

Annual Progress Report (APR)



2018 Air Quality Annual Progress Report (APR) for
East Renfrewshire Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

June 2018

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Executive Summary: Air Quality in Our Area

Air Quality in East Renfrewshire Council

Air quality in East Renfrewshire is generally good. There are no major industrial or commercial sources of air pollutants within the area and road traffic is therefore the main source of local air pollution. No air quality monitoring areas have been declared in East Renfrewshire and our monitoring of air quality across the district has found that pollutant levels have decreased over recent years.

Actions to Improve Air Quality

While our air quality is generally good, we have been working over the past year on a range of measures designed to improve local air quality and increase public awareness of the steps that we can all take to minimise our impact on our local environment. We have continued to carry out roadside emissions testing in conjunction with Police Scotland and have increased the level of vehicle idling enforcement schemes operating around local schools.



Figure 1: Promotional Material for regional Awareness Campaign (Billboards and Bus Advertising)

East Renfrewshire Council

We have also worked with school Junior Road Safety Officers to produce banners and leaflets promoting the “anti-idling” message at school events such as parent’s nights and induction days and supported a wider awareness campaign in conjunction with 5 neighbouring Local Authorities (Figure 1.).

East Renfrewshire Council in partnership with PoliceScotland and our corporate communications team have developed the **GO – SAFE East Ren Initiative** encompassing **safer driving, safer cycling and safer walking**



Figure 2: Promotional Material for School and Community events

Local Priorities and Challenges

As air quality in East Renfrewshire is generally good, local priorities are not only about meeting objectives but the challenge remains to go beyond compliance and to deliver the Council's 3rd Single Outcome Agreement in the Outcome Delivery Plan to ensure East Renfrewshire is "*a thriving, attractive and sustainable place for businesses and residents*".

This year we are extending our vehicle idling enforcement programme across East Renfrewshire. Our Community Safety Officers are now carrying out 10 hours per week of idling enforcement outside schools, leisure centres and at taxi stands / bus terminus.

As well as carrying out idling enforcement outside schools and community facilities, ERC's Education Department will be supported to deliver air quality education to pupils and promote active travel to and from school.

How to Get Involved

East Renfrewshire Council's Prevention Team has developed a unique partnership with many local MOT stations to offer free vehicle emissions checks to local residents. Any resident who is concerned about their vehicle's emissions can visit one of the participating local garages for a free check – details of all of the participating garages can be found on East Renfrewshire Council's website at <http://www.eastrenfrewshire.gov.uk/article/6006/Reducing-car-pollution>

Further information on local air quality and our enforcement and education activities can also be found on East Renfrewshire Council's website at <http://www.eastrenfrewshire.gov.uk/air-quality>

Residents who are concerned about local air quality can contact Environmental Health at environmentalhealth@eastrenfrewshire.gov.uk, by phone on 0141 577 3127 or via the 'Contact Us' section of our website.

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1. Local Air Quality Management

This report provides an overview of air quality in East Renfrewshire Council during 2017. 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) summarises the work being undertaken by East Renfrewshire 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.

East Renfrewshire Council has not declared any AQMAs.

2.2 Progress and Impact of Measures to address Air Quality in East Renfrewshire.

East Renfrewshire Council has taken forward a number of measures during the current reporting year of 2017 in pursuit of improving local air quality. As East Renfrewshire does not have any AQMAs, these measures are not specifically designed to target any particular location, but rather have been developed to improve air quality across the district more generally.

Key completed measures include the adoption of enhanced enforcement powers to target vehicle idling (particularly outside schools, at public transport hubs and leisure facilities) and roadside emissions checks, in conjunction with Police Scotland. We have worked with local Schools and Junior Road Safety Officers to produce promotional material that can be used to promote an anti-idling message around the school gates. Across East Renfrewshire Council, an active travel strategy has been developed, together with energy efficiency and sustainable transport projects. Further detail on these projects and others across East Renfrewshire are detailed in **Table 2.1** below.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
1	Air Quality education project in schools	Public Information	ERC Education Department will be supported to deliver active travel and air quality education in Primary schools.	ERC Education Department and Environment Department	1/4/17	1/4/18	No. Of Schools supported	4 Schools were targeted in trial	Ongoing	This Project successfully combines air quality and active travel education.
2.	Vehicle Idling Enforcement	Traffic management	Vehicle idling enforcement around local schools, leisure and transport hubs	ERC Community Safety	1/4/15	ongoing		Level of enforcement increased from 4 hours per week to 10 Hours per week	ongoing	Enforcement has increased from some local schools to all local schools, leisure centres and transport hubs.
3	Roadside emission checks	Traffic Management	ERC and Police Scotland carry out roadside vehicle emission testing, with Fixed Penalty Notice issued to any drivers vehicle which fails the test	ERC Environment in partnership with Police Scotland	1/4/15	ongoing	Nos. vehicle failing emission test	4 Days of enforcement carried out in 2017 (calendar year)	ongoing	4 enforcement Days to be completed in 2018
4	Local garage emission test partnership	Vehicle fleet efficiency	ERC created a partnership with local MOTstations to offer free vehicle emission checks to residents	ERC Environment and local garages	1/4/16	Scheme fully operational		16 Garages have signed up to voluntary scheme	ongoing	
5	Staff Pool Cars EElectric Vehicles available	Promoting low emission transport	ERC now has 7 electric vehicles available for use as a staff pool car	ERC Environment Department		Scheme fully operational		Scheme fully operational	ongoing	The scheme is publicised across all staff to encourage uptake.

East Renfrewshire Council

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Progress to Date	Estimated Completion Date	Comments
6.	Trial of Hybrid Transit vans for use in the parks department	Promoting low emission transport	4 Transit vans have been adapted to hybrid vehicles	ERC Environment Department	April 2017	2017		Performance monitoring	ongoing	The alteration to hybrid vehicles has been made to evaluate opportunity for further vehicles to be adapted.
7.	Enforcement of Parking in vehicle electrical charging spaces of controlled vehicles/	Promoting low emission transport	Community Wardens are monitoring electrical charging stations in controlled carparks for vehicles either not being charged or not capable of being charged	ERC Community Safety	April 2017	June 2017	No. of fixed penalty notices issued vs. no of spaces monitored	Fixed penalty notices have been issued	ongoing	Monitoring of electrical charging stations ensures that these bays can be fully available for recharging purposes.

2.3 Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland’s legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available at <http://www.gov.scot/Publications/2015/11/5671/17>. Progress by East Renfrewshire Council against relevant actions within this strategy is demonstrated below.

2.3.1 Transport – Avoiding travel – T1

All local authorities should ensure that they have a corporate travel plan, which is consistent with any local air quality action plan. Details of East Renfrewshire Council’s most recent climate change report can be viewed at <https://www.keepsotlandbeautiful.org/sustainability-climate-change/sustainable-scotland-network/climate-change-reporting/climate-change-reports/>. The report contains details of how ERC is performing in its target to promote active travel, promote the use of low emission vehicles and reduce the need for “unnecessary journeys”. The reduction of staff making “unnecessary journeys” is underpinned by Service redesign promoting the use of a digital platform for conference calls, agile working and hot desks.

2.3.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2

Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan to ensure that air quality considerations are covered. East Renfrewshire Council is currently finalising their Environmental Sustainability Strategy for 2018 – 2022/23.

This ESS will underpin a group of strategies, plans and policies that describe the function of the Council in reducing its resource use and mitigating its environmental impact; mainly in relation to emission of Greenhouse Gases (GHGs). The aim of the document is, therefore, to create a unified approach to resource use, sustainability and environmental management within the organisation.

The responsibility for implementing this Strategy will lie with the Council. However, there may be projects arising from this strategy that have a bearing on other community planning partnership organisations.

- The Council Cabinet will oversee this strategy.
- The Corporate Asset Management Group will assume the management role.
- Environment Dept. – namely the Environment Partnership will be responsible for the implementation of the overall Strategy.
- The responsibility for the success of the Strategy will rely on all Council staff understanding their part in helping to reduce the environmental impacts of the Council.

Air Quality considerations are covered across the strategy and include the following examples:

- Planning and the local development plan have targets to increase the current capacity of wind turbines, establish 2.85km of new walkway by 2029, establish new bus route for Levern valley by 2020 and establish new rail station at Barrhead south
- Public sustainable transport have targets to enhance the lengths of cycle tracks and cycle routes, work with public transport providers to increase the number of people using public transport by 2020, encourage the implementation of a school “walking bus” scheme by 2020.
- Housing have targets to ensure 100% of Council and RSL homes meet Energy Efficiency in Social Housing standards by 2020, to contact households re support for energy efficiency measures and maximise available support for home energy efficiency improvements directed towards the most vulnerable households

The launch of the **Think Green Campaign** within East Renfrewshire aims to support the Council by raising awareness of current environmental issues and encourage staff to take action.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

East Renfrewshire Council does not currently have any automatic monitoring sites.

3.1.2 Non-Automatic Monitoring Sites

East Renfrewshire Council undertook non- automatic (passive) monitoring of NO₂ at 22 sites during 2017. **APPENDIX A: MONITORING RESULTS**

Table A.1 in **Appendix A** shows the details of the sites.

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

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 (NO₂)

East Renfrewshire Council currently monitors nitrogen dioxide at 22 locations, using diffusion tubes. During 2017, nitrogen dioxide levels at all 22 sites were within the annual mean objective. **There is therefore no need to proceed to any more detailed monitoring or assessment of nitrogen dioxide levels for any location within East Renfrewshire.**

Although some monitoring sites have recorded a slight increase in nitrogen dioxide levels during 2017 compared to the previous calendar year, levels at 14 out of the 22 sites have either remained constant or shown a slight decrease. There continues to be an overall downward trend in NO₂ levels over the last six years as shown in **Figure 3.1** below.

Table A. in **Appendix A** compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 6 years with the air quality objective of 40µg/m³.

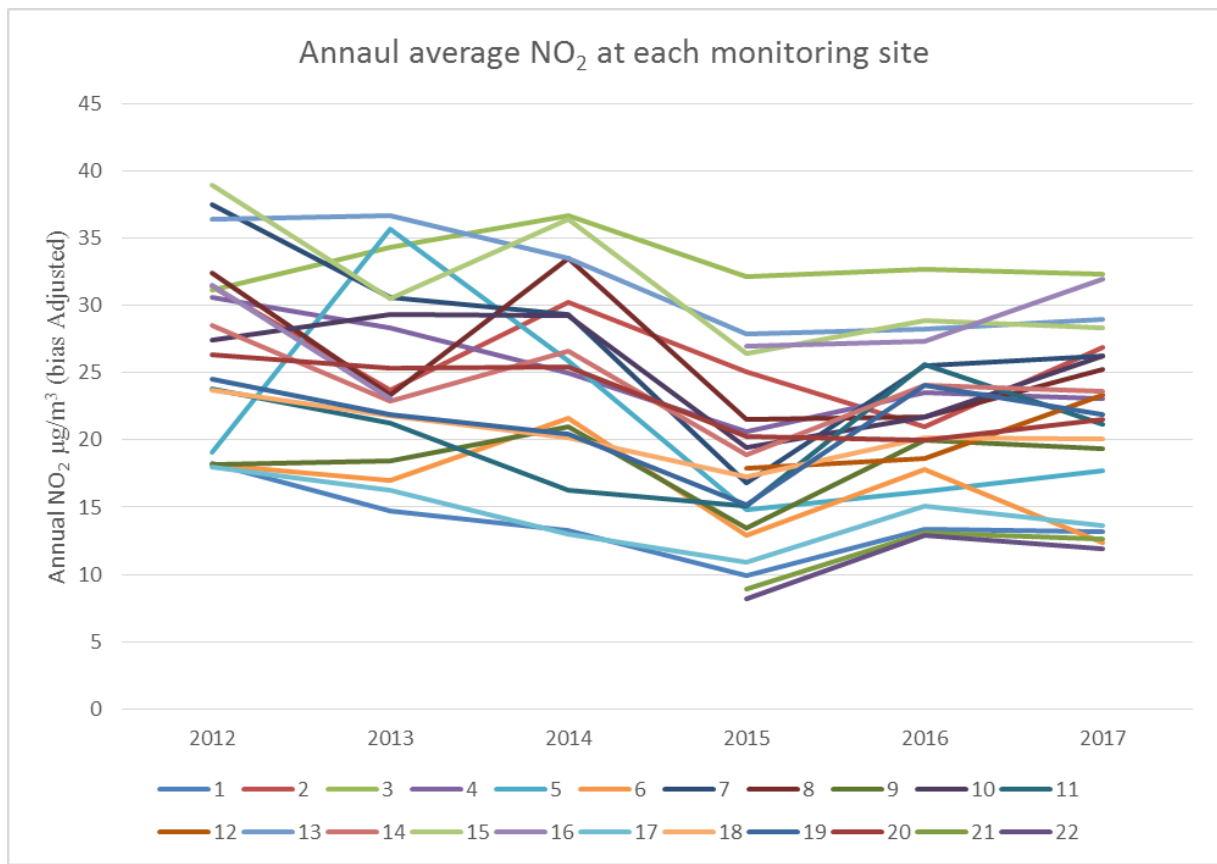


Fig. 3.1 Nitrogen Dioxide diffusion tube results at each monitoring site 2012-2017

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in **Appendix B- Table B1**.

3.2.2 Particulate Matter (PM₁₀)

PM₁₀. Monitoring was undertaken at Sheddens Roundabout until mid-2014. Data results up until that time had indicated that there was no likelihood of failing to meet the hourly or annual mean objective for PM₁₀.

3.2.3 Particulate Matter (PM_{2.5})

East Renfrewshire Council does not monitor PM_{2.5} and currently has no plans to do so.

3.2.4 Sulphur Dioxide (SO₂)

East Renfrewshire Council does not monitor SO₂ as there are no significant sources of SO₂ in the area.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

East Renfrewshire Council does not monitor any of these pollutants as there are no significant sources of these pollutants within our area.

4. New Local Developments

There are significant new local developments currently either being considered under the development management system or under construction around the south of Barrhead and Newton Mearns. As part of the development management process, air quality assessments are required for any significant development. These may be stand-alone assessments or may form a chapter of the wider Environmental Impact Assessment for the development. The conclusions of each of these air quality assessments has been reviewed by the Environmental Health Service; as background pollutant levels across the district are generally low, none of these developments has been considered to create a risk of exceedance of air quality objectives. Any of these air quality assessments can be viewed via East Renfrewshire Council's Online Planning Portal at:

<http://www.eastrenfrewshire.gov.uk/planning-and-building-standards>

4.1 Road Traffic Sources

2017 has not seen any new:

- Narrow congested streets with residential properties close to the kerb.
- Busy streets where people may spend one hour or more close to traffic.
- Roads with a high flow of buses and/or HGVs.
- Significant Junctions.
- New roads constructed or proposed
- Roads with significantly changed traffic flows.
- Bus or coach stations

4.2 Other Transport Sources

There are no airports or shipping ports within East Renfrewshire, nor are there any:

- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Industrial Sources

There are no new:

- **Industrial installations:** new or proposed installations for which an air quality assessment has been carried out.
- **Industrial installations:** existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- **Industrial installations:** new or significantly changed installations with no previous air quality assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.
- Poultry farms.

4.4 Commercial and Domestic Sources

There are no new:

- Biomass combustion plant – individual installations.
- Areas where the combined impact of several biomass combustion sources may be relevant.
- Areas where domestic solid fuel burning may be relevant.
- Combined Heat and Power (CHP) plant.

4.5 New Developments with Fugitive or Uncontrolled Sources

There are no new:

- Landfill sites.
- Quarries.
- Unmade haulage roads on industrial sites.
- Waste transfer stations, etc.
- Other potential sources of fugitive particulate matter emissions.

5. Planning Applications

There are significant areas of development around the south of Barrhead and Newton Mearns. These developments predominantly comprise residential development, together with associated community facilities e.g. schools. There is also approval for residential developments in areas to the north east of Barrhead and west of Newton Mearns regenerating industrial/commercial areas that have been lying vacant for a number of years.

Wherever such significant development is being considered, the Environmental Health Service recommends to the Development Management team that an air quality assessment is required. Often the developer's appointed consultant will contact the EH service to discuss the requirement for an assessment, obtain any available local monitoring data and agree a suitable methodology for the assessment.

For the smaller housing developments, the assessment usually comprises a stand-alone report. For larger scale developments, air quality is normally included as a chapter of the full Environmental Impact Assessment for the site. The assessment will cover both the construction and operational phases of the development. East Renfrewshire Council encourages developers to consider the cumulative effect of their own development and other nearby developments which are already the subject of a planning application or under construction.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

There were no exceedances of Scottish objectives identified within East Renfrewshire in 2017. The monitoring data shows a downward trend in NO_x levels over the last 5 years.

6.2 Conclusions relating to New Local Developments

There are areas of significant development around the south of the existing suburbs of Newton Mearns and Barrhead and a number of regeneration projects to bring vacant commercial and industrial land to the north of Barrhead and west of Newton Mearns back into use as residential areas. Much of this development is already under construction, although some is still being processed through the development management system. For all planning applications for significant development, air quality assessments are required. These assessments will include review of the impact on local air quality during any demolition works, construction works or the completed and operational phase of the development. None of these assessments have considered that any of the development present a risk of national air quality objectives being exceeded, primarily as a result of the comparatively low background levels of pollutants.

This notwithstanding, Environmental Health has liaised with the Development Management section and with other services across East Renfrewshire Council to work towards securing some mitigation of any impacts on local air quality. East Renfrewshire Council seeks to encourage active travel within the context of place-making for significant new developments.

As new developments are completed and occupied, Environmental Health will review East Renfrewshire Council's air quality monitoring network to ensure that it continues to be appropriate in both scale and location.

6.3 Proposed Actions

As there are no exceedances of national or Scottish air quality objectives within East Renfrewshire, there is no need to progress to any further formal assessments before the next annual Progress Report (due June 2019).

Although there is no requirement to proceed through any additional formal stages of the Local Air Quality Management process, East Renfrewshire Council is committed to improving local air quality, as part of the council's strategic outcome agreement to ensure that "*East Renfrewshire is a thriving, attractive and sustainable place for businesses and residents*" and as a part of ERC Environment Department's wider 'Prevention' agenda. East Renfrewshire Council is also cognisant of the key role of local authorities in delivery of the new Scottish Government "*Cleaner Air for Scotland*" strategy.

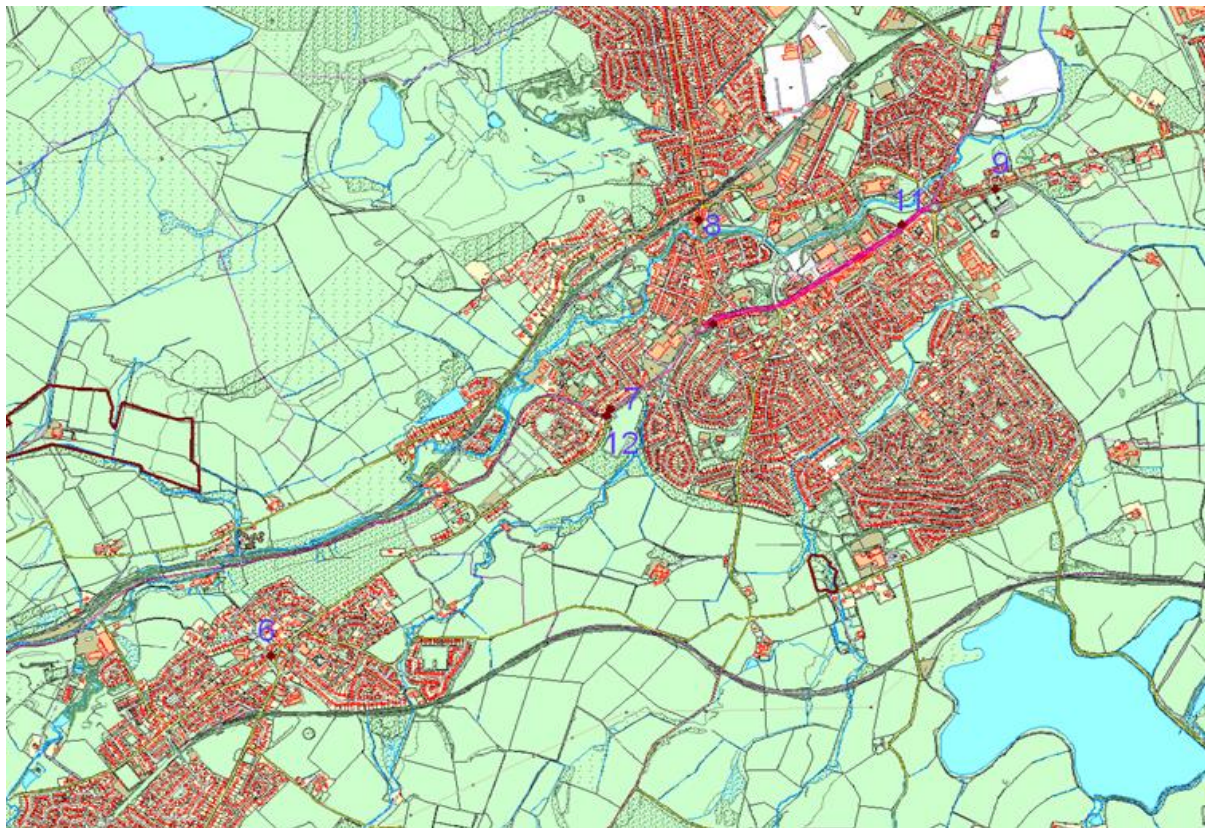
We will therefore be continuing to work throughout 2018/9 on air quality education projects within local schools, on vehicle idling enforcement, on promotion of the anti-idling message and on roadside emissions testing. East Renfrewshire Council is also committed to providing and promoting opportunities for active travel and will continue to deliver on this throughout 2018/9.

Environmental Health will continue to liaise with colleagues in Development Management and Development Plans to ensure that air quality impacts from new developments are appropriately assessed and that mitigation measures are included wherever necessary.

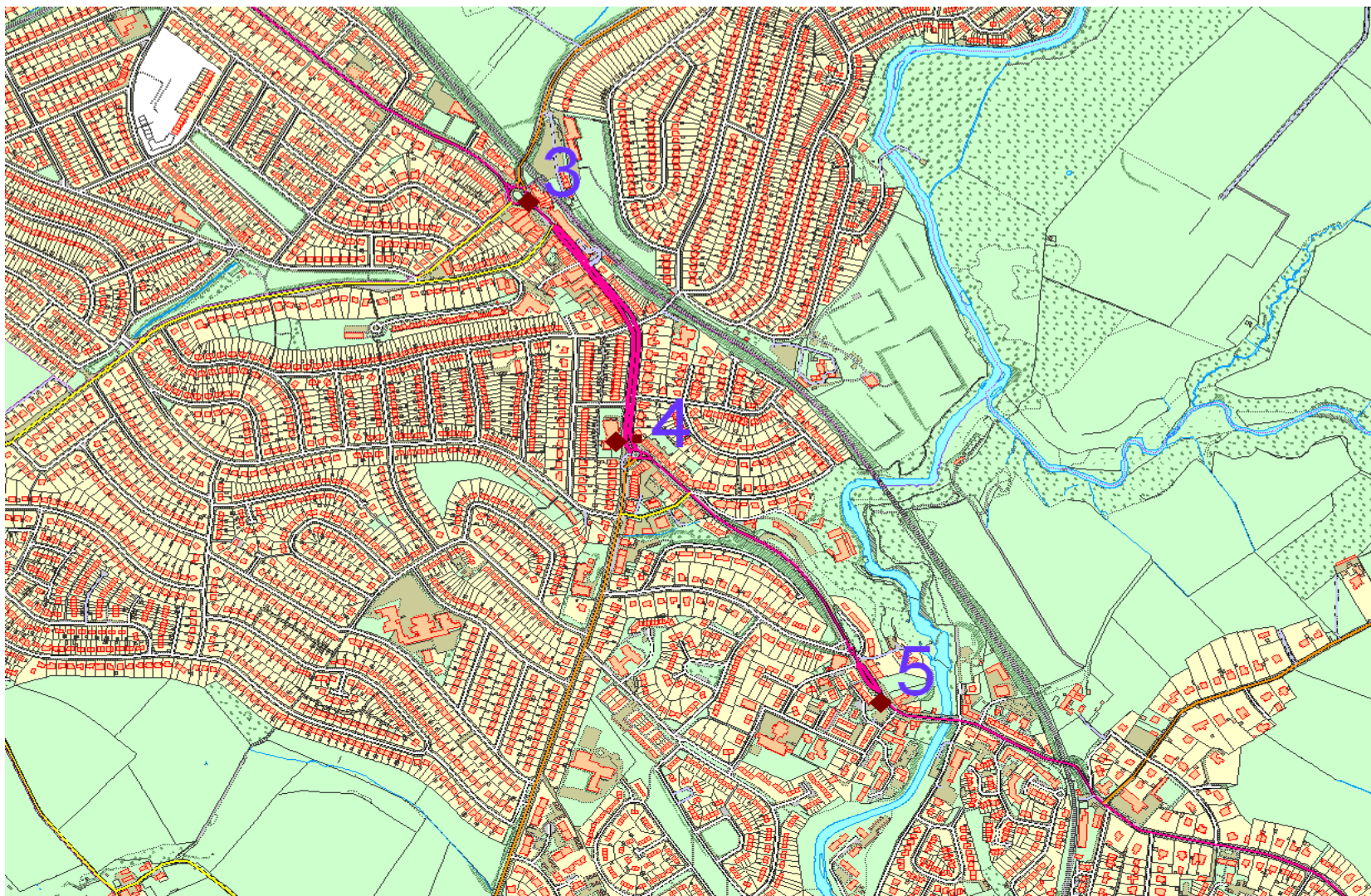
East Renfrewshire Council will demonstrate our on-going commitment to improving local air quality throughout 2018/9, through developing partnerships between ERC services and with external organisations. This integrated partnership approach will help us to deliver beyond air quality compliance, to contribute to wider environmental and health benefits for our residents.

APPENDIX A: MONITORING RESULTS**Table A.1 – Details of Non-Automatic Monitoring Sites for NO₂**

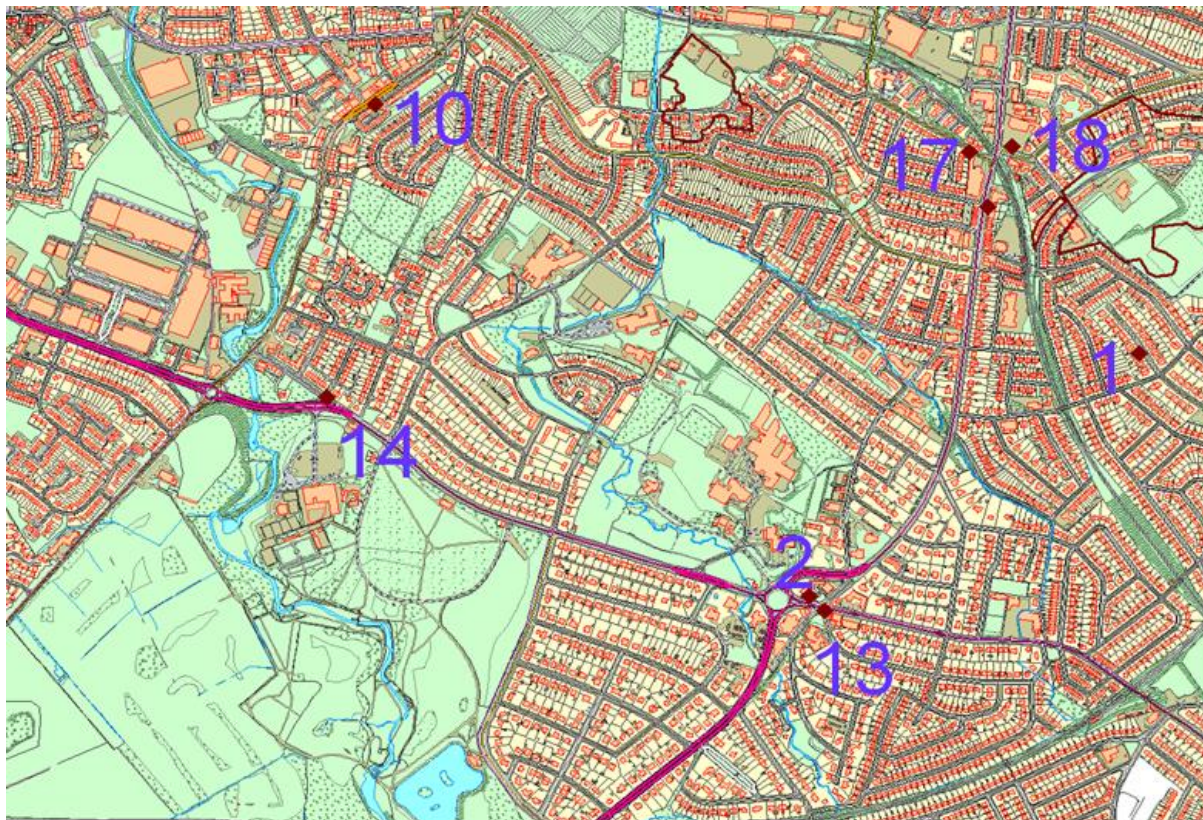
Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m)	Does this location represent worst-case exposure?
1	Huntly Drive, Giffnock	Roadside	256639	658900	Y 2.0m	0	Y
2	Eastwoodmains Road	Kerbside	255872	658311	Y 5.0m	2.5	Y
3	Clarkston Toll	Roadside	257278	657569	Y 5.0m	0	Y
4	Sheddens Roundabout	Kerbside	257459	657117	Y 2.0m	3	Y
5	Riverside Terrace, Busby	Kerbside	257889	656601	Y 2.5m	2.5	Y
6	Main Street, Neilston	Kerbside	248019	657343	Y 1.0m	2.5	Y
7	Kelburn St, Neilston Rd, Barrhead	Kerbside	249401	658377	Y 2.0m	2.5	Y
8	Cross Arthurlie St, Barrhead	Kerbside	249787	659237	Y 1.0m	2	Y
9	Darnley Rd, Barrhead	Kerbside	251009	659376	Y 5.0m	2.5	Y
10	Main St, Thornliebank	Kerbside	254880	659513	Y 5.0m	2.5	Y
11	Main St, Barrhead, North	Roadside	250633	659213	Y 5.0m	0.5	Y
12	Main St, Barrhead, South	Roadside	250636	659225	Y 15.0m	0.5	Y
13	Lochlibo Rd at W. Arthurlie	Kerbside	249344	658392	Y 7.0m	4	Y
14	Eastwoodmains Rd, Mains Ave	Kerbside	255920	658263	Y 5.0m	2	Y
15	Rouken Glen Rd	Kerbside	254761	658788	Y 5.0m	2	Y
16	195 Fenwick Road	Kerbside	256279	659209	Y 2.0m	0.5	Y
17	Mearnskirk Nursing Home	Roadside	253782	655404	Y 2.5m	1	Y
18	Brodict Place, Newton Mearns	Roadside	252407	655475	Y 1.0m	0	Y
19	Burnfield Road	Roadside	256218	659414	Y 1.0m	1.5	Y
20	Braidholm Rd, Giffnock	Roadside	252407	655475	Y 4.5m	2	Y
21	Mearns Castle High School Sports	Kerbside	255418	655216	Y 10m	2	Y
22	Mearns Castle High School Entrance	Kerbside	255459	655337	Y 5m	0.5	Y



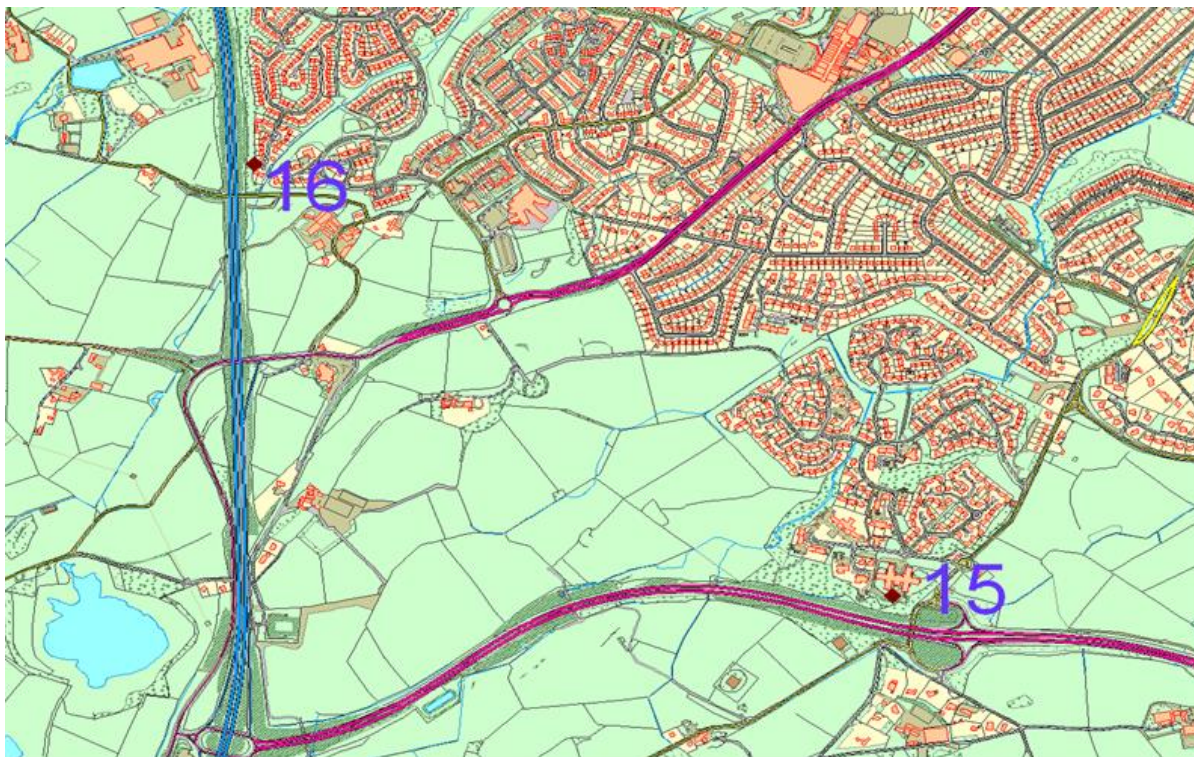
Barrhead and Neilston



Clarkston



Giffnock



Newton Mearns

Table A.2 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	Annual mean concentration (adjusted for bias) µg/m ³					
					2012* (Bias Adjustment Factor = 0.95)	2013* (Bias Adjustment Factor = 0.99)	2014 (Bias Adjustment Factor = 0.99)	2015 (Bias Adjustment Factor = 0.98)	2016 (Bias Adjustment Factor = 0.97)	2017 (Bias Adjustment Factor = 0.91)
1	Roadside	Diffusion tube	100%	100%	18.3	14.7	13.3	9.9	13.4	13.2
2	Kerbside	Diffusion tube	100%	100%	31.4	23.7	30.2	25.1	21.0	26.9
3	Roadside	Diffusion tube	67%	67%	31.1	34.3	36.7	32.1	32.7	32.4
4	Kerbside	Diffusion tube	100%	100%	30.6	28.3	25.0	20.6	23.5	23.1
5	Kerbside	Diffusion tube	92%	92%	19.1	35.7	25.9	14.8	16.2	17.7
6	Kerbside	Diffusion tube	92%	92%	18.2	17.0	21.6	12.9	17.8	12.4
7	Kerbside	Diffusion tube	75%	75%	37.5	30.6	29.3	16.8	25.5	26.3
8	Kerbside	Diffusion tube	83%	83%	32.4	23.3	33.5	21.5	21.7	25.3
9	Kerbside	Diffusion tube	92%	92%	18.2	18.4	21.0	13.5	20.0	19.3
10	Kerbside	Diffusion tube	100%	100%	27.4	29.3	29.2	19.4	21.7	26.2
11	Roadside	Diffusion tube	75%	75%	23.8	21.3	16.3	15.1	25.6	21.2
12	Kerbside	Diffusion tube	58%	58%	NA	NA	NA	17.9	18.6	23.4
13	Kerbside	Diffusion tube	100%	100%	36.4	36.7	33.5	27.9	28.2	28.9

Site ID	Site Type	Monitoring type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$					
					2012* (Bias Adjustment Factor = 0.95)	2013* (Bias Adjustment Factor = 0.99)	2014 (Bias Adjustment Factor = 0.99)	2015 (Bias Adjustment Factor = 0.98)	2016 (Bias Adjustment Factor = 0.97)	2017 (Bias Adjustment Factor = 0.91)
14	Kerbside	Diffusion tube	100%	100%	28.5	22.9	26.6	18.9	24.1	23.6
15	Roadside	Diffusion tube	92%	92%	38.9	30.5	36.4	26.4	28.9	28.3
16	Roadside	Diffusion tube	58%	58%	31.5	23.1	NA	27.0	27.3	31.9
17	Roadside	Diffusion tube	100%	100%	18.0	16.3	13.0	10.9	15.1	13.6
18	Roadside	Diffusion tube	92%	92%	23.7	21.8	20.2	17.3	20.2	20.1
19	Roadside	Diffusion tube	100%	100%	24.5	21.9	20.4	15.2	24.1	21.9
20	Roadside	Diffusion tube	100%	100%	26.3	25.3	25.4	20.3	20.0	21.5
21	Roadside	Diffusion tube	100%	100%	NA	NA	NA	8.9	13.1	12.6
22	Roadside	Diffusion tube	92%	92%	NA	NA	NA	8.2	12.9	12.0

Notes: Exceedences of the NO₂ annual mean objective of 40 $\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding 60 $\mu\text{g}/\text{m}^3$, indicating a potential exceedence of the NO₂ 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% and annualisation is appropriate. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2017**Table B.1 – NO₂ Monthly Diffusion Tube Results for 2017**

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⁾
1	Huntly Drive, Giffnock	23.2	19.4	16.9	7.8	9.5	7.8	6.9	8.9	13.1	12.1	17.2	31.2	14.5	13.2
2	Eastwoodmains Road, Giffnock	29.4	2 ²	33.4	25	21.7	21.1	16.7	21.1	37	25.3	41.1	53.3	29.6 ²	26.9
3	Clarkston Toll	45.7	X	44.1	26.9	14.3	X	X	26.8	X	34.4	38.8	53.4	35.6	32.4
4	Sheddens Roundabout, Clarkston	33.3	36.6	28.4	20.4	1.6	19.3	15.4	18.3	26	24.6	32.8	47.9	25.4	23.1
5	Riverside Terrace, Busby	22.2	26.1	19.2	X	35.5	11.8	10.6	9.2	15.3	13.5	20.7	29.7	19.4	17.7
6	Main Street, Neilston	X	19.8	18.4	8	21	9.2	8.2	8.2	8.4	14.5	12.2	21.5	13.6	12.4
7	Kelburn St @ Neilston Rd, Barrhead	X	39.2	33.8	X	36.6	2 ²	X	22.1	26.2	22.1	13.8	37.2	28.9 ²	26.3
8	Cross Arthurlie St, Barrhead	40.7	25.2	2 ²	2.1 ²	22.5	X	1.6 ²	19.1	26.4	26.9	X	33.7	27.8 ²	25.3
9	Darnley Rd, Barrhead	33	38	21.8	20.3	29.7	12.3	11.3	9.3	13.2	15.3	X	29.7	21.3	19.3
10	Main St, Thornliebank	37.8	68.3	29.7	11.7	17.2	19.5	18.9	17.5	26.7	29.6	31.8	37	28.8	26.2
11	Main St, Barrhead, North	X	19.1	32.1	19.5	X	20.6	21.1	21.3	16.6	13.5	45.6	X	23.3	21.2
12	Main St, Barrhead, South	X	X	X	5.7	35.1	12.3	X	X	32.8	28.8	25	40.2	25.7	23.4
13	Lochlibo Rd at W. Arthurlie	47.6	45.6	32	18.3	29.8	20	27	23.4	32.8	29.4	34.3	41.2	31.8	28.9
14	Eastwoodmains Rd @ Mains Ave	42.9	41.6	23.3	14.6	20.8	18.5	14	15	19.4	21.7	40.9	38.6	25.9	23.6
15	27 Rouken Glen Rd @ Gushet	47.2	2 ²	37.7	24.4	19.2	X	24.1	25	35.2	37.7	37.2	23.7	31.1 ²	28.3
16	195 Fenwick Road	40.9	47.5	X	26.3	16.5	X	X	X	35.8	36.5	42	X	35.1	31.9
17	Mearnskirk Nursing Home (GSO)	19.7	21.5	17.5	10.4	18.8	9.7	7.5	8.1	11.6	11.5	19	24.4	15.0	13.6
18	Broddick Place, Newton Mearns (M77)	32	27.3	24.2	18	23.5	16	13.2	15.1	19.1	24.8	29.6	X	22.1	20.1
19	5 Burnfield Road	33.3	38	28.1	14.7	15.6	15.5	14.7	14.4	26.9	20.4	30.1	37.5	24.1	21.9
20	8 Braidholm Rd, Giffnock	32.5	31.1	25.6	16.4	30.6	14.6	11.9	12.5	21.4	17.5	30.7	39.3	23.7	21.5
21	Mearns Castle High School Sports	20.6	18.6	16.6	5.5	23.9	9.9	8.2	7.3	9	11.3	15	20.3	13.9	12.6
22	Mearns Castle High School Entrance	22	22	20.5	6.5	X	9.9	6.2	6.4	9.3	11.1	12.7	17.9	13.1	12.0

(1) See Appendix C for details on bias adjustment

(2) Erroneous result has been removed to calculate annual mean of raw data.

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

Bias Adjustment Factor For Glasgow Scientific Services

The diffusion tubes are supplied and analysed by Glasgow Scientific Services (GSS) and are prepared using the 20% TEA in water method and in accordance with the procedures set out in the practical guidance. East Renfrewshire has not carried out any co-location studies itself, although co-location studies are available for GSS. The Department for Environment and Rural Affairs (DEFRA) reports that in co-location testing in 2017, GSS demonstrated 'good' precision for 4 out of 6 assessments (see https://laqm.defra.gov.uk/assets/Tube_Precision_2017_version_03_18%20Final%20REDUCED.pdf)

DEFRA further reports that the 2017 bias adjustment factor for GSS is 0.91 (see <https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>). This bias adjustment factor has therefore been applied to the annual average diffusion tube results reported above. Laboratory performance in analysing diffusion tubes is subject to quality assurance/control under the AIR-PT scheme operated by LGC and supported by the Health and Safety Laboratory.

Annualising Results

It is recommended that for results with less than 75% data collection that the results are annualised for the annual average. Three results for NO₂ diffusion tubes (location 3, 12 and 16) had below the recommended 75% collection rate (66% , 58% and 58% respectively) however the missing data was not in a block form but dispersed throughout the year which would make the annualisation process unreliable. Therefore the annualisation process was not completed on the three location results with low data capture. The results as they stand are considered to be "worst case scenario" and annualisation in the 3 cases would lower the annual mean.

Road Side Adjustment

Fall off from distance correction calculations are only required in the event that both of the following circumstances are met:

- A diffusion tube reports an NO₂ annual mean concentration to be greater than 36 µg/m³ (to account for the inherent uncertainty in diffusion tube monitoring concentration data); and
- That same diffusion tube is not located at relevant exposure.

Therefore, as all of the sites are recording concentrations to be lower than 36 µg/m³ road side adjustment calculations are not required.

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
ERC	East Renfrewshire Council
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

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