB	40	35	42	53	42.3	45.8	Y	0	X:386481 Y:389530
17 6	StockportS K21	Stockport	SK21	Carmichael Street	UB	31	24	23	30	28.3	27.1	N	48	X:388599 Y:389412
17 7	StockportS K22	Stockport	SK22	A6 Hazel Grove	UB	31	28	26	31	26.6	27.9	Y	0	X:391480 Y:387633
18 0	StockportS K25	Stockport	SK25	Central Marple	Rs	29	30	29	32	30.6	30.5	N	1026	X:395767 Y:388653
18 1	StockportS K26	Stockport	SK26	Midland Road	UB	19	16	17	21	21.2	19.7	N	296	X:389405 Y:387339
18 2	StockportS K27	Stockport	SK27	Pinewood Close	UB	19	17	18	24	20.5	20.8	N	90	X:387099 Y:391385
18 3	StockportS K28	Stockport	SK28	Finney Lane	Rs	40	38	40	49	42.2	43.7	Y	0	X:385702 Y:386226
18 4	StockportS K29	Stockport	SK29	Russell Street	UB	20	20	20	24	20.9	21.6	N	99	X:390085 Y:388547
18 5	Tameside MBCT 1	Tameside MBC	T 1	King Street Dukinfield	Rs	32.1	34.9	33.9	31.9	35.7	33.8	Y	0	X:394050 Y:397190
18 6	Tameside MBCT 2	Tameside MBC	T 2	Hyde Town Hall Hyde	UB	30.3	34.6	28			28.0	n	17	X:394770 Y:394930
18 7	Tameside MBCT 3	Tameside MBC	T 3	Thompson Road Denton	UB	28.3	32.2	29.6	29.2	30.5	29.8	Y	0	X:391000 Y:395130
18 8	Tameside MBCT SPEC	Tameside MBC	T SPEC	Penny Meadow Ashton	Rs	44.7	54.6	52.5	44.9	52.9	50.1	Y	0	X:394200 Y:399260
18 9	Tameside MBCT 5	Tameside MBC	T 5	Green Lane Hollingworth	UB	14.9	16.5	15.9	17.5	17	16.8	n	273	X:400510 Y:396520
19 0	Tameside MBCT 9	Tameside MBC	T 9	Two Trees School Denton	UB	19	19	19	19	19.8	19.3	n	45	X:393440 Y:394330
19 1	Tameside MBCT 10	Tameside MBC	T 10	Guide Lane Audenshaw	Rs	44.7	40.2	45.2	42	44.3	43.8	Y	0	X:392520 Y:396760
19 2	Tameside MBCT 11	Tameside MBC	T 11	Market Street Hollingworth	Rs	65.7	75.4	73.3	59.7	71.8	68.3	Y	0	X:400410 Y:396060
19 3	Tameside MBCT 13	Tameside MBC	T 13	Manchester Road Ashton	Rs	41	49	44.4	40.7	44.8	43.3	Y	0	X:392590 Y:398430

19 4	Tameside MBCT 14	Tameside MBC	T 14	Park Parade Ashton	Rs	40.6	41.3	38.9	34.6	40.9	38.1	Y	0	X:393710 Y:398790
19 5	Tameside MBCT 15	Tameside MBC	T 15	Stamford Street Stalybridge	Rs	28.6	30.6	29.8	29.4	31	30.1	Y	0	X:395410 Y:398730
19 6	Tameside MBCT 16	Tameside MBC	T 16	Manchester Road Audenshaw	Rs	39.4	41.8	38.4	38.3	41.5	39.4	Y	0	X:391470 Y:397930
19 7	Tameside MBCT 17	Tameside MBC	T 17	Manchester Road Droylsden	Rs	35.1	37.8	35.2	35.2	36.1	35.5	Y	0	X:389400 Y:398220
19 8	Tameside MBCT 18	Tameside MBC	T 18	Manchester Road Denton	Rs	47.3	49.9					Y	0	X:392120 Y:395510
19 9	Tameside MBCT 19	Tameside MBC	T 19	Manchester Road Crown Point	Rs	42	41.2	41.2	41.3	43.6	42.0	Y	0	X:392490 Y:395500
20 0	Tameside MBCT 20	Tameside MBC	T 20	B&Q Hyde	Rs	46	47	42.6	39.1	43	41.6	Y	0	X:394540 Y:395110
20 1	Tameside MBCT 21	Tameside MBC	T 21	Woolley Lane Hollingworth	Rs	43	53.1	50.6	48.4	53.4	50.8	Y	0	X:400400 Y:395980
20 2	Tameside MBCT 22	Tameside MBC	T 22	Dean Street Ashton	UB	22.9	24.6	25.3	24.4	25.2	25.0	n	122	X:393250 Y:399160
20 3	Tameside MBCT 23	Tameside MBC	T 23	Cavendish Mill Ashton	UB	25.8	27.6	24		24.1	24.1	n	20	X:393620 Y:398590
20 4	Tameside MBCT 24	Tameside MBC	T 24	Manchester Road Denton (Golf Course)	Rs	38.3	41.7	38.6	40.1	38.8	39.2	Y	0	X:390490 Y:395630
20 5	Tameside MBCT 25	Tameside MBC	T 25	Oldham Road Ashton	Rs	43.4	30.6	30.3	30.3	31.5	30.7	Y	0	X:393060 Y:401060
20 6	Tameside MBCT 26	Tameside MBC	T 26	Lees Road Ashton	Rs	22.3	24.8	25.8	23.9	28.1	25.9	n	107	X:394940 Y:395630
20 7	Tameside MBCT 27	Tameside MBC	T 27	Acres Lane Stalybridge	Rs	30.9	34.2	31.6	38.9		35.3	Y	0	X:396520 Y:398310
20 8	Tameside MBCT 28	Tameside MBC	T 28	George Lawton Hall Mossley	Rs	27.2	41.9	41.9	32		37.0	n	2446	X:397040 Y:402440
20 9	Tameside MBCT 29	Tameside MBC	T 29	Keane Street Ashton	Su	26.9	29.1	28.8	27	29	28.3	n	56	X:393370 Y:399493
21 0	Tameside MBCT 30	Tameside MBC	T 30	Oldham Road Ashton	Rs	41.6	45.9	42	41.3	45	42.8	Y	0	X:393380 Y:399810
21 1	Tameside MBCT 31	Tameside MBC	T 31	Waterton Lane Mossley	Su	18.9	20.9	23.6	21.2	22.3	22.4	n	2313	X:396900 Y:402450

21 2	Tameside MBCT 32	Tameside MBC	T 32	Arundel Street Mossley	Rs	26.9	31.2	28.6	26.9	29.1	28.2	n	2393	X:396982 Y:402437
21 3	Tameside MBCT 33	Tameside MBC	T 33	Lees Road Mossley	Rs	25	25.4	26.1	25.5	28.8	26.8	n	2376	X:397010 Y:402560
21 4	Tameside MBCT 34	Tameside MBC	T 34	Stockport Road Mossley	Rs	32.7	36.2	34.1	33.4	34.2	33.9	n	2433	X:397090 Y:402620
21 5	Tameside MBCT 35	Tameside MBC	T 35	Stamford Road Mossley	Rs	33.6	41.1	42.7	38.4	39.7	40.3	N	2448	X:397080 Y:402540
21 6	Tameside MBCT 36	Tameside MBC	T 36	Argyle Street Mossley	Su	22.6	25.9	25.9	21.5	24.3	23.9	n	2483	X:397060 Y:402390
21 7	Tameside MBCT 37	Tameside MBC	T 37	Stamford Street Mossley	Rs	35.6	37.6	41.4	37.4	40.7	39.8	n	3143	X:397720 Y:402050
21 8	Trafford1	Trafford	1	1 Dunham Sewage Works	Ru	21	20	16.6	22.7	17.2	18.8	N	2293	X:372680 Y:387541
21 9	Trafford2	Trafford	2	2 Altrincham General Hospital	UC	28	30	27.1	32	24.4	27.8	N	151	X:376650 Y:387831
22 0	Trafford3	Trafford	3	3 Sale Leisure Centre	UC	45	38	27.9	32.4	23.9	28.1	N	51	X:379119 Y:392033
22 1	Trafford4	Trafford	4	4 Trafford, Town Hall 12 (m)	UB	31	26	26.1	30.1	22.8	26.3	N	110	X:380904 Y:395817
22 2	Trafford5	Trafford	5	5 A56 White City	UC	42	40	34.9	31	28.6	31.5	Y	0	X:381221 Y:396441
22 3	Trafford6	Trafford	6	6 A56 Junction, Edge Lane	UC	41	45	37.2	46.1	30.8	38.0	Y	0	X:379699 Y:394452
22 4	Trafford7	Trafford	7	7 A56 Junction, M60	UC	38	42	39	35.4	29.3	34.6	Y	0	X:379083 Y:393283
22 5	Trafford8	Trafford	8	8 M60 Junction Parkway	UC	35	32	36.3	45.4	28.8	36.8	Y	0	X:377447 Y:395749
22 6	Trafford9	Trafford	9	9 Stockport Road, Timperley	UB	26	31	35.4	39.3	19.4	31.4	Y	0	X:379073 Y:389099
22 7	Trafford10	Trafford	10	10 A56 Marsland Road	Rs	32	33	25.7	40.6	25.2	30.5	Y	0	X:378004 Y:391466
22 8	Trafford19	Trafford	19	19w Moss Park School (AQMA)	UB		25	24.7	45.9	20.4	30.3	Y	245	X:378780 Y:394687
22 9	Trafford20	Trafford	20	20w A56 Chester Road AQMA	Rs		41	39.2	42.6	32.2	38.0	Y	0	X:379418 Y:394009

23 0	Trafford21	Trafford	21	21w Cleansing Depot	Rs	30	29.3	37.9	24.5	30.6	N	47	X:379619 Y:396371
23 1	Trafford22	Trafford	22	22w A56 corner of De Quincey Road	Ks	42	37.9	30.5	32.8	33.7	Y	0	X:377061 Y:390086
23 2	Wigan 1	Wigan	1	Ashwood Avenue 2, Ashton (M6)	Rs	46	43	43	44	43.3	Y	0	X:357045 Y:398774
23 3	Wigan 2	Wigan	2	Shevington Moor, Standish	Rs	37	30	34	34	32.7	Y	0	X:354199 Y:410631
23 4	Wigan 3	Wigan	3	Linden Court, Orrell	Rs		30	37	37	34.7	Y	0	X:353271 Y:404657
23 5	Wigan 4	Wigan	4	Orrell Road 3, Orrell (M6)	Rs	40	31	39	34	34.7	Y	0	X:354114 Y:404803
23 6	Wigan 5	Wigan	5	Parkside Crescent, Orrell (M6)	Rs	35	33	39	54	42.0	Y	0	X:353827 Y:404570
23 7	Wigan 6	Wigan	6	Twist Lane, Leigh	Rs	40	33	39	37	36.3	Y	0	X:364956 Y:400208
23 8	Wigan 7	Wigan	7	Old Hall Drive 2, Ashton (M6)	Rs	45	37	43	42	40.7	Y	0	X:357198 Y:398588
23 9	Wigan 8	Wigan	8	Queens Arms Hotel, Astley (A580 Junction)	Rs	42	36	45	42	41.0	Y	0	X:371452 Y:400960
24 0	Wigan 9	Wigan	9	Warrington Road, Hawkley, Wigan	Rs	46	39	48	45	44.0	Y	0	X:356857 Y:402846
24 1	Wigan 11	Wigan	11	Dobson Parkway, Ince	Rs	32	27	31	48	35.3	N	6	X:360233 Y:405170
24 2	Wigan 12	Wigan	12	Leigh Road, Hindley Green	Rs		28	36	34	32.7	N	59	X:364029 Y:402961
24 3	Wigan 13	Wigan	13	Atherton Road, Hindley+C89	Rs		33	42	39	38.0	N	22	X:361702 Y:404113
24 4	Wigan 14	Wigan	14	Wigan Road, Atherton	Rs	40	35	38	36	36.3	Y	0	X:366880 Y:403254
24 5	Wigan 15	Wigan	15	Atherton Road, Hindley	Rs		36	39	37	37.3	N	3	X:362290 Y:403878
24 6	Wigan 16	Wigan	16	Manchester Road, Tyldesley 3	Rs	47	43	43	44	43.3	Y	0	X:369528 Y:402023
24 7	Wigan 17	Wigan	17	East Lincs. Road, Astley 1 (A580)	Rs	50	38	47	73	52.7	Y	0	X:370622 Y:400574

24 8	Wigan 18	Wigan	18	Lower Green Lane, Astley	Ru	27	27	16	30	39	28.3	N	1322	X:370173 Y:398600
24 9	Wigan 20	Wigan	20	Fletcher Street, Atherton	Rs			27	35	32	31.3	Y	0	X:367357 Y:403206
25 0	Wigan 21	Wigan	21	Car Street, Platt Bridge	Ks	36	33	31	34	49	38.0	Y	0	X:360438 Y:402556
25 1	Wigan 22	Wigan	22	Fire Station, Newtown	Rs	37	36	32	35	33	33.3	Y	0	X:356973 Y:405147
25 2	Wigan 23	Wigan	23	Atherton Road, Hindley	Rs	42	40	37	43	36	38.7	Y	0	X:361834 Y:404089
25 3	Wigan 24	Wigan	24	Wigan Town Hall 2, Wigan	Rs		40	39	40	35	38.0	Y	0	X:358342 Y:405539
25 4	Wigan 25	Wigan	25	Walthew Lane, Platt Bridge	Rs	39	39	33	38	37	36.0	Y	0	X:360291 Y:402963
25 5	Wigan 26	Wigan	26	Bolton Road Atherton	Rs				35	33	34.0	Y	0	X:368201 Y:403595
25 6	Wigan 27	Wigan	27	Ladies Lane, Hindley	Rs	33	30	27	30	29	28.7	Y	0	X:361916 Y:404822
25 7	Wigan 28	Wigan	28	Turner Street, Leigh	Rs	43	49	39	41	42	40.7	Y	0	X:366423 Y:399893
25 8	Wigan 29	Wigan	29	Walmesley Street, Wigan	Rs	42	44	38	43	40	40.3	Y	0	X:358741 Y:405336
25 9	Wigan 30	Wigan	30	Smiths Lane, Hindley Green	Rs	33	29	27	31	28	28.7	N	7	X:363828 Y:402032
26 0	Wigan 31	Wigan	31	Manchester Road, Tyldesley 2	Rs	43	38	35	41	37	37.7	Y	0	X:370440 Y:401959
26 1	Wigan 32	Wigan	32	The Oval 2, Shevington (M6)	Rs	41	45	33	38	34	35.0	Y	0	X:353832 Y:408190
26 2	Wigan 33	Wigan	33	Rose Court, Ince	Rs	43	55	47	45	42	44.7	Y	0	X:359726 Y:405534
26 3	Wigan 34	Wigan	34	Rydal Street, Leigh	Rs	43	41	36	41	39	38.7	Y	0	X:365381 Y:399990
26 4	Wigan 35	Wigan	35	Woodfield Crescent, Ashton (M6)	Rs	48	49	41	43	48	44.0	Y	0	X:357130 Y:398668
26 5	Wigan 36	Wigan	36	Smallshaw Crescent, Ashton	Rs	41	35	30	35		32.5	Y	0	X:357368 Y:398952

26 6	Wigan 37	Wigan	37	Satinwood Close 2, Ashton (M6)	UC	47	43	36	42	41	39.7	Y	0	X:356913 Y:399045
26 7	Wigan 38	Wigan	38	Ashwood Avenue 3, Ashton (M6)	Rs	57	54	42	44	58	48.0	Y	0	X:357045 Y:398755
26 8	Wigan 39	Wigan	39	Ashwood Avenue 1, Ashton (M6)	Rs	49	52	38	46	48	44.0	Y	0	X:357053 Y:398794
26 9	Wigan 40	Wigan	40	Whelley 2, Wigan	Rs	41	33	30	35	34	33.0	Y	0	X:359776 Y:406905
27 0	Wigan 41	Wigan	41	Darlington Street East, Wigan	Rs	40	43	35	41	38	38.0	Y	0	X:359161 Y:405460
27 1	Wigan 42	Wigan	42	Bolton Road, Ashton	Rs	47	45	38	44	41	41.0	Y	0	X:358141 Y:399515
27 2	Wigan 43	Wigan	43	Marus Bridge Roundabout, Wigan	Rs	40	43	38	43	39	40.0	Y	0	X:356833 Y:403150
27 3	Wigan 44	Wigan	44	Wigan Road, Hindley	Rs	37	39	34	38	33	35.0	Y	0	X:361423 Y:404476
27 4	Wigan 45	Wigan	45	Queen Street, Wigan	Rs		34	32	35	33	33.3	Y	0	X:358257 Y:405160
27 5	Wigan 46	Wigan	46	Standish Centre 1, Standish	Rs	29	31	29	33	32	31.3	Y	0	X:356398 Y:409973
27 6	Wigan 51	Wigan	51	Nu Nu Nursery, Scholes	Rs	35	35	35	35	30	33.3	Y	0	X:358789 Y:405933
27 7	Wigan 52	Wigan	52	Church Lane, Lowton (A580)	Rs	52	50	40	46	48	44.7	Y	0	X:362137 Y:396947
27 8	Wigan 53	Wigan	53	New Miles Lane, Shevington (M6)	Rs	38	36	33	36	33	34.0	Y	0	X:353896 Y:408519
27 9	Wigan 54	Wigan	54	East Lancs. Road, Astley 2 (A580)	Rs	40	39	38	39	34	37.0	Y	0	X:370613 Y:400583
28 0	Wigan 55	Wigan	55	Orrell Road 3 , Orrell (M6 Junction)	Rs	57	65	52	57	53	54.0	Y	0	X:353931 Y:404899
28 1	Wigan 56	Wigan	56	Standish Centre 2, Standish	Rs	44	36	36	38	36	36.7	Y	0	X:356228 Y:410104
28 2	Wigan 57	Wigan	57	Pottery Road, Wigan	Rs		41	37	41	37	38.3	Y	0	X:357742 Y:405208
28 3	Wigan 58	Wigan	58	Poolstock 1, Wigan	Rs	36	41	36	41	37	38.0	Y	0	X:357624 Y:404201

28 4	Wigan 59	Wigan	59	Poolstock 2, Wigan	Rs	38	39	36	41	38	38.3	Y	0	X:357373 Y:403744
28 5	Wigan 60	Wigan	60	Ormskirk Road, Pemberton	Rs	40	41	35	39	37	37.0	Y	0	X:355103 Y:404558
28 6	Wigan 61	Wigan	61	Atherton Road, Hindley Green	Rs	34	39	33	41	36	36.7	Y	0	X:364025 Y:403079
28 7	Wigan 62	Wigan	62	Orrell Road 2, Orrell (M6)	Rs	45	51	43	49	47	46.3	Y	0	X:354411 Y:404728
28 8	Wigan 63	Wigan	63	Newtown, Wigan	Rs	32	34	33	37	33	34.3	Y	0	X:356930 Y:404984
28 9	Wigan 64	Wigan	64	Cross Street, Hindley	Rs			31	38	36	35.0	Y	0	X:356228 Y:410104
29 0	Wigan 65	Wigan	65	Liverpool Road, Hindley	Rs			33	37	37	35.7	Y	0	X:361517 Y:404242
29 1	Wigan 66	Wigan	66	Leigh Road, Howe Bridge	Rs			29	37	35	33.7	Y	0	X:366347 Y:402353
29 2	Wigan 67	Wigan	67	Warrington Road Newtown	Rs			36	36	35	35.7	Y	0	X:3566820 Y:404663
29 3	Wigan 68	Wigan	68	Westleigh Lane, Leigh	Rs			30	33	34	32.3	N	16	X:365221 Y:401688
29 4	Wigan 69	Wigan	69	Scot Lane, Wigan	Rs			31	40	36	35.7	Y	0	X:356257 Y:405960
29 5	Wigan 70	Wigan	70	Bickershaw Lane, Bickershaw	Rs			24	30	42	32.0	N	94	X:362329 Y:402037
29 6	Wigan 71	Wigan	71	Tyldesley Road, Tyldesley	Rs			34	41	42	39.0	Y	0	X:368244 Y:402562
29 7	Wigan 72	Wigan	72	Beech Hill Avenue, Beech Hill	Rs				35	33	34.0	Y	0	X:356322 Y:407002
29 8	Wigan 73	Wigan	73	Bolton Road, Atherton 2	Rs			27	35	32	31.3	Y	0	X:368769 Y:403913
29 9	Wigan 74	Wigan	74	Plank Lane, Leigh	Rs			24	29	26	26.3	N	93	X:363606 Y:399851
30 0	Wigan 75	Wigan	75	Woodhouse Lane, Wigan	Rs			30	36	34	33.3	N	1	X:357093 Y:406378
30 1	Wigan 76	Wigan	76	Fleet Street, Pemberton	Rs			25	31	47	34.3	N	18	X:354724 Y:404742

30 2	Wigan 77	Wigan	77	Lily Lane, Bamfurlong	Rs				24	32	29	28.3	N	207	X:359616 Y:401373
30 3	Wigan 78	Wigan	78	Castle Street Tyldesley	Rs				31	41	37	36.3	Y	0	X:368675 Y:402235
30 4	Wigan 79	Wigan	79	KittGreen Road, Kitt Green	Rs				27	33	28	29.3	Y	0	X:355291 Y:405930
30 5	Wigan 80	Wigan	80	Leigh Road, Atherton	Rs				27	34	31	30.7	Y	0	X:366907 Y:402905
30 6	Wigan 81	Wigan	81	Preston Road Standish	Rs				29	36	34	33.0	N	8	X:355978 Y:410362
30 7	Wigan 82	Wigan	82	Bryn Road, Ashton	Rs				28	34	31	31.0	Y	0	X:358339 Y:399752
30 8	Wigan 83	Wigan	83	Wigan Road Bryn	Rs				33	38	40	37.0	Y	0	X:357100 Y:400795
30 9	Wigan 84	Wigan	84	Westbourne Avenue, Leigh	Rs				27	34	34	31.7	Y	0	X:365587 Y:401359
31 0	Wigan 85	Wigan	85	Chaddock Lane, Astley	Rs				29	35	34	32.7	Y	0	X:370608 Y:400786
31 1	Wigan 86	Wigan	86	Firs Lane, Leigh	Rs				31	36	34	33.7	N	52	X:364427 Y:400291
31 2	Wigan 87	Wigan	87	Manchester Road, Leigh	Rs				30	39	35	34.7	Y	0	X:367128 Y:399718
31 3	Wigan 88	Wigan	88	Warrington Road, Leigh	Rs				32	40	36	36.0	Y	0	X:366959 Y:399312
31 4	Wigan 89	Wigan	89	Spring Road, Orrell (M6)	Rs				30	35	34	33.0	Y	0	X:353721 Y:405968
31 5	Wigan 90	Wigan	90	Moor Road, Orrell	Rs				33	43	40	38.7	N	1	X:353381 Y:405004
31 6	Wigan 91	Wigan	91	Wigan Road Bryn	Rs				32	36	38	35.3	Y	0	X:356897 Y:401353
31 7	Wigan 92	Wigan	92	High Street Hindsford	Rs				29	35	34	32.7	N	92	X:367807 Y:403196
31 8	Wigan 93	Wigan	93	Wigan Road Atherton	Rs				27	31	32	30.0	N	2	X:366020 Y:402974
31 9	Wigan 94	Wigan	94	Greendale, Hag Fold (Railway)	Rs				24	25	43	30.7	N	212	X:368059 Y:403805

USA12

Greater Manchester Authorities

Rochdale					1	2	15	16	34
Salford		1			3	10	18	32	
Stockport					1	7	21	29	
Tameside MBC	2		1	2	2	3	17	29	
Trafford				2		3	9	14	
Wigan	1			11	1	8	20	56	
Grand Total	1	1	2	1	3	3	73	192	322

Source (GMDATA)Monitoring Data_files\Non automatic data_files\Tables\Table2 2to2 6v1 2d.xlsm

Site Mapping / Classifications

Table A1.7 Site Mapping

Site Type (LAQM TG.03)	Mapped to
U1	UB Urban Background
U2	UB Urban Background
U3	UB Urban Background
U4	UB Urban Background
SU	Sb Urban Background
R1	Rs Roadside

Site Classifications

Kerbside	Sites with sample inlets within 1m of the edge of a busy road. Sampling heights are within 2-3m.
Roadside	Sites with sample inlets between 1m of the kerbside of a busy road and the back of the pavement. Typically this will be within 5m of the kerbside. Sampling heights are within 2-3m.

Urban Centre	Non-kerbside sites located in an area representative of typical population exposure in town or city centre areas eg pedestrian precincts and shopping areas. Sampling heights are typically within 2-3m.
Urban Background	Urban locations distanced from sources and broadly representative of city-wide background concentrations eg elevated locations, parks and urban residential areas
Urban Industrial	Sites where industrial emissions make a significant contribution to measured pollution levels.
Suburban	Sites typical of residential areas on the outskirts of a town or city.
Rural	Open country locations distanced from population centres, roads and industrial areas.
Remote	Open country locations within isolated rural areas, experiencing regional background pollution levels for much of the time.

Source : <http://aurn.defra.gov.uk/air-quality-info/site-classes.htm>

Appendix 2: QA\QC Data

2.1 Diffusion Tube Bias Adjustment Factors

The tubes are prepared and analysed by Staffordshire Scientific Services using the 20% triethanolamine (TEA) in water method. The laboratory method is UKAS accredited. Results from the quality control schemes published on the [LAQM](#) website give the laboratory a good precision rating.

NO₂ diffusion tubes are affected by several factors, which may cause them to have bias (over-read), or negative bias (under-read) relative to the reference technique. To compare with the AQS objectives it's important that tubes are corrected (adjusted) by comparing with a chemiluminescent analyser reference method, for NO_x and NO₂

Collocated tubes are located at Wigan (AURN), Manchester (3 sites), Salford (2 sites) and Stockport air quality stations. The Diffusion Bias Adjustment sheet v3 /12 was used to calculate the factor using these sites and the other local authority data submitted at the time. Overall 13 sites were included in the assessment. The Salford sites are manually added to the 11 sites using the recommended method in the spreadsheet. A bias factor of 0.883 was applied to all 2011 data.

Table A2.1 Bias Adjustment Calculation 2011

Local Authority	Diffusion Tube Mean Conc. (Dm) ($\mu\text{g}/\text{m}^3$)	Automatic Monitor Mean Conc. (Cm) ($\mu\text{g}/\text{m}^3$)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)	Calc Bias Cm/Dm	Bias (%)	Bias (Factor) ²	Bias
Stoke-on-Trent City Council	32	32	0.5%	G	0.99	0.99	0.5%	0.01	1.005
East Staffordshire Borough Council	52	39	34.5%	G	0.74	0.74	34.5%	0.34	1.345
Stoke-on-Trent City Council	40	39	4.3%	G	0.96	0.96	4.3%	0.04	1.043
South Staffordshire Council	36	34	7.0%	G	0.93	0.93	7.0%	0.07	1.070
Marylebone Road Intercomparison	119	100	18.8%	G	0.84	0.84	18.8%	0.19	1.188
Cannock Chase Council	47	45	3.3%	G	0.97	0.97	3.3%	0.03	1.033
WIGAN	30	23	29.9%	G	0.77	0.77	29.9%	0.30	1.299
Manchester City Council	30	23	32.4%	G	0.76	0.76	32.4%	0.32	1.324
Manchester City Council	77	66	16.8%	G	0.86	0.86	16.8%	0.17	1.168
Manchester City Council	48	44	8.3%	G	0.92	0.92	8.3%	0.08	1.083
Stockport MBC	31	29	6.4%	G	0.94	0.94	6.4%	0.06	1.064
Salford (eccl)	36	33	11.0%	G	0.90	0.90	10.5%	0.11	1.105
Salford (M60)	66	66	-1.0%	G	1.01	1.01	-0.7%	-0.01	0.993
Average									1.13
Overall Factor ¹ (13 studies) Bias Factor (1/Bias)									0.883

Table A2.2 Bias Adjustment Factors 2007-2011

Prior to 2011 each district applied its own bias factor from co-located tubes at their automatic or nearby monitoring sites using the AEA spreadsheet to check the bias and precision and derive the bias factor.

Local Authority	2007	2008	2009*	2010	2011	Comments
Bury		0.87	0.93	0.99	0.883	
Botlon		0.83(a)	0.81/0.82(b)	0.85(c)	0.883	(a)JUWE Spreadsheet version 09/09,(b) Eurofins 0.82 to July 2009; Staffordshire Scientific Services 0.81 from August 2009,(c)JUWE Spreadsheet version 06/11.
Manchester	0.9	0.83	0.79/0.75 (a)	0.93/0.89 (a)	0.88	(a) 2009 = 0.79 kerbside, roadside, urban centre and urban background locations; 0.75 suburban and rural sites. 2010 = 0.93 kerbside, roadside, urban centre and urban background locations; 0.89 suburban and rural sites
Oldham	0.9	0.83	(a)	0.85	0.883	(a)results for 2009 are included for completeness, but have not been bias adjusted due to a change in diffusion tube supplier part way through the year and also there was low data capture. It is best not to use these results to make any assumptions regarding compliance with the objectives or trends in pollution concentrations.
Rochdale					0.883	
Salford	0.89	0.95	0.97	0.98	0.883	2010 Two analyst Bureau Veritas(BV) (Jan-July) and Staffordshire Scientific Services (SSS), (Aug-Dec) used for survey. Bias factors calc for each analyst, for collocated
Stockport	0.9	0.7	0.745	0.85	0.883	
Tameside	0.776	0.806	0.768	0.782	0.883	
Trafford	0.9	0.83	0.9/.81	0.85	0.883	
Wigan	0.9	0.94	0.76	0.886	0.883	
GM Average factor	0.881	0.845	0.835	0.884	0.883	

Note

*NO2 diffusion tubes used by the GM districts up to July 2009 were provided by Bureau Veritas, exposed monthly and are based on 10% TEA (triethanolamine) in water; from August onwards Staffordshire Scientific provided the service using a 20% TEA in water method.

2.2 Automatic Site Adjustments

2011 Adjustment

Automatic monitoring site with less than 75% data capture in 2011 have been adjusted to an annual mean, as set out in Box 3.2 of LAQM.TG(09). The period mean (Pm) for each site is adjusted using the ratio (Am/Pm) of the annual means (Am) at nearby sites to the period mean(Pm). The details are set out below.

The closest three AURN sites are Manchester Piccadilly (urban centre), Manchester South (Suburban) and Wigan Centre (Urban Background). These are located in Greater Manchester and are geographically well separated across the area. The annual mean nitrogen dioxide concentrations and the period means for each of the three monitoring sites are presented below.

Table A1.3 Adjusted Annual means from Short Term Monitoring Data

Site	From	To		Man Picc (MAN3, UC)	Man South (MAN8,S U)	Wigan Centre (WIG5, UB)	Factor	Station mean	Adjusted Mean
Ref.	01/01/2011	31/12/2011	Annual Mean	44.0	22.8	23.0			
Oldham	01/01/2011	05/07/2011	Period Mean	46.4	25.1	24.6	0.93	33	30.7
			Ratio (Am/Pm)	0.95	0.91	0.94			
Bolton	01/01/2011	22/03/2011	Period mean	53.6	32.4	34.6	0.73	40	29.2
			Ratio	0.82	0.70	0.66			

AnnMeanAdjustments.xls

Short-term to Long-term Data adjustment for Bury 2010

Adjusted Annual means from Short Term Monitoring Data

Long Term Site	2010 Annual Mean (AM)	2010 Period Mean (PM)	Ratio AM/PM
Manchester Piccadilly	45	40	45/40 = 1.125
Glazebury	19.4	16	19.4/16 = 1.2125
Salford Eccles	42	31	42/31 = 1.354
			Average Ratio = 1.23

Tube	Period Mean x Average Ratio	Mean 2010	Mean x Bias Adjustment Correction (0.99)
BU1	39 x 1.23	47.97	47.97 x 0.99 = 48
BU3 (a)	68 x 1.23	83.64	86.1 x 0.99 = 83
BU3 (b)	70 x 1.23	86.1	86.1 x 0.99 = 85
BU3 (c)	65 x 1.23	79.95	79.95 x 0.99 = 79
BU4	43 x 1.23	52.89	52.89 x 0.99 = 52

BU5	35 x 1.23	43.05	43.05 x 0.99 = 43
BU6	43 x 1.23	52.89	52.89 x 0.99 = 52
BU7	33 x 1.23	40.59	40.59 x 0.99 = 40
BU8	27 x 1.23	33.21	33.7 x 0.99 = 33

2.3 QA/QC of automatic monitoring

Automatic air quality analysers in Greater Manchester area are subject to a high level of quality assurance/ quality control. Most analysers are either operated as part of the national Automatic Urban and Rural Network (AURN) or are part of the 'Calibration Club' scheme run by AEA Technology or similar schemes to provide accurate and robust data.

The procedures are equivalent to the UK Automatic Urban and Rural Network (AURN) the main features of the services being:-

Calibration Club

- data screened daily for errors and final data ratified and published to same standard as AURN sites.
- Data checked twice daily for errors and faults reported to Local Site operators
- Independent audits twice or once a year at Salford M60
- Final data set scaled and ratified to same standard as AURN.

Casella Data Management

The Casella service is similar to the calibration club with the exception of the independent audits. On site checks do include linearity test of analysers and gas phase titration (GPT) to check converter efficiency on the NO_x instruments. Data is scaled to same standard as TG(09). TEOM data is corrected using the Volatile Correction Method.

PM Monitoring & Adjustment

Particulate Monitoring

A number of different instruments are used in Greater Manchester for the measurement of particles. Historically TEOM a been used, but DEFRA recently replaced and number of instruments with TEOM FDMS and some sites use the BAM.

The reference method for the UK PM₁₀ Objectives (and EU limit values) is based upon measurements from a gravimetric sampler. This samples over a 24 hour period and the particulate proportion less than 10 microns (PM₁₀) is measured by the mass difference before and after exposure. It is labour intensive and the UK, and European Counties have invested heavily in the TEOM (Tapered Element Oscillating Microbalance (TEOM)). The TEOM reading have been historically adjusted by a factor of 1.3 to make them gravimetric equivalent. However to further improve the technique; the measurement was modified by lowering the sampling temperature from 50 C to 30 C and adding a dryer to remove water vapour. This system is referred to a Filter Dynamics Measurement System (FDMS) and is equivalent to EU reference method.

Due to widespread use of the TEOM, and its reliability and the need to report to the EU using an 'equivalent method', The Volatile Correction Model (VCM) was developed by Kings College London, to adjust the TEOM data. Studies have shown that FDMS sites within 200 kilometres can be used to correct the Teom data as it assumes that the sample lost by the heating is the same over this geographical area. Sufficient FDMS sites have only been available since 1998/9 for the correction to be applied.

The BAM Met one (Beta Attenuation Method). THE BAM (Met One) meets the EU equivalence after correction of factor.

Particulate data collected is corrected as follows

- All Teom data reported as gravimetric, corrected by 1.3
- FDMS results - no correction required
- BAM data (Manchester Piccadilly and South) 0.8333
- VCM corrected data- available in spreadsheet..