

Barnet Air Quality Annual Status Report for 2022

Date of publication: May 2023



The Archer, Eric Aumonier, 1940. Photo; Thierry Bal, 2016, East Finchley Station

This report provides a detailed overview of air quality in Barnet during 2022. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process¹.

Contact details:

Local Authority Officers	Nicole Asante, Senior Scientific Officer Ralph Haynes, Group Manager
Department	Scientific Services Environmental Health Department of Regulatory Services
Address	2 Bristol Avenue, Colindale, NW9 4EW
Telephone	020 8359 4429
Email	scientificservices@barnet.gov.uk

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

Contents

Abbreviations	5
1. Air Quality Monitoring.....	7
1.1 Locations.....	7
1.2 Comparison of Monitoring Results with AQOs	9
2. Action to Improve Air Quality.....	23
2.1 Air Quality Action Plan Progress	23
3. Planning Update and Other New Sources of Emissions	34
3.1 New or significantly changed industrial or other sources.	36
4. Additional Activities to Improve Air Quality	37
4.1 London Borough of Barnet Fleet	37
4.2 NRMM Enforcement Project.....	37
4.2 Air Quality Alerts	37
Appendix A Details of Monitoring Site Quality QA/QC	38
A.1 Automatic Monitoring Sites.....	38
A.2 Diffusion Tubes	38
A.3 Adjustments to the Ratified Monitoring Data	41
Appendix B Full Monthly Diffusion Tube Results for 2022	43

Tables

Table A.	Summary of National Air Quality Standards and Objectives.....	6
Table B.	Details of Automatic Monitoring Sites for 2022	7
Table C.	Details of Non-Automatic Monitoring Sites for 2022	7
Table D.	Annual Mean NO ₂ Ratified and Bias-adjusted Monitoring Results	9
Table E.	NO ₂ Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m ⁻³	18
Table F.	Annual Mean PM ₁₀ Automatic Monitoring Results (µg m ⁻³)	19
Table G.	PM ₁₀ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM ₁₀ 24-Hour Means > 50 µg m ⁻³	20
Table H.	Annual Mean PM _{2.5} Automatic Monitoring Results (µg m ⁻³).....	21
Table J.	Delivery of Air Quality Action Plan Measures	23
Table K.	Planning requirements met by planning applications in Barnet in 2022	34
Table L.	Bias Adjustment Factor	40
Table N.	NO ₂ Fall off With Distance Calculations.....	42
Table O.	NO ₂ Diffusion Tube Results.....	43

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})	20 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 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 not 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

Table B. Details of Automatic Monitoring Sites for 2022

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which 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
ABN1	Tally Ho	526344	192219	Kerbside	Y	5	0.5	3	NO ₂ , PM10	Chemiluminescent; TEOM
ABN2	Chalgrove School	524374	189642	Urban Background	Y	0	N/A	2.5	NO ₂ , PM10	Chemiluminescent; TEOM

Table C. Details of Non-Automatic Monitoring Sites for 2022

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	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)
PBN1	1 Pointalls Close	526278	190444	Roadside	Y	6	13	2.5	NO ₂	N
PBN2	71 Ballards Lane	525410	190980	Urban Centre	Y	0 ¹	4	2.5	NO ₂	N
PBN3	Sanders Lane Allotments	523754	191588	Urban background	Y	N/A	N/A	2.0	NO ₂	N
PBN5	St James Catholic High School	521885	190489	Urban background	Y	5	2	2.5	NO ₂	N
PBN6	355 Hendon Way*	523102	188205	Roadside	Y	8	1	2.5	NO ₂	N
PBN8	Tally Ho monitoring station	526346	192224	Urban Centre	Y	5 ¹	0.5	2.5	NO ₂	Y

PBN9	52 Golders Green Road	524965	187505	Urban Centre	Y	0 ¹	5	2.5	NO ₂	N
PBN10	High Street, Barnet	524496	196615	Urban Centre	Y	0 ¹	3	2.5	NO ₂	N
PBN12	1295 High Road Whetstone	526381	194059	Urban Centre	Y	0 ¹	10	2.5	NO ₂	N
PBN13	Courtland Avenue, A1	520968	193457	Roadside	Y	6	22	2.5	NO ₂	N
PBN14	William Hill, Station Road Edgware	519497	192075	Urban Centre	Y	0 ¹	5	2.5	NO ₂	N
PBN17	National Express Bus Stop, Golders Green Bus Station	525207	187425	Bus station	Y	0 ¹	N/A	2.5	NO ₂	N
PBN18	Rear of GG Bus Station	525278	187444	Bus station	Y	0 ¹	N/A	2.0	NO ₂	N
PBN19	Rear of 7-12 Dyson Court, Tilling Road	523348	187589	Roadside	Y	0 (façade of residential building)	10	2.5	NO ₂	N
PBN20	Flats above 16 Cricklewood Lane	523885	185764	Urban Centre	Y	0 (façade of residential building)	6	6	NO ₂	N
PBN21	8/9 Station Road, Mill Hill	521354	191991	Kerbside	Y	1.5	0.8	2.5	NO ₂	N
PBN22	Diploma Court	527270	189372	Urban Centre	Y	0 (façade of residential building)	11	2.5	NO ₂	N

1.2 Comparison of Monitoring Results with AQOs

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

Table D. Annual Mean NO₂ Ratified and Bias-adjusted Monitoring Results

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022
ABN1	Automatic	99.7	99.7	38.8	50.0	35.9	38.0	32.0	32.0	29.0
ABN2	Automatic	99.8	99.8	28.0	29.0	27.0	25.0	19.0	18.0	18.0
PBN1	Diffusion tube	83.3	81.0	38.9	34.9	36.8	31.4	21.6	23.5	23.2
PBN2	Diffusion tube	100	100.0	46.7	40.5	39.8	35.0	24.6	29.6	27.0
PBN3	Diffusion tube	100	100.0	22.3	21.0	20.0	15.5		12.8	13.5
PBN5	Diffusion tube	100	90.4	30.5	27.7	28.8	25.1		18.9	17.6
PBN6	Diffusion tube	100	100.0	50.6	49.5	41.4	37.5	33.1	35.6	33.1
PBN8	Diffusion tube	100	100.0	45.1	41.25	37.7	37.1	29.9	32.7	31.6
PBN9	Diffusion tube	100	100.0	53.5	43.8	43.5	39.9	27.7	36.6	38.7
PBN10	Diffusion tube	100	100.0	55.7	51.1	44.0	38.6	27.5	32.8	33.7
PBN12	Diffusion tube	100	100.0	50.8	46.3	39.0	39.1	29.5	31.1	31.1
PBN13	Diffusion tube	100	100.0	34.2	30.1	29.3	27.4	19.7	19.4	19.8

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022
PBN14	Diffusion tube	100	100.0	54.7	50.9	50.4	41.6	35.5	40.5	39.1
PBN17	Diffusion tube	100	90.4	58.4	50.8	46.8	38.9	29.3	33.8	32.2
PBN18	Diffusion tube	91.7	92.8	50.3	50.4	40.3	37.5		36.1	35.6
PBN19	Diffusion tube	100	100.0	52.2	49.1	47.2	41.6	29.3	34.7	31.8
PBN20	Diffusion tube	91.7	90.1	55.3		43.1	38.7	31.0	29.6	32.7
PBN21	Diffusion tube	100	9.6	-	-	-	-	-	-	28.5*
PBN22	Diffusion tube	100	9.6	-	-	-	-	-	-	31.6*

Notes:

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

Exceedances of the NO₂ annual mean AQO of 40 $\mu\text{g m}^{-3}$ are shown in **bold**.

NO₂ annual means in excess of 60 $\mu\text{g m}^{-3}$, indicating a potential exceedance of the NO₂ hourly mean AQS objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias.

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

* New locations which have less than 25% data capture for the full calendar year.

Results have been distance corrected where applicable.

(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%).

Discussion of data trends; Overview

The 7-year trend (2016-2022) reports and overall decrease in the ambient concentrations of NO₂ at all monitoring locations. In 2022, no locations returned a nitrogen dioxide concentration higher than the national air quality objective after bias correction and fall off with distance calculations.

Concentrations of NO₂ measured by diffusion tubes in 2022 were very similar to those measured in 2021, with relatively minor increases in concentration (in 5 locations) or decreases in concentrations (in 13 locations). The largest increase in concentration since 2021 was observed at PBN 20 flats above 16 Cricklewood Lane (10.6 %), and the largest decrease was observed at PBN2 71 Ballards Lane (8.7 %). The relative stability of monitoring results from 2021 to 2022 is potentially an indication of the permanence of behavioural changes in how people use their vehicles/travel in Barnet since the pandemic (e.g., flexible working/working from home, and the perceived shift in “rush hour” travel periods) as hypothesised in the ASR for 2021. Two new monitoring locations were established; PBN 21 8/9 Station Road, Mill Hill and PBN22 Diploma Court, East Finchley, and two sites were decommissioned (PBN 5 St James Catholic School, and PBN 17 Golders Green, National Express Bus Stop).

In 2022, the majority of Barnet remains outside of the London Ultra Low Emission Zone (ULEZ), which was expanded up to the North Circular Road (A406) in October 2021. Established monitoring sites (i.e., sites with more than 3 years of ambient concentration data) within the ULEZ (PBN9, PBN17, PBN18, PBN19, PBN20) did not experience significant decreases in NO₂ concentration in comparison to sites outside of the ULEZ; in two locations (PBN9 and PBN20) concentrations increased very slightly. This may suggest that there are other factors which may be implicated in the pollution levels in these locations.

Discussion by Site Type

Urban Background/Background Locations

Concentrations at PBN3 Sanders Lane Allotments and PBN5 St James Catholic School have generally continued to decrease over the years, however, concentrations

at PBN3 increased very slightly by 5.4 % ($0.7 \mu\text{g m}^{-3}$) in 2022. PBN5 experienced a decrease of 7.1 % ($1.3 \mu\text{g m}^{-3}$). As these are background locations, they are generally not directly influenced by traffic, the general reduction in NO_2 concentrations can be indicative of an overall improvement in air quality in the area; this includes reduced impacts from sources of NO_2 such as heating. Traffic at St James Catholic School is restricted during pick-up and drop off times as the location has a School Street, which further restricts traffic in the school's locality at these times of the day. Concentrations at St James Catholic School have tracked remarkably in well in past with concentrations observed at Chalgrove School (ABN2), which also has a School Street. The St James Catholic School site was decommissioned in November 2022, as urban Background Locations are well represented in Barnet, when other sources of monitored data (e.g., Chalgrove School, Breathe London Node monitors) are considered.

The slight increase in concentration at PBN3 may be attributed to activities such as localised burning of allotment waste.

Golders Green Bus Station

Concentrations of nitrogen dioxide for 2022 are slightly less than what was measured in 2021. The monitor at the rear of the bus station reported a decrease of 1.5 % ($0.5 \mu\text{g m}^{-3}$) and the monitor at the National Express bus stop reported a decrease of 4.6 % ($1.5 \mu\text{g m}^{-3}$). These are smaller decreases than what was observed in 2021, which implies that there have not been any significant changes between since 2021 in the way the location is used. This location is within the ULEZ, so this change may be down to general improvements in engine technologies and the lack of older, more polluting vehicles.

The annual air quality objective has been met at the monitors within the Golders Green Bus Station since 2019, and the concentrations have been below $60 \mu\text{g m}^{-3}$ (indicative limit for the hourly NO_2 objective) since 2016. There may be potential to revoke the Air Quality Management Area (AQMA) for hourly mean nitrogen dioxide concentrations in this location in the future.

The diffusion tube monitoring site at PBN17 National Express Bus Stop was decommissioned in November 2022; this monitor was commissioned originally to measure the impacts of the bus station, however due to its location (and despite

nearby free flowing traffic) concentrations are consistently lower than what is observed at PBN18 rear of the Golders Green Bus Station. Exposure is transient in this location for receptors, and the number of receptors in this location is minimised by Golder Green Road; therefore, it was deemed that there should be greater focus on the worse parts of the bus station.

High Street Locations

Very slight increases in NO₂ concentration were measured in several High Street locations in 2022, when compared to 2021 results. Of the 7 high street locations monitored, 3 experienced an increase in concentrations since 2021: PBN9 52 Golders Green Road, PBN10 High Street Barnet, and PBN20 flats above 16 Cricklewood lane. PBN20 experienced the largest increase in NO₂ concentration of all diffusion tube monitoring sites (a 10.6 %//3.1 µg m⁻³ from 29.6 µg m⁻³ in 2021 to 32.7 µg m⁻³ in 2022), The greatest reduction in NO₂ concentrations since 2021 is observable at PBN2 71 Ballards Lane, with: a reduction of 8.7 % (2.6 µg m⁻³). A new monitoring location was introduced in December 2022 on the A1000; PBN22 Diploma Court, East Finchley.

In contrast to the previous year, no high street location returned a concentration higher than the national air quality objective of 40 µg m⁻³. The only site was above the objective in 2021; PBN14 William Hill, 218 Station Road Edgware. Concentrations at this location fell below the National Objective in 2022, following a minor decrease in ambient NO₂ concentrations of 3.4 % (1.4 µg m⁻³) when compared to 2021 data. Minor changes in measured concentrations this year could be attributed to errors in the monitoring and analyses regime, however, the 2022 values being so close to the 2021 values, does increase the likelihood of the methodology being accurate. The small changes in concentrations in High Street areas is potentially indicative of the requirement for further action for in these areas to improve air quality. Transportation and business/commercial hubs (high street and town centre locations) in Barnet are hypothesised to show slower improvements due to the way they are used, i.e., their physical layouts (roads layout, parking etc.), and the fact that these locations have features/amenities which draw traffic to the area. Further investigations into the relative impacts of drivers of air pollution in Barnet's own centre and high street locations need to be considered.

Higher concentrations ($39.1 \mu\text{g m}^{-3}$) at PBN14 have been attributed to the location's status as local hub for business and transport, with features that can cause obstruction to free-flowing traffic (the bus station, and taxi rank, located in the middle of the road), as well as restaurants and shops which attract people and traffic.

In comparison, PBN9 52 Golders Green Road monitor also reported a relatively high concentration in 2022 ($38.7 \mu\text{g m}^{-3}$; an increase of 5.8 % from 2021's result of $36.6 \mu\text{g m}^{-3}$) and is located relatively close to a bus and tube station. Golders Green Road has parking to serve businesses and restaurants along the highroad and can experience heavy traffic like PBN14. Despite this, concentrations this high were last observed in 2019. This location is unlike PBN14 is located within the ULEZ and does not have a taxi rank.

Residential properties on major roads

There are several areas in Barnet where residential properties are located adjacent to busy roads. These routes are heavily utilised by all vehicles and are essential routes for private and public transport, and HGVs serving large regeneration projects in Barnet, such as the Brent Cross Regeneration project. All major road locations, barring PBN20 flats above 16 Cricklewood Lane, have experienced a decrease in ambient NO_2 concentrations since 2021.

Both PBN20 flats above 16 Cricklewood Lane, and PBN22 Diploma Court East Finchley, also take measurements representative of this category. PBN22 is a new location introduced in November 2022, along with PBN21 8/9 Station Road Mill Hill.

While concentrations at PBN20 increased in 2022 (as explained in the previous section), to greater concentrations than seen in 2020 and 2021, ambient NO_2 concentrations are still below 2019 levels by approx. 15 % ($6 \mu\text{g m}^{-3}$).

PBN6 355 Hendon Way (A41) reported the highest concentration of NO_2 in 2021 of all major road monitoring locations in 2022, however concentrations have decreased by 7 % ($\mu\text{g m}^{-3}$) in this location since 2021. The concentration measured at this location is greater than the $40 \mu\text{g m}^{-3}$ national objective, however when the distance between the monitoring station and the façade of the closest residential building considered, the concentration of ambient NO_2 impacting the residential properties is lower.

The traffic on the A406 is the main source of pollution monitored PBN1 1 Pointalls Close, and PBN19 rear of 7-12 Dyson Court. At the time of the 2022 monitoring campaign, the ULEZ had expanded up to the A406, however did not include the A406 itself, Concentrations at PBN19 fell below the national air quality objective for the first time in 2020, and this continued into 2021; concentrations have fallen even further in 2022 with an 8.3 % ($2.9 \mu\text{g m}^{-3}$) reduction since 2021. Dyson Court is one of the worst locations for residential exposure, however the concentrations have not returned to pre-pandemic levels. Concentrations of ambient NO_2 at PBN1 have remained below the air quality objective since 2014; 2022 saw a very small reduction in ambient NO_2 concentration of 1.4 % ($0.3 \mu\text{g m}^{-3}$). This may be indicative that concentrations in this location are beginning to plateau, although at least 3 further annual results will be required ascertain a trend.

Concentrations at PBN13 Courtland Avenue, appear to have plateaued, since 2020; no significant changes in ambient NO_2 concentration have been observed since. This location is mostly impacted by traffic flowing on the A1 (Barnet Way), however, concentrations comparable to urban background locations (i.e., Chalgrove School, PBN5 St James Catholic High School) have been observed here.

Two new monitoring locations have been introduced in locations close to residential properties on major roads/routes; PBN21 8/9 station Road, Mill Hill, and PBN22 Diploma Court East Finchley, were deployed in November 2022. These monitors were deployed to ascertain the conditions at residential properties adjacent to the M1 and A1000 respectively.

PBN22 reported concentrations below the national objective in December 2022. The A1000 (High Road) at East Finchley is a busy route, which is intersected by Fortis Green and East End Road; this road links directly with the A406 and is a direct route to neighbouring London boroughs. This location has a tube station and shopping area, which also attract traffic to the area.

PBN 21 reported concentrations below the national objective in December 2022. The M1, which runs above Mill Hill Broadway, Bus, and Rail station, has been known to be a potential source of poor air quality in the area. This location is a transport hub, which makes it part of the group of locations hypothesised to experience smaller

improvements in air quality, and measuring here may help to improve our understanding of the situation in these locations.

The opportunities for improvement relatively are few in these locations; there are high traffic volumes and periods of heavy congestion, and these routes tend to carry a high proportion of large vehicles (HGVs). TfL is the authority which looks after many of these routes, so any changes with the aim of improving air quality requires their lead and/or cooperation. The M1 is managed by National Highways, who are currently engaging with Barnet to look at the potential for improvements in the Mill Hill Broadway area. Beyond this, general improvements to engine technology, increasing efficiency and reducing the need to idle, will play a role in reducing pollutant concentrations across Barnet. The implementation of the proposed expansion of the ULEZ up to the M25 may also have an impact, as the whole of Barnet will be encompassed within the enforcement area.

7 Year Trend in Nitrogen Dioxide Concentrations

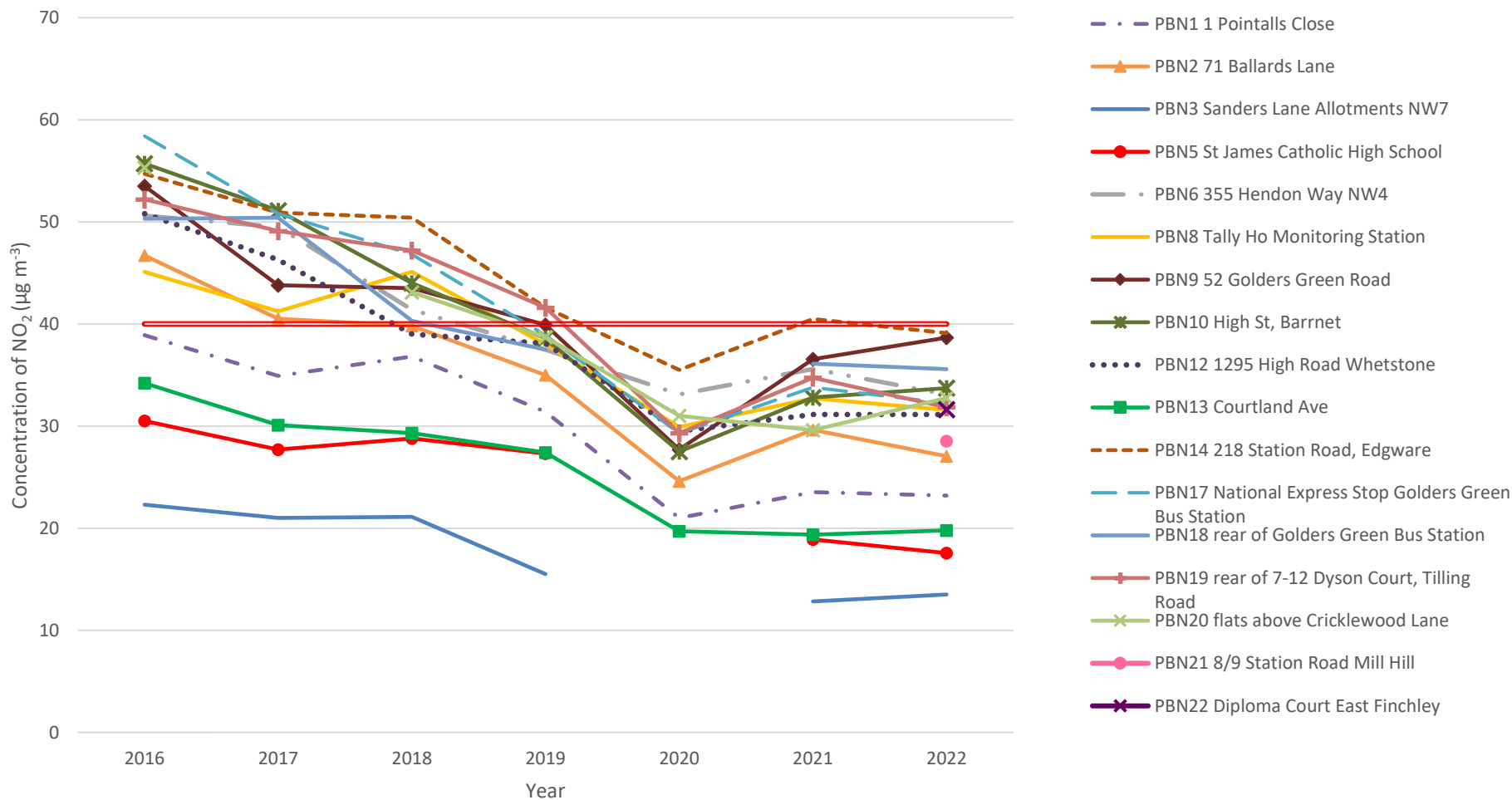


Table E. NO₂ Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m⁻³

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022
ABN1	99.79	99.79	0	1	0	0	0	0	1
ABN2	99.81	99.81	0	1	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 NO₂ 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 illustrates that there were no exceedances of the 200 µg m⁻³ hourly mean National Air Quality Objective for NO₂ recorded at either automatic monitoring site in 2021.

Table F. Annual Mean PM₁₀ Automatic Monitoring Results (µg m⁻³)

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022
ABN1	91.4	91.4	23	21	21	20	19	17	19
ABN2	96.9	96.9	18	18	17	17	17	14	16

Notes

The annual mean concentrations are presented as µg m⁻³.

Exceedances of the PM₁₀ 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%).

Table F shows that the annual mean concentration of PM₁₀ at both monitoring sites remains below the objective. There is a gradual yearly decrease in PM₁₀ for the sites over the last 7 years well below the annual mean. The roadside Tally Ho site regularly exceeded the annual mean over 10-15 years ago.

Table G. PM₁₀ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM₁₀ 24-Hour Means > 50 µg m⁻³

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022
ABN1	91.4	91.4	6 (32)	1	4	1	1	0	1
ABN2	96.9	96.9	4 (29)	1	3	1	1	0	0

Notes

Exceedances of the PM₁₀ 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 illustrates that the levels of PM₁₀ at both monitoring sites continue to comply with the daily mean objective. There is an overall reduction in instances where the PM₁₀ 24-hour mean has exceeded 50 µg m⁻³ since 2018. 1 instance was recorded in 2022. The number of exceedances is dependent on the instances of air pollution episodes, which are usually caused by weather conditions such as prolonged periods of low wind/fog. Rain typically results in less pollution since it dampens down and washes out particulate matter in the air and can also wash out pollutants that are dissolvable. Generally, the higher the precipitation, the lower the concentration of particulate matter.

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

Barnet do not currently measure PM_{2.5} at our automatic monitors in Barnet. This will change within the near future as Barnet are in the process of procuring a particulate matter monitoring system capable of measuring PM_{2.5} alongside PM₁₀.

Several communities/groups/locations in Barnet participate in the *Breathe London Project*: we have installed air quality node monitors, which measure ambient PM_{2.5} data along with NO₂.

These locations are as follows:

- Martin Primary School
- Wessex Gardens Primary School
- The Orion Primary School
- Cat Hill Allotments

Several more locations are currently scheduled to come online in the near future, including:

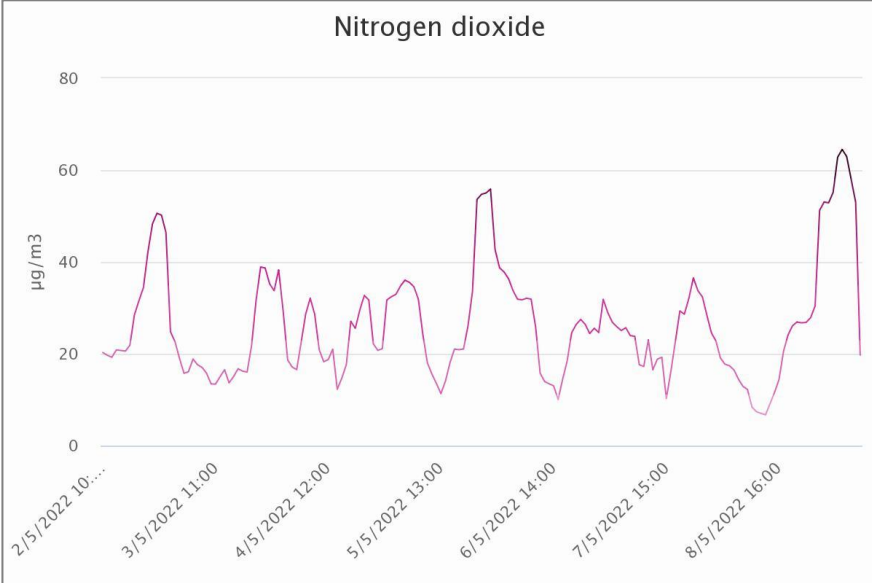
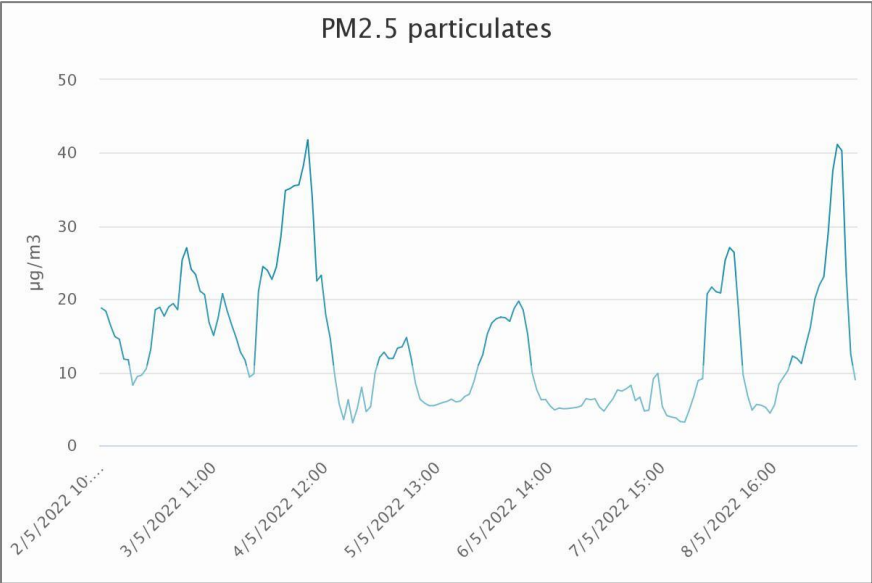
- Christs College Finchley
- Mill Hill Circus
- Golders Green Hippodrome Church
- Hampstead Garden Suburb

The data collected by these monitors are typically observable over a period of a week. See below for examples of data output from the node monitor at the Orion Primary School. We receive quarterly reports for monitoring at these locations.

Further information on the project, locations of node monitors, and monitoring data can be found at the following web address:

<https://www.breathelondon.org/>

Example Breathe London Outputs from Orion School



2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table J provides a brief summary of Barnet progress against the Air Quality Action Plan, showing progress made this year. 2022 was the year that the 2017-2022 air quality action plan for Barnet ended, and as such, many projects were completed in 2022. New projects which commenced in 2022 are shown at the bottom of the table. The new air quality action plan (2023-2028) for Barnet takes forward actions started and/or continuing throughout 2022.

Table J. Delivery of Air Quality Action Plan Measures

Measure	LLAQM Action Matrix Theme	Action	Progress <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
1	Emissions from developments and buildings	Minimise dust emissions from construction sites	Number of dust complaints received in 2022: 12. This figure includes dust from demolition & construction, as well as dust from industrial and commercial activities. Officers continue to respond to complaints of dust from construction sites and will investigate and take appropriate action using the Environmental Protection Act 1990
2	Emissions from developments and buildings	Enforce Non-Road Mobile Machinery (NRMM) air quality policies	Number of planning applications where NRMM condition was applied in 2022: 141. NRMM conditions are required for all applications. The North London NRMM project concluded in 2019; Barnet has extended the project, led by L. B. Merton, until further notice. In 2022/23, Cleaner Construction for London undertook 21 audits in Barnet. By the end of the year 14 sites were compliant and registered all machinery correctly prior to the audit; 6 sites were non-compliant before audit but met

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
			required emission standards by enacting all recommendations made by officers. 1 site was non-compliant.
3	Emissions from developments and buildings	Enforce CHP and biomass air quality policies	Total number of applications received in 2022: 856. CHP/Biomass boiler: no applications received. Instead, there is an increased uptake of air/ground source heat pumps and PV solar. All new CHP plan must comply with the mayor's emissions requirement and the team will ensure this through the planning process.
4	Localised Solutions	Enforce Air Quality policies and monitor sustainable Travel Plans for developments	856 planning applications were assessed by Scientific Services in 2022; 5 applications required an air quality report condition, and a further approx. 45 requiring air quality mitigation measures to be put in place. Further changes in resource occurred in 2022, so this number is an estimate, and likely greater than stated. Air quality reports are often submitted as part of initial applications; this data is not necessarily recorded, so the number of applications with air quality assessments is greater. Further discussion will occur regarding how we retain this information within our database. Air quality has steadily improved in the borough. No applications were recommended for refusal by Scientific Services on grounds of insufficient evidence of how poor air quality would be mitigated.
5	Emissions from developments and buildings	Increase planting of green barriers and vegetation	Barnet's Tree Policy is ground-breaking in England. Barnet planted in total across whole borough 846 trees in 22/23. Scientific Services continue to share information and data with Trees and Woodlands manager on where air quality hotspots and worst effected schools are. Trees were planted in many areas including: Arlington Road and in Southgate; Brunswick Park Road in New Southgate; Colney Hatch Lane; Brookside South, Cat Hill, and Daneland in East Barnet and Brunswick Park; Russel Lane

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
			<p>and Great Bushey Drive in Whetstone; Ashbourne Avenue, and Temple Fortune Lane in Golders Green; Hermitage Lane and Armitage Road in Childs Hill, Ash Grove, and Pennine Drive in Cricklewood; Crossway, Lynton avenue, and Poolsford Road in Colindale; Chandos Road, and Leslie Road in East Finchley; Gibbs Green, and Edgwarebury Lane in Edgware; Arrandene Open Space, and Tithe Walk in Mill Hill; Hadley Common in High Barnet; Northiam, and West Hill Way in Totteridge; Barnet Hill Open Space, and Mays Lane, Underhill.s</p>
6	Public Health and awareness raising	Enforce Smoke Control Areas	<p>Number of complaints of smoke from chimneys in 2022: 7 Number of enforcement actions: None, all were settled through informal action to secure compliance.</p>
7	Public Health and awareness raising	<p>Regularly brief Director of Public Health (DPH) on air quality issues in Barnet; what is being done, and what is needed.</p>	<p>The Barnet ICP has a responsibility to take actions forward to support health and wellbeing within its anchor institutions. Clean Air Day 2022 saw the launch of Barnet's Anti Idling campaign. partners from the ICP as well as schools, came together to talk about cleaner air at All Saints School, Whetstone. The Public Health directorate have led on the School Superzones project throughout 2022, at Edgware Primary School and Saracens High School. Air pollution is a main consideration in improving conditions around these schools, along with active travel and other measures to promote healthy living and provide a healthier environment for children. One of the actions was to complete an Air Quality Audit for Edgware primary in 2023 to identify the opportunities and constraints for improving conditions around the school.</p> <p>Public Health staff remain members of the Air Quality steering group, enabling regular communication and updates on air quality actions to be shared with the Director of Public Health.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
8	Public Health and awareness raising	Director of Public Health to sign off statutory Annual Status Reports and all new Air Quality Action Plans	Director of Public Health to sign off statutory Annual Status Reports and all new Air Quality Action Plans
9	Public Health and awareness raising	Encourage schools to join the TfL STARS accredited travel planning programme by providing information on the benefits to schools and supporting the implementation of such a programme	<p>The number of accredited schools in 2022 is 96, which is a reduction from 103 in 2021. 65 Schools currently have Gold accreditation, 4 have silver, and 27 have bronze. This loss in overall numbers is attributed to reduction in staffing, within Barnet Council, and schools (which no longer have the staff available to lead on accreditation).</p> <p>Barnet Schools continue to take part in Sustrans' annual the Big Walk and Ride (formely the Big Pedal) events.</p>
10	Public Health and awareness raising	Air quality projects with schools	<p>Air quality project contract with Sustrans (a UK walking and cycling charity and custodian of the National Cycle Network) was signed in 2021. This includes delivery of 3 sessions in up to 15 schools across the borough.</p> <p>The School Superzones project began in September 2022, with funding from a UKHSA/GLA grant, for Edgware primary School and Saracens High School. This project includes the development of performance indicators to monitor agreed health and wellbeing outcomes for children and young people. This project is due to finish in August 2023</p> <p>Barnet have begun a programme offering School Streets to all Schools in Barnet, via. the Highways Team. These streets will prevent traffic using selected roads around schools during school pick-up and drop off times. Implemented streets will prevent rat running through back streets during peak times, encourage active travel, and provide a safer and cleaner environment for children in the immediate vicinity of the school.</p>
10.2	Public Health and awareness raising	Schools Audits at schools in poor air quality areas	A School Audit has at completed Martin Primary School; Another Audit is scheduled for completion at Edgware

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
			<p>Primary School in 2023. A School Audit was planned for Edgware Primary School to Support the School Superzones Project. Barnet are keen to continue offering Schools the opportunity to audited and will continue targeting schools in locations which are close to the annual ambient NO₂ concentrations limit or are near busy roads. Increased awareness of air quality issues among the public may be a factor to encourage future participation among small private and faith-based schools.</p>
10.3	Public Health and awareness raising	Anti-Idling projects	<p>Barnet Launched its Anti Idling Campaign in June 2022 at All Saints Primary School in Whetstone. Barnet have begun assessing the most effective methods of fostering behaviour change around idling, first centring on community locations such as schools.</p>
10.4	Borough fleet actions	Public Health and Environmental Health Joint Communications Plan	<p>Director of communications has agreed to continue to publicise moderate and high air quality episodes, with links to our live air monitoring data on the air quality England website. The Barnet website, Barnet First magazine, social media, and other media may be used to better disseminate air quality information and spread awareness. There is the view to adopt a targeted approach to communicate with vulnerable residents within the borough. Airtext was previously deemed unsuitable for use within Barnet, given discrepancies between the alerts and conditions monitored at Tally Ho! and Chalgrove, however is now being reconsidered for use within the borough as the direct alerts service.</p>
11	Borough fleet actions	Green procurement policies Social Value Policy Sustainability Strategy	<p>Barnet have regard to air quality / green procurement when preparing procurement requirements (as appropriate) with services. This is good practice procurement; we work with the procurement launch document to support development of requirement with service.</p>

Measure	LLAQM Action Matrix Theme	Action	Progress <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
			<p>This includes a review of social value delivery attainable through the procurement activity following L.B. Barnet's adoption of a Social Value Policy. The policy is aligned with Our Plan for Barnet 2023-25 and Barnet TOMs to assess delivery against improved air quality aspects. A difficulty is the number of contracted out services. Services contracted out some years ago will not have had environmental considerations built in, and there is less scope to add them or influence them halfway through. On the positive side, a requirement for contractors with fleet to be members of FORS is already considered and factored in as appropriate to contract requirement. HBPLaw have reviewed contracts for construction requirements to include FORS and CLOC. The Transport Service team are aware of the requirement to operate the most efficient vehicles the budget permits and to maintain these appropriately.</p>
12	Borough fleet actions	Maintain Bronze accreditation of the Fleet Operator Recognition Scheme (FORS) for the borough's	Barnet Council have successfully renewed FORS membership for 2022-2023 and retained BRONZE status.
13	Borough fleet actions	Investigate the possibility of increasing the number of hydrogen, electric, hybrid, bio-methane and other cleaner vehicles in the borough's fleet	<p>Barnet Council currently have 12 zero emission capable vehicles within our fleet, and a pool (hire) car fleet of 9 PHEV cars and 1 ICE van. As part of Barnet's wider Sustainability Strategy, there is a long-term commitment to transition to a fully decarbonised vehicle fleet by 2030, where possible.</p> <p>Following on from supply issues in 2021 causing a shortage of vehicles, new vehicles are expected to be supplied in 2023.</p> <p>Further information on Barnet's Sustainability Strategy Framework can be found at the following web address:</p> <p>https://www.barnet.gov.uk/sustainability-barnet/barnets-sustainability-strategy/sustainability-strategy-targets-and</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
14	Borough fleet actions	Accelerate uptake of new Euro VI vehicles in borough fleet	All Council vehicles now meet Euro VI specifications.
15	Borough fleet actions	Safer Urban Driver training for drivers of vehicles in Borough's fleet; fuel-efficient driving and providing regular re-training of staff. This was introduced in 2012 with training from the Energy Savings Trust.	Safer driving courses are now run where required to alleviate over repetition of the course.
16	Localised Solutions	Control air pollution from industrial / commercial and residential sources	All inspections were completed for KPI - which met target 2022-23. There were 59 Dry cleaning installations in 2022 and no cement batching processes.
17	Monitoring and Other core statutory duties	Monitor air quality	<p>In 2022, we continued to monitor air quality (ambient NO₂ and PM₁₀ concentrations) at our two monitoring stations (Tally Ho & Chalgrove School) monthly. Barnet began procurement for a new PM_{2.5} monitor which will be situated at the Tally Ho Corner monitoring station in 2023/24.</p> <p>15 diffusion tubes were exchanged and sent for analysis each month. Some locations were changed this year, to allow observation of Barnet's transport hubs and high streets, which were identified as areas with slow improvements. The diffusion tubes on the A1000 were decommissioned in September 2022; one was reinstated to have representative monitoring in East Finchley (Diploma Court). At end of 2022, a monitoring regime was planned for Watling Avenue, Burnt Oak ahead of planned town centre improvement works. Developers continue to perform air quality monitoring at Brent Cross South and Cricklewood Rail Freight Facility.</p> <p>Barnet are also participating in the Breathe London Project; 4 locations within Barnet have Node monitors installed which measure PM_{2.5} and NO₂:</p> <ul style="list-style-type: none"> • Martin Primary School • Wessex Gardens Primary School • The Orion Primary School

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
			<ul style="list-style-type: none"> • Cat Hill Allotments <p>Results of monitoring can be obtained from the Breathe London webpage at: https://www.breathelondon.org/</p> <p>In 2022 two further groups in Barnet were awarded community monitors which will be deployed in due course:</p> <ul style="list-style-type: none"> • NW7 Hub • Christs College Finchley <p>Other groups in Barnet have obtained Node monitors and plan to deploy them in 2023/24.</p>
18	Cleaner Transport	Explore the option of extending the Ultra-Low Emission Zone (currently proposed to stop at the A406) to cover whole of London Borough of Barnet	The Ultra-Low Emission Zone (ULEZ) was expanded up to the A406 in October 2021. The Mayor of London has proposed the expansion of the ULEZ up to the M25. This expansion is due to occur in August 2023.
19	Cleaner Transport	Lower the legal speed limit to 20mph in areas close to certain schools	At end December 2022 there were approximately 61.5km of 20mph roads in Barnet; this is an increase of approx. 3.8km on the figure reported the previous year (to end Dec 2021).
19.1	Cleaner Transport	Implementation of the Long-Term Transport Strategy	<p>The Long-Term Transport Strategy (2020 – 2041) was published in September 2020. The change in council leadership in 2022 preceded a change in priorities for the council. As a result, this strategy is being considered for revision.</p> <p>the current strategy can be found using the following link: https://www.barnet.gov.uk/sites/default/files/2021-10/Barnet%20LTTS%20v8.pdf</p>
20	Cleaner Transport	Improvement of electric vehicle charging point infrastructure	The Sustainability Strategy Framework outlines our commitment to installing a comprehensive network of charge points by 2030. In the financial year 2022/2023, the council partnered with Trojan Energy to provide 500 charge points across 31 residential streets. Furthermore, through the LEVI scheme, the council has secured an

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
			<p>additional £1.5m of funding to support the rollout of 100 charge points within town centre locations. Implementation is now monitored through Barnet Plan reporting.</p>
21		<p style="text-align: center;">Increase provision of cycle parking</p>	<p>Barnet received £34K TfL cycle parking funding in 2022/23. £13k of this was used for preparatory/establishment work in 2022, but no physical measures were installed. £21k was carried over from 2022/23 into the current financial year. A further £66K has been received for installation of cycle stands and residential cycle hangars in the coming months.</p>
22	<p style="text-align: center;">Cleaner Transport</p>	<p>Encourage modal shift to bicycle through improved bicycle routes and encourage a shift to walking by providing safer, more accessible and attractive pedestrian routes.</p>	<p>The experimental A1000 cycle lane was completed in November 2020. The scheme has seen the creation of 3.2km of cycle lanes, as semi segregated lanes or marked route within in 20mph, in the Finchley / Golders Green areas of Barnet borough, providing a safe and direct green corridor for commuters and leisure cyclists alike. The cycle lane provides a speedy connection between North Finchley Town Centre in the north and the boundary with Haringey borough in the south.</p> <p>A1000 scheme was constructed earlier than envisaged in the council's Long-Term Strategy Plan 2020-2041, albeit as an experimental 'pop-up' design, to support Government emergency travel measures during the COVID-19 crisis.</p> <p>Following consultation in 2022, the A1000 cycle lane has been retained for use permanently. Barnet will now look towards establishing further cycling routes within the borough for 2023</p>
23	<p style="text-align: center;">Cleaner Transport</p>	<p style="text-align: center;">Liaise with Transport for London to explore traffic control actions on TfL controlled roads</p>	<p>We are continuing to investigate opportunities with TfL. Meetings have occurred in 2022, however no further progress has been made.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
24	Cleaner Transport	Liaise with the Highways Agency to explore options for improving air quality on the M1	<p>Headway has been made in conversations with National Highways (Highways England), and Barnet Councillors, with regard to the impact of the M1 on Mill Hill Broadway, and residential properties which border the road.</p> <p>Noise and air pollution impacts are at the forefront of these discussions, along with the gathering of ideas to reduce impacts from these pollutants. Suggestions include, but are not limited to:</p> <ul style="list-style-type: none"> • Replacement of the wall, • Installation of a noise barrier • Installation of greenery to block/absorb pollution from the M1. <p>All suggestions will be assessed for feasibility in discussions and following site visits.</p>
25	Localised Solutions	Improvements in Air quality focus areas to Create Healthy Town Centres	<p>Improve public realm to create Healthy Streets in Finchley Central: new town square (c.5,500 sqm) in development, due to start on site Autumn 2023. Low-emissions Local Delivery service trialled in Finchley to reduce pollution and congestion. In High Barnet significant public realm improvement to increase pedestrian area and significantly reduce parking on the A1000 which has reduced congestion. Almost 30 Temporary Streetspace Parklets installed in town centres across the borough to support businesses with social distancing and enhance local environments.</p> <p>More greening of Watling Avenue/A5 in Burnt Oak and improvements in public realm being planned to reduce congestion and improve pedestrianisation, this is a deprived area and will see ideas to encourage sustainable transport. Design team actively developing public realm approach in consultation with community in Burnt Oak.</p>

Measure	LLAQM Action Matrix Theme	Action	Progress <ul style="list-style-type: none"> • Emissions/Concentration data • Benefits • Negative impacts / Complaints
			<p>New landscaped 'pocket park' approved for Cricklewood Town Centre, including trees and green space; due for completion Spring 2024.</p> <p>Regeneration scheme to integrate Hendon Central/ near A41, the Burroughs and the Middlesex University HUB which will minimise parking and further encourage sustainable transport.</p>

3. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in Barnet in 2022

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	<p>All major developments</p> <p><i>An air quality assessment is a requirement for all major developments over ten units. This incorporates operational air quality, air quality neutral, and construction impacts. The planning vetting team ensures that all air quality assessments submitted are checked by the scientific team. Smaller developments in areas of poor quality have a requirement for air pollution mitigation measures to be installed, but no assessment.</i></p>
Number of planning applications required to monitor for construction dust	<p>1</p> <p><i>Barnet does this for the largest developments only, e.g., the Brent Cross Redevelopment project. We also typically request for dust monitoring should complaints be received.</i></p>
Number of CHPs/Biomass boilers refused on air quality grounds	<p>0</p> <p><i>No applications for CHP/biomass boilers were received in 2022</i></p>
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	<p>0</p> <p><i>No applications for CHP/biomass boilers were received in 2022</i></p>
Number of developments required to install Ultra-Low NO _x boilers	<p>All developments</p> <p><i>This is a standard Barnet requirement for all new homes, and so the number will be the number of new homes approved in the Borough. The Scientific Team were consulted on 856 planning applications</i></p>

Condition	Number
Number of developments where an AQ Neutral building and/or transport assessments undertaken	11 (minimum) <i>The majority of Air Quality assessments typically include Air Quality Neutral assessments without being requested to do so in our planning conditions. Our database currently records the number of conditions set.</i>
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	<i>Most assessments conclude that the development is air quality neutral. It is usually the transport emissions that do not meet the relevant benchmark rather than the building emissions. It can be a challenging process to negotiate further measures to offset emissions. Our database is not currently set up to record this information effectively.</i>
Number of planning applications with S106 agreements including other requirements to improve air quality	1
Number of planning applications with CIL payments that include a contribution to improve air quality	0
<p>NRMM: Central Activity Zone, Canary Wharf and Opportunity Areas</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Number of audits</p> <p>% of sites unregistered prior to audit</p> <p>Please include confirmation that you have checked that the development has been registered with the GLA through the relevant NRMM website and that all NRMM used on-site is compliant with Stage Stage IV of the Directive and/or exemptions to the policy.</p>	<p>LB Barnet has a standard condition for NRMM to be compliant and registered on the NRMM website.</p> <p>7 sites in Barnet are designated Opportunity Areas. 100 % of sites are now compliant.</p> <p>4 (57 %) sites were self-compliant*</p> <p>3 (43 %) sites were non-compliant and achieved compliance by enacting recommendations.</p> <p><i>*Site has met/exceeded emission standards and registered all machinery correctly prior to the audit.</i></p>
<p>NRMM: Greater London (excluding Central Activity Zone, Canary Wharf and Opportunity Areas)</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p>	<p>LB Barnet has a standard condition for NRMM to be compliant and registered on the NRMM website.</p>

Condition	Number
Number of audits % of sites unregistered prior to audit Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.	14 Greater London sites in Barnet were audited. 10 (71 %) sites were self-complaint. 3 (21 %) sites achieved compliant by enacting recommendations. 1 (8 %) site is currently not compliant

Some planning data as required in **Table K** is not collected or not collected in a form that is easily translatable into the table. At Barnet Council, the scientific team periodically define the parameters for which planning applications should be consulted on by us. Planning applications are vetted and sent to Scientific Services when certain parameters are met, and then assigned to team members using the Uniform/Idox system. KPIs are set to ensure the consultation response is made in good time. The planning officers and the scientific team maintain a good relationship for effective collaboration; submissions to discharge planning conditions are also reviewed by the Scientific team. Enforcement of conditions are applied to provide a basis to tackle complaints. There is no system to proactively ensure that air quality requirements and other conditions are complied with. For example, when there have been complaints of dust from construction sites, we have been able to use the threat of taking action for non-compliance with our Construction Method Statement condition. Through this we can also persuade companies/contractors to comply with the NRMM requirements by referring to it and applying a standalone condition for compliance with the newest NRMM standards.

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 Barnet Fleet

All Local Authority HGVs are currently Euro VI standard.

Barnet's Fleet is approximately 338 vehicle units; in the 'zero emission' category we currently have:

- 8 electric Vacuum cleaners for street use
- 1 Electric Pavement Sweeper
- 1 Supervisors Van
- 1 Electric Car
- 1 Hybrid car

This currently represents 3.6% of the fleet, however this number is set to rise with the implementation of the Barnet Sustainability Strategy, which commits to conversion to a 100% electric fleet by 2030 if practicable. Further electric vehicles (Electric Cage Tippers and supervisor's vans etc.) are planned for delivery in Barnet in 2023.

In addition to the above, Barnet also has a pool car fleet of 10 hybrid vehicles (9 cars and 1 van).

4.2 NRMM Enforcement Project

Barnet can confirm that the borough is continuing to support the NRMM Enforcement project in 2023 – 24.

4.2 Air Quality Alerts

Air text was previously not deemed to be suitable for use in Barnet, as alerts typically did not reflect the monitoring in Barnet at the automatic monitoring stations as Chalgrove School and Tally Ho! Corner. Suitability of AirTEXT for use in Barnet is to be reevaluated over the coming year.

Barnet communications team will continue to provide live/direct alerts about air quality conditions within the borough on the main website which is linked directly to the Ricardo AEA (Air Quality England) website. Further/planned actions also include the dissemination of data and information through GP surgeries, and collaboration with neighbouring London boroughs in providing a suite of advice to residents to improve air quality.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

ABN1 (Tally Ho) and ABN2 (Chalgrove School) are routinely calibrated, serviced and audited to ensure data is as accurate as possible. In 2022, the site audits and data management were carried out by Ricardo Energy and Environment to national standards and operational procedures defined by AURN. Site audits were carried out in May and November 2022 and post audit the site data was then ratified.

Routine calibrations took place monthly for ABN1 and ABN2 by Barnet Scientific Officers. Servicing and maintenance are carried out bi-annually by an external contractor. The contractor for both sites was Matts Monitors and bi-annual servicing followed the audits by Ricardo Energy and Environment.

PM₁₀ Monitoring Adjustment

No adjustments were made to Particulate Matter monitoring data which is performed by the TEOM method.

The Volatile Correction Model (VCM) is applied to the PM₁₀ data from TEOM analyser at Tally Ho Corner and Chalgrove School. VCM allows you to correct TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument. The resulting corrected measurements have been demonstrated as equivalent to the gravimetric reference equivalent. The VCM works by using the volatile particulate matter measurements provided by nearby FDMS instruments (within 130 km) to assess the loss of PM₁₀ from the TEOM; this value is then added back onto the TEOM measurements. This correction is automatically applied to our data and displayed at airqualityengland.co.uk.

A.2 Diffusion Tubes

The diffusion tubes for NO₂ used in all London Borough of Barnet sampling are supplied and analysed by Gradko International Ltd (UKAS 2187) and conform to BS EN 13528 Parts 1-3: 2002/3.

All the tubes used are prepared using 50% TEA/Acetone and analysed using the UKAS accredited in house method (GLM 9), by continuous flow colorimetric analyser. Gradko participates in the AIR proficiency-testing (AIR PT) NO₂ diffusion tube scheme

which uses artificially spiked diffusion tubes to test each participating laboratory's analytical performance on a quarterly basis. The scheme is designed to help laboratories meet the European Standard. Gradko's AIR PT result for May-June 2022 (AR050) was 100 %. Gradko's analytical precision for diffusion tubes is rated "G – Good", for all 14 studies used to derive the 2022 bias adjustment factor for the 50% TEA in Acetone method. Previously to the Air-PT scheme, Gradko participated in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis.

Diffusion Tube Storage:

When collected, exposed diffusion tube samples were sent to Gradko laboratory immediately after collection, for analysis.

Annualisation of Diffusion Tube Data:

We typically annualise our data in line with the current methodology as outlined within Box 4.3 of LLAQM.TG (19)² for London boroughs. This can be completed through application of the new Diffusion Tube Data Processing Tool. The new Diffusion Tube Data Processing Tool was used to process all diffusion tube data.

The tool is available here: <https://laqm.defra.gov.uk/tools-monitoring-data/dtdp.html>

The tool has been developed to calculate annual mean concentrations more easily for the diffusion tube monthly data, by amalgamating the following individual LAQM processing tools:

- Annualisation tool
- Precision and accuracy tool – calculation of local bias; and
- NO₂ fall off with distance calculator.

The tool produces outputs will be uploaded to the LAQM Portal via the Diffusion Tube Data Entry System (DTDES) upload facility. This is a new mandatory requirement to submit NO₂ diffusion tube data. The LAQM Portal has been developed to incorporate the previous Report Submission Website (RSW) and the Diffusion Tube Data Entry System (DTDES). This is to provide local authorities with a single access point to submit all relevant information regarding LAQM. Annualisation was not required for diffusion tube data in 2022.

Discussion of Choice of Factor to Use

Using the most recent national bias adjustment data (Version 03/23), a bias adjustment factor of 0.82 has been applied to all the diffusion tubes in the 2022 calendar year. For comparison, in 2021 a national bias adjustment factor of 0.83 was used. The relevant examples were selected using the spreadsheet workflow by using the same laboratory, and preparation method. A local bias adjustment was not used as there is only one tube co-located. Details are shown in Table L. The bias adjustment factor obtained from the LAQM Support Website at <https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

Table L. Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.82
2021	National	03/22	0.83
2020	National	03/21	0.82
2019	National	03/20	0.87
2018	National	03/19	0.92
2017	National	03/18	0.97
2016	National	03/17	1.03
2021	National	03/22	0.83

National Diffusion Tube Bias Adjustment Factor Spreadsheet						Spreadsheet Version Number: 03/23					
Follow the steps below in the correct order to show the results of relevant co-location studies										This spreadsheet will be updated at the end of June 2023	
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods										LAQM Helpdesk Website	
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet											
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.											
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.						Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.					
Step 1:		Step 2:		Step 3:		Step 4:					
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List		Select a Year from the Drop-Down List		Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ³ shown in blue at the foot of the final column.					
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.		If a year is not shown, we have no data.		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 ²	Year ³	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁵	Bias Adjustment Factor (A) (Cm/Dm)	
Gradko	50% TEA in acetone	2022	UB	City Of London	12	28	23	23.7%	G	0.81	
Gradko	50% TEA in Acetone	2022	KS	London Borough Of Croydon	12	41	37	11.1%	G	0.90	
Gradko	50% TEA in Acetone	2022	R	Royal Borough Of Windsor And Maidenhead	12	30	26	13.3%	G	0.88	
Gradko	50% TEA in Acetone	2022	R	Royal Borough Of Windsor And Maidenhead	12	27	27	-1.0%	G	1.01	
Gradko	50% TEA in Acetone	2022	R	Sandwell Mbc	12	34	27	27.1%	G	0.79	
Gradko	50% TEA in Acetone	2022	UB	Sandwell Mbc	12	21	19	11.9%	G	0.89	
Gradko	50% TEA in acetone	2022		Overall Factor³ (14 studies)				Use		0.82	

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

No annualisation has been performed on monitoring data for 2022.

Distance Adjustment

The following monitoring site nearly recorded an exceedance but was not representative of public exposure (PBN6/355 Hendon Way), therefore the procedure specified in LLAQM.TG (19) has been used to estimate the concentration at the nearest receptor. The process is described below. The distance correction was made, using the NO₂ “Fall-Off-With-Distance-Calculator”.

PBN6/355 Hendon Way (8 m from relevant exposure; measurement made 1 m from kerb; 22.2 µgm⁻³ local background annual mean) was adjusted from 41.8 µgm⁻³ (bias adjusted) to 33.1 µgm⁻³. Refer to **Table N**

Table N. NO₂ Fall off With Distance Calculations

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted ($\mu\text{g m}^{-3}$))	Background Concentration ($\mu\text{g m}^{-3}$)	Concentration Predicted at Receptor ($\mu\text{g m}^{-3}$)	Comments
PBN6	1.0	9.0	41.8	22.2	33.1	None

Appendix B Full Monthly Diffusion Tube Results for 2022

Table O. NO₂ Diffusion Tube Results

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
PBN1	99.7	99.7	77.1	26.9	40.4	23.0		17.9	18.1	24.6	23.3		15.0	16.5	28.3	23.2
PBN2	99.8	99.8	47.6	28.1	39.4	31.3	22.4	26.6	29.1	30.2	33.1	33.3	36.1	38.7	33.0	27.0
PBN3	83.3	81.0	27.1	15.0	25.1	12.2	11.6	9.2	11.1	12.1	14.2	18.6	19.8	21.9	16.5	13.5
PBN5	100	100.0	36.1	18.8	31.5	18.6	15.0	13.4	15.9	16.5	19.6	23.8	26.5		21.4	17.6
PBN6	100	100.0	68.2	44.8	56.8	41.5	44.1	47.7	46.9	47.8	50.8	57.7	55.5	50.6	51.0	41.8
PBN8	100	90.4	64.4	39.7	45.4	31.8	35.2	29.5	29.8	29.7	42.2	39.0	38.5	36.7	38.5	31.6
PBN9	100	100.0	59.3	28.9	47.8	42.5	35.4	31.1	36.3	44.6	44.5	40.2	112.2	43.2	47.2	38.7
PBN10	100	100.0	60.7	37.6	40.2	32.0	37.9	34.4	44.5	38.3	40.8	42.8	44.2	40.1	41.1	33.7
PBN12	100	100.0	51.2	42.2	36.8	31.2	35.8	34.0	29.4	30.9	36.1	42.5	47.3	38.1	38.0	31.1
PBN13	100	100.0	35.2	23.9	24.5	18.8	22.2	20.1	18.5	17.2	22.0	27.6	29.0	30.7	24.1	19.8
PBN14	100	100.0	54.9	39.2	60.6	45.0	41.0	42.4	42.6	51.1	49.4	47.5	50.0	48.6	47.7	39.1
PBN17	100	100.0	56.6	36.9	49.0	35.1	33.7	31.6	31.9	33.7	38.2	41.0	44.8		39.3	32.2
PBN18	100	100.0	60.4	49.0	42.8	35.6	39.3	42.1	38.4		31.1	43.4	49.0	46.0	43.4	35.6
PBN19	100	90.4	51.5	35.8	41.3	37.1	34.1	32.1	32.4	36.0	40.0	40.0	42.6	43.0	38.8	31.8
PBN20	91.7	92.8	49.5	36.6	42.3		36.8	38.2	37.0	34.7	37.5	40.6	45.5	40.6	39.9	32.7
PBN21	100	100.0	-	-	-	-	-	-	-	-	-	-	-	34.8	-	-
PBN22	91.7	90.1	-	-	-	-	-	-	-	-	-	-	-	38.6	-	-

Notes

Concentrations are presented as $\mu\text{g m}^{-3}$.

Exceedances of the NO₂ annual mean AQO of $40 \mu\text{g m}^{-3}$ are shown in **bold**.

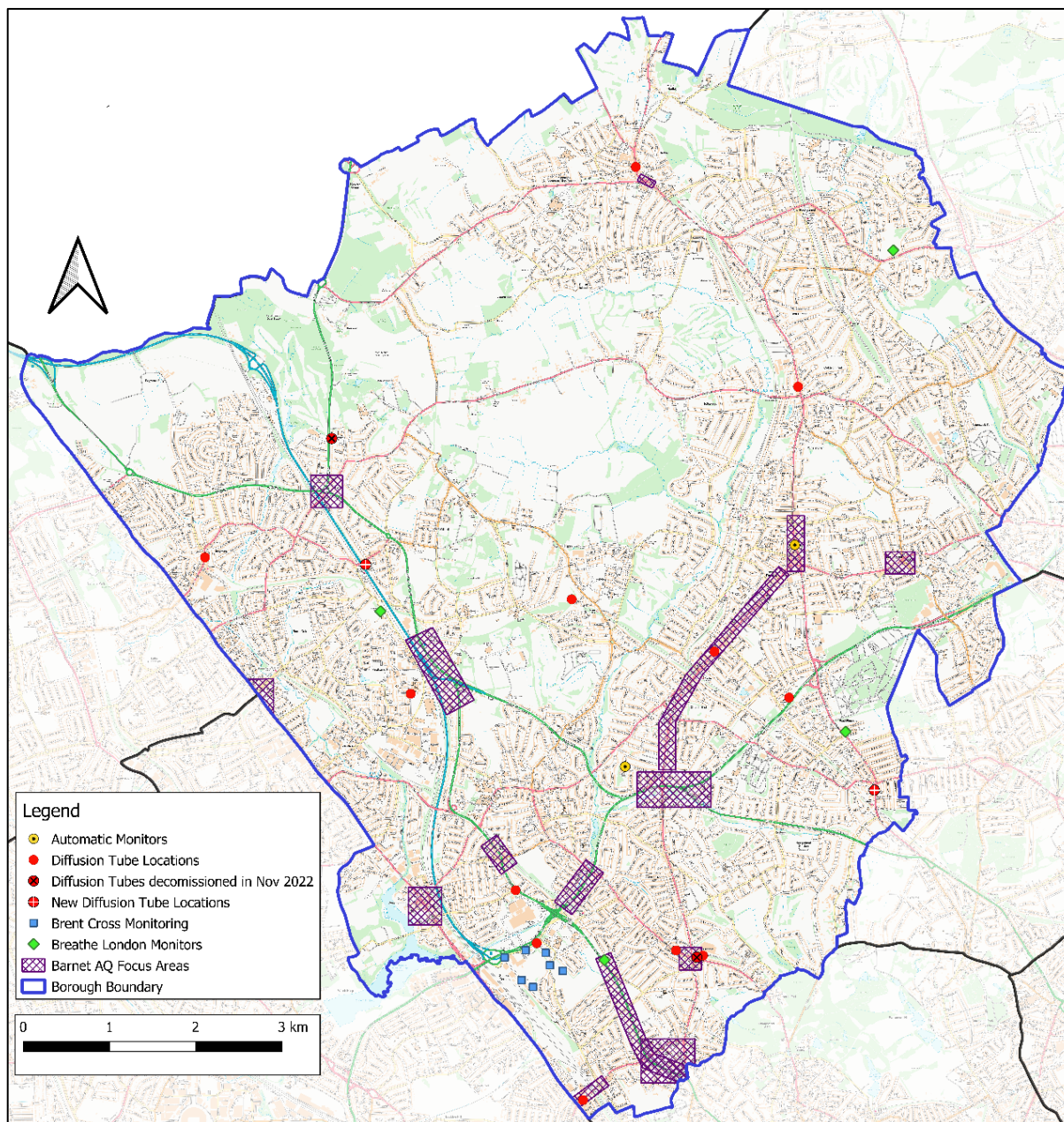
NO₂ annual means in excess of $60 \mu\text{g m}^{-3}$, indicating a potential exceedance of the NO₂ hourly mean AQS objective are shown in **bold and underlined**.

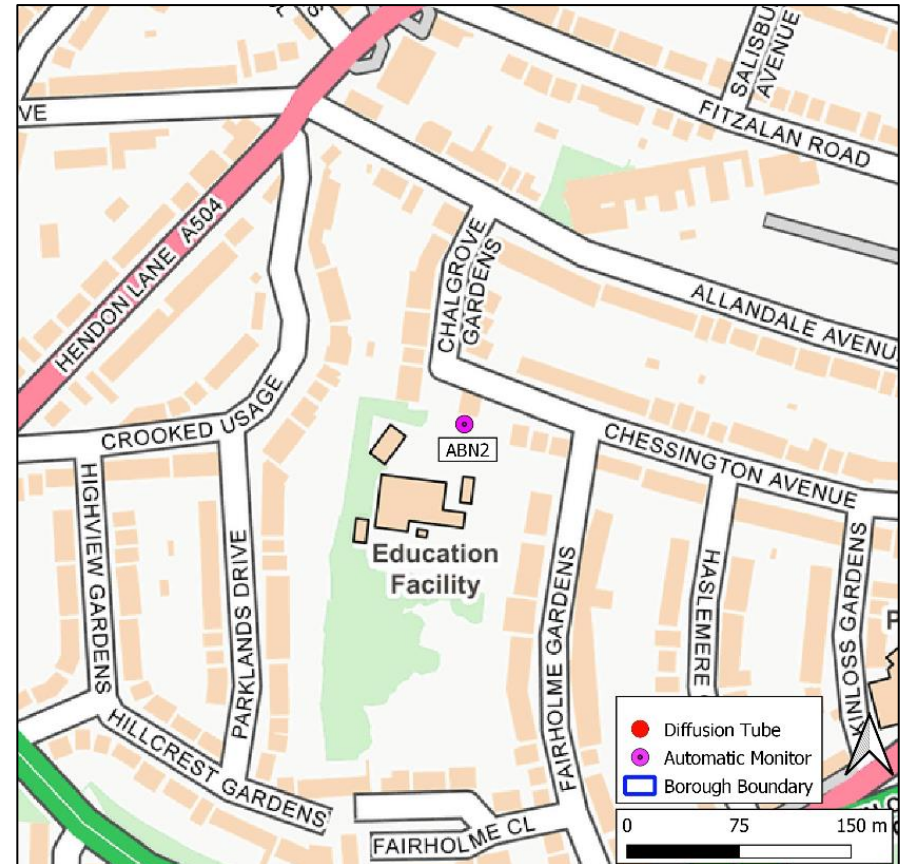
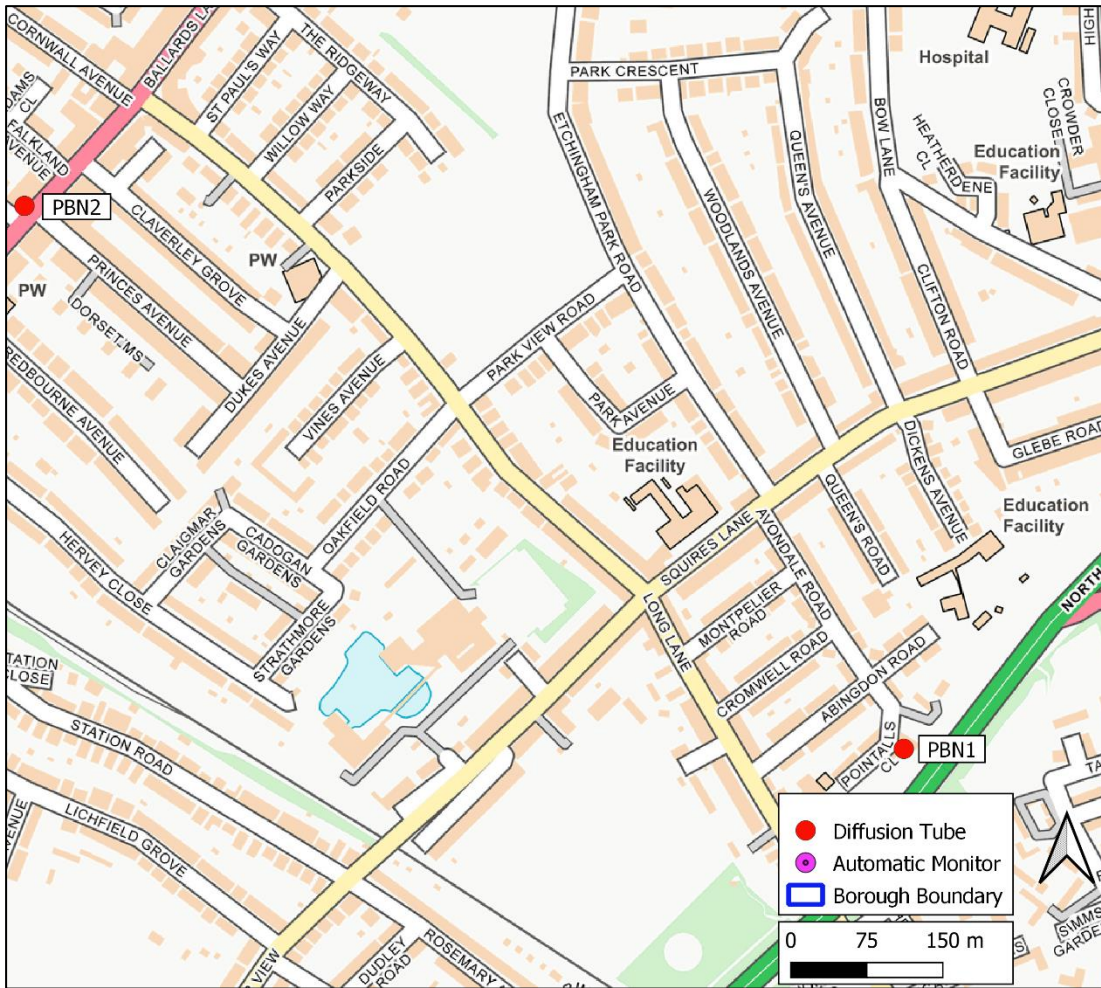
All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

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

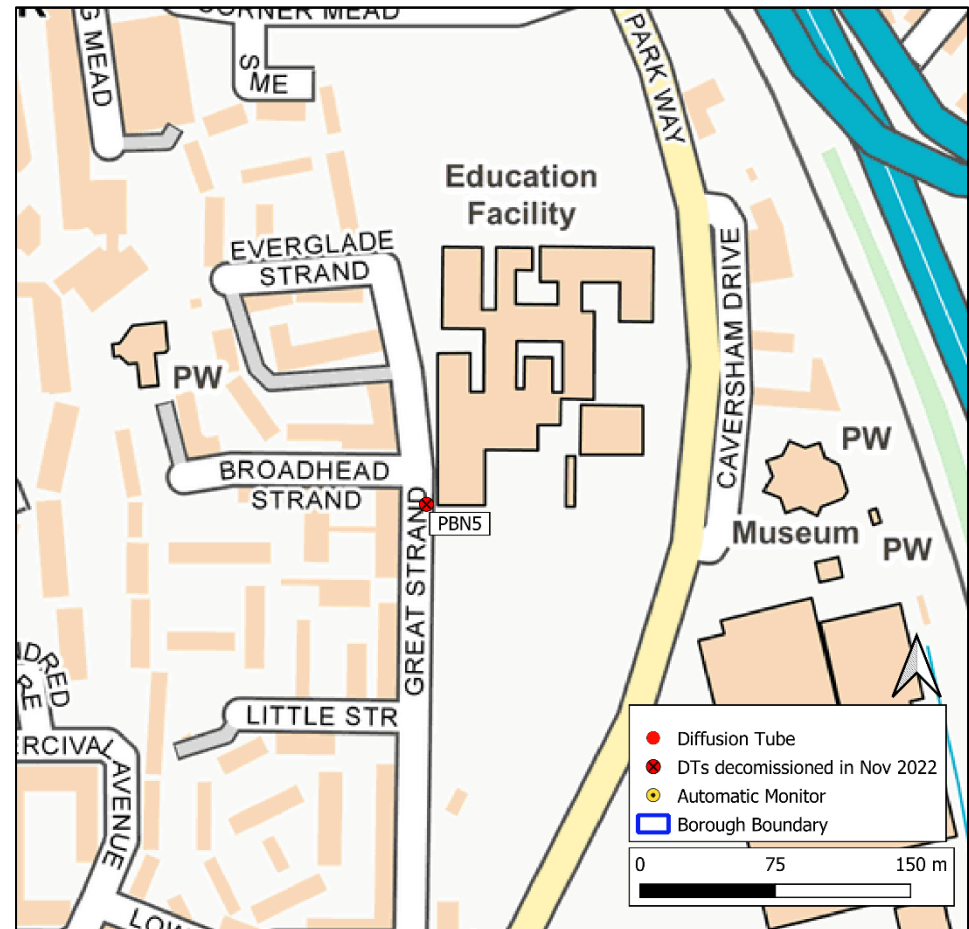
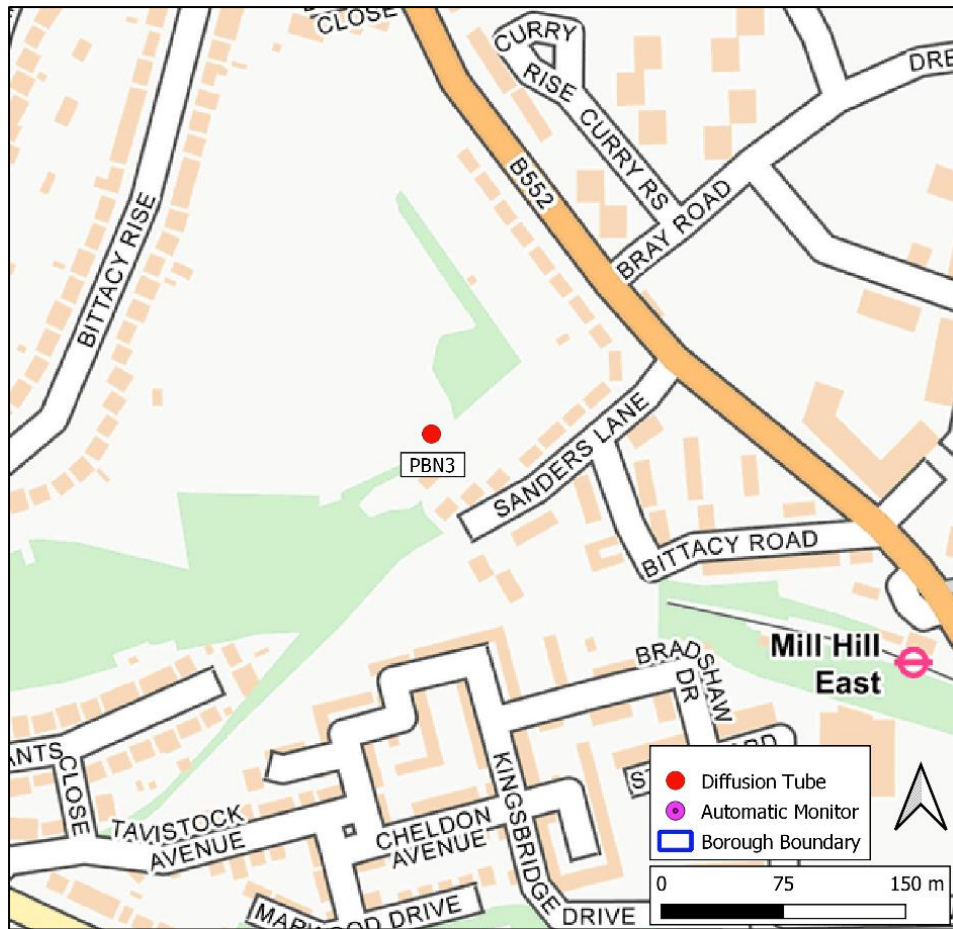
(b) data capture for the full calendar year (e.g., if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

Monitoring Locations in Barnet

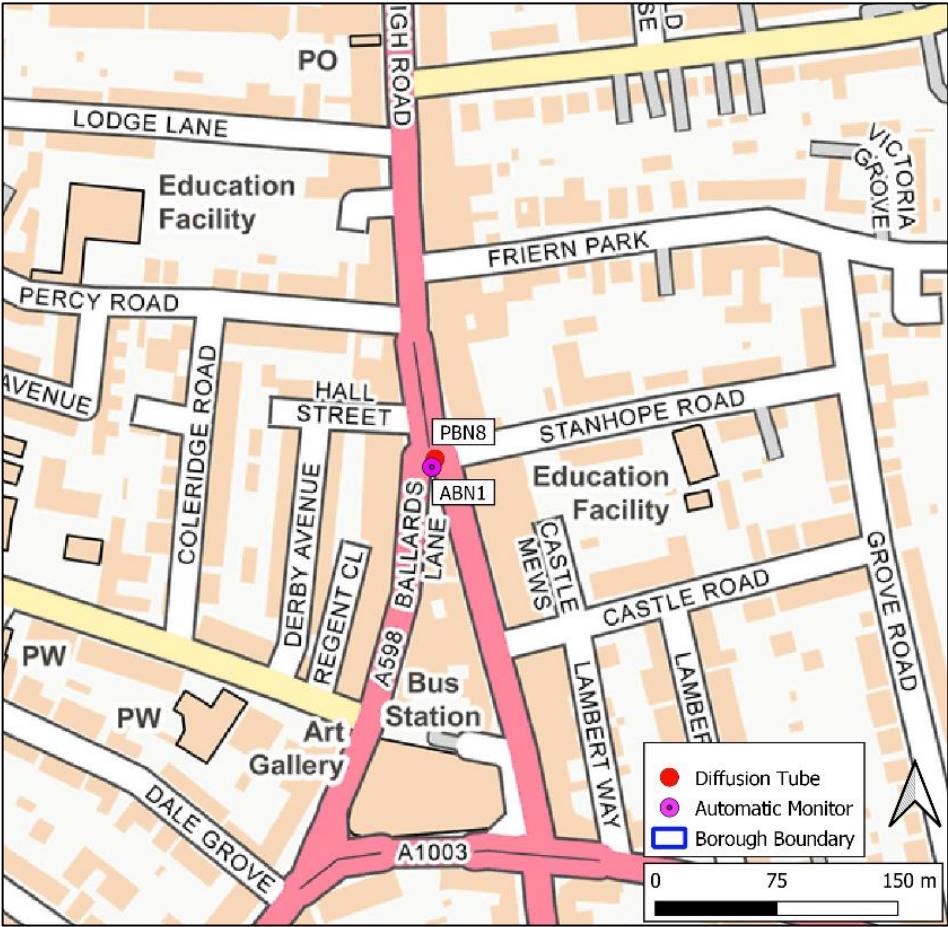
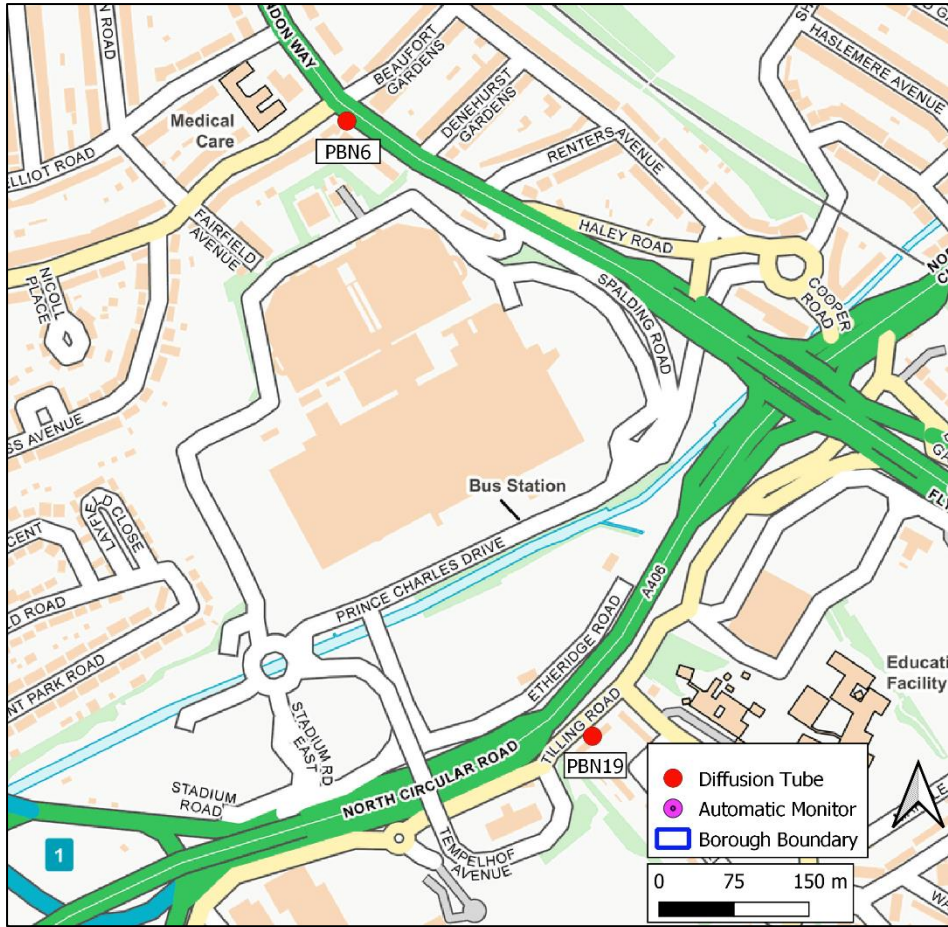




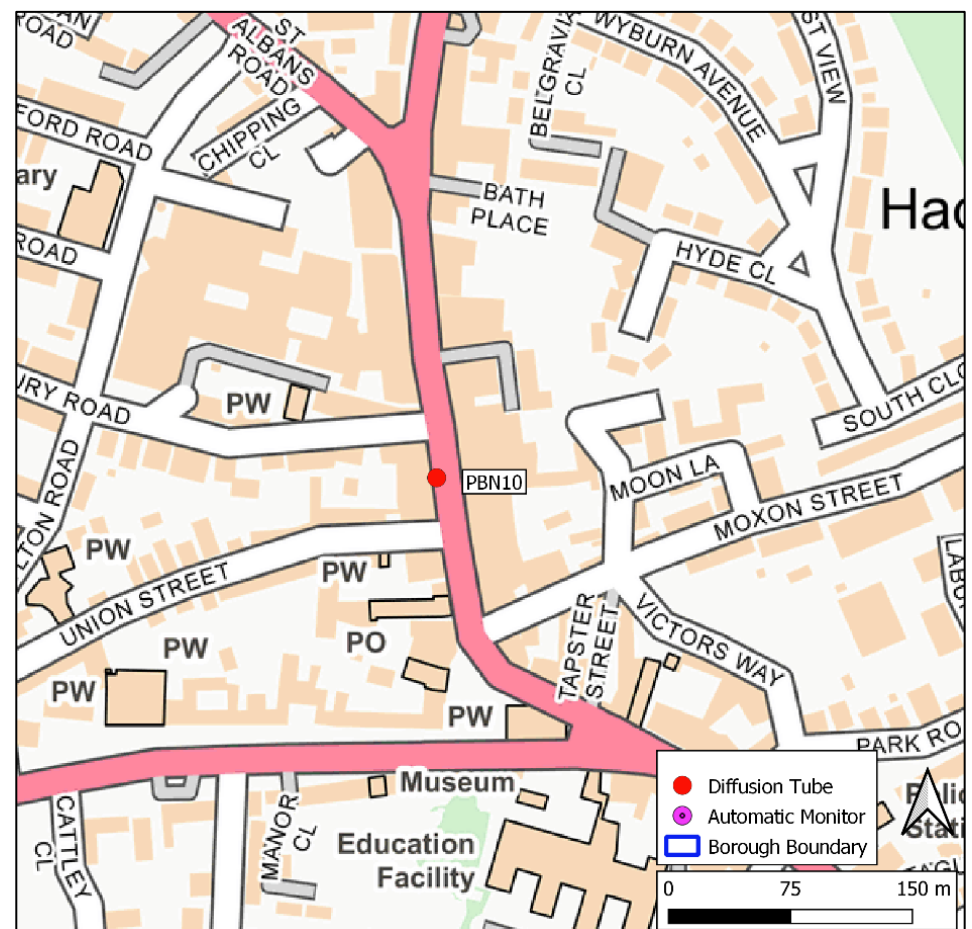
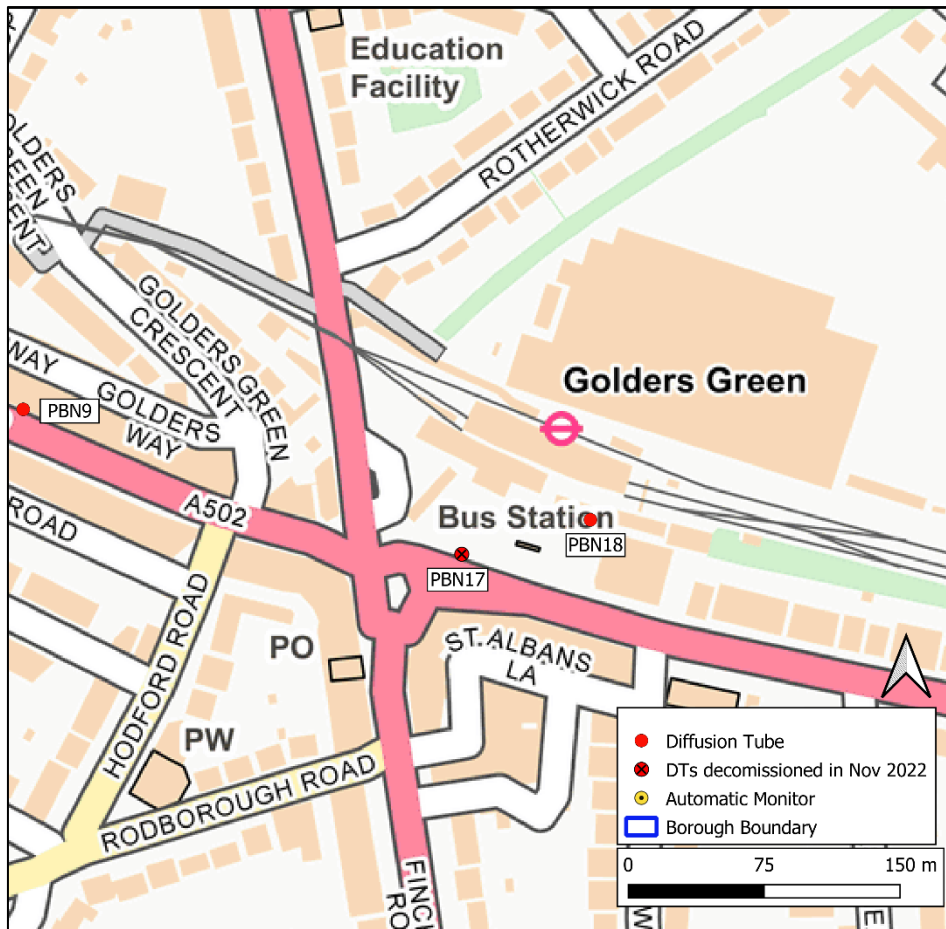
Pointalls Close, Ballards Lane, and Chalgrove School



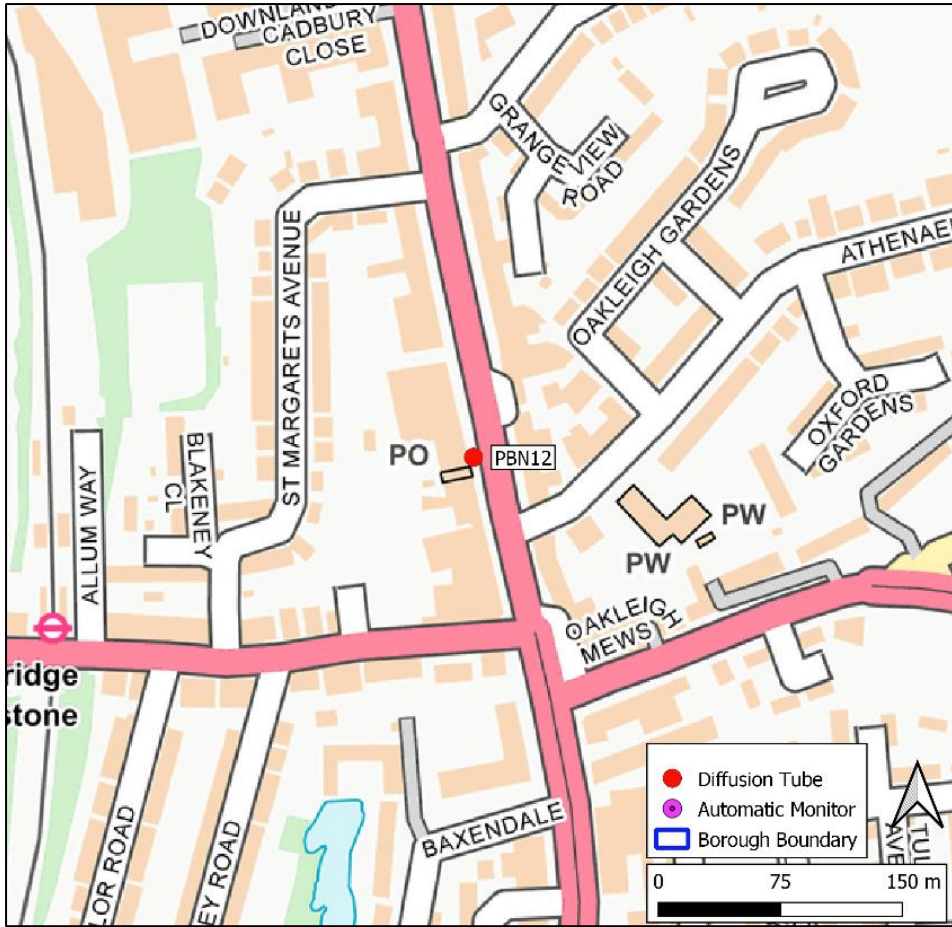
Sanders Lane Allotments and St James Catholic School



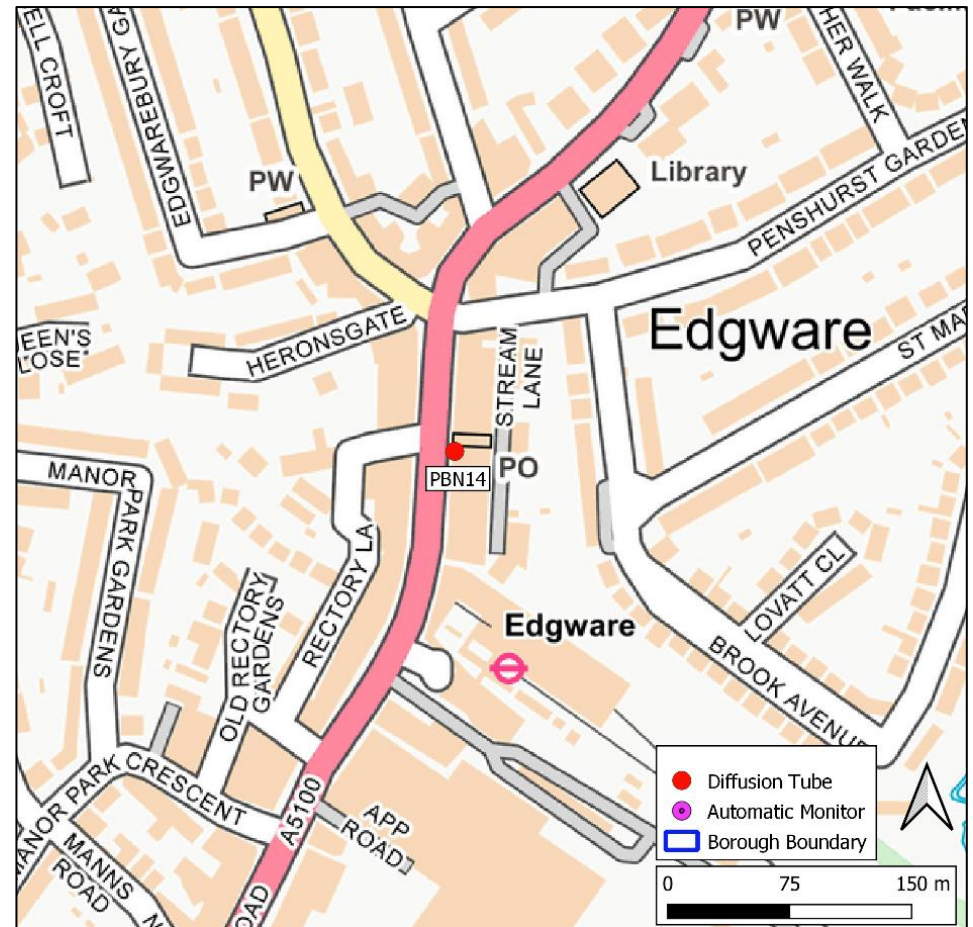
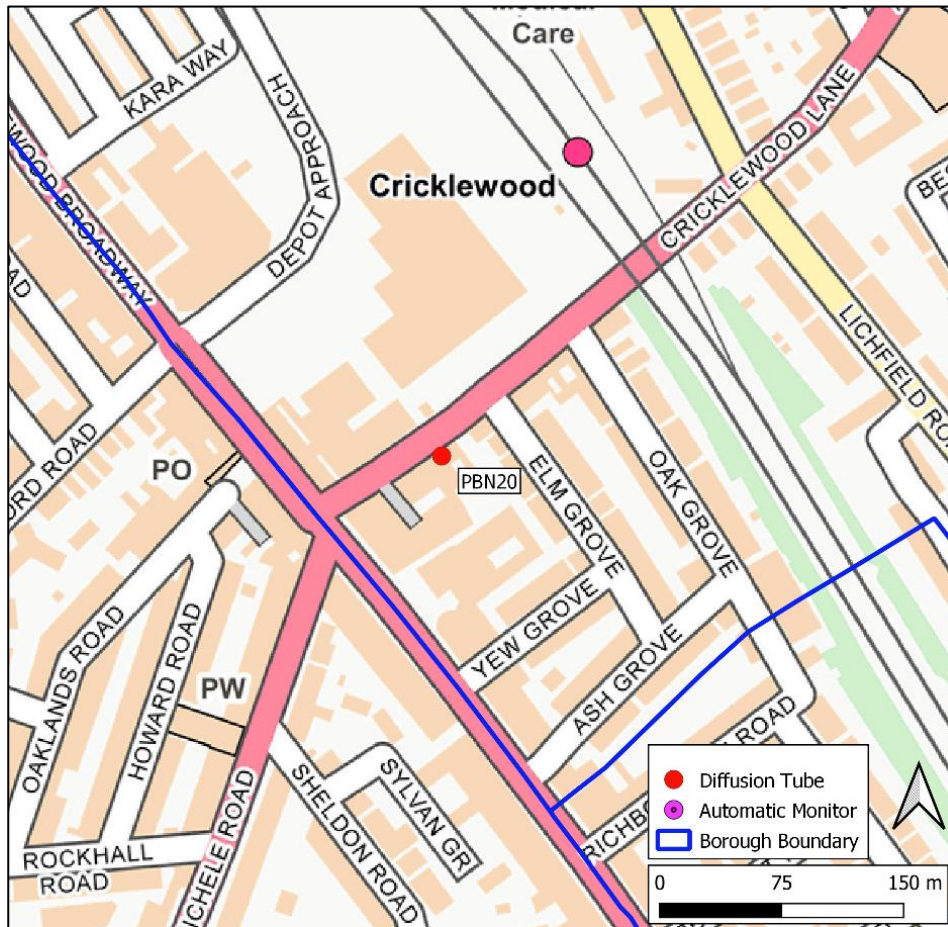
355 Hendon Way, behind 7-12 Dyson Court, and Tally Ho



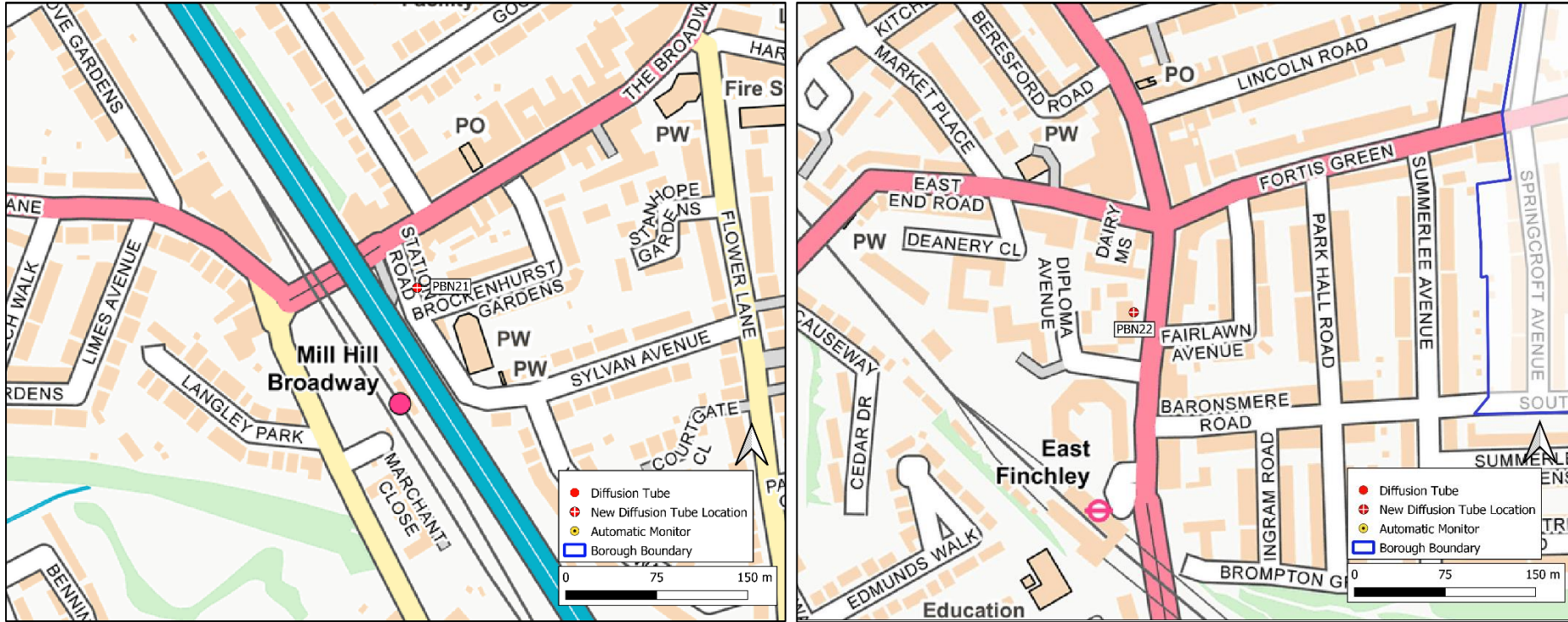
52 Golders Green Road, Back of Golders Green Bus Station, Golders Green National Express stop, and High Street, High Barnet



1295 High Road Whetstone, and Courtland Avenue



Flats above 16 Cricklewood Lane, Station Road Edgware.



8/9 Station Road Mill Hill, and Diploma Court East Finchley.