London Borough of Bromley
Air Quality Annual Status Report for 2021

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This report provides a detailed overview of air quality in London Borough of Bromley during 2021. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process[1].

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

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Abbreviations

Abbreviation	Description
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan
AQFA	Air Quality Focus Area
AQMA	Air Quality Management Area
AQN	Air Quality Network
AQO	Air Quality Objective
ASR	Annual Status Report
BAM	Beta Attenuation Monitor
BEB	Buildings Emission Benchmark
BIDs	Business Improvement Districts
BRY-CM3	Bromley Continuous Monitoring Site 3
CAB	Cleaner Air Borough
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CEO	Civil Enforcement Officer
CIL	Community Infrastructure Levy
CoCP	Code of Construction Practice
DC	Dry Cleaner
EFL	European Federation for Living
EV	Electric Vehicle
FORS	Fleet Operator Recognition Scheme
GLA	Greater London Authority
HEYL	London Healthy Early Years
HGV	Heavy Goods Vehicle
JSNA	Joint Strategic Needs Assessment
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LAQN	London Air Quality Network

Abbreviation	Description
LBB	London Borough of Bromley
LEN	Low Emission Neighbourhood
LIP	Local Implementation Plan
LLAQM	London Local Air Quality Management
NO_2	Nitrogen dioxide
NRMM	Non-Road Mobile Machinery
PCN	Penalty Charge Notice
PM_{10}	Particulate matter less than 10 micron in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micron in diameter
QA/QC	Quality Assurance/Quality Control
PVR	Petrol Vapour Recovery
SCA	Smoke Control Area
SCO	Smoke Control Order
SO_2	Sulphur dioxide
SPG	Supplementary Planning Guidance
STARS	Sustainable Travel: Active, Responsible, Safe
TEB	Transport Emissions Benchmark
TfL	Transport for London
TMO	Traffic Management Order
ULEV	Ultra-Low Emission Vehicle
UKPN	UK Power Network

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 ($PM_{2.5}$)	20 µg m^{-3}	Annual mean	2021
Particles ($PM_{2.5}$)	Target of 15% reduction in concentration at urban background locations	3-year mean	Between 2010 and 2021
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

1.1 Locations

The London Borough of Bromley has historically monitored at six continuous monitoring sites within the Borough, five of which are now closed. The operational monitoring station is currently located at Harwood Avenue, monitoring NO_2, PM_{10} and $PM_{2.5}$. Figure 1 and Table B provide details of this monitoring site. Monitoring at the site has been operated by the London Borough of Bromley since July 2011. Details of the relevant Quality Assurance / Quality Control (QA/QC) procedures that have been followed throughout the monitoring period are provided in Appendix A.

The London Borough of Bromley carries out passive monitoring using NO_2 diffusion tubes at 32 locations in the northern area of the Borough. All the diffusion tube sites are either at roadside or kerbside locations. The Harwood Avenue diffusion tube site is co-located with the Harwood Avenue automatic monitor. In April 2017 a diffusion tube site was installed on Beckenham Lane. Up until the end of 2020, there were 10 diffusion tube monitoring locations in triplicate, at which point 22 additional diffusion tube locations were installed and all monitoring locations commissioned with one tube. Figure 1 and Table C provide details of the operational diffusion tube sites within the Borough during 2021. Figure 1 and Table C provide details of the operational diffusion tube sites within the Borough during 2021. Bromley are supporting the Breathe London Nodes with two monitors commissioned in late 2021 at Princess Royal Hospital and Poverest Allotments.

Table B. Details of Automatic Monitoring Sites for 2021

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
BRY-CM3	Harwood Avenue	540523	169326	Roadside	Y	0.0	3.0	3.5	NO_2, $PM_{2.5}$ and PM_{10}	Chemiluminescence, Beta attenuation monitoring (BAM)

Table C. Details of Non-Automatic Monitoring Sites for 2021

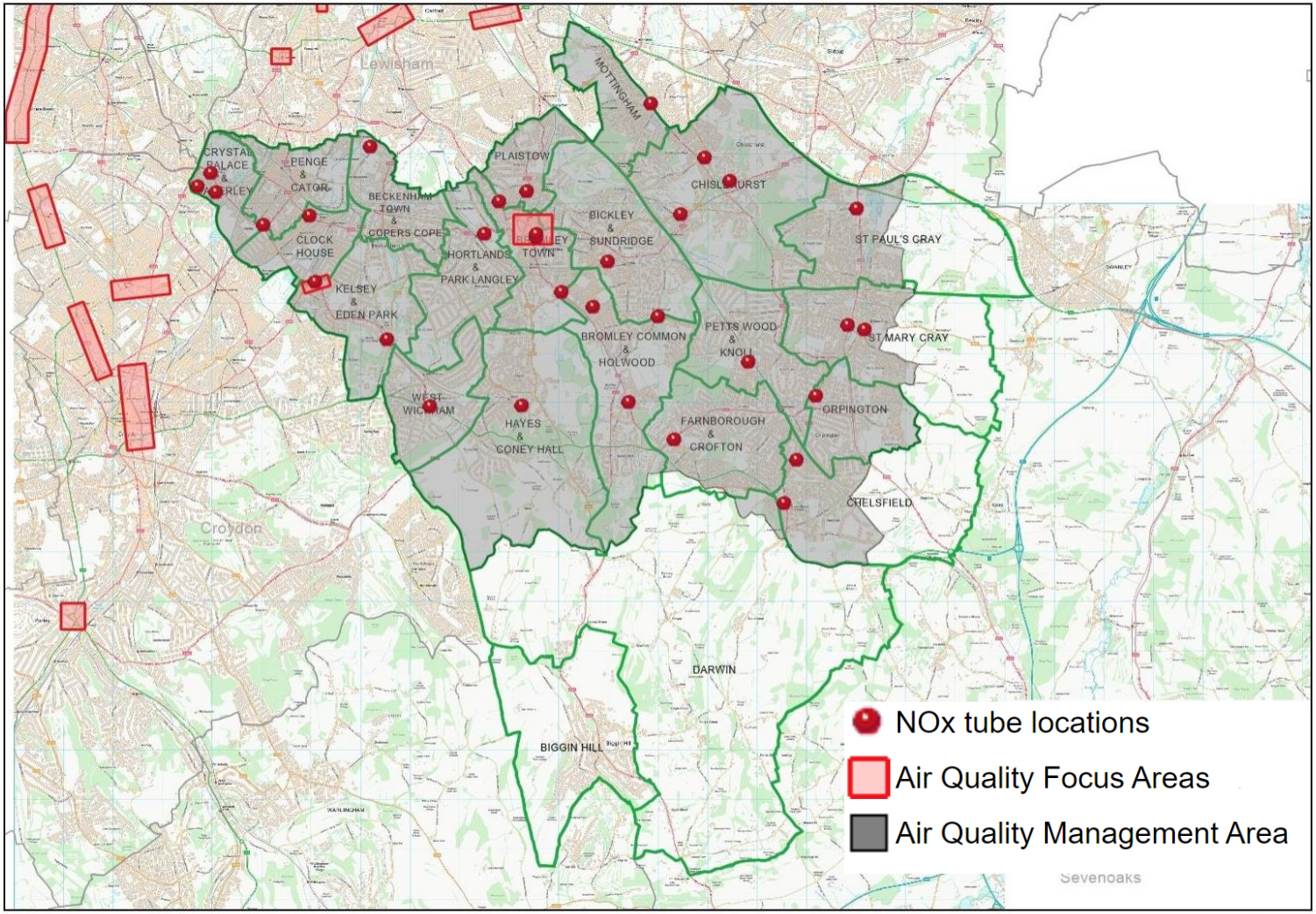
Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA (Y/N)	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor. (Y/N)
1	Homesdale Road	541047	168231	Roadside	Y	2.0	2.0	2.0	NO_2	N
2	Chatterton Road	541679	167931	Roadside	Y	3.3	2.0	2.0	NO_2	N
3	Hastings Road, McDonalds	542402	166012	Kerbside	Y	10.0**	0.8	2.0	NO_2	N
4	College Road	540336	170258	Roadside	Y	3.0	3.0	2.0	NO_2	N
5	London Road	539790	170050	Roadside	Y	4.0	2.0	2.0	NO_2	N
6	Shortlands Road	539486	169399	Roadside	Y	5.3	1.2	2.0	NO_2	N
7	Beckenham Road	535947	169765	Kerbside	Y	10.0**	0.5	2.0	NO_2	N
8	Worsley Bridge Road	536941	171320	Kerbside	Y	6.0	0.8	2.0	NO_2	N
9	Links Way	537511	167277	Kerbside	Y	9.5	0.8	2.0	NO_2	N
10	Elmers End Road	536076	168434	Roadside	Y	4.0	1.0	2.0	NO_2	N
11	Anerley Road	535006	169590	Kerbside	Y	3.0	0.5	2.0	NO_2	N
12	Anerley Hill	533949	170624	Kerbside	Y	13.0**	0.5	2.0	NO_2	N
13	Hamlet Road	534052	170237	Kerbside	Y	8.5	0.5	2.0	NO_2	N
14	Belverdere Road	533702	170354	Kerbside	Y	8.5	0.5	2.0	NO_2	N
15	Glebe Way	538398	165925	Kerbside	Y	8.0	0.8	2.0	NO_2	N

16	Ridgeway	540228	165941	Kerbside	Y	10.0	0.5	2.0	NO_2	N
17	Crofton Road	543303	165256	Kerbside	Y	7.2**	0.6	2.0	NO_2	N
18	Towncourt Lane	544779	166831	Roadside	Y	7.0**	2.6	2.0	NO_2	N
19	High Street, Orpington	546190	166135	Roadside	Y	3.8	1.7	2.0	NO_2	N
20	Cardinham Road	545861	164813	Roadside	Y	4.5	1.8	2.0	NO_2	N
21	Farnborough Hill	545439	164034	Kerbside	Y	8.8	0.6	2.0	NO_2	N
22	Poverest Road	546821	167564	Kerbside	Y	3.1	1.3	2.0	NO_2	N
23	High Street, St Mary Cray	547168	167471	Roadside	Y	3.3	1.4	2.0	NO_2	N
24	Midfield Way	546984	169905	Kerbside	Y	17.5	0.6	2.0	NO_2	N
25	Ashfield Lane	544437	170464	Roadside	Y	10.0	1.8	2.0	NO_2	N
26	Park Road	543930	170934	Roadside	Y	2.4	0.8	2.0	NO_2	N
27	Harwood Avenue	540525	169325	Roadside	Y	0*	3.0	2.0	NO_2	Y
28	Widmore Road	540519	169403	Roadside	Y	0*	3.0	2.0	NO_2	N
29	Blackbrook Lane	542980	167735	Roadside	Y	12.0	1.7	2.0	NO_2	N
30	Old Hill	543452	169793	Kerbside	Y	6.1	0.3	2.0	NO_2	N
31	Mottingham Road	542847	172021	Roadside	Y	0*	2.1	2.0	NO_2	N
32	Page Heath Lane	541960	168841	Kerbside	Y	1.8	0.4	2.0	NO_2	N

Notes:

* not directly on a façade, but representative of adjacent façade road distance
** monitoring site closer to the road source than the nearest façade

Figure 1. Monitoring Sites in 2021



0 1000 2000 3000 4000 5000 6000 metres

N

1.2 Comparison of Monitoring Results with AQOs

Annual mean NO_2 concentration results from automatic monitoring stations and diffusion tube monitoring locations since 2015 are presented in Table D and Figures 2 and 3.

The BRY-CM3 Harwood Avenue automatic monitor achieved a 97% data capture and did not exceed the NO_2 annual mean objective of 40 µg m^{-3}. Table E presents the number of 1-Hour means where they are more than 200 µg m^{-3}; no exceedances were recorded in 2021. All data have been ratified, and details of the data ratification process are provided in Appendix A.

Diffusion tube monitoring results presented are after adjustments for “annualisation” of sites that achieved less than 75% data capture in 2021, and following adjustments for bias, the details of which are described in Appendix A. Details of the QA/QC procedures applied to the diffusion tube results are also summarised in Appendix A. For those monitoring sites not located at points of relevant exposure, Defra’s façade distance correction tool has been used to estimate the annual mean NO_2 concentrations at the nearest location of relevant exposure (see Appendix A). These results are not shown in the main report in order to maintain time series consistency with previous reports however, the distance-corrected concentrations can be found in Appendix A.

Of the diffusion tube monitoring locations, there was one exceedance of the annual mean NO_2 objective in 2021 at diffusion tube 19, High Street, Orpington with a concentration of 41.9 µg m^{-3}, the maximum annual mean concentration recorded. Following distance correction for a location of relevant exposure, the predicted concentration was 35 µg m^{-3}. As there were no diffusion tube locations which had an annual mean concentration above 60 µg m^{-3}, this indicates that the 1 hour mean NO_2 objective is unlikely being exceeded.

The Council has been monitoring PM_{10} within the Borough since October 1999. The only operational monitoring station is at Harwood Avenue. A Beta Attenuation Monitor (BAM) is used for monitoring PM_{10}. The annual mean PM_{10} results are shown in Table F and the 24-hour mean PM_{10} results are presented in Table G. Data capture at the site in 2021 was 97%. The annual mean PM_{10} concentration in 2021 was 15.4 µg m^{-3}, which is below the annual mean objective of 40 µg m^{-3}. There were no days where the average concentration was above the 24-hour mean air quality objective value of 50 µg m^{-3}.

In 2015, an inlet particle sensor was attached to the PM_{10} monitor to monitor $PM_{2.5}$. This monitoring technique was not reference equivalent and as such provided indicative results. In 2020, a $PM_{2.5}$ beta attenuation monitor (BAM) was added to the existing continuous monitoring site at Harwood Avenue on 17th April, to replace the $PM_{2.5}$ inlet particle sensor. The annual mean $PM_{2.5}$ results from the BAM in 2021 are shown in Table H; all previous years of data presented in Table H were collected using the inlet sensor therefore any trends should be indicative. The annual mean $PM_{2.5}$ concentration in 2021 was 9.7 µg/m^3 which is below the annual mean objective of 20 µg/m^3; data capture in 2021 was 89%.

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

Site ID	Site type	Valid data capture for monitoring period %[a]	Valid data capture 2021 %[b]	2015	2016	2017	2018	2019	2020	2021
BRY-CM3	Automatic	97.0	97.0	30.7	31.9	28.6	25.7	24.7	21.3	21.8
1	Diffusion tube	100.0	100.0	**57.2**	**63.3**	**54.3**	**43.5**	39.4	29.3	30.9
2	Diffusion tube	90.5	90.5	-	-	-	-	-	-	18.3
3	Diffusion tube	100.0	100.0	-	-	-	-	-	-	27.5
4	Diffusion tube	100.0	100.0	-	**46.8**	36.4	35.6	33.1	25.7	25.5
5	Diffusion tube	100.0	100.0	**46.1**	**52.4**	**43.3**	37.6	37.6	27.7	26.8
6	Diffusion tube	100.0	100.0	-	-	-	-	-	-	27.1
7	Diffusion tube	100.0	100.0	**44.8**	**47.9**	38.0	38.2	36.0	28.6	30.2
8	Diffusion tube	92.4	92.4	-	-	-	-	-	-	20.6
9	Diffusion tube	100.0	100.0	-	-	-	-	-	-	25.4
10	Diffusion tube	100.0	100.0	**64.2**	**68.8**	**59.5**	**51.3**	**48.1**	39.5	37.5
11	Diffusion tube	92.4	92.4	**46.4**	**47.9**	38.2	35.2	36.4	27.9	29.2
12	Diffusion tube	100.0	100.0	**43.7**	**49.6**	**41.6**	39.0	**42.5**	35.1	35.9
13	Diffusion tube	92.4	92.4	-	-	-	-	-	-	26.6
14	Diffusion tube	100.0	100.0	-	-	-	-	-	-	18.2
15	Diffusion tube	100.0	100.0	-	-	-	-	-	-	27.9
16	Diffusion tube	92.4	92.4	-	-	-	-	-	-	16.2
17	Diffusion tube	100.0	100.0	-	-	-	-	-	-	25.0

Site ID	Site type	Valid data capture for monitoring period %[a]	Valid data capture 2021 %[b]	2015	2016	2017	2018	2019	2020	2021
18	Diffusion tube	100.0	100.0	-	-	-	-	-	-	15.4
19	Diffusion tube	100.0	100.0	-	-	-	-	-	-	**41.9**
20	Diffusion tube	100.0	100.0	-	-	-	-	-	-	19.4
21	Diffusion tube	92.4	92.4	-	-	-	-	-	-	33.3
22	Diffusion tube	100.0	100.0	-	-	-	-	-	-	22.4
23	Diffusion tube	92.4	92.4	-	-	-	-	-	-	25.1
24	Diffusion tube	100.0	100.0	-	-	-	-	-	-	24.7
25	Diffusion tube	91.3	91.3	-	-	-	-	-	-	19.6
26	Diffusion tube	100.0	100.0	-	-	-	-	-	-	21.0
27	Diffusion tube	100.0	100.0	34.0	31.3	30.3	27.3	28.3	21.4	21.1
28	Diffusion tube	100.0	100.0	**50.5**	**50.9**	**43.4**	39.1	38.4	30.9	32.8
29	Diffusion tube	100.0	100.0	-	-	-	-	-	-	23.0
30	Diffusion tube	90.5	90.5	-	-	-	-	-	-	26.6
31	Diffusion tube	100.0	100.0	-	-	-	-	-	-	29.7
32	Diffusion tube	100.0	100.0	-	-	-	-	-	-	25.3

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 Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

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

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

Table D and Figure 2 show the trend in NO_2 concentration at BRY-CM3 Harwood Avenue Automatic Monitor for the 2015 – 2021 period. Historically, this location shows a decreasing trend, with a slight increase from 2020 to 2021 which may be caused by life returning to normal after the COVID-19 pandemic and related lockdowns.

Table D and Figure 3 show the trends in NO_2 concentrations for diffusion tube monitoring sites for those with more than one year of data, for the 2015 – 2021 period. All of these sites show evidence for a decrease in NO_2 concentrations from the start of their monitoring period to 2021 and all sites were below the AQO in 2021. Some sites provide evidence for an increase between 2020 and 2021; this is likely to be caused by COVID-19 related lockdowns which led to a decrease in road traffic emissions during 2020. The current inconsistency of trends between post-pandemic monitoring periods is likely to be common as emissions sources such as those from road vehicles readjust following the pandemic.

Figure 2. Annual Mean NO_2 Concentrations at the Harwood Avenue Automatic Monitoring Site

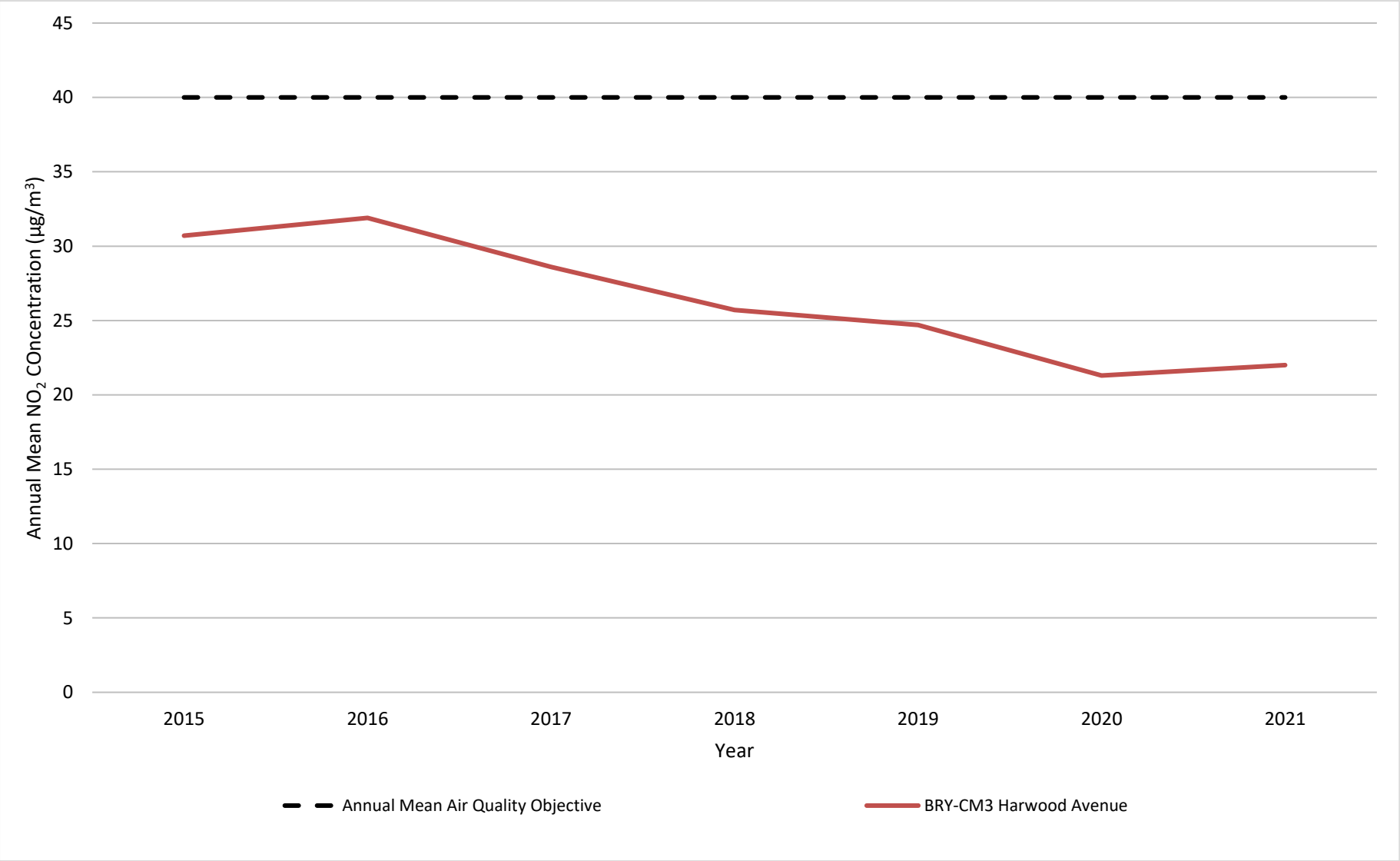


Figure 3. Annual Mean NO_2 concentrations at Non-Automatic Monitoring Sites

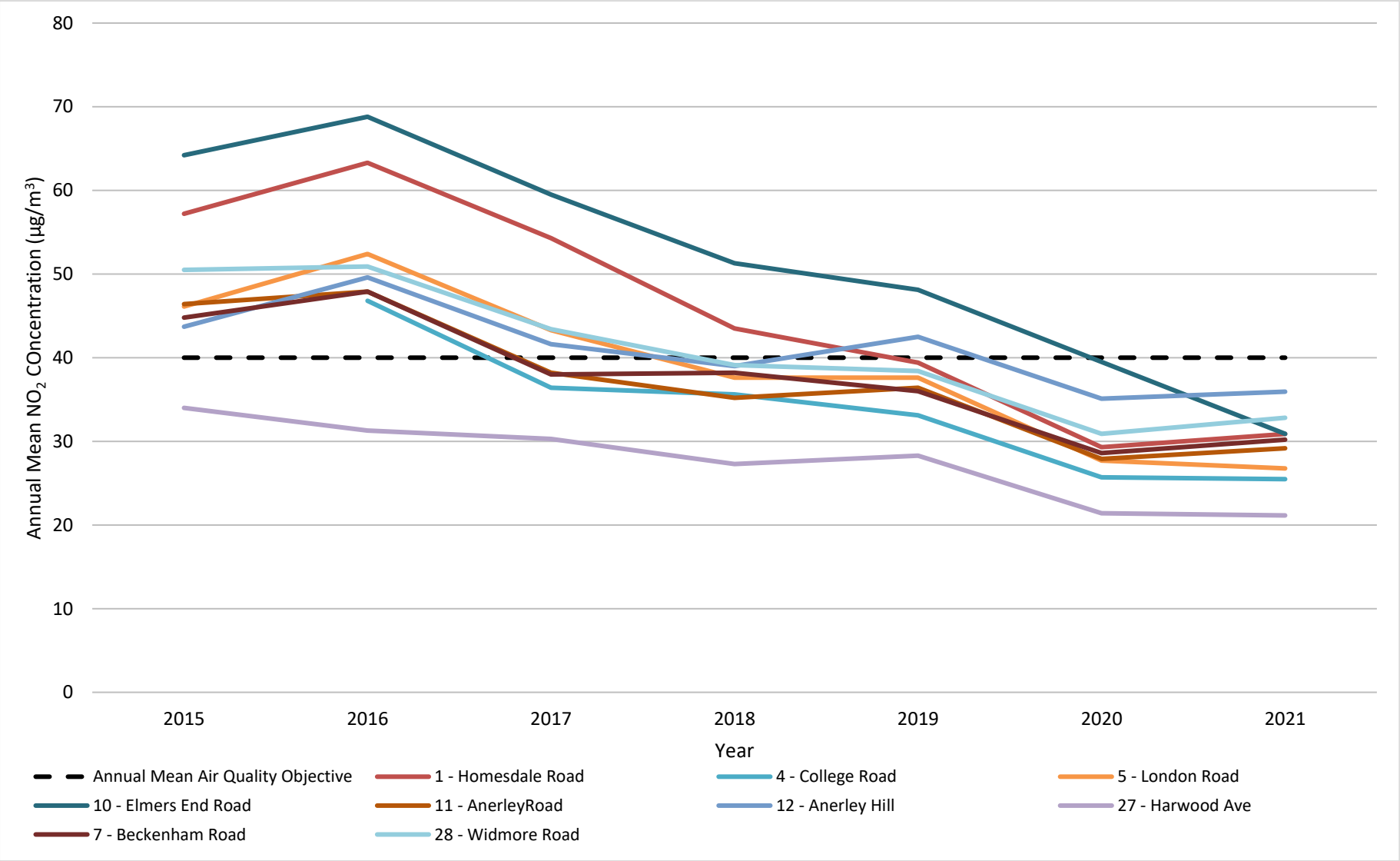


Table E. NO_2 Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m^{-3}

Site ID	Valid data capture for monitoring period %([a])	Valid data capture 2021 %([b])	2015	2016	2017	2018	2019	2020	2021
BRY-CM3	97	97	**0(90.6)**	**0(98.3)**	**0**	**0**	**0**	**0**	0

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%)

Table E shows the 1-hour NO_2 mean AQO was not exceeded between 2015 and 2021 at BRY-CM3.

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

Site ID	Valid data capture for monitoring period %([a])	Valid data capture 2021 %([b])	2015	2016	2017	2018	2019	2020	2021
BRY-CM3	96	96	30.1	29.5	16.8	16.5	18.8	15.8	15.4

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 Technical Guidance, if valid data capture is less than 75% and more than 25%.

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

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

Figure 4 and Table F show that there was a decline in the PM_{10} annual mean concentration between 2015 and 2018, with a slight increase between 2018 and 2019, then declining again from 2019 to 2021. It should be noted that the PM_{10} annual mean in 2020 and 2021 at BRY-CM3 may have been impacted by COVID-19 related lockdowns.

Figure 4. Annual Mean PM_{10} Concentrations at Harwood Avenue Automatic Monitoring Site

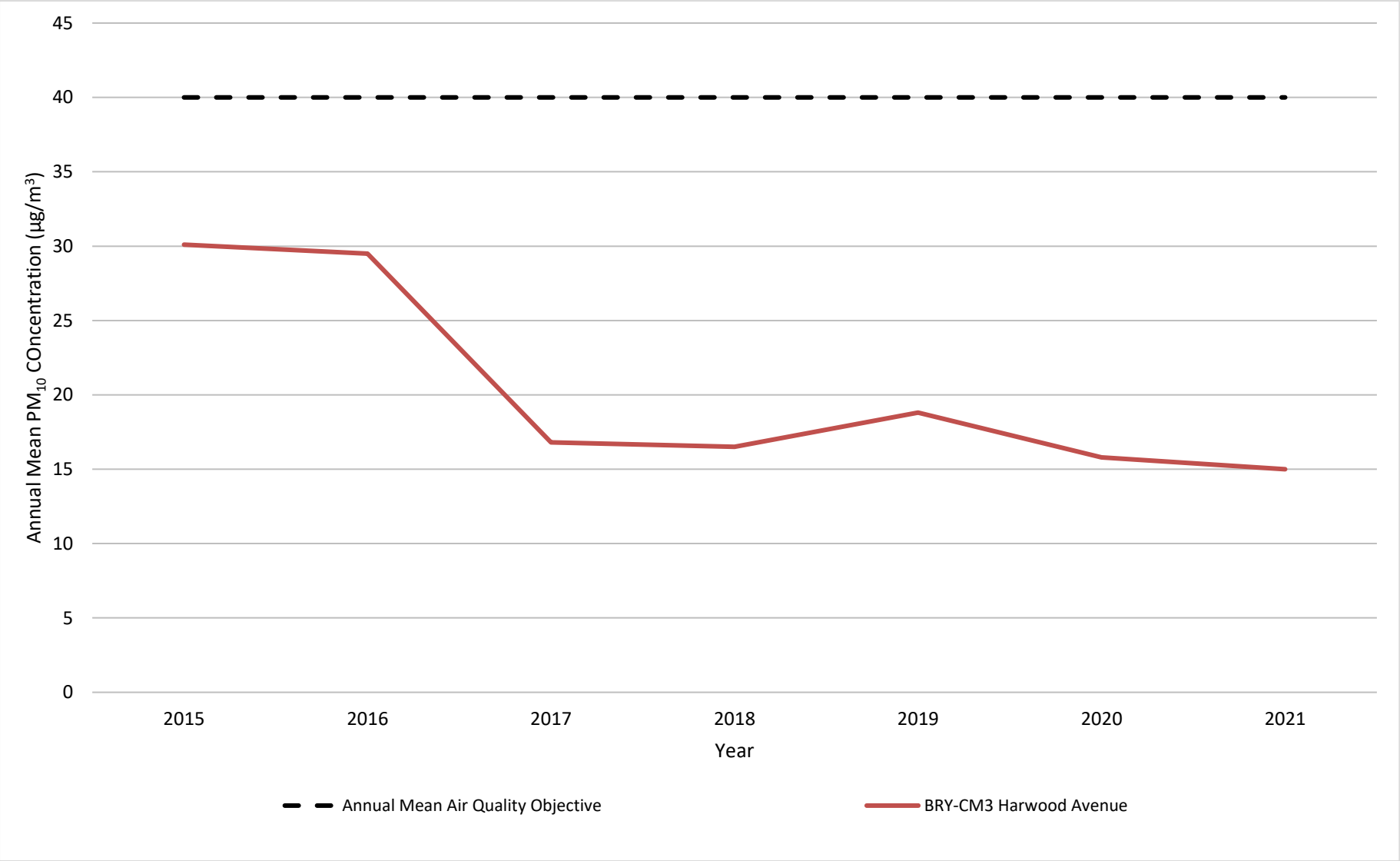


Table G. PM_{10} Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM_{10} 24-Hour Means > 50 µg m^{-3}

Site ID	Valid data capture for monitoring period %[(a)]	Valid data capture 2021 %[(b)]	2015	2016	2017	2018	2019	2020	2021
BRY-CM3	96	96	10(39)	**4(45)**	2(30)	**0(26)**	8	**1**	0

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 shows that the 24-hour PM_{10} AQO has not been exceeded between 2015 and 2021. Table G also shows that there has been an overall decline in the number of times 50 µg/m^3 was exceeded between 2015 and 2021, excluding an increase in 2019.

Table H. Annual Mean $PM_{2.5}$ Automatic Monitoring Results (µg m^{-3})

Site ID	Valid data capture for monitoring period %[a]	Valid data capture 2021 %[b]	2015	2016	2017	2018	2019	2020	2021
BRY-CM3	88	88	-	15.5	-	-	**-**	8.5	9.7

Notes

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

Exceedances of the $PM_{2.5}$ annual mean AQO of 20 µg m^{-3} are shown in **bold**.

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

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

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

Table H shows that between 2015 and 2021, the $PM_{2.5}$ annual mean has not exceeded the $PM_{2.5}$ annual mean AQO at BRY-CM3. Annual mean concentrations have increased between 2020 and 2021. It should be noted that the $PM_{2.5}$ data capture in 2020 was 56% in that year and the annual mean may have been impacted by COVID-19 related lockdowns, this may be the cause of the increase concentration observed between 2020 and 2021.

2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table J provides a summary of London Borough of Bromley's progress against the Air Quality Action Plan, showing progress made during 2021.

Table J. Delivery of Air Quality Action Plan Measures

AP	LLAQM Action Matrix Theme	Action	Progress
1.1	Monitoring and other core statutory duties	Ongoing maintenance of the Harwood Ave air quality monitoring station (AQMS) (%) Target: data capture over 90%	Achieved in 2021. Ongoing
1.2	Monitoring and other core statutory duties	Publish an annual report of air quality data on Bromley's website The successful submission and publication of Annual Status Reports and other statutory documents to the GLA	Achieved for 2021. Ongoing
1.3	Monitoring and other core statutory duties	Seek funding where appropriate (via s106 agreements) for reference monitoring in Bromley Submissions	Ongoing
1.4	Monitoring and other core statutory duties	Review of diffusion tube network following the extension of the AQMA and add additional diffusion monitoring points (no.)	Completed. In January 2021, the number of monitoring locations increased from 10 to 32 and these have been analysed monthly since.

AP	LLAQM Action Matrix Theme	Action	Progress
1.5	Monitoring and other core statutory duties	Seek funding for AQMS to measure PM_{10} and $PM_{2.5}$, NO_2 and O_3 at Biggin Hill by local agreement	Ongoing
1.6	Monitoring and other core statutory duties	Prioritise the provision of a $PM_{2.5}$ monitor if installing new monitors	Completed. A $PM_{2.5}$ BAM was installed at Harwood Monitoring Station. There are no current plans to install further monitoring stations.
1.7	Monitoring and other core statutory duties	Seek to test appropriate new smart monitoring technologies as they develop.	Report based on horizon scanning and reviewing of current and emerging technology completed for 2021 (Keeping up to date on progress and research: www.researchgate.net/publication/335466076_Review_of_the_Performance_of_Low-Cost_Sensors_for_Air_Quality_Monitoring. Installed an AQ sensor as part of Breathe London at the Princess Royal Hospital and Poverest Allotments). Will be revisited in 2022
1.8	Monitoring and other core statutory duties	Continue to support major developers in siting and installing construction site dust monitors Advice given though planning consultation system. Outputs – number of planning conditions /reports provided. Reported annually in the Annual Status Report (ASR)	Completed for 2021 (See 2.9 for numbers of Construction Management Plan conditions recommended to planners which includes the management and monitoring of dust on site). Will be revisited in 2022
1.9	Monitoring and other core statutory duties	Membership of the LAQN renewed.	Completed for 2021 (Membership maintained. Bromley's site makes an essential contribution to the LAQN. This network provides published information for forecasting air quality and predictive triggers for data dissemination) Will be revisited in 2022

AP	LLAQM Action Matrix Theme	Action	Progress
1.10	Monitoring and other core statutory duties	Borough review of Part B (Environmental Permitting) processes to ensure all relevant process are captured (%) Borough wide review to be completed by the end of 2021.	100% of relevant sites permitted completed for 2021 (A borough wide review found 86 operations across 11 process categories, of this 48 have been identified for further investigations of which 8 have been identified as likely to require a permit at this stage. Two periods of COVID lockdowns during 2021 resulted in some sites remaining closed, while others opened in a limited capacity only. H&S constraints also reduced the opportunity for site investigations. Work is ongoing on this project). Will be revisited in 2022
2.1	Emissions from developments and buildings	Require Construction Environmental Management Plans for 100% of major developments where works are likely to produce levels of dust	Completed for 2021. Will be revisited in 2022
2.2	Emissions from developments and buildings	Require real-time PM_{10} monitoring at high-risk sites in accordance with the Mayor of London Supplementary Planning Guidance (SPG). (%)	100% of new high-risk sites have monitoring in place completed for 2021. Will be revisited in 2022
2.3	Emissions from developments and buildings	Enforcement visits when complaints received. (%)	Completed for 2021 (96% of complaints received appropriately responded to. 53 of 55 complaints under this category responded to). Will be revisited in 2022
2.4	Emissions from developments and buildings	Update Bromley's existing Code of Construction Practice (CoCP)	Ongoing (The first draft of the COCP was completed at the start of 2022. The code has been updated to cover a wider range of topics in more detail and a new categorisation process has been added so that developers should have a list of minimum requirements that need to be completed based on the size/scale of the development).
2.5	Emissions from developments and buildings	Produce information for developers to promote low combustion and combustion free development	Completed (This information has been produced and will be available on Bromley's website in the near future)

AP	LLAQM Action Matrix Theme	Action	Progress
2.6	Emissions from developments and buildings	Adopt revised planning conditions and informatives regarding the use of diesel generators Adoption of any additional information /Informatives.	Completed (Requirements where practicable adopted in CEMPs as part of the approved planning process. Details also included in draft CoCP. Also, a Bromley Communique for developers was produced on 21st December 2021 to promote low combustion and combustion free development).
2.7	Emissions from developments and buildings	Effectively manage and mitigate emissions of development taking place in the designated Air Quality Focus Area (AQFAs) through New Bromley plan	Completed for 2021 (Conditions imposed on relevant applications. GIS layer of all AQFAs put on STATMap, where planners can view for new applications) Will be revisited in 2022
2.8	Emissions from developments and buildings	Where appropriate, use planning obligations to secure funding from developers for monitoring compliance checks on major and/or sensitive sites.	Completed for 2021. Will be revisited in 2022
2.9	Emissions from developments and buildings	Continue to assess all relevant planning applications for their air quality impact and condition as appropriate Number of applications assessed, against no received within 28 days.	Completed for 2021 (Number of applications conditioned w/regard to AQ: 163 Number of planning apps required to monitor for dust: 99 Number of developments required to install ultra-low NOx boilers: 149 Number of Neutral building and/or transport assessments undertaken: 7 (this does not include all the applications that came with assessments) Planning applications conditions for NRMM: 46 Planning applications conditioned for EV: 25) Will be revisited in 2022

AP	LLAQM Action Matrix Theme	Action	Progress
3.1	Emissions from developments and buildings	Apply conditions for construction sites to ensure compliance with the GLA's NRMM requirements *Planning conditions to include where appropriate: Air Quality Assessment Air Quality Network (AQN) assessment Construction Environment Management Plan (CEMP) to include PM10 monitoring NRMM compliance with London LEZ Seek funding for air quality measures through S.106, Community Infrastructure Levy (CIL) where feasible	100% of developments registered and compliant - completed for 2021. Will be revisited in 2022
3.2	Emissions from developments and buildings	Ensure emissions from construction sites are minimized through cooperation with developers and site visits, including effective dust monitoring where appropriate, and compliance with GLA NRMM requirements	Completed for 2021 (Provided an updated list of Major Planning sites where construction is starting or soon to start to NRMM Project Team for inspection. 20 Audits carried out in 2021. Follow up action was taken on the one non-compliant site with equipment removed from site). Will be revisited in 2022
4.1	Emissions from developments and buildings	Require developments with Combined Heat and Power (CHP) to be air quality neutral as a minimum Number of developments where AQ neutral is applied.	Completed for 2021.Will be revisited in 2022
4.2	Emissions from developments and buildings	Require developers to meet the GLA's emissions limits for CHP and Biomass boilers	Completed for 2021.Will be revisited in 2022
4.3	Emissions from developments and buildings	Set requirement for evidence of maintenance of CHP and associated plant	Completed for 2021.Will be revisited in 2022

AP	LLAQM Action Matrix Theme	Action	Progress
5.1	Emissions from developments and buildings	Apply Air Quality Positive for regeneration areas in line with the new London Plan Agree standard planning conditions to require compliance with AQN standards and London Plan policy.	Completed for 2021.Will be revisited in 2022
5.2	Emissions from developments and buildings	Set requirement for evidence of maintenance of CHP and associated plant	Completed for 2021.Will be revisited in 2022
6.1	Emissions from developments and buildings	Planning application / conditions - Set targets to improve levels of green infrastructure provided in new developments.*To be considered on a case-by-case basis through application of relevant London Plan Policies	Completed for 2021.Will be revisited in 2022
6.2	Emissions from developments and buildings	Ensure that exposure to poor air quality in amenity spaces is considered at design stage and as part of the Air Quality Assessment (AQA).*To be considered on a case-by-case basis through application of relevant London Plan Policies	No action required (London Plan Policies are applied to development proposals and considered via the consultation process)
7.1	Emissions from developments and buildings	Carry out awareness campaigns in relation to bonfires and wood burning stoves and provide advice on appropriate fuel by issuing guidance Guidance to be produced by the end of 2021 and to be promoted through newsletters including 'Environment Matters'. Estimated engagement can be demonstrated through circulation outputs, website page hits. We will circulate to providers of fuels and relevant businesses, demonstrated through number of correspondences.	Ongoing (The Council will utilise publications such as 'Environment Matters' to provide advice here)
7.2	Emissions from developments and buildings	Effectively fulfil statutory duties as a Smoke Control Area (SCA)	Completed for 2021 (Contributed towards 1 no. article for Environment Matters (November 2021 - see article 'Taking Care of Bromley's Air' & promotion of AirTEXT). 100% response to SCA related complaints. 18 of 18 complaints responded to and appropriate action taken. Includes complaints about smoke

AP	LLAQM Action Matrix Theme	Action	Progress
			emissions from chimneys in SCAs and use of unauthorised fuels only. Excludes more general enquiries about SCAs, authorised fuels, and requests for copies of smoke control orders (SCOs). Will be revisited in 2022
7.3	Emissions from developments and buildings	Continue to control emissions from permitted processes through inspections and enforcement (see also action 1)	Completed for 2021 (84 sites operating with Part B permits by the end of 2021. Based on risk rating at the beginning of the year, 97% of expected number of audit inspections carried out. 1 new permit issued during 2021. All existing DC (Dry Cleaners) & PVR (Petrol Vapour Recovery) sites subject to periodic review and permits updated as required. Actual audit inspections by the END of 2021 = 136% of those due in April as DCs were subject to desk top risk rating based on questionnaires requiring solvent returns and other documents per permit conditions. Most DCs now medium risk, so higher inspection frequency. NB: for the year 2020-21, Defra COVID guidance did not expect/require inspection of some Part B activities). Will be revisited in 2022
8.1	Emissions from developments and buildings	Promoting and delivering energy efficiency retrofitting projects in workplaces and homes	ECO Flex declarations commenced in 2017. The projected figure for Bromley in 2019/20 is 12 declarations covering 53 households with an escalation year on year. Target: 5% minimum increase annually. Ongoing
8.2	Emissions from developments and buildings	Follow up proposals for inclusion in a revised policy for the retrofitting of air pollutant reduction equipment for clients living in areas identified as most likely to trigger detrimental health effects	Ongoing
8.3	Emissions from developments and buildings	Continue with the advice service for households at risk of fuel poverty in southeast London. Target- to carry out 800 home visits and 800 one-to-one advice sessions at events	Completed for 2021 (52 advise sessions, 214 households referred to ECO-flex, 120 home visits). Will be revisited in 2022
8.4	Emissions from developments and buildings	As part of a current review of the use of discretionary grant funding linked to Disabled Facilities Grants and the Better Care Fund	Ongoing

AP	LLAQM Action Matrix Theme	Action	Progress
8.5	Emissions from developments and buildings	All projects have a demonstrable carbon reduction and will be appraised independently. Overall organisational emissions reductions will be evidenced in the Council's Carbon Management Programme	Completed for 2021 (Plan to utilise interest free heat decarbonisation loan scheme (Salix) until 2025 close to submission. Salix Finance Ltd. provides Government funding to the public sector to improve energy efficiency, reduce carbon emissions and lower energy bills. Salix Finance is a non-departmental public body, owned wholly by Government and is funded by the Department for Business, Energy and Industrial Strategy, the Department for Education, the Welsh Government and the Scottish Government. We are in the process of drafting a plan for future investment). Will be revisited in 2022
8A.1	Emissions from developments and buildings	Production of a sustainability toolkit for service leads to consider sustainability issues including carbon and air quality when initiating the procurement process.	Completed for 2021 (Toolkit being explored to migrate to an online platform, link up to a "CE directory", working with RELondon for product development) Will be revisited in 2022
8B.1	Emissions from developments and buildings	LB Bromley Sustainability Policy to be further developed	Completed in full: A policy has been developed and stipulates that the procurement process must take into account bids "seeking to minimise any negative environmental impacts of goods and services purchased, across the whole life cycle from raw material extraction to end of life"
8B.2	Emissions from developments and buildings	Seek to influence supplier behaviour through Circular Economy principles: reduced journeys, shared services, product life extension, waste minimisation, energy recovery from waste	Ongoing
9.1	Emissions from developments and buildings	Update ASR and planning portal	Ongoing
10.1	Public health and awareness raising	The Health and Well-Being Board will include a new section within the Joint Strategic Needs Assessment (JSNA) with up to date information on air quality impacts on the population *Public Health Team to support engagement	Ongoing

AP	LLAQM Action Matrix Theme	Action	Progress
		with local stakeholders (businesses, schools, community groups and healthcare providers)	
11.1	Public health and awareness raising	Promote active travel and public transport to businesses. The Council will host events such as free cycle training and Dr Bike sessions for bids who are proactively engaged (dependant on TFL funding and Covid restrictions)	Ongoing
12.1	Public health and awareness raising	Public Health team to support promotion through GP practices and pharmacies Membership of airTEXT consortium	Completed for 2021. (2020 baseline = 129 subscribers receiving airTEXT air quality alerts for Bromley. At the end of 2021 Bromley had 182 active subscribers, which was a net increase of 53 on the previous year, when there were 129 active subscribers. There were 13 alert days in Bromley in 2021, and 1,257 alert messages were sent by text, email or voicemail). Will be revisited in 2022
13.1	Public health and awareness raising.	Use of the STARS programme in schools as a tool to promoting active travel to school	Completed for 2021 ("The number of schools accredited is up to July 2021 (academic year 2020/21). Data for 2022 will be available Sept 2022. •Bronze – 18 •Silver – 34 •Gold – 42 (please note we lost one Gold due to the school closing) Total No points (1 for bronze, 2 for silver & 3 for gold) – 212. Currently 81% of open schools are accredited”) Will be revisited in 2022.
14.1	Public health and awareness raising	Ongoing co-ordination of the Heathy Schools London in Bromley project, to improve children and young people's health and well- being. Target is to add 5% more schools each year. *over ninety schools currently participating. London Healthy Early Years (HEYL) supports and recognises achievements in child health, wellbeing and education in early years settings. Well over one hundred	Completed for 2021. Healthy Schools - tbc HEYL bronze award (and above) include whether the EY setting has an air quality monitoring system in place as part of their sustainability aims. HEYL registered settings =225, HEYL First Steps badge 174, HEYL Bronze Award badge -14, HEYL Silver Award badge – 9)

AP	LLAQM Action Matrix Theme	Action	Progress
		Bromley Early Years settings have already registered with a target of an additional 5% year on year.	Will be revisited in 2022
14.2	Public health and awareness raising	The Borough is currently undertaking a trial of a green screen around Valley Primary School as part of the Shortlands Friendly Village (Liveable Neighbourhood) project. If successful, consideration will be given to how the green screens can be delivered to more schools in the AQMA. *This delivers on the LIP3 commitment to look to undertake a trial of new green infrastructure, such as trees and green walls around schools in the AQMA and alongside corridors with the highest concentrations as a means of natural emissions capture	Ongoing (Recently research published has suggested that Green Screens are not as effective as they were hoped to be. More evidence of their efficacy will be required before Bromley looks to introduce further Green Screens).
14.3	Public health and awareness raising	Promote campaign on anti-idling, involving specific signage, communications activity and increased enforcement in idling hotspots around 8 schools (see also 21).*A more targeted approach to idling, focusing on schools will be taken, which should make a differences in areas over short periods of time, utilising a variety of comms and enforcement action	Completed for 2021 (0 FPNs, 320 engagements with idling drivers). Will be revisited in 2022
15.1	Deliver servicing and freight	Seek to influence supplier behaviour through circular economy principles: reduced journeys, shared services, product life extension, waste minimisation, energy recovery from waste.	No action required
15.2	Deliver servicing and freight	Require environmental services suppliers with large fleets to have attained Bronze / Silver / Gold (Fleet Operator Recognition Scheme) FORS accreditation. *Bromley's LIP3 sets out a road map to reducing emissions from the London Borough of Bromley (LBB) fleet to 2041 and working with procurement, the Council will be asked to consider how they could ask contractors to innovate towards a greener fleet and to reduce emissions from the Council's fleet.	Completed for 2021 ("Environment service providers hold FORS accreditation. Veolia, idverde and Glendale - Bronze accreditation Id Verde are awaiting their FORS accreditation renewal due to Covid-19 reducing the number of assessments in 2021"). Will be revisited in 2022

AP	LLAQM Action Matrix Theme	Action	Progress
16.1	Deliver servicing and freight	Sustainability toolkit for service leads to consider sustainability issues including carbon and air quality when initiating the procurement process. Will require measurements that are proportional and appropriate to contract size	Ongoing (Awaiting appropriate contract to test and implement)
16.2	Deliver servicing and freight	LB Bromley Borough-Wide Emissions Strategy to be developed, as part of wider corporate Sustainability Policy	Ongoing
16.3	Deliver servicing and freight	The Council will continue to seek to work with collection locker providers to provide such facilities in some borough car parks to reduce delivery miles Provision of facilities installed.	Ongoing (currently have lockers in 7 of our car parks and are potentially looking at another 8 sites with our contractors. In total Bromley have 31 chargeable car parks, 2 free and 1 Disabled only car park).
16.4	Deliver servicing and freight	Any development likely to create a significant number of trips will, where necessary, is required to enter into an agreement to submit and implement acceptable Construction Logistics Plans, and Delivery/Servicing Plans. Consideration will be given to re- organisation of freight to support consolidation (or micro- consolidation) of deliveries, by setting up or participating in new logistics facilities, and/or requiring that council suppliers participate in these.	Completed for 2021.Will be revisited in 2022
17.1	Borough fleet	Council fleet and hired fleet to meet Quality Standard. Operating data and feedback will be collected to help inform future replacements and procurement projects.	Completed for 2021. (One fully electric van has been procured for Public Protection & Enforcement. A second fully electric van for facilities was cancelled by Renault due to production issues. Interim measures for charging these vehicles are being provided whilst a wider scheme for this is being worked on). Two electric vehicles are on order for Highways and 2 plug-in hybrids are on order for the Mayors office. Will be revisited in 2022
17.2	Borough fleet	Increase the number of plug-in hybrid and electric council vehicles through planned replacement programme	Completed for 2021 (Worked with Veolia to maintain 6 electric vans for their Environmental Managers. 1 additional electric van is

AP	LLAQM Action Matrix Theme	Action	Progress
			available within Public Protection). See also 17.1. Will be revisited in 2022
17.3	Borough fleet	Increase the uptake of new Euro VI vehicles in the heavier fleet, phase out older vehicles operated by our contractors by April 2020	Completed for 2021 (Waste Fleet Euro VI compliant). Still operating 6 x Euro 5 gritters (non-compliant with LEZ). Planning further replacements with Euro 6 vehicles this year but used stock is currently unavailable due to limitations on the flow of new chassis from manufacturers. Will be revisited in 2022
17.4	Borough fleet	Promote fuel-efficient driving through the driver induction and competence checks	Completed for 2021 (Ongoing activity when conducting tests with some recent induction with new electric van). Will be revisited in 2022
17.5	Borough fleet	Work in partnership with our Waste contractor to ensure our infrastructure allows for a fully electric waste collection fleet in 2026 Improvement in infrastructure.	Completed for 2022 (No infrastructure in place. Met with UK Power Network (UKPN) and Veolia to commence exploration of the requirements for a fully electric waste and street cleansing fleet in 2026). Will be revisited in 2022
17.6	Borough fleet	Monitor progress with vehicle manufacturers, other similar operators and technical developments to further support the intake of alternatively fueled vehicles.	Completed for 2021 (Considering hydrogen as well as electric for our future waste collection and artic vehicles). Will be revisited in 2022
17.7	Borough fleet	Increase the use of pool vehicles Uptake monitored and reported annually.	Completed for 2021 (2020 baseline = 0. 1 electric van is now in use within Public Protection. Pool vehicles are not electric as of yet. There has been no use of pool vehicles in 2021/22 due to Covid-19, whereby officers have opted to use their own vehicles wherever possible). Will be revisited in 2022
17.8	Borough fleet	Maintain the FORS accreditation held by the Council's Waste, Streets and Parks contractors.	Completed for 2021 ("Environment service providers hold FORS accreditation. Veolia, Id Verde and Glendale - Bronze accreditation. Id Verde behind on 2021/22 compliance test due to Covid-19 reducing the

AP	LLAQM Action Matrix Theme	Action	Progress
			assessment availability of the FORS team."). Will be revisited in 2022
17.9	Borough fleet	Equip waste vehicles with the 'Driving Efficiently and Safely' (DES) tracking and monitoring system to monitor and minimise idling, braking, over-revving, and contravention of speed limits	Completed for 2021 All waste vehicles equipped with DES but currently not linked with software to enable monitoring. DES is generally no longer used. Monitoring system being developed in conjunction with LBB and information will be displayed on PowerBI in real time). Will be revisited in 2022
17.10	Borough fleet	Supervisors of the waste and street cleansing service to use electric vehicles	Completed (March 2020 - 12 electric vehicles)
17.11	Borough fleet	Installation of electric charging point for Heavy Goods Vehicles (HGVs)	Completed for 2021 (No infrastructure in place. The infrastructure works for the depot improvement programme now focus only on critical works associated with the safe and compliant running of the waste depots. As such, the majority of the work to provide electric infrastructure has been removed from this programme. The programme itself will not commence construction until 2023). Will be revisited in 2022
17.12	Borough fleet	Increase the % of mobile equipment used (e.g. electric chainsaws) by the Arboriculture contractor	Ongoing (2020 baseline = 50%. Pending update from contractor).
17A.1	Borough fleet	Promote the uptake of alternative fuel cars via the staff lease scheme. The option to further incentivise drivers will be a discussion point when approaching the next procurement exercise	Completed for 2021. Drivers are being encouraged away from diesel cars. (14% of the fleet was hybrid/plug in or pure electric prior to 2021. There is a notable uptake of alternative fuelled vehicles by London Borough of Bromley Lease Car drivers. For 2021 there were 6 fully electric, 18 plugin/petrol and 26 hybrid/petrol vehicles with a further 42 vehicles on order including 3 electric, 7 plug in/petrol and 10 hybrid/petrol). Vehicle supply issues causing serious delays and many existing cars now under extensions. Actual 'in service' percentage of alternatively fuelled vehicles remains about the same at 15%.Will be revisited in 2022

AP	LLAQM Action Matrix Theme	Action	Progress
18.1	Localised solutions	Through Planning process, identify opportunities for green infrastructure	Completed for 2021.Will be revisited in 2022
18.2	Localised solutions	Feasibility of enhancing the public realm potentially through gyratory removal at Elmers End (see also 19).	Ongoing (ongoing - funding for LEN bid has not yet been identified)
18A.1	Localised solutions	Continue to provide an annual tree planting plan and where possible consider planting trees in areas where they will be of most benefit to local air quality. Progress a scheme to create/expand woodlands in the Borough.	Completed for 2021.Will be revisited in 2022 (417 trees were planted in 2019/20. 1225 trees were planted in 20/21. 1457 by end of 21/22)
18A.2	Localised solutions	Increase the number of street and parks trees via funding	Ongoing (No funding bids applied to in 2020)
19.1	Localised solutions	Review previously unsuccessful bid to the Mayor's Air Quality Fund for a Low Emission Neighbourhood in Birkbeck village in Bromley's AQMA, which is bounded by the A213 and A214 *Options are being considered for how the benefits of the scheme can be derived without LEN funding	Completed for 2021 (Funding for LENs has not yet come back on stream subsequent to TfL's funding having been drastically reduced. The principles of LENs and LTNs is also questioned as experience of an LTN in a neighbouring borough has been negative in regards to the fact that additional traffic congestion was observed during the scheme's operation) Will be revisited in 2022
19.2	Localised solutions	Feasibility study for enhancing the public realm potentially through gyratory removal at Elmers End.	Ongoing (funding has not yet been secured for this project)
19A.1	Localised solutions	Continue to provide existing comprehensive waste and recycling collection service	Completed for 2021 (Maintained comprehensive waste and recycling collection service. Garden waste customers continue to grow in number and currently exceed 45,000) Will be revisited in 2022
19B.1	Localised solutions	Provide a kerbside collection service for textiles, batteries and small electrical items*The Council provides a collection service for the Core Materials as required within the London Environment Strategy	Completed (Kerbside collection of textiles, batteries and small waste electronic and electrical items provided)

AP	LLAQM Action Matrix Theme	Action	Progress
19B.2	Localised solutions	Liaise with Council's contractor to expand on materials accepted at the kerbside and promote the Council's chargeable garden waste service	Completed for 2021 ("List of materials accepted available at www.bromley.gov.uk/wastenews Promotion of garden waste is a contractual requirement. Continue to consider accepting additional items at the kerbside through contract meetings. Garden waste collections were promoted in 2021/22 through targeted letters, JC Decaux adverts, the website, social media and articles in Environment Matters"). Will be revisited in 2022
19C.1	Localised solutions	Promote dust management at sites – using the accordance with the Mayor of London SPG as an exemplar	Completed for 2021 (Dust management is in accordance with the environmental permit) Will be revisited in 2022
19D.1	Localised solutions	Monitor and manage landfill gas generated by closed landfill site through existing network of pipes and landfill gas flare	Completed for 2021 (Landfill gas and leachate are managed at the closed landfill site in accordance with Environment Agency best practice).
19E.1	Localised solutions	Install wood chip bins within the Borough's parks instead of transporting woodchip outside the borough*Parks Contractor will be able to use woodchip for bedding, path creation rather than woodchip being used as biomass	Completed for 2021 (3 sites have been trialled in association with local Friends Groups, Whitehall Rec Ground, Brook Lane Community Gardens & High Elms Country Park with installation of recyclable wood chip piles. This is subject to review in April 2022 with an aim to expand on this project in the next financial year). Will be revisited in 2022
20.1	Cleaner transport	Through this AQAP and Bromley's LIP3 officers will continue dialogue regarding project and policy implementation. *Transport and Environmental Health staff form part of core AQAP Steering Group	Completed (This is also supported by involvement in the Green Recovery Group and other climate change discussion groups)
21.1	Cleaner transport	The Council is participating in the London-wide anti-idling campaign funded from the Mayor's Air Quality Fund with eight schools in the borough to hold anti-idling campaigns per annum. PCN enforcement will allow for a significantly higher penalty for idling to be applied	Completed for 2021 (Anti-Idling campaign has been running continuously since March 2020. We are currently enforcing at 7 school locations in the Borough, which is on top of the 21 other school locations where signage is installed to allow enforcement to take place). Will be revisited in 2022

AP	LLAQM Action Matrix Theme	Action	Progress
21.2	Cleaner transport	The borough has adopted powers to enforce against idling vehicles but will look to create a Borough-wide Traffic Management Order (TMO) to allow for PCN enforcement which will be easier to enforce with existing and widely allocated Civil Enforcement Officer (CEO) resources	TMO created and in effect from April 2020. Ongoing.
22.1	Cleaner transport	Work with BIDs to support a suitable programme of weekend road closures to allow town centres and high streets to be used in new and innovative ways, supporting vibrant town centres and communities	Completed (A programme of weekend closures has not been taken forward. Instead, the Council has promoted street party road closures and these have become more popular than ever before, primarily in the summer months (although these were not permitted during Covid lockdown periods).
22.2	Cleaner transport	Continue with Street Party events and engage with residents in discussions about possible changes in the locality that would enhance walking and cycling	Ongoing (2019 baseline = 66 total applications)
23.1	Cleaner transport	The use of electric vehicles will be promoted by providing the appropriate infrastructure	Completed (An Electric Vehicle Charging Strategy has now been produced with the intention to introduce pilot schemes for on street charge points and residential gullies in 2022)
24.1	Cleaner transport	Work with Bluepoint London to continue to roll out electric vehicle charging infrastructure. *There are national policies in place to influence road users' choice of vehicle but parking policy is not considered to have an impact on the use of those vehicles	Completed for 2021 (Further Bluepoint (now Source London – part of Total Energies) charge points are to be installed in early Spring 2022. Future plans will be determined by the procurement process currently place as part of the EV strategy and pilot scheme). Will be revisited in 2022
24.2	Cleaner transport	Install 4 Rapid Charge Points as part of the TFL scheme by March 2020 along with the 4 installed on the A232 TLRN in Coney Hall and West Wickham	Completed for 2021 (3 rapid charge points have now been installed on Nichol Lane, Bromley, Main Road, Biggin Hill and Maple Road, Penge. The proposed site of Ravensbourne Avenue could not go ahead due to issues with the power network. Due to major issues with TfL funding no further points are currently planned but LBB Officers are keeping abreast of potential developments). Will be revisited in 2022
24.3	Cleaner transport	Policy 30 of the Local Plan requires 1 in 5 car parking spaces to be provided with electric vehicle charge points	Completed for 2021.Will be revisited in 2022

AP	LLAQM Action Matrix Theme	Action	Progress
24.4	Cleaner transport	Implementation of a pilot for lamp post charging points, including £30K LIP investment match funded by GULCS	Completed for 2021 (Although it has been confirmed that purely lamp column charge points are not possible in Bromley due to the lamp column stock, similar products will be given serious consideration for the EV pilot scheme). Will be revisited in 2022
25.1	Cleaner transport	Development of new cycle routes, both as part of TfL's strategic cycle network and local routes	Completed for 2021 (Due to the continuing limited funding from TfL, it has not been possible to re-instate the pre-Covid LIP programme which set out proposals to further expand the local cycle network. The Crofton Road cycle and pedestrian route was completed in August and defects and omissions were rectified during September). Will be revisited in 2022
25.2	Cleaner transport	Delivery of the 'Shortlands Friendly Village Scheme' to include schemes to reduce traffic volumes on residential streets to facilitate a safer and more inviting environment for walking and cycling.	Completed for 2021.Will be revisited in 2022 (Elements of the scheme have been delivered, such as a zebra crossing, a tiger crossing and a cycle route, but TfL funding for Liveable Neighbourhoods has been suspended at present)
25.3	Cleaner transport	Delivery of area based schemes that promote walking and reduce road danger, including a new footpath to Valley Primary School, a parallel zebra crossing outside Bishop Challoner School and a segregated cycle route in Albermarle Road and Beckenham Road to connect Shortlands with Beckenham, plus a cycle route in Valley Road to Harris Primary.	Completed for 2021 (The footpath was not in the end feasible, but the parallel zebra (tiger) crossing and the cycle route were introduced. In place of the Valley Primary School footpath scheme a zebra crossing was installed outside the school). Will be revisited in 2022
25.4	Cleaner transport	Improve pedestrian safety- installation of new pedestrian crossings	Completed for 2021 (4 crossings were installed – Homesdale Rd zebra – Kent House Road Zebra – Baston Rd Informal Crossing and Pedestrian Refuge – Stanmore Terrace Informal Crossing). Will be revisited in 2022
25.5	Cleaner transport	Improve pedestrian infrastructure to encourage walking to school	Completed for 2021.Will be revisited in 2022
25.6	Cleaner transport	Provide high quality cycle hubs at stations and continue to deliver on-street cycle parking and Bike hangers	Completed for 2021.Will be revisited in 2022 (2 bike hangers installed in 2021)

3. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in London Borough of Bromley in 2021

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	163
Number of planning applications required to monitor for construction dust	99
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	149
Number of developments where an AQ Neutral building and/or transport assessments undertaken	7
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	3
Number of planning applications with S106 agreements including other requirements to improve air quality	0
Number of planning applications with CIL payments that include a contribution to improve air quality	0
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 relevant NRMM website and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.	N/A
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 through the NRMM webpage and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	20 21 Audits. Of these: 4 sites work complete, 1 site no qualifying NRMM, 2 sites Self-compliant, 12 sites compliant, 1 site non-compliant

3.1 New or significantly changed industrial or other sources

No new sources identified.

4. Additional Activities to Improve Air Quality

4.1 London Borough of Bromley Fleet

See Action point 17 within Table J.

4.2 NRMM Enforcement Project

Bromley is an active member of the GLA Pan London NRMM and will be continuing to support the NRMM Enforcement project in 2022 – 2023 through match funding.

4.2 Air Quality Alerts

London Borough of Bromley is a member of the AirText consortium. At the end of 2021, Bromley had 182 active subscribers.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

During 2021, the Harwood Avenue station was operated by the London Borough of Bromley. QA/QC procedures involve monthly maintenance and calibration visits by LB Bromley's local site operator (Matts Monitors), and regular service checks by instrument supplier EnviroTechnology. All data have been ratified according to Defra LAQM Technical Guidance standards.

In 2021, a $PM_{2.5}$ beta attenuation monitor (BAM) was added to the existing continuous monitoring site at Harwood Avenue (BRY-CM3). On several occasions, there were a few issues with the BAM Tape which would prevent $PM_{2.5}$ measurements from being recorded. However, these issues were quickly rectified by the appropriate service engineer within a couple of days of occurrence.

<u>PM_{10} Monitoring Adjustment</u>

All PM_{10} monitoring data has been fully ratified. Ratification of data is undertaken by Imperial in accordance with membership to the LLAQM. Prior to ratification, a fixed zero offset of 15 µg m^{-3} is removed from the raw PM_{10} concentration. The PM_{10} concentrations are then divided by 1.21 to make them equivalent to the reference method, following Defra guidance (LAQM.TG(16)).

A.2 Diffusion Tubes

Air proficiency testing (AIR-PT) is an independent analytical proficiency-testing scheme, operated by Laboratory of Government Chemists (LGC) Standards and supported by the Health and Safety Laboratory (HSL). AIR-PT is a scheme that has run from April 2014 to combine two long running PT schemes: LGC Standards Stack emission proficiency testing scheme and HSL Workplace Analysis Scheme for Proficiency scheme.

Gradko International participates in the AIR NO_2 PT scheme[2]. AIR NO2 PT forms an integral part of the UK NO2 Network's QA/QC and is a useful tool in assessing the

[2] LGC (2019) Summary of Laboratory Performance in AIR NO2 Proficiency Testing Scheme (January 2019 – March 2021) Available at:

analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). 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.

The results for Gradko International were overall satisfactory as stated here. Gradko International scored 75% satisfactory results for all relevant AIR-PT rounds unless stated otherwise:

AR036 (January-February 2020)

AR037 (May-June 2020) – No results reported

AR039 (July-August 2020) – No results reported

AR040 (September-October 2020) – 75%

AR042 (January-March 2021) – 25%

Rounds AR037 and AR039 were cancelled due to the COVID-19 pandemic

Bias Adjustment

Bias adjustment is effectively a calculated factor which shows whether diffusion tubes are overreading or under-reading ambient concentrations, and therefore allows for a correction to be made.

Factor from National Bias Adjustment

The national bias adjustment factor spreadsheet for 2021 is available from the Defra website. The results of multiple co-location studies are collated, and the average bias adjustment factor is taken for studies using the 20% TEA/water preparation method, analysed by Gradko. The national bias adjustment factor for 2021 version 3/22 is 0.84, based on 32 studies, using the LAQM national bias adjustment spreadsheet[3] which is shown in Figure A-1 details of which are shown in Figure A-1 below

https://laqm.defra.gov.uk/documents/LAQM%20NO2%20Performance%20data_Up%20to%20March%202021_v2.pdf

[3] Defra, LAQM, National bias adjustment factor spreadsheet. https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html accessed May 2021

Figure A-1: National Bias Adjustment Factor Spreadsheet (v3/22)

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/22

Follow the steps below in the correct order to show the results of relevant co-location studies

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet

This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2022

LAQM Helpdesk Website

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

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

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2021	R	Gedling Borough Council	12	32	26	23.1%	G	**0.81**
Gradko	20% TEA in water	2021	UB	West Northamptonshire Council	11	14	10	32.1%	G	**0.76**
Gradko	20% TEA in water	2021	R	Ards and North Down Borough Council	10	30	22	38.4%	G	**0.72**
Gradko	20% TEA in water	2021	R	Birmingham City Council	10	33	25	35.2%	G	**0.74**
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	34	29	14.1%	G	**0.88**
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	33	29	12.6%	G	**0.89**
Gradko	20% TEA in water	2021	R	Lisburn & Castlereagh City Council	12	25	19	31.9%	G	**0.76**
Gradko	20% TEA in water	2021	R	Nottingham City Council	12	32	35	-8.1%	G	**1.09**
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	32	5.2%	G	**0.95**
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	27	28.6%	G	**0.78**
Gradko	20% TEA in water	2021	R	Bath & North East Somerset	12	31	27	15.1%	G	**0.87**
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	34	31	7.6%	G	**0.93**
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	19	17	11.7%	G	**0.90**
Gradko	20% TEA in water	2021	R	Blackburn with Darwen Borough Council	12	27	20	32.3%	G	**0.76**
Gradko	20% TEA in water	2021	R	Brent Council	12	51	46	9.9%	G	**0.91**
Gradko	20% TEA in water	2021	R	Gateshead Council	10	23	19	23.8%	G	**0.81**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	25	22	13.7%	G	**0.88**
Gradko	20% TEA in water	2021	R	Gateshead Council	11	27	25	9.8%	G	**0.91**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	31	25	26.6%	G	**0.79**
Gradko	20% TEA in water	2021	R	Gateshead Council	12	32	34	-4.1%	G	**1.04**
Gradko	20% TEA in water	2021	KS	Marylebone Road Intercomparison	11	53	42	25.0%	G	**0.80**
Gradko	20% TEA in Water	2021	R	Monmouthshire County Concil	11	35	29	21.8%	G	**0.82**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	25	20	24.3%	G	**0.80**
Gradko	20% TEA in water	2021	UC	Belfast City Council	12	25	20	28.5%	G	**0.78**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	42	35	19.8%	G	**0.84**
Gradko	20% TEA in water	2021	R	Belfast City Council	12	38	27	39.4%	G	**0.72**
Gradko	20% TEA in water	2021	UB	Dudley MBC	12	20	15	36.0%	G	**0.74**
Gradko	20% TEA in water	2021	R	Dudley MBC	12	30	29	4.2%	G	**0.96**
Gradko	20% TEA in water	2021	R	Dudley MBC	12	42	40	5.5%	G	**0.95**
Gradko	20% TEA in Water	2021	R	Lambeth	10	91	62	46.6%	G	**0.68**
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	38	32	18.4%	G	**0.84**
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	28	27	4.9%	G	**0.95**
Gradko	20% TEA in water	2021		**Overall Factor[3] (32 studies)**					**Use**	**0.84**

Discussion of Choice of Factor to Use

In 2020, LB Bromley carried out a co-location study at the Harwood Avenue continuous monitor, with diffusion tubes in triplicate. In January 2021 there was one diffusion tube co-located with the continuous monitoring. There was therefore no local bias adjustment factor available for 2021 due to the lack of co-location duplicate or triplicate sites. Therefore, the national bias adjustment factor of 0.84 (version 03/22) for the diffusion tube method 20% triethanolamine in water, analysed by Gradko was used.

Table L. Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.84
2020	Local	-	0.82
2019	National	03/20	0.93

2018	National	03/19	0.93
2017	National	06/18	0.87
2016	National	03/17 v2	0.94
2015	National	06/16	0.88

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

Where data capture is less than 75% and greater than 25% of a full calendar year (between 3 and 9 months), the mean should be “annualised” – i.e. adjusted using the methodology outlined in LLAQM.TG(19) before being compared to annual mean objectives. Annualisation was not required to be undertaken at any sites.

Distance Adjustment

The monitoring sites that have been bias adjusted and shown to be with 10% of the NO_2 annual objective of 40 µg m^{-3} (i.e. above 36 µg m^{-3}) or above should be accounted for the inherent uncertainty in diffusion tube monitoring concentration data as advised in the LAQM technical guidance produce by Defra (LAQM.TG(16)).

Two sites are above the threshold (Elmers End Road, as seen in previous reports and High Street, Orpington) and are considered not representative of relevant exposure. For reference, the distance-corrected annual mean NO_2 concentrations are shown below. It has been decided not to present this concentration in the main report in order to maintain consistency with previous LAQM reports.

The local annual mean background concentrations in 2021 from the Defra 2018-based background maps (Defra, Background Mapping data for local authorities - 2018) have been used for the calculation.

Table N present the outputs from the NO_2 fall off with distance tool.

Table N. NO_2 Fall off With Distance Calculations

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted (µg m^{-3})	Background Concentration (µg m^{-3})	Concentration Predicted at Receptor (µg m^{-3})	Comments
10	1.0	5.0	37.5	17.3	30.9	None
19	1.7	5.5	41.9	15.6	35.0	None

Appendix B Full Monthly Diffusion Tube Results for 2021

Table O. NO_2 Diffusion Tube Results

Site ID	Valid data capture for monitoring period %[a]	Valid data capture 2021 %[b]	Jan (05/01 –02/02)	Feb (02/02– 02/03)	Mar (02/03 –06/04)	Apr (06/04 –04/05)	May (04/05 –08/06)	June (08/06 – 06/07)	Jul (06/07 – 03/08)	Aug (03/08 – 07/09)	Sept (07/09 – 05/10)	Oct (05/10 – 02/11)	Nov (02/11 – 07/12)	Dec (07/12 – 08/01)	Annual mean – raw data	Annual mean – bias adjusted
1	100.0	100.0	**43.3**	35.7	37.0	**44.9**	36.5	39.2	37.0	30.5	34.8	38.1	36.4	27.8	36.8	30.9
2	90.5	90.5	31.2	23.5	23.3	22.4	-	15.7	16.4	14.2	22.3	24.6	28.6	17.2	21.8	18.3
3	100.0	100.0	37.1	36.2	38.4	34.8	33.1	30.6	33.7	26.0	32.8	35.0	36.1	19.7	32.8	27.5
4	100.0	100.0	36.1	37.1	31.8	36.6	31.3	26.7	28.0	24.3	29.2	30.8	29.9	22.3	30.3	25.5
5	100.0	100.0	38.2	32.1	30.7	35.2	32.7	31.0	30.2	23.8	35.6	36.8	33.3	22.9	31.9	26.8
6	100.0	100.0	38.8	34.6	33.4	33.9	32.7	28.1	29.1	25.5	34.7	36.9	34.4	25.9	32.3	27.1
7	100.0	100.0	**40.6**	**40.3**	33.1	**40.4**	35.2	33.6	32.6	32.2	36.1	39.8	38.7	28.6	35.9	30.2
8	92.4	92.4	33.1	25.0	24.1	24.6	20.8	-	21.1	17.6	25.3	28.2	29.5	20.1	24.5	20.6
9	100.0	100.0	37.4	32.8	29.7	32.6	28.6	26.8	28.7	21.7	30.9	31.5	34.9	26.9	30.2	25.4
10	100.0	100.0	**54.4**	**48.5**	**45.0**	**47.2**	**46.4**	39.0	**41.2**	35.5	**46.2**	**48.4**	**48.3**	35.2	**44.6**	37.5
11	92.4	92.4	-	**66.7**	34.5	33.2	33.4	30.5	29.7	24.4	32.4	37.9	33.7	25.7	31.9	29.2
12	100.0	100.0	**47.6**	**47.5**	37.4	**43.3**	**43.9**	**40.2**	**41.7**	**40.1**	**43.9**	**45.7**	**44.8**	37.3	**42.8**	35.9
13	92.4	92.4	29.9	31.7	31.1	-	34.3	33.0	33.4	27.6	33.5	36.5	32.7	24.6	31.7	26.6
14	100.0	100.0	31.3	25.3	23.1	23.9	19.7	16.3	18.2	14.6	20.3	23.2	25.9	18.9	21.7	18.2
15	100.0	100.0	**40.5**	37.0	32.7	34.0	35.6	27.0	31.1	23.5	35.1	38.3	35.5	28.1	33.2	27.9

16	92.4	92.4	26.2	20.8	20.5	20.0	17.3	14.5	-	14.4	17.2	19.5	26.0	15.7	19.3	16.2
17	100.0	100.0	31.4	32.0	28.9	30.6	27.7	27.6	26.7	23.8	33.9	34.4	33.0	27.2	29.8	25.0
18	100.0	100.0	24.2	22.4	20.2	23.4	14.2	15.7	17.3	13.9	16.7	16.7	20.9	14.9	18.4	15.4
19	100.0	100.0	**57.1**	**47.6**	**54.7**	**46.2**	**53.8**	**50.5**	**46.5**	**41.5**	**48.5**	**56.8**	**56.4**	39.0	**49.9**	**41.9**
20	100.0	100.0	30.4	24.7	25.6	24.5	20.9	19.4	20.1	15.7	21.8	25.2	27.8	20.7	23.1	19.4
21	92.4	92.4	-	**73.7**	**46.9**	38.3	22.9	38.6	35.0	28.5	**40.7**	**45.4**	**40.2**	26.4	36.4	33.3
22	100.0	100.0	29.7	30.9	26.6	30.1	**43.1**	20.7	23.4	19.4	22.1	26.3	26.0	21.1	26.6	22.4
23	92.4	92.4	34.4	29.4	31.8	-	30.0	27.3	27.3	23.4	32.8	34.8	33.1	24.3	29.9	25.1
24	100.0	100.0	36.0	30.3	30.6	34.6	28.4	27.5	25.6	21.6	30.1	32.3	31.6	24.7	29.4	24.7
25	91.3	91.3	29.4	24.2	23.5	24.6	21.6	18.9	20.7	16.4	24.6	25.8	27.1	-	23.3	19.6
26	100.0	100.0	30.9	28.4	25.7	28.7	23.0	20.6	21.8	18.7	26.2	24.9	29.4	21.3	25.0	21.0
27	100.0	100.0	32.6	27.3	28.0	23.6	22.1	20.7	21.8	18.5	25.5	30.5	29.2	22.3	25.2	21.1
28	100.0	100.0	**46.0**	**43.7**	**42.6**	**41.7**	**41.8**	39.3	38.0	29.4	34.3	**40.6**	**43.2**	28.3	39.1	32.8
29	100.0	100.0	32.1	29.4	30.2	30.7	25.3	25.5	26.2	21.7	26.9	28.4	31.0	21.7	27.4	23.0
30	90.5	90.5	35.1	29.8	33.2	35.5	29.5	33.2	29.4	-	28.3	33.1	34.1	26.7	31.6	26.6
31	100.0	100.0	**43.3**	36.4	37.2	36.8	35.0	33.0	31.4	25.3	36.0	**40.4**	39.5	30.3	35.4	29.7
32	100.0	100.0	37.0	33.7	33.5	34.1	30.3	26.3	25.0	19.0	31.4	31.7	34.3	24.8	30.1	25.3

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 Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

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

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