



2012 Air Quality Updating and
Screening Assessment for

West Dunbartonshire Council

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

April 2012

West Dunbartonshire Council

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Executive Summary

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act 1995, the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. It represents West Dunbartonshire Council's latest Update and Screening Assessment. Results from monitoring in the Council area are presented and any potentially significant sources of air pollution are identified. The Update and Screening Assessment evaluates those changes since the last assessment which could lead to the risk of an air quality objective being exceeded.

Monitoring carried out in the area during 2011 has not identified any exceedences of the PM₁₀ or Nitrogen Dioxide (NO₂) objectives.

The Update and Screening Assessment has not identified any significant changes in emission sources within the Council area. There have been no new relevant industrial installations and no new or substantially altered roads within the Council area. There are also no new significant commercial, domestic or fugitive sources of emissions.

The main findings of the 2012 Update and Screening Assessment are summarised below.

Nitrogen Dioxide (NO₂)

Real Time Monitoring

West Dunbartonshire Council has two automatic monitoring stations. The location of these units has not changed since the 2011 Progress Report.

1. Dumbarton Roadside

This unit was affiliated into the national network (AURN) during 2010.

The ratified data from AEA confirms an annual mean of 19µg/m³ for 2011. There were no exceedences of the hourly mean.

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2. West Dunbartonshire, Clydebank (Kilbowie Roundabout).

The ratified data from AEA confirms an annual mean of $21\mu\text{g}/\text{m}^3$ for 2011. There were no exceedences of the hourly mean.

NO₂ Diffusion Tubes

There were 24 NO₂ diffusion tubes (excluding co-located triplicates) at various sites within the West Dunbartonshire Council area during 2011.

During that time one of these tubes – Milton 1 - breached the National Air Quality Objective for NO₂. This exceedence is fully discussed further on in this report.

West Dunbartonshire Council concludes that there is no need to proceed to Detailed Assessment in respect of Nitrogen Dioxide

PM₁₀

West Dunbartonshire Council has one Tapered Element Oscillating Microbalance (TEOM) with a Type C FDMS which was located at West Dunbartonshire, Clydebank throughout 2011. The ratified annual average confirmed by AEA for 2011 was $17\mu\text{g}/\text{m}^3$. There were 5 exceedences of the daily mean objective.

West Dunbartonshire Council concludes that there is no need to proceed to Detailed Assessment in respect of PM₁₀.

Conclusion

National Air Quality Objectives were not exceeded in 2011 in the West Dunbartonshire Council area. There is therefore no need to proceed to Detailed Assessment for any objective.

West Dunbartonshire Council will complete a Progress Report in 2013.

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- Appendix D - Clydebank NO₂ Diffusion Tube Locations
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1 Introduction

1.1 Description of Local Authority Area

West Dunbartonshire Council is the 4th smallest Scottish Council in terms of land area covering 17,792 hectares. Population is mid placed in the table of 32 Councils at approximately 96,000 in 43,000 households.

The Authority comprises two main areas:

Clydebank situated on the north of the River Clyde. Almost half the population of West Dunbartonshire Council lives in the Clydebank area giving it a population density level similar to large cities;

Dumbarton and the Vale of Leven are less densely populated areas extending along the banks of the River Leven to Loch Lomond.

The dominant landscape is moorland alongside rolling farmlands and rugged hills and ridges. West Dunbartonshire is widely recognised as containing some of the finest lowland countryside in Scotland. Although West Dunbartonshire is not a particularly agricultural area, a high proportion of the area is classed as open countryside. Contrastingly the level of urban development is significantly higher than the Scottish average. The area has the highest proportion of fresh water in Scotland, much of it of very high quality.

1.2 Purpose of Report

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

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded.

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A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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 LAQM in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
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 (PM ₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more	1-hour mean	31.12.2004

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	than 24 times a year		
	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

Report	Date	Outcome
Stage 1	1999	Proceed to Stage 2
Stage 2	2002	Continue monitoring until 2003 and report further
Update And Screening Assessment	2003	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment
Progress Report	2004	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment
Progress Report	2005	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment
Update And Screening Assessment	2006	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment
Progress Report	2007	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment
Progress Report	2008	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment
Update And Screening Assessment	2009	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment
Progress Report	2010	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment
Progress Report	2011	National Air Quality Objectives continued to be met therefore no need to proceed to detailed assessment

No exceedences of National Air Quality Objectives were identified during previous rounds of review and assessment in the West Dunbartonshire Council area.

Figure 1.1 Map of AQMA Boundaries (if applicable)

There are no Air Quality Management Areas within the West Dunbartonshire Council area.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

West Dunbartonshire Council has two automatic monitoring stations. Their location remains unchanged since the 2011 Progress Report. Location maps are included as Appendices B & C

1. Dumbarton Roadside

This unit, which contains a real time chemiluminescent NO_x analyser, was moved to the A814 (Glasgow Road, Dumbarton at its junction with Leven Street) in April 2007. This unit was affiliated into the national network (AURN) during 2010.

1. West Dunbartonshire, Clydebank

This unit houses a similar real time NO_x analyser and a TEOM fitted with a Type C FDMS. This unit is located at Kilbowie Roundabout which is the busiest junction in the West Dunbartonshire Council area. This unit has been located here since February 2007.

Details of QA/QC procedures for both automatic monitors are included as Appendix A in this report

Figure 2.1 Map(s) of Automatic Monitoring Sites (if applicable)

See Appendices B & C

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Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS GridRef	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	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?
Glasgow Road, Dumbarton (Dumbarton Roadside)	Roadside	X240238	Y675193	NOx	N	Chemiluminescent analyser	Y*(2.5m)	5m	N
West Dunbartonshire, Clydebank	Roadside	X 249723	Y672044	NOx PM ₁₀	N	Chemiluminescent analyser TEOM with FDMS Type C	N (18m)	25m	N

* This unit is located 5m back from kerb due to location difficulties. Nearest relevant exposure are residential properties set back 2.5 metres from kerb.

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2.1.2 Non-Automatic Monitoring Sites

West Dunbartonshire Council had 24 NO₂ diffusion tubes distributed throughout the Council area during 2011 (excluding co-located triplicates).

The number of diffusion tubes was reduced from 27 at the end of 2010 when tubes designated Vale of Leven 1 & 2 and Glasgow Road, Dumbarton 4 were removed from the network.

Diffusion tubes designated Vale of Leven 1, 2, 3 & 4 were put in place in 2009 to monitor what effect, if any, the construction of a new generator manufacturing facility would have/was having on local air quality. Tubes designated Vale of Leven 1 & 2 were subsumed into the factory grounds as the works neared completion in early 2011. Vale of Leven 3 and 4 remain and results from these tubes are included further on in this report.

The diffusion tube designated Glasgow Road Dumbarton 4 was persistently missing during 2011. The tube was located on a lamppost outside a shop frequented by local school children. It was concluded that the children were removing the tube. It was decided to remove the tube. The tube had been in place for several years with no breach of the National Air Quality Objective for NO₂.

NO₂ tubes are supplied and analysed by Glasgow Scientific Services (GSS).

The tube preparation method used by GSS is 20% triethanolamine (TEA) in water.

The tubes are used in accordance with the report "Diffusion Tube for Ambient NO₂ Monitoring: Practical Guidance for Laboratories and Users: Report to DEFRA and the Devolved Administrations: ED48673043: Issue 1a: February 2008.

Full QA/QC procedures for GSS are included in Appendix A. GSS participates in the Workplace Analysis Scheme.

Bias Adjustment Factor and Co-location Exercise

All NO₂ diffusion tube results have been bias adjusted using the 2011 factor of 0.94 obtained from the Review and Assessment website.

A locally derived bias adjustment factor was determined using results from triplicate diffusion tube co-located with the both automatic NO_x analysers. The local bias results were 0.82 for West Dunbartonshire Clydebank and 0.77 for Dumbarton

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Roadside. It was decided that the bias of 0.94 for GSS from the Review and Assessment website would be applied to results in order to be as conservative as possible. A copy of the spreadsheets used to derive the local bias can be found as Appendix H.

Figure 2.2 Map (s) of Non-Automatic Monitoring Sites (if applicable)

See Appendices D, E and F

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Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
Clydebank 1	Roadside	X248479	Y671115	NO ₂	N	N	N	4m	Y
Clydebank 6	Kerbside	X249725	Y672069	NO ₂	N	N	N(40)	1m	Y
Dumbarton 1	Roadside	X240322	Y675177	NO ₂	N	N	N (2.5)	1m	Y
Dumbarton 11	Roadside	X240515	Y675078	NO ₂	N	N	N (4)	1m	Y
Balloch 1	Kerbside	X238584	Y681562	NO ₂	N	N	N	12m	Y
Alexandria 1	Kerbside	X239024	Y680206	NO ₂	N	N	N(5)	1m	Y
Briar Drive, Triplicate 1	Roadside	X249723	Y672044	NO ₂	N	Y	N/A	25m	N/A
Briar Drive, Triplicate 2	Roadside	X249723	Y672044	NO ₂	N	Y	N/A	25m	N/A
Briar Drive, Triplicate 3	Roadside	X249723	Y672044	NO ₂	N	Y	N/A	25m	N/A
Dumbarton, Triplicate 1	Roadside	X240238	X675193	NO ₂	N	Y	N/A	5m	N/A
Dumbarton, Triplicate 2	Roadside	X240238	X675193	NO ₂	N	Y	N/A	5m	N/A
Dumbarton, Triplicate 3	Roadside	X240238	X675193	NO ₂	N	Y	N/A	5m	N/A

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Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
Milton 1	Kerbside	X242266	Y674235	NO ₂	N	N	N (12)	1m	Y
Milton 2	Roadside	X242160	Y674299	NO ₂	N	N	N (2m)	12m	N
Glasgow Rd, Dumbarton 2	Roadside	X240178	Y675228	NO ₂	N	N	N (8)	1m	Y
Glasgow Rd, Dumbarton 3	Roadside	X240279	Y675196	NO ₂	N	N	N (4.5)	1m	Y
Clydebank 7	Roadside	X249913	Y669865	NO ₂	N	N	N (4)	1m	Y
Clydebank 9	Kerbside	X248899	Y670784	NO ₂	N	N	N (3)	1m	Y
Clydebank 10	Kerbside	X249759	Y671845	NO ₂	N	N	N (8.5)	1m	Y
Clydebank 11	Roadside	X249801	Y672288	NO ₂	N	N	N (22)	1m	Y
Clydebank 12	Kerbside	X249747	Y671665	NO ₂	N	N	N (10)	1m	Y
Clydebank 13	Kerbside	X249762	Y671790	NO ₂	N	N	N (8.5)	1m	Y
Clydebank 14	Kerbside	X249872	Y671854	NO ₂	N	N	N (>25)	1m	N
Clydebank 15	Kerbside	X249746	Y671966	NO ₂	N	N	N (8.5)	1m	Y
Clydebank 16	Kerbside	X249967	Y672548	NO ₂	N	N	N (10)	1m	Y
Clydebank 17	Kerbside	X249987	Y672440	NO ₂	N	N	N (11)	1m	Y
Clydebank 18	Kerbside	X249972	Y672351	NO ₂	N	N	N (12)	1m	Y
Vale of Leven 3	Roadside	X240115	X677146	NO ₂	N	N	N(>25)	4m	Y
Vale of Leven 4	Kerbside	X240164	Y677014	NO ₂	N	N	N (>25)	1m	Y
Dumbarton 12	Kerbside	X239410	Y675330	NO ₂	N	N	N (7)	1m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

West Dunbartonshire Council monitoring results have shown that there was no exceedence of the National Air Quality Objectives for NO₂ or PM₁₀ during 2011.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Nitrogen Dioxide (NO₂)

Automatic Monitoring Data

West Dunbartonshire Council has two automatic NO_x monitoring stations. During 2011 they were located as detailed below. Neither station breached the National Air Quality Objective for NO₂. Location maps for each unit are included as Appendices B and C.

Dumbarton Roadside

This unit contains a real time chemiluminescent NO_x analyser and was moved to the A814 (Glasgow Rd, Dumbarton at its junction with Leven Street) in April 2007. The unit is located 5 metres from the kerbside. This unit was affiliated into the national network (AURN) during 2010.

The ratified data from AEA indicates that the annual average NO₂ level for 2011 was 19µg/m³. There were no exceedences of the hourly mean objective during 2011.

The nearest receptors are residential properties located 2.5m from the roadside. The NO₂ Distance Calculator on the R&A web site was used to predict the NO₂ levels at the nearest receptors which are 2.5 metres closer to the roadside than the automatic monitor. The calculator predicted NO₂ levels at the façade of the nearest residential property of 19.2µg/m³.

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West Dunbartonshire, Clydebank (Kilbowie Roundabout)

This unit houses a real time chemiluminescent NO_x analyser and a TEOM. It has been located there since February 2007. Kilbowie Roundabout is the busiest junction within the West Dunbartonshire Council area. The unit is located approximately 25 metres from the roundabout. The ratified data from AEA indicates that the annual average NO₂ level for 2011 was 21µg/m³. There were no exceedences of the hourly mean objective during 2010. The nearest receptors are residential properties located just over 40 metres from the roundabout.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2011 % ^b	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2007* ^c	2008* ^c	2009* ^c	2010* ^c	2011 ^c
West Dunbartonshire, Clydebank	Roadside	N	95	95	19	24	26	26	21
Dumbarton Roadside	Roadside	N	99	99	21	19	23	27	19

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

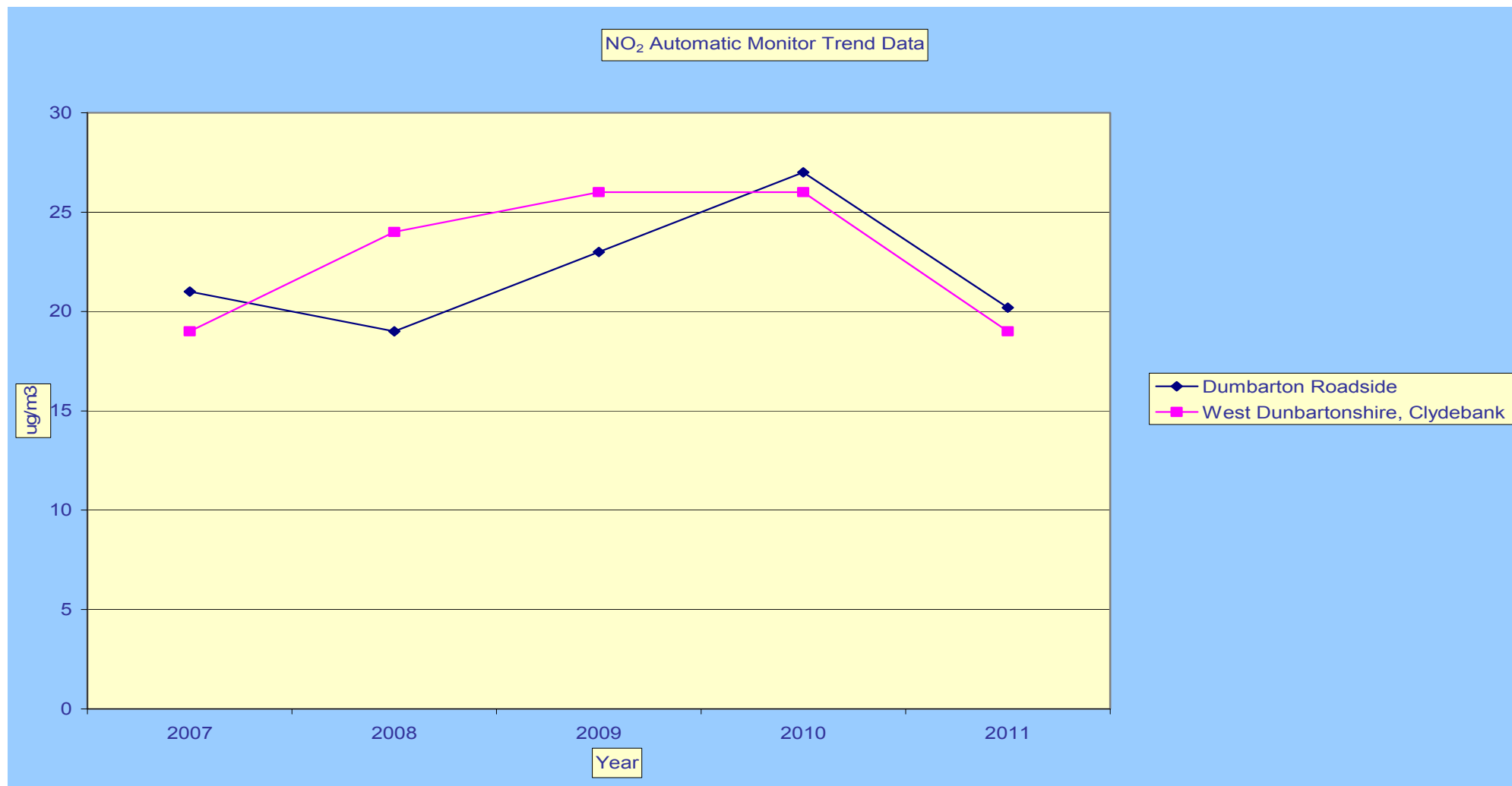
^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

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

*Annual mean concentrations for previous years are optional.

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Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations measures at Automatic Monitoring Sites



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Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2011 % ^b	Number of Exceedences of Hourly Mean (200 µg/m ³)				
					2007* ^c	2008* ^c	2009* ^c	2010* ^c	2011 ^c
West Dunbartonshire, Clydebank	Roadside	N	95	95	N/A	0	0	0	0
Dumbarton Roadside	Roadside	N	99	99	N/A	0	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 If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets

*Number of exceedences for previous years are optional.

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Diffusion Tube Monitoring Data

West Dunbartonshire Council monitored NO₂ at 24 locations (excluding co-located triplicates) throughout the Council area during 2011 using diffusion tubes.

All results have been bias adjusted using a factor of 0.94 based on information from the Review and Assessment website.

One of the monitored locations – Milton 1 - was found to exceed the National Air Quality Objective for NO₂. Another tube designated Glasgow Road Dumbarton 3 only had seven months worth of data. Both results are discussed below.

Milton 1 – bias adjusted annual average of 51.6µg/m³.

This tube is located at the Dumbuck traffic light junction on the A82. The A82 is the main trunk road access to the West of Scotland and is the busiest road within the Council area. It is not possible to locate an automatic monitor at the location as there is no suitable site.

The nearest receptors are residential properties located approximately 12 metres back from the kerb. An additional diffusion tube was placed in the front garden of one of the houses approximately 5 metres from the front façade to obtain data regarding NO₂ levels at the residences. The tube, designated Milton 2, has been at this site since 2008. The 2011 bias adjusted annual mean for Milton 2 was 28.8µg/m³. The NO₂ Distance Calculator from the Air Quality Archive web site was used to predict NO₂ levels at the residences based on the results of Milton 1 diffusion tube. The calculator predicted the NO₂ levels at the residences to be 29.9µg/m³ which although slightly higher than the Milton 2 diffusion tube result remains within the National Air Quality Objective for NO₂. There is therefore no need to proceed to Detailed Assessment at this location.

Glasgow Road Dumbarton 3 – bias adjusted annualised average 33.3 µg/m³

Only seven months worth of data was available for the diffusion tube designated Glasgow Road Dumbarton 3. The data was annualised in accordance with the methodology in TG (09). The figures used are included in Appendix A.

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Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.94)
								2011 ($\mu\text{g}/\text{m}^3$)
Clydebank 1	631 Dumbarton Rd, Clydebank	Roadside	N	N	11		N	32.8
Clydebank 6	Lamp-post outside Briar Drive, Clydebank	Kerbside	N	N	12		N	31.9
Dumbarton 1	62 Glasgow Rd, Dumbarton	Roadside	N	N	12		N	26.1
Dumbarton 11	151 Glasgow Rd, Dumbarton	Roadside	N	N	10		N	35.2
Balloch 1	3 Cameron Dr, Balloch	Kerbside	N	N	12		N	23.5
Alexandria 1	Bank St, Alexandria	Kerbside	N	N	11		N	29
Briar Drive, Triplicate 1	Kilbowie Roundabout, Clydebank	Roadside	N	Triplicate & co-located	11		N	20.4
Briar Drive, Triplicate 2	Kilbowie Roundabout, Clydebank	Roadside	N	Triplicate & co-located	12		N	26.5
Briar Drive, Triplicate 3	Kilbowie Roundabout, Clydebank	Roadside	N	Triplicate & co-located	12		N	22.9
Dumbarton, Triplicate 1	Dumbarton Roadside	Roadside	N	Triplicate & co-located	12		N	22.1
Dumbarton, Triplicate 2	Dumbarton Roadside	Roadside	N	Triplicate & co-located	12		N	22.3

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Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.94)
								2011 ($\mu\text{g}/\text{m}^3$)
Dumbarton, Triplicate 3	Dumbarton Roadside	Roadside	N	Triplicate & co-located	12		N	22.6
Milton 1	Dumbuck lights	Roadside	N	N	12		N	51.6
Milton 2	Cruachan, Stirling Rd, Dumbarton	Kerbside	N	N	10		N	28.8
Glasgow Rd, Dumbarton 2	55 Glasgow Road, Dumbarton	Roadside	N	N	11		N	31
Glasgow Rd, Dumbarton 3	77 Glasgow Road, Dumbarton	Roadside	N	N	7	Y	N	33.3*
Clydebank 7	Post – Corner of Argyll St/Glasgow Rd, Clydebank	Roadside	N	N	11		N	30.9
Clydebank 9	Post – along from 404 Dumbarton R Clydebank	Kerbside	N	N	12		N	28.9
Clydebank 10	Post – outside 455 Kilbowie Road, Clydebank	Kerbside	N	N	10		N	29.1
Clydebank 11	South end Road, In front of firemen Houses	Roadside	N	N	11		N	28.3
Clydebank 12	corner of 425 Kilbowie Rd & Hawthorn Street, C'Bank	Kerbside	N	N	10		N	24.1

West Dunbartonshire Council

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.94)
								2011 ($\mu\text{g}/\text{m}^3$)
Clydebank 13	Post at 437 Kilbowie Road, Clydebank	Kerbside	N	N	11		N	27
Clydebank 14	Post at 2 Morar Drive, Clydebank	Kerbside	N	N	10		N	16.8
Clydebank 15	Post outside 489 Kilbowie Road, Clydebank	Kerbside	N	N	10		N	24.3
Clydebank 16	Post – Kilbowie Rd Across from 1 Gavins Rd, C'ban	Kerbside	N	N	11		N	29.2
Clydebank 17	Post – Kilbowie Rd Across from 12 Gavins Rd, C'ban	Kerbside	N	N	10		N	30.9
Clydebank 18	Post – Kilbowie Rd Across from 19 Gavins Rd, C'ban	Kerbside	N	N	12		N	28.4
Vale of Leven 3	On Stirling Road, A813 Dumbarton	Roadside	N	N	11		N	25.1
Vale of Leven 4	On Stirling Road, A813 Dumbarton	Roadside	N	N	12		N	28.1
Dumbarton 12	Post – High Street D'ton,	Kerbside	N	N	11		N	21.7

*Annualised result – see Appendix A for details

West Dunbartonshire Council

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2007* (Bias Adjustment Factor = 0.96)	2008* (Bias Adjustment Factor = 0.97)	2009* (Bias Adjustment Factor = 1.23)	2010* (Bias Adjustment Factor = 1.1)	2011 (Bias Adjustment Factor = 0.94)
Clydebank 1	Roadside	N	27	33	38	32	32.8
Clydebank 6	Kerbside	N	30	38	42	43	31.9
Dumbarton 1	Roadside	N	23	33	32	36	26.1
Dumbarton 11	Roadside	N	31	37	35	36	35.2
Balloch 1	Kerbside	N	21	21	31	30	23.5
Alexandria 1	Kerbside	N	28	28	36	30	29
Briar Drive, Triplicate 1	Roadside	N	N/A	25	27	28	20.4
Briar Drive, Triplicate 2	Roadside	N	N/A	23	28	26	26.5
Briar Drive, Triplicate 3	Roadside	N	N/A	24	29	29	22.9
Dumbarton, Triplicate 1	Roadside	N	N/A	22	23	27	22.1
Dumbarton, Triplicate 2	Roadside	N	N/A	22	23	25.5	22.3
Dumbarton, Triplicate 3	Roadside	N	N/A	22	25	26	22.6
Milton 1	Roadside	N	43	63	60	54	51.6
Milton 2	Kerbside	N	N/A	24	30	25	28.8
Glasgow Rd, Dumbarton 2	Roadside	N	N/A	35	36	35	31
Glasgow Rd, Dumbarton 3	Roadside	N	N/A	35	39	42	33.3*
Clydebank 7	Roadside	N	N/A	N/A	28	37	30.9
Clydebank 9	Kerbside	N	N/A	N/A	29	27	28.9
Clydebank 10	Kerbside	N	N/A	N/A	34	39	29.1
Clydebank 11	Roadside	N	N/A	N/A	27	28	28.3

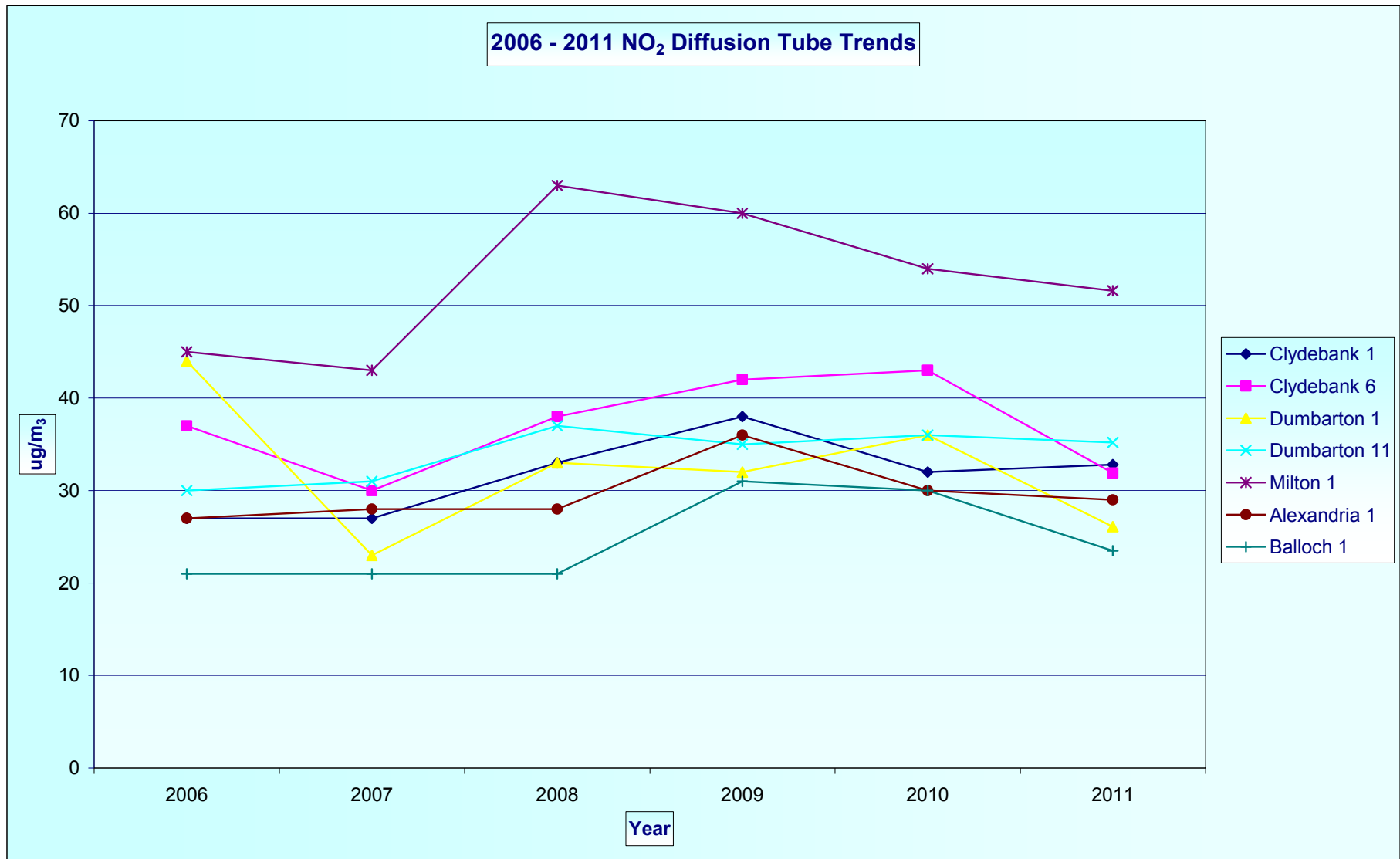
West Dunbartonshire Council

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2007* (Bias Adjustment Factor = 0.96)	2008* (Bias Adjustment Factor = 0.97)	2009* (Bias Adjustment Factor = 1.23)	2010* (Bias Adjustment Factor = 1.1)	2011 (Bias Adjustment Factor = 0.94)
Clydebank 12	Kerbside	N	N/A	N/A	34	30	24.1
Clydebank 13	Kerbside	N	N/A	N/A	41	41	27
Clydebank 14	Kerbside	N	N/A	N/A	38	19	16.8
Clydebank 15	Kerbside	N	N/A	N/A	34	30	24.3
Clydebank 16	Kerbside	N	N/A	N/A	31	26	29.2
Clydebank 17	Kerbside	N	N/A	N/A	29	28	30.9
Clydebank 18	Kerbside	N	N/A	N/A	30	28	28.4
Vale of Leven 3	Roadside	N	N/A	N/A	32	26	25.1
Vale of Leven 4	Roadside	N	N/A	N/A	32	23	28.1
Dumbarton 12	Kerbside	N	N/A	N/A	25	25	21.7

*Annualised result – see Appendix A for details

West Dunbartonshire Council

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



West Dunbartonshire Council

The above chart shows the NO₂ levels trend over the last five years. Only seven tubes have been on site for a significantly long enough time to indicate trends in NO₂ levels.

From the chart above and the chart in Figure 2.3 it appears that until last year NO₂ levels in the West Dunbartonshire Council area were increasing. 2011 has shown a decrease in NO₂ levels recorded – whether this is a trend which will continue remains to be seen. Another factor to be considered is bias adjustment. In 2007 and 2008 the bias was 0.96 and 0.97 respectively in 2009 the bias jumped to 1.23 and remained above 1 in 2010 at 1.1. However in 2011 the bias reduced to 0.94 perhaps bringing the results back into line with the 2007/8 results.

West Dunbartonshire Council

2.2.2 PM₁₀

West Dunbartonshire Council has one TEOM with a Type C FDMS designated West Dunbartonshire, Clydebank. The unit is located in very close proximity to Kilbowie Roundabout which is the busiest junction in the Council area.

The TEOM unit is located 25 metres back from the roundabout. The nearest relevant receptors are residences located just over 40 metres from the roundabout some 15 metres further back from the location of the automatic monitor.

The ratified data from AEA has shown that annual average for this location for 2011 was 17µg/m³.

Advice sought previously from the R&A Helpdesk has been that as a Type C FDMS is not equivalent there is no published correction factor which can be applied to the data. This data has therefore not undergone any correction.

In September 2010 a light scattering device (Osiris) was located at McKenzie Drive, Balloch. The device was placed there to monitor what effect, if any, a biomass boiler at the Loch Lomond and Trossachs National Park Authority headquarters building in Carrochan Road, Balloch was having on local air quality.

The biomass boiler, a Froeling Turbomatic 110kW, was installed in the building in 2008. It was included in the approved appliance legislation in 2008.

The boiler was assessed in accordance with guidance (TG (09)) in our 2009 Update and Screening Assessment. It was concluded that there was no need to proceed to detailed assessment. However it was decided to install the Osiris to assess the effects of the boiler on local air quality.

The annualised average for the Osiris in 2010 was 12.1µg/m³. This annualised figure was multiplied by 1.3 and 1.14 correction factors again as dictated by guidance TG (09). The corrected results were 15.7µg/m³ and 13.8µg/m³ respectively. Both results were within the National Air Quality Objective for PM₁₀. The unit was constantly off-line and attempts to effect repair failed. As it had been demonstrated that the National Air Quality Objective for PM₁₀ was not being breached it was decided to permanently remove the unit in early 2011.

West Dunbartonshire Council

Table 2.7 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration µg/m ³				
						2007* ^c	2008* ^c	2009* ^c	2010* ^c	2011 ^c
West Dunbartonshire Clydebank	Roadside	N	92	92	NA	N/A	13.2	17	18	17

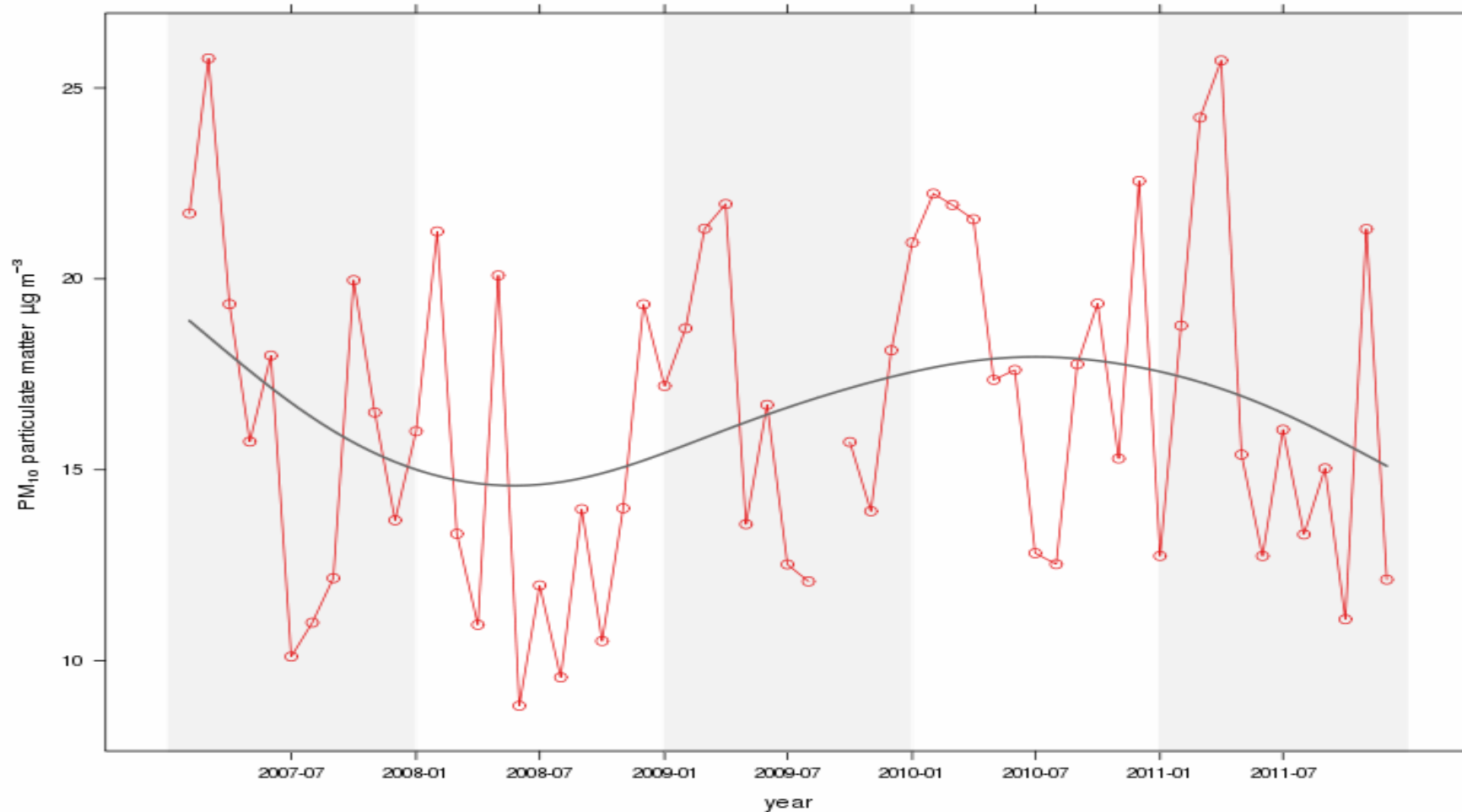
Table 2.8 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 µg/m ³)				
						2007*	2008*	2009*	2010*	2011
West Dunbartonshire Clydebank	Roadside	N	92	92	N/A	N/A	0	3	3	5

West Dunbartonshire Council

Figure 2.5 Trends in Annual Mean PM₁₀ Concentrations

Trend for West Dunbartonshire Clydebank



This chart shows PM₁₀ levels recorded in the West Dunbartonshire Council area over the last five years. There appears to be no discernible trend.

West Dunbartonshire Council

2.2.3 Sulphur Dioxide

West Dunbartonshire Council does not carry out SO₂ sampling

2.2.4 Benzene

West Dunbartonshire Council does not carry out benzene sampling

2.2.5 Other pollutants monitored

West Dunbartonshire Council does not monitor for any other pollutant.

2.2.6 Summary of Compliance with AQS Objectives

West Dunbartonshire Council has examined the results from monitoring in the Council area. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

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

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

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

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

West Dunbartonshire Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

West Dunbartonshire Council confirms that there are no new/newly identified busy junctions/busy roads.

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

West Dunbartonshire Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

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

3.7 Bus and Coach Stations

West Dunbartonshire Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

West Dunbartonshire Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

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

4.2.2 Moving Trains

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

4.3 Ports (Shipping)

West Dunbartonshire Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

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

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

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

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

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

5.2 Major Fuel (Petrol) Storage Depots

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

5.3 Petrol Stations

West Dunbartonshire Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

West Dunbartonshire Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

West Dunbartonshire Council has one biomass boiler located within its area. It is located within the Loch Lomond and Trossachs National Park Authority Headquarters in Balloch. The nearest relevant receptors are residences approximately 100 metres distant. In September 2010 a light scattering device (Osiris) was located at McKenzie Drive, Balloch.

The biomass boiler, a Froeling Turbomatic 110kW, was installed in the building in 2008. It was included in the approved appliance legislation in 2008.

The boiler was assessed in accordance with guidance (TG (09)) in our 2009 Update and Screening Assessment. It was concluded that there was no need to proceed to detailed assessment however it was decided to install the Osiris to assess the effects of the boiler.

The annualised average for the Osiris in 2010 was $12.1\mu\text{g}/\text{m}^3$. This annualised figure was multiplied by 1.3 and 1.14 correction factors again as dictated by guidance TG (09). The corrected results were $15.7\mu\text{g}/\text{m}^3$ and $13.8\mu\text{g}/\text{m}^3$ respectively. Both results were within the National Air Quality Objective for PM_{10} .

West Dunbartonshire Council has assessed the biomass combustion plant and concluded that will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

West Dunbartonshire Council confirms that there are no biomass combustion plants in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

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

7 Fugitive or Uncontrolled Sources

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

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

There have been no exceedences of the National Air Quality Objectives within the West Dunbartonshire Council area. There is no need therefore for West Dunbartonshire Council to proceed to Detailed Assessment.

8.2 Conclusions from Assessment of Sources

This Update and Screening Assessment has not identified any new or significantly changed sources within the West Dunbartonshire Council area which would result in an exceedence of the National Air Quality Objectives

8.3 Proposed Actions

This Update and Screening Assessment has not identified any need to proceed to Detailed Assessment for any pollutant.

No need for additional monitoring or changes to the present monitoring programme has been identified.

West Dunbartonshire Council will submit a Progress Report in 2013.

9 References

Local Air Quality Management Technical Guidance (TG09)
The Environment Act 1995
The Air Quality (Scotland) Regulations 2000
The Air Quality (Scotland) (Amendment) Regulations 2002
West Dunbartonshire Council Air Quality Progress Report 2011
West Dunbartonshire Council Air Quality Progress Report 2010
West Dunbartonshire Council Update and Screening Assessment 2009
West Dunbartonshire Council Air Quality Progress Report 2008
West Dunbartonshire Council Air Quality Progress Report 2007
West Dunbartonshire Council Update and Screening Assessment 2006
West Dunbartonshire Council Air Quality Progress Report 2005
West Dunbartonshire Council Air Quality Progress Report 2004

Appendices

- Appendix A – QA/QC Data
- Appendix B – Dumbarton Roadside Automatic Monitor
- Appendix C – West Dunbartonshire Clydebank Automatic Monitor
- Appendix D – Clydebank NO₂ Diffusion Tube Locations
- Appendix E – Dumbarton NO₂ Diffusion Tube Monitoring Locations
- Appendix F – Vale of Leven Diffusion Tube Locations
- Appendix G – Key for NO₂ diffusion tube monitoring locations
- Appendix H – Completed bias spreadsheets used to derive local bias
- Appendix I – AEA Pollution Report for Dumbarton Roadside
- Appendix J – AEA Pollution Report for West Dunbartonshire, Clydebank
- Appendix K – 2011 Monthly NO₂ diffusion tube results

Appendix A: QA: QC Data

Factor from Local Co-location Studies (if available)

Local bias adjustment figure based on data from the real-time chemiluminescent NO_x analysers designated Dumbarton Roadside and West Dunbartonshire Clydebank and their triplicate co-located NO₂ diffusion tubes were derived using the spreadsheet on the R&A website. It was submitted to the R&A website.

The Glasgow Road, Dumbarton automatic monitor is part of the Automatic Urban and Rural Network (AURN) and as such is subject to the highest QA/QC procedures (see below for details). Copies of the completed co-location spreadsheets are included as Appendix H.

The locally derived bias adjustment factors for 2011 were 0.77 for Dumbarton Roadside and 0.83 for West Dunbartonshire Clydebank. However in order to be as conservative as possible the bias adjustment factor of 0.94 from the R&A website has been applied to all 2011 NO₂ tube results.

Diffusion Tube Bias Adjustment Factors

A bias adjustment figure of 0.94 for GSS in 2011 has been applied to all NO₂ results. This bias figure was obtained from the Review and Assessment website spreadsheet.

Discussion of Choice of Factor to Use

As stated above in order to be as conservative as possible the national bias adjustment factor of 0.94 for GSS has been applied to 2011 NO₂ diffusion tube results.

PM Monitoring Adjustment

Advice sought from the R&A Helpdesk has been that a Type C FDMS is not equivalent and there is no published correction factor which can be applied to the data. This data has therefore not undergone any correction.

West Dunbartonshire Council

Short-term to Long-term Data adjustment

Site	Site Type	Annual Mean	Period Mean	Ratio
Bush Estate	Rural	6.2	6.8	0.911
Grangemouth	Urban Ind.	15	17	0.88
Edinburgh St Leonards	Urban Background	25	27.7	0.902
Eskdalemuir	Rural	3.3	3.2	1.03
			Average	0.931

Glasgow Road, Dumbarton 3. Estimated annual mean* = $38 \times 0.931 = 35.4 \mu\text{g}/\text{m}^2$

Bias adjusted estimated annual mean of $33.3 \mu\text{g}/\text{m}^3$

QA/QC of automatic monitoring

Data from West Dunbartonshire Council automatic monitors is downloaded daily by AEA. The data is screened, scaled and ratified by AEA and a full report is provided for each calendar year.

Additionally AEA carry out an audit of all automatic monitors twice yearly. The Glasgow Road, Dumbarton and the West Dunbartonshire, Clydebank have a comprehensive service contract and are serviced by Horiba at 6 monthly intervals. West Dunbartonshire Council staff change filters and carry out manual calibration of the NO_x analysers on a fortnightly basis. The calibration data is forwarded to AEA for QA/QC purposes. The NO_x units also carry out automatic calibration every three days.

The TEOM head is dismantled and cleaned every four weeks by West Dunbartonshire Council staff.

The units are remotely checked by West Dunbartonshire Council staff each working day to ensure that data capture is optimal.

QA/QC of diffusion tube monitoring

West Dunbartonshire Council use Glasgow Scientific Services (GSS) for NO₂ tube analysis. Tubes are provided and analysed by GSS.

The NO₂ tube preparation method used is 20% triethanolamine (TEA) in water.

GSS participated in HSL WASP NO₂ PT rounds 108 - 115 and the percentage (%) of results submitted which were subsequently determined to be satisfactory based upon a z-score of $< \pm 2$.

West Dunbartonshire Council

Appendix B – Dumbarton Roadside Automatic Monitor Location



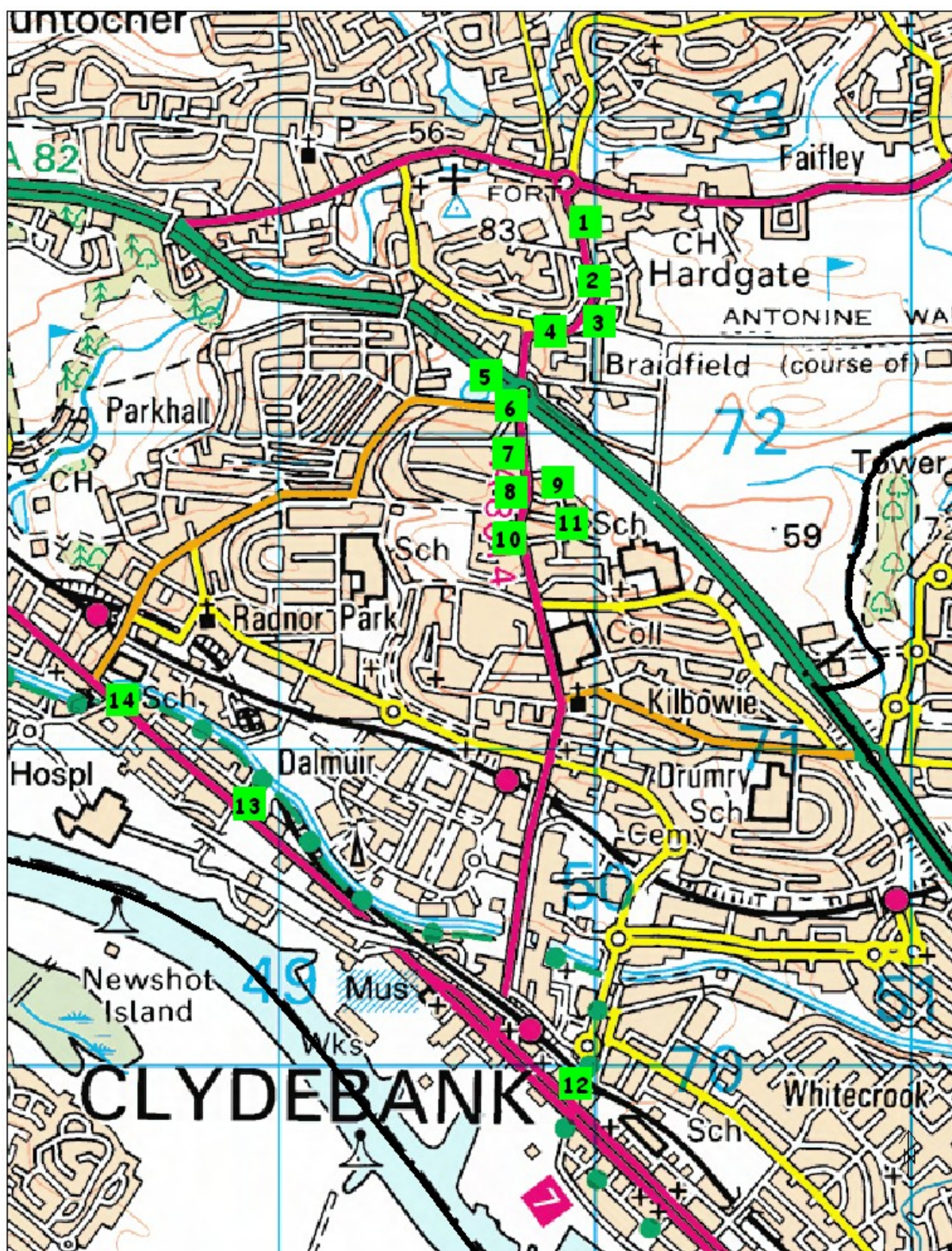
West Dunbartonshire Council

Appendix C – West Dunbartonshire Clydebank Automatic Monitor Location



West Dunbartonshire Council

Appendix D – Clydebank NO₂ Diffusion Tube Locations



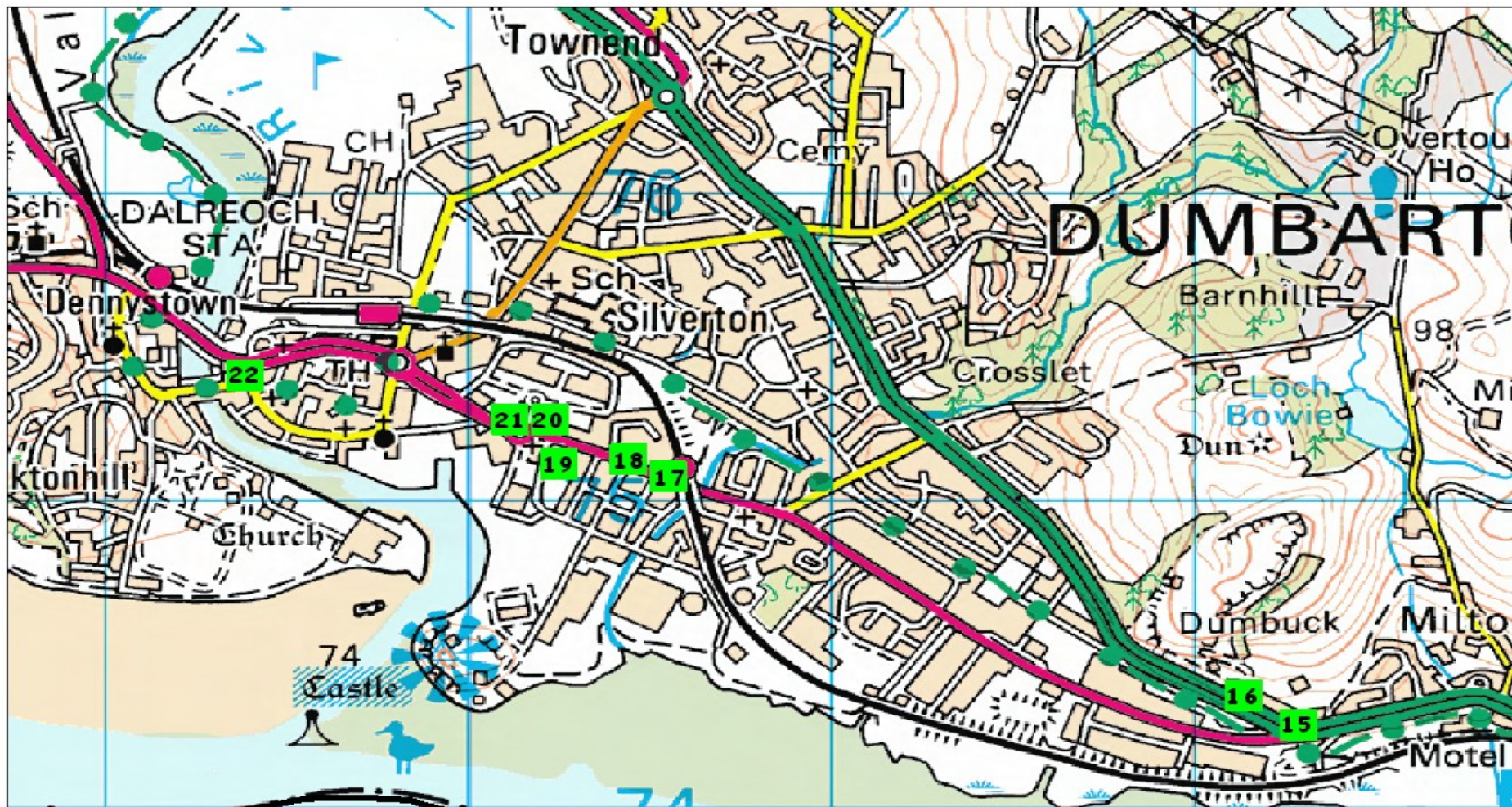
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Map No.
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Scale : 1:15000
Date : 05/04/2012

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Appendix E – Dumbarton NO₂ Diffusion Tube Monitoring Locations



West Dunbartonshire Council

Title: - N02 Map - Dumbarton

Date: 05/04/2012

Scale: 1:15000

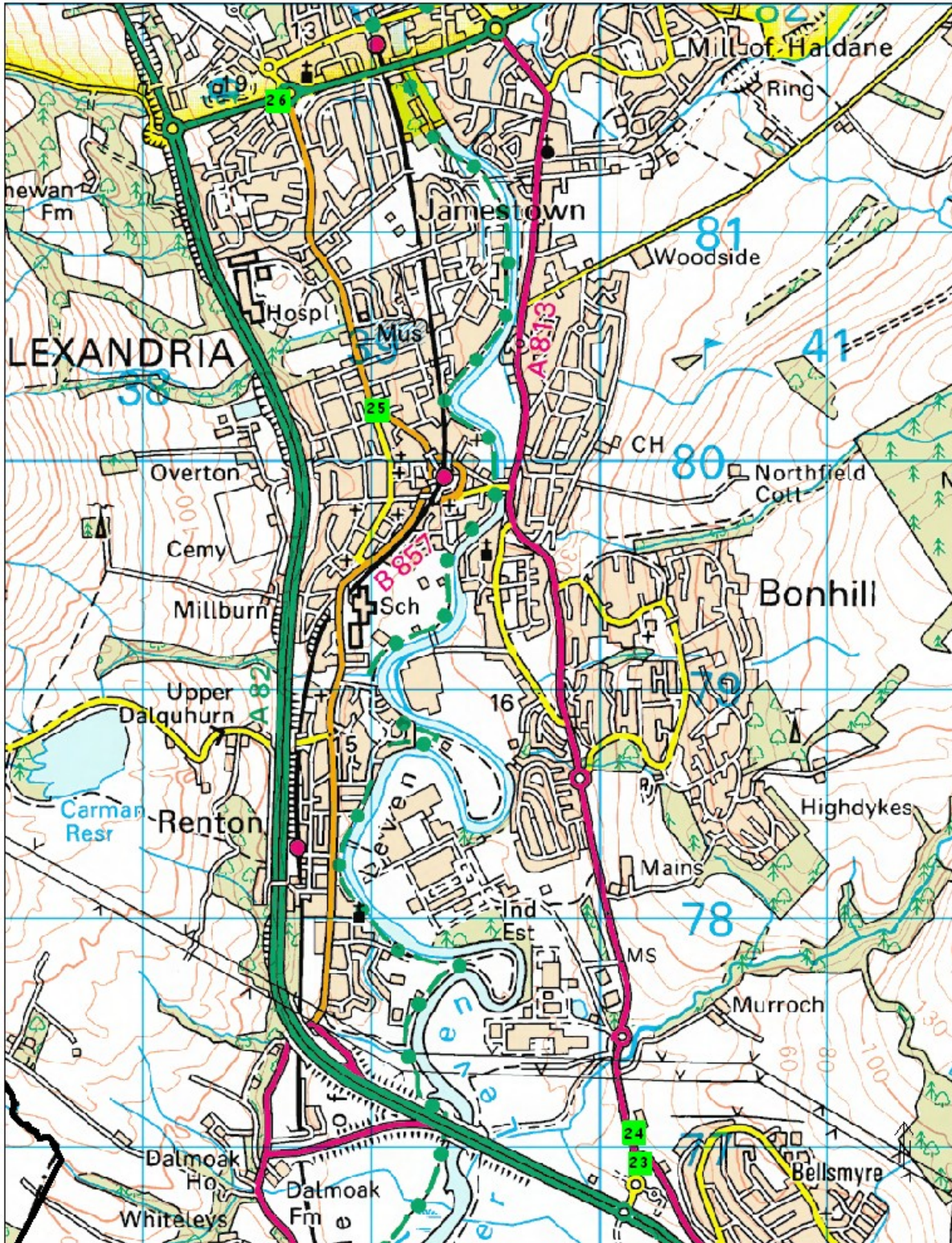
Map Reference: NS4075

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Appendix F – Vale of Leven Diffusion Tube Locations



Title : N02 Map - Vale of Leven

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Map No.
Map Reference : NS3979
Scale : 1:20672
Date : 05/04/2012

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Appendix G – Key for NO₂ diffusion tube monitoring locations

Map Number	Name of site
1	Clydebank 16
2	Clydebank 17
3	Clydebank 18
4	Clydebank 11
5	Clydebank 6
6	West Dunbartonshire Clydebank Co-located
7	Clydebank 15
8	Clydebank 13
9	Clydebank 10
10	Clydebank 12
11	Clydebank 14
12	Clydebank 7
13	Clydebank 9
14	Clydebank 1
15	Milton 1
16	Milton 2
17	Dumbarton 11
18	Glasgow Road Dumbarton 3
19	Dumbarton Roadside Co-located
20	Glasgow Road, Dumbarton 2
21	Dumbarton 1
22	Dumbarton 12
23	Vale of Leven 4
24	Vale of Leven 3
25	Alexandria 1
26	Balloch 1

Checking Precision and Accuracy of Triplicate Tubes

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	06/01/2011	01/02/2011	29.9	37.0	34.2	34	3.6	11	8.9
2	01/02/2011	01/03/2011	38.2	40.1	36.2	38	2.0	5	4.8
3	01/03/2011	01/04/2011	21.3	18.9	22.3	21	1.7	8	4.3
4	01/04/2011	27/04/2011	26.3	25.9	25.4	26	0.5	2	1.1
5	27/04/2011	31/05/2011	13.9	14.9	15.7	15	0.9	6	2.2
6	31/05/2011	28/06/2011	24.4	29.1	27.5	27	2.4	9	5.9
7	28/06/2011	03/08/2011	20.9	16.8	19.5	19	2.1	11	5.2
8	03/08/2011	01/09/2011	22.1	22.2	25.6	23	2.0	9	4.9
9	01/09/2011	29/09/2011	16.0	14.2	16.4	16	1.2	8	2.9
10	29/09/2011	02/11/2011	17.7	10.7	14.2	14	3.5	25	8.7
11	02/11/2011	01/12/2011	26.1	30.2	28.2	28	2.1	7	5.1
12	01/12/2011	05/01/2012	24.9	24.2	23.1	24	0.9	4	2.3
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
31.6	94	Good	Good
20.1	99	Good	Good
22.1	100	Good	Good
16.5	100	Good	Good
9	99	Good	Good
15	99	Good	Good
14	99	Good	Good
18	100	Good	Good
11	100	Good	Good
15	100	Poor Precision	Good
23.4	100	Good	Good
23.1	100	Good	Good

Overall survey -->

Good precision Good Overall DC

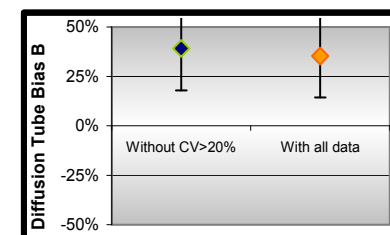
Site Name/ ID: **Dumbarton Roadside**

Precision 11 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)	
without periods with CV larger than 20%	
Bias calculated using 11 periods of data	
Bias factor A	0.75 (0.65 - 0.89)
Bias B	33% (12% - 55%)
Diffusion Tubes Mean:	25 μgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	18 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	18 (16 - 22) μgm^{-3}

Accuracy (with 95% confidence interval)	
WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.77 (0.66 - 0.91)
Bias B	30% (10% - 51%)
Diffusion Tubes Mean:	24 μgm^{-3}
Mean CV (Precision):	9
Automatic Mean:	18 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	18 (16 - 22) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

West Dunbartonshire Council

Appendix I: AEA Pollution Report for Dumbarton Roadside

Produced by AEA on behalf of Defra and the Scottish Government

DUMBARTON ROADSIDE 1st January to 31st December 2011

These data have been fully ratified by AEA

POLLUTANT	NO ₂	NO _x
Maximum hourly mean	138 µg m ⁻³	678 µg m ⁻³
Average	19 µg m ⁻³	40 µg m ⁻³
Data capture	99.4 %	99.4 %

All gaseous pollutant mass units are at 20°C and 1013 mb.
NO_x mass units are NO_x as NO₂ µg m⁻³

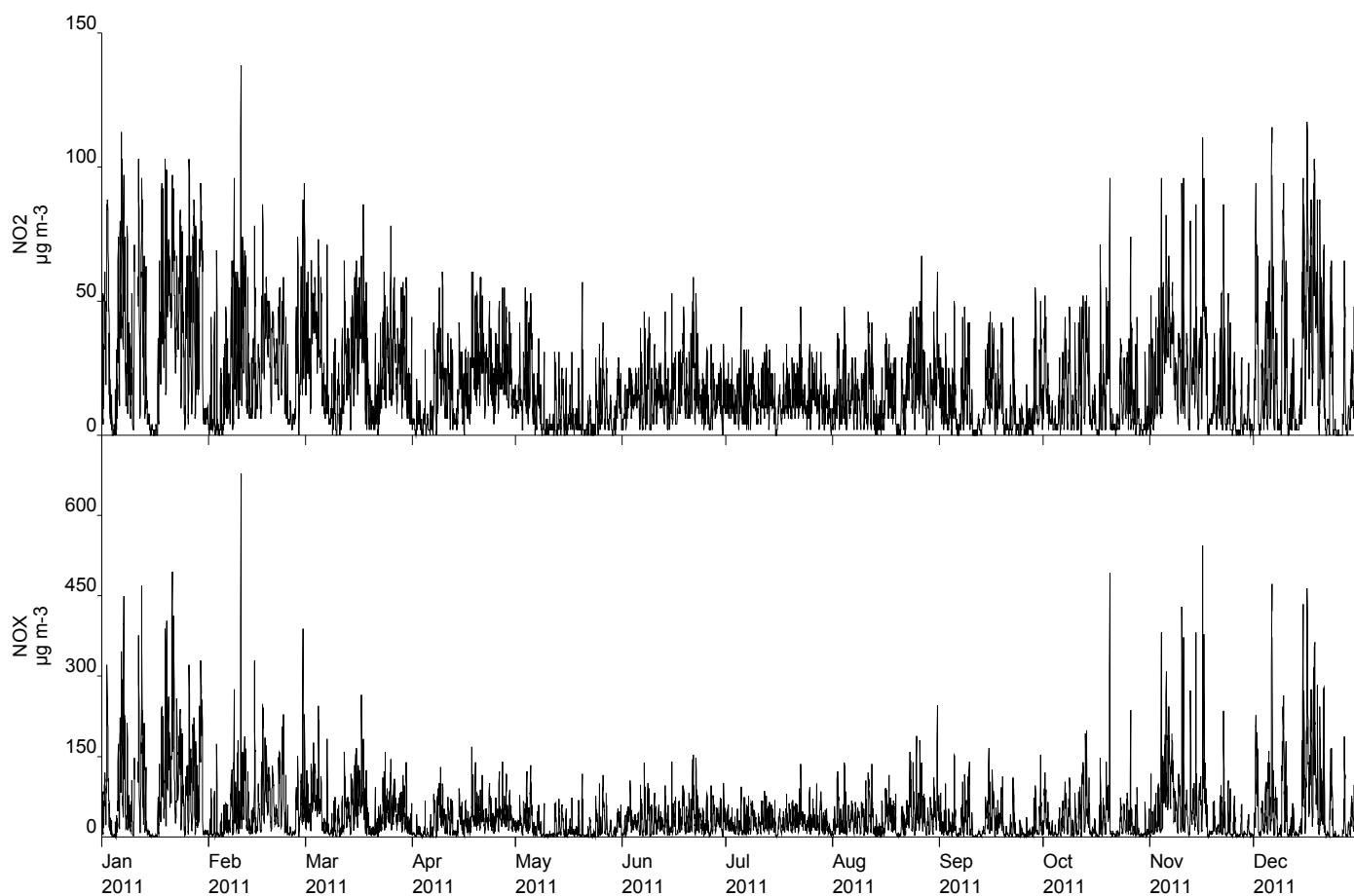
Pollutant	Air Quality Regulations (2000) and Air Quality (Scotland) Amendment Regulations 2002	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m ⁻³	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m ⁻³	0	0

Note: For a strict comparison against the objectives there must be a data capture of >90% throughout the calendar year

West Dunbartonshire Council

Produced by AEA on behalf of Defra the Scottish Government

**Dumbarton Roadside
Hourly Mean Data for 1st January to 31st December 2011**



Date Created: 16/04/2012

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West Dunbartonshire Council

Appendix J: AEA Pollution Report for West Dunbartonshire, Clydebank

Produced by AEA on behalf of the Scottish Government

WEST DUNBARTONSHIRE CLYDEBANK 1st January to 31st December 2011

These data have been fully ratified by AEA

POLLUTANT	PM ₁₀ ⁺	NO ₂	NO _x
Maximum hourly mean	115 µg m ⁻³	136 µg m ⁻³	693 µg m ⁻³
Maximum running 24-hour mean	66 µg m ⁻³	78 µg m ⁻³	290 µg m ⁻³
Maximum daily mean	57 µg m ⁻³	75 µg m ⁻³	273 µg m ⁻³
Average	17 µg m ⁻³	21 µg m ⁻³	45 µg m ⁻³
Data capture	91.8 %	95.1 %	95.1 %

+ PM₁₀ as measured by a FDMS using a gravimetric factor of 1

All gaseous pollutant mass units are at 20°C and 1013 mb. Particulate matter concentrations are reported at ambient temperature and pressure.

NO_x mass units are NO_x as NO₂ µg m⁻³

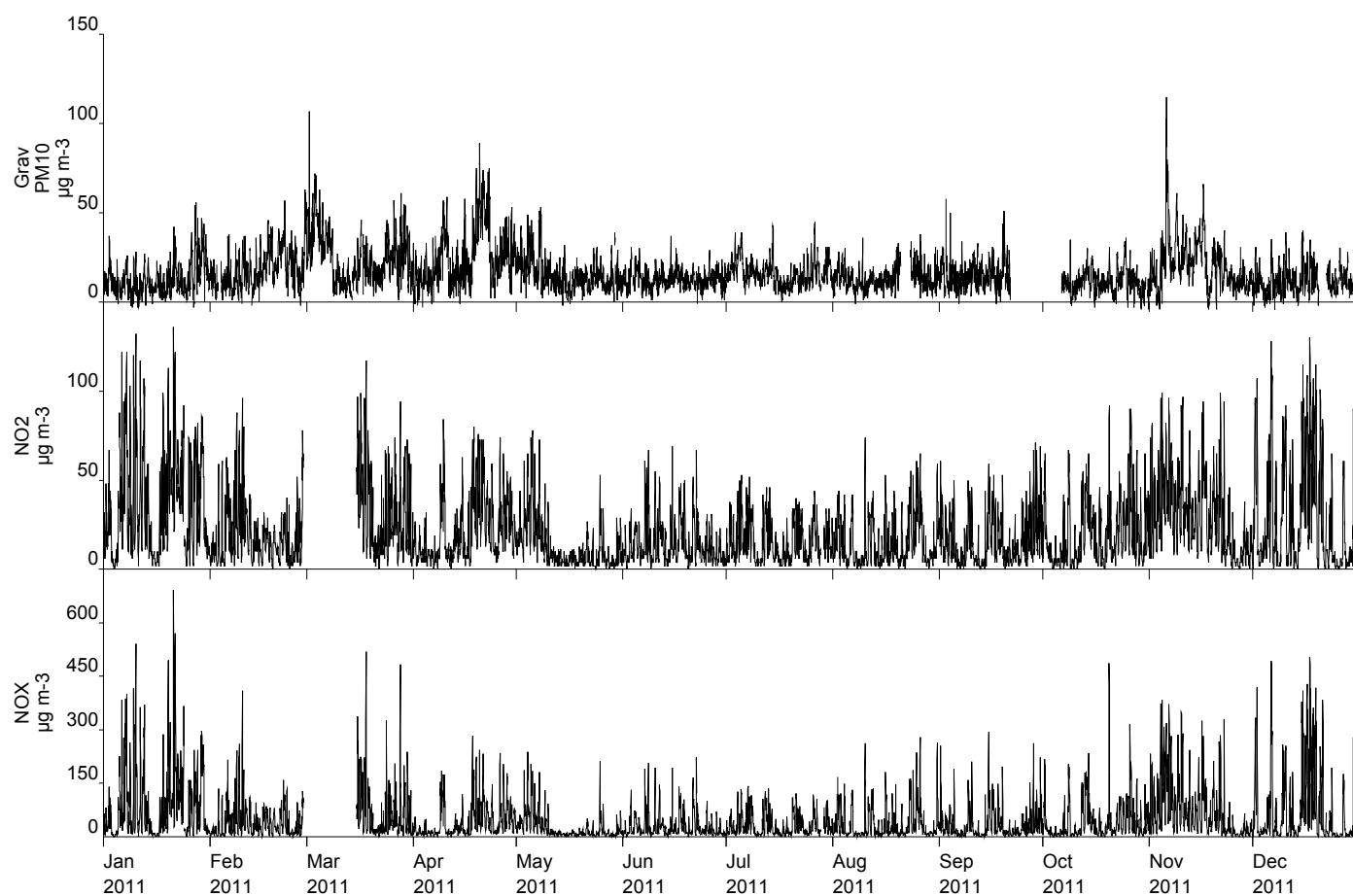
Pollutant	Air Quality Regulations (2000) and Air Quality (Scotland) Amendment Regulations 2002	Exceedences	Days
PM ₁₀ Particulate Matter (Gravimetric)	Daily mean > 50 µg m ⁻³	5	5
PM ₁₀ Particulate Matter (Gravimetric)	Annual mean > 18 µg m ⁻³	0	-
Nitrogen Dioxide	Annual mean > 40 µg m ⁻³	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m ⁻³	0	0

Note: For a strict comparison against the objectives there must be a data capture of >90% throughout the calendar year

West Dunbartonshire Council

Produced by AEA on behalf of the Scottish Government

West Dunbartonshire Clydebank Hourly Mean Data for 1st January to 31st December 2011



Date Created: 30/03/2012

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West Dunbartonshire Council

Appendix K – 2011 Monthly NO₂ figures

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Clydebank 1		54.2	36.6	22.3	24	25	29	22.2	57.4	25.9	48.2	39
Clydebank 6	47.7	47	41.2	27.2	19.5	23.1	31.7	29.8	29.8	32.8	42.1	34.7
Clydebank 7	40.3	29.5	36.8	24.6	25.4	34.6	<1.7	47.3	28.5	28.2	34.4	31.8
Clydebank 9	48.2	37.3	38.7	21.4	26.7	30.6	27.6	25.7	21.2	26	34	31.8
Clydebank 10	32.4	43.6	41.8		23.5	25.5		22.5	27.2	21.1	39.2	32.4
Clydebank 11	42.8	46.1	39.2	25.1	22.3		21.6	20.4	26	20.6	36.1	30.9
Clydebank 12	34.4	34.3	34.8	17.8	23.1		21.8	20.3	23	21.6		28.2
Clydebank 13	40.8	43.8	37.1		18.9	19.6	17.8	22.4	25.2	16.3	37	37.3
Clydebank 14	24.9	35.3	21.6	11.6	12.8	14.9	12.6	14	13.5		22.9	
Clydebank 15		29.8	36	26.1	18.6	21.1	23.3		21.9	17.4	37.4	26.6
Clydebank 16	34.7	55.6	35.9		40.7	21.1	22.2	20.3	21.2	22.8	33.5	33.5
Clydebank 17	45.6	52.9	35	21.5		26.6		24.6	28.8	25.2	32.8	35.4
Clydebank 18	50.8	43.1	33.5	23.2	19.6	20.4	22.8	25	24.7	23.1	37.5	38.4
Dumbarton 1	38	28	47.5	22.2	30.1	28	22	23.8	18.2	13.2	31.9	30.2
Dumbarton 11	57.6	40.4	41.5		38.3	32.7	32.5	31.2	25.3		35.8	31.9
Dumbarton 12		47.3	27.1	17.8	18.4	18.8	19.2	17.2	14.8	19.2	31.9	22.6
Glasgow Rd, D'ton 2	27.9	51.6	38.8	26.7	33.2		32.1	30.7	30.5	13.4	37.1	40.2
Glasgow Rd, D'ton 3	65.7		30.2	41.9	18.8			33.6			43.3	35.9
Milton 1	46.3	102	63	56.7	51.4	53.1	53.9	43	18.7	48.7	72.8	48.6
Milton 2	29.4	51.9	34.9		21.5	25.9		20.3	59.1	16.3	25.4	21.5
Alexandria 1		61.5	33.1	22.6	27.7	27.7	26.5	20	28.3	19.6	39.3	33.2
Balloch 1	26.9	56.2	33	19.8	17.7	24.1	25.1	19.3	17.6	10.1	29.7	19.9
Vale of Leven 3	30.1	44.3	33.1	15.6	22.1	29.9		23.5	23.2	18.6	26.6	26.6
Vale of Leven 4	52.2	39.5	31.8	19.6	24.5	29.1	27.1	28.6	26.1	21.7	30.1	28.5
Briar Drive 1		29.5	22.1	24.5	17.2	15.2	22.3	19.6	17.1	18.1	27.1	25.6
Briar Drive 2	39.8	45.8	21.2	33.2	24.5	22	18.9	19.2	17.6	24.1	43.7	27.8
Briar Drive 3	35.1	34.5	24.6	28.6	17.4	20.8	21.4	19.3	20.7	16.4	26.9	26.1
Dumbarton triplicate 1	29.9	38.2	21.3	26.3	13.9	24.4	20.9	22.1	16	17.7	26.1	24.9
Dumbarton triplicate 2	37	40.1	18.9	25.9	14.9	29.1	16.8	22.2	14.2	10.7	30.2	24.2
Dumbarton triplicate 3	34.2	36.2	22.3	25.4	15.7	27.5	19.5	25.6	16.4	14.2	28.2	23.1

* Less than 9 months of data.