London Borough of Merton Air Quality Annual Status Report for 2020

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This report provides a detailed overview of air quality in the London Borough of Merton during 2020. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process[1].

Contact details:

Jason Andrews

Environmental Health Pollution Team

Environment and Regeneration

London Borough of Merton

Civic Centre

Morden

Surrey, SM4 5DX

Telephone 0208 545 3059

Email: jason.andrews@merton.gov.uk

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

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Abbreviations

Abbreviation	Description
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
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 Standards and Objectives

Pollutant	Standard / Objective (UK)	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
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})	40 µg m^{-3}	Annual mean	31 Dec 2004
Particles ($PM_{2.5}$)	25 µg m^{-3}	Annual mean	2020
Particles ($PM_{2.5}$)	Target of 15% reduction in concentration at urban background locations	3-year mean	Between 2010 and 2020
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} mot to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004

Notes:

(1) Date by which to be achieved by and maintained thereafter

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 of time to show real-world trends. It is affected by, temperature, weather, local conditions and wind direction. It is not necessarily accurate to compare one year's data with the next without considering all of the variable factors. However, this does provide an 'indication' of local changes.

As with all London boroughs we fail our air quality objectives, these almost entirely along our main roads and associated with traffic. There are two pollutants we are legally required to measure at this time, these are, nitrogen dioxide (NO_2) and Particulate Matter (PM_{10}). NO_2 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. Particulates however, exist in the environment with many incidents or episodes of pollution being caused nationally or globally.

All data from the automatic monitoring analysers undergoes quality assurance and quality control (QA/QC) procedures to ensure that the data is of a high quality. The standards of QA/QC at the London Air Quality Network (LAQN) sites are similar to those of the government's national Automatic Urban and Rural Network (AURN) sites. All data has traceability to national standards and operational procedures are defined for the London Air Quality Network (LAQN). For quality assurance purposes, all continuous analysers are manually checked and calibrated every two weeks[2], serviced every six months and audited by an independent auditor (National Physical Laboratory) every six months. With data ratification being undertaken by Imperial College London.

Merton Council also undertakes non-automatic monitoring of nitrogen dioxide (NO_2) using diffusion tubes, this provides a comprehensive coverage of all hotspots including most main roads and town centres throughout the borough. All sites are kept under

[2] During 2020 the onsite calibration frequency was impacted by COVID-19. Calibration frequency decreased to once every 2-4 weeks.

constant review and a few will be amended or moved, often in response to requests for more relevant monitoring during the year. Diffusion tubes offer a relatively inexpensive means of gauging NO_2 concentrations at a number of locations across the borough. The results provide monthly NO_2 averages and can be used to compare measured concentrations with the annual mean NO_2 objective following annualisation. The accuracy of diffusion tube data is improved by comparing results with automatic monitoring data and a bias adjusted applied based on calculation of a local bias adjustment factor.

Effects of the COVID-19 Pandemic (2020)

As a borough we decided that even during the period of 'lockdown', air quality monitoring was a priority as we believe this data would positively contribute to many different areas of work and research including health and policy making. Diffusion tube analytical services were suspended in April 2020 due to distancing restrictions; the exposed tubes collected throughout the borough were refrigerated and sent to Gradko International for analysis at the end of May 2020 when the laboratory reopened. The overall the diffusion tube data capture rate was 96% which is excellent considering the constraints imposed by COVID-19 and is testament to the dedication of Merton's Air Quality Officers.

In 2020 Merton operated two automatic air quality monitoring sites and a diffusion tube network covering 50 locations around the borough. The latest monitoring results for 2020 are heavily influenced by COVID-19. The diffusion tube data provides a detailed local picture of the impact that 'lockdown' had on localised pollution in the borough when vehicle movement was restriction. Air pollution in the London Borough of Merton still exceeds the Government Air Quality objectives, and therefore there is still a need for Merton to be designated as an AQMA and to pursue improvements in air quality.

In August 2019 an extensive 'school air quality monitoring programme' was initiated by Merton Council to gather information about actual nitrogen dioxide exposure at schools and to determine where any necessary mitigation or additional measures are required. Diffusion tubes were located at all educational institutions in the borough recorded on the Gov.UK register of schools. Initial

‘screening’ data indicated that the majority of educational sites are ‘low risk’. Where the initial, the monitoring period was extended to run through 2020. Following on from this extended monitoring period where monitoring found nitrogen dioxide concentrations to be potentially close to, or in excess of the annual air quality objective those sites were added to the main diffusion tube network for observation, the results are presented in Appendix C Diffusion Tube Results for Schools Monitoring Programme.

A number of community groups also carry out diffusion tube monitoring to investigate localised areas of concern, where this identifies new hot spots additional locations can then be considered for addition to the council’s diffusion tube monitoring network. In 2020 due to COVID-19 community monitoring was largely suspended; community volunteers were supported where they wished to continue with monitoring in accordance with the current Government guidelines, available data is reported in Appendix D Diffusion Tube Results for Citizen Science Monitoring. We would like to take the opportunity to thank community volunteers who continued to monitor air quality in the borough during a time of great uncertainty.

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2020

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
ME2	Merton Road, South Wimbledon	525808	170122	Roadside	Y	3	0.6	1.6	PM_{10}	BAM
ME9	Civic Centre, Morden	525588	168498	Roadside	Y	0.6	3.0	2.5	NO_2	chemiluminescent

Table C. Details of Non-Automatic Monitoring Sites for 2020

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance to kerb of nearest road (N/A if not applicable) (m)	Distance from monitoring site to relevant exposure (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
1	A298 Bushey Rd nr Bushey Ct, SW20	523139	169056	Roadside	Y	1.5	15.3	2.5	NO_2	N
2 (GA)	A24 Jct with Garth Drive Morden, SM3 9HU	524131	166112	Roadside	Y	1.7	12.2	2.4	NO_2	N
3	A24 Jct Tudor Drive, SM4 4PE	524137	166122	Kerbside	Y	0.7	9.6	2.4	NO_2	N
4 (FA)	154 Grand Drive Raynes Park	523315	168048	Kerbside	Y	0.9	3.6	2.4	NO_2	N
5 (BA)	Sacred Heart Sch, Burlington Road New Malden	522501	168235	Kerbside	Y	0.7	7.9	2.4	NO_2	N
6 (JC)	17 Grand Drive Raynes Park	523207	169195	Kerbside	Y	0.3	8.4	2.4	NO_2	N

7	A298 Kingston Rd, SW20 8LX	524401	169351	Roadside	Y	1.5	8.3	2.4	NO_2	N
8	A238 Coombe Lane, SW20 8NF	523246	169333	Kerbside	Y	0.6	2	2.2	NO_2	N
9	2 Lambton Rd, SW20	523241	169415	Kerbside	Y	0.5	3.6	2.2	NO_2	N
10	A238 Coombe Lane, SW20	521912	169806	Roadside	Y	1.7	16.4	2.4	NO_2	N
11	Kingston Rd SW20 1JW	525602	170042	Kerbside	Y	0.4	3.4	2.4	NO_2	N
12 (RA)	Pepys Road Morden	523357	169534	Kerbside	Y	0.6	10.1	2.4	NO_2	N
13	B281 Cottenham Pk Rd, SW20	522069	169765	Kerbside	Y	0.6	12.4	2.2	NO_2	N
14 (AC)	20 The Ridgeway Wimbledon	524120	170874	Kerbside	Y	0.4	1.5	2.4	NO_2	N
15	20 High St,Wimbledon, SW19 5BY	523808	171100	Kerbside	Y	0.5	2.8	2.2	NO_2	N

16	84 High St, Wimbledon, SW19	524071	171076	Kerbside	Y	0.6	2.9	2.2	NO_2	N
17 (WA)	Woodside Wimbledon	524608	170873	Kerbside	Y	0.5	6.7	2.4	NO_2	N
18	Hand & Racquet, Wimbledon Hill	524696	170725	Kerbside	Y	0.3	2.6	2.4	NO_2	N
19	Wimbledon Station	524770	170645	Roadside	Y	2.5	3.6	2.4	NO_2	N
20	Hartfield Rd, Wimbledon b	524867	170500	Kerbside	Y	0.4	4.8	2.2	NO_2	N
21 (EA)	246 Merton Rd, Sth Wimbledon A219	525798	170081	Roadside	Y	0.5	1.9	2.4	NO_2	N
22	12-16 Upper Green West, CR4 3AA	527785	169049	Roadside	Y	2	4.2	2.4	NO_2	N
23	183 Kingston Rd, SW19 1LH	525156	169935	Kerbside	Y	0.6	1.9	2.2	NO_2	N
24	75 Hartfield Rd SW19 3TJ	524994	170329	Kerbside	Y	0.7	4.1	2.4	NO_2	N
25	Alexander Rd, SW19 7LE	525132	171174	Roadside	Y	2.1	4	2.2	NO_2	N

26	Gap Rd, SW19 8JG	525708	171413	Roadside	Y	2.3	5.1	2.2	NO_2	N
27	Plough Lane	526035	171472	Roadside	Y	2.3	6.5	2.2	NO_2	N
28 (BC)	11 Haydons Road SW19 1HG	526158	170167	Roadside	Y	2.4	5.9	2.4	NO_2	N
29 (HA)	A24 - 44 High St Colliers Wood, SW19 2AB	526927	170654	Kerbside	Y	0.7	2.6	2.4	NO_2	N
30	A24 Christchurch Rd, SW19 2PB	526791	170087	Roadside	Y	0.3	3	2.4	NO_2	N
31 (LA)	Alley Charminster Ave Morden	525449	169152	Background	Y	15	9	2.4	NO_2	N
32	Merantum Way, SW19 2JY	526109	169818	Kerbside	Y	0.8	4.8	2.4	NO_2	N
33	A24 Morden Rd, SW19 3BP	525803	169467	Roadside	Y	2.7	3.6	2.2	NO_2	N
34 (GC)	Western Rd Colliers Wood	526840	169694	Roadside	Y	2	2.3	2.2	NO_2	N
35 (MA)	Lavender Ave Morden	527621	169646	Kerbside	Y	0.4	5.8	2.2	NO_2	N

36 (DC)	35 London Rd Tooting	527913	170518	Roadside	Y	1.5	1.9	2.4	NO_2	N
37 (CC)	107 London Rd Tooting	527932	169502	Kerbside	Y	0.6	2.4	2.4	NO_2	N
38 (EC)	BHF, 265 London Rd, Mitcham	527743	168874	Kerbside	Y	0.6	4.2	2.4	NO_2	N
39 (FC)	Church Rd, Mitcham	527158	168646	Kerbside	Y	0.6	3	2.4	NO_2	N
40	A217 London Rd, CR4 4BF	527370	168312	Kerbside	Y	0.8	5.4	2.4	NO_2	N
41	A239 Morden Rd, SM4 6AU	526395	168172	Roadside	Y	1.5	3.1	2.4	NO_2	N
42	St Hellier Rd, SM4 6JE	526211	167683	Roadside	Y	3.3	12.8	2.4	NO_2	N
43	Morden Hall Rd nr jct, SM4 5JG	526151	168293	Roadside	Y	2.4	22.2	2.3	NO_2	N
44 (AA)	Oxfam, London Rd, Morden	525817	168643	Kerbside	Y	0.6	4.9	2.4	NO_2	N
45 (IC)	HSBC, London Rd Morden	525778	169824	Kerbside	Y	0.9	2.6	2.4	NO_2	N
46 (HC)	80 Crown Lane Morden	525401	168502	Kerbside	Y	0.6	5	2.4	NO_2	N

47	Civic Centre, Morden	525588	168498	Roadside	Y	1.5	1.5	2.4	NO_2	Y
48	Aberconway Rd, SM4 5LF	525757	168509	Roadside	Y	1.2	7.7	2.4	NO_2	N
49	Crown Rd, Jcn Stanley Rd	525500	168470	Kerbside	Y	0.8	2.9	2.4	NO_2	N
50	Martin Way, SM4 4AR	524638	168616	Kerbside	Y	0.7	9.7	2.4	NO_2	N
51	A24 Streatham Rd nr Sandy Lane/Gorringe Pk Sch	528219	169782	Roadside	Y	1.6	5.2	2.4	NO_2	N
52	West Barnes Lane nr level crossing	522749	168500	Kerbside	Y	0.6	1.4	2.4	NO_2	N
53	A24 139 Epsom Rd, nr traffic lights, SM3 9EY	524621	166786	Kerbside	Y	0.7	3.6	2.4	NO_2	N
54	43 Upper Green East, Mitcham, CR4 2PF	527890	168920	Roadside	Y	2.4	2.0	2.3	NO_2	N
55	213 Manor Road, Mitcham, CR4 1JH	529661	168839	Kerbside	Y	0.6	5.2	2.2	NO_2	N

1.2 Comparison of Monitoring Results with AQOs

The results presented are after bias adjustment using the national bias adjustment factor (refer to Appendix A2 for details). Annualisation was not required at any site in the main Merton diffusion network in 2020, as all sites achieved a data capture rate of 75% or higher.

Where the annual mean is 10% of, or above, the 40μg m^{-3} AQO relevant exposure has been calculated, refer to Table N, Appendix A3 for corrected data. All data presented in Table D has not been corrected for distance and represent a worst case picture.

Notes:

Any ID's from 2016 or earlier are in brackets. Full site descriptions and the 2020 monitoring data for the revised network are provided in Table C.

Table D. Annual Mean NO_2 Ratified and Bias-adjusted Monitoring Results

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2020 % [b]	Annual Mean Concentration (μg m^{-3})						
					2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]	2020 [c]
ME9	Civic Centre, Morden	RS Automatic	100	74	38 (37.9)	34	Faulty	Faulty	**48**	**51**	**41(43)**
1	A298 Bushey Rd nr Bushey Ct, SW20	RS DT	100	100	not open	not open	not open	**52**	**47.8**	**47.1**	34.3
2 (GA)	A24 Jct with Garth Drive Morden, SM3 9HU	RS DT	92	92	32.8	32	32[d]	**41[c]**	36.7	35.7	26.8
3	A24 Jct Tudor Drive, SM4 4PE	KS DT	closed	closed	not open	not open	not open	34	closed	closed	closed

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2020 % [b]	Annual Mean Concentration (µg m^{-3})						
					2014 [c]	2015[c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]	2020 [c]
4 (FA)	154 Grand Drive Raynes Park	KS DT	100	100	**43.4** (36.5)	32	39.3[d]	37	30.4	30.6	26.6
5 (BA)	Sacred Heart Sch, Burlington Road New Malden	KS DT	100	100	32.9	28	32[c]	**42**	38.0	33.0	27.6
6 (JC)	17 Grand Drive Raynes Park	KS DT	100	100	32.4	N/A	34[d]	**45**	**43.0**	**42.6**	33.2
7	A298 Kingston Rd, SW20 8LX	RS DT	100	100	not open	not open	not open	**44**	**46.0**	**41.1**	33.0
8	A238 Coombe Lane, SW20 8NF	KS DT	100	92	not open	not open	not open	**53**	**43.1**	**46.3**	37.5
9	2 Lambton Rd, SW20	KS DT	100	75	not open	not open	not open	**43**	**46.8**	**43.3**	37.3
10	A238 Coombe Lane, SW20	RS DT	closed	closed	not open	not open	not open	38	**43.6**	closed	closed
11	Kingston Rd SW20 1JW	KS DT	100	83	not open	not open	not open	35	35.8	33.9	27.8
12 (RA)	Pepys Road Morden	KS DT	closed	closed	32.8	26	36	30	closed	closed	closed
13	B281 Cottenham Pk Rd, SW20	KS DT	100	92	not open	not open	not open	**44**	36.9	35.4	23.4

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2020 % [b]	Annual Mean Concentration (µg m^{-3})						
					2014 [c]	2015[c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]	2020 [c]
14 (AC)	20 The Ridgeway Wimbledon	KS DT	100	100	**41.6** (38)	N/A	**45**[d]	**44**	**42.2**	**43.7**	26.9
15	20 High St, Wimbledon, SW19 5BY	KS DT	closed	closed	not open	not open	not open	26	26.2	closed	closed
16	84 High St, Wimbledon, SW19	KS DT	100	100	not open	not open	not open	39	**44.9**	**44.8**	32.6
17 (WA)	Woodside Wimbledon	KS DT	closed	closed	**40.5** (36.1)	25	37	30	closed	closed	closed
18	Hand & Racquet, Wimbledon Hill	KS DT	92	92	not open	not open	not open	**64**	**65.6**	**64.7**	**56.9**
19	Wimbledon Station	RS DT	100	100	not open	not open	not open	**52**	**54.5**	**50.9**	**40.2**
20	Hartfield Rd, Wimbledon b	KS DT	100	83	not open	not open	not open	**48**	**55.1**	**52.4**	38.9
21 (EA)	246 Merton Rd, Sth Wimbledon A219	KS DT	100	83	**61.1 (50.5)**	**65**	**61**[d]	**57**	**68.8**	**63.2**	**51.5**

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2020 % [b]	Annual Mean Concentration (µg m^{-3})						
					2014 [c]	2015[c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]	2020 [c]
22	12-16 Upper Green West, CR4 3AA	RS DT	100	100	not open	not open	not open	**77**	**63.7**	**56.5**	**47.0**
23	183 Kingston Rd, SW19 1LH	KS DT	100	100	not open	not open	not open	**61**	**58.3**	**54.8**	**49.0**
24	75 Hartfield Rd SW19 3TJ	KS DT	100	100	not open	not open	not open	38	39.0	32.3	30.8
25	Alexander Rd, SW19 7LE	RS DT	100	100	not open	not open	not open	**41**	39.1	40.0	31.6
26	Gap Rd, SW19 8JG	RS DT	100	92	not open	not open	not open	**47**	**45.3**	**44.5**	34.4
27	Plough Lane	RS DT	100	100	not open	not open	not open	**46**	**45.5**	**42.2**	32.0
28 (BC)	11 Haydons Road SW19 1HG	RS DT	100	100	**43.6 (42.6)**	N/A	**54[d]**	**46**	**49.0**	**43.1**	33.4
29 (HA)	A24 - 44 High St Colliers Wood, SW19 2AB	KS DT	100	100	**49.8 (46.6)**	31	**49.9[c,d]**	**61**	**65.9**	**60.3**	**45.1**
30	A24 Christchurch Rd, SW19 2PB	KS DT	100	92	not open	not open	not open	**48**	**50.9**	**51.0**	34.9
31 (LA)	Alley Charminster Ave Morden	BG DT	100	100	26	17	24	20	20.5	19.8	14.5

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2020 % [b]	Annual Mean Concentration (µg m^{-3})						
					2014 [c]	2015[c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]	2020 [c]
32	Merantum Way, SW19 2JY	KS DT	100	100	not open	not open	not open	**42**	38.2	34.7	29.2
33	A24 Morden Rd, SW19 3BP	RS DT	100	100	not open	not open	not open	**49**	**48.2**	**47.1**	34.0
34(GC)	Western Rd Colliers Wood	RS DT	100	100	N/A	**53**	**64[d]**	**59**	**55.4**	**53.8**	**43.3**
35 (MA)	Lavender Ave Morden	KS DT	100	75	32.2	32	39	31	31.2	28.8	24.9
36 (DC)	35 London Rd Tooting	RS DT	100	100	**55.5 (50.2)**	**45**	**57[d]**	**42**	**46.9**	**40.4**	32.8
37 (CC)	107 London Rd Tooting	KS DT	100	100	**67.2 (54.5)**	**64**	**62[d]**	**61**	**67.3**	**56.1**	**40.8**
38 (EC)	BHF, 265 London Rd, Mitcham	KS DT	100	100	38	37	39[d]	**41**	**44.3**	**41.0**	33.4
39 (FC)	Church Rd Mitcham	KS DT	100	92	36.2	37	**41[d]**	**45**	**47.9**	**40.3**	29.6
40	A217 London Rd, CR4 4BF	KS DT	100	100	not open	not open	not open	**46**	**51.9**	**41.0**	32.5
41	A239 Morden Rd, nr O, CR4 6AU	RS DT	100	92	not open	not open	not open	**41**	**47.5**	**45.4**	**40.8**

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2020 % [b]	Annual Mean Concentration (µg m^{-3})						
					2014 [c]	2015[c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]	2020 [c]
42	St Hellier Rd, SM4 6JE	RS DT	100	100	not open	not open	not open	35	37.9	**42.0**	34.0
43	Morden Hall Rd nr jct, SM4 5JG	RS DT	100	92	not open	not open	not open	**44**	**50.1**	**44.5**	35.8
44 (AA)	Oxfam, London Rd, Morden	KS DT	100	92	**51 (48.7)**	N/A	38[c,d]	**57**	**61.9**	**62.2**	**50.9**
45 (IC)	HSBC, London Rd Morden	KS DT	100	92	N/A	**40**	**45[c,d]**	**45**	**48.2**	**47.8**	**43.0**
46 (HC)	80 Crown Lane Morden	KS DT	100	100	N/A	**46**	**48[d]**	61	**52.9**	**48.7**	**41.7**
47	Civic Centre, Morden	RS DT	100	100	not open	not open	not open	**51**	**51.3**	**51.7**	**44.2**
48	Aberconway Rd, SM4 5LF	RS DT	100	92	not open	not open	not open	**41**	**42.1**	38.7	30.7
49	Crown Rd, Jcn Stanley Rd	KS DT	100	100	not open	not open	not open	39	39.9	39.3	30.0
50	Martin Way, SM4 4AR	KS DT	100	100	not open	not open	not open	**45**	**43.2**	40.0	31.3
51	A24 Streatham Rd nr Sandy Lane/Gorringe Pk Sch	RS DT	100	100	not open	not open	not open	not open	37.8	33.3	25.7

Site ID	Site Name	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2020 % [b]	Annual Mean Concentration (µg m^{-3})						
					2014 [c]	2015 [c]	2016 [c]	2017 [c]	2018 [c]	2019 [c]	2020 [c]
52	West Barnes Lane nr level crossing	KS DT	100	100	not open	not open	not open	not open	34.6	30.0	24.7
53	A24 139 Epsom Rd, nr traffic lights, SM3 9EY	KS DT	100	100	not open	not open	not open	not open	**43.1**	**50.6**	**41.0**
54	43 Upper Green East, Mitcham, CR4 2PF	RS DT	100	100	not open	not open	not open	not open	not open	**61.5**	**47.4**
55	213 Manor Road, Mitcham, CR4 1JH	KS DT	100	100	not open	not open	not open	not open	not open	**44.5**	36.3

Notes:

The annual mean concentrations are presented as µg m^{-3}.

Exceedances of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 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.TG(19) if valid data capture for the calendar year is less than 75% and greater than 33%.

Results have been distance corrected where applicable see Appendix A, Table N for corrected data.

(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 D shows the NO_2 diffusion tube monitoring results, with bias corrected values for each year from 2014 to 2020. (Note – see Table O for the uncorrected monthly data for 2020).

Notes about the data:

Prior to 11th October 2017 continuous monitoring of nitrogen dioxide was measured by instrument ME1. The roadside site was located at Morden Civic Centre and suffered a series of faults during 2016, no data is available for 2016 and 2017 for this reason. A new chemiluminescent NO_2 analyser was installed on the 11th October 2017 identified as ME9.

The results in bold indicate an exceedance of the annual mean Air Quality Objective (AQO) of 40 μgm^{-3} and the results underlined indicate an NO_2 annual mean in excess of 60 μgm^{-3} highlighting a potential exceedance of the NO_2 hourly mean AQO. Diffusion tube have been bias corrected (for details see Appendix A Details of Monitoring Site Quality QA/QC), as the data capture was above 75% at all sites annualisation was not necessary. The overall the data capture rate in 2020 96% which is excellent considering the COVID-19 pandemic and is testament to the dedication of Merton's Air Quality Officers.

The distance correction calculations for monitoring sites that exceeded the annual mean objective are presented in Appendix A, Table N. Nitrogen dioxide concentration reduces rapidly with distance from the kerbside, the data in Table N shows what a dramatic effect distance has on a roadside / kerbside measurement. After correcting for distance, 4 sites out of 50 are still predicted to exceed the AQO at the nearest sensitive receptor, that is the NO_2 concentration is predicted to be below the AQO of 40 μgm^{-3}.

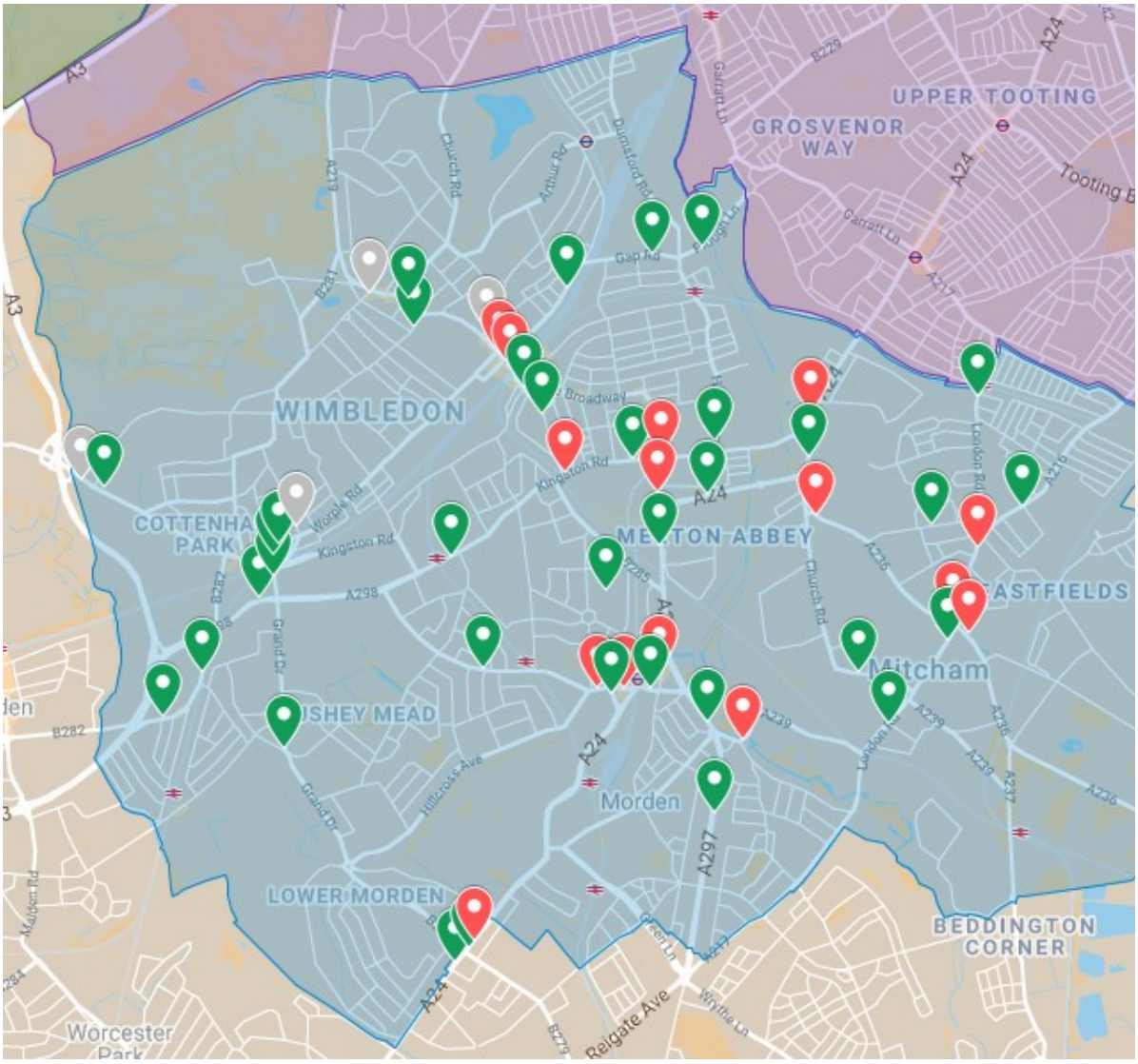
Diffusion Tube Data Analysis

In 2020 the diffusion tube network consisted of 50 monitoring locations across Merton. The original diffusion tube network of 20 monitoring locations was incorporated into the 2017 revised network to help assess trends over time. 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.

In 2020, as a borough we decided that even during the period of 'lockdown', air quality monitoring was a priority as we believe this data would positively contribute to many different areas of work and research including health and policy making. Diffusion tube analytical services were suspended in April 2020 due to distancing restrictions; the exposed tubes collected throughout the borough were refrigerated and sent to Gradko International for analysis at the end of May 2020.

The results from the 2020 monitoring (Table D) show that the objective of 40 μgm^{-3} was exceeded at 15 monitored locations in the borough which is 30% of sites, concentrations are mapped in Figure 1. Long term monitoring data (2012-2020) is available for 20 locations in the borough and is charted in Figure 2, the impact of COVID-19 manifested in a steep drop in NO_2 at all of these monitoring locations. Most significantly, all annual mean NO_2 concentrations were below an annual mean of 60 μgm^{-3} indicating that the 1 hour-mean objective is likely to have been achieved across the borough and in all town centres for the first time. However, all results for 2020 must be treated with caution due to the COVID-19 pandemic which affected traffic volume and in turn pollutant concentrations. The main source of pollution in town centres remains road traffic, it is essential that bold measures are taken to remove the dirtiest vehicles and reduce vehicle numbers to relieve congestion so that pollution does not return to pre-COVID-19 concentrations. The impacts of COVID-19 on air quality in Merton are discussed in greater detail in Section 2. Impact of COVID-19 upon LAQM.

Figure 1: London Borough of Merton mapped 2020 NO_2 concentrations



Legend

Compliant site:

Annual mean NO_2 <40 μgm^{-3}

Non-compliant site:

Annual mean NO_2 >40 μgm^{-3}

Closed site

Figure 2: Long term NO2 concentration trends in Merton 2012-2020 (all data bias adjusted). *Presented in the following 4 charts.*

Chart 1 of 4

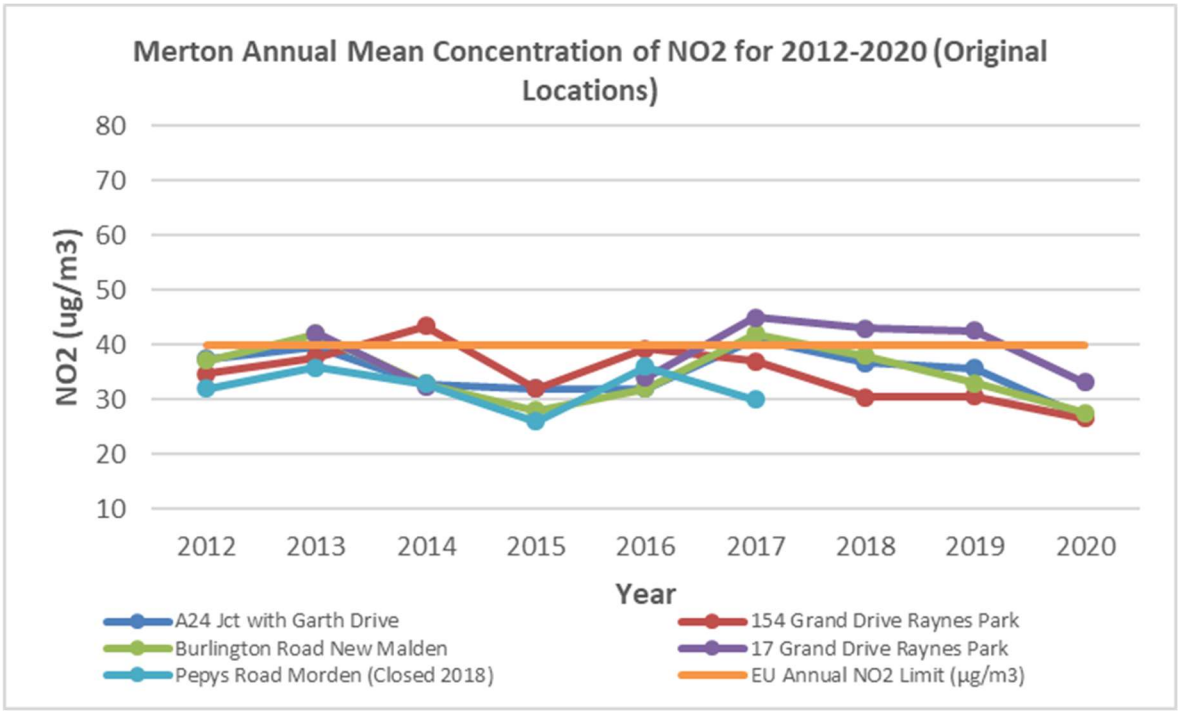


Chart 2 of 4

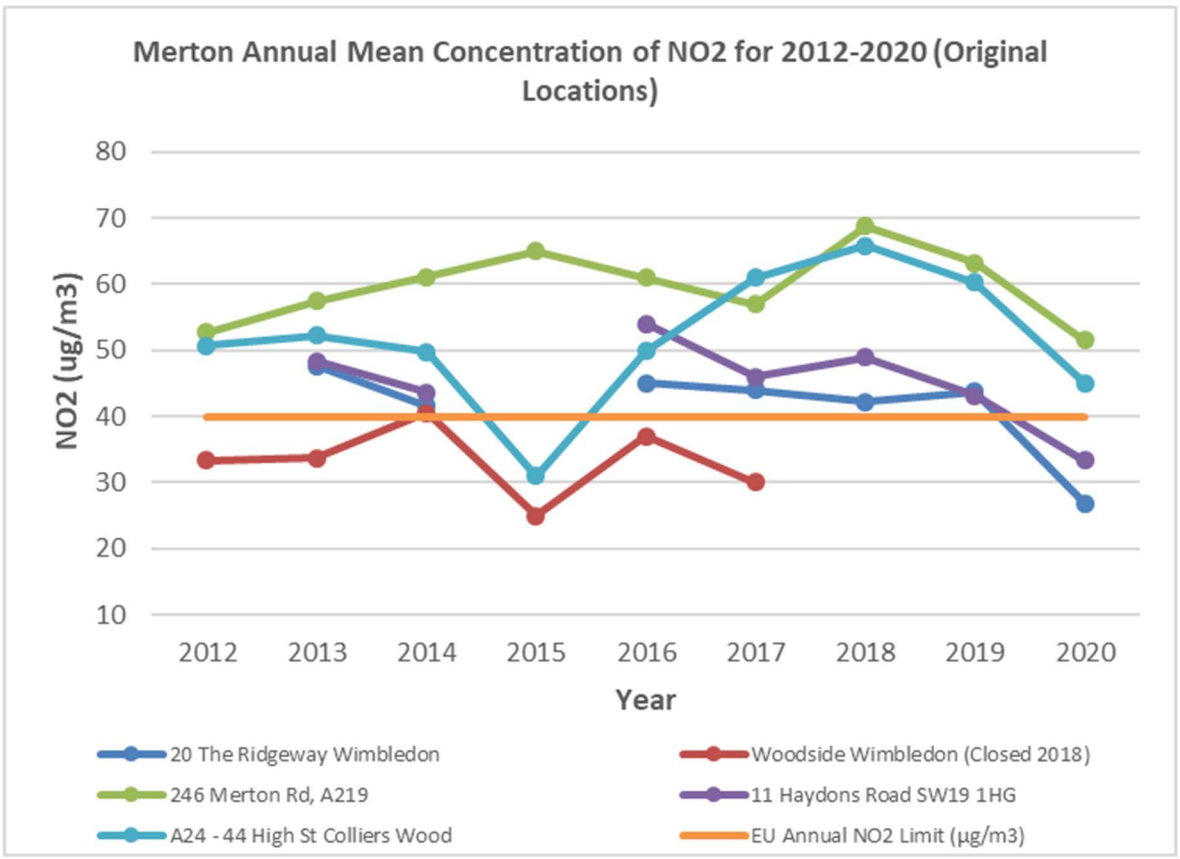


Chart 3 of 4

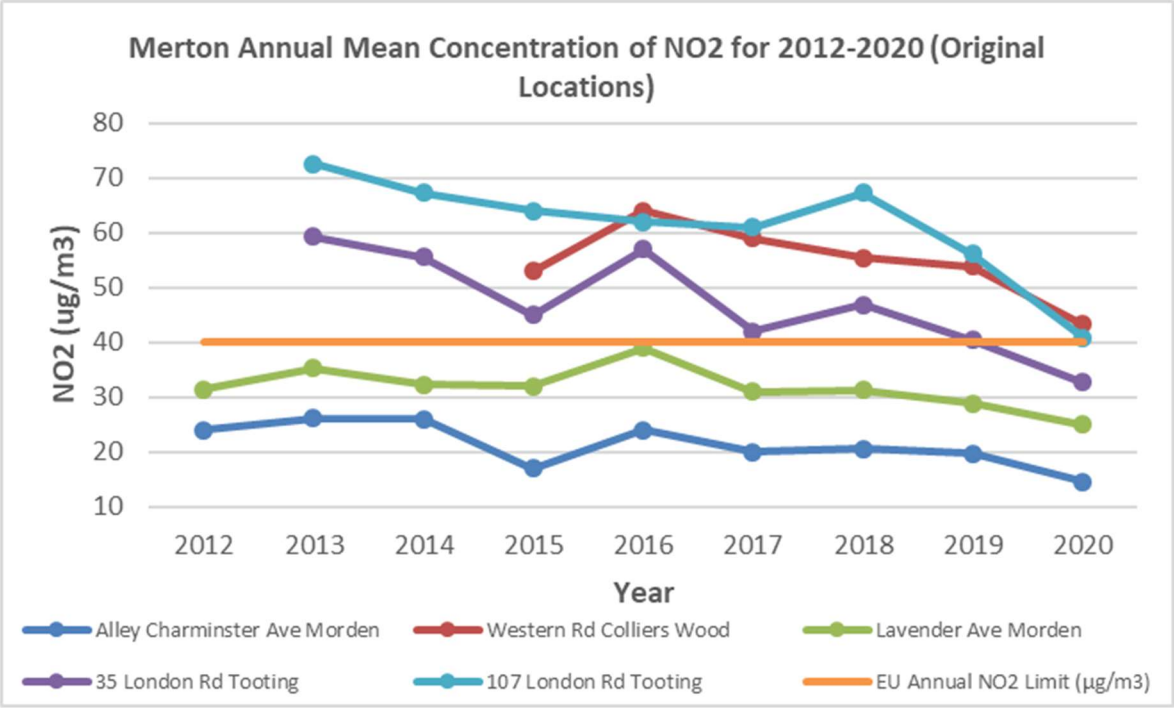


Chart 4 of 4

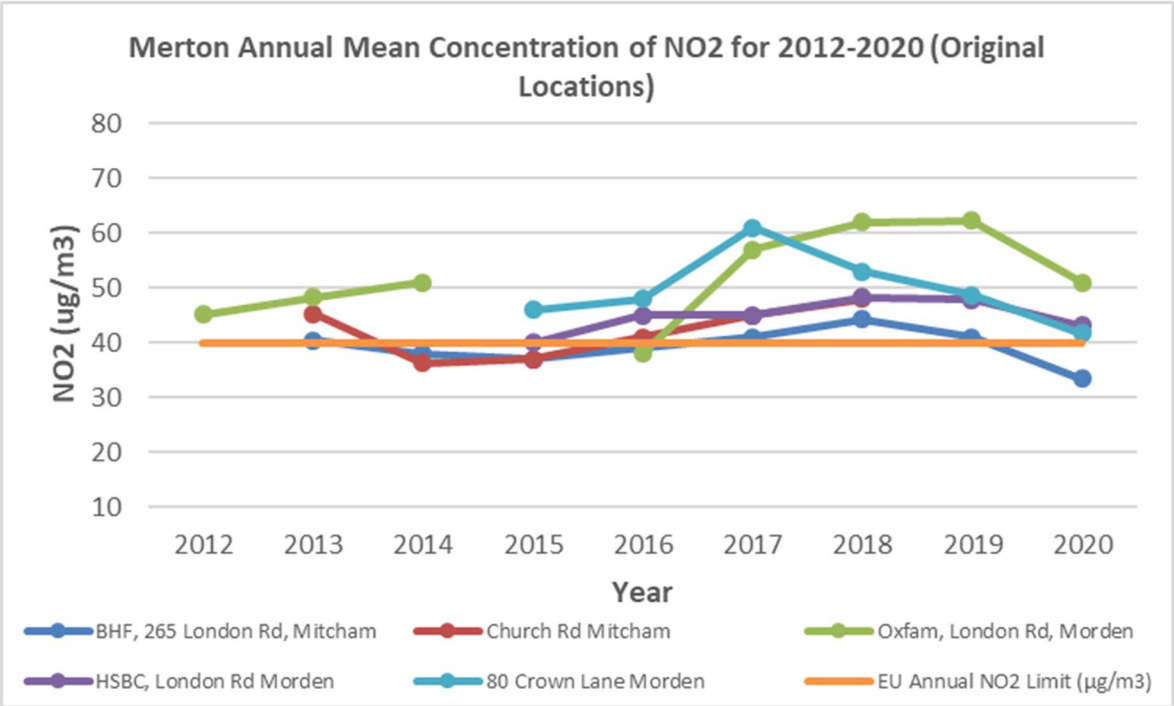


Table E. NO_2 Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m^{-3}

Site ID	Valid data capture for monitoring period %([a])	Valid data capture 2020 %([b])	2014	2015	2016	2017	2018	2019	2020
ME9	74	74	No data	No data	No data	No data	0	1	0 (158.4)

Notes

Results are presented as the number of 1-hour periods where concentrations greater than 200 µg m^{-3} have been recorded.

Exceedance of the NO_2 short term AQO of 200 µg m^{-3} 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%).

Prior to 11th October 2017 continuous monitoring of nitrogen dioxide was measured by instrument ME1. The roadside site was located at Morden Civic Centre and suffered a series of faults during 2016, no data is available for 2016 and 2017 for this reason. A new chemiluminescent NO_2 analyser was installed on the 11th October 2017 identified as ME9.

Table E provides results for the automatic monitoring station at the Civic Centre, Morden (ME9) site which houses a chemiluminescent NO_2 analyser. The automatic monitoring data are subject to correction by the Environmental Research Group (ERG) at Imperial College London as part of the London Air Quality Network (LAQN). At the time of reporting all data fully ratified.

The short term air quality objective of hourly mean concentration of 200 μgm^{-3} not to be exceeded more than 18 days per year was achieved at the Civic Centre site. As the period of valid data was less than 85% the 99.8th percentile of the 1-hour means is provided in brackets in Table E, calculated to be 158.4 $\mu g/m^{-3}$.

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. The last three years monitoring data from the Civic Centre site show the short term AQO to be consistently achieved, with very low (1) to nil exceedences of the 200 μgm^{-3} hourly mean concentration.

Poor data capture in 2020

Monitoring took place over the full 12-month period of 2020; however, data for a large portion of October and all of November and December were excluded during the data ratification process.

The NO_2 continuous analyser is serviced every six months by TRL and also audited by NPL every six months as part of the LLAQN QA/QC procedure, to ensure optimum data quality. A full discussion of the QA/QC procedures are provided in Appendix A.

The ME9 analyser failed its spring 2021 audit which took place on 5th March 2021. The auditor reported the analyser gave an unstable response to span gas, and poor repeatability and linearity. The efficiency of the analyser's molybdenum converter was also found to be very low. A callout was issued to TRL and they found a leak within the analyser at site on 10th March 2021 which likely explained the faults identified at audit.

During the data ratification process, it was evident that there had been some instances of rainwater ingress via the sample inlet funnel. One of these occurred on 3rd October 2020 and resulted in a very large drop in the analyser's response. Although the response was subsequently reset by TRL on 14th October 2020, it is suspected that the problems identified at audit started with the water ingress on 3rd October 2020 and measurements have therefore had to be excluded from then.

Table F. Annual Mean PM_{10} Automatic Monitoring Results (µg m^{-3})

Site ID	Valid data capture for monitoring period %(a)	Valid data capture 2020 %(b)	2014	2015	2016	2017	2018	2019	2020
ME2	90	90	28	25	24c	24	34c	28	26

Notes

The annual mean concentrations are presented as µg m^{-3}.

Exceedances of the PM_{10} annual mean AQO of 40 µg m^{-3} are shown in **bold**.

All means have been "annualised" in accordance with LLAQM.TG(19), if valid data capture is less than 75% and more than 33%.

(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 F provides results for the automatic monitoring station at the Merton Road, South Wimbledon (ME2) site which houses a Beta Attenuation Monitor (BAM) particulate analyser. The automatic monitoring data for the automatic monitoring stations are subject to correction by the Environmental Research Group (ERG) at Imperial College London as part of the London Air Quality Network (LAQN). At the time of reporting data have not been fully ratified due to COVID impacting upon ERG services; as such data is provisional but is unlikely to change significantly following ratification.

BAM particulate analysers are equivalent to the PM_{10} reference method and the applicable correction factor has been applied by ERG for all data presented in this report.

The annual mean objective of 40 μgm^{-3} was achieved at the Merton Road (ME2) site, with an annual mean concentration of 26 μgm^{-3}, this correlates well with pre-2018 data. The data capture was poor for 2018 and the data required annualisation in accordance with LLAQM.TG(19) which may have resulted in an artificial concentration 'spike'. Where data capture is below 75% no firm conclusions can be drawn as results may not be representative of the full year and should be used for guidance only.

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. The data from Merton Road indicates there has been no significant change to annual mean PM_{10} concentrations over the last 7 years (excluding 2018 as discussed). It is important to highlight that despite reduced traffic during 2020 due to COVID-19 a marked reduction in PM_{10} was not observed.

The annual Air Quality Objective is comfortably achieved however, in London a focus is required to be maintained on Particulate Matter even when meeting the PM_{10} targets, because the London boroughs are collectively working to meet the World Health Organization (WHO) health based $PM_{2.5}$ limits by 2030. The WHO annual mean limits for PM_{10} and $PM_{2.5}$ are significantly lower than the current UK/EU standard at 20 $\mu g/m^{-3}$ and 10 $\mu g/m^{-3}$ respectfully.

Table G. PM_{10} Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM_{10} 24-Hour Means > 50 µg m^{-3}

Site ID	Valid data capture for monitoring period %[(a)]	Valid data capture 2020 %[(b)]	2014	2015	2016	2017	2018	2019	2020
ME2	90	90	17 (44.4)	21	8 (36.6)	10 (37.6)	13 (47.3)	20	11

Notes

Exceedances of the PM_{10} 24-hour mean objective (50 µg m^{-3} 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 G provides a comparison of the 2019 monitoring data with the 24-hour mean objective. The objective of no more than 35 days exceeding 50 µgm^{-3} was achieved at the Merton Road (ME2) site in 2020, a total of 11 daily means exceeded 50 µgm^{-3}.

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 poor data capture in previous years it is currently not possible to accurately identify a trend in the data. As data capture was below 75% in 2016, 2017 and 2018, data was annualised in accordance with LLAQM.TG(19) and the figure for annual comparison is bracketed. Where data capture is below 75% no firm conclusions can be drawn as results may not be representative of the full year and should be used for guidance only. Keeping this in mind, the data from Merton Road indicates there has been no significant change to the number of exceedences

of the 24-hour mean objective over the last 4 years. There appears to be a spike in 2019, elevated PM_{10} concentrations can result from ‘pollution episodes’, which are often the result of local combined 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 PM_{10} was not observed.

The 24 hour Air Quality Objective is comfortably achieved, however, in London a focus is required to be maintained on Particulate Matter even when meeting the PM_{10} targets, because the London boroughs are collectively working to meet the World Health Organization (WHO) health based PM2.5 limits by 2030. The WHO 24-hour mean limit for PM2.5 is significantly lower at 25 $\mu g/m^{-3}$.

2. Impact of COVID-19 upon LAQM

The impact of COVID-19 on health and the response necessary to limit its transmission has been unprecedented in modern times. With such drastic changes to transport and travel, there are opportunities to consider the impact on air quality at a local, regional and national level. As we return to a 'new normal' there is also an opportunity to learn from this terrible experience, and to help shape future policy over the coming years to tackle poor air quality.

Unfortunately, the pandemic has pushed air quality concerns down the agenda as national and local policymakers grapple with immediate healthcare and economic impacts. Important measures like Clean Air Zones (CAZs) have lost what priority they had, sometimes on the grounds that air quality has improved this year as a by-product of restrictions to control the spread of the virus. However, **this is a temporary phase and not a solution**. We cannot forget that the tragic death of nine-year-old Ella Adoo-Kissi-Debrah who lived near the South Circular Road in Lewisham, South-East London. Ella died in 2013 following an asthma attack and has become the first person in the UK to have air pollution listed as a cause of death.

In 2020 TfL announced the suspension of LIP funding which stalled the delivery of match funded projects such as Idling Action and Healthy Streets Everyday(HSE). While COVID-19 has had a damaging impact on TfL projects and programmes affecting the borough funding was forth coming to implement a number of transport projects https://www.merton.gov.uk/streets-parking-transport/covid-19-transport-projects

Links with Sars-cov-2 and Air Quality

We are learning everyday about the Sar-cov-2 virus, including its morbidity, mortality and its ability to spread, something that will continue for many months and years. Its interactions with health and areas of poor air quality, and its ability to be spread by particulates is something of great speculation at this moment in time, also studies that will continue for many years to come.

Monitoring of Air Pollution in Merton

We have two real time automated air quality monitoring stations in the borough for particulate matter (PM10) and nitrogen dioxide (NO_2), these feed live data into - the London Air Quality Network (LAQN). This is supplemented by an extensive network of diffusion tubes at many locations in the borough. These are very useful for identifying and monitoring areas of high NO_2 concentration, particularly when dealing with sources such as traffic emissions. The diffusion tubes are collected and replaced monthly and provide the monthly mean values for nitrogen dioxide (NO_2) in specific areas of the borough.

As a borough we decided that even during the period of 'lockdown', air quality monitoring was a priority as we believe this data can positively contribute to many different areas of work and research including health and policy making.

Diffusion tube analytical services were suspended in April 2020 due to distancing restrictions; the exposed tubes collected throughout the borough were refrigerated and will be sent to labs at the end of May 2020.

This diffusion tube data provides a detailed local picture of the lockdown impact on restricting vehicle movements have had on localised pollution in the borough.

Making sense of any data

Air quality is a complex area of science with many variables to be considered. Monitoring needs to be carried out over an extended period of time to show real-world trends. It is affected by, temperature, weather, local conditions and wind direction. It is not necessarily accurate to compare one year's data with the next without considering all of the variable factors. However, this does provide an 'indication' of local changes.

Air Pollution in the Borough.

As with all London boroughs we fail our air quality objectives, these almost entirely along our main roads and associated with traffic.

There are two pollutants we are legally required to measure at this time, these are, NO_2 and Particulate Matter (PM_{10}).

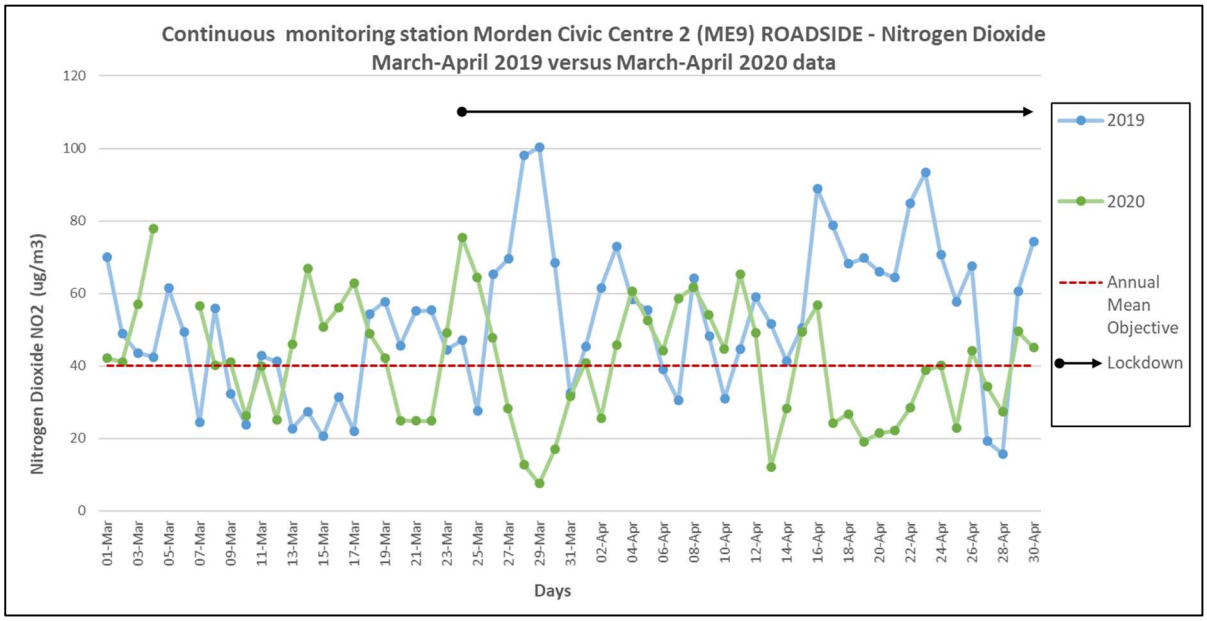
NO_2 is almost entirely linked to combustion and a reliable indicator, this is because it is generally not naturally occurring outside lightning strikes.

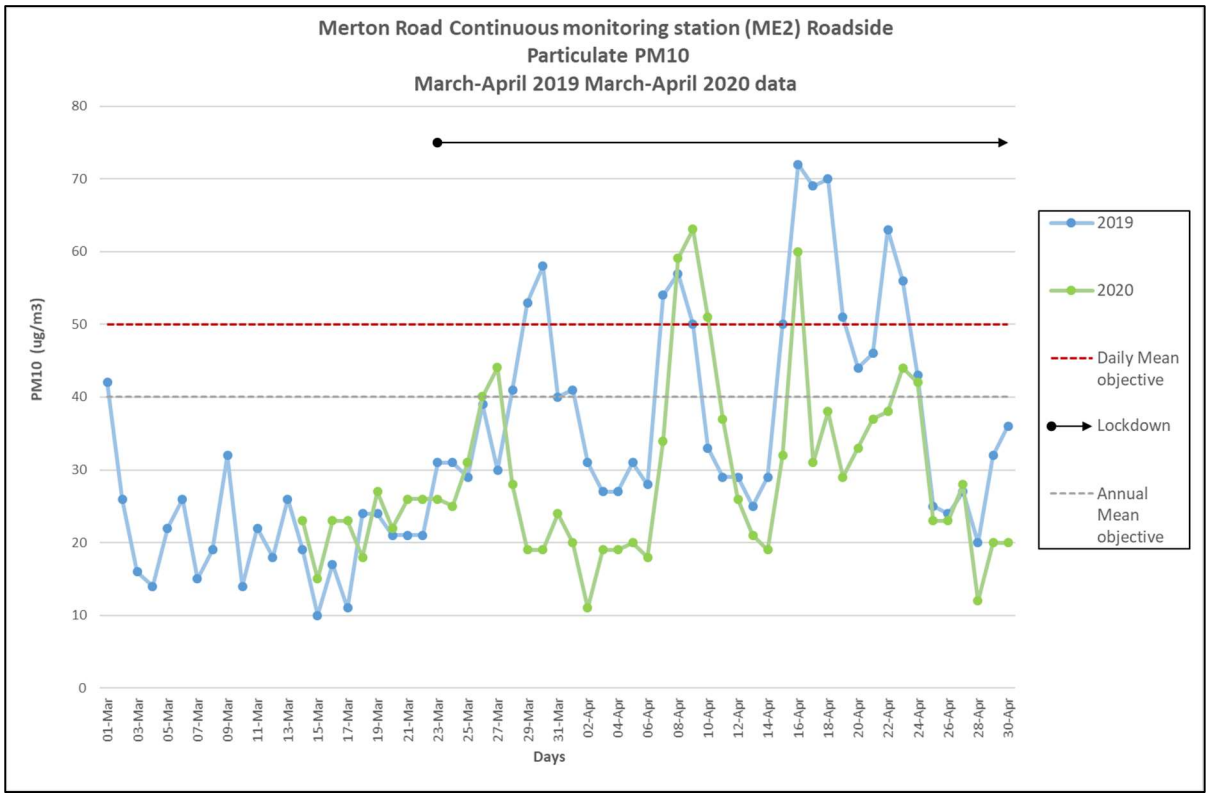
Particulates however, exist in the environment with many incidents or episodes of pollution being caused nationally or globally.

What we have measured

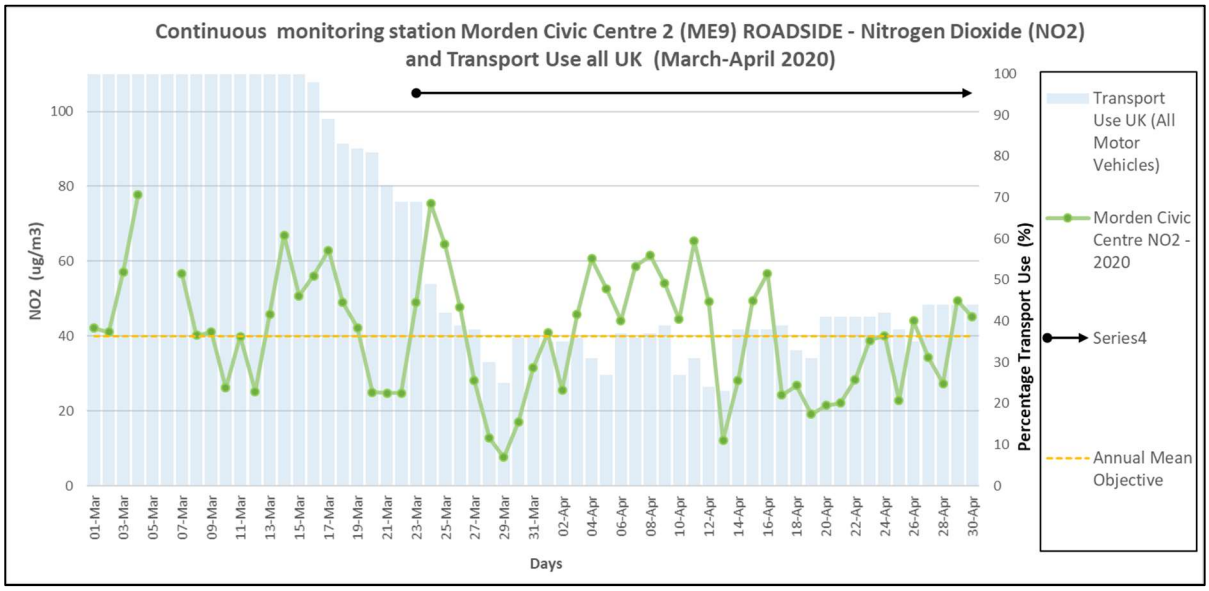
Automated monitoring sites

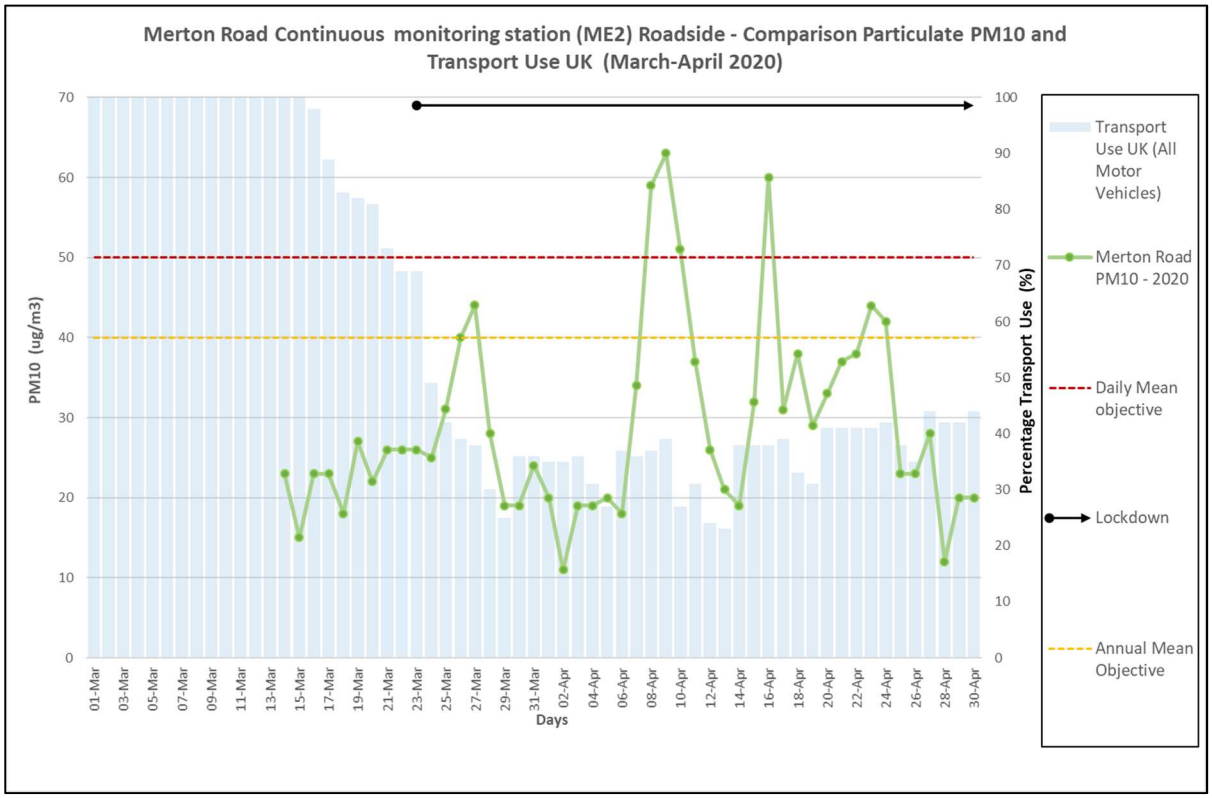
The following charts relate to our automated monitoring sites and compare 2019 to 2020 data during the period of lockdown.





The following charts relate to our automated monitoring sites and compare air quality data during the period of lockdown in 2020 with the transport use of all motor vehicles.

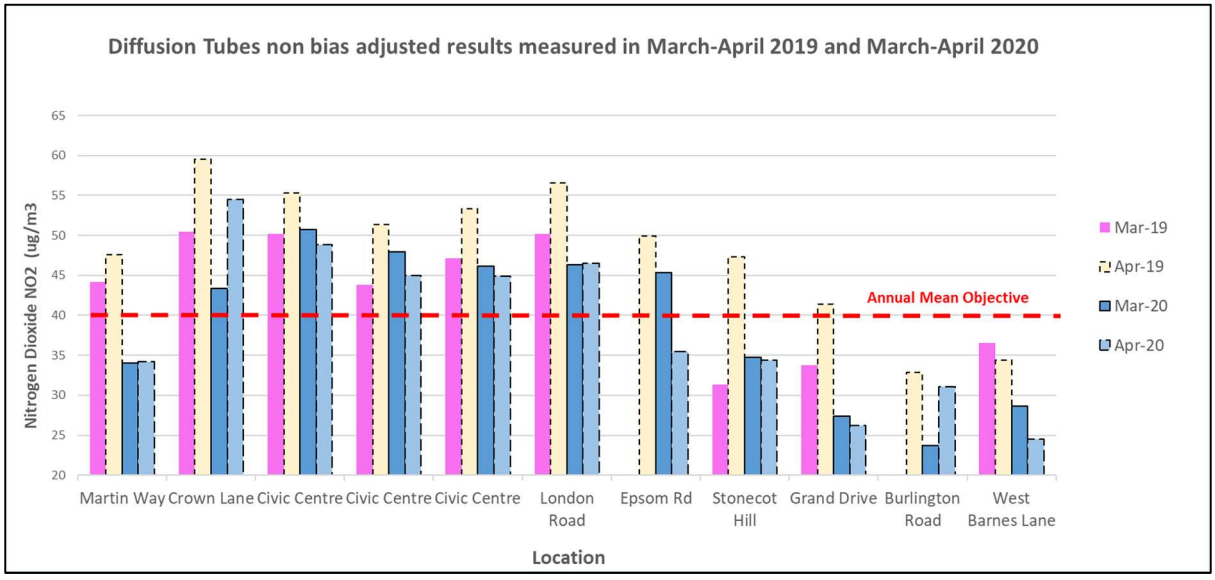


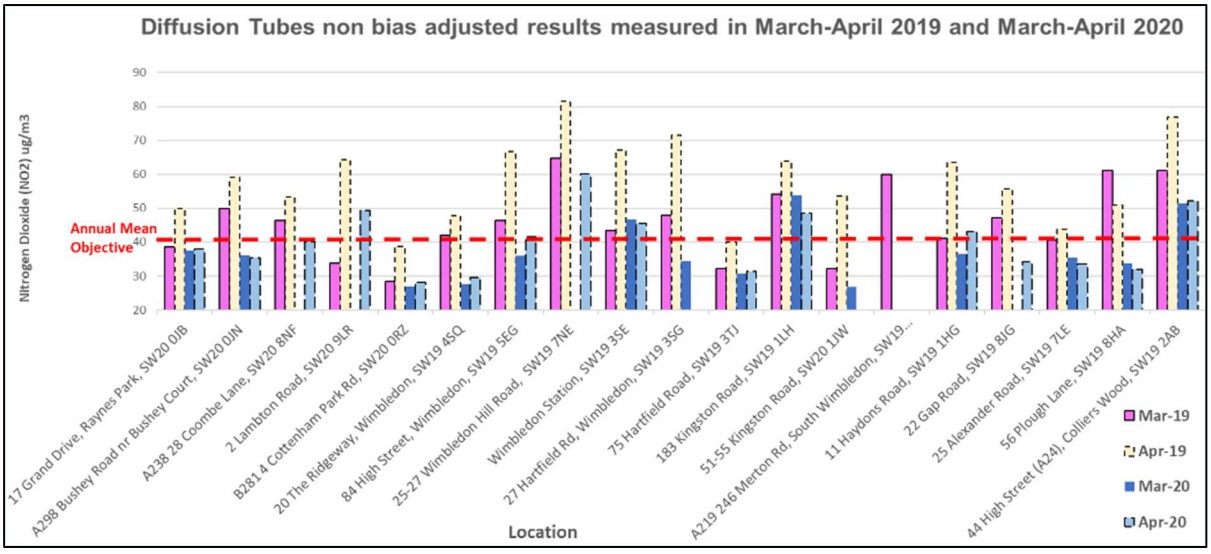


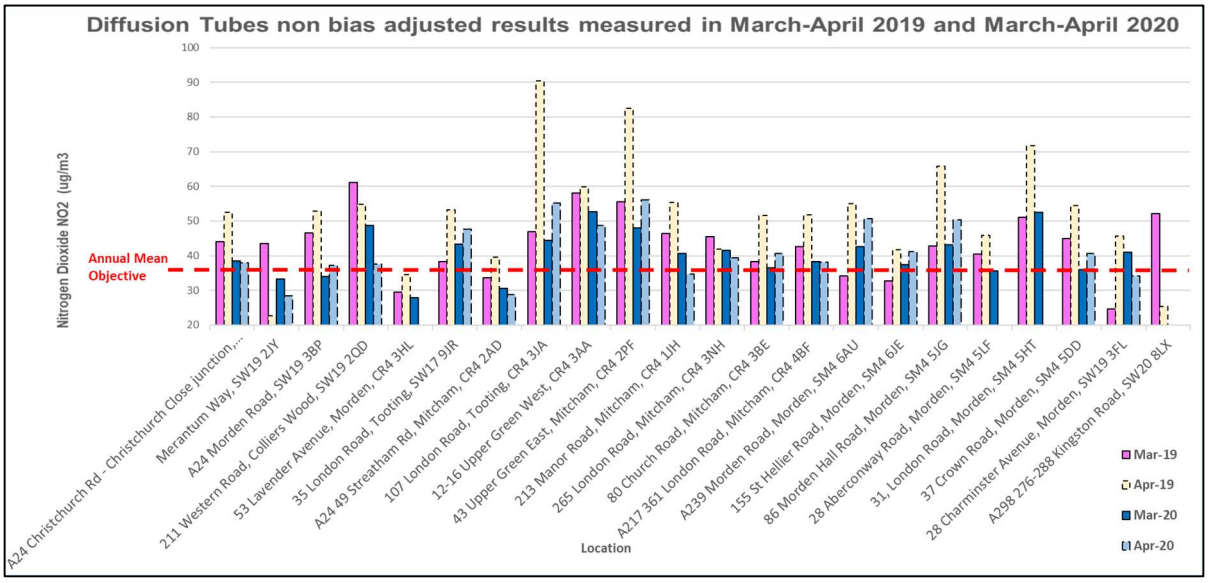
Diffusion Tube Results

The diffusion tube data provides a detailed local picture of the lockdown impact on restricting vehicle movements have had on localised pollution in the borough at 50 monitoring locations.

The following three charts relate to our diffusion tube sites and compare 2019 to 2020 data during the period of lockdown. The monthly mean results between January to April 2019 show that the objective of 40 µgm-3 was exceeded for a total of 48 monitored locations. In contrast for the same period in 2020 the objective of 40 µgm^{-3} was exceeded for a total of 36 monitored locations.







Preliminary Conclusions

We need to heavily caveat this data, there are a number of unknown variables that may or may not have affected these measurements, these include a potential increase in delivery vehicles during this period and the increase use of residential boilers. This data may become clearer over the coming months. In particular, we do generally see an increase in particulates at this time of year blown in from agriculture and industry.

The measurements show Appendix E.

- **27% decrease in NO_2** when compared **March-April 2019 to March-April 2020** daily mean results recorded at Merton's continuous monitoring station (ME9).
- **24% NO_2 daily mean average decrease** when compared **pre-lockdown** data (March 1st-23rd 2020) and **lockdown** (24th March-30th April 2020) data recorded at Merton's continuous monitoring station.
- **20% decrease in NO_2** when compared **March-April 2019 to March-April 2020** monthly mean results recorded at 50 diffusion tube locations.
- **20% NO_2 monthly mean average decrease** when compared **pre-lockdown** data (January-February 2020) and **lockdown** (March-April 2020) data recorded at 50 diffusion tube locations.
- No definitive overall reduction in **PM_{10}** when compared **pre-lockdown** data with the **lockdown** data, this is likely due to 'episodes' blown over from the continent. It is not uncommon to see escalated particulates at this time of the

year. These episodes are showed in the charts as peaks (Particle pollution episodes are a regular feature of springtime over Western Europe. They occur when the wind direction becomes easterly and air pollution builds up across the continent and the UK).

Please note: - Provisional data from the continuous analysers for March and April 2020 has been used in the analysis. At the time of writing this report the NO_2 data had been fully ratified and the data remained valid, the PM_{10} data remains provisional but is unlikely to significantly change once ratified. Likewise, raw diffusion tube data was used. An explanation of this data adjustment process is provided in Appendix A Details of Monitoring Site Quality QA/QC.

Overall, data is generally in line with current conclusions both regionally and nationally and suggests that the source of pollution in town centres remains road traffic, it is essential that bold measures are taken to remove the dirtiest vehicles and reduce vehicle numbers to relieve congestion.

Takeaway messages

1. The pandemic does not lessen the need for action on air quality:

A number of cities (including Leeds, Bristol, Sheffield and Greater Manchester) have either delayed the implementation of Clean Air Zones or cancelled their plans on the grounds that these measures were not immediately necessary.

2. Greater home-working is not the answer to cleaner air:

A number of commentators have argued that a longer-term uptake of remote working is the solution to improve air quality in cities. London is the city that has seen the highest levels of home-working during the pandemic, with over half of workers being able to work from home and many continuing to do so. Despite this, London's NO_2 concentrations are back to normal exceedances. Research has shown that people who work from home are more likely to use their car for other purposes, such as leisure or shopping. It has also been suggested that more people spending more time at home as a result of remote working could worsen air quality because energy consumption overall increases.

3. We need to disincentivise car and other vehicle usage to improve air quality:

What 2020 does show, is that anthropogenic (man-made) air pollution generated by traffic can be cut if behaviour changes, and that behaviours will not change without policy action. While it is clear that reducing vehicle usage to levels seen in April 2020 is not achievable any time soon, policies such as charging zones contribute to making driving less attractive, particularly for the most polluting vehicles. For example, the Ultra Low Emission Zone in London led to a 44 per cent decrease in NO_2 concentrations between February 2017 and February 2020, more than five times the national average reduction.

4. Reducing car usage does not affect all pollutants equally:

While NO_2 concentrations did fall with the reduction in traffic in most cities and large towns, $PM_{2.5}$ did not. This is because of the differing sources of $PM_{2.5}$. Action on traffic alone will not be enough to improve particulate pollution.

Key Focus

- Encourage people to return to, and swap to, public transport once the pandemic is under control. The implementation of charging Clean Air Zones will only be successful if people have alternatives to private vehicles.
- Expanding public transport usage must be at the core of long-term strategies for cleaner air, which need to work hard to rebuild habits and confidence eroded by the pandemic.
- Evaluate temporary active travel measures introduced during the pandemic and implement them if they are shown to be effective.
- Encouraging people to change behaviour, that should be made permanent.
- Move away from the reliance on private vehicles.
- Better understand our pollutants at a local and national level, in Particulates especially.

3. Action to Improve Air Quality

3.1 Air Quality Action Plan Progress

Table J provides a brief summary of the London Borough of Merton's progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2020 are shown at the bottom of the table.

Table J. Delivery of Air Quality Action Plan Measures

Measure	Action	Progress
Monitoring Air Quality		
1	Make available on the Council website all monitoring data in an accessible form.	Annual Status Reports containing tabulated and mapped data are publically available on the Council website. Ongoing – progressed delayed through 2020: A mapping system refresh is underway. Existing maps will be migrated to the new system. It will be possible to embed web maps on the Council website for groups to view the data that they have collected, data will be uploaded by the Council.
2	Continue to annually review our diffusion tube network and identify additional priority locations.	Due to COVID-19 community monitoring was largely suspended in 2020. No new monitoring locations were identified through this channel. ..Community data can be found in Appendix D Diffusion Tube Results for Following an initial screening phase where diffusion tube monitoring took place at all education institutions in Merton (accurate as of the 2019 Edubase database); a further 12-month monitoring programme was completed in 2020 at schools where air quality was found to be poorer (having an average NO_2 concentration of more than 32 μgm^{-3}). Based on the results of

		the 12-month programme, 9 school sites were added to the Council's main diffusion tube network in January 2021. Monitoring data is provided in Appendix C Diffusion Tube Results for Schools Monitoring Programme
3	Positively encourage and support citizen science activities where these actively contribute to identify and tackling air quality in the borough	Merton continue to support citizen science projects and provide training and resources including funding additional diffusion tubes. A Community Volunteer Coordinator has been appointed from the Environmental Sub Group (ESG) to liaise with the Council and coordinate all community diffusion tube monitoring. Handheld monitors available for loan for projects.
4	Invest in hand-held monitoring equipment that can be used by citizen science groups and schools.	Ongoing – delayed due to COVID-19: Investment planned in a new calibrated mobile monitor to use for monitoring specific locations and support projects, including $PM_{2.5}$ and sub PM_1 monitors
5	Seek additional funding for a refresh and update of our monitoring network including grant funding, Section 106 and Community Infrastructure Levy.	Ongoing – delayed due to COVID-19: Funding secured through Section 106 agreement at Wimbledon Stadium for an automated monitoring station. Quotes being submitted and need to concentrate on fine particulate matter $PM_{2.5}$ as well as nitrogen dioxide. Timeframe of installation will be determined by access to budget. Location of monitoring will be (Plough Lane). The monitoring data will link into the London Air Quality Network.

6	Produce and update an interactive map of diffusion data that can be contributed to by groups and citizen science activities.	Ongoing: Map refresh underway with GIS Team, procurement took place in 2019 and implementation will continue through 2020. 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).
7	Assess and incorporate new technology in the world of air quality.	Officers attend the London Air Quality Network (LAQN) conference hosted by King's College London annually. The LAQN is a unique collaboration between the public, private and academic sectors and the annual conferences are a chance for air quality researchers and practitioners to discuss the latest findings and developments in the field. The Council has regular meetings with suppliers to discuss and evaluate new air quality monitoring equipment.
8	We will commission modelling of air quality in the borough up to 2022, by King's College London, including predicted trends and contributing sources.	An updated London Atmospheric Emissions Inventory (LAEI) for the base year 2016 was published by the Greater London Authority in 2019. The inventory provides emissions estimates of key pollutants (NOx, PM_{10}, $PM_{2.5}$ and CO_2) by source type. The LAEI provides a best estimate of pollution across the borough where direct monitoring is not available. The GIS Team imported LAEI data onto the Council's mapping system to allow the data to be viewed, these maps have been migrated to the new system and work is ongoing in 2021 to finalise the air quality resources. Funding was secured for the key project in 2020 to complete borough specific air quality modelling through sunk funding arrangements. Note: the faculty at King's College London that

		undertakes modelling moved to Imperial College London in 2020.
9	Map Focus Areas & air quality 'hotspots' on planning GIS mapping to ensure these areas are highlighted	The GIS Team imported Air Quality Focus Area data onto the Council's mapping system to allow them to be easily viewed, these maps have been migrated to the new system and work is ongoing in 2021 to finalise air quality resources.
Reducing Emissions from Buildings & Developments		
10	Ensure that air quality is a vital part of the Council's New Local Plan.	Improving air quality and mitigation in developments will be embedded in the new Local Plan and supporting (emerging) Air Quality Supplementary Planning Document (SPD). Following the public consultation in 2020. Merton's Air Quality Supplementary Planning Document (SPD) is expected to be adopted by the Council in summer 2021. Following rounds of public consultations and public examination Merton's Local Plan is expected to be adopted winter 2021. Next round of Local Plan public consultation is spring 2021. The new London Plan was formally adopted in February 2021. https://www.merton.gov.uk/planning-and-buildings/planning/local-plan/newlocalplan
11	Adoption of New AQ Supplementary Planning Document (SPD) to ensure emissions from new	Ongoing.

	development are minimised and effective mitigation is integrated into the scheme of design.	Following the public consultation in 2020. Merton's Air Quality Supplementary Planning Document (SPD) is expected to be adopted by the Council in summer 2021. https://www.merton.gov.uk/planning-and-buildings/planning/supplementary-planning-documents/air-quality-spd
12	Ensure air-quality-neutral development is required, and request where applicable an air quality assessment	This is now standard practice in the planning process.
13	Work with key partners in the GLA to explore the feasibility and delivery of air-quality-positive development particularly around our Focus Areas.	Ongoing. Improving air quality and mitigation in developments will be embedded in the new Local Plan and supporting (emerging) Air Quality Supplementary Planning Document (SPD). Following the public consultation in 2020. Merton's Air Quality Supplementary Planning Document (SPD) is expected to be adopted by the Council in summer 2021.
14	Ensure that new development contributes to funding air quality measures in the borough through Section 106 and CIL payments.	Ongoing. Improving air quality and mitigation in developments will be embedded in the new Local Plan and supporting (emerging) Air Quality Supplementary Planning Document (SPD). Following the public consultation in 2020. Merton's Air Quality Supplementary Planning Document (SPD) is expected to be adopted by the Council in summer 2021.

15	Ensure that new development have a scheme of mitigation for tackling air quality including traffic reduction and low emissions strategies.	Ongoing. Improving air quality and mitigation in developments will be embedded in the new Local Plan and supporting (emerging) Air Quality Supplementary Planning Document (SPD). Following the public consultation in 2020. Merton's Air Quality Supplementary Planning Document (SPD) is expected to be adopted by the Council in summer 2021. .
16	Produce and promote guidance to homeowners on what they can do to their homes to help reduce pollution in the borough.	In November 2020, Council approved Merton's Climate Strategy and Action Plan which sets 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 p10 and 11 contains 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 also 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. As part of the commitment to supporting emissions reduction, Merton Climate Action Group has been set up as a joint Council community initiative to support community-led carbon reduction projects. One of the themes is Building and Energy and following the first meeting on 28th April 2021, they group have focused on setting up Energy Advice Cafes in Merton to help people to reduce energy bills through switching,

		putting in place energy efficiency measures and undertaking retrofit on their properties.
17	Consider how we can extend the provision of vehicle charging to smaller residential development to ensure the borough is ready for electric vehicles.	Ongoing. Improving air quality and mitigation in developments will be embedded in the new Local Plan and supporting (emerging) Air Quality Supplementary Planning Document (SPD). Following the public consultation in 2020. Merton's Air Quality Supplementary Planning Document (SPD) is expected to be adopted by the Council in summer 2021.
18	Continue to run our Non-Road Mobile Machinery (NRMM) Project across the south of London and extend this to other boroughs.	Progressed the 2019-2022 Pan London NRMM Project covering all 33 boroughs. Designed desktop auditing protocol for use during the 3 lockdown periods, otherwise continued as normal. Continual industry guidance in the approach to and following the Sept 2020 increase in standards to IIIB, IV and V according to zone and type. Delivered many training events to industry stakeholders. Presented at numerous Air Quality events for GLA, City of London, cluster groups and other stakeholders. Successful as winners of the Local Government Chronicle Environmental Services award.
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 to be beneficial to air quality, such as	Ongoing.

	Construction Logistics and Delivery and Service Planning.	Improving air quality and mitigation in developments will be embedded in the new Local Plan and supporting (emerging) Air Quality Supplementary Planning Document (SPD). Following the public consultation in 2020. Merton's Air Quality Supplementary Planning Document (SPD) is expected to be adopted by the Council in summer 2021.
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	Ongoing. Internal meetings underway funding streams identified. Following the public consultation in 2020. Merton's Air Quality Supplementary Planning Document (SPD) is expected to be adopted by the Council in summer 2021 to include Section 106 arrangements. Funding secured at around £140K to date.
22	Continue to request robust and enforceable measures to minimise the impact of developments during the construction phase	Ongoing. Planning Conditions to be reviewed in 2021 as part of the RSP Pollution Team initiatives.
Reducing Emissions from Road Transport		
23	Commitment to a cycle Quiet-way between Clapham Common & Wimbledon forming the Merton section of the Wandle trail.	Completed. Merton to liaise with TfL regarding rebranding of route/ upgrade to signage.
24	Review funding available through Section 106 and CILs around transport and travel infrastructure.	Support for transport infrastructure from relevant substantial developments where meets Section 106 tests. Transport

		improvements around individual sites are provided through funding from developments (via Section 278 legal agreements) Between 2019 and 2020 Merton's Neighbourhood fund 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 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 TfL in August 2019 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.
26	Programme of installing bicycle infrastructure	To encourage more people to cycle and improve safety for cyclists within the borough of Merton, light segregation in the form of cycle lane defenders have been installed within the borough in response to Covid 19 at locations including Church Road, Plough Lane, Haydons Road Bridge and Merton High Street. 20 secure cycle storage units (cycle hangars) have been installed around the borough, providing 120 cycle parking spaces. 20 cycle shelters have been installed at 16 schools providing over 200 cycle parking spaces.

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.	This project has now been deferred due to funding. The Clean Air Villages 3 (CAV3) project was utilised to monitor traffic in Wimbledon Town Centre in 2020 using Vivacity monitors. Project report to be made available on the Council website in 2021.
28	Air Quality Audit traffic and congestion in our three air quality focus areas.	Borough wide scheme to install a network of low cost air quality monitors, funding for 2021 through the Innovate project.
29	Support and promote the use of a cleaner vehicle checker to inform the public of cleaner vehicle choice.	Ongoing: Merton had 5 rapid chargers (50kw) on main roads (Transport for London Road Network), plus 2 approved in Wimbledon for installation in 2020. Fast chargers (7kw) 145 installed on the Source London network. The installation of 90 slow lamp column in residential areas around the borough was delayed in 2020 due to COVID-19 but is going ahead in 2021.
30	Lobby for Cleaner Buses and Taxis	Ongoing: The following activities are ongoing but were not focused on in 2020 due to the pandemic. The Mayor's Transport Strategy (MTS) was published in March 2018. Proposal 29 sets outs 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. Individual bus route contracts are typically retendered on a rolling 5 to 7 year basis. This 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 at 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.
31	Introduce Air Quality initiatives, benefits and monitoring in the new South Wimbledon Junction design and build.	Ongoing: 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.
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. **Note: The Sustainable Communities and Transport Overview and Scrutiny Panel to conduct pre-decision scrutiny on the scope of any reviews on parking levies.*	Merton consider the use of the parking agenda as key to delivering cleaner air. The diesel levy was one of a number of Parking/Air Quality Initiatives which now include a review of parking charges throughout the borough.

In April 2017, Merton took the innovative and bold decision to implement a diesel levy to encourage drivers/owners to move away from diesel vehicles. Diesel vehicle ownership as a percentage of permits sold has reduced slightly in nearly all permit zones since the introduction of the diesel levy in April 2017. This is believed to be mainly a result of national and regional policy signals on diesel cars including the London Ultra Low Emission Zone (ULEZ) zone but the Merton diesel levy may have had an effect in further amplifying this pricing signal.

Permit holders that had changed their vehicles from diesel to petrol were contacted to establish the reason for their change. Customers gave a range of reasons such as, environmental concerns and change in work arrangements. However, price was one of the top reasons cited, particularly in relation to the proposed expansion of ULEZ, which highlights that pricing signals can influence decision making.

In 2019/20 there was a decline in permits issued particularly for diesel vehicles.

Year	Petrol	Diesel	Electric	Total Permits
2016/2017				17541
2017/2018	13,345	5,578	23	18,946
2018/2019	14,332	5,990	51	20,373
2019/2020	14,107	5,025	112	19,244

Merton Council are now consulting on the move towards mirroring the ULEZ emissions scheme with our parking charges, linking Air Quality and Climate Change agendas. An additional charge on vehicles below Euro 6 Diesel and Euro 4 Petrol will

		be imposed. The proposals seek to raise the costs of parking for more polluting vehicles to encourage a positive shift towards cleaner vehicles to improve air quality and health.
Raising Awareness		
33	We will continue to support, fund and promote airText and other health based initiatives in the borough.	Ongoing: Merton continues to fund airText a publically available air pollution forecast service. https://www.airtext.info/
34	We will continue to support and update information on our Love Clean Air Website.	Ongoing.
35	We will review and update our own corporate website to include themed initiatives.	Ongoing: Council Communications Plan reviewed to keep air quality a running feature. Dedicated Anti Idling webpage created https://www.merton.gov.uk/communities-and-neighbourhoods/pollution/air-quality-and-air-pollution/tackling-idling In 2020 the main focus of Council comms was COVID-19.
36	We will play an active and co-ordinating role in national and regional campaigns such as National Clean Air Day.	Ongoing: National campaigns such as Clean Air Day 2020 were suspended during 2020 due to COVID-19.

37	Continue to aspire to London's Cleaner Air Borough status award.	Ongoing.
38	Ensure that the good work and best practice we are delivering is publicised and disseminated to colleagues in the air quality industry.	Ongoing: Merton continues to run the ground breaking Non-Road Mobile Machinery (NRMM) project throughout London as Cleaner Construction. Best practice is shared with stakeholders including London Boroughs, the GLA and construction industry.
39	Work closely with our Public Health colleagues around joint health benefits.	Ongoing: 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.
Working Together		
40	Establish a borough-wide air quality group.	Completed: The Environmental Sub Group which brings together interested and influential people to help deliver the Air Quality Action Plan (AQAP) and help lobby for changes, meets on a quarterly basis.
41	Establish an internal steering group within the local authority.	Completed: The steering group includes colleagues from Public Health and Climate Change.

42	Provide internal training sessions on air quality to internal partners and Councillors.	Planning ties continue to be strengthened. Planning and Air Quality training session for Councillors deferred to 2021 due to COVID-19.
43	Co-ordinate air quality funding and lobby national government to provide further financial and strategic support for local authorities to improve air quality.	Ongoing: 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.
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. Active discussions were held at the end of 2019 with TfL to undertake partnership working to tackle taxi idling in Wimbledon Town Centre in 2020. Not progressed in 2020 due to COVID-19, to be revisited in 2021.
45	The Director of Public Health (DPH) to be kept fully updated on air quality status and initiatives.	See Action 39
46	Public Health teams to support engagement and projects aimed at local stakeholders (businesses, schools, community groups and healthcare providers).	Joint SNAP (School Neighbourhood Approach Pilot, formerly the Superzones project). The pilot involved identifying the potential the Council has to improve the urban environment in the 400 metres around a school, and then working with a selected school and local people and business to take action on issues that matter to them, such as air quality and a healthy environment, with the ultimate aim of reducing health inequalities. New schools are being scoped to join the programme. SNAP project put on hold during 2020 due to COVID-19 and school closures.

		At the end of 2019 funding was obtained by the Council's Public Health Team from the Local Government Association (LGA) Behavioural Insights programme. This 12-month project will investigate the most effect form of anti-idling messaging at Primary Schools on a pilot study level. Progress delayed during 2020 due to COVID-19, the project continues in 2021. Joint Emissions Based Parking review completed to link together Public Health and Air Quality and how Parking Policy can deliver benefits to both agendas.
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.	Deferred. The overwhelming focus of Public Health during 2020 was COVID-19.
Leading by Example		
49	Review our procurement contracts for outsourced transport services and incorporate policies to establish the best and most cost effective fleet possible.	The Council continues to operate with c90 front line vehicles which are purchased through an agreed Capital programme. 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. 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. 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.
50	Review our maintenance and servicing arrangements for our buildings to ensure that these are as energy efficient and cost effective as possible.	The Council have continued to invest in the installation of low carbon measure such as insulation and solar PV through a 10-year long programme called "Invest to Save" which has resulted in a 40% reduction in carbon emissions from the Council's building stock since 2009. Since the declaration of a climate emergency, work has begun to carry out deeper retrofit on buildings to work towards our net-zero targets. After a successful bid to the Public Sector Decarbonisation Fund, a range of low carbon measures are planned for a number of children centres and community buildings for completion before the end of 2021, which includes the replacement of gas boilers with low carbon electric heating; which will reduce NOx emissions from the building stock.
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.	The review of the Council's Active Travel Plan and parking arrangements for staff across the council which was not been progressed in 2020 due to COVID-19 and the Civic Centre being closed. However, the Council's review of working arrangements post pandemic will influence commuting frequency and staff travel. 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.	Project currently underway to reduce use of private vehicles by staff. This will include any emission charging for staff permits. This was not progressed in 2020 due to the Civic Centre being closed due to the pandemic. However the council's review of working arrangements post pandemic will influence commuting frequency and staff travel.
54	Recruit an Air Quality Officer, funded by our Diesel Surcharge.	Completed. Air Quality Officer appointed in 2018 and funded fulltime on a permanent contract.
Innovation & Technology		

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.	The overwhelming focus of the Public Health Team during 2020 was COVID-19. Fortunately, a former Healthy Places Officer from the Public Health Team moved to support air quality project delivery within the RSP Pollution Team during 2020.
56	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 *Formerly King's College London	Annual meetings attended. Vivacity and Breathe London monitors are being secured through the South London partnership for deployment in 2021.
57	Apply for grant schemes and incorporate new technologies and best practice.	Ongoing projects in 2020: Those supported by the third round of the Mayor's Air Quality Fund (2019-2022): • Idling Action – a project to take action on idling (including enforcement), spanning 27 boroughs. • South London Construction Consolidation Centre – an initiative to consolidate construction deliveries across six south London boroughs, cutting at least 150 construction vehicle movements per day. • Non-Road Mobile Machinery Zone enforcement – a pan-London project to inspect construction sites in every borough to ensure they are using the cleanest construction equipment.

		• Healthy Streets Everyday – a project spanning 16 boroughs, which will deliver 250 car free and pedestrianisation initiatives or events over three years Funding awarded from Defra's Air Quality Grant scheme: • Clean Air Villages 3 (CAV3) - to deliver a CAV in Wimbledon Town Centre 2020/21. The year-long project spanning 12 London boroughs and 4 Business Improvement Districts, aims to improve air quality in 16 different London 'villages', where both air pollution and population density levels are high. The London Borough of Merton acquired a Vivacity monitoring sensor as part of Cross River Partnership's Clean Air Villages 3 project. The Vivacity sensor, facing East, was located on The Broadway, Wimbledon Town Centre. The sensor recorded vehicle classification and counts in September and December 2020. The report will be available on Merton Council's website in 2021. Funding awarded from Local Government Association (LGA) Behavioural Insights programme. This 12-month pilot project will investigate the most effect form of anti-idling messaging at Primary Schools. Progress delayed during 2020 due to COVID-19, the project continues in 2021.
58	Disseminate and publicise our ground-breaking work around schools and Non Road Mobile Machinery (NRMM).	This is ongoing through working with partner boroughs, the South London Air Quality Cluster Group and the Greater London Authority.

		Contribution from the NRMM project team: Continual industry guidance in the approach to and following the September 2020 increase in standards to IIIB, IV and V according to zone and type. Delivered many training events to industry stakeholders. Presented at numerous Air Quality events for GLA, City of London, cluster groups and other stakeholders. Successful as winners of the Local Government Chronicle Environmental Services award.
Tackling Pollution in our Borough		
59	Anti-idling to be adopted as an enforcement action in the borough with associated signage in problem areas.	Over 200 anti-idling signs have been installed in the borough at schools, level crossings and taxi ranks. No further signage was installed in 2020. Currently 50% of schools have anti-idling signage installed. The roll out of signage to all remaining schools is on hold until the findings of the Behavioural Insights project are published in March 2021. Refer to Action 46/57. Civil Enforcement Officers (CEOs) have been trained to engage with idling drivers during their daily duties with a particular focus at schools during drop-off and pick-up times.
60	Start partnership working with the GLA and surrounding boroughs on anti-idling campaigns.	Merton were successful in its bid to the Pan London Idling Action project. Additional resources being sought from Cllr's and Community Leaders to supplement our internal anti-idling campaigns.

61	Work with neighbouring boroughs to consider tighter restrictions on bonfires.	Ongoing: Considering options and lobbying for greater powers.
62	Conduct campaigns relating to wood burning appliances and seek additional funding from DEFRA to carry out an impact assessment and explore further controls	Future action. We continue to lobby for tighter regulations on wood burning appliances.
62	Deliver cleaner construction throughout South London through our Non Road Mobile Machinery (NRMM) project and extend this nationally.	Project now London wide and funded by Mayors Air Quality Fund (MAQF) / Greater London Authority (GLA) and match funding from London Boroughs.
64	Assess and inspect newly installed CHPs to ensure compliance with planning conditions	Future action. No staff for this function.
Our Schools		
65	Maintain our ongoing commitment to school travel plans and the STARS review.	Merton employ staff specifically for this function also supported by SusTrans, we are coordinating action and linking this to our schools work particularly around anti-idling to minimise duplication and maximise resources. There has been a reduced programme in 2020 due to schools being closed due to the pandemic and restrictions on activities such as cycle training. However physical measures including installing cycle parking at 16 schools and School Streets at 25 schools have been progressed instead. See Action 69.

		Of the 105 institutions (including nursery, primary and secondary) listed on the Edubase database the accreditation split is as follows: Gold: 14 Silver: 4 Bronze: 13 Engaged: 1 Not engaged: 74 Some of the institutions listed with an EAN number will not have or chose to have a STARS School Travel Plan.
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.	Action deferred to 2021 following air quality monitoring data from the 'school monitoring programme' which commenced in August 2019. Following an initial screening phase where diffusion tube monitoring took place at all education institutions in Merton (accurate as of the 2019 Edubase database); a further 12-month monitoring programme was completed in 2020 at schools where air quality was found to be poorer (having an average NO_2 concentration of more than 32 μgm^{-3}). Based on the results of the 12-month programme, 9 school sites were added to the Council's main diffusion tube network in January 2021 and receive an Air Quality Audit. Monitoring data is provided in Appendix C Diffusion Tube Results for Schools Monitoring Programme

<table>
<tr><td>67</td><td>Review and assess annually the necessity for audits at schools and nurseries in areas subject to high levels of pollution.</td><td>As Action 66.</td></tr>
<tr><td>68</td><td>Incorporate schools in areas of poor air quality into our monitoring network and regime.</td><td>As Action 66
Action due for completion in summer 2020.</td></tr>
<tr><td>69</td><td>Joint working arrangements with Public Health partners around schools to deliver joint health benefits.</td><td>SNAP project (School Neighbourhood Approach Pilot, formerly the Superzones project) is underway at Merton Abbey Primary School. Expansion to further school sites are being investigated. SNAP project put on hold during 2020 due to COVID-19 and school closures.
The operation of three School Streets commenced in 2019. The original plan (2019) was to extend four more sites in 2020 however due to an increase in funding arising from the COVID-19 pandemic an additional 25 school streets were rolled out under Experimental Orders which came into effect on 8 October 2020. The statutory consultation will run for a period of 6-12 months. By the 18th month, a final decision will be taken about which school streets will be made permanent.

<table><tr><th>School</th><th>Restricted roads</th></tr><tr><td>All Saints</td><td>Hanover Rd
Deburgh Rd (between Norman Rd and Hanover Rd)</td></tr></table></td></tr>
</table>

		Aragon	Aragon Rd (between Kingsbridge Rd and Cleveland Rise Aragon Place
		Beecholme	Beecholme Ave
		Benedict Primary	Benedict Road
		Bishop Gilpin and Ricards Lodge	Lake Rd (from Leopold Rd to Church Hill Richards Rd; Leopold Ave; Helme Close
		Date Valley	Cricket Green (cul-de sac section)
		Garfield	Garfield Rd (from Tennyson Rd to Milton Rd) and Dryden Rd
		Gorringe Park	Sandy Lane Between Fernlea Rd and Streatham Rd) Harbour Close; Tide Close; Summerhill Way; Spring Grove
		Harris Primary Academy	Ivy Gardens
		Hillcross	Ashridge Way (between Leamington Ave to Hillcross Ave) Woodland Way

			Monkleigh Rd (from Hillcross ave to Northernhay Walk) Shaldon Drive (from Monkleigh Rd to Northernhay Walk)
		Holy Trinity	Effra Rd (from Evelyn Rd to Trinity Rd) Faraday Rd (from Evelyn Rd to Trinity Rd)
		Holymount	Cambridge Rd, SW20 (from Pepys Rd to Lambton Rd)
		Links Primary School	Frinton Road Gunton Road
		Malmesbury	Malmesbury Rd and Leominster Rd (between Newminster Rd and Netley Gdns) Neath Gardens
		Merton Park Primary	Erridge Rd from its junction with Poplar Rd Stratton Close; Stratton Road; Keswick Ave Church Lane (cul de sac)
		Pelham Primary	Southey Rd, SW19 (from Pelham Rd to Kingston Rd)

		Poplar	Poplar Rd South (between Cranleigh Rd and Crown Lane)
		Rutlish	Watery Lane and Manor Gardens
		Singlegate Primary (on hold)	South Gardens
		St Marks Primary	St Marks road (between St Mark's Rd to Armfield Crescent) Chalkley Close
		St Marys	Russell Rd, SW19 (from Pelham Rd to car Park)
		St Matthews	Cottenham Park Rd, SW20 (from Burdett Ave to cul de sac)
		St Teresa	Montacute Rd (From Middleton Rd to Lillishall Rd)
		St Thomas of Canterbury Catholic Primary School	Commonside East (access road)
		Stanford	Chilmark Rd, SW16 Hassocks Rd

<table>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>Oxtoby Way
Byards Croft</td></tr>
<tr><td>The Sherwood</td><td>Abbots Rd (from Sherwood Park Rd to Commonside East)
Castleton Rd
Hadley Rd</td></tr>
<tr><td>Ursuline High</td><td>Crescent Road and Southdown Drive</td></tr>
<tr><td>William Morris</td><td>Recreation way, Mitcham
Between the roundabout and Huntington Close</td></tr>
<tr><td>Wimbledon Park primary</td><td>Havana Rd SW19
Wellington Rd</td></tr>
</table>
https://www.merton.gov.uk/streets-parking-transport/traffic-management/school-streets-programme
</td></tr>
<tr><td>70</td><td>Work with and provide specialist advice and support to schools around air quality issues.</td><td>There is much collaborative working internally at Merton Council to maximise the resources available, share knowledge and avoid unnecessary duplication. Various examples of this have been provided in previous specific action updates.</td></tr>
</table>

New Projects commenced in 2019 - updates		
NP1:2019	Healthy Streets Everyday (HSE)	Funding awarded by the Mayor of London. Active dates 2019-2022. A project spanning 16 boroughs, which will deliver 250 car-free and pedestrianisation initiatives or events over three years During 2020 Merton's HSE Mayors Air Quality Fund (MAQF) funding was reallocated to delivering Parklets outside three primary schools (Benedict Primary, Singlegate Primary & Lonesome Primary School). Delivery of the Parklets was delayed in 2020 due to COVID-19 restrictions, implementation due in Summer 2021 ready for the new school year in September. https://crossriverpartnership.org/projects/healthy-streets-everyday/
NP2:2019	Behavioural Insights	Funding awarded from Local Government Association: Behavioural Insights programme. This 12-month pilot project will investigate the most effect form of anti-idling messaging at Primary Schools. Project delivery was delayed due to COVID-19 restrictions and continues in 2021
New Projects 2020		

NP1:2020	Clean Air Villages 3 (CAV3)	Funding awarded by DEFRA. Active dates April 2020 – March 2021. Delivery of a Clean Air Village in Wimbledon Town Centre 2020/21. The year-long project spanning 12 London boroughs and 4 Business Improvement Districts, aims to improve air quality in 16 different London 'villages', where both air pollution and population density levels are high. Project delivery was delayed until September 2020 due to COVID-19 restrictions. Between September and December 2020 the CAV3 team contacted 82 businesses via email or phone. A 1-page communication to business was sent out demonstrating the different options offered including the Cargo Bike scheme, EV Dongle, being part of the directory or other options for deliveries. Business that were interested in the Cargo Bike scheme. At the start of November 2020 there were 3 businesses interested in using the scheme. Since the lockdown many businesses chose to close down or were not getting any customer demand during November. When lockdown was lifted, the business were re-contacted, but they were waiting for demand to increase with the vaccine roll out in the new year. 116 attempted engagements to business have been made to get them involved in the project and 6 out of 8, one-to-ones. Final update to be reported in the 2021 Annual Status Report (ASR). https://crossriverpartnership.org/projects/clean-air-villages-3/ The London Borough of Merton acquired a Vivacity monitoring sensor as part of Cross River Partnership's Clean Air Villages 3 project. The Vivacity sensor, facing East, was located on The Broadway, Wimbledon Town Centre. The sensor recorded

		vehicle classification and counts in September and December 2020. The report will be available on Merton Council's website in 2021.

4. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in the London Borough of Merton in 2020

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	A total of 131 planning applications were referred internally by the Planning Team for comment.
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	6
Number of developments where an AQ Neutral building and/or transport assessments undertaken	6
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	0
Number of planning applications with S106 agreements including other requirements to improve air quality	S106 Contributions: Air Quality Contribution x4 Tree Planting x3 Electric Charging x2 Car Club x17 Cycle Provision x1
Number of planning applications with CIL payments that include a contribution to improve air quality	Under the CIL Regulations 2010 CIL expenditure is not accounted for at the planning application level.
NRMM: Central Activity Zone and Canary Wharf Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered with the GLA through	The London Borough of Merton is entirely outside of the Central Activity Zone and Canary Wharf

Condition	Number
the relevant NRMM website and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.	
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. 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 IIIA of the Directive and/or exemptions to the policy.	Cleaner Construction for London undertook 13 site audit(s) in the borough of Merton. • 2 site(s) achieved Self-Compliant status, 5 site(s) worked towards and achieved Compliance and 0 site(s) failed and were recorded as non-Compliant. • 5 site(s) upon arrival/engagement were completed and 1 site(s) had No NRMM within scope (37-560kW) presently deployed. 15% of sites audited were cold engaged and therefore not registered prior to auditing. • 15% of sites audited were cold engaged and therefore not registered prior to auditing. • 0% of Non-Compliant sites have refused our officers access and/or stated that they will not cooperate with the NRMM Scheme. This caused their sites to be recorded as 'Declined Audit'. • . 0% of Site Non-compliance is due to sites being unable to evidence a machine's compliance. This means that the Type Approval Number was not found on the engine, and further, suitable supporting documentation was not available for the machine. • 0% of Site Non-compliance is due to 1 or more machines not meeting the required emission standards. • 0% of Non-compliance is due to sites not using the online NRMM London Register, even though all their machinery is of the stage required by the Mayor's SPG.

4.1 New or significantly changed industrial or other sources

No new sources identified.

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.

The NO_2 continuous analyser is automatically calibrated every night and also manually checked and calibrated every two to four weeks by the contractor, TRL, employed by LBM for LSO visits during 2020. 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 NO_2 continuous analysers is serviced every six months by TRL and also audited by NPL every six months as part of the Imperial LAQN QA/QC procedure, to ensure optimum data quality.

PM_{10} Monitoring Adjustment

PM_{10} particulates are measured using a Tapered Element Oscillating Microbalance (TEOM) analyser, with the data presented as the gravimetric equivalent.

No automatic or fortnightly calibrations are carried out on the TEOM. Calibrations are only carried as part of the routine servicing and regular independent audits. The on-going performance of the monitor is checked online, by the Imperial College London Duty Officer[3]. The role of the LSO at the fortnightly visits is to make more detailed

[3] In July 2020 King's College London merged with Imperial College London. The Environmental Research Group (ERG) also moved across to Imperial.

performance checks. The LSO is also on standby at other times, to change the TEOM's monitoring filter as required, depending on the filter loading.

Since 2009, TEOM data have been improved by routine adjustments, using the volatile correction method (VCM). This corrects for the loss of any volatile mass, which has been driven off by the heat applied in the TEOM's inlet column. The VCM adjustments are carried out by Imperial College London, prior to dissemination of the data.

The TEOM equipment is serviced every six months by TRL and also audited by NPL every six months as part of the Imperial LAQN QA/QC procedure, to ensure optimum data quality. Both sites are part of the LAQN and KCL are responsible for the daily data collection, storage, validation and dissemination via the LAQN website (www.londonair.org.uk). KCL ratifies the data periodically, viewing data over longer time periods and using the results from fortnightly checks, equipment services and equipment audits.

A.2 Diffusion Tube Quality Assurance / Quality Control

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 NO_2 along with other pollutants. Under the Directive, annual mean NO_2 concentration data derived from diffusion tube measurements must demonstrate an accuracy of ±25 % to enable comparison with the NO_2 air quality objectives of the Directive.

In order to ensure that NO_2 concentrations reported are of a high quality, strict performance criteria need to be met through the execution of QA and QC procedures. A number of factors have been identified as influencing the performance of NO_2 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 NO_2 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 NO_2 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.

Details of Gradko International Limited's laboratory precision results

- Performance in AIR NO_2 PT Scheme (February 2019 – October 2020)

- Summary of Precision Results for 2018 - 2020

- UKAS schedule of accreditation (April 2020)

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 NO_2 Proficiency Testing Scheme (February 2019 – October 2020)

Gradko participate in the AIR PT NO_2 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 2020 for 50% TEA in Acetone. Gradko was contacted for comment as their performance was lower than in previous years. It was confirmed that a procedural error occurred which only affected the AIR-PT samples and that routine diffusion tube sample analysis were not affected.

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 NO_2 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 Limited’s performance for 2020 is covered by rounds AR031 to AR040 of the AIR-PT scheme.

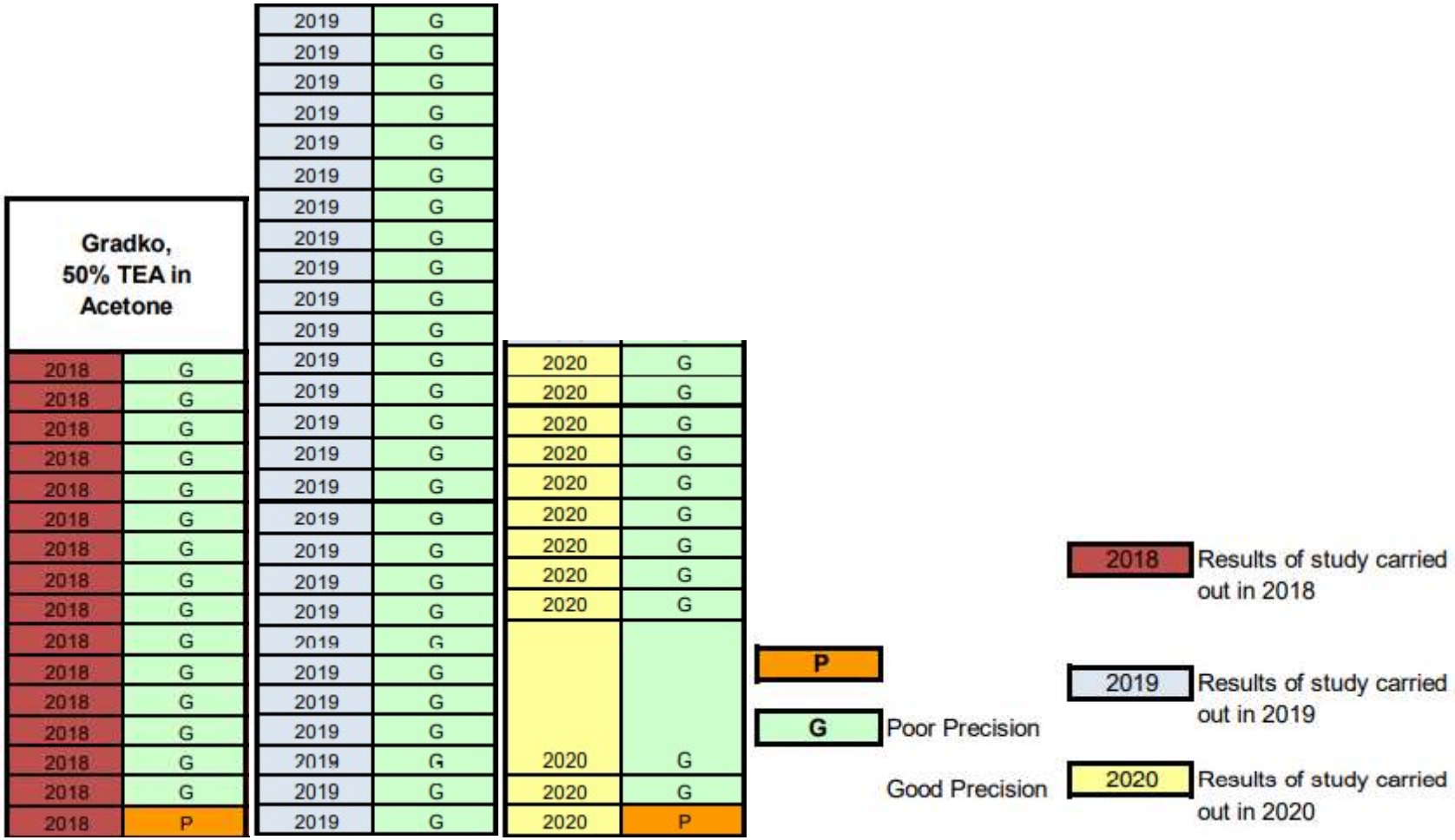
Table 1: Laboratory summary performance for AIR NO_2 PT rounds AR0030, 31, 33, 34, 36. 37, 39 and 40

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent AIR NO_2 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 AR030	AIR PT AR031	AIR PT AR033	AIR PT AR034	AIR PT AR036	AIR PT AR037	AIR PT AR039	AIR PT AR040
Round conducted in the period	January – February 2019	April – May 2019	July – August 2019	September – November 2019	January – February 2020	May – June 2020	July – August 2020	September – October 2020
Aberdeen Scientific Services	75 %	100 %	100 %	100 %	100 %	NR [4]	NR [4]	100 %
Cardiff Scientific Services	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Edinburgh Scientific Services	100 %	NR [2]	100 %	25 %	50 %	NR [4]	NR [4]	100 %
SOCOTEC	87.5 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	NR [4]	NR [4]	100 % [1]
Exova (formerly Clyde Analytical)	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Glasgow Scientific Services	100 %	100 %	100 %	50 %	100 %	NR [4]	NR [4]	100 %
Gradko International	75 %	100 %	100 %	100 %	75 %	NR [4]	NR [4]	75 %
Kent Scientific Services	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Kirklees MBC	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Lambeth Scientific Services	50 %	100 %	50 %	100 %	100 %	NR [4]	NR [4]	100 %
Milton Keynes Council	100 %	100 %	50 %	100 %	100 %	NR [4]	NR [4]	25 %
Northampton Borough Council	NR [3]	NR [3]	NR [3]	NR [3]	NR [3]	NR [4]	NR [4]	NR [3]
Somerset Scientific Services	100 %	100 %	100 %	100 %	100 %	NR [4]	NR [4]	100 %
South Yorkshire Air Quality Samplers	100 %	100 %	100 %	75 %	100 %	NR [4]	NR [4]	100 %
Staffordshire County Council	100 %	75 %	75 %	75 %	100 %	NR [4]	NR [4]	50 %
Tayside Scientific Services (formerly Dundee CC)	100 %	NR [2]	100 %	NR [2]	100 %	NR [4]	NR [4]	100 %
West Yorkshire Analytical Services	100 %	100 %	100 %	50 %	100 %	NR [4]	NR [4]	NR [2]

[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 and Northampton Borough Council; no longer carry out NO2 diffusion tube monitoring and therefore did not submit results.
[4] Round was cancelled due to pandemic.

2018 - 2020 Summary of Precision Results for Nitrogen Dioxide Diffusion Tube Collocation Studies for Gradko Laboratory 50% TEA in Acetone.



Numerical results for this data are contained in the National Bias Adjustment Spreadsheet version 03/20

Gradko is accredited by UKAS for the analysis of NO_2 diffusion tubes. It undertakes the analysis of the exposed diffusion tubes by ultra violet spectrophotometry.

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

UKAS TESTING

2187

Accredited to ISO/IEC 17025:2017

Gradko International Ltd
(Trading as Gradko Environmental)

Issue No: 024 **Issue date:** 15 April 2020

St Martins House	**Contact: Mr A Poole**
77 Wales Street	**Tel: +44 (0)1962 860331**
Winchester	**Fax: +44 (0)1962 841339**
Hampshire	**E-Mail: diffusion@gradko.co.uk**
SO23 0RH	**Website: www.gradko.co.uk**

Testing performed at the above address only

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	Chemical Tests	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

UKAS TESTING 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:** 024 **Issue date:** 15 April 2020
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)	Chemical Tests (cont'd)	
	Qualitative Analysis and Estimation of Volatile Organic Compounds on diffusion (sorbent) tubes and monitors	GLM 13 by Thermal Desorption GC-Mass Spectrometry with estimations in accordance with ISO standard 16000-6
	Naphthalene	GLM 13-1 by Thermal Desorption GC-Mass Spectrometry
	Tetrachloroethylene Trichloroethylene	GLM 13-2 by Thermal Desorption GC-Mass Spectrometry
	trans-1,2-Dichloroethene cis-1,2-Dichloroethene	GLM 13-3 by Thermal Desorption GC-Mass Spectrometry
	Indane Styrene	GLM 13-4 by Thermal Desorption GC-Mass Spectrometry
	1,2,3-Trimethylbenzene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene	GLM 13-5 by Thermal Desorption GC-Mass Spectrometry
	1,3-Butadiene	GLM 13-6 by Thermal Desorption GC-Mass Spectrometry
	Carbon Disulphide	GLM 13-7 by Thermal Desorption GC-Mass Spectrometry
	Vinyl Chloride	GLM 13-8 by Thermal Desorption GC-Mass Spectrometry
	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	LWI 47 by Thermal Desorption GC-Mass Spectrometry
END		

NO_2 diffusion tube analysis method

NO_2 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). NO_2 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 NO_2 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 NO_2 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 ultra violet 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 2020 the Borough undertook a co-location study placing with three NO_2 diffusion tubes (Site IDs 47, 47/2, 47/3) with the continuous NO_2 monitoring equipment at the Civic Centre Morden (ME9).

However, it was not possible to derive the local bias adjustment factor for 2020 due to periods of poor data capture from the automatic nitrogen dioxide analyser; as such the national bias adjustment factor of 0.82[4] has been used to correct diffusion tube data. The guidance states, the use of nationally derived bias adjustment factor will provide the best estimate of the true annual mean concentration as it is based on more studies than a locally derived one.

[4] National Diffusion Tube Bias Adjustment Factor Spreadsheet. Spreadsheet Version Number 03/21.

Table L. Bias Adjustment Factor

Year	Local or National	If Local, Version of National Spreadsheet	Adjustment Factor
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
2015	National	03/16	0.96
2014	National	03/15	0.80

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

NO_2 Adjustment (Diffusion tubes)

No data adjustment (annualisation) required for diffusion tube monitoring locations as all sites achieved a data capture rate of 75% or more in 2020.

NO_2 Adjustment (ME9)

Automatic monitoring took place over the full 12-month period in 2020, however, data for a large portion of October and all of November and December were excluded during the data ratification process.

The NO_2 continuous analyser is serviced every six months by TRL and also audited by NPL every six months as part of the LLAQN QA/QC procedure, to ensure optimum data quality. A full discussion of the QA/QC procedures are provided in Appendix A.

The ME9 analyser failed its spring 2021 audit which took place on 5th March 2021. The auditor reported the analyser gave an unstable response to span gas, and poor repeatability and linearity. The efficiency of the analyser's molybdenum converter was also found to be very low. A callout was issued to TRL and they found a leak within the analyser at site on 10th March 2021 which likely explained the faults identified at audit.

During the data ratification process, it was evident that there had been some instances of rainwater ingress via the sample inlet funnel. One of these occurred on 3rd October 2020 and resulted in a very large drop in the analyser's response. Although the response was subsequently reset by TRL on 14th October 2020, it is suspected that the problems identified at audit started with the water ingress on 3rd October 2020 and measurements have therefore had to be excluded from then.

As the data capture rate fell below 75%, the measured annual mean has been adjusted using the annualistation methodology in Box 4.2 of LLAQM.TG(19), details provided in Table M.

Table M. Short-Term to Long-Term Monitoring Data Adjustment

Site ID	Annualisation Factor Hillingdon - Harlington	Annualisation Factor Wandsworth - Wandsworth Town Hall	Annualisation Factor Lambeth - Streatham Green	Annualisation Factor Greenwich - Eltham	Average Annualisation Factor	Raw Data Annual Mean (µg m^{-3})	Annualised Annual Mean (µg m^{-3})	Comments
ME9	1.075	1.049	1.070	1.040	1.059	41	43	ME9 experienced poor data capture (7%) during October and during the ratification process data for November and December were found to be of poor quality and excluded. The period mean was therefore calculated using data for January to September inclusive.

PM_{10} Adjustment (ME2)

Data capture for the automatic analyser ME2 in 2020 was 96% and as such data adjustment (annualisation) was not required.

Distance Adjustment

Where an exceedance has been measured at a monitoring site which is not representative of public exposure, the procedure specified in LLAQM.TG(19) and NO_2 fall-off with distance calculator (Version 4.2) Excel tool has been used to estimate the concentration at the nearest receptor.

NO_2 fall-off with distance calculator

This Excel tool has been developed to help local authorities derive the NO_2 concentration at locations relevant for exposure as it is not always possible to measure concentrations at precisely the desired location. The calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site. The monitoring can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be.

The methodology consists of comparing the monitored annual mean NO_2 concentrations at a given point against known relationships between NO_2 concentrations and the distance from a road source.

Limitations

1. Each distance inputted should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitoring is closer to the kerb than this is likely to be reasonable).
2. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other.
3. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.
4. Distances should be measured perpendicular to the kerb and the calculator assumes that the monitor and receptor have similar elevations.

5. The results of the calculator will have a greater uncertainty than measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

6. The measurement and the background must be for the same year. The background concentration could come from the national maps published at https://uk-air.defra.gov.uk/data/laqm-background-home , or alternatively from a nearby monitor in a background location.

7. The calculator can only be used where the influence of one road source is present i.e. an increasing distance from a road source in one direction cannot lead to a decreased distance toward a secondary road source.

Table N. NO_2 Fall off With Distance Calculations

Site Name/ID		Distance (m)		NO_2 Annual Mean Concentration (μgm^{-3})			Comment
	Site Description	Monitoring Site to Kerb	Receptor to Kerb	Background (Merton Site ID 31 – bias adjusted)	Monitored at Site (bias adjusted)	Predicted at Receptor	
8	A238 28 Coombe Lane, SW20 8NF	0.6	2.6	14.5	37.5	31.3	
9	2 Lambton Road, SW20 9LR	0.5	4.1	14.5	37.3	28.8	
18	25-27 Wimbledon Hill Road, SW19 7NE	0.3	2.9	14.5	56.9	**41.3**	Predicted concentration at Receptor above AQS objective.
19	Wimbledon Station, SW19 3SE	2.5	6.1	14.5	40.2	34.6	
20	27 Hartfield Rd, Wimbledon, SW19 3SG	0.4	5.2	14.5	38.9	28.3	
21 (EA)	A219 246 Merton Rd, South Wimbledon, SW19 1AU	0.5	2.4	14.5	51.5	**41.2**	Predicted concentration at Receptor above AQS objective.
22	12-16 Upper Green West, CR4 3AA	2.0	6.2	14.5	47.0	*38.4*	Predicted concentration at Receptor within 10% the AQS objective.

23	183 Kingston Road, SW19 1LH	0.6	2.5	14.5	49.0	**40.0**	Predicted concentration at Receptor above AQS objective.
29 (HA)	44 High Street (A24), Colliers Wood, SW19 2AB	0.7	3.3	14.5	45.1	*36.2*	Predicted concentration at Receptor within 10% the AQS objective.
34 (GC)	211 Western Road, Colliers Wood, SW19 2QD	2.0	4.3	14.5	43.3	*38.1*	Predicted concentration at Receptor within 10% the AQS objective.
37 (CC)	107 London Road, Tooting, CR4 3JA	0.6	3.0	14.5	40.8	33.1	
41	A239 Morden Road, Morden, SM4 6AU	1.5	4.6	14.5	40.8	34.4	
44 (AA)	31, London Road, Morden, SM4 5HT	0.6	5.5	14.5	50.9	*36.2*	Predicted concentration at Receptor within 10% the AQS objective.
45 (IC)	192-110 London Road, Morden, SM4 5AX	0.9	3.5	14.5	43.0	35.4	
46 (HC)	80 Crown Lane, Morden, SM4 5BN	0.6	5.6	14.5	41.7	30.6	
47	Civic Centre, Morden, SM4 5DX	1.5	3.0	14.5	44.2	*39.7*	Predicted concentration at Receptor within 10% the AQS objective.
53	A24 139 Epsom Rd, SM3 9EY	0.7	4.3	14.5	41.0	32.0	

54	43 Upper Green East, Mitcham, CR4 2PF	2.4	4.4	14.5	47.4	**42.5**	Predicted concentration at Receptor above AQS objective.
55	213 Manor Road, Mitcham, CR4 1JH	0.6	5.8	14.5	36.3	27.3	

Notes

For an NO_2 concentration within 10% of the annual mean objective of 40 μgm^{-3} (between 36.0 μgm^{-3} and <40 μgm^{-3}) the concentration is shown in italics.

Exceedances of the NO_2 annual mean objective of 40 μgm^{-3} are shown in bold.

Appendix B Full Monthly Diffusion Tube Results for 2020

Table O. NO_2 Diffusion Tube Results

				Annual Mean NO_2 (ugm^{-3})													
Site Code	**Site Description**	**Valid data capture for monitoring period % a**	**Valid data capture 2019 % b**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual mean – raw data c**	**Annual mean – bias adjusted c**
1	A298 Bushey Road nr Bushey Court, SW20 0JN	100	100	50.9	54.1	36.2	35.4	29.3	35.8	30.2	42.6	45.6	45.4	54.2	41.6	41.8	34.3
2 (GA)	A24 7 Stonecot Hill, SM3 9HB	100	92	43.2	35.1	34.8	34.4	25.9	12.4	25.6	M	33.1	33.1	46.2	36.2	32.7	26.8
4 (FA)	154 Grand Drive, Raynes Park, SW20 9NQ	100	100	37.1	30.1	27.4	26.2	23.2	26.7	36.3	32.0	35.3	35.4	44.4	35.1	32.4	26.6
5 (BA)	Sacred Heart School, Burlington Road, New Malden, KT3 4NE	100	100	44.3	41.4	23.7	31.1	25.4	26.9	20.7	33.6	40.4	36.7	46.1	33.2	33.6	27.6
6 (JC)	17 Grand Drive, Raynes Park, SW20 0JB	100	100	52.5	37.3	37.5	38.0	38.3	20.0	27.5	43.5	43.5	47.6	54.9	45.1	40.5	33.2

7	A298 276-288 Kingston Road, SW20 8LX	100	100	49.5	50.2	41.0	34.2	33.8	33.8	37.3	30.1	48.7	39.6	47.5	36.9	40.2	33.0
8	A238 28 Coombe Lane, SW20 8NF	100	92	55.1	40.5	M	40.2	39.6	36.7	43.7	50.1	47.8	47.1	60.5	41.2	45.7	37.5
9	2 Lambton Road, SW20 9LR	100	75	55.7	40.9	M	49.4	39.3	M	34.0	45.1	48.3	55.5	M	41.4	45.5	37.3
11	51-55 Kingston Road, SW20 1JW	100	83	40.7	38.4	26.8	M	M	29.2	21.4	35.8	36.2	32.5	46.0	32.4	33.9	27.8
13	B281 4 Cottenham Park Rd, SW20 0RZ	100	92	41.1	30.9	27.1	28.3	25.2	23.9	13.1	26.2	31.3	M	38.4	28.1	28.5	23.4
14 (AC)	20 The Ridgeway, Wimbledon, SW19 4SQ	100	100	44.7	35.0	27.5	29.7	26.7	24.8	30.8	31.6	36.8	33.3	43.2	29.5	32.8	26.9
16	84 High Street, Wimbledon, SW19 5EG	100	100	47.2	36.0	36.0	41.5	35.6	34.4	31.4	39.0	38.1	42.0	53.5	42.2	39.7	32.6
18	25-27 Wimbledon Hill Road, SW19 7NE	100	92	74.0	67.0	M	60.2	57.4	63.9	66.7	79.9	70.4	70.3	87.7	65.6	69.4	**56.9**
19	Wimbledon Station, SW19 3SE	100	100	63.2	51.1	46.8	45.5	42.3	43.0	38.1	50.9	48.2	52.8	57.1	49.7	49.1	**40.2**
20	27 Hartfield Rd, Wimbledon, SW19 3SG	100	83	M	44.7	34.4	M	42.1	37.4	45.0	53.6	53.9	48.9	64.2	50.1	47.4	38.9
21 (EA)	A219 246 Merton Rd, South Wimbledon, SW19 1AU	100	83	55.4	44.5	M	M	60.9	62.3	52.4	76.7	68.2	60.6	81.7	65.2	62.8	**51.5**
22	12-16 Upper Green West, CR4 3AA	100	100	72.6	72.7	52.6	48.7	42.0	53.7	53.2	57.0	62.5	56.2	64.4	51.9	57.3	**47.0**

23	183 Kingston Road, SW19 1LH	100	100	80.0	68.7	53.8	48.6	48.8	46.5	55.2	72.0	64.2	57.2	70.8	51.6	59.8	**49.0**
24	75 Hartfield Road, SW19 3TJ	100	100	54.3	49.6	30.7	31.3	26.0	26.7	31.0	38.4	38.9	37.5	48.9	36.7	37.5	30.8
25	25 Alexander Road, SW19 7LE	100	100	50.1	39.5	35.3	33.6	27.8	31.6	32.7	38.0	42.9	41.4	53.1	37.1	38.6	31.6
26	22 Gap Road, SW19 8JG	100	92	56.0	49.4	M	34.2	29.1	36.5	30.9	40.6	41.8	43.6	58.8	41.2	42.0	34.4
27	56 Plough Lane, SW19 8HA	100	100	51.7	48.4	33.9	31.9	29.5	34.6	33.4	35.9	40.9	40.0	51.4	36.3	39.0	32.0
28 (BC)	11 Haydons Road, SW19 1HG	100	100	53.4	40.7	36.7	43.2	34.6	37.6	27.4	48.1	37.1	39.0	51.6	39.3	40.7	33.4
29 (HA)	44 High Street (A24), Colliers Wood, SW19 2AB	100	100	67.5	58.6	51.3	52.2	48.4	53.4	48.2	57.0	57.7	55.2	60.9	49.5	55.0	**45.1**
30	A24 Christchurch Rd - Christchurch Close junction, SW19 2PB	100	92	M	37.6	38.4	37.9	37.6	42.0	40.0	50.1	48.0	41.8	51.1	43.1	42.5	34.9
31 (LA)	28 Charminster Avenue, Morden, SW19 3FL	100	100	23.8	19.7	17.6	18.0	12.1	10.6	10.2	14.4	18.2	18.6	28.6	20.3	17.7	14.5
32	Merantum Way, SW19 2JY	100	100	56.6	42.8	33.3	28.3	27.6	26.8	31.8	31.6	35.8	34.5	45.3	33.3	35.6	29.2
33	A24 Morden Road, SW19 3BP	100	100	55.3	44.4	34.0	37.2	31.8	36.9	27.8	45.7	41.6	40.7	56.0	46.7	41.5	34.0
34 (GC)	211 Western Road, Colliers Wood, SW19 2QD	100	100	69.5	60.4	48.7	37.6	34.0	45.0	46.2	48.4	52.4	66.8	68.8	55.1	52.7	**43.3**

35 (MA)	53 Lavender Avenue, Morden, CR4 3HL	100	75	37.8	30.5	27.9	M	M	M	23.6	25.9	31.4	29.5	38.1	29.0	30.4	24.9
36 (DC)	35 London Road, Tooting, SW17 9JR	100	100	51.3	33.5	43.4	47.6	35.1	33.2	27.3	39.1	35.5	39.4	52.0	42.1	40.0	32.8
37 (CC)	107 London Road, Tooting, CR4 3JA	100	100	60.5	41.5	44.4	55.2	48.0	47.5	36.0	53.9	48.9	51.8	64.6	44.8	49.8	**40.8**
38 (EC)	265 London Road, Mitcham, CR4 3NH	100	100	49.5	40.4	41.6	39.4	34.0	32.5	39.3	45.8	45.5	39.8	48.0	33.6	40.8	33.4
39 (FC)	80 Church Road, Mitcham, CR4 3BE	100	92	M	34.9	36.5	40.6	36.6	32.0	30.5	38.7	39.7	34.0	40.6	33.1	36.1	29.6
40	A217 361 London Road, Mitcham, CR4 4BF	100	100	50.2	40.4	38.3	38.1	29.9	31.7	30.6	41.5	42.0	43.4	51.8	37.1	39.6	32.5
41	A239 Morden Road, Morden, SM4 6AU	100	92	58.9	43.2	42.6	50.7	44.5	36.8	M	72.6	55.7	47.9	55.9	38.9	49.8	**40.8**
42	155 St Hellier Road, Morden, SM4 6JE	100	100	56.9	39.7	37.4	41.1	37.3	36.0	32.8	41.7	40.1	37.9	53.7	42.6	41.4	34.0
43	86 Morden Hall Road, Morden, SM4 5JG	100	92	47.8	37.9	43.1	50.4	44.1	41.0	38.3	50.9	42.4	45.0	M	39.7	43.7	35.8
44 (AA)	31, London Road, Morden, SM4 5HT	100	92	78.3	52.8	52.5	M	56.1	63.7	54.1	74.4	60.5	60.9	71.5	58.5	62.1	**50.9**
45 (IC)	192-110 London Road, Morden, SM4 5AX	100	92	58.3	44.9	46.3	46.5	M	44.7	50.6	54.4	53.7	54.9	68.6	54.4	52.5	**43.0**
46 (HC)	80 Crown Lane, Morden, SM4 5BN	100	100	52.4	52.2	43.4	54.5	48.9	46.2	49.2	53.9	52.4	51.0	58.6	47.3	50.8	**41.7**

47	Civic Centre, Morden, SM4 5DX	100	100	71.2	61.5	50.8	48.8	39.2	50.1	39.0	52.3	41.4	56.8	84.5	62.0	54.8	**44.9**
47/2	Civic Centre, Morden, SM4 5DX	100	100	73.1	59.2	47.9	45.0	37.2	52.7	39.6	55.2	41.0	51.9	73.8	54.5	52.6	**43.1**
47/3	Civic Centre, Morden, SM4 5DX	100	100	65.6	69.4	46.1	44.9	44.3	58.2	45.4	57.2	56.5	51.8	70.1	44.5	54.5	**44.7**
48	28 Aberconway Road, Morden, SM4 5LF	100	92	55.2	40.7	35.6	M	31.8	28.1	33.0	36.1	36.8	36.0	44.7	33.8	37.4	30.7
49	37 Crown Road, Morden, SM4 5DD	100	100	44.7	32.3	36.0	40.6	35.7	34.3	27.7	40.9	36.4	32.9	42.3	35.7	36.6	30.0
50	75 Martin Way, SM4 4AR	100	100	47.2	41.2	34.0	34.2	32.0	29.6	33.9	37.2	37.0	40.4	52.7	38.5	38.2	31.3
51	A24 49 Streatham Rd, Mitcham, CR4 2AD	100	100	44.3	29.6	30.6	28.7	23.1	26.6	21.8	31.9	30.8	31.8	44.1	33.4	31.4	25.7
52	50 West Barnes Lane, New Malden, KT3 4PS	100	100	38.9	29.5	28.6	24.5	22.4	21.2	30.6	27.6	31.2	31.6	43.3	32.6	30.2	24.7
53	A24 139 Epsom Rd, SM3 9EY	100	100	71.8	51.0	45.3	35.5	30.7	46.5	46.7	49.4	49.3	59.8	68.8	45.7	50.1	**41.0**
54	43 Upper Green East, Mitcham, CR4 2PF	100	100	68.5	55.2	48.0	56.0	55.1	49.4	59.3	64.7	57.7	54.9	69.9	55.5	57.8	**47.4**
55	213 Manor Road, Mitcham, CR4 1JH	100	100	55.5	50.1	40.7	34.8	34.5	33.2	42.6	43.9	46.3	51.7	56.4	40.9	44.2	36.3

Notes

Concentrations are presented as µg m^{-3}.

Exceedances of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in **bold and underlined**.

All means have been "annualised" in accordance with LLAQM.TG(19) if valid data capture for the calendar year is less than 75% and greater than 33%.

(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%).

M = Missing diffusion tube

Table P. Monthly triplicate NO_2 diffusion tube results for co-location site Civic Centre Morden

Site ID	Data Capture	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unadjusted annual mean	Bias adjusted (National factor = 0.82)
47	100	71.2	61.5	50.8	48.8	39.2	50.1	39.0	52.3	41.4	56.8	84.5	62.0	54.8	**44.9**
47/2	100	73.1	59.2	47.9	45.0	37.2	52.7	39.6	55.2	41.0	51.9	73.8	54.5	52.6	**43.1**
47/3	100	65.6	69.4	46.1	44.9	44.3	58.2	45.4	57.2	56.5	51.8	70.1	44.5	54.5	**44.7**

Notes

Concentrations are presented as µg m^{-3}.

Exceedances of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold**.

Appendix C Diffusion Tube Results for Schools Monitoring Programme

In August 2019 an extensive school air quality monitoring programme was initiated by LBM. Diffusion tubes were located at all educational institutions in the borough recorded on the Gov.UK register of schools https://get-information-schools.service.gov.uk/ . Where there were two road sources tubes were installed on both school/road boundaries.

Due to the large number of sites it was decided the monitoring programme would be split into two phases:

- A screening phase August to December 2019.

The screening phase was used to establish which schools were low risk and could be removed from the programme. Low risk sites were characterised as having an average NO_2 concentration of at least 20% below the annual AQO (32 μgm^{-3} 'raw' unadjusted value). The results for the screening phase were reported in the 2019 Annual Status Report. To summarise the majority of educational sites were found to be 'low risk' and additional monitoring was completed at 24 schools.

- Full 12 months monitoring programme January to December 2020.

A total of 24 schools were monitored between January and December 2020 the monitoring results are presented in Table Q. These schools were identified during the screening phase as having an average NO_2 concentration of more than 32 μgm^{-3} ('raw' unadjusted value).

All means have been "annualised" in accordance with LLAQM.TG(19) if valid data capture for the calendar year is less than 75% and greater than 33% in order to estimate an annual mean concentration which can then be compared to the AQO to assess compliance. The final annualised and bias adjusted concentrations are provided in Table Q, lab notes provided in Table R and annualisation calculations are provided in Table S. Correction for distance calculation was not required as none of the annual concentrations exceeded the AQO. The annual mean AQO was achieved at all monitoring locations however 9 school sites were added to the Council's main diffusion tube network in January 2021 for observation, nitrogen dioxide

concentrations were the highest at these sites. The schools which will receive ongoing monitoring are listed in Table T and are mapped in Figure 3. In line with Action 66 of the Air Quality Action Plan (AQAP) the schools will receive an air quality audit in order to assess how the impact of air pollution can be mitigated.

Table Q. Diffusion tube results for the School's Air Quality Monitoring Programme 2020

School	ID	Data Capture %	Jan/Feb/Mar	Mar/Apr	May/Jun	Jul/Aug	Aug/Sep	Oct/Nov	Nov/Dec	Average	Annualised Concentration (D1)	Annualised & Bias Adjusted Concentration
Abbey Children's Centre Merton Abbey Primary School	S1/2	50	M	21	15	17	25	24	34	22.5	22.0	18
All Saints' C of E Primary School	S4B	58	54	31	24	33	33	42	53	38.6	37.8	31
Church Road Children's Centre	S24	58	32	27	18	19	23	25	37	25.8	23.3	19
Cranmer Primary School	S11	58	36	31	20	28	34	32	45	32.2	32.1	26
Cricket Green School	S64	58	32	31	18	24	27	30	49	30.3	30.7	25
Eagle House School	S68	58	43	47	31	42	45	43	54	43.3	42.4	35
Just Learn	S69	42	M	M	29	36	45	20	49	35.7	36.1	30
Lavender Children's Centre (car park)	S8	58	19	22	14	14	18	22	33	20.4	21.0	17
Lavender Children's Centre	S8B	58	31	34	23	11	30	32	39	28.5	30.6	25

(London Road)												
Liberty Primary School	S27	58	34	23	16	23	24	28	42	26.9	26.4	22
Morden Primary School	S51	58	44	35	24	29	35	36	50	36.4	35.6	29
Park Community School (Dorset Rd)	S36	50	M	26	15	18	23	24	34	23.5	23.5	19
Park Community School (Merton Road)	S36B	42	M	38	27	34	42	M	50	38.3	38.8	32
Poplar Primary School	S35	50	M	22	12	12	17	21	28	18.6	18.6	15
Raynes Park High School	S49	50	M	29	20	27	31	32	43	30.4	30.4	25
RISE Education	S67	42	40	37	27	M	M	37	48	37.7	34.9	29
Singlegate Primary School	S9	50	37	29	19	M	28	30	32	29.3	27.6	23
St Marks Primary School / Children's Centre	S17/ S18	25	M	21	M	20	M	M	30	23.9	Insufficient data	N/A
St Peter and Paul Catholic Primary School	S12	50	38	40	31	34	38	32	M	35.5	36.6	30

St Thomas of Canterbury Catholic Primary School (Commonside East)	S20	58	35	22	17	22	28	26	38	27.1	26.5	22
St Thomas of Canterbury Catholic Primary School (Early Years, Gatson Road)	S20B	50	13	19	12	M	19	21	31	19.1	18.1	15
Steers Mead Children's Centre	S26	42	35	25	M	24	M	28	36	29.7	27.1	22
West Wimbledon Primary School (West Barnes Lane)	S48	42	M	27	19	M	20	28	36	26.0	25.1	21
West Wimbledon Primary School (Bodnant Gardens)	S48B	50	M	22	14	16	26	22	29	21.5	21.5	18
Wimbledon Common Preparatory School	S72	17	M	27	M	M	M	M	35	31.3	Insufficient data	N/A
Wimbledon High School	S63	50	41	43	M	39	46	38	51	43.1	41.4	34

Notes All means have been “annualised” in accordance with LLAQM.TG(19) if valid data capture for the calendar year is less than 75% and greater than 33%. M = Missing diffusion tube

Table R: Lab Report Notes

Monitoring period by month	Report Ref.	Lab report notes
January - March	O03110R	Tubes were exposed for longer than the recommended time. Results may be compromised.
March - April	O03106	No notes
May - June	O03766R	Tubes were exposed for longer than the recommended time. Results may be compromised.
July - August	O05241R	Tubes were exposed for longer than the recommended time. Results may be compromised.
August - September	O05763R	Tubes were exposed for longer than the recommended time. Results may be compromised.
October - November	O06699R	Tubes were exposed for longer than the recommended time. Results may be compromised.
November - December	P00618R	No notes

Due to constraints arising from COVID-19 affecting tube collection there was some variation in exposure duration and monitoring dates across locations. The annualisation process takes account of these variations and provides an estimation of the annual mean for each site for bias adjustment and then comparison to the annual AQO to assess compliance. Please note that due to the different exposure dates being used across sites it was not possible to use the new Annualistation Tool. Data was annualised in accordance with LLAQM.TG19.

Table S Annualisation of Schools data

Site ID S1 / S2: Merton Abbey Primary School / Abbey Children's Centre

			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S1 / S2	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
25/03/2020	30/04/2020	20.6	14.5	32.9	
30/04/2020	29/06/2020	14.6	9.4	23.9	
29/06/2020	01/09/2020	17.0	10.0	22.3	
01/09/2020	01/10/2020	24.8	14.3	33.9	
01/10/2020	20/11/2020	24.1	13.8	32.4	
20/11/2020	31/12/2020	33.9	19.2	36.1	
	Period Mean	22.5	13.5	30.3	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	0.99	0.98
	Annualised Concentration D1	22.0			
Site ID S51: Morden Abbey Primary School					

			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S51	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
14/01/2020	25/03/2020	44.4	15.0	33.2	
25/03/2020	30/04/2020	35.3	14.5	32.9	
30/04/2020	24/06/2020	24.4	8.9	23.9	
24/06/2020	13/08/2020	29.3	11.0	23.3	
13/08/2020	30/09/2020	35.2	12.3	28.8	
30/09/2020	20/11/2020	36.3	13.7	32.4	
20/11/2020	31/12/2020	49.7	19.2	36.1	
	Period Mean	36.4	13.5	30.1	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	1.00	0.98
	Annualised Concentration D1	35.6			
Site ID S11: Cranmer Primary School					
			B1 when D1 available	B2 when D1 available	

Start Date	End date	D1 - Site ID S11	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
14/01/2020	25/03/2020	35.7	15.0	33.2	
25/03/2020	30/04/2020	31.4	14.5	32.9	
30/04/2020	29/06/2020	19.9	9.4	23.9	
29/06/2020	18/08/2020	27.7	10.6	23.4	
18/08/2020	01/10/2020	33.8	12.2	29.0	
01/10/2020	20/11/2020	32.2	13.8	32.4	
20/11/2020	31/12/2020	44.7	19.2	36.1	
	Period Mean	32.2	13.3	29.6	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.98	1.01	1.00
	Annualised Concentration D1	32.1			
Site ID S20: St Thomas of Canterbury (Front)					
			B1 when D1 available	B2 when D1 available	

Start Date	End date	D1 - Site ID S20	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
14/01/2020	25/03/2020	35.4	15.0	33.2	
25/03/2020	30/04/2020	22.3	14.5	32.9	
30/04/2020	24/06/2020	17.3	8.9	23.9	
24/06/2020	17/08/2020	22.1	11.2	23.9	
17/08/2020	01/10/2020	28.5	12.2	28.7	
01/10/2020	20/11/2020	26.3	13.8	32.4	
20/11/2020	31/12/2020	37.8	19.2	36.1	
	Period Mean	27.1	13.5	30.2	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	0.99	0.98
	Annualised Concentration D1	26.5			
Site ID S20B: St Thomas of Canterbury (rear)					
			B1 when D1 available	B2 when D1 available	

Start Date	End date	D1 - Site ID S20B	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
14/01/2020	25/03/2020	13.1	15.0	33.2	
25/03/2020	30/04/2020	19.4	14.5	32.9	
30/04/2020	24/06/2020	11.6	8.9	23.9	
17/08/2020	01/10/2020	18.5	12.2	28.7	
01/10/2020	20/11/2020	21.3	13.8	32.4	
20/11/2020	31/12/2020	30.9	19.2	36.1	
	Period Mean	19.1	13.9	31.2	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.93	0.96	0.95
	Annualised Concentration D1	18.1			
Site ID S68: Eagle House School					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S68	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background	

				Continuous Monitor DC for 2020 = 99% (B2)	
14/01/2020	25/03/2020	42.7	15.0	33.2	
25/03/2020	30/04/2020	46.6	14.5	32.9	
30/04/2020	29/06/2020	30.6	9.4	23.9	
29/06/2020	18/08/2020	42.1	10.6	23.4	
18/08/2020	01/10/2020	44.8	12.2	29.0	
01/10/2020	20/11/2020	42.6	13.8	32.4	
20/11/2020	31/12/2020	53.9	19.2	36.1	
	Period Mean	43.3	13.5	30.1	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	1.00	0.98
	Annualised Concentration D1	42.4			
Site ID S24 Church Road Children's Centre					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S24	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC	

				for 2020 = 99% (B2)	
14/01/2020	25/03/2020	31.6	15.0	33.2	
25/03/2020	30/04/2020	26.9	14.5	32.9	
30/04/2020	29/06/2020	17.7	9.4	23.9	
29/06/2020	18/08/2020	19.5	10.6	23.4	
18/08/2020	01/10/2020	23.0	12.2	29.0	
01/10/2020	20/11/2020	24.6	13.8	32.4	
20/11/2020	31/12/2020	37.5*	19.2	36.1	
	Period Mean	23.9	13.5	30.1	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	1.00	0.98
	Annualised Concentration D1	23.3			
*Tube contained water droplets. Results may be compromised.					
Site ID S67 RISE Education					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S67	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous	

				Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	40.1	15.2	33.4	
25/03/2020	30/04/2020	36.7	14.5	32.9	
30/04/2020	29/06/2020	26.7	9.4	23.9	
01/10/2020	20/11/2020	37.2	13.8	32.4	
20/11/2020	31/12/2020	48.0	19.2	36.1	
	Period Mean	37.7	14.4	31.7	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.90	0.95	0.92
	Annualised Concentration D1	34.9			
Site ID S8 Lavender Children's Centre					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S8	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	19.1	15.2	33.4	

25/03/2020	30/04/2020	22.3	14.5	32.9	
30/04/2020	24/06/2020	14.0	8.9	23.9	
24/06/2020	17/08/2020	13.7*	11.2	23.9	
17/08/2020	30/09/2020	17.9	12.3	28.7	
30/09/2020	20/11/2020	22.4	13.7	32.4	
20/11/2020	31/12/2020	33.3	19.2	36.1	
	Period Mean	21.5	13.6	30.2	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	0.99	0.98
	Annualised Concentration D1	21.0			
*Tubes contained webs. Results may be compromised					
Site ID S8B Lavender Children's Centre					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S8B	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	31.0	15.2	33.4	

25/03/2020	30/04/2020	34.0	14.5	32.9	
30/04/2020	24/06/2020	23.3	8.9	23.9	
24/06/2020	17/08/2020	11.1*	11.2	23.9	
17/08/2020	30/09/2020	29.7	12.3	28.7	
30/09/2020	20/11/2020	31.6	13.7	32.4	
20/11/2020	31/12/2020	38.9	19.2	36.1	
	Period Mean	31.4	13.6	30.2	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	0.99	0.98
	Annualised Concentration D1	30.6			
*Tubes contained webs. Results may be compromised					
Site ID S25 Steers Mead Children's Centre					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S25	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	35.2	15.2	33.4	

25/03/2020	30/04/2020	25.0	14.5	32.9	
24/06/2020	17/08/2020	24.0	11.2	23.9	
30/09/2020	20/11/2020	28.2	13.7	32.4	
20/11/2020	31/12/2020	36.2	19.2	36.1	
	Period Mean	29.7	14.8	31.7	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.88	0.95	0.91
	Annualised Concentration D1	27.1			
Site ID S27 Liberty Primary School					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S27	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	33.7	15.2	33.4	
25/03/2020	30/04/2020	23.0	14.5	32.9	
30/04/2020	24/06/2020	16.0	8.9	23.9	
24/06/2020	13/08/2020	22.5	11.0	23.3	

13/08/2020	30/09/2020	23.7	12.3	28.8	
30/09/2020	20/11/2020	28.2	13.7	32.4	
20/11/2020	31/12/2020	42.2	19.2	36.1	
	Period Mean	27.0	13.5	30.1	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	1.00	0.98
	Annualised Concentration D1	26.4			
Site ID S12 St Peter & St Paul Primary School					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S12	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	38.2	15.2	33.4	
25/03/2020	30/04/2020	39.8	14.5	32.9	
30/04/2020	29/06/2020	31.0	9.4	23.9	
29/06/2020	17/08/2020	33.7	10.6	23.5	
17/08/2020	01/10/2020	38.3	12.2	28.7	
01/10/2020	20/11/2020	32.3	13.8	32.4	

	Period Mean	35.5	12.6	29.1	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		1.03	1.03	1.03
	Annualised Concentration D1	36.6			
Site ID S64 Cricket Green Primary School					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S64	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	32.5	15.2	33.4	
25/03/2020	30/04/2020	31.5	14.5	32.9	
30/04/2020	29/06/2020	18.3	9.4	23.9	
29/06/2020	17/08/2020	23.9*	10.6	23.5	
17/08/2020	01/10/2020	27.0	12.2	28.7	
01/10/2020	20/11/2020	29.8	13.8	32.4	
20/11/2020	31/12/2020	49.4	19.2	36.1	
	Period Mean	31.4	13.6	30.1	
	Annual Mean		13.0	30.0	Ratio

	Annualisation Ratio		0.96	1.00	0.98
	Annualised Concentration D1	30.7			
*Tube 1573861 was dirty when received. Result may be compromised.					
Site ID S9 Singlegate Primary School					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S9	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	37.0	15.2	33.4	
25/03/2020	30/04/2020	29.3	14.5	32.9	
30/04/2020	29/06/2020	19.4	9.4	23.9	
18/08/2020	01/10/2020	28.0	12.2	29.0	
01/10/2020	20/11/2020	30.4	13.8	32.4	
20/11/2020	31/12/2020	31.6	19.2	36.1	
	Period Mean	29.3	14.1	31.3	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.93	0.96	0.94

	Annualised Concentration D1	27.6			
Site ID S4B All Saints Primary School (Haydons Road)					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S4B	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
15/01/2020	25/03/2020	53.9	15.2	33.4	
25/03/2020	30/04/2020	31.2	14.5	32.9	
30/04/2020	24/06/2020	24.1	8.9	23.9	
24/06/2020	13/08/2020	33.0	11.0	23.3	
13/08/2020	30/09/2020	32.9	12.3	28.8	
30/09/2020	20/11/2020	42.0	13.7	32.4	
20/11/2020	30/12/2020	52.9	18.9	35.8	
	Period Mean	38.6	13.5	30.1	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.96	1.00	0.98

	Annualised Concentration D1	37.8			
Site ID S63 Wimbledon High School					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S63	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
31/01/2020	25/03/2020	41.2	12.4	29.2	
25/03/2020	30/04/2020	42.8	14.5	32.9	
24/06/2020	13/08/2020	39.4	11.0	23.3	
13/08/2020	30/09/2020	45.7	12.3	28.8	
30/09/2020	20/11/2020	38.2	13.7	32.4	
20/11/2020	31/12/2020	51.2	19.2	36.1	
	Period Mean	43.1	13.9	30.5	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.94	0.99	0.96
	Annualised Concentration D1	41.4			

Site ID S36 Park Community School (Dorset Rd)					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S36	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
25/03/2020	30/04/2020	25.9	14.5	32.9	
30/04/2020	24/06/2020	15.3	8.9	23.9	
24/06/2020	13/08/2020	18.4	11.0	23.3	
13/08/2020	30/09/2020	23.1	12.3	28.8	
30/09/2020	20/11/2020	24.2	13.7	32.4	
20/11/2020	30/12/2020	34.3	18.9	35.8	
	Period Mean	23.5	13.2	29.5	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.98	1.02	1.00
	Annualised Concentration D1	23.5			
Site ID S36B Park Community School (Merton Rd)					

			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S36B	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
25/03/2020	30/04/2020	38.4	14.5	32.9	
30/04/2020	24/06/2020	27.4	8.9	23.9	
24/06/2020	13/08/2020	34.3	11.0	23.3	
13/08/2020	30/09/2020	41.7	12.3	28.8	
20/11/2020	30/12/2020	49.6	18.9	35.8	
	Period Mean	38.3	13.1	28.9	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.99	1.04	1.01
	Annualised Concentration D1	38.8			
Site ID S48 West Wimbledon Primary School (West Barnes Lane)					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S48	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background	

				Continuous Monitor DC for 2020 = 99% (B2)	
25/03/2020	30/04/2020	26.9	14.5	32.9	
30/04/2020	24/06/2020	19.1	8.9	23.9	
13/08/2020	30/09/2020	20.0	12.3	28.8	
30/09/2020	20/11/2020	28.2	13.7	32.4	
20/11/2020	30/12/2020	36.0	18.9	35.8	
	Period Mean	26.0	13.7	30.8	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.95	0.98	0.96
	Annualised Concentration D1	25.1			
Site ID S48B West Wimbledon Primary School (Bodnant Gardens)					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S48B	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
25/03/2020	30/04/2020	22.3	14.5	32.9	

30/04/2020	24/06/2020	13.6	8.9	23.9	
24/06/2020	13/08/2020	16.0	11.0	23.3	
13/08/2020	30/09/2020	25.8	12.3	28.8	
30/09/2020	20/11/2020	22.4	13.7	32.4	
20/11/2020	30/12/2020	28.7	18.9	35.8	
	Period Mean	21.5	13.2	29.5	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.98	1.02	1.00
	Annualised Concentration D1	21.5			
Site ID S49 Raynes Park High School					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S49	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
25/03/2020	30/04/2020	29.2	14.5	32.9	
30/04/2020	24/06/2020	19.8	8.9	23.9	
24/06/2020	13/08/2020	26.9	11.0	23.3	

13/08/2020	30/09/2020	31.1	12.3	28.8	
30/09/2020	20/11/2020	32.5	13.7	32.4	
20/11/2020	30/12/2020	43.0	18.9	35.8	
	Period Mean	30.4	13.2	29.5	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.98	1.02	1.00
	Annualised Concentration D1	30.4			
Site ID S35 Poplar Primary School					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S35	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
25/03/2020	30/04/2020	21.5	14.5	32.9	
30/04/2020	24/06/2020	12.3	8.9	23.9	
24/06/2020	13/08/2020	12.1	11.0	23.3	
13/08/2020	30/09/2020	16.6	12.3	28.8	
30/09/2020	20/11/2020	20.8	13.7	32.4	

20/11/2020	30/12/2020	28.1	18.9	35.8	
	Period Mean	18.6	13.2	29.5	
	Annual Mean		13.0	30.0	Ratio
	Annualisation Ratio		0.98	1.02	1.00
	Annualised Concentration D1	18.6			
Site ID S69 Just Learn					
			B1 when D1 available	B2 when D1 available	
Start Date	End date	D1 - Site ID S69	Greenwich Eltham - Suburban Continuous Monitor DC for 2020 = 94% (B1)	Wandswoth Town Hall - Urban Background Continuous Monitor DC for 2020 = 99% (B2)	
30/04/2020	29/06/2020	28.8	9.4	23.9	
24/06/2020	17/08/2020	35.9	11.2	23.9	
17/08/2020	01/10/2020	45.2	12.2	28.7	
01/10/2020	20/11/2020	19.9	13.8	32.4	
20/11/2020	31/12/2020	48.6	19.2	36.1	
	Period Mean	35.7	13.2	29.0	
	Annual Mean		13.0	30.0	Ratio

	Annualisation Ratio		0.99	1.03	1.01
	Annualised Concentration D1	36.1			

Table T. Schools added to main diffusion network 2021

School	ID	Postcode	Street
*Abbey Children's Centre / Merton Abbey Primary School	S1/2	SW19 2JY	High Path
All Saints' C of E Primary School	S4B	SW19 1HL	Haydons Road
Eagle House School	S68	CR4 3HD	London Road
Just Learn	S69	CR4 2QA	Commonside East
Morden Primary School	S51	SM4 5PX	London Road
Park Community School (Dorset Rd / Merton Road)	S36 / S36B	SW19 3EF	Dorset Road
RISE Education	S67	CR4 3ED	Western Road
St Peter and Paul Catholic Primary School	S12	CR4 4LA	Cricket Green
Wimbledon High School	S63	SW19 4AB	Wimbledon Hill

*Added to main diffusion network to ongoing monitoring commitments not due to air quality concerns.

Figure 3. School monitoring locations 2021


Wimbledon & Putney Commons
Wimbledon Park
UPPER TOOTING
GROSVENOR WAY
Royal Wimbledon Golf Club
WIMBLEDON
COTTENHAM PARK
MERTON ABBEY
EASTFIELDS
Mitcham
BUSHEY MEAD
Morden
Morden Park
LOWER MORDEN
BEDDINGTON CORNER
Worcester Park
A24
A3
A297
Kingston Rd
The Broadway
Reigate Ave

Appendix D Diffusion Tube Results for Citizen Science Monitoring

At the start of 2020 diffusion tubes were supplied by LBM to three community groups in the borough:

- Mitcham Society
- Wimbledon Park Residents Association
- Wimbledon Park Ward

However, due to the COVID-19 pandemic community monitoring was largely suspended in March 2020; community volunteers were supported where they wished to continue with monitoring in accordance with the current Government guidelines. The Wimbledon park Residents Association continued with their quarterly monitoring regime and the data for this is presented in Appendix D1, the other groups did not and as such there is no data to report.

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 Details of Monitoring Site Quality QA/QC for quality assurance/quality control procedures. Tubes were supplied to a representative of the group on a monthly basis in 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 the 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.

D.1. Wimbledon Park Residents Association

The Wimbledon Park Residents Association (WPRA) monitor air quality at set locations on a quarterly basis. Unfortunately, there was insufficient data to perform annualisation calculations as a minimum of 4 data sets are required (33% data capture in a 12-month period). It should be noted that fewer than 4 monthly averages are not directly comparable to either the hourly or annual mean air quality objective and as such should be used for information only as an indication of air quality at the particular location at the time monitored. Monitoring results are provided in Table U. comprehensive list of monitoring locations and descriptions provided by WPRA is presented Table V.

Table U. Wimbledon Park Residents Association diffusion tube data 2020

Site Code	Site Description	Data Capture	January	April	July	October
Wimbledon Park 1	12a Ravensbury Terrace	17%	M	NM	14.10	26.17
Wimbledon Park 2	33 Wellington road	17%	M	NM	12.81	20.02
Wimbledon Park 3	363 Durnsford Road	17%	M	NM	21.66	31.27
Wimbledon Park 4	162 Durnsford road	25%	40.48	NM	17.46	28.65
Wimbledon Park 5	141 Arthur Road	25%	40.87	NM	19.16	27.06
Wimbledon Park 6	44 Home Park Road	25%	36.41	NM	14.31	20.87

Notes

NM = not monitored.

Table V. Wimbledon Park Residents Association monitoring locations

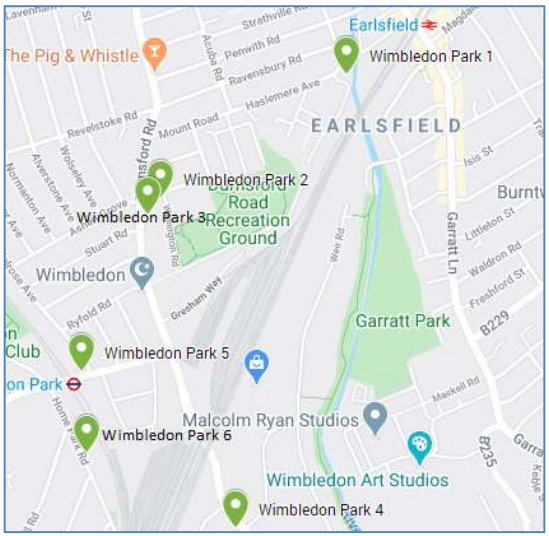
Site ID	Location	Description	Distance from tube to kerb (m)	Distance to nearest receptor	Height to tube inlet (m)
Wimbledon Park 1	12A Ravensbury Terrace SW18 4RL	 On lamppost 009. Between 2 large housing construction sites 1 of 24 dwellings the other 129 dwellings on the old Haslemere Industrial site. Opposite an allotment, nearest current housing 50 metres.	At kerb		2m

Wimbledon Park 2	37 Wellington Road SW19 8EQ	 On lamp post 001. Near the junction with Havana Road. Outside WP Primary school in a residential area. Road used by vehicles entering the Wellington Road Industrial Estate.	At kerb		2m
Wimbledon Park 3	363 Durnsford Road SW19 8EF		2m		2m

		On lamppost 045. On the main road by a pelican crossing used by children to access the primary school. Housing both sides of the road.			
Wimbledon Park 4	Opposite 162 Durnsford Road SW19 8GY	 On lamp post 018. On the junction with Endeavour Way. Entry to an industrial estate used by very large wagons eg Occado, Reston Waste and others. Housing other side of the road.	At kerb		2m

Wimbledon Park 5	147 Arthur Road SW19 8AB	 On the zebra crossing outside Wimbledon Park tube station	At kerb		2m
Wimbledon Park 6	44 Home Park Road SW19 7HN	 Residential area. Road links WP with Wimbledon town centre therefore a lot of through traffic.	At kerb		2m

Figure 5 Map of annual mean NO2 concentrations in Wimbledon Park (WPRA)



Appendix E Lockdown data comparison

Table W. Nitrogen Dioxide (NO_2) Monthly Diffusion Tube Results for the Merton Council Network January-April 2019 and January-April 2020 (Raw Data in ug/m3).

Site	Site Name	X (m)	Y (m)	Site Type	Jan -19	Feb-19	Mar-19	Apr-19	Jan -20	Feb-20	Mar-20	Apr-20	Mar-Apr	Mar-Apr	Mar-April	Jan-Feb	Mar-Apr	Jan-Feb
50	75 Martin Way, SM4 4AR	524638	168616	Kerbside	60	52	44	48	47	41	34	34	46	34	**-26**	44	34	**-23**
46	80 Crown Lane, Morden, SM4 5BN	525401	168502	Kerbside	58	53	51	60	52	52	43	54	55	49	**-11**	52	19	**-6**
47	Civic Centre, Morden, SM4 5DX	525588	168498	Roadside	61	69	50	55	71	61	51	49	53	50	**-6**	66	22	**-24**
47/2	Civic Centre, Morden, SM4 5DX	525588	168498	Roadside	72	85	44	51	73	59	48	45	48	46	**-4**	66	21	**-30**
47/3	Civic Centre, Morden, SM4 5DX	525588	168498	Roadside	69	69	47	53	66	69	46	45	50	45	**-10**	68	18	**-34**
45	192-110 London Road, Morden, SM4 5AX	525778	169824	Kerbside	69	55	50	57	58	45	46	46	53	46	**-13**	52	17	**-12**

Site	Site Name	X (m)	Y (m)	Site Type	Jan -19	Feb-19	Mar-19	Apr-19	Jan -20	Feb-20	Mar-20	Apr-20	Mar-Apr	Mar-Apr	Mar-April	Jan-Feb	Mar-Apr	Jan-Feb
53	A24 139 Epsom Rd, SM3 9EY	524621	166786	Kerbside	63	67		50	72	51	45	35	50	40	**-20**	61	10	**-34**
2	A24 7 Stonecot Hill, SM3 9HB	542131	166112	Roadside	52	46	31	47	43	35	35	34	39	35	**-10**	39	12	**-10**
4	154 Grand Drive, Raynes Park, SW20 9NQ	523315	168048	Kerbside		44	34	41	37	30	27	26	38	27	**-29**	34	-1	**-21**
5	Sacred Heart Sc,Burlington Rdd, New Malden KT3 4NE	522501	168235	Kerbside	56	42	20	33	44	41	24	31	26	27	**4**	43	16	**-37**
52	50 West Barnes Lane, New Malden, KT3 4PS	522749	168500	Kerbside	52	46	37	34	39	30	29	25	35	27	**-23**	34	2	**-21**
6	17 Grand Drive, Raynes Park, SW20 0JB	523207	169195	Kerbside	60	57	39	50	52	37	38	38	44	38	**-14**	45	12	**-16**
1	A298 Bushey Road nr Bushey Court, SW20 0JN	523139	169056	Roadside	60	64	50	59	51	54	36	35	55	36	**-35**	53	0	**-32**
8	A238 28 Coombe Lane, SW20 8NF	523246	169333	Kerbside	70	58	46	53	55	41		40	50	40	**-56**	48	-8	**-54**

Site	Site Name	X (m)	Y (m)	Site Type	Jan -19	Feb-19	Mar-19	Apr-19	Jan -20	Feb-20	Mar-20	Apr-20	Mar-Apr	Mar-Apr	Mar-April	Jan-Feb	Mar-Apr	Jan-Feb
9	2 Lambton Road, SW20 9LR	523241	169415	Kerbside	56	55	34	64	56	41		49	49	49	**-41**	48	4	**-40**
13	B281 4 Cottenham Park Rd, SW20 0RZ	522069	169765	Kerbside	36	46	28	39	41	31	27	28	34	28	**-18**	36	5	**-22**
14	20 The Ridgeway, Wimbledon, SW19 4SQ	524120	170874	Kerbside	63	54	42	48	45	35	28	30	45	29	**-36**	40	-4	**-28**
16	84 High Street, Wimbledon, SW19 5EG	524071	171076	Kerbside	64	54	46	67	47	36	36	42	56	39	**-30**	42	4	**-7**
18	25-27 Wimbledon Hill Road, SW19 7NE	524696	170725	Kerbside	86	78	65	81	74	67		60	73	60	**-18**	71	21	**-15**
19	Wimbledon Station, SW19 3SE	524770	170645	Roadside	68	69	43	67	63	51	47	46	55	46	**-16**	57	15	**-19**
20	27 Hartfield Rd, Wimbledon, SW19 3SG	524867	170500	Kerbside	71	66	48	72		45	34		60	34	**-43**	45	-4	**-24**
24	75 Hartfield Road, SW19 3TJ	524994	170329	Kerbside	48	40	32	40	54	50	31	31	36	31	**-18**	52	7	**-40**

Site	Site Name	X (m)	Y (m)	Site Type	Jan -19	Feb-19	Mar-19	Apr-19	Jan -20	Feb-20	Mar-20	Apr-20	Mar-Apr	Mar-Apr	Mar-April	Jan-Feb	Mar-Apr	Jan-Feb
23	183 Kingston Road, SW19 1LH	525156	169935	Kerbside	78	70	54	64	80	69	54	49	59	51	**-14**	74	19	**-31**
11	51-55 Kingston Road, SW20 1JW	525602	170042	Kerbside	47	38	32	54	41	38	27		43	27	**-37**	40	-5	**-32**
21	A219 246 Merton Rd, South Wimbledon, SW19 1AU	525798	170081	Roadside	76	77	60		55	44			60			50		
28	11 Haydons Road, SW19 1HG	526158	170167	Roadside	52	52	41	63	53	41	37	43	52	40	**-23**	47	8	**-15**
26	22 Gap Road, SW19 8JG	525708	171413	Roadside	60	62	47	56	56	49		34	52	34	**-35**	53	0	**-36**
25	25 Alexander Road, SW19 7LE	525132	171174	Kerbside	59	56	41	44	50	40	35	34	42	34	**-19**	45	8	**-24**
27	56 Plough Lane, SW19 8HA	526035	171472	Roadside	61	52	61	51	52	48	34	32	56	33	**-41**	50	-4	**-34**
29	44 High Street (A24), Colliers Wood, SW19 2AB	526927	170654	Kerbside	72	71	61	77	67	59	51	52	69	52	**-25**	63	13	**-17**

Site	Site Name	X (m)	Y (m)	Site Type	Jan -19	Feb-19	Mar-19	Apr-19	Jan -20	Feb-20	Mar-20	Apr-20	Mar-Apr	Mar-Apr	Mar-April	Jan-Feb	Mar-Apr	Jan-Feb
30	A24 Christchurch Rd SW19 2PB	526791	170087	Roadside	75	70	44	52		38	38	38	48	38	**-21**	38	9	**0**
32	Merantum Way, SW19 2JY	526109	169818	Kerbside	46	53	44	23	57	43	33	28	33	31	**-6**	50	12	**-31**
33	A24 Morden Road, SW19 3BP	525803	169467	Roadside	49	61	47	53	55	44	34	37	50	36	**-28**	50	4	**-28**
34	211 Western Road, Colliers Wood, SW19 2QD	526840	169694	Roadside	69	80	61	55	70	60	49	38	58	43	**-26**	65	9	**-34**
35	53 Lavender Avenue, Morden, CR4 3HL	527621	169646	Kerbside	48	41	30	34	38	30	28		32	28	**-13**	34	7	**-18**
36	35 London Road, Tooting, SW17 9JR	527913	170518	Roadside	53	49	38	53	51	33	43	48	46	45	**-2**	42	22	**7**
51	A24 49 Streatham Rd, Mitcham, CR4 2AD	528219	169782	Roadside	48	48	34	40	44	30	31	29	37	30	**-19**	37	5	**-19**
37	107 London Road, Tooting, CR4 3JA	527932	169502	Kerbside	73	74	47	90	61	41	44	55	69	50	**-28**	51	11	**-2**

Site	Site Name	X (m)	Y (m)	Site Type	Jan -19	Feb-19	Mar-19	Apr-19	Jan -20	Feb-20	Mar-20	Apr-20	Mar-Apr	Mar-Apr	Mar-April	Jan-Feb	Mar-Apr	Jan-Feb
22	12-16 Upper Green West, CR4 3AA	527785	169049	Roadside	74	77	58	60	73	73	53	49	59	51	**-14**	73	18	**-30**
54	43 Upper Green East, Mitcham, CR4 2PF	527890	168920	Roadside	79	70	56	82	69	55	48	56	69	52	**-25**	62	13	**-16**
55	213 Manor Road, Mitcham, CR4 1JH	529661	168839	Kerbside	64	52	46	55	55	50	41	35	51	38	**-25**	53	6	**-47**
38	265 London Road, Mitcham, CR4 3NH	527743	168874	Kerbside	56	54	45	42	49	40	42	39	44	40	**-9**	45	16	**-11**
39	80 Church Road, Mitcham, CR4 3BE	527158	168646	Kerbside	68	49	38	52		35	37	41	45	39	**-13**	35	13	**11**
40	A217 361 London Road, Mitcham, CR4 4BF	527370	168312	Kerbside	69	54	43	52	50	40	38	38	47	38	**-19**	45	10	**-16**
41	A239 Morden Road, Morden, SM4 6AU	526395	168172	Roadside	62	47	34	55	59	43	43	51	45	47	**4**	51	25	**-8**
42	155 St Hellier Road, Morden, SM4 6JE	526211	167683	Roadside	56	53	33	42	57	40	37	41	37	39	**5**	48	22	**-19**

Site	Site Name	X (m)	Y (m)	Site Type	Jan -19	Feb-19	Mar-19	Apr-19	Jan -20	Feb-20	Mar-20	Apr-20	Mar-Apr	Mar-Apr	Mar-April	Jan-Feb	Mar-Apr	Jan-Feb
43	86 Morden Hall Road, Morden, SM4 5JG	526151	168293	Roadside	60	58	43	66	48	38	43	50	54	47	**-13**	43	17	**9**
48	28 Aberconway Road, Morden, SM4 5LF	525757	168509	Roadside	62	51	40	46	55	41	36		43	36	**-16**	48	10	**-25**
44	31, London Road, Morden, SM4 5HT	525817	168643	Kerbside	67	84	51	72	78	53	53		61	53	**-13**	66	20	**-20**
49	37 Crown Road, Morden, SM4 5DD	525500	168470	Kerbside	55	54	45	54	45	32	36	41	50	38	**-24**	39	7	**-3**
31	28 Charminster Avenue, Morden, SW19 3FL	525449	169152	Background	31	31	25	46	49	50	41	34	35	38	**9**	50	23	**-24**
7	A298 276-288 Kingston Road, SW20 8LX	524401	169351	Roadside	63	57	52	25	24	20	18	18	39	18	**-54**	22	-18	**18**
													Average (%):		**-20**	Average (%):		**-20**

Notes:

Table W shows the NO_2 diffusion tube monitoring results in μgm^{-3}. Data is not bias corrected for January-April 2019 and January-April 2020.

NO_2 monthly means below 40 μgm^{-3}, indicating a potential compliance of the NO_2 annual mean AQS objective are shown in green.

NO_2 monthly means in excess of 40 μgm^{-3}, indicating a potential exceedance of the NO_2 annual mean AQS objective are shown in orange.

NO_2 monthly means in excess of 60 μgm^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in red.