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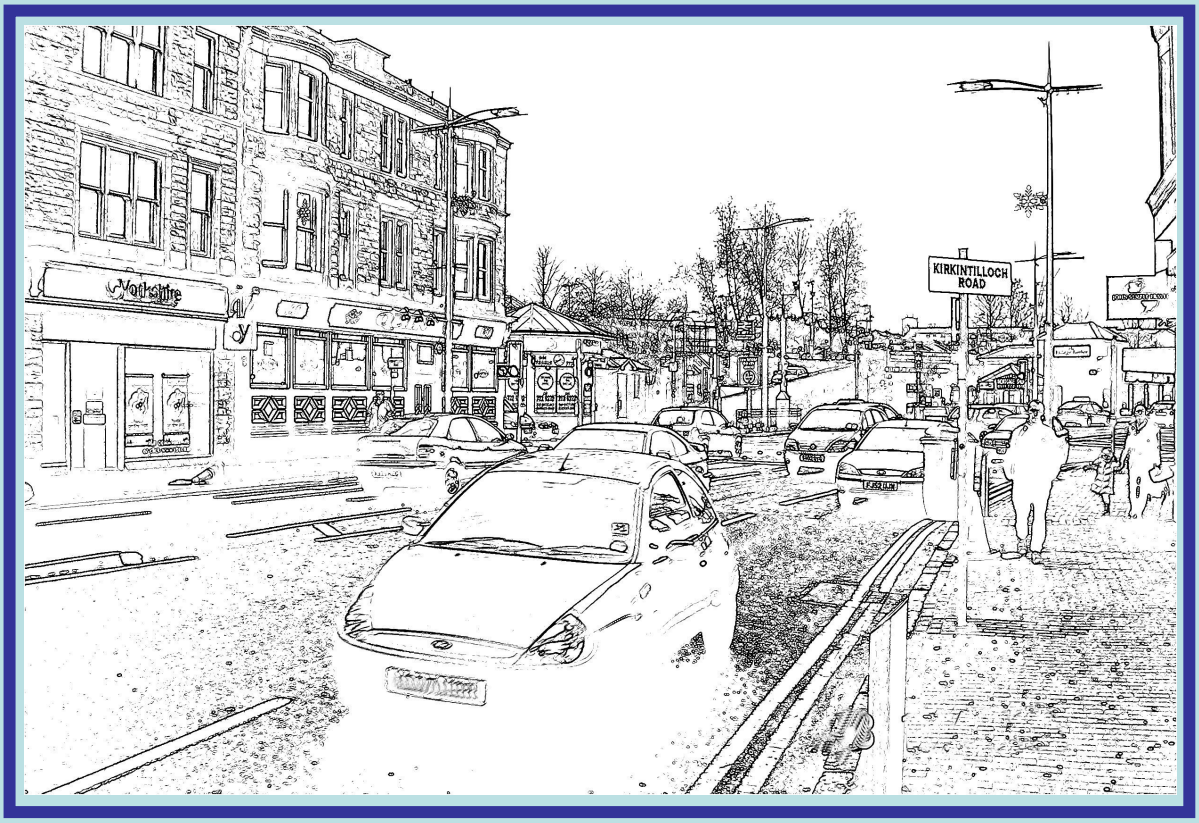
Local Air Quality Management

Updating and Screening Assessment 2006



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ENVIRONMENTAL CONSULTANCY
AND INFORMATION SYSTEMS

East Dunbartonshire Council Local Air Quality Management Updating and Screening Assessment 2006

A Report for East Dunbartonshire Council

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EXECUTIVE SUMMARY

The report considers atmospheric pollutant monitoring data and updated information relating to road traffic, transport, industrial, commercial and domestic sources of atmospheric pollutants within the East Dunbartonshire Council area.

The report assesses data in relation to the seven main pollutants listed in the National Air Quality Strategy (NAQS) and compares monitored and predicted concentrations to the objective concentrations set out in the Strategy.

The main findings of the report are presented in the summary table below.

Pollutant	Previous Assessments	Update
Carbon monoxide (CO)	No potential for exceedence of NAQS objectives	No change
Benzene	No potential for exceedence of NAQS objectives	No change
1,3-Butadiene	No potential for exceedence of NAQS objectives	No change
Lead	No potential for exceedence of NAQS objectives	No change
Nitrogen dioxide (NO_2)	Annual mean NO_2 concentration exceeded (modelling / passive diffusion tube monitoring) in 2004 Bishopbriggs Air Quality Management Area officially declared in December 2005	Additional automatic NO_x analyser on the A809 in Bearsden to assess concentrations in the area predicted to exceed the annual mean NAQS objective by modelling in 2004 Ongoing assessment of NO_2 within Bishopbriggs Air Quality Management Area. Further Assessment due for submission in December 2006. Automatic NO_x analyser planned to be located at Industry Street/ Parliament Road/Townhead junction in Kirkintilloch.
Sulphur dioxide (SO_2)	No potential for exceedence of NAQS objectives	Decommissioning of SO_2 bubbler sites due to consistently low concentrations and outdated method No potential for exceedence of NAQS objectives
Particulates (PM_{10})	2010 annual mean NAQS objective concentration for PM_{10} exceeded (modelling / automatic monitoring) in 2004 and 2005 and predicted exceedence in 2010 Bishopbriggs Air Quality Management Area officially declared in December 2005	Additional automatic beta-attenuation PM_{10} analyser planned for the A809 in Bearsden to assess concentrations in an area predicted to exceed annual mean NAQS objective by modelling in 2004. Gravimetric PM_{10} analyser co-location study commenced in September 2005 at the Bishopbriggs Cross monitoring site. Ongoing assessment of PM_{10} within Bishopbriggs Air Quality Management Area. Further Assessment due for submission in December 2006. Automatic PM_{10} analyser planned to be located at Industry Street/ Parliament Road/Townhead junction in Kirkintilloch.

1 INTRODUCTION

1. BMT Cordah Ltd has been commissioned by East Dunbartonshire Council to carry out the 2006 Local Air Quality Management (LAQM) updating and screening assessment for 2006.

Purpose

2. The aim of the report is to summarise the air quality and provide an update on air quality issues within the East Dunbartonshire Council area since the previous review and assessment report.

3. The assessment uses updated information pertaining to industrial, transport, commercial and domestic atmospheric emissions combined with current monitoring data to identify areas where there is potential for exceedence of the National Air Quality Strategy (NAQS) objectives.

4. The report follows guidance set out in LAQM.TG(03) technical guidance[1], LAQM.PG(04) policy guidance[2] and subsequent guidance amendments[3].

LAQM framework and local authority requirements

5. The Environment Act 1995 and subsequent regulations require local authorities to assess compliance of air quality in their area with the standards and objectives set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000[4] (NAQS). For local authorities within Scotland further regulations are set out in the Air Quality (Scotland) Regulations 2000 and Air Quality (Scotland) Amendment Regulations 2002.

6. The LAQM framework requires that local authorities carry out regular reviews of air quality. The first round of Review and Assessment commenced in 1998 and comprised a four stage approach to the assessment of air quality.

7. The Review and Assessment process was revised in 2003 and now comprises two phases. The first phase of the Review and Assessment is an Updating and Screening Assessment (U&SA). The U&SA considers any changes that have occurred in pollutant emissions and sources since the last round of Review and Assessment that may affect air quality. The second phase is either a Detailed Assessment or a Progress Report depending upon the outcome of the Updating and Screening Assessment.

8. The LAQM guidance requires that where a risk of exceedence of an air quality objective at a location with relevant public exposure is identified then a Detailed Assessment is undertaken. A Detailed Assessment will consider any risk of exceedence of an objective in greater depth in order to determine whether it is necessary to declare an Air Quality Management Area (AQMA).

9. During years when an U&SA is not being conducted local authorities are required to submit a Progress Report detailing ongoing air quality monitoring results and providing updated information on air quality issues within the local authority area. A Progress Report includes information on new

[1] Part IV of the Environment Act 1995, Local air quality management technical guidance, LAQM.TG(03), Defra et al, January 2003.
[2] Part IV of the Environment Act 1995, Local air quality management policy guidance, LAQM.PG(04), Defra et al, January 2004.
[3] Part IV of the Environment Act 1995, Local air quality management technical guidance update, LAQM.TG(03) – update: January 2006, Defra et al, January 2006.
[4] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Working together for clean air, Defra, January 2000

developments, policies or monitoring data relating to air quality. Air quality information and data are used to identify changes in air quality that result in a potential exceedence of the NAQS objectives.

10. The second round of Review and Assessment was completed in 2005 and this report commences the third round of Review and Assessment for air quality.

National air quality strategy

11. The NAQS details assessment criteria for eight pollutants in the form of atmospheric concentration levels for which an objective deadline is set. Of the eight pollutants identified only seven are required to be assessed and reported. The pollutants contained within the NAQS and their relevant objectives for Scotland are shown in Table 1.

Table 1: Pollutant Objectives outlined in the NAQS

Pollutant	Air Quality Objective			Date to be achieved by
	Concentration	Measured as	Equivalent percentile	
Benzene	16.25 µg/m^3	running annual mean	-	31 / 12 / 2003
	3.25 µg/m^3	running annual mean	-	31 / 12 / 2010
1,3-butadiene	2.25 µg/m^3	running annual mean	-	31 / 12 / 2003
Carbon monoxide (CO)	10 mg/m^3	running 8 hour mean	-	31 / 12 / 2003
Lead	0.5 µg/m^3	annual mean	-	31 / 12 / 2004
	0.25 µg/m^3	annual mean	-	31 / 12 / 2008
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times per year	1-hour mean	99.79th percentile of 1-hour means	31 / 12 / 2005
	40 µg/m^3	annual mean	-	31 / 12 / 2005
Particulate (PM_{10})	50 µg/m^3 not to be exceeded more than 35 times a year	24-hour mean	90.4th percentile of 24-hour-means	31 / 12 / 2004
	40 µg/m^3	annual mean	-	31 / 12 / 2004
	50 µg/m^3 not to be exceeded more than 7 times a year	24-hour mean	98th percentile of 24-hour-means	31 / 12 / 2010
	18 µg/m^3	annual mean	-	31 / 12 / 2010
Sulphur dioxide (SO_2)	125 µg/m^3 not to be exceeded more than 3 times a year	24-hour mean	99th percentile of 24-hour means	31 / 12 / 2004
	350 µg/m^3 not to be exceeded more than 24 times a year	1-hour mean	99.7th percentile of 1-hour means	31 / 12 / 2004
	266 µg/m^3 not to be exceeded more than 35 times a year	15-minute mean	99.9th percentile of 15-minute means	31 / 12 / 2005

Council area

12. East Dunbartonshire is one of the smaller local authorities within Scotland covering approximately 200 square kilometres. The council area is located to the north of Glasgow and is bordered by the City of Glasgow Council to the south, West Dunbartonshire Council to the west, Stirling Council to the north and east and North Lanarkshire Council to the south east. The local authority is landlocked and contains a mixture of both urban and rural areas. A map of East Dunbartonshire Council is provided in Figure 1.

Population and urban centres

13. The population of East Dunbartonshire is approximately 110,000 with the majority of the residents based in the urbanised region to the south, which is contiguous with Greater Glasgow. The main urban centres are Bearsden, Bishopbriggs, Kirkintilloch, Lenzie 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 located within the local authority.

Topography

14. The southern part of East Dunbartonshire lies within the Kelvin valley which is aligned roughly east-west. The terrain is therefore low-lying undulating land featuring the River Kelvin and the Forth and Clyde canal dissecting the area east to west and Luggie water in the south east of the council area. The northern and north western parts of East Dunbartonshire are dominated by the Campsie Fells, Kilpatrick Hills and the Kilsyth Hills which border the catchment areas for the River Kelvin, Glazert Water, Bardowie Loch, Mugdock Reservoir and Craigmaddie Reservoir.

Meteorology

15. The meteorological parameters having the greatest impact upon atmospheric pollutant dispersion and transportation are wind speed and wind direction. Temperature and rainfall also impact upon pollutant concentrations by acting as a catalyst to chemical reactions, creating convective curents or washing pollution out of the atmosphere.

16. The meteorological station at Glasgow airport approximately 25km south west of the centre of East Dunbartonshire records a full suite of meteorological parameters. The meteorological station has been at its current location since 2000, although a meteorological station has been operated at the airport site since 1967.

17. Figure 2 details the wind roses for 2001 – 2005 at Glasgow Airport.

Summary of previous assessments

18. East Dunbartonshire Council completed its U&SA in April 2003[5]. The U&SA concluded that it was unlikely that NAQS objectives for NO_2, SO_2, lead, CO, benzene or 1,3-butadiene would be exceeded within the East Dunbartonshire Council area. However, the U&SA concluded that there was potential for the NAQS objectives for PM_{10} to be exceeded due to road traffic at busy junctions and that a Detailed Assessment was required.

19. A Detailed Assessment[6] was undertaken in 2004 and included a dispersion modelling study of road traffic emissions and updated monitoring results for both NO_2 and PM_{10}. It was concluded that the 2004 objectives for PM_{10} would be met, but that there was a possibility that both the annual mean objective and the 24-hour mean objective for 2010 would be exceeded. Automatic monitoring data was only available for 6 months and NO_2 diffusion tube concentrations did not indicate an exceedence at sensitive receptors. It was therefore concluded that the decision to declare an AQMA for PM_{10} would be taken upon completion of a years automatic monitoring and that the NO_2 diffusion tube results would be reconsidered upon completion of a full years co-location study at Bishopbriggs Cross.

20. An addendum[7] to the Detailed Assessment was produced upon completion of a years automatic monitoring. The report concluded that it was likely that NAQS objectives for NO_2 and PM_{10} would be exceeded and that there was the requirement for an AQMA for PM_{10} at Bishopbriggs Cross and AQMAs for NO_2 at Bishopbriggs Cross and the junction of Kirkintilloch Road (A803) and Colston Road (B182). In addition it was recommended that automatic monitoring be considered for PM_{10} at Bearsden Cross and the Industry St / Lenzie Road / Townhead junction in Kirkintilloch and for NO_2 at Bearsden Cross.

21. The LAQM progress report[8] was submitted in May 2005 and monitoring data reported for NO_2 and PM_{10} confirmed exceedences of the respective 2005 and 2010 NAQS objectives along Kirkintilloch Road at Bishopbriggs Cross and the junction of Colston road.

22. A consultation for the declaration of an AQMA along the A803 Kirkintilloch Road was carried out between June and October 2005. An AQMA for NO_2 and PM_{10} was declared on 24th October 2005 with the official order coming into effect on 23rd December 2005. A map locating the Bishopbriggs AQMA is shown in Figure 3.

[5] Air Quality Review Updating and Screening Assessment 2003, East Dunbartonshire Council, April 2003
[6] Local Air Quality Management Detailed Assessment for East Dunbartonshire Council, BMT Cordah Ltd report ref: EDC_001, September 2004
[7] LAQM Detailed Assessment Addendum report for East Dunbartonshire Council, BMT Cordah Ltd report ref: EDC_003(1), April 2005.
[8] LAQM Progress Report for East Dunbartonshire Council 2005, BMT Cordah Ltd report ref: EDC_003(2), May 2005.

Inventory of monitoring

23. East Dunbartonshire Council maintain a network of monitoring sites located throughout the council area. The network includes monitoring sites for NO_2, PM_{10} and SO_2. A map locating the NO_2 monitoring sites is shown in Figure 4. The locations of the SO_2 monitoring sites are shown in Figure 5 and a map of the PM_{10} monitoring sites is shown in Figure 6. An inventory of monitoring sites within East Dunbartonshire Council area is included in Table 2.

24. Four new NO_2 diffusion tube monitoring sites were installed in 2005 to increase the spatial distribution of the monitoring network at locations predicted to have high NO_2 concentrations. It is planned that a second co-location study will be undertaken at the Bearden Cross automatic monitor during 2006.

25. During 2005 a beta -attenuation analyser (with a heated inlet) was located at Bearsden Cross following the conclusions of the Detailed Assessment and 2005 Progress Report.

26. A gravimetric analyser has been co-located with the beta-attenuation analyser (with a heated inlet) at Bishopbriggs Cross to improve the accuracy of PM_{10} monitoring data within the AQMA. The analyser commenced operation in 2006.

27. It is planned that a new automatic station will be located at the Industry Street / Parliament Road / Townhead junction in Kirkintilloch. The automatic monitor will include NO_X and PM_{10} analysers to verify potential exceedences predicted at the junction in the 2004 Detailed Assessment.

28. The SO_2 8-port bubbler site at Lenzie Road in Kirkintilloch was discontinued in 2004 and the six remaining SO_2 8-port bubbler monitoring sites were decommissioned at the end of December 2005.

Table 2: Monitoring sites within East Dunbartonshire

Monitoring Site	Location	Grid Reference	Monitoring method	Pollutant	Clasification
Bearsden 1	118 Drymen Rd	NS 54218 72193	PDT	NO_2	Roadside
Bearsden 3	5 Ravelston Rd	NS 54655 70158	PDT	NO_2	Urban Background
Bearsden 4	8 Lowther Av	NS 53075 73382	PDT	NO_2	Urban Background
Beasrden 5	Westerton Hall, Maxwell Av	NS 53980 70605	8-port bubbler	SO_2	Urban Background
Bearsden 7	Traffic lights at Bearsden Cross	NS 54269 72069	PDT	NO_2	Kerbside
Bearsden 8	Hanging basket at Bearsden Cross	NS54275 72047	PDT	NO_2	Kerbside
Bearsden 9	Switchback at Braemar Crescent	NS 54751 70621	PDT	NO_2	Roadside
Bearsden 10	Junction of Maryhill Rd & Rannoch Dr	NS 55394 70683	PDT	NO_2	Roadside
Bearsden 13	Canniesburn Toll	NS 54809 71057	PDT	NO_2	Kerbside
Bearsden 14	1 Milngavie Rd, Canniesburn Toll	NS 54877 71000	PDT	NO_2	Kerbside
Bearsden 15	1 Milngavie Rd, Canniesburn Toll	NS 54898 71023	PDT	NO_2	Kerbside
Bearsden 16A	Bearsden Cross	NS 54269 72067	PDT Chemiluminescence Beta -attenuation	NO_2 NO_2 PM_{10}	Kerbside
Bearsden 16B	Bearsden Cross	NS 54269 72067	PDT	NO_2	Kerbside
Bearsden 16C	Bearsden Cross	NS 54269 72067	PDT	NO_2	Kerbside
Bishopbriggs 5	Huntershill House, Crowhill Rd	NS 60948 69610	PDT 8-port bubbler	NO_2 SO_2	Urban Background
Bishopbriggs 6	145 Kirkintilloch Rd	NS 61016 70198	PDT	NO_2	Kerbside
Bishopbriggs 8	77 Brackenbrae Avenue	NS 60842 70278	PDT	NO_2	Urban Background
Bishopbriggs 12	South of Arnold Clark garage, Kirkintilloch Rd	NS 60581 69527	PDT	NO_2	Kerbside
Bishopbriggs 13	1495 Springburn Rd	NS 60549 69312	PDT	NO_2	Kerbside
Bishopbriggs 14A	128 Crowhill Rd, Bishopbriggs Cross	NS 60995 70130	PDT Chemiluminescence Gravimetric Beta -attenuation	NO_2 NO_2 PM_{10} PM_{10}	Roadside
Bishopbriggs 14B	128 Crowhill Rd, Bishopbriggs Cross	NS 60995 70130	PDT	NO_2	Roadside
Bishopbriggs 14C	128 Crowhill Rd, Bishopbriggs Cross	NS 60995 70130	PDT	NO_2	Roadside
Kirkintilloch 8	Merkland Recreation Centre, Merkland Place	NS 67000 74100	8-port bubbler	SO_2	Urban Background
Kirkintilloch 10	John St Hostel, John St	NS 65935 74115	8-port bubbler	SO_2	Urban Background
Kirkintilloch 15	Townhead lights	NS 65640 73501	PDT	NO_2	Roadside
Kirkintilloch 16	Parliament Rd	NS 65695 73521	PDT	NO_2	Roadside
Lennoxtown 9	Craighead Primary School, Craighead Rd	NS 65220 76830	8-port bubbler	SO_2	Urban Background
Milngavie 1	1 Grange Av	NS 55550 74590	8-port bubbler	SO_2	Urban Background
Milngavie 4	junction of Station Rd & Strathblane Rd	NS 55728 74486	PDT	NO_2	Roadside
Milngavie 5	Woodburn Way near junction with Park Rd	NS 55327 74137	PDT	NO_2	Roadside
Milngavie 6	Park Rd at junction with South gate	NS 55288 74121	PDT	NO_2	Roadside

PDT- passive diffusion tube

Inventory of industrial activities

29. An inventory of all the industrial sites regulated for atmospheric emissions is presented in Table 3.

Table 3: Regulated industrial sites within East Dunbartonshire

Company	Process	Location	Permit / Licence	Atmospheric Pollutants
IPPC Processes				
P W Hall Ltd	Inorganic Chemicals (plastics compounding)	Kirkintiloch	PPC/A/1000058 (IPC/076/1995)	Lead, PM_{10}, NO_X, SO_2, VOCs
Part B Processes				
Flexible Ducting Ltd	Coating of metal and plastic	Milngavie	IPC/W/30038	VOCs, PM_{10}, NO_X, SO_2
William Begg & Son	Waste oil burner	Bearsden	PPC/W/30043	VOCs, PM_{10}, NO_X, SO_2
Mr J McGregor & Mr S McGregor	Petrol vapour recovery	Lennoxtown	PPC/W/30099 (APC/W/20143)	Benzene & other VOCs
Robeslee Concrete Co. Ltd.	Cement batching	Kirkintilloch	PPC/W/30138 (APC/W/00230)	PM_{10}, dust
Arnold Clark Automobiles Ltd.	Vehicle re-spraying	Bishopbriggs	PPC/W/30152 (APC/W/20487)	VOCs
H. Morris & Co. Ltd.	Solvent emissions	Campsie Glen	PPC/W/30169	VOCs
RMC Russell plc	Roadstone coating process	Twechar	PPC/B/1003211 (APC/W/00004)	PM_{10} , dust
Archibald Young	Brass founders	Kirkintilloch	APC/W/00234	VOCs, PM_{10}, NO_X, SO_2
Marley Building Materials	Cement batching & manufacture of concrete tiles	Bishopbriggs	APC/W/00008	PM_{10} , dust
RMC Russell plc	Cement batching	Twechar	APC/W/00003	PM_{10} , dust
RMC (Scotland) Ltd	Cement batching	Twechar	APC/W/00005	PM_{10} , dust
Bardon Aggregates Ltd	Concrete batching	Torrance	APC/W/00226	PM_{10} , dust
Montgomery [Daniel Montgomery & Son]	Coating of plastic moulded bottle closures by spray application, including metallising lacquers	Kirkintilloch	APC/W/00228	VOCs, PM_{10}, NO_X, SO_2
RMC (Scotland) Ltd	Mortar batching	Twechar	APC/W/00007	PM_{10} , dust
McGavigan [John McGavigan Ltd]	Printing	Bishopbriggs	APC/W/20483	VOCs, PM_{10}, NO_X, SO_2
Gillespie's of Lenzie	Road vehicle re-finishing (body repair workshop)	Lenzie	APC/W/20042	VOCs, PM_{10}, NO_X, SO_2
Ferryhill Motors	Road vehicle re-spraying	Torrance	APC/W/20062	VOCs, PM_{10}, NO_X, SO_2
BP Oil UK Ltd	Unloading of petrol at a service station	Berasden / Glasgow	APC/W/20131	Benzene & other VOCs
Calanike Retailing Ltd	Unloading of petrol at a service station	Kirkintilloch	APC/W/20144	Benzene & other VOCs
ESSO Petroleum Company Ltd	Unloading of petrol at a service station	Bearsden	APC/W/20290	Benzene & other VOCs
Fuel Force Ltd	Unloading of petrol at a service station	Bearsden	APC/W/20402	Benzene & other VOCs
Gillespie [J Gillespie (ME) Ltd]	Unloading of petrol at a service station	Lenzie	APC/W/20229	Benzene & other VOCs
Gillespie [J Gillespie (ME) Ltd]	Unloading of petrol at a service station	Kirkintilloch	APC/W/20230	Benzene & other VOCs
Gillespie [J Gillespie (ME) Ltd]	Unloading of petrol at a service station	Milngavie	APC/W/20233	Benzene & other VOCs
Gillespie [J Gillespie (ME) Ltd]	Unloading of petrol at a service station	Kirkintilloch	APC/W/20234	Benzene & other VOCs
Malthurst Ltd	Unloading of petrol at a service station	Bearsden	APC/W/20170	Benzene & other VOCs

Company	Process	Location	Permit / Licence	Atmospheric Pollutants
Potter [William Potter]	Unloading of petrol at a service station	Bearsden	APC/W/20348	Benzene & other VOCs
Shell UK Ltd	Unloading of petrol at a service station	Kirkintilloch	APC/W/20300	Benzene & other VOCs
Shell UK Ltd	Unloading of petrol at a service station	Bishopbriggs	APC/W/20302	Benzene & other VOCs

30. There have been no variations to operating permits within East Dunbartonshire since the 2005 LAQM Progress Report.

Description of road network

31. The principal routes passing through East Dunbartonshire are the A739, A809, A810, A81, A807, A803 and A891. The B-roads include the B8050, B812, B819, B822, B757, B8023 and B8048.

32. The busiest roads within the council area that are of concern in relation to air quality are:

- A803 and B812 at Bishopbriggs;
- A81 through Milngavie; and
- A809 and A739 through Bearsden.

Description of other transport

33. There are two train routes passing through East Dunbartonshire. One of the main Edinburgh to Glasgow lines passes approximately east - west through Lenzie and Bishopbriggs. The Glasgow to Milngavie route passes north - south through Bearsden and Milngavie in the west of the council area.

34. There are no airports or harbour areas within East Dunbartonshire.

35. The Forth and Clyde canal passes east to west bi-secting the council area. There is some shipping such as narrow boats and small motorised boats using the canal although it is primarily leisure craft and not significant in terms of atmospheric pollutants.

36. There are no bus stations within East Dunbartonshire.

2 CARBON MONOXIDE

37. The NAQS objective for CO for Scottish local authorities is detailed as a maximum 8-hour running mean not to exceed 10mg/m^3. The objective deadline was set as 31st December 2003.

Monitoring data

38. East Dunbartonshire Council has not previously and does not currently monitor CO. The nearest automatic monitoring sites for CO are operated by the neighbouring local authority, Glasgow City Council.

39. Glasgow City Council operate three automatic CO analysers, one at an urban background site, one at a kerbside and one at a roadside location. Urban areas of Glasgow are contiguous with urban areas within East Dunbartonshire; the measured CO concentrations from Glasgow are therefore considered representative of the CO concentrations within urban parts of East Dunbartonshire. The measured CO concentrations for 2003 to 2005 are presented in Table 4.

Table 4: Monitored CO concentrations for Glasgow

Monitoring site	Maximum 8-running hour mean concentration (mg/m^3)			No. exceedences of the 8-hour running mean objective (2003 – 2005)
	2003	2004	2005	
Glasgow Centre	2.4	3.0	2.3	0
Glasgow City Chambers	2.9	1.9	3.0	0
Glasgow Kerbside	2.3	1.3	1.4	0

40. There have been no exceedences of the 8-hour running mean NAQS objective for CO since the second round of review and assessment.

41. The National Environment Technology Centre (Netcen) provide a national database of background concentrations for pollutants listed in the NAQS[9]. The estimated background CO concentrations for East Dunbartonshire Council are presented in Table 5.

Table 5: 2005 Background CO concentrations for East Dunbartonshire (mg/m^3)

	Maximum	Minimum	Mean
Annual mean concentration	0.24	0.11	0.17

42. The maximum 2005 annual mean background concentration of CO are significantly below the NAQS objectives for 2003, accounting for less than 3% of the 8-hour running mean objective.

Transport sources

Very busy roads or junctions in built up areas

43. The LAQM.TG(03) Update – January 2006 technical guidance states that consideration of CO from busy roads or junctions should be made if the background concentration is greater than 1mg/m^3. As was noted for the previous updating and screening assessment the maximum background concentration is 0.24mg/m^3 and therefore no assessment is required for CO from transport sources.

[9] http://www.airquality.co.uk/archive/laqm/tools.php

CO conclusions

44. There have been no significant changes to sources of CO within East Dunbartonshire since the last round of assessment. It is concluded from estimated background concentrations and measured data in the neighbouring local authority, Glasgow City Council, that CO concentrations have not exceeded the 8-hour running mean objective concentration of 10mg/m^3. It is therefore concluded that a Detailed Assessment is not required for CO.

3 BENZENE

45. The objective for benzene for all local authorities, contained within the Air Quality Regulations 2000 and Amendment Regulations 2002, is detailed as a running annual mean not to exceed 16.25µg/m^3. The objective deadline was 31st December 2003.

46. An additional objective for benzene for Scottish local authorities, contained within the air quality amendment regulations (Scotland) 2002, is detailed as a running annual mean of 3.25µg/m^3. The objective deadline is 31st December 2010.

47. The EU has also set a limit for benzene of 5µg/m^3 as an annual mean to be achieved by 1 January 2010. The limit is included within the second Air Quality Daughter Directive[10].

Monitoring data

Monitoring data outside an AQMA

48. East Dunbartonshire Council has not previously and does not currently monitor benzene. The nearest automatic monitoring site for benzene is operated by the neighbouring local authority, Glasgow City Council.

49. Glasgow City Council operate one automatic benzene analyser at a kerbside location. Urban areas of Glasgow are contiguous with urban areas within East Dunbartonshire; the measured benzene concentrations from Glasgow are therefore considered representative of the benzene concentrations within urban parts of East Dunbartonshire. The measured benzene concentrations for 2003 to 2005 are presented in Table 6.

Table 6: Monitored benzene concentrations for Glasgow kerbside

Annual mean concentration (µg/m^3)				No. exceedences of the annual mean objective (2003 – 2005)		
2003	**2004**	**2005**	**Predicted for 2010**	**16.25µg/m^3**	**5µg/m^3**	**3.25µg/m^3**
1.83	1.41	1.17	0.98	0	0	0

50. There have been no exceedences of the annual mean NAQS objective for benzene since the second round of review and assessment.

51. The estimated background benzene concentrations for East Dunbartonshire Council taken from the Netcen database are presented in Table 7.

Table 7: 2005 Background benzene concentrations for East Dunbartonshire (µg/m^3)

	Maximum	Minimum	Mean
Annual mean concentration 2005	0.55	0.12	0.32
Projected annual mean concentration 2010	0.48	0.11	0.28

52. The maximum annual mean background concentrations of benzene are significantly below the NAQS objectives for both 2003 and 2010, accounting for less than 4% and 15% of the respective objectives and less than 10% of the EU Directive limit.

[10] 2nd Air Quality Daughter Directive (2000/69/EC)

Monitoring data within an AQMA

53. There are no AQMAs for benzene within East Dunbartonshire.

Transport sources

Very busy roads or junctions in built up areas

54. The LAQM.TG(03) Update – January 2006 technical guidance states that consideration of benzene from busy roads or junction should be made if the background concentration is greater than 2µg/m^3. As was noted for the previous updating and screening assessment the maximum background concentration is 0.55µg/m^3 and therefore no assessment is required for benzene from transport sources.

Industrial sources

55. SEPA was consulted regarding any new or significantly changed regulated processes within East Dunbartonshire Council area.

56. It was confirmed there have been no new processes or processes with significantly changed benzene emissions within East Dunbartonshire Council area since the previous LAQM report.

Petrol stations

57. It was confirmed from the SEPA registers that there have been no new petrol stations installed within the East Dunbartonshire Council area since the previous updating and screening assessment.

58. There are currently 12 regulated petrol stations within East Dunbartonshire. None of the petrol stations are located near to a road of 30,000 AADT or greater. It is therefore predicted that there is no potential for exceedence of the NAQS objectives for benzene due to petrol stations.

Major fuel storage depots (petroleum only)

59. As stated in previous Review and Assessments there area no major fuel depots located within East Dunbartonshire.

Benzene conclusions

60. There have been no significant changes to sources of benzene within East Dunbartonshire since the last round of assessment. It is concluded from estimated background concentrations and measured data in the neighbouring local authority, Glasgow City Council that benzene concentrations have not exceeded the 2003 annual mean objective concentration of 16.25µg/m^3. From the assessment of monitoring data and sources of benzene it is concluded that benzene concentrations within East Dunbartonshire are unlikely to exceed the 2010 annual mean NAQS objective concentration of 3.25µg/m^3 or the EU limit concentration of 5µg/m^3. It is therefore concluded that a Detailed Assessment is not required for benzene.

4 1,3-BUTADIENE

61. The objective for 1,3-butadiene for all local authorities, contained within the Air Quality Regulations 2000 and Amendment Regulations 2002, is detailed as a running annual mean not to exceed 2.25µg/m^3. The objective deadline was 31st December 2003.

Monitoring data

62. East Dunbartonshire Council has not previously and does not currently monitor 1,3-butadiene. The nearest automatic monitoring site for 1,3-butadiene is operated by the neighbouring local authority, Glasgow City Council.

63. Glasgow City Council operate one automatic 1,3-butadiene analyser at a kerbside location. Urban areas of Glasgow are contiguous with urban areas within East Dunbartonshire; the measured 1,3-butadiene concentrations from Glasgow are therefore considered representative of the 1,3-butadiene concentrations within urban parts of East Dunbartonshire. The measured 1,3-butadiene concentrations for 2003 to 2005 are presented in Table 8.

Table 8: Monitored 1,3-butadiene concentrations for Glasgow kerbside

Annual mean concentration (µg/m^3)			No. exceedences of the annual mean objective (2003 – 2005)
2003	**2004**	**2005**	**2.25µg/m^3**
0.42	0.28*	0.22	0

* % data capture rate < 75%

64. There have been no exceedences of the annual mean NAQS objective for 1,3-butadiene since the second round of review and assessment.

65. The estimated background 1,3-butadiene concentrations for East Dunbartonshire Council taken from the Netcen database are presented in Table 9.

Table 9: Background 1,3-butadiene concentrations for East Dunbartonshire (µg/m^3)

	Maximum	Minimum	Mean
Annual mean concentration 2005	0.16	0.04	0.10

66. The maximum 2005 annual mean background concentration of 1,3-butadiene is significantly below the NAQS objective for 2003, accounting for less than 8% of the annual mean objective.

Industrial sources

67. SEPA was consulted regarding any new or significantly changed regulated processes within East Dunbartonshire Council area.

68. It was confirmed there have been no new processes or processes with significantly changed 1,3-butadiene emissions within East Dunbartonshire Council area since the previous LAQM report.

1,3-butadiene conclusions

69. There have been no significant changes to sources of 1,3-butadiene within East Dunbartonshire since the last round of assessment. It is concluded from estimated background concentrations and measured data in the neighbouring local authority, Glasgow City Council that 1,3-butadiene

concentrations have not exceeded the 2003 annual mean objective concentration of 2.25µg/m^3. It is therefore concluded that a Detailed Assessment is not required for 1,3-butadiene.

5 LEAD

70. Two objectives for lead for all local authorities are contained within the Air Quality Regulations 2000 and Amendment Regulations 2002. The objectives were set as:

- the annual mean concentration not to exceed 0.5µg/m^3 by 31st December 2004; and
- the annual mean concentration not to exceed 0.25µg/m^3 by 31st December 2008.

Monitoring data

71. East Dunbartonshire Council has not previously and does not currently monitor lead. The nearest automatic monitoring sites for lead are operated by neighbouring local authorities, Glasgow City Council and North Lanarkshire Council.

72. Glasgow City Council operate one lead monitoring site at a roadside location and North Lanarkshire Council operate one lead monitoring site at the Civic Centre in Motherwell. The measured lead concentrations for 2003 to 2005 are presented in Table 10.

Table 10: Monitored lead concentrations for Glasgow and Motherwell

Site	Annual mean concentration (µg/m3)			No. exceedences of the annual mean objective (2003 – 2005)	
	2003	2004	2005	0.5µg/m3	0.25µg/m3
Glasgow	0.015	0.015	0.013	0	0
Motherwell	0.010	0.008	0.003	0	0

73. There have been no monitored exceedences of the annual mean NAQS objective for lead in Scotland since the second round of review and assessment. It is therefore unlikely that lead concentrations within East Dunbartonshire will exceed either the 2004 or the 2008 NAQS objectives for lead.

Industrial sources

74. SEPA was consulted regarding any new or significantly changed regulated processes within East Dunbartonshire Council area. It was confirmed that there have been no new industrial sources of lead or industrial sources with substantially increased lead emissions, or new relevant exposure within the East Dunbartonshire Council area since the previous updating and screening assessment.

Lead conclusions

75. There have been no significant changes to sources of lead within East Dunbartonshire since the last round of assessment. It is concluded from estimated background concentrations and measured data in the neighbouring local authorities of North Lanarkshire and Glasgow City Council that lead concentrations have not exceeded the 2004 annual mean objective concentration of 0.5µg/m^3. From the assessment of monitoring data and sources of lead it is concluded that lead concentrations within East Dunbartonshire are unlikely to exceed the 2008 annual mean NAQS objective concentration of 0.25µg/m^3 It is therefore concluded that a Detailed Assessment is not required for lead.

6 NITROGEN DIOXIDE

76. Two objectives for NO_2 for all local authorities are contained within the Air Quality Regulations 2000 and Amendment Regulations 2002. The objectives were set as:

- the annual mean concentration not to exceed 40µg/m^3 by 31st December 2005; and
- the 1-hour mean concentration not to exceed 200µg/m^3 on more than 18 occasions by 31st December 2005.

77. The same two objectives for NO_2 are contained within the 1st EU Daughter Directive[11] for Air Quality with a limit deadline of 31st December 2010.

Monitoring data

78. East Dunbartonshire Council operate a network of 24 NO_2 diffusion tubes and two automatic analysers. The automatic monitor at Bishopbriggs Cross was off-line between May and September 2005.

79. The National Environment Technology Centre (Netcen) provide a national database of background concentrations for pollutants listed in the NAQS. Revised background NO_X and NO_2 concentrations were issued at the end of 2005 based upon 2004 data. The revised and original 2001 estimates of background NO_2 concentrations for East Dunbartonshire Council are presented in Table 11.

Table 11: Background NO_2 concentrations for East Dunbartonshire (µg/m^3)

	Maximum	Minimum	Mean
2005 annual mean concentration (2001 estimates)	27.1	8.9	18.7
2005 annual mean concentration (2004 estimates)	18.2	3.0	8.2
2010 annual mean concentration (2001 estimates)	23.1	7.1	15.9
2010 annual mean concentration (2004 estimates)	16.3	2.5	6.7

80. The mean background NO_2 concentration for East Dunbartonshire for 2005 decreased by approximately 10.5µg/m^3 using the 2004 estimates compared to the 2001 estimates. This is a significant difference compared to the results reported in the last U&SA.

QA/QC of Diffusion Tube Data

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

82. Diffusion tube monitoring is less accurate than continuous monitoring techniques. Technical guidance LAQM.TG(03) recommends that diffusion tubes are co-located with chemiluminescent analysers to compare the results in order to validate the performance of the diffusion tubes and analysis technique. This performance is assessed by calculating the laboratory bias.

83. Glasgow City Council Scientific Services participates in the AEA inter-comparison scheme, with bias correction factors calculated and applied annually. The laboratory bias factors determined for Glasgow City Council and the East Dunbartonshire monitoring site are presented in Table 12.

[11] 1st Air Quality Daughter Directive (1999/30/EC)

Table 12: 2005 Bias adjustment factors for NO_2 diffusion tubes

Monitoring site	Period mean diffusion tube concentration (µg/m3) (Dm)	Period mean chemiluminescent concentration (µg/m3) (Cm)	Bias adjustment factor (Cm/Dm)	Diffusion tube bias (Dm-Cm)*100 /Cm
Glasgow City Council Urban Background Site (12 months)	47	34	0.73	- 38%
Glasgow City Council Kerbside Site (11 months)	87	64	0.74	- 36%
East Dunbartonshire Council (8 months)	38.1	40.3	1.06	7%
Mean	-	-	0.84	-

84. There is therefore a noticeable difference between the calculated bias correction factors for the three nearest co-location monitoring sites. It is likely that this difference can be attributed to the particulars of each site.

85. The local bias correction factor for 2005 is based on 8 months data due to the automatic monitor being offline between the 12th June and 13th September. Therefore the average bias adjustment factor has been applied to all East Dunbartonshire Council data as for the previous assessment.

Monitoring data outside an AQMA

86. Seventeen NO_2 diffusion tubes are located outside the AQMA, two in Bishopbriggs, two in Kirkintiloch and thirteen in Bearsden and Milngavie. The 2005 diffusion tube monitoring results outside the AQMA are detailed in Table 13.

Table 13: NO_2 Concentrations outside the AQMA (µg/m^3)

Site	2003 annual mean bias corrected concentration	2004 annual mean bias corrected concentration	2005 annual mean measured concentration	2005 annual mean concentration corrected for bias of 0.84	2005 annual mean concentration corrected for bias of 1.06
Bearsden 1	29	30	30	26	32
Bearsden 3	22	20	21	18	22
Bearsden 4	19	12	13	11	13
Bearsden 7	34	37	39	33	41
Bearsden 8	35	37	39	32	41
Bearsden 9	29	30	40	33	42
Bearsden 10	31	32	35	29	37
Bearsden 13	38	34	42	35	44
Bearsden 14	32	34	39	33	41
Bearsden 15	31	34	39	33	41
Bishopbriggs 5	19	18	19	16	20
Bishopbriggs 8	18	17	19	16	20
Kirkintilloch 15	35	32	33	28	34
Kirkintilloch 16	-	-	37	31	40
Milngavie 4 *	-	-	32	27	33
Milngavie 5 *	-	-	27	23	29
Milngavie 6 *	-	-	39	33	41

*Monitoring station commenced operation July 2005: 6 month's data only

87. The data capture rate at all sites outside the AQMA was greater than 80%, with exception of four sites (Bearsden 13, Kirkintilloch 16, Milngavie 4 and Milngavie 5) all data capture rates were above the 90% recommended for detailed assessments.

88. Using the mean bias correction factor of 0.84 results in all NO_2 concentrations recorded outside the AQMA being below the annual mean NAQS objective of 40µg/m^3. However, if the local bias correction factor of 1.06 from Bishopbriggs is used, results indicate exceedences at eight sites outside the AQMA (Bearsden 7, 8, 9, 13, 14, 15, Kirkintilloch 15 and Milngavie 6). Of theses sites four are at kerbside sites where there is no relevant public exposure, two are at sites with 6-months of monitoring data and two at Bearsden Cross where an automatic NO_X analyser has been located in recognition of high NO_2 concentrations.

89. Data recorded at the Bearsden Cross NOx analyser during 2005 was invalid due to technical problems with span gas calibration. A replacement cylinder of gas has been installed at the monitor and the site will be operational for 2006.

Monitoring data within an AQMA

90. Six NO_2 diffusion tubes and the automatic analyser are located within the AQMA. Two diffusion tubes are sited to the north of Bishopbriggs Cross junction, the automatic analyser and co-location tubes at Bishopbriggs Cross junction and one diffusion tube at the junction of Kirkintilloch Road and Colston Road.

91. The 2005 automatic monitoring data is presented in Table 14 and the diffusion tube monitoring results within the AQMA are detailed in Table 15.

Table 14: NO_2 Concentrations measured by automatic analyser within the AQMA

Objective	Bishopbriggs Cross
2004 annual mean concentration (µg/m^3)	35.8
99.8th percentile of 1-hour mean concentrations (µg/m^3)	114.2
Maximum 1-hour mean concentration (µg/m^3)	137.3
2004 data capture rate (%)	100
2005 period mean	38.3
2005 estimated annual mean concentration (µg/m^3)	35.6
99.8th percentile of 1-hour mean concentrations (µg/m^3)	160.3
Maximum 1-hour mean concentration (µg/m^3)	375.3
2005 data capture rate (%)	73.7

92. The annual mean concentration at the chemiluminescent analyser site is below the annual mean NAQS objective for NO_2 in both 2004 and 2005. However, the data capture rate for 2005 is significantly below the 90% required for detailed assessments and Further Assessments of AQMAs.

93. The three diffusion tubes located at this site have all recorded annual mean NO_2 concentrations marginally below the concentrations measured by the automatic monitor in both 2004 and 2005. The local bias correction factors of 1.07 and 1.06 for the past two years indicate that the monitored NO_2 concentrations recorded by the two monitoring methods at the site are consistent.

Table 15: NO_2 Concentrations within the AQMA (µg/m^3)

Site	2003 annual mean bias corrected concentration	2004 annual mean bias corrected concentration	2005 annual mean concentration (raw data)	2005 annual mean concentration corrected for bias of 0.84	2005 annual mean concentration corrected for bias of 1.06
Bishopbriggs 6	38	39	42	35	44
Bishopbriggs 12	40	35	40	34	43
Bishopbriggs 13	41	42	47	39	50
Bishopbriggs 14A	-	32	34	28	36
Bishopbriggs 14B	-	30	34	29	36
Bishopbriggs 14C	-	30	34	28	36

94. The data capture rate at all sites within the AQMA was 100% ensuring a high confidence in results.

95. Using the mean bias correction factor of 0.84 results in all NO_2 concentrations recorded within the AQMA being below the annual mean NAQS objective of 40µg/m^3. However, if the local bias correction factor of 1.06 from Bishopbriggs is used, results indicate exceedences at three sites (Bishopbriggs 6, 12 and 13).

Transport sources

96. The Scottish Executive and East Dunbartonshire Council Roads Department were contacted for updated road traffic flow data for roads within East Dunbartonshire.

Narrow congested streets with residential properties close to the kerb

97. The 2003 U&SA identified the Townhead road in Kirkintilloch as a narrow congested street with residential properties within 5m of the kerb. The 2005 NO_2 concentration recorded at the kerbside monitoring site was 28µg/m^3 and the estimated NO_2 background concentrations at this location have decreased for 2005 by 8.7µg/m^3 therefore the NAQS objectives for NO_2 are not predicted to be exceeded at this location.

Junctions

98. The 2003 U&SA assessed nine junctions within East Dunbartonshire using the DMRB screening model. Properties at Bishopbriggs Cross were shown to exceed the annual mean NAQS objective for NO_2 and properties at the junction of Colston Road and Kirkintilloch Road were shown to be within 2µg/m^3 of the NAQS Objective. Both these sites are now incorporated within the Bishopbriggs AQMA. The estimated NO_2 background concentrations within the AQMA have decreased for 2005 by 8µg/m^3 to 9µg/m^3. The Further Assessment of the AQMA will include a discussion of background concentrations and use the 2004 revised estimates in addition to monitoring data to verify exceedences of NO_2 predicted in the Detailed Assessment.

Busy streets where people may spend 1-hour or more close to traffic

99. The 2003 U&SA identified Kirkintilloch Road in Bishopbriggs, Drymen Road in Bearsden and Townhead in Kirkintilloch as locations where people may spend 1-hour or more close to a busy road.

100. All three roads were assessed as part of the Detailed Assessment for road traffic. The Detailed Assessment concluded that NO_2 concentrations simulated by the atmospheric dispersion model were predicted to exceed the annual mean NAQS objective at several properties along Kirkintilloch Road in Bishopbriggs, at properties near Bearsden Cross on the A809 and at properties close to the Industry Street/Parliament Road/Townhead junction in Kirkintilloch.

101. Kirkintilloch Road is incorporated within the Bishopbriggs AQMA and an automatic NO_x analyser has been installed at Bearden Cross to monitor NO_2 concentrations prior to making a decision on the requirement for an AQMA. A new automatic monitoring station is planned for the assessed junction in Kirkintilloch, which will include a NO_x analyser to verify model predictions.

102. The estimated NO_2 background concentrations along the assessed roads within East Dunbartonshire have decreased for 2005 by 7µg/m^3 to 10µg/m^3. This indicates that previous DMRB and modelling assessments using the 2001 background concentrations may have over-estimated the predicted NO_2 concentrations at roadside locations. A DMRB assessment using the revised background concentrations was carried out for properties at the Bishopbriggs Cross junction, where an exceedence was predicted using 2001 background concentrations. The DMRB assessment is presented in Appendix 2. The results of the revised DMRB assessment indicate that there will not be an exceedence of NAQS objectives for NO_2 at properties close to the junction. The Further Assessment will provide further analysis on background concentration estimates within the AQMA and monitoring at Kirkintilloch and Bearsden will be used to confirm the results of the 2004 Detailed Assessment.

Roads with high flows of buses and / or HGVs

103. The 2003 U&SA concluded that there were no roads within East Dunbartonshire where there was a high proportion of HGV's and /or buses. Updated traffic flows were assessed and it was determined that this conclusion is still valid.

New roads to be constructed or proposed since the previous round of R&A

104. Two phases of the Bishopbriggs Relief Road, which is being constructed in five phases, were completed prior to the 2003 U&SA. The planning process for the remaining three phases is currently underway and a detailed assessment of the Relief Road and its impacts upon the Bishopbriggs AQMA will be carried out as part of the Further Assessment to be submitted in December 2006. Detailed modelled traffic flow data is currently being compiled for the purposes of air quality assessment.

Roads with significantly changed traffic flows, or new relevant exposure

105. There have been no new residential developments located within 10m of a busy road since the last U&SA. The available traffic data from the Scottish Executive and East Dunbartonshire Roads Department indicated between 2004 and 2005 road traffic flows within East Dunbartonshire have varied by less than 5% and traffic flows along the A803, which passes through the AQMA have decreased by 2%.

Bus stations

106. As stated in the previous U&SA there are no bus stations within East Dunbartonshire.

Aircraft

107. As stated in previous Review and Assessments there are no airports within the East Dunbartonshire area.

New developments

108. New residential and commercial developments discussed in the 2005 LAQM Progress Report for which construction has been completed, already commenced or is expected to commence in 2006 include Katrine Water Project, Canniesburn Hospital site, ASDA in Bearsden, Cancer Research Facility at Garscube, and a housing and business development in Lennoxtown. It was concluded that these developments were unlikely to result in a significant detriment to local air quality.

109. Planning permission has also been granted and construction commenced for a leisure centre at Woodhead Park in Kirkintilloch and a commercial development on Westerhill Road in Bishopbriggs. These developments are likely to lead to a slight increase in road traffic and therefore emissions of NO_2 within Kirkintilloch and Bishopbriggs respectively.

110. Outline planning permission has been granted for the development of seven school sites which will include a mixture of housing and school facilities. These developments are unlikely to generate significant increases in road traffic as part of the land will remain under its current use.

111. Outline planning permission for 920 housing units has been granted for the Woodilee area of Kirkintilloch east of Lenzie. This has the potential to increase road traffic and thus NO_2 emissions within Kirkintilloch although it is likely that much of the traffic generated will not pass through the centre, where recorded levels of NO_2 are high.

112. Outline consent for 320 units at Lennox Castle Hospital is likely to result in increased NO_2 concentrations due to increases in road traffic. However, current NO_2 concentrations in the Lennoxtown are significantly below NAQS objectives and therefore local air quality is unlikely to be an issue.

113. There are also several proposals which are still not determined but are likely to have a significant impact upon local air quality:

- The Kirkintilloch Link Road and Bishopbriggs Relief Road for the phase including a bridge over the rail line will be considered further as part of the Bishopbriggs AQMA Further Assessment;
- Bishopbriggs East housing proposal (up to 400 units) is still under discussion;
- Planning permission was refused for redevelopments at Low Moss prison north of Bishopbriggs and a public enquiry will be held in 2006 for the appeal against the decision;
- Planning consents for an Arts and Culture centre, industrial / business and housing developments at the canal basin on Southbank Road in Kirkintilloch have been granted but no development has yet taken place; and
- Kilmardinny / Westpark area was being set aside in the East Dunbartonshire Council Master Plan for business, housing, retail, sports amenities and rail halt and is still under discussion.

Industrial sources

114. SEPA was consulted regarding any new or significantly changed regulated processes within East Dunbartonshire Council area. It was confirmed there have been no new processes or processes with significantly changed NO_2 emissions within East Dunbartonshire Council area since the previous LAQM report.

NO_2 conclusions

115. There have been no significant changes to sources of NO_2 within East Dunbartonshire since the last round of assessment. The Detailed Assessment, completed in 2004, reported on monitored and modelled NO_2 concentrations within East Dunbartonshire and set out the evidence used to declare the AQMA in Bishopbriggs. It was determined that there was not sufficient monitoring data to verify modelling exceedences in Bearsden, Kirkintilloch and Milngavie and that further monitoring would be undertaken in these areas. An automatic chemiluminescence monitor has been installed at Bearsden Cross to provide hourly NO_2 concentrations; however, a full year of monitoring data is not available for this site.

116. Dependent upon the bias correction factors used (laboratory mean or local) measured NO_2 concentrations for 2005 at three locations within the existing AQMA in Bishopbriggs and at eight locations in Bearsden, Kirkintilloch and Milngavie were close to or above the annual mean 2005 NAQS objective of 40µg/m^3. NO_2 concentrations measured at the chemiluminescence analyser within the AQMA were below the annual mean 2005 NAQS objective of 40µg/m^3.

117. From the assessment of automatic monitoring data and sources of NO_2 it is concluded that NO_2 concentrations within East Dunbartonshire are unlikely to have exceeded the 2005 1-hour mean NAQS objective concentration of 200µg/m^3

118. It is therefore concluded that a Detailed Assessment is not required for NO_2 but that ongoing monitoring and modelling will be reported in the AQMA Further Assessment to be submitted in December 2006.

7 SULPHUR DIOXIDE

119. Three objectives for SO_2 for all local authorities are contained within the Air Quality Regulations 2000 and Amendment Regulations 2002. The objectives were set as:

- the 24-hour mean concentration not to exceed 125µg/m^3 on more than 3 occasions by 31st December 2004;
- the 1-hour mean concentration not to exceed 350µg/m^3 on more than 24 occasions by 31st December 2004; and
- the 15-minute mean concentration not to exceed 266µg/m^3 on more than 35 occasions by 31st December 2005.

Monitoring data

120. The estimated background SO_2 concentrations for East Dunbartonshire Council taken from the Netcen database are presented in Table 16.

Table 16: Background SO_2 concentrations for East Dunbartonshire (µg/m^3)

	Maximum	Minimum	Mean
Annual mean concentration 2005	2.41	0.95	1.36

121. Maximum background concentrations of SO_2 for 2005 are significantly below the relevant NAQS objectives accounting for less than 2% of the 24-hour, 1-hour and 15-minute mean objective concentrations.

Monitoring data outside an AQMA

122. East Dunbartonshire Council has previously monitored SO_2 using bubbler analysers at six sites. The locations of the SO_2 bubblers are presented in Figure 5 and detailed in Table 17.

Table 17: Locations of SO_2 bubbler sites

Site	Site No.	Location	Grid Reference	2005 Data Capture Rate (%)
Bearsden 5	BD5	Westerton Hall, Maxwell Av, Bearsden	NS 53980 70605	87
Bishopbriggs 5	BB5	Huntershill House, Crowhill Rd	NS 60948 69610	86
Kirkintilloch 8	K8	Merkland Recreation Centre, Merkland Place	NS 67000 74100	100
Kirkintilloch 10	K10	John St Hostel, John St	NS 65935 74115	98
Lennoxtown 9	L1	Craighead Primary School, Craighead Rd	NS 65220 76830	98
Milngavie 1	M1	1 Grange Av	NS 55550 74590	92

123. The LAQM.TG(03) technical guidance provides correction factors for calculating the 99.9th percentile of 15-minute means and the 99.7th percentile of 1-hour means based upon the maximum daily mean recorded during a given year. The SO_2 concentrations are determined by net titration, therefore the technical guidance states that the maximum daily mean should be factored by 1.25 to account for the under-read of bubblers at high concentrations. Equations 1 and 2 provide the estimates for the 15-minute and 1-hour mean percentiles corresponding to the NAQS objectives for SO_2.

Equation 1

99.9th percentile of 15-minute means = 1.8962 * maximum daily mean

Equation 2

99.7th percentile of 1-hour means = 1.3691 * maximum daily mean

124. The annual mean SO_2 concentrations recorded in East Dunbartonshire during 2005 are presented in Table 18.

Table 18: SO_2 Concentrations for East Dunbartonshire during 2005 (µg/m^3)

Site	Annual mean concentration	Maximum 24-hour mean concentration	99th percentile of 24-hour mean concentration	Estimated 99.7th percentile of 1-hour mean concentration	Estimated 99.9th percentile of 15-minute mean concentration
Bearsden 5	16	39	38	53	74
Bishopbriggs 5	17	60	45	82	114
Kirkintilloch 8	12	42	36	58	80
Kirkintilloch 10	19	49	45	67	93
Lennoxtown 9#	19	92	61	136	175
Milngavie 1	14	99	43	136	188

The maximum 24-hour mean concentration recorded at the Lennoxtown 9 site was 332 , which was more than 3 times the maximum recorded at any other site and 3 times the other 24-hour mean concentrations recorded at Lennoxtown during 2005. The smoke concentration recorded at the site on the same day was not high and it was therefore considered outside the usual statistical range and discounted.

125. The monitoring results in Table 16 indicate that the monitoring site at Lennoxtown 9 experienced the highest SO_2 concentrations during 2005. However, the projected short-term SO_2 concentrations for 2005 are significantly below the 24-hour, 1-hour and 15-minute NAQS objectives for SO_2.

126. The SO_2 bubbler sites in East Dunbartonshire ceased operation at the end of 2005. The bubbler sites were closed following the announcement of the decommissioning of the National SO_2 bubbler network. The SO_2 bubbler sites within East Dunbartonshire have been discontinued due to the significant decline in SO_2 concentrations within the area, which was highlighted in the 2005 LAQM Progress Report. Monitoring of SO_2 using the 8-port bubblers and the net titration technique is less accurate at low concentrations than using automatic analysers. Due to the continued decrease in SO_2 concentrations across the council area it was considered unnecessary to maintain the bubbler monitoring sites.

127. The nearest automatic monitoring site for SO_2, recording 1-hour mean and 15-minute mean concentrations, is operated by the neighbouring local authority, Glasgow City Council. The results of the automatic SO_2 monitor in Glasgow are presented in Table 19.

Table 19: Monitored SO_2 concentrations for Glasgow Centre

Objective	Concentration (µg/m^3)			No. exceedences of the objective (2003 – 2005)
	2003	2004	2005	
99th %ile of 24-hour means	24	8	7	0
99.79th %ile of 1-hour means	43	19	16	0
99.9th %ile of 15-minute means	69	32	19	0

128. There have been no measured exceedences of the SO_2 objectives at either the SO_2 bubbler sites in East Dunbartonshire or the automatic SO_2 monitor site in Glasgow.

Monitoring data within an AQMA

129. There are no AQMAs for SO_2 within East Dunbartonshire.

Industrial sources

130. SEPA was consulted regarding any new or significantly changed regulated processes within East Dunbartonshire Council area. It was confirmed there have been no new processes or processes with significantly changed SO_2 emissions within East Dunbartonshire Council area since the previous LAQM report.

Small boilers > 5MW$_{(thermal)}$

131. There were no boilers greater than 5MW $_{(thermal)}$ identified in the 2003 U&SA.

132. East Dunbartonshire Council Estates Department confirmed that it did not operate any boiler houses at schools or other sites which exceed 5MW.

133. There are no large hospital sites operated by NHS Greater Glasgow within the East Dunbartonshire Council area.

134. It is therefore concluded that there is no potential for exceedence of the NAQS objectives for SO_2 due to emissions from small boilers.

Domestic sources

Areas of domestic coal burning

135. Domestic fuel burning was assessed in the 2003 U&SA. It was determined that there was no potential for exceedence of the NAQS objectives for SO_2 due to domestic fuel burning. There have been no substantial changes to domestic fuel burning therefore it is concluded that there is no potential for exceedence of the NAQS objectives for SO_2 due to domestic coal burning.

Transport sources

Shipping

136. As stated in previous Review and Assessments there are no harbours or ports within the East Dunbartonshire area.

Railway locomotives

137. The U&SA completed in 2003 identified two rail lines, used by diesel trains, passing through areas of East Dunbartonshire:

- The diesel line from Glasgow through Bishopbriggs and Lenzie stations; and

- The diesel line from Glasgow through Westerton Station servicing the north west of Scotland.

138. An electric line from Westerton Station passing through Bearsden and Hillfoot Stations terminating at Milngavie Station was also identified. No diesel trains use this line therefore it is concluded that there is no potential for exceedence of the 15-minute mean NAQS objective for SO_2 along this line.

139. Information gathered for the 2003 U&SA confirmed that there were no locations within East Dunbartonshire where diesel trains might stop for 15 minutes or more. Updated information on locations within East Dunbartonshire where diesel trains might be left idling for periods of greater than 15 minutes was requested from EWS and First Scotrail. No information has yet been received and therefore it is concluded that the conclusions of the previous assessment remain valid. Any additional data received from EWS and First Scotrail will be reported in the 2007 LAQM Progress report.

SO_2 conclusions

140. There have been no significant changes to sources of SO_2 within East Dunbartonshire since the last round of assessment. It is concluded from measured data that SO_2 concentrations have not exceeded the 24-hour mean NAQS objective concentration for 2004 of 125µg/m^3, the 1-hour mean objective concentration for 2004 of 350µg/m^3 or the 15-minute mean NAQS objective concentration for 2005 of 266µg/m^3. From the assessment of monitoring data and sources of SO_2 it is concluded that a Detailed Assessment is not required for SO_2.

8 PARTICULATES

141. Two objectives for PM_{10} for all local authorities are contained within the Air Quality Regulations 2000 and a further two more stringent objectives are contained in the Air Quality (Scotland) Amendment Regulations 2002. The objectives were set as:

- the annual mean concentration not to exceed 40µg/m^3 by 31st December 2004;
- the 24-hour mean concentration not to exceed 50µg/m^3 on more than 35 occasions by 31st December 2004;
- the annual mean concentration not to exceed 18µg/m^3 by 31st December 2010; and
- the 24-hour mean concentration not to exceed 50µg/m^3 on more than 7 occasions by 31st December 2010.

Monitoring data

142. East Dunbartonshire Council have previously monitored PM_{10} using a beta-attenuation analyser. The analyser was installed at the Bishopbriggs Cross road junction where it was identified in the last U&SA that there was potential for exceedence of NO_2 and particulates due to road traffic emissions. Upon completion of a full year of monitoring, an AQMA was declared for the section of the A803 through Bishopbriggs from Colston Road to Cadder Roundabout. East Dunbartonshire Council decided it would be appropriate to install a gravimetric analyser at the site to obtain more accurate PM_{10} measurements. A second PM_{10} analyser has been installed at Bearsden Cross where modelling carried out during the Detailed Assessment revealed that there was potential for exceedence of the 2010 annual mean NAQS objective for PM_{10}. The locations of the analysers are shown in Figure 6.

143. The National Environment Technology Centre (Netcen) provide a national database of background concentrations for pollutants listed in the NAQS. Revised background PM_{10} concentrations were issued at the end of 2005 based upon 2004 data. The revised and original 2001 estimated background PM_{10} concentrations for East Dunbartonshire Council are presented in Table 20.

Table 20: Background PM_{10} concentrations for East Dunbartonshire (µg/m^3)

	Maximum	Minimum	Mean
2005 annual mean concentration (2001 estimates)	18.0	13.2	15.4
2005 annual mean concentration (2004 estimates)	20.0	13.3	15.7
2010 annual mean concentration (2001 estimates)	16.9	12.5	14.5
2010 annual mean concentration (2004 estimates)	18.8	12.6	14.8

144. The mean background PM_{10} concentration for East Dunbartonshire for 2005 increased by approximately 0.1µg/m^3 using the 2004 estimates compared to the 2001 estimates. This is a marginal difference compared to the results reported in the last U&SA.

Monitoring data outside an AQMA

145. A PM_{10} beta attenuation analyser, with a heated inlet, was installed at Bearsden Cross in October 2005 therefore only 2 months of data are available for 2005. The results of the beta attenuation analyser (with a heated inlet) have been multiplied by a factor of 1.3 in line with the LAQM.TG(03) technical guidance. The results are presented in Table 21.

Table 21: PM_{10} Concentrations outside the AQMA during 2005 (µg/m^3).

Site	Bearsden Cross (beta-attenuation analyser)
2-month mean concentration (µg/m^3)	24.1
Estimated annual mean concentration (µg/m^3)	24.6
98th percentile of 24-hour mean concentrations (µg/m^3)	56.1
Maximum 24-hour mean concentration (µg/m^3)	79.7
No. of exceedences of the 24-hour mean objective concentration of 50µg/m^3	2
Data capture rate (%)	100%
Projected annual mean concentration for 2010 (µg/m^3)	23.0
Projected No. of exceedences of the 24-hour mean objective concentration of 50µg/m^3 for 2010	8

146. The projected annual mean PM_{10} concentration for 2010 is above the NAQS objective of 18µg/m^3. However, the monitoring commenced in November 2005 and therefore a full year of monitoring will be undertaken before making the decision as to whether an AQMA in Bearsden is required.

Monitoring data within an AQMA

147. There are currently two PM_{10} analysers co-located within the Bishopbriggs Cross AQMA. The beta-attenuation analyser (with a heated inlet) was installed in 2004 and the gravimetric analyser in 2006. Data from the gravimetric analyser will be included in the subsequent LAQM reports as there is currently insufficient data for reporting. The results from the beta-attenuation analyser have been multiplied by 1.3 following current technical guidance for quality assurance of data and are presented in Table 22.

Table 22: PM_{10} Concentrations within the AQMA during 2005

Site	Bishopbriggs Cross (beta-attenuation analyser)
Annual mean concentration (µg/m^3)	25.3
98th percentile of 24-hour mean concentrations (µg/m^3)	67.5
Maximum 24-hour mean concentration (µg/m^3)	208.3
No. of exceedences of the 24-hour mean objective concentration of 50µg/m^3	20
Data capture rate (%)	100%
Projected annual mean concentration for 2010 (µg/m^3)	23.7
Projected No. of exceedences of the 24-hour mean objective concentration of 50µg/m^3 for 2010	10

148. The projected annual mean PM_{10} concentration for 2010 at the beta-attenuation analyser site is above the NAQS objective of 18µg/m^3. The projected number of exceedences of the 24-hour mean NAQS objective is greater than the seven permitted. This indicates that the decision to declare an AQMA for this area is still valid.

149. A Further Assessment of the Bishopbriggs Cross AQMA will be submitted to the Scottish Executive in December 2006 followed by an Action Plan in 2007.

Transport sources

Busy roads and junctions in Scotland

150. The 2003 U&SA assessed nine junctions within East Dunbartonshire using the DMRB screening model. Properties at all junctions were shown to exceed the annual mean NAQS objective for PM_{10}.

151. A Detailed Assessment of road traffic emissions within East Dunbartonshire was carried out in 2004.The Detailed Assessment used an atmospheric dispersion model to predict concentrations of PM_{10} at sensitive receptors along the busy routes. The report concluded that exceedences of the 2010 annual mean concentration were predicted by the model at properties at:

- Colston Road / Kirkintilloch Road / Springburn Road junction in Bishopbriggs;
- Kirkintilloch Road north of Bishopbriggs Cross in Bishopbriggs;
- Milngavie Road at the Roman Road / Boclair Road junction in Milngavie;
- Drymen Road at the Roman Road/ Kirk Road junctions in Bearsden; and
- Drymen Road, Maryhill Road, McFarlane Drive within 100m of Garscube Switch Roundabout.

152. The Detailed Assessment also concluded that predicted concentrations of PM_{10} for 2010 were close to the annual mean NAQS objective at Townhead in Kirkintilloch.

153. The estimated PM_{10} background concentrations along the assessed roads within East Dunbartonshire have increased for 2004 by 1.2µg/m^3 to 2.4µg/m^3 and for 2010 by 1.2µg/m^3 to 2.3µg/m^3. This indicates that previous DMRB and modelling assessments using the 2001 background concentrations may have under-estimated the predicted PM_{10} concentrations at roadside locations. The Further Assessment will provide further analysis on background estimates within the AQMA and monitoring at Kirkintilloch and Bearsden will be used to confirm the results of the 2004 Detailed Assessment.

154. An AQMA was declared in December 2005 which encompassed the predicted areas of exceedence in Bishopbriggs. No monitoring data was available for the Bearsden and Milngavie areas therefore it was recommended that a full year of monitoring be undertaken prior to making the decision to declare an AQMA. Results from the monitoring will be reported in the 2007 Progress Report.

155. It is planned that an automatic PM_{10} analyser will be installed at the Industry Street / Parliament Road / Townhead junction in Kirkintilloch to verify PM_{10} concentrations that were predicted, in the Detailed Assessment, to be close to the annual mean NAQS objective for 2010.

Junctions

156. These are covered in the previous section.

Roads with high flows of buses and / or HGVs

157. The 2003 U&SA concluded that there were no roads within East Dunbartonshire where there was a high proportion of HGV's and /or buses. Updated traffic flows were assessed and it was determined that this conclusion is still valid.

New roads to be constructed or proposed since the previous round of R&A

158. Two phases of the Bishopbriggs Relief Road, which is being constructed in five phases, were completed prior to the 2003 U&SA. The planning process for the remaining three phases is currently underway and a detailed assessment of the Relief Road and the impacts upon the Bishopbriggs AQMA will be carried out as part of the Further Assessment to be submitted in December 2006.

Roads with significantly changed traffic flows, or new relevant exposure

159. There have been no new residential developments located within 10m of a busy road since the last U&SA. The available traffic data from the Scottish Executive and East Dunbartonshire Roads Department indicated that between 2004 and 2005 road traffic flows within East Dunbartonshire have varied by less than 5% and traffic flows along the A803, which passes through the AQMA have decreased.

Roads close to the objective during the second round of Review and Assessment

160. All roads, assessed in the last U&SA, were predicted to result in exceedences of the 2010 annual mean objective at nearby properties. All major routes were included in the Detailed Assessment and a new beta attenuation analyser is now operating at Bearsden Cross to monitor PM_{10} at a location where the atmospheric dispersion model predicted exceedences of the 2010 annual mean NAQS objective.

Aircraft

161. As stated in previous Review and Assessments there are no airports within the East Dunbartonshire area.

New developments

162. New residential and commercial developments discussed in the 2005 LAQM Progress Report for which construction has been completed, already commenced or is expected to commence in 2006 include Katrine Water Project, Canniesburn Hospital site, ASDA in Bearsden, Cancer Research Facility at Garscube, and a housing and business development in Lennoxtown. It was concluded that these developments were unlikely to result in a significant detriment to local air quality.

163. Planning permission has also been granted and construction commenced for a leisure centre at Woodhead Park in Kirkintilloch and a commercial development on Westerhill Road in Bishopbriggs. These developments are likely to lead to a slight increase in road traffic and therefore emissions of PM_{10} within Kirkintilloch and Bishopbriggs respectively.

164. Outline planning permission has been granted for the development of seven school sites which will include a mixture of housing and school facilities. These developments are unlikely to generate significant increases in road traffic as part of the land will remain under its current use.

165. Outline planning permission for 920 housing units has been granted for the Woodilee area of Kirkintilloch east of Lenzie. This has the potential to increase road traffic and thus PM_{10} emissions within Kirkintilloch although it is likely that much of the traffic generated will not pass through the centre, where predicted levels of PM_{10} are high.

166. Outline consent for 320 units at Lennox Castle Hospital is likely to result in increased PM_{10} concentrations due to increases in road traffic. However, current estimated PM_{10} concentrations in the Lennoxtown are significantly below NAQS objectives and therefore local air quality is unlikely to be an issue.

167. There are also several proposals which are still not determined but are likely to have a significant impact upon local air quality:

- The Kirkintilloch Link Road and Bishopbriggs Relief Road for the phase including bridge over the rail line will be considered further as part of the Bishopbriggs AQMA Further Assessment;

- Bishopbriggs East housing proposal (up to 400 units) is still under discussion;
- Planning permission was refused for redevelopments at Low Moss prison north of Bishopbriggs and a public enquiry will be held in 2006 for the appeal against the decision;
- Planning consents for an Arts and Culture centre, industrial / business and housing developments at the canal basin on Southbank Road in Kirkintilloch have been granted but no development has yet taken place; and
- Kilmardinny / Westpark area was being set aside in the East Dunbartonshire Council Master Plan for business, housing, retail, sports amenities and rail halt and is still under discussion.

Industrial sources

168. SEPA was consulted regarding any new or significantly changed regulated processes within East Dunbartonshire Council area. It was confirmed there have been no new processes or processes with significantly changed PM_{10} emissions within East Dunbartonshire Council area since the previous LAQM report.

Quarries / landfill sites / opencast coal / handling of dusty cargo at ports etc.

169. The 2003 U&SA identified three sites within East Dunbartonshire and two sites within 1km of the East Dunbartonshire boundary with potential fugitive PM_{10} emissions.

170. Douglasmuir Quarry, Summerston landfill and Dawsholm refuse destruction were assessed to have no relevant public exposure.

171. Inchbelle Quarry and landfill site in Kirkintilloch was assessed to have several properties with relevant exposure. However, from the site inspection reports and no records of complaint it was concluded that the site did not require further assessment.

172. There have been no new or significant changes to authorised quarries or landfills within the East Dunbartonshire Council area. It is therefore concluded that the assessment of the 2003 U&SA remain valid.

Domestic sources

Areas of domestic coal burning

173. Domestic fuel burning was assessed in the 2003 U&SA, it was determined that there was no potential for exceendence of the NAQS objectives for PM_{10} due to domestic fuel burning. There have been no substantial changes to domestic fuel burning therefore it is concluded that there is no potential for exceedence of the NAQS objectives for PM_{10} due to domestic coal burning.

PM_{10} conclusions

174. There have been no significant changes to sources of PM_{10} within East Dunbartonshire since the last round of assessment. The Detailed Assessment, completed in 2004, reported on monitored and modelled PM_{10} concentrations within East Dunbartonshire and set out the evidence used to declare the AQMA in Bishopbriggs. It was determined that there was not sufficient monitoring data to verify modelling exceedences in Bearsden, Kirkintilloch and Milngavie and that further monitoring would be

undertaken at Bearden. An automatic TEOM monitor has been installed at Bearsden Cross to verify modelled exceedences.

175. Measured PM_{10} concentrations for 2005 within the existing AQMA in Bishopbriggs and at Bearsden complied with the annual mean and 24-hour mean NAQS objective concentrations. However, concentrations at both locations exceeded the 2010 annual mean NAQS objective of 18µg/m^3 .and are predicted to exceed the annual mean objective concentration in 2010. A full year of monitoring data is not available for the Bearsden site therefore the decision to declare an AQMA will be made upon completion of the full year of monitoring. .

176. It is therefore concluded that a Detailed Assessment is not required for PM_{10} but that ongoing monitoring and modelling will be reported in the AQMA Further Assessment to be submitted in December 2006.

9 SUMMARY OF FINDINGS AND CONCLUSIONS

Changes to atmospheric emission sources

177. There were no new or significantly changed industrial sites, small boiler sites, quarries or landfill sites identified since the last U&SA.

178. Road traffic flows within the area have not changed significantly (< 5%) and there were no roads or junctions identified that currently require assessment. There are two road schemes currently at planning stage, Bishopbriggs Relief Road and the Kirkintilloch Link Road, that are likely to have a significant impact upon the Bishopbriggs AQMA. These two road schemes will be assessed as part of the Further Assessment, which will be submitted in December 2006.

179. There was no significant change identified in other forms of transport within the area since the last U&SA.

180. There was no significant change identified in domestic fuel use within the area since the last U&SA.

Changes to pollutant monitoring

181. The raw NO_2 diffusion tube monitoring indicates that there were two sites within the Bishopbriggs AQMA where an exceedence of the annual mean NAQS objective of 40µg/m^3. Applying an averaged bias correction factor for the Glasgow City Council Scientific Services results in a near exceedence (39µg/m^3) at one site within the Bishopbriggs AQMA. However, applying the local bias correction factor from the Bishopbriggs Cross monitoring site results in exceedences of the annual mean NAQS objective at eleven sites (three within the AQMA, four at kerbside sites where there is no relevant public exposure, two at sites with 6 months monitoring and two at Bearsden Cross). An automatic NO_X analyser has been located at Bearsden Cross, which will be used to verify the high concentrations recorded by diffusion tubes at this location. A second co-location study will also be undertaken at this site during 2006. The diffusion tube sites with 6 months data, which recorded high concentrations of NO_2, will be re-assessed upon completion of a full years monitoring. An additional NO_X analyser is planned to be located in Kirkintilloch.

182. Over the past two decades, the SO_2 bubbler monitoring sites have recorded declining SO_2 concentrations with consistently low concentrations over the last few years. The National network of SO_2 bubbler sites was closed at the end of 2005. In conjunction with the National network closure and in recognition of the inaccuracies associated with measuring low concentrations of SO_2 using the 8-port bubbler and net titration techniques, East Dunbartonshire Council decommissioned the six remaining bubbler sites at the end of December 2005.

183. PM_{10} monitoring data from the beta-attenuation analyser at Bishopbriggs Cross indicated that for the second year running PM_{10} concentrations at the site were above the 2010 annual Mean NAQS objective and were predicted to exceed the 18µg/m^3 concentration in 2010 and the 24-hour mean NAQS objective. The gravimetric PM_{10} analyser installed at Bishopbriggs Cross at the beginning of 2006 will provide more accurate measurements of particulate matter.

184. The PM_{10} monitoring data for Bearsden Cross available for 2005 indicated that current concentrations were above the 2010 annual mean NAQS objective and were predicted to exceed the 18µg/m^3 concentration in 2010. However, this will be reassessed upon completion of a full year of monitoring. An additional PM_{10} analyser is planned to be located in Kirkintilloch.

Conclusions and actions

185. It is concluded from the review and assessment of local emissions sources and air quality monitoring data that there is no potential for exceedence of the NAQS objectives for CO, benzene, 1,3-butadiene, lead or SO_2 within East Dunbartonshire Council area.

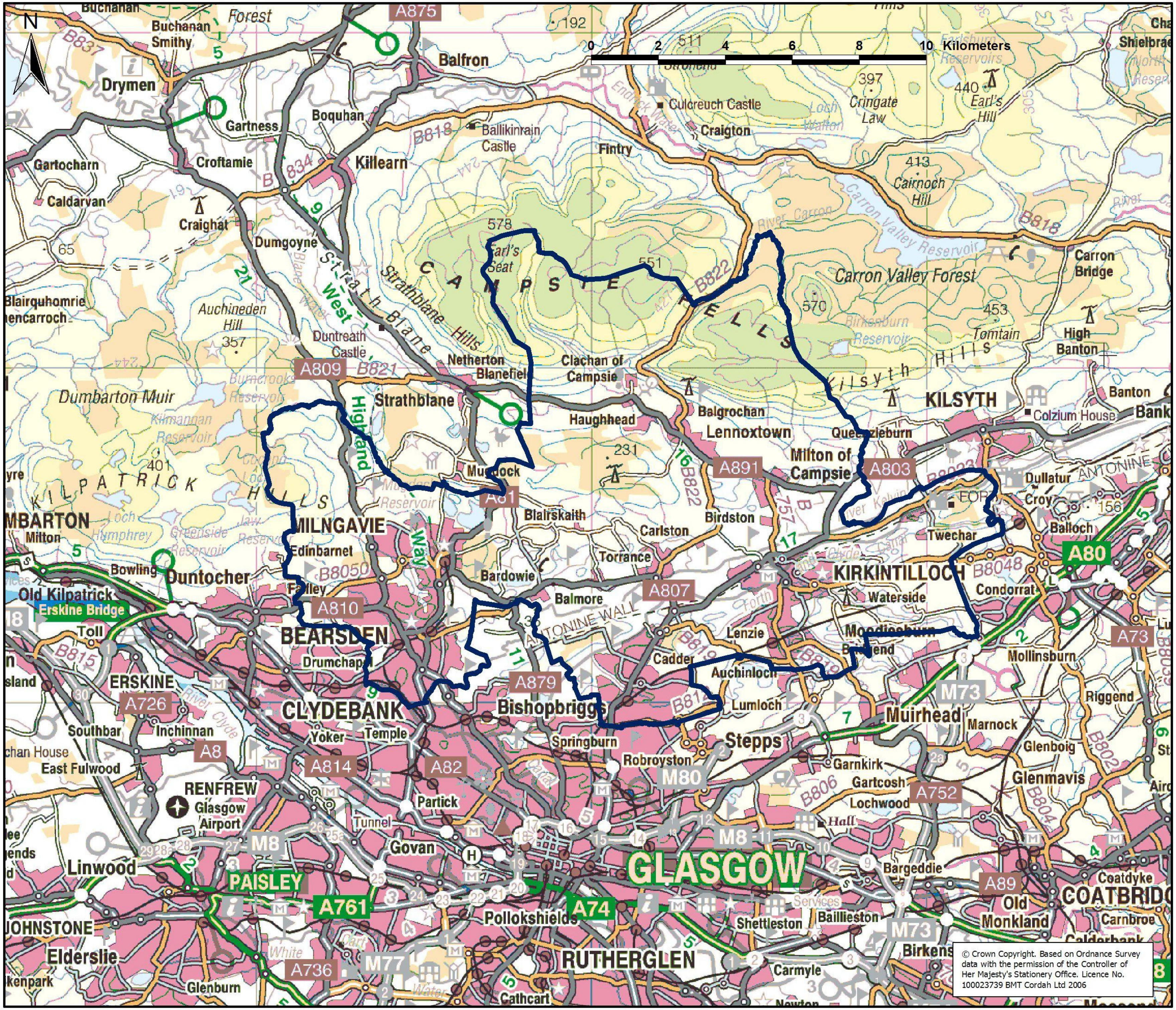
186. Bias corrected concentrations of NO_2 are shown to comply with the annual mean and hourly NAQS objective at all monitoring sites. However, there are high concentrations recorded at diffusion tube sites within the Bishopbriggs Cross AQMA and at locations around Canniesburn Roundabout and Bearsden Cross in Bearsden. Continued assessment of NO_2 concentrations and sources within the Bishopbriggs AQMA will be undertaken during 2006 as part of the Further Assessment.

187. Current monitoring data indicate that PM_{10} concentrations will exceed the 2010 annual mean NAQS objective concentration at both Bishopbriggs Cross and Bearsden Cross. Continued assessment of PM_{10} concentrations and sources within the Bishopbriggs AQMA will be undertaken during 2006 as part of the Further Assessment. Measured concentrations will be re-assessed at Bearsden upon completion of a full year of monitoring.

188. The Further Assessment of the Bishopbriggs AQMA is due for submission to the Scottish Executive in December 2006.

189. The next requirement for LAQM review and assessment is the 2007 Progress Report, which will be submitted to the Scottish Executive by the 30th April 2007.

APPENDIX 1: Figures



East Dunbartonshire Council

Legend

East Dunbartonshire Council

Date	12th May 2006
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Project title
LAQM Updating and Screening Assessment

Figure no. 1

Figure title
East Dunbartonshire Council Area

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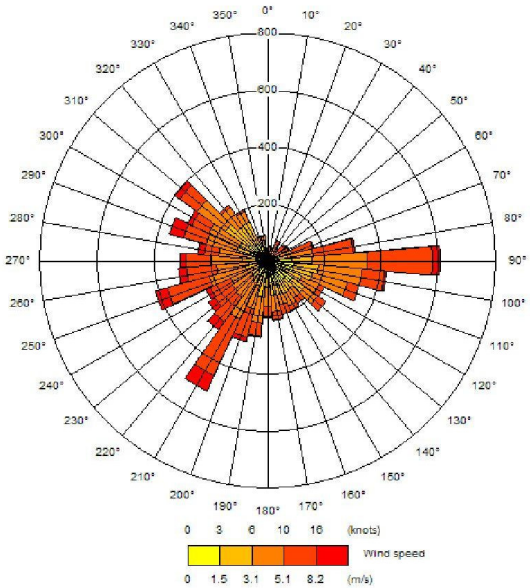
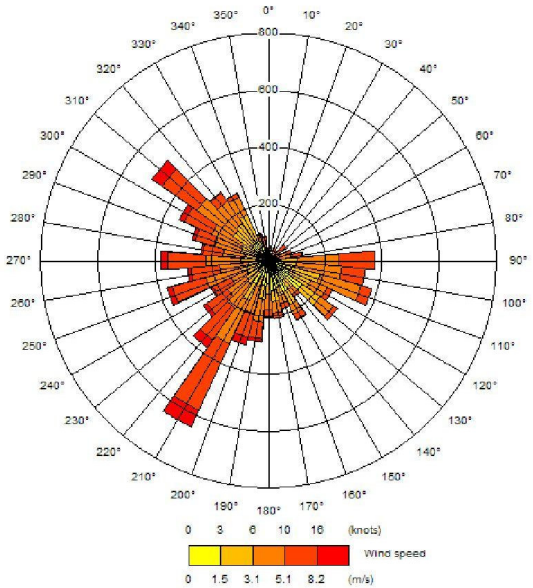
2002



2003



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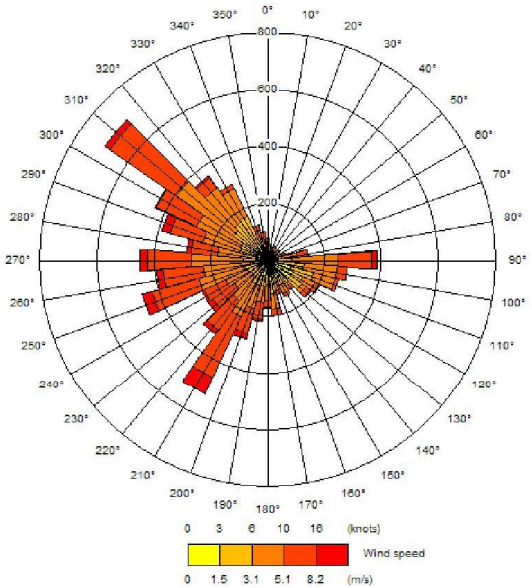
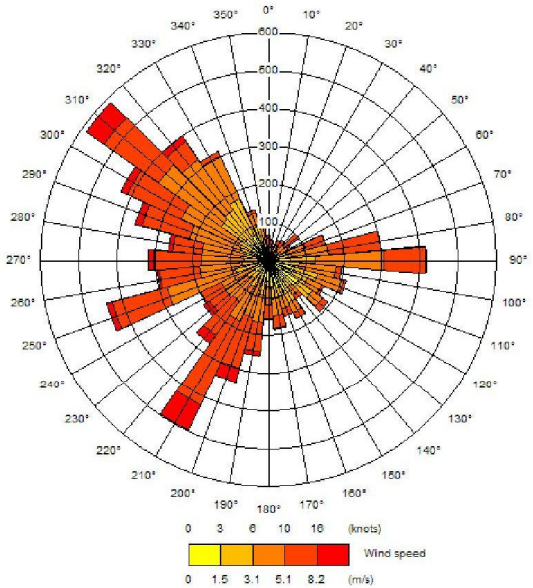


2005



East Dunbartonshire Council

Date	12th May 2006

Project title
LAQM Updating and Screening Assessment

Figure no. **2**

Figure title
Windroses for Glasgow meteorological station

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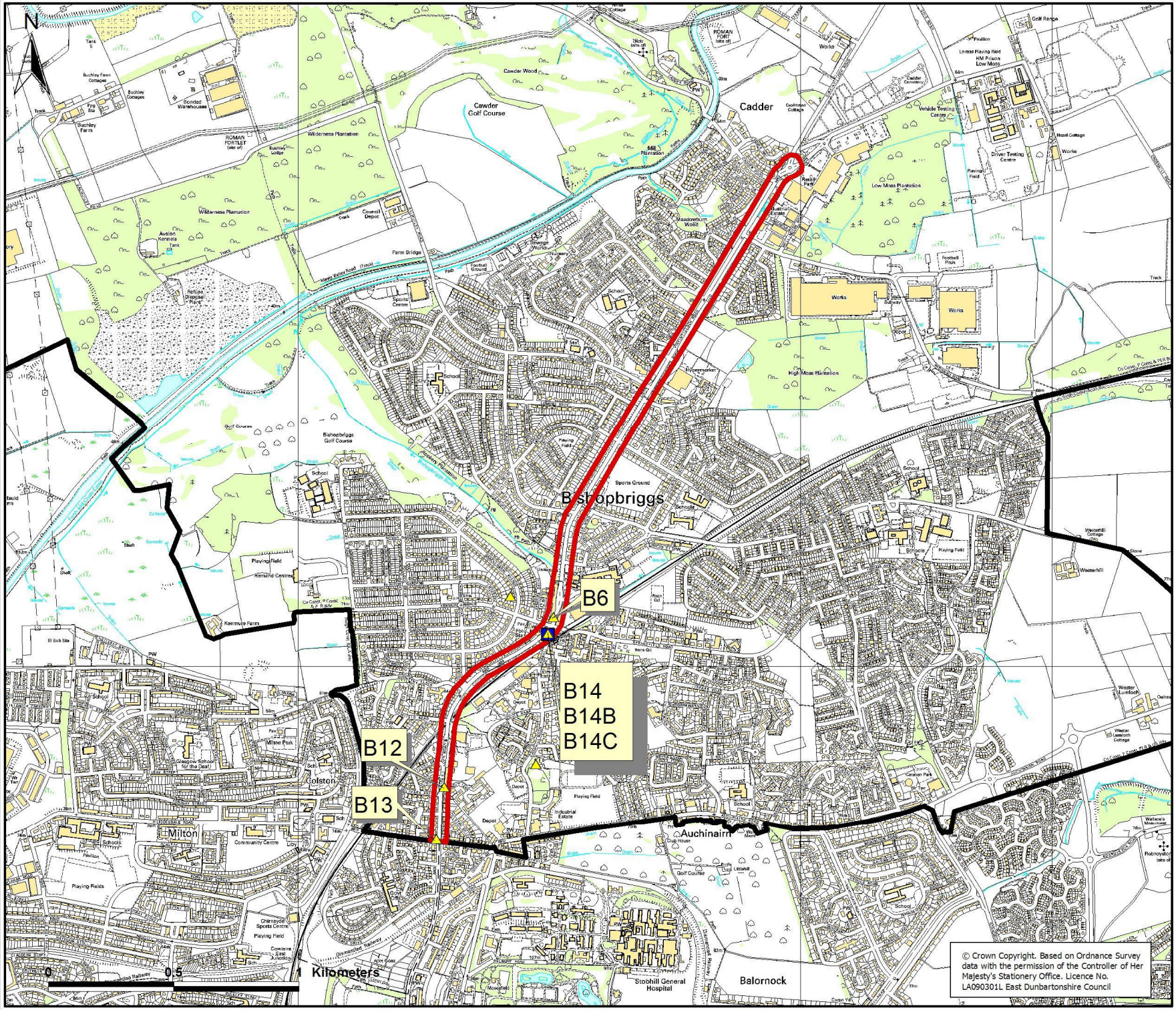

East Dunbartonshire Council

Legend

- NO2 diffusion tube sites
- Automatic monitor sites
- Bishopbriggs AQMA
- East Dunbartonshire Council

BD1: 118 Drymen Road
BD3: 5 Ravelston Rd
BD4: 8 Lowther Av
BD7: Bearsden Cross
BD8: Bearsden Cross
BD9: Switchback Rd
BD10: Maryhill Rd
BD13: Canniesburn Toll
BD14: 1 Milngavie Rd
BD15: 1 Milngavie Rd
BD16: Bearsden Cross
B5: Crowhill Rd
B6: 145 Kirkintilloch Rd
B8: 77 Brackenbrae Av
B12: Kirkintilloch Rd
B13: 1495 Springburn Rd
B14: Bishopbriggs Cross
K15: Townhead
K16: Parliament Rd
M4: Station Rd
M5: Woodburn Way
M6: Park Rd

Date	12th May 2006
Scale	refer to scale bar

Project title
LAQM Updating and Screening Assessment

Figure no. 3

Figure title
East Dunbartonshire Council Air Quality Manangement Area

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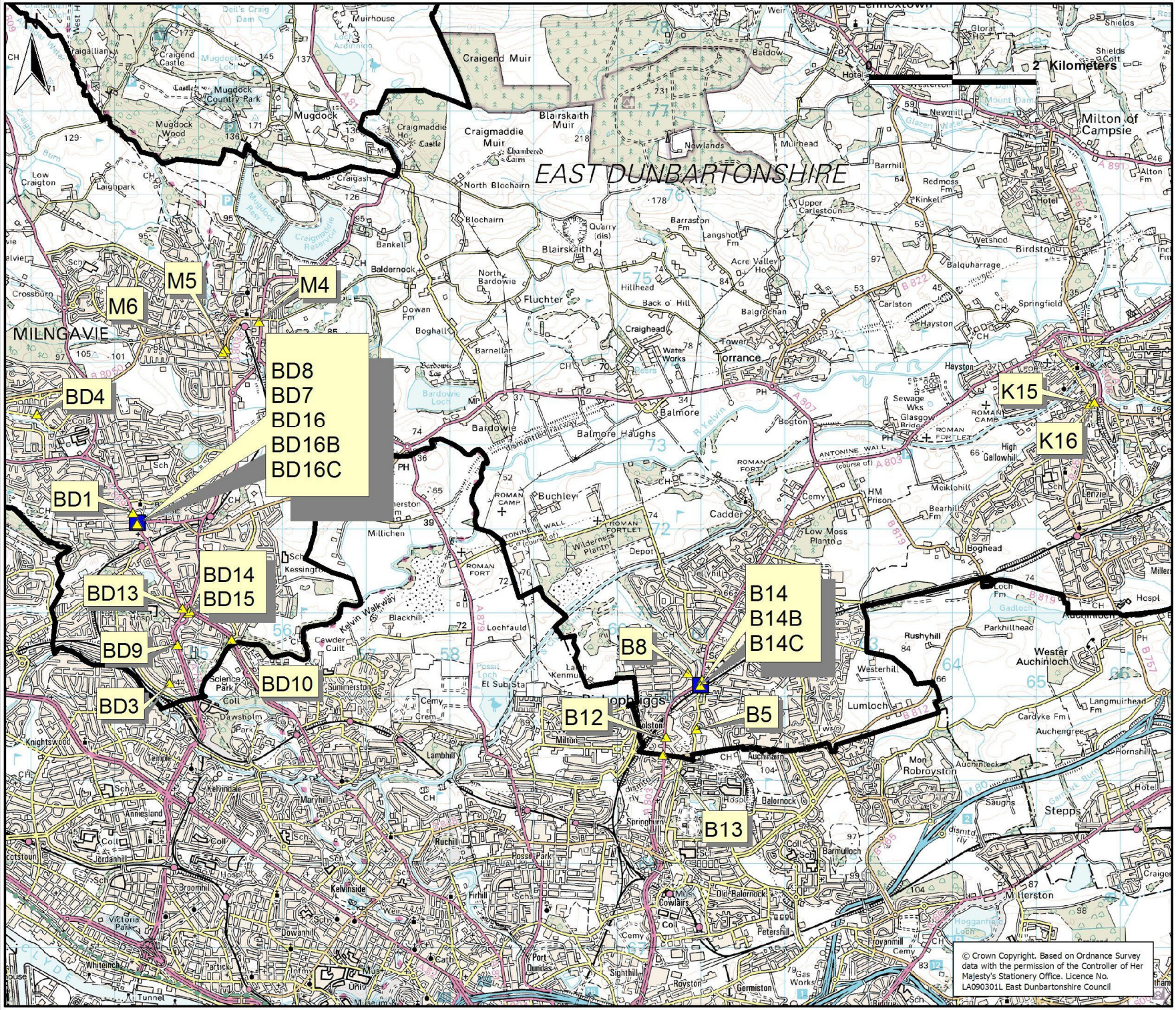

East Dunbartonshire Council

Legend

- NO2 diffusion tube sites
- NOx Chemiluminescence analysers
- East Dunbartonshire Council

BD1: 118 Drymen Road
BD3: 5 Ravelston Rd
BD4: 8 Lowther Av
BD7: Bearsden Cross
BD8: Bearsden Cross
BD9: Switchback Rd
BD10: Maryhill Rd
BD13: Canniesburn Toll
BD14: 1 Milngavie Rd
BD15: 1 Milngavie Rd
BD16: Bearsden Cross
B5: Crowhill Rd
B6: 145 Kirkintilloch Rd
B8: 77 Brackenbrae Ave
B12: Kirkintilloch Rd
B13: 1495 Springburn Rd
B14: Bishopbriggs Cross
K15: Townhead
K16: Parliament Rd
M4: Station Rd
M5: Woodburn Way
M6: Park Rd

Date	12th May 2006
Scale	refer to scale bar

Project title
LAQM Updating and Screening Assessment

Figure no. 4

Figure title
Locations of NO2 Monitoring Sites in East Dunbartonshire Council

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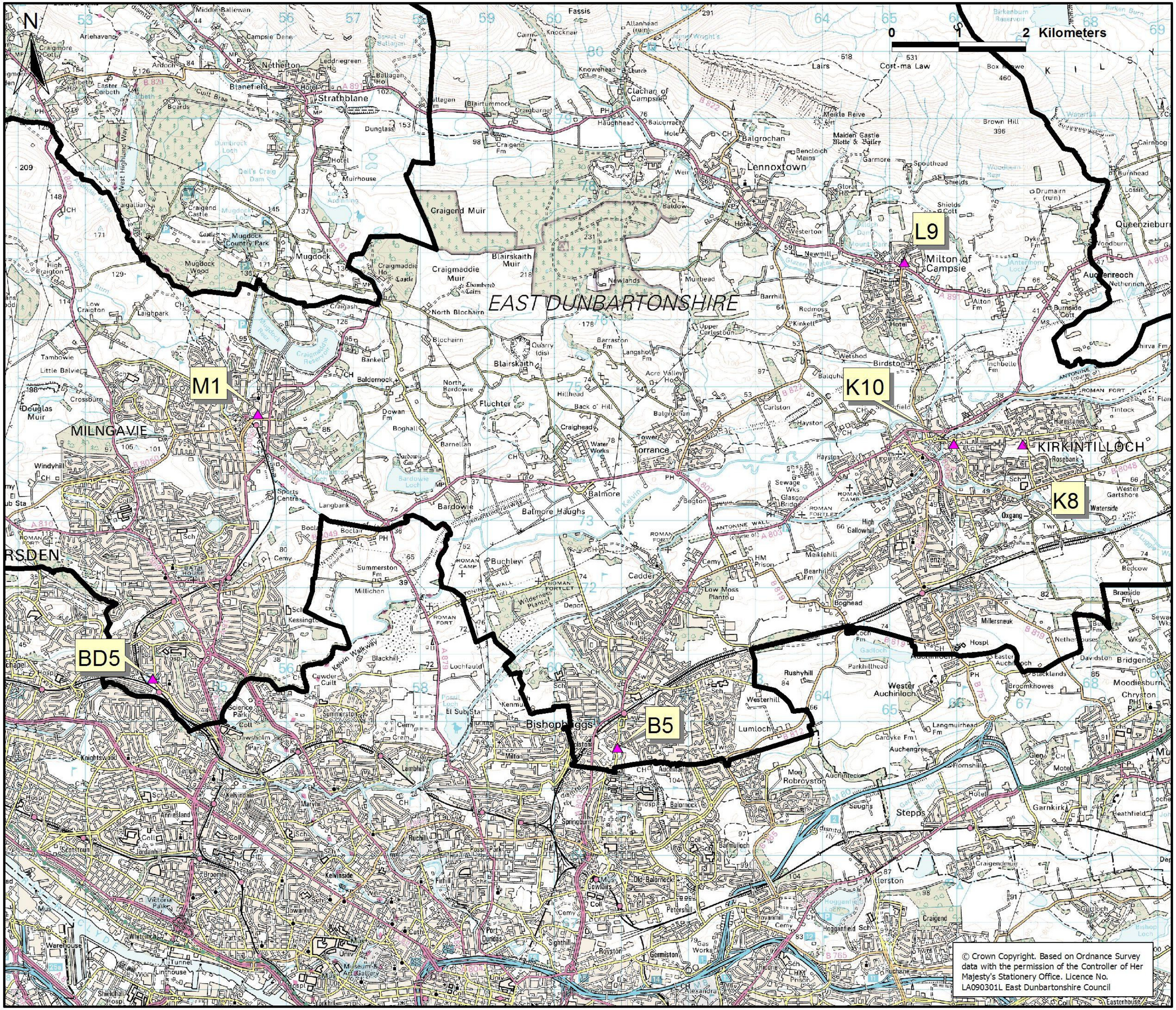

East Dunbartonshire Council

Legend

- SO2 8-port bubbler sites
- East Dunbartonshire Council

B5: Huntershill House, Crowhill Rd, Bishopbriggs

BD5: Westerton Hall, Maxwell Av, Bearsden

K8: Merkland Recreation Centre, Merkland Pl, Kirkintilloch

K10: John St Hostel, John St, Kirkintilloch

L9: Craighead Primary School, Craighead Rd, Milton of Campsie

M1: 1 Grange Av , Milngavie

Date	12th May 2006
Scale	refer to scale bar

Project title
LAQM Updating and Screening Assessment

Figure no. 5

Figure title
Locations of SO2 Monitoring Sites in East Dunbartonshire Council

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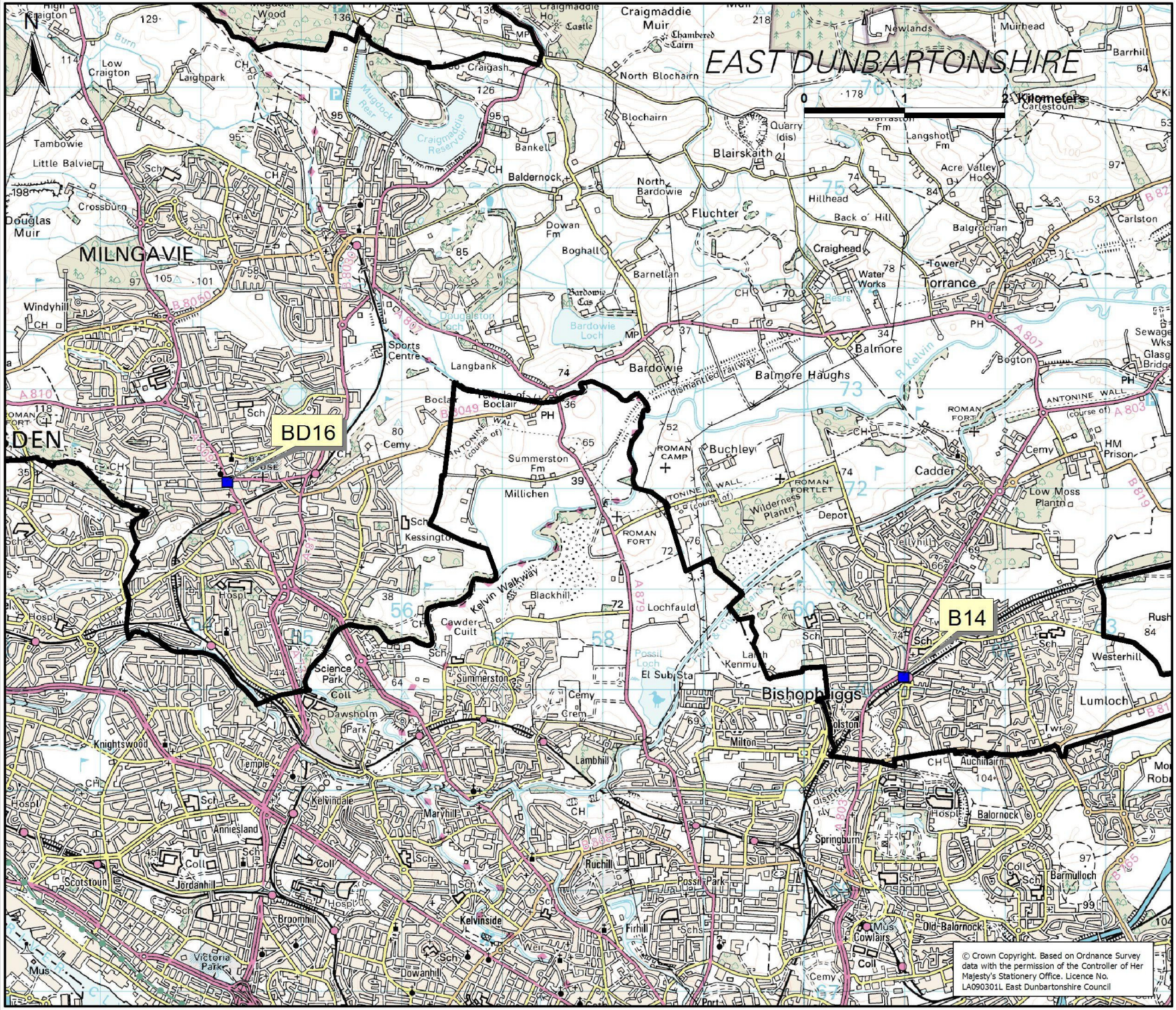

East Dunbartonshire Council

Legend

- PM10 analysers
- East Dunbartonshire Council

BD16: Bearsden Cross
Beta-attenuation analyser

B14: Bishopbriggs Cross
Beta-attenuation analyser &
Gravimetric analyser

Date	12th May 2006
Scale	refer to scale bar

Project title
LAQM Updating and
Screening Assessment

Figure no. 6

Figure title
Locations of PM10 Monitoring Sites
in East Dunbartonshire Council

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APPENDIX 2: DMRB Assessment

DMRB: Assessment of Local Air Quality

INPUT SHEET

Step 1	Receptor name	House Bishopbrigss Cross	Receptor number	1	*Step 6*
Step 2	Year	2005			*Step 7*
Step 3	Number of links	3			

Step 4

Background concentrations for 2005					
CO (mg/m^3)	Benzene ($\mu g/m^3$)	1,3-butadiene ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)
0	0	0	20	16	0

Step 5

Link number	Distance from link centre to receptor (m)	Traffic flow & speed		Traffic composition							
		AADT (combined, veh/day)	Annual average speed (km/h)	Road type (A,B,C,D)	Vehicles <3.5t GVW (LDV)			Vehicles>3.5t GVW (HDV)			
					% passen-ger cars	% light goods vehicles	Total % LDV	% buses and coaches	% rigid HGV	% articulated HGV	Total % HDV
1	11	24696	30	A			89				11
2	20	3472	30	B			95				5
3	3	3457	30	B			97				3
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

DMRB: Assessment of Local Air Quality

OUTPUT SHEET

Current receptor

Receptor Name	House Bishopbrigss Cross	Receptor number	1
Assessment year	2005		

Results

Pollutant	Annual mean				For comparison with Air Quality Standards		
	Background concentration	Road traffic component	Total	Units	Metric	Value	Units
CO	0.00	0.21	0.21	mg/m^3	Annual mean*	0.21	mg/m^3
Benzene	0.00	0.27	0.27	$\mu g/m^3$	Annual mean	0.27	$\mu g/m^3$
1,3-butadiene	0.00	0.37	0.37	$\mu g/m^3$	Annual mean	0.37	$\mu g/m^3$
NO_x	20.0	62.4	82.4	$\mu g/m^3$	Not applicable		
NO_2	16.0	14.2	30.2	$\mu g/m^3$	Annual mean*	30.2	$\mu g/m^3$
PM_{10}	0.0	7.79	7.79	$\mu g/m^3$	Annual mean	7.8	$\mu g/m^3$
					Days >50$\mu g/m^3$	0	Days

* See Footnote 4 in DMRB Volume 11 Chapter 3

Contribution of each link to annual mean

Link number	CO (mg/m^3)	Benzene ($\mu g/m^3$)	1,3-butadiene ($\mu g/m^3$)	NOx ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)
1	0.16	0.21	0.33	53.84	6.62
2	0.02	0.02	0.02	3.91	0.51
3	0.03	0.04	0.03	4.63	0.65
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

All receptors

Receptor number	Name	Year	Pollutant concentrations at receptor						
			CO *	Benzene	1,3-butadiene	NO_x	NO_2 *	PM_{10}	
			Annual mean mg/m^3	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Days >50$\mu g/m^3$
1	House Bishopbrigss Cross	2005	0.21	0.27	0.37	82.38	30.24	7.79	0.00

* See Footnote 4 in DMRB Volume 11 Chapter 3