

# 2009 Air Quality Updating and Screening Assessment for Cheltenham Borough Council

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

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#### **Executive Summary**

Cheltenham Borough Council have undertaken this Updating and Screening Assessment in fulfilment of Part IV of the Environment Act 1995 which requires local authorities to review and assess air quality within their administrative area. This Updating and Screening Assessment (Round 4) updates all monitoring data since the last Updating and Screening Assessment (undertaken in 2006) and screens for various potential sources of pollution with the Borough's administrative area accordance with the Local Air Quality Management Technical Guidance 2009 (LAQM.TG(09)). Cheltenham Borough Council currently has one AQMA for nitrogen dioxide annual mean objective at (lower) Bath Road.

This Updating and Screening Assessment has concluded the following:

Assessment of Monitoring Data:

- There are continued exceedances of the nitrogen dioxide annual mean objective within the AQMA.
- There are exceedances of the nitrogen dioxide annual mean objective outside the AQMA but there is no relevant exposure at these locations.
- There are no other pollutants of concern within Cheltenham Borough Council.

Assessment of Sources:

- Following the screening criteria in LAQM.TG(09), there are no <u>transport sources</u> of concern, therefore, a Detailed Assessment will not be required.
- Following the screening criteria in LAQM.TG(09), there are no <u>other transport sources</u> of concern, therefore, a Detailed Assessment will not be required.
- Following the screening criteria in LAQM.TG(09), there are no <u>industrial sources</u> of concern, therefore, a Detailed Assessment will not be required.
- Following the screening criteria in LAQM.TG(09), there are no <u>commercial/domestic</u> <u>sources</u> of concern, therefore, a Detailed Assessment will not be required.
- Following the screening criteria in LAQM.TG(09), there are no <u>fugitive sources</u> of concern, therefore, a Detailed Assessment will not be required.

Cheltenham Borough Council will submit a Progress Report in April 2010. Additionally, Cheltenham Borough Council is currently working on their Further Assessment and Air Quality Action Plan for the (lower) Bath Road AQMA which will be submitted in 2010.

### **Table of Contents**

Exe	cutiv	e Summary	iii
Tab	le of	Contents	iv
List	of Ta	ables	vi
List	of Fi	gures	vii
1	Intro	oduction	1
	1.1	Description of Local Authority Area	1
	1.2	Purpose of Report	1
	1.3	Air Quality Objectives	2
	1.4	Summary of Previous Review and Assessments	3
2	New	Monitoring Data	5
	2.1	Summary of Monitoring Undertaken	5
	2.2	Comparison of Monitoring Results with AQ Objectives	8
3	Roa	d Traffic Sources	11
	3.1	Narrow Congested Streets with Residential Properties Close to the Kerb	11
	3.2	Busy Streets Where People May Spend 1-hour or More Close to Traffic	11
	3.3	Roads with a High Flow of Buses and/or HGVs.	11
	3.4	Junctions	12
	3.5 Asse	New Roads Constructed or Proposed Since the Last Round of Review and ssment	12
	3.6	Roads with Significantly Changed Traffic Flows	12
	3.7	Bus and Coach Stations	13
4	Oth	er Transport Sources	14
	4.1	Airports	14
	4.2	Railways (Diesel and Steam Trains)	14
	4.3	Ports (Shipping)	15
5	Indu	Istrial Sources	16
	5.1	Industrial Installations	16
	5.2	Major Fuel (Petrol) Storage Depots	17
	5.3	Petrol Stations	17
	5.4	Poultry Farms	17
6	Con	nmercial and Domestic Sources	18
	6.1	Biomass Combustion – Individual Installations	18
	6.2	Biomass Combustion – Combined Impacts	18
	6.3	Domestic Solid-Fuel Burning	18
7	Fug	itive or Uncontrolled Sources	19
8	Con	clusions and Proposed Actions	20
	8.1	Conclusions from New Monitoring Data	20

Upda	ting a	nd Screening Assessment, 2009	Cheltenham Borough Council	
	8.2	Conclusions from Assessment of Sources		20
	8.3	Proposed Actions		20
Арре	endix	A: QA:QC Data		21
	Diffusi	ion Tube Bias Adjustment Factors		21
	QA/Q	C of automatic monitoring		22
Appe	endix	B: List of Service Stations		24
Арре	endix	C Permitted Processes		25
Арре	endix	D: Map of proposed NW Cheltenham	Extension area	26
Арре	endix	E: Photos showing residential expos	ure within Cheltenham AQMA	27

### List of Tables

Table 1: Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.	2
Table 2: Details of Automatic Monitoring Sites	5
Table 3: Details of Non- Automatic Monitoring Sites in Cheltenham.	7
Table 4: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with AnnualMean Objective	8
Table 5: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-Hour Mean Objective	8
Table 5.1 Results of Nitrogen Dioxide Diffusion Tube Monitoring in Cheltenham	9
Table 6: Results of Automatic Monitoring for PM <sub>10</sub> : Comparison with Annual Mean Objective	9
Table 7: Results of Automatic Monitoring for $PM_{10}$ : Comparison with 24-Hour Mean Objective	9
Table 8: Results of Automatic Monitoring for SO <sub>2</sub> : Comparison with 24-Hour Mean Objective	10
Table 9: Results of Automatic Monitoring for SO <sub>2</sub> : Comparison with 24-Hour Mean Objective	10
Table 10: Results of Automatic Monitoring for $SO_2$ : Comparison with 24-Hour Mean Objective	10
Table 11: Results of Automatic Monitoring for $O_3$ : Comparison with 24-Hour Mean Objective	10
Table 12: List of Service Stations	24
Table 13: List of permitted processes	25

### List of Figures

Figure 1: Map of Cheltenham Borough Council	1
Figure 2: Lower Bath Road AQMA	4
Figure 3: Monitoring locations in lower Bath Road AQMA.	4
Figure 4: Location of AQMS in Cheltenham	5
Figure 5: Location of diffusion tubes sites in Cheltenham.	6
Figure 6: Local bias adjustment factor 2008	21
Figure 7: Map of NW Cheltenham Extension	26

#### 1 Introduction

#### 1.1 Description of Local Authority Area

Cheltenham Borough Council is situated in central Gloucestershire. It is bordered by Tewkesbury Borough Council and Cotswold District Council (Figure 1). Cheltenham Borough Council has a population of approximately 111,700 and lies some five kilometres to the east of the M5 motorway mid-way between Bristol and Birmingham on the edge of the Cotswold Hills.

The Borough is based on the town of Cheltenham and is mainly urban with some areas of surrounding countryside. It covers an area of approximately 4,680 hectares of which 17 percent is designated as green belt and 22 percent as an area of outstanding natural beauty.



Figure 1: Map of Cheltenham Borough Council

**NW Cheltenham Extension**: There is a proposal currently under consideration for the development of 5000 new houses to the north-west of Cheltenham (Appendix D). This development will primarily impact on Tewkesbury Road, Cheltenham and on Junction 10 of the M5. Cheltenham Borough Council and Tewkesbury Borough Council are working closely together to ensure that air quality is adequately considered for this development.

#### 1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedances 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.

#### 1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1. This table shows the objectives in units of microgrammes per cubic metre  $\mu$ g/m<sup>3</sup> (milligrammes per cubic metre, mg/m<sup>3</sup> for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table 1: Air Quality Objectives	included in	Regulations	for the	purpose	of Local	Air
Quality Management in England		_				

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

#### 1.4 Summary of Previous Review and Assessments

In recent years Cheltenham Borough Council submitted the following reports:

- 2003: Updating and Screening Assessment
- 2004: Progress Report
- 2005: Progress Report
- 2006: Updating and Screening Assessment
- 2007: Progress Report
- 2007: Detailed Assessment of Bath Road for Nitrogen Dioxide
- 2008: Progress Report

The 2003 Updating and Screening Assessment did not identify any exceedances of the UK air quality objectives. In 2004 Cheltenham Borough Council proceeded to a Progress Report. In this report the authority identified the need to proceed to a Detailed Assessment for Nitrogen Dioxide at (lower) Bath Road. A Detailed Assessment was required in 2005 but due to delays in compiling this report the authority proceeded in the interim to a Progress Report in 2005. This report again identified concerns for nitrogen dioxide at the same locations but also reported that there were no new locations of concern. Cheltenham Borough Council undertook a Detailed Assessment for NO<sub>2</sub> at (lower) Bath Road (following on from the 2004 Progress Report).

A Detailed Assessment was completed for Bath Road and High Street in 2007 where an exceedance of the annual mean objective for  $NO_2$  occurred with relevant exposure. In December 2008 an Air Quality Management Area (AQMA) was declared along a section of Bath Road (Figure 2). The area is designated in relation to a likely breach of the nitrogen dioxide (annual mean) objective as specified in the Air Quality Regulations (England) 2000. The designated area incorporates High Street from the junction at Grosvenor Street following through to the lower part of Bath Road where it meets the junction with Bath Street and Vernon Place. This includes the residential properties at 2A, 2B and 8A Bath Road, Flats 1-4 at 63A High Street, Flats 1-5 at 65 High Street and Flats 1 & 2 at 68 High Street.

A network of duplicate NO<sub>2</sub> monitoring tubes was installed in January 2009 which gave a total of thirteen monitoring locations with 26 tubes along the lower end of Bath Road including the designated AQMA.

There have been no significant changes to the traffic flows in the Borough since the last round of Review and Assessment. One new industrial source was reported within the Borough in 2006. This is Kohler Mira (Kingsville Trading Estate, Cheltenham) a copper and alloy process established for the casting of gunmetal shower components. The process was permitted in October 2005, the emission limits as per PG 2/08 and the nearest significant receptor is 330 metres away. It is not considered that this process will have a significant influence on local air quality within the Borough.



Figure 2: Lower Bath Road AQMA



Figure 3: Monitoring locations in lower Bath Road AQMA.

#### 2 New Monitoring Data

#### 2.1 Summary of Monitoring Undertaken

#### 2.1.1 Automatic Monitoring Sites

During this round of Review and Assessment, Cheltenham Borough Council managed a realtime air quality monitoring station (AQMS) for NO<sub>x</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, O<sub>3</sub> and PM<sub>10</sub> (operated by Casella ETi). There are triplicate nitrogen dioxide diffusion tubes co-located at this site providing a local bias adjustment factor. The site is located near to the town centre within 200m of roads carrying between 12,000 and 18,000 vehicles per day (some of these roads form part of the A40 between Oxford and Gloucester). The monitoring site is within a Smoke Control Area and was chosen to represent urban background pollution in Cheltenham. See Figure 3 for location of the AQMS. The main local pollution source is road traffic and there are no significant polluting sources (Part A) within 5 miles of the site. There are a number of Part B processes within the area and a hospital boiler within 0.5 km. The data for Cheltenham AQMS is outlined in Table 2. This site was discontinued during 2009 due to financial constraints.

#### **Table 2: 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 ?
Town Hall	Urban Background	394715 222031	NO <sub>2</sub> , SO <sub>2</sub> , PM <sub>10</sub> , O <sub>3</sub> ,	N	Ν	N/A	Ν



Figure 4: Location of AQMS in Cheltenham

#### 2.1.2 Non-Automatic Monitoring

Cheltenham Borough Council has been undertaking diffusion tube monitoring at a number of locations since 2003. The majority of the locations monitored have been consistently below the annual mean objective, however (lower) Bath Road, Tewkesbury Road, the Promenade and Boots Corner have exceeded the annual mean objective. Figure 5 illustrates the monitoring sites within the council and Table 3 provides details of the locations.



Figure 5: Location of diffusion tubes sites in Cheltenham.

#### **Details of Bias Adjustment**

Nitrogen dioxide diffusion tubes used by Cheltenham Borough Council are 20% TEA in water supplied and analysed by Bristol Scientific Services. It can be confirmed that the lab follows the procedures set out in the Harmonisation Practical Guidance Procedures under the DEFRA practical guidance. Appendix A shows bias adjustment factors for the annual colocation studies undertaken by Cheltenham Borough Council during 2008 at the AQMS. The tubes at all 21 locations throughout the Cheltenham Borough Council area have a monthly exposure period. A triplicate co-location study at the automatic monitoring site generated a local 2008 bias adjustment factor of 0.87 which has been applied to all nitrogen dioxide diffusion tube data for 2008. The Bias Adjustment factor applied to the diffusion tube data was that obtained utilising the co-location results from the AQMS and using the Precision and Accuracy Tool provided by AEA Energy & Environment. Bristol Scientific Services participates in the WASP scheme, the latest results show them as 'good' on the basis of RPI old and new criteria.

Map Ref.	Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure ?	Distance to kerb of nearest road (N/A if not applicable)	Worst- case Location?
A	Boots Corner	Roadside	394950 - 222512	NO <sub>2</sub>	N	N	5m	Y
В	54 Upper Norwood St	Urban Background	394494 - 220820	NO <sub>2</sub>	N	Y	1m	Y
С	212 London Road	Roadside	395969 - 221349	NO <sub>2</sub>	N	Y	5m	Y
D	Church Road Police Station	Urban Background	392819 - 221873	NO <sub>2</sub>	N	Y	1m	Y
ш	Chelsea Close	Urban Background	395791 - 221460	NO <sub>2</sub>	N	Y	1m	Y
F	Old Bakery Prestbury	Roadside	397009 - 223888	NO <sub>2</sub>	N	Y	2m	Y
G	Cambray	Urban Centre	395064 - 222264	NO <sub>2</sub>	N	Y	5m	Y
Н	179 Bath Road	Roadside	394614 - 221153	NO <sub>2</sub>	N	Y	2m	Y
Ι	Off Tewkesbury Road	Roadside	393887 - 223444	NO <sub>2</sub>	N	Y	2m	Y
J	Tewkesbury Road	Kerbside	393849 - 223400	NO <sub>2</sub>	N	N	2m	Y
К	St Georges Street	Kerbside	394695 - 222733	NO <sub>2</sub>	N	Y	1m	Y
L	Fiddlers Green Lane	Roadside	391354 - 222624	NO <sub>2</sub>	N	Y	1m	Y
М	Miserden Road	Roadside	391997 - 222051	NO <sub>2</sub>	N	Y	1m	Y
N	Promenade	Kerbside	394705 - 222183	NO <sub>2</sub>	N	N	2m	Y
0	St Aidans Close	Urban Background	392084 - 222739	NO <sub>2</sub>	N	Y	1m	Y
Р	6 [lower] Bath Road	Roadside	395149 - 222151	NO <sub>2</sub>	Y	Y	2m	Y
U	P.E.Way	Roadside	391996 - 222133	NO <sub>2</sub>	N	Y	5m	Y
V	Westal Green	Roadside	393924 - 221608	NO <sub>2</sub>	N	Y	2m	Y
W	56 Church Road	Roadside	394577 - 219728	NO <sub>2</sub>	N	Y	2m	Y
Х	124 Gloucester Road	Roadside	393802 - 222595	NO <sub>2</sub>	N	Y	5m	Y
Z	Town Hall AQ Station	Urban Background	394715 - 222031	NO <sub>2</sub>	N	N	50m	N

### Table 3: Details of Non- Automatic Monitoring Sites in Cheltenham.

#### 2.2 Comparison of Monitoring Results with AQ Objectives

#### 2.2.1 Nitrogen Dioxide

During 2008, Cheltenham Borough Council maintained one continuous analyser and 21 diffusion tube locations in their administrative area.

#### 2.2.1.1 Automatic Monitoring Data

Automatic air quality monitoring was carried out at the AQMS, located behind the Cheltenham Town Hall – which measures urban background levels of nitrogen dioxide. There were no exceedances of the annual mean or 1-hour air quality objectives

## Table 4: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	WithinProportion of AQMA?Annual Mean Co (µg/m				
			data 2008 (%)	2006	2007	2008	
AQMS	Town Hall	N	99.8%	20.4	23.4	21.5	

#### Table 5: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-Hour Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 (%)	Number of E mea If the period 90% of a full y of hourl 2006	Exceedances an (200 µg/m d of valid data is rear, include th y means in bra 2007	s of hourly 3) s less than e 99.8 <sup>th</sup> %ile ckets. 2008
AQMS	Town Hall	N	99.8%	0	0	0

#### 2.2.1.1 Diffusion Tube Monitoring Data

Cheltenham Borough Council undertook diffusion tube monitoring at 21 locations across their administrative area. The results are included in the table below. The only exceedance of the annual mean objective with relevant exposure is that on Bath Road (lower) which has since been declared an AQMA.

The 2008 annual mean concentrations indicate that four locations exceed the annual mean objective, namely, Boots Corner ( $40\mu g/m^3$ ), Tewkesbury Road ( $41\mu g/m^3$ ), Promenade ( $41\mu g/m^3$ ) and lower Bath Road ( $43\mu g/m^3$ ). Relevant exposure only exists at lower Bath Road and this location was declared an AQMA in 2008. No Detailed Assessment will therefore be required.

Further detailed monitoring of  $NO_2$  has occurred during 2009 using duplicate tubes at 13 locations along Bath Road and the adjoining High Street. Preliminary results indicate that the AQMA may need to be extended due to continuing exceedance of the annual mean objective for  $NO_2$ . This will be reported on in the forthcoming Further Assessment Report due to be produced in 2010.

Site ID	Location	Within AOMA2	Data Capture	Annual Mean Concentrations		trations
			2000 (78)	2006 <sup>A</sup>	(μg/m) 2007 <sup>в</sup>	2008 <sup>c</sup>
Α	Boots Corner	N	75	37.7	42.2	40.7
В	54 Upper Norwood St	N	100	17.5	20.3	18.9
С	212 London Road	Ν	83.33	24.8	25.6	26.1
D	Church Road Police Stn.	Ν	100	20.4	27.4	30.0
E	Chelsea Close	Ν	100	19.0	21.4	20.0
F	Old Bakery Prestbury	Ν	100	36.2	33.7	34.4
G	Cambray	Ν	100	25.7	26.1	27.8
Н	179 Bath Road	Ν	100	24.1	34.5	32.7
	off Tewkesbury Road	Ν	100	25.4	24.6	24.5
J	Tewkesbury Road	Ν	100	37.6	41.1	41.5
K	St Georges Street	Ν	91.67	30.2	30.5	31.6
L	Fiddlers Green Lane	Ν	100	22.5	24.1	25.6
М	Miserden Road	Ν	100	30.1	32.9	31.3
N	Promenade	Ν	91.67	44.2	44.8	42.1
0	St Aidans Close	N	83.33	22.2	27.0	25.4
Р	6 [lower] Bath Road	Y	100	46.2	44.6	44.0
U	P.E.Way	Ν	100	33.4	32.0	30.0
V	Westal Green	N	100	34.1	35.2	31.6
W	54 Church Road	N	100	23.3	23.7	23.5
Х	124 Gloucester Road	N	100	30.5	32.8	31.9
Z	Town Hall AQ Station	N	100	20.9	23.5	22.1

 Table 5.1 Results of Nitrogen Dioxide Diffusion Tube Monitoring in Cheltenham

A: Bias adjustment factor for 2006 was 0.95

B: Bias adjustment factor for 2007 was 0.88

C: Bias adjustment factor for 2008 was 0.87

#### 2.2.2 PM<sub>10</sub>

 $PM_{10}$  monitoring was carried out at the AQMS. There was 1 exceedance of the 24 hour mean during the monitoring period (2008). The annual mean was 13.6ug/m<sup>3</sup> and the one 24 hour exceedance of this air quality objective is not considered significant.

Table 6:	Results	of	Automatic	Monitoring	for	PM <sub>10</sub> :	Comparison	with	Annual	Mean
Objective	9									

Site ID	Location	Within AQMA?	Proportion of year with valid	Annual Mean Concentratior (μg/m <sup>3</sup> )		trations
			data 2008 (%)	2006	2007	2008
AQMS	Town Hall	N	100%	14.9	15.3	13.6

Table 7:	Results	of	Automatic	Monitoring	for	<b>PM</b> <sub>10</sub> :	Comparison	with	24-Hour	Mean
Objective	e									

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 (%)	Number o hourly If data captu %ile of ho 2006	f Exceedance mean (50 µg re < 90%, inclu urly means in b 2007	es of 24 g/m <sup>3</sup> ) ude the 90 <sup>th</sup> prackets. 2008
AQMS	Town Hall	N	100%	0	0	1

#### 2.2.3 Sulphur Dioxide

Sulphur Dioxide monitoring was carried out at the AQMS during 2008. There were no exceedances of the 15 minute mean, 1 hour mean or the 24 hour mean during the monitoring period.

## Table 8: Results of Automatic Monitoring for $SO_2$ : Comparison with 15-minute Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid	Number of Exceedances of minute mean (366 μg/m <sup>2</sup>		es of 15- .g/m <sup>3</sup> )
			data 2008 (%)	2006	2007	2008
AQMS	Town Hall	N	99.7%	0	0	0

### Table 9: Results of Automatic Monitoring for $SO_2$ : Comparison with 1 Hour Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid	Number of Exceedances of mean (350 μg/m <sup>3</sup> )		s of 1-hour <sup>3</sup> )
			data 2008 (%)	2006	2007	2008
AQMS	Town Hall	N	99.7%	0	0	0

### Table 10: Results of Automatic Monitoring for $SO_2$ : Comparison with 24-Hour Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 (%)	Number o hourly 2006	f Exceedanc mean (125 μ 2007	es of 24 g/m <sup>3</sup> ) 2008
AQMS	Town Hall	N	99.7%	0	0	0

#### 2.2.4 Other pollutants

No benzene, carbon monoxide, 1,3-butadiene or lead monitoring was carried out by Cheltenham Borough Council during the last round of Review and Assessment.

#### 2.2.5 Ozone

Ozone monitoring was carried out at the AQMS during 2008. There were a total of ten exceedances of the 8-hour mean level of 100ug/m<sup>3</sup> during 2008.

### Table 11: Results of Automatic Monitoring for $O_3$ : Comparison with 24-Hour Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid	Number of Exceedances of 8 mean (100 μg/m <sup>3</sup> )		s of 8-hour <sup>3</sup> )
			data 2008 (%)	2006	2007	2008
AQMS	Town Hall	N	99.7%	54	15	10

#### 3 Road Traffic Sources

The focus of attention for road traffic sources in Round 4 of Review and Assessment is on relevant locations close to busy roads, especially in congested areas and near to junctions, where emissions will be higher, and in built up areas where the road is canyon like, with buildings on either side of the road restricting dispersion and dilution of the emissions.

## 3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Consideration has been given to locations where traffic is slow moving, with stop/start driving, and where buildings on either side reduce dispersion. This element of the Updating and Screening Assessment only considers  $NO_2$ . Further information on the detailed criteria followed can be found in Section A1, Box 5.3 of LAQM.TG(09).

There are currently no newly identified congested streets with a flow above 5,000 vehicles per day that need to go towards Detailed Assessment at this stage. However, Cheltenham Borough Council has recently reviewed their nitrogen dioxide monitoring network in January 2010 and relocated many diffusion tubes to incorporate streets where congestion is known and there are properties present in close proximity to the road. Further details of this will be reported during the next Annual Progress report in 2010.

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

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

Consideration has been given to streets with many shops and/or outdoor cafes and bars where people may be expected to regularly spend 1-hour or more. This element of the Updating and Screening Assessment only considers  $NO_2$ . Further information on the detailed criteria followed can be found in Section A2, Box 5.3 of LAQM.TG(09).

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

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

Consideration has been given to street locations where traffic flows are not necessarily high but there are an unusually high proportion of buses and/or HGVs. This element of the Updating and Screening Assessment considers both  $NO_2$  and  $PM_{10}$ . Further information on the detailed criteria followed can be found in Section A3, Box 5.3 of LAQM.TG(09).

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

#### 3.4 Junctions

Pollution concentrations may be higher close to junctions due to both the combined impact of traffic emissions on two or more roads and the influence of stop/start traffic. Consideration has been given to junctions of this type. This element of the Updating and Screening Assessment considers both  $NO_2$  and  $PM_{10}$ . Further information on the detailed criteria followed can be found in Section A4, Box 5.3 of LAQM.TG(09).

Cheltenham Borough Council confirms that there are no new/newly identified busy junctions/busy roads.

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

Consideration has been given to new roads constructed or proposed since the last round of Review and Assessment. This element of the Updating and Screening Assessment considers both  $NO_2$  and  $PM_{10}$ . Further information on the detailed criteria followed can be found in Section A5, Box 5.3 of LAQM.TG(09).

Cheltenham Borough Council confirms that there are no new/proposed roads.

#### 3.6 Roads with Significantly Changed Traffic Flows

This section of the Updating and Screening Assessment only consider those roads that have not been assessed in above. A significant increase can be considered as a 25% increase in traffic flow on any road with more than 10,000 vehicles per day. This element of the Updating and Screening Assessment considers both NO<sub>2</sub> and PM<sub>10</sub>. Further information on the detailed criteria followed can be found in Section A6, Box 5.3 of LAQM.TG(09).

There is a proposal currently under consideration for the development of 5000 new houses to the north-west of Cheltenham (termed the North-west extension area) is still in the early consultation phase. This development will primarily impact on Tewkesbury Road, Cheltenham and also on the M5 Junction 10. A map of the proposed development is in Appendix D. To date there has been some consultation by the Developer's Agents with regards to the potential impact on air quality from this proposed development. Cheltenham Borough Council has agreed with the Developer's Agents for a number of NO<sub>2</sub> diffusion tubes to be placed in strategic positions in the vicinity of the proposed development to monitor current background NO<sub>2</sub> levels. These monitoring tubes should allow modelling of the likely increase in NO<sub>2</sub> as a result of the development and whether or not mitigation measures should be implemented. During forthcoming consultation periods it will be recommended that sufficient mitigation measures are adopted as part of the proposed development to ensure that traffic derived NO<sub>2</sub> levels do not exceed statutory limits.

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

#### 3.7 Bus and Coach Stations

This section considers bus stations or section of bus stations that are not enclosed, and where relevant exposure exists. This element of the Updating and Screening Assessment considers both  $NO_2$  objectives (annual mean and 1-hour). Further information on the detailed criteria followed can be found in Section A7, Box 5.3 of LAQM.TG(09).

Cheltenham Borough Council confirms that there are no relevant bus stations in the Local Authority area.

#### 4 Other Transport Sources

Most sources in this section have been considered in previous rounds of Review and Assessment however future consideration may be required where there have been substantial change, where new relevant exposure exists or if a busy railway line with diesel locomotives goes through a local authority's area.

#### 4.1 Airports

Consideration has been given to airports with >10 million passengers per annum (100,000 tonnes freight = 1mppa) and with relevant exposure within 1000m of the airport boundary. This element of the Updating and Screening Assessment considers just NO<sub>2</sub> (consideration of PM<sub>10</sub> has been removed from the new Technical Guidance). Further information on the detailed criteria followed can be found in Section B1, Box 5.4 of LAQM.TG(09).

Cheltenham Borough Council confirms that there are no airports in the Local Authority area.

#### 4.2 Railways (Diesel and Steam Trains)

Stationary locomotives, diesel and coal fired, can give rise to high levels of  $SO_2$  close to the point of emissions. Additionally, recent evidence suggests that lines with heavy traffic of moving locomotives may give rise to high levels of  $NO_2$  close to the track.

#### 4.2.1 Stationary Trains

Consideration has been given to locations where locomotives, diesel or coal fired, are regularly stationary for period of 15 minutes or more and where relevant exposure exists. This element of the Updating and Screening Assessment considers just  $SO_2$ . Further information on the detailed criteria followed can be found in Section B2, Box 5.4 of LAQM.TG(09).

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

#### 4.2.2 Moving Trains

Consideration has been given to sections of tracks with large numbers (>300) moving diesel locomotives, with background NO<sub>2</sub> concentrations >25µg/m<sup>3</sup> and relevant exposure with 30m of the edge of the tracks. This element of the Updating and Screening Assessment considers just NO<sub>2</sub>. Further information on the detailed criteria followed can be found in Section B2, Box 5.4 of LAQM.TG(09) and in the associated FAQ on the R&A Website (<u>http://www.uwe.ac.uk/aqm/review/FAQ\_Railway\_Locomotives\_100209.pdf</u>). Table 5.1 of LAQM.TG(09), which lists the rail lines with a heavy traffic of diesel passengers, identifies no lines of concern within Cheltenham.

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

#### 4.3 Ports (Shipping)

Consideration is given to ports where large ships generally burn oils with a high sulphur content in their main engines (bunker oils). This element of the Updating and Screening Assessment considers just  $SO_2$ . Further information on the detailed criteria followed can be found in Section B3, Box 5.4 of LAQM.TG(09).

Cheltenham Borough Council is a land-locked authority and confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

#### 5 Industrial Sources

#### 5.1 Industrial Installations

Industrial sources are controlled by the Environment Agency (EA) and by local authorities under the Pollution Prevention and Control regulations and through the Clean Air Act. Many of these sources have been previously assessed in detail in previous Rounds of Review and Assessment, therefore focus in this Updating and Screening Assessment is primarily on new installations and those with significantly changed emissions. This section considers all of the regulated pollutants although those most at risk included SO<sub>2</sub>, NO<sub>2</sub>, PM<sub>10</sub> and Benzene.

Cheltenham Borough Council does not have any major industrial installations within its area. There are several small-scale industrial processes, such as cement works, paint spraying booths and metal coating works which are regulated under the Environmental Permitting (England & Wales) Regulations 2007 and as such are inspected annually for compliance with their permit conditions. None of the permitted installations is considered to significantly impact air quality within the Cheltenham area.

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

Consideration has been given to any new or proposed industrial installations for which an Air Quality Assessment has been carried out. Further information on the detailed criteria followed can be found in Section C1, Approach 1, Box 5.5 of LAQM.TG(09).

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

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

Consideration has been given to any existing industrial installations where emissions have increased substantially or new exposure introduced. Further information on the detailed criteria followed can be found in Section C1, Approach 2, Box 5.5 of LAQM.TG(09).

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

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

Consideration has been given to any new or significantly altered industrial installations for which no Air Quality Assessment has been produced. Further information on the detailed criteria followed can be found in Section C1, Approach 3, Box 5.5 of LAQM.TG(09).

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

#### 5.2 Major Fuel (Petrol) Storage Depots

There is the potential for major fuel depots (petrol) to emit benzene and risk exceeding the 2010 objective. This element of the Updating and Screening Assessment considers benzene only. Further information on the detailed criteria followed can be found in Section C2, Box 5.5 of LAQM.TG(09).

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

#### 5.3 Petrol Stations

Petrol stations combined with nearby busy roads may potentially emit sufficient benzene to risk exceeding the 2010 objective. Consideration has been given to all petrol stations with an annual throughput of more than 2000m3 of petrol, with busy roads close by and relevant exposure with 10m of the pumps. This element of the Updating and Screening Assessment considers benzene only. Further information on the detailed criteria followed can be found in Section C3, Box 5.5 of LAQM.TG(09).

Details of all permitted petrol stations within the Borough are provided in Appendix C.

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

#### 5.4 Poultry Farms

Previous rounds of Review and Assessment have identified the potential exceedances of the  $PM_{10}$  objectives associated with emissions from poultry farms (defined as chickens (laying hens and broilers), turkeys, ducks and guinea fowl). Consideration has been given to any farms housing in excess of 400,000 birds (mechanically ventilated), 200,000 birds (naturally ventilated) or 100,000 turkeys (any ventilation) where relevant exposure exists with 100m. This element of the Updating and Screening Assessment considers  $PM_{10}$  only. Further information on the detailed criteria followed can be found in Section C4, Box 5.5 of LAQM.TG(09).

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

#### 6 Commercial and Domestic Sources

Commercial (including the service sector) and domestic sources need to be considered in relation to biomass combustion and the use of domestic solid-fuel usage. The process of combustion of biomass material may result in an increase in  $PM_{10}$  and  $NO_X$  emissions.

#### 6.1 Biomass Combustion – Individual Installations

Consideration has been given to large individual installations (50kW to 20MW in size) burning biomass. This element of the Updating and Screening Assessment considers  $PM_{10}$  and  $NO_2$ . Further information on the detailed criteria followed can be found in Section D1a, Box 5.8 of LAQM.TG(09).

In Cheltenham, there is a proposal to install a biomass heating system at the University of Gloucestershire's Hardwick campus. This facility is rated at 700KW. The Campus site and proposed boiler is in a Smoke Control Area and the boiler will need to be exempt under Section 21 of the Clean Air Act 1993. However the proposed development has been put on hold and there is currently insufficient information available to conduct an air quality assessment. Should the proposed development resume, then a screening assessment will be carried out at this time.

Cheltenham Borough Council 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

Numerous small biomass combustion units, while acceptable individually, may have a cumulative impact on  $PM_{10}$  concentrations. This element of the Updating and Screening Assessment considers  $PM_{10}$  only. Further information on the detailed criteria followed can be found in Section D1b, Box 5.8 of LAQM.TG(09) and subsequent FAQ (http://www.uwe.ac.uk/aqm/review/mfaqfiles/FAQ%20on%20solid%20fuel%20burning%20Ap ril%202009%20v5%20final.pdf).

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

#### 6.3 Domestic Solid-Fuel Burning

Consideration has been given to locations where domestic solid-fuel burning (coal) may give rise to exceedances of the  $SO_2$  objectives. This element of the Updating and Screening Assessment considers  $SO_2$  only. Further information on the detailed criteria followed can be found in Section D2, Box 5.8 of LAQM.TG(09).

Cheltenham Borough Council has a Smoke Control Area which covers approximately 70% of the Borough. Within this area only exempt fuels or exempt appliances can be used in domestic fuel burning situations. Although anecdotal evidence points to an increase in the use of woodburners and multi-fuel stoves in Cheltenham, it is not thought that this in having a significant impact on air quality at present.

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

#### 7 Fugitive or Uncontrolled Sources

Fugitive or uncontrolled sources may give rise to emissions of  $PM_{10}$ . This section considers numerous sources such as quarries, landfill sites, stockyards, construction work and waste management site. Consideration has been given to elements such as:

- the passage of vehicles over unpaved roads;
- handling of dust materials;
- process dust e.g. concrete cutting; and
- windblown dust from stockpiles and dusty surfaces.

This element of the Updating and Screening Assessment considers  $PM_{10}$  only. Further information on the detailed criteria followed can be found in Section E1, Box 5.10 of LAQM.TG(09).

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

#### 8 Conclusions and Proposed Actions

#### 8.1 Conclusions from New Monitoring Data

The nitrogen dioxide monitoring data demonstrates a continuing exceedance of the annual mean objective at four locations within Cheltenham, namely, Tewkesbury Road, The Promenade, Boots Corner and Bath Road (lower). Only Bath Road (lower) has relevant exposure with residential flats at first and second floor level at a number of locations (see Appendix E for photos) and this location was designated as an AQMA in December 2008. Duplicate monitoring tubes were subsequently placed in thirteen locations within and near to the AQMA and they have been monitored monthly during 2009. This data will be reported on in the forthcoming Progress Report and Further Assessment.

There were no other exceedances of any pollutants or objectives in 2006, 2007 and 2008.

#### 8.2 Conclusions from Assessment of Sources

- Following the screening criteria in LAQM.TG(09), there are no <u>transport sources</u> of concern, therefore, a Detailed Assessment will not be required.
- Following the screening criteria in LAQM.TG(09), there are no <u>other transport sources</u> of concern, therefore, a Detailed Assessment will not be required.
- Following the screening criteria in LAQM.TG(09), there are no <u>industrial sources</u> of concern, therefore, a Detailed Assessment will not be required.
- Following the screening criteria in LAQM.TG(09), there are no <u>commercial/domestic</u> <u>sources</u> of concern, therefore, a Detailed Assessment will not be required.
- Following the screening criteria in LAQM.TG(09), there are no <u>fugitive sources</u> of concern, therefore, a Detailed Assessment will not be required.

#### 8.3 **Proposed Actions**

Cheltenham Borough Council will submit a Progress Report in April 2010. Additionally, Cheltenham Borough Council is currently working on their Further Assessment and Air Quality Action Plan for the (lower) Bath Road AQMA which will be submitted in 2010.

#### Appendix A: QA:QC Data

#### **Diffusion Tube Bias Adjustment Factors**

The diffusion tubes (20% TEA in Acetone) are supplied and analysed by Bristol Scientific Services Ltd. The tubes at all locations throughout the area have a monthly exposure period. A triplicate co-location study at Cheltenham's Automatic monitoring station (AQMS) generated a 'local' bias adjustment factors which has been applied to all nitrogen dioxide diffusion tube data. This data has been assessed using the Precision and Accuracy Bias Tool available on the Air Quality Archive Website. The bias adjustment factors utilised are:

- 2006 bias adjustment factor: 0.95
- 2007 bias adjustment factor: 0.88
- 2008 bias adjustment factor: 0.87



Figure 6: Local bias adjustment factor 2008

#### **Discussion of Choice of Factor to Use**

The co-location study results have been checked for precision and accuracy to confirm the precision of the diffusion tube results, and the accuracy of the automatic monitoring results in relation to data capture. All results had good data capture and a coefficient of variation less than 15%, with the exception of one monitoring period where a variation of 23% was recorded. From these results, a bias adjustment factor of 0.87 was determined. A bias adjustment factor for 2008 was also estimated using the published Bias Adjustment Factors Spreadsheet (v04/08). A factor of 0.87 was estimated from four studies (excluding results from the Cheltenham co-location study). Although in many cases, using an overall correction factor derived from as many co-location studies as possible will provide the 'best estimate' of the 'true' annual mean concentration, it is important to recognise that uncertainty associated with this bias adjusted annual mean remains. One analysis has shown that the uncertainty for tubes bias adjusted in this way is  $\pm 20\%$  (at 95% confidence level). This compares with a

typical value of  $\pm$  10% for chemiluminescence monitors subject to appropriate QA/QC procedures. Having studied both scenarios regarding which factor to use it has been decided use the 'local' co-location adjustment factor of 0.87 as it is more representative of the local situation.

#### QA/QC of automatic monitoring

#### Introduction

Cheltenham Borough Council's Air Quality Monitoring Station (AQMS) is operated and managed by Casella Eti Data Services. During 2008 they provided a service to Cheltenham Borough Council which included routine servicing and maintenance of the monitoring equipment together with calibration and reporting of results on a quarterly basis. They were also responsible for daily data checking and responding to alarms and replacement of calibration gases.

The AQMS at Cheltenham uses daily automatic calibration checks to validate the data for O3, NOx and SO2. An automatic daily calibration check is conducted to verify the response of the analyser in reference to the 'zero' and 'span' by introducing a high known concentration of a calibration gas. The daily calibration check produces an actual zero and actual span response value which is stored on a calibration file on the logger. The calibration results are then used to create a calibration factor, which is used to rescale the data. The analysers are serviced every six months by Cassella ETI to ensure correct functioning of the instruments.

#### 1.1 NOx Analyser

The Monitor Labs 9841B NOx analysers measure nitric oxide and oxides of nitrogen in total. These analysers use a technique called chemiluminescence to detect the gases. The analytical technique used can be broadly explained by stating that a beam of light is directed onto the molecules of gases as they enter the analyser. As a result, the gas molecules themselves either emit or absorb light, and it is the intensity of the emitted or absorbed light that is measured by the analysers, and the concentrations of the pollutants are then calculated. The concentrations of the gases are then expressed in parts per billion (parts of gas per billion parts of air).

#### 1.2 SO2 Analyser

The Monitor Labs 9850B SO2 analyser employs ultra-violet fluorescence (UVF). SO2 molecules are excited to higher but unstable energy states by UV radiation at 212 nm. These energy states decay, causing an emission of secondary fluorescent radiation with an intensity proportional to the concentration of SO2 in the sample. The fluorescent radiation is incident upon a photomultiplier tube (PMT), which converts the wavelength to an analogue voltage. The PMT and photodetector outputs produce a compensated voltage proportional to the ambient SO2 concentrations.

#### 1.3 Ozone Analyser

The Monitor Labs ML9810 Ozone analyser is a Ultra-violet photometer which measures ozone concentrations in ambient air. Ozone is converted to oxygen by a catalyst and passed through an absorption cell where the amount of transmitted UV radiation at 254nm is measured. This is termed the reference measurement. Another sample of ambient air is passed directly into the absorption cell, without being catalysed, and the UV reading is compared to the reference measurement using the Beer-Lambert relationship to calculate the ozone concentration, which is also compensated for temperature and pressure.

#### 1.4 **TEOM**

PM10 particle concentrations are measured by a Rupprecht & Patashnick tapered element oscillating microbalance (TEOM) series 1400a. This involves measuring the cumulative weight of articles collected on a filter. Pollution concentrations are expressed in microgram's per cubic metre.

#### **TEOM Operation and data adjustment**

The TEOM operates differently from the gas analysers, with differing data ratification requirements.

The two main requirements when operating the TEOM are:-

(i) Ensure that the TEOM filter is changed correctly, and within the lifespan of the filter i.e. before the filter reaches 90%.

(ii) The data produced from the TEOM is checked on a daily basis ensuring that any faults in the operation of the TEOM are detected quickly.

Calibration of the TEOM is undertaken during the six monthly services conducted by Casella ETi.

The UK PM10 Objectives (and EU limit values) are based upon measurements carried out using the European reference sampler, which is a gravimetric device where the particle mass is collected onto a filter and subsequently weighed. This method has a number of disadvantages in that only 24-hour mean concentrations are recorded and the data cannot be disseminated to the public in real time and the operation is labour intensive. Historically TEOM analysers have been predominantly used in the UK. A significant problem with instruments using heated inlets, such as TEOM analysers, is the loss of semi-volatile components when heated to drive off excess moisture. A default correction factor of 1.3 was recommended to be applied to the data of analysers using heated inlets in order to generate a nominal 'gravimetric-equivalent' result. However for TEOM data the guidance is now to use the volatile correction model (VCM) which uses the Filter Dynamics Measurement System (FDMS) 'purge measurement' as an indicator of the volatile component of PM10 and is based on the assumption that the volatile component of PM10 lost during the heated sampling with a standard TEOM is consistent across a defined geographical area, such that the measurements of this component at one location may be used to correct measurements at another. A VCM web portal now allows local authorities to download geographically specific correction factors to apply to TEOM PM10 results.

However the PM10 data within this report have been adjusted using the earlier nationally recognised correction factor of 1.3.

#### Appendix B: List of Service Stations

#### Table 12: List of Service Stations

		Post	Process
IPC ID	Location	Code	Guidance
EPR	Wm Morrisons Filling Station, Greatfield		
1/14(06)2.01	Park, Up Hatherley, Cheltenham	GL51 5BW	Petroleum PG1/14
EPR	Shell Cheltenham, 352-35 Gloucester		
1/14(06)2.02	Road, Cheltenham	GL51 7AY	Petroleum PG1/14
EPR	Shell Arle, Princess Elizabeth Way,		
1/14(06)2.03	Cheltenham	GL51 7PA	Petroleum PG1/14
EPR	Tesco Petrol Filling Station, Colletts		
1/14(06)2.04	Drive, Cheltenham	GL51 8JQ	Petroleum PG1/14
EPR	Sainsbury's Petrol Filling Station,		
1/14(06)2.05	Tewkesbury Road, Cheltenham	GL51 9AA	Petroleum PG1/14
EPR	Waitrose Petrol Filling Station,		
1/14(06)2.06	Honeybourne Way, Cheltenham	GL50 3QW	Petroleum PG1/14
EPA 1 / 14.01			
V1	394 Gloucester Road, Cheltenham	GL51 7AT	Petroleum PG1/14
EPA 1 / 14.04	Sixways Service Station, London Road,		
V1	Cheltenham	GL52 6HZ	Petroleum PG1/14
EPA 1 / 14.07	Cheltenham Service Station, Bouncers		
V1	Lane, Prestbury, Cheltenham	GL52 4JF	Petroleum PG1/14
EPA 1 / 14.09	East End Service Station, London Road,		
V1	Cheltenham	GL52 6YY	Petroleum PG1/14
EPA 1 / 14.10			
V1	Tewkesbury Road, Cheltenham	GL51 9SG	Petroleum PG1/14
EPA 1 / 14.12	Star Cheltenham Service Station, Westall		
V1	Green, Cheltenham	GL50 2JA	Petroleum PG1/14
EPA 1 / 14.17	Budgens (Jet) Petrol Station, 80-86		
V1	Prestbury Road, Cheltenham, GL52 2DJ	GL52 2DJ	Petroleum PG1/14

#### **Appendix C Permitted Processes**

One new industrial source has been identified in the Borough. This is Kohler Mira (Kingsville Trading Estate, Cheltenham, GL51 9NZ) a copper and alloy process established for the casting of gunmetal shower components. The process was permitted in October 2005, the emission limits as per PG 2/08 and the nearest significant receptor is 330 metres away.

Local	Licensed processes	Date of last	Principal Controlled
Authority ref.		Variance or	Emissions
_		Authorisation	
EPAP6/17.02	Printing of food packaging film	07/06/2003	VOCs
EPAP5/2.02	Cremation	01/08/2008	HCI, particulates, CO, organics
EPAP2/08.01	Low pressure die casting	05/12/2008	Particulates, amines, HF
IPPC P. 3/1.01	Concrete batching	08/03/2004	Cementitious material
IPPC P. 3/1.02	Concrete batching	08/03/2004	Cementitious material
IPPC P. 3/1.03	Concrete batching	26/03/2008	Cementitious material
IPPC P. 3/1.04	Concrete batching	26/03/2008	Cementitious material
PPC 6/34(04).1	Respraying of road vehicles	04/03/2008	VOCs / particulates
PPC 6/34(04).3	Respraying of road vehicles	26/03/2008	VOCs / particulates
PPC 6/34(04).4	Respraying of road vehicles	04/03/2008	VOCs / particulates
PPC 6/34b(06).5	Respraying of road vehicles	07/07/2008	VOCs / particulates
PPC 6/34b(06).6	Paint spraying of new vehicles	28/08/2008	VOCs
FPR	Unloading of petrol into storage		
1/14(06)2.01	tanks at service stations	14/12/2009	VOCs
EPR	Unloading of petrol into storage		
1/14(06)2.02	tanks at service stations	14/12/2009	VOCs
EPR	Unloading of petrol into storage		
1/14(06)2.03	tanks at service stations	14/12/2009	VOCs
EPR	Unloading of petrol into storage		
1/14(06)2.04	tanks at service stations	14/12/2009	VOCs
EPR	Unloading of petrol into storage		
1/14(06)2.05	tanks at service stations	14/12/2009	VOCs
EPR	Unloading of petrol into storage		
1/14(06)2.06	tanks at service stations	21/12/2009	VOCs
	Unloading of petrol into storage		
EPA 1 / 14.01 V1	tanks at service stations	03/01/2007	VOCs
	Unloading of petrol into storage		
EPA 1 / 14.04 V1	tanks at service stations	19/09/2002	VOCs
	Unloading of petrol into storage		
EPA 1 / 14.07 V1	tanks at service stations	11/09/2002	VOCs
	Unloading of petrol into storage		
EPA 1 / 14.09 V1	tanks at service stations	11/09/2002	VOCs
	Unloading of petrol into storage		
EPA 1 / 14.10 V1	tanks at service stations	11/09/2002	VOCs
	Unloading of petrol into storage		
EPA 1 / 14.12 V1	tanks at service stations	19/09/2002	VOCs
	Unloading of petrol into storage		
EPA 1 / 14.17 V1	tanks at service stations	04/04/2008	VOCs
	Burning of waste oil in burners less	10/00/0001	
PPC 1/1.03	than 0.4MW net rated thermal input	10/03/2004	Soot / smoke
	Burning of waste oil in burners less	04/00/0004	
PPC 1/1.01	than 0.4MW net rated thermal input	04/03/2004	Soot / smoke
PPC B/DC 01	Dry Cleaning	26/10/2006	Perchioroethylene/VOC's
PPC B/DC 02	Dry Cleaning	01/11/2007	Perchioroethylene/VOC's
PPC B/DC 03	Dry Cleaning	01/11/2007	Perchioroethylene/VOC's
PPC B/DC 04	Dry Cleaning	01/11/2007	Perchloroethylene/VOC's
PPC B/DC 05	Dry Cleaning	01/11/2007	Perchloroethylene/VOC's

Table 13: List of permitted processes



Appendix D: Map of proposed NW Cheltenham Extension area



### Appendix E: Photos showing residential exposure within Cheltenham AQMA



View south down Lower Bath road from High Street – showing corridor effect of buildings



Junction of High Street and Bath Road. Residential exposure above shop



Residential exposure above shops on southern side of High Street



Residential exposure above shops on southern side of High Street



Exposure on northern side of High Street



View east down High Street to corner with Bath Road showing relevant exposure above shops