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2013 Air Quality Progress Report for

EAST DUNBARTONSHIRE COUNCIL

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

June 2013

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Executive Summary

This report is the 2013 Progress Report for air quality in East Dunbartonshire Council (EDC) detailing 2012 data for Nitrogen Dioxide (NO^2) and Particulate Matter (PM_{10}) pollutants, and providing up to date information on industrial and commercial developments to determine if air quality in the East Dunbartonshire Council area is in compliance with the United Kingdom and Scotland specific air quality objectives.

East Dunbartonshire Council continue to work towards improving air quality in the area and has two Air Quality Management Areas in Bearsden and Bishopbriggs with an Action Plan already in place for Bishopbriggs and one being implemented for Bearsden.

This report highlights that air quality is improving overall with only two exceedences of the Local Air Quality Management (LAQM) objective in 2012 which was the measured annual mean NO^2 concentration at Bearsden Cross and a diffusion tube at Bishopbriggs 13. Three out of the four sites in the council area met the daily mean objective for PM_{10} and the fourth site had incomplete data so could not be used for 2012. The number of measured PM_{10} exceedences did not breach the number of permitted exceedences in 2012.

Monitoring of NO^2 and PM_{10} continue within the Bearsden Air Quality Management Area. The annual mean NO^2 at Bearsden was 41 $\mu g/m^3$ and there was 1 exceedence of the 1 hour mean. Unfortunately there was a fault during 2012 at the Bearsden air monitor which resulted in a loss of PM10 data.

The other Air Quality Management Area (AQMA) in East Dunbartonshire Council (EDC) is at Bishopbriggs where there was one exceedence of an NO^2 diffusion tube in 2012, Bishopbriggs 13 and no exceedences for the PM_{10} objective in either 2011 or 2012.

Kirkintilloch has shown signs of improved air quality over the past two years with both the NO^2 and the PM_{10} annual mean concentrations below the respective 40 $\mu g/m^3$ and 18 $\mu g/m^3$ objectives. This is a strong indicator that the construction of the Kirkintilloch Link Road contributed to elevated levels of NO^2 and PM_{10} in recent years. Although there are signs of improvement, there is still queuing traffic at the road junction and the results of a Detailed Assessment are due imminently.

2012 was the first complete year of data from the fixed analyser installed at Milngavie in August 2011. Measured NO^2 and PM_{10} concentrations at the Milngavie site during 2012 were below the air quality objectives.

The main focus is to increase awareness about air quality and the council will endeavour to reduce air pollution by working with the general public through vehicle emission testing days and vehicle idling campaigns, including school visits, radio commercials and leaflet distribution.

Air quality is also at the fore when processing planning applications and implementing transport policies.

One of the biggest challenges for the future for local authorities attempting to reduce air pollutant levels is the increase in biomass boiler applications. Whilst the council is required to meet Climate Change obligations, there can be a negative impact on local air quality.

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1.1 Description of Local Authority Area

The East Dunbartonshire Council area covers approximately 200 square kilometres located to the north of Glasgow and is bordered by Glasgow City Council to the south, West Dunbartonshire Council to the west, Stirling Council to the north and North Lanarkshire Council to the east. The local authority area is landlocked and contains a mixture of both urban and rural areas. A map of East Dunbartonshire area is provided in Appendix A.

The population of East Dunbartonshire is approximately 105,000 with the majority of residents based in the urban areas to the south, which are contiguous with Glasgow. The main urban centres are Kirkintilloch, Bishopbriggs, Lenzie, Bearsden and Milngavie. The northern part of East Dunbartonshire is largely rural with a few small population centres in Torrance, Lennoxtown, Twechar and Milton of Campsie. There are relatively low levels of industrial activity within the local authority area.

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

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

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	3.25 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year (the rest of the UK)	24-hour mean	31.12.2004
	50 $\mu g/m^3$, not to be exceeded more than 7 times a year (Scotland)	24-hour mean	31.12.2010
	40 $\mu g/m^3$ (the rest of the UK)	Annual mean	31.12.2004
	18 $\mu g/m^3$ (Scotland)	Annual mean	31.12.2010
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

A summary of all previous reviews and assessments of local air quality since 2003 in East Dunbartonshire are presented in Table 1.2 and described further in the following texts.

The locations of both AQMA's are presented in Figures 2 and 3.

Table 1.2: Details of local air quality reviews submitted by East Dunbartonshire Council

Date submitted	Assessment / Report	Conclusions
May 2003	Updating and Screening Assessment (2003 U&SA)	The risk of exceeding NO^2 and PM_{10} objectives at several busy roads and junctions was identified in Bishopbriggs, Bearsden and Milngavie.
September 2004	Detailed Assessment of NO^2 and PM_{10} (2004 DA)	The assessment considered NO^2 and PM_{10} concentrations resulting from road traffic emissions along the A803 in Bishopbriggs, and the A81 and A809 in Bearsden and Milngavie. The assessment concluded that annual mean NO^2 and PM_{10} objectives would be exceeded and that an Air Quality Management Area (AQMA) should be declared in Bishopbriggs. The study also identified potential exceedences of the 2010 annual mean PM_{10} air quality objective within Bearsden and Milngavie. However, further action was deferred until the modelling results could be verified with monitored data
April 2005	Addendum to Detailed Assessment of NO^2 and PM_{10} (2004 DA- Addendum)	
May 2005	Progress Report (2005 PR)	No new areas were identified where exceedences of NAQS objectives were predicted The intention to declare an AQMA in Bishopbriggs was confirmed. Following the results of the DA it was noted that the Council intended to install automatic monitoring for PM_{10} and NO^2 in Bearsden
October 2005	Bishopbriggs AQMA declaration	An AQMA covering a 60m corridor along the A803 Kirkintilloch Road between Colston Road and a point 30m north of Cadder Roundabout was declared on 23rd October 2005 and implemented on 23rd December 2005.
June 2006	Updating and Screening Assessment (2006 U&SA)	The risk of NO^2 and PM_{10} objectives being exceeded at Bearsden Cross was identified. Due to a low data capture rate at automatic monitoring site it was recommended that further monitoring was carried out prior to proceeding to a Detailed Assessment.
May 2007	Bishopbriggs AQMA Further Assessment (2007 FA)	The Further Assessment confirmed the requirement for an AQMA, for both NO^2 and PM_{10}, in Bishopbriggs. The Further Assessment considered two proposed future road traffic emission scenarios: the implementation of a quality bus corridor on the A803; and completion of the Bishopbriggs Relief Road. The assessment concluded that both options would generally improve air quality within the AQMA but that there may be a marginal increase in pollutant concentrations at the junction between Colston Road and Kirkintilloch Road at the south of the AQMA as a result of both schemes. The assessment concluded that the completion of the Bishopbriggs Relief Road in addition to the implementation of the quality bus corridor would achieve the highest improvement in air quality within the AQMA, although concentrations of both pollutants were still predicted to exceed the NAQS objectives in 2010.

Date submitted	Assessment / Report	Conclusions
June 2007	Progress Report (2007 PR)	The report identified that measured NO^2 concentrations at four sites in Bearsden and one in Milngavie exceeded the annual mean NO^2 objective. Potential exceedences of the PM_{10} annual mean and 24 hour mean objectives were identified in Bearsden and Milngavie. It was concluded that a Detailed Assessment of NO^2 and PM_{10} was required for busy junctions in Bearsden and Milngavie.
October 2007	Bishopbriggs AQMA Further Assessment (2007 FA-Addendum)	The Addendum report included additional information on source apportionment within the AQMA. It was identified that transboundary sources accounted for the greatest proportion of both PM_{10} and NO_X concentrations. The greatest contributions from local sources were from road traffic and commercial and domestic sources. It was shown that particulate emissions from tyre, break wear and re-suspension contributed significantly to road traffic emissions of PM_{10} and HGVs were the greatest contributor to road traffic emissions of NO_x.
January 2008	Bishopbriggs AQMA Draft Action Plan (2008 AP-draft)	Following the a series of consultations with the local community and stakeholders, including a citizens panel questionnaire, a short-life working group and 2 workshops; the Draft Action Plan was issued in conjunction with the Local Transport Strategy (LTS). A joint Strategic Environmental Assessment (SEA) was undertaken separately which assessed the wider impacts of both the LTS and AP.
April 2008	Detailed Assessment Bearsden & Milngavie (2008 DA)	The assessment of NO^2 and PM_{10} concentrations in Bearsden and Milngavie concluded that there were some areas within Bearsden and Milngavie where predicted NO^2 and PM_{10} concentrations were above the respective air quality objectives; however, the locations were not classified as locations of relevant public exposure. Furthermore, there were several areas along Drymen Road at which predicted concentrations were close to, but not exceeding, the 2010 annual mean PM_{10} objective. Based on the results of the Detailed Assessment it was concluded that an AQMA in Bearsden or Milngavie was not required; however, further monitoring was recommended.
August 2008	Progress Report (2008 PR)	No identified or predicted exceedences of NAQS objectives.
March 2009	Bishopbriggs AQMA Final Action Plan (2009 AP)	Following consultation with SEPA, neighbouring local authorities, all Council departments and the Scottish Government the final version Action Plan was issued.
July 2009	Bishopbriggs AQMA – Progress Report 2009	Measured NO^2 concentrations within the AQMA indicate two exceedences during 2008. Measured concentrations of PM_{10} are in compliance with the 2010 NAQS objectives.

Date submitted	Assessment / Report	Conclusions
September 2009	Updating and Screening Assessment 2009	The review of monitoring data identified exceedences of the annual mean NAQS objective for NO^2 and predicted exceedences of the 2010 annual mean NAQS objective for PM_{10} at locations of relevant exposure along Drymen Road in Bearsden. East Dunbartonshire Council intend to declare an AQMA along Drymen Road in Bearsden in respect to measured and predicted exceedences of the annual mean NAQS objectives for NO^2 and PM_{10}. An Automatic Air Quality Analyser is being installed in Milngavie to ensure that the annual mean objective is not exceeded. The PM_{10} monitoring data for Bishopbriggs indicate that concentrations within the AQMA have reduced such that the 2010 annual mean objective for PM_{10} is not being exceeded. NO^2 concentrations continue to exceed the annual mean NAQS objective at some locations within the AQMA.
May 2010	Progress Report	The measured PM_{10} concentration at Kirkintilloch exceeds the 2010 annual mean objective, giving a level of 22.5 µg/m^3 however; the construction of the Kirkintilloch Link Road is taking place very close by. It is anticipated that the PM_{10} level will decrease once the Kirkintilloch Link Road is complete in the summer of 2010. An Automatic Air Quality Analyser is being installed in Milngavie to ensure that the annual mean objective is not exceeded.
August 2011	Progress Report	The installation of a new automatic monitoring site in Milngavie is expected to be operational by August 2011. Measured concentrations of both NO^2 and PM10 at Kirkintilloch are in excess of the relevant annual mean objectives at 45µg/m^3 and 26µg/m^3 respectively. The construction of the Kirkintilloch Link Road was completed in November 2010. It is the Council's intention to proceed to a Detailed Assessment for both pollutants in this area.

Date submitted	Assessment / Report	Conclusions
October 2012	Updating and Screening Assessment	Measured pollutant concentrations across the council area were typically lower than those measured in 2010. The Detailed Assessment of Kirkintilloch is currently underway. Measured PM10 concentrations exceeded the annual mean objective at the automatic monitoring sites in Bearsden and Kirkintilloch in 2011 however with an observed decrease in measured concentrations at both locations from 2010 to 2011. The automatic monitoring site at Bearsden recorded a decrease in the annual mean concentration of 5µg/m³ while a decrease of 7µg/m³ was recorded at Kirkintilloch. This is thought to have been influenced by 2010 having a particularly high background concentration of PM10. A similar drop in annual mean concentrations of PM10 has been seen across the UK from 2010 to 2011.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

East Dunbartonshire Council monitor NO^2 and PM_{10} using a combination of automatic analysers and passive diffusion tubes (PDT). The automatic monitoring sites are presented in Table 2.1 and the details of non-automatic monitoring sites are presented in Table 2.2.

Since the previous Progress Report in 2011 there has been a new fixed air monitor installed in Milngavie which has been running since August 2011.

For all four fixed air monitors there have been regular calibrations, bi-annual services and bi-annual audits.

All automatic monitoring NO^2 and PM_{10} data has been fully ratified by Ricardo-AEA on behalf of the Scottish Government.

Diffusion tube data has been corrected using the national and local bias correction factor and the PM_{10} data from the Eberline-BAM analysers at Bishopbriggs and Bearsden have been altered using the gravimetric equivalent.

Details of the quality control and data correction processes carried out are reported in Appendix B.

2.1.1 Automatic Monitoring Sites

East Dunbartonshire Council operate four automatic NOx analysers and four automatic PM_{10} monitors. The analysers are located at four sites:

- the junction of Drymen Road (A809) and Roman Road in Bearsden (since December 2005)
- the junction of Kirkintilloch Road (A803) with Springfield Road and Kenmure Avenue in Bishopbriggs (since December 2003)
- the Townhead junction in Kirkintilloch (since October 2007)
- the junction of Main Street and Park Road, Milngavie (since August 2011)

There is a NOx and PM_{10} analyser at each monitoring location.

A gravimetric partisol PM_{10} analyser is due to be installed at Milngavie Road, Bearsden in 2013.

The locations of the automatic monitoring sites are annotated in Figures 2, 3, 4 and 5.

Table 2.1: Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Bearsden 16	Kerbside	254269 672067	NO^2 PM_{10}	Horiba 360, Eberline BAM (heated inlet)	Y	Y<2m	1m	Y
Bishopbriggs 14	Roadside	260995 670130	NO^2 PM_{10}	Horiba 360, Eberline BAM (heated inlet)	Y	Y 5m	2 m to nearest road 10m to junction with main road	N
Kirkintilloch 17	Kerbside	265700 673500	NO^2 PM_{10}	Thermo 42i TEOM (FDMS)	N	Y <2m	1m	Y
Milngavie 10	Roadside	255328 674115	NO^2 PM_{10}	Thermo 42i TEOM (FDMS)	N	Y	1m	Y

2.1.2 Non-Automatic Monitoring

East Dunbartonshire Council maintain a network of forty NO^2 diffusion tube sites located across the council area. The monitoring sites represent public exposure and areas of high pollution concentrations at a variety of kerbside, roadside and urban background locations. The locations of the non-automatic monitoring sites are also annotated in Figures 2, 3, 4 and 5.

Table 2.2: Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Reference	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst case Location?
Bearsden 1	R	254218 672193	NO^2	Y	Y (3m)	2m	Y
Bearsden 3	UB	254655 670158	NO^2	N	N (8m)	5m	Y
Bearsden 4	UB	253075 673382	NO^2	N	N (6m)	5m	Y
Bearsden 7	K	254269 672069	NO^2	Y	Y (<2m)	1m	Y
Bearsden 8	K	254275 672047	NO^2	Y	N (18m)	1m	Y
Bearsden 9	R	254751 670621	NO^2	N	N (30m)	2m	Y
Bearsden 10	R	255394 670683	NO^2	N	N (24m)	2m	Y
Bearsden 13	K	254809 671057	NO^2	Y	Y (26m)	1m	Y
Bearsden 14	K	254877 671000	NO^2	Y	Y (8m)	1m	N
Bearsden 15	K	254898 671023	NO^2	Y	Y (2m)	1m	Y
Bearsden 16	K	254269 672067	NO^2	Y	Y (2m)	1m	Y
Bearsden 16B	K	254269 672067	NO^2	Y	Y (2m)	1m	Y
Bearsden 16C	K	254269 672067	NO^2	Y	Y (2m)	1m	Y
Bearsden 17	K	254258 672077	NO^2	Y	Y(<2m)	1m	Y
Bearsden 18	K	254275 672069	NO^2	Y	Y(<2m)	1m	Y
Bishopbriggs 5	UB	260948 669610	NO^2	N	N (44m)	5m	N
Bishopbriggs 6	K	261016 670198	NO^2	Y	Y (<2m)	1m	Y
Bishopbriggs 8	UB	260842 670278	NO^2	N	N (<2m)	5m	N
Bishopbriggs 12	K	260581 669527	NO^2	Y	N (4m)	1m	Y
Bishopbriggs 13	K	260549 669312	NO^2	Y	N (5m)	1m	Y
Bishopbriggs 14	R	260995 670130	NO^2	Y	N (42m)	2m	N
Bishopbriggs 14B	R	260995 670130	NO^2	Y	N (42m)	2m	N
Bishopbriggs 14C	R	260995 670130	NO^2	Y	N (42m)	2m	N
Bishopbriggs 16	K	260580 69533	NO^2	Y	Y (<2m)	2m	Y
Bishopbriggs 17	K	260552 69320	NO^2	Y	Y (<2m)	2m	Y

Site Name	Site Type	OS Grid Reference	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst case Location?
Kirkintilloch 15	R	265640 673501	NO^2	N	Y (2m)	2m	Y
Bishopbriggs 18	UB	260604 670337	NO^2	N	N (<2m)	5m	N
Kirkintilloch 16	R	265695 673521	NO^2	N	N (3m)	2m	Y
Kirkintilloch 17	R	265700 673500	NO^2	N	Y (3m)	2m	Y
Kirkintilloch 17B	R	265700 673500	NO^2	N	Y (3m)	2m	Y
Kirkintilloch 17C	R	265700 673500	NO^2	N	Y (3m)	2m	Y
Kirkintilloch 18	K	265667 673532	NO^2	N	Y (<2m)	2m	Y
Milngavie 4	R	255728 674486	NO^2	N	N (5m)	2m	Y
Milngavie 5	R	255327 674137	NO^2	N	N (50m)	2m	Y
Milngavie 6	R	255288 674121	NO^2	N	N (10m)	2m	Y
Milngavie 7	R	255279 674124	NO^2	N	N (<2m)	9m	Y
Milngavie 8	R	255251 674198	NO^2	N	N (3m)	1m	Y
Milngavie 9	R	255331 674214	NO^2	N	Y (7m)	2m	Y
Milngavie 10	R	255325 674116	NO^2	N	Y	1 m	Y
Milngavie 10 B	R	255325	NO^2	N	Y	1 m	Y
Milngavie 10 C	R	674116	NO^2	N	Y	1 m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

The annual mean and 1-hour mean NO^2 automatic monitoring data for 2012 and previous years are presented in Tables 2.3 and 2.4 respectively, and Chart 1.1 shows the annual mean concentrations in graph form. Measured exceedences of NAQS objectives are highlighted in bold.

The data capture rate of all the analysers was good, with a data capture rate of greater than 95% achieved at all four sites in 2012.

Table 2.3 Results of Automatic Monitoring for Nitrogen Dioxide (NO^2) Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Annual mean concentrations (objective ≤ 40 µg/m³)					
			2007	2008	2009	2010	2011	2012
Bearsden	Bearsden Cross	Y	39.4	**44.1**	39.6	**47**	39.5	**41.42**
	Data Capture		99	99	99	100	100	100
Bishopbriggs	Bishopbriggs Cross	Y	34.1	31.5	33.4	33	35.7*	30
	Data Capture		99	90	90	91	65	95
Kirkintilloch	Townhead	N/A	-	35.6	**42**	**45**	**43**	34
	Data Capture		-	100	94	94	87	100
Milngavie	Main Street	N/A	-	-	-	-	-	25
	Data Capture		-	-	-	-	20	98

*Annualised in line with TG(09)

Chart 1.1 Annual Mean Concentrations of all automatic monitors for Nitrogen Dioxide (NO^2)

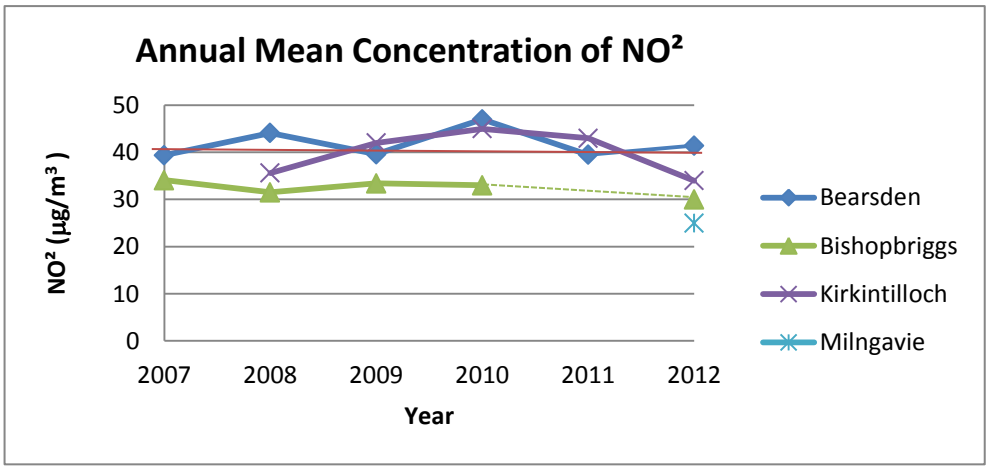


Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide (NO^2): Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Number of exceedences of hourly mean (200 µg/m³ not to be breached >18 times per year)					
			2007	2008	2009	2010	2011	2012
Bearsden	Bearsden Cross	Y	0	3	**19**	**37**	0	1
Bishopbriggs	Bishopbriggs Cross	Y	0	0	1	0	0 (115)	0
Kirkintilloch	Townhead	N/A	-	0	0	4	0 (151)	4
Milngavie	Main Street	N/A	-	-	-	-	0	0

Bearsden

The measured annual mean NO^2 concentration at Bearsden Cross in 2012 was 41.42 μg/m³, which is marginally above the annual mean objective level of 40 μg/m³.

Chart 1.1 demonstrates that the annual mean concentration of NO^2 at Bearsden has been fairly steady over the past 6 years, sitting on, or around, the annual mean objective limit of 40 μg/m³ however in 2011 it was below the mean objective sitting at 39.5 μg/m The past two years have shown a big decrease since 2010 when it was at its highest NO^2 annual mean concentration of 47 μg/m³.

There was one recorded exceedence of the 1-hour objective for NO^2 at Bearsden which is a significant improvement on 2010 when there were thirty seven recorded exceedences of the 1-hour objective for NO^2 at the Bearsden monitoring site.

Bishopbriggs

Chart 1.1 shows that annual concentrations have been below the annual mean concentration objective of 40 μg/m³ since 2007 with concentrations of between 31 μg/m³ and 35 μg/m³, reaching an all-time low of 30 μg/m³ in 2012.

Measured NO^2 concentrations at the Bishopbriggs Cross site during 2012 were below both the annual mean and 1-hour mean NAQS objectives for NO^2. Measured concentrations indicate that the NAQS objectives for NO^2 are being met at Bishopbriggs Cross.

Kirkintilloch

Chart 1.1 highlights a clear trend in the five year period starting in 2007 at 35.6 μg/m³, rising to a peak of 45 μg/m³ in 2010 and then decreasing over the past two years to 34 μg/m³ in 2012. This is a strong indicator that the construction of the Kirkintilloch Link Road contributed to elevated levels of NO^2 and PM_{10} over that period until it opened in 2010.

The measured annual mean NO^2 concentration at Kirkintilloch in 2012 was 34 μg/m³, which is below the annual mean objective level of 40μg/m. There were four measured exceedences of the 1-hour objective for NO^2 however this is well below the limit of 18.

The actions in the last 2011 Progress Report required a detailed assessment of Kirkintilloch, which is scheduled for 2013.

Milngavie

2012 was the first complete year of data from the fixed analyser installed at Milngavie in August 2011. Measured NO^2 concentrations at the Milngavie site during 2012 were below both the annual mean and 1-hour mean objectives for NO^2. Measured concentrations indicate that the objectives for NO^2 are being met at Milngavie.

The 2012 NO^2 annual mean was 25 μg/m³ which shows that air quality in the vicinity of Main Street, Milngavie is below the annual mean objective of 40 μg/m³.

Diffusion Tube Monitoring Data

The NO^2 diffusion tube monitoring data for 2012 and previous years are presented in Table 2.5. As the data capture for all sites was above 75% there has been no need to annualise the data. The diffusion tube monitoring results have been adjusted for laboratory bias using a local bias adjustment factor. Further detail of the annualisation and laboratory bias adjustment is provided in Appendix B. Trend charts of historic diffusion tube data at urban background, roadside and kerbside sites are presented in Charts 2.1, 2.2 and 2.3 respectively. Measured exceedences of NAQS objectives are highlighted in bold.

Table 2.5: Results of Nitrogen Dioxide (NO^2) Diffusion Tubes

Site ID	Location	Within AQMA?	Data capture for monitoring period (%)	Data Capture for full calendar year 2012 (%)	Annual mean concentrations (μg/m^3)					
					2007	2008	2009	2010	2011	2012
Bearsden 1	118 Drymen Rd	Y	**90**	**92**	30	33	32	**42.5**	31	34.3
Bearsden 3	5 Ravelston Rd	N	**92**	**100**	19	17	23	22.7	12	20.9
Bearsden 4	8 Lowther Ave	N	**100**	**100**	10	14	15	15.9	13	11.4
Bearsden 7	Bearsden Cross Traffic lights	Y	**92**	**100**	**43**	**48**	**42**	**46.6**	31	39.1
Bearsden 8	Bearsden Cross Hanging basket	Y	**100**	**100**	38	38	**40**	**40.4**	25	32.2
Bearsden 9	Switchback	N	**100**	**100**	27	29	31	33.0	32	28.9
Bearsden 10	Maryhill Rd/ Rannoch Dr	N	**92**	**92**	34	33	31	35.6	27	27.2
Bearsden 13	Canniesburn Toll	Y	**100**	**100**	37	39	38	**43.7**	37	37.5
Bearsden 14	Milngavie Rd at CanniesburnToll	Y	**100**	**100**	39	38	39	**43.5**	37	33.1
Bearsden 15	Milngavie Rd	Y	**100**	**100**	34	**40**	38	39.8	33	37.2
Bearsden 16 (average of 3 collocated tubes for 2012)	102 Drymen Rd	Y	**100**	**100**	**40**	**46**	**40**	**45.5**	35	38.8

Bearsden 16B (average of 3 collocated tubes for 2012)	102 Drymen Rd	Y	**92**	**100**	**41**	**45**	39	**46.0**	40	38.8
Bearsden 16C (average of 3 collocated tubes for 2012)	102 Drymen Rd	Y	**100**	**100**	39	**43**	**40**	**48.3**	35	38.8
Bearsden 17	Drymen Rd	Y	**75**	**100**	/	/	/	**42.2**	30	**39.7**
Bearsden 18	Roman Rd	Y	**75**	**100**	/	/	/	38.6	30	30.8
Bishopbriggs 5	Huntershill House	N	**83**	**100**	14	15	21	17.1	13	15.8
Bishopbriggs 6	145 Kirkintilloch Rd	Y	**100**	**100**	37	37	36	**42.7**	32	30.5
Bishopbriggs 8	77 Brackenbrae Avenue	N	**-**	**20**	15	17	21	22.2	16	removed
Bishopbriggs 12	24 Kirkintilloch Rd	Y	**92**	**100**	34	**40**	**40**	**46.0**	35	37.3
Bishopbriggs 13	1495 Springburn Rd	Y	**100**	**100**	**51**	**51**	**47**	**52.1**	**40**	**43.2**
Bishopbriggs 14 (average of 3 collocated tubes for 2012)	128 Kirkintilloch Rd	Y	**100**	**100**	30	31	33	34.4	29	29.4
Bishopbriggs 14B (average of 3 collocated tubes for 2012)	128 Kirkintilloch Rd	Y	**100**	**100**	32	33	37	38.1	28	29.4
Bishopbriggs 14C (average of 3 collocated tubes for 2012)	128 Kirkintilloch Rd	Y	**100**	**100**	29	32	33	38.2	31	29.4
Bishopbriggs 16	24 Kirkintilloch Rd (Building Facade)	Y	**75**	**92**	/	/	/	31.5	29	30
Bishopbriggs 17	1495 Springburn Road (Building Facade)	Y	**75**	**100**	/	/	/	37.8	32	35.6
Bishopbriggs 18	Lamp post Beaufort Gdns	N	**83**	**83**	/	/	/	/	/	16.1

Kirkintilloch 15	Lamp post R2 Townhead Lights	N/A	**100**	**100**	35	32	**44**	38.5	30	32.4
Kirkintilloch 16	Parliament Rd	N/A	**83**	**100**	38	33	**48**	37.1	35	33.7
Kirkintilloch 17 (average of 3 collocated tubes for 2012)	1 Broomfield Walk	N/A	**100**	**100**	/	36	**44**	**42.9**	35	38.2
Kirkintilloch 17B (average of 3 collocated tubes for 2012)	1 Broomfield Walk	N/A	**100**	**100**	/	35	**41**	**42.5**	37	38.2
Kirkintilloch 17C (average of 3 collocated tubes for 2012)	1 Broomfield Walk	N/A	**100**	**100**	/	34	**42**	**41.8**	34	38.2
Kirkintilloch 18	Belmont Court	N/A	**80**	**100**	/	/	/	36.4*	28	28.8
Milngavie 4	Station Rd	N/A	**100**	**100**	26	29	30	31.5	29	27.6
Milngavie 5	Woodburn Way/ Park Rd	N/A	**100**	**92**	24	26	25	30.3	23	22.3
Milngavie 6	Park Rd	N/A	**92**	**100**	**40**	**42**	36	**41.0**	35	**39.9**
Milngavie 7	29 Southgate	N/A	**100**	**100**	/	/	34*	**40.2**	35	36.5
Milngavie 8	6-12 Park Road	N/A	**100**	**100**	/	/	27*	30.3	24	24.1
Milngavie 9	Fairview Court	N/A	**92**	**92**	/	/	28*	33.6	28	28.6
Milngavie 10 (average of 3 collocated tubes for 2012)	Main Street	N/A	**100**	**100**	/	/	/	/	/	25.9
Milngavie 10B (average of 3 collocated tubes for 2012)	Main Street	N/A	**100**	**100**	/	/	/	/	/	25.9
Milngavie 10C (average of 3 collocated tubes for 2012)	Main Street	N/A	**100**	**100**	/	/	/	/	/	25.9

Chart 2.1 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Urban Background Diffusion Tube Monitoring Sites

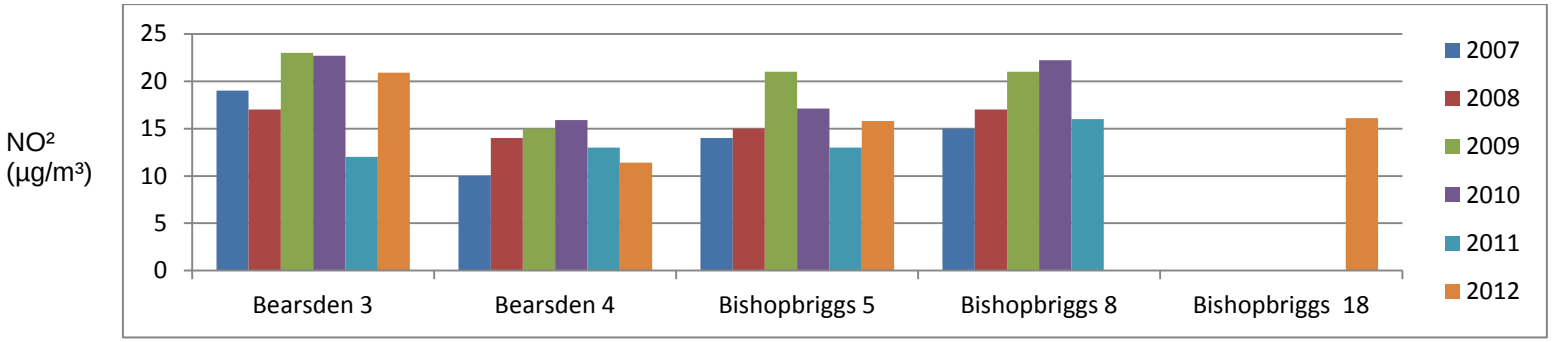


Chart 2.2 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Roadside Diffusion Tube Monitoring Sites

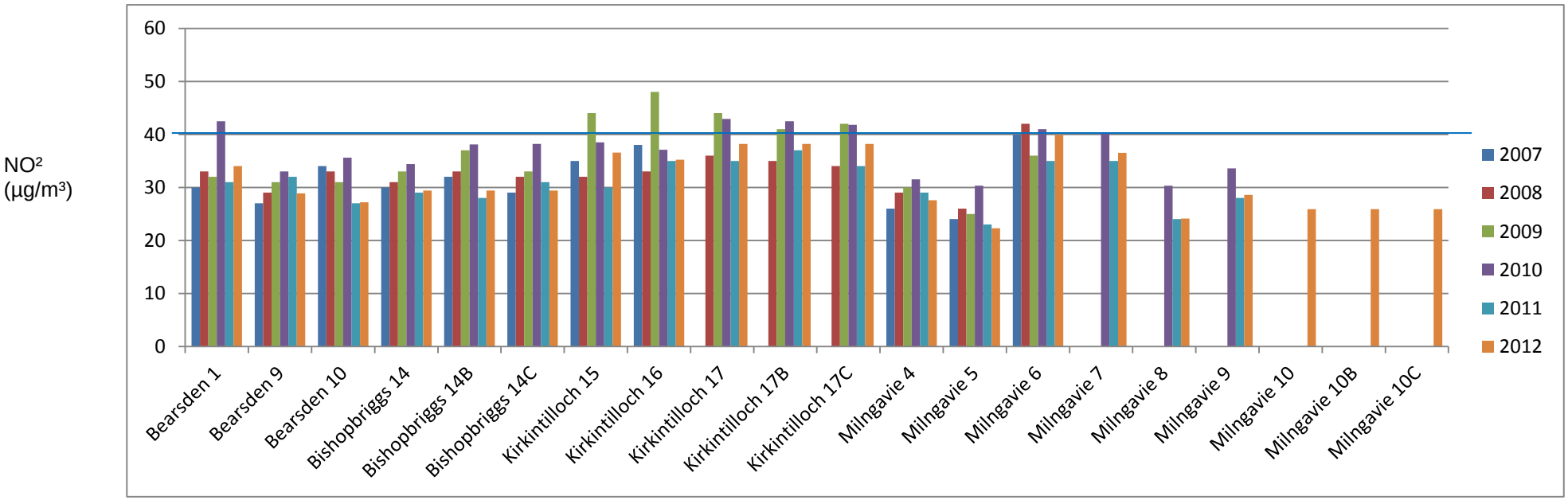
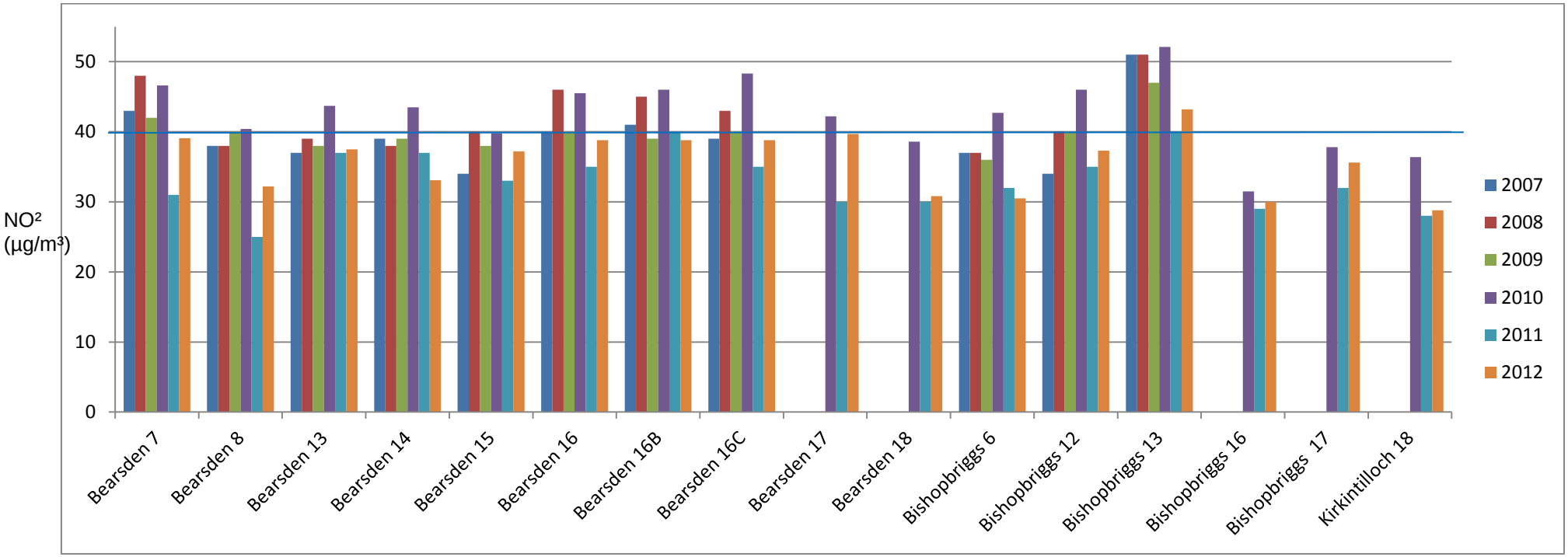


Chart 2.3 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Kerbside Diffusion Tube Monitoring Sites



Charts 2.1, 2.2 and 2.3 highlight that measured concentrations at all locations show an overall downward trend in annual mean concentrations from 2007 to 2012.

All of the diffusion tubes at Kirkintilloch, Bearsden and Milngavie were below the 40 µg/m³ annual mean concentrations in 2012 and all of the urban background and roadside diffusion tubes were below the 40 µg/m³ annual mean objective for 2012 with 21 µg/m³ being the highest concentration of the four urban background diffusion tube locations.

There was one diffusion tube (Bishopbriggs 13) where the measured annual mean concentration was in excess of the objective of 40 µg/m³ which was 43.2 µg/m³ for 2012. This diffusion tube at Bishopbriggs 13 is located on a lamp post at a very busy road junction and has always exceeded the 40 µg/m^3 objective. Subsequently another tube (Bishopbriggs 17) was installed in 2012 as it sits on the side of a house two metres from Bishopbriggs 13 and has been below the 40 µg/m^3 concentration every year. As Bishopbriggs 13 is at the side of the road it is unlikely that it reflects the exposure on humans for more than an hour in 24 hours, so this could possibly be replaced by Bishopbriggs 17 in the long term. This is the same situation for Milngavie 6 and 7 where Milngavie 6 is at a street lamp and Milngavie 7 is on the house veranda. This may also result in the kerbside diffusion tube being replaced in the long run.

2.2.2 PM_{10}

The measured annual mean and 24-hour mean PM_{10} concentrations for 2012 and previous years are presented in Tables 2.6 and 2.7 respectively. Measured and predicted exceedences of NAQS objectives are highlighted in bold. The data capture rate of all the PM_{10} analysers was good with the exception of Bearsden where a fault led to a loss of data. There was greater than 90% capture rate at Bishopbriggs and Milngavie, and 82% at Kirkintilloch.

Table 2.6 Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Annual mean concentrations (objective ≤ 18µg/m³)					
			2007	2008	2009	2010	2011	2012
Bearsden	Bearsden Cross	Y	**20.6**	**22.8**	**20.5**	**25**	**20**	-
	Data Capture		85	79	70	96	97	42
Bishopbriggs (Eberline/BAM)	Bishopbriggs Cross	Y	**21.1**	17.8	**18.9**	**19**	17	15
	Data Capture		97	94	79	99	96	94
Kirkintilloch	Townhead	N	-	**22.0**	**22.5**	**26**	**19**	18
	Data Capture		-	55	93	79	91	82
Milngavie	Main Street	N	-	-	-	-	-	14
	Data Capture		-	-	-	-	-	99

Chart 2.4 Annual Mean Concentrations of all automatic monitors for Particulate Matter (PM_{10})

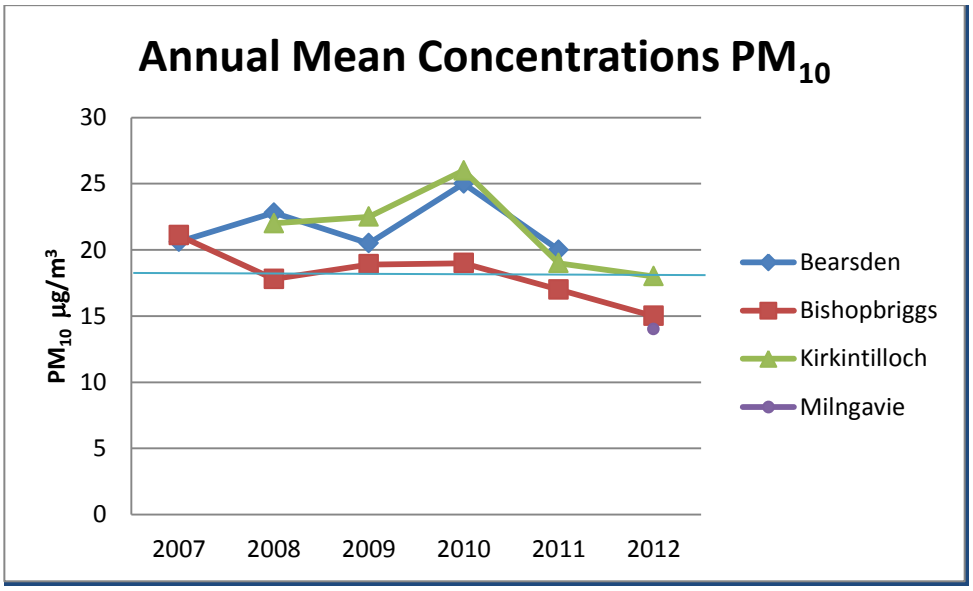


Chart 2.4 highlights the annual mean concentrations of PM_{10} data for the four fixed air monitors in East Dunbartonshire Council between 2007 and 2012.

Bearsden

The PM_{10} annual mean concentration at Bearsden was marginally over the mean objective of 18μg/m³ between 2007 and 2009 sitting at 20 μg/m³, or just over 20 μg/m³ then peaking at 25μg/m³ in 2010 and dropping again to 20 μg/m³ in 2011. Unfortunately the Eberline BAM PM_{10} monitor at Bearsden had a fault in 2012 and the data could not be used.

Bishopbriggs

The PM_{10} data at Bishopbriggs shows that PM_{10} fell consistently over the past 6 years from 20 μg/m³ in 2007 to 15 μg/m³ annual mean concentration in 2012. The annual mean concentration over the past two years has been under the annual mean objective of 18 μg/m³.

Kirkintilloch

Kirkintilloch shows a clear trend in the five year period starting in 2007 at 22 μg/m³, rising steadily to a peak of 26 μg/m³ in 2010 and then decreasing over the past two years to an all-time low of 18 μg/m³. This is a strong indicator that the construction of the Kirkintilloch Link Road contributed to elevated levels of NO^2 and PM_{10} over that period until it opened in November 2010.

Milngavie

2012 was the first complete year of data from the fixed analyser installed at Milngavie in August 2011. The 2012 PM_{10} annual mean was 14 μg/m³ which shows that air quality in the vicinity of Main Street, Milngavie is well below the annual mean objective of 18 μg/m³.

Table 2.7 Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Number of exceedences of daily mean objective (50 μg/m³ not to be breached >7 times per year)					
			2007	2008	2009	2010	2011	2012
Bearsden	Bearsden Cross	Y	3	5	5	**20**	0	0
Bishopbriggs (BAM)	Bishopbriggs Cross	Y	6	4	5	11	0	3
Kirkintilloch	Townhead	N	3	6	15	**21**	1	6
Milngavie	Main Street	N	-	-	-	-	-	3

The measured annual mean PM_{10} concentrations during 2012 indicate that PM_{10} concentrations at all automatic monitoring sites were on or below the annual mean objective.

The number of measured exceedences of the daily mean objective for PM_{10} at all monitoring sites did not breach the number of permitted exceedences.

Elevated levels of PM_{10} measured at Kirkintilloch significantly decreased between 2010 and 2012 with one exceedence of the daily mean objective in 2011 and six in 2012, both less than the permitted limit of 50 μg/m³ not to be breached more than 7 times in a year.

2.2.3 Sulphur Dioxide

East Dunbartonshire Council does not currently monitor SO_2. Historical monitoring data indicated a decline in concentration in line with those experienced across the UK. Concentrations measured from 1992 to 2005 were significantly below objective levels for SO_2.

2.2.4 Benzene

East Dunbartonshire Council does not currently monitor Benzene.

2.2.5 Other pollutants monitored

East Dunbartonshire Council does not undertake monitoring of any other pollutants.

2.2.6 Summary of Compliance with AQS Objectives

The air quality at Kirkintilloch and Milngavie monitoring stations all complied with the NO^2 objectives and there were only two exceedences that occurred in East Dunbartonshire Council in 2012 – one was the NO^2 at the fixed analyser at Bearsden Cross and the other was a diffusion tube exceedence of NO^2 in the Bishopbriggs AQMA.

All sites in the East Dunbartonshire Council area complied with the PM_{10} objectives of being under 18 $\mu g/m^3$ however this may have been different if the Bearsden PM_{10} analyser was working properly in 2012 and data could have been monitored.

3 New Local Developments

The Council Planning Service has advised that the following developments are under consideration:

- Westerhill Business Park, Westerhill Road, Bishopbriggs – Planning permission in principle for mixed use development of offices, hotel, cinema. Initial air quality assessment completed.
- Lairdsland Primary School, Donaldson Street, Kirkintilloch – new build primary school – air quality assessment under way.
- Bishopbriggs Town Centre Redevelopment, Bishopbriggs. Refused. Large supermarket own site and planned new store, offices, shopping development. Appeal expected.
- Waitrose, West of Scotland Rugby Club, Milngavie. Councillors minded to approve.
- Scotus College, Chesters Road, Bearsden. Residential development of 25 houses – approved 03.01.13.
- McGavigan's Field, Woodilee Road, Kirkintilloch. Housing development of 45 houses. Pre application discussions underway.
- ASDA Bearsden, Petrol Filling Station, Bearsden – referred for site visit.

3.1 Road Traffic Sources

The Council Roads Services have advised that there were no new or significantly changed road traffic sources, as per the screening criteria, that have not been previously assessed. It was therefore concluded that there have been no significant changes to emissions from traffic sources within the Council area since the 2010 Progress Report.

3.2 Other Transport Sources

There have been no newly identified emissions from rail, shipping or aircraft operations within the Council area since the 2010 Progress Report.

3.3 Industrial Sources

The Scottish Environment Protection Agency (SEPA) were contacted to determine if there have been any new or significantly changed industrial processes in the area which may impact on air quality.

The register of Pollution Prevention and Control (PPC) processes did not include any new PPC installations in the council area.

All Pollution Prevention and Control (PPC) Part A and Part B permits regulated by SEPA in the East Dunbartonshire Council area can be seen in Appendix C.

3.4 Commercial and Domestic Sources

East Dunbartonshire Council Planning Services were consulted with regards to any new or changed commercial and domestic sources. No new commercial biomass combustion sources were identified. No new areas of domestic fuel burning were identified.

3.5 New Developments with Fugitive or Uncontrolled Sources

SEPA were consulted in relation to any changed waste, landfill or quarry processes identified in the public registers. There have been no significant changes to existing process emissions and no new fugitive sources identified.

4 Local / Regional Air Quality Strategy

East Dunbartonshire Council prepared an Air Quality Strategy in January 2010 which has yet to be fully implemented. It was hoped that the strategy would be completed in a more user friendly form by late 2011 however this has not been possible. It is hoped that an update can be completed during 2013.

5 Planning Applications

East Dunbartonshire Council has reviewed all planning applications received during 2012 and the following are planning applications which may have an impact on air quality:

- Westerhill Business Park , Westerhill Road, Bishopbriggs – mixed use development - not yet approved.
- Lairdsland Primary School, Donaldson Street, Kirkintilloch – new school – not yet approved
- Bishopbriggs Town Centre Redevelopment – refused –appeal expected
- McGavigan's Field, Woodilee Road, Kirkintilloch – Housing development of 45 houses
- Scotus College, Chesters Road, Bearsden – residential development of 25 houses
- Asda Bearsden – petrol filling station

6 Air Quality Planning Policies

East Dunbartonshire Council Planning Service have a Local Plan and a Draft Local Development Plan and air quality impact assessments are requested where it is considered that there is likely to be a significant impact on the environment e.g. increased traffic generation, or where the proposed development is within or close to an AQMA.

The Local Plan gives clear advice on how the environmental impact of proposed developments, including air quality, will be assessed through the planning process for the benefit of developers and communities.

7 Local Transport Plans and Strategies

The new draft Local Transport Strategy covers 2013 – 2017 and seeks to build on the success of the previous strategy as a means of delivering an integrated transport network across the area; improving the transport infrastructure and services, facilitating sustainable economic growth whilst contributing to improved health, community safety and other Council and partner priorities.

The purpose of the Local Transport Strategy is to:

- Set out and guide the strategy for the Council's roads and transportation plans
- Provide a transport policy link between the Council's Single Outcome Agreement , Local Development Plan and other policy documents
- Coordinate transport funding spend from a variety of sources making sure that investment contributes positively to roads maintenance, regeneration and sustainable development
- Review the transport network and monitor travel demand in the area, and
- Guide partnership working with key transport organisations

8 Climate Change Strategies

East Dunbartonshire Council produced its original Strategy and Implementation Plan in 2008. This has been updated and an East Dunbartonshire Council Climate Change Declaration, East Dunbartonshire Council Sustainable Development Strategy and Action Plan and Carbon Management Plan have been produced, along with East Dunbartonshire Council Green Office Policy and East Dunbartonshire Council Energy Policy.

Sustainable development, including carbon reduction, is a key strategic priority for East Dunbartonshire Council, reflected in strategic plans and practical activities, including creation of a Climate Change Team dedicated to tackling the issue of Climate Change.

9 Implementation of Action Plans

The Bishopbriggs Air Quality Management Area Action Plan was updated during 2012 and has been submitted as a stand-alone document.

A Draft Bearsden Air Quality Management Area Action Plan is being worked on.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Measured concentrations of NO^2 and PM_{10} at Bishopbriggs, Kirkintilloch and Milngavie in 2011 and 2012 all met the air quality objectives. An AQMA will continue to be in place in Bishopbriggs and a Detailed Assessment is scheduled for Kirkintilloch due to the elevated readings for NO^2 and PM_{10} in 2010 and the years leading up to 2010.

The air quality at Bearsden Cross continues to cause concern with exceedences of the air quality objectives. The Action Plan is well underway and in order to measure PM_{10} outside the AQMA boundary in Bearsden a Partisol 2025 is being set up to measure PM_{10} at Milngavie Road, Bearsden.

10.2 Conclusions relating to New Local Developments

No new local developments were identified for which there was a need to proceed to a Detailed Assessment.

10.3 Proposed Actions

The next LAQM requirement for the Council will be to submit a Progress Report in 2014.

A new automatic monitoring station measuring PM_{10} will be located in Bearsden as part of the Bearsden AQMA and Action Plan.

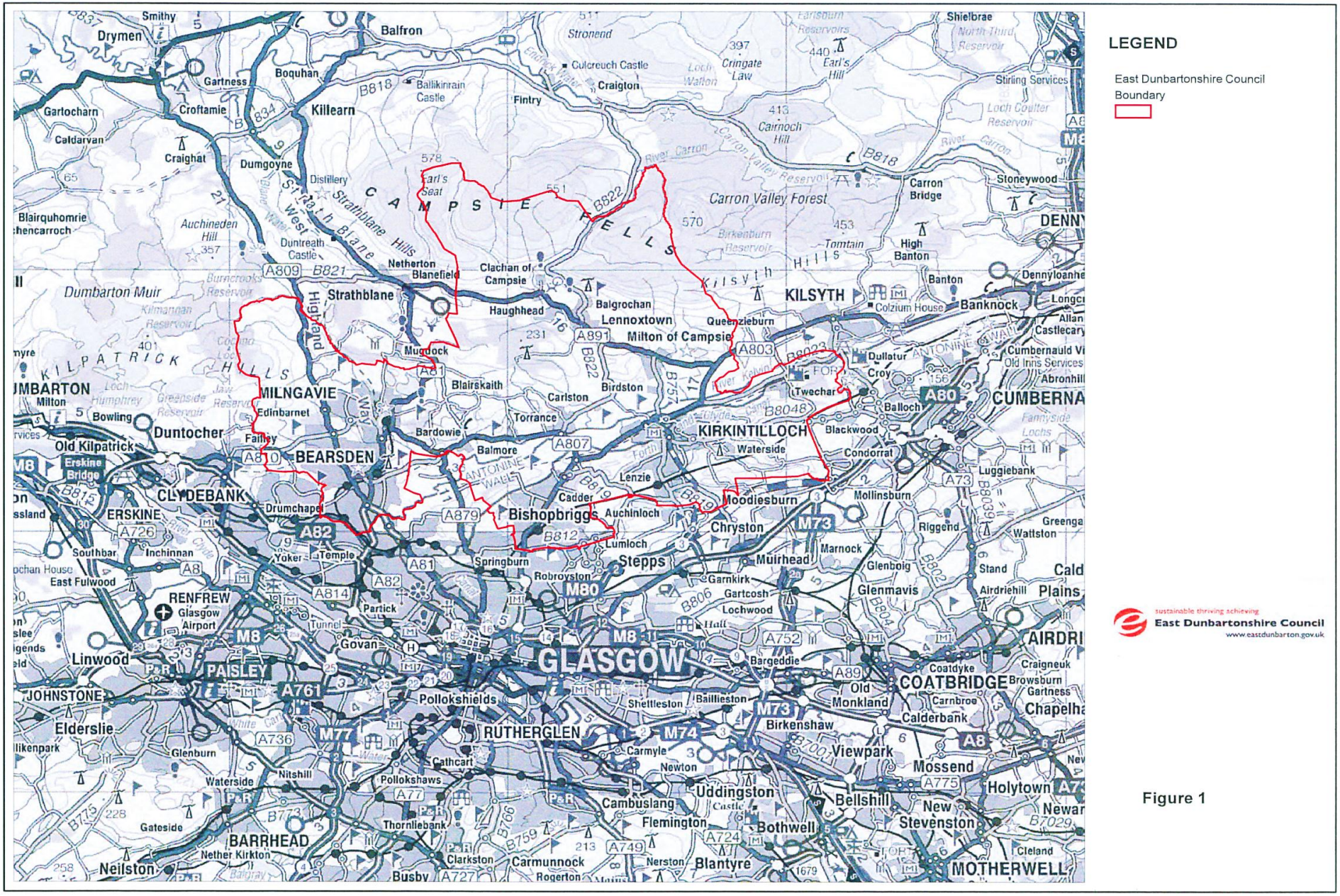
The Council hope to submit a Detailed Assessment for NO_2 and PM_{10} at Kirkintilloch during 2013.

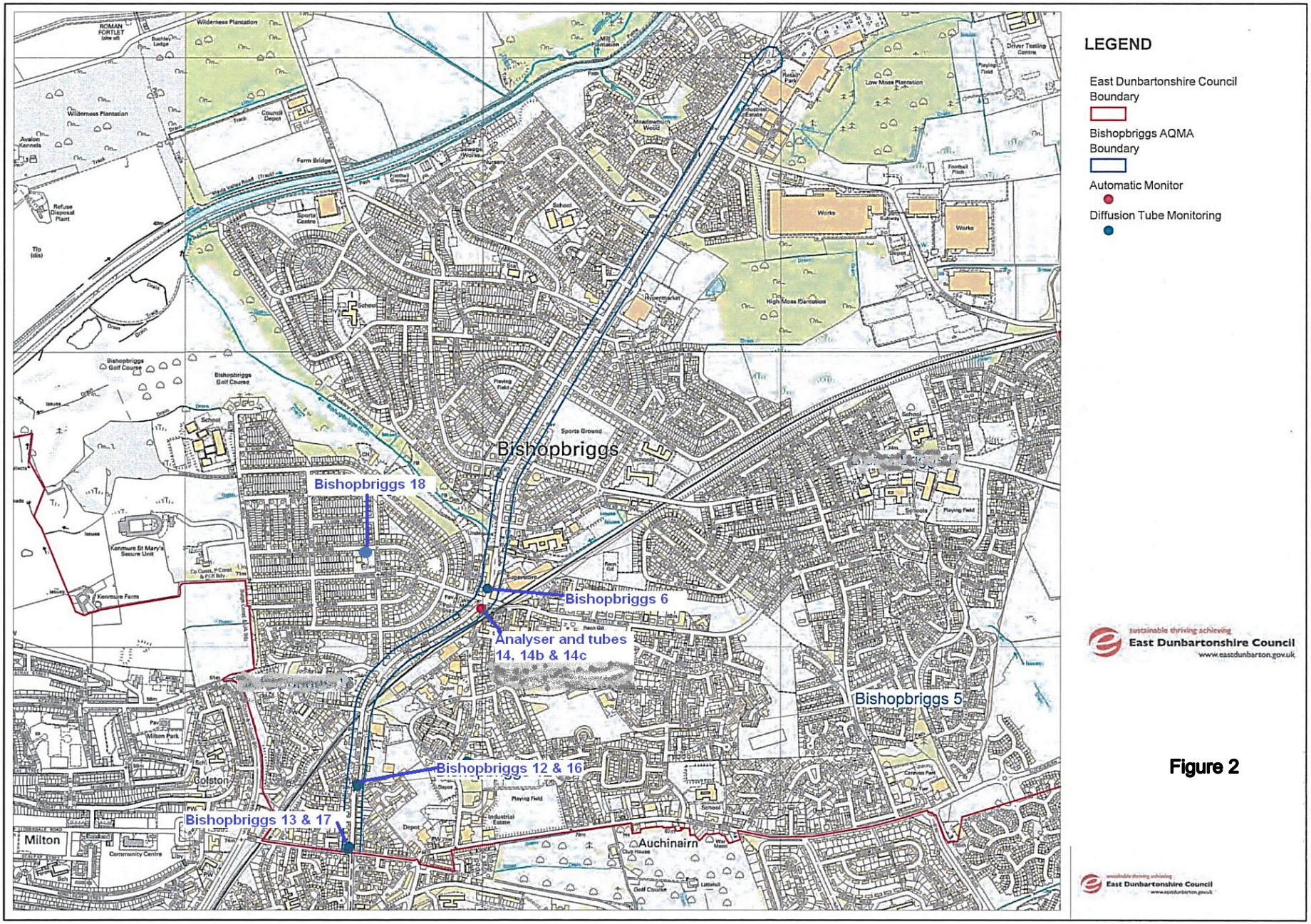
A Further Assessment of NO_2 and PM_{10} at Bishopbriggs will be carried out in 2013 to establish whether the AQMA can be revoked in 2014.

APPENDICES

APPENDIX A

FIGURES


LEGEND
East Dunbartonshire Council Boundary
sustainable thriving achieving
East Dunbartonshire Council
www.eastdunbarton.gov.uk
Drymen
Balfron
Gartness
Boquhan
Killearn
Gartocharn
Croftamie
Caldarvan
Craighat
Dumgoyne
Blairquhomrie
Auchineden Hill
Duntreath Castle
Netherton
Blanefield
Clachan of Campsie
Strathblane
Dumbarton Muir
Highland Way
Mugdock
Milngavie
Edinbarnet
Bowling
Duntocher
Old Kilpatrick
Erskine Bridge
Bearsden
Clydebank
Erskine
Drumchapel
Bishopbriggs
Southbar
Inchinnan
East Fulwood
Renfrew
Glasgow Airport
Yoker
Temple
Springburn
Robroyston
Partick
Govan
Linwood
Paisley
Johnstone
Elderslie
Glenburn
Nitshill
Pollokshaws
Pollokshields
Cathcart
Rutherglen
Glasgow
Gateside
Barrhead
Nether Kirkton
Neilston
Busby
Clarkston
Carmunnock
Thornliebank
Flemington
Cambuslang
Uddingston
Bothwell
Blantyre
Nerston
Rogerton
Motherwell
Wishaw
Carmyle
Newton
Shettleston
Baillieston
Tollcross
Parkhead
Bridgeton
Dalmarnock
Cambuslang
Rutherglen
Hamilton
Lenzie
Kirkintilloch
Twechar
Croy
Kilsyth
Banton
Colzium House
Banknock
Haughhead
Lennoxtown
Balgrochan
Milton of Campsie
Queenzieburn
Carlston
Birdston
Torrance
Balmore
Bardowie
Waterside
Blackwood
Condorrat
Dullatur
Cumbernauld
Old Inns Services
Balloch
Cumbernauld
Moodiesburn
Chryston
Auchinloch
Lumloch
Stepps
Muirhead
Mollinsburn
Riggend
Luggiebank
Garnkirk
Gartcosh
Glenmavis
Lochwood
Marnock
Glenboig
Airdriehill
Wattston
Greenfield
Coatbridge
Coatdyke
Old Monkland
Carnbroe
Calderbank
Browsburn
Gartness
Chapelhall
Birkenshaw
Viewpark
Mossend
Holytown
New Stevenston
Bellshill
Carron Valley Forest
Carron Bridge
Stoneywood
Denny
Dennyloanhead
Banknock
Castlecary
Cumbernauld
Abronhill
Kilsyth Hills
Campsie Fells
Earl's Seat
Cairnoch Hill
Tomtain Hills
Carron Valley Reservoir
Loch Coulter Reservoir
Stirling Services
Shielbrae
Earl's Hill
Cringate Law
Fintry
Culcreuch Castle
Craigton
Ballikinrain Castle
Distillery
Strathblane Hills
Burncrooks Reservoir
Kilmannan Reservoir
Greenside Reservoir
Humphrey Jaw Reservoir
Milton
Faifley
Auchineden Hill
Earlsburn Reservoirs
North Third Reservoir
Birkenburn Reservoir
Figure 1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Bishopbriggs AQMA Boundary
Automatic Monitor
Diffusion Tube Monitoring
Bishopbriggs
Bishopbriggs 18
Bishopbriggs 6
Analyser and tubes 14, 14b & 14c
Bishopbriggs 5
Bishopbriggs 12 & 16
Bishopbriggs 13 & 17
Milton
Colston
Auchinairn
sustainable thriving achieving
East Dunbartonshire Council
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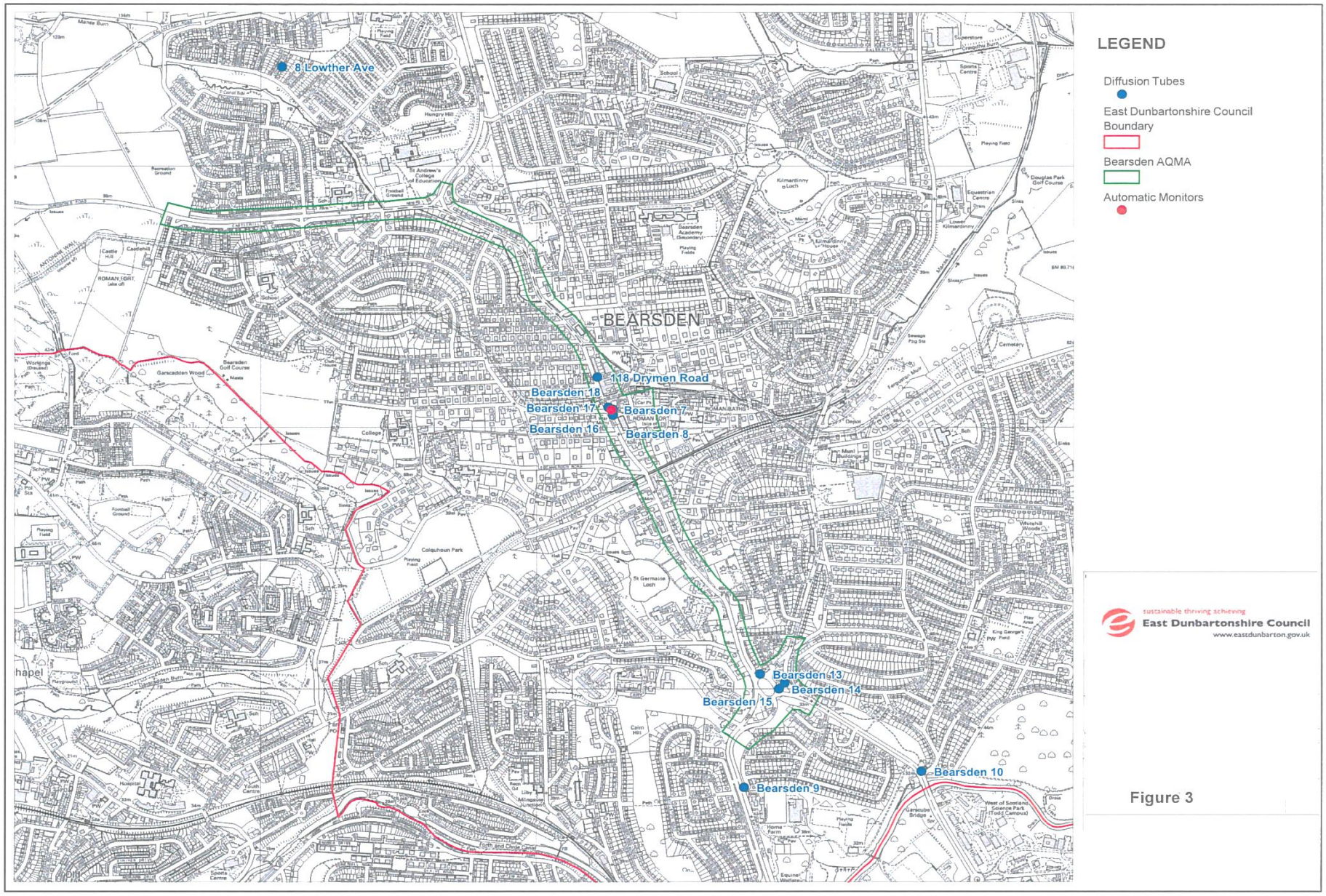
Figure 2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Diffusion Tubes
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Bearsden AQMA
Automatic Monitors
8 Lowther Ave
BEARSDEN
118 Drymen Road
Bearsden 18
Bearsden 17
Bearsden 7
Bearsden 16
Bearsden 8
Bearsden 13
Bearsden 14
Bearsden 15
Bearsden 10
Bearsden 9
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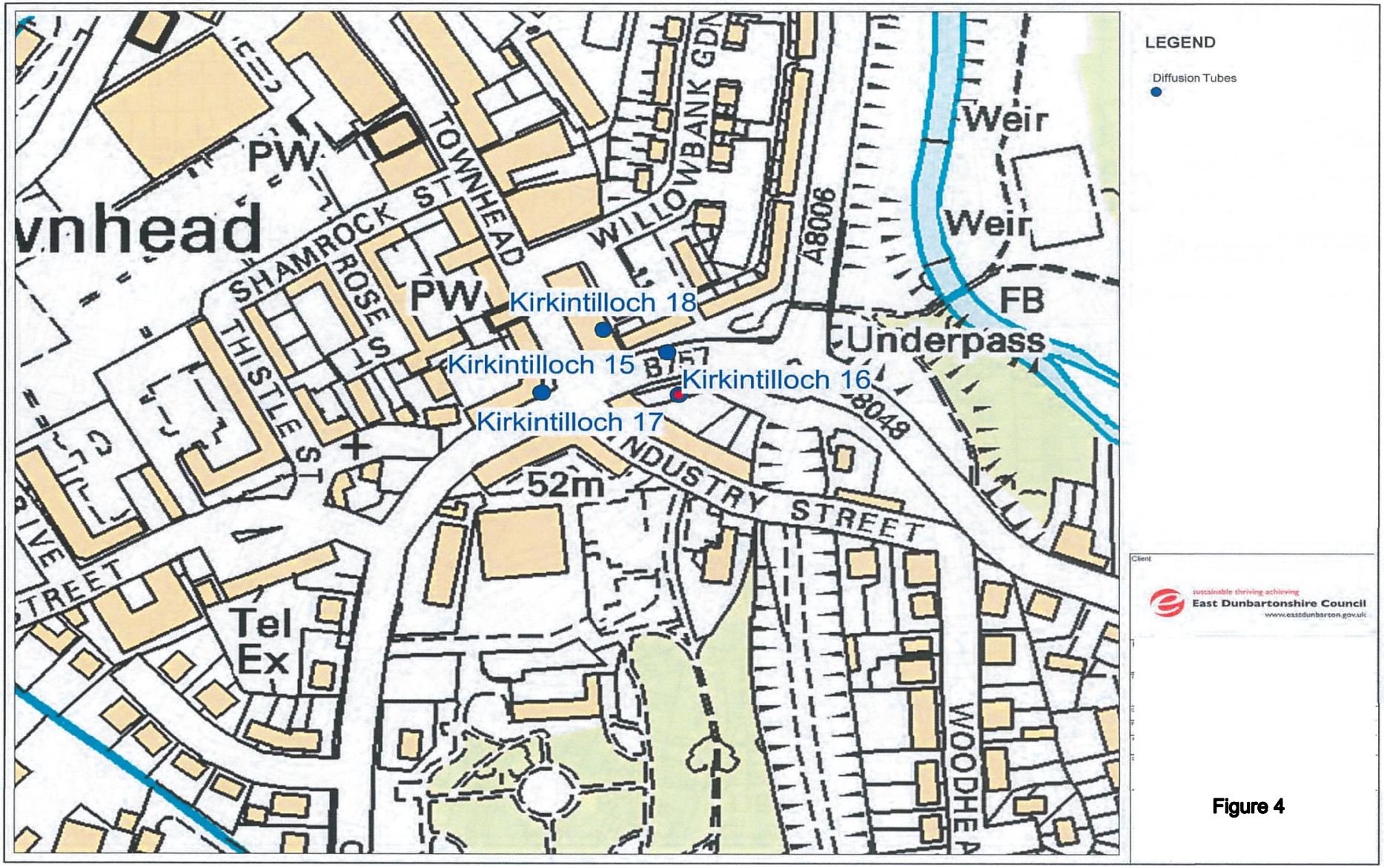
Figure 3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Diffusion Tubes
Kirkintilloch 18
Kirkintilloch 15
Kirkintilloch 16
Kirkintilloch 17
PW
PW
TOWNHEAD
SHAMROCK ST
ROSE ST
THISTLE ST
WILLOWBANK GDNS
A8006
Weir
Weir
FB
Underpass
B757
A8049
INDUSTRY STREET
52m
Tel
Ex
WOODHEAD
Client
sustainable thriving achieving
East Dunbartonshire Council
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Figure 4

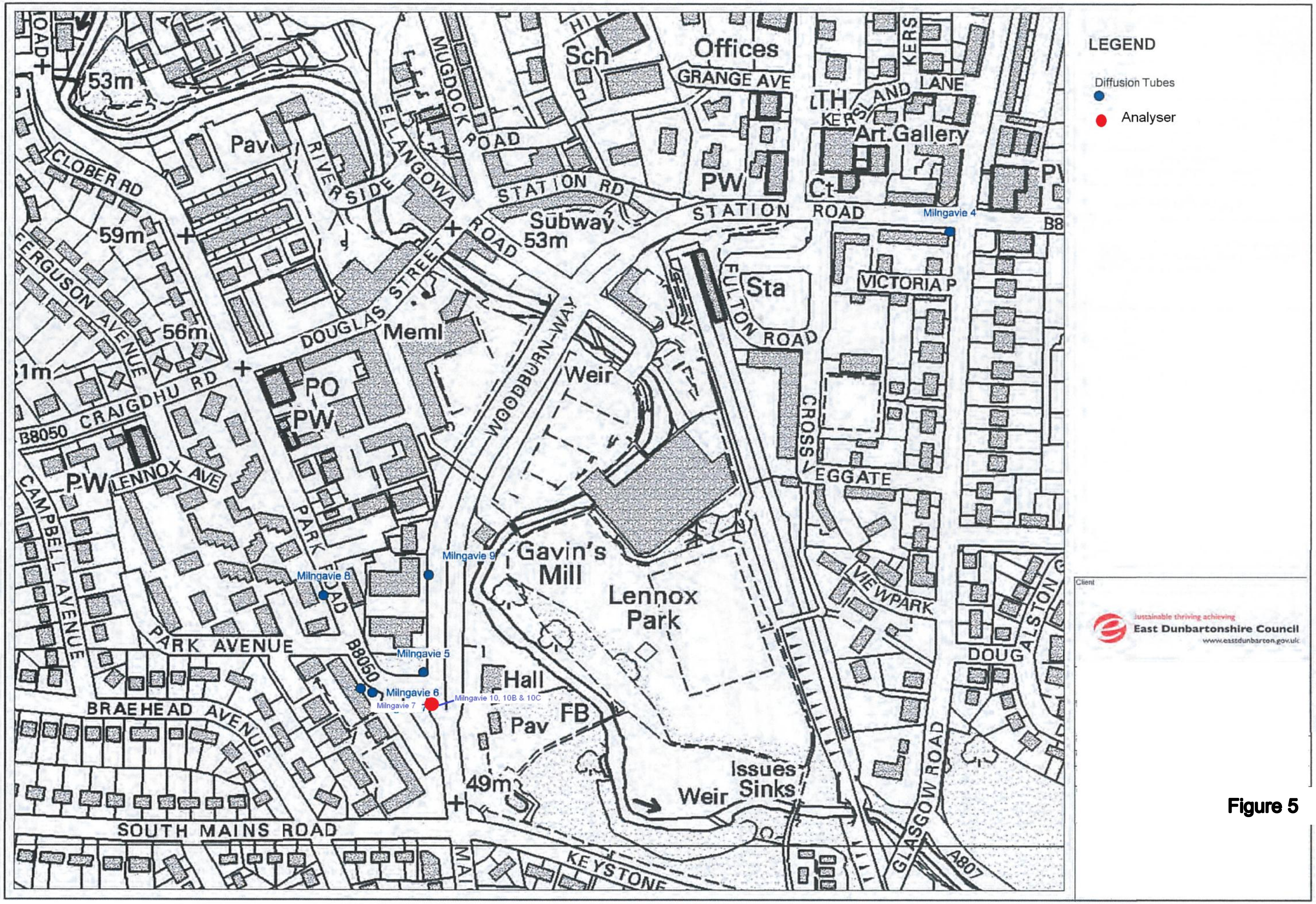
LEGEND
Diffusion Tubes
Analyser
Milngavie 4
Milngavie 5
Milngavie 6
Milngavie 7
Milngavie 8
Milngavie 9
Milngavie 10, 10B & 10C
Client
East Dunbartonshire Council
Offices
GRANGE AVE
Sch
Art Gallery
STATION ROAD
STATION RD
Subway
53m
59m
56m
49m
CLOBER RD
FERGUSON AVENUE
CRAIGDHU RD
B8050
LENNOX AVE
CAMPBELL AVENUE
PARK AVENUE
PARK ROAD
BRAEHEAD AVENUE
SOUTH MAINS ROAD
KEYSTONE
DOUGLAS STREET
MUGDOCK ROAD
ELLANGOWAN ROAD
RIVERSIDE
WOODBURN WAY
FULTON ROAD
VICTORIA P
CROSS
VEGGATE
VIEWPARK
GLASGOW ROAD
A807
Sta
Weir
Meml
PO
PW
Gavin's Mill
Lennox Park
Hall
Pav
FB
Issues
Sinks

Figure 5

APPENDIX B

QA: QC DATA

The laboratory analysis of the passive diffusion tubes used by the Council is undertaken by Glasgow Scientific Services. Glasgow Scientific Services is a UKAS accredited laboratory with documented Quality Assurance/Quality Control (QA/QC) procedures for diffusion tube analysis. The laboratory prepares the diffusion tubes using the 20% triethanolamine (TEA) in water method.

Glasgow Scientific Services public analyst participates in the AEA inter-comparison scheme, with bias correction factors calculated and applied annually. The laboratory analyses results from co-location studies at various locations.

The laboratory co-location factors are presented in Table A.1.

Site Name	Study duration	Tube precision	Bias correction factor
Glasgow City Council	11	P	**1.14**
Glasgow City Council	10	P	**0.87**
Glasgow City Council	11	P	**1.02**
East Dunbartonshire Council	12	P	**1.07**
East Dunbartonshire Council	11	G	**1.07**
East Dunbartonshire Council	12	P	**0.74**
East Dunbartonshire Council	12	P	**0.97**
Marylebone Road Intercomparison	12	G	**0.89**
West Dunbartonshire Council	12	P	**0.92**
West Dunbartonshire Council	12	P	**0.95**
Overall factor from Glasgow Scientific Services co-location studies			**0.95**

Factor from Local Co-location Studies

The data for the four co-location studies carried out by East Dunbartonshire Council were put into the Ricardo-AEA bias adjustment spreadsheet and the results are presented in Table B2.

Automatic Analyser Site Name	Study duration	Tube precision	Bias correction Factor
Bearsden	12	Poor	0.91
Bishopbriggs	12	Good	0.98
Kirkintilloch	12	Poor	0.86
Milngavie	12	Poor	1.05
Overall factor for East Dunbartonshire Council			**0.95**

Discussion of Choice of Factor to Use

For 2012 data both the national and the local bias adjustment factor tools give the same factor overall. So the data from the NO^2 tubes for EDC were multiplied by 0.95.

PM Monitoring Adjustment

East Dunbartonshire Council monitor PM_{10} using two types of analyser:

- Eberline - Beta-attenuation monitor (BAM);

- Tapered Element Oscillating Microbalance (TEOM) with a Filter Dynamics Measurement System(FDMS); and

The Eberline - beta attenuation analysers at Bearsden and Bishopbriggs are maintained by Horiba and undergo regular calibration. The TEOM (FDMS)s at Kirkintilloch and Milngavie are maintained by Air Monitors Ltd.

The Eberline - beta-attenuation monitors (BAMs) used by East Dunbartonshire Council have a heated inlet which can cause evaporation of some semi-volatile particles thereby reducing the measured PM_{10} concentration. All data have been ratified and multiplied by the gravimetric equivalent by Ricardo-AEA technology

The TEOM FDMS is equivalent to the European Reference Sampler and the results are therefore fully comparable to the AQS objectives, with no need for adjustment.

Short-term to Long-term Data adjustment

East Dunbartonshire Council has not undertaken any short-term monitoring of pollutants which require adjustment to calculate long-term mean concentrations.

QA/QC of automatic monitoring

Quality Assurance/Quality Control (QA/QC) audits are carried out by Ricardo-AEA Technology Ltd twice a year at all four sites.

Table 1: Laboratory summary performance for WASP NO_2 PT rounds 113 - 120

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent HSL WASP NO_2 PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of ± 2 as defined above.

WASP Round	WASP R113	WASP R114	WASP R115	WASP R116	WASP R117	WASP R118	WASP R119	WASP R120
Round conducted in the period	Apr-June 2011	Jul – Sep 2011	Oct – Dec 2011	Jan – Mar 2011	Apr-Jun 2012	Jul – Sep 2012	Oct – Dec 2012	Jan – Mar 2013
GSS	100%	100%	100%	100%	50%	100%	100%	50%

Glasgow Scientific Services have prepared a report in response to this which can be seen below.

Summary of Nitrogen Dioxide Diffusion Tube Proficiency Test Results and internal Quality Control Programmes.

This report is in response to a request from Anne Higgins, Environmental Services Manager on behalf of the Local Authorities on the Laboratory Management Group. The following question was posed in relation to the Health and Safety Laboratory proficiency testing scheme results:

Across a rolling five quarter period, the lab should achieve 95% accuracy. However, averaging the five quarters to March 2013, GSS only achieved 90%; averaging the five quarters to December 2012, GSS only achieved 80% accuracy. I am also advised that in two non-consecutive quarters, only 50% was achieved.

Four tubes are received each round, with four rounds per year. The results are compared to the spiked value and a z score is assigned to each result. The performance over the last 24 months was as follows:

WASP - NO2 results (z-scores)

		Tube 1	Tube 2	Tube 3	Tube 4
Round	113	-1.3	-1.2	-0.7	-1
	114	0.6	0.9	0.1	0.9
	115	-0.2	0	-0.1	-0.2
	116	0.7	-0.2	-0.5	0.3
	117	-0.9	**-2**	**-2.1**	**-2.8**
	118	0.4	0	0.2	0.2
	119	-0.8	-0.5	0.1	-1.6
	120	**-2.4**	**-2.1**	-1.7	-1.4

Key — Result satisfactory when uncertainty of measurement is taken into account. Considered as a warning as z-score ≥ ±2.

Summary: 1 result in 32 outside of z-score ≥ ±2
Percentage pass: 96.9%

The general classification of a Z_{score} is

$Z_{score} \leq \pm 2$ – satisfactory result

$Z_{score} > \pm 2$ and $\leq \pm 3$ – questionable (warning) result

$Z_{score} > \pm 3$ – unsatisfactory result

Results with a z-score ≥ ±2 are investigated in accordance with the quality system. The results for Round 120 were found to be satisfactory when the method uncertainty of measurement is taken into account (remedial action report NC345). Tube 4 result (Round 117) remained a warning result and was investigated (remedial action report NC142). All QCs and instrument performance were satisfactory and as the sample cannot be repeated, the reason for the warning result could not be explained. No unsatisfactory results have been reported (i.e. z-score ≥ ±3).

Summary of Nitrogen Dioxide Diffusion Tube Proficiency Test Results and internal Quality Control Programmes.

In addition to the above, the laboratory takes part in an monthly inter-field comparison exercise where tubes are co-located with automatic analysers. The results for the last 24 months have all been satisfactory and the latest bias adjustment factor for Glasgow Scientific Services is 0.96. See:

http://laqm.defra.gov.uk/documents/Database_Diffusion_Tube_Bias_Factors-v06_13-Final.xls

The internal Quality Control for the LA monthly diffusion tube samples have been satisfactory. This involves running standards and blanks, with approximately 160 points being generated in our control chart every month. Finally, no issues have been raised by either internal audit or external audit by UKAS.

I hope this information provides you with some comfort on the performance of the method, however please get back to me if you would like further information.

Gary Walker
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APPENDIX C

PPC Part A and Part B

PPC Part A and Part B

Part A
PW Hall, Woodilee Ind Estate, Kirkintilloch

Part B (standard)
Robeslee Concrete Co Ltd, Southbank Road, Kirkintilloch
George Beattie & Sons – Mobile Plant, although base is in Auchivole, Twechar
Cemex Roadstone Coating Plant, Gartshore, Twechar
Cemex Cumbernauld Readymix, Gartshore, Twechar
Ferrymill Motors, Campsie Road, Torrance
Archibald Young Ltd, Milton Road, Kirkintilloch
Marley Eternit Ltd, Cadder, Bishopbriggs
John McGavigan Ltd, 111 Westerhill Road, Bishopbriggs
Guala Closures UK Ltd, Broomhill Ind Est, Kirkintilloch
Guala Closures UK Ltd, Old Mill Park Ind Est, Kirkintilloch
Aggregate Industries , Kirkintilloch Readymix Plant, Torrance

Part B (dry cleaner)
Johnson Cleaners UK Ltd, 73 Cowgate, Kirkintilloch
Cross Court Cleaners, 8 The Cross Court, Bishopbriggs
Bearsden Dry Cleaners, 1 Canniesburn Toll, Bearsden
The Dry Cleaning Company, Block 17C Unit 2, Old Mill Park Industrial Estate, Kirkintilloch
Dry Clean Depot Ltd, Unit 12 ,Baljafray Shopping Centre, Grampian Way, Bearsden

Part B (Petrol Vapour Recovery)
Lennox Service Station, Main Street, Lennoxtown
Bearsden Filling Station, Duntocher Road, Bearsden
Kirkintilloch Filling Station, Waterside Road, Kirkintilloch
Canniesburn Service Station, Maryhill Road, Bearsden
Millersneuk Garage, 63-69 Auchinloch Road, Lenzie
Malthust Fuel, 42 Glasgow Road, Milngavie
Shell Low Moss Filling Station, Kirkintilloch Road, Bishopbriggs
Shell Westermains FS, Glasgow Road, Kirkintilloch
Malthurst Service Station, Stockiemuir Road, Bearsden