Annual Progress Report (APR)

2019 Air Quality Annual Progress Report (APR) for
West Dunbartonshire Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

June 2019

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Report Reference number	APR/19/1
Date	June 2019

Executive Summary: Air Quality in Our Area

Air Quality in West Dunbartonshire Council

Local air quality within the West Dunbartonshire Council area remains generally satisfactory.

No Air Quality Management Areas have been declared within the Council Area.

West Dunbartonshire Council has two automatic air quality monitoring stations. The first, West Dunbartonshire Clydebank, is located at Briar Drive in Clydebank and monitors Nitrogen Dioxide (NO_2,) PM_{10} and $PM_{2.5}$. The second, West Dunbartonshire Glasgow Road, is situated at the corner of Glasgow Road and Leven Street, Dumbarton. This unit monitors NO_2 and is part of the Automatic Urban and Rural Network (AURN). Both automatic units have triplicate co-located NO_2 diffusion tubes.

During 2018 we also monitored NO_2 (passive diffusion tubes) at 28 locations (excluding co-located triplicates) throughout the West Dunbartonshire Council area.

Monitoring carried out during 2018 did not identify any exceedances of National Air Quality Objectives for NO_2, PM_{10} or $PM_{2.5}$

No significant changes in emission sources within the Council area were identified during 2018.

There have been no new relevant industrial installations and no new or substantially altered roads within the Council area.

There were no new significant commercial, domestic or fugitive sources of emissions.

Actions to Improve Air Quality

West Dunbartonshire Council has not declared an Air Quality Management Area.

The Council has adopted the provisions of the Road Traffic (Vehicle Emissions) (Fixed Penalty) (Scotland) Regulations 2003.

Following consultation with the Scottish Government West Dunbartonshire Council no longer carries out roadside vehicle emission testing but instead concentrates on regular idling engines patrols with emphasis being placed on schools, taxi ranks and bus termini in addition to responding to complaints.

Local Priorities and Challenges

West Dunbartonshire Council has no specific priorities in respect of local air quality beyond that of statutory monitoring and idling engines enforcement. During 2018 we introduced educational workshops in targeted local primary schools focussing on sustainable travel options and its impact on local air quality.

How to Get Involved

Further information about air quality and related subjects can be obtained by visiting

http://www.west-dunbarton.gov.uk/business/environmental-health/pollution/air-quality/

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1. Local Air Quality Management

This report provides an overview of air quality in West Dumbarton during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Progress Report (APR) is summarises the work being undertaken by West Dunbartonshire Council to improve air quality and any progress that has been made.

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10 µg/m^3	Annual mean	31.12.2020
Sulphur dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	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	10.0 mg/m^3	Running 8-Hour mean	31.12.2003

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Lead	0.25 µg/m^3	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

West Dunbartonshire Council currently does not have any AQMAs.

2.2 Sustainable Travel Plan

The West Dunbartonshire Travel Plan 'Westbound' aims to tackle the increasing numbers of vehicles on the road by promoting and supporting more sustainable modes of travel to and from work and for business travel. Details of Westbound are below.

Traveline Scotland provides up to date, impartial public transport journey planning and timetables. Click on Plan your Journey to create a journey plan between any two locations in Scotland.

Visit: www.travelinescotland.com Or call: 0871 200 22 33 (open 24 hours every day)

Information on public transport in West Dunbartonshire is available through Council transport web pages.

Reassessing our Travel needs and using more sustainable travel options can have a number of positive economic, social, health and environmental benefits. There are a number of ways we can make travel more sustainable:

Car - Car sharing, Electric or Hybrid vehicles;

Using Public transport;

Cycling more;

The Council provides support and encouragement for sustainable travel specifically relating to commuting, business travel and within the local community including

Journey sharing

Pool bikes

Cycle to work scheme

Bus tokens.

3. Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

West Dunbartonshire Council undertook automatic (continuous) monitoring at 2 sites during 2018. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at http://www.scottishairquality.co.uk

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

West Dunbartonshire Council undertook non- automatic (passive) monitoring of NO_2 at 28 sites during 2018. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Two of the tubes (Milton 3 & 4) are located within 0.5 metres of the A82 trunk road, the third (Milton 5) is located at Crannog Court which is the nearest residential premises to the proposed junction. Crannog Court is located 14 metres from the A82. Milton 3 and 4 breached the National Air Quality Objectives for NO_2 with bias adjusted, annualised results of 43.9µg/m^3 and 42.5µg/m^3 respectively. The bias adjusted, annualised result for Milton 5 was 21.2µg/$m^{3.}$ As a comparison the NO_2 fall off with distance calculator was used and the estimated NO_2 level at Milton 5 was 23.3 µg/m^3 which while marginally higher was still well within the National Air Quality Objective.

One passive NO_2 monitoring site has been removed this year, DT28 East Thompson Street. This was an additional site that we previously added due to perceived pollution levels reported by members of the public. After 2 years of monitoring we concluded that this site was not a problem and have now ceased monitoring at this site.

3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Milton 3 and Milton 4 exceeded the annual average Air Quality Objective however see levels at nearest receptor Milton 5

Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 18µg/m^3.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 7 times per year.

West Dunbartonshire Council recorded no exceedance of the National Air Quality Objective for PM_{10} in 2018. The annual mean was 10µg/m^3. A trend graph is included in Appendix E which shows this level remaining fairly static but there is still insufficient data to be sure.

3.2.2 Particulate Matter ($PM_{2.5}$)

West Dunbartonshire Council recorded no exceedance of the National Air Quality Objective for $PM_{2.5}$. The annual average for 2018 was 6µg/m^3. A trend chart is included in Appendix E which shows this level remaining fairly static. However as we have only been monitoring since 2015 there may not be sufficient data to have confidence in this trend.

Table A.7 in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years with the air quality objective of 10µg/m^3.

3.2.3 Sulphur Dioxide (SO_2)

West Dunbartonshire Council does not monitor sulphur dioxide

3.2.4 Carbon Monoxide, Lead and 1,3-Butadiene

West Dunbartonshire Council does not monitor for carbon monoxide, lead or 1,3-Butadiene

4. New Local Developments

There are two proposed developments which may possibly impact on local air quality. These were included in last years APR and have not progressed significantly this year.

The first is a residential development of a former council owned site in Clydebank. It is proposed to build 126 houses and flats. An Air Quality Impact Assessment has been requested.

The second is a proposed leisure/tourist development in Balloch including hotel, bunkhouse accommodation, self-catering holiday lodges; self catering boathouse accommodation; residential development; leisure and recreational facilities. The consultation process is ongoing at the time of writing this report.

4.1 Road Traffic Sources

There are no new traffic sources identified within the West Dunbartonshire Council area

4.2 Other Transport Sources

There are no new transport sources identified in the West Dunbartonshire Council area.

4.3 Industrial Sources

There are no new industrial sources identified within the West Dunbartonshire Council area.

4.4 Commercial and Domestic Sources

There are no new commercial or domestic sources within the West Dunbartonshire Council area.

4.5 New Developments with Fugitive or Uncontrolled Sources

There are no new developments with fugitive or uncontrolled sources within the West Dunbartonshire Council area.

5. Planning Applications

Apart from the proposed developments discussed above there have been no new planning applications granted which may have an effect on local air quality

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

Monitoring of local air quality during 2018 has shown no exceedance of the National Air Quality Objectives at any relevant location.

6.2 Conclusions relating to New Local Developments

There are no new local developments which require consideration in this report.

6.3 Proposed Actions

Monitoring throughout 2018 did not identify any exceedance on the National Air Quality Objective. However proposed developments have been identified which may have a future impact on local air quality. The progress of these developments will be monitored and necessary alterations/additions to the diffusion tube network duly considered.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	West Dunbartonshire Clydebank	Roadside	249723	672044	NO_2; PM_{10} $PM_{2.5}$	N	Chemiluminescent; FIDAS	18	4.5	1.5
CM2	West Dunbartonshire Glasgow Road	Roadside	240238	675193	NO_2	N	Chemiluminescent	2.5	5	1.5

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
DT1	Clydebank 1	Roadside	248479	671115	NO_2	No	2	<1	No
DT2	Clydebank 6	Kerbside	249725	672069	NO_2	No	40	<1	No
DT3	Clydebank 7	Kerbside	249913	669865	NO_2	No	4	<1	No
DT4	Clydebank 9	Kerbside	248899	670784	NO_2	No	3	<1	No
DT5	Clydebank 10	Kerbside	249759	671845	NO_2	No	8.5	<1	No
DT6	Clydebank 11	Kerbside	249801	672288	NO_2	No	22	<1	No
DT7	Clydebank 12	Kerbside	249747	671665	NO_2	No	10	<1	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
DT8	Clydebank 13	Kerbside	249762	671760	NO_2	No	3.5	<1	No
DT9	Clydebank 14	Roadside	249872	671854	NO_2	No	>25	10	No
DT10	Clydebank 15	Kerbside	249746	671966	NO_2	No	8.5	<1	No
DT11	Clydebank 16	Kerbside	249967	672548	NO_2	No	10	<1	No
DT12	Clydebank 17	Kerbside	249987	672440	NO_2	No	11	<1	No
DT13	Dumbarton 1	Roadside	240322	675177	NO_2	No	2.5	2.5	No
DT14	Dumbarton 11	Kerbside	240515	675078	NO_2	No	4	<1	No
DT15	Dumbarton 12	Kerbside	239410	675330	NO_2	No	7	<1	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
DT16	Glasgow Rd, D'ton 2	Kerbside	240178	675228	NO_2	No	8	<1	No
DT17	Glasgow Rd, D'ton 3	Kerbside	240279	675196	NO_2	No	4.5	<1	No
DT18	Milton 1	Kerbside	242266	674235	NO_2	No	12	<1	No
DT19	Milton 2	Roadside	242160	674299	NO_2	No	2	12	No
DT20	Alexandria 1	Kerbside	239024	680206	NO_2	No	5	<1	No
DT21	Balloch 1	Kerbside	238584	681562	NO_2	No	12	<1	No
DT22	Briar Drive 1	Roadside	249723	672044	NO_2	No	2.5	5	Yes
DT23	Briar Drive 2	Roadside	249723	672044	NO_2	No	2.5	5	Yes

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
DT24	Briar Drive 3	Roadside	249723	672044	NO_2	No	2.5	5	Yes
DT25	Dumbarton triplicate 1	Roadside	240238	675193	NO_2	No	18	4.5	Yes
DT26	Dumbarton triplicate 2	Roadside	240238	675193	NO_2	No	18	4.5	Yes
DT27	Dumbarton triplicate 3	Roadside	240238	675193	NO_2	No	18	4.5	Yes
DT29	Clydebank 19	Kerbside	249844	669919	NO_2	No	6	<1	No
DT30	Clydebank 20	Roadside	250098	669677	NO_2	No	9.5	2	No
DT31	Clydebank 21	Kerbside	250531	669269	NO_2	No	20	<1	No
DT32	Clydebank 22	Kerbside	250199	669551	NO_2	No	4	<1	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
DT33	Milton 3	Kerbside	242378	674258	NO_2	No	21	<1	No
DT34	Milton 4	Kerbside	242421	674270	NO_2	No	12	<1	No
DT35	Milton 5	Roadside	242413	674288	NO_2	No	2	14	No

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2014	2015	2016	2017	2018
CM1	Roadside	Automatic	51.3	51.3	21	18	22	19	22.05(3)
CM2	Roadside	Automatic	96.3	96.3	17	17.1	21	20	18
DT1	Roadside	Diffusion tube	100.0	100.0	25	26.82	23.1	23.8	22.5
DT2	Kerbside	Diffusion tube	100.0	100.0	29.3	23.99	26.8	28.4	28.37
DT3	Kerbside	Diffusion tube	91.7	91.7	27.4	21.44	22.7	23.7	20.63
DT4	Kerbside	Diffusion tube	100.0	100.0	19.7	19.96	18.7	19.7	22.00
DT5	Kerbside	Diffusion tube	100.0	100.0	21.7	24.32	22.0	23.4	20.62
DT6	Kerbside	Diffusion tube	100.0	100.0	20.1	19.07	21	18.9	17.25
DT7	Kerbside	Diffusion tube	100.0	100.0	19	17.78	21.1	23.1	19.89
DT8	Kerbside	Diffusion tube	100.0	100.0	20.9	21.37	21	21.4	18.68

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2014	2015	2016	2017	2018
DT9	Roadside	Diffusion tube	91.7	91.7	13.1	12.28	13.8	13.5	10.97
DT10	Kerbside	Diffusion tube	100.0	100.0	22.9	24.25	18.6	22.0	21.54
DT11	Kerbside	Diffusion tube	100.0	100.0	21.8	23.11	19.6	20.5	21.60
DT12	Kerbside	Diffusion tube	100.0	100.0	21.3	21.09	17.7	21.0	18.04
DT13	Roadside	Diffusion tube	100.0	100.0	25.8	24.56	25.3	23.3	21.94
DT14	Kerbside	Diffusion tube	100	100	28.1	24.07	23.2	22.9	18.81
DT15	Kerbside	Diffusion tube	91.7	91.7	15.3	14.77	17.8	16.6	14.39
DT16	Kerbside	Diffusion tube	91.7	91.7	24.1	25.87	25.5	25.7	24.92
DT17	Kerbside	Diffusion tube	100.0	100.0	28.8	24.34	23.5	21.0	26.63
DT18	Kerbside	Diffusion tube	100	100	**54.8**	**40**	**44.3**	**47.1**	38.19
DT19	Roadside	Diffusion tube	50.0	50.0	18.6	15.02	16	18.7	**20.25[3]**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
DT20	Kerbside	Diffusion tube	100.0	100.0	28.1	23.33	23.6	23.5	21.1
DT21	Kerbside	Diffusion tube	100.0	100.0	19.6	16.05	19.6	22.8	18.03
DT22	Roadside	Diffusion tube	100.0	100.0	20.1	17.91	19.1	20.5	19.31
DT23	Roadside	Diffusion tube	100.0	100.0	20.2	18.19	20.6	20.7	17.31
DT24	Roadside	Diffusion tube	100.0	100.0	21	19.22	20.2	21.6	19.27
DT25	Roadside	Diffusion tube	100.0	100.0	16.9	15.72	17.4	16.4	18.7
DT26	Roadside	Diffusion tube	100.0	100.0	16.5	17.6	17	20.6	16.6
DT27	Roadside	Diffusion tube	100.0	100.0	17.6	15.47	16.5	18.0	16.3
DT29	Kerbside	Diffusion tube	100.0	100.0				21.3	19.85
DT30	Roadside	Diffusion tube	83	83				27.1	23.8
DT31	Kerbside	Diffusion tube	100.0	100.0				21.0	20.2

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
DT32	Kerbside	Diffusion tube	91.7	91.7				19.3	15.5
DT33	Kerbside	Diffusion tube	100.0	100.0				**49.0**	**43.9**
DT34	Kerbside	Diffusion tube	100.0	100.0				**48.5**	**42.5**
DT35	Roadside	Diffusion tube	100.0	100.0				22.4	21.2

Notes: Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2014	2015	2016	2017	2018
CM1	Roadside	Automatic	51.3	51.3	0	0	0	0	0 (92)
CM2	Urban Background	Automatic	96.3	96.3	0	0	0(106)	0(101)	0

Notes: Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} Annual Mean Concentration (µg/m^3) (3)				
				2014	2015	2016	2017	2018
CM1	Roadside	98.8	98.8	N/A	10	9	9	10

Notes: Exceedances of the PM_{10} annual mean objective of 18µg/m^3 are shown in **bold.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been "annualised" as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2014	2015	2016	2017	2018
CM1	Roadside	98.8	98.8	N/A	0	No data	0	0

Notes: Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 7 times/year) are shown in **bold.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 98.1st percentile of 24-hour means is provided in brackets.

Table A.7 – Annual Mean $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3) (3)				
				2014	2015	2016	2018	2018
CM1	Roadside	98.8	98.8	N/A	6	6	5	6

Notes: Exceedances of the PM_{10} annual mean objective of 10µg/m^3 are shown in **bold.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been "annualised" as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results for 2018

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
DT1	40.2	33.1	34.3	22.9	19.1	7.3	22.3	16.4	22.1	22.8	43.6	29.8	26.2	22.5
DT2	38.8	41.1	42.9	37	34.4	13.7	20.8	21.6	15.2	22.8	58.3	49.2	33.0	28.37
DT3	30.2	32.9	30.3	29	17.9	5.9	18.8	17.3	20.4	29.2		32	24.0	20.63
DT4	24.7	31.4	39.9	24.3	15.4	7.1	15.9	9.8	17.5	17.6	41.1	62.3	25.6	22.00
DT5	35.1	32.1	26.2	27.8	20.1	8	18.7	16.6	8.8	21.1	40.8	32.4	24.0	20.62
DT6	27.7	30.6	5.5	23.6	25	8.1	13.3	10.4	11.6	17.8	39.9	27.2	20.1	17.25
DT7	30.1	34	24.7	16.1	19	6.1	16.7	18.6	23.6	18.2	42.4	28	23.1	19.89
DT8	31.7	32.3	24	16.9	18.4	4.4	17.1	16.9	17.4	19.3	33.2	29.1	21.7	18.68
DT9	15.5	19.7	15.9	13.2	11.2	2	9.9	9.3	14.2	9.8		19.6	12.8	10.97
DT10	32.5	35.5	29.4	27.3		5.4	19.8	14.2	15.7	18.2	45.1	32.4	25.0	21.54
DT11	33	32.9	26.7	54.4	16.1	5.5	16.2	14.8	19.2	19.1	35.5	28	25.1	21.60
DT12	30.3	29.6	21.7	22.2	14.8	9.1	20	13.8	11.6	17.3	34.5	26.8	21.0	18.04
DT13	30.2	30.9	20.9	23	10.6	14.1	21.7	22.2	22.3	34.2	33.1	43	25.5	21.94
DT14	33	31.1	25.6	21.8	15.6	11.7	14.3	12.7	13.1	24.9	26.1	32.5	21.9	18.81
DT15	23.7	20	23	17.6	18.2	10.2	14.4	7.2	8.4	18.3	23.1		16.7	14.39
DT16		41	40.1	32.4	22.9	28.7	27.1	19.1	13.7	22.7	34.5	36.6	29.0	24.92
DT17	42.1	38.4	35.4	32.1	34.6	26.3	27.5	13.6	12.6	40.9	29.3	38.8	31.0	26.63
DT18	42.6	54.9	68.4	14	59.3	19.8	37.1	34.1	27.6	52.7	59.6	62.8	44.4	38.19
DT19	14.9		19.4	62.3	17.8	8.7	18.2						23.6	22.05
DT20	31.5	32.4	22.3	27.7	21	15	19.7	17.6	11.5	23.1	36.1	36.3	24.5	21.08
DT21	23.6	30	22.1	25.7	20	13.8	15.3	11.5	13.8	16.2	30.9	28.7	21.0	18.03

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
DT22	25.9	30	29.3	24.5	20.4	10.6	14.6	9.3	9	19.2	44	32.7	22.5	19.31
DT23	29.2	14.2	27.1	1.6	25.4	12.3	12.5	10.5	14.1	17.7	44.9	32.1	20.1	17.31
DT24	30.7	31.5	30.3	22.5	23.2	10.5	12.3	12.9	2	16.1	41.9	35	22.4	19.27
DT25	23.7	23.6	58.9	18.5	14.8	6.5	13.2	12.7	9.6	24.6	21.4	33.1	21.7	18.68
DT26	27.8	25.5	25.8	19.3	12.8	12.9	12.3	10.8	4.3	23.2	25.9	31.6	19.4	16.64
DT27	26.4	25.3	26.5	18.6	15	9.5	13.5	13.1	3.8	17.7	25.5	32.1	18.9	16.27
DT29	28	24.1	26.7	20.8	18.7	7.3	17.4	15.3	29.6	18	40.8	30.3	23.1	19.85
DT30		36	30.8	26.7		10.1	17.3	9.8	46.4	30.8	40.9	27.6	27.6	23.77
DT31	28.5	31.6	23.8	25.9	14.8	5.5	12.3	13.6	40.5	17.9	37.8	29.5	23.5	20.19
DT32	25.3	27.3	24	20.8	13.3	4.8	15.8	12.5	15.1	13.2		26.3	18.0	15.51
DT33	64	61.3	60.6	20.5	66.8	30.5	54.9	59.3	13.8	64.3	57.2	59.5	51.1	43.91
DT34	47.6	60.7	61.8	57.4	68.1	2	74.1	38.1	8.3	57.5	59.9	57.2	49.4	42.48
DT35	23.2	60.2	25.2	24.7	22.2	7.8	21.5	16.7	16.4	21.9	23.9	32.5	24.7	21.23

(1) See Appendix C for details on bias adjustment

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

During 2018 data from West Dunbartonshire Council automatic monitors was downloaded daily by AEA. The data was screened, scaled and ratified by AEA and an annual report provided. Both of the automatic monitors have a comprehensive service contract and are serviced at six monthly intervals. West Dunbartonshire Glasgow Rd, Dumbarton is serviced by Enviro Technology and West Dunbartonshire Clydebank by Horiba (NOx unit) and Air Monitors (FIDAS).

The full Air Pollution Report for 2018 produced by Ricardo Energy and Environment for West Dunbartonshire Glasgow Road (site ID WDB4) and West Dunbartonshire Clydebank (site ID WDB3) can be accessed at http://www.scottishairquality.co.uk.

Annualisation of NO_2 data for 2018

Site	% Data Capture	AM	PM	Ra
Glasgow High St	98	30.7	31.4	1.02
Glasgow Townhead	99	23.7	24.5	1.03
Glasgow W/millglen	99	8.7	9.46	1.09
Total Ra				1.05

Milton 2 NO_2 period mean = 20.25 x 1.05 = 21.26µg/m^3

West Dunbartonshire Clydebank = 21x1.05 = 22.05µg/m3

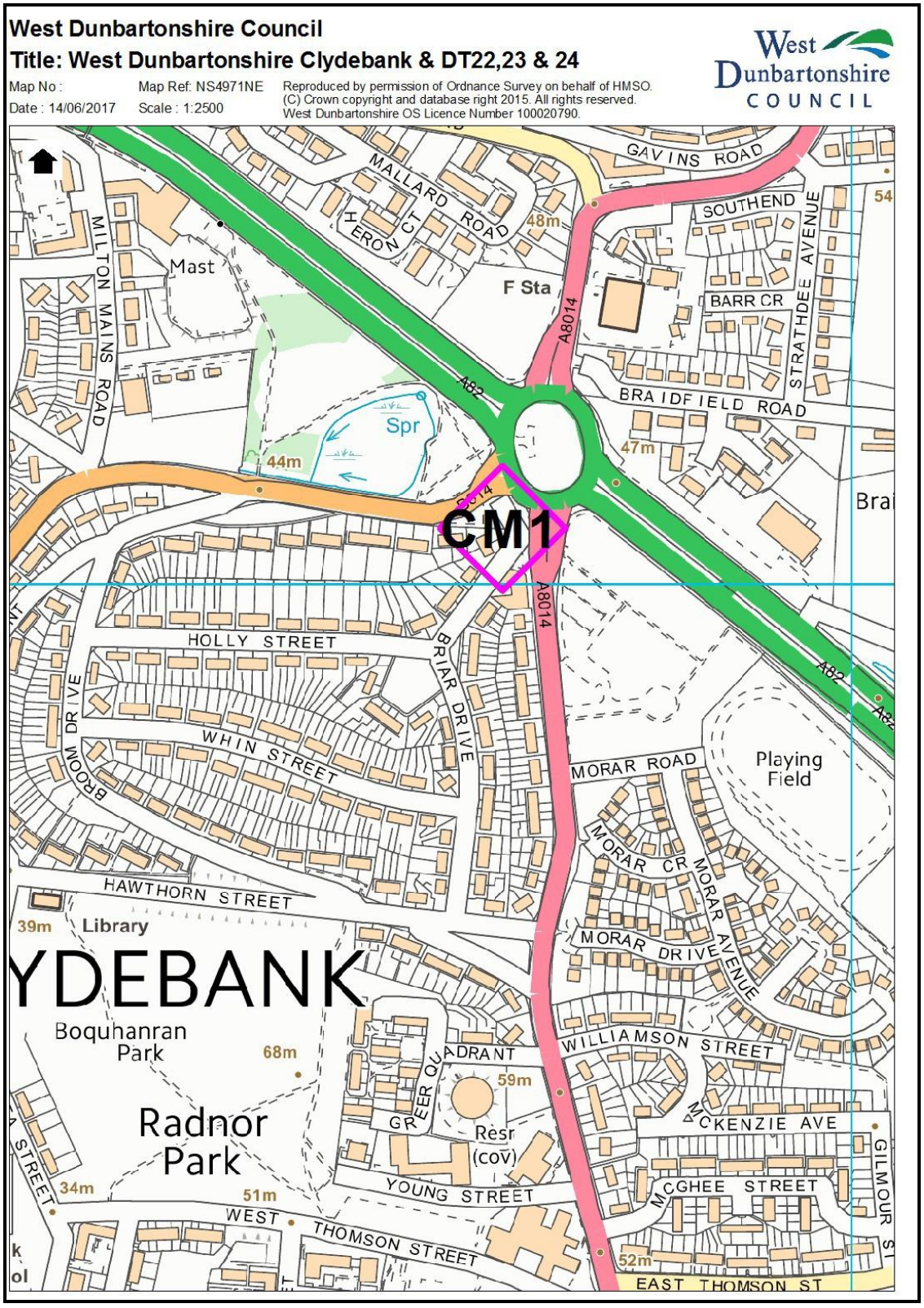
West Dunbartonshire Council use Glasgow Scientific Services (GSS) for NO_2 tube analysis. Tubes are provided and analysed by GSS.

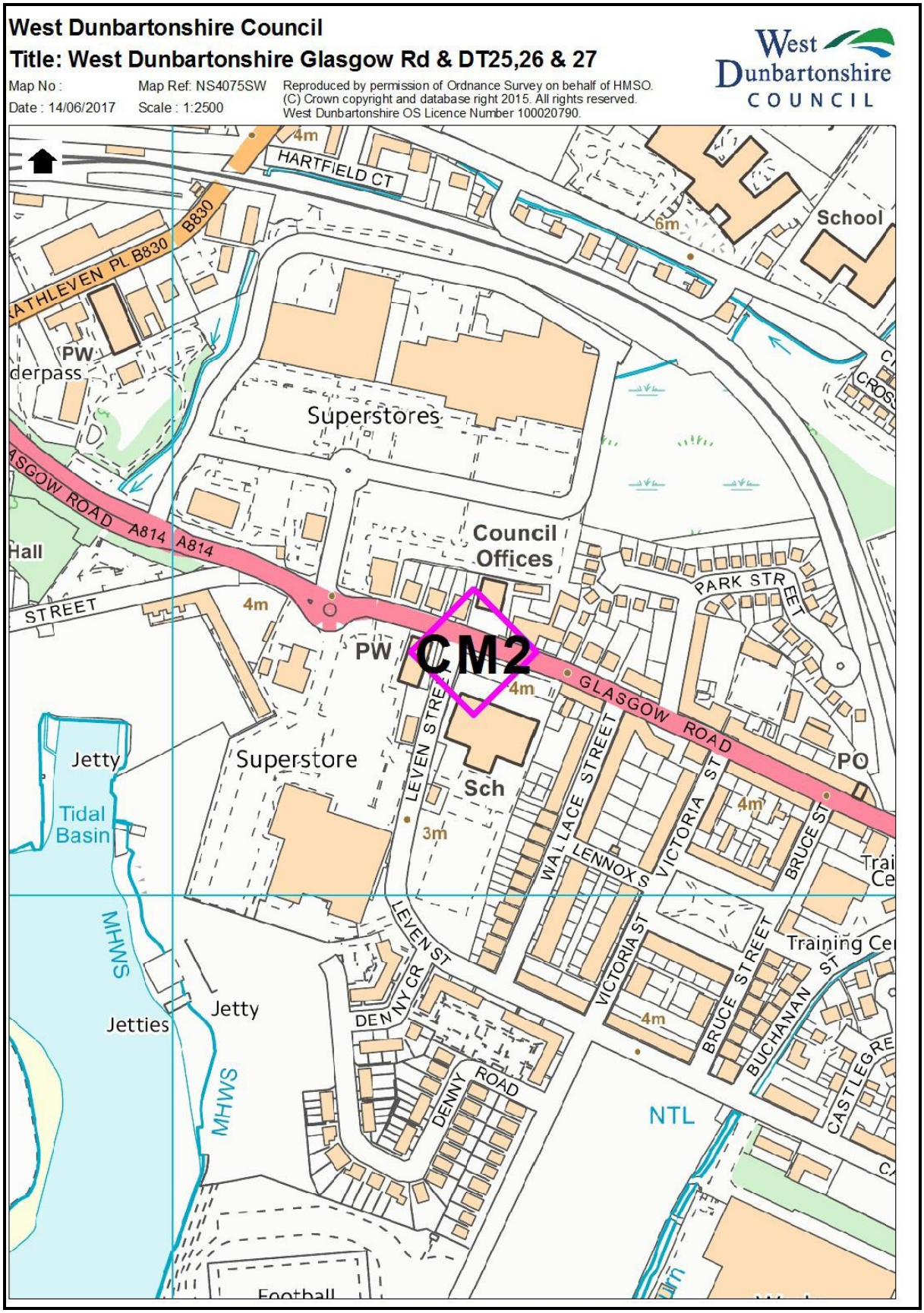
The NO_2 tube preparation method used is 20% triethanolamine (TEA) in water.

Glasgow Scientific Services participate in the AIR NO_2 Proficiency Testing Scheme. In 2018 the results the lab submitted to the scheme were determined to be satisfactory based on a z-score of ≤±2.

A bias of 0.86 has been used to adjust NO_2 tube data. The bias was obtained from the National Diffusion Tube Bias Adjustment Factor spreadsheet.

Appendix D: Automatic Monitoring Site Location Maps co-located NO_2 tubes




West Dunbartonshire Council
Title: West Dunbartonshire Glasgow Rd & DT25,26 & 27
Map No :
Map Ref: NS4075SW
Date : 14/06/2017
Scale : 1:2500
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CM2
HARTFIELD CT
B830
ATHLEVEN PL B830
School
Superstores
GLASGOW ROAD A814
Council Offices
Hall
STREET
PARK STREET
GLASGOW ROAD
Superstore
Sch
PO
Jetty
Tidal Basin
MHWS
Jetties
LEVEN STREET
WALLACE STREET
VICTORIA ST
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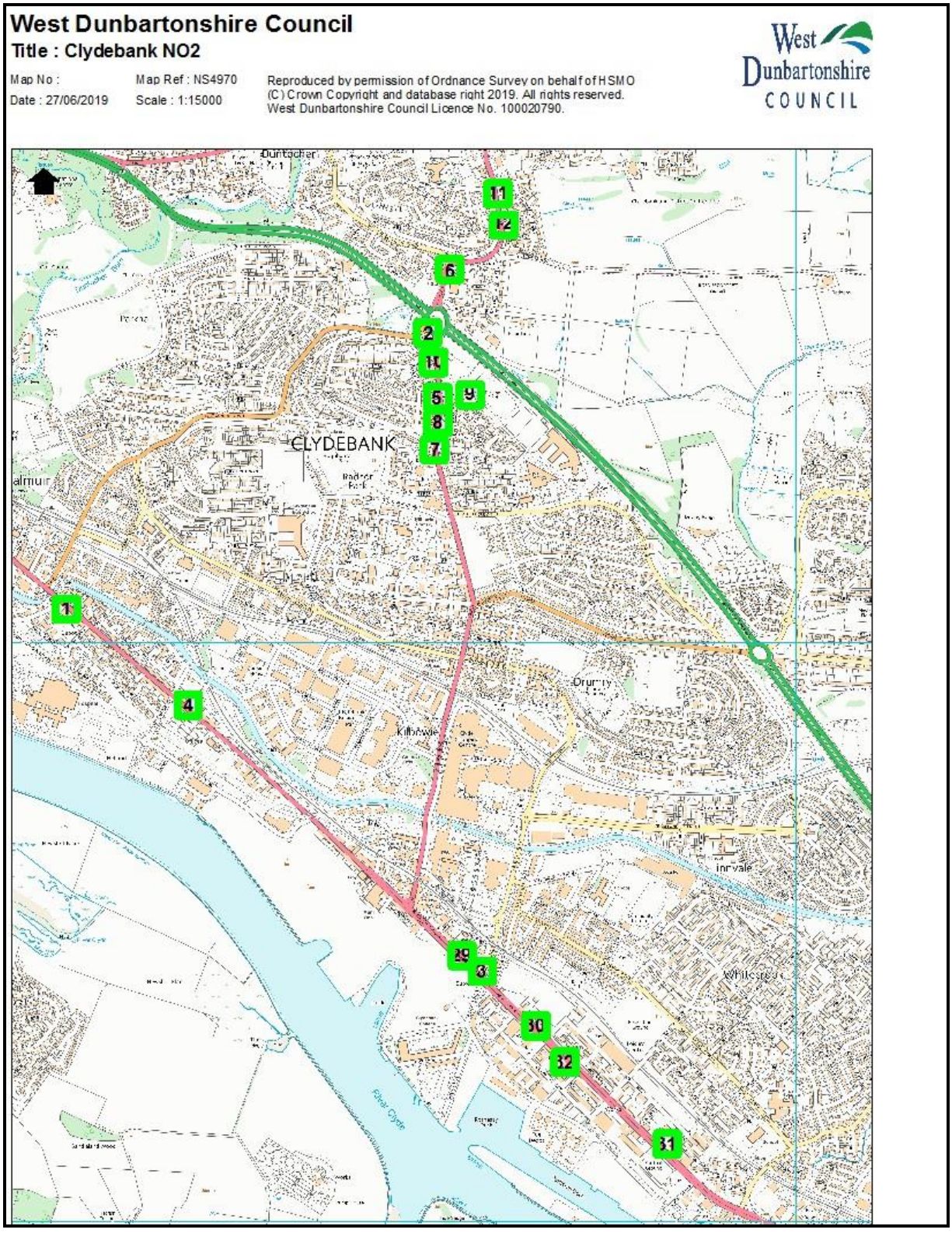
CASTLEGREEN
NTL
Training Ce
Football
4m
6m
3m


West Dunbartonshire Council
Title : Clydebank NO2
Map No :
Map Ref : NS4970
Date : 27/06/2019
Scale : 1:15000
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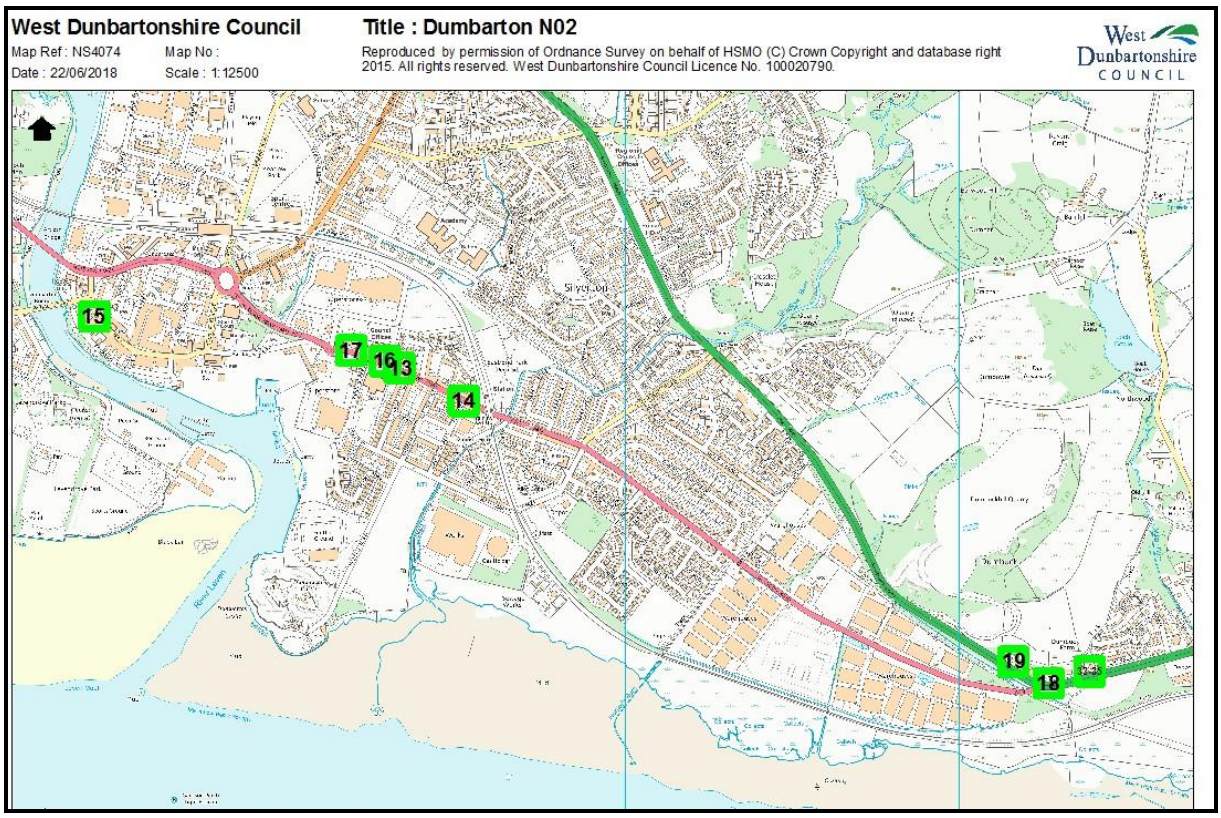
Dunbarton
CLYDEBANK
Drumry
Kilbowie
Whitecrook
River Clyde
1
2
3
4
5
6
7
8
9
11
12
29
30
31
32


West Dunbartonshire Council
Map Ref : NS4074
Map No :
Date : 22/06/2018
Scale : 1:12500
Title : Dumbarton N02
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West Dunbartonshire COUNCIL
15
17
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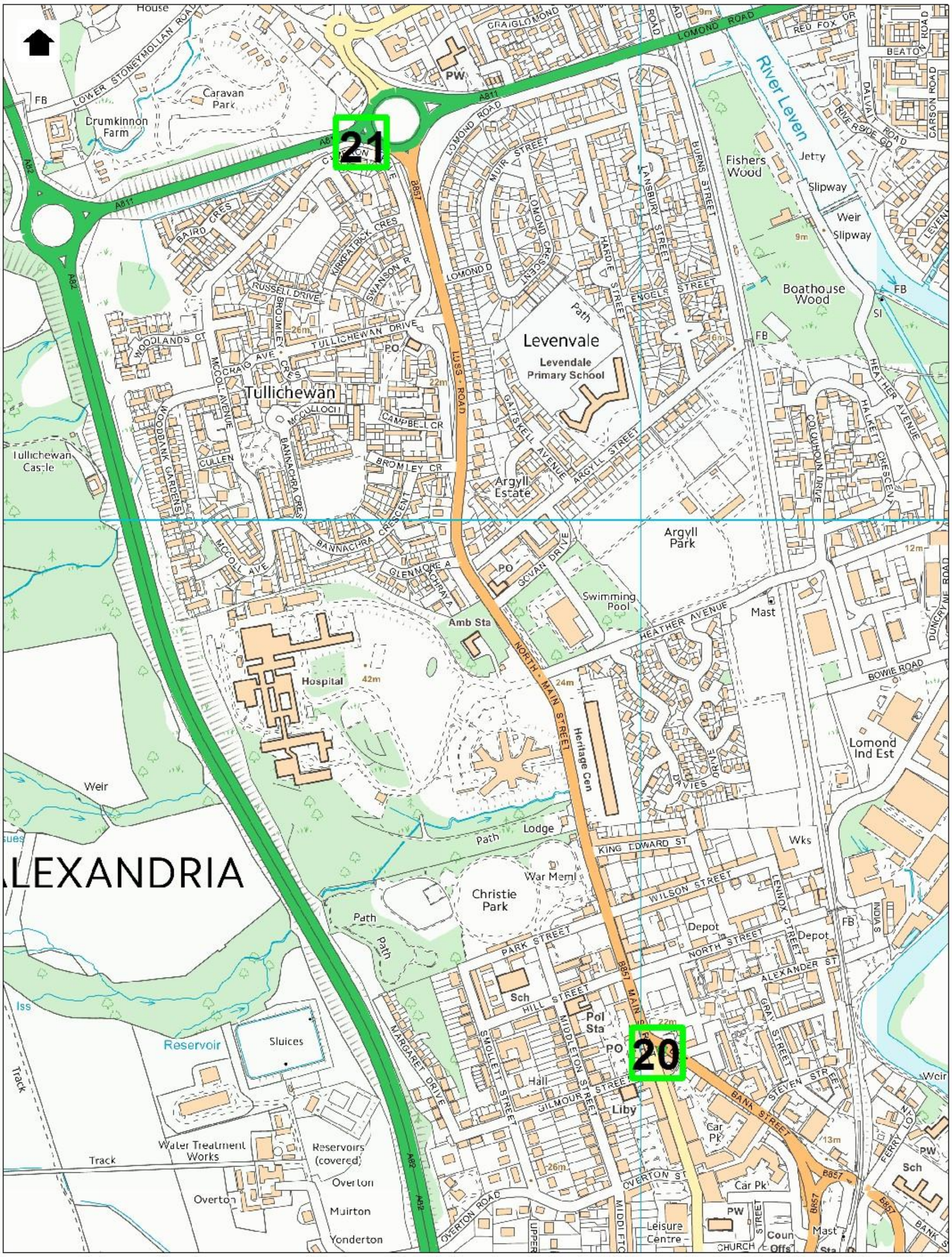
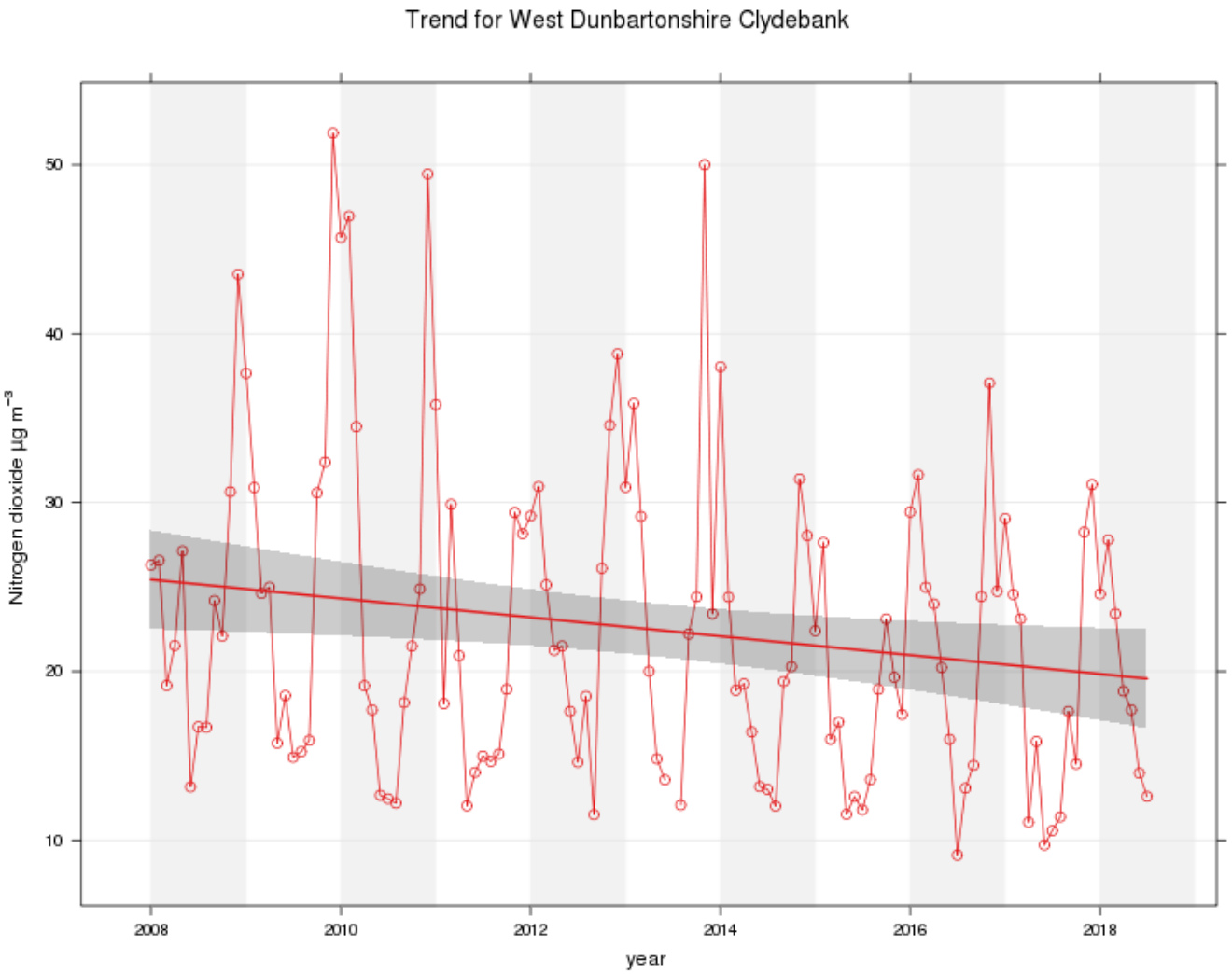
West Dunbartonshire Council

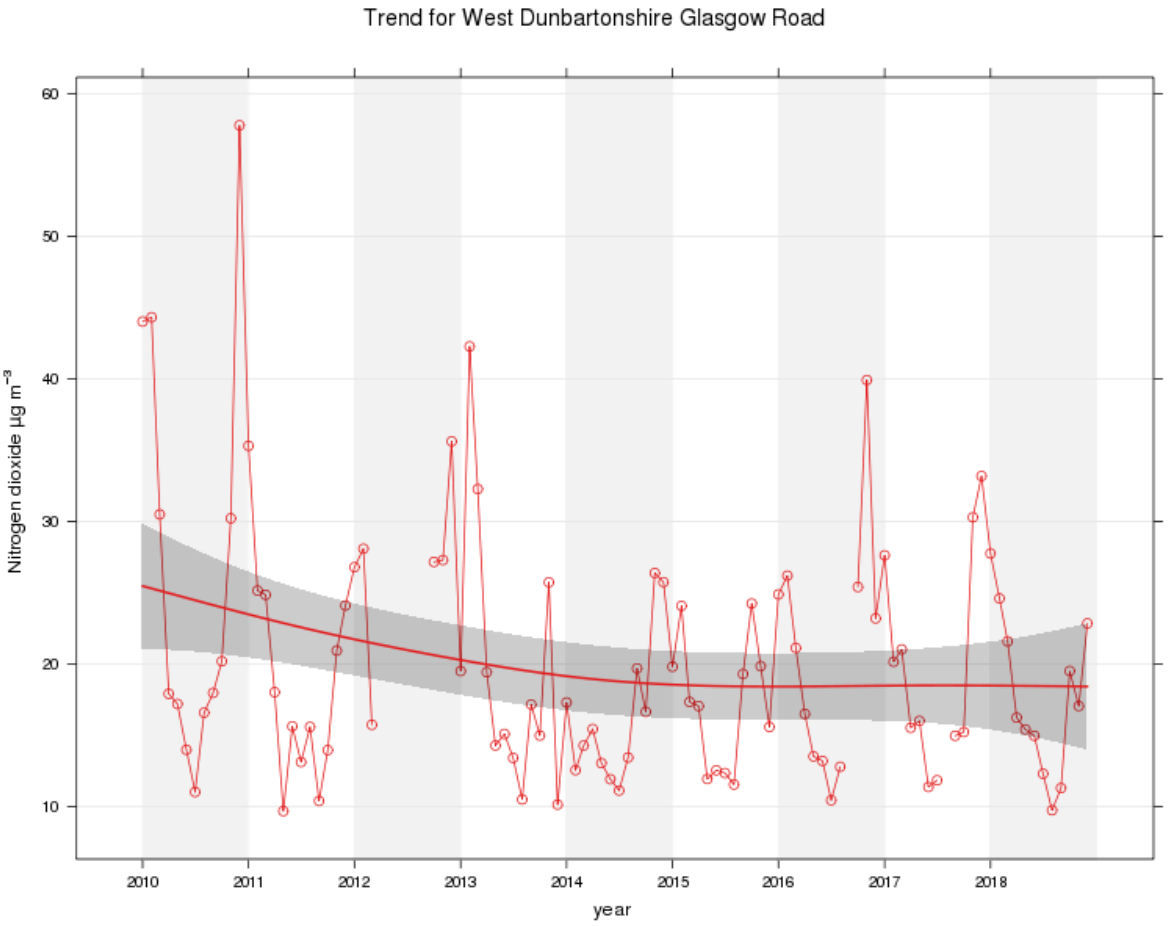
Title: Vale of Leven NO2

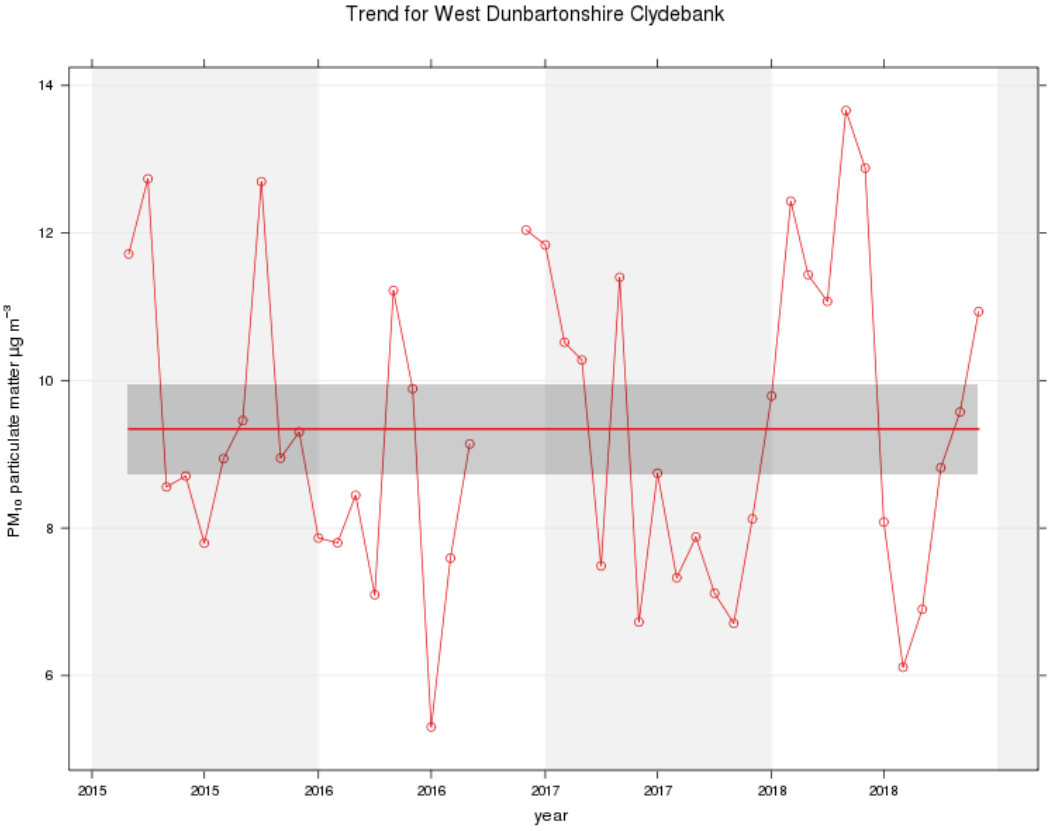
Map No :
Map Ref: NS3880
Date : 14/06/2017
Scale : 1:5000

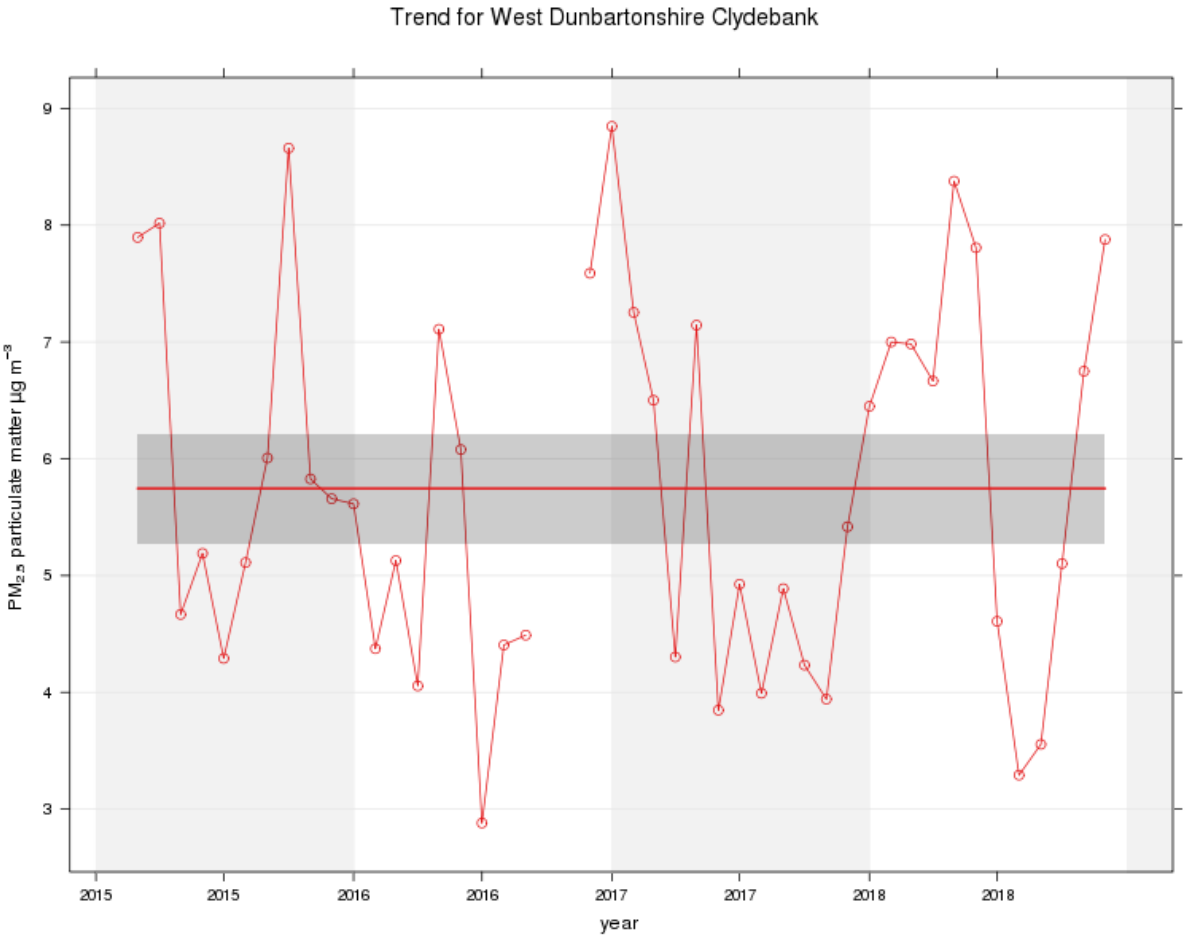


Appendix E: Automatic Monitor trends 2010 -2018




Trend for West Dunbartonshire Glasgow Road
Nitrogen dioxide µg m^{-3}
60
50
40
30
20
10
2010
2011
2012
2013
2014
2015
2016
2017
2018
year


Trend for West Dunbartonshire Clydebank
PM$_{10}$ particulate matter µg m^{-3}
14
12
10
8
6
2015
2015
2016
2016
2017
2017
2018
2018
year


Trend for West Dunbartonshire Clydebank
PM2.5 particulate matter µg m−3
9
8
7
6
5
4
3
2015
2015
2016
2016
2017
2017
2018
2018
year

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- **Local Air Quality Management Technical Guidance (TG16)**
- **The Environment Act 1995**
- **The Air Quality (Scotland) Regulations 2000**
- **The Air Quality (Scotland) (Amendment) Regulations 2002**
- **West Dunbartonshire Council Annual Progress Report 2017**