Renfrewshire Council

Annual Progress Report 2021

Bureau Veritas

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Annual Progress Report (APR)

2021 Air Quality Annual Progress Report (APR) for Renfrewshire Council

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

June 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Renfrewshire Council

There are currently three Air Quality Management Areas (AQMAs) within Renfrewshire. The AQMAs are located within Paisley Town Centre (PTC), Johnstone High Street (JHS) and Renfrew Town Centre (RTC). The AQMAs have been declared due to exceedances of the air quality objective (AQO) levels for nitrogen dioxide (NO_2) and particulate matter (PM_{10}, Paisley only). The monitored concentrations of both NO_2 and PM_{10} continue to show a downward trend across Renfrewshire, and there were no exceedances of the relevant AQOs reported during 2020.

Concentrations of the annual mean and relevant short-term objectives for NO_2, PM_{10} and $PM_{2.5}$ recorded at all automatic monitoring sites during 2020 were below AQO levels, with all sites indicating a downward trend in 2020, when compared to 2019 concentrations. The Gordon Street automatic monitoring site currently monitors both PM_{10} and NO_2 and, during 2020, the NO_2 data reported below the 33% minimum data capture required for annualisation to be applied (26% data capture achieved due to instrument faults). The mean NO_2 concentrations for Gordon Street are therefore not reported within this year's Annual Progress Report (APR). The Gordon Street PM_{10} monitor was converted from PM_{10} to $PM_{2.5}$ in February 2021, following advice from SEPA, considering the low PM_{10} concentration trends at the site and Scotland's statutory focus on $PM_{2.5}$. The $PM_{2.5}$ data at Gordon Street will therefore be reported within next year's APR. Renfrew Inchinnan Road automatic monitoring station was introduced in January 2019 to monitor NO_2 and reported a 2020 concentration reduction of 4.3µg/m^3 in comparison to 2019. The Cockels Loan monitoring station ceased monitoring PM_{10} concentrations in August 2019, following consistently low PM_{10} concentrations, and is the Council's only automatic site located outside of an AQMA. The Cockels Loan monitoring location, which is located close to the M8 motorway, reported a significant downward trend in NO_2 concentrations in 2020, of over 10µg/m^3. This suggests that the uncharacteristic travel behaviours experienced across the U.K in 2020, in response to the ongoing pandemic's lockdown restrictions, may have contributed to a more significant downward concentration trend across some of Renfrewshire's 2020 automatic monitoring network.

In response to the previous year's APR appraisal, Renfrewshire Council conducted an overhaul of their diffusion tube monitoring network in 2020. Fifteen sites were removed in

2020 when compared to the 2019 regime, following either continued low NO_2 concentrations or not being located at relevant exposure. One site (DT58) was also removed due to a lamppost being taken down, in response, DT101 was introduced within the vicinity of DT58 in February 2020. In addition to DT101, five new sites (DT 92, 93, 94, 95, 96) were introduced in 2020 largely in Paisley, in order to capture areas of more relevant exposure and help to identify any pollution hot spots. It was recommended, within the previous APR appraisal, for more sites to be introduced on the south side of Johnstone High Street to accompany monitoring location DT59. As such, in March 2021, three new diffusion tube sites were introduced on the south side of Johnstone High Street and will be reported in next year's APR. Of the fifty-four diffusion tube monitoring sites across Renfrewshire in 2020, following bias adjustment and prior to the application of distance correction, there was one exceedance of the NO_2 annual mean AQO recorded in 2020, at diffusion tube DT8 (40.2µg/m^3) within the RTC AQMA. Following distance correction in line with LAQM guidance, DT8 reported just below the AQO at 39.9µg/m^3. DT59, located within the JHS AQMA, reported a bias adjusted concentration of 39.2µg/m^3 and, following distance correction in line with LAQM guidance, reported 38.8µg/m^3. DT82, prior to the fall off with distance adjustment, also reported within 10% of the AQO at 36.1µg/m^3 and fell below 10% of the AQO following distance correction to 35.6µg/m^3. DT8 has historically reported exceedances of the AQO in previous years however, DT8 indicated a reduction in 2020 levels in comparison to 2019 (-0.8µg/m^3). In contrast, DT59 reported a slight increase of 1.4µg/m^3 before distance correction, when compared to 2019. This location is reported to be in close proximity to a large supermarket in Johnstone, within a street canyon, and is considered a main traffic route. DT59 was not considered to experience a decrease in traffic levels in 2020, when compared to much of Renfrewshire.

Within the PTC AQMA, there continued to be no exceedances of either the NO_2 or PM_{10} AQOs at the automatic and passive monitoring locations for over 5 years. The PTC AQMA has been declared for both annual mean and short term NO_2 exceedances, and for annual mean PM_{10} exceedances. Within the previous year's APR appraisal, the revocation or amendment of both PTC and JHS AQMAs was supported and recommended the decisions be accompanied by a detailed assessment. Although continued downward trends are reported within the AQMAs, the Council have advised that the City Deals transport infrastructure improvement projects, delayed due to COVID-19, could still potentially influence some traffic volumes throughout the PTC AQMA, in particular. The Glasgow Airport Investment Area (GAIA) project is currently expected to be operational from late summer in 2021 and the Clyde Waterfront and Renfrew Riverside (CWRR)

project has a completion delay of up to Q4 2023. The Council therefore propose to await operational traffic volumes following the works before a consideration may be given to the revocation or amendment of the PTC and JHS AQMAs.

Actions to Improve Air Quality

The 2019 Renfrewshire Air Quality Action Plan (AQAP) incorporates all three existing AQMAs and, with approval from the Council Board and statutory consultees, including the Scottish Government and Scottish Environment Protection Agency (SEPA), was published in March 2019. Throughout 2020, several sustainable travel-based measures detailed within the 2019 AQAP have been progressed to improve air quality throughout Renfrewshire. All measures and their progression in 2020 are further discussed in Section 1.3.

Figure 0.1 –Community Cycle Hub

Following the Council's successful grant application for funding in 2019, funding has been allocated to new cycling infrastructure and active travel schemes throughout 2020. The cycle infrastructure project in Robertson Park has been led by Renfrewshire Council's Environment & Infrastructure, Land Services Section and has enabled the restoration of a bicycle playground within the park and proposes a Paisley-Renfrew cycleway to link the park with Paisley via a 4km cycle route. Consultation was also undertaken during 2020 with a community bicycle building project, that teaches youth and young adults how to strip, build and restore bicycles. The new directional finger posts installed as part of the project (Figure 0.1), also signpost the community cycle hub building, which is located adjacent to the Inchinnan Road Automatic monitoring station, and plans to host cycling workshops and establish a cycling hub for the local community. The promotion of active travel within Robertson Park will also tie in with projects being delivered as part of the Glasgow City

Region City Deal that will significantly improve the cycling connections in Renfrew. These include:

- Clyde Waterfront and Renfrew Riverside (CWRR) project; Renfrew to Yoker bridge, linking Renfrew with the National Cycle Network (NCN Route 7).
- Glasgow Airport Investment Area (GAIA); cycleway and pedestrian bridge over the Black Cart linking the Advanced Manufacturing Innovation District (AMIDS) and Inchinnan to Renfrew.
- Wright Street Bridge connecting AMIDS with Westway Industrial Park, Renfrew.

Electric bikes for use within the council, and associated charging infrastructure in relation to the Council's Sustainable Travel Planning Scheme, were also progressed further in 2020. The new bicycle playground infrastructure was completed in March 2021 and its impact, together with the progression of other cycling infrastructure and projects within the area, will be explored further in next year's APR.

Sixteen measures are presently published within the existing AQAP, covering the following topic areas:

- Freight and delivery management;
- Policy guidance and development control;
- Promoting low emission transport;
- Promoting travel alternatives;
- Public information;
- Transport planning and infrastructure;
- Traffic management;
- Alternatives to private vehicle use; and
- Vehicle fleet efficiency.

Due to COVID-19 impacts, the Council have delayed the Safer Schools Pilot initiative, which was scheduled to take place from April 2020. The six month scheme will now take place from April 2021, introducing an exclusion zone in the streets around the entrances of four local primary schools in the council area, with the aim of easing congestion issues, reducing harmful emissions, and ensuring the safety of children. This will be discussed further in next year's APR and further details on the scheme can be found at http://renfrewshire.gov.uk/saferschoolspilot.

Local Priorities and Challenges

Due to the COVID-19 outbreak in 2020, several measure updates were not available at time of publication of the 2021 APR due to project delays, such as City Deals projects. Further updates of all measures taken forward in 2021 will be provided in the 2022 APR. Additional proposed actions and LAQM requirements for Renfrewshire Council are as follows:

- Progression of the two City Deals projects (Clyde Waterfront & Renfrew Riverside Project and the Glasgow Airport Investment Area Project), which will bring significant new road infrastructure including the Renfrew North Development Road (RNDR). Works for the Glasgow Airport Investment Area (GAIA) project commenced in summer 2019, however this was suspended in 2020 in light of the COVID-19 pandemic. Works are now expected to be completed late Summer 2021. The Clyde Waterfront & Renfrew Riverside Project (CWRR) is ongoing and is expected to be completed at the end of 2023. The RNDR road will reduce traffic volume through Renfrew Town Centre resulting in improved air quality levels, in particular within the RTC AQMA;
- Publish a Corporate Travel Plan and development of the Transport Network Action Plan for use with Renfrewshire Council's local planning guidance;
- Progression with the Council's Sustainable Travel Planning Scheme, including the use of electric bikes, implementation of the Robertson Park cycling infrastructure and restoration of a bicycle playground by March 2021;
- Progression of further urban traffic control system upgrades at 66 sites and 30 junctions across Renfrewshire;
- Following the engagement of 49 schools within Renfrewshire Council concerning anti-idling awareness, the next phase of the scheme will be now progressed in 2021 concerning the introduction of exclusion zones in streets close to selected schools at the start and the end of the school day;
- Development of a new cycle route connecting Canal Street and High Paisley Street following funding awarded from the Scottish Government's Low Carbon Travel and Transport Challenge Fund, together with an EV Charging Hub to be installed in Paisley;
- Assess the 2021 monitoring data within the PTC AQMA when available, with consideration to revoking/amending the AQMA in the future, based upon the NO_2 and particulate monitoring results, once the highway infrastructure improvements have been completed as part of the City Deals projects (GAIA construction

expected to be completed late Summer 2021);

- Continue to review all air quality assessments that are submitted as part of planning applications in relation to possible impacts upon local air quality;
- Continue to monitor NO_2, PM_{10} and $PM_{2.5}$ at all relevant locations throughout Renfrewshire, with the conversion of the PM_{10} monitoring equipment at Gordon Street to solely monitor $PM_{2.5}$ from 2021, following SEPA's recommendations; and
- Submit the 2022 Annual Progress Report.

How to Get Involved

The general public can find out more about air quality and how to get involved on the Renfrewshire Council web site at http://www.renfrewshire.gov.uk/airquality, current and historic pollution levels and up to date forecasts are available at http://www.scottishairquality.co.uk/, and further details on the 2020 Clean Air Day are available at https://www.cleanairday.org.uk/clean-air-scotland. In addition, details on the 2021 Safer Schools Pilot can be found here http://renfrewshire.gov.uk/saferschoolspilot.

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1 Local Air Quality Management

This report provides an overview of air quality in Renfrewshire during 2020. 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 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 Concentration	Air Quality Objective Measured as	Date to be Achieved by
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen dioxide (NO_2)	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
Particulate Matter (PM_{10})	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
Sulphur dioxide (SO_2)	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	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

1.1 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.

A summary of AQMAs declared by Renfrewshire Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries, are available online at http://www.scottishairquality.scot/laqm/aqma?id=382

There have been no reported exceedances of the NO_2 and PM_{10} AQOs within the PTC AQMA for over five years, however the Council will continue to maintain its current monitoring strategy across all AQMAs, together with the continued progression of the AQAP. In last year's APR, the Council was considering the possible revocation of the PTC AQMA within early 2021. The Council wish to await the completion of the City Deals Projects to ensure that the real-time traffic, following completion of the projects, does not impact on the area of Paisley. The Council advise that detailed assessments have been completed within the area and applications have been granted, however the Council wish to maintain a conservative approach until the new traffic infrastructure's impacts are known.

Table 1.2 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
Paisley Town Centre (PTC)	NO_2 annual mean NO_2 1-hour mean PM_{10} 24-hour mean	Paisley	An area encompassing a large part of central Paisley and extending a short distance along some radial roads	Renfrewshire Council Air Quality Action Plan 2019: http://www.renfrewshire.gov.uk/airquality
Johnstone High Street (JHS)	NO_2 annual mean	Johnstone	From the junction of High Street and Peockland Place; thence along High	Renfrewshire Council Air Quality

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
			Street to the junction of Barrochan Road and Napier Street	Action Plan 2019: http://www.renfrewshire.gov.uk/airquality
Renfrew Town Centre (RTC)	NO_2 annual mean NO_2 1-hour mean	Renfrew	From the junction of Paisley Road, Inchinnan Road, Hairst Street and Glebe Street; thence along Glebe Street to property number 4 Glebe St; thence along Paisley Road to the junction of Donaldson Drive; thence along Inchinnan Road to the junction of Longcroft Drive; thence along Hairst Street to the junction with Canal Street and High Street; thence along Canal St to the junction with Ferry Road	Renfrewshire Council Air Quality Action Plan 2019: http://www.renfrewshire.gov.uk/airquality

1.2 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 on the Scottish Government's website. Progress by Renfrewshire Council against relevant actions within this strategy is demonstrated below.

1.2.1 Transport – Avoiding Travel – T1

All local authorities should ensure that they have a corporate travel plan (perhaps within a carbon management plan) which is consistent with any local air quality action plan.

A draft travel plan and travel directories were prepared and provided by the consultant during Nov 2019. Renfrewshire Council has included a measure within their 2019 AQAP to develop a Corporate Travel Plan (Measure 14, Table 1.3) together with ongoing detailed reviews of transport plans within Paisley and Johnstone. The steering group had been planned for spring 2020 to finalise the travel plan, however due to the current pandemic, has now been put on hold. It is not yet known when the steering group may be established, however once the plan is published and measures implemented, an additional staff survey is planned to determine any changes in travel behaviour. The £1.13bn Glasgow City Region City Deal infrastructure fund is to enable investment in the transport network and improve public transport in Renfrewshire. The City Deal projects within Renfrewshire include the Glasgow Airport Investment Area Project (GAIA) and the Clyde Waterfront & Renfrew Riverside (CWRR) projects. The GAIA construction works commenced in summer 2019 and, following some delays due to COVID-19 impacts, the project is expected to be completed in late summer 2021. The CWRR project faced similar delays, however a contractor was instructed in May 2021, with works to commence in early 2022 with a completion anticipated in Q4 2023. The projects aim to improve the region's transport links, most significantly within Renfrew Town Centre. The air quality assessments submitted, as part of the projects' Environmental Impact Assessments (EIA), predict a reduction in NO_2 annual mean concentration of 3µg/m^3 at the previously exceeding monitoring location (DT8), and reductions of up to 3.9µg/m^3 along Inchinnan Road within the Renfrew Town Centre AQMA. This reduction was reported based on implementation of the CWRR development in 2020, in comparison to 2020 baseline levels. Following the pandemic, it is not yet known how the levels will be impacted, although the delayed completion dates may potentially indicate a greater reduction in concentrations than initially reported due to the time elapsed since the EIA was published.

1.2.2 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. In addition to the Council's 2014 Carbon Management Plan, and as discussed in

the Council's AQAP, Renfrewshire Council commissioned a study during 2019 to review the AQAP measures in line with the CAFS objectives. As such, it was found that within the 16 AQAP measures listed, the decarbonising transport and low emission vehicle use aspects were strongly aligned with the CAFS strategy.

1.3 Progress and Impacts of Measures to address Air Quality in Renfrewshire Council

Renfrewshire Council has taken forward a number of measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 1.3. More detail on these measures can be found in the air quality Action Plan relating to each AQMA. Key completed measures are listed as follows:

- Measure 2 – In July 2020 the Council has further instructed Urban Traffic Control (UTC) Split, Cycle, Offset Optimisation Technique (SCOOT) system upgrades at 66 sites across Renfrewshire. The upgrades aim to reduce congestion by replacing the existing council installed UTC system with a cloud-based system, enhancing the traffic control at junctions across the council area;
- Measure 15 – Progression of the development of the Council's cycle network, with consultations completed with local progression of the cycle hub at Robertson Park in early 2021.

Progress on the following measures has been slower than expected and, due to impacts of the ongoing pandemic, some measures were subsequently placed on hold until further notice. Additional impacts due to funding distribution or documentation availability was also noted:

- Measure 7 - The ECO Stars scheme is currently on hold as funding is being prioritised to take forward other measures within the AQAP at this time;
- Measure 8 – The Council await publication of a revised National and Regional Transport Strategy before preparation of Renfrewshire's Local strategy may be undertaken;
- Measure 11 - Given the current COVID-19 pandemic, further engagement with bus operators has been put on hold and it is unclear when this will recommence;

- Measure 14 – Establishment of a steering group to inform the corporate travel plan was planned for spring 2020 but has now been put on hold due to the current pandemic.

Renfrewshire Council expects the following measures to be completed over the course of the next reporting year:

- Measure 1 – GAIA road infrastructure improvement project completion expected in late summer 2021;
- Measure 9 – PTC transportation improvements to be further developed in 2021, and;
- Measure 12 - A six-month pilot scheme in 2021 will introduce a part-time vehicle exclusion zone at the start and end of the school day in some of the surrounding streets of four primary schools.

Table 1.3 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Glasgow City Region City Deal Projects Clyde Waterfront & Renfrew Riverside Project (CWRR) Glasgow Airport Investment Area Project (GAIA)	Transport Planning and Infrastructure Traffic Management Promoting Travel Alternatives	Road Infrastructure	Scottish Government & Local Authorities (LAs) across the region. The decision-making body is the Glasgow City Region Cabinet. The Renfrewshire projects are led within the Council by Communities, Housing and Planning Services City Deals Section.	March 2017 – proposal of Application Notices submitted. April to May 2017 – consultation with Elected Members/ Community Councils/ public. June 2017 - submission of planning applications (GAIA 'Core' 17/0485/PP, GAIA 'Cycleway' 17/0487/PP & CWRR 17/0486/PP).	GAIA Nov 2017 – planning consent granted Spring 2019 – tender contracts awarded June 2019 – start of construction. CWRR Nov 2018 – planning consent granted (by Scottish Ministers) Autumn 2019 – tenders published Jan 2021 – proposed start of construction	Various – reduced traffic volume through Renfrew Town Centre following construction of Renfrew North Development Road (as part of the CWRR project) and reduced congestion and journey times. KPIs may be measured via: - % change in traffic flow: annual traffic counts on key commuter routes - % improvement in journey times - % reduction in queue lengths	Renfrew AQMA The AQAs conclude that pollutant concentrations at receptors due to traffic flow changes from the developments will be below AQO levels. The 2020 baseline concentrations vs 2020 with CWRR development will result in a minor to moderate beneficial impact on air quality levels (reduction of up to 3.9ugm3) measured at the 3 DTs on Inchinnan Road. A reduction of 3 ugm3 is expected at DT No.8 where there is a current	For the GAIA, construction works did commence summer 2019, however these works were delayed by the COVID 19 pandemic and works are now expected to be completed late Summer 2021. For the CWRR, a Contractor has been identified following procurement process and contracts are in the process of finalisation	GAIA – completion delayed until late summer 2021. CWRR – completion anticipated Q4 2023. City Deal funding from the UK and Scottish Governments will be unlocked in 5year funding blocks. The formal process for agreeing the release of funding will be a series of 5yearly Gateway Reviews. If the City Deal meets agreed outputs and outcomes at each review, the full £1 billion of funding from the UK and Scottish Governments	Refer to section 3.1.7 of the 2019 Renfrewshire Council Air Quality Action Plan for further details on this measure.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
								exceedance (41.1ugm3 in 2019, before distance correction). Reference should be made to the AQAs for full details.	to allow award in May 2021. Based on this award for the Design& Construct contract, site work is likely to commence in early 2022 and completion in 2023.	will be unlocked.	
2	Upgrades & Improvements to the Council's Urban Traffic Control (UTC) system Identification of faults within the Council's UTC SCOOT system, repair/ replacement of defective loops, validation of traffic signals & PROM updates to traffic controllers to	Traffic Management	UTC, congestion management	Environment & Infrastructure - Roads and Infrastructure	Jan/Feb 2017 preparation and advertising of tender. March 2017 award of tender.	May 2017 to Nov 2017	An effective SCOOT system may reduce traffic delay by an average of 20%. Peak time congestion is an issue within the AQMAs. If this can be reduced, then traffic would flow more freely resulting in a reduction in emissions. Data in relation to traffic congestion pre and post SCOOT	Paisley & Johnstone AQMA Paisley – 9 traffic signal sites repaired and validated on the Paisley Town Centre (PTC) ring road. The PTC source apportionment analysis confirmed that congestion contributes to pollutant levels to varying degrees dependant on location within the AQMA.	Defective loops repaired/replaced in June 2017. Validation of traffic signals & PROM updates completed in November 2017. Further plans to upgrade 66 sites to a cloud-based SCOOT system from 2020.	Initial council upgrade is to be expanded upon as of 2020, following instruction of a 10 year contract with Siemens at 66 sites across 30 junctions across the Council.	Additional information on this measure is provided in the 2019 Renfrewshire Council Air Quality Action Plan.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	ensure full optimisation of traffic signals in order to reduce congestion.						updates will be compared to identify the level of improvement achieved. KPIs may be measured via: - reduction in congestion monitored by an increase in overall speed through the junctions. - % improvement in journey times -improved traffic flow.	Johnstone – 2 sites on High St repaired and validated.			
3	Council Fleet Improvements - Continue to improve the standard of fleet	Promoting Low Emission Transport	Company vehicle procurement - Prioritising uptake of low emission vehicles	Environment & Infrastructure – Fleet Solutions and Social Transport	Ongoing. There is an annual vehicle replacement programme whereby vehicles at the end of their service life are replaced with an improved EURO standard or an electric alternative.	Ongoing In 2016/17 12 HGVs were replaced with EURO VI standard. Further 12 EURO V HGVs replaced with EURO VI HGVs during 2017/18 (10 HGV lorries and 2 buses).	Reduces number of polluting vehicles, operational running costs of vehicles and CO2 emissions across entire Council area. Existing Council KPIs: - 2017/18 twelve EURO V HGVs will be replaced with EURO VI	All AQMAs, council wide air quality improvements. Reduces overall environmental impact of vehicles. Paisley – the Council's transport depot is located within the Paisley AQMA therefore all vehicles travelling to	Approximately 32 HGVs are currently EURO VI standard.	Ongoing. The Council will continue to improve the standard of fleet and introduce greener vehicles where opportunities and funding permits. Full replacement of HGV fleet with minimum EURO VI	See measure no.4 which deals specifically with electric vehicle numbers within the fleet.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
					The Council fleet consists of approx 500 vehicles of which >70% are of EURO V or VI standard. There are approx 80 HGV vehicles, 32 of which are EURO VI standard with the remaining 48 being of EURO V standard. The EURO V HGVs are prioritised for replacement with EURO VI vehicles.		standard vehicles - amount of CO2 emitted by vehicle fleet KPIs may also be measured via: -an annual review of Council vehicle fleet inventory in order to track year on year improvements which can then be reported in AQAP updates.	and from the depot will go through the AQMA in addition to operating within it. The Council's HQ is also located within the Paisley AQMA. Several thousand employees work from this location.		vehicles by 2022 at latest. Funded via the Council's Vehicle Replacement Capital Programme.	
4	Council Fleet Improvements - Increase numbers of electric vehicles (EVs) & associated charging infrastructure - EV Fleet Strategy	Promoting Low Emission Transport	Company vehicle procurement prioritising uptake of low emission vehicles & Procuring alternative refuelling	Environment & Infrastructure – Fleet Solutions and Social Transport	Ongoing. First Council EVs and charging points purchased and installed in 2012. The Council currently have 41 EVs (cars/vans) in the fleet.	Ongoing The Council have worked in partnership with Transport Scotland to purchase an additional 48 EVs (30 cars & 18 vans) with delivery between June and Nov 2019	Existing Council KPIs: -% of the vehicle fleet which uses alternative fuels i.e. electricity (2018/19 target was 9% and we achieved 10%). Target	All AQMAs, council wide air quality improvements. By acting to reduce its own emissions through the uptake of low emissions technology and vehicles, the Council will	Electric fleet planned to increase from 41 EVs to 89 in 2019-20. There are currently 25 council operated charging points.	Ongoing. The Council will continue to introduce EVs & charging points where opportunities and funding permits. As technology evolves the Council will	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Feasibility Study		infrastructure to promote low emission vehicles, EV rechargin g		An EV Fleet Strategy feasibility study has been completed to determine the maximum no. of EVs that could replace current diesel fleet vehicles. There is the potential for up to 200 EV vehicles to be purchased over the following 3/4 years subject to funding.	which will take the EV fleet total to 89. The cars will support the Sustainable Travel Project (see measure No.6). The 18 vans will arrive end of 2019 and will replace fossil-fuelled vans. 19 EV Charing Units (38 Charging Bays) will be installed during 2019 in publicly accessible council car parks in Paisley, Johnstone, Renfrew, Bridge of Weir and Houston. In addition, there have been 23 charging bays recently installed in Renfrewshire House to support the new EV pool cars.	for 2019/20 is 21% - amount of CO2 emitted by vehicle fleet.	hopefully encourage other vehicle users to consider greener fuel options.	This will increase to 63 in 2019-20. The EV Fleet Strategy has been completed and the conclusion s presented to the Council Board meeting in March 2019 with implement ation of aspects of this expected 2019. In 2020, in addition to pool cars, the council have 10 pool bikes for staff to use for business travel as part of the Business Travel Hierarchy. The	extend the EV Fleet Strategy to include all vehicles including HGVs and buses. Costs: EV car costs variable. Funded via the Council's Replacement Vehicle Programme, Transport Scotland Switched on Fleets funding and the Scottish Government AQAP grant. Chargers cost from £5k to £40k to install. Funding mainly from Transport Scotland & Scottish Government AQAP Grant.	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
									addition of electric pool bikes is seen as an attractive incentive for increased use of this form of transport for business use		
5	Masternaut Connect Fleet Telemetric System - Upgrade of fleet tracking telemetric system fitted to all Council vehicles to optimise utilisation of fleet. The tracking system allows close monitoring of movement and operating status of all fleet vehicles.	Freight and Delivery Management Vehicle Fleet Efficiency	Route management plans/ Strategic routing strategy for HGVs	Environment & Infrastructure – Fleet Solutions and Social Transport	Masternaut was originally installed in all council vehicles in 2009-10. This was upgraded to a newer Masternaut Connect version early 2017 which provides an easier reporting system and focuses in more detail on driver behaviour, vehicle utilisation etc.	System effective from 1st April 2017. Dedicated member of staff employed from Autumn 2018 to work solely with the Masternaut system to provide regular reports and identify problem areas e.g. low mileage users, excessive idling. Mileage of EV vehicles will also be monitored to ensure EV vehicles are being used to their optimum.	Improved scheduling and routing of journeys via optimising vehicle movements and increased utilisation of fleet thus reducing the no. of vehicles in operation. Reduction of idling is also a key area to reduce fuel and maintenance costs & to lower emissions. Masternaut is able to monitor vehicle idling	All AQMAs, council wide air quality improvements. The new Masternaut provides an easier reporting system which may allow calculations to be undertaken on emissions reductions. This will be reviewed once the system has been fully operational for a period of time.	System operational from April 2017. Dedicated member of staff employed from Autumn 2018.	Operational and ongoing.	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
					Procurement process undertaken during 2016 and awarded at the end of 2016 following approval by Council Board.		times and this is a specific area that will be monitored and addressed. KPIs may be measured via: - reduction in vehicle fleet numbers due to identification of underutilisation of vehicles. - reduction of idling times - improvements in driver behaviour e.g. harsh braking/ acceleration.				
6	Renfrewshire Council Sustainable Travel Planning Scheme - Supply high mileage users with council cars and introduce a fleet of pool vehicles to replace business	Alternatives to Private Vehicle Use Promoting Low Emission Transport	Car clubs/ sharing schemes	Environment & Infrastructure – Roads and Infrastructure	Phase 1 of the Sustainable Travel Planning Scheme was introduced across several teams within Environment & Infrastructure during 2017/18. This involved 35 vehicles	Phase 1 – introduced Oct 2018. Phase 2 – introduced Jan 2019 and ongoing. Prior to the formal introduction of pool cars, a trial pool car scheme was undertaken in 2016/17 with one EV pool car being available for use by the	Encourage more efficient and cost-effective methods of business travel Reduce the impact on the environment Increase the use of electric vehicles and charging infrastructure	All AQMAs, council wide air quality improvements. Renfrewshire House, the Council's HQ is situated within the Paisley AQMA therefore business trips undertaken by staff based here will start and end within	Phase 1 of the Scheme was introduced Oct 2018 and is now complete. Phase 2 of the scheme was introduced Jan 2019. 300 HQ staff are now using	Phase 3 is ongoing. The majority of funding for the EVs has come from Transport Scotland Switched On Fleet funding.	The introduction of the scheme means that officers no longer require to use their own car for work purposes. From experience this leads to officers travelling into work by alternative means e.g.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	mileage for employees. - Pool bikes are available for staff to use to carry out Council business. - Encouraging staff to walk or use public transport where appropriate to carry out Council business.				being available for use to staff within this Service. Staff required to use the fleet cars in replacement of their own cars. Phase 2 involved pool cars being available for all other relevant staff members across Services in Renfrewshire House. Phase 3 involves locating pool vehicles at other Council buildings. A feasibility study for this was completed summer 2019.	Environmental Improvements Section within Communities, Housing and Planning Services. The purchase of this vehicle was funded via the Scottish Govn AQAP grant fund. With regard to the pool bikes, the aim is to increase awareness of these to staff through further advertising. The Corporate Travel Plan & Roadshow event was used to assist with this (see measure No.14).		the Paisley AQMA. Target pollution reduction may potentially be measured via: -An annual review of the reduction in mileage and the equivalent 'savings' in emissions. Also, the aim is for all pool cars to be EVs, thereby reducing emissions by replacing trips that would otherwise have been undertaken by non EV vehicles.	pool vehicles. Currently, there are 47 electric pool vehicles with 23 charger units located in Renfrewshire HQ. 300,000 miles have been travelled by pool vehicles since October 2018. Phase 3 – locating pool vehicles at other council buildings has started with EV charging units now installed at HCSP office in Paisley for Care at Home teams.		train or cycling as observed from the trial of the EV pool car by the Environmental Improvements team. By end of 2019 all pool cars based at Renfrewshire House were EVs as discussed in measure No.4.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
									EVs are on order and are scheduled for delivery March 2021.		
7	ECO Stars (Efficient and Cleaner Operations) Fleet Recognition Scheme - A fuel management and operational efficiency support programme aimed at operators of goods vehicles, vans, buses, taxis and coaches. This measure is currently on hold as of summer 2019.	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	Communities, Housing and Planning Services - Environmental Improvements Section	Scheme was initiated on a small scale during 2016/17. Scottish Govn funding received to fully implement during 2017/18 & 2018/19. Procurement process undertaken Winter 2017.	Full scheme implemented April 2018.	KPIs may be measured via: -membership numbers & numbers of vehicles within scheme. Total no. of members as of 2019 – 92 Total no. of vehicles operated by those members - 4564	All AQMAs, council wide air quality improvements.	Scheme first initiated at the end of 2016 on a small-scale trial period. 10 members established during this time. Continuation of scheme during 2017/18 and into 2019.	Current scheme funded until June 2019. Fully funded via the Scottish Government AQAP fund, no cost to council. 2016/17 £9,000 2018/19 £22,500 The scheme is currently on hold as funding is being requested and used to take forward other measures within the AQAP.	Additional information on this measure is provided in the 2019 Renfrewshire Council Air Quality Action Plan.
8	Renfrewshire's Local Transport Strategy - Publication of a new	Policy Guidance and Development Control	Other policy	Communities, Housing and Planning Services -	The Council's 2007 LTS sets out key objectives and vision	New Renfrewshire LTS will be produced following publication of	The 2007 LTS contains measures relevant to AQ e.g. development	All AQMAs, council wide air quality improvements. Any potential target pollution	A refresh of the Renfrewshire LTS was undertaken	To be determined	Refer to section 3.1.2 of the 2019 Renfrewshire Council Air Quality Action

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	Local Transport Strategy (LTS) to replace the Council's 2007 LTS will be undertaken.			Policy & Regeneration Environment & Infrastructure - Roads and Infrastructure	for transport over 10-20 yrs. A refresh was undertaken in Feb 2017 providing an update on the Council's achievements to date. A new Renfrewshire LTS will be prepared following publication of the new National and Regional Transport Strategies which are currently under review.	the new National and Regional Transport Strategies. The new LTS will identify short, medium- and long-term priorities that contribute towards relevant local, regional and national transport targets and goals. Renfrewshire Council are a stakeholder as part of the Regional Transport Strategy review and we are currently in communication with SPT in this regard.	of a transport strategy for Paisley town centre (measure no.9 of this AQAP). Progress against these is detailed within the Feb 2017 refreshed LTS. The new LTS will provide detailed aims and actions with specific KPIs associated with these. In addition the following KPIs may be relevant: - % change in traffic flow: annual traffic counts on key commuter routes - % improvement in journey times - % reduction in queue lengths.	reduction will be dependent on the proposed new/updated action measures within the Renfrewshire Local Transport Strategy.	Feb 2017 but awaiting publication of the new National and Regional Transport Strategies before a new Renfrewshire LTS will be prepared.		Plan for further details on this measure.
9	Paisley Town Centre Transportatio	Policy Guidance and	Other policy & Congestio	Environment & Infrastructu	Procurement process for consultant to	Ongoing. The proposed options are	The following KPIs may be relevant:	Paisley AQMA In terms of target pollution	The draft feasibility study	Whilst a prioritised programme of	Refer to section 3.1.5 of the 2019

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	n Improvements - aim is to allow Paisley to reach a vision for a more connected and accessible place with significant environmental and AQ benefits.- Undertake a feasibility study of potential transport interventions for Paisley town centre e.g. reinstating two-way traffic flows, amending key junctions, review of lining & signage and trial removal of certain traffic lights on ring road.	Development Control Traffic Management	n management	re - Roads and Infrastructure	undertake feasibility study awarded the beginning of 2017. First draft of the feasibility study produced which establishes initial proposals and reports on potential areas of improvement, their technical feasibility, benefits and deliverability. The development of a Transport Strategy for Paisley Town Centre (PTC) was identified as a key action within the Renfrewshire LTS and PTC 2016-2026 Action Plan. The conclusions	intentionally high level, providing ideas of key potential transport interventions for Paisley. Some of these measures will now be developed from the current concept phase taking into account traffic modelling and allowing for appropriate assessment, design and eventual delivery. The conclusions will then be subject to senior management review, Board approval and consultation with stakeholders before any decisions are made on potential action measures. Implementation of final proposals will thereafter be subject to	- % change in traffic flow: annual traffic counts on key commuter routes -improved flow in traffic - % reduction in queue lengths -overall reduction in congestion -% improvement in journey times -% improvement in bus journey times -improved connectivity and accessibility within the town centre.	reduction, it is recognised that the future implementation of recommended interventions may have a significant impact on traffic movement throughout Paisley town centre and therefore air quality. A requirement of the next phase of this study will be modelling the effect on air quality from proposed interventions.	details a programme of phased interventions covering the short, medium and long term. Works will be prioritised in 2021.	works has been identified for the short to medium term, further modelling has yet to be undertaken and a timeline for implementation of the measures yet to be decided. Some long-term improvements are also identified in line with the PTC 10yr Action Plan, but these require further investigation. The feasibility study has been funded via SPT. Funding of any future proposed measures will be subject to availability of capital funding with the potential of funding	Renfrewshire Council Air Quality Action Plan for further details on this measure.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
					of this feasibility study may feed into any PTC Transport Strategy.	identification of funding streams.				from external partners also e.g. SPT.	
10	Johnstone Town Centre Transportation Improvements	Policy Guidance and Development Control Traffic Management	Other policy & Parking enforcement on Highway	Environment & Infrastructure - Roads and Infrastructure Communities, Housing and Planning Services - Development Management, Policy & Regeneration and Community Safety Wardens	Ongoing. An initial survey of Johnstone Town Centre has been undertaken with traffic management issues/problem areas identified. Initial infrastructure improvements proposed e.g. review of TRO yellow line restrictions and effective enforcement of these, new parking signage and relocation of bus stops.	A final implementation plan requires to be developed and Implemented in a phased basis following approval.	The following KPIs may be relevant: - % change in traffic flow: annual traffic counts on key commuter routes - % improvement in journey times - % reduction in queue lengths.	Johnstone AQMA Any potential target pollution reduction will be dependent on the proposed action measures within the final implementation plan.	Ongoing. As per information within the Planning Phase.	Implementation of measures will be subject to approval and capital funding.	Refer to section 3.1.6 of the 2019 Renfrewshire Council Air Quality Action Plan for further details on this measure.
11	Improvements in the Bus Fleet Standard	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	Renfrewshire Council Environment & Infrastructure and Communiti	Consultation with local bus operators and SPT still to be undertaken	Subject to consultation outcomes	KPIs may be measured via % of buses meeting set EURO standard	Johnstone AQMA Primarily, but possibly Council wide benefits. The Air Quality	An initial meeting was held in April 2019 with the management of the	To be determined	Once consultation on this measure has taken place, the Council will require

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
				es, Housing and Planning Services in consultation with local bus operators and SPT				Action Plan Support 2017 Study by AECOM identified interventions around bus operations as the most effective way of reducing emissions in the short term within the Johnstone AQMA to levels below air quality objectives. From the scenarios considered, the greatest reduction was from upgrading all buses to Euro VI emission standard. Implementing this measure would result in a reduction of 1.6ug/m3 at the diffusion tube location (DT No. 59) where the 2019 bias adjusted, and	largest bus operator in Renfrewshire and staff from Renfrewshire Council to discuss the AQAP and potential improvements in bus operations. Further engagement is required. Given the current COVID-19 pandemic, further engagement with bus operators has been put on hold and it is unclear when this will recommence.		considering how this is implemented and taken forward. It is anticipated this will be a voluntary measure with the cooperation of local bus operators. Refer to section 3.3 of the 2019 Renfrewshire Council Air Quality Action Plan for further details on this measure.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
								distance corrected concentration was 37.5µg/m3.			
12	Vehicle Idling Awareness Raising - Regular targeted campaigns to raise awareness regarding idling vehicles & air pollution.Campaigns aimed at specific categories of drivers or in areas where vehicles idle unnecessarily e.g. schools, bus terminals, taxi ranks or in response to complaints.	Traffic Management. Public Information	Anti-idling enforcement & information via other mechanisms	Renfrewshire Community Safety Partnership; Communities, Housing and Planning Services Safety Wardens and Environment & Infrastructure Service	General idling awareness campaigns have been ongoing since 2011.	A School Parking Campaign was introduced in April 2018 aimed at road safety around schools including safe parking and an anti-idling message. By Aug 2019, all 49 primary schools in Renfrewshire were engaged in the campaign. Banners were erected at school entrances and every pupil received a school parking pledge leaflet which contained a message regarding no idling and encouraging parents to sign up to safe parking pledges around schools.	Improves overall awareness of fuel efficiency & environmental impacts of vehicles particularly at areas of sensitive receptors e.g. primary schools.However, an effective awareness raising campaign may actually increase the number of complaints received. Also need to be aware that cold weather can affect personal preferences to idle engines. The second phase of the scheme aims to address	All AQMAs. Measure is more an awareness raising tool however it is also a useful measure to prevent vehicles idling and stopping in inappropriate places that may cause congestion, which is a significant cause of emissions generated in the AQMAs. The measure can be used where necessary to reduce congestion and keep traffic flowing.	By August 2019, all 49 Primary schools in Renfrewshire were engaged in the campaign. Regarding the second phase of the scheme, four primary schools have been identified to introduce an exclusion zone in the streets around their entrances as we aim to create a safer, healthier school environment for	Ongoing measure. The School Parking Campaign has been funded internally by Communities, Housing and Planning Services and Environment & Infrastructure Services.	The use of Fixed Penalty Notices has historically not been adopted by the Council. Instead drivers have been requested to turn their engines off voluntarily. However the use of FPNs for this purpose was approved at board in November 2019. Training will be delivered to frontline staff on the back of the pandemic with implementation thereafter. Current hotspot areas will be targeted once implemented.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
						A second phase of the campaign will consider the closure of surrounding roads around selected primary schools. A feasibility study for this was undertaken in 2019.	congestion issues, reduce emissions, and ensure the safety of children around our schools. The new scheme will help promote active travel by encouraging pupils to walk or cycle to school.		pupils. This was due to commence in April 2020 but will now be put on hold until April 2021 given the current pandemic situation. When it is next able to commence, it will consist of a six-month pilot scheme and will introduce a part-time vehicle exclusion zone at the start and end of the school day in some of the surrounding streets of the four schools.		
13	Vehicle Emissions Testing	Vehicle Fleet Efficiency	Testing vehicle emissions	Renfrewshire's Community	An awareness raising and	From 2011 to March 2018.	Improves overall awareness of	All AQMAs The testing location was	Testing would be undertaken	Measure has now ceased. Funding was	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	- programme of roadside vehicle emissions testing of private vehicles in accordance with the Road Traffic (Vehicle Emissions) (Fixed Penalty) (Scotland) Regulations 2003.This measure ceased in March 2018 in accordance with the Scottish Government's preference for air quality funding to be focused on vehicle idling reduction and educational awareness.			Safety Partnership; Community Safety Wardens & Police Scotland with assistance from Glasgow City Council, East Renfrewshire Council & North Lanarkshire Council's taxi enforcement and emissions testing officers.	communication strategy would be undertaken prior to testing. This included: -publication of a public notice and press release in local and national press -information letters and idling leaflets sent to bus, taxi and large transport businesses operating within Renfrewshire -information being made available on the Council's website. All drivers stopped & tested were given a Renfrewshire Council "Don`t Be An Idler"		fuel efficiency & environmental impacts of vehicles. Reduces numbers of polluting vehicles.	chosen to be within or as close to the AQMAs as possible. Target pollution reduction would be minimal, but the measure was an effective awareness raising tool.	over two days twice a year from 2011 to March 2018. Where vehicles failed relevant emissions standards, drivers were issued with a fixed penalty notice. However, where the driver presented a MOT test certificate within 14 days indicating that the fault had been repaired and vehicle exhaust emissions complied with current legislation then the	previously via the Scottish Government Air Quality grant funding.	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
					information leaflet and explanatory letter.				notice was deemed to be complied with. A test undertaken in October 2017 resulted in 432 vehicles being tested with 3 FPNs served for failing the emissions test.		
14	Renfrewshire Council Corporate Travel Plan	Promoting Travel Alternatives	Workplace Travel Planning	Communities, Housing and Planning Services – Environmental Improvements Section	The Scottish Government's Cleaner Air for Scotland Strategy requires LAs with AQMAs to prepare a corporate travel plan that is consistent with its AQAP. A procurement process was undertaken at the end of 2018 and a consultant instructed to	Jan 2019 - Consultant undertook site visits to relevant council offices to determine existing facilities. June 2019 - staff travel survey issued to determine current transport modes etc. A Roadshow event was also held on Clean Air Day in June 2019 at Renfrewshire House. Council staff and the consultants	KPIs will be an integral part of the Travel Plan and will be determined during development of the plan. KPIs may be measured via: -the overall distance travelled by Council staff per year on company business.-the percentage of travel by staff using public transport per year.	All AQMAs, council wide air quality improvements.	Ongoing. A draft travel plan and travel directories were prepared and provided by the consultant during Nov 2019. A council steering group requires to be established to finalise the plan and	Funding was granted from the Scottish Government's 2018/19 AQAP grant to cover the cost of this measure. Costs associated with implementation of proposed measures will require funding to be sourced.	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
					commence the development of this measure.	were in attendance to provide travel planning advice, info on pool cars, promotion of the travel survey etc. Dr Bikes and Scotrail were also in attendance. A staff commuter challenge was undertaken in August 2019. Nov 2019 – draft plan provided by consultant			then consultation of this with other relevant services/ organisations. This had been planned for spring 2020 but has now been put on hold due to the current pandemic. It is unclear when this stage will recommence. Once the plan is published and measures implemented a second staff survey is planned to determine any change in travel behaviour.		

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
15	Renfrewshire Council Cycle Strategy & Action Plan - The strategy contains a Cycling Action Plan which sets out a programme of activities and network interventions for the coming ten years including upgrades and expansion of cycle networks, upgrading the Council's facilities for cyclists and updating the Council's Travel Plan.	Promoting Travel Alternatives	Promotion of cycling	Environment & Infrastructure - Roads and Infrastructure	2014-2016	The Cycle Strategy was approved by Board in Dec 2016. Measures contained within the action plan will be implemented dependant on funding. There are five cycling infrastructure projects which are currently at concept design /public consultation design stage. The routes for these are – 1.Paisley to Renfrew 2.Renfrew to GCC Boundary 3.Hawkhead Rd/ Glasgow Rd junction 4.Southbar Rd/ Parkway roundabout 5.Elderslie Gap.	KPIs are detailed within the Cycle Strategy and Action Plan. Currently there is a low level of everyday cycle use within Renfrewshire and so the KPI focus is on a small number of key targets to be achieved by 2025. For example -3% of all journeys to work being made by bicycle -% of children travelling to school by bicycle -% of primary schools offered Bikeability Level 2 training.	All AQMAs, council wide air quality improvements. The strategy identifies areas of improvement required on existing cycle routes, areas of potential expansion of the cycle network and methods to encourage increased cycle usage. Action measures associated with these have been identified, prioritised and timelines provided. The target pollution reduction will be non-measurable.	Upgrade and development of the cycling network is ongoing as per the strategy priorities. The five stated projects are currently at concept design/ public consultation design stage.	Ongoing Funding is applied for each financial year from the Scottish Government under the Cycling, Walking and Safer Streets fund. At least 36% of this fund has to be allocated to cycling including for example infrastructure or design works. All concept designs are due for completion in 2021 and are being funding 100% by Sustrans. The total cost for projects 1-4 is £100,000. Project 5, Elderslie Gap, is awaiting Sustrans funding approval. Thereafter we will apply to	Refer to section 3.1.8 of the 2019 Renfrewshire Council Air Quality Action Plan for further details on this measure.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
										Sustans for 50% match funding for construction of these projects in forthcoming years.	
16	Renfrewshire Council Staff Cycling Incentives - Staff Cycle to Work Scheme. Council employees can participate in this Government approved salary sacrifice scheme which allows them to purchase a bike with tax free benefits. This measure is currently on hold pending a review by the Council's HR to determine feasibility of offering this	Promoting Travel Alternatives	Promotion of cycling	Environment & Infrastructure		Ongoing	KPIs may be measured via: -% of employees participating in scheme and who regularly travel to work by cycle - usage of the hire bikes	All AQMAs, council wide air quality improvements.	Cycle to work scheme last open to employees Oct 2016.	Ongoing	Update not provided at time of 2021 APR publication. To provide update in 2022 APR report.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
	to staff. The review will be complete by end of 2019.										

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken

2.1.1 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.

Renfrewshire Council undertook automatic (continuous) monitoring at three sites during 2020. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at http://www.scottishairquality.scot/latest/

Maps showing the location of the monitoring sites are provided in Appendix A: Monitoring Results. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

2.1.2 Non-Automatic Monitoring Sites

Renfrewshire Council undertook non- automatic (passive) monitoring of NO_2 at fifty-four sites, including three triplicate sites, during 2020. Table A 2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix A. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

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: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

2.1.3 Nitrogen Dioxide (NO_2)

Table A.3 compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. All automatic monitoring sites achieved compliance for NO_2 AQOs in 2020 and have not reported an exceedance within the past 11 years, inside an AQMA. Cockels Loan automatic monitoring site, which is not located within an AQMA, last recorded a NO_2 annual mean AQO exceedance (43µg/m3) in 2011, however the site has since achieved compliance for the NO_2 annual mean AQO. In 2020, the Gordon Street automatic monitoring site failed to achieve the minimum 33% annual data capture required in 2020 to allow for annualisation of NO_2 data to take place. The Gordon Street monitoring site did not therefore provide any NO_2 data for inclusion within this year's APR.

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. In 2020, fifteen diffusion tubes were removed from the 2019 monitoring regime due to not being representative of exposure or consistently reporting low concentrations. One location (DT58) ceased monitoring at the start of 2020, as the original lamppost was removed. A new site nearby was therefore established in February 2020 (DT101). As part of the Council's diffusion tube overhaul, there were five new sites established in 2020, mostly located within the Paisley area, with two sites deployed in the Lochwinnoch area. Where diffusion tubes reported erroneous data in 2020 and, as recommended in paragraphs 7.137 and 7.161 of the April 2021 updated LAQM Technical Guidance TG(16), the data was removed prior to data adjustment calculations. Such erroneous data was primarily within the periods of March and April 2020, where all diffusion tubes were exposed for two months. As the Council achieved a good diffusion tube data capture overall and, as the over exposure was as a direct result of COVID-19 restrictions, it was considered best practice to remove the data in this instance. This further ensures that all data reported within this year's APR remains in line with the LAQM diffusion tube calendar as much as is reasonably practicable in addition to excluding concentration data captured at the height of uncharacteristic pandemic restrictions. For completeness, the two-month exposure data is provided in Table A.3, however the data not been calculated as part of the NO2 annual mean results for 2020. Five diffusion tube locations required annualisation in 2020, with calculations provided in Table C.2. DT96 commenced monitoring in July 2020, with a 52% time-weighted average data capture for 2020, therefore annualisation was applied. The remaining annualised sites (DTs 66, 70, 71, 89) were all existing monitoring locations that ranged between a 50% to 67% time-weighted average data

capture in 2020. Distance correction was undertaken for three monitoring sites, all of which were located within an AQMA. DT8, DT59 and DT82 were not sited at locations of relevant exposure and reported concentrations in exceedance or within 10% of the AQO. During 2020, prior to distance correction, DT8 in the RTC AQMA reported 40.2µg/m^3, DT59 in the JHS AQMA reported 39.5µg/m^3 and DT82 in the PTC AQMA reported 35.6µg/m^3. Following distance correction, DT8 reported 39.9µg/m^3, DT59 reported 39.1µg/m^3 and DT82 reported 35.6 µg/m^3. All diffusion tube monitoring locations in Renfrewshire Council therefore achieved NO_2 AQO compliance in 2020, following distance correction to relevant exposure, with DT8 reporting the highest concentration. In 2019, following distance correction; DT8 was the only reported exceedance (41.1µg/m^3), with previous exceedances reported in 2017 at DT59 (JHS AQMA) and 2018 at DT8 (RTC AQMA); 40.6µg/m^3 and 40.8µg/m^3, respectively. A largely downward trend in concentrations is observed across the Council's 2020 monitoring data, with 83% of existing diffusion tube monitoring sites reporting a decrease in NO_2 concentrations in 2020 from 2019 levels. Despite downward trends reported for Renfrewshire Council in previous years, the 2020 downward trends may be partially attributed to the atypical traffic conditions observed across the U.K during the pandemic. The extent of any 2021 downward concentration trends in comparison to 2020 levels will be therefore considered and duly discussed, in next year's APR.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year. No exceedances of the hourly mean air quality objective for NO_2 were recorded at any of the automatic monitoring sites.

2.1.4 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 18µg/m^3. The PM_{10} automatic monitoring sites have not recorded an exceedance of the annual mean AQO since their installation.

Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than seven times per year. In 2020, both Gordon Street and the Johnstone automatic monitors reported no instances of 24-hour mean AQO exceedances. Following on from

last year's APR, it is therefore assured that the previous year's 14 PM_{10} 24-hour mean exceedances reported at the Johnstone monitoring location were an isolated event as a result of localised building works undertaken in the summer of 2019.

2.1.5 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years with the air quality objective of 10µg/m^3. From the monitoring results obtained from the $PM_{2.5}$ monitor in Johnstone, there was no exceedance of the annual AQO for $PM_{2.5}$. In terms of the Council's future $PM_{2.5}$ monitoring regime, the Council intend to report $PM_{2.5}$ data at the Gordon Street automatic monitoring site in place of the existing PM_{10} monitoring from 2021.

2.1.6 Sulphur Dioxide (SO_2)

Renfrewshire Council does not currently monitor SO_2 within the Council area. Historically SO_2 was measured at the Glasgow Airport monitoring station however, due to the concentrations recorded being substantially below the AQO, monitoring of SO_2 was discontinued at the monitoring site at the end of 2007.

2.1.7 Carbon Monoxide, Lead and 1,3-Butadiene

Renfrewshire Council does not currently monitor carbon monoxide, lead or 1,3- Butadiene concentrations within the Council area. No significant sources of these pollutants have been identified in previous rounds of Review and Assessment.

3 New Local Developments

The Clyde Waterfront and Renfrew Riverside (CWRR) and Glasgow Airport Investment Area Projects (GAIA) are part of a wider City Deal generation project that consists of 20 infrastructure projects across the Glasgow City Region. The £1.13bn City Deal has been designed to create thousands of new jobs, improve public transport and connectivity; and deliver significant economic growth through investment within Renfrewshire. Works for the GAIA and CWRR projects commenced in summer 2019 and January 2020, respectively. Both projects were placed on hold in March 2020 due to the ongoing pandemic and are now expected to be completed in late summer 2021 (GAIA) and Q4 2023 (CWRR). The projects aim to provide significant new roads infrastructure within Renfrewshire that will provide a positive impact on air quality in certain areas. They are therefore prioritised as action measure No.1 within the 2019 Renfrewshire Air Quality Action Plan.

The air quality assessments submitted, as part of the City Deal projects' Environmental Impact Assessments (EIA), predicted a reduction of 3µg/m^3 at the historically exceeding monitoring location, DT8, and reductions of up to 3.9µg/m^3 along Inchinnan Road. Both locations are currently within the RTC AQMA. This anticipated reduction is reported based on the CWRR Project being operational in 2020, in comparison to 2020 baseline levels. It may be anticipated that vehicle movement trends as a result of the CWRR scheme, and its 2023 completion date, are now therefore set to improve further from the initial 2020 assumptions.

The Coronavirus (Scotland) Act came into force on 7 April 2020 and sets out that planning permission that would otherwise lapse in six months until 6 October 2020, will be extended by one year to allow work to start, once the current restrictions are lifted.

3.1 Road Traffic Sources

- Application reference 19/0044/PP. Demolition of nightclub and erection of 36 flats and Class 3 (restaurant) commercial unit. 22 Bridge Street, Paisley, PA1 1XN. Granted December 2019.

This 2019 application, identified as introducing new sensitive receptors within the Paisley Town Centre AQMA, has progressed in 2020 with the demolition of the nightclub. An air

quality assessment was completed for the application and reviewed by Renfrewshire Council. The development is to move forward during 2021.

- Application reference 19/0877/PP. Residential Development of 35 flatted dwellings along with associated infrastructure. Land To South West Of Junction With High Street Macdowall Street Johnstone. Granted July 2020.

Air Quality Assessment submitted and confirmed to be satisfactory.

- Application reference 20/0308/PP. Residential development comprising the erection of 73 flats, the formation of new roads, parking and landscaping. Site Bounded By Smithhills St Lawn St Abbey View And Weir St Paisley. Granted October 2020.

An air quality assessment was requested as part of the planning application but has yet to be received.

3.2 Other Transport Sources

No planning applications were received by Renfrewshire Council during 2020 that identified any new or significantly changed other transport sources.

3.3 Industrial Sources

- Application reference 20/0365/NO. Erection of recycling shed and increase in facility volume to 75,000 tonnes per annum. Granted July 2020.

Located in an industrial park, north west of Glasgow airport, this application proposes to extend an existing site in order to increase site operations.

3.4 Commercial and Domestic Sources

- Application reference 19/0410/PP. Unit A Barnhill Farm, Houston Rd, Inchinnan PA4 9LU - Change of use of agricultural barn to farmhouse shop and café (includes a biomass boiler) Granted September 2019.

Air quality assessment not required, however a Biomass Boiler Information Request Form was completed and submitted.

- Application reference 19/0794/PP. Weels Farm, Kaim Rd Lochwinnoch - Installation of 5 biomass boilers in retrospect. Granted March 2020.

Full air quality assessment not required due to small size of biomass and no nearby receptors. A Biomass Boiler Information Request Form was completed, and satisfactory screening undertaken.

- Application reference 20/0424/NO. Erection of grid stability facility with associated landscaping, access, parking and grid connection. Neilston Grid Electricity Sub - Station Complex Gleniffer Road Paisley. Granted September 2020.

Consultations were undertaken in August and September 2020 surrounding the installation of a new Grid Park in Paisley. New Developments with Fugitive or Uncontrolled Sources

No planning applications were received by Renfrewshire Council during 2020 that identified any new developments with fugitive or uncontrolled sources.

4 Planning Applications

Table 4.1 provides a summary of the planning applications either progressed or received by Renfrewshire Council, in 2020.

Table 4.1 – Planning Application Summary 2020

Application Reference	Assessment Received	Application Outcome
19/0410/PP. Change of use of agricultural barn to farmhouse shop and café (includes a biomass boiler). Unit A Barnhill Farm, Houston Rd, Inchinnan PA4 9LU	Biomass Boiler Information Request Form	Approved September 2019
19/0044/PP Demolition of nightclub and erection of 36 flats and Class 3 (restaurant) commercial unit. 22 Bridge Street, Paisley, PA1 1XN.	Air Quality Assessment	Approved December 2019
19/0841/PP Installation of a 600kW biomass boilers with associated housing, fuel stores and flues. Main Depot and Recycling Centre, Renfrewshire Council Depot, Underwood Road, Paisley, PA3 1TL.	Air Quality Assessment	Approved February 2020

Application Reference	Assessment Received	Application Outcome
19/0794/PP. Installation of 5 biomass boilers in retrospect. Weels Farm, Kaim Rd Lochwinnoch	Biomass Boiler Information Request Form	Approved March 2020
19/0219/PP Refurbishment of industrial/warehouse units; erection of industrial/business units; erection of bridge, erection of hotel; erection of multi-storey car park; erection of residential development; erection of restaurant; alterations to road layout and formation of parking. Land at Westway Distribution Park, Porterfield Road, Renfrew.	Air Quality Assessment	Approved May 2020
20/0365/NO Erection of recycling shed and increase in facility volume to 75,000 tonnes per annum. 6 Newmains Avenue, Inchinnan, Renfrew, PA4 9RR	AQA not required	Approved July 2020
19/0877/PP. Residential Development of 35 flatted dwellings along with associated infrastructure. Land To South West Of	Air Quality Assessment	Approved July 2020

Application Reference	Assessment Received	Application Outcome
Junction With High Street Macdowall Street Johnstone.		
20/0424/NO Erection of grid stability facility with associated landscaping, access, parking and grid connection. Neilston Grid Electricity Sub - Station Complex Gleniffer Road Paisley	AQA not required	Approved September 2020
20/0308/PP. Residential development comprising the erection of 73 flats, the formation of new roads, parking and landscaping. Site Bounded By Smithhills St Lawn St Abbey View And Weir St Paisley.	AQA not yet received	Approved October 2020

5 Impact of COVID-19 upon LAQM

During 2020, Renfrewshire Council's monitoring regime was impacted during March and April of the reporting year, where the Council were unable to undertake the April 2020 diffusion tube deployment due to the initial lockdown restrictions. The Council were able to recommence diffusion tube changes from the ensuing month, therefore March and April passive monitoring data was impacted during 2020, only. Glasgow Scientific Services laboratory provided concentration data to cover the two-month extended exposure period and this is presented in Table A.3 for information. The data has not been reported as part of the this year's APR annual mean concentration data, as is outlined within Section 2.1.3.

The Council was unable to also attend the automatic monitoring locations to carry out scheduled calibrations during the month of March. In response, the Council's service providers attended site at this time and were able to undertake calibrations and supply the Council with the calibration details for the month of March. The automatic monitoring network was therefore unaffected by COVID-19 restrictions.

During 2020, the Council did not undertake any indicative low-cost monitoring, and so this was unaffected by the lockdown periods imposed. The Council experienced no further issues with the LAQM network in response to COVID-19 in terms of LAQM monitoring. AQMA revocation and amendment consideration was however delayed for the PTC and JHS AQMAs, following the suspension and subsequent postponement of the City Deals development Projects. The Council advise that once operational traffic data is available, real-time traffic impacts deriving from the projects can be observed, if any, ahead of AQMA revocation or amendment considerations. Additional information on the project delays and their impact can be found in Section 3.

6 Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

Ahead of distance correction, there was one reported exceedance in relation to the 40µg/m^3 NO_2 annual mean AQO, in 2020, at DT8 (40.2µg/m^3). DT8 is located within the RTC AQMA and has historically reported concentrations above the AQO, reporting 41.4µg/m^3 in 2019, prior to distance correction. In 2020, DT8 fell below the NO_2 annual mean AQO for the first time in three years, reporting 39.9µg/m^3 following distance correction. DT59, located in the JHS AQMA, and DT82, located within the PTC AQMA, both reported within 10% of the AQO, 39.2µg/m^3, and 36.1µg/m^{3}respectively, before distance correction. In 2019, DT59 also reported within 10% of the NO_2 annual mean AQO at 37.9µg/m^3, prior to distance correction, indicating a slight concentration increase in 2020. Following distance correction, DT59 fell to 39.1µg/m^3 in 2020, remaining within 10% of the NO_2 annual mean AQO of 40µg/m^3 and reporting a 1.4µg/m^3 increase following distance correction, in comparison to the 2019 concentration (37.5µg/m^3). A largely downward trend is observed across the Council's 2020 monitoring data, with 83% of existing diffusion tube monitoring sites reporting a decrease in NO_2 concentrations in 2020, from 2019. It may be possible that the significant number of 2020 passive monitoring sites indicating such trends could be as a result of the atypical traffic conditions observed across the U.K during the pandemic, however in terms of sites such as DT82 where a 7.2µg/m^3 increase in NO_2 concentration was reported in 2020 from 2019 and, the average decrease in existing diffusion tube site trends averaging 2.3µg/m^3, it may be concluded that not all monitoring locations were directly affected through impacts of COVID-19 restrictions. The increase at monitoring location DT82 suggests an increase in road traffic activity in the area, returning to concentration levels previously recorded in 2016 and 2017.

The Cockels Loan automatic monitoring location reported the most significant decrease in pollutant concentration in 2020, with a 11.1µg/m^3 reduction in the site's NO_2 annual mean concentration when compared to 2019. It was observed that the site's lowest concentrations were recorded between April and July 2020. The Cockels Loan automatic monitor is located close to the M8 motorway, which suggests that the 2020 concentration

levels reported were as a direct result of COVID-19 restrictions, where it was not permitted to travel long distances during lockdown periods.

The PM_{10} automatic monitoring sites have not recorded an exceedance of the 18µg/m^3 annual mean AQO since their installation. In 2020, both the Gordon Street and Johnstone automatic monitors reported no instances of 24-hour mean AQO exceedances. In 2019, the Johnstone monitoring location recorded 14 PM_{10} 24-hour mean exceedances, however it is observed that this was an isolated event as a result of localised building works undertaken in the summer of 2019.

Considering the generally downward trends in 2020, the Council's proposed revocation of the PTC AQMA in last year's APR, and the recommendation from last year's appraisal concerning the amendment of the JHS AQMA; it may be feasible to consider AQMA changes within the coming year or so. Nevertheless, following the 2020 pandemic and subsequent infrastructure project delays (GAIA and CWRR City Deals Projects), although the downward concentration trends largely continue across all pollutants, the Council wish to maintain the current AQMAs and continue to progress and develop the AQAP measures, with a further review of the PTC and JHS AQMA changes to be carried out following the completion of the upcoming road infrastructure improvements.

6.2 Conclusions relating to New Local Developments

Renfrewshire Council is satisfied that any new developments likely to have an impact upon local air quality, or potentially introduce new receptors into areas of poor air quality have been adequately assessed during the planning process. Processes and guidance notes are in place to ensure that prospective developers and Renfrewshire Council Planning Officers have clear instructions on what information is required in relation to certain types of development, especially biomass, and when to request more detailed information on the potential impacts of the proposals. In terms of the City Deals Projects, although planning permission has been approved alongside the relevant air quality impact assessments, the Council wish to await to observe operational traffic influences on monitoring concentrations ahead of a commitment to any changes in the Council's AQMAs at this time.

6.3 Proposed Actions

Renfrewshire Council's proposed actions following the publication of the 2021 APR are as follows:

- To recommence the suspended CWRR development in order to achieve its proposed 2023 completion date;
- Ensure the completion of the GAIA road infrastructure improvement project in late summer 2021;
- Paisley transportation improvements to be further developed in 2021;
- Introduction of a 2021 piloted vehicle exclusion zone, to be in place for six months and to be active from the start to the end of the school day, surrounding four primary schools in Renfrewshire;
- As part of the Council's Sustainable Travel Planning Scheme, the completion of the cycle hub and bicycle playground at Robertson Park is expected in 2021, with associated improvements to local cycle infrastructure and the use of electric bikes within the Council;
- Progression of UTC system upgrades to a cloud-based system, to improve traffic management efficiency across 66 traffic signal installations in Renfrewshire;
- Continue to review all air quality assessments that are submitted as part of planning applications in relation to possible impacts upon local air quality;
- Assess if the completion of the GAIA project in late summer 2021 impacts pollutant concentration levels within the PTC AQMA ahead of any revocation considerations (in addition to amendments within the JHS AQMA);
- Continue to monitor NO_2, PM_{10} and $PM_{2.5}$ at all relevant locations throughout Renfrewshire, including the conversion of the Gordon Street PM_{10} monitor to a $PM_{2.5}$ monitor in 2021;
- Consider additional passive monitoring sites along the south side of Johnstone High Street in order to identify any hot spots and increase data capture in the areas around DT59;
- Assess the 2021 monitoring data when available, to highlight to what extent the 2020 downward trends were influenced by reduced vehicle use during the 2020 pandemic restrictions, and;
- Submit the 2022 Annual Progress Report.

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? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
REN01	Cockels Loan	Roadside	250463	665934	NO_2	N	Chemiluminescent	5	18	2.2
REN02	High Street, Johnstone	Roadside	242984	663178	PM_{10}, $PM_{2.5}$	Y - JHS	FIDAS 200	0.5 (3)	2.9	1.9
REN03	Inchinnan Road, Renfrew	Roadside	250567	667558	NO_2	Y - RTC	Chemiluminescent	7.1	3.9	1.6
PAI3	Gordon Street, Paisley	Roadside	248316	663612	NO_2, PM_{10}	Y - PTC	Chemiluminescent, FDMS	6.5	10	NO_x 2.2, PM_{10} 2.4

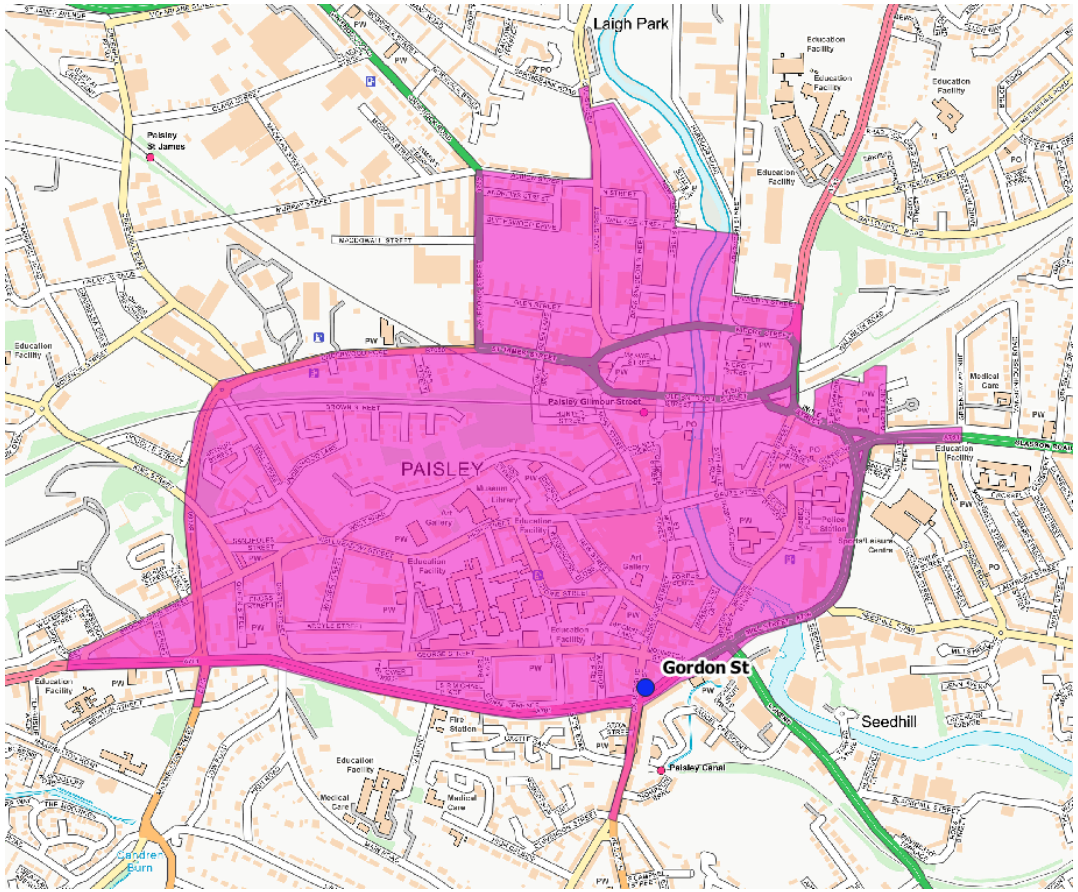
Notes:

(1) 0m 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.

(3) The distance of 0.5m is to the façade of the closest building, there are commercial units at ground level and residential units on the first floor.

Figure A.1 - Automatic Monitoring Site: Paisley



Legend

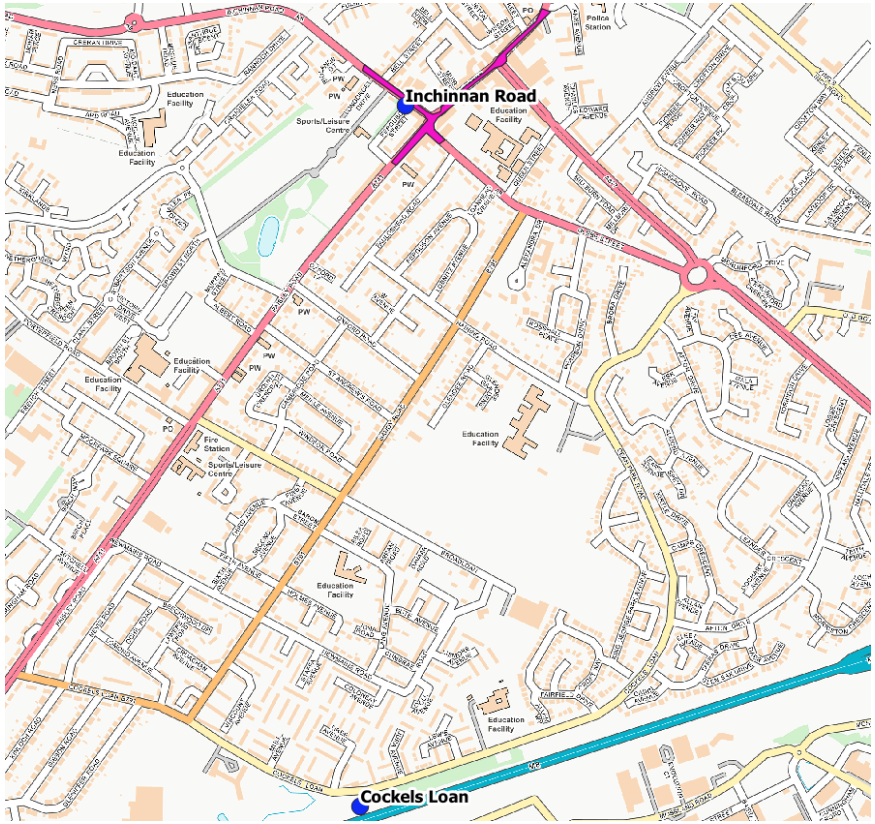
AQMA Boundary

Automatic Monitor

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Automatic Monitoring Site: Paisley	
By JD	**Approved** HS
Scale Not to Scale	**Job Ref** 10738055
Date June 2021	**Figure No.** A.1

Figure A.2 - Automatic Monitoring Sites: Renfrew



Legend

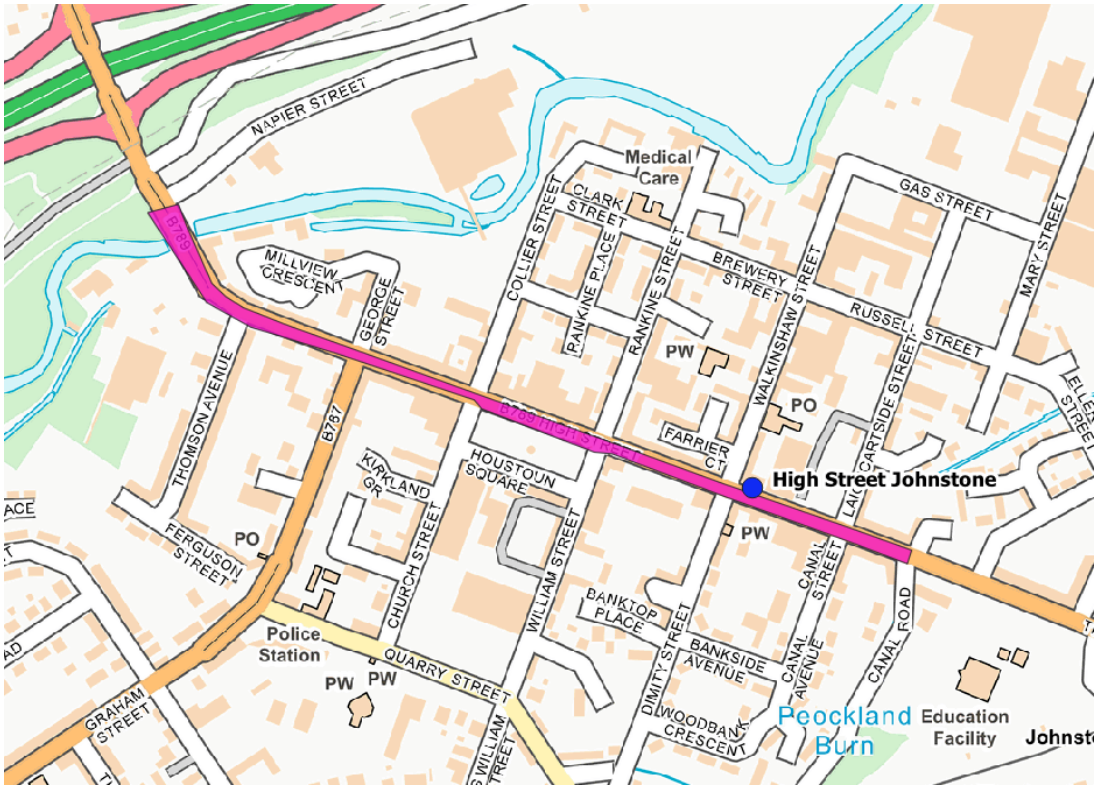
AQMA Boundary

Automatic Monitor

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Automatic Monitoring Sites: Renfrew	
By JD	**Approved** HS
Scale Not to Scale	**Job Ref** 10738055
Date June 2021	**Figure No.** A.2

Figure A.3 - Automatic Monitoring Site: Johnstone



Legend

AQMA Boundary

Automatic Monitor

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Automatic Monitoring Site: Johnstone	
By JD	**Approved** HS
Scale Not to Scale	**Job Ref** 10738055
Date June 2021	**Figure No.** A.3

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? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
1	Paisley1	Urban Centre	248350	664082	NO_2	Y-PTC	70.0	68.0	No	2.7
2	Paisley2	Urban Background	247925	664052	NO_2	Y-PTC	11.0	35.0	No	2.4
3	Paisley3	Urban Background	249002	662138	NO_2	N	8.0	1.5	No	2.4
8	Renfrew8	Kerbside	250589	667547	NO_2	Y-RTC	0.1	2.6	No	2.4
17	Renfrew17	Roadside	251524	666287	NO_2	N	0.0	28.0	No	2.3
19	Paisley19	Roadside	245701	663603	NO_2	N	5.0	2.5	No	2.5
20	Johnstone20	Kerbside	242675	663286	NO_2	Y-JHS	0.5	1.4	No	2.3
21(1), 21(2), 21(3)	Paisl 21(3)	Roadside	248316	663612	NO_2	Y-PTC	6.3	9.9	Yes	2.3
33	Paisley 33	Roadside	248277	663524	NO_2	Y-PTC	1.1	2.8	No	2.8
35	Paisley 35	Roadside	248360	664272	NO_2	Y-PTC	0.4	3.4	No	2.7
36	Paisley 36	Roadside	247948	664774	NO_2	Y-PTC	4.5	3.3	No	2.5
40	Renfrew 40	Roadside	250763	667631	NO_2	Y-RTC	0.3	6.2	No	2.5
43	Paisley 43	Roadside	248481	664154	NO_2	Y-PTC	0.0	2.5	No	2.5
44	Paisley 44	Roadside	248209	664474	NO_2	Y-PTC	0.2	2.2	No	2.5
45	Renfrew45	Kerbside	251803	667365	NO_2	N	18.0	2.0	No	2.5
48	Renfrew48	Roadside	251264	666217	NO_2	N	8	45.0 (M8) (3)	No	2.6
50	Paisley 50	Roadside	248985	665494	NO_2	N	7.0	12.0	No	2.5
52	Renfrew 52	Roadside	251515	666955	NO_2	N	4.0	3.0	No	2.3
56	Renfrew 56	Roadside	250579	667488	NO_2	Y-RTC	3.5	4.5	No	2.4
57	Renfrew 57	Roadside	250597	667473	NO_2	Y-RTC	1.2	6.0	No	2.4
101(4)	Renfrew 97	Roadside	250656	667457	NO_2	N	4.5	2.5	No	2.3
59	Johnstone 59	Kerbside	242656	663281	NO_2	Y-JHS	0.1	1.7	No	2.5
60	Paisley 60	Roadside	247525	664326	NO_2	Y-PTC	7.8	0.5	No	2.4
61	Kilbarchan 61	Roadside	240584	663007	NO_2	N	0.1	1.1	No	2.4
62(1), 62(2), 62(3)	Cockels Loan 62 (3)	Roadside	250463	665934	NO_2	N	5.0	18.0	Yes	3.0

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube co-located with a Continuous Analyser?	Tube Height (m)
63	Paisley 63	Roadside	249159	665710	NO_2	N	6.8	3.7	No	2.4
65	Kilbarchan 65	Roadside	240599	663000	NO_2	N	0.4	2.0	No	2.2
66	Kilbarchan 66	Roadside	240573	663021	NO_2	N	0.4	1.6	No	2.2
67	Kilbarchan67	Roadside	240512	663027	NO_2	N	1.8	3.0	No	2.3
68	Renfrew68	Roadside	250522	667419	NO_2	N	0.2	3.0	No	2.3
69	Renfrew69	Roadside	250537	667602	NO_2	Y-RTC	0.1	2.9	No	2.0
70	Renfrew70	Roadside	250599	667561	NO_2	Y-RTC	4.5	3.7	No	2.0
71	Renfrew71	Roadside	251729	666360	NO_2	N	0.0	26.5 (M8) [3]	No	2.0
72	Johnstone72	Roadside	243080	663140	NO_2	Y-JHS	0.5	3.0	No	2.3
73	Paisley73	Roadside	248566	664072	NO_2	Y-PTC	0.2	2.0	No	2.5
74	Paisley74	Roadside	248313	663621	NO_2	Y-PTC	0.2	3.3	No	2.2
75	Renfrew75	Roadside	250853	667747	NO_2	Y-RTC	0.2	5.0	No	2.5
78	Paisley78	Roadside	248339	662576	NO_2	N	0.2	2.6	No	2.5
79	Paisley79	Roadside	248632	664212	NO_2	Y-PTC	0.2	2.8	No	2.2
80	Paisley80	Roadside	249653	664123	NO_2	N	1.9	2.1	No	2.4
82	Paisley82	Roadside	247513	664024	NO_2	Y-PTC	0.2	2.3	No	2.4
83	Paisley83	Kerbside	247671	663913	NO_2	Y-PTC	0.4	3.3	No	2.5
84	Paisley84	Roadside	251254	667876	NO_2	N	18.0	0.5	No	2.4
85	Johnstone85	Roadside	242622	663306	NO_2	Y-JHS	0.6	1.1	No	2.4
86	Johnstone86	Roadside	242495	663358	NO_2	Y-JHS	0.1	2.7	No	2.4
87	Johnstone87	Roadside	243117	663127	NO_2	Y-JHS	0.4	3.0	No	2.5
88	Paisley 88	Roadside	249850	663991	NO_2	N	7.0	2.1	No	2.4
89	Paisley 89	Roadside	248467	664303	NO_2	Y-PTC	0.1	3.5	No	2.3
90(1), 90(2), 90(3)	Renfrew90(3)	Roadside	250567	667558	NO_2	Y-RTC	7.0	3.9	Yes	1.6
92	Lochwin92	Roadside	234904	658634	NO_2	N	0.5	2.0	No	2.4
93	Lochwin93	Roadside	235280	658877	NO_2	N	0.4	1.2	No	2.6
94	Paisley94	Roadside	248186	663925	NO_2	Y-PTC	2.1	0.5	No	2.4
95	Paisley95	Roadside	248479	664216	NO_2	Y-PTC	0.5	1.7	No	2.5
96	Paisley96	Roadside	248998	665204	NO_2	N	19.0	2.2	No	2.2

Notes:

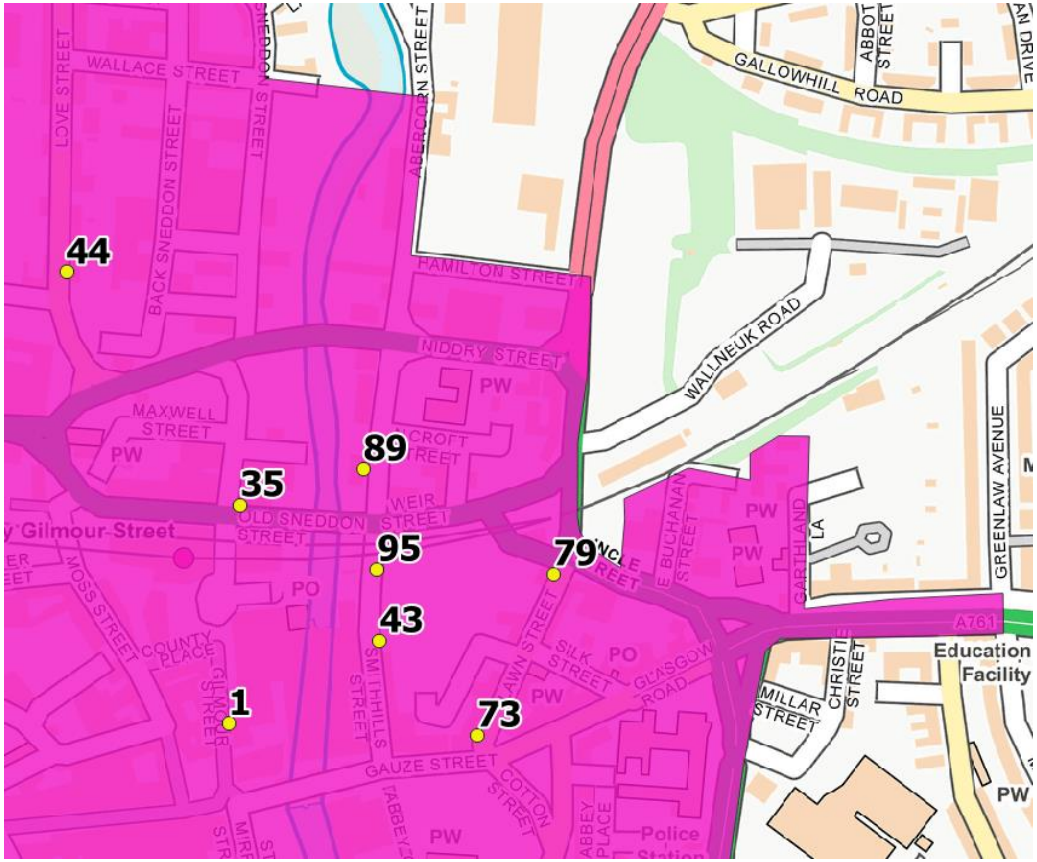
(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

(3) Value (in brackets), for distance of the tube to the kerb, are reflective of the 2020 APR representation of the nearest road source proximity to the relevant exposure. As is recommended in TG(16), sites are not eligible for distance correction where additional road sources impact the receptor, where the annual mean NO_2 concentration falls below 36µg/m^3, or where the receptor is >20m from the monitoring location.

(4) Renfrew58 ceased monitoring at start of 2020 as the site's lamppost was removed. Renfrew101 was sited close to the previous Renfrew58 site during the February 2020 deployments.

Figure A.4 - Diffusion Tube Monitoring Locations: Paisley Central



Legend

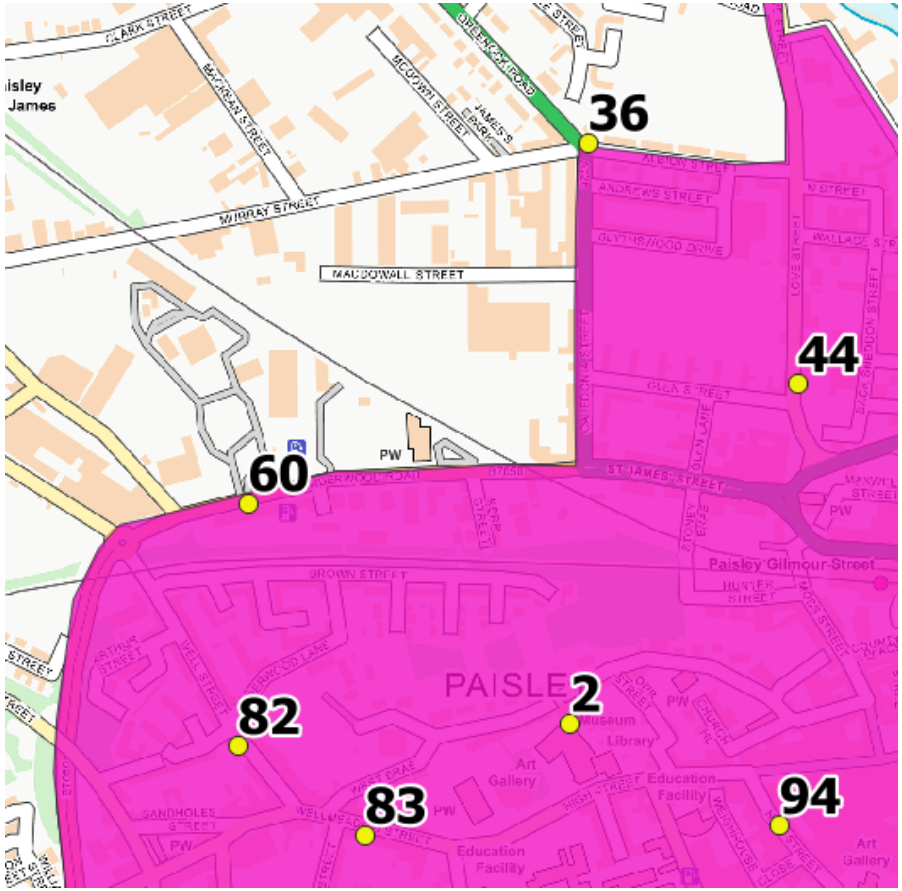
AQMA Boundary

Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Paisley Central	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.4

Figure A.5 - Diffusion Tube Monitoring Locations: Paisley West



Legend

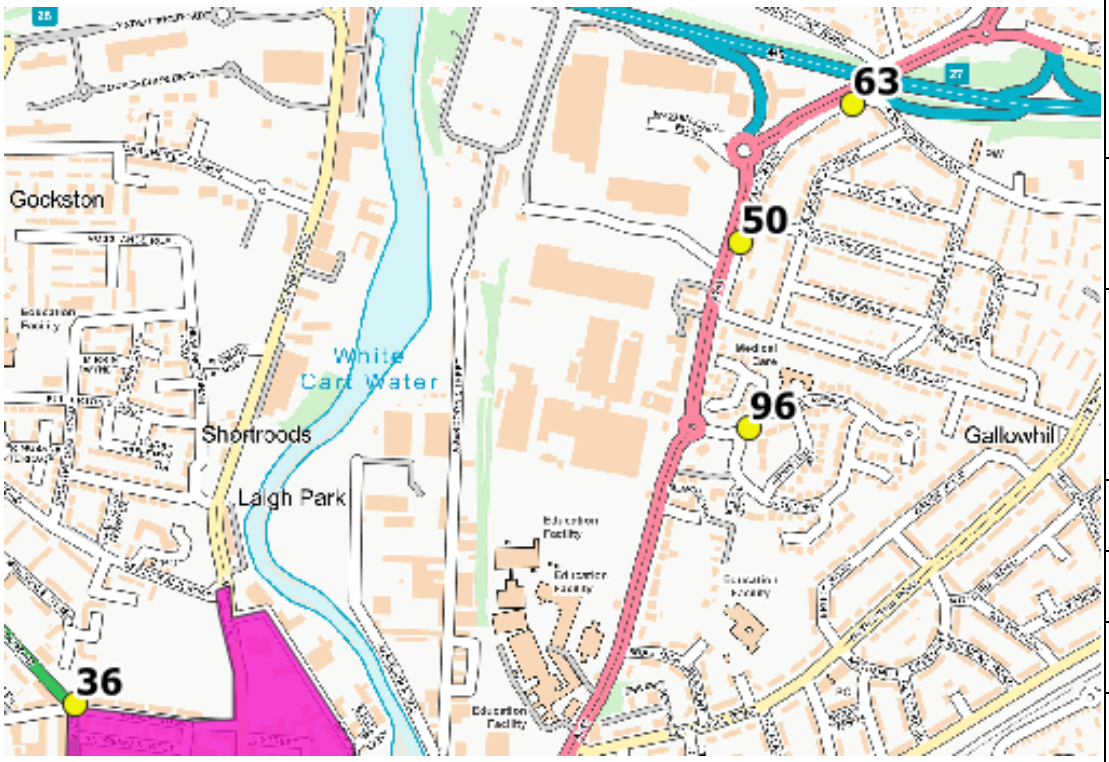
AQMA Boundary

Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Paisley West	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.5

Figure A.6 - Diffusion Tube Monitoring Locations: Paisley North



Legend

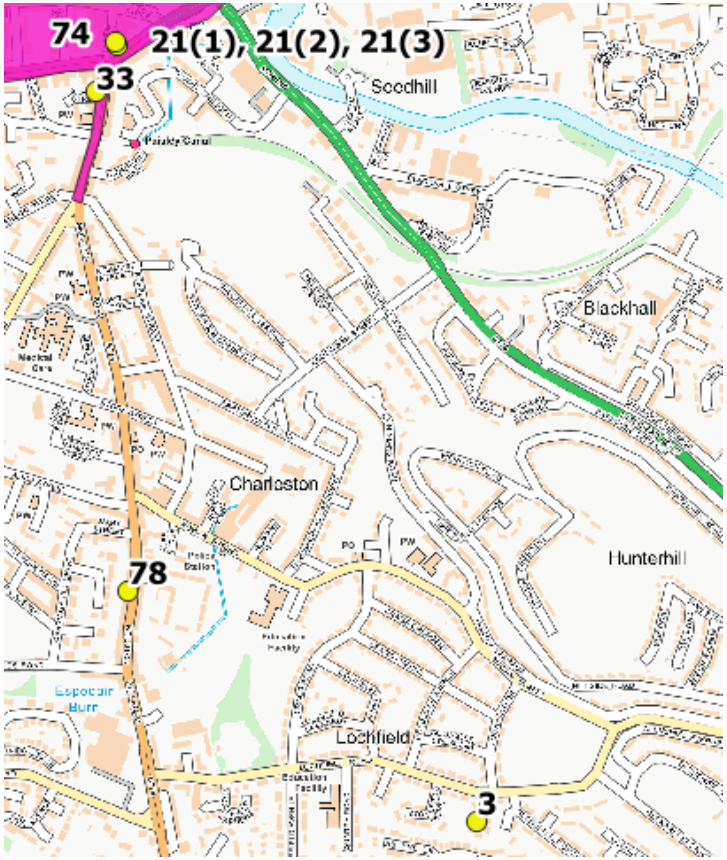
AQMA Boundary

Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Paisley North	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.6

Figure A.7 - Diffusion Tube Monitoring Locations: Paisley South



Legend

AQMA Boundary

Diffusion Tube

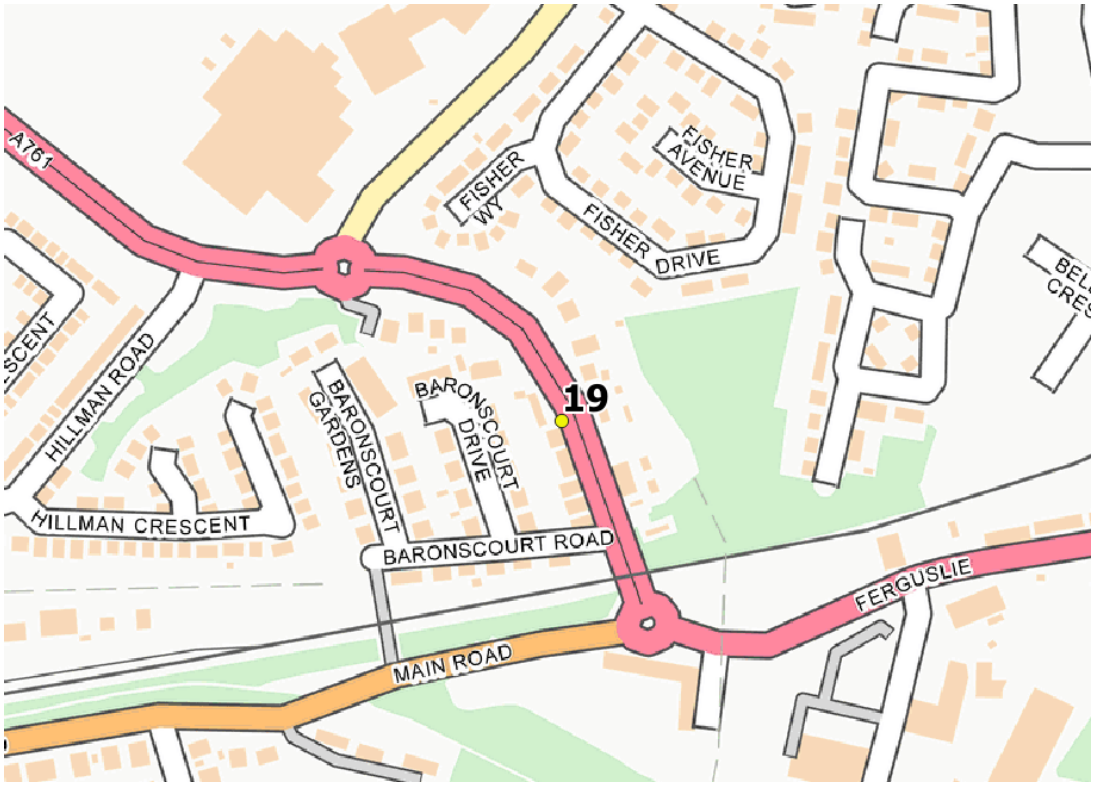
	Air Quality Bureau Veritas 5th Floor 66 Prescot Street London, E1 8HG
Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Paisley South	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.7

Figure A.8 - Diffusion Tube Monitoring Locations: Paisley East

Legend
Diffusion Tube

	Air Quality Bureau Veritas 5th Floor 66 Prescot Street London, E1 8HG
Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Paisley East	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.8

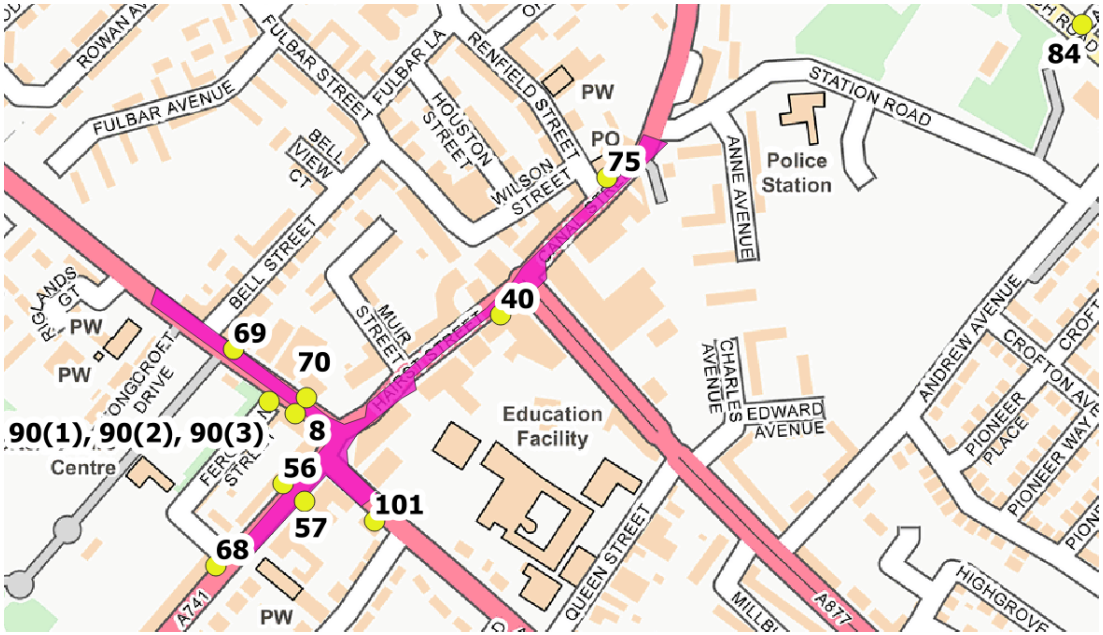
Figure A.9 - Diffusion Tube Monitoring Locations: Paisley South West



Legend
Diffusion Tube

	Air Quality Bureau Veritas 5th Floor 66 Prescot Street London, E1 8HG
Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Paisley South West	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.9

Figure A.10 - Diffusion Tube Monitoring Locations: Renfrew Central



Legend

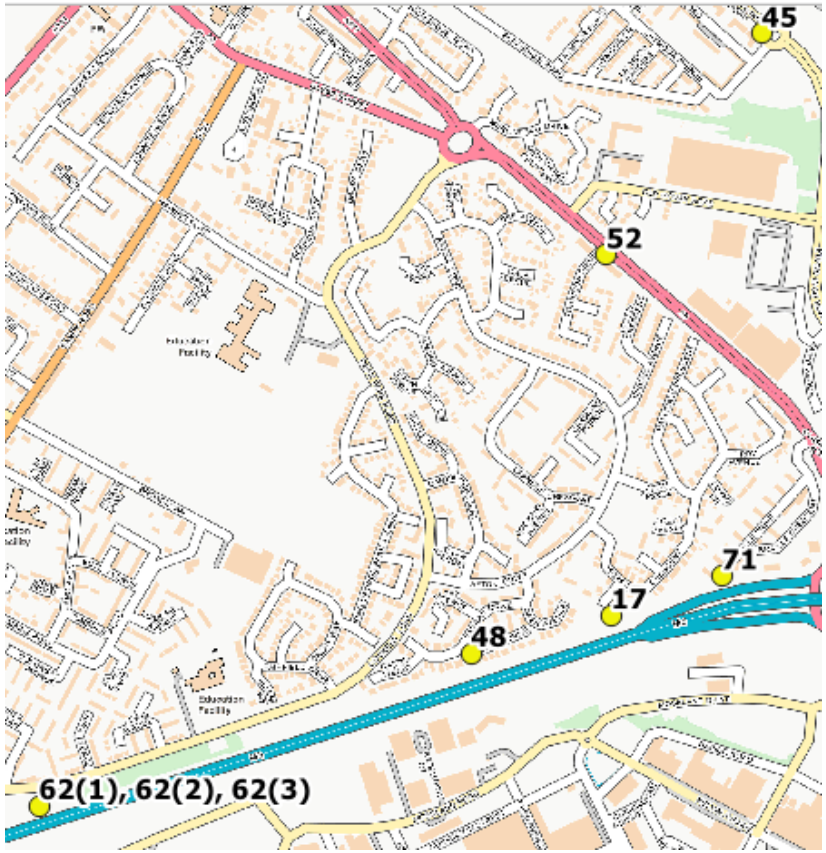
AQMA Boundary

Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Renfrew Central	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.10

Figure A.11 - Diffusion Tube Monitoring Locations: Renfrew East

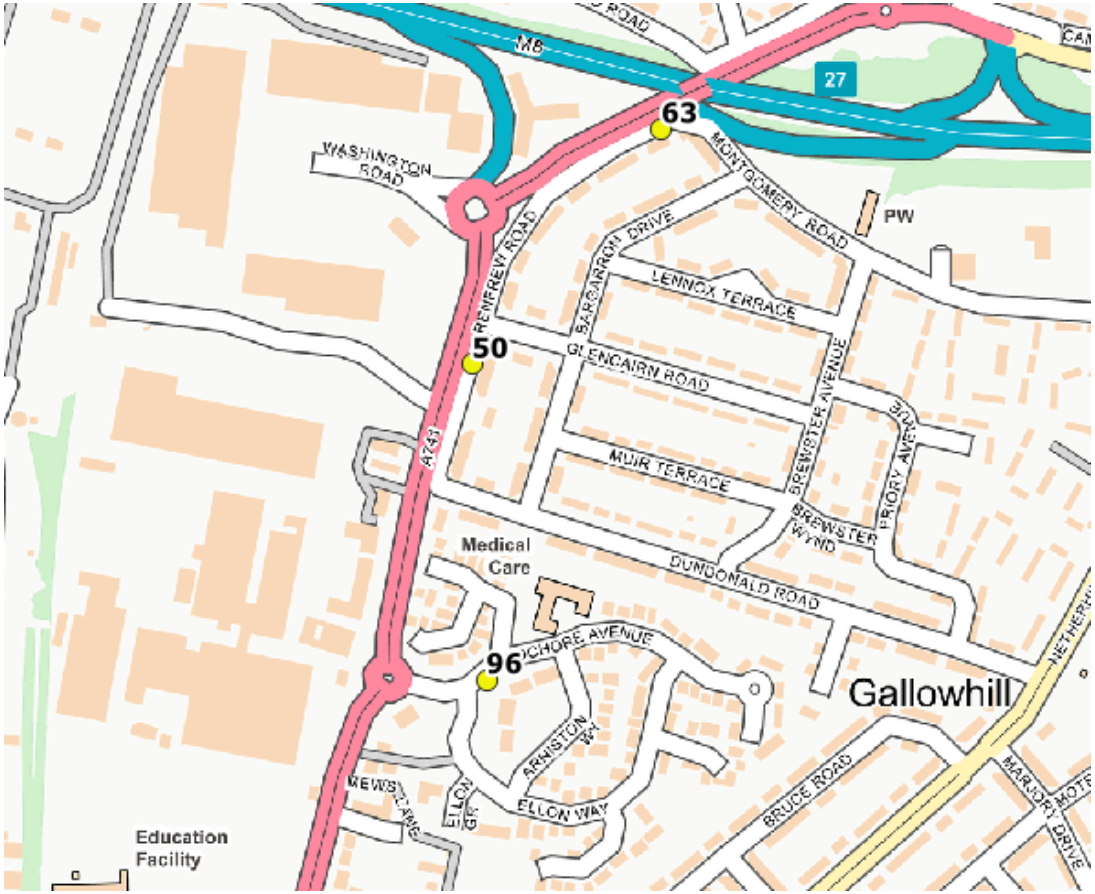


Legend
Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Renfrew East	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.11

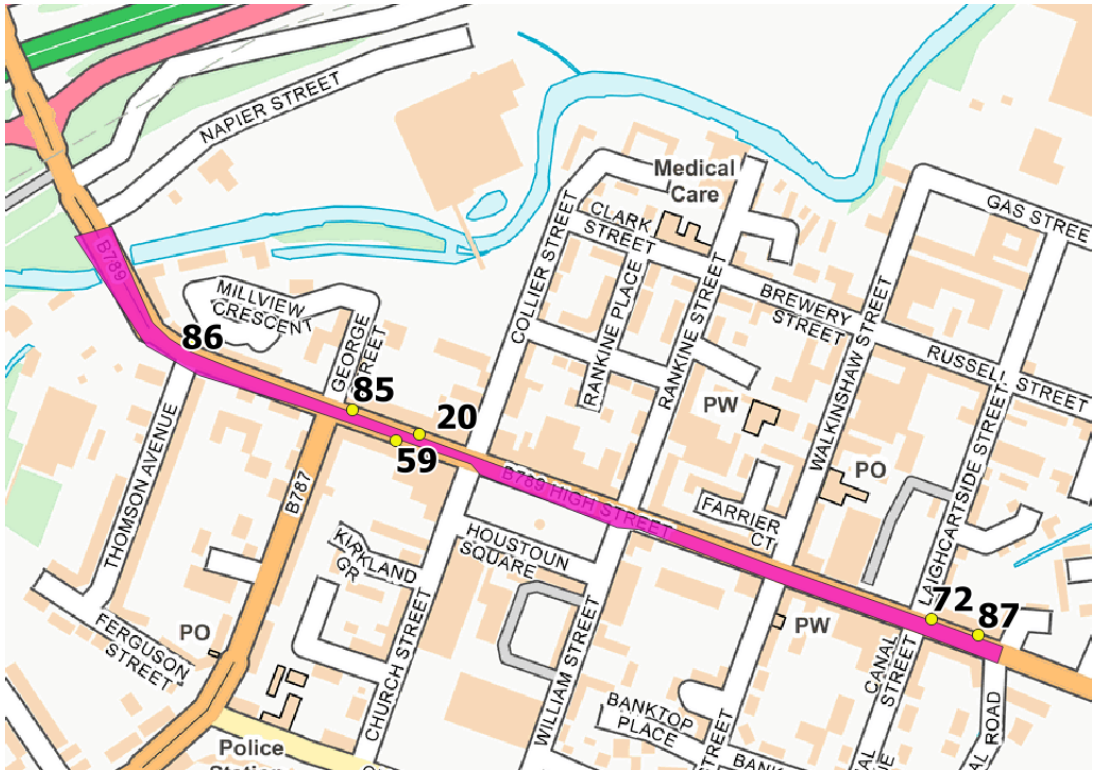
Figure A.12 - Diffusion Tube Monitoring Locations: Gallowhill



Legend
Diffusion Tube

	Air Quality Bureau Veritas 5th Floor 66 Prescot Street London, E1 8HG
Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Gallowhill	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.12

Figure A.13 - Diffusion Tube Monitoring Locations: Johnstone



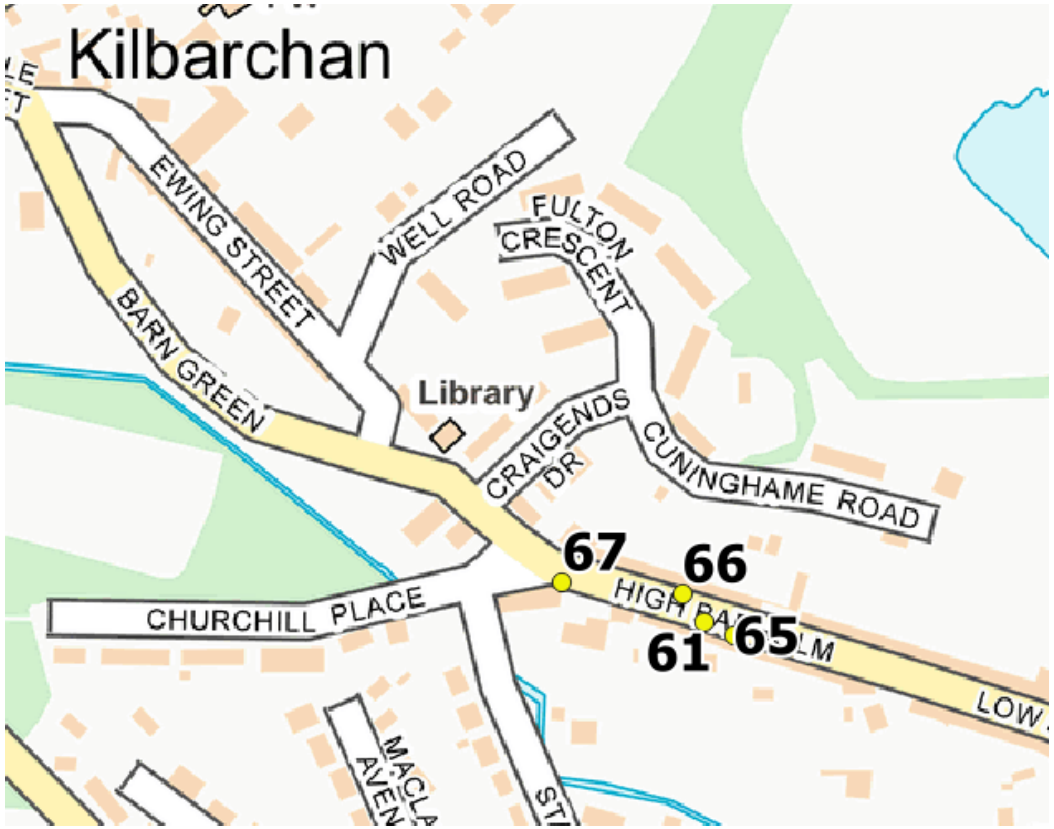
Legend

AQMA Boundary

Diffusion Tube

	Air Quality Bureau Veritas 5th Floor 66 Prescot Street London, E1 8HG
Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Johnstone	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.13

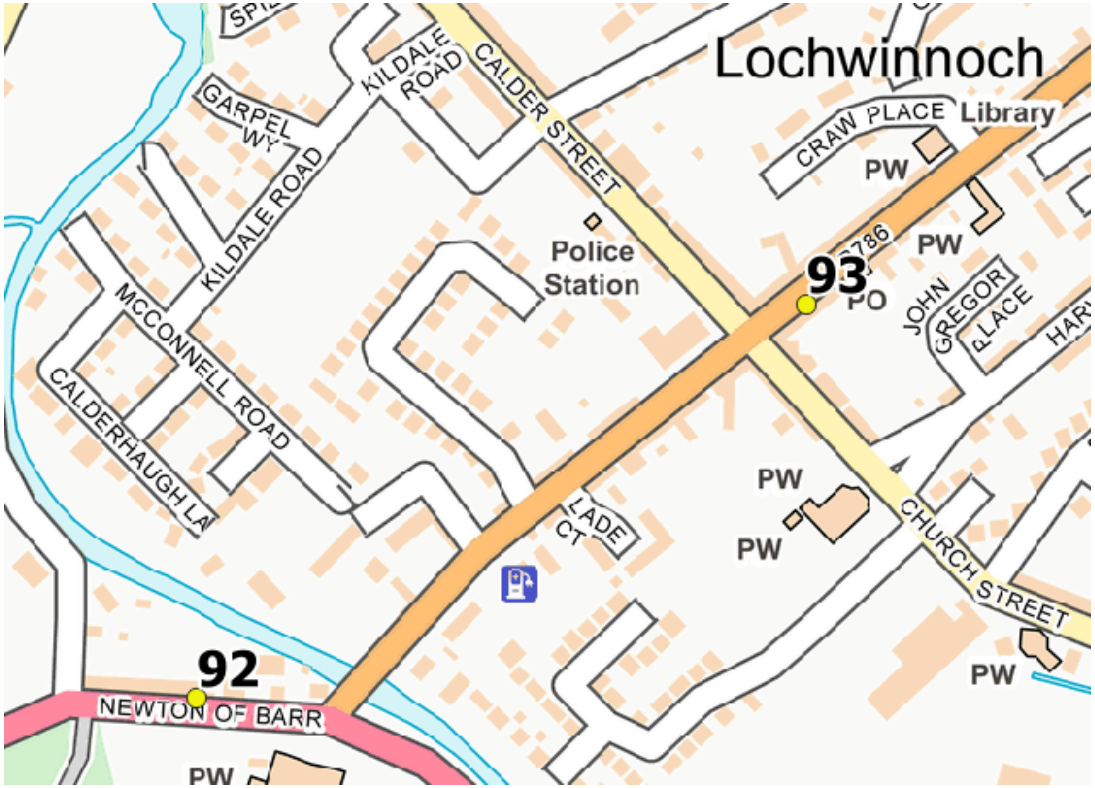
Figure A.14 - Diffusion Tube Monitoring Locations: Kilbarchan



Legend
Diffusion Tube

	Air Quality Bureau Veritas 5th Floor 66 Prescot Street London, E1 8HG
Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Kilbarchan	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.14

Figure A.15 - Diffusion Tube Monitoring Locations: Lochwinnoch



Legend
Diffusion Tube

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location Renfrewshire Council	
Title Diffusion Tube Monitoring Locations: Lochwinnoch	
By JD	Approved HS
Scale Not to Scale	Job Ref 10738055
Date June 2021	Figure No. A.15

Table A.3 – Annual Mean NO_2 Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
Cockels Loan (REN01)	Roadside	Automatic	96.8	96.8	34	32.1	31.6	32.1	20.9
Inchinnan Road (REN03)	Roadside	Automatic	97.3	97.3	-	-	-	24.2	19.9
Gordon Street (PAI3)	Roadside	Automatic	25.9	25.9	30	27.4	31.5	28.7	-(3)
1	Urban Centre	Passive	75.0	76.9	18.0	21.1	20.3	21.3	16.1
2	Urban Background	Passive	83.3	84.6	14.8	12.5	14.4	14.6	10.9
3	Urban Background	Passive	83.3	84.6	9.8	9.5	12.0	11.6	8.9
8	Kerbside	Passive	83.3	84.6	37.8	**42.8**	**41.1**	**41.4**	**40.2**
17	Roadside	Passive	83.3	84.6	32.5	31.5	33.7	32	26.3
19	Roadside	Passive	83.3	84.6	25.5	25.6	28.3	24.9	24.1
20	Kerbside	Passive	83.3	84.6	27.8	28.5	29.7	28.7	25.5
21(1), 21(2), 21(3)	Roadside	Passive	83.3	84.6	28.8	28.6	28.9	27.6	25.7
33	Roadside	Passive	83.3	84.6	30.1	32.8	31.7	28.8	27.7
35	Roadside	Passive	83.3	84.6	34.4	32.6	34.7	31.1	31.5
36	Roadside	Passive	75.0	76.9	27.4	28.7	30.4	28.2	27.7
40	Roadside	Passive	83.3	84.6	28.1	28.7	27.4	25.8	21.6
43	Roadside	Passive	83.3	84.6	30.0	28.5	28.9	26.7	20.4
44	Roadside	Passive	75.0	76.9	21.5	22.5	23.6	21.9	16.3
45	Kerbside	Passive	83.3	84.6	23.2	24.5	25.8	21.5	20.3
48	Roadside	Passive	83.3	84.6	29.0	28.7	30.9	29.1	24.8
50	Roadside	Passive	75.0	75.0	23.5	32.3	29.4	24.3	21.8
52	Roadside	Passive	75.0	75.0	26.8	29.1	31.8	25.3	24.9
56	Roadside	Passive	83.3	84.6	30.6	30.6	30.3	26.3	24.4
57	Roadside	Passive	75.0	76.9	22.3	26.0	24.1	24.4	18.1

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
101[4]	Roadside	Passive	81.8	76.9	-	-	-	-	21.5
59	Kerbside	Passive	83.3	84.6	39.1	**41.0**	**40.0**	37.9	39.5
60	Roadside	Passive	83.3	84.6	31.6	30.3	34.4	33.6	30.1
61	Roadside	Passive	83.3	84.6	30.4	36.7	32.4	30.2	26.0
62(1), 62(2), 62(3)	Roadside	Passive	77.8	84.6	32.3	34.6	36.8	34.3	30.5
63	Roadside	Passive	83.3	84.6	31.2	32.5	33.2	29.4	25.2
65	Roadside	Passive	83.3	84.6	26.6	33.2	28.2	30.3	25.8
66	Roadside	Passive	66.7	67.3	18.1	23.0	19.3	22.3	18.1
67	Roadside	Passive	83.3	84.6	14.3	17.3	18.6	17.5	18.6
68	Roadside	Passive	83.3	84.6	25.9	27.3	27.4	23.8	21.0
69	Roadside	Passive	75.0	75.0	39.7	31.2	30.7	29.9	25.0
70	Roadside	Passive	58.3	59.6	26.0	26.8	31.7	25.4	26.9
71	Roadside	Passive	50.0	48.1	28.1	29.7	28.5	29.2	26.2
72	Roadside	Passive	83.3	84.6	22.3	20.9	22.9	23.4	20.2
73	Roadside	Passive	83.3	84.6	35.8	35.1	32.0	26.1	27.0
74	Roadside	Passive	83.3	84.6	30.8	28.0	30.9	27.8	28.6
75	Roadside	Passive	83.3	84.6	23.7	25.3	22.6	22.1	21.1
78	Roadside	Passive	83.3	84.6	28.8	27.8	28.9	26.6	24.4
79	Roadside	Passive	83.3	84.6	34.4	39.6	32.5	27.8	32.0
80	Roadside	Passive	83.3	84.6	23.1	25.8	24.9	23.9	23.7
82	Roadside	Passive	75.0	75.0	39.5	37.7	33.2	28.9	36.1
83	Kerbside	Passive	83.3	84.6	38.1	30.5	31.1	33.2	25.1
84	Roadside	Passive	83.3	84.6	32.9	20.2	24.3	23.1	16.8
85	Roadside	Passive	83.3	84.6	-	28.5	26.1	25.0	30.2
86	Roadside	Passive	83.3	84.6	-	19.5	28.1	27.0	29.9
87	Roadside	Passive	83.3	84.6	-	22.5	22.8	26.0	24.3
88	Roadside	Passive	83.3	84.6	-	18.5	21.9	23.4	22.5
89	Roadside	Passive	66.7	69.2	-	-	22.4	30.4	24.9
90(1), 90(2), 90(3)	Roadside	Passive	83.3	84.6	-	-	-	24.4	21.4
92	Roadside	Passive	83.3	84.6	-	-	-	-	14.8
93	Roadside	Passive	83.3	84.6	-	-	-	-	14.1
94	Roadside	Passive	83.3	84.6	-	-	-	-	21.0

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
95	Roadside	Passive	81.8	76.9	-	-	-	-	33.5
96	Roadside	Passive	100.0	51.9	-	-	-	-	24.2

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**.

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. Distance corrected values are provided in Table C.4.

(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) As data capture fell below the LAQM.TG(16) recommended 33% data capture in 2020, the Gordon Street, Paisley automatic monitoring location data was not annualised and therefore does not provide a NO_2 annual mean concentration in 2020.

(4) DT58 ceased monitoring and DT101 was sited close to the original DT58 site in February 2020.

Figure A.16 - Renfrew Town Centre AQMA NO_2 Annual Mean Concentrations 2016 – 2020

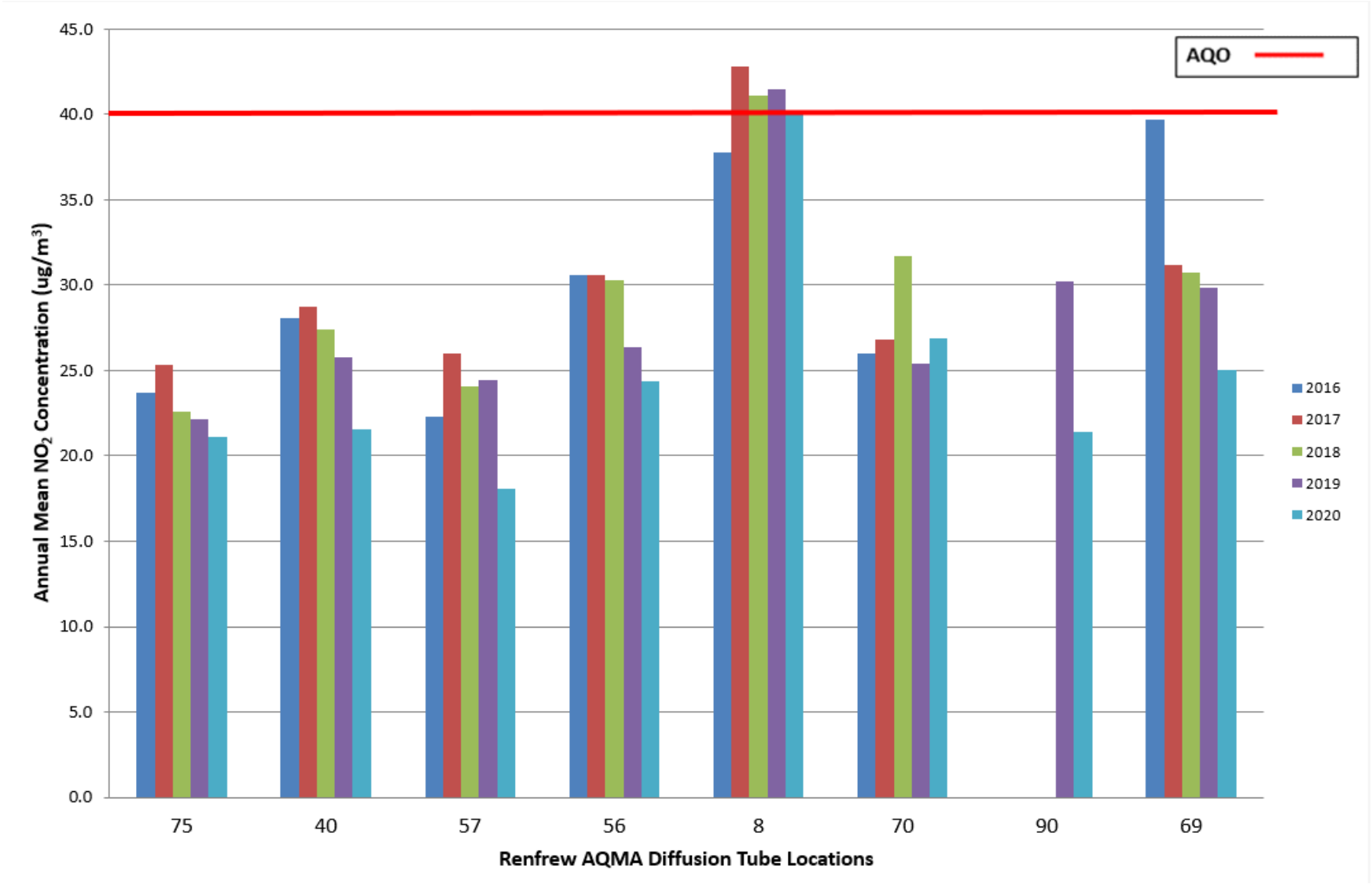


Figure A 17 - Johnstone High Street AQMA NO_2 Annual Mean Concentrations 2016 – 2020

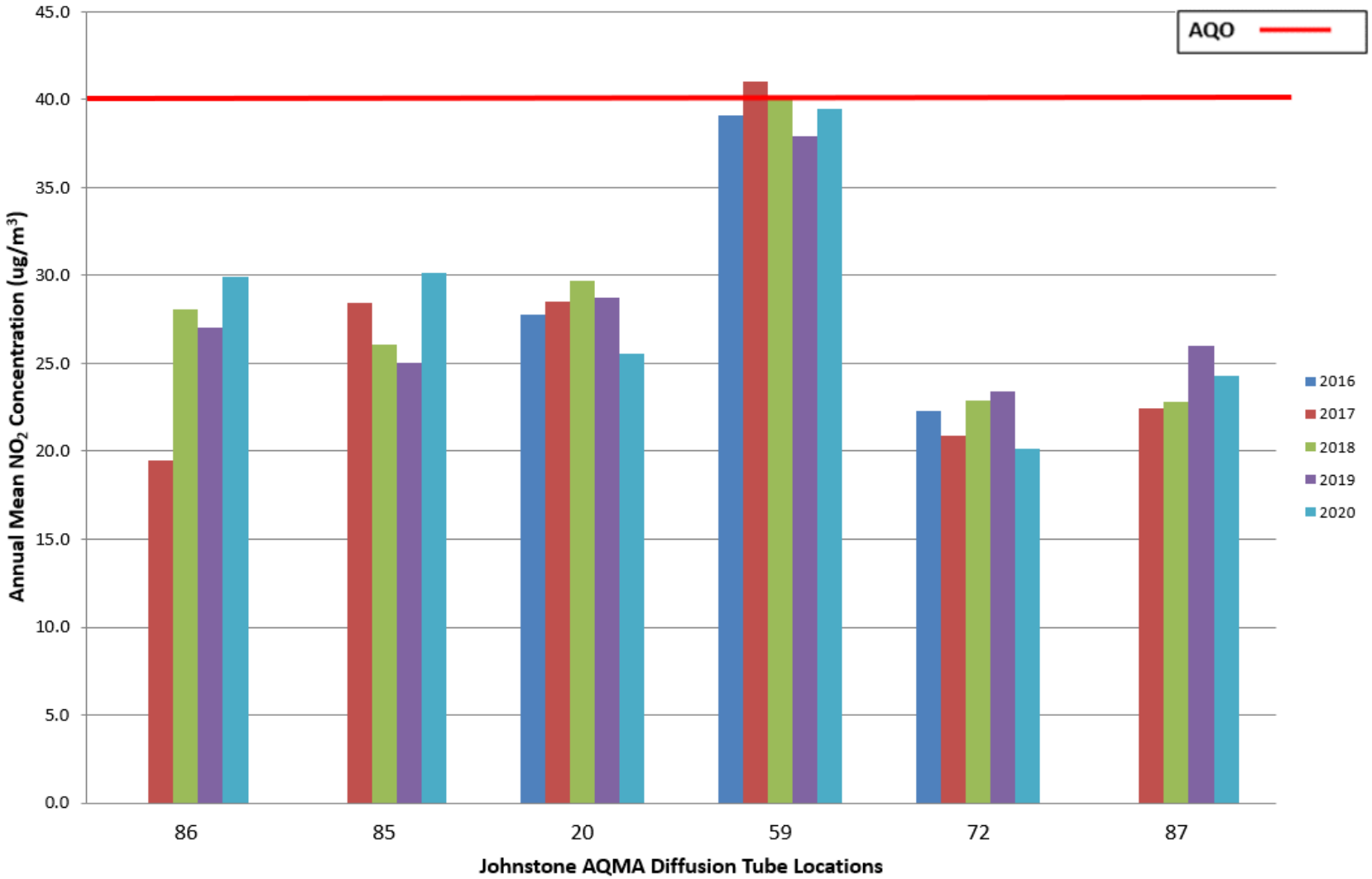


Figure A.18 - Paisley Town Centre AQMA NO_2 Annual Mean Concentrations 2016– 2020

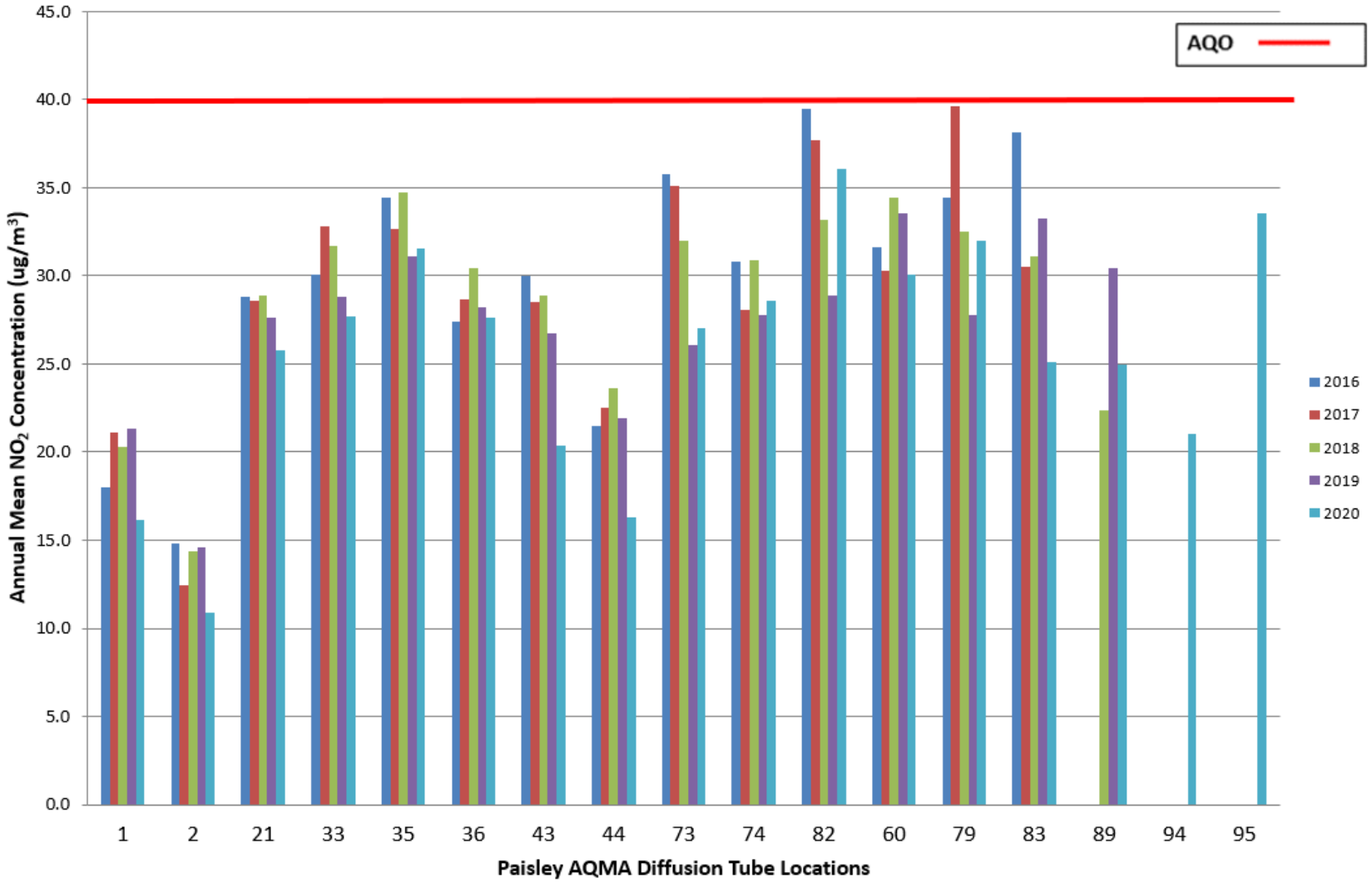


Figure A.19 - Paisley NO_2 Annual Mean Concentrations 2016 – 2020

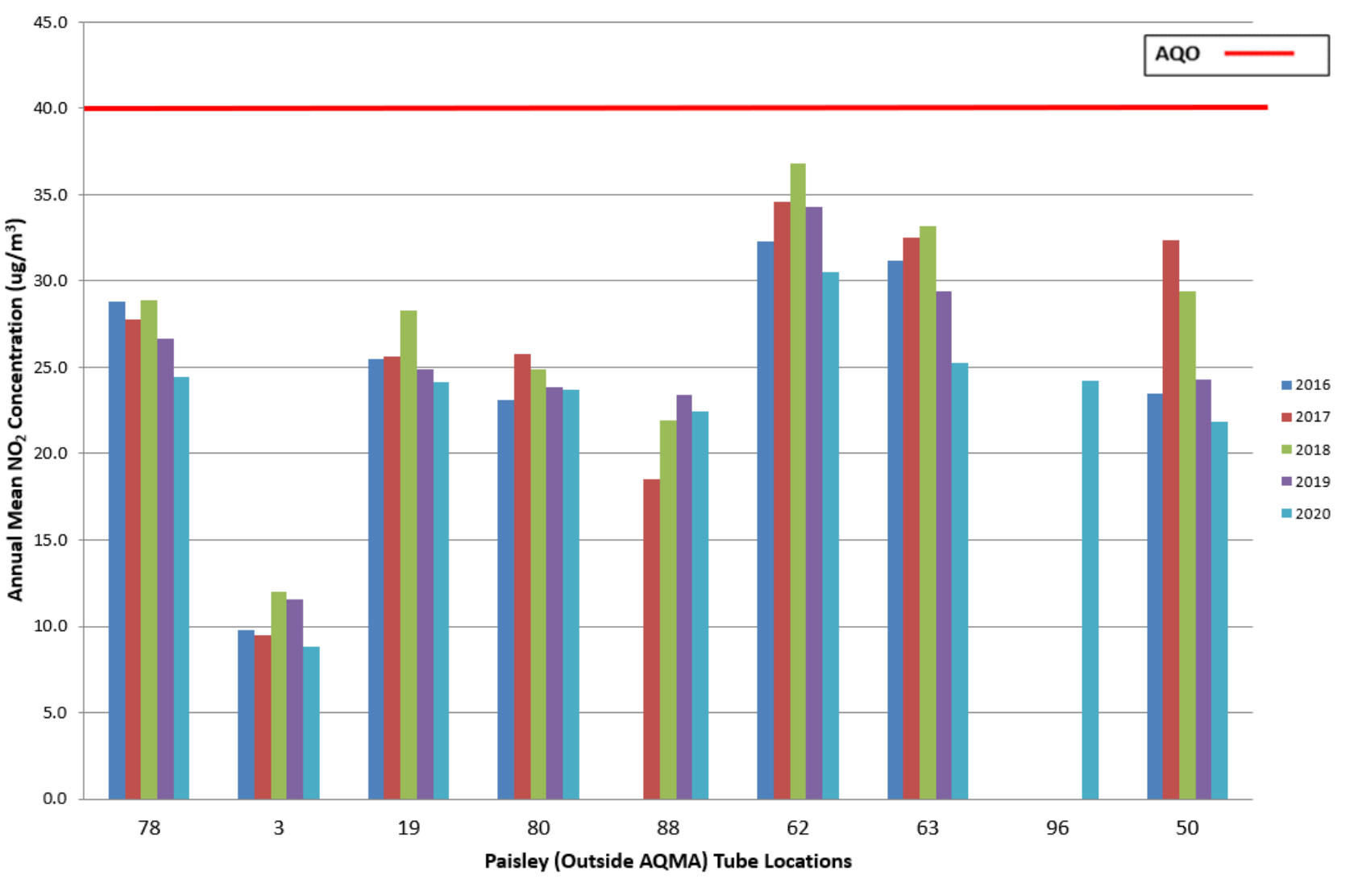


Figure A.20 - Renfrew NO_2 Annual Mean Concentrations 2016 – 2020

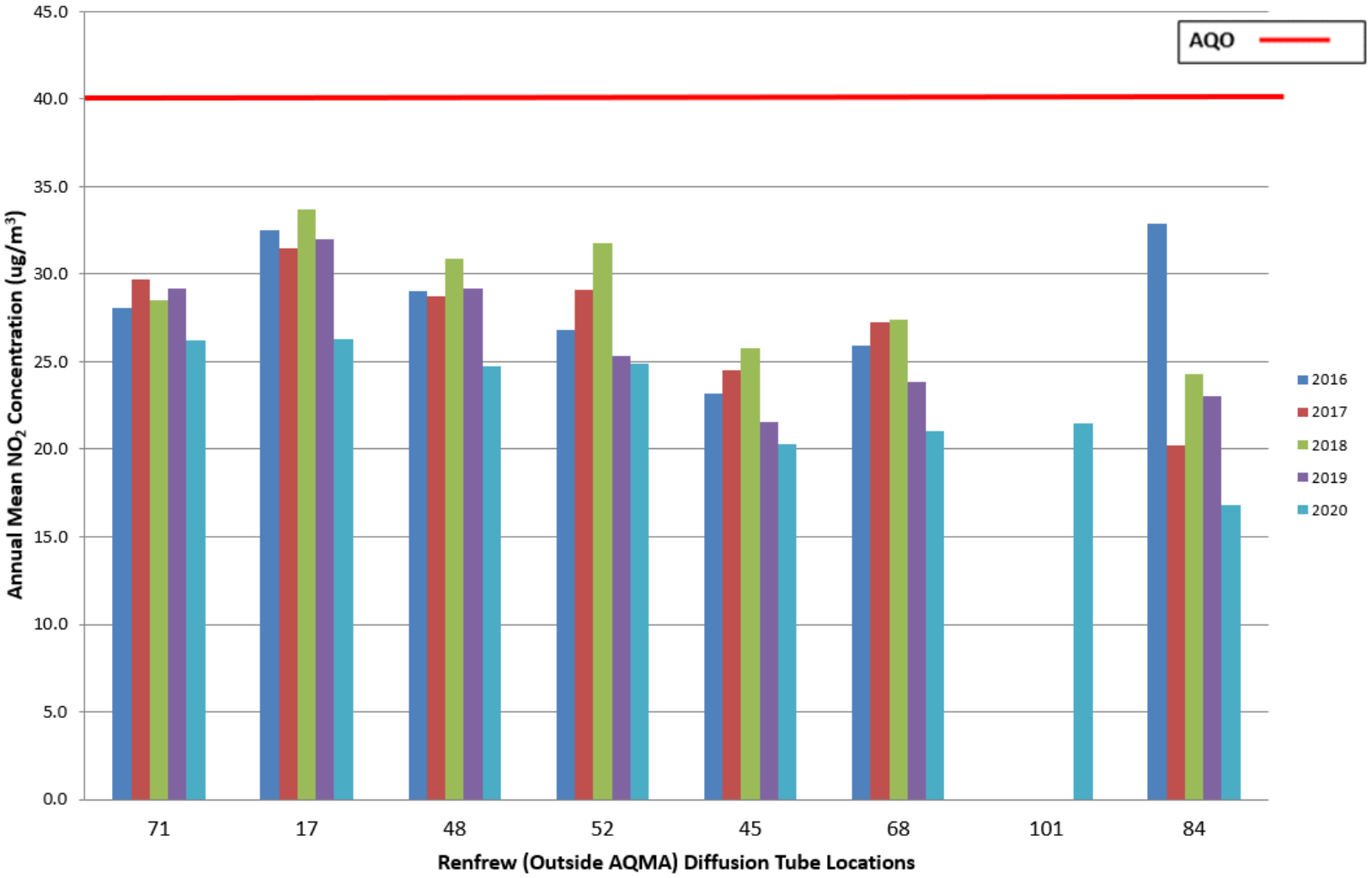


Figure A.21 – Lochwinnoch and Kilbarchan NO_2 Annual Mean Concentrations 2016 – 2020

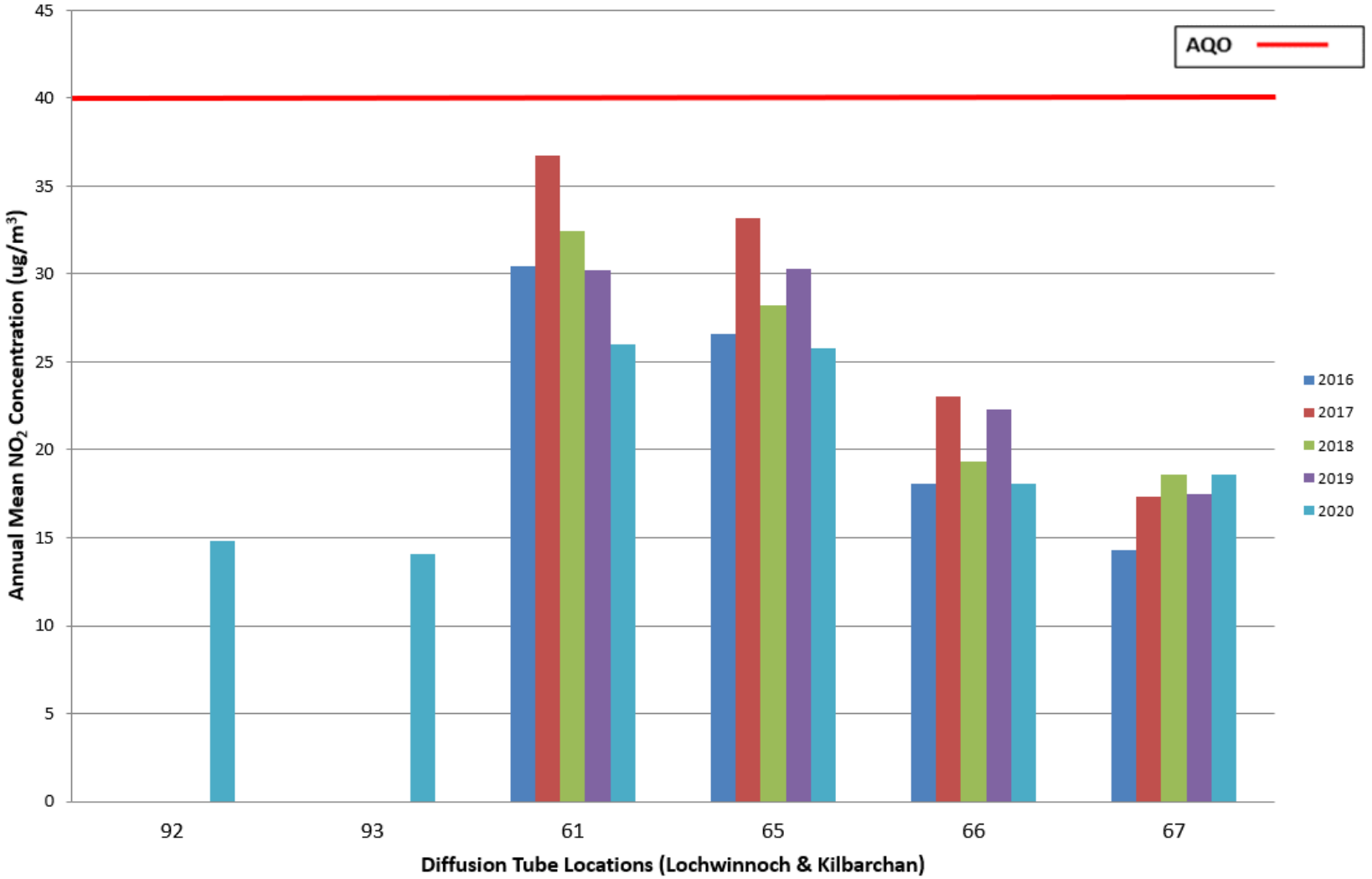


Figure A 22 - Automatic Monitoring NO_2 Annual Mean Concentrations 2016 – 2020

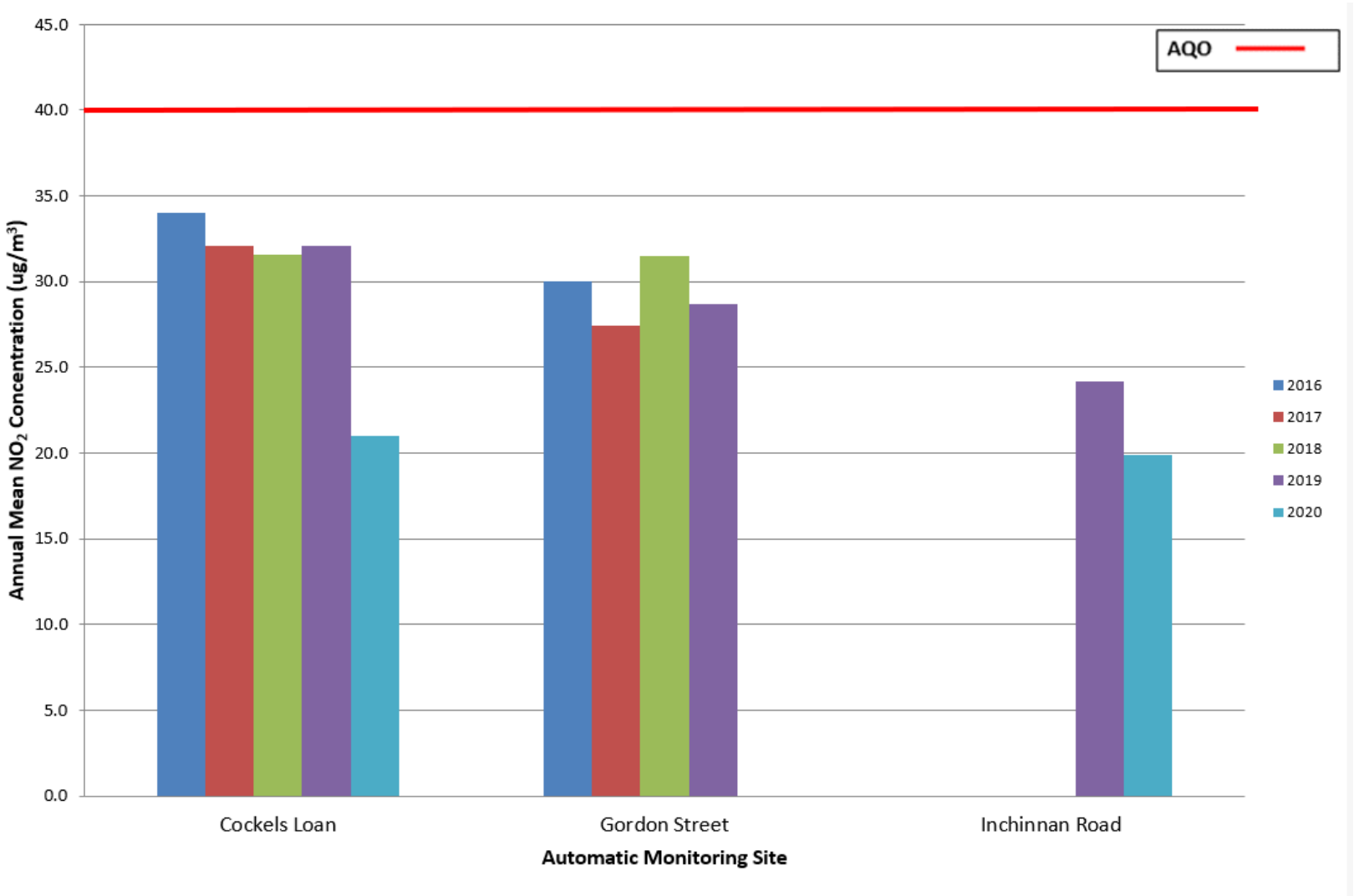


Table A.4 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
REN01, Cockels Loan	Roadside	Automatic	96.8	96.8	0	0	0	0 (122)	0
REN03, Inchinnan Road	Roadside	Automatic	97.3	97.3	-	-	-	0	0
PAI3, Gordon Street	Roadside	Automatic	25.9	25.9	0	3 (149)	0	0	0 (85)

Notes:

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

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

(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 simple data capture for the full calendar year is 50%).

Table A.5 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
PAI3, Gordon Street	Roadside	96.6	96.6	14	14.7	12	12.1	10.1
REN02, High Street, Johnstone	Roadside	92.3	92.3	-	11.7	13	16.4	10.3

Notes:

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

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.

(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 simple data capture for the full calendar year is 50%).

Figure A 23 - Automatic Monitoring PM_{10} Annual Mean Concentrations 2016 – 2020

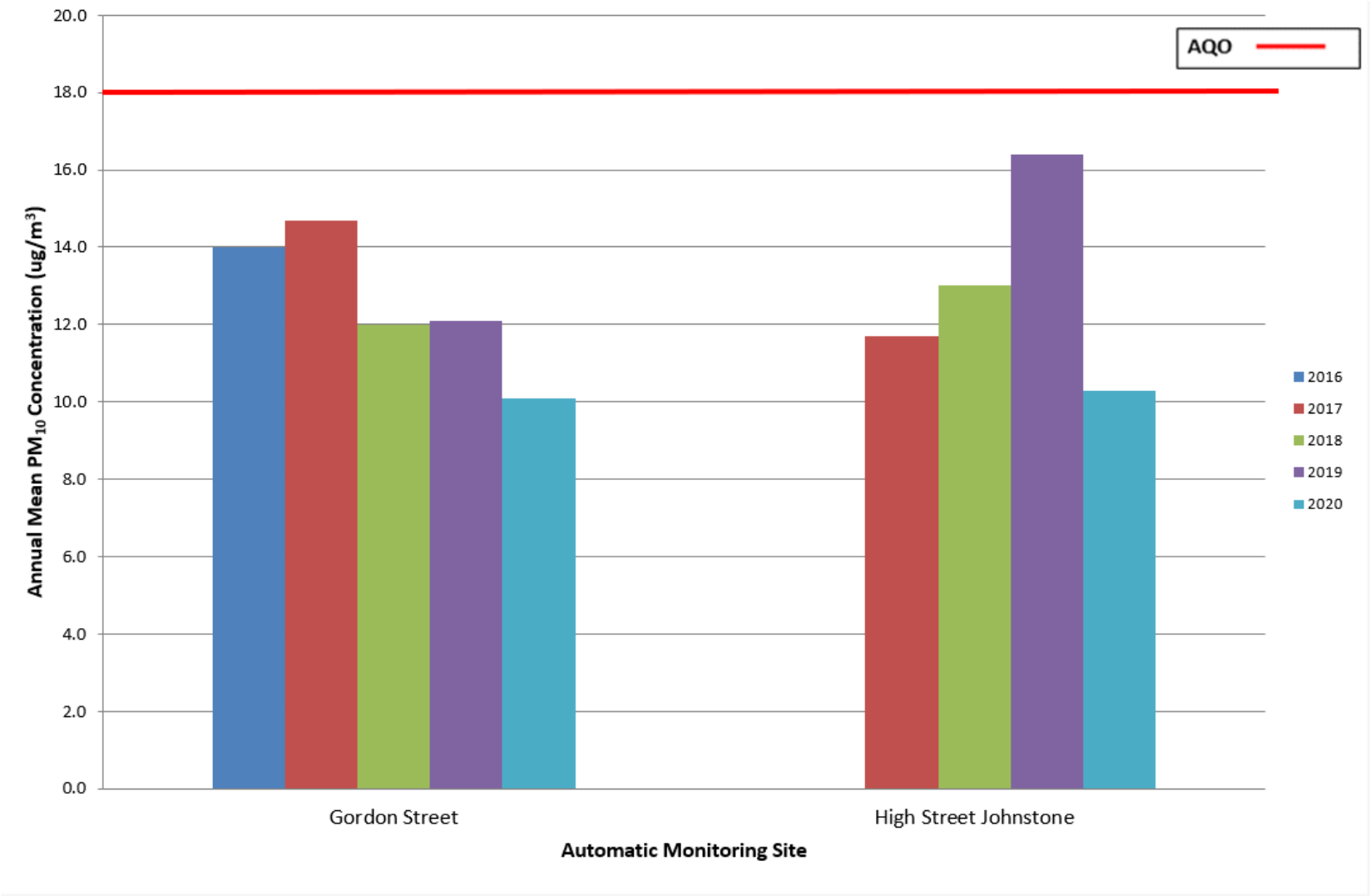


Table A.6 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
PAI3, Gordon Street	Roadside	96.6	96.6	0	0 (36)	0	4	0
REN02, High Street, Johnstone	Roadside	92.3	92.3	-	0 (25)	1 (51)	14	0

Notes:

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

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

(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 simple data capture for the full calendar year is 50%).

Table A.7 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
REN02, High Street, Johnstone	Roadside	92.3	92.3	-	7.1	7	7.9	5.6

Notes:

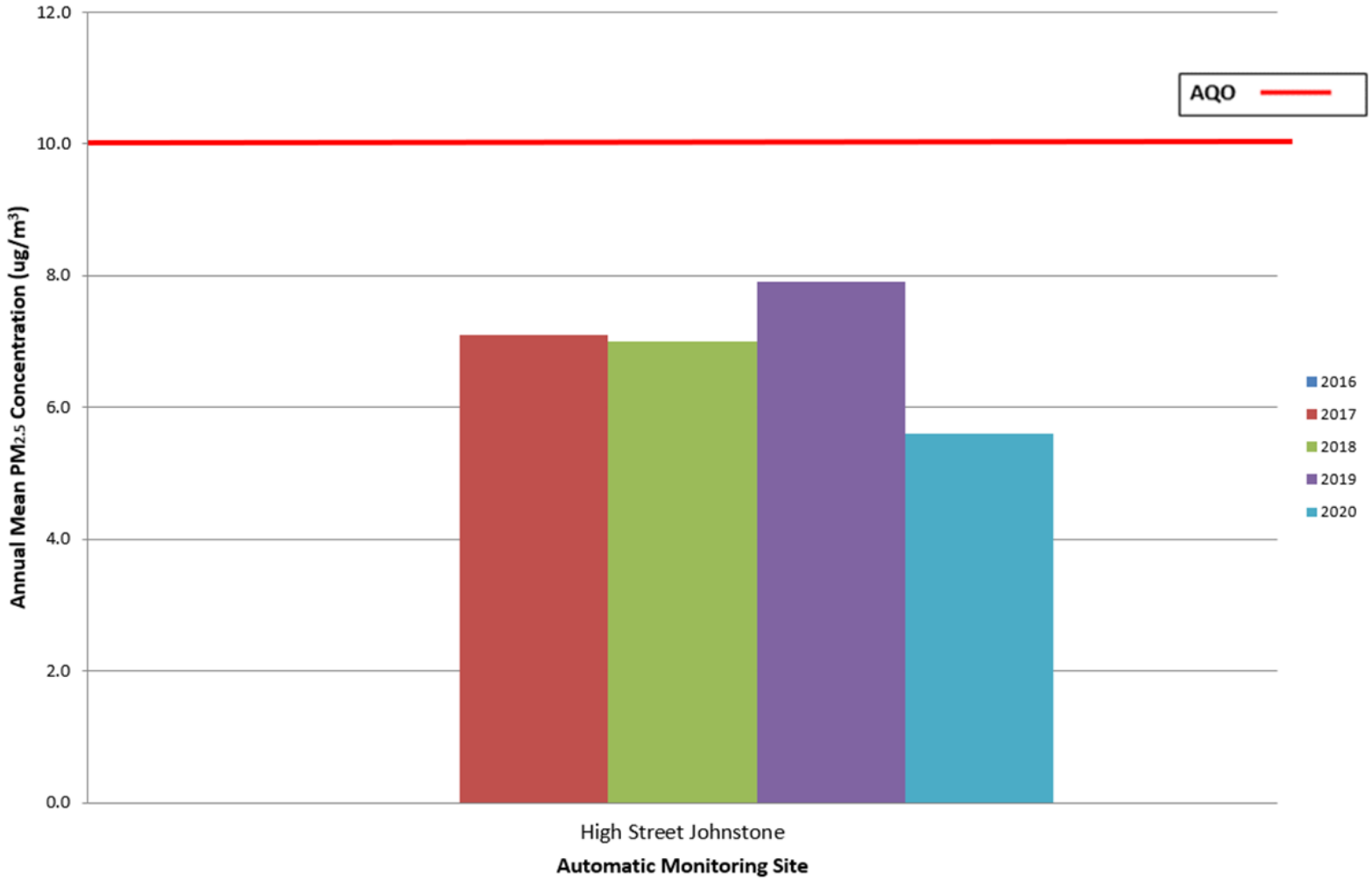
Exceedances of the $PM_{2.5}$ annual mean objective of 10 µg/m^3 are shown in bold.

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.

(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%).

Figure A 24 - Automatic Monitoring $PM_{2.5}$ Annual Mean Concentrations 2016 – 2020



Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Monthly Diffusion Tube Results (µg/m^3)

Site ID	Jan	Feb	Mar[1]	Apr[1]	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted [2]
1		14.0	*8.8*		7.4	11.9	6.4	16.6	6.3	16.1	12.8	29.5	13.4	16.1
2	10.9	14.3	*8.3*		3.8	8.4	3.6	10.3	6.7	11.5	5.5	15.9	9.1	10.9
3	6.5	5.2	*5.5*		3.6	8.3	3.3	6.5	6.1	8.6	7.4	18.3	7.4	8.9
8	49.0	45.3	*19*		20.5	22.2	16.4	28.3	24.6	41.4	21.8	65.2	33.5	**40.2**
17	37.8	29.6	*17.8*		9.6	24.4	9.4	25.1	13.0	28.9	9.0	32.1	21.9	26.3
19	23.0	20.6	*12.6*		7.9	18.0	9.0	24.1	20.9	27.1	19.7	30.6	20.1	24.1
20	24.1	18.2			15.4	24.6	11.4	21.1	16.4	30.6	22.9	28.1	21.3	25.5
21(1)	29.7	27.0	*18.3*		11.9	19.1	10.7	30.2	17.1	29.1	26.8	25.1	-	-
21(2)	26.0	21.8	*12.2*		11.3	19.0	10.3	23.0	14.6	30.1	22.8	20.0	-	-
21(3)	27.1	28.1			12.1	20.9	11.4	25.0	25.8	29.7	22.3	15.7	23.1	27.7
33	25.0	22.6	*15.6*		16.2	21.7	15.8	30.6	27.4	31.4	26.3	14.1	26.3	31.5
35	40.5	33.4	*15.8*		18.7	19.6	13.1	30.7	24.8	35.1	21.4	25.6	23.0	27.7
36	33.2	34.6	*15.2*		12.8		12.7	27.5	20.3	31.0	16.0	19.3	18.0	21.6
40	25.6	19.5	*12.5*		8.3	12.7	6.4	22.1	16.7	22.6	29.2	16.6	17.0	20.4
43	29.9	24.5	*12.2*		4.8	14.8	7.0	11.5	14.1	24.5	20.7	17.8	13.6	16.3
44	19.0	19.4	*12.3*		7.6	14.3	4.9	18.0	6.2	18.3		14.6	16.9	20.3
45	21.6	29.4	*11.8*		7.6	17.1	7.1	17.0	13.8	23.5	13.0	19.1	20.6	24.8
48	29.3	26.2	*14.3*		11.1	16.5	8.2	24.5	15.1	26.4	26.1	22.9	18.2	21.8
50	29.8	24.8	*12.5*		8.8	9.9	7.3	22.4	21.7		20.9	18.2	20.8	24.9
52	26.6	25.2	*11.9*			8.1	10.3	15.0	15.8	25.4	24.5	35.9	20.3	24.4
56	29.8	25.0	*16.6*		9.9	16.3	14.7	14.1	21.7	29.5	19.9	22.2	15.1	18.1
57	21.1		*12.8*		8.5	14.5	6.6	14.2	13.8	23.3	11.4	22.4	17.9	21.5
101		39.3	*10.2*		7.9	15.7	7.2	12.8	13.5	23.1	18.0	23.6	32.9	39.5
59	44.2	21.2	*25.2*		24.0	26.6	28.3	36.4	38.5	44.9	30.8	34.2	25.1	30.1
60	32.2	22.6	*18.6*		12.3	23.7	15.9	27.1	28.2	35.4	23.7	29.4	21.6	26.0
61	28.4	19.9	*16.3*		14.7	19.6	14.1	27.2	18.8	30.7	17.6	25.4	23.1	27.7
62(1)	42.7	29.0	*18.3*		14.0	23.6	15.7	28.0	29.9	30.1	47.7	19.5	-	-

Site ID	Jan	Feb	Mar[1]	Apr[1]	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted [2]
62(2)	34.4	33.1	*24.7*		7.7		11.6	31.3	29.6	30.9	18.2	19.9	-	-
62(3)	36.2	31.9	*18.4*		10.6	24.3	10.8	27.8	18.0	33.1	29.5		25.4	30.5
63	26.1	15.9	*7.7*		16.2	21.2	16.9	27.6	16.4	31.4	23.9	14.7	21.0	25.2
65	26.2	27.7	*7.8*		13.9	18.2	11.7	18.4	21.3	28.7	23.2	25.5	21.5	25.8
66	13.9	14.4	*11.3*		6.9	13.3	4.9	22.4		17.6	16.6		13.8	18.1
67	50.1	15.8	*4.7*		4.9	10.7	6.2	10.9	10.9	15.0	14.4	16.3	15.5	18.6
68	26.9	19.3	*11.4*		8.4	13.7	11.0	15.7	11.4	26.2	22.7	20.0	17.5	21.0
69	26.3	19.1	*14.6*		6.1	17.1	14.3	22.5	24.4	25.3	32.4		20.8	25.0
70	24.0	26.8	*12*		11.9		12.0	23.6		28.2	25.4		21.7	26.9
71	35.2	31.1	*18.3*			22.6			20.1		29.4	24.5	27.2	26.2
72	17.1	16.2			7.7	19.8	4.9	21.8	18.3	22.5	15.4	24.3	16.8	20.2
73	29.7	28.3	*10.3*		14.5	15.2	13.7	18.9	17.4	30.1	27.1	30.1	22.5	27.0
74	26.9	22.8	*14.6*		14.6	25.7	9.3	32.1	18.2	31.1	21.8	35.5	23.8	28.6
75	25.4	21.0	*8.9*		6.9	13.4	8.3	21.6	19.3	22.5	20.6	17.2	17.6	21.1
78	30.7	21.2	*13.9*		8.3	14.2	11.5	27.4	16.6	27.4	28.9	17.4	20.4	24.4
79	32.5	60.2	*9.4*		9.2	19.1	9.1	25.8	29.4	32.7	26.7	21.7	26.6	32.0
80	20.7	23.4	*13.7*		9.5	13.0	12.6	19.3	17.7	24.5	27.2	29.9	19.8	23.7
82	37.2	53.2	*15.2*		10.9	17.9	15.3	32.1	33.4	32.0	38.7		30.1	36.1
83	24.8	23.6	*6.6*		10.7	16.3	16.2	25.9	15.3	28.7	25.8	21.8	20.9	25.1
84	18.7	19.1	*10.7*		6.1	9.1	7.2	14.2	13.3	16.8	17.6	18.3	14.0	16.8
85	21.9	33.4	*9.6*		14.0	27.7	15.1	34.0	23.3	29.9	24.0	28.0	25.1	30.2
86	17.8	41.5	*12.2*		14.4	29.7	10.9	33.6	25.7	28.1	21.9	25.6	24.9	29.9
87	15.3	11.5	*11.2*		10.1	17.2	10.4	24.9	21.6	25.4	33.1	33.1	20.3	24.3
88	14.7	21.3	*11.7*		8.4	14.2	9.1	21.8	17.5	19.2	29.8	31.2	18.7	22.5
89	31.8	15.8	*16.7*		13.4			26.3	27.8	24.9	22.2	28.4	23.8	24.9
90(1)	20.7	15.9			10.3	16.9	8.7	24.5	20.1	25.1	20.6	21.4	-	-
90(2)	16.2	12.4	*13.8*		11.1	14.4	8.1	24.8	17.7	23.0	25.3	27.4	-	-
90(3)	15.3	15.5	*13*		8.9	16.1	6.0	24.6	17.1	24.5	22.6	20.2	17.8	21.4
92	15.5	12.6	*6.9*		8.9	14.0	7.6	18.8	10.8	9.3	13.3	12.4	12.3	14.8
93	15.1	11.3	*8.3*		6.2	12.1	5.2	14.8	11.0	12.6	13.9	15.4	11.8	14.1
94	18.2	17.2	*13*		8.3	14.0	8.2	27.4	14.6	23.2	21.9	22.1	17.5	21.0
95		34.3	*21.6*		12.4	41.7	11.6	30.8	26.3	35.2	32.9	26.2	27.9	33.5
96							13.4	22.9	16.2	19.4	39.3	23.8	22.5	24.2

Notes:

(1) March 2020 tubes were exposed over a two-month period. The data presented in the table for March 2020 is not included within the 2020 NO_2 annual mean calculation results.

(2) See Appendix C for details on bias adjustment. Distance corrected values are provided in Table C.4.

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

New or Changed Sources Identified Within Renfrewshire During 2020

Renfrewshire Council has not identified any new sources relating to air quality within the monitoring year of 2020.

Additional Air Quality Works Undertaken by Renfrewshire Council During 2020

Renfrewshire Council has not completed any additional works within the monitoring year of 2020.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2020 were supplied and analysed by Glasgow Scientific Services (GSS), the tubes were prepared using the 20% TEA in water preparation method. All results have been bias adjusted and annualised (where required) before being presented in Appendix A: Monitoring Results.

GSS is a UKAS accredited laboratory and participates in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre.

The latest AIR-PT results were as follows:

- AIR-PT AR031 (April to May 2019) – 100%
- AIR-PT AR033 (July to August 2019) – 100%
- AIR-PT AR034 (September to November 2019) – 50%
- AIR-PT AR036 (January to February 2020) – 100%
- AIR-PT AR037 (May to June 2020) – No Results (NR)

- AIR-PT AR039 (July to August 2020) – NR
- AIR-PT AR040 (September to October 2020) – 100%

Over a rolling five round AIR-PT window, it is expected that 95% of laboratory results should be ≤+2. If this percentage is substantially lower than 95% for a particular laboratory, within this five-round window, then one can conclude that the laboratory in question may have sources of error within their analytical procedure.

For the latest five round window, where results have been provided (rounds AR037 and AR039 were cancelled due to the pandemic), 90% of GSS results were ≤+2 therefore the GSS diffusion tube performance has been assessed as satisfactory.

Diffusion Tube Annualisation

Data capture at sites which recorded less than 75% data capture, but more than 33% data capture, during 2020 has been annualised according to the method set out in LAQM.TG(16) Box 7.9. The details of the annualisation have been provided in Table C.2.

Diffusion Tube Bias Adjustment Factors

The 2020 national adjustment factor is based on nine studies of which seven are of poor precision, and two are of good precision. Taking the average of all relevant national studies, a factor of 0.95 is given. When taking an average of only the studies with good precision, this gives a factor of 0.89. The Council's 2020 national factor is illustrated in Figure C.1.

Figure C.1 – National Bias Adjustment Factor Spreadsheet (v06/21)

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 06/21

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of Sept 2021
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1:	Step 2:	Step 3:	Step 4:								
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.								
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953								
Analysed By[1]	Method To undo your selection, choose (All) from the pop-up list	Year[2] To undo your selection, choose (All)	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[4]	Bias Adjustment Factor (A) (Cm/Dm)
Glasgow Scientific Services	20% TEA in water	2020	R	East Dunbartonshire Council	11	23	19	15.8%	P	0.86
Glasgow Scientific Services	20% TEA in water	2020	R	East Dunbartonshire Council	11	19	18	3.9%	G	0.96
Glasgow Scientific Services	20% TEA in water	2020	R	East Dunbartonshire Council	10	15	15	-2.9%	P	1.03
Glasgow Scientific Services	20% TEA in water	2020	KS	Marylebone Road Intercomparison	11	53	44	21.7%	G	0.82
Glasgow Scientific Services	20% TEA in water	2020	R	Glasgow City Council	12	26	23	13.1%	P	0.88
Glasgow Scientific Services	20% TEA in water	2020	R	Glasgow City Council	12	21	20	4.7%	P	0.96
Glasgow Scientific Services	20% TEA in water	2020	R	Glasgow City Council	11	22	23	-3.6%	P	1.04
Glasgow Scientific Services	20% TEA in water	2020	KS	Glasgow City Council	12	33	36	-8.4%	P	1.09
Glasgow Scientific Services	20% TEA in water	2020	UB	Glasgow City Council	12	19	17	6.9%	P	0.94
Glasgow Scientific Services	20% TEA in water	2020		Overall Factor[3] (9 studies)				Use		0.95

Renfrewshire Council have applied a local bias adjustment factor of 1.20 to the 2020 monitoring data. The 2020 local factor has been calculated using the co-located monitoring location at Inchinnan Road in Renfrew, which reported good overall precision and data capture during the input quality check (QC) of the local bias calculation (Figure C.6). The Council has in previous years used an average of several co-located monitoring locations, however during 2020, the Cockels Loan and Gordon Street co-located sites reported a poor overall precision and poor overall data capture, respectively (Figure C.7 and Figure C.8). Furthermore, as the national factor is of a lower value than the Inchinnan Road local factor, the 1.20 local adjustment factor calculated from Inchinnan Road provides a conservative, worst case approach, also keeping in line with the Council's previous years' choice of bias adjustment option. The 2020 local factor is much higher in comparison to previous local factors (see Table C.1), however due to the exclusion of the March and April concentration values and conceivable impacts due to the pandemic, it was considered sensible to adopt a more conservative approach for 2020. A summary of bias adjustment factors used by Renfrewshire Council over the past five years is presented in Table C.1 and the Inchinnan Road local factor calculation provided in Table C.3.

Table C.1 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	Local	-	1.20
2019	Local	-	0.89
2018	Local	-	0.92
2017	National	03/18	0.91
2016	Local	-	0.98

NO_2 Fall-off with Distance from the Road

Three monitoring sites (DT8, DT59 and DT82) each reported either in exceedance of or within 10% of the NO_2 AQS objective and each site is located within an AQMA. Furthermore, as each diffusion tube site was not representative of exposure, the NO_2 fall-off with distance calculator was used to estimate the NO_2 concentration at the nearest location with relevant exposure for each site. The calculations are shown in Table C.4.

QA/QC of Automatic Monitoring

Automatic monitoring of NO_x, PM_{10} and $PM_{2.5}$ is completed within Renfrewshire Council using Chemiluminescence (NO_x), FDMS (PM_{10}) and Fidas (PM_{10} and $PM_{2.5}$) analysers. During March 2020, there were no Local Site Operator (LSO) visits to the station due to the impacts of COVID-19. Equipment Support Unit (ESU) visits were however undertaken as scheduled, in order to complete equipment servicing at all of the Council's automatic monitoring sites. This ensured that calibration information was still available for the March 2020 period for LSO records. All data is available in real-time and, following data dissemination, is ratified by Ricardo Energy and Environment to AURN standards. The following extracts from the Scottish Air Quality website present the 2020 data graphs for each automatic site in Renfrewshire.

Figure C.2 - Cockels Loan Automatic Data 2020

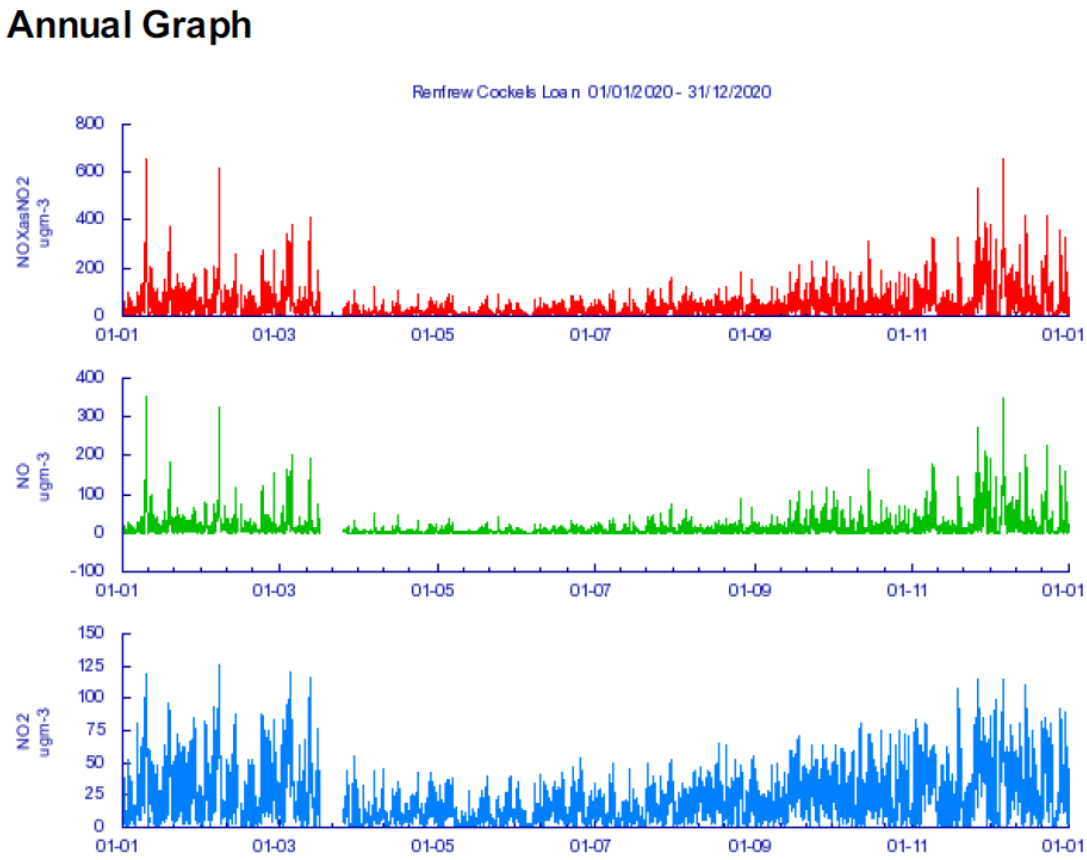


Figure C.3 - Gordon Street Automatic Data 2020

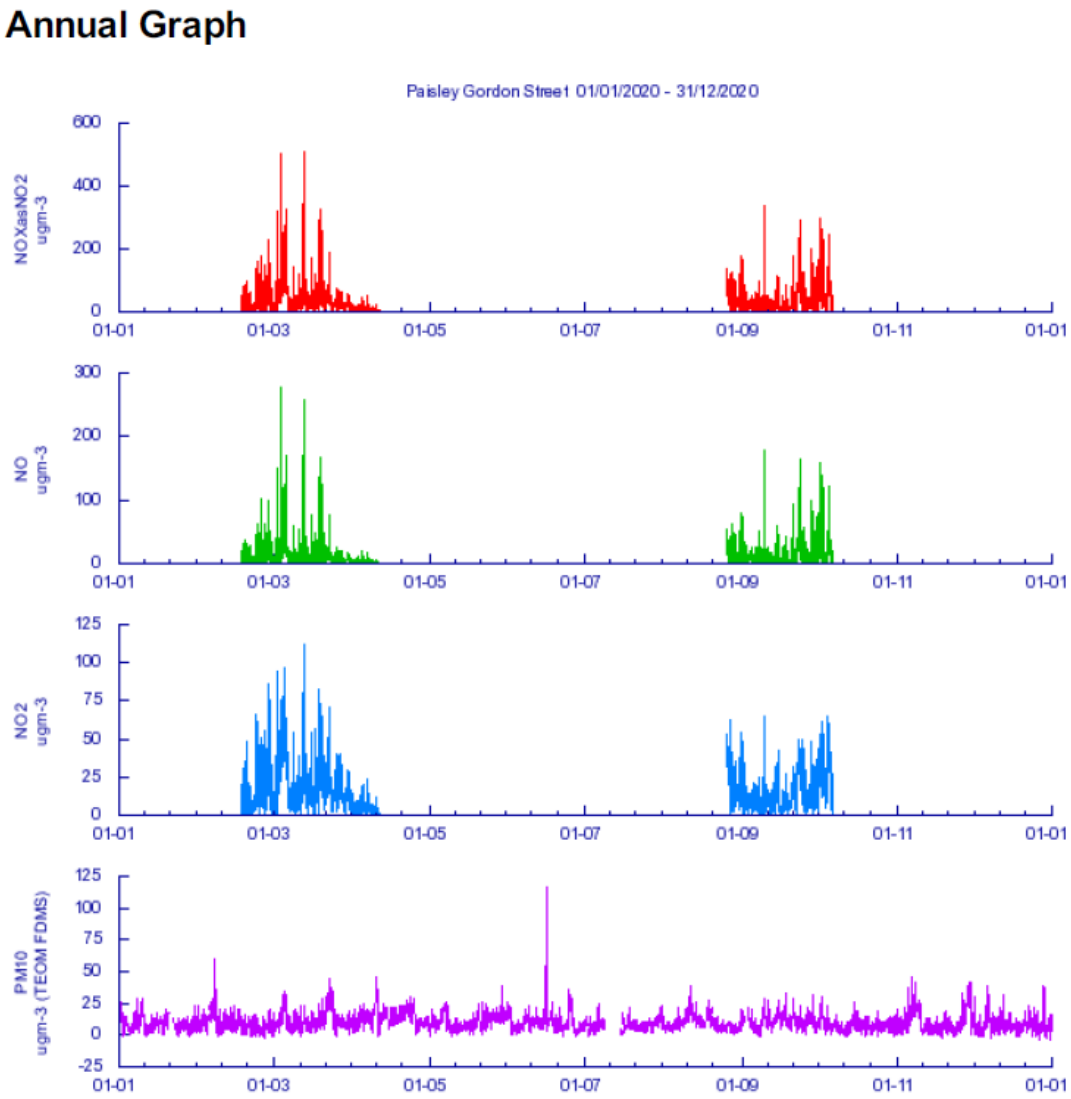


Figure C.4– Johnstone Automatic Data 2020

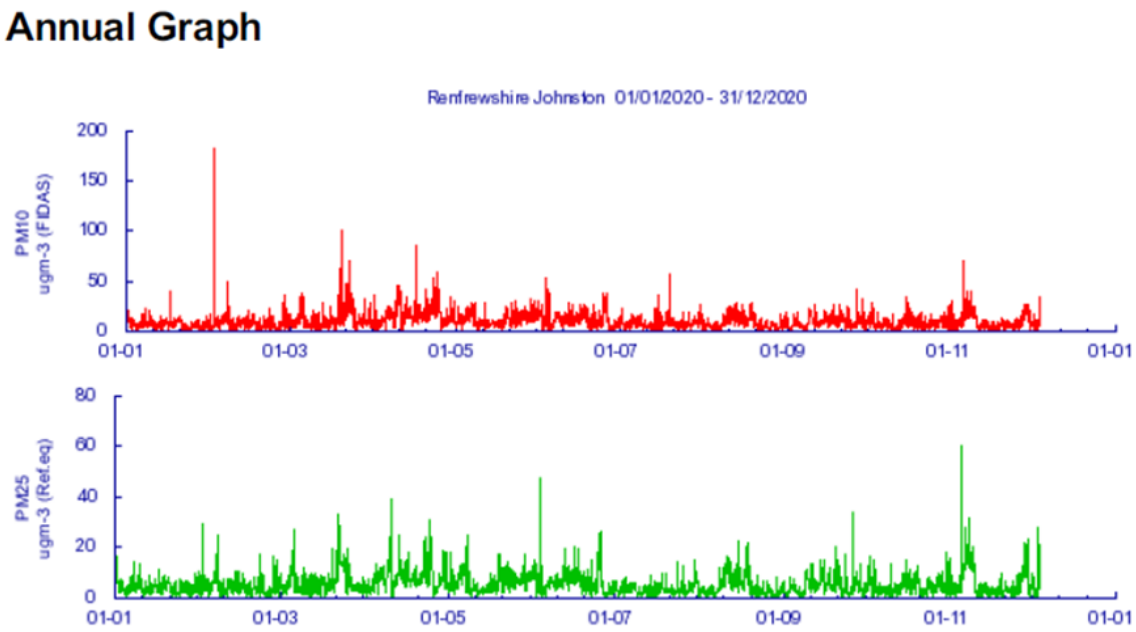
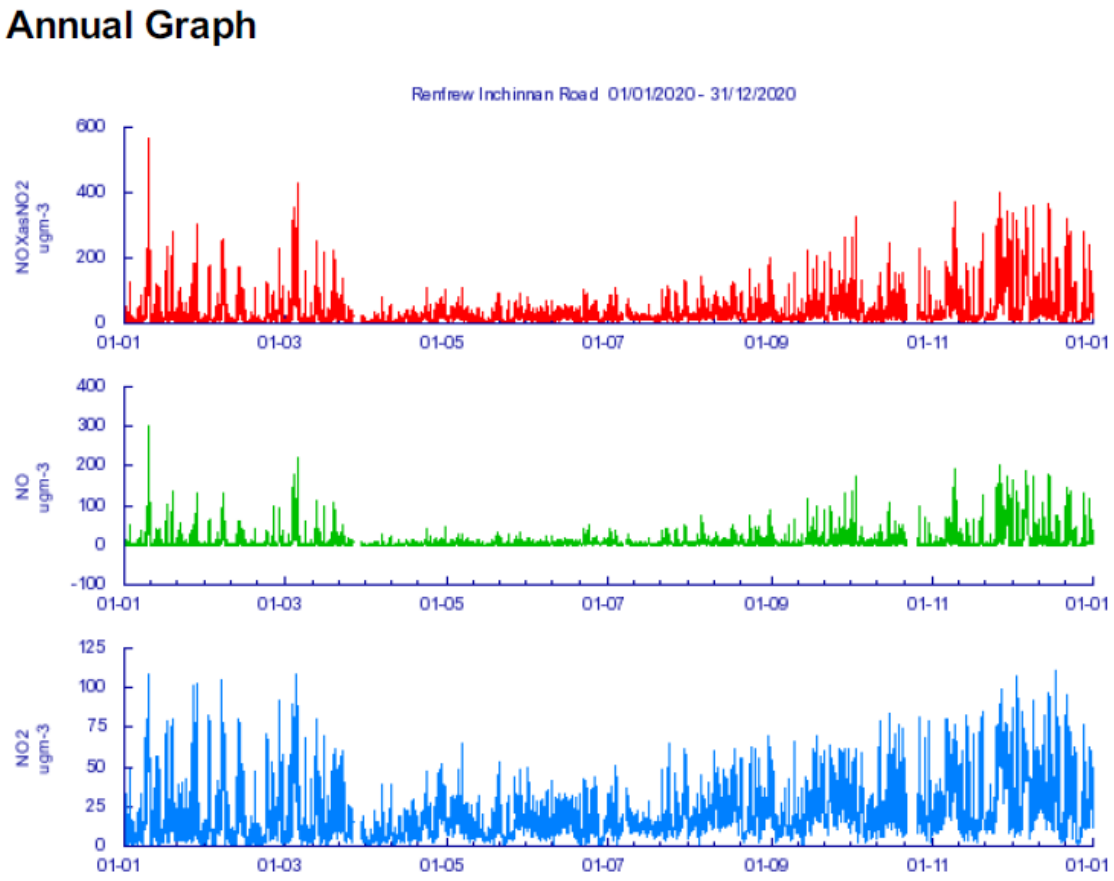


Figure C.5 - Inchinnan Road 2020 Automatic Data



PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10} and $PM_{2.5}$ monitors utilised within Renfrewshire Council did not require the application of a correction factor during 2020.

Automatic Monitoring Annualisation

All automatic monitoring locations within Renfrewshire Council, except for Gordon Street (NO_2 – 25.9% time-weighted data capture), recorded an annual data capture of greater than 75%. It was therefore not required to annualise any automatic monitoring data with data capture of greater than 75%and below 33%, in accordance with the LAQM technical guidance, TG(16).

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Glasgow Townhead	Annualisation Factor Peebles	Annualisation Factor Edinburgh St. Leonards	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
66	1.0768	1.1401	1.0750	1.0973	13.8	15.1	-
70	1.0155	1.0870	0.9948	1.0324	21.7	22.4	-
71	0.7957	0.8011	0.8182	0.8050	27.2	21.9	-
89	0.8711	0.8735	0.8709	0.8718	23.8	20.8	-
96	0.8964	0.8551	0.9369	0.8961	22.5	20.2	-

Table C.3 – Local Bias Adjustment Calculations

	Local Bias Adjustment – Inchinnan Road
Periods used to calculate bias	10
Bias Factor A	1.2 (1.03 - 1.43)
Bias Factor B	-16% (-30% - -3%)
Diffusion Tube Mean (µg/m^3)	17.8
Mean CV (Precision)	10.8%
Automatic Mean (µg/m^3)	21.4
Data Capture	98%
Adjusted Tube Mean (µg/m^3)	21 (18 - 26)

Notes:

A single local bias adjustment factor (derived from Inchinnan Road monitoring site data) has been used to bias adjust the 2020 diffusion tube results.

Figure C.6 – Inchinnan Road Local Bias Adjustment inputs

Period	NO_2 Period Mean (µg/m^3)			Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of Mean	Data Quality Check
	Tube 1	Tube 2	Tube 3					
1	20.7	16.2	15.3	17.4	2.9	17%	7.2	Good
2	15.9	12.4	15.5	14.6	1.9	13%	4.8	Good
3								
4								
5	10.3	11.1	8.9	10.1	1.1	11%	2.8	Good
6	16.9	14.4	16.1	15.8	1.3	8%	3.2	Good
7	8.7	8.1	6.0	7.6	1.4	19%	3.5	Good
8	24.5	24.8	24.6	24.6	0.2	1%	0.4	Good
9	20.1	17.7	17.1	18.3	1.6	9%	3.9	Good
10	25.1	23.0	24.5	24.2	1.1	4%	2.7	Good
11	20.6	25.3	22.6	22.8	2.4	10%	5.9	Good
12	21.4	27.4	20.2	23.0	3.9	17%	9.6	Good
								Good Overall Precision

Period	Period Mean	Data Capture (%)	Data Quality Check
1	18.4	100.0%	Good
2	16.3	99.9%	Good
3	18.0	89.6%	Good
4	10.6	99.7%	Good
5	14.3	99.9%	Good
6	15.1	98.5%	Good
7	13.6	95.7%	Good
8	22.1	100.0%	Good
9	22.5	98.4%	Good
10	23.4	88.0%	Good
11	32.9	100.0%	Good
12	35.1	98.5%	Good
			Good Overall Data Capture

Figure C.7 – Cockels Loan Local Bias Adjustment inputs

Period	NO_2 Period Mean (µg/m^3)			Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of Mean	Data Quality Check
	Tube 1	Tube 2	Tube 3					
1	42.7	34.4	36.2	37.8	4.4	12%	10.8	Good
2	29.0	33.1	31.9	31.3	2.1	7%	5.2	Good
3								
4								
5	14.0	7.7	10.6	10.8	3.2	29%	7.8	Poor Precision
6	23.6		24.3	24.0	0.5	2%	4.4	Good
7	15.7	11.6	10.8	12.7	2.6	21%	6.5	Poor Precision
8	28.0	31.3	27.8	29.0	2.0	7%	4.9	Good
9	29.9	29.6	18.0	25.8	6.8	26%	16.9	Poor Precision
10	30.1	30.9	33.1	31.4	1.6	5%	3.9	Good
11	47.7	18.2	29.5	31.8	14.9	47%	37.0	Poor Precision
12	19.5	19.9		19.7	0.3	1%	2.5	Good
								Poor Overall Precision

Period	Period Mean	Data Capture (%)	Data Quality Check
1	30.7	99.1%	Good
2	28.4	92.7%	Good
3	23.8	67.7%	Poor Data Capture
4	9.7	100.0%	Good
5	9.6	100.0%	Good
6	12.5	100.0%	Good
7	11.3	99.7%	Good
8	19.0	99.9%	Good
9	22.5	98.7%	Good
10	23.1	100.0%	Good
11	31.3	99.4%	Good
12	35.7	99.5%	Good
			Good Overall Data Capture

Figure C.8 – Gordon Street Local Bias Adjustment inputs

Period	Period Mean	Data Capture (%)	Data Quality Check
1		0.0%	
2	20.4	66.5%	Poor Data Capture
3	20.4	99.3%	Good
4	5.4	37.5%	Poor Data Capture
5		0.0%	
6		0.0%	
7		0.0%	
8	23.7	19.2%	Poor Data Capture
9	13.2	98.5%	Good
10	27.1	18.6%	Poor Data Capture
11		0.0%	
12	5.4	15.1%	Poor Data Capture
			Poor Overall Data Capture

Period	NO_2 Period Mean ($\mu g/m^3$)			Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of Mean	Data Quality Check
	Tube 1	Tube 2	Tube 3					
1	29.7	26.0	27.1	27.6	1.9	7%	4.7	Good
2	27.0	21.8	28.1	25.6	3.4	13%	8.4	Good
3								
4								
5	11.9	11.3	12.1	11.8	0.4	4%	1.0	Good
6	19.1	19.0	20.9	19.7	1.1	5%	2.7	Good
7	10.7	10.3	11.4	10.8	0.6	5%	1.4	Good
8	30.2	23.0	25.0	26.1	3.7	14%	9.2	Good
9	17.1	14.6	25.8	19.2	5.9	31%	14.6	Poor Precision
10	29.1	30.1	29.7	29.6	0.5	2%	1.3	Good
11	26.8	22.8	22.3	24.0	2.5	10%	6.1	Good
12	25.1	20.0	15.7	20.3	4.7	23%	11.7	Poor Precision
								Good Overall Precision

Table C.4 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
8	2.6	2.7	40.2	13.6	*39.9*	*Predicted concentration at Receptor within 10% the AQS objective.*
59	1.7	1.8	39.5	8.1	*39.1*	*Predicted concentration at Receptor within 10% the AQS objective.*
82	2.3	2.5	36.1	10.9	35.6	

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 LAQM.TG(16). April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG(S)16. April 2018. Published by the Scottish Government.
- Renfrewshire Council (2016-2020) Annual Progress Reports.
- Air Quality in Scotland website (2020 Monitoring data), available at http://www.scottishairquality.co.uk/
- National Diffusion Tube Bias Adjustment Factor Spreadsheet version 06/21 available at https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html
- Diffusion Tube Data Processing Tool v1.1 available at https://laqm.defra.gov.uk/tools-monitoring-data/dtdp.html
- AIR-PT-Rounds 30 to 40 (Jan 2019 to Oct 2020) available at https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html
- Renfrewshire Council Carbon Management Plan 2014/15 – 2019/20
- Renfrewshire Cycling Strategy 2016 – 2025.
- Defra LAQM helpdesk – https://laqm.defra.gov.uk/
- Renfrewshire Air Quality Action Plan 2019.
- http://renfrewshire.gov.uk/citydeal