

London Borough of Merton

Air Quality Annual Status Report for 2023

Date of publication: 6th June 2024



This report provides a detailed overview of air quality in the London Borough of Merton during 2023. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process¹.

Contact details:

Jason Andrews, EH Pollution Manager (Air Quality)

Email: jason.andrews@merton.gov.uk

Miar Crutchley, Lead Officer Air Quality & Contaminated Land

Email: miar.crutchley@merton.gov.uk

Daniel Baker, Senior Air Quality Officer

Email: daniel.baker@merton.gov.uk

Regulatory Services Partnership

Serving the London Boroughs of Merton, Richmond upon Thames and Wandsworth

Civic Centre, London Road, Morden, SM4 5DX

Telephone: 020 8545 3025

¹ LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19))

Contents

1.	Air Quality Monitoring.....	6
1.2	Comparison of Monitoring Results with AQOs	15
2.	Action to Improve Air Quality.....	45
2.1	Air Quality Management Areas	45
2.2	Air Quality Action Plan Progress	47
3.	Planning Update and Other New Sources of Emissions	80
3.1	New or significantly changed industrial or other sources	82
4.	Additional Activities to Improve Air Quality	83
4.1	London Borough of Merton Fleet	83
4.2	NRMM Enforcement Project	83
4.2	Air Quality Alerts	83
Appendix A	Details of Monitoring Site Quality QA/QC	84
A.1	Automatic Monitoring Sites	84
A.2	Diffusion Tubes	85
A.3	Adjustments to the Ratified Monitoring Data	94
Appendix B	Full Monthly Diffusion Tube Results for 2023.....	96
Appendix C	Maps of Monitoring Locations and AQMAs	98
Appendix D	Community Monitoring.....	102

Tables

Table A. Summary of National Air Quality and International Standards, Objectives and Guidelines	5
Table B. Details of Automatic Monitoring Sites for 2023	8
Table C. Details of Non-Automatic Monitoring Sites for 2023	9
Table D. Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³) 15	
Table E. Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)	18
Table F. NO₂ Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg/m³	30
Table G. Annual Mean PM ₁₀ Automatic Monitoring Results (µg/m ³)	31
Table H. PM ₁₀ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM ₁₀ 24-Hour Means > 50 µg/m ³	34
Table I. Annual Mean PM _{2.5} Automatic Monitoring Results (µg/m ³)	36
Table J. Declared Air Quality Management Areas	46
Table K. Delivery of Air Quality Action Plan Measures.....	47
Table L. Planning requirements met by planning applications in the London Borough of Merton in 2023	80
Table M. Bias Adjustment Factor	94

Figures

Figure 1: ME9 automatic monitoring station annual mean nitrogen dioxide trend chart 2017-2023.....	17
Figure 2: Long term NO ₂ concentration trends in Merton 2017-2023 (all data bias adjusted) from non-automatic monitoring (diffusion tubes).....	26
Figure 3: ME2 automatic monitoring station annual mean PM ₁₀ trend chart 2017-2023.....	33
Figure 4: Distribution of PM _{2.5} by season.....	43
Figure A. Map of Non-Automatic Monitoring Sites	99
Figure B. Map of Automatic Monitoring Sites	100
Figure C. Map of Breathe London Node Monitoring Sites.....	101

Abbreviations

Abbreviation	Description
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQN	Air Quality Neutral
AQO	Air Quality Objective
AQP	Air Quality Positive
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM ₁₀	Particulate matter less than 10 micron in diameter
PM _{2.5}	Particulate matter less than 2.5 micron in diameter
TEB	Transport Emissions Benchmark
TfL	Transport for London

Table A. Summary of National Air Quality and International Standards, Objectives and Guidelines

Pollutant	Standard / Objective / Guideline	Averaging Period	Date ⁽¹⁾
Nitrogen dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
Nitrogen dioxide (NO ₂)	40 µg/m ³	Annual mean	31 Dec 2005
Nitrogen dioxide (NO ₂)	WHO AQG ⁽²⁾ : 10 µg/m ³	Annual mean	
Particles (PM ₁₀)	50 µg/m ³ not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
Particles (PM ₁₀)	WHO AQG ⁽²⁾ : 45 µg/m ³ not to be exceeded more than 3-4 times a year	24-hour mean	
Particles (PM ₁₀)	40 µg/m ³	Annual mean	31 Dec 2004
Particles (PM ₁₀)	WHO AQG ⁽²⁾ : 15 µg/m ³	Annual mean	
Particles (PM _{2.5})	20 µg/m ³	Annual mean	2020
Particles (PM _{2.5})	London Mayoral Objective ⁽³⁾ : 10 µg/m ³	Annual mean	2030
Particles (PM _{2.5})	WHO AQG ⁽²⁾ : 5 µg/m ³	Annual mean	
Particles (PM _{2.5})	Target of 15% reduction in concentration at urban background locations	3-year mean	Between 2010 and 2021
Particles (PM _{2.5})	WHO AQG ⁽²⁾ : 15 µg/m ³	24-hour mean	
Sulphur dioxide (SO ₂)	266 µg/m ³ not to be exceeded more than 35 times a year	15-minute mean	31 Dec 2005
Sulphur dioxide (SO ₂)	350 µg/m ³ not to be exceeded more than 24 times a year	1-hour mean	31 Dec 2004
Sulphur dioxide (SO ₂)	125 µg/m ³ not to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004
Sulphur dioxide (SO ₂)	WHO AQG ⁽²⁾ : 40 µg/m ³ not to be exceeded more than 3-4 times a year	24-hour mean	

Notes:

- (1) Date by which to be achieved by and maintained thereafter.
- (2) 2021 World Health Organization Air Quality Guidelines.
- (3) London Mayoral Objective.

1. Air Quality Monitoring

Air quality is a complex area of science with many variables to be considered. Monitoring needs to be carried out over an extended period to show real-world trends. It is affected by temperature, weather, geography/local conditions, and wind direction. It is not necessarily accurate to compare one year's data with the next without considering all the variable factors. However, this does provide an 'indication' of local changes. The latest monitoring results for 2023 confirm that nitrogen dioxide levels in Merton still exceed the National Air Quality Objectives along some of the main roads and is predominantly associated with vehicle emissions. There is still a need for Merton to be designated as an Air Quality Management Area and to pursue improvements in air quality.

Merton also recognise the possibility of stricter objectives following changes to the World Health Organization Guidelines on 22nd September 2021. There are two pollutants we are legally required to measure currently, these are, nitrogen dioxide (NO₂) and particulate matter (PM₁₀). NO₂ is almost entirely linked to combustion and a reliable indicator of pollution arising from traffic, this is because it is generally not naturally occurring outside lightning strikes. Particulate matter, however, exists throughout the environment with many incidents or episodes of pollution being caused regionally, nationally, or globally.

Air quality is measured by three principal techniques in Merton:

1. Continuous monitoring

There are two continuous monitoring stations located in Merton, an NO₂ analyser at the Civic Centre in Morden (ME9) and the second, a particulate matter (PM₁₀) analyser on Merton Road in South Wimbledon (ME2). These stations are expensive to install and maintain and so using them at multiple locations is cost prohibitive, they produce accurate, real-time data that feed into the London Air Quality Network (LAQN) and can be viewed on the LondonAir website.

Merton has made a significant investment in its continuous monitoring and in 2024/25 the network will be refreshed and expanded to cover a total of 4 locations. Each monitoring location will continuously monitor nitrogen dioxide, particulate matter PM₁₀ and PM_{2.5}.

2. Non-continuous monitoring using nitrogen dioxide (NO₂) diffusion tubes

In 2023 62 locations were monitored. Diffusion tubes provide a comprehensive coverage of all hotspots including most main roads and town centres throughout the borough. All sites are kept under constant review with changes taking effect in January annually. Diffusion tubes offer a relatively inexpensive means of gauging NO₂ concentrations at multiple locations across the borough and are useful for trend analysis over a number of years.

3. Low-cost sensors using Breathe London Nodes

Most recently, commencing in late 2021, a network of Breathe London Nodes were installed across the borough to measure NO₂ and fine particulate matter (PM_{2.5}). The Breathe London network is run by the Environmental Research Group at Imperial College London – the same group who run the London Air Quality Network. The nodes provide a low-cost solution for real-time monitoring.

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2023

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
ME2	Merton Road, South Wimbledon	Roadside	525808	170122	PM ₁₀	YES Merton AQMA	BAM	3.0	0.6	1.6
ME9	Civic Centre, Morden	Roadside	525588	168498	NO ₂	YES Merton AQMA	Chemiluminescent	0.6	3.0	2.5

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

Table C. Details of Non-Automatic Monitoring Sites for 2023

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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	Bushey Road	Roadside	523139	169056	NO ₂	Merton AQMA	15.3	1.5	No	2.5
2	Stonecot Hill	Roadside	524489	166637	NO ₂	Merton AQMA	12.2	1.7	No	2.4
4	154 Grand Drive	Kerbside	523315	168048	NO ₂	Merton AQMA	3.6	0.9	No	2.4
5	Sacred Heart PS	Kerbside	522501	168235	NO ₂	Merton AQMA	7.9	0.7	No	2.4
6	17 Grand Drive	Kerbside	523207	169195	NO ₂	Merton AQMA	8.4	0.3	No	2.4
7	Kingston Road (A298)	Roadside	524401	169351	NO ₂	Merton AQMA	8.3	1.5	No	2.4
8	Coombe Lane	Kerbside	523246	169333	NO ₂	Merton AQMA	2.0	0.6	No	2.2
9	Lambton Road	Kerbside	523203	169369	NO ₂	Merton AQMA	3.6	0.5	No	2.2
11	Kingston Road	Kerbside	525602	170042	NO ₂	Merton AQMA	3.4	0.4	No	2.4
13	Cottenham Park Road	Kerbside	523181	170264	NO ₂	Merton AQMA	12.4	0.6	No	2.2
14	20 The Ridgeway	Kerbside	524111	170879	NO ₂	Merton AQMA	1.5	0.4	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
16	84 High Street	Kerbside	524067	171074	NO ₂	Merton AQMA	2.9	0.6	No	2.2
18	25-27 Wimbledon Hill	Kerbside	524696	170725	NO ₂	Merton AQMA	2.6	0.3	No	2.4
19	Wimbledon Station	Roadside	524770	170645	NO ₂	Merton AQMA	3.6	2.5	No	2.4
20	Hartfield Road	Kerbside	524867	170500	NO ₂	Merton AQMA	4.8	0.4	No	2.2
21	246 Merton Road	Roadside	525798	170081	NO ₂	Merton AQMA	1.9	0.5	No	2.4
22	12-16 Upper Green West	Roadside	527756	168993	NO ₂	Merton AQMA	4.2	2.0	No	2.4
23	183 Kingston Road	Kerbside	525156	169935	NO ₂	Merton AQMA	1.9	0.6	No	2.2
24	75 Hartfield Road	Kerbside	524994	170329	NO ₂	Merton AQMA	4.1	0.7	No	2.4
25	Alexandra Road	Roadside	525104	171125	NO ₂	Merton AQMA	4.0	2.1	No	2.2
26	Gap Road	Roadside	525708	171413	NO ₂	Merton AQMA	5.1	2.3	No	2.2
27	Plough Lane	Roadside	526035	171472	NO ₂	Merton AQMA	6.5	2.3	No	2.2
28	11 Haydons Road	Roadside	526158	170167	NO ₂	Merton AQMA	5.9	2.4	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
29	44 High Street	Kerbside	526792	170376	NO ₂	Merton AQMA	2.6	0.7	No	2.4
30	Christchurch Road	Roadside	526791	170087	NO ₂	Merton AQMA	3.0	0.3	No	2.4
31	Alley Charminster Avenue	Urban Background	525452	169137	NO ₂	Merton AQMA	9.0	15.0	No	2.4
32	Merantun Way	Kerbside	526138	169825	NO ₂	Merton AQMA	4.8	0.8	No	2.4
33	Morden Road	Roadside	525803	169467	NO ₂	Merton AQMA	3.6	2.7	No	2.2
34	Western Road	Roadside	526840	169694	NO ₂	Merton AQMA	2.3	2.0	No	2.2
35	Lavender Avenue	Kerbside	527621	169646	NO ₂	Merton AQMA	5.8	0.4	No	2.2
36	35 London Road	Roadside	527915	170518	NO ₂	Merton AQMA	1.9	1.5	No	2.4
37	107 London Road	Kerbside	527935	169502	NO ₂	Merton AQMA	2.4	0.6	No	2.4
38	265 London Road	Kerbside	527738	168863	NO ₂	Merton AQMA	4.2	0.6	No	2.4
39	Church Road	Kerbside	527158	168646	NO ₂	Merton AQMA	3.0	0.6	No	2.4
40	London Road (A217)	Kerbside	527370	168312	NO ₂	Merton AQMA	5.4	0.8	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
41	Morden Road (A239)	Roadside	526395	168172	NO ₂	Merton AQMA	3.1	1.5	No	2.4
42	St Helier Avenue	Roadside	526210	167683	NO ₂	Merton AQMA	12.8	3.3	No	2.4
43	Morden Hall Road	Roadside	526151	168293	NO ₂	Merton AQMA	22.2	2.4	No	2.3
44	31 London Road	Kerbside	525817	168643	NO ₂	Merton AQMA	4.9	0.6	No	2.4
45	HSBC	Kerbside	525778	169824	NO ₂	Merton AQMA	2.6	0.9	No	2.4
46	11 Crown Lane	Kerbside	525435	168499	NO ₂	Merton AQMA	5.0	0.6	No	2.4
47	Civic Centre	Roadside	525588	168498	NO ₂	Merton AQMA	1.5	1.5	Yes	2.4
47/2	Civic Centre	Roadside	525588	168498	NO ₂	Merton AQMA	1.5	1.5	Yes	2.4
47/3	Civic Centre	Roadside	525588	168498	NO ₂	Merton AQMA	1.5	1.5	Yes	2.4
48	Aberconway Road	Roadside	525757	168509	NO ₂	Merton AQMA	7.7	1.2	No	2.4
49	Crown Road Junction	Kerbside	525500	168470	NO ₂	Merton AQMA	2.9	0.8	No	2.4
50	Martin Way	Kerbside	525638	168616	NO ₂	Merton AQMA	9.7	0.7	No	2.4

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
51	Streatham Road	Roadside	528219	169782	NO ₂	Merton AQMA	5.2	1.6	No	2.4
52	West Barnes Lane	Kerbside	522749	168500	NO ₂	Merton AQMA	1.4	0.6	No	2.4
53	139 Epsom Road	Kerbside	524621	166786	NO ₂	Merton AQMA	3.6	0.7	No	2.4
54	43 Upper Green East	Roadside	527890	168920	NO ₂	Merton AQMA	2.0	2.4	No	2.3
55	213 Manor Road	Kerbside	529661	168839	NO ₂	Merton AQMA	5.2	0.6	No	2.2
56	1 Weir Road	Roadside	525875	171682	NO ₂	Merton AQMA	13.0	1.5	No	2.3
57	363 Durnsford Road	Roadside	525396	172558	NO ₂	Merton AQMA	5.0	2.4	No	1.9
S01	Merton Abbey PS	Roadside	525941	169866	NO ₂	Merton AQMA	8.3	1.2	No	2.3
S4B	All Saints PS	Roadside	526136	170328	NO ₂	Merton AQMA	3.4	0.7	No	2.3
S12	St Peter & St Paul PS	Roadside	527639	168362	NO ₂	Merton AQMA	7.2	2.0	No	2.3
S36B	Park Community School	Roadside	525815	169235	NO ₂	Merton AQMA	12.0	2.7	No	2.3
S49B	Raynes Park High School	Roadside	522509	168640	NO ₂	Merton AQMA	19.9	9.2	No	2.3

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
S51	Morden Primary School	Roadside	525093	167325	NO ₂	Merton AQMA	6.1	3.5	No	2.3
S63	Wimbledon High School	Roadside	524505	170891	NO ₂	Merton AQMA	18.1	3.3	No	2.2
S67	Rise Education	Roadside	527552	169099	NO ₂	Merton AQMA	6.1	1.8	No	2.3
S68	Eagle House	Roadside	527831	169253	NO ₂	Merton AQMA	18.1	0.7	No	2.3
S69	Just Learn	Roadside	527947	168855	NO ₂	Merton AQMA	14.3	2.2	No	2.3

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.

1.2 Comparison of Monitoring Results with AQOs

The results presented are after adjustments for “annualisation” and for distance to a location of relevant public exposure (if required), the details of which are described in Appendix A.

Table D. Annual Mean NO₂ Monitoring Results: Automatic Monitoring (µg/m³)

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2023 % ^(b)	2017	2018	2019	2020	2021	2022	2023
ME9	Automatic	100	99	Insufficient valid results available for this year	48	51	43	Insufficient valid results available for this year	38	31

Notes:

The annual mean concentrations are presented as µg/m³.

Exceedances of the NO₂ annual mean AQO of 40 µg/m³ are shown in **bold**.

NO₂ annual means in excess of 60 µg/m³, indicating a potential exceedance of the NO₂ hourly mean AQS objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

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

The continuous nitrogen dioxide analyser produces a continuous stream of data which can be used to calculate the long term, annual objective as reported in Table D and also the short-term annual objective as reported in Table F.

At the time of writing, all data from ME9 have been fully ratified and annualisation was not required as the data capture rate was sufficiently high.

At this monitoring location, overall, there has been a downward trend in nitrogen dioxide concentration, between 2018 and 2023 nitrogen dioxide concentration has decreased significantly, down by 35% a concentration reduction of 17 $\mu\text{g}/\text{m}^3$.

2023 reported the lowest NO_2 annual mean concentration at ME9 since its installation and complied with the 40 $\mu\text{g}/\text{m}^3$ annual mean National Air Quality Objective for a second year in a row. The 7-year trend data is plotted in Figure 1.

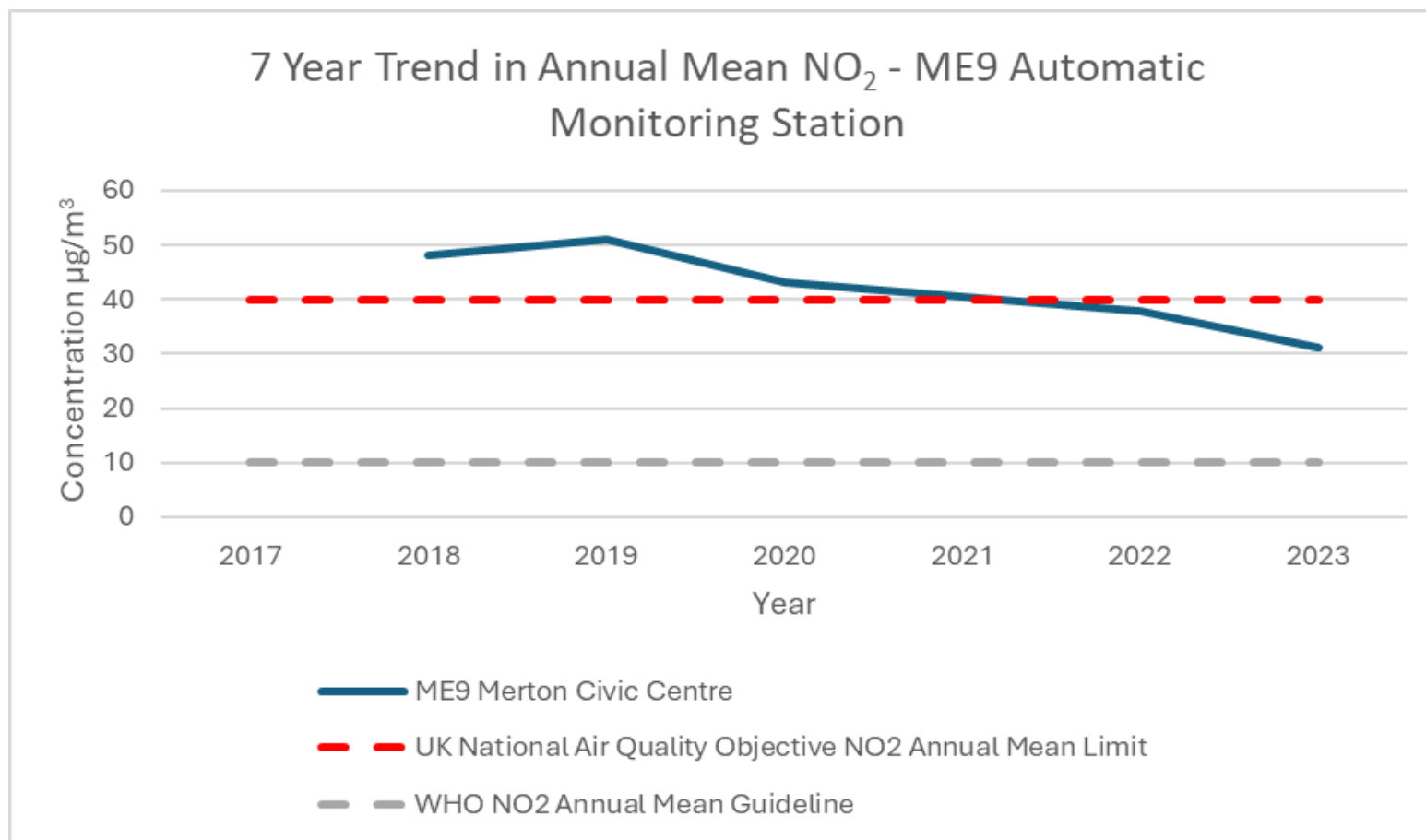


Figure 1: ME9 automatic monitoring station annual mean nitrogen dioxide trend chart 2017-2023

Note: Data for 2017 is not included due to insufficeinet data capture

- (1) In 2017 the ME9 monitoring station was faulty.
- (2) In 2021 insufficient valid results available for the year.

Table E. Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

All data is adjusted for bias as described in Appendix A. Data capture was sufficiently high to negate the need for annualisation.

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2017	2018	2019	2020	2021	2022	2023
1	Bushey Road	523139	169056	Roadside	100	100.0	52.0	48.0	47.0	34.0	36.0	36.0	29.8
2	Stonecot Hill	524489	166637	Roadside	92.3	92.3	41.0	37.0	36.0	27.0	30.0	25.0	21.5
4	154 Grand Drive	523315	168048	Kerbside	100	100.0	37.0	30.0	30.0	27.0	28.0	26.0	21.2
5	Sacred Heart PS	522501	168235	Kerbside	100	100.0	42.0	38.0	33.0	27.0	29.0	27.0	24.8
6	17 Grand Drive	523207	169195	Kerbside	100	100.0	45.0	43.0	43.0	33.0	35.0	34.0	29.3
7	Kingston Road (A298)	524401	169351	Roadside	75	75.0	44.0	46.0	41.0	33.0	34.0	32.0	28.9
8	Coombe Lane	523246	169333	Kerbside	73.1	73.1	53.0	43.0	46.0	38.0	38.0	34.0	31.6
9	Lambton Road	523203	169369	Kerbside	92.3	92.3	43.0	47.0	43.0	37.0	35.0	31.0	26.3
11	Kingston Road	525602	170042	Kerbside	100	100.0	35.0	35.0	34.0	28.0	28.0	26.0	22.9
13	Cottenham Park Road	523181	170264	Kerbside	100	100.0	44.0	37.0	35.0	23.0	24.0	20.0	17.2
14	20 Ridgway	524111	170879	Kerbside	100	100.0	44.0	42.0	44.0	27.0	28.0	25.0	22.0
16	84 High Street	524067	171074	Kerbside	100	100.0	39.0	45.0	45.0	33.0	36.0	31.0	26.7
18	25-27 Wimbledon Hill	524696	170725	Kerbside	100	100.0	64.0	66.0	65.0	57.0	58.0	52.0	44.8
19	Wimbledon Station	524770	170645	Roadside	82.7	82.7	52.0	55.0	51.0	40.0	40.0	38.0	33.4
20	Hartfield Road	524867	170500	Kerbside	100	100.0	48.0	55.0	52.0	39.0	47.0	40.0	31.2
21	246 Merton Road	525798	170081	Roadside	100	100.0	57.0	69.0	63.0	52.0	59.0	51.0	44.7
22	12-16 Upper Green West	527756	168993	Roadside	100	100.0	77.0	64.0	57.0	47.0	44.0	45.0	42.4
23	183 Kingston Road	525156	169935	Kerbside	100	100.0	61.0	58.0	55.0	49.0	46.0	42.0	38.2
24	75 Hartfield Road	524994	170329	Kerbside	84.6	84.6	38.0	39.0	32.0	31.0	29.0	28.0	22.8
25	Alexandra Road	525104	171125	Roadside	90.4	90.4	41.0	39.0	40.0	32.0	34.0	28.0	25.2
26	Gap Road	525708	171413	Roadside	100	100.0	47.0	45.0	45.0	34.0	35.0	29.0	26.8
27	Plough Lane	526035	171472	Roadside	100	100.0	46.0	46.0	42.0	32.0	32.0	32.0	28.4

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2017	2018	2019	2020	2021	2022	2023
28	11 Haydons Road	526158	170167	Roadside	100	100.0	46.0	49.0	43.0	33.0	31.0	28.0	25.7
29	44 High Street	526792	170376	Kerbside	92.3	92.3	61.0	66.0	60.0	45.0	46.0	41.0	37.3
30	Christchurch Road	526791	170087	Roadside	100	100.0	48.0	51.0	51.0	35.0	36.0	33.0	31.2
31	Alley Charminster Avenue	525452	169137	Urban Background	84.6	84.6	20.0	21.0	20.0	15.0	15.0	14.0	12.3
32	Merantun Way	526138	169825	Kerbside	73.1	73.1	42.0	38.0	35.0	29.0	29.0	25.0	25.6
33	Morden Road	525803	169467	Roadside	92.3	92.3	49.0	48.0	47.0	34.0	37.0	32.0	26.9
34	Western Road	526840	169694	Roadside	100	100.0	59.0	55.0	54.0	43.0	41.0	39.0	34.2
35	Lavender Avenue	527621	169646	Kerbside	100	100.0	31.0	31.0	29.0	25.0	24.0	21.0	19.6
36	35 London Road	527915	170518	Roadside	100	100.0	42.0	47.0	40.0	33.0	34.0	31.0	26.8
37	107 London Road	527935	169502	Kerbside	100	100.0	61.0	67.0	56.0	41.0	44.0	42.0	37.1
38	265 London Road	527738	168863	Kerbside	92.3	92.3	41.0	44.0	41.0	33.0	35.0	33.0	33.9
39	Church Road	527158	168646	Kerbside	100	100.0	45.0	48.0	40.0	30.0	30.0	26.0	24.8
40	London Road (A217)	527370	168312	Kerbside	100	100.0	46.0	52.0	41.0	33.0	33.0	33.0	32.5
41	Morden Road (A239)	526395	168172	Roadside	84.6	84.6	41.0	48.0	45.0	41.0	40.0	30.0	27.3
42	St Helier Avenue	526210	167683	Roadside	100	100.0	35.0	38.0	42.0	34.0	38.0	33.0	29.4
43	Morden Hall Road	526151	168293	Roadside	100	100.0	44.0	50.0	45.0	36.0	39.0	36.0	33.9
44	31 London Road	525817	168643	Kerbside	100	100.0	57.0	62.0	62.0	51.0	54.0	52.0	39.4
45	HSBC	525778	169824	Kerbside	100	100.0	45.0	48.0	48.0	43.0	38.0	33.0	26.6
46	11 Crown Lane	525435	168499	Kerbside	92.3	92.3	61.0	53.0	49.0	42.0	40.0	38.0	29.6
47	Civic Centre	525588	168498	Roadside	100	100.0	51.0	51.0	52.0	44.0	42.0	37.0	31.4
47/2	Civic Centre	525588	168498	Roadside	92.3	92.3	51.0	51.0	52.0	44.0	42.0	37.0	32.1
47/3	Civic Centre	525588	168498	Roadside	90.4	90.4	51.0	51.0	52.0	44.0	42.0	37.0	31.5
48	Aberconway Road	525757	168509	Roadside	100	100.0	41.0	42.0	39.0	31.0	31.0	28.0	25.8
49	Crown Road Junction	525500	168470	Kerbside	92.3	92.3	39.0	40.0	39.0	30.0	30.0	27.0	23.3
50	Martin Way	525638	168616	Kerbside	100	100.0	45.0	43.0	40.0	31.0	33.0	29.0	24.9
51	Streatham Road	528219	169782	Roadside	90.4	90.4	not open	38.0	33.0	26.0	30.0	33.0	24.4

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2017	2018	2019	2020	2021	2022	2023
52	West Barnes Lane	522749	168500	Kerbside	100	100.0	not open	35.0	30.0	25.0	25.0	23.0	21.0
53	139 Epsom Road	524621	166786	Kerbside	76.9	76.9	not open	43.0	51.0	41.0	48.0	41.0	32.0
54	43 Upper Green East	527890	168920	Roadside	92.3	92.3	not open	not open	62.0	47.0	49.0	45.0	39.9
55	213 Manor Road	529661	168839	Kerbside	100	100.0	not open	not open	45.0	36.0	37.0	36.0	39.4
56	1 Weir Road	525875	171682	Roadside	100	100.0	not open	not open	not open	not open	not open	22.0	21.0
57	363 Durnsford Road	525396	172558	Roadside	92.3	92.3	not open	not open	not open	not open	not open	23.0	21.9
S01	Merton Abbey PS	525941	169866	Roadside	82.7	82.7	not open	not open	26.0	18.0	20.0	18.0	16.6
S4B	All Saints PS	526136	170328	Roadside	100	100.0	not open	not open	46.0	31.0	30.0	27.0	24.4
S12	St Peter & St Paul PS	527639	168362	Roadside	82.7	82.7	not open	not open	38.0	30.0	34.0	33.0	30.4
S36B	Park Community School	525815	169235	Roadside	100	100.0	not open	not open	39.0	32.0	35.0	33.0	27.2
S49B	Raynes Park High School	522509	168640	Roadside	82.7	82.7	not open	not open	not open	not open	not open	not open	31.8
S51	Morden Primary School	525093	167325	Roadside	100	100.0	not open	not open	42.0	29.0	37.0	31.0	24.1
S63	Wimbledon High School	524505	170891	Roadside	100	100.0	not open	not open	56.0	34.0	33.0	31.0	29.5
S67	Rise Education	527552	169099	Roadside	90.4	90.4	not open	not open	43.0	29.0	33.0	32.0	28.9
S68	Eagle House	527831	169253	Roadside	100	100.0	not open	not open	53.0	35.0	40.0	39.0	39.6
S69	Just Learn	527947	168855	Roadside	100	100.0	not open	not open	43.0	30.0	36.0	33.0	29.6

- Annualisation has been conducted where data capture is <75% and >25% in line with LLAQM.TG19
- Diffusion tube data has been bias adjusted.
- Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.

Notes:

The annual mean concentrations are presented as $\mu\text{g}/\text{m}^3$.

Exceedances of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu\text{g}/\text{m}^3$, 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” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

Diffusion Tube Monitoring Data

Summary of data tables within this report:

- Table E provides the annual mean NO₂ diffusion tube monitoring results, with bias corrected values for each year from 2017 to 2023.
- Table M of Appendix A provides the bias adjustment factor used.
- Table O in Appendix A provides the NO₂ fall off with distance calculations.
- Table P in Appendix B provides monthly data for 2023.

Diffusion tube data was corrected using the locally derived bias adjustment factor of 0.84, provided in Table M. Data capture was sufficiently high across all monitoring locations for the annual mean to be calculated without the need for annualisation. Diffusion tube data undergoes QA/QC procedures to ensure integrity, these procedures are explained in Appendix A.

In 2023, NO₂ was monitored across an extensive diffusion tube network consisting of 62 monitoring locations. For London boroughs, as per London Local Air Quality Management Technical Guidance (LLAQM. TG) (19) paragraph 3.10, current guidance states that the last four years of monitoring data should be considered, and a trend analysis undertaken to identify any significant changes. Over the last four years, nitrogen dioxide concentrations have decreased across Merton.

The results from the 2023 monitoring (Table E) show that the annual NO₂ national air quality objective of 40 µg/m³ was exceeded at 3 of the 62 monitored locations in the borough which equates to 5% of sites, a visual overview of compliance is provided in Figure 2. However, once those 3 exceeding sites were corrected for distance (Appendix A, Table O) to provide an indication of the concentration at relevant exposure (sensitive receptor), 0 (zero) sites were found to be at or above the objective.

Since 2020, no diffusion tube monitoring location has exceeded an annual mean of 60 µg/m³ indicating that the 1 hour-mean objective is likely to have been achieved across the borough in all town centres, marking a significant improvement in air quality. Data from the borough's diffusion tube network between 2017 and 2023 have been charted in Figure 2 across 4 charts, the locations have been grouped geographically to aid comparison.

The impact of COVID-19 manifested in a drop in annual mean NO₂ concentrations at all monitoring locations in 2020. In 2019, 38 monitoring locations exceeded the annual mean NO₂ national air quality objective (NAQO) of 40 µg/m³, compared to 14 in 2020, a significant improvement.

While NO₂ concentrations did rebound slightly in 2021, with 35 of the then 59 monitoring sites showing an increase in annual mean concentration compared to 2020, the number of locations exceeding the annual mean NO₂ NAQO reduced to 12.

The downward trend continued in 2022 with NO₂ concentrations reducing across the borough at all but one monitoring location as compared to 2021, concentrations of NO₂ in 2022 largely returned to or fell below, 2020 levels. The number of locations exceeding the annual mean NO₂ NAQO reduced to 9.

In 2023, all but 2 of the 62 monitoring locations showed decreases in NO₂ annual mean concentrations compared with 2022. The number of locations exceeding the annual mean NO₂ NAQO reduced to 3, equating to a compliance rate of 95% with the annual mean NO₂ NAQO. This marks a significant improvement in air quality across Merton.

The lowest concentrations for NO₂ recorded in 2023 were at site ID 13 (kerbside) with 17.2 µg/m³ and site ID 31 (urban background) with 12.3 µg/m³, meaning that currently despite the improvements in air quality, no location monitored in Merton would meet the new WHO guideline value of 10 µg/m³ (annual mean) set to protect the public from the health effects of gaseous nitrogen dioxide.

The main source of pollution in the borough remains road traffic. The updated London Atmospheric Inventory (LAEI 2019) released in 2022, estimates 60% of nitrogen oxide emissions originate from road transport, followed by industrial/commercial heat and power 20%, and domestic heat and power 12%.

As road transport is the largest contributor to NO₂ emissions, many factors at all levels of central and local government have contributed to the reduction in emissions that we are observing.

The Euro 6 standard (directive set by the European Union to help reduce the level of harmful pollutants produced by new diesel and petrol vehicles) is having a positive

effect on emission levels. The Society of Motor Manufacturers and Traders (SMMT) state

“It would take 50 new cars today to produce the same amount of pollutant emissions as one vehicle built in the 1970s.” The following figures quoted by the SMMT highlight the extent to which Euro standards are reducing harmful by-products.

- Carbon monoxide (CO): petrol down 63%, diesel down 82% since 1993
- Hydrocarbons (HC): petrol down 50% since 2001
- Nitrogen oxide (NOx): down 84% since 2001
- Particulate matter (PM): diesel down 96% since 1993

The announcement by the UK government that all new petrol and diesel-powered cars and vans are set to be banned from sale in the UK in 2035 also appears to have helped. This means that from 2035 the only new cars and vans that can be sold will be pure electric ones, plus any hydrogen-powered cars, that may exist at the point.

In 2023 a total of 1,903,054 new cars were registered and reached the road, marking a 17.9% increase from 2022, but still 17.7% below pre-pandemic levels according to the latest figures from the SMMT. Fleet investment was instrumental in driving the growth; fleet deliveries rose by 38.7%. Meanwhile, private consumer demand remained stable.

Low and zero emission vehicle sales grew in 2023: Hybrid Electric Vehicle (HEV) and Plug-in Hybrid Electric Vehicle (PHEV) sales increased, whilst Battery-powered Electric Vehicle (BEV) volumes reached a record high.

BEVs accounted for one in six new cars registered in 2023. Many fleet and business buyers opted for them due to tax incentives.

As for used cars sold in 2023 the number was 7,242,692 compared to 6,890,777 in 2022. That is a 5% increase in used car sales in 2023 compared to 2022.

Of those 7.2 million used cars sold, 56% were petrol, 38% were diesel, 3% were HEV, 2% were BEV, and 1% were PHEV. Used BEV sales increased by 91% from 2022. In 2023, the total market share of diesel vehicles was 13.6%, declining from 16.4% in 2022, however there was a 37% increase of diesel vehicle sales in 2023 compared to 2022.

There are a number of Air Quality Action Plan measures that are directly linked to reducing road transport emissions and progress against these are reported in Table K. In summary:

More residents are switching to electric or hybrid the number of electric permits in the borough has increased to 3.1% of the total vehicle permits issued in 2022/23.

There are 30 operational School Streets in the borough.

Encouragement for modal shift away from private car onto bicycles, cargo bikes, walking, and public transport.

Even in outer London where public transport cannot compete with central London, planning applications are assessed and encouraged, where realistic, to be car free. Electric vehicle charge points (EVCP's) are conditioned in all possible planning applications and are being rolled out borough wide.

Idling is a priority in Merton. Targeted monthly awareness events are delivered which are increasing driver awareness and behaviour change away from engine idling.

The overall monitoring results for the borough in 2023 are positive and show significant improvements toward borough wide compliance with the annual mean National Air Quality Objective for nitrogen dioxide. To recap, 95% of monitoring locations achieved compliance at the point of monitoring, rising to 100% compliance following distance correction of the 3 exceeding diffusion tube sites. Tightening (concentration reduction) of NAQO are welcome, since the more we know and understand about harm to health associated with air pollution, the more we want to aim for achieving the more stringent voluntary WHO levels set out in September 2021.

Figure 2: Long term NO₂ concentration trends in Merton 2017-2023 (all data bias adjusted) from non-automatic monitoring (diffusion tubes). Presented in the following 4 charts by area.

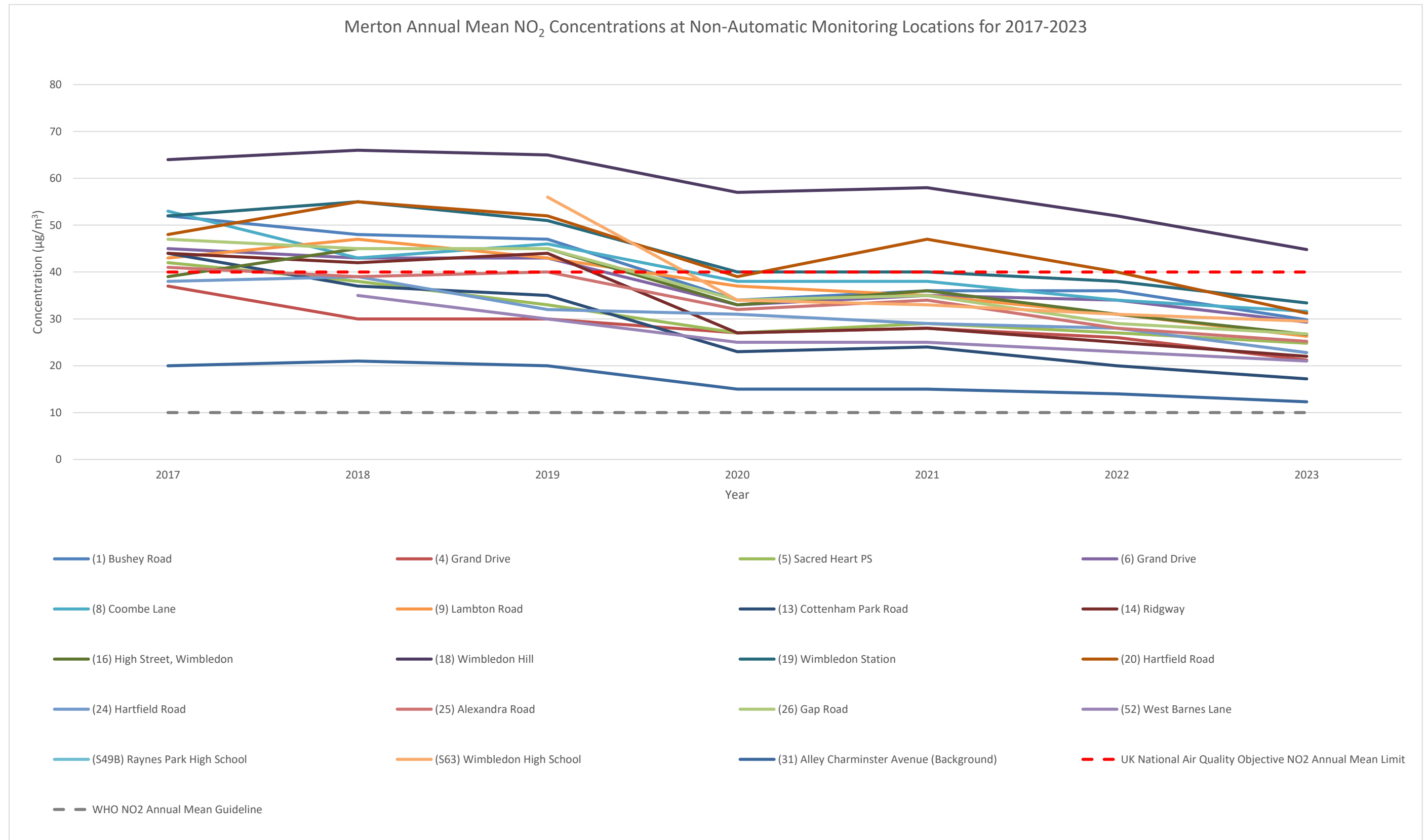


Chart 1 of 4: Raynes Park / New Malden / Wimbledon

Notes: (1) Site 52 opened in 2018. (2) Site S49B opened in 2023. (3) Site S63 opened in 2019.

Merton Annual Mean NO₂ Concentrations at Non-Automatic Monitoring Locations for 2017-2023

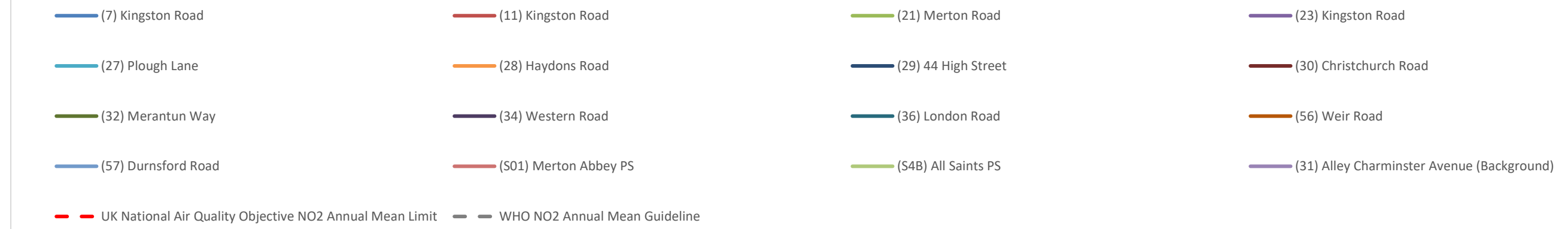
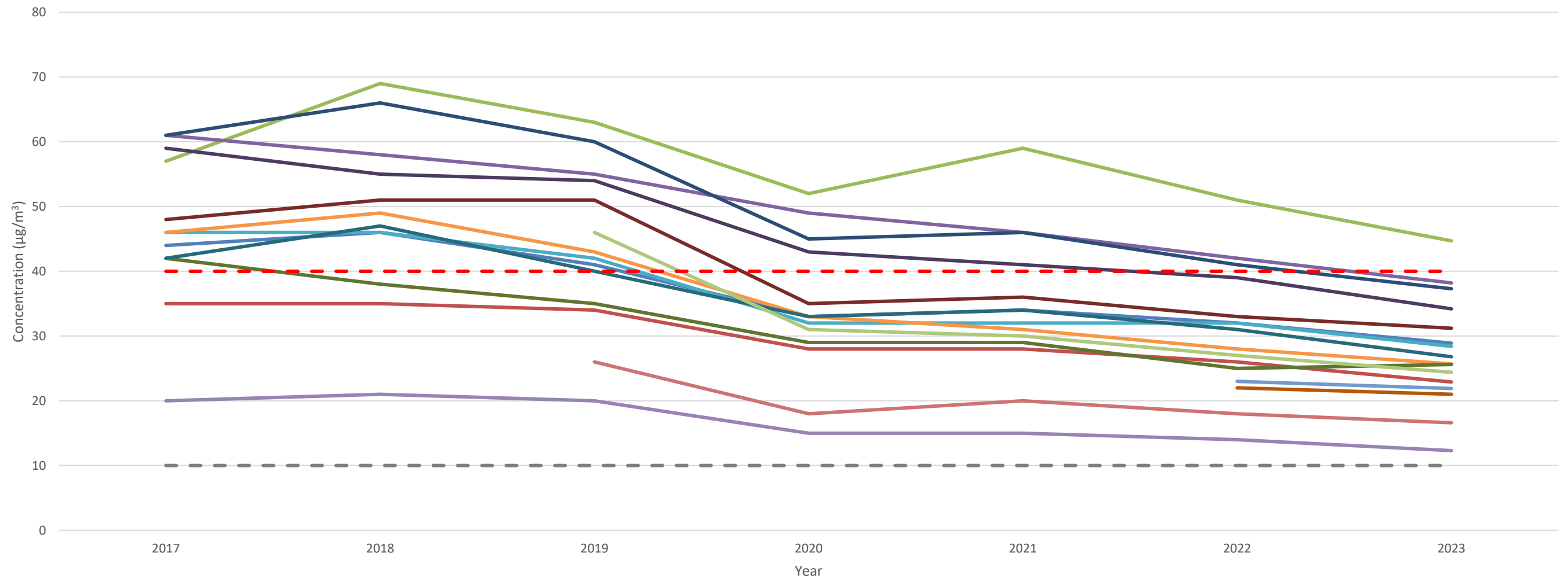


Chart 2 of 4: South Wimbledon / Colliers Wood / Tooting

Notes: (1) Sites 56 and 57 opened in 2022. (2) Sites S01 and S4B opened in 2019.

Merton Annual Mean NO₂ Concentrations at Non-Automatic Monitoring Locations for 2017-2023

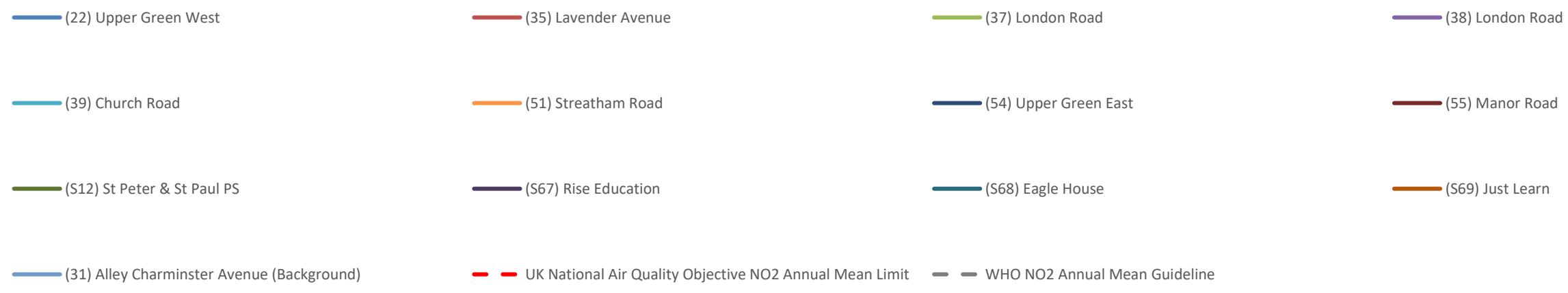
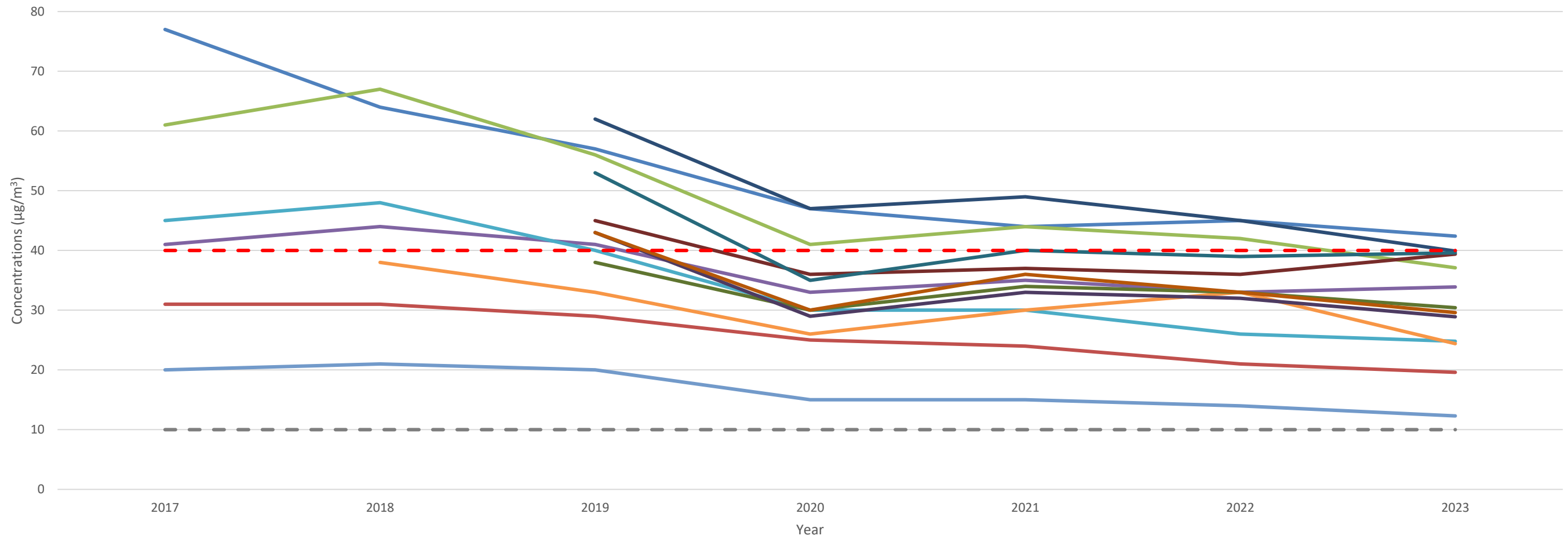
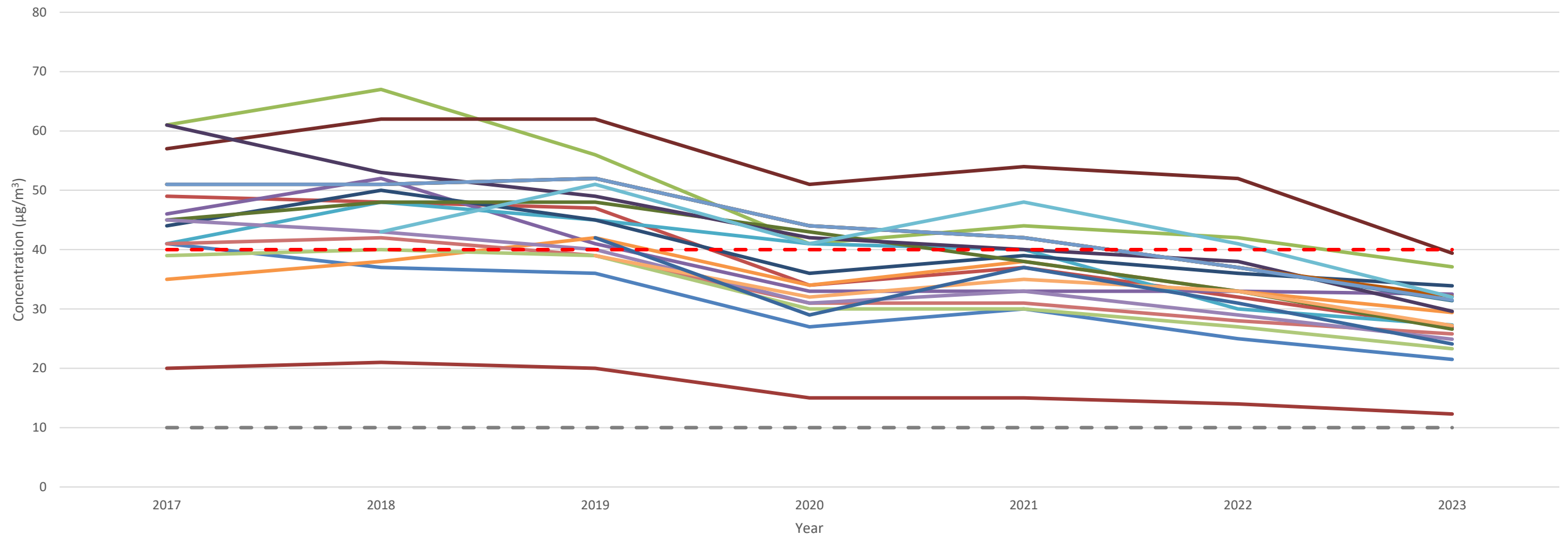


Chart 3 of 4: Mitcham

Notes: (1) Site 51 opened in 2018. (2) Sites 54, 55, S12, S67, S68 and S69 opened in 2019.

Merton Annual Mean NO₂ Concentrations at Non-Automatic Monitoring Locations for 2017-2023



- (2) Stonecot Hill
- (33) Morden Road
- (37) London Road
- (40) London Road
- (41) Morden Road
- (42) St Helier Avenue
- (43) Morden Hall Road
- (44) London Road
- (45) HSBC
- (46) Crown Lane
- (47) Civic Centre
- (47/2) Civic Centre
- (47/3) Civic Centre
- (48) Aberconway Road
- (49) Crown Road Junction
- (50) Martin Way
- (53) Epsom Road
- (S36B) Park Community School
- (S51) Morden PS
- (31) Alley Charminster Avenue (Background)
- UK National Air Quality Objective NO2 Annual Mean Limit
- WHO NO2 Annual Mean Guideline

Chart 4 of 4: Morden

Notes: (1) Site 53 opened in 2018. (2) Sites S36B and S51 opened in 2019.

Table F. NO₂ Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg/m³

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2023 % ^(b)	2017	2018	2019	2020	2021	2022	2023
ME9	100	99	No data	0	1	0 (158.4)	No or insufficient valid results available for this year.	0 (108.8)	0

Notes

Results are presented as the number of 1-hour periods where concentrations greater than 200 µg/m³ have been recorded.

Exceedance of the NO₂ short term AQO of 200 µg/m³ over the permitted 18 hours per 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.

(a) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

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

The 7-year trend in short term nitrogen dioxide concentrations shows that exceedances of 200 µg/m³ are uncommon at the ME9 monitoring site. There were no exceedances of 200 µg/m³ at the ME9 site in 2023 and the monitoring station continues to meet the short-term 1-hour mean objective. The monitoring equipment is to be upgraded in 2024/25.

Table G. Annual Mean PM₁₀ Automatic Monitoring Results (µg/m³)

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2023 % ^(b)	2017	2018	2019	2020	2021	2022	2023
ME2	100	18	24	34	28	26	23 (21.9)	26 (24.7)	Insufficient Data

Notes

The annual mean concentrations are presented as µg/m³.

Exceedances of the PM₁₀ annual mean AQO of 40 µg/m³ are shown in **bold**.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture is less than 75% and more than 25%.

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

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

Particulate matter is measured using a BAM (Beta Attenuation Monitor), these analysers are equivalent to the PM₁₀ reference method, and the applicable correction factor has been applied by ERG for all data presented in this report. **As the data capture rate for 2023 was below 25%, annualisation of the data was not possible.**

In 2023 there were challenges maintaining equipment due to an issue with the cabin housing the analyser. There has been considerable resourcing allocated to refreshing the network and at the time of writing (May 2024) new equipment has been procured and is awaiting installation in 2024/25 which will greatly improve data quality.

For London boroughs, as per LLAQM.TG(19) paragraph 3.10, current guidance states that the last four years of monitoring data should be considered, and a trend analysis undertaken to identify any significant changes. Due to historically poor data, it is

currently not possible to accurately identify a trend in the data, however it appears that there has been no significant change to annual mean PM₁₀ concentrations over the time. The same magnitude of change observed for nitrogen dioxide is not manifesting for particulate matter. This indicates that local measures along with regional policies implemented to reduce NO₂ are not as effective at mitigating PM₁₀. The updated London Atmospheric Inventory (LAEI 2019) released in 2022 estimates the most significant contributors to PM₁₀ emissions in Merton to be road transport at 33%, followed by; construction 17%, resuspension 15% and domestic biomass/wood burning 13%. An added complication is the range of PM₁₀ pollution, it is not confined to localised sources but can travel large distances. Often PM₁₀ pollution episodes (periods of higher-than-normal particulate concentrations) often originate from agriculture and industry in continental Europe.

Although the annual mean Air Quality Objective for PM₁₀ has been comfortably achieved historically, there remains no safe level for particulate pollution. A focus is required to be maintained on Particulate Matter even when meeting the PM₁₀ targets, because the London boroughs are collectively working to meet the World Health Organization (WHO) health-based limits by 2030. In September 2021, WHO tightened the annual mean guideline values for PM₁₀ and PM_{2.5} making them significantly lower than the current UK/EU standard, PM_{2.5} 5 µg/m³ and PM₁₀ 15 µg/m³ (annual means). Currently, PM₁₀ would not meet the new WHO guideline value of 15 µg/m³ (annual mean) set to protect the public from the health effects of particulate matter. It will be a huge challenge to drive down particulate matter concentrations to these levels in Merton based on borough monitoring data from 2017 to date. The same can be said for all London boroughs.

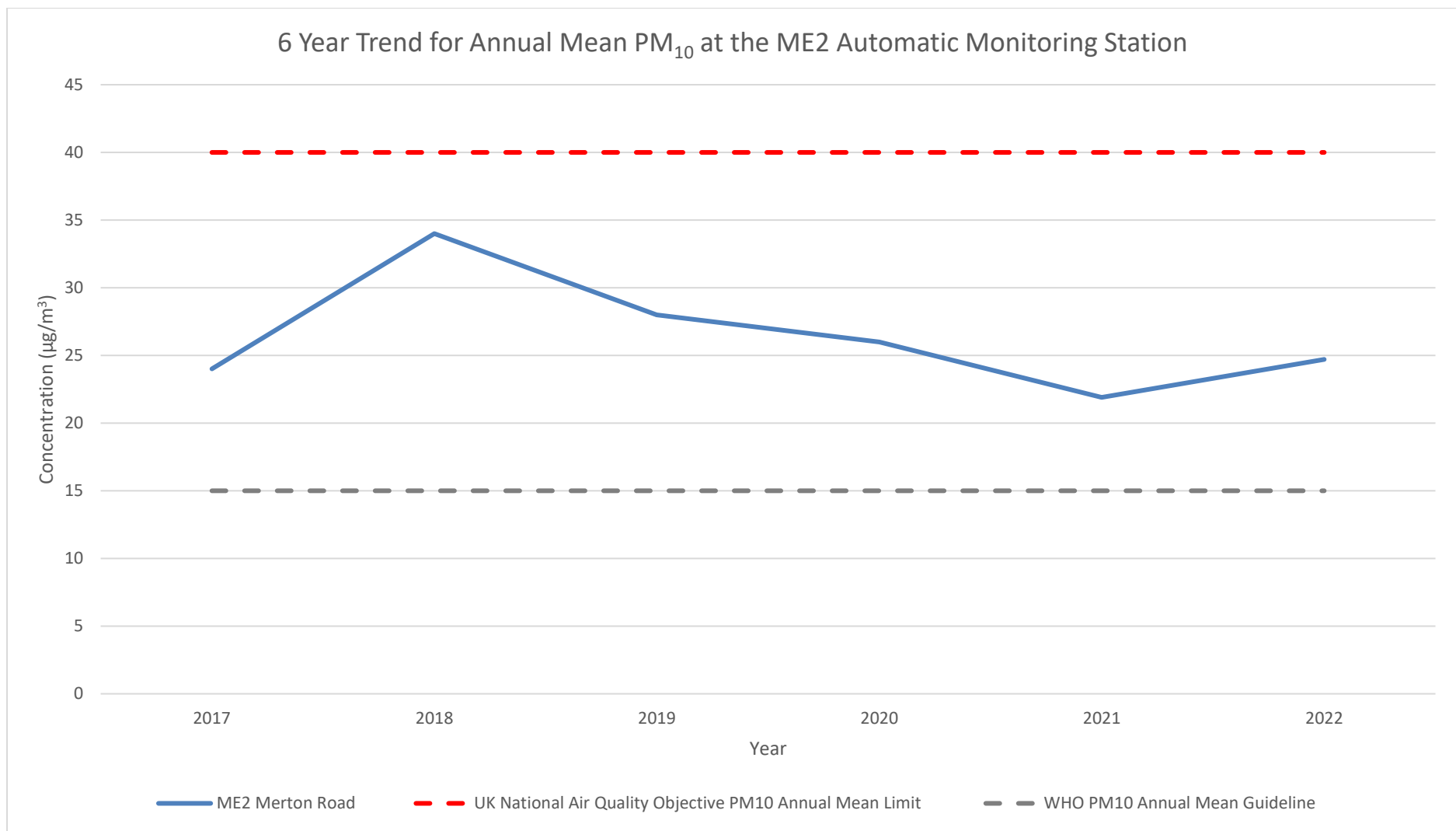


Figure 3: ME2 automatic monitoring station annual mean PM₁₀ trend chart 2017-2022

Note: Data for 2023 is not included as data capture was below 25%.

Table H. PM₁₀ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM₁₀ 24-Hour Means > 50 µg/m³

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2023 % ^(b)	2017	2018	2019	2020	2021	2022	2023
ME2	100	18	10 (37.6)	13 (47.3)	20	11	8 (36.6)	6 (44.0)	Insufficient Data

Notes

Exceedances of the PM₁₀ 24-hour mean objective (50 µg/m³ over the permitted 35 days per year) are shown in **bold**.

Where the period of valid data is less than 85% of a full year, the 90.4th percentile is provided in brackets.

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

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

Table H provides a comparison of monitoring data with the 24-hour means objective (short-term objective). **As the data capture rate for 2023 was below 25%, it is not recommended to calculate the 90.4th percentile of the 24-hour annual means and as such no value is reported.**

Due to historically poor data, it is currently not possible to accurately identify a trend in the data. Data capture was below 85% in 2016, 2017, 2018 and 2021 data the 90.4th percentile result has also been reported for comparison, this figure is bracketed. There appears to be a spike in 2019, elevated PM₁₀ concentrations can result from ‘pollution episodes’, which are often the result of local combine with imported transboundary conditions from elsewhere in the UK and Europe. It is important to highlight that despite reduced traffic during 2020 due to COVID-19 a marked reduction in PM₁₀ was not observed. The 24-hour Air Quality Objective is comfortably achieved, however, a focus is required to be maintained on Particulate Matter even when meeting the PM₁₀ targets,

because the London boroughs are collectively working to meet the World Health Organization (WHO) health-based limits by 2030. In September 2021, WHO tightened the annual mean guideline values for PM₁₀ and PM_{2.5} making them significantly lower than the current UK/EU standard, PM_{2.5} 5 µg/m³ and PM₁₀ 15 µg/m³ (annual means). Currently, PM₁₀ would not meet the new WHO guideline value of 15 µg/m³ (annual mean) set to protect the public from the health effects of particulate matter. It will be a huge challenge to drive down particulate matter concentrations to these levels in Merton based on borough monitoring data from 2017 to date. The same can be said for all London Boroughs.

Table I. Annual Mean PM_{2.5} Automatic Monitoring Results (µg/m³)

Breathe London measurement network

In addition to our statutory monitoring network, LB Merton operates a network of indicative monitors using Breathe London monitoring devices, or “nodes.” In total in 2022 and 2023 this included a total of 57 nodes, though with a smaller operational network in 2023 due to funding constraints. While these instruments measure both hourly PM_{2.5} and NO₂, the measurements of NO₂ are considered less reliable due to interference from temperature and humidity, and these NO₂ measurements are not discussed further. Of the nodes, two were located at Urban Background sites, and the rest at Roadside (or Kerbside) sites (see tables below). A map of the 2023 node network is provided in Table K in relation to Action 7.

Table I.1 Annual mean measurements of PM_{2.5} from Merton’s Breathe London network

Table I.1. Annual mean measurements of PM_{2.5} from Merton’s Breathe London network, µg/m³		
PM_{2.5}, µg/m³	2022	2023
All nodes	11.9±1.4	9.3±0.9
Kerbside	11.8±1.3	9.3±0.8
Roadside	12.2±1.2	9.5±0.9
Urban Background	8.2±0.4	7.7±0.4

Table I.2 Breathe London Node Results for PM_{2.5}

Table I.2 – Breathe London Node Results for PM _{2.5}								
Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Site Type (v2)	Valid Data Capture for period (%)	Valid Data Capture 2023 (%)	2022	2023
CLDP0053	517913	174738	Urban Background	Urban Background	99.9	99.9	8.2	7.4
CLDP0124	515074	174049	Roadside	Kerbside	97.6	97.6	10.7	8.8
CLDP0136	514074	171108	Roadside	Roadside	87.0	87.0	13.5	10.1
CLDP0138	515293	172835	Roadside	Roadside	1.0	1.0	11.2	
CLDP0139	515453	173059	Roadside	Kerbside	99.8	99.8	12.0	10.2
CLDP0140	516945	172124	Roadside	Roadside	1.3	1.3	10.2	
CLDP0141	520507	175797	Roadside	Kerbside	1.4	1.4	11.1	
CLDP0142	518354	174235	Roadside	Kerbside	1.0	1.0	10.9	
CLDP0143	513927	173927	Roadside	Kerbside	1.8	1.8	9.5	
CLDP0144	518538	177259	Roadside	Roadside	0.7	0.7	10.2	

Table I.2 – Breathe London Node Results for PM_{2.5}

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Site Type (v2)	Valid Data Capture for period (%)	Valid Data Capture 2023 (%)	2022	2023
CLDP0145	520545	175404	Roadside	Kerbside	0.7	0.7	10.5	
CLDP0146	519909	175941	Roadside	Kerbside	96.7	96.7	10.1	8.2
CLDP0147	519043	177352	Roadside	Kerbside	0.7	0.7	10.0	
CLDP0148	520641	173991	Roadside	Kerbside	90.4	90.4	10.9	9.0
CLDP0149	514531	171392	Roadside	Roadside	1.3	1.3	10.7	
CLDP0150	521686	176435	Roadside	Kerbside	1.3	1.3	9.4	
CLDP0151	519852	175855	Roadside	Kerbside	1.3	1.3	10.5	
CLDP0176	519212	177179	Roadside	Roadside	7.9	7.9	12.6	
CLDP0177	518460	173737	Roadside	Kerbside	1.3	1.3	12.8	
CLDP0178	522468	176445	Roadside	Kerbside	1.4	1.4	12.6	
CLDP0179	520494	175653	Roadside	Kerbside	1.2	1.2	14.3	

Table I.2 – Breathe London Node Results for PM_{2.5}

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Site Type (v2)	Valid Data Capture for period (%)	Valid Data Capture 2023 (%)	2022	2023
CLDP0180	518055	173088	Roadside	Kerbside	96.8	96.8	13.9	11.0
CLDP0181	514128	169495	Roadside	Roadside	1.3	1.3	12.8	
CLDP0182	515322	168748	Roadside	Kerbside	1.3	1.3	12.9	
CLDP0183	517576	169484	Roadside	Kerbside	1.4	1.4	12.0	
CLDP0184	517495	169355	Roadside	Kerbside	1.3	1.3	12.3	
CLDP0185	515359	171646	Roadside	Roadside	98.9	98.9	13.5	10.7
CLDP0186	513693	169699	Roadside	Kerbside	1.3	1.3	12.5	
CLDP0189	515934	171084	Roadside	Roadside	1.0	1.0	12.6	
CLDP0190	514594	172737	Roadside	Kerbside	1.0	1.0	12.5	
CLDP0191	514203	173724	Roadside	Kerbside	10.0	10.0	9.5	
CLDP0193	516140	173600	Roadside	Kerbside	90.3	90.3	12.2	9.6

Table I.2 – Breathe London Node Results for PM_{2.5}

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Site Type (v2)	Valid Data Capture for period (%)	Valid Data Capture 2023 (%)	2022	2023
CLDP0194	513885	173028	Roadside	Kerbside	1.0	1.0	13.3	
CLDP0195	516581	171364	Roadside	Kerbside	1.0	1.0	12.8	
CLDP0196	517928	174786	Roadside	Kerbside	93.4	93.4	12.9	9.0
CLDP0197	516257	173257	Roadside	Kerbside	1.3	1.3	13.0	
CLDP0198	516613	174410	Roadside	Kerbside	1.3	1.3	12.2	
CLDP0199	516217	171875	Roadside	Kerbside	1.3	1.3	12.6	
CLDP0200	515414	173924	Roadside	Kerbside	1.2	1.2	12.9	
CLDP0201	516628	174831	Roadside	Kerbside	1.3	1.3	12.0	
CLDP0202	518695	176403	Roadside	Roadside	99.9	99.9	12.6	9.6
CLDP0203	516832	174259	Roadside	Kerbside	95.9	95.9	11.7	9.3
CLDP0204	516216	171134	Roadside	Kerbside	0.7	0.7	12.4	

Table I.2 – Breathe London Node Results for PM_{2.5}

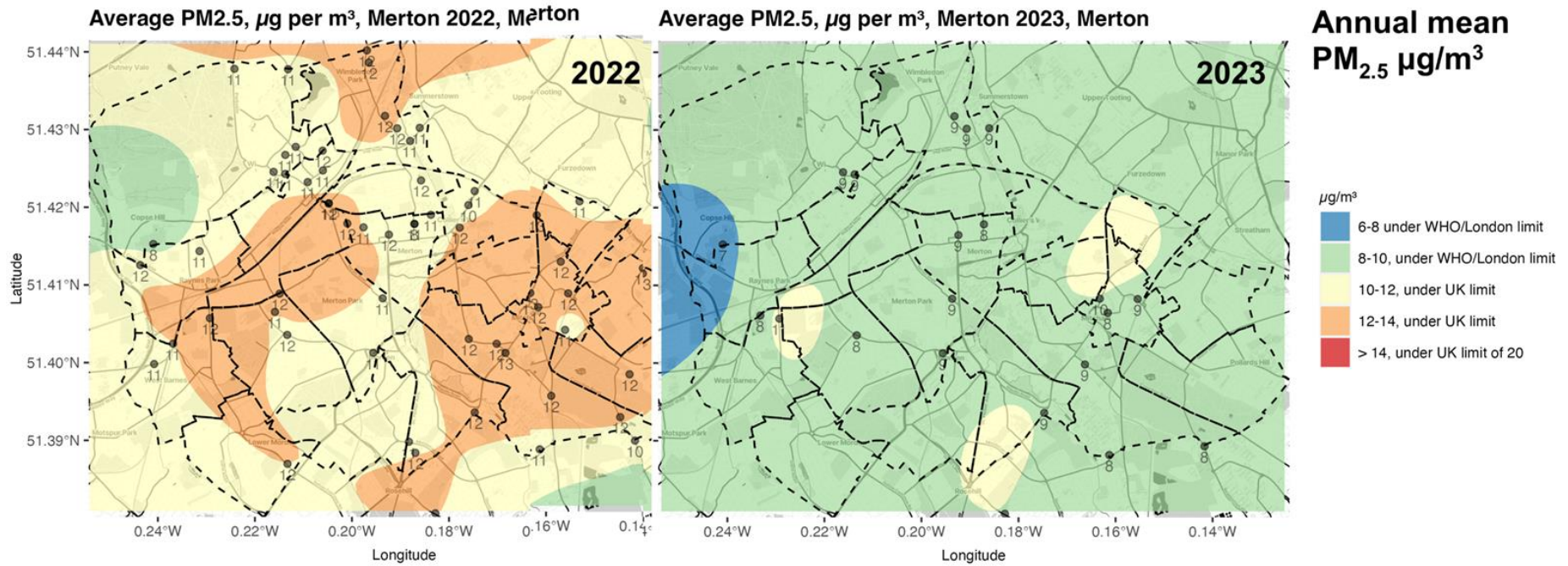
Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Site Type (v2)	Valid Data Capture for period (%)	Valid Data Capture 2023 (%)	2022	2023
CLDP0205	517489	174305	Roadside	Kerbside	1.3	1.3	12.1	
CLDP0206	513576	173616	Roadside	Roadside	99.2	99.2	12.2	9.5
CLDP0284	515572	170977	Roadside	Roadside	1.8	1.8	13.0	
CLDP0285	515890	173395	Roadside	Roadside	2.3	2.3	12.9	
CLDP0362	515146	171839	Urban Background	Urban Background	98.0	98.0		8.0
CLDP0429	517637	170073	Roadside	Roadside	98.7	98.7		8.0
CLDP0430	514332	171483	Roadside	Kerbside	93.6	93.6		10.1
CLDP0431	515563	174136	Roadside	Roadside	98.5	98.5		9.1
CLDP0432	514866	172024	Roadside	Roadside	88.9	88.9		10.2
CLDP0433	514475	171308	Roadside	Roadside	95.4	95.4		8.2
CLDP0434	514333	170913	Roadside	Roadside	93.2	93.2		10.0

Table I.2 – Breathe London Node Results for PM _{2.5}								
Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Site Type (v2)	Valid Data Capture for period (%)	Valid Data Capture 2023 (%)	2022	2023
CLDP0435	518079	175259	Roadside	Kerbside	96.2	96.2		9.1
CLDP0436	517919	174928	Roadside	Kerbside	95.3	95.3		8.4
CLDP0437	521332	175460	Roadside	Roadside	96.0	96.0		9.8

Quality control of the data

In 2022, 47 monitoring nodes achieved 80% or better valid data for PM_{2.5}, while in 2023 23 nodes achieved this level. Within the years 80% or greater data availability was achieved over many nodes over individual seasons. Given this high level of data availability, we confine our analysis to statistics based only on these high data availability nodes. To estimate uncertainty in the results presented below, we use the standard deviation. A more detailed analysis of the instrumental sources of error in the Breathe London nodes is beyond the scope of this report. Analysis has also been completed to investigate the impact of changes in the node network on the statistics (not shown) which indicates that this is unlikely to have skewed the results tabulated.

Figure 4: Distribution of PM_{2.5} by season



Mapping of the distribution of PM_{2.5} by season using standard interpolation techniques, as shown in the maps presented below.

Analysis

While analysis of the data is only now beginning, using data from nodes with 80% or higher in period, several observations are evident (See Table I.1). First, while in 2022 the average values of PM_{2.5} across the network of nodes were $11.9 \pm 1.4 \mu\text{g/m}^3$ which is above the Greater London Authority target for London, in 2023 the annual mean was $9.3 \pm 0.9 \mu\text{g/m}^3$ which is below the London

target. Separating the observations for Roadside and Kerbside sites from those for the two Urban Background sites shows that in both years the Urban Background sites measured values below the London target, while the Roadside and Kerbside sites in 2022 exceeded the target by $1.9 \pm 1.4 \mu\text{g}/\text{m}^3$, but in 2023 their average values were below the target at $9.3 \pm 0.9 \mu\text{g}/\text{m}^3$. Given the uncertainties in the value, it is likely that this is a statistically significant difference, provoking the question of whether the reductions in 2022 seen at roadsides is due to a change in traffic composition, flows or behaviours. An initial analysis of weather patterns in the two years indicates no substantial differences in key wind or temperature patterns that might explain difference due to dispersion or vertical stability in the atmospheric boundary layer. Clearly further analysis is warranted but one possible explanation is changes in the fleet ahead of and after the introduction of the 2023 outer expansion of the London ULEZ.

Considering the annual and seasonal maps of $\text{PM}_{2.5}$ presented in Figure 4, much higher levels were evident in the Winter and Spring of 2022 than in the same seasons in 2023. Similar distributions and patterns are also evident in the data, with higher levels towards the West, East and South of the borough, which could be representative of underlying emissions patterns. Further analysis is planned.

Conclusions

Initial analysis of the measurements suggests that $\text{PM}_{2.5}$ in Merton in 2023 was below the WHO Interim Target 4/London target for $\text{PM}_{2.5}$ of $10 \mu\text{g}/\text{m}^3$ annual mean, though above it in 2022. Considering the distribution of the measurements across road and background sites and having initially ruled out effects from meteorology and changes in the network of nodes between the two years, one possible explanation is that this reduction is due to changes in emissions from road transport. This could potentially have been linked to the expansion of the London Ultra Low Emission Zone (ULEZ). Further analysis is underway to explore this question.

2. Action to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

A summary of AQMAs declared by London Borough of Merton can be found in Table J. The table presents a description of the AQMA that is currently designated within the London Borough of Merton. Appendix C provides maps of AQMA and the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation are as follows:

- NO₂ annual mean
- PM₁₀ 24-hour mean

Table J. Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Number of Years Compliant with Air Quality Objective	Name and Date of AQAP Publication	Web Link to AQAP
Merton AQMA	17/11/2003	Nitrogen dioxide NO ₂ annual mean Particulate Matter PM ₁₀ 24-hour mean	17/11/2003, An area encompassing the whole borough of Merton. Source: Road transport unspecified	NO	Information not available	No exceedances reported in 2023	NO ₂ 2 years compliant at ME9 PM ₁₀ at least 7 years compliant at ME2 Compliance measured at automatic site	London Borough of Merton Air Quality Action Plan 2018-2023	Merton AQAP

London Borough of Merton confirm the information on UK-Air regarding their AQMA(s) is up to date (confirm by selecting in box).

London Borough of Merton confirm that all current AQAPs have been submitted to GLA (confirm by selecting in box).

2.2 Air Quality Action Plan Progress

At the time of publication, the AQAP in place was for the period 2018-2023. It was planned to revise the AQAP in 2023, however this was delayed until 2024. At the time of writing a cross-party task group was being formed to create a new plan for 2024-2029. Until the new AQAP is adopted the 2018-2023 plan will remain active and we continue to deliver against the actions therein.

Table K provides a summary of Merton's progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2023 are shown at the bottom of the table.

Table K. Delivery of Air Quality Action Plan Measures

Measure	Action	Progress
1	Make available on the Council website all monitoring data in an accessible form.	Annual Status Reports containing tabulated and mapped data are publicly available on the council website. Discussions ongoing to embed mapped air quality data on the council website for public access.
2	Continue to annually review our diffusion tube network and identify additional priority locations.	Diffusion tube monitoring locations are reviewed annually in November/December and implemented in January. Locations are removed or relocated in response to council or community concerns regarding potential pollution hotspots. In 2023, the diffusion tube network spanned 62 locations including schools, town centres and main routes in the borough.

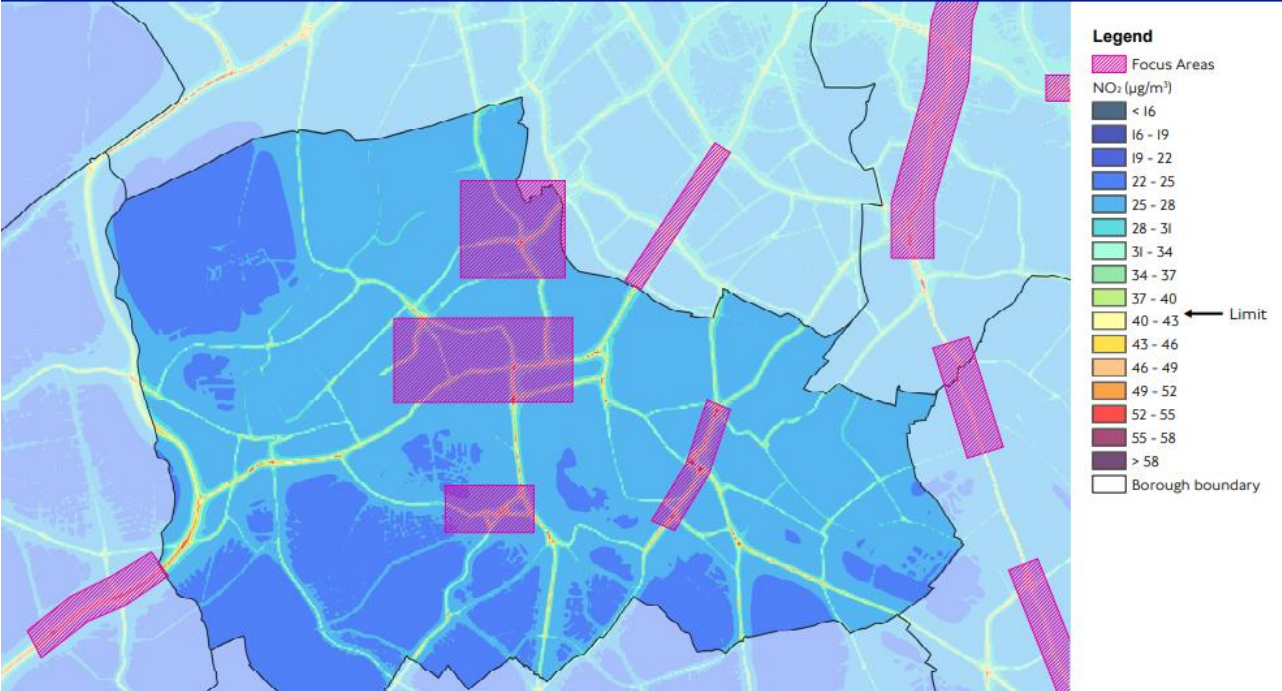
Measure	Action	Progress
3	Positively encourage and support citizen science activities where these actively contribute to identify and tackling air quality in the borough.	Progress has been made in expanding the citizen science project In Merton. The citizen science project has successfully been expanded by 10 new locations from the original 11 locations at the start of the year. This brings the total number of Merton citizen scientist diffusion tubes to 21 at the end of 2023. As a council we are working with Sustainable Merton and a representative from Wimbledon Park Residents Association to coordinate and distribute nitrogen dioxide diffusion tubes out to the willing volunteers across the borough. The objective of the project is to engage with residents of Merton, raising levels of positive involvement and interest in air quality. Air Quality Officers provide training and ongoing support to help review the data collected. Community data is reported in Appendix D.
4	Invest in hand-held monitoring equipment that can be used by citizen science groups and schools.	The Pollution Team currently has four calibrated mobile monitors used for monitoring specific locations and supporting projects. These are the SidePak (PM _{2.5}), MetOne Aerocet 831 (PM _{2.5} , PM ₁₀), TSI Quest and 3M Quest (PM ₁ , PM _{2.5} , PM ₁₀ , VOC, CO, CO ₂) Investment is planned for procurement of two new MetOne Aerocet handheld monitors to be used for complaint investigation, citizen science projects and school assessments in 2024 onwards.
5	Seek additional funding for a refresh and update of our monitoring network including grant funding, Section 106 and Community Infrastructure Levy.	Procurement commenced in 2022 to refresh and expand the automatic monitoring network and to increase the number of automated stations and include the capture of PM _{2.5} data. At the time of writing (May 2024) new equipment awaiting installation at the two existing continuous monitoring sites in Morden and South Wimbledon, along with completely new monitoring sites in Wimbledon Park and Mitcham. All monitoring sites will continuously measure nitrogen dioxide, coarse particulate matter (PM ₁₀) and fine particulate matter (PM _{2.5}). All monitoring data will be publicly available in real-time on the London Air website https://londonair.org.uk and reported annually in the council's Annual Status Report.

Measure	Action	Progress
6	Produce and update an interactive map of diffusion data that can be contributed to by groups and citizen science activities.	<p>Not progressed in 2023. Carried forward to 2024.</p> <p>Work continues to embed web maps on the council website. It will be possible to embed web maps on the council website for groups to view the data that they have collected (all data will be uploaded by the council).</p> <p>Work to be scheduled in for 2024/25 – using ArcGIS Online, to develop public-facing web mapping applications displaying the data.</p>
7	Assess and incorporate new technology in the world of air quality.	<p>Merton continue to use new technology to monitor & model air quality. In 2021 a large low-cost sensor roll out was completed as part of the InnOvaTe (Internet Of Things) (IOT) project. Details available in the 2022 Annual Status Report.</p> <p>The air quality sensors installed (Breathe London Nodes) measure fine particulate matter PM_{2.5} and nitrogen dioxide NO₂, the data is streamed live to a dedicated website https://www.breathelondon.org/.</p> <p>Following the end of the IoT project, 21 Breathe London Nodes were retained to capture localised real-time data around schools, Low Traffic Neighbourhoods, Air Quality Focus Areas, Town Centres and routes in and out of the borough.</p> <p>The data collected by the BLN network will be used to influence Merton’s new Air Quality Action Plan for 2024-2029. Analysis of the PM_{2.5} data is reported in Table I.1 and Table I.2. Mapped locations are provided in Appendix C Figure C.</p> <p>A second Innovate project which trialled real-time monitoring of pollutants including NO₂, PM₁₀, PM_{2.5}, PM₁ and noise at three waste management sites ended in 2023 when funding stopped. The Air Quality Team were finalists in both the Local Government Chronicle and Municipal Journal Awards 2023 because of this work. Funding was sought from the 4th round Mayors Air Quality Fund in 2023 to pick up the Innovate pilot project dealing with waste sites, unfortunately it was unsuccessful.</p>

Measure	Action	Progress
8	<p>We will commission modelling of air quality in the borough up to 2022, by King's College London, including predicted trends and contributing sources.</p> <p>Note: the faculty at King's College London that undertakes modelling moved to Imperial College London in 2020</p>	<p>No additional updates.</p> <p>An updated London Atmospheric Emissions Inventory (LAEI) for the base year 2019 was published by the Greater London Authority in 2021. The inventory provides emissions estimates of key pollutants (NO_x, PM₁₀, PM_{2.5} and CO₂) by source type. The LAEI provides a best estimate of pollution across the borough where direct monitoring is not available. These maps are available to view within the Council's mapping system and form part of the Air Quality data resource available to the Council and in the near future the public.</p> <p>Funding was secured for the key project in 2020 to complete borough specific air quality modelling through sunk funding arrangements. This has not yet been completed.</p> <p>The air quality monitoring undertaken through the Innovate project reported against Action 7 has been a precursor to the aforementioned 'borough specific air quality modelling'. Merton installed a dense coverage of low cost Breathe London sensors to monitor PM_{2.5} and NO₂.</p>
9	<p>Map Focus Areas & air quality 'hotspots' on planning GIS mapping to ensure these areas are highlighted</p>	<p>Completed</p>
10	<p>Ensure that air quality is a vital part of the Council's New Local Plan.</p>	<p>The draft Local Plan has embedded measures to improve air quality in the borough. A number of policies within the Plan contribute to tackling poor air quality for example sustainable transport, air quality, places and spaces in a growing borough (design), health (including mental health) and wellbeing, and climate change policies.</p> <p>It clearly states that developers must have regard to and follow <i>any guidance provided by Merton Council on local environmental impacts and pollution as well as on noise generating and noise sensitive development.</i></p> <p>Where necessary, the Council will set planning conditions to reduce and mitigate pollutant impacts (including air quality).</p>

Measure	Action	Progress
		<p>The Local Plan requires Air Quality Assessment (AQA) (depending on development) to be submitted with planning applications. The further guidance on AQA can be found in the Air Quality SPD.</p> <p>In addition, the Local Plan has adopted a number of approaches which contribute to tackling poor air quality for example:</p> <p>Healthy Streets Approach.</p> <p>20 minutes neighbourhoods</p> <p>Importantly, the Local Plan has had regard to the London Plan and its associated guidance, for example Mayor of London Transport Strategy and Environment Strategy and contributes to the target and aims of London as set by the Mayor of London.</p> <p>The Planning Inspectors and the council are working proactively to enable the plan to proceed to adoption (subject to Inspectors Report).</p> <p>https://www.merton.gov.uk/planning-and-buildings/planning/local-plan/newlocalplan/local-plan-submission</p>
11	Adoption of New AQ Supplementary Planning Document (SPD) to ensure emissions from new development are minimised and effective mitigation is integrated into the scheme of design.	<p>Completed.</p> <p>Merton formally adopted the Air Quality Supplementary Planning Document (SPD) on 22nd June 2021 and is now a material planning consideration when determining development proposals submitted for planning permission. SPD is material consideration supporting and provide further guidance on implementing Local Plan and technical guidance.</p>
12	Ensure air quality neutral development is required, and request where applicable an air quality assessment.	<p>This is now standard practice in the planning process. Planning statistics are provided in Table L.</p>

Measure	Action	Progress
13	Work with key partners in the GLA to explore the feasibility and delivery of air-quality-positive development particularly around our Focus Areas.	<p>The Local Plan requires that ‘Development proposals in Air Quality Focus Areas (AQFAs) or development proposal that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure following London Plan policy SI 1: Improving air quality’.</p> <p>In March 2021 the Greater London Authority (GLA) published Air Quality Positive Guidance for consultation. The guidance was adopted in February 2023.</p> <p>The Air Quality Positive approach aims to maximise benefits to local air quality in and around a large-scale development sites and masterplan area while also minimising exposure to existing sources of poor air quality. It requires planners, designers, architects, and air quality experts to demonstrate what measures have been taken during the design stages to achieve the best possible outcomes for air quality.</p> <p>In 2022 the Greater London Authority reassessed and updated the Air Quality Focus Areas (AQFA) based on the 2019 London Atmospheric Emissions Inventory and borough feedback. In Merton one AQFA was removed from Raynes Park and a new AQFA created in Wimbledon Park. The existing 4 AQFAs are mapped below. AQFAs are locations that not only exceed the EU annual mean limit value for nitrogen dioxide (NO₂) but are also locations with high human exposure. AQFAs are not the only areas with poor air quality but they have been defined to identify areas where currently planned national, regional, and local measures to reduce air pollution may not fully resolve poor air quality issues.</p>

Measure	Action	Progress
		<p data-bbox="734 272 2011 344">Focus Areas LAEI 2019 in Merton</p>  <p data-bbox="734 1054 2018 1129">Available on the data store https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2019-air-quality-focus-areas.</p>
14	Ensure that new development contributes to funding air quality measures in the borough through	Merton's submitted Local Plan has embedded that the council states clearly that the council will seek financial contributions using Planning Obligations towards air quality measures where a proposed development is not air quality neutral, or mitigation measures do not reduce the impact upon poor air quality. This approach is supported by the new Air Quality Neutral Guidance published by the GLA in February 2023.

Measure	Action	Progress
	Section 106 and CIL payments.	In 2023 the Air Quality Team successfully obtained Section 106 funding from large scale developments to fund new air quality measure, details are reported in Table L.
15	Ensure that new development have a scheme of mitigation for tackling air quality including traffic reduction and low emissions strategies.	The effective delivery of this action falls across several teams within the council including Air Quality, Climate change and Transport. Linked to Actions 10-14. All major developments require an Air Quality Assessment to include an Air Quality Neutral Assessment. If the development is not neutral for building and/or transport emissions and the proposals cannot be changed to achieve air quality neutral status, mitigation is conditioned through the planning process to reduce the impact on air quality.
16	Produce and promote guidance to homeowners on what they can do to their homes to help reduce pollution in the borough.	<p>In November 2020, Merton Council approved Merton's Climate Strategy and Action Plan which sets out how a framework to achieve a net-zero carbon borough for 2050 and a net-zero carbon Council by 2030. It sets out the major transitions that need to take place in the borough to buildings, transport, and the economy. The action section on pages 10 and 11 contain a high-level but comprehensive set of actions that can be taken to reduce emissions targeted at those who own their own home, landlords, businesses, and other organisations and how the council will support. These include reducing energy consumption and electrifying heating, both of which are likely to reduce the air pollution impact of boilers; responsible for about 1/5 of NOx emissions in the UK.</p> <p>Merton's Climate Delivery Plan Year 3 was adopted in March 2023 and the progress made in 2023 has been reported in the Climate Delivery Plan – Year 4. To support delivery and expand climate considerations to every part of the council, 8 workstreams were established in the council's delivery plan including retrofit of the residential and non-residential building stock (Workstream 2).</p> <p>In 2023, the key areas of progress for workstream 2 at Merton Council included:</p> <ul style="list-style-type: none"> • Lobbying central and regional government for appropriate policies and funding schemes to support retrofit through the South London Partnership and London Councils Retrofit London work programme.

Measure	Action	Progress
		<ul style="list-style-type: none"> • Working with local energy advice partner, Thinking Works, to support fuel poor households in accessing national and regional funding to retrofit their homes. • Running a Housing Association Retrofit and Skills Event in February 2023 to share lessons learnt and discuss challenges and opportunities for collaboration in decarbonising the social housing stock in Merton. • Supporting Housing Associations in bidding for national retrofit funding schemes (e.g. Social Housing Decarbonisation Fund). • Working with the Buildings and Energy sub-group of Merton's Climate Action Group to promote energy efficiency and retrofit by developing case studies and delivering the Energy Matters project in Merton schools in partnership with the Centre for Sustainable Energy. • Recruiting additional capacity to lead on the enforcement of Minimum Energy Efficiency Standards (MEES) in Merton's Private Rental Sector. • Commissioning a delivery partner for Merton's new Home Energy Efficiency Loan Scheme. • Starting to develop retrofit guidance for homeowners in Merton. • Bidding for various funding schemes for retrofit projects.
17	Consider how we can extend the provision of vehicle charging to smaller residential development to ensure the borough is ready for electric vehicles.	<p>Merton has continued to develop transport policies including through the submission of Merton's New Local Plan¹, which strengthens the focus towards active and sustainable travel, in accordance with the Mayor's Transport Strategy², the new London Plan³ and the Government's recently published Decarbonising Transport strategy⁴.</p> <p>In 2023, a total of 769 EV charging points were active in the borough. Including the installation of 530 lamp column EV charge points across the borough.</p> <p>Secured government LEVI funding for a future project to deliver fast charge points and to address any gaps in the existing network.</p> <p>Commissioned a consultant to develop Merton's EV charging strategy and</p>

Measure	Action	Progress
		<p>Merton's cycling and walking strategy</p> <p>(1) Merton Local Plan submission to the Secretary of State (2021 examination hearings held in 2022 and aiming for adoption 2024), available at: https://www.merton.gov.uk/planning-and-buildings/planning/local-plan/newlocalplan/localplan-submission</p> <p>(2) Mayor's Transport Strategy, available at: https://tfl.gov.uk/corporate/about-tfl/the-mayors-transport-strategy</p> <p>(3) Mayor's London Plan (2021), available at: https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/london-plan-2021</p> <p>(4) Department for Transport's Decarbonising Transport (2021), available at: https://www.gov.uk/government/publications/transport-decarbonisation-plan</p>
18	Continue to run our Non-Road Mobile Machinery (NRMM) Project.	<p>Successfully extended to 2025/26. Funded from GLA and recovered match-funding from all boroughs.</p> <p>Continued involvement with the Stage V and battery system refresh to the Generator Fleet. Many depot visits in industrial outreach and trade show attendances, increasing awareness and developing a cutting edge understanding of the innovative technologies pertinent to generator deployment. Numerous cluster group and industry presentations, articles and industry press etc.</p> <p>Mayors Air Quality Fund Round 4 secured to commence expansion in 2024/25 to 2026/27. This shall determine fleet profile baselines in Waste Transfer, Events and Street works, across the London area.</p>
19	Seek additional funding from DEFRA/GLA/Construction Industry to promote good practice on construction sites.	Funded as part of Action 18 – NRMM London Wide Project.
20	Request adoption of new techniques that have proven	<p><u>New major developments (Planning)</u></p> <p>For new major developments, both a Construction Logistics Plan and a Delivery and Servicing is requested.</p>

Measure	Action	Progress
	to be beneficial to air quality, such as Construction Logistics and Delivery and Service Planning.	<p><u>Business – green logistics</u></p> <p>Following on from the 2022 Defra funded Clean Air Villages 4 project: https://crossriverpartnership.org/wp-content/uploads/2022/07/CAV4-Case-Study-Merton-Cargo-Bike-Business-Engagement-web-document-12.pdf</p> <p>The Smarter Greener Logistics (SGL) - Collaborating for Clean Air project commenced in July 2023. It will be active over the period 1st July 2023 – 31st December 2024 and will deliver ambitious Logistics Elements for a continued Clean Air business recovery from COVID-19. SGL will share lessons between partners, geographical areas, elements, and sectors, for maximum take-up of successful initiatives and impacts. The focus of the SGL project in Merton is Willow Lane industrial estate. For further information please refer to the new projects section at the end of Table K.</p>
21	Review the Council's allocation of the Section 106 and CILs budget to see if this can provide funding to benefit air quality measures.	<p>Merton's Air Quality Supplementary Planning Document (SPD) was adopted in June 2021 and includes Section 106 arrangements.</p> <p>Planning Obligation (often called s106 agreements) are agreements with developers for the provision of site-specific mitigation measures necessary to ensure a development meets the requirements of the Local Plan and for a number of areas including affordable housing, local training, skills, job brokerage and the obligation of Merton's Air Quality Action Plan. Merton's Planning Obligation SPD explains how obligations are used. £92k Strategic CIL has been allocated to the provision of air quality monitoring stations at four locations across the borough, delivery, and expenditure during 2023-24.</p>
22	Continue to request robust and enforceable measures to minimise the impact of developments during the construction phase	<p>All major developments are required to submit an Air Quality Assessment at the planning application stage. The AQA informs of the mitigation measures required to minimise the impact during demolition and construction. The requirements identified are then secured by a Construction Environmental Management Plan planning condition. Sites are considered for construction dust on a case-by-case basis, particulate matter (PM₁₀) monitoring and locations are agreed where a moderate or high risk to receptors are identified. Monitoring requirements can be included in the CEMP. All major developments are also required to have compliant Non-Road Mobile Machinery onsite, this is secured through an NRMM planning condition.</p>

Measure	Action	Progress
23	Commitment to a cycle Quiet-way between Clapham Common & Wimbledon forming the Merton section of the Wandle trail.	Not progressed in 2023. However, Merton Council will be looking into Wayfinding Signage for this route and others in the Borough. The Wayfinding will need to follow Transport for London criteria.
24	Review funding available through Section 106 and CILs around transport and travel infrastructure.	Where necessary for development to take place, Merton seeks section 106 contributions towards transport and travel infrastructure. In London all boroughs pay Community Infrastructure Levy towards Crossrail. Transport improvements around individual sites are provided through funding from developments (via Section 278 legal agreements). Since 2019 Merton's Neighbourhood fund has sponsored Merton Chamber of Commerce's "Community Champions" programme, one of whose roles was raising awareness of actions residents could take to improve air quality
25	Carryout a borough wide cycling network audit to review and update the network.	Cycling is part of Merton's Local Improvement Plan 3, delivering the Mayor's Transport Strategy. Merton's Local Implementation Plan (LIP) to deliver the Mayor of London's transport strategy was formally signed off by Transport for London in August 2019. This third Local Implementation Plan set out Merton Council's three-year delivery programme for the period 2019/20 to 2020/22 and outlined an indicative programme through to 2041. https://www.merton.gov.uk/streets-parking-transport/lip3 A cycling strategy will be developed by 2023 as set out in the Climate Strategy Action Plan . In 2023, a delivery agent was assigned to deliver Cycling strategy and at the time of writing this was ongoing.
26	Programme of installing bicycle infrastructure	In 2023 the following installations were completed: <ul style="list-style-type: none"> • Plough Lane segregated cycle lane. • Merton High Steet - Temporary cycle lane defenders were removed and replaced with a stepped cycle track.

Measure	Action	Progress
		<ul style="list-style-type: none"> • Haydons Road Bridge - Temporary cycle lane defenders were removed and replaced with a stepped cycle track. • Deen City Farm: Path between tram and crossing completed. A section of path along the Wandle between Deen City Farm and Merantun Way has also been completed. • Commonside West: At the time of writing a shared-use path on Three Kings Piece is currently in the process of being completed. <p>Other work streams:</p> <ul style="list-style-type: none"> • Consulted on a shared pedestrian route on Commonside West and a pedestrian crossing at Madeira Road. • Conducted feasibility, design, and consultation for a major active travel scheme along the length of Streatham Road. • Identified schemes for Merton's Local Implementation Plan (LIP) bids for FY24/25.
27	Feasibility study to consider the use of Clean Air Zones (CAZ's) or a Merton Specific Ultra Low Emission Zone for Focus Areas and beyond	The Ultra Low Emission Zone was expanded on the 29 th of August 2023 to cover all London Boroughs. This strategic approach to reducing emissions across London supersedes borough level CAZs.
28	Air Quality Audit traffic and congestion in our three air quality focus areas.	Air quality and traffic data collected in 2022 for the Innovate project (refer to Action 7) has been reviewed in 2023 and included in a committee paper submitted on impact of transport and air quality. As part of the South London Innovate Project, 68 Vivacity traffic monitoring sensors were set up throughout the borough to help us understand transport composition and traffic movements in the borough the data collected in 2022 was reported in the Overview and Scrutiny Committee in 2023. Traffic count data collected over a 6-month period 01/08/22 - 31/01/23, when data for sensors located in Plough Lane and Crown Lane were analysed the HGV

Measure	Action	Progress
		to car ratio was found to be 1:56 and 1:54 respectively. The outcome highlights the continued need to tackle emissions from non-commercial vehicles.
29	Support and promote the use of a cleaner vehicle checker to inform the public of cleaner vehicle choice.	<p>https://www.merton.gov.uk/streets-parking-transport/scrap-a-vehicle</p> <p>Merton Council's website provides information on the Mayor of London's Ultra Low Emission Zone (ULEZ) expansion, which from the 29th of August 2023 included Merton.</p> <p>Information includes the vehicle scrappage schemes available from the Mayor of London and Merton Council for vehicles that don't meet the ULEZ emissions standards.</p> <p>Merton's scrappage scheme</p> <p>In September 2023, Merton Council launched a £1m local vehicle scrappage scheme for Merton residents wanting to swap their higher-polluting cars for a sustainable alternative, but who are struggling with the cost-of-living crisis.</p> <p>A £1000 grant per vehicle is now available to help residents in the poorest areas in our community that are not well connected by public transport, provided their car meets the Transport for London (TfL) scrappage criteria. The grant is also available for Merton's hardworking carers.</p> <p>Check your vehicle</p> <p>The council website includes a link to the TfL website for residents to check if their vehicle meets emissions and safety standards required to drive in the ULEZ, or if they need to pay a daily charge.</p>
30		<p>The Mayor's Transport Strategy (MTS) was published in March 2018. Proposal 29 sets out timeframe as to how the mayor will clean London's bus fleet and that by 2037 all TfL buses will be electric or hydrogen. Merton Council continues to lobby for a greater share of TfL bus fleet investment to be targeted towards providing zero emission vehicles on the most polluted routes passing through this borough. We believe that TfL's MTS target does not go far enough and that the bus procurement programme should be accelerated so that the whole of greater London can enjoy the benefits of cleaner buses much sooner.</p>

Measure	Action	Progress
	Lobby for Cleaner Buses and Taxis	<p>Individual bus route contracts are typically retendered on a rolling 5-to-7-year basis. Merton Council strongly believes that all new bus service contracts should explicitly stipulate the purchase of only electric or hydrogen buses now (or hybrid double deckers, if cleaner alternatives are not available at the time). It is also noted that from 2020 TfL will buy only electric or hydrogen single deck vehicles and all double deckers meet Euro VI standard as a minimum.</p> <p>Current low emission electric bus routes in the borough include 200, 413 and 264. Fully converted: 93, 154, 164, 200, 264, 413, Partially converted: 80, 163. Source https://tfl.gov.uk/info-for/media/pressreleases/2023/august/london-reaches-major-milestone-with-morethan-1-000-zero-emission-buses</p>
31	Introduce Air Quality initiatives, benefits and monitoring in the new South Wimbledon Junction design and build.	<p>Not progressed due to lack of Transport for London Funding. No additional updates.</p> <p>South Wimbledon junction will be reviewed in line with the Healthy Streets objectives, which include sustainable transport and improved air quality. All measures that are funded via the Mayor's Transport Strategy (LIP) will be considered against the healthy streets agenda and objectives.</p>
32	Review the impact of our diesel levy* and consider a review of parking and charges to help reduce combustion engine vehicle use and the consequent emissions.	<p>In April 2017, Merton took the innovative and bold decision to implement a diesel levy on parking permits to encourage drivers/owners in Controlled Parking Zones (CPZs) to move away from diesel vehicles.</p> <p>Expansion of the Ultra Low Emission Zone (ULEZ) on the 29th of August 2023 is expected to significantly accelerate the reduction in diesel vehicles registered in CPZs.</p> <p>Merton also offers an incentive for CPZ residents to change to electric vehicles. Permits for these cars are offered at a subsidised price of £20 per annum.</p>

Measure	Action	Progress																																																														
	<p><i>*Note: The Sustainable Communities and Transport Overview and Scrutiny Panel to conduct pre-decision scrutiny on the scope of any reviews on parking levies.</i></p>	<table border="1" data-bbox="730 288 1933 786"> <thead> <tr> <th data-bbox="730 288 902 400">Period</th> <th data-bbox="902 288 1043 400">Petrol</th> <th data-bbox="1043 288 1184 400">% of total sales</th> <th data-bbox="1184 288 1326 400">Diesel</th> <th data-bbox="1326 288 1487 400">% of total sales</th> <th data-bbox="1487 288 1650 400">Electric</th> <th data-bbox="1650 288 1798 400">% of total sales</th> <th data-bbox="1798 288 1933 400">Total</th> </tr> </thead> <tbody> <tr> <td data-bbox="730 400 902 464">2017/18</td> <td data-bbox="902 400 1043 464">13,345</td> <td data-bbox="1043 400 1184 464">70%</td> <td data-bbox="1184 400 1326 464">5,578</td> <td data-bbox="1326 400 1487 464">29.5%</td> <td data-bbox="1487 400 1650 464">23</td> <td data-bbox="1650 400 1798 464">0.5%</td> <td data-bbox="1798 400 1933 464">18,946</td> </tr> <tr> <td data-bbox="730 464 902 528">2018/19</td> <td data-bbox="902 464 1043 528">14,332</td> <td data-bbox="1043 464 1184 528">70%</td> <td data-bbox="1184 464 1326 528">5,990</td> <td data-bbox="1326 464 1487 528">29.4%</td> <td data-bbox="1487 464 1650 528">51</td> <td data-bbox="1650 464 1798 528">0.6%</td> <td data-bbox="1798 464 1933 528">20,373</td> </tr> <tr> <td data-bbox="730 528 902 592">2019/20</td> <td data-bbox="902 528 1043 592">14,107</td> <td data-bbox="1043 528 1184 592">73%</td> <td data-bbox="1184 528 1326 592">5,025</td> <td data-bbox="1326 528 1487 592">26%</td> <td data-bbox="1487 528 1650 592">112</td> <td data-bbox="1650 528 1798 592">1%</td> <td data-bbox="1798 528 1933 592">19,244</td> </tr> <tr> <td data-bbox="730 592 902 655">2020/21</td> <td data-bbox="902 592 1043 655">16,108</td> <td data-bbox="1043 592 1184 655">73%</td> <td data-bbox="1184 592 1326 655">5,565</td> <td data-bbox="1326 592 1487 655">25%</td> <td data-bbox="1487 592 1650 655">263</td> <td data-bbox="1650 592 1798 655">2%</td> <td data-bbox="1798 592 1933 655">21,936</td> </tr> <tr> <td data-bbox="730 655 902 719">2021/22</td> <td data-bbox="902 655 1043 719">17,461</td> <td data-bbox="1043 655 1184 719">75%</td> <td data-bbox="1184 655 1326 719">5,248</td> <td data-bbox="1326 655 1487 719">22.5%</td> <td data-bbox="1487 655 1650 719">504</td> <td data-bbox="1650 655 1798 719">2.5%</td> <td data-bbox="1798 655 1933 719">23,213</td> </tr> <tr> <td data-bbox="730 719 902 783">2022/23</td> <td data-bbox="902 719 1043 783">17,955</td> <td data-bbox="1043 719 1184 783">77%</td> <td data-bbox="1184 719 1326 783">4,697</td> <td data-bbox="1326 719 1487 783">20%</td> <td data-bbox="1487 719 1650 783">738</td> <td data-bbox="1650 719 1798 783">3%</td> <td data-bbox="1798 719 1933 783">23,390</td> </tr> </tbody> </table> <p data-bbox="730 911 2022 1034">Since the introduction of the diesel levy, in conjunction with the proposed extension of the ULEZ, there has been a reduction of over 9% in the proportion of permits issued to diesel vehicles. During the same period the proportion of permits issued to electric vehicles has increased from around 0.5% to 3.1%.</p> <p data-bbox="730 1050 1977 1129">Future proposals may seek to raise the cost of parking permits for the highest carbon-emitting vehicles, to address the challenge of the climate emergency.</p> <p data-bbox="730 1145 2022 1268">Merton ownership of Ultra Low Emission Vehicles for 2023 were 3,940 (includes both private and company Battery EVs and plug-in hybrids) and the Merton ownership of Battery Electric Vehicles were 2,415 (including both private and company Battery EVs).</p>							Period	Petrol	% of total sales	Diesel	% of total sales	Electric	% of total sales	Total	2017/18	13,345	70%	5,578	29.5%	23	0.5%	18,946	2018/19	14,332	70%	5,990	29.4%	51	0.6%	20,373	2019/20	14,107	73%	5,025	26%	112	1%	19,244	2020/21	16,108	73%	5,565	25%	263	2%	21,936	2021/22	17,461	75%	5,248	22.5%	504	2.5%	23,213	2022/23	17,955	77%	4,697	20%	738	3%	23,390
Period	Petrol	% of total sales	Diesel	% of total sales	Electric	% of total sales	Total																																																									
2017/18	13,345	70%	5,578	29.5%	23	0.5%	18,946																																																									
2018/19	14,332	70%	5,990	29.4%	51	0.6%	20,373																																																									
2019/20	14,107	73%	5,025	26%	112	1%	19,244																																																									
2020/21	16,108	73%	5,565	25%	263	2%	21,936																																																									
2021/22	17,461	75%	5,248	22.5%	504	2.5%	23,213																																																									
2022/23	17,955	77%	4,697	20%	738	3%	23,390																																																									
33	We will continue to support, fund and promote airText and	Merton continues to fund airText a publicly available air pollution forecast service.																																																														

Measure	Action	Progress
	other health-based initiatives in the borough.	https://www.airtext.info/ An application was made to the Defra Air Quality Grant 2023: Raising Awareness and Enabling Behaviour Change to Reduce Exposure in London Polluted Areas Project. Following the announcement that the application had been successful the funding was withdrawn. We continue to seek new avenues and funding streams to deliver this type of workstream with Public Health colleagues. Refer to Action 39 for further information.
34	We will continue to support and update information on our Love Clean Air Website.	The 'South London Cluster Group' formed of Bromley, Croydon, Kingston, Lewisham, Merton, Richmond, Sutton, and Wandsworth councils worked together to create Love Clean Air to promote air quality in the region. Love Clean Air is all about letting you know how clean the air is in South London, and what you and others can do to make it even cleaner. A complete refresh is planned for 2024/25. https://lovecleanair.org/
35	We will review and update our own corporate website to include themed initiatives.	Council Communications Plan reviewed to keep air quality a running feature.
36		Clean Air Day – 15th June 2023 On Clean Air Day itself an awareness raising event took place in the centre of Wimbledon on the piazza. The air quality officers informed the public about the benefits of active travel and encouraged people to walk, cycle, and scoot; to consider using public transport more; and to use private/personal vehicles less. Other topics discussed included idling and wood burning with a plethora of air quality literature available for the public to take away and digest. All equipment for the day was transported to the venue with the assistance of a cargo bike. The air quality officers were joined by Dr Bike, who was offering free bike checks and repairs, the police

Measure	Action	Progress
	<p>We will play an active and co-ordinating role in national and regional campaigns such as National Clean Air Day.</p>	<p>marking initiative, officers from the Climate Change team and members of Sustainable Merton (environmental charity) providing services and information.</p> <p>Junior Citizen – 5th – 9th June 2023</p> <p>The Junior Citizen Scheme is a partnership initiative aimed at giving young children the skills to deal with a wide range of emergency situations, and to enable them to make a valued contribution to their local community through good citizenship. The Air Quality team worked alongside London Fire Brigade, Police, Transport for London, and Merton Cycling during the weeklong event. The partner organisations put the year 6 students through life-like scenarios and workshops to arm them with life skills to prepare them for secondary school and adulthood. The Air Quality team held an air pollution and idling workshop, which involved educating the students on air pollutants and teaching them how to improve air quality and how to reduce exposure to air pollutants.</p> <p>Mitcham Carnival – 25th June 2023</p> <p>More than 5,800 residents came to Mitcham Carnival where the air quality team promoted active travel, discussed the borough’s air, and answered any questions from residents.</p> <p>Canons Sustainable Summer Fair – 29th July 2023</p> <p>Officers from the Air Quality Team attended Merton’s Sustainable Fair at Canons House in Mitcham to engage with the public to promote active travel and discuss air quality topics.</p> <p>The Big Merton Help Out</p> <p>The Big Help Out is a National Day of Volunteering and the Merton event was held on the 8th of May, the bank holiday Monday of the Coronation weekend.</p>

Measure	Action	Progress
		The community volunteering day took place at Three Kings Piece, Mitcham, where volunteers, including members of the air quality team helped to plant wildflower beds and build habitats for local wildlife.
37	Continue to aspire to London's Cleaner Air Borough status award.	As a Beacon borough, key focus areas in Merton include Non-Road Mobile Machinery, School Air Quality Audits, Idling Action, and Wood Burning.
38	Ensure that the good work and best practice we are delivering is publicised and disseminated to colleagues in the air quality industry.	<p>Merton has successfully obtained funding to continue the ground-breaking Non-Road Mobile Machinery (NRMM) project into 2025. This operates throughout London as Cleaner Construction. Best practice is shared with stakeholders including London Boroughs, the GLA and construction industry.</p> <p>Learnings in the non-road sector have been shared within the Westminster Commission for Road Air Quality, of which Merton is a member and active participant.</p> <p>Over 6 presentations have been given to construction industry SHEQ teams, in training events provided by the NRMM Project Team.</p> <p>The NRMM Team have commenced a regular column in the generator industry trade magazine published for AMPS.</p> <p>Presentations given to the Defra, IAQM and IEH national events.</p> <p>The team continues to be involved with the utilisation of Hydrogen in the zero-carbon journey, present and participative at numerous events and platforms, as well as the launch of the Westminster Commission Hydrogen Working Party.</p> <p>The Air Quality Team publishes a quarterly 'Air Quality Newsletter' showcasing the work undertaken in the field. The newsletter is circulated to both internal and external partners and is very positively received.</p>

Measure	Action	Progress
39	Work closely with our Public Health colleagues around joint health benefits.	<p>We work closely and meet regularly with colleagues in Public Health including Directorship. Almost all air quality initiatives are now linked to the public health agenda.</p> <p>In 2023 the Health and Wellbeing Board identified a priority for Air Quality, Tobacco and Respiratory Health and a task and finish group was formed to create an organisational wide action plan covering areas such as: Love Clean air and Health, Indoor air quality, Active and Sustainable Travel Planning, The Mayor of London's Good Work Standard, Schools, Air quality and Asthma which includes a joint project with the Air Quality Team, SWL ICB, CLCH and Public Health to understand the impact of air quality on children's asthma which will be reporting at the end of 2024. Communication and Awareness and Community of Practice - multi-agency learning.</p> <p>An application was made to the Defra Air Quality Grant 2023: Raising Awareness and Enabling Behaviour Change to Reduce Exposure in London Polluted Areas Project.</p> <p><u>Project Objective</u></p> <p>Making vulnerable people of the population aware of their exposure levels whilst walking in polluted areas of London and communicating to them the health benefits of choosing lower exposure routes ensures that individuals can take effective action to protect their health from air pollution. School children in particular areas of London walk to school through very busy roads which, especially if they are asthmatic, should be avoided given the high level of traffic emissions and resuspension along such routes.</p> <p>As such, the objective of this Project is to raise awareness and enable behaviour change to reduce exposure in polluted areas by improving local knowledge and information about air quality near places where vulnerable groups of the population tend to go to, targeting schools, health centres/GPs and hospitals located in areas of poor air quality and conveying such local information to the users of these locations (school children, parents, health practitioners). Simultaneously, the project aims to directly engage with health practitioners so they can</p>

Measure	Action	Progress
		<p>both understand the reduced exposure levels that can be achieved by selecting lower exposure routes in comparison to higher exposure routes and disseminate this information to sensitive individuals at their practices, complemented with tailored information provided by the project team on the health benefits achieved by doing so and the risks of air pollution.</p> <p>Lead Borough: London Borough of Merton</p> <p>Borough Partners: 6 (including RSP: Richmond and Wandsworth)</p> <p>Following the announcement that the application had been successful the funding was withdrawn. We continue to seek new avenues and funding streams to deliver this type of workstream with Public Health colleagues.</p>
40	Establish a borough-wide air quality group.	Localised air quality actions such as nitrogen dioxide diffusion tube monitoring were delivered in 2023 through citizen science groups. Data Appendix D
41	Establish an internal steering group within the local authority.	<p>The steering group includes colleagues from Public Health and Climate Change. The steering group will be refreshed as part of the new Air Quality Action Plan (2024-2029).</p> <p>A cross party working group was planned to be established in 2023/2024 as part of the development of the new AQAP, this was pushed back into 2024.</p>
42	Provide internal training sessions on air quality to internal partners and Councillors.	Not progressed during 2023 due to resourcing. Carried forward to 2024.
43	Co-ordinate air quality funding and lobby national government to provide further	We actively respond to all consultations and initiatives, locally, regionally, and nationally to raise the issues of air quality and the support needed for Local Authorities.

Measure	Action	Progress
	financial and strategic support for local authorities to improve air quality.	In response to consultations the Air Quality Team liaises with the Association of Public Health Directors, London Councils, Local Government Association and has an established working relationship with the Greater London Authority.
44	Lobby Transport for London (TfL) for action on cleaner buses and taxis in our Air Quality Focus Areas.	This is a priority for the borough and an action we continue to do through partnership meetings with TfL. The Ultra Low Emission Zone (ULEZ) was expanded to all London Boroughs from the 29 th of August 2023. The ULEZ applies to cars, motorcycles, vans, and specialist vehicles (up to and including 3.5 tonnes) and minibuses (up to and including 5 tonnes).
45	The Director of Public Health (DPH) to be kept fully updated on air quality status and initiatives.	The Air Quality Team regularly meets with working group Air Quality and Health Delivery Group to share Best Practice. Links to Action 39: Health and Wellbeing Board - air quality priority.
46	Public Health teams to support engagement and projects aimed at local stakeholders (businesses, schools, community groups and healthcare providers).	<p>Superzone project:</p> <p>The Superzone project engages primary school communities, including pupils and parents, to start conversations about the local environment how it impacts their wellbeing. Issues raised during engagement activities included traffic congestion around school gates, air quality, safety concerns on walking routes due to poor lighting, under-use of green assets, litter, and the lack of public art and community ownership of public spaces.</p> <p>Over 2022/23 Public Health secured three grants for three primary schools to participate in the GLA School Superzone Programme.</p> <p>1. Merton Abbey Primary School began its active Travel Pilot in May 2022, and which completed in June 2023</p>

Measure	Action	Progress
		<p>2. Abbotsbury Primary began its safer travel / after school play space pilot in February 2023 and actions are in progress. The pilot is focused on the pupil's needs for safe passage to and from school via their local park, to redesign the Central reservation to be child friendly.</p> <p>3. St Mark's Primary began its pilot in January 2023 and has now largely been completed. This pilot is focused on reducing the threat of harm and hazards faced by the students, parents, and staff on the school run. This resulted in a multidisciplinary steering group meeting regularly to co-ordinate all council efforts to improve safety. Implemented measures include fencing and green up and area outside the school to reduce use by non-school residents, introducing a new light for safety and a ball court.</p>
47	All air quality policies to be signed off by the Director of Public Health and to form close links to Public Health objectives.	Ongoing.
48	Make air quality part of The Health & Wellbeing Strategy / Joint Strategic Needs Assessment (JSNA) – the Director of Public Health to be retained as a member of the Air Quality steering group.	The Director of Public Health released the Annual Public Health Report in 2022/2023. In June 2023 the Annual Public Health Report was reviewed by the Health and Wellbeing Board who identified a priority for Air Quality, Tobacco, and Respiratory Health. A task and finish group was formed to create an organisational wide action plan covering areas such as: Love Clean air and Health, Indoor air quality, Active and Sustainable Travel Planning, The Mayor of London's Good Work Standard, Schools, Air quality and Asthma which includes a joint project with the Air Quality Team, SWL ICB, CLCH and Public Health to understand the impact of air quality on children's asthma which will be reporting at the end of 2024. Communication and Awareness and Community of Practice - multi-agency learning.

Measure	Action	Progress
49	Review our procurement contracts for outsourced transport services and incorporate policies to establish the best and most cost-effective fleet possible.	<p>The Council continues to operate with c90 front line vehicles which are purchased through an agreed Capital programme.</p> <p>We are committed in our aim of being carbon neutral by 2030 and are currently seeking external funding for a power upgrade into the Garth Road transport depot. If successful we will look into the required infrastructure required to support a fully carbon neutral fleet of vehicles.</p> <p>With reference to the Council's outsourced service such as waste collection and street cleansing the current fleet is scheduled to be replaced in 2025.</p> <p>For more information Merton Council's fleet and transport policies are set out in Merton's climate strategy and action plan on pages 22-25 in relation to the borough, and 28 and 29 in relation to actions to electrify the Council fleet.</p> <p>At the time of writing (May 2024) a full fleet analysis was in progress with a view to have recommendations for future fleet purchases, the report will be finalised and submitted to Cabinet in the summer 2024.</p>
50	Review our maintenance and servicing arrangements for our buildings to ensure that these are as energy efficient and cost effective as possible.	<p>Initial Public Sector Decarbonisation Scheme (PSDS) programme has provided funding for the installation of 4 PV batteries, which will lower utility consumption on site by increasing use of renewable technology. A second PSDS bid has been successful for the upgrading of heating in the civic centre to a low carbon system which will reduce emissions from the site. This work is funded till end March 2025.</p> <p>Site energy surveys have been undertaken on 20 sites to start preparing sites for climate emergency targets.</p> <p>Update - Solar Panel installations on operational buildings being started and continuing into 2024 and beyond.</p> <p>Work on LED installation on remaining operational sites being started.</p> <p>Second PSDS scheme is underway now, with heating system designs being carried out throughout 2023.</p>

Measure	Action	Progress
51	Ensure all new build and extensions within the council portfolio are to the highest, most efficient standards possible within the allocated budget.	See Action 50
52	Encourage more walking, cycling and use of public transport for council business and review active travel plan for all staff.	Merton Council have a fleet of electric and non-electric bikes for staff and investment in new Brompton bikes that can be taken on public transport to move staff away from private vehicle use Merton also offer a business mileage scheme for cycling, to push staff towards cycling. Our Cleaner Construction project (NRMM) operates a Brompton bicycle loan scheme for staff to travel across London sustainably by public transport and bicycle.
53	Review staff parking to reduce the use of personal vehicles.	At the time of writing (May 2024), a review of travel plan and staff parking was in progress to advise on the options available. Robust assessment of the need for justification of personal vehicles.
54	Recruit an Air Quality Officer, funded by our Diesel Surcharge.	Completed.
55	We will work closely with our Public Health colleagues to keep up to date with the latest research relating to air quality and health.	Regularly meet with the working group Air Quality and Health Delivery Group to share Best Practice. As the Air Quality team sit within the Regulatory Services Partnership formed of Merton, Wandsworth, and Richmond, we have the added benefit of sharing knowledge and expertise across all three partner boroughs.

Measure	Action	Progress
56	<p>We will work closely with Imperial College London*, the Greater London Authority and APRIL (Air Pollution Research in London – air quality expert group) to review the latest monitoring techniques.</p> <p>*Formerly King’s College London</p>	<p>Annual meetings attended by Air Quality Officers.</p> <p>The low-cost air quality sensor (Breathe London Node) network (refer to Action 7) is managed by Imperial College London. We continue to work closely with Imperial to maximise the benefit of the new monitoring network.</p>
57	<p>Apply for grant schemes and incorporate new technologies and best practice.</p>	<p>Funding applications 2023/24:</p> <p>Successful Round 4 of the Mayor’s Air Quality Fund (MAQF R4) multi-borough applications</p> <p><u>Idling Action Project</u>: A collaboration between 20 boroughs to reduce commercial sector vehicle engine idling by engaging with fleet operators, driving instructors, and policymakers.</p> <p><u>Non-Road Mobile Machinery (NRMM) Beyond Construction</u>: A pilot scheme to research the impact of NRMM used on roadworks, licensed events, and waste sites to inform London boroughs’ efforts to reduce associated emissions.</p> <p><u>London Woodburning Project</u>: A project to create a pan-London training scheme to enforce smoke control areas for borough officers, building on the success of previous work to reduce emissions from wood burning.</p> <p>Unsuccessful Round 4 of the Mayor’s Air Quality Fund (MAQF R4) multi-borough funding applications</p> <p>Innovation in Managing Air Pollution from Waste Sites in London</p>

Measure	Action	Progress
		<p>Citizen Science for Local Air Quality Actions</p> <p>Successful DEFRA Air Quality Grant 2023 funding applications: <u>Smarter Greener Logistics (SGL)</u> – Collaborating for Clean Air (Commenced July 2023 – refer to the end of Table M for further information). <u>London Household Indoor Air Quality Monitoring Project</u>. Unfortunately, the funding was later withdrawn. <u>Raising Awareness and Enabling Behaviour Change to Reduce Exposure in London Polluted Areas Project</u>. Unfortunately, the funding was later withdrawn.</p> <p>Unsuccessful DEFRA Air Quality Grant 2023 funding applications London Wood Burning Project. However, this piece of work is being funded through the Mayor of London Air Quality Fund.</p>
58	Disseminate and publicise our ground-breaking work around schools and Non-Road Mobile Machinery (NRMM).	<p>This major piece of work is ongoing through working with partner boroughs and the Greater London Authority. Details provided against Action 38.</p> <p>Continue to deliver and implement the Pan London NRMM Low Emission Zone. Delivered many training events to industry stakeholders. Presented at numerous Air Quality events for the Greater London Authority, City of London, Air Quality Cluster Groups, and other stakeholders.</p>
59	Anti-idling to be adopted as an enforcement action in the borough with associated signage in problem areas.	<p>Prior to 2023 over 200 anti-idling signs were installed in the borough at schools, level crossings and taxi ranks. A further 18 No Idling signs were installed in 2023 following a comprehensive review of idling complaints received by the Pollution Team.</p> <p>An Anti-Idling Action Plan (AIAP) was created in 2021, the plan covers internal and external partner engagement, communications, signage, and events. The plan aims to deliver one event each month of the</p>

Measure	Action	Progress
		<p>year (excluding July and August). Events are primarily delivered by Air Quality Officers and focus on idling hotspots such as level crossings and schools but also in response to complaints. The air quality officers are supported by volunteers, including councillors and members of resident's associations at certain events, particularly the level crossing events when there is likely to be tailbacks of queuing traffic. The officers are also supported by students at school idling action events, who approach drivers and encourage them to switch off.</p> <p>Ten anti-idling events were delivered during 2023, four of those events took place at level crossings in the borough, four events took place around school sites, and the other two events were held following a resident's association raising concerns about a particular area, the other event materialised following a councillor request. The AIAP is a live document and continues to be implemented in 2023.</p> <p>Behavioural Insights project to investigate the impact that active signage had on idling vehicles queuing at West Barnes Lane Level Crossing was successfully delivered in 2022. The sign was installed in June 2022 and was found to have a statistically significant impact on the number of drivers turning off their engine whilst waiting at the barrier. The full project report is published on the LGA website: https://www.local.gov.uk/case-studies/using-behavioural-insights-improve-air-quality-london-borough-merton</p>
60	Start partnership working with the GLA and surrounding boroughs on anti-idling campaigns.	<p>Following the end of the pan-London Idling Action project in March 2022 which was funded by the Mayors Air Quality Fund. In 2023, joined the funding application for the 4th round of Idling Action London, Apr-24 to Mar-27. The bid was successful.</p> <p>The next phase of the Idling Action project will focus on commercial / fleet focus, plus an additional run/s of 'Engine Off Every Stop' campaign and training, lobbying and policy activities to improve idling enforcement in the participating boroughs.</p>

Measure	Action	Progress
61	Work with neighbouring boroughs to consider tighter restrictions on bonfires.	<p>Ongoing:</p> <p>Considering options and lobbying for greater powers. There is political reluctance to introducing new bye laws to tackle bonfires. Merton are instead using lobbying powers for a new Clean Air Act to cover all domestic burning, both indoors and outdoors.</p>
62	Conduct campaigns relating to wood burning appliances and seek additional funding from DEFRA to carry out an impact assessment and explore further controls.	<p>We continue to lobby for tighter regulations on wood burning appliances.</p> <p>Funding awarded by DEFRA in 2022 for a London Wood Burning Project. Active dates April 2022 – March 2024.</p> <p>The Council understand that solid fuel burning is a major source of PM_{2.5} that must be controlled at the local level. Domestic burning is the second largest contributor to PM_{2.5} in Merton after road transport at 25%. Addressing this source is crucial for achieving the WHO guideline levels for PM_{2.5} by 2030. The Pollution Team investigate all domestic Smoke Control related complaints.</p> <p>Merton is part of the GLA engagement group on wood burning.</p> <p>A pan London media campaign was delivered through the project in Winter 2023/24 to raise awareness of health impacts for internal burning.</p> <p>An application to Round 4 of the Mayor Air Quality Fund (MAQF Round 4) was made in 2023 to expand the wood burning project, the bid was successful. The project commenced in May 2024 and will create a pan-London training scheme to enforce smoke control areas for borough officers, building on the success of previous work to reduce emissions from wood burning.</p>
63	Deliver cleaner construction throughout London through	<p>In London the NRMM project is funded by the Greater London Authority (GLA) and match funding from participating London Boroughs.</p> <p>The London NRMM project operates as Cleaner Construction for London (CCFL). The CCFL scheme, which has been running since 2016, allows for the machinery to be removed from site or work to be stopped until</p>

Measure	Action	Progress
	our Non-Road Mobile Machinery (NRMM) project and extend this nationally.	<p>equipment that complies with local air quality standards is brought in. Despite numerous presentations at national events, plans to roll out the scheme across the country, have not yet come to fruition due to the difficulties local authorities have in balancing books for statutory services. Modelling currently shows almost a halving of emissions from construction machinery due to the fleet upgrade that has taken place in London.</p> <p>Funding was obtained from the Round 4 MAQF to expand activities to include events, street works and waste facilities. This shall form a sibling 'Beyond Construction Project' running from 24/25 to 26/27. The project seeks to determine the baseline profile of fleet in these sectors, and whether a forthcoming implementation of a regulatory framework shall offer any significant AQ benefits.</p>
64	Assess and inspect newly installed CHPs (Combined Heat and Power) to ensure compliance with planning conditions.	Not progressed during 2023. There is no resource available to perform this function.
65	Maintain our ongoing commitment to school travel plans and the STARS review.	<p>In 2023, the focus was on gold schools and either building towards from silver or maintaining gold accreditations. Merton continues to operate School Streets but have no plans currently to extend to other schools.</p> <p>The accreditation split is as follows:</p> <p>Gold: 14</p> <p>Silver: 3</p> <p>Bronze: 3</p>

Measure	Action	Progress
		<p>Engaged: 3</p> <p>Not Engaged 89</p>
66	Carry out audits of schools in the most polluted areas of the borough and help provide a scheme of mitigation where necessary and possible.	<p>In 2023, 11 schools were contacted for an air quality assessment and 3 schools took up the offer.</p> <p>Desktop audits are in the pipeline for 2024 for the schools that do not engage.</p>
67	Review and assess annually the necessity for audits at schools and nurseries in areas subject to high levels of pollution.	<p>This work stream continued in 2023.</p>
68	Incorporate schools in areas of poor air quality into our monitoring network and regime.	<p>Completed.</p> <p>Based on the results of a 12-month air quality monitoring programme using nitrogen dioxide diffusion tubes, 9 school sites were added to the Council's main diffusion tube network in January 2021 and continue to be monitored. In 2023 one more school site was added to the monitoring network.</p>
69	Joint working arrangements with Public Health partners around schools to deliver joint health benefits.	<p>Refer to Action 46 and Action 48.</p>
70	Work with and provide specialist advice and support	<p>No additional update. The operation of three School Streets commenced in 2019. At the time of writing this report there were 30 active School Streets in the borough. There are currently no plans to expand.</p>

Measure	Action	Progress
	to schools around air quality issues	https://www.merton.gov.uk/streets-parking-transport/traffic-management/school-streets-programme
71	Work with and provide specialist advice and support to schools around air quality issues.	The Air Quality Team is available to advise schools on how to improve air quality and signpost schools to air quality information and funding opportunities. The most effective delivery of this is through an Air Quality Audit, workshop, or Idling Action event.

New Projects which commenced in 2023:

Smarter Greener Logistics (SGL) - Collaborating for Clean Air project. Active dates 1st July 2023 – 31st December 2024

Merton Council are part of Smarter Greener Logistics – a Defra funded project run by the Cross River Partnership, aimed at reducing NO₂ emissions. The project started in July 2023. Merton Council are part of a workstream aimed at monitoring emissions from a waste transfer site (Willow Lane) in order to reduce emissions. Merton Council have also worked with the CRP on other workstreams in the SGL project, such as cargo bike deliveries and shared electric vehicle schemes. These strands of the project did not come to fruition; however, Merton will be using strategies and case studies created with other partner boroughs as learnings in future projects.

Merton Council's expanded local vehicle scrappage scheme – providing additional support during cost-of-living crisis

Merton Council launched a £1 million local vehicle scrappage scheme in September 2023, to help people who need to swap their high-polluting car for a sustainable alternative but struggling with the cost-of-living crisis.

A £1000 grant per vehicle is available to help the poorest areas in our community that are not well connected by public transport, provided their car meets the Transport for London (TfL) scrappage criteria. The grant is also available for the borough's carers.

According to TfL, over 90% of cars driving in Outer London meet the Ultra Low Emission Zone (ULEZ) standards. But for those that don't meet the standards, financial support is needed.

More details on the scrappage scheme can be found on the council website <https://www.merton.gov.uk/streets-parking-transport/scrap-a-vehicle>

3. Planning Update and Other New Sources of Emissions

Table L. Planning requirements met by planning applications in the London Borough of Merton in 2023

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	33
Number of planning applications required to monitor for construction dust	3
Number of CHPs/Biomass boilers refused on air quality grounds	0
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	0
Number of developments required to install Ultra-Low NO _x boilers	0
Number of developments where an AQ Neutral building and/or transport assessments undertaken	14
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	2
Number of planning applications with S106 agreements including other requirements to improve air quality	Air Quality Contribution 2 Tree Planting 0 Electric Charging 0 Car Club 2 Cycle Provision 0 Walkway Contribution 2
Number of planning applications with CIL payments that include a contribution to improve air quality	£92k Strategic CIL has been allocated to the provision of air quality monitoring stations at four locations across the borough, delivery, and expenditure during 2023-24.
<p>NRMM: Central Activity Zone, Canary Wharf and Opportunity Areas</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Number of audits</p> <p>% of sites unregistered prior to audit</p> <p>Please include confirmation that you have checked that the development has been registered with the GLA through the relevant NRMM website and that all NRMM used on-site is compliant with Stage IV of the Directive and/or exemptions to the policy.</p>	N/A
<p>NRMM: Greater London (excluding Central Activity Zone, Canary Wharf and Opportunity Areas)</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Number of audits</p> <p>% of sites unregistered prior to audit</p>	<p>NRMM conditions recommended to be attached to all planning applications where construction and demolition is proposed (12).</p> <p>Cleaner Construction for London (CCfL) undertook 21</p>

Condition	Number
<p>Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.</p>	<p>site audits in the borough of Merton in 2023.</p> <p>1 site achieved Self-Compliant status in 2023. (Self-Compliant - site has met/exceeded emission standards and registered all machinery correctly prior to the audit.</p> <p>6 sites worked towards and achieved Compliance in 2023. (Compliant - site was non-compliant before CCfL interaction however met required emission/administration standards by enacting all recommendations made by CCfL officers).</p> <p>11 sites had No NRMM within scope (37-560kW) presently deployed.</p> <p>3 sites were complete.</p> <p>62% of sites audited were cold engaged (an unregistered site, identified on the ground and subsequently engaged).</p> <p>38% of sites audited were not cold engaged and therefore were already registered on the NRMM website prior to auditing.</p>

NRMM condition recommended to be attached to all planning applications where construction and demolition is proposed. NRMM is a standard planning condition applied to all major developments.

All major developments are passed to the Air Quality Officers in the Pollution Team for comment. All major developments are required to submit an AQA. All relevant national, Mayoral and Merton local policies are applied by the Pollution Team to all relevant planning consultations. Sites are considered for construction dust on a case-by-case basis, particulate matter (PM₁₀) monitoring required, and locations agreed, where a moderate or high risk to receptors are identified.

CHP/biomass are not recommended and actively discouraged, developers are urged to select non-combustion or at least ultra-low NOx heating systems. We are observing over time that more developments are proposing non-combustion, maximum insulation and renewables to increase BREEAM ratings. The largest contribution to emissions from development coming from transport and not buildings.

Air Quality Neutral Assessments are required as part of the planning process to assess the building and transport nitrogen dioxide and fine particulate matter (PM_{2.5}) emissions from a proposed development. Where emissions exceed the benchmark, mitigation is required to reduce the excess emissions. Where emissions cannot be reduced a Section 106 agreement may be considered to offset emissions.

3.1 New or significantly changed industrial or other sources

No new sources identified.

4. Additional Activities to Improve Air Quality

4.1 London Borough of Merton Fleet

In 2023, 7.4% of the borough's fleet was composed of zero emission and zero emission capable vehicles. The zero-emission fleet included 1 electric vehicle, 1 hybrid vehicle and 4 electric bikes.

In 2023, commissioned consultant support to investigate fleet decarbonisation options, and to form a strategy to decarbonise the council's vehicle fleet and its supporting infrastructure. This piece of work formed part of Merton's Climate Delivery Plan Year 3 that was adopted in March 2023.

4.2 NRMM Enforcement Project

The London Borough of Merton continues to support the London-wide NRMM Enforcement project in 2024-2025.

Standard NRMM planning condition:

All Non-Road Mobile Machinery (NRMM) of net power of 37kW and up to and including 560kW used during the course of the demolition, site preparation and construction phases shall comply with the emission standards set out in chapter 7 of the GLA's supplementary planning guidance "Control of Dust and Emissions During Construction and Demolition" dated July 2014 (SPG), or subsequent guidance.

Unless it complies with the standards set out in the SPG, no NRMM shall be on site, at any time, whether in use or not, without the prior written consent of the local planning authority. The developer shall keep an up-to-date list of all NRMM used during the demolition, site preparation and construction phases of the development on the online register at <https://nrmm.london/>

The NRMM wording is applied in the Decision Notice but may also appear in S106 Agreement and Construction Environmental Management Plan.

The NRMM planning condition is applied to all major developments.

4.2 Air Quality Alerts

The London Borough of Merton continues to support airTEXT (<https://www.airtext.info/>).

Merton will review how the mayor's air quality alert messaging is cascaded in 2024/25.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

All data undergoes quality assurance and quality control (QA/QC) procedures to ensure that the data obtained are of a high quality. Automatic monitoring took place over the full 12-month period in 2023.

NO₂ Monitoring

The NO₂ chemiluminescent continuous analyser is automatically calibrated every night and manually checked and calibrated every two to four weeks by the contractor, TRL, employed by the London Borough of Merton for Local Support Officer (LSO) visits during 2023. There is a need for frequent calibration adjustments as the gradual build-up of dirt within the analyser reduces the response rate. This fall off in response needs appropriate correction, to ensure the recording of the true concentrations. The calibration process involves checking the monitoring accuracy against a known concentration of span gas. The span gas used is nitric oxide and is certified to an accuracy of 5%. Both the automatic and manual calibrations use this same certified span gas (i.e. the automatic overnight one does not use the less accurate permeation tube method). The NO₂ continuous analysers is serviced every six months by TRL and audited by the National Physical Laboratory (NPL) every six months as part of Environmental Research Groups (ERG) - Imperial College London's, London Air Quality Network (LAQN) QA/QC procedure, to ensure optimum data quality.

PM₁₀ Monitoring Adjustment

Particulate matter is continuously monitored using a Beta Attenuation Monitor (BAM). Scaling is applied automatically to measurements from PM10 instruments to correct 'base' dust readings to EU reference equivalent PM10 values prior to dissemination. The scaling applied is specific to the type of instrument involved. For PM10 BAMs, standard correction factors are applied as per the slope correction stated in their reference equivalence certification, taking into account whether the inlet is heated or unheated.

In 2023 there were challenges maintaining the BAM equipment largely due to water ingress into the enclosure housing the equipment and this resulted in a portion of the data being void during the annual data ratification process. The valid data capture for ME2 in 2023 was just 18%. As the data capture was below 25% it was not possible to apply the annualisation process to estimate an annual mean concentration for 2023.

There has been considerable resourcing allocated to refreshing the network at the time of writing, equipment has been procured and awaiting installation in 2024/25, this will greatly improve data quality.

A.2 Diffusion Tubes

Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe (EC, 2008) sets air quality objectives for NO₂ along with other pollutants. Under the Directive, annual mean NO₂ concentration data derived from diffusion tube measurements must demonstrate an accuracy of $\pm 25\%$ to enable comparison with the NO₂ air quality objectives of the Directive.

To ensure that NO₂ concentrations reported are of a high quality, strict performance criteria need to be met through the execution of QA and QC procedures. Several factors have been identified as influencing the performance of NO₂ diffusion tubes including the laboratory preparing and analysing the tubes, and the tube preparation method (AEA, 2008). QA and QC procedures are therefore an integral feature of any monitoring programme, ensuring that uncertainties in the data are minimised and allowing the best estimate of true concentrations to be determined.

Our NO₂ diffusion tubes are analysed for us by Gradko using 50% TEA in acetone method of preparation. Gradko take an active role in developing rigorous QA and QC procedures in order to maintain the highest degree of confidence in their laboratory measurements. Gradko were involved in the production of the Harmonisation Practical Guidance for NO₂ diffusion tubes (AEA, 2008) and have been following the procedures set out in the guidance since January 2009. Since April 2014 Gradko has taken part in a new scheme AIR-PT, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme.

This section contains details of Gradko International Ltd.'s Results of laboratory precision.

This section contains details of Gradko International Ltd.'s Results of laboratory precision

- Performance in AIR NO₂ PT Scheme (September 2021 – October 2023)
- Summary of Precision Scores for 2021 – 2023
- UKAS schedule of accreditation (November 2023)

Gradko International Ltd is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre.

Summary of Laboratory Performance in AIR NO₂ Proficiency Testing Scheme (September 2021 – October 2023)

Gradko participate in the AIR PT NO₂ diffusion tube scheme, which uses artificially spiked diffusion tubes to test each participating laboratory's analytical performance on a quarterly basis. The scheme is designed to help laboratories meet the European Standard. Gradko demonstrated "satisfactory" laboratory performance in 2023 for 50% TEA in Acetone.

The laboratory follows the procedures set out in the Harmonisation Practical Guidance and participates in the AIR proficiency-testing (AIR-PT) scheme. Previously to the Air-PT scheme, Gradko participated in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis. Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme.

Laboratory performance in the AIR-PT is also assessed by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Inter-Comparison Exercise carried out at for Gradko at Marylebone Road, central London. A laboratory is assessed and given a 'z' score, a score of ± 2 or less indicates satisfactory laboratory performance. Gradko International Ltd.'s performance for 2023 is covered by rounds AR055 to AR059 of the AIR-PT scheme.

From the most recent laboratory performance data available, the five round window used to assess Gradko International Ltd.'s performance is covered by rounds

AR046-AR059 of the AIR-PT scheme. During this time 100% of the results submitted by Gradko were determined to be satisfactory.

Table 1: Laboratory summary performance for AIR NO₂ PT rounds AR046, 49, 50, 52, 53, 55, 56, 58 and 59

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent AIR NO₂ PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of $\leq \pm 2$ as defined above.

AIR PT Round	AIR PT AR046	AIR PT AR049	AIR PT AR050	AIR PT AR052	AIR PT AR053	AIR PT AR055	AIR PT AR056	AIR PT AR058	AIR PT AR059
Round conducted in the period	September – October 2021	January – February 2022	May – June 2022	July – August 2022	September – October 2022	January – February 2023	May – June 2023	July – August 2023	September – October 2023
Aberdeen Scientific Services	100 %	100 %	100 %	100 %	100 %	0 %	100 %	100 %	75 %
Cardiff Scientific Services	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]
Edinburgh Scientific Services	75 %	NR [2]	50 %	100 %	100 %	100 %	75 %	100 %	50 %
SOCOTEC	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]
Exova (formerly Clyde Analytical)	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]
Glasgow Scientific Services	NR [2]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Gradko International	100 %	100 %	100 % [1]	100 %	100 %	100 %	100 %	100 %	100 %
Kent Scientific Services	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]
Kirklees MBC	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]
Lambeth Scientific Services	75 %	50 %	75 %	100 %	50 %	0 %	75 %	50 %	0 %
Milton Keynes Council	100 %	75 %	100 %	100 %	100 %	50 %	75 %	100 %	100 %
Northampton Borough Council	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]
Somerset Scientific Services	100 %	75 %	100 %	75 %	100 %	100 %	75 %	100 %	100 %
South Yorkshire Air Quality Samplers	100 %	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]	NR [2]
Staffordshire County Council, Scientific Services	100 %	100 %	100 %	0 %	100 %	100 %	100 %	100 %	100 %
Tayside Scientific Services (formerly Dundee CC)	100 %	NR [2]	NR [2]	100 %	100 %	NR [2]	100 %	NR [2]	NR [2]
West Yorkshire Analytical Services	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]

[1] Participant subscribed to two sets of test results (2 x 4 test samples) in each AIR PT round.

[2] NR, No results reported.

[3] Cardiff Scientific Services, Exova (formerly Clyde Analytical), Kent Scientific Services, Kirklees MBC, Northampton Borough Council and West Yorkshire Analytical Services; no longer carry out NO₂ diffusion tube monitoring and therefore did not submit results.

Precision Summary Results

The diffusion tube precision summary results are provided on the following page. This details the total number of recorded good/bad precision results for the last 3 years for laboratories that currently provide diffusion tube analysis.

2021 - 2023 Summary of Precision Results for Nitrogen Dioxide Diffusion Tube Collocation Studies UK Laboratories including for Gradko Laboratory 50% TEA in Acetone

Precision Summary Table

Diffusion Tube Preparation Method	2021 Good	2021 Bad	2022 Good	2022 Bad	2023 Good	2023 Bad
Gradko, 50% TEA in Acetone	16	0	16	0	14	0
Gradko, 20% TEA in Water	34	0	33	0	21	0
ESG Didcot / SOCOTEC, 50% TEA in Acetone	25	3	29	0	28	0
ESG Didcot / SOCOTEC, 20% TEA in Water	14	1	11	0	4	0
Staffordshire Scientific Services	15	1	13	0	11	0
Glasgow Scientific Services	2	5	3	3	1	0
Edinburgh Scientific Services	6	0	1	0	0	1
Milton Keynes Council	4	0	1	0	1	0
Tayside Scientific Services	1	0	1	0	1	0
Lambeth Scientific Services	8	1	6	4	3	0
Aberdeen Scientific Services	7	0	7	0	7	0
South Yorkshire Air Quality Samplers	1	0	0	0	0	0
ESG Glasgow, 50% TEA in Acetone	0	1	1	0	1	0
ESG Glasgow, 20% TEA in Water	0	1	1	0	1	0
Somerset County Council	11	0	14	0	4	0

Numerical results for this data are contained in the National Bias Adjustment Spreadsheet version 03/24

Numerical results for this data are contained in the National Bias Adjustment Spreadsheet version 03/24. In 2023, the tube precision for NO₂ Annual Field Inter-Comparison for Gradko International using the 50% TEA in acetone method was 'good' for the results of 14/15 participating local authorities, no participating local authorities were deemed to be 'bad'.

Analysed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	50% TEA in acetone	2023	UB	City Of London Corporation	10	28	22	26.3%	G	0.79
Gradko	50% TEA in acetone	2023	R	City Of London Corporation	11	36	31	15.0%	G	0.87
Gradko	50% TEA in acetone	2023	R	LB Newham	12	27	21	28.0%	G	0.78
Gradko	50% TEA in acetone	2023	SU	Redcar And Cleveland Borough Council	12	14	10	48.0%	G	0.68
Gradko	50% TEA in Acetone	2023	R	Sandwell Mbc	12	33	26	27.6%	G	0.78
Gradko	50% TEA in acetone	2023	UB	Sandwell Mbc	11	21	18	15.8%	G	0.86
Gradko	50% TEA in acetone	2023	R	Sandwell Mbc	12	23	20	14.2%	S	0.88
Gradko	50% TEA in Acetone	2023	UC	Falkirk Council	12	33	29	14.9%	G	0.87
Gradko	50% TEA in Acetone	2023	UB	Falkirk Council	12	15	13	8.9%	G	0.92
Gradko	50% TEA in acetone	2023	R	London Borough Of Lewisham	11	33	27	22.7%	G	0.82
Gradko	50% TEA in Acetone	2023	R	London Borough Of Merton	12	37	31	18.5%	G	0.84
Gradko	50% TEA in acetone	2023	KS	Marylebone Road intercomparison	11	47	38	25.7%	G	0.80
Gradko	50% TEA in acetone	2023	R	Royal Borough Of Windsor And Maidenhead	11	27	23	21.6%	G	0.82
Gradko	50% TEA in acetone	2023	R	Royal Borough Of Windsor And Maidenhead	12	24	24	0.6%	G	0.99
Gradko	50% TEA in acetone	2023	R	London Borough Of Richmond Upon Thames	11	18	16	15.6%	G	0.86
Gradko	50% TEA in acetone	2023		Overall Factor³ (15 studies)					Use	0.83

**Schedule of Accreditation issued by United Kingdom Accreditation Service
(UKAS)**

Gradko is accredited by UKAS for the analysis of NO₂ diffusion tubes. It undertakes the analysis of the exposed diffusion tubes by ultra-violet spectrophotometry. The relevant test is shown below on the UKAS Schedule of Accreditation issued 10 November 2023. Schedule of accreditation on the next page.

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 <p>UKAS TESTING</p> <p>2187</p> <p>Accredited to ISO/IEC 17025:2017</p>	<p>Gradko International Ltd (Trading as Gradko Environmental)</p> <p>Issue No: 026 Issue date: 10 November 2023</p>
<p>St Martins House 77 Wales Street Winchester Hampshire SO23 0RH</p>	<p>Contact: Mr A Poole Tel: +44 (0)1962 860331 Fax: +44 (0)1962 841339 E-Mail: diffusion@gradko.co.uk Website: www.gradko.co.uk</p>
<p>Testing performed at the above address only</p>	

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ATMOSPHERIC POLLUTANTS Collected on diffusion (sorbent) tubes and monitors	<u>Chemical Tests</u>	Documented In-House Methods
	Ammonia as ammonium (NH ₄ ⁺)	GLM 8 by Ion Chromatography
	Benzene Toluene Ethyl benzene Xylene	GLM 4 by Thermal Desorption/ FID Gas Chromatography
	Hydrogen chloride as chloride (Cl ⁻) Nitrogen dioxide as nitrite (NO ₂ ⁻) Sulphur dioxide as sulphate (SO ₄ ²⁻) Hydrogen fluoride as fluoride (F ⁻)	GLM 3 by Ion Chromatography
	Hydrogen sulphide	GLM 5 by Colorimetric determination (UV Spectrophotometry)
	Ozone as nitrate (NO ₃ ⁻)	GLM 2 by Ion Chromatography
	Nitrogen Dioxide as nitrite (NO ₂ ⁻)	GLM 7 by Colorimetric determination (UV Spectrophotometry)
	Sulphur dioxide as sulphate (SO ₄ ²⁻)	GLM 1 by Ion Chromatography
	Formaldehyde as formaldehyde-DNPH	GLM 18 by HPLC
	Volatile Organic Compounds including: Benzene Toluene Ethylbenzene p-Xylene o-Xylene	GLM 13 by Thermal Desorption GC-Mass Spectrometry



2187

Accredited to
ISO/IEC 17025:2017

Schedule of Accreditation

Issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

Gradko International Ltd (Trading as Gradko Environmental)

Issue No: 026 Issue date: 10 November 2023

Testing performed at main address only

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ATMOSPHERIC POLLUTANTS Collected on diffusion (sorbent) tubes and monitors (cont'd)	<p><u>Chemical Tests</u> (cont'd)</p> <p>Qualitative Analysis and Estimation of Volatile Organic Compounds on diffusion (sorbent) tubes and monitors</p> <p>Naphthalene Tetrachloroethylene Trichloroethylene Styrene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene</p> <p>trans-1,2-Dichloroethene cis-1,2-Dichloroethene</p> <p>1,3-Butadiene</p> <p>Carbon Disulphide</p> <p>Flexible scope for quantitative analysis of Volatile Organic Compounds on diffusion (sorbent) tubes and monitors in accordance with methods developed and validated by in-house procedure LWI 47</p>	<p>GLM 13 by Thermal Desorption GC-Mass Spectrometry with estimations in accordance with ISO standard 16000-6</p> <p>GLM 13-1 by Thermal Desorption GC-Mass Spectrometry</p> <p>GLM 13-3 by Thermal Desorption GC-Mass Spectrometry</p> <p>GLM 13-6 by Thermal Desorption GC-Mass Spectrometry</p> <p>GLM 13-7 by Thermal Desorption GC-Mass Spectrometry</p> <p>LWI 47 by Thermal Desorption GC-Mass Spectrometry</p>
END		

NO₂ diffusion tube analysis method

NO₂ diffusion tubes are passive monitoring devices. They are made up of a Perspex cylinder, with two stainless steel mesh discs, coated with triethanolamine (TEA) absorbent held inside a polythene cap, which is sealed onto one end of the tube.

Diffusion tubes operate on the principle of molecular diffusion, with molecules of a gas diffusing from a region of high concentration (open end of the tube) to a region of low concentration (absorbent end of the tube) (AEA, 2008). NO₂ diffuses up the tube because of a concentration gradient and is absorbed by the TEA, which is present on the coated discs in the sealed end of the tube. All of Merton's NO₂ diffusion tubes are prepared by Gradko using 50% v/v TEA with Acetone as the absorbent.

Prior to and after sampling, an opaque polythene cap is placed over the end of the diffusion tube opposite the TEA coated discs to prevent absorption. The NO₂ diffusion tubes are labelled and kept refrigerated in plastic bags prior to and after exposure.

In the laboratory, the steel mesh is removed and washed with distilled water which is then analysed. The concentration of nitrogen dioxide is found by shining ultraviolet light (UV) through the water sample. The amount of light absorbed is equivalent to the concentration of nitrogen dioxide that was present in the air during the monitoring period.

Factor from Local Co-location Studies

In 2023 the Borough undertook a co-location study placing with three NO₂ diffusion tubes (Site IDs 47, 47/2, 47/3) with the continuous NO₂ monitoring equipment at the Civic Centre Morden (ME9), roadside site. Co-location study data was provided to NPL via the questionnaire to enable inclusion of our data into the database of bias adjustment factors.

Annual mean data:

Site ID 47: 31.4 µg/m³

Site ID 47/2: 32.1 µg/m³

Site ID 47/3: 31.5 µg/m³.

ME9: 31 µg/m³

Discussion of Choice of Factor to Use

Both local and national Bias Adjustment Factors were available for 2023. The Local Bias Adjustment Factor of 0.84 was used to correct the diffusion tube data as it was derived using borough specific data.

The tube precision was 'good'. The National Factor was 0.83. Historically, where the national factor used this has been due to the unavailability of a local factor, usually due to poor data capture from the continuous monitor (ME9).

Table M. Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	Local	03/24	0.84
2022	National	03/23	0.82
2021	National	03/22	0.83
2020	National	03/21	0.82
2019	Local	03/20	0.89
2018	National	03/19	0.92
2017	National	03/18	0.97
2016	National	03/17	1.03

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

Annualisation was not required for any of the diffusion tube data or for the NO₂ automatic monitoring data as the data capture was sufficiently high enough to calculate the annual mean.

Annualisation was not possible for PM₁₀ as the data capture was below 25%.

Annualisation is required when data is less than 75% and greater than 25% of a full calendar year (between 3 and 9 months), the mean should be "annualised" – i.e. adjusted using the methodology outlined in LLAQM.TG(19) before being compared to annual mean objectives.

Distance Adjustment

If an exceedance is measured at a monitoring site which is not representative of public exposure, use the procedure specified in LLAQM.TG(19) to estimate the concentration at the nearest receptor and describe the process followed here. Distance correction was completed for 10 locations where the annual mean was above 36 µg/m³. Following distance correction all concentrations at the receptor were below 36 µg/m³ which is within 10% of the AQS (Air Quality Standard). Results are reported in Table O.

Table O. NO₂ Fall Off with Distance Calculations

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted (µg/m ³))	Background Concentration (µg/m ³)	Concentration Predicted at Receptor (µg/m ³)	Comments
18	0.3	2.9	44.8	12.3	32.8	
21	0.5	2.4	44.7	12.3	35.7	
22	2.0	6.2	42.4	12.3	34.4	
23	0.6	2.5	38.2	12.3	31.5	
29	0.7	3.3	37.3	12.3	30.0	
37	0.6	3.0	37.1	12.3	29.8	
44	0.6	5.5	39.4	12.3	28.4	
54	2.4	4.4	39.9	12.3	35.8	
55	0.6	5.8	39.4	12.3	28.1	
S68	0.7	18.8	39.6	12.3	22.7	

Appendix B Full Monthly Diffusion Tube Results for 2023

Table P. NO₂ 2023 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	523139	169056	38.5	42.4	35.8	42.3	34.3	35.6	29.0	28.9	39.9	37.6	37.2	24.9	35.5	29.8		
2	524489	166637	35.9	34.4	29.0	30.6	28.0	23.6	17.4	17.8		22.5	25.5	17.0	25.6	21.5		
4	523315	168048	37.5	38.3	28.7	22.9	23.1	20.1	19.4	20.2	23.1	23.2	28.4	18.2	25.2	21.2		
5	522501	168235	37.5	41.7	29.1	29.8	26.2	26.6	24.1	24.5	31.0	24.4	32.7	26.6	29.5	24.8		
6	523207	169195	45.4	42.8	37.2	37.5	30.7	30.8	32.0	27.7	36.1	36.1	36.8	25.0	34.8	29.3		
7	524401	169351	39.8	49.1	36.5	28.4	31.0	31.1				34.2	33.2	26.6	34.4	28.9		
8	523246	169333	44.3	51.7	35.4	36.6	37.8				34.4	35.0	39.0	24.6	37.6	31.6		
9	523203	169369	37.3	42.4	33.0	30.7	33.4	30.4	22.2	25.2		33.2	32.0	24.5	31.3	26.3		
11	525602	170042	34.3	35.6	27.1	24.1	28.4	29.3	16.3	22.8	28.0	27.7	33.9	19.4	27.2	22.9		
13	523181	170264	26.9	30.1	22.3	18.5	18.2	18.2	14.2	15.2	19.8	21.7	26.4	14.5	20.5	17.2		
14	524111	170879	41.4	32.9	26.6	22.6	26.7	24.8	20.4	20.6	27.6	24.7	27.6	19.0	26.2	22.0		
16	524067	171074	39.3	42.4	32.6	41.4	34.2	32.7	23.5	22.6	32.1	29.3	30.9	20.4	31.8	26.7		
18	524696	170725	61.5	69.8	57.9	61.1	46.0	49.4	47.7	43.7	56.4	51.5	56.5	38.6	53.3	44.8	33.8	
19	524770	170645	43.2	50.2	42.0	46.3	39.4	38.4			39.0	36.0	37.4	25.6	39.8	33.4		
20	524867	170500	46.8	52.5	38.2	41.6	37.2	35.9	28.4	30.7	38.1	31.5	39.9	24.8	37.1	31.2		
21	525798	170081	58.6	64.3	57.4	68.7	64.6	59.1	37.6	43.2	55.5	48.4	46.1	35.2	53.2	44.7	36.5	
22	527756	168993	52.5	58.6	52.6	45.8	42.5	45.4	54.6	46.8	61.8	56.3	46.5	41.5	50.4	42.4	35.1	
23	525156	169935	56.4	58.2	46.4	49.9	46.3	47.3	37.7	35.5	46.0	40.2	48.8	33.8	45.5	38.2	32.2	
24	524994	170329	41.5		57.7		21.9	19.4	16.5	19.5	23.2	25.1	29.2	17.7	27.2	22.8		
25	525104	171125	38.4	39.8	30.9	30.2	29.2	27.0	21.6	24.3	30.5	31.2		26.4	30.0	25.2		
26	525708	171413	33.8	42.1	33.1	31.4	30.6	33.9	26.5	25.2	35.7	32.4	34.5	24.4	32.0	26.8		
27	526035	171472	42.0	45.8	34.0	33.9	28.6	30.7	30.1	31.9	35.6	32.7	33.8	27.1	33.8	28.4		
28	526158	170167	37.1	40.8	32.5	30.7	35.2	25.7	21.0	25.9	32.4	29.7	32.6	23.8	30.6	25.7		
29	526792	170376	46.9	54.5	46.2	44.2	50.0	49.4	36.3	38.4	48.6		40.4	33.6	44.4	37.3	30.8	
30	526791	170087	47.0	42.4	37.9	35.0	37.8	34.3	30.9	32.1	41.1	40.9	36.8	30.1	37.2	31.2		
31	525452	169137	25.0		15.6	13.8		10.6	9.0	11.1	12.7	15.6	18.8	13.8	14.6	12.3		
32	526138	169825	39.1	41.2	25.7	24.5	23.7				34.2	29.5	34.4	21.9	30.5	25.6		
33	525803	169467	40.2	46.9	37.2	32.7	31.2	28.0	23.0	23.9	33.6		30.9	25.2	32.0	26.9		
34	526840	169694	44.3	50.4	43.9	41.7	34.3	33.3	41.5	36.9	45.5	43.8	40.6	32.5	40.7	34.2		
35	527621	169646	31.7	32.1	24.2	23.3	21.1	19.3	13.3	17.7	23.0	26.4	28.3	20.3	23.4	19.6		
36	527915	170518	35.4	43.2	34.4	32.7	33.4	32.0	22.2	26.6	35.6	33.5	30.9	22.5	31.9	26.8		
37	527935	169502	47.0	54.2	46.3	45.6	46.2	48.5	37.2	40.8	51.2	47.8	37.9	27.4	44.2	37.1	30.6	
38	527738	168863	38.8	50.5	38.4	38.9	44.3	38.3	35.8	36.1	42.3	41.7	39.1		40.4	33.9		
39	527158	168646	35.5	40.2	27.5	29.7	33.1	27.7	22.0	24.7	29.7	31.7	29.6	23.2	29.5	24.8		
40	527370	168312	48.5	51.2	36.8	35.1	38.1	37.1	34.9	34.5	41.2	40.1	36.0	31.0	38.7	32.5		
41	526395	168172	38.6	47.3	27.2			30.4	24.7	31.1	36.3	33.4	31.9	23.5	32.5	27.3		
42	526210	167683	39.9	44.5	39.1	38.8	37.4	33.9	28.8	29.3	38.6	38.4	26.2	24.8	35.0	29.4		
43	526151	168293	44.9	53.2	38.9	41.1	51.9	43.0	32.7	33.4	40.6	40.6	35.5	28.9	40.4	33.9		
44	525817	168643	61.0	63.4	58.6	61.1	45.1	44.0	44.4	33.3	44.2	43.4	32.1	32.5	46.9	39.4	29.5	
45	525778	169824	45.0	49.6	39.1	15.6	38.2	31.5	25.2	27.7	31.6	27.8	28.3	21.0	31.7	26.6		
46	525435	168499	47.5	49.1	40.7	34.1		35.1	27.8	21.2	38.8	36.2	31.7	25.7	35.3	29.6		
47	525588	168498	57.4	47.3	44.1	44.1	31.4	32.7	31.7	29.2	37.0	37.4	33.8	23.1	37.4	31.4		
47/2	525588	168498	47.8	49.4	41.7	42.0	33.5	34.8	35.8	29.5	38.4	34.9	31.9		38.2	32.1		
47/3	525588	168498	47.0	47.7	42.5	44.7	34.1	31.2	35.7		39.2	34.3	29.7	26.7	37.5	31.5		

48	525757	168509	39.6	43.2	30.9	32.4	30.1	28.8	24.8	25.5	30.3	30.0	30.6	22.8	30.8	25.8		
49	525500	168470	34.2	40.8	32.4		26.7	24.3	18.9	28.7	27.3	27.6	27.7	16.4	27.7	23.3		
50	525638	168616	45.3	43.6	33.1	31.2	27.8	24.5	21.4	22.5	27.9	26.9	30.5	21.5	29.7	24.9		
51	528219	169782	39.9	41.7	30.1	16.3	29.1	27.5	25.1		31.7	24.9	31.2	22.0	29.0	24.4		
52	522749	168500	30.4	36.0	25.7	20.7	20.7	18.6	19.4	19.2	23.5	28.9	34.9	22.0	25.0	21.0		
53	524621	166786	54.7	54.2	48.0		35.0	33.3		26.6	31.7		35.5	23.7	38.1	32.0		
54	527890	168920	50.5	61.0	49.6		56.2	46.3	36.0	42.6	55.3	46.9	44.4	34.3	47.5	39.9	36.2	
55	529661	168839	60.6	61.4	40.4	48.9	48.4	46.1	42.2	42.0	48.8	48.3	42.9	32.5	46.9	39.4	29.3	
56	525875	171682	35.9	35.0	24.8	21.3	21.4	21.5	17.3	19.5	23.6	24.4	33.6	21.9	25.0	21.0		
57	525396	172558		35.0	28.9	29.1	29.0	25.5	16.7	20.5	26.1	26.8	28.5	20.3	26.0	21.9		
S01	525941	169866	29.3	30.8	21.0	15.8			11.1	14.0	18.5	20.7	19.8	17.1	19.8	16.6		
S4B	526136	170328	38.6	38.9	31.9	29.2	25.5	20.3	22.5	23.6	30.2	29.9	33.1	24.6	29.0	24.4		
S12	527639	168362	44.1	43.7		37.4	38.0	34.8	27.1	32.0	43.3		38.4	23.2	36.2	30.4		
S36B	525815	169235	45.1	48.1	36.5	36.7	35.6	30.9	24.6	26.1	29.6	24.2	30.5	20.4	32.3	27.2		
S49B	522509	168640	48.4	42.9		37.0		36.5	33.3	32.8	36.2	37.4	39.5	34.8	37.9	31.8		
S51	525093	167325	44.1	48.7	36.9	35.8	29.7	27.3	17.3	16.8	23.4	23.2	26.8	13.6	28.6	24.1		
S63	524505	170891	44.6	50.9	33.7	39.1	35.0	33.3	29.8	26.4	35.1	33.0	32.9	27.0	35.1	29.5		
S67	527552	169099	39.0	44.2	35.2	27.2	31.3	29.4	30.2	32.4	39.6	42.2		27.5	34.4	28.9		
S68	527831	169253	51.0	56.2	50.1	46.8	62.0	49.5	35.6	41.7	50.4	42.0	44.5	36.4	47.2	39.6	24.4	
S69	527947	168855	42.5	46.7	36.4	29.8	39.3	28.4	23.0	32.6	39.0	34.3	40.6	30.3	35.2	29.6		

- All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table (confirm by selecting in box).
- Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22 (confirm by selecting in box).
- Local bias adjustment factor used (confirm by selecting in box).
- National bias adjustment factor used (confirm by selecting in box).
- Where applicable, data has been distance corrected for relevant exposure in the final column (confirm by selecting in box).
- Merton confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System (confirm by selecting in box).

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

Appendix C Maps of Monitoring Locations and AQMAs

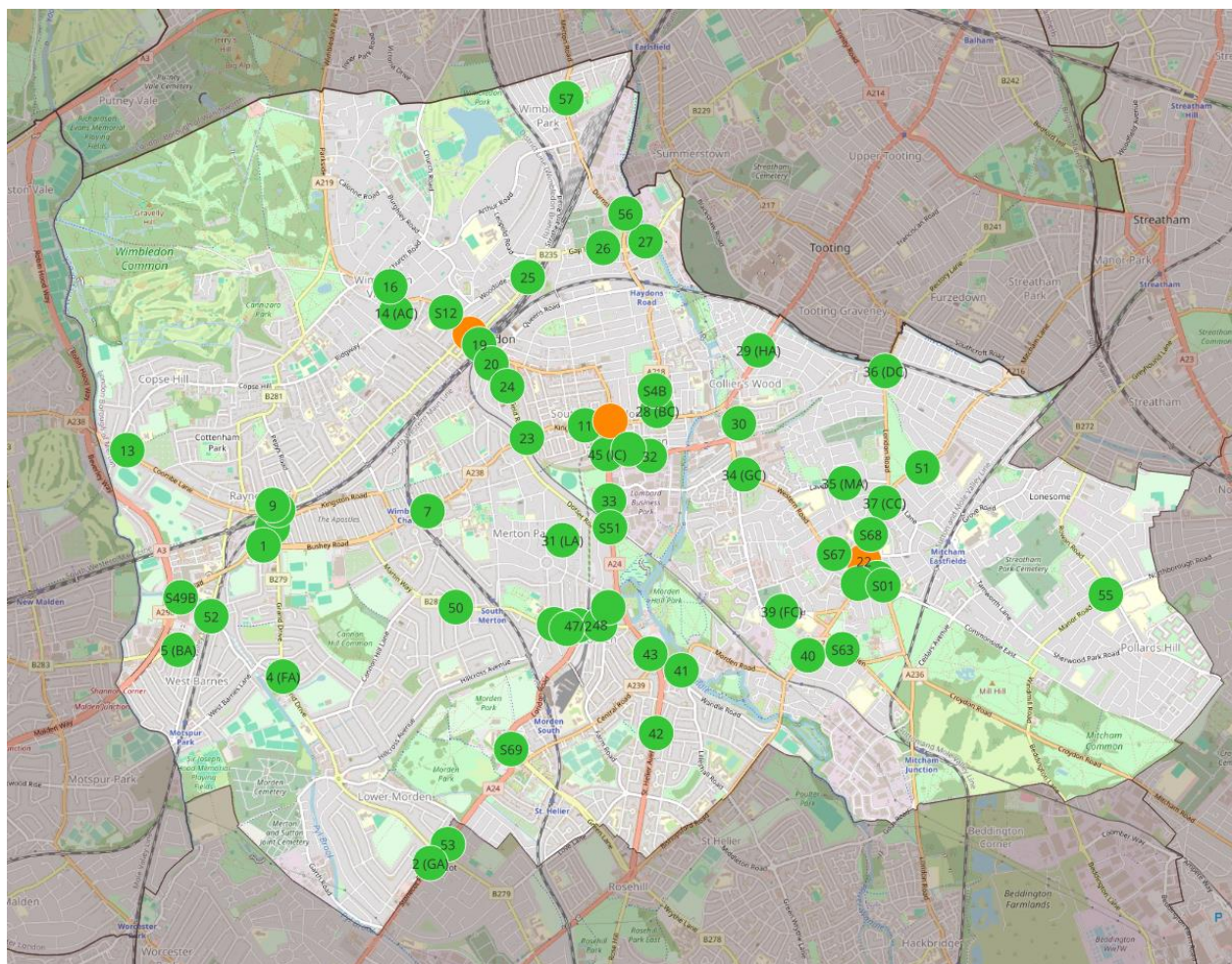
The whole borough of Merton is designated as an Air Quality Monitoring Area (AQMA) for nitrogen dioxide (NO₂) and particulate matter (PM₁₀). Air quality is measured by three principal techniques, monitoring types and locations are mapped below. Monitoring locations are shown in relation to the borough boundary.

Figure A. Map of Non-Automatic Monitoring Sites

Figure B. Map of Automatic Monitoring Sites

Figure C. Map of Breathe London Node Monitoring Sites

Figure A. Map of Non-Automatic Monitoring Sites in Merton



Legend

Compliant site: Annual mean NO₂
below 40 µg/m³



Non-compliant site: Annual mean NO₂
above 40 µg/m³ but below 60 µg/m³



Figure B. Map of Automatic Monitoring Sites in Merton

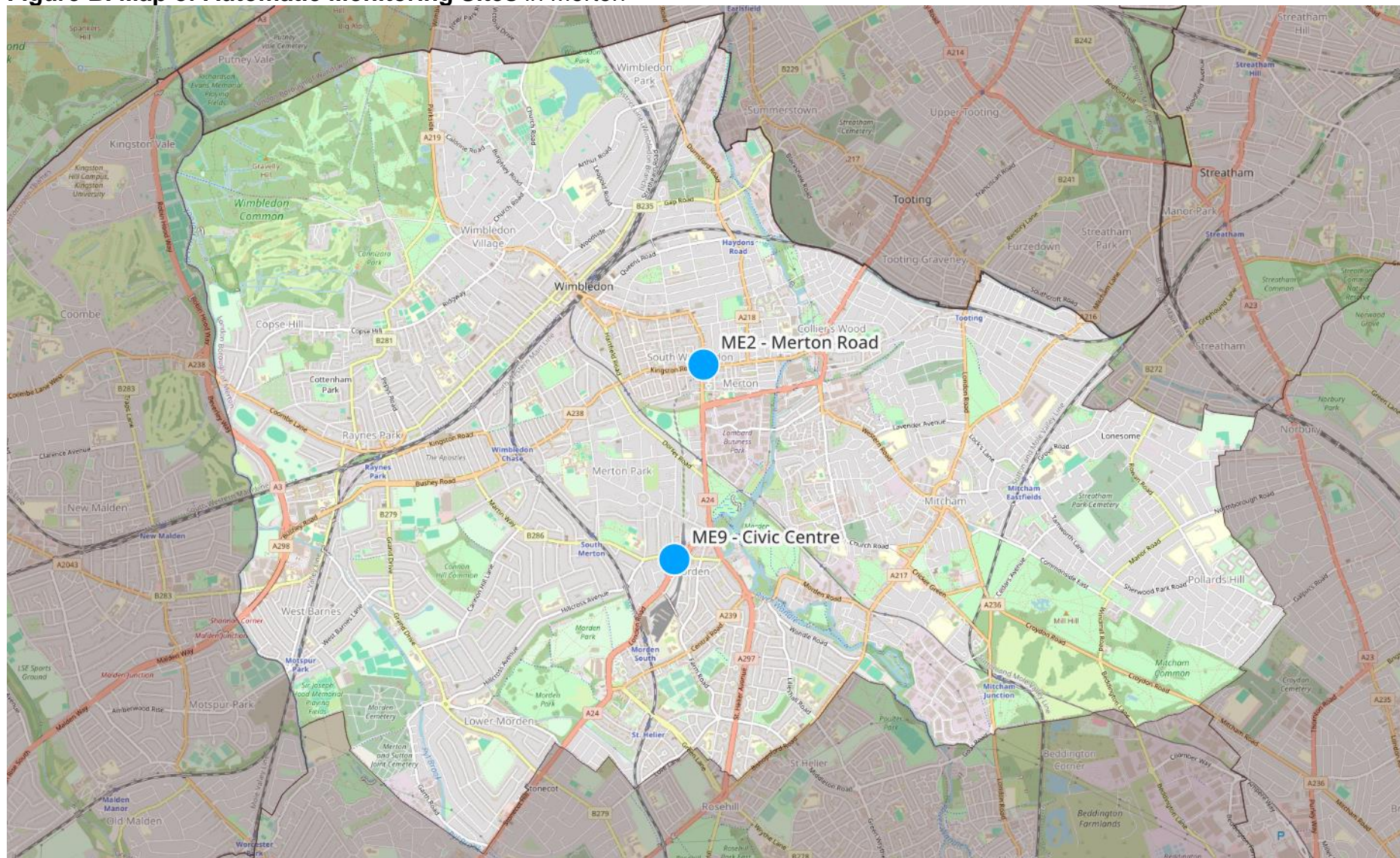
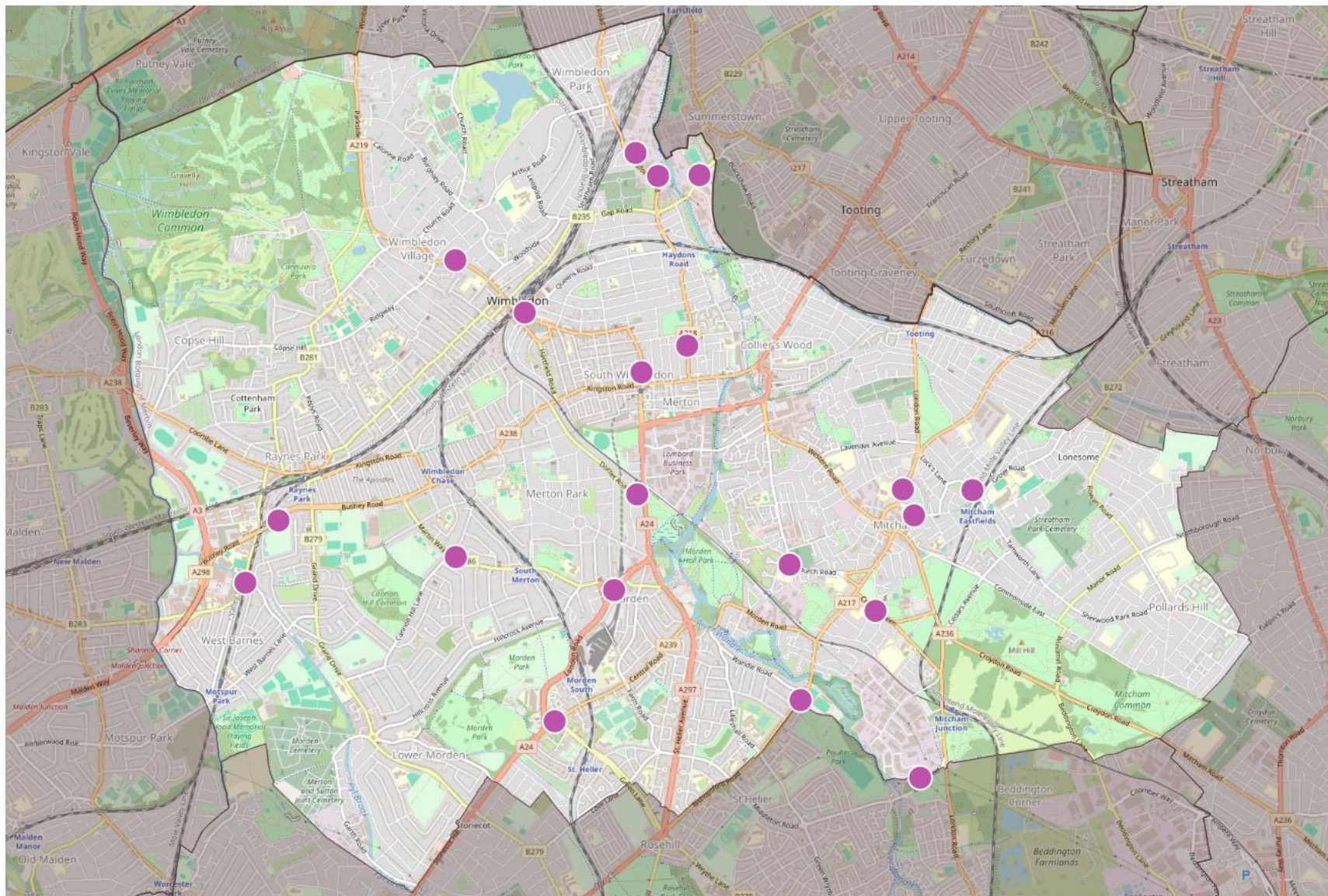


Figure C. Map of Breathe London Node Monitoring Sites in Merton



Appendix D Community Monitoring

During 2023 diffusion tubes were supplied by the London Borough of Merton (LBM) to several community groups and residents across the borough:

- Wimbledon Park Residents Association (WPRA)
- Sustainable Merton (SM) – (SM give guidance and distribute diffusion tubes to the Colliers Wood Group and Raynes Park Association volunteers)
- Abbey Road Resident's Association (ARRA)
- Wimbledon Society (WS)
- Merton Residents
- Resident Councillors

While monitoring instructions were provided to a representative of each group the monitoring locations have not been verified by LBM, nor can the correct usage and storage be confirmed. All tubes were prepared and analysed by Gradko Limited, refer to Appendix A for quality assurance/quality control procedures. Tubes were supplied to a representative of the WPRA on a quarterly basis to and a monthly basis to SM, ARRA, WS, Merton Councillors, and individual Merton residents to allow monitoring to follow the Defra diffusion tube exposure calendar and returned to LBM for collation and onward shipping to Gradko. All analysis reports were sent directly to LBM for checking and then distributed to a representative of each group.

We would like to take the opportunity to thank all groups and the individuals who gave up their time to extend diffusion tube monitoring in the borough. The network has grown exponentially, and it has been great to see so many dedicated and passionate citizen scientists taking an interest in air quality and striving to make a difference and improve the air quality in the London borough of Merton.

Summary of data tables:

- Table Q provides details of non-automatic monitoring sites (diffusion tubes).
- Table R provides the annual mean NO₂ diffusion tube monitoring results, with bias corrected values.
- Table S provides the annualisation summary.
- Table T provides the NO₂ fall off with distance calculations.
- Table U NO₂ 2023 diffusion tube monthly results.

Table Q: Details of the Citizen Science Non-Automatic Monitoring Sites for 2023

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
SC1	Marlborough Road/High Street	Kerbside	526941	170628	NO ₂	Merton AQMA	2.6	0.9	No	2.5
SC2	South Gardens/Singlegate School	Kerbside	526880	170296	NO ₂	Merton AQMA	2.5	0.6	No	2.5
SC14	Christchurch Road/Burger King	Kerbside	526689	170220	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC15	Worple Rd	Kerbside	524510	170559	NO ₂	Merton AQMA	2.5	0.5	No	2.5
RP1	Lambton Rd/Coombe Ln	Kerbside	523219	169313	NO ₂	Merton AQMA	2.5	0.5	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
RP2	Coombe Ln (Costcutter)	Kerbside	523118	169315	NO ₂	Merton AQMA	2.5	0.5	No	2.5
RP3	Approach Rd/Grand Dr	Kerbside	523235	169262	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC17	Kenley Road	Kerbside	525858	168721	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC18	Middleton Road	Kerbside	526481	167085	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC19	Bishopsford Road	Kerbside	527128	167717	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC20	Lilleshall Road	Kerbside	526695	167717	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC22	Cambridge Road	Roadside	523004	169373	NO ₂	Merton AQMA	2.7	2.4	No	2.5
SC23	Durham Road	Kerbside	522583	169696	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC24	Wimbledon Broadway	Kerbside	525102	170481	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC25	Erridge Rd/Keswick Ave	Kerbside	525441	169321	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC26	Merton High Street/Abbey Rd	Kerbside	526232	170110	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC27	Wimbledon Congregational Church	Kerbside	524703	170156	NO ₂	Merton AQMA	2.5	0.5	No	2.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	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)
SC28	Arthur's Road Coop	Kerbside	525401	172217	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC29	7 Sandringham Avenue	Kerbside	524358	169412	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC30	11a Church Road	Kerbside	524313	171494	NO ₂	Merton AQMA	2.5	0.5	No	2.5
SC31	138 Lambton Road	Kerbside	523109	169716	NO ₂	Merton AQMA	2.5	0.5	No	2.5
Wimbledon Park 1	12A Ravensbury Terrace	Kerbside	525861	172917	NO ₂	Merton AQMA	2.5	0.5	No	2.5
Wimbledon Park 2	37 Wellington Road	Kerbside	525454	172603	NO ₂	Merton AQMA	6.0	0.5	No	2.5
Wimbledon Park 4	162 Durnsford Road	Kerbside	525647	171843	NO ₂	Merton AQMA	4.0	0.5	No	2.5
Wimbledon Park 5	147 Arthur Road	Kerbside	525264	172177	NO ₂	Merton AQMA	2.0	0.5	No	2.5
Wimbledon Park 6	44 Home Park Road	Kerbside	525282	172003	NO ₂	Merton AQMA	3.0	0.5	No	2.5
Wimbledon Park 7	1 Lucien Road	Kerbside	525558	172631	NO ₂	Merton AQMA	4.0	0.5	No	2.5

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.

Table R: Annual Mean NO₂ Monitoring Results: Citizen Science Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2022	2023
SC1	Marlborough Road/High Street	526941	170628	Kerbside	100	100	33	36.7
SC2	South Gardens/Singlegate School	526880	170296	Kerbside	100	100	17	18.4
SC14	Christchurch Road/Burger King	526689	170220	Kerbside	100	100	30	34.3
SC15	Worple Rd	524510	170559	Kerbside	100	84.6	33	32.5
RP1	Lambton Rd/Coombe Ln	523219	169313	Kerbside	100	92.3	-	32.5
RP2	Coombe Ln (Costcutter)	523118	169315	Kerbside	100	100	-	33.3
RP3	Approach Rd/Grand Dr	523235	169262	Kerbside	100	100	-	29.6
SC17	Kenley Road	525858	168721	Kerbside	100	82.7	-	23.5
SC18	Middleton Road	526481	167085	Kerbside	100	92.3	-	20.7
SC19	Bishopsford Road	527128	167717	Kerbside	100	92.3	-	22.1
SC20	Lilleshall Road	526695	167717	Kerbside	100	67.3	-	20.2
SC22	Cambridge Road	523004	169373	Roadside	100	57.7	-	13.7
SC23	Durham Road	522583	169696	Kerbside	100	75	-	16.7
SC24	Wimbledon Broadway	525102	170481	Kerbside	100	51.9	-	29.7
SC25	Erridge Rd/Keswick Ave	525441	169321	Kerbside	100	59.6	-	12.3
SC26	Merton High Street/Abbey Rd	526232	170110	Kerbside	100	40.4	-	49.8
SC27	Wimbledon Congregational Church	524703	170156	Kerbside	100	59.6	-	13.9
SC28	Arthur's Road Coop	525401	172217	Kerbside	100	32.7	-	16.2
SC29	7 Sandringham Avenue	524358	169412	Kerbside	100	32.7	-	18.3
SC30	11a Church Road	524313	171494	Kerbside	100	32.7	-	20.9
SC31	138 Lambton Road	523109	169716	Kerbside	100	32.7	-	13.3
Wimbledon Park 1	12A Ravensbury Terrace	525861	172917	Kerbside	25	25	16	15.5
Wimbledon Park 2	37 Wellington Road	525454	172603	Kerbside	25	17.3	16	-
Wimbledon Park 4	162 Durnsford Road	525647	171843	Kerbside	25	15.4	22	-

Diffusion Tube ID	Site Name	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2022	2023
Wimbledon Park 5	147 Arthur Road	525264	172177	Kerbside	25	25	23	20.6
Wimbledon Park 6	44 Home Park Road	525282	172003	Kerbside	25	25	18	16.8
Wimbledon Park 7	1 Lucien Road	525558	172631	Kerbside	25	25		2.8

Notes:

The annual mean concentrations are presented as $\mu\text{g}/\text{m}^3$.

Exceedances of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu\text{g}/\text{m}^3$, 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” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

Table S: Annualisation Summary of the Citizen Science Non-Automatic Monitoring for 2023

Diffusion Tube ID	Annualisation Factor ME9 Civic Centre	Annualisation Factor RI1 Castelnaud	Annualisation Factor WA2 Wandsworth Town Hall	Annualisation Factor CR5 Croydon, Norbury	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m3)	Annualised Data Simple Annual Mean (µg/m3)
SC20	0.9718	0.9081	0.9840	1.0083	0.9681	24.9	24.1
SC22	1.0462	0.9925	1.0022	0.9929	1.0085	16.1	16.3
SC24	1.0919	1.0472	1.0887	1.0849	1.0782	32.8	35.4
SC25	1.1403	1.0581	1.1357	1.1326	1.1167	13.1	14.6
SC26	1.1449	1.1520	1.2094	1.1591	1.1663	50.9	59.3
SC27	1.1403	1.0581	1.1357	1.1326	1.1167	14.8	16.5
SC28	1.1202	1.1393	1.1606	1.1730	1.1483	16.8	19.3
SC29	1.0881	0.8822	1.0674	1.1110	1.0372	21.0	21.8
SC30	1.0881	0.8822	1.0674	1.1110	1.0372	24.0	24.9
SC31	1.0881	0.8822	1.0674	1.1110	1.0372	15.3	15.8
Wimbledon Park 1	0.9855	0.9934	0.9213	0.9199	0.9550	19.3	18.5
Wimbledon Park 5	0.9855	0.9934	0.9213	0.9199	0.9550	25.7	24.5
Wimbledon Park 6	0.9855	0.9934	0.9213	0.9199	0.9550	21.0	20.1
Wimbledon Park 7	0.9855	0.9934	0.9213	0.9199	0.9550	16.0	15.3
56	0.9855	0.9934	0.9213	0.9199	0.9550	25.0	23.9
57	0.9855	0.9934	0.9213	0.9199	0.9550	28.3	27.1

Distance Adjustment

If an exceedance is measured at a monitoring site which is not representative of public exposure, use the procedure specified in LLAQM.TG(19) to estimate the concentration at the nearest receptor and describe the process followed here. Distance correction was completed for 2 Citizen Science monitoring locations where the annual mean was above 36 $\mu\text{g}/\text{m}^3$. **Following distance correction all concentrations at the receptor were below the annual mean objective 40 $\mu\text{g}/\text{m}^3$.** Results are reported in Table T.

Table T: NO₂ Fall Off with Distance Calculations for Citizen Science Non-Automatic Monitoring

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted ($\mu\text{g}/\text{m}^3$))	Background Concentration ($\mu\text{g}/\text{m}^3$)	Concentration Predicted at Receptor ($\mu\text{g}/\text{m}^3$)	Comments
SC1	0.9	3.5	36.7	12.3	30.1	
SC26	0.5	3.0	49.8	12.3	37.9	Predicted concentration at Receptor within 10% the AQS objective

Table U: NO₂ 2023 Citizen Science Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted <(x.x)>	Annual Mean: Distance Corrected to Nearest Exposure	Comment
SC1	526941	170628	61.0	25.0	50.0	44.0	46.0	41.0	40.0	44.8	44.0	47.0	46.0	35.0	43.7	36.7	30.1	
SC2	526880	170296	34.0	48.0	20.0	14.0	16.0	15.0	14.0	15.8	20.0	23.0	26.0	17.0	21.9	18.4	-	
SC14	526689	170220	56.0	45.0	39.0	39.0	41.0	38.0	32.5	34.4	42.0	44.0	45.0	34.0	40.8	34.3	-	
SC15	524510	170559	45.0	45.0	46.0	44.0	40.0	40.0	24.7	29.4	35.0		38.0		38.7	32.5	-	
RP1	523219	169313	51.0	52.0	42.0	36.0	30.0	33.0		36.7	37.0	40.0	38.0	30.0	38.7	32.5	-	
RP2	523118	169315	54.0	56.0	41.0	45.0	43.0	39.0	27.4	34.8	41.0	27.0	40.0	28.0	39.7	33.3	-	
RP3	523235	169262	58.0	47.0	38.0	31.0	30.0	31.0	21.8	29.4	37.0	37.0	36.0	26.0	35.2	29.6	-	
SC17	525858	168721		36.0	34.0	26.0	24.0		23.1	23.1	31.0	34.0	29.0	19.0	27.9	23.5	-	
SC18	526481	167085	40.0	37.0	28.0	25.0	21.0	18.6	18.6	18.4		17.0	29.0	18.0	24.6	20.7	-	
SC19	527128	167717	49.0	40.0	19.0	17.0		20.5	20.5	26.1	20.0	26.0	28.0	23.0	26.3	22.1	-	
SC20	526695	167717	38.0	27.0	28.0					16.1	28.0	21.0	27.0	14.0	24.9	20.2	-	
SC22	523004	169373				17.0	10.0	26.9			12.0	16.0	20.0	11.0	16.1	13.7	-	
SC23	522583	169696				17.0	17.0	18.0	14.4	17.2	22.0	26.0	28.0	19.0	19.9	16.7	-	
SC24	525102	170481						33.0	29.6	30.4	32.0	33.0	39.0		32.8	29.7	-	
SC25	252185	169296						10.0	7.6	18.9	12.0	15.0	18.0	10.0	13.1	12.3	-	
SC26	526232	170110						42.0	83.4		46.0	52.0		31.0	50.9	49.8	37.9	
SC27	524703	170156						13.0	9.5	15.1	12.0	18.0	23.0	13.0	14.8	13.9	-	
SC28	525401	172217							14.5	14.5	13.0	25.0			16.8	16.2	-	
SC29	524358	169412									19.0	22.0	25.0	18.0	21.0	18.3	-	
SC30	524313	171494									27.0	25.0	24.0	20.0	24.0	20.9	-	
SC31	523109	169716									14.0	18.0	21.0	8.0	15.3	13.3	-	
Wimbledon Park 1	525861	172917		25.0			19.0			14.0					19.3	15.5	-	
Wimbledon Park 2	525454	172603		23.0						12.0					-	-	-	
Wimbledon Park 4	525647	171843		36.0			17.0								-	-	-	
Wimbledon Park 5	525264	172177		35.0			23.0			19.0					25.7	20.6	-	
Wimbledon Park 6	525282	172003		31.0			18.0			14.0					21.0	16.8	-	
Wimbledon Park 7	525558	172631		24.0			13.0			11.0					16.0	12.8	-	

This page is blank