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2010 Air Quality Progress Report for *EAST DUNBARTONSHIRE COUNCIL*

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

April 2010

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Executive Summary

This report considers up to date monitoring data and new information on industrial, commercial and retail developments to determine if air quality in the East Dunbartonshire Council area is in compliance with the United Kingdom air quality objectives. The report was conducted in accordance with the LAQM Technical Guidance and Progress Report guidance documents.

Monitoring data identified levels close to the annual mean NAQS objective for NO₂ and predicted exceedences of the 2010 annual mean objective for PM₁₀ at locations of relevant exposure within the vicinity of Bearsden Cross. Based on previous NO₂ and PM₁₀ figures East Dunbartonshire Council has already agreed in principle to commence the declaration and designation process for a new Local Air Quality Management Area in Bearsden.

The installation of a new Automatic Air Quality Analyser to monitor NO₂ and PM₁₀ levels in Milngavie is underway. There has been predicted and measured exceedences of the respective air quality objectives in Milngavie therefore continuous monitoring should provide accurate data to give an indication as to what action may be warranted.

Monitoring of PM₁₀ and NO₂ continues within the Bishopbriggs Air Quality Management Area. The Bishopbriggs monitoring site has both a Beta Attenuation Monitor and a Partisol 2025 monitor. A review of monitoring data indicates an annual mean of 18.9 microgrammes/cubic metre with the BAM and an annual mean of 17.4 microgrammes/cubic metre with the Partisol. The NO₂ annual mean of 33.4 microgrammes/cubic metre was within the NAQS objective for NO₂.

The PM₁₀ concentration at Kirkintilloch exceeds the 2010 annual mean objective, giving a level of 22.5 microgrammes/cubic metre however, the construction of the Kirkintilloch Link Road is taking place very close by. It is anticipated that the PM₁₀ level will decrease once the Kirkintilloch Link Road is complete in the summer of 2010. The elevated PM₁₀ concentrations are due in part to construction emissions and traffic congestion resulting from the road construction. It is therefore intended to continue the monitoring at the Townhead junction and review measured PM₁₀ concentrations following completion of the Kirkintilloch Link Road to assess the requirement for an AQMA.

Table of contents

1	Introduction	6
1.1	Description of Local Authority Area	6
1.2	Purpose of Progress Report	6
1.3	Air Quality Objectives	6
1.4	Summary of Previous Review and Assessments	8
2	New Monitoring Data	11
2.1	Summary of Monitoring Undertaken	11
2.2	Comparison of Monitoring Results with Air Quality Objectives	18
3	New Local Developments	28
3.1	Road Traffic Sources	28
3.2	Other Transport Sources	28
3.3	Industrial Sources	28
3.4	Commercial and Domestic Sources	28
3.5	New Developments with Fugitive or Uncontrolled Sources	28
4	Local / Regional Air Quality Strategy	29
5	Planning Applications	30
6	Air Quality Planning Policies	31
7	Local Transport Plans and Strategies	32
8	Climate Change Strategies	33
9	Implementation of Action Plans	34
10	Conclusions and Proposed Actions	41
10.1	Conclusions from New Monitoring Data	41
10.2	Conclusions relating to New Local Developments	41
10.3	Other Conclusions	41
10.4	Proposed Actions	41
11	References	42

Appendices

Appendix A	Figures
Appendix B	QA: QC Data

List of Tables

Table 1.1 Air Quality Objectives

Table 1.2 Details of local air quality reviews

Table 2.1 Details of Automatic Monitoring Sites

Table 2.2 Details of Non-Automatic Monitoring Sites

Table 2.3a Results of Automatic Monitoring for NO₂ – Annual Mean Comparison

Table 2.3b Results of Automatic Monitoring for NO₂ – comparison with 1 hour Mean Objective

Table 2.4a Results of NO₂ Diffusion Tubes

Table 2.4b Predicted NO₂ concentrations at nearest receptors

Table 2.5a Results of PM₁₀ Automatic Monitoring – Comparison with Annual Objective

Table 2.5b Results of PM₁₀ Automatic Monitoring – Comparison with 24 hour Mean Objective

Table 9.1 Action Plan Progress – East Dunbartonshire Area

Table 9.2 Action Plan Progress – Bishopbriggs AQMA

Table B1 Details of the 2009 bias correction factors for NO₂ diffusion tubes

Table B2 Details of the 2009 co-location studies

List of Figures

Fig 1 – East Dunbartonshire Council map of area

Fig 2 – Bishopbriggs AQMA

Fig 3 – Bearsden Automatic Monitor

Fig 4 – Bishopbriggs Automatic Monitor

Fig 5 – Kirkintilloch Automatic Monitor

Fig 6 – Non automatic monitoring locations in Bearsden

Fig 7 – Non automatic monitoring locations in Bishopbriggs

Fig 8 – Non automatic monitoring locations in Kirkintilloch

Fig 9 – Non automatic monitoring locations in Milngavie

1 Introduction

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 is landlocked and contains a mixture of both urban and rural areas. A map of East Dunbartonshire is provided in Figure 1 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, Lennoxton, Twechar and Milton of Campsie. There are relatively low levels of industrial activity within the local authority area.

1.2 Purpose of Progress Report

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

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

1.3 Air Quality Objectives

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

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

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	3.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	18 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

East Dunbartonshire Council have undertaken regular reviews of air quality; the submitted reports are listed in Table 1.2. The location of the AQMA is indicated in Figure 2.

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) ¹	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) ²	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) ³	
May 2005	Progress Report (2005 PR) ⁴	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) ⁵	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) ⁶	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

¹ Air Quality Review Updating and Screening Assessment 2003, East Dunbartonshire Council, April 2003

² LAQM Detailed Assessment of NO₂ and PM₁₀, BMT Cordah Ltd report E_EDC_001, September 2004

³ LAQM Detailed Assessment Addendum, BMT Cordah Ltd report, E_EDC_003 (1), April 2005

⁴ LAQM Progress Report 2005 BMT Cordah Ltd report E_EDC_003 (2), May 2005

⁵ LAQM Updating and Screening Assessment 2006, BMT Cordah Ltd report E_EDC_005, April 2006

⁶ LAQM Bishopbriggs AQMA Further Assessment, BMT Cordah Ltd report E_EDC_004, May 2007

		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.
June 2007	Progress Report (2007 PR) ⁷	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) ⁸	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) ⁹	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) ¹⁰	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) ¹¹	No identified or predicted exceedences of NAQS objectives.
March 2009	Bishopbriggs AQMA Final Action Plan (2009 AP) ¹²	Following consultation with SEPA, neighbouring local authorities, all Council departments and the Scottish Government the final version Action Plan was issued.

⁷ LAQM Progress Report 2007 BMT Cordah Ltd report E_EDC_006 (1), June 2007

⁸ LAQM Bishopbriggs AQMA Further Assessment Addendum, BMT Cordah Ltd report E_EDC_006 (2), May 2007

⁹ Bishopbriggs AQMA Draft Action Plan, BMT Cordah Ltd report E_EDC_007, January 2008

¹⁰ LAQM Detailed Assessment of NO₂ and PM₁₀, BMT Cordah Ltd report E_EDC_006 (4), April 2008

¹¹ LAQM Progress Report 2008 BMT Cordah Ltd report G_EDC_008 (1), August 2008

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.
September 2009	Updating and Screening Assessment 2009	<p>The review of monitoring data identified exceedences of the annual mean NAQS objective for NO₂ and predicted exceedences of the 2010 annual mean NAQS objective for PM₁₀ at locations of relevant exposure along Drymen Road in Bearsden.</p> <p>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 NO₂ and PM₁₀.</p> <p>An Automatic Air Quality Analyser is being installed in Milngavie to ensure that the annual mean objective is not exceeded.</p> <p>The PM₁₀ monitoring data for Bishopbriggs indicate that concentrations within the AQMA have reduced such that the 2010 annual mean objective for PM₁₀ is not being exceeded. NO₂ concentrations continue to exceed the annual mean NAQS objective at some locations within the AQMA.</p>

¹² Bishopbriggs AQMA Action Plan, BMT Cordah Ltd report G_EDC_008 (2), March 2009

2 New Monitoring Data

During 2009 East Dunbartonshire Council monitored both PM₁₀ and NO₂ at several locations throughout the council area using both automatic and passive sampling methods.

Recorded NO₂ and PM₁₀ data have been ratified for erroneous results with all negative and spurious readings removed. Measured 24-hour mean concentrations with less than 18-hours of recorded data have been omitted from any final reported results. Finally results have been corrected using where available local bias correction factors. Details of the quality control and data correction processes carried out are reported in Appendix B.

2.1 Summary of Monitoring Undertaken

East Dunbartonshire monitor NO₂ and PM₁₀ using a variety 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.

2.1.1 Automatic Monitoring Sites

East Dunbartonshire Council operate three automatic NO_x analysers and four automatic PM₁₀ monitors. The analysers are located at three sites:

- . the junction of Drymen Road (A809) and Roman Road in Bearsden;
- . the junction of Kirkintilloch Road (A803), Springfield Road and Kenmure Avenue in Bishopbriggs;
- .the Townhead junction in Kirkintilloch.

There is a NO_x and PM₁₀ analyser at each monitoring location. An additional gravimetric partisol PM₁₀ analyser is located at Bishopbriggs Cross.

The locations of the automatic monitoring sites are annotated in Figures 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	NS 54269 72067	NO ₂ PM ₁₀	APNA 360, BAM (heated inlet)	N	Y < 2m	1m	Y
Bishopbriggs 14	Roadside	NS 60995 70130	NO ₂ PM ₁₀	APNA 360, BAM (heated inlet), Partisol	Y	Y 5m	2 m to nearest road 10m to junction with main road	N
Kirkintilloch 17	Kerbside	NS 65700 73500	NO ₂ PM ₁₀	Thermo 42i TEOM (FDMS)	N	Y < 2m	1m	Y

2.1.2 Non-Automatic Monitoring

East Dunbartonshire Council maintain a network of twenty nine NO₂ diffusion tube sites located across the council area. A further three NO₂ diffusion tubes were added in April 2009 taking the total to 32 NO₂ diffusion tubes. 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 annotated in Figures 6, 7, 8 and 9 at the rear of this report.

Table 2.2 Details of Non – Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Bearsden 1	Roadside	NS 54218 72193	NO ₂	N	Y (3m)	2m	Y
Bearsden 3	Urban background	NS 54655 70158	NO ₂	N	N (8m)	5m	Y
Bearsden 4	Urban background	NS 53075 73382	NO ₂	N	N (6m)	5m	Y
Bearsden 7	Kerbside	NS 54269 72069	NO ₂	N	Y (<2m)	1m	Y
Bearsden 8	Kerbside	NS 54275 72047	NO ₂	N	N (18m)	1m	Y
Bearsden 9	Roadside	NS 54751 70621	NO ₂	N	N (30m)	2m	Y
Bearsden 10	Roadside	NS 55394 70683	NO ₂	N	N (24m)	2m	Y
Bearsden 13	Kerbside	NS 54809 71057	NO ₂	N	Y (26m)	1m	Y

Table 2.2 Details of Non – Automatic Monitoring Sites (ctd)

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Bearsden 14	Kerbside.	NS 54877 71000	NO ₂	N	Y (8m)	1m	N
Bearsden 15	Kerbside	NS 54898 71023	NO ₂	N	Y (2m)	1m	Y
Bearsden 16	Kerbside	NS 54269 72067	NO ₂	N	Y (2m)	1m	Y
Bearsden 16B	Kerbside	NS 54269 72067	NO ₂	N	Y (2m)	1m	Y
Bearsden 16C	Kerbside	NS 54269 72067	NO ₂	N	Y (2m)	1m	Y
Bishopbriggs 5	Urban background	NS 60948 69610	NO ₂	N	N (44m)	5m	N
Bishopbriggs 6	Kerbside	NS 61016 70198	NO ₂	Y	Y (<2m)	1m	Y
Bishopbriggs 8	Urban background	NS 60842 70278	NO ₂	N	N (<2m)	5m	N
Bishopbriggs 12	Kerbside	NS 60581 69527	NO ₂	Y	N (4m)	1m	Y

Table 2.2 Details of Non – Automatic Monitoring Sites (ctd)

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Bishopbriggs 13	Kerbside	NS 60549 69312	NO ₂	Y	N (5m)	1m	Y
Bishopbriggs 14	Roadside	NS 60995 70130	NO ₂	Y	N (42m)	2m	N
Bishopbriggs 14B	Roadside	NS 60995 70130	NO ₂	Y	N (42m)	2m	N
Bishopbriggs 14C	Roadside	NS 60995 70130	NO ₂	Y	N (42m)	2m	N
Kirkintilloch 15	Roadside	NS 65640 73501	NO ₂	N	Y (2m)	2m	Y
Kirkintilloch 16	Roadside	NS 65695 73521	NO ₂	N	N (3m)	2m	Y
Kirkintilloch 17	Roadside	NS 65700 73500	NO ₂	N	Y (3m)	2m	Y
Kirkintilloch 17B	Roadside	NS 65700 73500	NO ₂	N	Y (3m)	2m	Y
Kirkintilloch 17C	Roadside	NS 65700 73500	NO ₂	N	Y (3m)	2m	Y

Table 2.2 Details of Non – Automatic Monitoring Sites (ctd)

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Milngavie 4	Roadside	NS 55728 74486	NO ₂	N	N (5m)	2m	Y
Milngavie 5	Roadside	NS 55327 74137	NO ₂	N	N (50m)	2m	Y
Milngavie 6	Roadside	NS 55288 74121	NO ₂	N	N (10m)	2m	Y
Milngavie 7	Roadside	NS 55279 74124	NO ₂	N	N (<2m)	9m	Y
Milngavie 8	Roadside	NS 55251 74198	NO ₂	N	N (3m)	1m	Y
Milngavie 9	Roadside	NS 55331 74214	NO ₂	N	Y (7m)	2m	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 NO₂ automatic monitoring data for 2009 and previous years are presented in Tables 2.3a and 2.3b respectively. Measured exceedences of NAQS objectives are highlighted in bold.

The data capture rate of all the NO_x analysers was good, with a data capture rate of greater than 90% achieved at all three sites.

Measured NO₂ concentrations at the Bishopbriggs Cross site during 2009 were below both the annual mean and 1-hour mean NAQS objectives for NO₂. Measured concentrations indicate that the NAQS objectives for NO₂ are being met at Bishopbriggs Cross. (Bishopbriggs 14.)

The measured annual mean NO₂ concentration at Kirkintilloch Townhead (Kirkintilloch 17) in 2009 was higher than the annual mean objective level of 40 microgrammes/cubic metre. The monitor is sited at a roadside location close to the Townhead Roundabout where major work to construct the Kirkintilloch Link Road is currently underway. There is frequently queuing traffic and there has been partial road closures throughout 2009.

The measured annual mean NO₂ concentration at Bearsden Cross (Bearsden 16) in 2009 was just below the annual mean objective level of 40 microgrammes/cubic metre. The monitor is sited at a kerbside location on the north-east corner of the junction between Drymen Road (A809) and Roman Road. There is frequently traffic queuing at the junction and relevant public exposure within 2m of the road namely the school to the south of the junction and residential properties close to the junction along Roman Road and Drymen Road.

There was one recorded exceedence of the 1-hour objective for NO₂ at the Bearsden monitoring site.

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison **with Annual Mean Objective**

Site ID	Location	Within AQMA?	Data Capture for monitoring period ^a %	Data Capture for full calendar year 2009 ^b %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
					2007 ^{c, d}	2008 ^{c, d}	2009 ^c
Bearsden 16	Bearsden X	N	97	97	39.4	44.1	39.6
Bishopbriggs 14	Bishopbriggs X	Y	97	97	34.1	31.5	33.4
Kirkintilloch 17	Townhead	N	92	92	39.2	35.6	42.8

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

^d Annual mean concentrations for previous years are optional.

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture for monitoring period ^a %	Data Capture for full calendar year 2009 ^b %	Number of Exceedences of hourly mean (200 µg/m ³) If the period of valid data is less than 90% of a full year, include the 99.8 th percentile of hourly means in brackets.		
					2007 ^c	2008 ^c	2009
Bearsden 16	Bearsden Cross	N	97	97	0	10	1
Bishopbriggs14	Bishopbriggs Cross	Y	97	97	0	1	0
Kirkintilloch 17	Townhead	N	92	92	0	0	0

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

^c Numbers of exceedences for previous years are optional.

Diffusion Tube Monitoring Data

The NO₂ diffusion tube monitoring data for 2009 and previous years are presented in Table 2.4a. Measured concentrations above the annual mean objective level are highlighted in bold. Bias adjusted nitrogen dioxide concentrations at nearest receptors are presented in Table 2.4b.

Table 2.4a Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Data capture for monitoring period ^a %	Data Capture for full calendar year 2009 ^b %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
					2007 ^{c, d}	2008 ^{c, d}	2009 ^c
Bearsden 1	118 Drymen Road	N	100	100	30	33	32
Bearsden 3	Ravelston Road	N	92	92	19	17	23
Bearsden 4	Lowther Avenue	N	100	100	11	14	15
Bearsden 7	Bearsden Cross Traffic lights	N	92	92	43	48	42
Bearsden 8	Bearsden Cross Hanging basket	N	92	92	38	38	40
Bearsden 9	Switchback	N	100	100	27	29	31
Bearsden 10	Maryhill Road/ Rannoch Drive	N	100	100	34	33	31
Bearsden 13	Canniesburn Toll	N	100	100	37	39	38
Bearsden 14	Milngavie Road at Canniesburn Toll	N	100	100	39	38	39
Bearsden 15	Milngavie Road	N	100	100	34	40	38
Bearsden 16	102 Drymen Rd	N	100	100	40	46	40
Bearsden 16B	102 Drymen Rd	N	100	100	41	45	39
Bearsden 16C	102 Drymen Rd	N	100	100	39	43	40
Bishopbriggs 5	Huntershill House	N	100	100	14	15	21
Bishopbriggs 6	145 Kirkintilloch Road	Y	100	100	37	37	36
Bishopbriggs 8	77 Brackenbrae Avenue	N	100	100	15	17	21
Bishopbriggs 12	Kirkintilloch Road Arnold Clark	Y	100	100	34	40	40
Bishopbriggs 13	1495 Springburn Road	Y	100	100	51	51	47
Bishopbriggs 14	128 Kirkintilloch Road	Y	100	100	30	31	33
Bishopbriggs 14B	128 Kirkintilloch Road	Y	100	100	32	33	37
Bishopbriggs 14C	128 Kirkintilloch Road	Y	100	100	29	32	33
Kirkintilloch 15	Lamp post R2 Townhead Lights	N	100	100	35	32	44
Kirkintilloch 16	Parliament Rd	N	92	92	38	33	48
Kirkintilloch 17	1 Broomfield Walk	N	100	100	/	36	44
Kirkintilloch 17B	1 Broomfield Walk	N	100	100	/	35	41
Kirkintilloch 17C	1 Broomfield Walk	N	100	100	/	34	42
Milngavie 4	Station Road	N	100	100	26	29	30
Milngavie 5	Woodburn Way/ Park Road	N	100	100	24	26	25
Milngavie 6	Park Road	N	100	100	40	42	36
Milngavie 7	29 Southgate	N	75	75	/	/	34*
Milngavie 8	6-12 Park Road	N	67	67	/	/	27*
Milngavie 9	Fairview Court	N	58	58	/	/	28*

*tubes added April 2009

Table 2.4b Predicted nitrogen dioxide concentrations at nearest receptors

Site ID	2009 bias Adjustment factor	Within AQMA	Data Capture 2009 %	2009 Annual Mean Concentrations adjusted bias ($\mu\text{g}/\text{m}^3$)	
				At monitoring location	At nearest relevant exposure
Bearsden 1	1.14	N	100	32	28
Bearsden 7	1.14	N	92	42	36
Bearsden 8	1.14	N	92	40	30
Bearsden 13	1.14	N	100	38	33
Bearsden 14	1.14	N	100	39	30
Bearsden 15	1.14	N	100	38	32
Kirkintilloch 16	1.412	N	92	48	36
Bishopbriggs 12	1.215	Y	83	40	36
Bishopbriggs 13	1.215	Y	100	47	40
Milngavie 6	1.14	N	100	36	24
Kirkintilloch 15	1.412	N	100	44	44
Bishopbriggs 6	1.215	Y	100	36	36

May 2010

East Dunbartonshire Council - Scotland

Measured NO₂ concentrations using diffusion tubes exceeded the 2005 annual mean objective at two locations in the AQMA (Bishopbriggs 12 and 13.) The two diffusion tubes are at kerbside locations north of the busy junction between Colston Drive (B812) and Kirkintilloch Road (A803) where there is frequently queuing traffic.

Four diffusion tube sites in Bearsden (Bearsden 7,8,16 and 16C) also recorded exceedences of the annual mean NO₂ objective for 2005 during 2009.

The diffusion tube sites in Bearsden are at kerbside locations north of Drymen Road (A809) and Roman Road junction and on the north side of Canniesburn Toll roundabout.

All five diffusion tubes in Kirkintilloch recorded exceedences of the annual mean NO₂ objective for 2005 during 2009.

Table 2.4b shows the bias adjusted annual mean concentrations at nearest receptors. Bishopbriggs 13 and Kirkintilloch 15 indicate exceedences of the annual mean NO₂ objective level.

2.2.2 PM₁₀

The measured annual mean and 24-hour mean PM₁₀ concentrations for 2009 and previous years are presented in Tables 2.5a and 2.5b respectively. Measured and predicted exceedences of NAQS objectives are highlighted in bold. The data capture rate of all the PM₁₀ analysers was good, with greater than 95% capture rate at Bearsden and Kirkintilloch and 80% at Bishopbriggs.

Table 2.5a Results of PM₁₀ Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA ?	Data Capture for monitoring period ^a %	Data Capture for full calendar year 2009 ^b %	Annual mean concentrations (µg/m ³)		
					2007 ^{c, d}	2008 ^{c, d}	2009 ^c
Bearsden 16	Bearsden Cross	N	97	97	20.6	22.8	20.5
Bishopbriggs 14	Bishopbriggs Cross	Y	80 (BAM)	80	21.1	17.8	18.9
Bishopbriggs 14	Bishopbriggs Cross	Y	96 (Partisol)	96	18.5	17.7	17.4
Kirkintilloch 17	Townhead	N	98	98	23.7	22.0	22.5

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

^d Annual mean concentrations for previous years are optional.

Table 2.5b Results of PM₁₀ Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture for monitoring period ^a %	Data Capture 2009 ^b %	Number of Exceedences of daily mean objective (50 µg/m ³) If data capture < 90%, include the 90 th percentile of daily means in brackets.		
					2007 ^c	2008 ^c	2009 ^c
Bearsden 16	Bearsden Cross	N	96	96	3	5	5
Bishopbriggs 14	Bishopbriggs Cross	Y (BAM)	80	80	6	4	5
Bishopbriggs 14	Bishopbriggs Cross	Y (Partisol)	96	96	7	6	8
Kirkintilloch 17	Townhead	N	98	98	3	6	15

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

^c Numbers of exceedences for previous years are optional.

The PM₁₀ concentrations measured during 2009 indicate that PM₁₀ concentrations at Bishopbriggs 14 monitoring site located within the AQMA are exceeding the 2010 objective.

The monitor is located to the south east of the Bishopbriggs Cross junction, approximately 10m from Kirkintilloch Road (A803). The monitoring location does not represent the location of maximum impact within the AQMA which occurs at the property facades along Kirkintilloch Road.

PM₁₀ concentrations measured in 2009 at Bearsden and Kirkintilloch are above the 2010 annual mean NAQS objective. Due to the elevated levels of NO₂ and PM₁₀, a proposal indicating the Council's Intention to Declare an Air Quality Management Area at Bearsden Cross has been approved by committee and the declaration process is underway.

The elevated levels of PM₁₀ measured at Kirkintilloch are expected to decrease in 2010 following completion of the Kirkintilloch Link Road (KLR.) The elevated PM₁₀ concentrations are due in part to construction emissions and increased traffic congestion resulting from the road construction. It is therefore intended to continue the monitoring at the Townhead junction and review measured PM₁₀ concentrations following completion of the Kirkintilloch Link Road.

2.2.3 Sulphur Dioxide

East Dunbartonshire Council does not currently monitor SO₂. Historical monitoring data indicated a decline in concentration inline with those experienced across the

UK. Concentrations measured from 1992 to 2005 were significantly below objective levels for SO₂.

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

East Dunbartonshire Council has examined the results from monitoring in the district. Concentrations are not all below the objectives, however there is no need to proceed to a Detailed Assessment. The declaration process is underway for Bearsden and levels at Kirkintilloch should decrease on the opening of the Kirkintilloch Link Road

3 New Local Developments

3.1 Road Traffic Sources

3.2 Other Transport Sources

3.3 Industrial Sources

3.4 Commercial and Domestic Sources

3.5 New Developments with Fugitive or Uncontrolled Sources

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

4 Local / Regional Air Quality Strategy

Development of an Air Quality Strategy for the East Dunbartonshire Council area is underway and completion is anticipated late 2010.

5 Planning Applications

Bishopbriggs Town Centre Redevelopment – outline application for redevelopment for housing/retail/commercial/community uses received May 2009 – Council minded to grant subject to legal agreement – demolition delayed for contractual reasons – redevelopment period uncertain. Adjacent to Bishopbriggs Local Air Quality Management Area.

Tesco, Milngavie – redevelopment involving large scale demolition and rebuild – application refused – appeal expected.

Townhead Clinic, Lenzie Road, Kirkintilloch – demolition of former clinic and redevelopment of site – timescale uncertain.

St Andrews Campus (surplus site) – consent granted for mixed development housing, business, care home – proposed demolition of Listed Buildings on site likely to begin imminently – redevelopment over next few years.

Douglasmuir Quarry, Milngavie – twenty year extension of sand and gravel extraction to the west – granted June 2010.

Low Moss Prison redevelopment – under construction.

Bishopbriggs East Housing proposal – remaining area (254 units) subject to a legal agreement – still outstanding.

Bishopbriggs Relief Road – remainder to be consented with the housing above – no progress.

Woodilee Housing proposal – 920 units – likely start date September 2010.

6 Air Quality Planning Policies

East Dunbartonshire Council Planning Service request air quality impact assessments where it is considered that there is likely to be a significant impact on the environment e.g. traffic generation (Local Policy DQ 3) and with regard to the Air Quality Management Area in Bishopbriggs.

The Finalised Draft East Dunbartonshire Local Plan 2 (September 2009) 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 main policy document prepared by East Dunbartonshire Council with the potential to impact on local air quality is the Bishopbriggs Air Quality Action Plan. The Bishopbriggs AQAP is designed to assist with reducing pollutant concentrations within the AQMA in order to achieve compliance with the UK air quality objectives. The plan outlines various methods to help change public behaviour to encourage a modal shift from private car use to public transport use as well as road changes. A Local Transport Strategy has also been prepared in conjunction with the Action Plan and subjected to a joint Strategic Environmental Assessment. (SEA)

8 Climate Change Strategies

9 Implementation of Action Plans

Table 9.1 indicates the progress of certain measures put in place, or initiatives which are underway to improve air quality within the East Dunbartonshire area.

Table 9.2 is not yet complete and further details will follow.

Table 9.1 Action Plan Progress – for East Dunbartonshire Area.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
1	Complete and implement Air Quality Strategy	Aid Planning & Development of EDC area by setting out the Council's stance on Air Quality	EDC	2009/2010	2010/2011	Implementation & adoption of strategy	N/A	Initial draft and accompanying SEA underway		Autumn 2010	The AQS will consider only air quality & sources of atmospheric emissions within EDC area. Strategy will highlight any local boundary issues.
2	Integration with Planning system	Avoid worsening air quality by adopting local planning policies.	EDC	2009/2010	2010/2011	New developments must demonstrate accessibility by walking, cycling & public transport. (p66 Local Plan)		Still in draft	Progress from Draft to Final Draft	Final adoption due 2011	Planning authority will not normally support development proposals for significant travel generating uses in locations which encourage private car use.
3	Strategic	Selection of	EDC	2009/2010	2011	Reduce					Parking

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	management of travel demands	sustainable locations for development, town centre transport action plans, parking policies including parking control zones, park& ride facilities.	Transport and Planning		onwards	reliance on private cars					controls within AQMA are useful but lack of Park & Ride facilities does not encourage use of public transport.
4	Manage bus emissions	Spotchecks at bus terminus adjacent to AQMA – regular inspections of fleet by SPT inspectors	EDC & SPT	2009	2009	Reduction in bus engine idling on stationary buses at termini		Number of drivers warned re engine idling. Penalised by SPT			Successful campaign in getting message across to drivers. Regular spot checks and idling patrols.
5	Alternative travel information campaign	Awareness raising campaign – “Healthy Habits” to highlight cycle paths, walking, access to countryside	EDC Transport	2009	2009	Funded by government for 2 years. Maps & routes available from Council buildings & on internet to reduce car use				Possibly when funding ends	

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
		paths etc									
6	Manage private car use/engine idling in vicinity of schools	Vehicle engine idling patrols to be undertaken regularly to target vehicles around schools at drop off/collection times	EDC Transport & Env Health	2010	2011 onwards	Initially issue warnings during publicity phase – elevate to fixed penalties if no improvement					Signage around schools will have to be provided prior to publicity campaign. Encourage “switch off” via schools info to parents
7	Develop & integrate policy on biomass & boiler plant developments	Require a method for assessing no of installations within EDC	EDC Planning & Env Health	2010	2011	Installations all to require planning permission. Above a certain size (>50kW) require Air Quality Impact Assessment.			Register available with all applications.		Biomass developments require to be monitored & controlled to prevent impact on air quality.
8	Develop a method for monitoring installation of wood burning stoves and/or opening up/installing open fireplaces in	No of telephone enquiries has increased re installing wood burning appliances or opening up fireplaces within smoke	EDC Planning & Env Health	2010	2011	No's of installations.					Need to assess and control any increase of unauthorised fuels or appliances being used in smoke control areas.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
	smoke control areas.	control areas. Need to know how many people go ahead and whether they install an "approved appliance."									

Table 9.2 – Details to follow.

Table 9.2 Action Plan Progress – Bishopbriggs AQMA

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments relating to emission reductions
1											
2											
3											
4											

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Two exceedences of the NO₂ annual mean objective were recorded during 2009 at sites within the Bishopbriggs AQMA. There were four exceedences of the annual mean objective in Bearsden and five exceedences in Kirkintilloch.

There were recorded exceedences of the 2010 annual mean for PM₁₀ in Bearsden, Bishopbriggs and Kirkintilloch and exceedences of the 24 hour mean NAQS objective for 2010 at Bishopbriggs and Kirkintilloch.

10.2 Conclusions relating to New Local Developments

10.3 Other Conclusions

10.4 Proposed Actions

Although new monitoring data has identified exceedences in Bearsden, the process is underway to declare an AQMA in the vicinity of Bearsden Cross/ Roman Road for both NO₂ and PM₁₀.

It is anticipated that the elevated levels of both NO₂ and PM₁₀ in Kirkintilloch are due to the ongoing construction of the Kirkintilloch Link Road. Completion is due July/August 2010 and it is expected that the levels will decrease.

East Dunbartonshire Council conclude therefore that it is not necessary to proceed to a Detailed Assessment for any pollutant at present.

11 References



Appendices

Appendix A: Figures

Figure 1 : East Dunbartonshire Council area

Figure 2 : Bishopbriggs AQMA

Figure 3 : Bearsden automatic monitor location

Figure 4 : Bishopbriggs automatic monitor location

Figure 5 : Kirkintilloch automatic monitor location

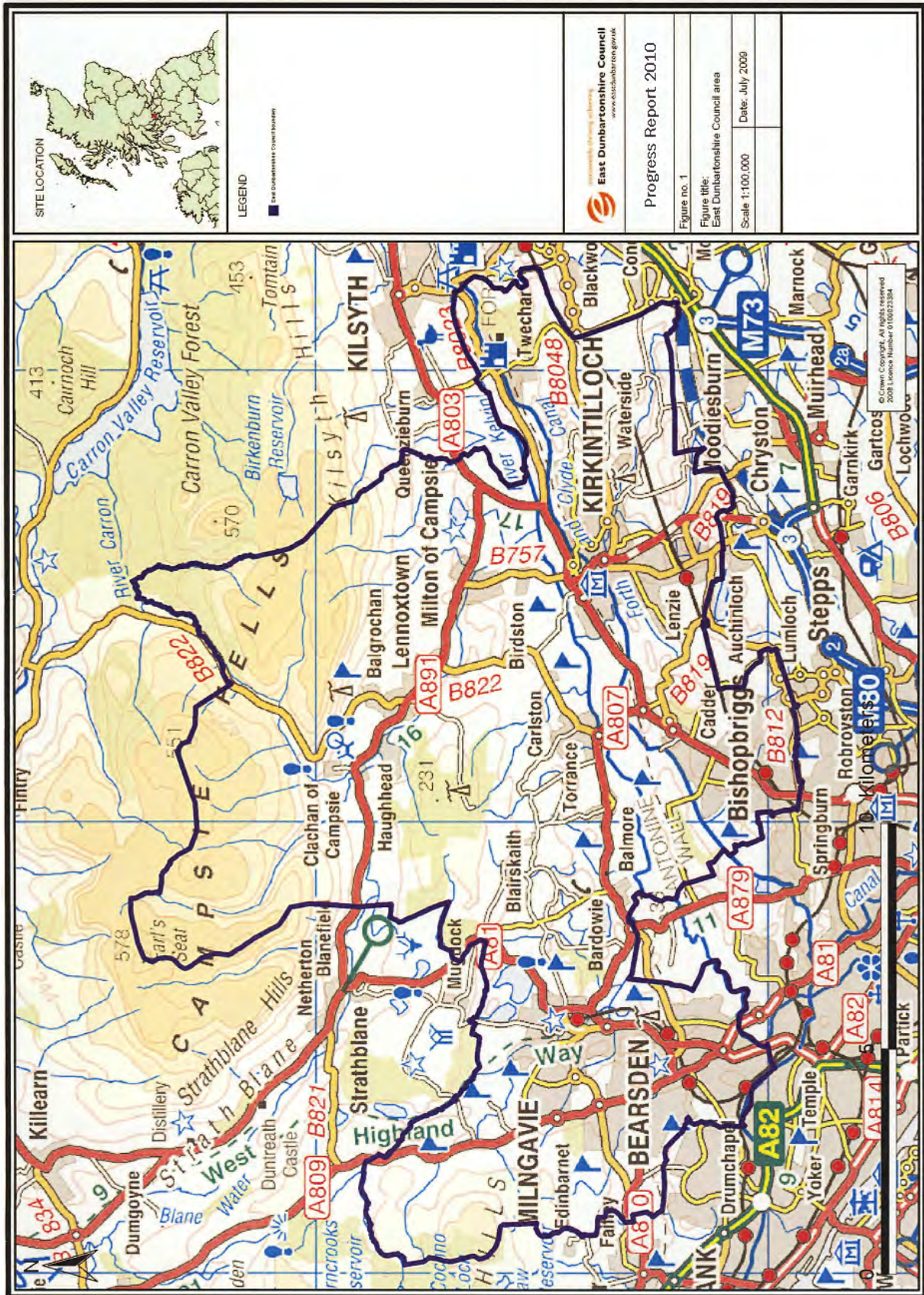
Figure 6 : Non-automatic monitoring locations in Bearsden


Figure 7 : Non-automatic monitoring locations in Bishopbriggs

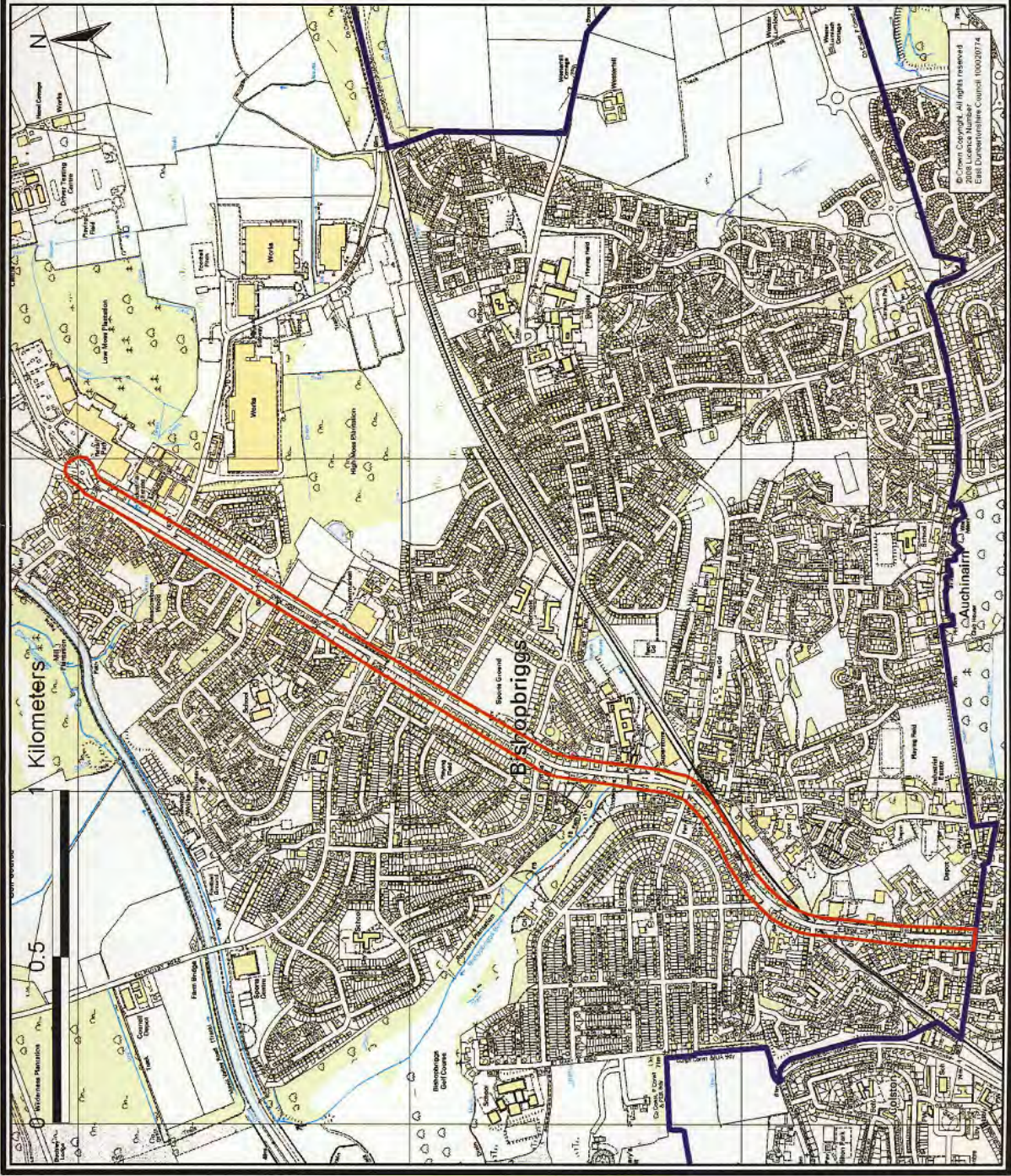
Figure 8 : Non-automatic monitoring locations in Kirkintilloch

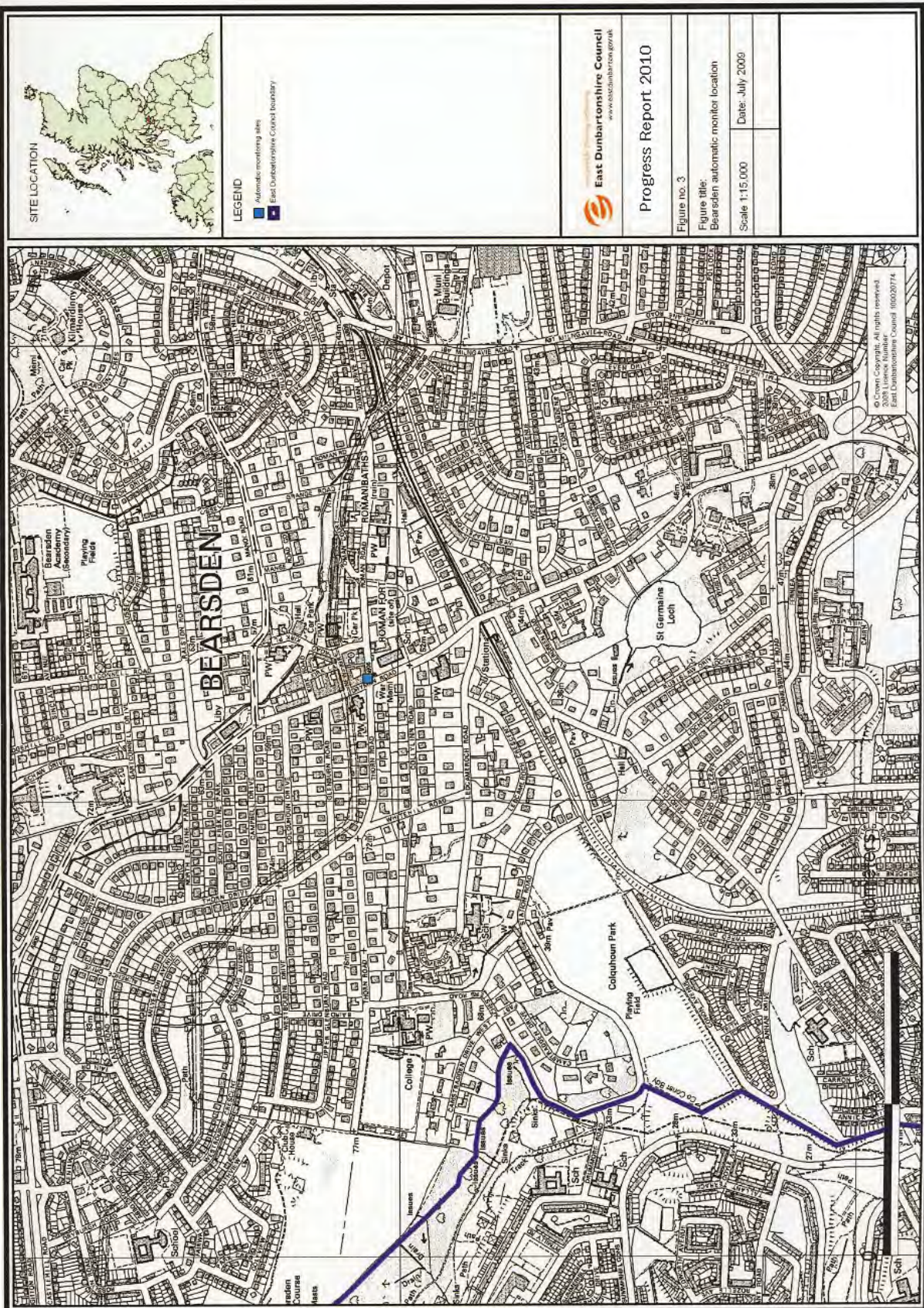
Figure 9 : Non-automatic monitoring locations in Milngavie






<p>SITE LOCATION</p> 	<p>LEGEND</p> <ul style="list-style-type: none"> ▬ Blairgowrie A/GMA boundary ▬ East Dunbartonshire Council boundary 	<p>East Dunbartonshire Council www.eastdunbarton.gov.uk</p>	<p>Progress Report 2010</p>	
			<p>Figure no. 2</p> <p>Figure title: Blairgowrie A/GMA</p> <p>Scale 1:15,000</p> <p>Date: July, 2009</p>	





SITE LOCATION



LEGEND

- Automatic monitoring sites
- Bishopbriggs ACMA boundary
- East Dunbartonshire Council boundary

East Dunbartonshire Council
www.eastdunbarton.gov.uk

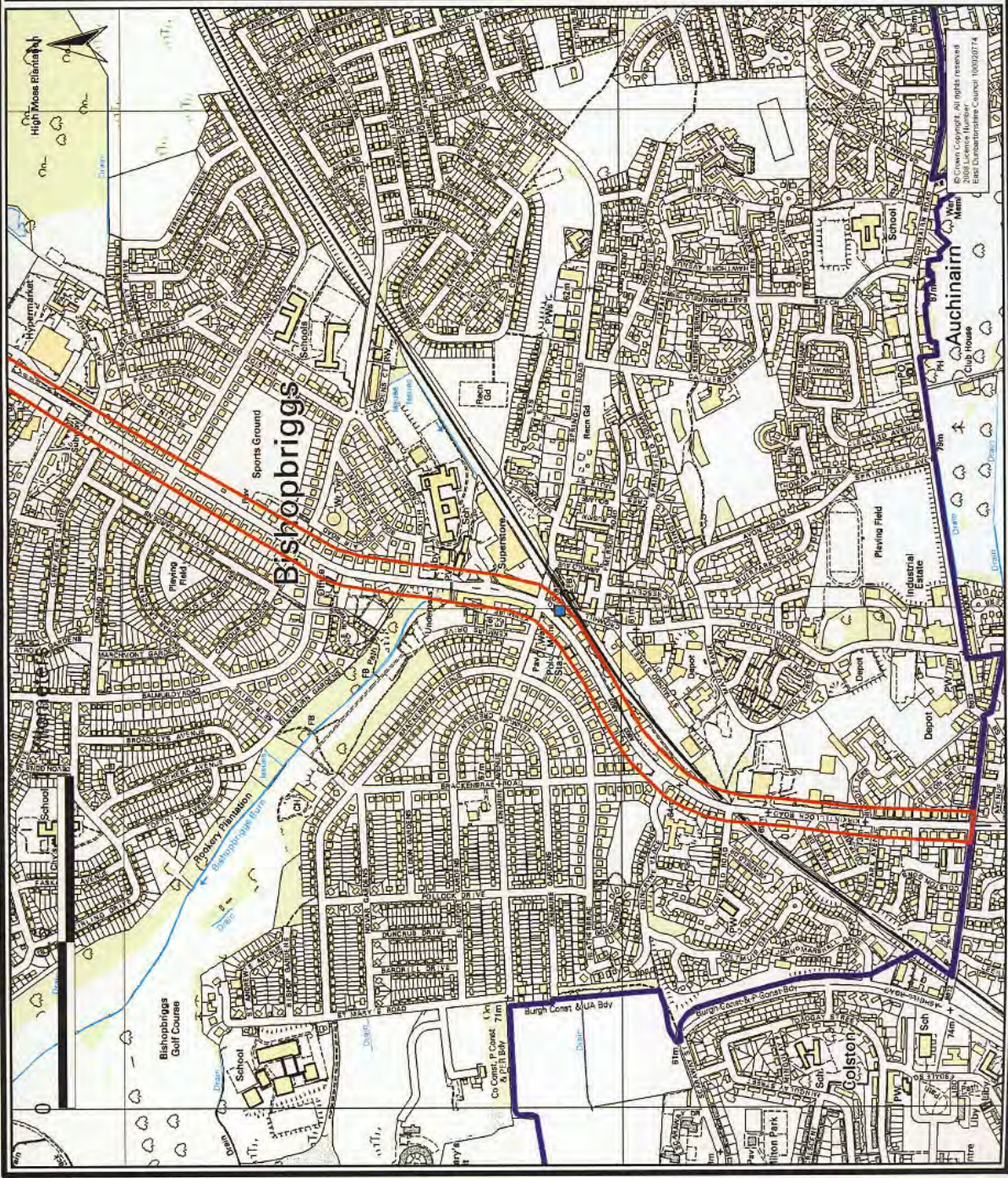
Progress Report 2010

Figure no. 4

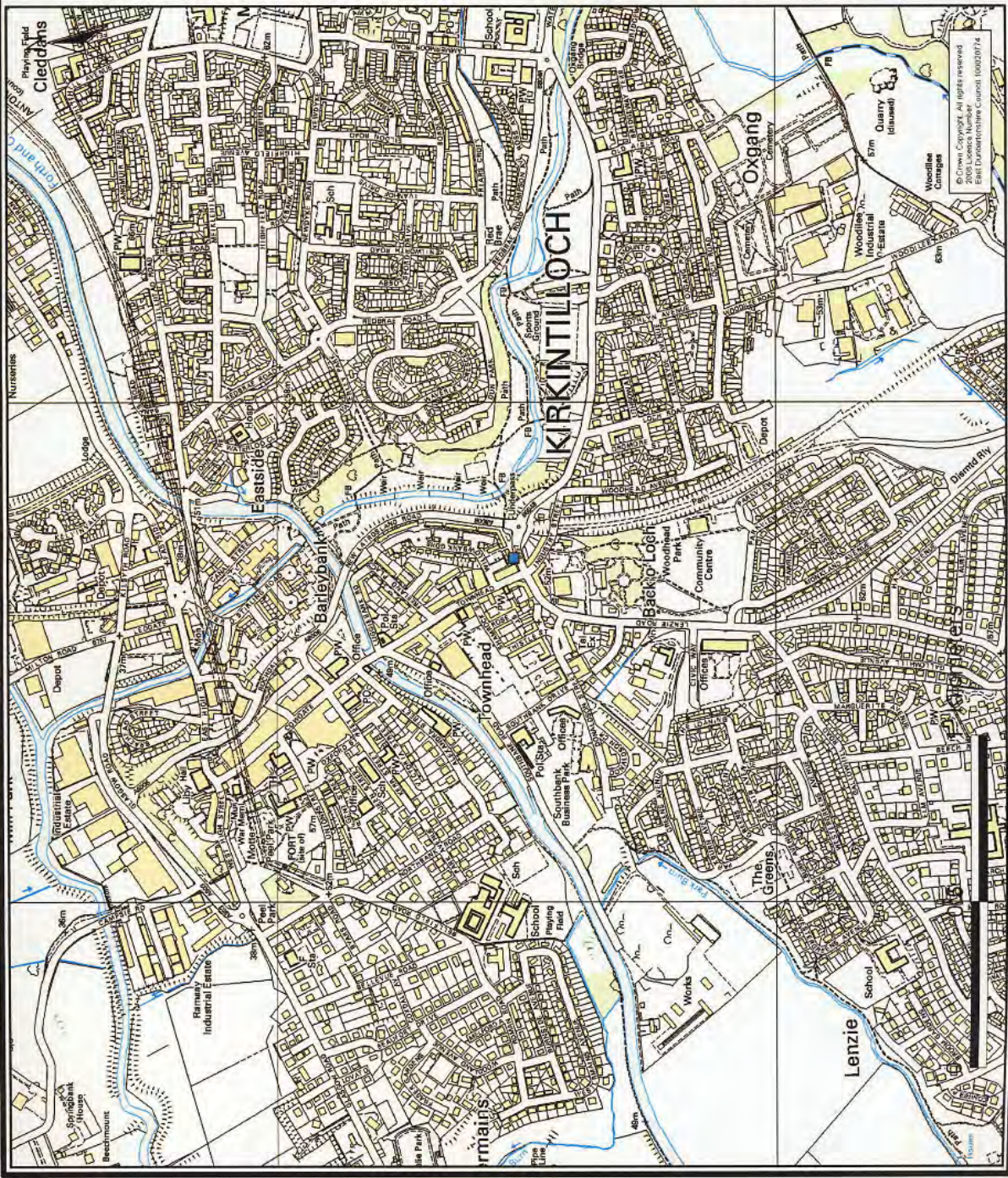
Figure title:
Bishopbriggs automatic monitor location

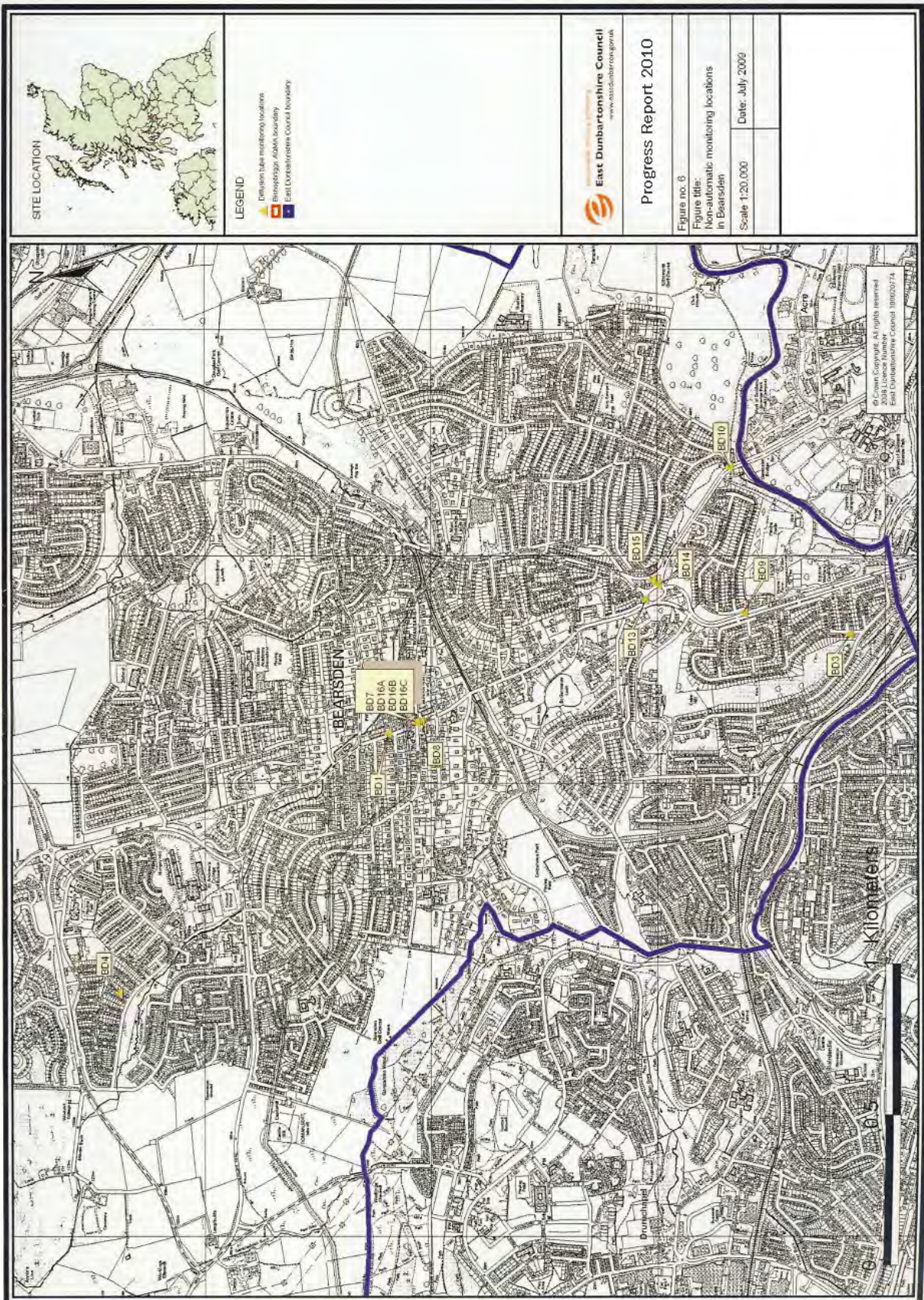
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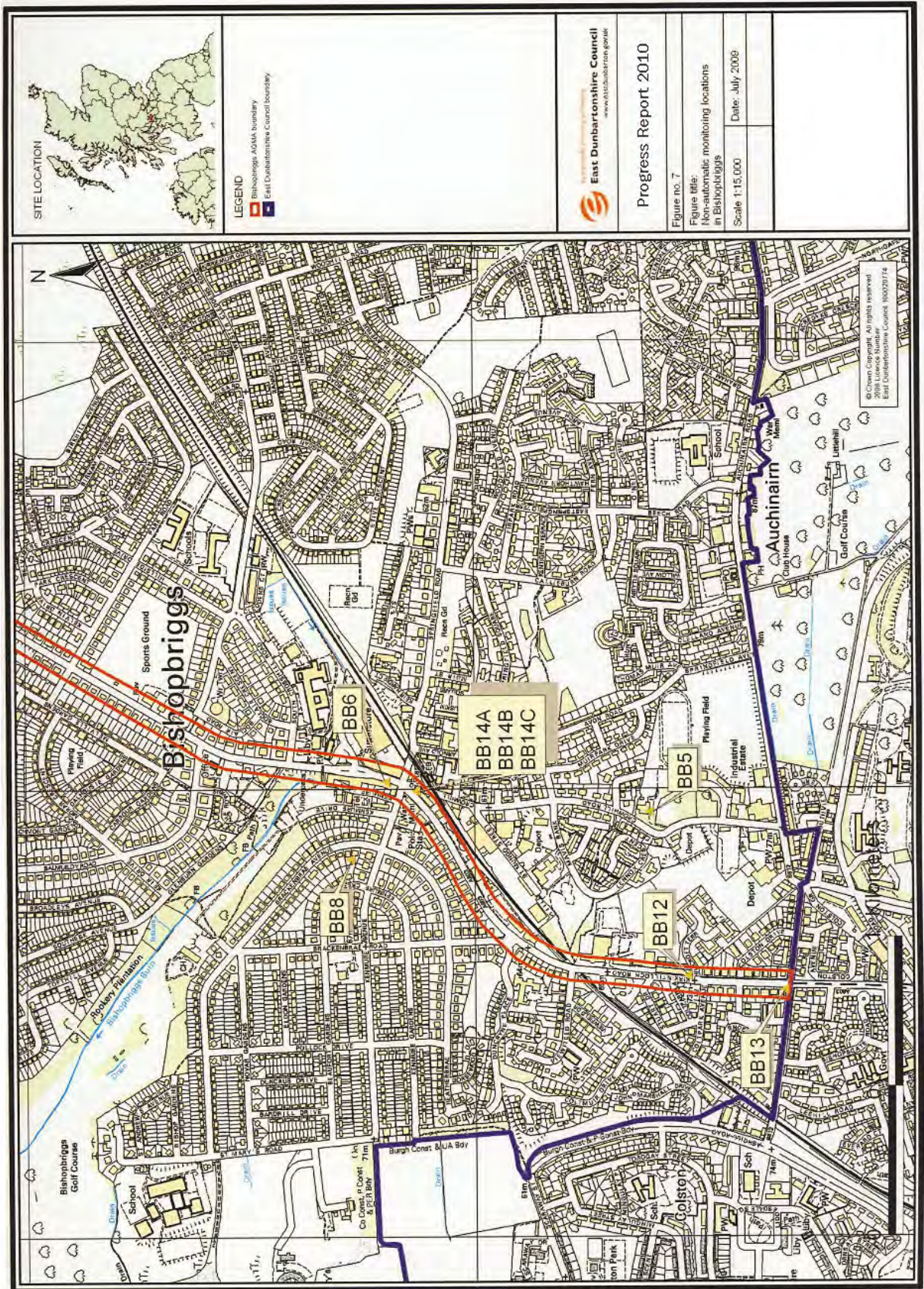
Date: July 2009

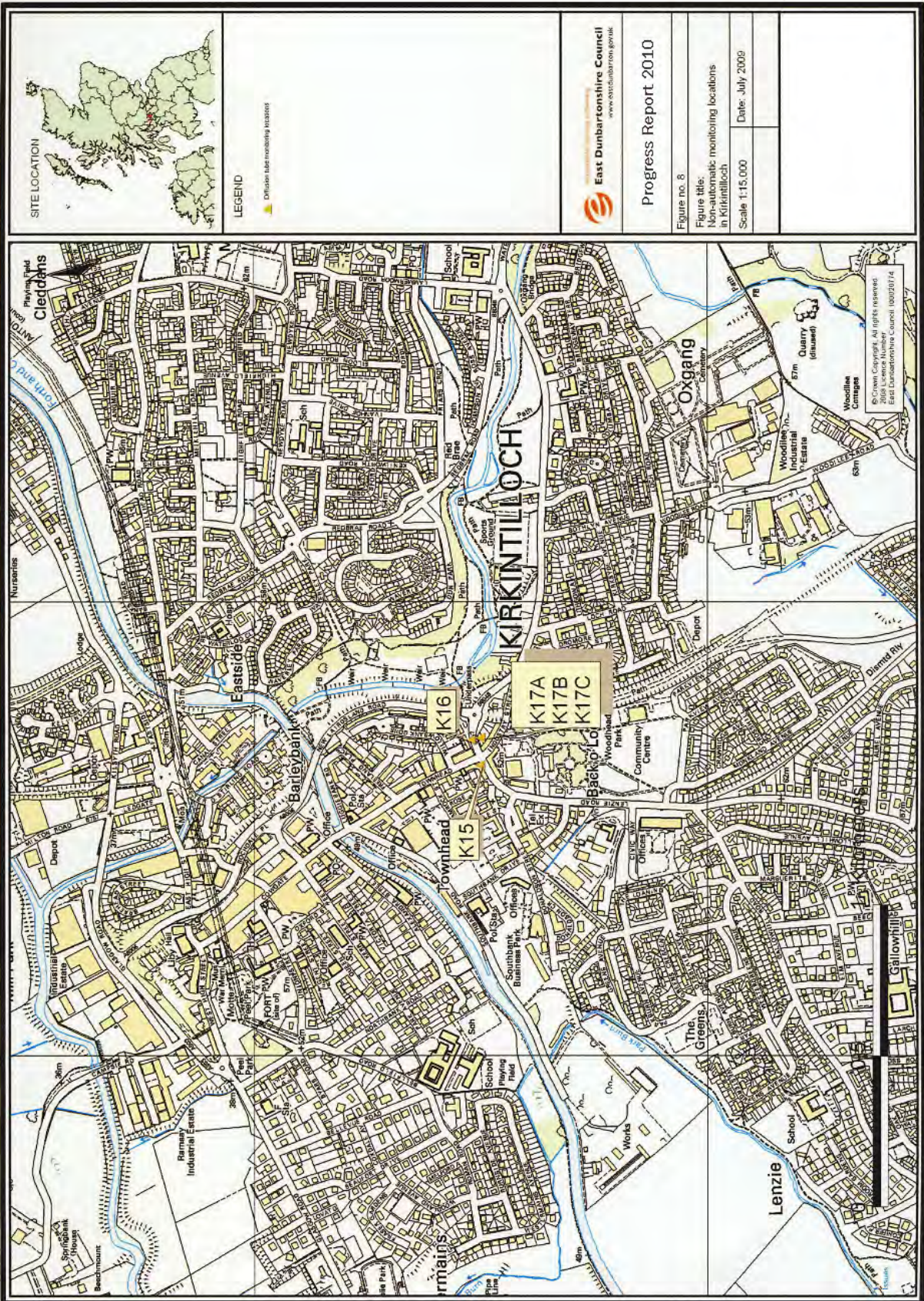


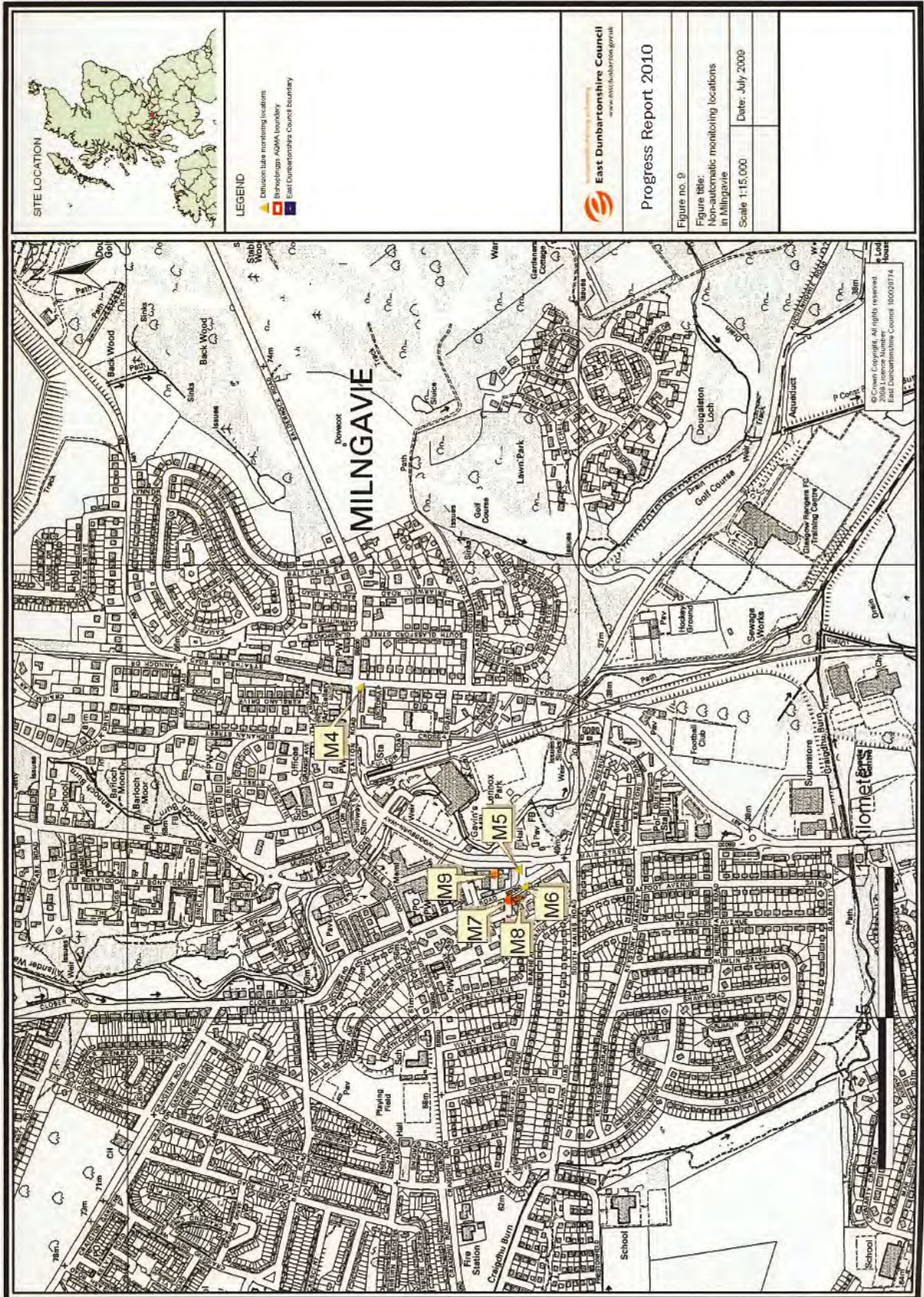
<p>SITE LOCATION</p> 	<p>LEGEND</p> <ul style="list-style-type: none"> Automatic monitoring sites 	<p>East Dunbartonshire Council www.eastdunbarton.gov.uk</p>	<p>Progress Report 2010</p>	<p>Figure no. 5</p>	<p>Figure title: Kirkintilloch automatic monitor location</p>	<p>Scale 1:15,000</p>	<p>Date: July 2009</p>
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Appendix B: QA:QC Data

Diffusion Tube Bias Adjustment Factors

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 participates in the AEA inter-comparison scheme, with bias correction factors calculated and applied annually.

East Dunbartonshire Council has undertaken a co-location study at Bishopbriggs Cross since December 2003, a co-location study at Bearsden since November 2005 and a co-location study at Kirkintilloch since August 2007. The laboratory bias factors taken from the AEA study for Glasgow Scientific Services, the East Dunbartonshire Council monitoring sites and the overall bias factors from Glasgow Scientific Services are presented in Table B1.

Table B1 Details of the 2009 bias correction factors for NO₂ diffusion tubes

Site Name	Study duration	Tube precision	Bias correction Factor
Bishopbriggs automatic analyser	12	Poor	1.215
Bearsden automatic analyser	12	Good	1.140
Kirkintilloch automatic analyser	11	Poor	1.412
Overall factor from 3 Glasgow Scientific Services co-location studies			1.23

Factor from Local Co-location Studies (if available)

The results for the three co-location studies carried out by East Dunbartonshire Council are presented in Table B2.

Table B2 Details of the 2009 co-location studies

Site Name	Annual mean NO ₂ concentration automatic analyser	Annual mean NO ₂ concentration diffusion tube annual means	Bias adjustment factor
Bishopbriggs 14	33	28	1.22
Bearsden 16	40	35	1.14
Kirkintilloch 17	43	30	1.41

The co-location studies indicate that in general the diffusion tubes are under-predicting compared to the automatic analysers.

Discussion of Choice of Factor to Use

The co-location results for the East Dunbartonshire studies represent a worst case prediction for NO₂ concentrations. The bias correction factors for Bishopbriggs and Bearsden are considered appropriate for diffusion tubes in these areas and closely resemble the bias correction factors for the co-location studies. The annual mean concentration for the diffusion tubes in Kirkintilloch show a greater variance from the annual mean concentration at the automatic analyser however the kerbside analyser is situated close to major construction works on the Kirkintilloch Link Road hence the considerably higher annual mean at the analyser. The three bias correction factors calculated have therefore been used for diffusion tubes in the area surrounding each co-location study.

PM Monitoring Adjustment

East Dunbartonshire Council monitor PM₁₀ using three types of analyser:

- Beta-attenuation monitor (BAM);
- Tapered Element Oscillating Microbalance (TEOM) with a Filter Dynamics Measurement System (FDMS); and
- Partisol gravimetric analyser

The beta attenuation analysers are maintained by Horiba and undergo regular calibration. The TEOM (FDMS) is maintained by Air Monitors Ltd. The gravimetric analyser was provided by Casella ETI and the filters are analysed by Glasgow Scientific Services which is a UKAS accredited laboratory.

The beta-attenuation monitors (BAMs) used by East Dunbartonshire Council have a heated inlet which has been found to cause evaporation of some semi-volatile particles thereby reducing the measured PM₁₀ concentration. Adjustment factors were therefore used however, TG(09) does not provide a factor for beta-attenuation monitors which have a heated inlet. East Dunbartonshire Council undertake a local co-location study at Bishopbriggs Cross using a Partisol gravimetric analyser which is equivalent to the EU reference standard. The local co-location factor has therefore been used to correct results for both beta attenuation monitors operated by the Council.

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 AEA Energy & Environment twice a year at all three sites.

QA/QC of diffusion tube monitoring

Method	Year	Site Type	Local Authority	Length of study	Diffusion Tube Mean Conc (Cm) (μm^3)	Automatic Monitor Mean Conc (Cm) (μm^3)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)
20% TEA in Water	2009	R	East Dunbartonshire Council	12	28	33	-17.7%	P	1.21
20% TEA in Water	2009	R	East Dunbartonshire Council	12	35	40	-12.3%	G	1.14
20% TEA in Water	2009	R	East Dunbartonshire Council	11	30	43	-29.2%	P	1.41
20% TEA in Water	2009	K	AEA Tech Intercomparison	11	92	108	-14.5%	G	1.17
Overall Factor (4 studies)							Use		1.23

...