



2010 Air Quality Progress Report for Glasgow City Council

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

April 2010

Local Authority Officer	Dom Callaghan
--------------------------------	-------------------------------

Department	Public Health Group
Address	231 George Street, Glasgow G1 1RX
Telephone	0141 287 6628
e-mail	Dom.callaghan@glasgow.gov.uk

Report Reference number	
Date	April 2010

Executive Summary

Local Authorities are required to regularly review and assess the air quality within their area. These reviews and assessments are the basis of local air quality management and are intended to compare current and future concentrations of key air pollutants with the objectives detailed in regulations as part of the National Air Quality Strategy. This report comprises Glasgow City Council's Progress Report as part of Round 4 of review and assessment. This Progress Report has looked in detail at the new monitoring data available since the last round of review and assessment as well as considering the impact from various potential sources of air pollution.

Previous rounds of review and assessment have shown the potential for exceedences of the 2010 objective for PM₁₀ at various locations throughout the city. Specifically, the 2009 Updating and Screening Assessment highlighted the possibility of exceedences of the annual mean NO₂ objective at both the Bridge St and Queen Margaret Drive areas of the city. The USA also showed the possibility of exceedences of the annual mean PM₁₀ objective level at a variety of locations throughout the city. In general the monitoring results from 2009 show that this situation is unchanged with the exception of a reduction in the observed annual mean NO₂ levels at the Queen Margaret Drive 2 diffusion tube. The results from this are now below the objective level.

As a result of the 2009 USA it was decided that Glasgow City Council should proceed to a Detailed Assessment for these areas of concern. This Detailed Assessment is ongoing and is expected to be completed by the end of May 2010.

No new areas of concern have been identified as a result of this Progress Report.

Table of contents

1	Introduction	7
1.1	Description of Local Authority Area	7
1.2	Purpose of Progress Report	7
1.3	Air Quality Objectives	7
1.4	Summary of Previous Review and Assessments	10
2	New Monitoring Data	16
2.1	Summary of Monitoring Undertaken	16
2.2	Comparison of Monitoring Results with Air Quality Objectives	25
3	New Local Developments	38
3.1	Road Traffic Sources	38
3.2	Other Transport Sources	41
3.3	Industrial Sources	43
3.4	Commercial and Domestic Sources	46
3.5	New Developments with Fugitive or Uncontrolled Sources	47
4	Implementation of Action Plans	48
5	Conclusions and Proposed Actions	62
10.1	Conclusions from New Monitoring Data	62
10.2	Conclusions relating to New Local Developments	62
10.3	Proposed Actions	63
6	References	64

AppendicesAppendix A 2009 NO₂ Diffusion Tube Data**List of Tables**

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

Table 1.2 Summary of Previous Rounds of Review and Assessment

Table 2.1 Details of Automatic Monitoring Sites

Table 2.2a-d Details of Non- Automatic NO₂ Monitoring Sites

Table 2.3 Details of Non- Automatic Benzene Monitoring Sites

Table 2.4 Details of Non- Automatic Lead Monitoring Sites

Table 2.5 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Table 2.6 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Table 2.7a Results of Nitrogen Dioxide Diffusion Tubes within City Centre AQMA

Table 2.7b Results of Nitrogen Dioxide Diffusion Tubes within the Byres Rd & Dumbarton Rd AQMA

Table 2.7c Results of Nitrogen Dioxide Diffusion Tubes Within the Parkhead Cross AQMA

Table 2.7d Results of Nitrogen Dioxide Diffusion Tubes outwith the existing AQMAs

Table 2.8a Results of PM₁₀ Automatic Monitoring: Comparison with Annual Mean Objective

Table 2.8b Results of PM₁₀ Automatic Monitoring: Comparison with 24-hour Mean Objective

Table 2.9 Measured Annual Mean Sulphur Dioxide

Table 2.10 Measured Annual Means and Maximum 8-hr running means for CO₂

Table 2.11 Annual mean lead levels

List of Figures

- Fig 1.1 Map of AQMA Boundaries
- Fig 1.2 Parkhead Cross Air Quality Management Area
- Fig 1.3 Byres Rd and Dumbarton Rd Air Quality Management Area
- Fig 1.4 City Centre Air Quality Management Area
- Fig 2.1 Air Quality Monitoring Sites in Glasgow
- Fig 2.2 Annual Mean NO₂ Levels 2007 – 2009 from Automatic Monitoring
- Fig 2.3 Annual Mean NO₂ Levels 2007 – 2009 Within Byres Rd & Dumbarton Rd AQMA
- Fig 2.4 Annual Mean NO₂ Levels 2007 – 2009 Within Parkhead Cross AQMA
- Fig 2.5 Annual Mean PM10 Levels 2007 – 2009 from Automatic Monitoring
- Fig 2.6 Running Annual Mean Benzene levels measured at Glasgow Kerbside
- Fig 2.7 Monthly Mean Benzene levels measured by diffusion tube
- Fig 2.8 Running Annual Mean 1,3-Butadiene levels measured at Glasgow Kerbside

1 Introduction

1.1 Description of Local Authority Area

Glasgow City Council, serving a population of around 580,000, is Scotland's largest local authority. As the largest city in Scotland, Glasgow is a centre for business, manufacturing and retail. As such, the city attracts a large daily influx of people and traffic from the surrounding areas.

The city of Glasgow lies at the western end of the Clyde Valley which takes its name from the river which runs through the city.

Glasgow in many ways typifies the modern developed city where road traffic tends to be the major air quality concern, superseding a long industrial heritage.

1.2 Purpose of Progress Report

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

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in Scotland are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97), the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre, $\mu\text{g}/\text{m}^3$

April 2010

Glasgow City Council

(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 Local Air Quality Management in Scotland.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	3.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (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
	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	18 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

The Environment Act 1995 requires that local authorities review the air quality within their boundaries. Where the review concludes that air quality objectives will not be met within the statutory timeframe then the local authority is required to designate an Air Quality Management Area (AQMA). The local authority is then required to produce an Air Quality Action Plan (AQAP) to demonstrate how the authority intends to work towards meeting the air quality objectives within its AQMA.

Glasgow's first AQMA was declared in 2002 for NO₂ within the City Centre area. Since that time further assessments have concluded that the boundary of the original AQMA required to be increased and that new AQMAs were required for both Parkhead Cross and for the Byres Rd / Dumbarton Rd area.

Table 1.2 below shows a summary of the previous rounds of review and assessment and a brief description of the outcomes from each.

Table 1.2 Summary of Previous Rounds of Review and Assessment

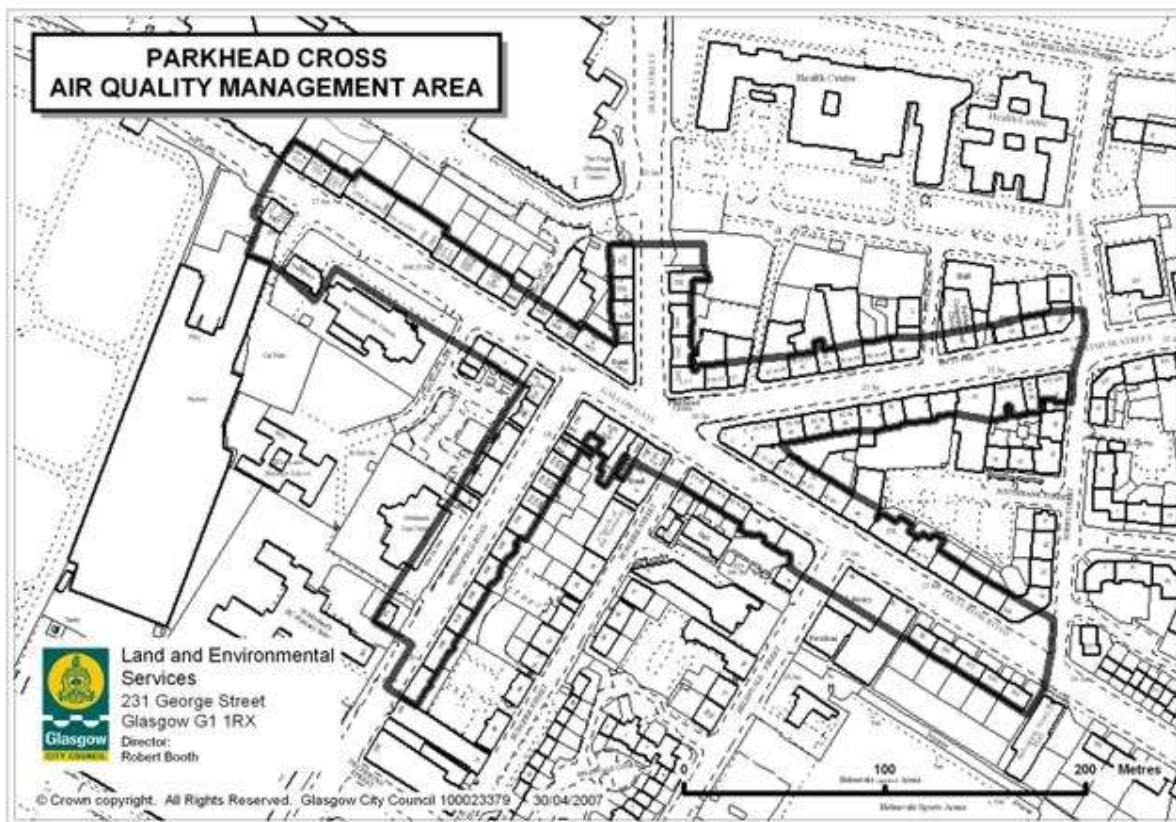
Report	Date Produced	Outcome
Stage I	1998	Proceed to Stage II for CO. Proceed to Stage III for NO ₂ and PM ₁₀
Stage II	2000	Concluded that levels of CO and SO ₂ will meet objectives.
Stage III	2001	Recommended an AQMA be declared for the city centre for NO ₂
USA	2003	Proceed to DA for NO ₂ , SO ₂ and PM ₁₀
Stage IV	2004	Confirmed city centre AQMA declaration for NO ₂
Detailed Assessment	2005	Recommended AQMA's be declared for NO ₂ at Parkhead Cross and Dumbarton Rd / Byres Rd. Extension of city centre AQMA to Royston Rd and recommended declaration of the city centre as an AQMA for PM ₁₀
Progress Report	2005	Reported on continued monitoring and recommended new monitoring at appropriate locations
USA	2006	Proceed to DA for NO ₂ in a variety of areas. Recommended new monitoring of PM ₁₀ at various locations
Detailed Assessment	2007	Recommended additional NO ₂ monitoring at locations of concern.
Further Assessment	2008	Confirmed ongoing exceedences of the objectives in the declared AQMA's
Progress report	2008	Confirmed ongoing exceedences of the objectives in the declared AQMA's and predicted likely exceedences of PM ₁₀ objectives for 2010.
USA	2009	Proceed to DA for NO ₂ at a variety of locations and proceed to DA for PM ₁₀ citywide.
Detailed Assessment	2010	Ongoing – assessment of areas highlighted in previous USA.

Glasgow City Council has declared three Air Quality Management Areas across the city. The areas are shown in Figure 1.1

Figure 1.1 Map of AQMA Boundaries



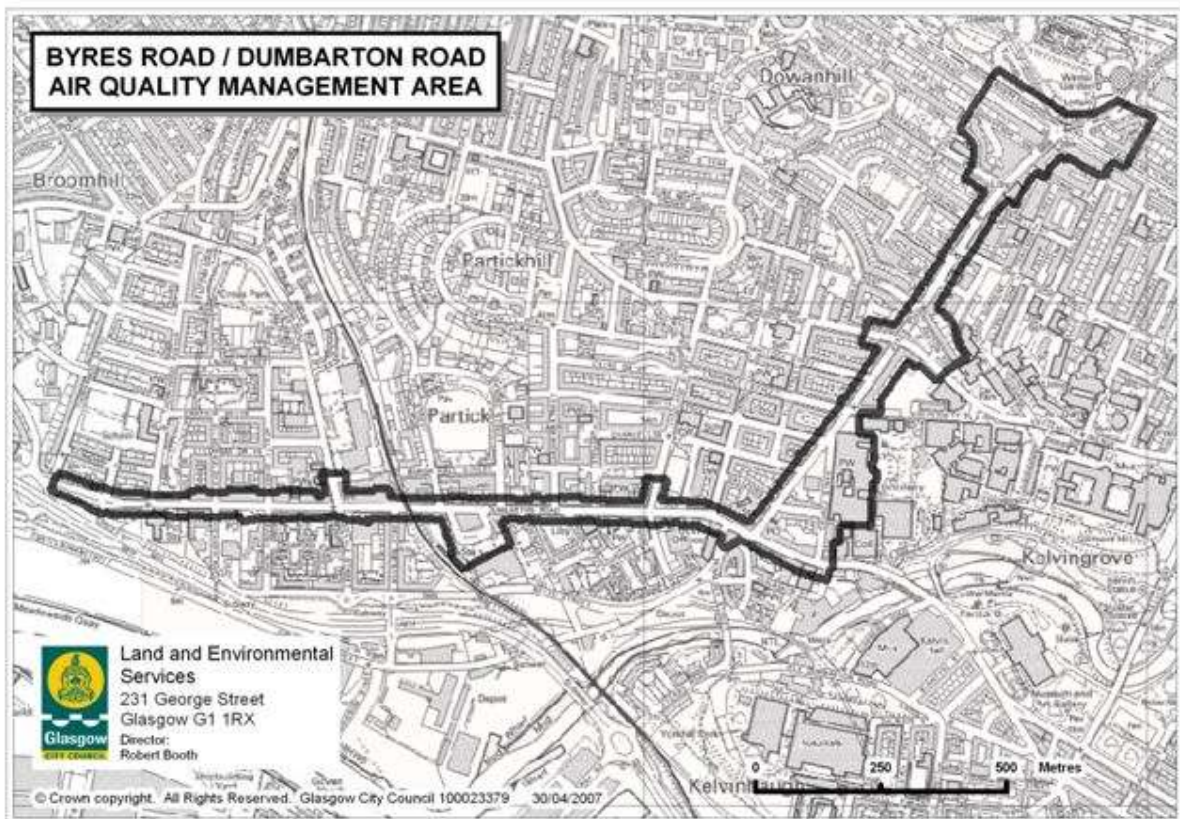
Parkhead Cross is formed by the convergence of five roads in Glasgow’s east end. The roads are Westmuir Street, Tollcross road, Springfield Road, Duke Street and Gallowgate. The area is a mixture of commercial and residential properties within mostly tenement properties.

Fig 1.2 Parkhead Cross Air Quality Management Area

The detailed street listing for this AQMA can be found in the 1st July 2007 order.

Byres Road and Dumbarton Road are at the heart of Glasgow's west end and comprise a mixture of residential and commercial properties within mostly tenement type properties. The Area covers from the junction of Byres Road and Great Western Road south to Dumbarton Road and west along Dumbarton Road as far as Thornwood Drive roundabout.

Fig 1.3 Byres Rd and Dumbarton Rd Air Quality Management Area

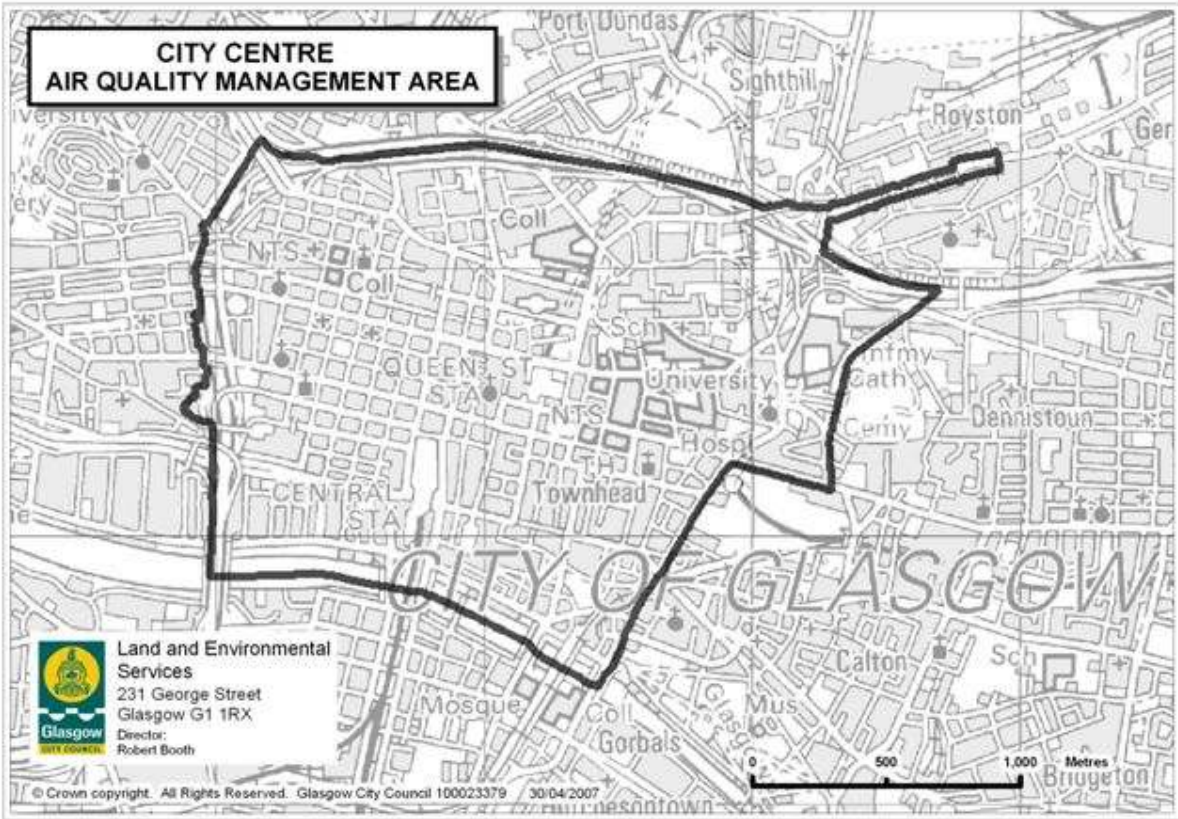


The detailed street listing for this AQMA can be found in the 1st July 2007 order.

The city centre area has been extensively developed with a large number of multi-storey properties for both commercial and residential use.

The city centre AQMA is loosely bound by the M8 motorway to the west and north (with slight protrusions at North Street and Royston Road), by High Street and Saltmarket to the east and by the river Clyde to the south.

Fig 1.4 City Centre Air Quality Management Area



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Glasgow City Council operates an extensive monitoring network across the city to measure ambient levels of air pollutants.

Automated monitoring equipment is located at eleven sites with three of the units (Glasgow Kerbside, Glasgow Centre and the City Chambers) forming part of the Department for Environment, Food and Rural Affairs (DEFRA) Automated Urban and Rural Network (AURN).

Equipment located at the sites measure a variety of air pollutants including NO₂, carbon monoxide, sulphur dioxide and PM₁₀. Hydrocarbons including benzene and 1,3-butadiene are monitored at the Glasgow Kerbside site. Instruments at these sites are calibrated every two weeks by the Local Site Operators and audits are carried out every six months by AEA Technology. All of the automatic air quality data we gather is independently ratified by AEA Technology and made available for viewing by the public at the Scottish Government funded air quality website at: <http://www.scottishairquality.co.uk>

Fig 2.1 Air Quality Monitoring Sites in Glasgow

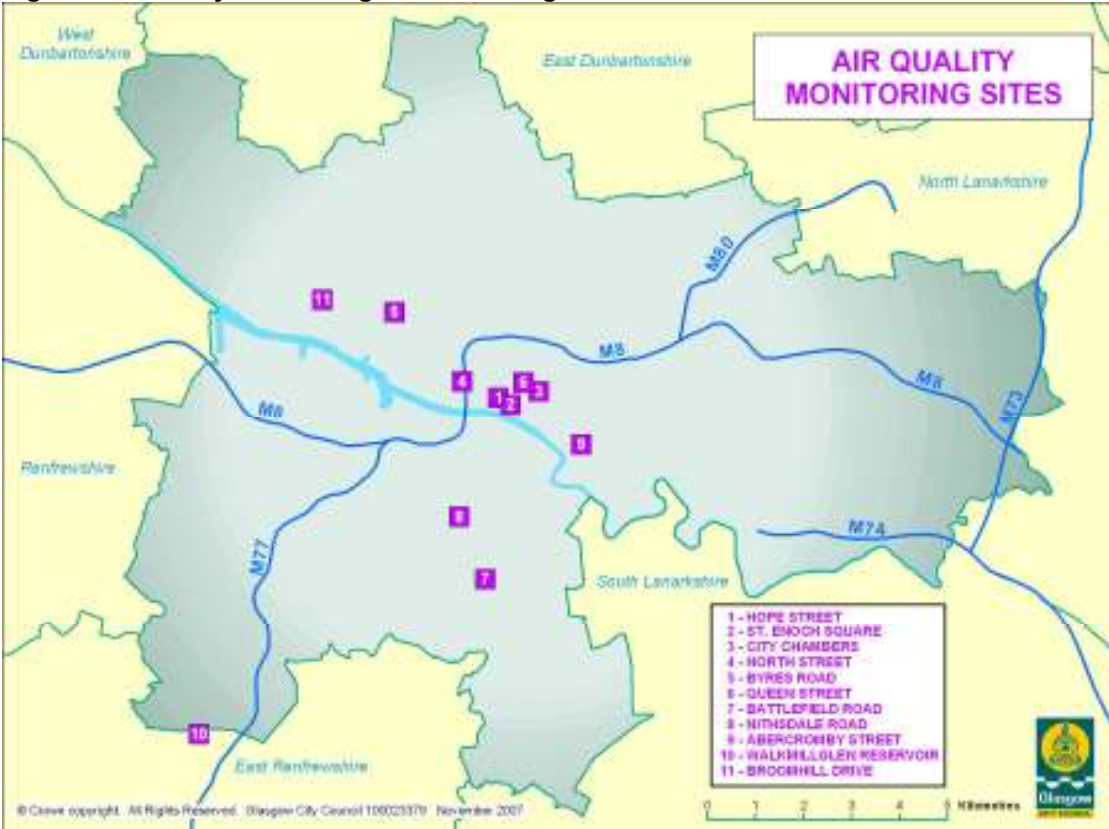


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Glasgow Kerbside	Kerbside	X 258708 Y 665200	NO ₂ PM ₁₀ Hydrocarbon	Y	Y	1m	Y
Glasgow Centre	Urban Centre	X 258902 Y 665028	NO ₂ PM ₁₀ CO O ₃ SO ₂	Y	N (>10m)	>10m	N
Glasgow Chambers	Urban Background	X 259528 Y 665308	NO ₂	Y	Y	3m	N
Glasgow Anderston	Urban Background	X 257925 Y 665487	NO ₂ PM ₁₀ CO SO ₂	Y	Y	N/A	N
Glasgow Byres Rd	Roadside	X 256526 Y 666933	NO ₂ PM ₁₀ CO	Y	Y	3m	Y
Glasgow Battlefield Rd	Roadside	X 258427 Y 661385	NO ₂ PM ₁₀	N	Y	3m	Y
Glasgow Abercromby St	Roadside	X 260420 Y 664175	PM ₁₀	N	Y	3m	Y
Glasgow Broomhill	Roadside	X 255030 Y 667195	PM ₁₀	N	Y	3m	Y
Glasgow Nithsdale Rd	Roadside	X 257883 Y 662673	PM ₁₀	N	Y	3m	Y
Glasgow Waulkmillglen Reservoir	Rural	X 252520 Y 658095	NO ₂ PM ₁₀ O ₃	N	N	N/A	N

The automatic monitoring sites located at Nithsdale Road, Abercromby Street and Broomhill Drive were first installed in late 2007 and therefore only data from 2008 and 2009 have been included in this report. These sites all contain FDMS TEOM analysers for monitoring PM₁₀ concentrations.

All PM₁₀ analysers are FDMS apart from those located at Anderston, Byres Rd, Battlefield Rd and Waulkmillglen Reservoir. The results from these sites have been adjusted using the Volatile Correction Model developed by King's College.

2.1.2 Non-Automatic Monitoring

Glasgow City Council also operate a non-automatic monitoring network of diffusion tubes which measure NO₂ levels at almost 100 sites around the city. NO₂ diffusion tubes represent a simple, effective and low cost method of monitoring ambient concentrations of nitrogen dioxide in a large number of locations. However, NO₂ concentration data provided by diffusion tubes is limited to fairly long-term exposure. Tubes are generally exposed for periods of a month, annual mean concentrations determined and compared with the annual mean objective. Furthermore, the accuracy of diffusion tubes can vary depending on the preparation methodology, handling procedures and the identity of the analysing laboratory.

To correct for this possible bias in tube data, results are corrected using information gained from co-location studies. Triplicate tubes are co-located with the automatic NO₂ analysers at Glasgow Centre, Glasgow Kerbside, Glasgow Anderston and Byres Road. Concentrations detected by these tubes were compared against those recorded through chemiluminescent detection over the same sampling period and a bias-correction factor determined using the guidance outlined in LAQM.TG(09). For 2009 annual means a bias correction factor of 1.09 was used. Diffusion tubes utilised by Glasgow City Council are prepared and analysed by Glasgow City Council's Scientific Services. This laboratory participates in both the WASP scheme and the field intercomparison exercise managed by AEA. The laboratory also follows the procedures set out in the Harmonisation Practical Guidance.

In addition to these monitoring methods Glasgow City Council also operated benzene diffusion tubes at four sites across the city and lead levels are monitored by filter analysis at one further location. All analysis is conducted by Glasgow City Council Scientific Services Laboratory.

Table 2.2a Details of Non- Automatic NO₂ Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Hope St	Kerbside	258708 665200	NO ₂	Y	N (5M)	<1m	Y
George Square	Urban Background	259296 665389	NO ₂	Y	N(30m)	30m	N
Union St	Roadside	258829 665201	NO ₂	Y	Y	3m	Y
Bath St	Roadside	258215 665864	NO ₂	Y	N (3m)	3m	Y
Glassford St	Roadside	259355 665254	NO ₂	Y	Y	3m	Y
Briggait	Kerbside	259458 664701	NO ₂	Y	N	<1m	Y
Castle St	Roadside	260068 665589	NO ₂	Y	Y	3m	N
Hope St 2	Roadside	258733 665363	NO ₂	Y	Y	3m	Y
Hope St 3	Kerbside	258857 665913	NO ₂	Y	N (5m)	1m	N
Montrose St	Roadside	259548 665283	NO ₂	Y	Y	3m	Y
Cochrane St	Roadside	259430 665316	NO ₂	Y	Y	3m	Y
Renfield St	Roadside	258898 665644	NO ₂	Y	Y	3m	Y
George St	Kerbside	259551 665380	NO ₂	Y	N (3m)	1m	Y
North St	Roadside	257883 665650	NO ₂	Y	N (15m)	3m	N
Hope St 1	Roadside	258730 665322	NO ₂	Y	Y	3m	Y
Gordon St	Roadside	258766 665347	NO ₂	Y	N (5m)	3m	N
Heilan'man's Umbrella North	Roadside	258770 665117	NO ₂	Y	Y	3m	Y
Heilan'man's Umbrella South	Roadside	258769 665106	NO ₂	Y	Y	3m	Y
Saltmarket	Roadside	259545 664739	NO ₂	Y	Y	3m	Y
High St	Roadside	259732 664991	NO ₂	Y	Y	3m	Y
Dobbies Loan	Urban Background	259414 666194	NO ₂	Y	Y	3m	N

Table 2.2b Details of Non- Automatic NO₂ Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Cathedral Bridge	Roadside	259136 665661	NO ₂	Y	N (10m)	3m	N
Dundasvale St	Urban Background	258820 666305	NO ₂	Y	Y	15m	N
Royston Rd	Roadside	260435 666265	NO ₂	Y	N (5m)	3m	N
St Mungo Avenue	Urban Background	259389 665867	NO ₂	Y	Y	5m	N
Brown St	Roadside	258300 665062	NO ₂	Y	Y	3m	N
McLeod St 1	Urban Background	260077 665481	NO ₂	Y	Y	8m	N
McLeod St 2	Urban Background	260077 665481	NO ₂	Y	Y	8m	N
Sauchiehall St	Urban Background	258639 665852	NO ₂	Y	N (10m)	N/A	N
Kennedy Path	Urban Background	259726 665980	NO ₂	Y	Y	10m	N
Byres Rd	Roadside	256526 666933	NO ₂	Y	N (20m)	4m	Y
Dumbarton Rd	Roadside	256209 666525	NO ₂	Y	N (3m)	3m	Y
Lawrence St	Roadside	256295 666816	NO ₂	Y	N (5m)	2m	N
Cooperswell St	Roadside	256154 666478	NO ₂	Y	Y	4m	Y
Westmuir St	Roadside	262589 664139	NO ₂	Y	Y	3m	Y
Mossie Rd	Roadside	257235 662064	NO ₂	N	N (3m)	3m	Y
Bridge St	Roadside	258702 664480	NO ₂	Y	N (3m)	3m	Y
Finnieston St	Roadside	257235 665108	NO ₂	N	N(5m)	3m	Y
Hillcrest Rd 1	Roadside	256485 663205	NO ₂	N	N (5m)	3m	N
Hillcrest Rd 2	Roadside	256485 663205	NO ₂	N	N (5m)	3m	N
St Andrews Dr	Urban Background	256230 662587	NO ₂	N	Y	N/A	N

Table 2.2c Details of Non- Automatic NO₂ Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Haggs Rd	Roadside	256295 661792	NO ₂	N	Y	3m	Y
Pollokshaws Rd	Roadside	255864 661180	NO ₂	N	Y	5m	N
Queen Margaret Dr	Roadside	257440 668016	NO ₂	N	N (20m)	3m	Y
Napiershall St	Roadside	257793 666794	NO ₂	N	Y	4m	Y
Queen Margaret Dr 2	Roadside	257216 667639	NO ₂	N	Y	3m	Y
Queen Margaret Dr 3	Roadside	256941 667363	NO ₂	N	Y	3m	N
Oxford St	Roadside	258731 664590	NO ₂	N	Y	3m	N
Anniesland Cross	Roadside	254613 668885	NO ₂	N	Y	15m	N
Balshagray Ave	Roadside	254497 667298	NO ₂	N	Y	10m	N
Dougie Rd	Roadside	259586 658996	NO ₂	N	N (20m)	3m	Y
Main St (Bridgeton)	Roadside	260654 663429	NO ₂	N	Y	5m	Y
Aikenhead Rd	Roadside	259229 662581	NO ₂	N	Y	6m	Y
Langside Primary School	Roadside	257135 661622	NO ₂	N	N (5m)	3m	N
Thornwood Dr	Roadside	254904 666856	NO ₂	N	Y	3m	N
Springburn Rd	Roadside	269540 669268	NO ₂	N	Y	6m	Y
Paisley Rd West	Roadside	255705 664325	NO ₂	N	Y	3m	Y
Sutherland Avenue	Urban Background	256343 663153	NO ₂	N	N (10m)	5m	N
Belmont St	Roadside	257533 667418	NO ₂	N	N (5m)	3m	Y
Mallaig Pl	Urban background	253984 665299	NO ₂	N	N (20m)	6m	N
Govanhill St	Roadside	258545 665299	NO ₂	N	N (3m)	3m	N
Westercraigs	Urban Background	260943 665225	NO ₂	N	Y	15m	N

Table 2.2d Details of Non- Automatic NO₂ Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Inveresk Lane	Urban Background	264162 664854	NO ₂	N	Y	20m	N
Kippen St	Urban Background	259727 668476	NO ₂	N	N (5m)	3m	N
Sacone SW	Urban background	263920 664570	NO ₂	N	Y	20m	N
Castlemilk	Urban Background	260156 659189	NO ₂	N	N (10m)	30m	N
Invergarrie Rd	Urban Background	253824 658589	NO ₂	N	N (5m)	3m	N
Easterhouse	Roadside	267005 666215	NO ₂	N	Y	5m	N
Dunn St	Urban Background	261288 663931	NO ₂	N	Y	5m	N
Glasgow Harbour	Urban Background	254475 666544	NO ₂	N	Y	30m	N
Mavisbank Gardens	Roadside	257118 664914	NO ₂	N	Y	3m	N

Table 2.3 Details of Non- Automatic Benzene Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure ? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Heilanmans Umbrella North	Roadside	258770 665117	Benzene	Y	Y	3m	Y
Hope Street	Kerbside	258708 665200	Benzene	Y	N (3m)	<1m	Y
Ochiltree Avenue	Roadside	254839 669295	Benzene	N	N (3m)	5m	Y
Pollokshaws Road	Roadside	255869 661185	Benzene	N	N (3m)	3m	Y

Table 2.4 Details of Non- Automatic Lead Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure ? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Chambers	Urban Background	259528 665308	Lead	Y	Y	3m	Y
Pattersons	Urban Background	267663 663336	Lead	N	Y	N/A	N

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Nitrogen dioxide is monitored using automatic analysers at seven locations; the three AUN sites and Glasgow Anderson, Byres Road, Battlefield and Waulkmillglen reservoir. Table 2.5 shows the measured annual mean at the all seven sites over the last three years.

Table 2.5 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Location	Within AQMA?	Proportion of year with valid data 2009 %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
			2007	2008	2009
Glasgow Kerbside	Y	96.9	70	82	78
Glasgow Centre	Y	90.7	31	35	42
Glasgow Chambers	Y	97.2	47	48	46
Glasgow Anderston	Y	92.3	33	32	36
Glasgow Byres Rd	Y	99.6	40	43	40
Glasgow Battlefield Rd	N	99.6	34	32	34
Glasgow Waulkmillglen Reservoir	N	94.0	9	12	12

Figure 2.2 shows that the Kerbside, Chambers and Byres Road sites are recording concentrations of nitrogen dioxide which are continually breaching the annual mean objective. In addition to this the Glasgow Centre site also recorded an exceedence of the annual mean NO_2 objective for 2009.

Fig 2.2 Annual Mean NO₂ Levels 2007 – 2009 from Automatic Monitoring

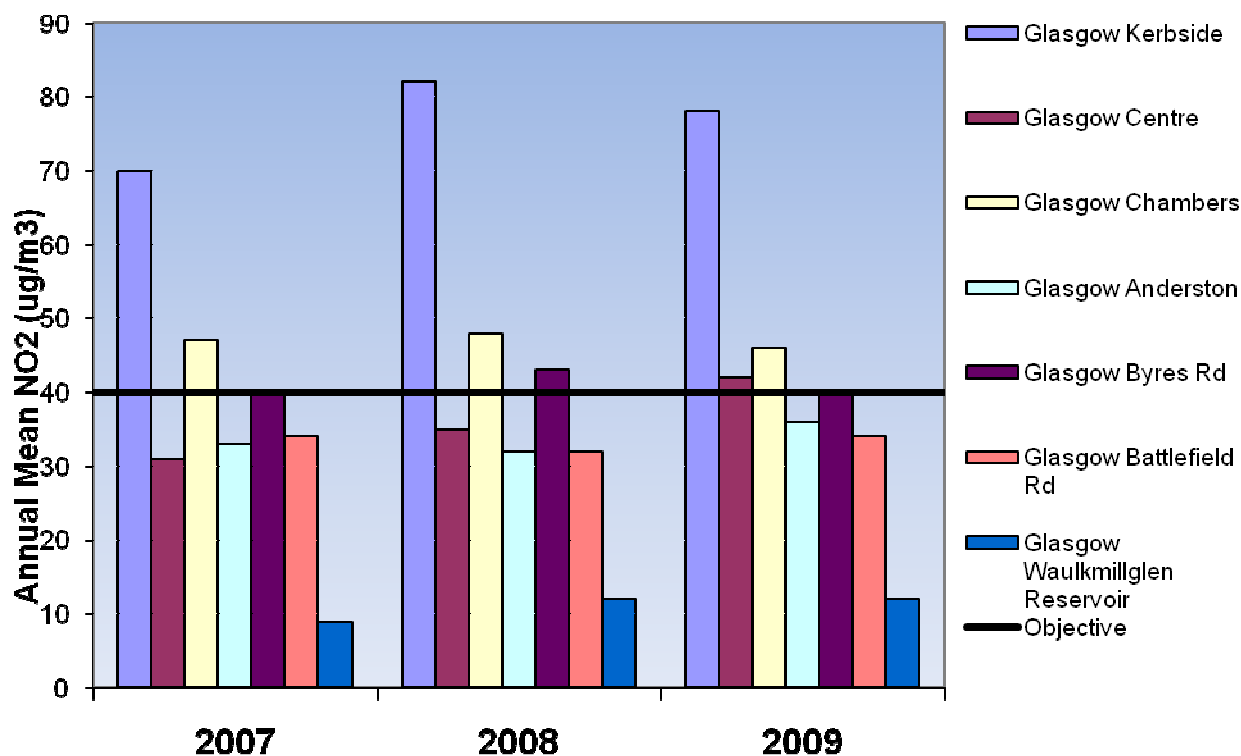


Table 2.6 shows the number of exceedences of the 200µg/m³ hourly objective. Glasgow Kerbside is the only site which regularly breaches the permitted 18 exceedences of this objective per year. However, in 2009 48 exceedences were recorded at Glasgow Centre. This was attributed to a Christmas Market being set up around the monitoring site. Several diesel generators were located in the area with the exhaust for one located just a few feet from the sample inlet.

Table 2.6 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Location	Within AQMA?	Data Capture 2009 %	Number of Exceedences of hourly mean (200 µg/m ³)		
			2007	2008	2009 *
Glasgow Kerbside	Y	96.9	21	72	57
Glasgow Centre	Y	90.7	0	0 (175)	48
Glasgow Chambers	Y	97.2	2	0	12
Glasgow Anderston	Y	92.3	0	1 (137)	4
Glasgow Byres Rd	Y	99.6	6	6	0
Glasgow Battlefield Rd	N	99.6	0	0	1
Glasgow Waulkmillglen Reservoir	N	94.0	0	0 (87)	0

Diffusion Tube Monitoring Data

Tables 2.7a – 2.7d show the annual mean NO₂ concentrations measured using diffusion tubes. All values have been corrected for bias using the factor appropriate for the year represented (2007 = 0.92, 2008 = 0.87, 2009 = 1.09).

Table 2.7a Results of Nitrogen Dioxide Diffusion Tubes within City Centre AQMA

Location	Annual mean concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias		
	2007	2008	2009
Hope St	77	83	64
George Square	53	47	44
Union St	74	66	61
Bath St	40	60	53
Glassford St	63	67	51
Castle St	42	40	32
Hope St 3	64	62	57
Montrose St	45	41	42
Cochrane St	42	-	44
Renfield St	74	66	54
George St	35	57	53
North St	59	44	40
Hope St 1	90	82	83
Gordon St	74	57	81
Heilan'man's Umbrella North	92	91	76
Saltmarket	46	47	43
High St	59	58	54
Dobbies Loan	35	31	32
Cathedral Bridge	56	59	60
Dundasvale St	36	35	36
Royston Rd	46	49	42
St Mungo Avenue	46	35	38
Brown St	38	40	32
McLeod St 1	42	39	39
McLeod St 2	41	38	34
Sauchiehall St	42	51	46
Kennedy Path	35	36	31

Table 2.7b Results of Nitrogen Dioxide Diffusion Tubes within the Byres Rd & Dumbarton Rd AQMA

Location	Annual mean concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias		
	2007	2008	2009
Byres Rd	55	57	47
Dumbarton Rd	41	38	40
Lawrence St	30	33	30
Cooperswell St	30	33	27
Queen Margaret Dr 3	45	39	45

Figure 2.3 below shows that the diffusion tubes at Byres Road, Dumbarton Rd and Queen Margaret Drive 3 breach the annual mean objective for NO₂. However, the other diffusion tubes within this AQMA are showing levels of NO₂ within the objective.

Fig 2.3 Annual Mean NO₂ Levels 2007 – 2009 Within Byres Rd & Dumbarton Rd AQMA

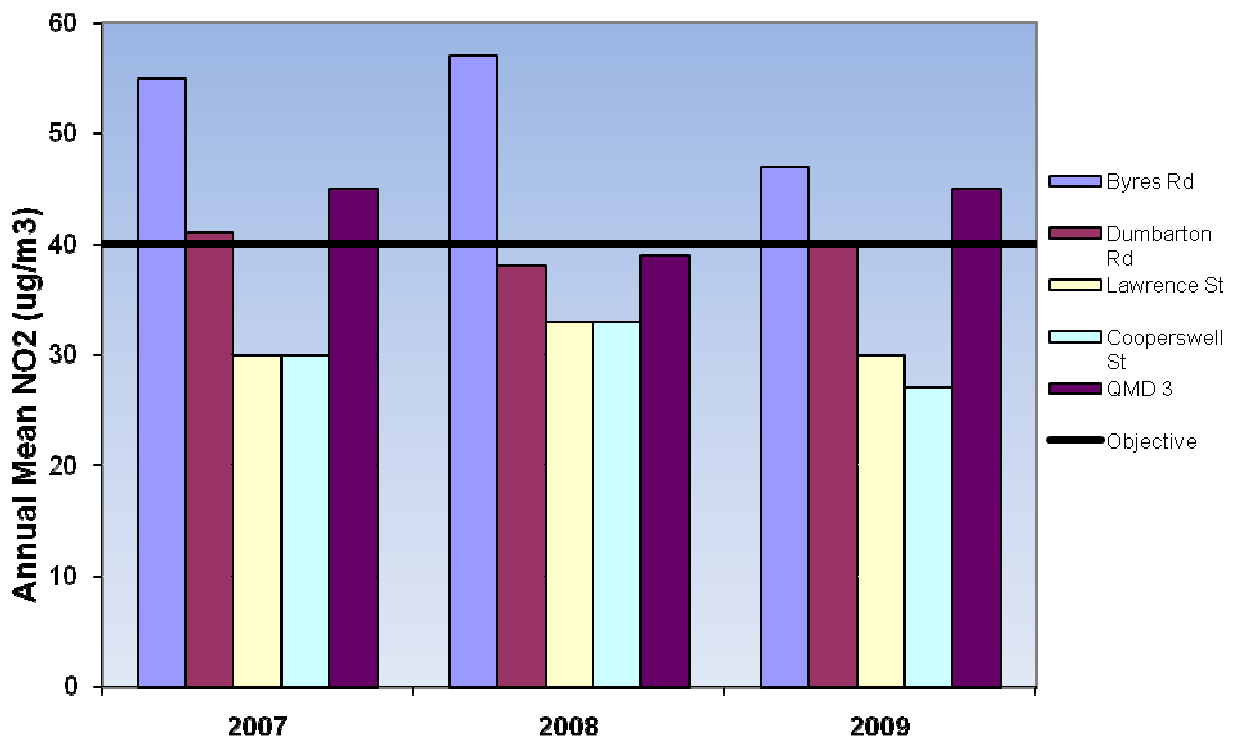


Table 2.7c Results of Nitrogen Dioxide Diffusion Tubes Within the Parkhead Cross AQMA

Location	Annual mean concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias		
	2007	2008	2009
Westmuir St	54	49	49

The Westmuir Street diffusion tube within this AQMA continually breaches the objective level for NO_2 . However, a regular decline in annual mean NO_2 has been observed in recent years.

Fig 2.4 Annual Mean NO_2 Levels 2007 – 2009 Within Parkhead Cross AQMA

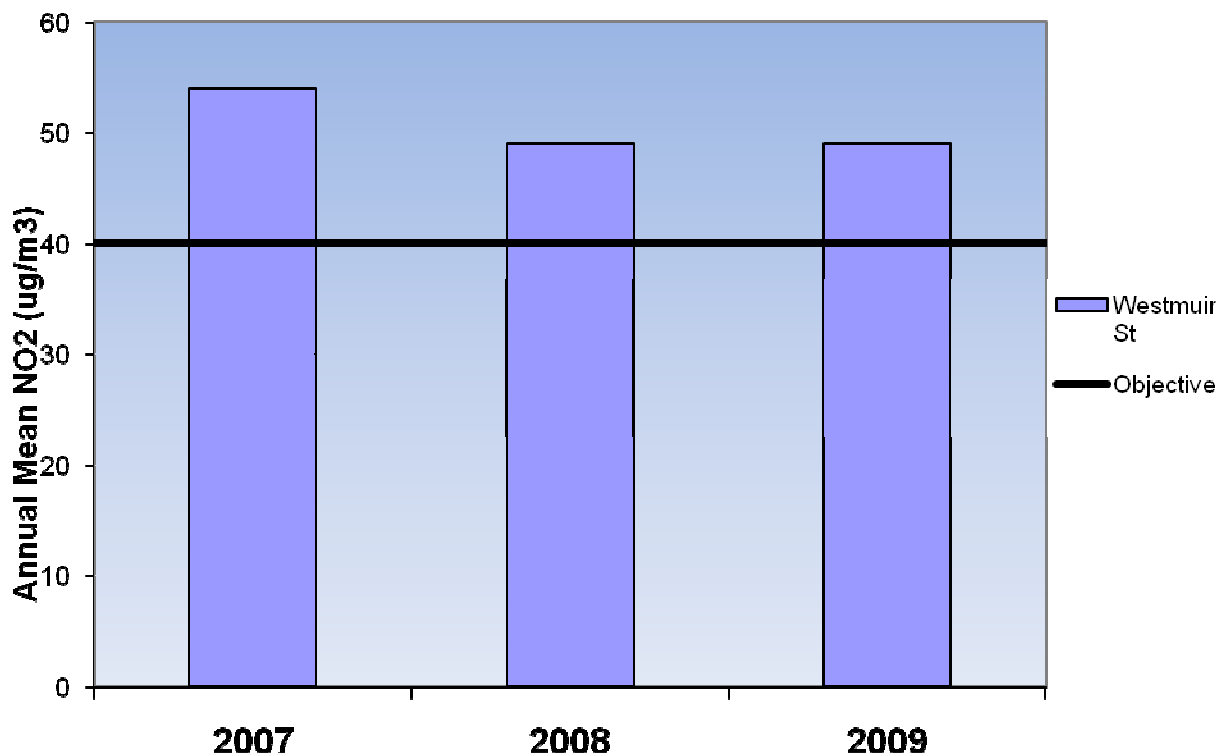


Table 2.7d Results of Nitrogen Dioxide Diffusion Tubes outwith the existing AQMAs

Location	Annual mean concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias		
	2007	2008	2009
Mossie Rd	38	35	36
Bridge St / Norfolk St	49	50	43
Finnieston St	44	48	37
Hillcrest Rd 1	26	22	26
St Andrews Dr	26	22	21
Haggs Rd	35	36	36
Pollokshaws Rd	28	27	27
Queen Margaret Dr	35	32	35
Napiershall St	38	37	35
Queen Margaret Dr 2	33	42	39
Oxford St	36	32	38
Annie'sland Cross	45	39	29
Balshagray Ave	33	30	32
Dougie Rd	26	23	23
Main St (Bridgeton)	29	25	27
Aikenhead Rd	26	29	27
Langside Primary School	29	22	24
Thornwood Dr	29	25	26
Springburn Rd	33	30	31
Paisley Rd West	36	37	33
Sutherland Avenue	20	21	20
Belmont St	26	26	28
Mallaig Pl	24	29	27
Govanhill St	32	30	31
Westercraigs	26	27	25
Inveresk Lane	23	20	20
Kippen St	22	21	28
Sacone SW	26	21	22
Castlemilk	19	19	17
Invergarrie Rd	22	16	19
Easterhouse	22	21	20
Dunn St	31	26	23
Glasgow Harbour	30	27	28
Hyndland Road	-	-	32
Silverburn	-	-	23

2.2.2 PM₁₀

Levels of PM₁₀ recorded through automatic analysers within Glasgow are summarised in Table 2.8a. Glasgow meets the current 40µg/m³ National Air Quality Strategy objective for annual mean PM₁₀, however in 2010 the objective is lowered to 18µg/m³.

Table 2.8a Results of PM₁₀ Automatic Monitoring: Comparison with Annual Mean Objective

Location	Within AQMA?	Data Capture 2009 %	Annual mean concentrations (µg/m ³)		
			2007	2008	2009
Glasgow Kerbside	Y	94.3	32	23	26
Glasgow Centre	Y	75.7	20	16	25
Glasgow Anderston	Y	92.3	19	14	20
Glasgow Byres Rd	Y	98.1	25	18	19
Glasgow Battlefield Rd	N	88.9	23	15	16
Glasgow Abercromby St	N	92.5	-	19	18
Glasgow Broomhill	N	92.4	-	19	18
Glasgow Nithsdale Rd	N	90	-	21	17
Glasgow Waulkmillglen	N	97.6	15	11	11

As shown above, the current PM₁₀ levels at several sites within Glasgow are above the objective level required by 2010.

Fig 2.5 Annual Mean PM10 Levels 2007 – 2009 from Automatic Monitoring

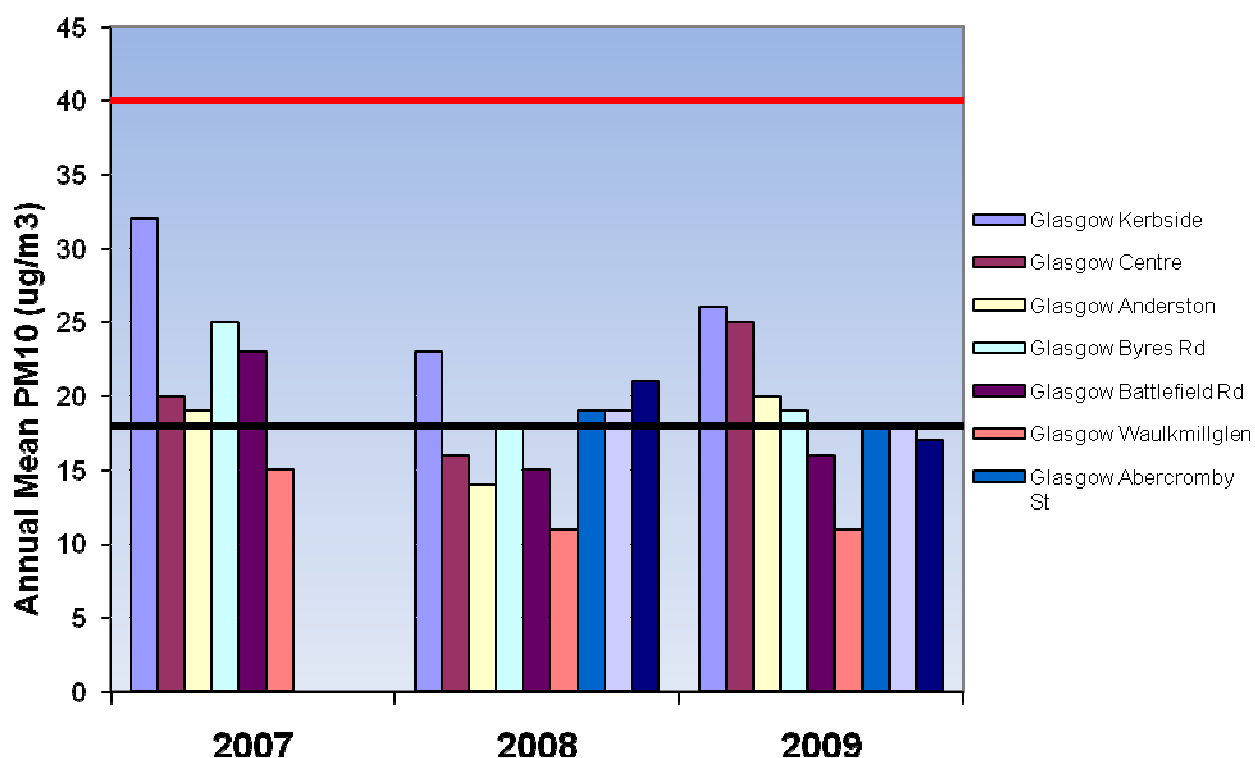


Table 2.8b Results of PM₁₀ Automatic Monitoring: Comparison with 24-hour Mean Objective

Location	Within AQMA?	Data Capture 2009 %	Number of Exceedences of 24 hour mean (50 µg/m ³) <i>If data capture < 90%, include the 98.1th %ile of hourly means in brackets.</i>		
			2007	2008	2009
Glasgow Kerbside	Y	94.3	41	10	18
Glasgow Centre	Y	75.7	4	0	21(58)
Glasgow Anderston	Y	92.3	3	1	12
Glasgow Byres Rd	Y	98.1	10	1	2
Glasgow Battlefield Rd	N	88.9	7	0	2(42)
Glasgow Abercromby St	N	92.5	-	9	7
Glasgow Broomhill	N	92.4	-	8	7
Glasgow Nithsdale Rd	N	90	-	7	6
Glasgow Waulkmillglen	N	97.6	3	0	0

It can be seen from Table 2.8b that there has been a large increase in the number of exceedences of the 24hr mean at Glasgow Centre. As with the hourly mean NO₂ this can be largely attributed to the presence of a Christmas Market with all the exceedences occurring during the period of the market.

2.2.3 Sulphur Dioxide

Sulphur Dioxide is measured at two sites in Glasgow using automatic analysers. Table 2.9 shows the measured annual mean concentrations of SO₂ measured at the Glasgow Centre and Glasgow Anderston sites.

The air quality objectives for SO₂ are 15-minute, 1-hour and 24-hour means. There were no measured exceedences of these objectives in Glasgow.

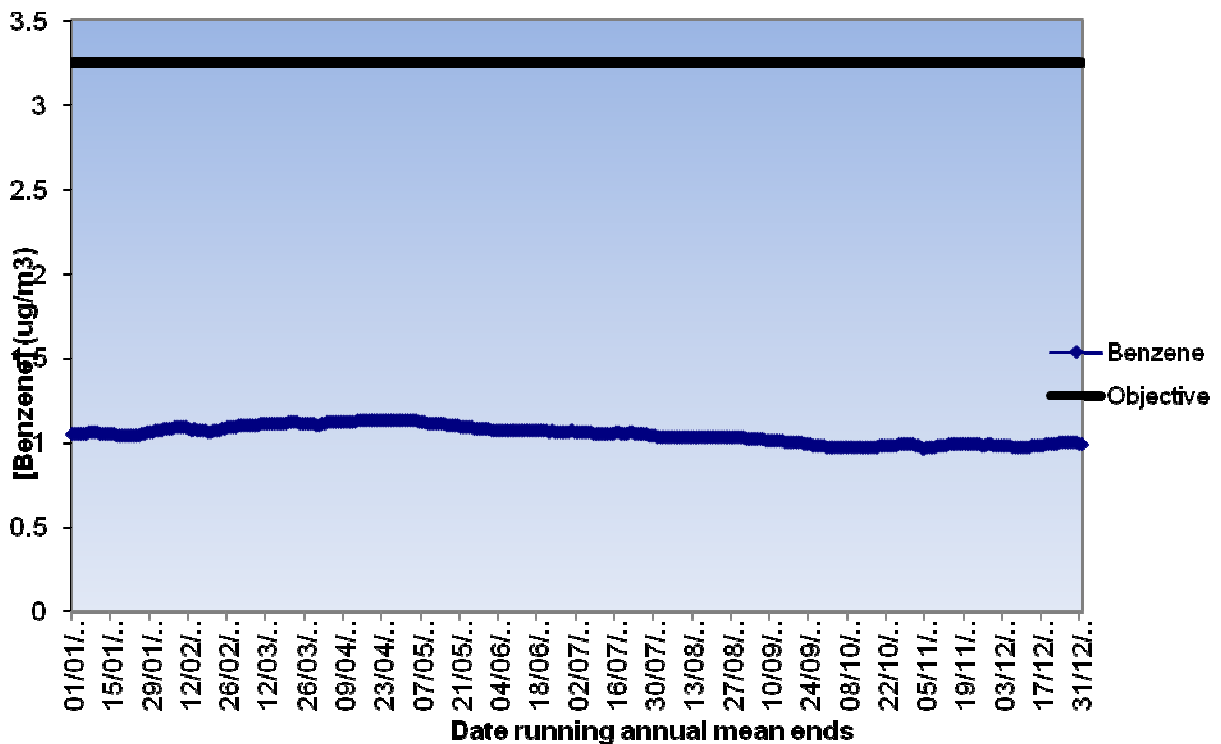
Table 2.9 Measured Annual Mean Sulphur Dioxide

Location	Measured Annual Mean (µgm ⁻³)		
	2007	2008	2009
Glasgow Anderston	3.54	1.88	1.87
Glasgow Centre	2.19	1.98	3.55

2.2.4 Benzene

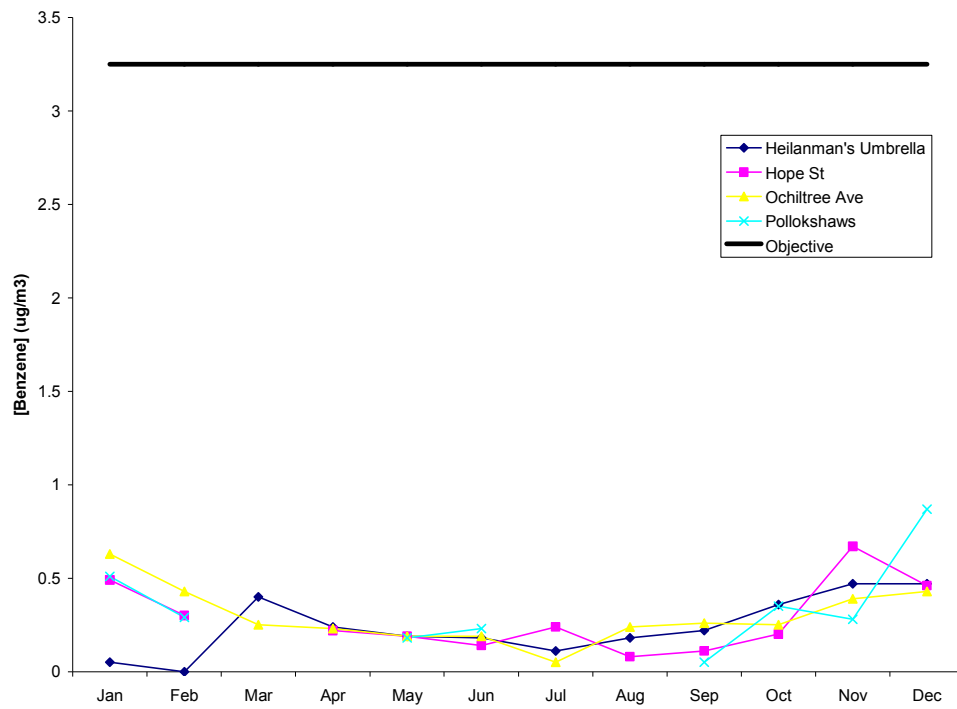
Benzene is measured at Glasgow Kerbside using an automatic analyser, the results of which are shown in Figure 2.6. As can be seen the running annual mean is well below the objective level at this location.

Fig 2.6 Running Annual Mean Benzene levels measured at Glasgow Kerbside



Benzene is also measured using diffusion tubes at four sites in Glasgow. The tubes at these sites have been in operation since early 2006 and the tubes are exposed for one month at a time and then analysed. The results can be seen in Figure 2.7.

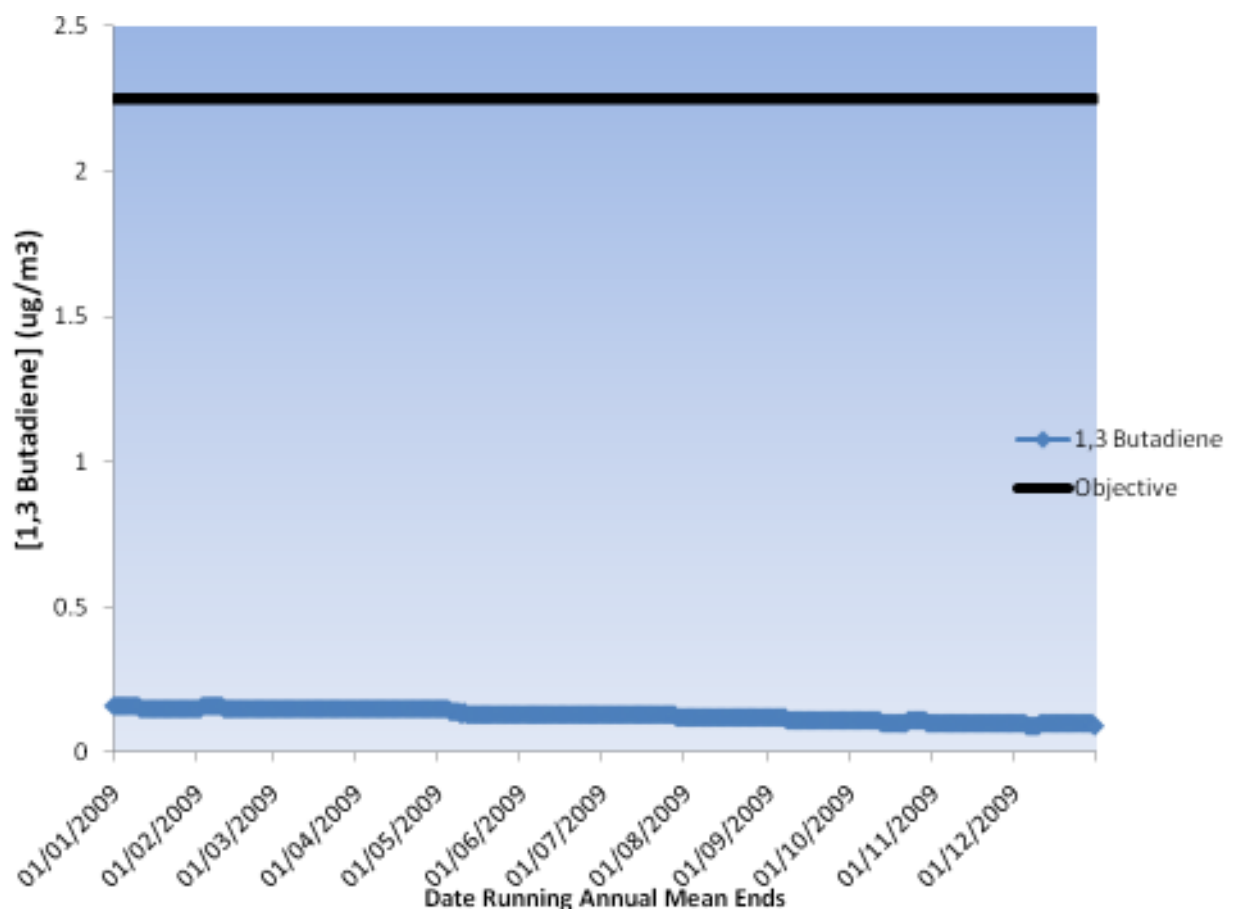
Fig 2.7 Monthly Mean Benzene levels measured by diffusion tube



2.2.5 1,3-Butadiene

1,3-Butadiene is measured at Glasgow Kerbside using the same automatic analyser which measures benzene, the results of which are shown in Figure 2.8. As can be seen the running annual mean is well below the objective level at this location.

Fig 2.8 Running Annual Mean 1,3-Butadiene levels measured at Glasgow Kerbside



2.2.6 Carbon Monoxide

Table 2.10 shows CO concentrations measured at three sites using automatic analysers. The air quality objective for Scotland for CO is a running 8-hour mean of 10.0 mg/m³. In Glasgow there have been no exceedences of this objective.

Table 2.10 Measured Annual Means and Maximum 8-hr running means for CO₂

	Data Capture 2008 %	Measured Annual Mean (mg/m ³)			Maximum 8hr running mean (mg/m ³)		
		2007	2008	2009	2007	2008	2009
Glasgow Centre	95.6	0.3	0.3	0.2	1.1	2.8	1.9
Glasgow Anderston	92.5	0.1	0.2	0.1	1.0	2.2	1.6
Glasgow Byres Road	98	0.3	0.3	0.3	1.8	2.9	1.8

2.2.7 Lead

Glasgow City Council operates 2 monitoring sites for lead. One is located within the City Chambers while the other is located close to the Patterson's tip in the east end of the city. A measured concentration is pulled through a filter. Particulate matter is gathered on the filter and analysed using wet chemical techniques to determine the concentration of lead deposited.

Table 2.11 – Annual mean lead levels

	Lead Concentration (µg/m ³)		
	2007	2008	2009
City Chambers	0.026	0.022	0.021
Pattersons	0.028	0.027	0.026

Annual averages recorded at both sites are significantly below the Air Quality Strategy Objective of 0.25µg/m³.

2.2.8 Summary of Compliance with AQS Objectives

Glasgow City Council has measured concentrations of nitrogen dioxide above the annual mean objective at a relevant location outwith the existing AQMA's. Measurements of PM10 above the annual mean objective have also been made at relevant locations outwith the existing AQMA's. However, all of these locations were identified in the 2009 USA and as such the decision to proceed to a Detailed Assessment was made. This assessment is currently under way and is expected to be completed in May 2010.

No new areas for potential exceedences of the objectives have been identified within this Progress Report.

3 New Local Developments

3.1 Road Traffic Sources

3.1.1 Narrow Congested Streets with Residential Properties Close to the Kerb

A location with a combination of high traffic volume and narrow streets is where exceedences of the objectives are most likely. Slow moving, stop/start driving can cause high emissions, with buildings on either side of the road reducing dispersion. Such locations should be assessed for potential exceedences of the air quality objectives.

Previous rounds of review and assessment have considered these streets in some detail. No new streets which meet the criteria have been identified.

Glasgow City Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

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

There are certain locations where members of the public may be expected to spend 1-hour or more on a regular basis, such as shopping areas. These need to be assessed if they are next to a busy road where there is the potential for exceedences of the 1-hour objective for NO₂.

Glasgow has a number of locations such as these. However, the busiest streets for traffic and for shopping are currently within the existing boundary of the city centre

AQMA. Therefore, these will not to be assessed further at the present time. No new streets which meet the criteria have been identified.

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

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

Certain streets may not have an exceptionally high traffic flow, but if there is a high proportion of buses or heavy goods vehicles (HGVs), which are large emitters of NO_x, there may still be elevated concentrations of pollution.

Outwith the existing AQMA's it is considered that there are no roads which meet the criteria laid out in LAQM.TG(09).

Glasgow City Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.1.4 Junctions and Busy Roads

Busy road junctions are areas where concentrations of NO₂ can increase due to build up of traffic. Busy junctions are those with more than 5000 vehicles per day where the annual mean PM₁₀ background in 2010 is expected to be above 15µg/m³. Alternatively it can be considered if there are more than 10,000 vehicles per day where the mean background level in 2010 is expected to be below 15µg/m³. It is not necessary to assess those junctions that do not have relevant exposure.

It is considered that all junctions which meet the above criteria have been evaluated in previous rounds of review and assessment.

Glasgow City Council confirms that there are no new/newly identified busy junctions/busy roads.

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

Previous rounds of review and assessment have considered the potential impact on air quality from two major proposed new roads. These are the M74 extension and the East End Regeneration Route. At present both of these roads are under construction. Air quality monitoring has been undertaken along both of these routes to help quantify any potential impact. Monitoring will continue after the routes are completed.

At the present time there are no new major roads proposed for within the city of Glasgow.

Glasgow City Council confirms that there are no new/proposed roads.

3.1.6 Roads with Significantly Changed Traffic Flows

Those roads which were previously at risk of exceeding the objectives may be subject to higher concentration of pollutants if there has been a 'large' increase in traffic flow, where 'large' is defined as,

"..more than 25% increase in traffic flow."

The road network in Glasgow has not undergone any major changes that could lead to such an increase in traffic flow since the last round of review and assessment.

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

3.1.7 Bus and Coach Stations

Because of the high volume of buses and coaches using bus stations on a regular basis, there is a risk of exceedences of the hourly objective for NO₂. The main bus station in Glasgow is Buchanan Bus Station, located within the city centre AQMA.

This bus station has been extensively assessed in previous rounds of review and assessment.

Glasgow City Council confirms that there are no relevant bus stations in the Local Authority area.

3.2 Other Transport Sources

3.2.1 Airports

Aircraft are significant sources of nitrogen oxide emissions, most particularly during takeoff. It is thought that they can make a significant contribution to ground-level concentrations when they are below 200m.

Glasgow International Airport is located outwith the city boundary and falls within the jurisdiction of Renfrewshire Council. Guidance suggests to,

...establish whether there is relevant exposure within 1000m of the airport boundary...

Since the airport is more than two kilometres from the city boundary, there is no relevant exposure and so emissions from aircraft takeoff are not predicted to have any effect on air quality in Glasgow.

Glasgow City Council confirms that there are no airports in the Local Authority area.

3.2.2 Railways (Diesel and Steam Trains)

Diesel and coal-fired railway locomotives can potentially emit large quantities of SO₂, and if these engines are stationary while running for 15-minute periods or more, then there is a risk of exceedences of the 15-minute objective. Locations where this is likely to occur include stations, depots and junctions. For this to be an issue in terms of public exposure, there must be, according to the Technical Guidance, a potential for:

“regular outdoor exposure of members of the public within 15m of the stationary locomotives”.

It is considered unlikely that there will be any locations where diesel trains have their engines running for extended periods *and* where there is potential exposure for the public. Even in locations like Glasgow Central and Queen Street stations, where engines may idle occasionally, the areas where the public would wait are more than 15m from the locomotive engines. In addition, the potential exists for locomotive engines running at rail depots; however, such sites are not generally accessible to the public.

3.2.3 Stationary Trains

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

3.2.4 Moving Trains

The main Glasgow to Edinburgh line has been identified as a section of track that may have a large number of movements of diesel locomotives. However, there are no areas along the route identified using the national background maps where the background annual mean NO₂ concentration is above 25 µg/m³.

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

3.2.5 Ports (Shipping)

Large ships, such as cross-Channel ferries or cruise ships, often use fuel oil which has a high sulphur content, and if there is a large amount of shipping traffic in the area around a port, there will be a risk of exceedences of the 15-minute objective. However, there is currently on average three freight ships a week visiting Glasgow, with an average draft of 1500 tonnes. Consequently, it is considered unlikely that this volume of traffic would cause any exceedences of the SO₂ objective. Therefore, *there is no requirement* to progress to a Detailed Assessment of SO₂ for this source.

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

3.3 Industrial Sources

Industrial Installations

Industrial sources can make a significant contribution in relation to the 1-hour objective. They are not as important in terms of annual mean concentrations.

No new industrial sources which could make a significant contribution to pollutant concentrations have commenced operation in Glasgow since the last round of review and assessment.

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

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

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

Existing industrial installations have been considered extensively in previous rounds of review and assessment. At present there are no existing installations with substantially increased emissions since prior assessment.

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

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

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

3.3.3 Major Fuel (Petrol) Storage Depots

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

3.3.4 Petrol Stations

Petrol stations that are to be considered for benzene emissions are defined in the guidance as,

“..all petrol stations with an annual throughput of more than 2000m³ of petrol (2 million litres) per annum and with a busy road nearby.”

A busy road is identified as,

“..one with more than 30,000 vehicles per day.”

In Glasgow, there are no locations with a busy road, a sufficiently large petrol station and relevant exposure in the immediate vicinity. Two of the benzene diffusion tubes are located close to petrol stations to confirm this assertion. These are the Polokshaws Rd and the Ochiltree Avenue tubes. Results from these tubes are considerably and consistently below the objective level for benzene.

Glasgow City Council confirms that there are no petrol stations meeting the specified criteria.

3.3.5 Poultry Farms

Glasgow City Council confirms that there are no poultry farms meeting the specified criteria.

3.4 Commercial and Domestic Sources

Significant development is taking place around Glasgow in relation to the 2014 Commonwealth Games. Work is underway on the construction of the velodrome and athletes village in the Parkhead area of Glasgow. Environmental assessments for these developments are being undertaken and may be considered further in future review and assessments.

3.4.1 Biomass Combustion – Individual Installations

Biomass burning can lead to an increase in PM₁₀ emissions, due to the nature of combustion. NO₂ levels can also be higher than in conventional gas installations. Rising prices for conventional fuels and pressure to reduce carbon emissions has seen the popularity of biomass as a fuel source grow.

At present Glasgow has no major biomass combustion plants. There have been early stage proposals, including the potential for a biomass boiler system at the Glasgow School of Art and a biodiesel CHP plant for the redevelopment of the Collegelands campus. These developments are currently undertaking air quality assessments and may be considered in more detail in later rounds of review and assessment.

3.4.2 Biomass Combustion – Combined Impacts

Glasgow City Council confirms that there are no significant areas with large numbers of small biomass combustion plant in the Local Authority area.

3.4.3 Domestic Solid-Fuel Burning

In areas where domestic solid fuel is still in widespread use, there can be a problem with PM₁₀ concentrations. The growth in popularity of biomass in domestic situations, particularly the use of wood burning stoves could lead to potential problems with PM₁₀. At present within Glasgow, there is no area of 500 x 500m with sufficient numbers of small solid fuel burners to present a significant impact on PM₁₀ levels.

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

3.5 New Developments with Fugitive or Uncontrolled Sources

Fugitive emissions from a variety of sources can give rise to elevated PM₁₀ concentrations. Fugitive sources, i.e. dust has the potential to be a problem in the achievement of the PM₁₀ objectives, especially in Scotland where the objective level for 2010 is lower than in the rest of the UK. It is thought that dust emissions contain around 20% PM₁₀.

The guidance on dealing with these sources is to identify potential sources, and then determine whether there are dust concerns at the facility. This assessment should be based on dust complaints about the facility, air quality assessments already carried out or a visual inspection indicating significant dust.

The only potential sources which Glasgow contains within its boundaries are landfill sites, of which there are several. These have been considered in previous rounds of review and assessment where it was concluded that they would not have a significant impact on PM₁₀ concentrations.

Glasgow City Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

4 Implementation of Action Plans

Below is the update for the 2004 Air Quality Action Plan. After the declaration of the additional AQMA's a further Action Plan was published in 2009. There will be an update to this produced later in 2010 and this may be incorporated into future rounds of review and assessment.

Air Quality Action Plan Update 2009

The final version of the Council's Air Quality Action Plan was published in November 2004. Within that report 20 actions were set out in it to improve air quality in the City Centre Air Quality Management Area.

Implementation of the plan continues and involves liaison with the Scottish Government and other Council Services, including Development and Regeneration, Education and Social Work.

Generally speaking, good progress has been made with the action plan. For example the M74 extension is now well underway and is expected to be fully completed by 2011. Similarly, there has been advancement with the East End Regeneration Route now that this new road is required for the 2014 Commonwealth Games. The programmed road opening for phase 2 of the project is April 2012.

The 3 major public transport actions are now complete. The new Shields Road park and ride facility and the Larkhall – Milngavie rail link are now well established and are being well utilised by passengers. The implementation of the quality bus corridors and bus information and signalling system is now complete and fully functioning. The implementation of a bus quality partnership scheme is being investigated by the council as further progression from quality bus corridors.

Vehicle emissions testing and vehicle idling enforcement have been well publicised by the council. Advertising campaigns to raise awareness of the issues have been undertaken by Glasgow City Council in conjunction with neighbouring authorities. These have included TV, radio and billboard advertising.

Advancement has been made with the Green Travel Plan action. The Council have produced a draft workplace travel plan for employees, and have consulted employees on this plan. The plan includes key initiatives to help offset, share and reduce travel costs to the individual, whilst promoting greater levels of personal fitness and also lowering the carbon footprint of GCC dependent travel. Potential measures include: subsidised public transport, season ticket interest free loan, participation in a GCC journey share program and, involvement in the cycle to work scheme.

Following the declaration of 2 new AQMAs in 2007, a new 2009 Air Quality Action Plan was published in September 2009. This plan sets out a number of new actions, ranging from Low Emission Zones to tree planting, that aim to reduce NO₂ and PM₁₀ levels. An update will be provided following the implementation of this new action plan, and it is intended that the next update report will encompass both the 2004 and 2009 action plans.

The following table provides details on each action and the progress made in their implementation:

No	Action Plan	Original Timescale	Progress with Measure	Outcome to date	Comments	Responsibility
1	<p>Local Traffic Management</p> <p>Proposed M74 Extension</p>	<p>Road to open at end of 2008</p>	<p>Completion of the M74 was delayed by legal challenges. Permission for the construction works to commence was given in February 2008 and the project is now well under way.</p>	<p>Work is ongoing at all four major junctions and the 15 new flyovers and bridges. It is anticipated that construction should be completed in 2011.</p>	<p>Once the construction of the road is complete and it is open to traffic, monitoring results can be analysed to determine the impact of the road on local air quality.</p>	<p>Scottish Executive/ Glasgow City Council/ South Lanarkshire Council/ Renfrewshire Council</p>
b)	<p>East End Regeneration Route</p>	<p>Completion between 2008 and 2010</p>	<p>The East End Regeneration Route is now past the planning stage.</p> <p>The proposals for this new road were detailed in the bid document for the 2014 Commonwealth Games and hosting the 2014 Commonwealth Games has provided the necessary impetus.</p>	<p>Phase 1 separately funded, on site and due for completion in 2010. The former railway bridge adjacent to Dalmarnock Railway station was removed in April 2009.</p> <p>Phase 2 was tendered in May 2009, and a site start is expected in early 2010, and road opening in early 2012. Phase 3 was tendered in Aug 2009 for a design and cost only. The construction start of Phase 3 is yet to be determined</p>		<p>Glasgow City Council</p>

c)	Variable Message Signs	Unknown	<p>A successful pilot was completed for the northern area of the city centre. Drivers are given up to date information on car park capacity on the approach to the Buchanan Galleries and other car parks in the north of the city centre. These are now over 7 years old and funding is being looked at for their replacement.</p>	<p>On the eastern and western approaches to car parks, signs have been installed at 10 locations for each approach giving capacity indications for 14 different car parks. Funding is not yet in place for complete signage for the southern approaches to the City Centre although it is hoped to complete this during 2010/2011. Potentially a Total of 21 Car Parks in the City are now able to be monitored and their space availability shown on 15 VMS. In addition Shields Road Car Park is monitored and its occupancy displayed on a Motorway VMS.</p>	<p>There are a further 5 Large Strategic VMS placed on main arterials into the city which provide more strategic information</p>	Glasgow City Council
----	-------------------------------	---------	---	---	--	----------------------

No	Action Plan	Original Timescale	Progress with measure	Outcome to date	Comments	Responsibility
2.	Public Transport					
a)	Quality Bus Corridors/Bus Info etc	Completion through 2004/2005	All eight of the proposed QBCs have now been established and the BIAS system is in full operation.	An air quality assessment is underway based on monitoring information from the first four corridors. The results of this assessment are expected by April 2010.	Information from the NO ₂ diffusion tubes used to monitor air quality along the corridors is included in the appendix	Glasgow City Council/West Dunbartonshire Council/South Lanarkshire Council/First Glasgow (buses)
b)	Park and Ride Scheme	Autumn 2005	The proposed multi storey facility at Shields Road Underground station was completed in 2006 and there are now 800 parking spaces at this location.	Since opening, this facility has been well utilised by commuters coming into the city. Approximately 3,600 cars make use of this facility every week.	No monitoring has been carried out prior to or after construction so the local improvement in air quality is not known.	Glasgow City Council/SPT
c)	Larkhall-Milngavie Rail Link	2005	The new line opened in December 2005. Four new stations were established.	Passenger numbers have proved this to be necessary and valuable link. 590,000 passenger journeys were made using the new stations in 2009. The rail line has improved access to jobs, education and health services for the communities involved.		Scottish Executive/SPT/South Lanarkshire Council
d)	Cycling and Walking Strategies	Ongoing	Footpaths and cycle ways have been upgraded and improved throughout the city to encourage people utilise this mode of transport.	Glasgow City Council has consulted the public on the "Glasgow Core Paths Plan" which will influence the development of Glasgow's Path Network over the next five years.		Glasgow City Council

No	Action Plan	Original Timescale	Progress with Measure	Outcome to Date	Comments	Responsibility
e)	School Travel Plans	Ongoing	A total of 66 schools have an established School Travel Plan. A further 6 schools have a draft School Travel Plan	An NO ₂ diffusion tube was placed outside a local Primary School which is developing a Travel Plan to determine the effect of the School Travel Plan on local traffic. NO ₂ levels fell from 29ug/m ⁻³ to 22ug/m ⁻³ during the first year the plan was implemented. Data for the second year will be available in April 2010.	A further 15 schools are in the process of developing School Travel Plans.	Glasgow City Council/Schools/Parents
3.	Parking and Fiscal Measures					
a)	Vehicle Emission Testing/Idling Vehicles	Commenced from March 2004	Vehicle emission testing commenced in 2004 and is continuing. Formal enforcement of the Idling Vehicle Regulations commenced in November 2005	Since taking over vehicle emission testing from VOSA, 15,748 vehicles have been tested on 258 test days. A total of 487 Fixed Penalty Notices have been issued to drivers. Idling vehicle enforcement was publicised in an advertising campaign prior to giving informal advice to motorists. Formal vehicle idling enforcement commenced on November 2005. Since then a total of 391 fixed penalty notices have been issued. Publicity campaigns to raise awareness of the issue have been undertaken by Glasgow City Council in conjunction with neighbouring authorities. These have included TV, radio and billboard advertising.		Glasgow City Council

No	Action Plan	Original Timescale	Progress with Measure	Outcome to Date	Comments	Responsibility
4.	Other Air Quality Enforcement					
a)	Smoke Control Areas	Ongoing	All complaints are dealt with as and when they are received. Complaints are allocated to individual officers for investigation.	Since September 2005, 399 complaints have been received concerning generation of smoke in Smoke Control Areas. All complaints were dealt with by giving advice or an informal warning.		Glasgow City Council
b)	Environmental Protection Act and Statutory Nuisance	Ongoing	All complaints are dealt with as and when they are received. Complaints are allocated to individual officers for investigation.	Since September 2005, 377 complaints have been received concerning dust, grit and environmental air pollution nuisance affecting residents in the City. All these were dealt with by giving general advice or informal warnings. These complaints were located across the city.		Glasgow City Council

No	Action Plan	Original Timescale	Progress with Measure	Outcome to Date	Comments	Responsibility
5.	Non-Transport Based Emission Sources					
a)	Commercial and Domestic Sources	Ongoing	<p>The Council launched a Fuel Poverty Strategy in 2005 which aims to remove fuel poverty partly through increasing insulation and installing energy efficient heating systems in domestic properties. This aimed to help reduce domestic emissions.</p>	<p>Following a monitoring report and update to this strategy, the Council's Executive Committee agreed a report proposing to establish a Fuel Poverty Advice Team for the City. A business plan has been produced and funding options are now being pursued.</p> <p>Glasgow City Council is a supporter of Energy Savings Scotland Advice Centres (ESSACs) who provide free, independent and impartial energy advice to households and businesses throughout West Central Scotland. As well as providing energy advice, they also administer a small grants scheme on behalf of Glasgow City Council.</p> <p>Actions to reduce fuel poverty form part of the City's Local Housing Strategy and commit the Council, in partnership with other agencies, to eradicating fuel poverty within Glasgow by 2016.</p>	<p>It is impossible at present to quantify whether such schemes have resulted in improvements in air quality in the AQMA.</p>	Glasgow City Council

				<p>The council's Environmental Strategy outlines the commitment that Glasgow has to sustainable development and reducing air pollution.</p>		
<p>b)</p>	<p>Industrial Sources</p>		<p>Glasgow City Council continues to enforce the Clear Air Act 1993 and the Environmental Protection Act 1990 with respect to industrial premises</p>	<p>Due to the limited number of industrial premises any actions in this area will have a limited effect on overall air quality</p>		<p>Glasgow City Council/ SEPA</p>

No	Action Plan	Original Timescale	Progress with Measure	Outcome to Date	Comments	Responsibility
6.	Leading by Example					
a)	Emission Testing of Council Fleet	Complete	Prior to the introduction of vehicle emission testing for the general public. Emission testing of the Council Fleet was carried out.	Initially, this was carried out as a warm-up exercise for the new Vehicle Emission Testing Team. This has been repeated on occasion since. Heavy goods vehicles and buses are currently tested every 6 weeks at the council depot.	Although a number of vehicles failed their test, the sample group was skewed to find the worst emitters.	Glasgow City Council
b)	Alternative Fuels	Ongoing	The Council continues to take steps to cut emissions from its own fleet where possible and to ensure only the most efficient and least polluting vehicles are purchased or leased.	The Council are currently in the process of ordering 50 electric vehicles through a government backed scheme, with a view to expanding the number if they prove to be effective. Most of these vehicles will be used for council business, but some of this fleet will be sub-leased to other bodies e.g. the police and Strathclyde fire & rescue.	10 vans, 10 7-seat cars and 30 5-seat cars have been ordered.	Glasgow City Council
c)	Green Travel Plans	Ongoing	The Council have produced a draft workplace travel plan for employees, and have consulted employees on this plan. The plan includes key initiatives to help offset, share and reduce travel costs to the individual, whilst promoting greater levels of personal fitness and also lowering the carbon footprint	Currently, the council are compiling the feedback from the consultation. They will integrate this feedback into the final document, which will then go to committee for approval and implementation. It is expected that a final version of the plan will be communicated to staff by June 2010. Some measures are almost ready for implementation and others will be introduced on a phased basis over the next few years.	.	Glasgow City Council

No	Action Plan	Original Timescale	Progress with Measure	Outcome to Date	Comments	Responsibility
7.	Education and Awareness Raising					
a)	Website	Ongoing	The air quality page of the Glasgow City Council website has been updated to provide more information for the public regarding the air quality in the city and how that is being monitored.	The council hope to make further changes to the website to enable people to view real-time pollution levels being monitored in the city.		Glasgow City Council.
b)	Walk to School Week	Ongoing	Community Action Officers are involved with encouraging local Primary Schools to participate in Walk to School week.	In 2009, 129 out of the 149 Primary Schools in Glasgow registered to participate in Walk to School Week		Glasgow City Council
c)	Car Free Day	Continuing	In 2009 Glasgow took part in European Mobility Week and 'In Town Without My Car Day' and South Frederick Street in front of the City Chambers was closed to all traffic from 8am until 6pm to enable the public to experience a car free extension to George Square. These events are aimed to promote alternative transport modes such as	These events occur on an annual basis and it is anticipated that Glasgow City Council will continue to support and promote these events		Glasgow City Council.

April 2010

Glasgow City Council

			cycling, walking, public transport and car pooling.		
--	--	--	---	--	--

No	Action Plan	Original Timescale	Progress with Measure	Outcome to Date	Comments	Responsibility
D)	Air Quality Monitoring	Continuing	Glasgow City Council operates 11 automatic air quality monitoring stations, along with a comprehensive NO ₂ passive diffusion tube network.	The results from the city centre monitoring stations continue to show that NO ₂ levels are breaching the National Air Quality Objectives.		Glasgow City Council.

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

Automatic analyser and diffusion tube monitoring of NO₂ within this Progress Report indicates that concentrations of NO₂ are likely to continue to exceed the National Air Quality Objectives at several locations within the existing Air Quality Management Areas. The diffusion tube results also show that there continues to be the potential for exceedences of the NO₂ objective around the Bridge St / Norfolk St area. These areas are subject to a Detailed Assessment expected to be completed in May 2010.

Previous rounds of review and assessment have shown the potential for exceedences of the 2010 objective for PM₁₀ at various locations throughout the city. These areas are also being considered in the ongoing Detailed Assessment.

Monitoring results for carbon monoxide, sulphur dioxide, benzene, 1,3-butadiene and lead continue to show that in Glasgow, levels of these pollutants are well below the National Air Quality Objectives.

5.2 Conclusions relating to New Local Developments

Road, transport, industrial and domestic sources of air pollution were considered as part of the Progress Report. It was shown that there are no new developments or changes to existing developments likely to lead to significant contributions to air pollution levels.

Environmental assessments relating to various developments for the 2014 Commonwealth Games are currently being undertaken. These developments may be considered in greater depth in future rounds of review and assessment.

5.3 Proposed Actions

Monitoring results have confirmed the conclusions of the 2009 Updating and Screening Assessment which stated that Glasgow is unlikely to meet the 2010 objective for PM₁₀ at a number of locations. Although there is a declining trend in recorded PM₁₀ levels, this is unlikely to lead to compliance with the objectives within the timescale. The Detailed Assessment which was recommended by the USA is currently being undertaken and is due for completion in May 2010.

No further areas of likely exceedences of the objectives have been identified within this Progress Report.

6 References

- Department of the Environment, Food and Rural Affairs (2000). Part IV The Environment Act 1995, Local Air Quality Management, Technical Guidance, LAQM.TG(09);
- Glasgow City Council (1998). Local Air Quality Management, Review and Assessment of Air Quality in Glasgow Stage 1;
- Glasgow City Council (2000). Local Air Quality Management, Review and Assessment of Air Quality in Glasgow Stage 2;
- Glasgow City Council (2001). Local Air Quality Management, Review and Assessment of Air Quality in Glasgow Stage 3;
- Glasgow City Council (2003). Local Air Quality Management, Review and Assessment of Air Quality in Glasgow Stage 4;
- Glasgow City Council (2003). Local Air Quality Management, Updating and Screening Assessment;
- Glasgow City Council (2004). Local Air Quality Action Plan;
- Glasgow City Council (2005). Local Air Quality Management, Detailed Assessment;
- Glasgow City Council (2005). Local Air Quality Management, Progress Report;
- Glasgow City Council (2007). Local Air Quality Management, Detailed Assessment;
- Glasgow City Council (2008). Local Air Quality Management, Further Assessment;
- Glasgow City Council (2008). Local Air Quality Management, Progress Report;
- Glasgow City Council (2009). Local Air Quality Management, Updating and Screening Assessment;
- The Scottish Executive (2002). Air Quality (Scotland) Amended Regulations

Appendices

Appendix A: 2009 NO2 Diffusion Tube Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	Bias Corrected
Mosspark Boulevard	48.1	21.1	25.1	24.2	14.1	20.4	14.2	15.5	14.9	30.5	35.6	44.7	25.7	28.0
St Andrews Drive	28.6	21.2	20.1	23.6	10.3	13.2	14.1	11.3	14.3	22.7	23.5	29.4	19.4	21.1
Haggs Rd	42	28.6	28.6	31.6	14.1	20.7	20.4	31.4	19.2	45	46.9	68.2	33.1	36.0
Pollokshaws Rd	39.1	23.9	30.1	26.9	10.8	17.4	13.9	19.3	16.9	26.1	25.4	45.3	24.5	26.7
Invergarric Rd	21.3	23.3	16.3	11.7	7.9	12.4	11.2	8.5	9.9	17.7	36.8	45.3	17.6	19.2
High St	66.4	44.3	58.5	60.4	23.9	32.4	42.9	47.4	45.6			82.3	49.2	53.6
Saltmarket	48.5	40.5	52.4	35.3	21.2	24.1	32.1	33.6	35.9	46.4	39	63	39.3	42.9
Glassford St						38.1	46.9	34.8	38.8	49.2	55.9	66.2	47.1	51.4
George Square	60.4	44	46.4	39.5	30.2	31.9	36.1	42.3	33.5	45.4	18.6	53.5	40.2	43.8
Buchanan Street	60.1	69.3	58.7	51.3	32.8	56.6				40.4			52.7	57.5
Union St	68.2	64.9	71.2				62	60.9	45	51.5	15.5	62.8	55.8	60.8
ST Enoch AUN (1)	36.9	55.2	51.6	32.6	25.8	26.9	35.1	22.5	34.7	27.4	49.6	57.3	38.0	41.4
ST Enoch AUN (2)	41.8	36.9	41.5	34.3	22.3	34.1	32.5	21.4	34.5	28.1	49.9	79.3	38.1	41.5
ST Enoch AUN (3)	42.7	34.1	49.9		24.6	37.6	30.5	21.8	36.9	28.8	69.1	54	39.1	42.6
H Umbrella North	97.3	73.9		83.2	46.8	74.4	63.8	52.2	59	58.6	76.1	85.7	70.1	76.4
H Umbrella South	105	47.6	116										89.5	97.6
Hope Street AUN (1)	84.9	59.1	96.9	83.1	38.3		54.8	39.6	43.4	37.8	49.1	89.5	61.5	67.0
Hope Street AUN (2)	73	86.4	95.8	91.1	37.7		94.8	49	16.4	71.7	75	95.2	71.5	77.9
Hope Street AUN (3)	71.9	44.2	71	77.1	38.8		63.5	32.7	43.7	69.4	28.6	99.4	58.2	63.4
Hope Street 1	101	63.3	71.5	90.9	41.6	70.6	74.8	76.2		68.7	82.2	91.3	75.6	82.5
Gordon st	94.8	61.3		67.9									74.7	81.4
Cathedral Bridge	65.8	42	52.3	54.1	52.8	57	49.8		56.1	50	55.1	71.7	55.2	60.1
Sauchiehall Street	58.6	40.4	45	49.9	25.1	29.9	35.6	30.8	39.9	46.3	45	55.1	41.8	45.6
Bath Street	65.7	45.9	46.1	66.5	30	33.4	40.4	41.1	40.8	44.5	54.5	71.8	48.4	52.7
Hope Street 3	69.9	50.2	55.9	66.4	29.3	30.8	45.8		42	58.1	58.4	70.4	52.5	57.2
Castle Street	38.4			34.5	20.5	23.6	16.8	24.7	21.4	34.4	32.5	49.8	29.7	32.3
McLeod Street	47.1	35.3	32.8	37.2	22.8	23.2	31.2	30.2	27.4	32.7	50.3	53.2	35.3	38.5
Montrose Street	42.2	33.1	46.7	43.7	23.7	33.6	33		38.7	38.8	30.6	58	38.4	41.8

Glasgow City Council

April 2010

Renfield Street	63.7	46.2	60.3	56.5	28.1	31.5	52.5	54.9	48.4	51	51.7	49.5	54.0
Dundasvale Street	49.2	32.8	37.1	39.4	20.4	18.9	29.1	24.1	30.2	38.7	59.6	33.3	36.3
Westercraigs	36.1	28.7	26.1	4.8	15	9.2	16	14.5	17.9	35.2	52.7	22.6	24.7
Dunn Street	32.9	22	21.2	20	10.4	12.8	14.5	13.5	17.5	26.5	41.4	21.2	23.1
Hillcrest Road	28.3	23	27.4	20.5		16		11.2	17.1	20.2	48.1	23.4	25.5
Westmuir Street	52.4	50.9	63.9	55.6	23.7	24.3	37.9	36.9	51.8	44.9	75	44.6	48.6
Inveresk Lane	27.5	24.4	12.3	19.5	8.8	12.3	12.2	12.6		15.9	44.6	18.6	20.3
Easterhouse Sports Centre	28.2	23.6	20.8	22.2	9.3	10.6	15.2	15.1	8.8	22	26.5	18.0	19.6
George Street	63.8	66	61.7	52.1	22.2	33.5	34.7	49.9	47.9	44.8	57.6	48.3	52.7
Kipen Street	36.3	24.5	20.7	25.4	17.8		29.3	25.2	14.5	30	21.7	25.5	27.8
QMD / Maryhill Street	39.2	43.8	35	39.4	20.3	18.7	25.8	10.3	24.8	34.1	51	31.8	34.7
Groundhog (1)	56.2	21.4	33.3	40.9	18.6	25.1	16.8	22.4	19.6	43	35.5	31.7	34.6
Groundhog (2)	48	23.9	32	33.7	19.9	23.4	18.3	24.1	20.3	36.5	48.1	31.3	34.1
Groundhog (3)	69.5	19.3	30.1	36.1	22.7	19.4	17.1	26.5	17.9	40	52.9	33.7	36.7
Anniesland Cross	32.5	27.2	34.4	24	14.5	23.7	24.9	12.6	15.6	20.5	38	26.5	28.8
Balshagray Avenue	30	28	27.6	26	17	27.7		14.9	19.3	37.8	47.6	29.0	31.6
Belmont Road	39.9	34.4	22.9	23	11.5	13.9		9.1		30.4	31.1	25.8	28.1
Napiershall Street	33.5	37.8	36.7	39.9	20.7	20.4	37.4		28.4	34.6	34.3	31.8	34.7
North Street	61.7	39.9	31.9	46.3	23.8	29	36.7	38.2	23.2	38.8	49.9	36.3	39.6
Bridge Street / Norfolk Street	61	43.8	40.2	34.6	19.1	47.3		22.2	39.3	38.9	54.5	39.7	43.3
Govanhill Street	33.8	28.8	41.9	26	14.9	23.2	17.2	19.8	25.5	25	43.5	28.2	30.8
Castlemilk Sports Centre	23.6	17.7	19.4	13.6	6.9	13.4	7.5	5.5	10.4	16.9	36.4	15.9	17.4
Mossie Road	98.6	28.7	31.6	30.1	16.1	31.5	19.4	22.5	22.2	23.4	51.9	33.3	36.3
Sutherland Avenue	27.9	20.6	20.3	16.8	9.3	15.2	9.9	3.3	8.4	26.5	44.3	18.4	20.1
Mallaig Place	32	32.5	25.9	24.9	12.5	16.3	17.3	8	13.3	28.2	55.1	24.6	26.8
Rollalong 1	52.6	68.5	49	53.4	32.8	38.7	43.7	28.4	36.8		67.9	49.0	53.4
Rollalong 2	56.8	39.6	50.7	55.5	36.5	47.3	37.3	27.1	35.3	39.4	54.8	45.6	49.7
Rollalong 3	68.9	43.7	42.3	59.6	26.2	41	35.1	29.7	32	45.7	63	46.6	50.8
Dumbarton Road	45.6	37.8	38.2	36.8	19.1	27.1		38.9	28.1	32.1	60.5	36.4	39.7
Broomielaw	63.6	56.7	53.1	47.2		30.9	35.6	34.8	31.1	46.6	71.5	47.1	51.4
Finnieston Street	52.7	32.7	31.4	38.7	20.4	24.3	26	27.1	25.6	33.3	51.6	34.2	37.3
Hope Street Network	97.5	60.3	75.1	90.8	41.4	49.9	78.9	57.5				68.9	75.1
McLeod Street Network	49.9	38.7	21.3	35.9	20.1	19.9	32.4	32.2	26.8			30.8	33.6
Sutherland Ave Network	26	22.8	18.4	18.5	7.1	11.7	11.5	8.8	9.5	12.8		14.7	16.0
Hillcrest Rd Network					10.8		12.8					11.8	12.9

April 2010

Glasgow City Council

QMD2	49.7	40.3	38.2	40	22.9	23.6	33.9	26.2	26.9	37.7	45.3	43.5	35.7	38.9
QMD3	57	31.9	46.7	43.7	26	28.5	50.7	26.3	37.6	42.9	57.1	45.2	41.1	44.8
Lawrence Street	39.1	32.3	27.7	27.5	20	18	21.2	11.2	19.6	28.1	39.2	48.7	27.7	30.2
Cooperswell Street	37.1	25.3	27	27.5	19.4	24.1	23.3	9.1	18.3	27.6	27.8	33.9	25.0	27.3
Royston Road	45.8	38.8	51.9	28.6	16.6	35.4	46.1	22.8	16.8	40.8	40.5	43.5	38.3	41.8
Oxford Street	58	34.9	39	28.6	13	16.1	15.2	14	30.5	32.2	40.5	49.8	34.5	37.6
Dougrie Road	28.5	24.2	21.5	18	8.4	12.1	13.6	13.3	7.1	23.2	29.2	37.5	20.6	22.5
Sacone SW	31.9	27.1				35.3	33.6	47.2	38.1	52.7	20.6	55.8	40.5	21.9
Cochrane Street						16.4	18.4	17.2	21.2	28.4	16.6	51.4	24.4	44.1
Main Street (Bridgeton)	32.7	26.2	26.5	26	11.9	16.4	15.9	16.4	17	31.2	36.2	27.1	24.7	26.9
Calder Street / Aikenhead Road	44.3	24.2	22.6	26.6	14.1	20.6	10.4	13.1	13.5	21.4	30.2	54.1	21.9	23.9
Langside Primary School	35	24.7	21	15.5	8.9	15	23.7	23.7	14	22.8	33.7	29.7	23.7	25.8
Thornwood Drive	33.9	26.3	21.1	23.9	12.9	18.8								
Glasgow Harbour	39.6	32.5	30.9	27.6	13	22.3	22.1	11.2	18.8	28.3	34.2	36.3	25.4	27.7
Springburn Road	54.6	26.8	26.7	31.9	21	20.3	25.7	11.2	19.2	28.3	39.9	39.9	28.3	30.9
Dobbies Loan	50	27.2	22.5	31.1	18.2	17.3	20.4	20.3	23.9	31.8	48.5	45	29.7	32.4
Kennedy Path	44.4	29.8	27.7	24.6	13.8	15.5	22.9	22.4	23.5	29.7	34.7	50.5	28.3	30.8
St Mungo Avenue	44.8	38.6	41.3	39.8	21.2	17.6	28.7	31.8	36.4	35.5	29.8	53.1	34.9	38.0
Brown Street	46.3	33.1	17.5	32	15.5	22.5	26.3	22.7	20.9	30.3	33.4	54.6	29.6	32.3
Paisley Road West		34.1	40.4	29.5	16.3	29.2	30.4	15.8	21.4	32.3	47.3	39.4	30.6	33.3
Hyndland Rd	38.2	32		31.6	16.3	16	29.7	12.7	20.3	34.3	43.8	51.8	29.7	32.4
Silverburn	21.9			20.8	18.7	18.7	7.1	10.9	11.6	26.8	24.3	49	21.0	22.9
Crow Road									33.8	49.5	44	61.6	47.2	51.5
Whittingehame Drive									14.9	31	20.9	34.3	25.3	27.5