



# 2013 Air Quality Progress Report for Aberdeen City Council

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

September 2013



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## Executive Summary

This Progress Report has been undertaken to fulfil Aberdeen City Council's duty to annually review and assess air quality. The Report provides the latest monitoring results and discusses the implications for air quality management in Aberdeen. In writing the Report, the Council has regard to the Government's published guidance LAQM.TG(09).

In 2012 the annual mean nitrogen dioxide level ( $\text{NO}_2$ ) continued to exceed the national air quality objective across the City Centre Air Quality Management Area (AQMA). Pockets of exceedances were also recorded within the Wellington Road and Anderson Drive/Haudagain Roundabout/Auchmill Road AQMAs. Levels at monitoring locations were generally similar to previous years with the exception of Wellington Road where the level increased from  $51\mu\text{g m}^{-3}$  in 2011 to  $59\mu\text{g m}^{-3}$  in 2012. The 2009-2012 trend at Wellington Road shows there has been an increase in concentrations in recent years. Traffic counters indicated a 5-10% increase in traffic flow over the period 2006-2013 which may have contributed to the increased measured concentrations.

There were no exceedances of the  $\text{NO}_2$  1 hour objective at the continuous monitoring sites although diffusion tube data suggested potential exceedances at specific locations in the City Centre AQMA. Diffusion tubes located outwith the AQMAs did not record any exceedances of the annual mean  $\text{NO}_2$  objective.

The annual mean  $\text{PM}_{10}$  objective was exceeded at Wellington Road, Market St, Union Street and King Street. The objective was met at Errol Place and Anderson Drive. Concentrations at Anderson Drive, Market Street and Wellington Road have remained steady over the period 2009-2012, however there has been a slight increase in levels at both King Street and Union Street.

The increase of  $1\mu\text{g m}^{-3}$  evident at King Street in 2011 and 2012 (measured concentration  $19\mu\text{g m}^{-3}$ ) compared to previous years is significant as the annual mean objective of  $18\mu\text{g m}^{-3}$  is exceeded. During 2012 it became evident that the BAM monitors at both Market Street and King Street recorded significantly elevated levels during prolonged periods of wet weather. Data over selected periods was removed during the data ratification process; however it is possible that other, less obvious periods of elevated levels were not identified. A heat exchanger was installed at Market Street in November 2012 which should prevent further moisture interference. King Street is an older BAM model and it was not possible to install a heat exchanger at this location. Historical levels at both sites may also be slightly elevated.

The 24-hour objective was met at Errol Place, Union Street, Anderson Drive and King Street, but exceeded at Market Street and Wellington Road. Concentrations exceeded  $50\mu\text{g m}^{-3}$  at Market Street on 15 occasions in both 2011 and 2012. At Wellington Road concentrations exceeded  $50\mu\text{g m}^{-3}$  on 1 occasion in 2010, 8 in 2011 and 10 in 2012. This increase may also be linked to the increased traffic flow.

The 2012 monitoring data indicates the current AQMAs remain valid and Aberdeen City Council has no proposals to undertake any Detailed Assessments during 2013.

PM<sub>10</sub> concentrations at King Street will continue to be assessed and the need for further action will be considered in future Progress Reports.

An Air Quality Action Plan Progress Report was developed during 2012 and published in January 2013. This report includes specific indicators and trend analysis to monitor progress in the implementation of the Action Plan measures.

There were no new developments or other sources of pollution introduced in Aberdeen during 2012 likely to have had a significant impact on local air quality.

# Table of Contents

<b>1</b>	<b>Introduction</b>	<b>7</b>
1.1	Description of Local Authority Area	7
1.2	Purpose of Progress Report	7
1.3	Air Quality Objectives	8
1.4	Summary of Previous Review and Assessments	10
<b>2</b>	<b>New Monitoring Data</b>	<b>15</b>
2.1	Summary of Monitoring Undertaken	15
2.2	Comparison of Monitoring Results with Air Quality Objectives	23
<b>3</b>	<b>New Local Developments</b>	<b>41</b>
3.1	Road Traffic Sources	41
3.2	Other Transport Sources	41
3.3	Industrial Sources	41
3.4	Commercial and Domestic Sources	41
3.5	New Developments with Fugitive or Uncontrolled Sources	43
<b>4</b>	<b>Local / Regional Air Quality Strategy</b>	<b>44</b>
<b>5</b>	<b>Planning Applications</b>	<b>45</b>
<b>6</b>	<b>Air Quality Planning Policies</b>	<b>47</b>
<b>7</b>	<b>Local Transport Plans and Strategies</b>	<b>48</b>
<b>8</b>	<b>Climate Change Strategies</b>	<b>49</b>
<b>9</b>	<b>Implementation of Action Plans</b>	<b>50</b>
<b>10</b>	<b>Conclusions and Proposed Actions</b>	<b>51</b>
10.1	Conclusions from New Monitoring Data	51
10.2	Conclusions relating to New Local Developments	51
10.3	Other Conclusions	51
10.4	Proposed Actions	52
<b>11</b>	<b>References</b>	<b>53</b>

**List of Tables**

Table 1.1	Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management
Table 1.2	Summary of Air Quality Reports and Outcomes
Table 2.1	Details of Automatic Monitoring Sites
Table 2.2	Details of Non-Automatic Monitoring Sites
Table 2.3	Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective
Table 2.4	Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1 hour Mean Objective
Table 2.5	Results of Nitrogen Dioxide Diffusion Tubes 2012
Table 2.6	Results of Nitrogen Dioxide Diffusion Tubes 2009-2012
Table 2.7	Results of PM <sub>10</sub> Automatic Monitoring: Comparison with Annual Mean Objective
Table 2.8	Results of PM <sub>10</sub> Automatic Monitoring: Comparison with 24-hour Mean Objective
Table 2.9	Results of PM <sub>2.5</sub> Automatic Monitoring: Comparison with Annual Mean Objective
Table 2.10	Results of Automatic Monitoring for Ozone: Comparison with Annual Mean Objective
Table 3.1	Biomass Combustion Plant considered during 2012
Table 5.1	Planning Applications with Potential Air Quality Impact
Table B1	Bias Factor Calculations
Table C1	Measured 4-Weekly Diffusion Tube Data
Table C2	Annual Mean Bias Adjusted Diffusion Tube Data and Correction to Façade
Table C3	Diffusion Tube Concentrations Showing Calculations to Façade

**List of Figures**

Figure 2.1	Trends in Annual Mean NO <sub>2</sub> concentrations measured at Automatic Sites
Figure 2.2	Trends in Annual Mean PM <sub>10</sub> concentrations measured at Automatic Sites
Figure A1	Map of City Centre AQMA
Figure A2	Map of Anderson Drive AQMA
Figure A3	Map of Wellington Road AQMA
Figure A4	Map of Continuous Monitoring and Diffusion Tube Locations

**Appendices**

Appendix 1 Maps of AQMAs and monitoring locations

Appendix 2 QA/QC Data

Appendix 3 Diffusion Tube Data and Calculations

Appendix 4 Air Quality Action Plan Progress Report

Appendix 5 Air Quality Action Plan Progress Report Monitoring Table

# **1 Introduction**

## **1.1 Description of Local Authority Area**

Aberdeen is situated on the east coast of Scotland by the North Sea and has a population of 220,000. The city acts as a focus for employment, service and leisure activities both for residents of Aberdeen and the surrounding area.

There is little heavy industry within the city and much of the economy is based around services to the oil industry. Road traffic is the main source of atmospheric pollution. Aberdeen's road transportation system is constrained by the River Dee to the south of the city and the River Don to the north therefore there are limited routes to either arrive at or pass around the city. Construction of a Western Peripheral Route around the city was due to commence during 2010, however appeals against the development were lodged in the Court of Session and in May 2010 and subsequently the Supreme Court in April 2012. This Appeal was rejected in October 2012 and development work can now commence. Completion is anticipated by 2018. The A90 and A96 trunk roads, A93 North Deeside Road, A956 Ellon Road and A956 Wellington Road are the most significant routes to converge or pass through the city centre. Much of the commuter traffic entering the city comes from the neighbouring Aberdeenshire.

Aberdeen Harbour is located in the city centre and is a thriving environment acting as the UK's main base for supply vessels to offshore installations. There are also regular ferries to The Shetland and Orkney Islands. Aberdeen Airport (Dyce) is located around 7km to the northwest of the city.

## **1.2 Purpose of Progress Report**

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

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

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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
<b>Benzene</b>	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
<b>1,3-Butadiene</b>	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
<b>Carbon monoxide</b>	10 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
<b>Lead</b>	0.50 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
<b>Nitrogen dioxide</b>	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
<b>Particulate Matter (PM<sub>10</sub>) (gravimetric)</b>	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
<b>Sulphur dioxide</b>	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 outcomes of the first, second, third and fourth rounds of the review and assessment process for NO<sub>2</sub> and PM<sub>10</sub> are described in sections 1.4.1-1.4.5. All rounds of the process concluded levels of carbon monoxide, benzene, 1,3-butadiene, sulphur dioxide and lead in Aberdeen are unlikely to exceed the national air quality objectives.

### **1.4.1 First Round of Review and Assessment**

The first round of the review and assessment process predicted exceedances of the annual mean objective for NO<sub>2</sub> in parts of the city centre. An Air Quality Management Area (AQMA) was declared in June 2001 centering around Market Street and Union Street. Following subsequent Detailed Assessments in 2001 and 2002 the AQMA was slightly amended in March 2003 to include adjoining areas.

### **1.4.2 Second Round of Review and Assessment**

The second round of review and assessment confirmed levels of NO<sub>2</sub> continued to exceed the annual mean objective in the city centre, including streets adjacent to the AQMA. Exceedances of the 1-hour objective were also predicted on Market Street. Additionally, exceedances of the new annual mean objective for PM<sub>10</sub>, to be achieved by 2010, were also predicted in the city centre. Following a Detailed Assessment, the AQMA was amended in January 2005 to include all areas of current or predicted exceedances of both the NO<sub>2</sub> and 2010 PM<sub>10</sub> annual mean objectives in the city centre and the 1-hour NO<sub>2</sub> objective on Market Street.

Emissions from Aberdeen Harbour were considered in the Detailed Assessment. It was concluded that emissions from shipping contributed to elevated levels of NO<sub>2</sub> and PM<sub>10</sub> in the Market Street and Guild Street areas, but do not cause exceedance of the objectives.

An Air Quality Action Plan was also published in July 2006 detailing measures to improve the air quality in the AQMA. These included

- Pedestrianisation of Union Street and associated road infrastructure improvements
- Additional controlled parking
- Additional Park and Ride facilities
- Green Transport Plans
- Improved Public Transport
- Increase Public Awareness of Air Quality Issues
- Construction of a Western Peripheral Route around the city (AWPR)

### **1.4.3 Third Round of Review and Assessment**

A further Updating and Screening Assessment and Progress Reports were completed in 2006, 2007 and 2008 respectively. NO<sub>2</sub> levels across the City and PM<sub>10</sub> levels on Union Street were found to be similar to previous years. In 2007 elevated levels of PM<sub>10</sub> were recorded on Market St due to roadworks and the development of the Union Square retail park adjacent to the continuous monitoring station. Potential exceedances of the annual mean objective for both PM<sub>10</sub> and NO<sub>2</sub> were predicted on the Anderson Drive/Haudagain roundabout corridor even with the construction of the proposed Aberdeen Western Peripheral Route (AWPR) and on parts of Wellington Road.

A Detailed Assessment completed in March 2008 concluded that the annual mean NO<sub>2</sub> objective and the annual mean 2010 PM<sub>10</sub> objective were likely to be exceeded in 2010 at the Haudagain roundabout (A96/A90), locations along the A90 Anderson Drive and Wellington Road (Queen Elizabeth II Bridge to Balnagask Road) without the AWPR. With the AWPR exceedances were still predicted on Wellington Road although levels slightly below the objectives were predicted on the Haudagain roundabout/Anderson Drive corridor.

Wellington Road (Queen Elizabeth II Bridge to Balnagask Road) was designated an AQMA in November 2008 as a result of the Detailed Assessment and annual mean NO<sub>2</sub> and PM<sub>10</sub> levels recorded in the 2008 Progress Report. The Haudagain roundabout/Anderson Drive corridor was also declared an AQMA for both pollutants as NO<sub>2</sub> monitoring in the vicinity of the roundabout had frequently recorded measurements in excess of the objective and the AWPR would not be completed until 2012 at the earliest.

The Detailed Assessment also considered NO<sub>2</sub> and PM<sub>10</sub> levels on King Street. Although potential exceedances of both objectives were identified, there was a lack of monitoring data in the area to confirm the likelihood of exceedances. Accordingly further monitoring was recommended prior to any decision being made on the requirement for an AQMA on King Street.

### **1.4.4 Fourth Round of Review and Assessment**

The 2009 Updating and Screening Assessment and 2010 Progress Report completed in July 2009 and July 2010 respectively confirmed measured NO<sub>2</sub> levels were again similar to previous years with the exception of Market Street. The Market Street monitoring station was relocated in 2008 and the lower levels recorded at the new site are attributable to the more open nature of the site and reduced congestion. Both reports confirmed continued widespread exceedances of the NO<sub>2</sub> annual mean objective within the City Centre AQMA and pockets of exceedances within the Wellington Road and Anderson Drive/Haudagain roundabout AQMAs.

PM<sub>10</sub> levels were lower in 2009 compared to previous years. It is believed that the replacement of Errol Place TEOM with an FDMS and the use of the VCM for the first time contributed to the lower values.

In 2012 diffusion tube concentrations identified likely exceedances of the annual mean objective just outwith the existing boundaries of the City Centre and Anderson Drive/Haudagain roundabout AQMAs. These AQMAs were extended in November 2011 to include the following areas:

- City Centre AQMA: Victoria Road to the junction with Sinclair Road, Bridge Street and West North Street to the junction with Littlejohn Street
- Anderson Drive/Haudagain roundabout AQMA: Auchmill Road to the junction with Howes Road.

Additionally, the Union Street continuous monitoring recorded exceedances of the 1 hour NO<sub>2</sub> objective. As diffusion tube data indicated likely exceedances at several sites across the City Centre AQMA, the AQMA was also amended to include exceedance of the 1 hour objective.

A new Air Quality Action Plan (AQAP) covering all 3 AQMAs was adopted in March 2011. Measures to improve air quality were grouped into the following 6 categories:

- Modal Shift and Influencing Travel Choice
- Lower Emissions and Cleaner Vehicles
- Road Infrastructure
- Traffic Management
- Planning and Policies
- Non-Transport Measures

Maps of the 3 AQMAs are shown in Figures A1-A3 in Appendix A.

#### **1.4.5 Fifth Round Review and Assessment**

The 2012 Updating and Screening Assessment again confirmed continued exceedances of the annual mean PM<sub>10</sub> and NO<sub>2</sub> objectives across the 3 AQMAs. NO<sub>2</sub> and PM<sub>10</sub> levels were broadly similar to previous years with the exception of the Union St continuous monitor which recorded a 25% decrease in the annual mean concentration. The reason for the dramatic decrease is unknown but equipment malfunction may have been a factor, especially as traffic flows remained the same.

There were no exceedances of the 1 hour NO<sub>2</sub> objective and a slight rise in the number of exceedances of the 24 hour PM<sub>10</sub> objective at Market St, Union St, King St and Wellington Road.

A study of emissions from shipping and their impact on the City Centre AQMA was also completed in 2011. It was concluded that, whilst emissions from shipping are not likely to cause an exceedance of the annual mean objectives, they do contribute to existing exceedances in specific areas near the Harbour.

Table 1.2 summarises the outcome of previous air quality reports.

**Table 1.2 Summary of Air Quality Reports and Outcomes**

<b>Report</b>	<b>Outcomes</b>
Stages 1, 2, 3 and 4 Reports 2000-2003	City centre AQMA declared in June 2001 due to predicted exceedances of annual mean NO <sub>2</sub> objective. Area of AQMA extended in March 2003.
Updating and Screening Assessment August 2003	Detailed Assessment of NO <sub>2</sub> and PM <sub>10</sub> recommended in city centre and assessment of Aberdeen Harbour.
Detailed Assessment August 2004	Extension of city centre AQMA for NO <sub>2</sub> and inclusion of predicted exceedances of 1-hour objective on Market Street. City Centre AQMA declared for PM <sub>10</sub> due to predicted exceedances of the 2010 annual mean objective. Concluded emissions from Aberdeen Harbour do not cause exceedances of objectives, but contribute to elevated levels of NO <sub>2</sub> and PM <sub>10</sub> on Market Street and Guild Street areas.
Progress Report 2005	Update of monitoring results and new developments.
Updating and Screening Assessment July 2006	Update of monitoring results and new developments.
Air Quality Action Plan July 2006	Detailed measures to improve air quality in the AQMA.
Progress Report June 2007	Detailed Assessment of NO <sub>2</sub> and PM <sub>10</sub> recommended on Wellington Road, Anderson Dr/Haudigain roundabout/Auchmill Rd corridor and King Street.
Detailed Assessment March 2008	AQMAs declared November 2008 on Anderson Drive/Haudagain roundabout and Wellington Rd (Queen Elizabeth II Bridge – Balnagask Rd) due predicted exceedances of NO <sub>2</sub> and 2010 PM <sub>10</sub> annual mean objectives.
Progress Report May 2008	Update of monitoring results and new developments and progress on implementation of the Air Quality Action Plan.
Updating and Screening Assessment July 2009	Update of monitoring results. Recommended additional NO <sub>2</sub> diffusion tubes at potential areas of exceedances. Modelling of City Centre PM <sub>10</sub> and NO <sub>2</sub> recommended to support proposed new Action Plan.
City Centre modelling study March 2010	City Centre modelling predicted widespread exceedances of annual mean PM <sub>10</sub> objective and minor potential areas of exceedances of the NO <sub>2</sub> annual mean objective outwith the AQMA.
Progress Report July 2010	Update of monitoring results and progress in the development of a new Air Quality Action Plan covering the 3 AQMAs.
Progress Report June 2011	Update of monitoring results, extension of City Centre and Anderson Drive/Haudagain roundabout AQMAs and amendment of City Centre AQMA to include exceedance of the 1 hour NO <sub>2</sub> objective.
Air Quality Action Plan March 2011	Detailed measures to improve air quality across the 3 AQMAs.
Updating and	Update of monitoring results and planning developments.

Screening Assessment July 2012	Assessment of emissions from Aberdeen Harbour.
Action Plan Progress Report January 2013	Update of progress in the Action Plan implementation, including specific indicators and trend analysis.

## **2 New Monitoring Data**

### **2.1 Summary of Monitoring Undertaken**

#### **2.1.1 Automatic Monitoring Sites**

There are 6 continuous monitoring sites in Aberdeen. Details of pollutants monitored, equipment types and site locations are described in Table 2.1. Figure A4 in Appendix A shows the site locations. QA/QC procedures are detailed in Appendix B.

The Market St site required to be removed in October 2008 due to the construction of the adjacent Union Square retail park. A new site at the junction of Market Street/Poynerook Road commenced collecting data in July 2009.

The Market St TEOM was replaced with a BAM in March 2010 and a replacement NO<sub>x</sub> analyser installed in April 2010. The Union Street NO<sub>x</sub> analyser was replaced in February 2012 due to recurrent technical problems during 2011.



Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
CM1	Errol Place	Background	X394397	Y807392	7.0	PM <sub>10</sub> , PM <sub>2.5</sub> , O <sub>3</sub> , NO <sub>2</sub> (NO, NO <sub>x</sub> )	N	FDMS Chemiluminescence	N/A	N/A	N
CM2	Union Street	Roadside	X393656	Y805967	1.5	PM <sub>10</sub> , NO <sub>2</sub> (NO, NO <sub>x</sub> )	Y	TEOM Chemiluminescence	Y(2m)	2m	Y
CM3	Market Street	Roadside	X394560	Y805677	1.5	PM <sub>10</sub> , NO <sub>2</sub> (NO, NO <sub>x</sub> )	Y	BAM Chemiluminescence	Y(0m)	2m	N
CM4	Anderson Drive	Roadside	X392506	Y804186	1.5	PM <sub>10</sub> , NO <sub>2</sub> (NO, NO <sub>x</sub> )	Y	TEOM Chemiluminescence	Y(10m)	6m	N
CM5	Wellington Road	Roadside	X394395	Y804779	1.5	PM <sub>10</sub> , NO <sub>2</sub> (NO, NO <sub>x</sub> )	Y	TEOM Chemiluminescence	Y(5m)	4m	Y
CM6	King Street	Roadside	X394333	Y808770	1.5	PM <sub>10</sub> , NO <sub>2</sub> (NO, NO <sub>x</sub> )	n	BAM Chemiluminescence	Y(10m)	3m	N

### **2.1.2 Non-Automatic Monitoring Sites**

Levels of nitrogen dioxide are also monitored across the city via diffusion tubes attached to lampposts and downpipes. Figure A4 in Appendix A shows the site locations. The diffusion tubes provide an indication of longer-term average NO<sub>2</sub> concentrations and highlight areas of high NO<sub>2</sub> concentrations. Tubes are co-located in triplicate at all the continuous monitoring sites detailed in Table 2.1 to enable the bias adjustment of the city wide survey. Duplicate tubes are also co-located at several city centre sites. Table 2.2 provides details of diffusion tube monitoring sites.

**Table 2.2 Details of Non- Automatic Monitoring Sites**

<b>Site ID</b>	<b>Site Name</b>	<b>Site Type</b>	<b>X OS Grid Reference</b>	<b>Y OS Grid Reference</b>	<b>Site Height (m)</b>	<b>Pollutants Monitored</b>	<b>In AQMA?</b>	<b>Is Monitoring Co-located with a Continuous Analyser (Y/N)</b>	<b>Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)</b>	<b>Distance to Kerb of Nearest Road (m) (N/A if not applicable)</b>	<b>Does this Location Represent Worst-Case Exposure?</b>
DT1	Bucksburn Primary Sch, Inverurie Road	Roadside	389744	809575	2.5	NO <sub>2</sub>	Y	N	Y (façade)	8m	N
DT2	885 Gt Northern Rd	Roadside	391167	809161	2.5	NO <sub>2</sub>	Y	N	Y (11m)	3m	Y
DT3	549 N Anderson Dr	Roadside	391394	808949	2.5	NO <sub>2</sub>	Y	N	Y (17m)	3m	Y
DT4	38 Ellon Rd	Roadside	394652	809714	2.5	NO <sub>2</sub>	N	N	Y(7m)	3m	Y
DT5	520 King St	Roadside	394236	808066	2.5	NO <sub>2</sub>	N	N	Y(9m)	0.1m	N
DT6	86 Victoria Rd, Torry	Roadside	394764	805197	2.5	NO <sub>2</sub>	N	N	Y(façade)	3m	Y
DT7	Wellington Rd//Kerloch Pl	Roadside	394411	804407	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT8	107 Anderson Dr	Roadside	392337	804340	2.5	NO <sub>2</sub>	Y	N	Y(14m)	3m	Y
DT9	31 Market St	Roadside	394258	806157	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y

**Aberdeen City Council**
**September 2013**

<b>Site ID</b>	<b>Site Name</b>	<b>Site Type</b>	<b>X OS Grid Reference</b>	<b>Y OS Grid Reference</b>	<b>Site Height (m)</b>	<b>Pollutants Monitored</b>	<b>In AQMA?</b>	<b>Is Monitoring Co-located with a Continuous Analyser (Y/N)</b>	<b>Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)</b>	<b>Distance to Kerb of Nearest Road (m) (N/A if not applicable)</b>	<b>Does this Location Represent Worst-Case Exposure?</b>
DT10	184/192 Market St	Roadside	394530	805708	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT11	105 King St	Roadside	394406	806637	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT12	40 Union St	Roadside	394284	806284	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT13	Music Hall, Union St	Roadside	393777	806030	2.5	NO <sub>2</sub>	Y	N	Y(façade)	6m	Y
DT14	Dyce Prim, Gordon Ter	Urban background	389046	812794	2.5	NO <sub>2</sub>	N	N	Y(N/A)	N/A	N
DT15	Northfield swimming pool	Urban background	390801	808132	2.5	NO <sub>2</sub>	N	N	Y(N/A)	N/A	N
DT16	Guild St/Market St	Roadside	394336	806097	2.5	NO <sub>2</sub>	Y	N	Y(facade)	5m	Y
DT17	43/45 Union St	Roadside	394284	806284	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT18	14 Holburn St	Roadside	393305	805734	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT19	468 Union St	Roadside	393386	805826	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT20	212 King St	Roadside	394400	806842	2.5	NO <sub>2</sub>	N	N	Y(façade)	4m	N
DT21	26 King St	Roadside	394449	806453	2.5	NO <sub>2</sub>	Y	N	Y(façade)	4m	Y
DT22	104 King St	Roadside	394425	806634	2.5	NO <sub>2</sub>	Y	N	Y(façade)	4m	Y

## Aberdeen City Council

September 2013

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
DT23	785 Gt Northern Rd	Roadside	391458	809102	2.5	NO <sub>2</sub>	N	N	Y(façade)	3m	Y
DT24	40 Auchmill Rd	Roadside	389913	809603	2.5	NO <sub>2</sub>	N	N	Y(facade)	3m	Y
DT25	21 Holburn St	Roadside	393323	805728	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT26	147 Holburn St	Roadside	393323	805728	2.5	NO <sub>2</sub>	N	N	Y(façade)	3m	N
DT27	80 Holburn St	Roadside	393233	805565	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT28	61 Holburn St	Roadside	393275	805624	2.5	NO <sub>2</sub>	Y	N	Y(5m)	3m	Y
DT29	469 Union St	Roadside	393400	805811	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT30	209 Union St	Roadside	393795	806009	2.5	NO <sub>2</sub>	Y	N	Y(façade)	5m	Y
DT31	249 Union St	Roadside	393170	805120	2.5	NO <sub>2</sub>	Y	N	Y(façade)	5m	Y
DT32	Willowbank Rd/Albury Rd	Roadside	393642	805503	2.5	NO <sub>2</sub>	N	N	Y(5m)	3m	N
DT33	East North St	Roadside	394505	806529	2.5	NO <sub>2</sub>	Y	N	Y(façade)	4m	Y
DT34	404 King Street	Roadside	394317	807527	2.5	NO <sub>2</sub>	N	N	Y(façade)	9m	N

## Aberdeen City Council

September 2013

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
DT34	Riverside House, Riverside Drive	Roadside	39425	804873	2.5	NO <sub>2</sub>	N	N	Y(façade)	6m	N
DT36	115 Menzies Rd/Wellington Rd	Roadside	394403	804799	2.5	NO <sub>2</sub>	Y	N	Y(12m)	1m	Y
DT37	137 Wellington Road	Roadside	394697	803735	2.5	NO <sub>2</sub>	N	N	Y(17m)	14m	N
DT38	Wellington Road / 4 Nigg Kirk Road	Roadside	394719	803329	2.5	NO <sub>2</sub>	N	N	Y(7m)	3m	N
DT39	819 Gt Northern Rd	Roadside	391293	809136	2.5	NO <sub>2</sub>	Y	N	Y(façade)	3m	Y
DT40	852 Fullerton Ct (facade)	Facade	391353	809158	2.5	NO <sub>2</sub>	Y	N	Y(façade)	7m	Y
DT41	852 Fullerton Ct (roadside)	Roadside	391352	809151	2.5	NO <sub>2</sub>	Y	N	Y(7m)	0.1m	Y
DT42	248 George St	Roadside	393868	806741	2.5	NO <sub>2</sub>	N	N	Y(façade)	2m	N
DT43	25 Rosemount PI	Roadside	393424	806685	2.5	NO <sub>2</sub>	N	N	Y(3m)	3m	N
DT44	214 Rosemount PI	Roadside	392897	806352	2.5	NO <sub>2</sub>	N	N	Y(façade)	3m	N

**Aberdeen City Council**
**September 2013**

<b>Site ID</b>	<b>Site Name</b>	<b>Site Type</b>	<b>X OS Grid Reference</b>	<b>Y OS Grid Reference</b>	<b>Site Height (m)</b>	<b>Pollutants Monitored</b>	<b>In AQMA?</b>	<b>Is Monitoring Co-located with a Continuous Analyser (Y/N)</b>	<b>Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)</b>	<b>Distance to Kerb of Nearest Road (m) (N/A if not applicable)</b>	<b>Does this Location Represent Worst-Case Exposure?</b>
DT45	111 S Anderson Dr	Facade	392311	804349	2.5	NO <sub>2</sub>	Y	N	Y(façade)	13m	N
DT46	West North Street	Roadside	394277	806671	2.5	NO <sub>2</sub>	Y	N	Y(façade)	4m	Y

## **2.2 Comparison of Monitoring Results with Air Quality Objectives**

The Union Street and Market Street continuous monitoring sites are on busy city centre roads and are representative of population exposure for NO<sub>2</sub>. Union Street is the city's main shopping street with shops on the ground level and commercial premises and flats on the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> floors. Almost all of the city's bus routes pass along at least part of Union Street and the inside lane of both sides of the road are designated bus lanes. Market Street is adjacent to Aberdeen Harbour and has a high proportion of HGV's travelling between the north-east of Scotland, the Harbour and locations to the south of Aberdeen. The street is used by pedestrians travelling to the city centre from residential properties to the south of the river Dee, visiting the new Union Square retail park and people working around the Harbour area. There are a small number of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> floor flats. Emissions from Aberdeen Harbour also contribute to the pollution on Market Street.

The Anderson Drive site is 4m from the kerb and is not representative of population exposure as residential properties are set back 10-20m from the kerb. Similarly the site at Wellington Road is around 3-4m closer to the kerb than residential properties in the area. The nearest properties are 10m from the King Street site, however the location is typical of flatted properties close to the kerb at other locations on King Street. Errol Place is representative of typical residential properties close to the city centre but not adjacent to a major road.

Diffusion tubes on Market Street, Union Street and the majority of those on Holburn Street and King Street within the city centre are at building façade and are representative of population exposure. Some of the tubes outwith the city centre are at roadside locations with the façade of the nearest relevant property 5-20m back from the roadside. Procedures within LAQM.TG(09) have been used to estimate the concentration at the nearest receptor where appropriate.



## Nitrogen Dioxide (NO<sub>2</sub>)

### Automatic Monitoring Data

Table 2.3 shows the annual mean NO<sub>2</sub> concentrations at the continuous monitoring stations for NO<sub>2</sub> from 2008-2012. Concentrations at Union Street, Market Street and Wellington Road continue to exceed the annual mean objective. At Errol Place, Anderson Drive and King Street concentrations are well below the objective. The Anderson Drive AQMA was declared due to predicted exceedances of the annual mean objective at locations elsewhere along the Anderson Drive/Haudagain roundabout corridor. Errol Place and King Street are outwith the AQMAs.

Trends in the annual mean concentration are shown in Figure 2.1. Concentrations at Errol Place, Market Street and King Street were similar to previous years. At Anderson Drive the annual mean increased slightly compared to previous years, but was still well below the objective. There was a 12ugm<sup>-3</sup> increase in the annual mean concentration at Union Street compared to 2012, however the 2012 value of 53ugm<sup>-3</sup> is consistent with levels over the period 2008-2010. Although the 2011 data was fully ratified and checked by AEA Technology, the data was acknowledged to be suspect. The 2012 data confirms that the 2011 data does not appear representative of the annual mean concentration.

Levels at Wellington Road increased significantly from 51ugm<sup>-3</sup> in 2011 to 59ugm<sup>-3</sup> in 2012. The 2008-2012 trend also shows a substantial increase over this period. Traffic counters in the vicinity of the monitoring station indicate a 5-10% increase in traffic volume over the period 2006-2013 which may have contributed to the increased concentrations.

Table 2.4 shows the number of exceedances of the 1-hour objective at the automatic monitoring sites. The hourly NO<sub>2</sub> objective was met at all sites. There was a decrease in the number of occasions when measurements were >200ugm<sup>-3</sup> at Union St over the period 2008-2012, but an increase in occasions >200ugm<sup>-3</sup> at Wellington Road over this period. This observation is consistent with the increase in the annual mean at Wellington Road. Only sporadic occasions of concentrations >200ugm<sup>-3</sup> have been recorded at the other sites.

**Table 2.3 Results of Automatic Monitoring for NO<sub>2</sub>: Comparison with Annual Mean Objective**

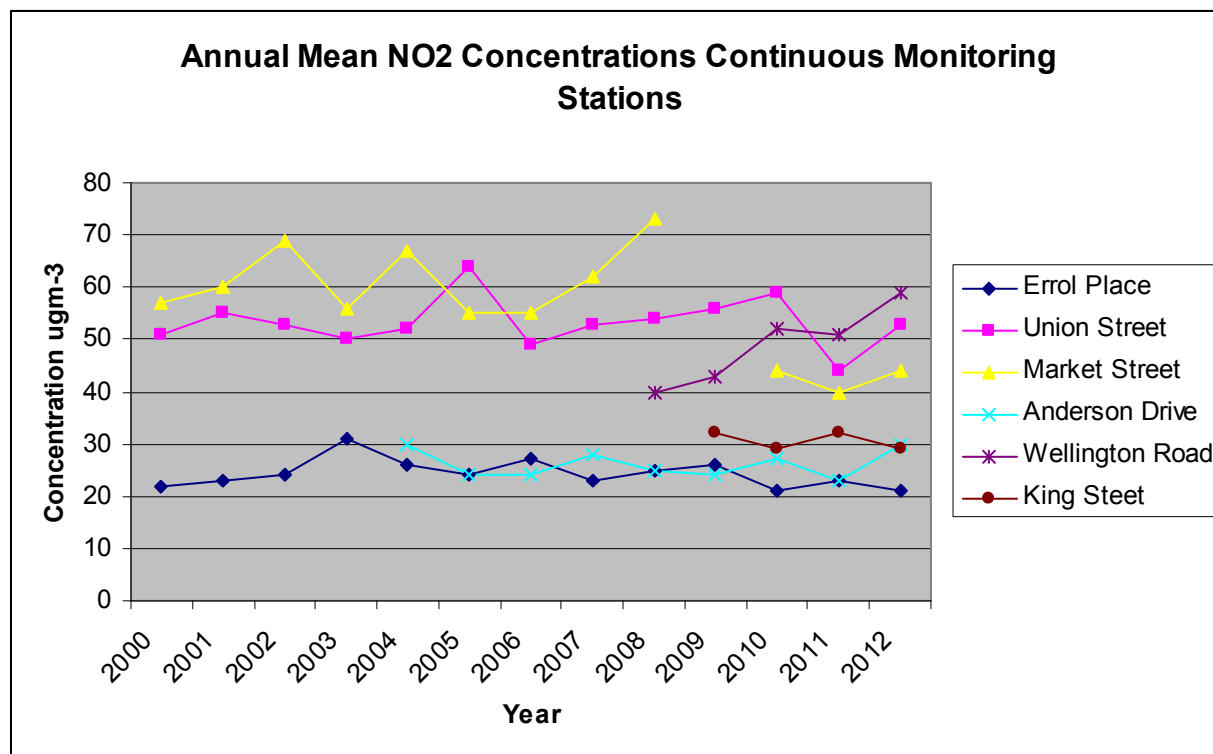
Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2012 % <sup>b</sup>	Annual Mean Concentration (µg/m <sup>3</sup> )				
					2008* <sup>c</sup>	2009* <sup>c</sup>	2010* <sup>c</sup>	2011* <sup>c</sup>	2012 <sup>c</sup>
CM1	Urban Background	N		93.4	25	26	21	23	21
CM2	Roadside	Y		97.4	<b>54</b>	<b>56<sup>c</sup></b>	<b>59</b>	<b>44</b>	<b>53</b>
CM3	Roadside	Y		95.7	<b>73<sup>d</sup></b>	38 <sup>c</sup>	<b>44</b>	<b>40</b>	<b>44</b>
CM4	Roadside	Y		94.1	25	24	27	23	30
CM5	Roadside	Y		95.5	<b>40<sup>c</sup></b>	<b>43</b>	<b>52</b>	<b>51</b>	<b>59</b>
CM6	Roadside	N		87.8	N/A	32	29	32	29

<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

<sup>c</sup> data has been seasonally adjusted to provide “annualised” data using procedures within TG(09), where monitoring was not carried out for the full year.

<sup>d</sup> The Market Street site (CM3) ceased operation in October 2008 due to the development of the adjacent land and was relocated in 2009. Data capture for 2008 and 2009 was 77% and 36% respectively.

**Figure 2.1 Trends in Annual Mean NO<sub>2</sub> Concentrations Measured at Automatic Monitoring Sites**

**Table 2.4 Results of Automatic Monitoring for NO<sub>2</sub>: Comparison with 1-hour Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2012 % <sup>b</sup>	Number of Hourly Means > 200µg/m <sup>3</sup>				
					2008* <sup>c</sup>	2009* <sup>c</sup>	2010* <sup>c</sup>	2011* <sup>c</sup>	2012 <sup>c</sup>
CM1	Urban Background	N		93.4	0	0	0(101)	0	0
CM2	Roadside	Y		97.4	21	10(190)	17(202)	6(168)	1
CM3	Roadside	Y		95.7	94 <sup>d</sup> (244)	2(175)	0(157)	1	0
CM4	Roadside	Y		94.1	2	0	0(111)	0	0
CM5	Roadside	Y		95.5	0(153)	0	1	4	10
CM6	Roadside	N		87.8	N/A	0	0	0	0(108.4)

<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

<sup>c</sup> Where data capture is less than 90% the 99.8<sup>th</sup> percentile of hourly means is presented in brackets

<sup>d</sup> The Market Street site (CM3) ceased operation in October 2008 due to the development of the adjacent land and was relocated in 2009. Data capture for 2008 and 2009 were 77% and 36% respectively

## Diffusion Tube Monitoring Data

Table 2.5 shows the results of the diffusion tube monitoring. Tubes have been bias adjusted using the methodology described in LAQM.TG(09). In recent years there has been a significant variation in the bias factors for the different continuous monitoring sites. In 2011 the national helpline recommended adjustment of 2010 data using the factor from the nearest continuous monitoring site for reporting in the 2011 Progress Report.

In 2011 the helpline recommended using the orthogonal regression of the roadside sites to adjust roadside diffusion tubes and the Errol Place factor for background sites. The same approach was used to adjust 2012 diffusion tube values. Table B1 in Appendix B show the bias adjustment calculations. 2011 and 2012 bias factors are summarised below.

<b>Diffusion Tube Site</b>	<b>2011 Value</b>	<b>2012 Value</b>
Union Street	N/A	0.94
Market Street	0.77	0.78
Anderson Drive	0.91	0.99
King Street	0.87	0.84
Wellington Road	0.96	0.98
Errol Place	0.67	0.78

Uncorrected 4-weekly diffusion tube data, bias adjustment calculations and calculations to correct to façade where appropriate are shown in Tables C1-C3 in Appendix C.

The majority of diffusion tubes within the City Centre AQMA continued to exceed the annual mean objective. Concentrations greater than  $60\mu\text{g m}^{-3}$  were recorded at several sites indicating a risk of exceedance of the 1-hour objective. The AQMA was extended in 2011 to include Victoria Road, Torry and West North Street as a result of previous measured exceedances at Victoria Road and modelling carried out in 2010. The concentration at the Victoria Rd site was below the objective in 2011, but marginally exceeded the objective in 2012. Monitoring at West North Street commenced in autumn 2011. The annual mean objective in 2012 was well below the objective. Measurements over the next 2-3 years will indicate whether the modelling over estimated concentrations at this location. Bias adjustment concentrations at the majority of City Centre sites were generally higher in 2012 compared to 2011.

Concentrations at several sites within both the Wellington Road and Anderson Dr/Haudigan roundabout/Auchmill Road AQMAs exceeded the annual mean objective. These values agreed with previous years indicating pockets of exceedances across the AQMAs. No trend of increased or decrease concentrations was evident within either AQMA.

Outwith the AQMAs concentrations at all sites were well below the objective, including 38 Ellon Road where concentrations reached the objective for the first time in 2011.

Table 2.5 Results of NO<sub>2</sub> Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) <sup>a</sup>	2012 Annual Mean Concentration (µg/m <sup>3</sup> ) - Bias Adjustment factor Roadside = 0.898 Urban background = 0.78
DT1	Bucksburn Primary Sch, Inverurie Road	Roadside	Y	Single	11	34
DT2 <sup>b</sup>	885 Gt Northern Rd	Roadside	Y	Single	11	40
DT3 <sup>b</sup>	549 N Anderson Dr	Roadside	Y	Single	9	29
DT4 <sup>b</sup>	38 Ellon Rd	Roadside	N	Single	12	37
DT5 <sup>b</sup>	520 King St	Roadside	N	Co-located	9	29
DT6	86 Victoria Rd, Torry	Roadside	N	Co-located	12	<b>41</b>
DT7	Wellington Rd//Kerloch Pl	Roadside	Y	Single	12	<b>42</b>
DT8 <sup>b</sup>	107 Anderson Dr	Roadside	Y	Single	12	<b>46</b>
DT9	31 Market St	Roadside	Y	Co-located	12	<b>59</b>
DT10	184/192 Market St	Roadside	Y	Co-located	12	<b>71</b>
DT11	105 King St	Roadside	Y	Co-located	11	<b>62</b>
DT12	40 Union St	Roadside	Y	Co-located	10	<b>57</b>
DT13	Music Hall, Union St	Roadside	Y	Co-located	12	<b>48</b>
DT14	Dyce Prim, Gordon Ter	Urban background	N	Single	12	10
DT15	Northfield swimming pool	Urban background	N	Single	10	13
DT16	Guild St/Market St	Roadside	Y	Co-located	12	<b>54</b>
DT17	43/45 Union St	Roadside	Y	Co-located	12	<b>54</b>
DT18	14 Holburn St	Roadside	Y	Co-located	12	<b>61</b>
DT19	468 Union St	Roadside	Y	Co-located	12	<b>61</b>
DT20	212 King St	Roadside	N	Co-located	12	36

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) <sup>a</sup>	2012 Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Bias Adjustment factor Roadside = 0.898 Urban background = 0.78
DT21	26 King St	Roadside	Y	Co-located	12	<b>43</b>
DT22	104 King St	Roadside	Y	Co-located	12	<b>49</b>
DT23 <sup>b</sup>	785 Gt Northern Rd	Roadside	N	Single	11	33
DT24	40 Auchmill Rd	Roadside	N	Single	12	<b>47</b>
DT25	21 Holburn St	Roadside	Y	Single	12	<b>55</b>
DT26	147 Holburn St	Roadside	N	Single	12	33
DT27	80 Holburn St	Roadside	Y	Co-located	12	33
DT28 <sup>b</sup>	61 Holburn St	Roadside	Y	Co-located	12	<b>44</b>
DT29 <sup>a</sup>	469 Union St	Roadside	Y	Co-located	5	<b>56<sup>a</sup></b>
DT30	209 Union St	Roadside	Y	Single	12	<b>55</b>
DT31	249 Union St	Roadside	Y	Co-located	11	38
DT32 <sup>b,c</sup>	Willowbank Rd/Albury Rd	Roadside	N	Single		N/A
DT33	East North St	Roadside	Y	Co-located	12	<b>52</b>
DT34	404 King Street	Roadside	N	Co-located	12	33
DT35 <sup>c</sup>	Riverbank House, Riverside Dr			Single		N/A
DT36 <sup>b</sup>	115 Menzies Rd/Wellington Rd	Roadside	Y	Co-located	11	<b>48</b>
DT37 <sup>b</sup>	137 Wellington Road	Roadside	N	Single	11	36
DT38 <sup>b</sup>	Wellington Rd/Nigg Kirk Road	Roadside	N	Single		N/A
DT39 <sup>a</sup>	819 Gt Northern Rd	Roadside	Y	Single	7	<b>69<sup>a</sup></b>
DT40	852 Fullerton Ct (facade)	Facade	Y	Single	12	36
DT41 <sup>b</sup>	852 Fullerton Road (roadside)	Roadside	Y	Single	12	30

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) <sup>a</sup>	2012 Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Bias Adjustment factor Roadside = 0.898 Urban background = 0.78
DT42c	248 George St	Roadside	N	Single		N/A
DT43 <sup>b,c</sup>	25 Rosemount Pl	Roadside	N	Single		N/A
DT44 <sup>c</sup>	214 Rosemount Pl	Roadside	N	Single		N/A
DT45	111 S Anderson Dr	Facade	Y	Single	11	36
DT46	West North Street	Roadside	Y	Single	11	30

<sup>a</sup> Although collection is <75% data has not been annualised in accordance with LAQM.TG(09) since the periods of data collection was sporadic over the 12 month period.

<sup>b</sup> Concentrations at nearest relevant receptor have been estimated using the “NO<sub>2</sub> fall-off with distance calculator” described in LAQM.TG.(09) and are discussed in Appendix B.

<sup>c</sup> Monitoring ceased in September 2011 as sites consistently recorded levels below the annual mean objective.

**Table 2.6 Results of NO<sub>2</sub> Diffusion Tubes (2008 to 2012)**

Site ID	Site Type	Within AQMA?	Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Adjusted for Bias <sup>a</sup>				
			2008 (Bias Adjustment Factor = RD 0.97, UB 0.88)	2009 (Bias Adjustment Factor = RD 0.89, UB 0.74)	2010 (Bias Adjustment Factor = nearest site 0.76-1.0))	2011 (Bias Adjustment Factor = RD 0.864, UB 0.67)	2012 (Bias Adjustment Factor = RD 0.898, UB 0.78)
DT1	Roadside	Y	37	33	37	33	34
DT2 <sup>b</sup>	Roadside	Y	40	41	39	41	40
DT3 <sup>b</sup>	Roadside	Y	27	27	30	28	29
DT4 <sup>b</sup>	Roadside	N	38	38	31	40	37



Site ID	Site Type	Within AQMA?	Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Adjusted for Bias <sup>a</sup>				
			2008 (Bias Adjustment Factor = RD 0.97, UB 0.88)	2009 (Bias Adjustment Factor = RD 0.89, UB 0.74)	2010 (Bias Adjustment Factor = nearest site 0.76-1.0))	2011 (Bias Adjustment Factor = RD 0.864, UB 0.67)	2012 (Bias Adjustment Factor = RD 0.898, UB 0.78)
DT5 <sup>b</sup>	Roadside	N	25	30	31	30	29
DT6	Roadside	N	39	34	41	33	41
DT7	Roadside	Y	47	43	45	45	42
DT8 <sup>b</sup>	Roadside	Y	44	42	42	42	46
DT9	Roadside	Y	58	55	63	52	59
DT10	Roadside	Y	75	64	76	64	71
DT11	Roadside	Y	70	67	66	63	62
DT12	Roadside	Y	62	53	62	51	57
DT13	Roadside	Y	52	45	57	42	48
DT14	Urban background	N	12	11	13	9	10
DT15	Urban background	N	15	13	18	11	13
DT16	Roadside	Y	63	53	63	46	54
DT17	Roadside	Y	60	54	61	55	54
DT18	Roadside	Y	59	53	67	55	61
DT19	Roadside	Y	64	55	68	54	61
DT20	Roadside	N	38	36	38	37	36
DT21	Roadside	Y	46	44	46	43	43
DT22	Roadside	Y	52	47	52	48	49
DT23 <sup>b</sup>	Roadside	N	34	32	36	32	33
DT24	Roadside	N	47	39	44	41	47
DT25	Roadside	Y	56	49	55	47	55
DT26	Roadside	N	38	35	38	31	33
DT27	Roadside	Y	36	38	38	31	33
DT28 <sup>b</sup>	Roadside	Y	43	38	44	38	44
DT29	Roadside	Y	71	65	65	63	56
DT30 <sup>a</sup>	Roadside	Y	61	57	62	57	55
DT31	Roadside	Y	39	36	41	35	38
DT32 <sup>b</sup>	Roadside	N	24	21	27	27	N/A
DT33	Roadside	Y	54	53	53	51	52
DT34	Roadside	N	41	40	33	35	33

Site ID	Site Type	Within AQMA?	Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Adjusted for Bias <sup>a</sup>				
			2008 (Bias Adjustment Factor = RD 0.97, UB 0.88)	2009 (Bias Adjustment Factor = RD 0.89, UB 0.74)	2010 (Bias Adjustment Factor = nearest site 0.76-1.0))	2011 (Bias Adjustment Factor = RD 0.864, UB 0.67)	2012 (Bias Adjustment Factor = RD 0.898, UB 0.78)
DT34	Roadside	N	31	28	30	27	N/A
DT36 <sup>b</sup>	Roadside	Y	<b>47</b>	<b>44</b>	<b>42</b>	31	<b>48</b>
DT37 <sup>b</sup>	Roadside	N	34	32	32	31	36
DT38 <sup>b</sup>	Roadside	N	30	31	33	31	N/A
DT39 <sup>a</sup>	Roadside	Y	N/A	<b>54</b>	<b>55</b>	<b>55</b>	<b>69</b>
DT40	Roadside	Y	N/A	36	<b>40</b>	36	30
DT41 <sup>b</sup>	Roadside	Y	N/A	29	28	22	36
DT42	Roadside	N	N/A	34 <sup>a</sup>	38 <sup>a</sup>	35	30
DT43 <sup>b</sup>	Roadside	N	N/A	30 <sup>a</sup>	32 <sup>a</sup>	28	N/A
DT44	Roadside	N	N/A	26 <sup>a</sup>	30 <sup>a</sup>	26	N/A
DT45	Roadside	Y	N/A	N/A	32	29	N/A
DT46	Roadside	Y	N/A	N/A	N/A	N/A	30

In bold, exceedence of the NO<sub>2</sub> annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

Underlined, annual mean > 60 $\mu\text{g}/\text{m}^3$ , indicating a potential exceedence of the NO<sub>2</sub> hourly mean AQS objective

<sup>a</sup> Means have been “annualised” in accordance with LAQM.TG(09) as calendar year data capture is less than 75%, except DT30 and DT58 where missing data was sporadic over the year.

<sup>b</sup> Concentrations at nearest relevant receptor have been estimated using the “NO<sub>2</sub> fall-off with distance calculator” described in LAQM.TG.(09) and are discussed in section Appendix B.

### 2.2.1 Particulate Matter (PM<sub>10</sub>)

The Union Street and Market Street continuous monitoring locations are representative of population exposure for PM<sub>10</sub> due to the proximity of flats in the area. Anderson Drive and Wellington Road are both closer to the kerb than the façade of the nearest residential properties and are not representative of population exposure. The nearest properties are 10m from the King Street site, however the location is typical of flatted properties close to the kerb at other locations on King Street. Errol Place is representative of typical residential properties close to the city centre but not adjacent to a major road.

Tables 2.7 and 2.8 show the annual mean and number of exceedances of the 24 hour objective for PM<sub>10</sub> obtained from the continuous monitoring sites over the period 2008-2012. All data was ratified by AEA Technology. TEOM and BAM data from 2009 has been corrected to gravitational equivalent by AEA Technology using the processes described in Appendix B. Prior to 2009 the annual mean concentration for TEOM monitoring sites in Scotland required to be reported with a 1.3 and a 1.14 correction factor to gravitational equivalent. Table 2.7 therefore reports 2008 and 2009 data with both correction factors.

The annual mean objective was exceeded at Market Street, Union Street, Wellington Road and King Street continuous monitoring sites. Concentrations were below the objective at Errol Place and Anderson Drive.

There was an increase of  $1\mu\text{g m}^{-3}$  at King Street in 2011 and 2012 compared to 2010, which is significant as the increase caused the annual mean objective to be exceeded. The King Street site is outwith the existing AQMAs. During 2012 it became apparent that the BAMs at both Market Street and King Street were recording significantly elevated levels during prolonged periods of wet weather or sea mist in the area. AEA Technology recommended the removal of selected data periods from the 2012 ratified data. A heat exchanger was installed at Market Street in November 2012 which should prevent future moisture interference. King Street is an older BAM model and it was not possible to install a heat exchanger. Historical levels at both sites may therefore be slightly elevated above true levels.

The trend at the Errol Place urban background monitoring site suggests annual mean concentrations have reduced slightly over the period 2009-2012. This is consistent with other background sites across the country. Concentrations at Anderson Drive, Market Street and Wellington Road have remained steady over the period 2009-2012, however there has been a slight increase in levels at Union Street.

The 24-hour objective was met at Errol Place, Union Street, Anderson Drive and King Street. Exceedances were observed at Market Street and Wellington Road. There were 15 occasions when the daily means at Market Street exceeded  $>50\mu\text{g m}^{-3}$  which is identical to 2011, however the number of exceedances at Wellington Road increased from 1 occasion in 2010 to 8 and 10 occasions in 2011 and 2012 respectively.

**Table 2.7 Results of Automatic Monitoring for PM<sub>10</sub>: Comparison with Annual Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2012 % <sup>b</sup>	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m <sup>3</sup> )					
						2008		2009	2010	2011	2012
TEOM Correction to gravitational equivalent						1.3	1.1 4				
CM1	Urban Background	N		96.2	N/A	18	16	15	13	14	12
CM2	Roadside	Y		98.9	Y	22	19	18	18	22	21
CM3	Roadside	Y		77.4	Y	80 <sup>d</sup>	70 <sup>d</sup>	28 <sup>c</sup>	22 <sup>c</sup>	22	23
CM4	Roadside	Y		96.3	Y	18	16	15	14	16	15
CM5	Roadside	Y		97.2	Y	26 <sup>c</sup>	23 <sup>c</sup>	23	22	24	23
CM6	Roadside	N		92.9	Y	N/A	N/A	17	18	19	19

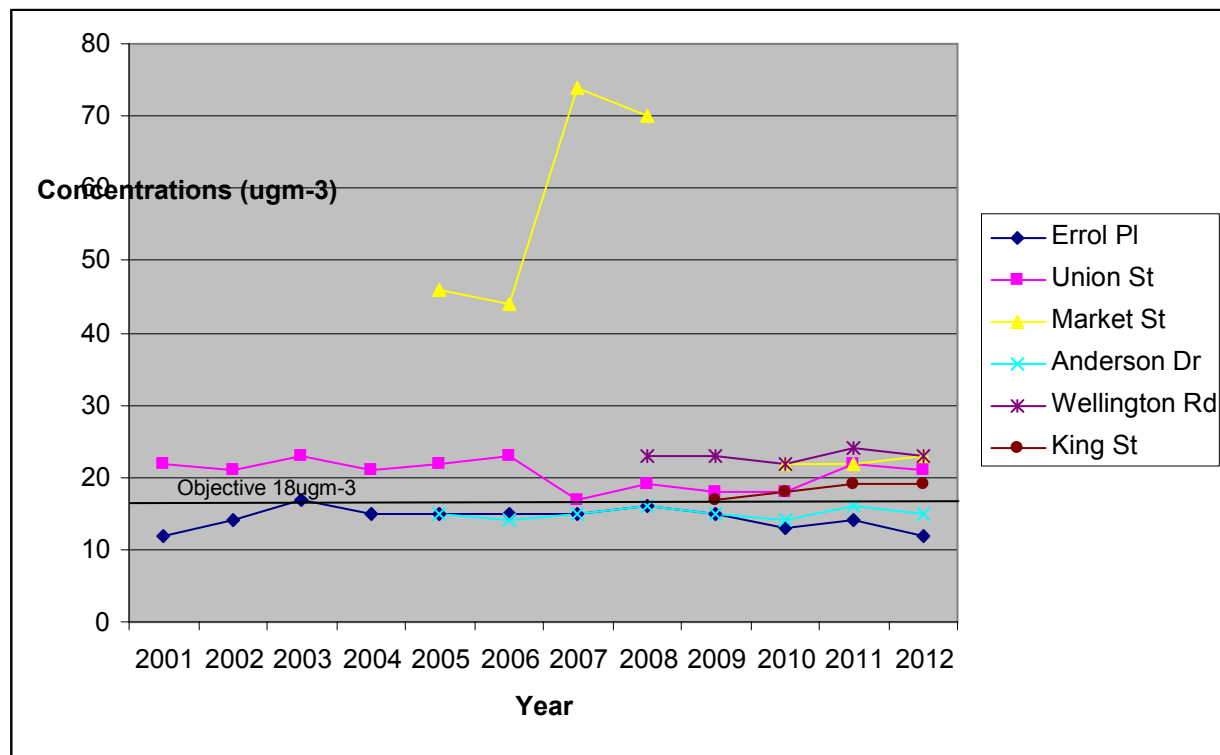
In bold, exceedence of the PM<sub>10</sub> annual mean AQS objective of 18µg/m<sup>3</sup>

<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

<sup>c</sup> data has been seasonally adjusted to provide “annualised” data using Errol Place background and procedures within TG(09),

<sup>d</sup> The Market Street site ceased operation in October 2008 due to construction works at a neighbouring development site. 2008 data data collection was 77%. The site was relocated in 2009.

**Figure 2.2 Trends in Annual Mean PM<sub>10</sub> Concentrations**

**Table 2.8 Results of Automatic Monitoring for PM<sub>10</sub>: Comparison with 24-hour Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % <sup>a</sup>	Valid Data Capture 2012 % <sup>b</sup>	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m <sup>3</sup>				
						2008* <sup>c</sup>	2009* <sup>c</sup>	2010* <sup>c</sup>	2011* <sup>c</sup>	2012 <sup>c</sup>
CM1	Roadside	Y	95	92	Y	2	5	7	8	4
CM2	Roadside	Y	100	80	Y	6	<b>8 (53.2)</b>	5	6	<b>7 (58.5)</b>
CM1	Urban Background	N		96.2	N/A	4	2	1	1	1
CM2	Roadside	Y		98.9	Y	0	1(39)	0	4	3
CM3	Roadside	Y		77.4	Y	116	148(170)	<b>6(53)</b>	<b>15</b>	<b>15(71.1)</b>
CM4	Roadside	Y		96.3	Y	5	0	0(32)	0	0
CM5	Roadside	Y		97.2	Y	N/A	3(46)	1	<b>8</b>	<b>10</b>
CM6	Roadside	N		92.9	Y	N/A	N/A	4	7(38)	6

In bold, exceedence of the PM<sub>10</sub> daily mean AQS objective (50µg/m<sup>3</sup> – not to be exceeded more than 7 times per year)

Where data capture is less than 90% the 98<sup>th</sup> percentile of hourly means is presented in brackets.

<sup>a</sup> data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

<sup>c</sup> The Market Street site ceased operation in October 2008 due to construction works at a neighbouring development site. 2008 data data collection was 77%. The site was relocated in 2009.

### 2.2.2 Sulphur Dioxide (SO<sub>2</sub>)

No monitoring of sulphur dioxide was carried out in 2012 as previous assessments did not predict a likelihood of exceedances of the objective and there has been no significant change in local emissions.

### 2.2.3 Benzene

No monitoring of benzene was carried out in 2012 as previous assessments did not predict a likelihood of exceedances of the objectives and there has been no significant change in local emissions.

### 2.2.4 Other Pollutants Monitored

#### PM<sub>2.5</sub>

Monitoring of PM<sub>2.5</sub> at Errol Place commenced in February 2009 as part of the UK automatic urban network (AUN). The new objectives for PM<sub>2.5</sub> have not been incorporated into the LAQM regime and authorities are not required to review and assess air quality against the objectives. Table 2.9 shows the annual mean concentration from 2009-2012. These results indicate the PM<sub>2.5</sub> objective of 12ugm<sup>-3</sup>, to be achieved by 2020, is likely to be met at urban background sites in Aberdeen. Concentrations have increased slightly over the 3-year monitoring period suggesting the target of a 15% reduction in concentrations at urban background sites, measured as a 3-year mean is unlikely to be met unless measures are adopted to reduce PM<sub>2.5</sub> concentrations.

**Table 2.9 Results of PM<sub>2.5</sub> Automatic Monitoring: Comparison with the Annual Mean Objective**

Year	Data Capture for Monitoring Period (%)	Annual Mean (ugm <sup>-3</sup> )
2009	60.6	7
2010	80	7
2011	90.8	8
2012	96.4	9

## Ozone

Monitoring of ozone is also carried out at Errol Place as part of the AUN. Concentrations of ozone are outwith the control of local authorities and hence ozone is not part of the Local Air Quality Management process. Action to reduce concentrations is a responsibility of the UK government and devolved administrations.

The national objective for ozone is a running 8-hour mean of  $100\mu\text{g m}^{-3}$  not to be exceeded more than 10 times a year. Table 2.10 shows the annual mean concentration and number of exceedances of the 8-hour running mean at Errol Place over the period 2005-2012. It can be seen that the annual mean was similar in 2012 to previous years. Changes in ozone are reflective of meteorological conditions and the variable number of exceedance of the 8 hour objective over the monitoring period is likely to be attributable to the changeable weather.

**Table 2.10 Results of Automatic Monitoring for Ozone: Comparison with the Annual Mean Objective**

Year	Data Capture for Monitoring Period (%)	Annual Mean ( $\mu\text{g m}^{-3}$ )	Number of exceedances of 8-hour objective
2005	99.0	50	26
2006	99.0	48	13
2007	98.5	48	2
2008	98.9	50	30
2009	94.4	42	1
2010	90.3	44	0
2011	96.0	42	38
2012	99.4	44	7



### 2.2.5 Summary of Compliance with AQS Objectives

Aberdeen City Council has examined the results from monitoring in the district.

Concentrations within the City Centre AQMA still exceed the annual mean and the 1-hour NO<sub>2</sub> objectives and the annual mean NO<sub>2</sub> objective in the Wellington Road and Anderson Drive/Haudigan roundabout/Auchmill road AQMA. The AQMA for NO<sub>2</sub> remains valid.

Concentrations within both the City Centre and Wellington Rd AQMA still exceed the annual mean and 24 hour PM<sub>10</sub> objectives and the annual mean P<sub>M10</sub> objective in the Anderson Drive/Haudigan roundabout/Auchmill Road AQMA.

Concentrations of both NO<sub>2</sub> and PM<sub>10</sub> outside of the AQMA are all below the objectives at relevant locations with the exception of the annual mean PM<sub>10</sub> objective at the King Street continuous monitoring station where the objective was marginally exceeded. Recorded measurements from BAM equipment may be elevated during periods of prolonged wet weather or sea mist resulting in a slightly elevated annual mean concentration at this location. A Detailed Assessment is not proposed at this time due to the uncertainty of data validity, however levels will continue to be monitored and the requirement for a Detailed Assessment assessed in future years.

## **3 New Local Developments**

### **3.1 Road Traffic Sources**

There are no significant road traffic sources since the 2012 Updating and Screening Assessment. Planning permission has been granted for a crossing over the River Don (Third Don Crossing). Construction works are proposed to commence in 2014 with completion expected within 3 years. Construction of the Aberdeen Western Peripheral Route (AWPR) will also commence in 2014 with completion anticipated by 2018. The AWPR will significantly improve air quality, particularly the Anderson Dr/Haudigain roundabout/Auchmill Road AQMA. The 3<sup>rd</sup> Don Crossing will also improve air quality at Ellon Rd near the existing bridge of the River Don where levels are currently close to the objective. Air quality assessments for both developments were discussed in previously Progress Reports.

### **3.2 Other Transport Sources**

There are no new transport sources since the last Updating and Screening Assessment.

### **3.3 Industrial Sources**

There are no new industrial installations, major fuel storage depots, petrol stations or poultry farms since the last Updating and Screening Assessment.

### **3.4 Commercial and Domestic Sources**

Table 3.1 summarises planning applications that were considered during 2012 for proposed new biomass combustion plants. A summary of each development and the outcome of air quality assessments is also provided. There are no areas where the combined impact of several biomass combustion sources or where domestic solid fuel burning may be relevant.

There is little domestic fuel burning in Aberdeen as the City is provided with a natural gas supply. Approximately 5-10 complaints are received each year regarding odours from domestic fuel burning. Although, at a national level, there has been an increase

in solid fuel burning in recent years, this authority has not experienced a significant increase in complaints.

**Table 3.1 Biomass combustion plant considered during 2012**

Address	Grid reference	Capacity	Description	Air Quality Impact
Woodside Medical Centre, Marquis Rd, Tillydrone, Aberdeen	X392826 Y808639	199kW boiler	Wood pellet process. Stack height	ADMS dispersion modelling predicted max annual mean NO <sub>2</sub> and PM <sub>10</sub> contribution of 1ugm <sup>-3</sup> and 0.2ugm <sup>-3</sup> . Magnitude of NO <sub>2</sub> impact 'small', impact significance 'imperceptible' due to low background level. PM <sub>10</sub> impact magnitude 'imperceptible' and significance 'negligible'.
Stoneywood Mill CHP, Stoneywood, Aberdeen		76MW CHP, stack height 70m	Woodchip CHP process replacing existing gas fired turbine	Breeze AERMOD 7.2.5 dispersion modelling predicted max annual mean NO <sub>2</sub> and PM <sub>10</sub> contribution of 1.47ugm <sup>-3</sup> and 0.07ugm <sup>-3</sup> . Magnitude of NO <sub>2</sub> impact 'small', impact significance 'imperceptible' due to low background level. PM <sub>10</sub> impact magnitude 'imperceptible' and significance 'negligible'.

### Woodside Medical Centre

The proposed site is within a residential area where existing NO<sub>2</sub> and PM<sub>10</sub> background levels are well below the annual mean objectives. Applying the Environmental Protection UK guidance Development Control: Planning for Air Quality (2010 Update), modelling predicted worst case magnitude of impact for both PM<sub>10</sub> and NO<sub>2</sub> to be negligible.

There are 4 storey flatted properties within 73m and houses within 35m of the site and the potential for emissions to cause amenity nuisance. Dispersion modelling was also used to predict particulate deposition rates arising from the biomass stack emissions. Predicted deposition rates were all significantly below the benchmark of 200mg/m<sup>2</sup>/day, at which receptors are likely to be annoyed and the likelihood of nuisance was considered negligible.

### Stoneywood CHP

The application was considered a major development in the context of planning legislation, providing electricity to the grid and heat and power to Stoneywood Paper

Mill. As the proposed capacity is >50MW, the plant will require to be licensed by SEPA under the PPC regime.

The proposed site is located on an area of land within the existing paper mill site where background NO<sub>2</sub> and PM<sub>10</sub> concentrations are well below the annual mean objectives. Applying the Environmental Protection UK guidance Development Control: Planning for Air Quality (2010 Update), modelling predicted the worst case magnitude of impact for both PM<sub>10</sub> and NO<sub>2</sub> to be negligible. Although the air quality assessment was based on the anticipated CHP design criteria, the modelling results, existing low background levels and licensing requirements ensuring Best Available Techniques are applied to the specific design suggest exceedance of the air quality objectives are unlikely.

### **3.5 New Developments with Fugitive or Uncontrolled Sources**

No potential new sources of fugitive or uncontrolled particulate matter were identified since the last Updating and Screening Assessment.

Aberdeen City Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

- Biomass combustion plant, Woodside Medical Medical Centre, Marquis Road, Tillydrone Aberdeen
- CHP combustion plant, Stoneywood Papermill, Stoneywood, Aberdeen

Both of these processes were the subject of an air quality assessment and will not require further assessment.

## **4 Local / Regional Air Quality Strategy**

There is no local or regional Air Quality Strategy covering the Aberdeen area, however there are various City and Regional initiatives that consider air quality issues. These are described in Section 7.

## 5 Planning Applications

Section 3.4 describes biomass plant considered in the planning process. Table 5.1 provides information on other planning applications that have the potential to impact on air quality. The Elswick development is just outwith the Aberdeen city boundary and has been included due to the potential impact on receptors within Aberdeen.

**Table 5.1 Planning Applications with Potential Air Quality Impact**

Location	Application Approved	Development Description	Air Quality Impact
Charleston Housing Development, Loriston, Aberdeen	Yes - 2011	Erection of approx 737 dwellings/flats and commercial units	AAQuIRE model used for assessment. NO <sub>2</sub> and PM <sub>10</sub> impact magnitude 'imperceptible' and significance 'negligible' overall. Within Wellington Rd AQMA, NO <sub>2</sub> increase 0.9ugm <sup>-3</sup> , impact of 'small' magnitude and 'slight adverse' significance overall.
Davidson Mill, Bucksburn Aberdeen	Yes - 2011	Erection of approx 900 residential units and 2000sqm mixed used	DMRB assessment associated with increased traffic. Negligible impact except in proximity to existing properties on Mugiemoss Rd/Gt Northern Rd where increase defined as 'slight' due to existing levels close to annual mean objective.
Stoneywood Mill, Stoneywood Estate, Aberdeen	Yes- 2011	Erection of 425 residential units and 200sqm supporting uses	Predicted max NO <sub>2</sub> increase up to 10ugm <sup>-3</sup> and PM <sub>10</sub> increase of 0.61ugm <sup>-3</sup> . NO <sub>2</sub> magnitude of change 'medium/large', but overall impact 'negligible' as concentration well below objectives. PM <sub>10</sub> magnitude 'negligible'.
Elswick, Aberdeenshire	Unknown	Development of approx 4,045 houses and associated schools, retail and commercial premises over a 15 year period.	Detailed assessment only considered major junctions in vicinity of the development where existing background levels are low. Assessment predicted an overall reduction in traffic flow due to the construction of the AWPR and negligible air quality impact on Aberdeen's 3 AQMAs.
Kingswells Business	Various	Erection of various office	No air quality assessment was carried out, various applications

Park, Kingswells		blocks and associated car parking facilities	being submitted for office developments. Business Park on green field and, while there will be significant increase in local traffic, there will be negligible impact on the 3 AQMA's. Development adjacent to the route of the proposed AWPR.
Dubford, Bridge of Don, Aberdeen	Yes - 2012	Erection of 550 homes	DMRB assessment predicted a 2% increase in PM10 (max conc 13.7ugm <sup>-3</sup> ) and 5% increase in NO <sub>2</sub> (max conc 29.1ugm <sup>-3</sup> ). No risk of exceedance of objectives
Grandholme Masterplan, Grandholme Estate	Unknown	4,700 homes, associated neighbour centre, 4 primary and 1 secondary school phased over a 15 year period.	EIA undertaken, awaiting detailed air quality assessment.

## 6 Air Quality Planning Policies

The Aberdeen City and Shire Structure Plan was approved in August 2009 and sets out the council's development policies over the next 25 years. No specific reference is made to air quality as these are considered in the Local Plan and Transport Strategy. Partnership arrangements have been adopted with Aberdeenshire Council to account for major developments in Aberdeenshire that have the potential to impact significantly on traffic volumes in Aberdeen. This includes developer contributions to improve the transport network and, as a result, reduce the air quality impact. The Structure Plan will be reviewed and updated during 2013 when more specific reference to air quality will be considered.

Aberdeen's Local Development Plan (LDP), including specific Air Quality Supplementary Guidance (SPG), was formally adopted in February 2012. The LDP sets out the Council's proposals for development and how policy issues will be addressed up until 2023. The SPG provides guidance on the way air quality will be dealt with through the planning process, when an air quality assessment will be required and what should be included. A review of the LDP and associated SPG will commence in 2013 when the air quality guidance will additionally be reviewed.

The SPG does not contain any specific policy on biomass installations. A subsequent biomass policy was approved by the Council's Housing and Environment Committee in November 2011. The policy recommends that new biomass installations are not permitted in an AQMA or adjacent defined buffer zone unless it can be demonstrated that the change in the annual mean NO<sub>2</sub> or PM<sub>10</sub> concentration will be negligible. Although the biomass policy does not have the same weighting as SPGs in the planning process, it nonetheless clearly states the Council's position with regards to the provision of new biomass installations in locations where there is existing poor air quality.



## 7 Local Transport Plans and Strategies

Aberdeen's Local Transport Strategy (LTS) and the Aberdeen and Aberdeenshire Regional Transportation Strategy (RTS) were adopted in 2008 and will be reviewed and refreshed in 2013. Various remedial measures outlined throughout the LTS are designed to improve air quality at hot spots, primarily through travel planning issues that aim to encourage modal shift by improving the attractiveness of walking, cycling and public transport. Specific policies and actions cover issues such as car parking, land use and travel planning, traffic management and infrastructure measures. Within the 2008 RTS the Environmental Objective ENV3 was to 'reduce air quality throughout the City' with a target to comply with the national air quality objectives by 2012. This objective has not been achieved and a new, more realistic and appropriate target will be included in the 2013 Strategy.

Various other initiatives are ongoing to address transport issues. For example, the Council works closely with Nestrans (the Transport Partnership for Aberdeen City and Aberdeenshire). The purpose of Nestrans is to develop and deliver a long term regional transport strategy and take forward transport improvements that support and improve the economy, environment and quality of life across Aberdeen City and Shire. Nestrans are responsible for the development of the RTS. Specific objectives within the 2008 Strategy that relate to air quality and climate change are as follows:

- Reduce the proportion of journeys made by cars and especially single occupant cars
- Reduce the environmental impact of transport in line with national targets
- Reduce growth in vehicle kilometres travelled.

The review of the LTS and RTS offer significant opportunities to implement significant changes to the local road network and prioritise sustainable and active transport.

Nestrans produced a Freight Action Plan and Bus Action Plan in 2009 for Aberdeen City and Shire. Both of these Plans and the RTS complement and build on the objectives within the LTS by setting out measures to provide more sustainable transport within in the area.

The Council also commenced the development of a Strategic Urban Mobility Plan (SUMP) for the City Centre during 2012. A SUMP is essentially a transport masterplan looking at the way people move around by different modes of transport. These include walking, cycling, bus, train, taxi, motorcycle, car, van and HGVs. The SUMP objectives are to create a city centre which is easy to move around and encourages appropriate access for all modes. Footfalls studies, on street interview, on-line questionnaire and 4 stakeholder workshops were all used to engage and consult with the public and other stakeholders. Aberdeen received a E10,000 EU award in recognition of excellence in the development of the SUMP. The Plan will be further developed in 2013.

## 8 Climate Change Strategies

Aberdeen City Council does not have a Climate Change Strategy, however a Carbon Management Plan was adopted in April 2010. The Plan covers the period 2010-2015 and aims to reduce CO<sub>2</sub> emissions from Council buildings, vehicles, street lighting and landfill by 23% by 2015 and 42% by 2020. In 2007 Aberdeen City Council, along with other Scottish local authorities, signed the Climate Change Declaration demonstrating ongoing commitment to combating the effects of climate change. Aberdeen's Climate Declaration Report 2009 considers actions to reduce emissions from specific council operations and the wider authority area.

No specific reference is made to air quality in either report, however the majority of proposed actions will have a positive impact on air quality. For example, the Carbon Management Plan considers the council's fleet, including the introduction of alternative weekly collections to reduce the number of journeys, business travel plans and a review of the council's car usage, car parking and travel plans. Emissions from premises are also considered with the replacement of inefficient oil fired burners in schools and the main council office and a general reduction in energy usage.

## **9 Implementation of Action Plans**

A review of progress in the implementation of the Actions in the 2011 Air Quality Action Plan identified a need to improve the reporting methodology and identify specific indicators and targets/outcomes. A working group set up to consider how this could be achieved developed a new progress monitoring spreadsheet. The resultant spreadsheet includes a coloured key (red, yellow and green) to track the progress in the implementation of each action. The Air Quality Action Plan Progress Report January 2013 and associated progress spreadsheet are reproduced in Appendix D.

## **10 Conclusions and Proposed Actions**

### **10.1 Conclusions from New Monitoring Data**

The new monitoring data confirmed concentrations continue to exceed the annual mean NO<sub>2</sub> and PM<sub>10</sub> objectives within the 3 AQMAs and the 1 hour NO<sub>2</sub> and 24 hour PM<sub>10</sub> objectives within the City Centre and Wellington Road AQMAs.

The annual mean PM<sub>10</sub> objective was also marginally exceeded at the King Street continuous monitoring station. Concentrations from the BAM monitor at this location may be elevated during prolonged periods of heavy rain and sea mist. A Detailed Assessment is not proposed at this time, however concentrations will continue to be monitored and reviewed to determine if further action is necessary. There were no exceedances of the objectives at any other location outwith the AQMAs.

### **10.2 Conclusions relating to New Local Developments**

There are no new local developments that will require more detailed consideration in the next Updating and Screening Assessment.

Additional diffusion tubes will be located near sensitive receptors along the route of the proposed 3<sup>rd</sup> Don Crossing to assess both the impact on receptors in the vicinity of the new route and to monitor any reduction in NO<sub>2</sub> concentrations along the existing road network where the traffic flow is expected to reduce.

### **10.3 Other Conclusions**

The Air Quality Action Plan was reviewed and updated to include specific indicators and targets/outcomes. The new progress monitoring spreadsheet will improve the information provided on progress in the implementation of the Actions within the Action Plan.

No other Plans or Policies relating to air quality were reviewed in 2012 and there are no planning applications that will require further assessment.

## 10.4 Proposed Actions

The following Actions are proposed:

- Installation of diffusion tubes near sensitive receptors along the route of the proposed 3<sup>rd</sup> Don Crossing and the existing road network where traffic flows are expected to reduce.
- Continued monitoring and specifically review PM<sub>10</sub> concentrations at the King Street continuous monitoring station
- A detailed feasibility study of a potential City Centre Low Emission Zone following the publication of new vehicle emission factors
- Liaison with the Planning Service on the Local and Regional Transportation Strategies which will be updated during 2013. A review of the Local Development Plan will also commence in 2013. The air quality Supplementary Guidance and other relevant policies will be considered during the Local Development Plan review.

New monitoring data has not identified a need for any other additional monitoring or changes to the existing AQMAs and no other LAQM Tasks have been identified. The next course of action is to submit a 2014 Air Quality Progress Report.

## 11 References

- 1 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DETR July 2007.
- 2 Environment Act 1995.
- 3 The Air Quality (Scotland) Regulations 2000.
- 4 The Air Quality (Scotland)(Amendment) Regulations 2001.
- 5 Aberdeen City Council Updating and Screening Report August 2003.
- 6 Aberdeen City Council Detailed Assessment of Air Quality, August 2004.
- 7 Aberdeen City Council Air Quality Action Plan July 2006.
- 8 Aberdeen City Council Updating and Screening Assessment, July 2006
- 9 Aberdeen City Council Progress Report, June 2007
- 10 Aberdeen City Council Detailed Assessment, March 2008
- 11 Aberdeen City and Shire Structure Plan 2009
- 12 Local Air Quality Management Technical Guidance LAQM, TG(09), DEFRA, February 2009
- 13 Local Air Quality Management Policy, (PG)(S)(09), DEFRA, February 2009
- 14 Aberdeen City Council Updating and Screening Assessment, July 2009
- 15 Aberdeen City Council Air Quality Modelling Study, March 2010
- 16 Aberdeen City Council Progress Report, July 2010
- 17 Aberdeen City Council 2011 Local Plan
- 18 Aberdeen City Council Action Plan, March 2011
- 19 Aberdeen City Council Progress Report, July 2011
- 20 Aberdeen Harbour Local Air Quality Study, September 2011
- 21 Aberdeen City Council Updating and Screening Assessment, July 2012

# Appendices

## Appendix A

Figure A1 Map of City Centre AQMA

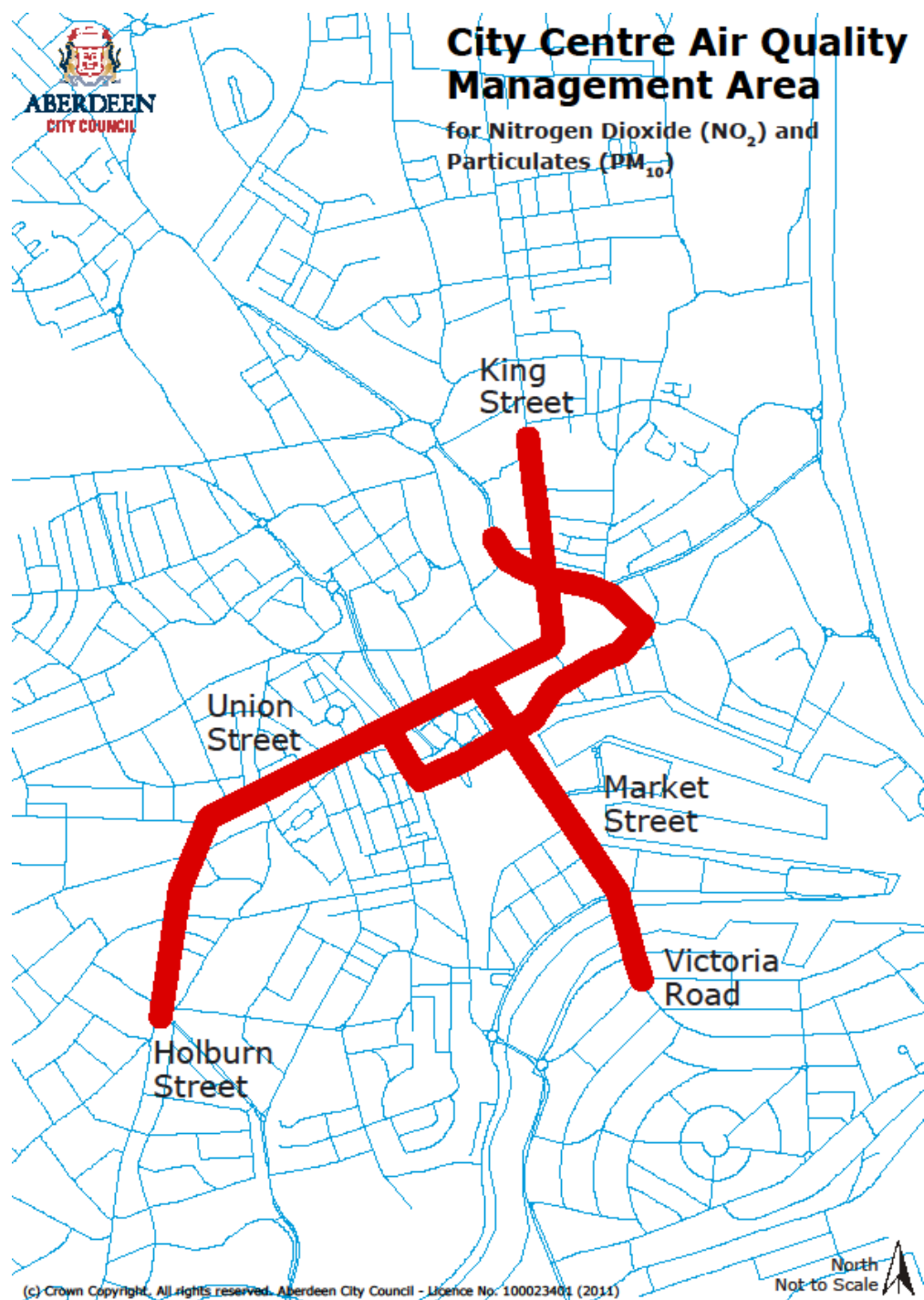


Figure A2 Map of Anderson Drive/Haudagain roundabout/Auchmill Road AQMA

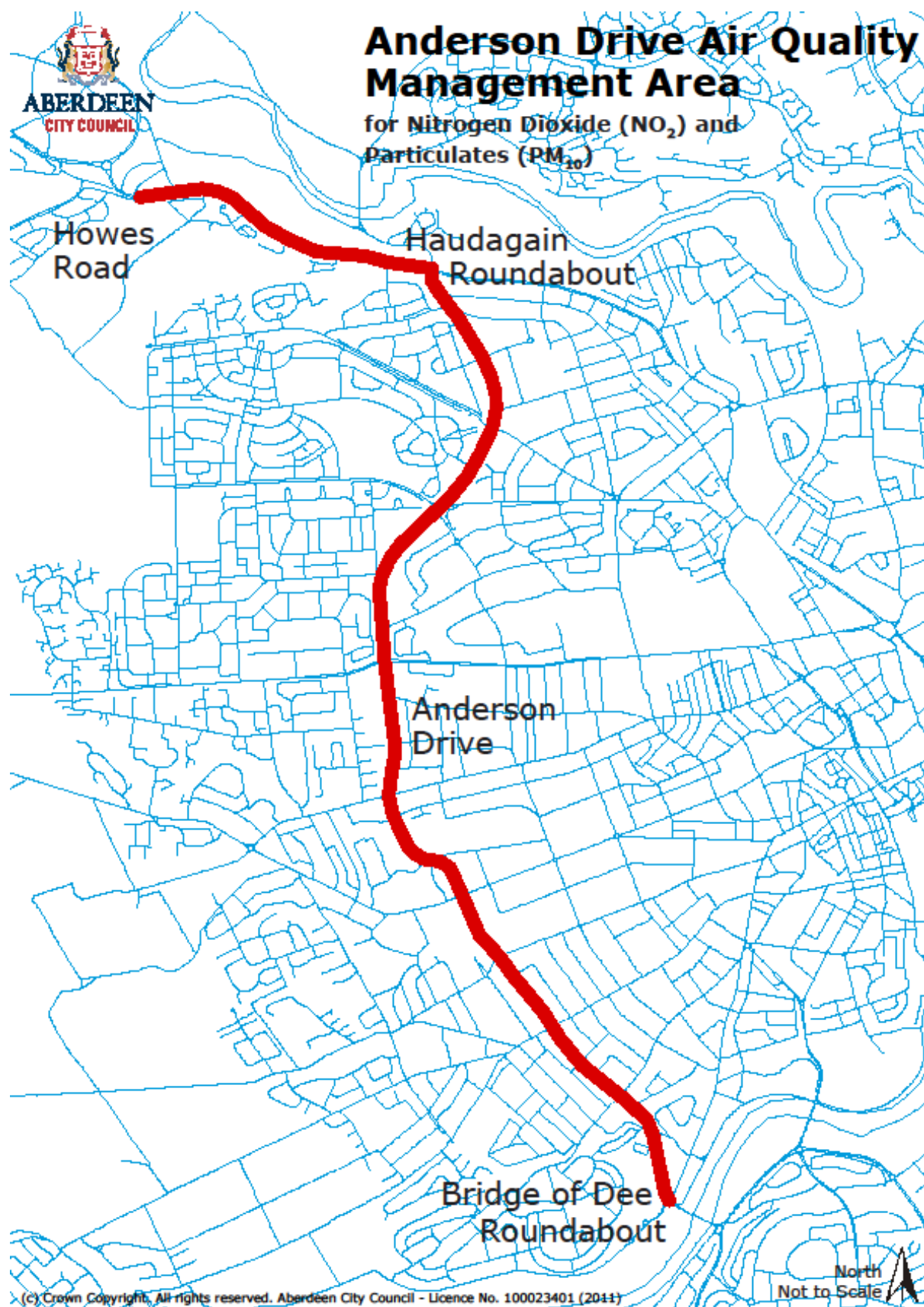
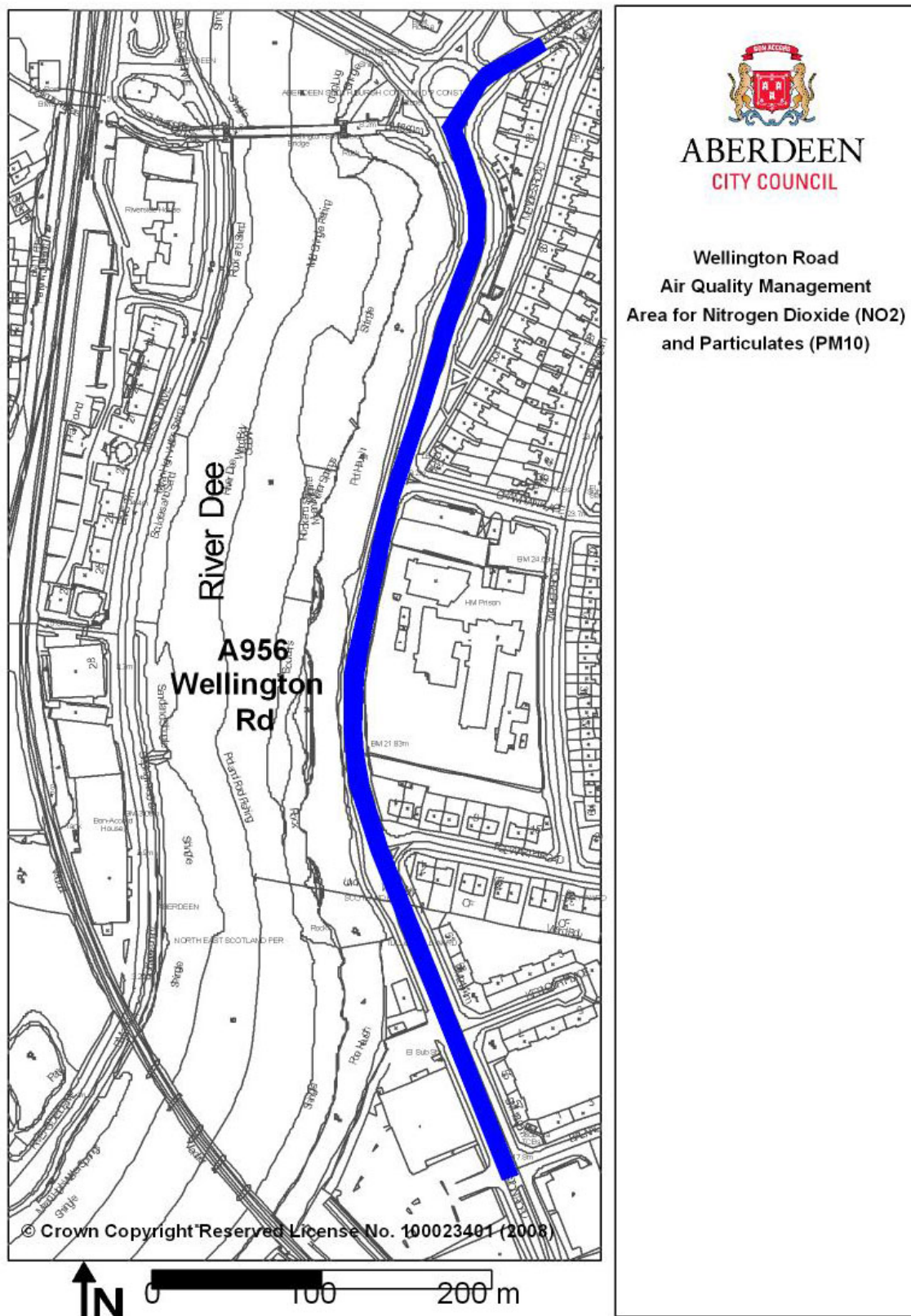




Figure A3 Map of Wellington Road AQMA



## Appendix B: QA:QC Data

### Factor from Local Co-location Studies

Spreadsheets downloaded from the DEFRA Local Air Quality Management website were used to calculate bias adjustment factors and the precision and accuracy of the co-located tubes. Table B1 summarises the bias adjustment factors. Only data with good precision and accuracy has been used. Errol Place is an urban background site while the others sites are roadside.

### Diffusion Tube Bias Adjustment Factors

**Table B1 Bias Factor Calculations**

Type	DT Mean ( $\mu\text{g m}^{-3}$ )	CM Mean ( $\mu\text{g m}^{-3}$ )	Bias Factor A (%)	Bias Factor B (%)	CM Data Capture	No Monitoring Periods
Errol Place	28	22	78	28	93.4	12
Union Street	57	54	94	7	97.4	11
Wellington Road	60	59	98	2	95.7	12
King Street	35	29	84	19	94.1	10
Union Street	56	44	78	28	95.5	12
Anderson Drive	31	31	99	1	87.8	9

The tubes are provided by Gradko International and analysed by Aberdeen City Council's Public Analyst. The preparation technique is 20% tri-ethanolamine in water.

### Discussion of Choice of Factor to Use

The web based spreadsheet of national bias adjustment factors (NBAFS) was reviewed however the information for Aberdeen is limited to one site. Although the Council's Public Analyst undertakes the analysis of diffusion tubes from neighbouring authorities, Aberdeen City Council is the only authority with continuous monitoring stations that can be used to calculate bias adjustment factors. Accordingly, a locally derived bias factor based on the co-located tubes at the Aberdeen continuous monitoring stations was used to adjust diffusion tube measurements at the other locations across the city. The Errol Place bias factor was used to adjust background sites and, on the advice of the national air quality helpline in 2011, the orthogonal regression of the roadside sites was used to adjust road site tubes. This process was considered appropriate due to the lack of other co-located studies using the laboratory for tube analysis, the remote location of Aberdeen from other conurbations and the good QA/QC performance of the laboratory.

**PM Monitoring Adjustment**

All 2009, 2010, 2011 and 2012 TEOM data from Union Street, Anderson Drive and Wellington Road was corrected to gravitational equivalent by AEA using the Volatile Correction Model (VCM). Data from the BAMs at King Street and Market Street were also corrected by AEA Technology (AEAT) using a gravitational factor of 0.83333 for Gravitational Equivalent.

**Short-term to Long-term Data adjustment**

Data capture at all continuous monitoring sites was greater than 75% therefore no data required to be seasonally adjusted. Data from diffusion tubes, with the exception of those sites where monitoring ceased in September 2011 and DT 28 (61 Holburn St) and DT38 (819 Gt Northern Rd), was also carried out for the full year. No seasonal adjustment has been carried out on the sites where monitoring ceased as concentrations are well below the annual mean objective. DT28 and DT38 were also not seasonally adjusted as the periods of data omission were sporadic throughout the year.

**QA/QC of automatic monitoring**

All equipment is subject to the QA/QC procedure recommended with LAQM.TG(09). Equipment is serviced at 6 monthly intervals. The contract includes call outs to site for repairs and the routine replacement of consumables.

The Errol Place and Union Street sites are part of the UK's Automatic Urban Network. All sites are part of the Scottish Government data reporting process and subject to independent audit by AEAT at 6 monthly intervals. Data validation and ratification is also performed by AEAT.

The analysers perform daily automatic calibrations which are used to assess the routine performance of the analysers and any long term response drift. Manual calibrations are performed by trained Council officers every two weeks using a calibration mixture traceable to national standards. These calibrations act as a check on the operation of the analysers and enable determination of the instrument response factors used to calculate the concentration of NO<sub>2</sub>.

Data is checked daily (Monday-Friday). Should a problem be identified either by Council officers or by AEAT the site is visited immediately and, if necessary, a further manual calibration is performed. Data considered suspect is deleted. Records are kept of instrument breakdowns, services and audits and any local activities or weather that may influence readings.

**QA/QC of diffusion tube monitoring**

Diffusion tube monitoring is carried in accordance with the procedures contained in the guidance 'Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance for Laboratories and Users' and LAQM.TG(09). All tubes, other than those co-located at the continuous analysers are attached to lampposts/downpipes at a height of 2m above ground level and exposed for 4 weeks. Co-located tubes are located in triplicate close to the analyser air intake. All exposure times are recorded. Three unexposed travel blanks are submitted to the laboratory with each batch of exposed tubes.

Aberdeen City Council's Public Analyst is UKAS accredited for the analysis of diffusion tubes and also participates in the WASP scheme and the monthly intercomparison exercise managed by AEA. UKAS carried out an annual assessment of the laboratory in March 2013 to ensure laboratory guidance is being implemented. No problems were identified. All rounds of the WASP performance reporting scheme over the period 2011-2013 recorded the performance of the public analyst's performance as 'satisfactory'.

## Appendix C: Diffusion Tube Data and Calculations

**Table C1 Measured 4-Weekly Diffusion Tube Data**

Site	Ref	Monitoring Period												Mean ( $\mu\text{g m}^{-3}$ )	No Periods
		1	2	3	4	5	6	7	8	9	10	11	12		
Bucksburn Primary School	1	37	37	42	47	43	45	22	34	31	43	40		38	11
885 Gt Northern Rd at Haudigan	2	56	59	65	56	64	63	50	58	44	59	67		58	11
549 North Anderson Drive	3	44	37	40	55	62				25	38	38	49	43	9
38 Ellon Road	4	62	63	56	55	31	32	33	39	32	48	59	47	46	12
Linksfeld Centre, 520 King Street	5	55	52	49	59	54			54	46		62	37	52	9
86 Victoria Road, Torry	6	42	40	43	56	48	45	41	34	30	55	46	66	46	12
Wellington Rd/ Kerloch Place	7	47	48	51	51	45	48	43	52	39	41	49	50	47	12
107 South Anderson Drive	8	81	74	71	69	91	70	68	69	46	67	70	82	72	12
31 Market St	9	65	55	63	92	74	80	52	78	43	62	58	66	66	12
184/192 Market St	10	72	76	81	88	92	80	72	74	59	88	88	84	80	12
105 King St	11	82	70	73		60	56	57	64	73	68	82	73	69	11
40 Union St	12	101	59	59	72	55	60	53	65	49	62			64	10
Music Hall, Union St	13	57	54	57	59	52	51	44	44	42	54	56	68	53	12
Dyce Primary School	14	20	18	15	7	9	7	7	10	10	14	22	21	13	12
Northfield Swimming Pool	15	21	17	15	13	15	16		12		15	17	25	17	10
Guild St/ Market St roundabout	16	54	56	62	90	57	71	47	60	43	58	58	62	60	12
43/45 Union St	17	60	58	55	66	61	63	58	78	50	55	61	59	60	12
14 Holburn	18	80	74	74	74	66	58	53	52	57	73	73	85	68	12
468 Union St	19	76	72	73	65	64	60	61	55	56	72	73	87	68	12
212 King St	20	48	50	51	29	31	26	31	53	30	44	48	44	40	12
26 King Street	21	54	45	50	45	46	46	47	56	34	41	56	56	48	12
104 King St	22	57	49	56	62	60	55	54	58	45	49	54	55	55	12
785 Gt Northern Road at Shell garage	23	56	50	47	34	38		30	34	39	54	58	56	45	11
40 Auchmill Road	24	57	58	51	56	47	45	43	42	50	58	58	58	52	12
21 Holburn	25	66	50	54	83	71	69	55	59	51	57	60	58	61	12
147 Holburn Street	26	43	31	36	44	43	37	31	31	24	35	40	42	36	12
82 Holburn St (Malt Mill)	27	40	39	37	44	42	38	30	29	21	35	39	46	37	12
61 Holburn	28	58	48	51	62	61	54	41	49	40	48	54	53	52	12

Street															
469 Union Street	29		72							35	61	70	75	<b>63</b>	5
209 Union St	30	77	44	67	63	58	53	55	64	52	58	74	68	<b>61</b>	12
249 Holburn Street	31	48		45	44	46	39	35	41	31	42	48	50	<b>43</b>	11
Willowbank Road./Albury Rd	32													<b>N/A</b>	N/A
East North Street	33	62	54	54	72	54	44	50	66	52	52	62	65	<b>57</b>	12
404 King Street	34	49	44	48	28	28	22	27	38	32	39	48	37	37	11
Riverside House, Riverside Dr.	35													N/A	N/A
115 Wellington Road	36	64	62	75	86	90	82	62		57	66	66	69	<b>71</b>	7
137 Wellington Road	37	61	31	42		61	30	29	28	36	40	53	40	41	12
Wellington Rd / 4 Nigg Kirk Rd	38													N/A	N/A
819 Gt Northern Rd	39	66	72	73	60			52		14 4	68			<b>77</b>	7
852 Fullerton Court	40	48	52	47	30	26	25	27	38	38	48	52	46	<b>40</b>	12
852 Fullerton Court Roadside	41	67	75	63	36	45	36	37	50	51	68	78	66	<b>56</b>	12
248 George St	42													N/A	N/A
25 Rosemount Place	43													N/A	N/A
214 Rosemount Pl	44													N/A	N/A
111 South Anderson Drive	45	40		39	51	47	48	39	35	24	33	44	41	40	11
West North Street	46	60		32	28	29	25	25	36	23	29	40	46	34	11

**Table C2 Annual Mean Bias adjusted diffusion tube data and correction to façade**

Map Ref	Site	Measured Conc ( $\mu\text{g m}^{-3}$ )	Bias Adjusted Conc ( $\mu\text{g m}^{-3}$ )	Façade Conc ( $\mu\text{g m}^{-3}$ )
1	Bucksburn Primary Sch, Inverurie Rd	38	34	34
2	885 Gt Northern Road	<b>58</b>	<b>52</b>	40
3	549 North Anderson Dr	<b>43</b>	39	29
4	38 Ellon Road	<b>46</b>	<b>42</b>	37
5	Linksfield Centre, 520 King St	<b>52</b>	<b>47</b>	29
6	86 Victoria Road Torry	<b>46</b>	41	<b>41</b>
7	Wellington Rd/ Kerloch Pl	<b>47</b>	<b>42</b>	<b>42</b>
8	107 Anderson Drive	<b>72</b>	<b>64</b>	<b>46</b>
9	31 Market St	<b>66</b>	<b>59</b>	<b>59</b>
10	184/192 Market St	<b>80</b>	<b>71</b>	<b>71</b>
11	105 King Street	<b>69</b>	<b>62</b>	<b>62</b>
12	40 Union St	<b>64</b>	<b>57</b>	<b>57</b>
13	Music Hall Union St	<b>53</b>	<b>48</b>	<b>48</b>
14	Dyce Primary, Gordon Terr	13	10	10
15	Northfield swimming pool, Keppleshill Cres	17	13	13
16	Guild St/ Market Street	<b>60</b>	<b>54</b>	<b>54</b>
17	43/45 Union St	<b>60</b>	<b>54</b>	<b>54</b>
18	14 Holburn St	<b>68</b>	<b>61</b>	<b>61</b>
19	468 Union St	<b>68</b>	<b>61</b>	<b>61</b>
20	212 King Street	<b>40</b>	36	36
21	26 King Street	<b>48</b>	<b>43</b>	<b>43</b>
22	104 King St (Gala Bingo)	<b>55</b>	<b>49</b>	<b>49</b>
23	785 Gt Northern Road	<b>45</b>	33	33
24	40 Auchmill Road	<b>52</b>	<b>47</b>	<b>47</b>
25	21 Holburn St	<b>61</b>	<b>55</b>	<b>55</b>
26	147 Holburn Street	36	33	33
27	82 Holburn St	37	33	33
28	61 Holburn Street	<b>52</b>	46	<b>44</b>
29	469 Union Street	<b>63</b>	<b>56</b>	<b>56</b>
30	209 Union St	<b>61</b>	<b>55</b>	<b>55</b>
31	249 Holburn Street	<b>43</b>	38	38
32	Willowbank Rd/Albury Rd	<b>N/A</b>	N/A	N/A
33	East North Street	<b>57</b>	<b>52</b>	<b>52</b>
34*	404 King Street	37	33	33
35	Riverside House, Riverside Dr.	N/A		N/A
36	115 Wellington Road	<b>71</b>	<b>64</b>	<b>48</b>
37	137 Wellington Road	41	36	36
38	Wellington Rd / 4 Nigg Kirk Rd	N/A	N/A	N/A
39	819 Great Northern Road	<b>77</b>	<b>69</b>	<b>69</b>
40	852 Fullerton Court	<b>40</b>	30	30
41	852 Fullerton Court	<b>56</b>	36	36

	Roadside			
42	248 George Street	N/A	N/A	N/A
43	25 Rosemount Place	N/A	N/A	N/A
44	214 Rosemount Place	N/A	N/A	N/A
45	111 South Anderson Drive	40	36	36
46	West North Street	34	30	30

**Table C3 Diffusion Tube concentrations showing calculations to façade**

Site Ref	Site	Bias Factor Conc Cy (ugm <sup>-3</sup> )	Background Conc (ugm <sup>-3</sup> )	Dist to kerb Dy (m)	Dist façade Dz (m)	Calculated Façade Conc (ugm <sup>-3</sup> )
2	885 Gt Northern Rd	52.4	15.4	3	11	<b>39.9</b>
3	549 North Anderson Dr	38.7	17.5	3	17	29.2
4	Ellon Rd	41.7	18.0	3	7	<b>36.5</b>
5	520 King Street	46.7	18.2	0.1	9	29.1
8	107 South Anderson Dr	64.2	18.2	3	14	<b>45.9</b>
23	785 Gt Northern Rd	40.5	15.4	3	9	33.3
28	61 Holburn St	46.3	25.4	3	5	43.5
36	115 Menzies Rd	63.6	26.2	1	8	47.9
37	137 Wellington Rd	36.8	28.4	10	13	36.0
41	Fullerton Court roadside	50.3	15.4	0.1	7	29.9

Dy - distance to kerb at which concentrations were measured

Dz – distance to kerb at which concentrations are to be predicted



## Appendix 4: Air Quality Action Plan Progress Report



# Aberdeen City Council Air Quality Action Plan Progress Report

January 2013



**Table of Contents**

1. Introduction
2. Legislative Context
3. Air Quality Management Areas in Aberdeen
4. Air Quality Action Plan
5. Next Steps
6. Conclusions

**Appendix 1: Air Quality Actions, Measures and Progress**

**Figures and Tables**

**Figure 1: Map of City Centre, Anderson Drive/Haudagain roundabout/Auchmill Road corridor and Wellington Road Air Quality Management Areas**

## **1 Introduction**

Aberdeen City Council approved a new Air Quality Action Plan (AQAP) in March 2011 to cover the City's 3 Air Quality Management Areas (AQMAs). The 2011 Action Plan replaced the original 2006 Plan that covered only the City Centre area.

The AQAP recognises the solutions to Aberdeen's air quality issues need a coordinated approach involving a range of stakeholders. A wide number of measures are included in the AQAP. The majority are concerned with reducing the impact of transport emissions which have been identified as the main cause of the increased pollution levels. Specific indicators and targets have been developed, in line with the Local Transport Strategy (LTS) and Regional Transport Strategy (RTS), to improve the monitoring of progress in the implementation of the AQAP.

The Council must work in partnership with businesses and other interested parties across the City if it is to meet its air quality objectives. The proposals and actions detailed in this report summarise the progress made over the last 12 months, but also show that the Action Plan is an active document designed as a rolling programme that will run for several years.

A number of other Council plans, policies and actions relating to the environment such as energy, climate change and noise management have the potential to influence air quality. For example, the Environmental Noise Directive (ENDs) requires major cities and transport systems to be mapped for environmental noise and Action Plans developed to manage noise in these areas. Future plans and policies will require to be linked to ensure the most efficient use of resources and, where possible, the implementation of measures that will have a positive impact across these areas.

## **2 Legislative Context**

Part IV of the Environment Act 1995 places a statutory duty on all Local Authorities in the UK to periodically review and assess air quality to determine compliance with the Government's health-based objectives for seven key pollutants set out in the National Air Quality Strategy and Air Quality Regulations (Scotland) 2000 and 2002 amendment. Authorities that determine air quality in their areas is likely to fail to meet the objectives are required to declare the exceedance area as an AQMA. Thereafter they must prepare an Action Plan in pursuit of achievement of the air quality objectives within the designated area.

## **3 Air Quality Management Areas in Aberdeen**

There are 3 AQMAs in Aberdeen all of which were declared due to exceedances of the annual mean objectives for nitrogen dioxide (NO<sub>2</sub>) and particles (PM<sub>10</sub>). The 1 hour objective for NO<sub>2</sub> and 24 hour objective for PM<sub>10</sub> are also exceeded in the City Centre. Road traffic is the main source of the raised emissions. While air quality in the AQMAs is of particular concern, the AQAP aims to address air quality issues across Aberdeen.

**Figure 1: Map of the City Centre, Wellington Road and Anderson Drive Haudigain roundabout/Auchmill Road AQMAs**



#### **4 Air Quality Action Plan**

The AQAP sets out a strategic approach to improving air quality in Aberdeen. It puts forward a range of measures aimed at reducing emissions in order to achieve the Air Quality objectives. These are prioritised into the following 6 categories or 'action headings':

- Modal Shift and Influencing Travel Choice
- Lower Emissions and Cleaner Vehicles
- Road Infrastructure
- Traffic Management
- Planning and Policies
- Non-Transport Measures

As road traffic is the main source of the emission, this Progress report additionally aims to improve the integration of the AQAP with the measures in the LTS and RTS. Specific targets, in line with the LTS and RTS, are presented that will support the monitoring of progress.

It is also important to emphasise the link between travel demand, the land use planning system and the Local Plan. Coordinated planning across the City can help to locate and design developments such that the need to travel by car is reduced significantly. A coordinated approach can also ensure that road infrastructure improvements are planned to accommodate new developments and improve the existing network. In this way the cumulative effect of road transport emissions from multiple developments can be minimised and congestion on the existing network reduced.

Table 1 summarises the AQAP measures and progress in implementation. The following highlights some of the key initiatives that have been progressed in the last year and sets out the timescale for implementation of the road infrastructure improvements that are likely to have a significant impact on air quality.

### **Action 1: Encourage Modal Shift and Influencing Travel Choice**

#### **Car Club/ Car Pooling**

- On 2nd April 2012 the Aberdeen Co-wheels Car Club was launched. Members book a car via the phone or the internet when they need it and are charged on a pay-as-you-drive basis. Originally launched with eleven 4-7 seater cars available to members of the public and businesses, the Club has already expanded to include another car at Aberdeen harbour. All of the cars are low emissions for their class, with eight of them under 100g/ CO<sub>2</sub> per km. A great deal of literature and advertising has taken place with radio adverts and a short web video made. A leaflet drop to 10,000 households and businesses in the City Centre is also underway.

Now six months on the City has the fastest growing new Car Club in the UK, with over 300 members (Car Plus, Oct 2012). In this time hydrogen vehicles have been trialled as part of the All Energy Conference in Aberdeen and the Club hopes to be the first in the UK to officially adopt clean (i.e. wind produced) hydrogen vehicles on a permanent basis. By April 2013 Co-wheels plan to expand the Car Club to another 3 locations and add an electric car to the fleet.

Aberdeen City Council Planning service is also developing robust policies as part of the Aberdeen Local Development Plan to secure developer contributions for the Car Club especially in low or no car housing developments.

#### **Air Quality/ Active Travel Promotional and Awareness Activities**

- 3 'Getabout' 1 minute rolling presentations were produced showing the benefits of walking/cycling, using local transport and why car usage should be discouraged. The presentations included air quality information and were displayed at a promotional event held in a city centre shopping centre. They are also available on You Tube and a link is shortly to be put up on the Council's Transport Strategy Facebook page.
- A 'Getabout'/air quality event that involved the closure of Belmont Street in the city centre was organised as part of European Mobility Week 2011. Bikes of various type were available for the public to try in a designated area and marquees set up with representatives from the council's air quality and transportation strategy teams, 'Getabout', Aberdeen Cycling Forum and the Carbon Trust to provide information and numerous freebies. Local cycle vendors and the bus companies were also present. Another similar event took place at Aberdeen Beach in September 2012 and attracted approximately 1000 people, with over 500 trialling the bikes.



- The Scottish Government launched a free national 'Know and Respond' text message pollution alert system in February 2012. Alerts are sent via a text message or email to those who sign up to the system advertising when moderate or worsening air pollution is forecast for the day ahead. In June 2012 the Council, in conjunction with NHS Grampian, advertised the system in the local press to encourage local uptake.

### **Walking and Cycling Infrastructure**

- The Council is working on a number of strategic cycle projects around the City however the main ones running through AQMA's are the National Cycle Network (NCN) Route 1, the A96 and A90 Dual Use Paths. Changes to the NCN have included rerouting the cycle route away from the Market Street corridor/AQMA, instead using quieter parallel routes and then Union Street. The A90 is currently going through initial design for future phased implementation. Phase 1 of the A96 route is complete (Haudagain to Bucksburn) with resurfacing improvements, dropped kerbs, signage and installation of two toucan crossings. Phase 2 of the A96 route which will be undertaken in 2014 will involve work with the Aberdeen Western Peripheral Route (AWPR) Managing Agent as the intention is to connect this strategic cycle route to the new Park & Choose site.

## **Action 2: Lower Emissions and Cleaner Vehicles**

### **Green Vehicle Procurement and Fuel**

- Officers are currently working on an Electric Vehicle Strategy future implementation of electric charge points funded at the moment by Transport Scotland. In 2011/12 ten charging posts were installed in Council and public car parks. Work is ongoing to ensure that these are fully operational and converted to a Pay As You Go system for maximum public accessibility. Two further electric vehicles were also procured for the Council fleet. This brings the total number of electric vehicles in the Council's fleet to six including one hybrid vehicle. The two electric vans are also used for a shared mail run between Aberdeen City Council, NHS Grampian, Grampian Police and Aberdeenshire Council.
- Aberdeen City Council supported applications by Stagecoach for the Scottish Government's Green Bus Fund in 2011. Several hybrid buses are now running in the City to Aberdeen Royal Infirmary from the City Centre. The buses have a 30% reduction in emissions compared to diesel equivalents.

### **No Idling Study**

- A 'No Idling Feasibility Study' was carried out that located potential areas to enforce no idling initiatives and install signage. Although the Council determined not to install signs, a leaflet was developed and distributed to all taxi drivers, bus and freight operators, major businesses and other relevant

stakeholders as part of a publicity campaign. Information is also available on the Council's website.

### **Action 3: Road Infrastructure**

#### **Road Building/ Junction Alterations**

- The Aberdeen Western Peripheral Route Legal Challenge submitted to the Court of Session was dismissed in June 2011, however a further appeal to the Supreme Court was lodged in May 2012. An announcement on 17<sup>th</sup> October 2012 has rejected the Appeal and as a result work can now start on implementing the route. The date of completion is currently indicated as Spring 2018. In addition to the direct benefits of this project, a number of 'Locking in the Benefits' projects can now be developed further with a view to implementation post AWPR.

### **Action 4: Traffic Management**

#### **Freight and Commercial Vehicle Access**

- A Freight Consolidation Centre was considered as part of EU Interreg Project STRATMOS. Several possible locations were identified and a new EU Interreg Project, Greco, will investigate these in further detail.
- A Commercial Delivery Strategy for the city centre is currently investigating potential improvements to ensure better access for freight and quick turnaround on deliveries, etc. Possible actions so far include route prioritisation, revisiting delivery times, potential delivery spaces and complementary activities, such as ensuring that bus lanes are clearways at certain times, with all other vehicles that block the flow of traffic being booked immediately.

#### **Intelligent Transport Systems**

- Officers are currently working with Transport Scotland to deliver real time information at and on approach to Park & Rides using Variable Message Signs (VMS). This will inform drivers of the time taken to take the bus in to town compared to the car. Air quality information may also be displayed to inform drivers of when air quality is particularly poor in the city centre. In addition, VMS signs will offer alternatives to congested routes – thereby enabling drivers to avoid, rather than add traffic to already congested areas.

### **Action 5: Planning and Policy**

#### **Supplementary Planning Guidance**

- Draft air quality Planning Supplementary Guidance (SPG) was produced in 2010 as part of the development of a new Aberdeen Local Development Plan

(ALDP). Consultation on the ALDP, took place during 2011 and the final ALDP, including the Air Quality SPG was formally adopted in February 2012. The SPG provides guidance on the way air quality will be dealt with through the planning process, when an air quality assessment will be required and what should be included.

The SPG does not contain any specific policy on biomass installations. A subsequent biomass policy was approved by the Council's Housing and Environment Committee in November 2011. The policy recommends that new biomass installations are not permitted in an AQMA or adjacent defined buffer zone unless it can be demonstrated that the change in the annual mean NO<sub>2</sub> or PM<sub>10</sub> concentration will be negligible. Although the biomass policy does not have the same weighting as SPGs in the planning process, it nonetheless clearly states the Council's position with regards to the provision of new biomass installations in locations where there is existing poor air quality.

- Both the Council's 2012 ALDP and the Aberdeen City and Shire Structure Plan 2009 include the provision of several major residential and commercial developments and associated transportation interventions in Aberdeen and along strategic growth corridors in Aberdeenshire over the period 2011-2023. A 30% increase in annual mean kilometres travelled is predicted. Cumulatively these developments have the potential to significantly impact on air quality in the AQMAs. Planning permission has been granted for several developments and construction commenced.

A modelling study in 2011 was carried out to indicate the likely cumulative impact of the developments on the AQMAs. Although the modelling predicted NO<sub>2</sub> and PM<sub>10</sub> concentrations would reduce by 75-85% and 80-90% by 2023, further sensitivity tests that excluded predicted vehicle efficiency improvements indicated an increase of 40% by 2023. More detailed traffic and dispersion modelling is proposed in 2013 using the recently updated vehicle emission factors.

- Modelling of the new Union Square retail development located between Market Street and Guild Street and adjacent to the City Centre AQMA was also carried out during 2011. This 'high level' modelling predicted NO<sub>x</sub> and PM<sub>10</sub> emissions would increase by 1% (9.8 tonnes) and 1.5% (10.37 tonnes) as a result of Union Square. Potentially more substantial increases were also identified at specific parts of the network. Again more detailed road traffic and air quality dispersion modelling is proposed to provide a greater understanding of the local variations in traffic and air quality impact at relevant receptors. The modelling will additionally indicate whether the measures in the AQAP require further consideration to account for the impact of Union Square.

### **Low Emission Zone/ Transport Masterplan**

- The Low Emission Study concluded that a bus Low Emission Zone (LEZ) on Union Street and a HGV LEZ on Market Street would provide maximum benefit. The LEZ is now being considered as part of the Transport Masterplan or Sustainable Urban Mobility Plan for the City Centre. This will involve the creation of a holistic 'Masterplan' and include all influences on traffic in the city



centre such as development of brownfield sites, car parking regimes, car clubs, electric charging, walking and cycling networks, pedestrianised areas, freight deliveries, etc.

### **Car Parking Policies**

- An Emissions Based Parking Charges Feasibility Study was undertaken in 2011/12 to explore the possible models for implementation in Aberdeen after Councillors determined that the system should apply to all car parking zones, not just city centre ones. The report suggested that a 50% reduction could be offered to Euro V/ VI petrol vehicles with under 100g/km CO<sub>2</sub> with staggered reductions after this. Individuals would apply for the reduction as part of their business/residential permit or they could sign up for mobile phone payments when using on-street or off-street car parks. Enterprise, Planning & Infrastructure Committee agreed to put the option forward for consideration in the Autumn 2012 Parking Review which is due to report back to Committee in Spring 2013.

## **5 Next Steps**

The major activities taking place over the next 12 months will focus on the Aberdeen Western Peripheral Route and associated Locking in the Benefits Schemes, the Car Club, Parking Charges, the application of Supplementary Planning Guidance, the continued installation and roll out of electric vehicle infrastructure, work on the Sustainable Urban Mobility Plan and further events for air quality and sustainable transport. The Local and Regional Transport Strategies will also be reviewed. These Strategies offer significant opportunities in the wake of the Aberdeen Western Peripheral Route Appeal rejection to now implement significant changes to the local road network and prioritise sustainable and active transport. Similarly a Noise Action Plan will be developed in 2013 providing an opportunity to link noise and air quality.

## **6 Conclusions**

Good progress has been made in the implementation of a number of the policies and measures set out in the AQAP. However, NO<sub>2</sub> and PM<sub>10</sub> concentrations have not reduced significantly in recent years and exceedance of the objectives is still evident across the 3 AQMAs. The AWPR will have a positive effect on air quality in these areas, but without the implementation of further measures compliance with the objectives in the near future is unlikely. The Council will need to continue to promote sustainable travel and raise awareness through the implementation of the AQAP, however greater consideration of major policies and potential infrastructure measures is required if compliance is to be achieved. It is also important air quality is considered along side other environmental policies and strategies such as climate change, energy efficiency and noise management to ensure that, where possible, policies are adopted that will benefit all areas of the environment.