2018 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

April 2021(Version 2)

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Executive Summary: Air Quality in Our Area

Air Quality in Hertsmere

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Hertsmere Borough Council is located in South East England, within the County of Hertfordshire. To the south lie the London Boroughs of Harrow and Barnet, to the east the London Borough of Enfield, to the northeast Welwyn Hatfield District, to the north St Albans District and to the west Watford District and Three Rivers District. The M25, M1 and A1 either border or run through Hertsmere. The main air quality issues are related to emissions from traffic, particularly within the town of Potters Bar and the village of Elstree, and close to major roads of the M25 and M1.

There are currently six AQMAs of varying size, all of which have been declared for nitrogen dioxide:

- Two AQMAs have been declared in the town of Potters Bar, one in the High Street and one on the periphery close to the M25;
- One AQMA has been declared within the village of Elstree;
- Three AQMAs have been declared in the vicinity of motorways, one close to junction 1 of the M1, and two in proximity of junction 23 of the M25.

Hertsmere Borough Council continues to review the declaration of two further AQMA's, one in the village of Radlett, Watling Street (AQMA 7) and one along the Shenley Road in Borehamwood (AQMA 8) and to alter three of the existing AQMAs 4, 5 and 6.

See https://uk-air.defra.gov.uk/aqma/list for further information on the six declared AQMAs.

Hertsmere Borough Council is actively working to improve air quality in its area through implementation of the Air Quality Action Plan, last reviewed in 2010, the Air Quality

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010

[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Strategic Plan for Hertfordshire, as well as the Hertfordshire Local Transport Plan (Hertfordshire County Council 2011) developed in partnership with Transport, Planning and Public Health colleagues.

Hertsmere Borough Council belongs to the Herts and Beds Air Quality Group; this group includes other local authorities in Hertfordshire and Bedfordshire. The group meets and discusses air quality, which allows continuity in the Counties, also in close connection with the County Councils.

Actions to Improve Air Quality

Hertsmere Borough Council has taken forward a number of measures in pursuit of improving local air quality. Work is currently on-going on a number of actions, including a variety of measures to improve the borough's air quality through improved traffic management, promotion of low emission transport and travel alternatives, promotion of air quality to schools and local residents and air quality monitoring.

Hertsmere intends to implement further measures to improve air quality within the borough in the future. These include further actions to promote travel alternatives, further actions to manage traffic, public information measures and promoting air quality in schools.

Hertsmere applied for grant funding from Defra in 2016 to install electric car charging points in Council car parks, to start up an electric car club, and promote air quality through schools and to fund an air quality champion, but the application was not successful. For the Air Quality Grant round in 2018, Hertsmere Borough Council successfully obtained a grant to implement a Cleaner Air 4 Hertsmere Schools project at 24 schools in Hertsmere, involving a mixture of primary and secondary schools, all of which border an area of poor air quality.

Conclusions and Priorities

Hertsmere Borough Council's ASR concludes that concentrations of PM_{10} and $PM_{2.5}$ were below relevant air quality objectives in 2017 at all monitoring locations. Nitrogen dioxide concentrations were, however, above the annual mean objective at one diffusion tube monitoring site (following distance correction) in 2017. This site (HM61) is located within AQMA 3 Blanche Lane, South Mimms, where concentrations have previously been measured above the objective. It is therefore recommended that AQMA 3 remains declared. No exceedances of the 1-hour mean objective were measured at both the roadside and the background automatic monitoring stations. The 2019 ASR will undertake a review of the AQMAs (once 2018 data are available) with a view to concluding whether any AQMAs could be revoked. There are no relevant

new developments. A priority for the coming year will be to undertake an update of the existing Air Quality Action Plan.

Local Engagement and How to get Involved

Members of the public can help improve air quality in Hertsmere by reducing travel where possible and travelling using sustainable transport options such as walking, cycling and using public transport. Further information regarding Hertsmere's air quality and past reports can be found on the website www.hertsmere.gov.uk.

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1 Local Air Quality Management

This report provides an overview of air quality in Hertsmere Borough Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Hertsmere to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of Hertsmere Borough Council's declared, altered and proposed AQMAs can be found in Figures 2.1 to 3.1. Please note that AQMAs 7 and 8 are only at this present time proposed and are not on the Defra website. AQMAs 4, 5 and 6 are to be changed.

Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at http://uk-air.defra.gov.uk/aqma/list

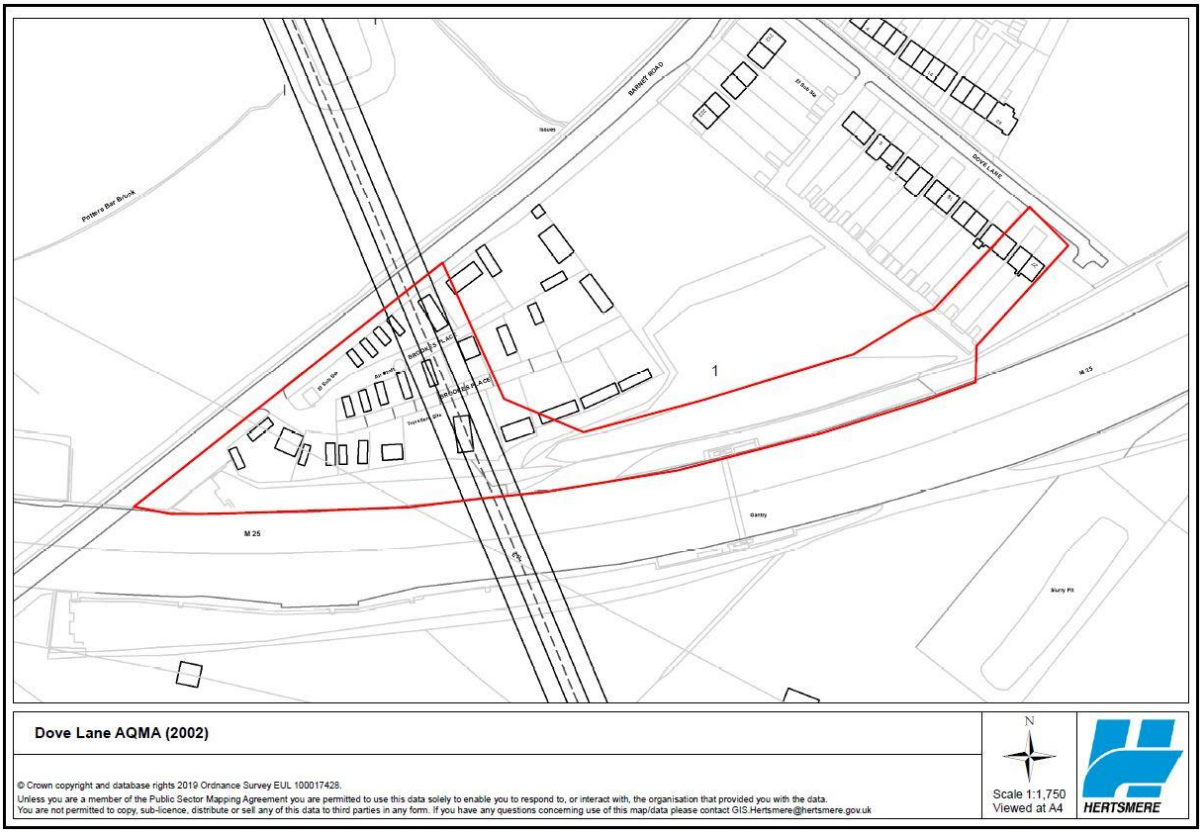

Figure 2.1: Hertsmere AQMA No.1 Dove Lane and Brookes Place

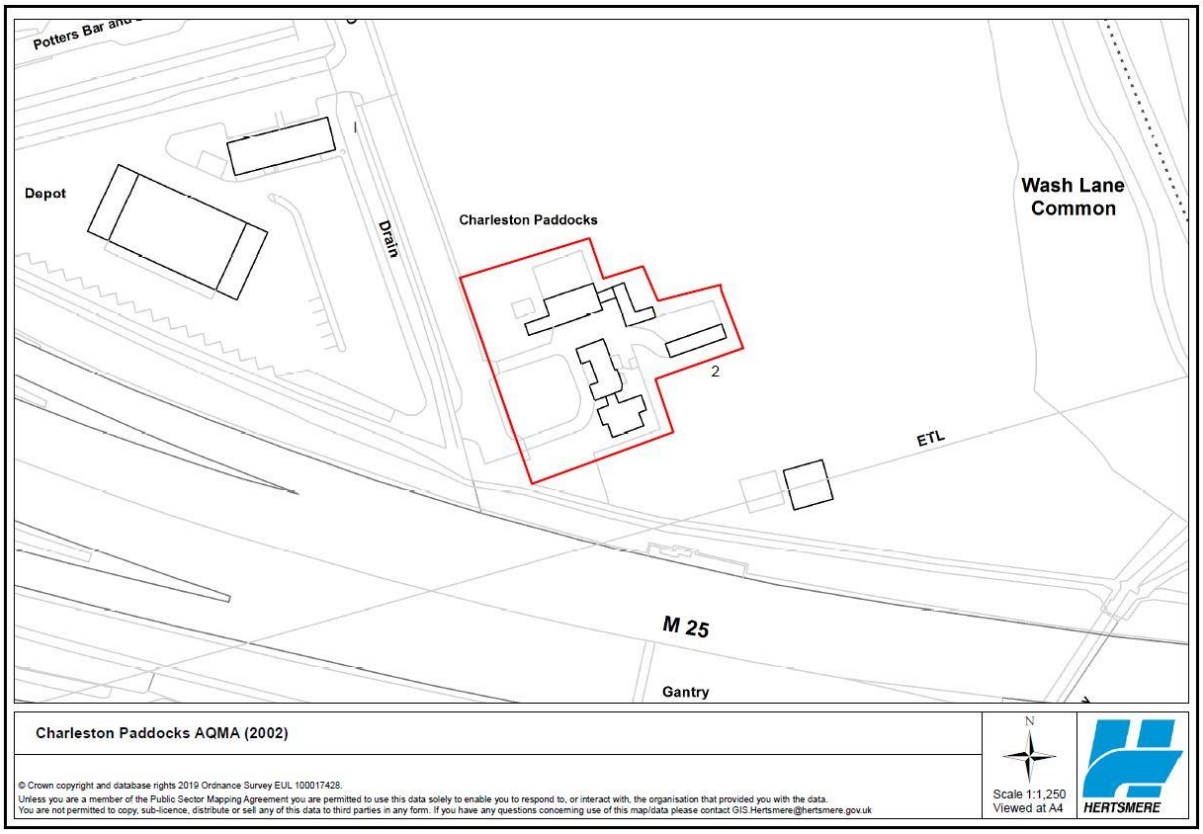

Figure 2.2: Hertsmere AQMA No. 2 Charleston Paddocks St Albans Road

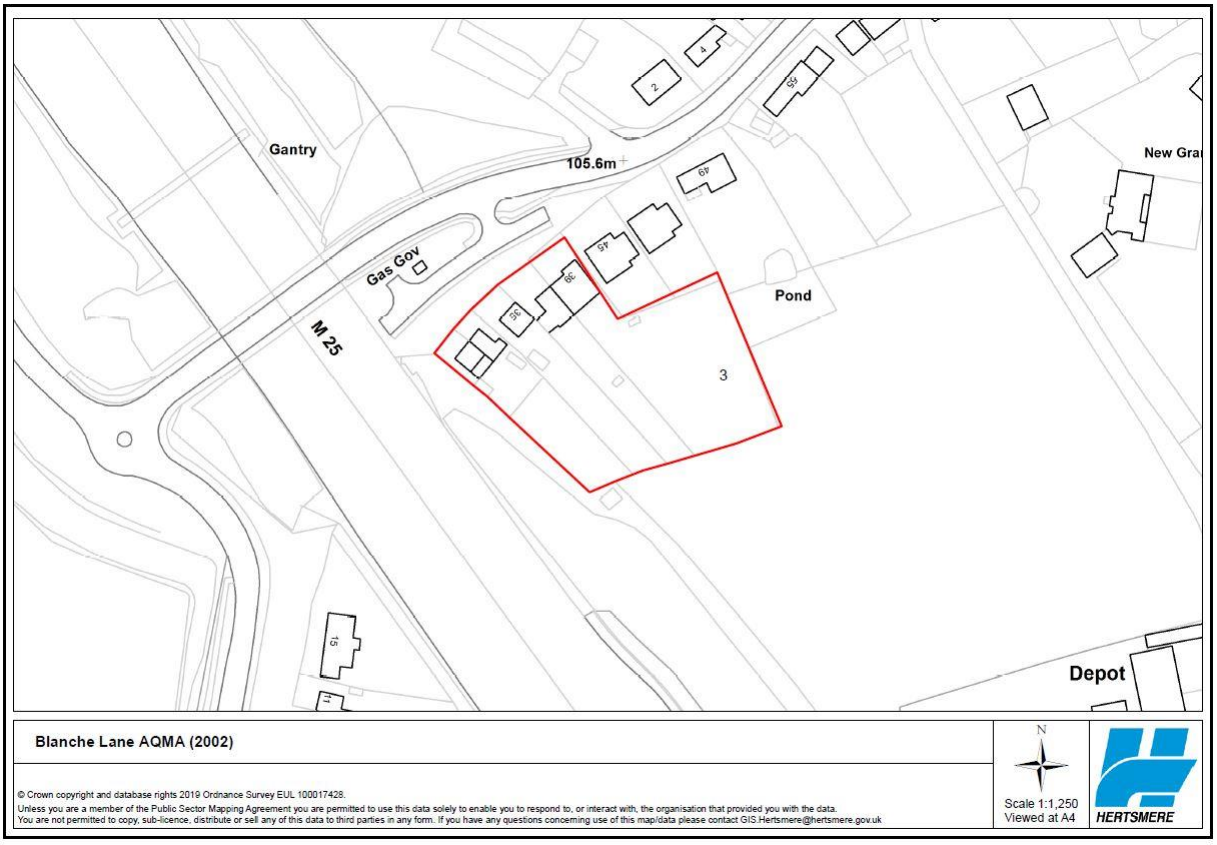

Figure 2.3: Hertsmere AQMA No 3 Blanche Lane, South Mimms.

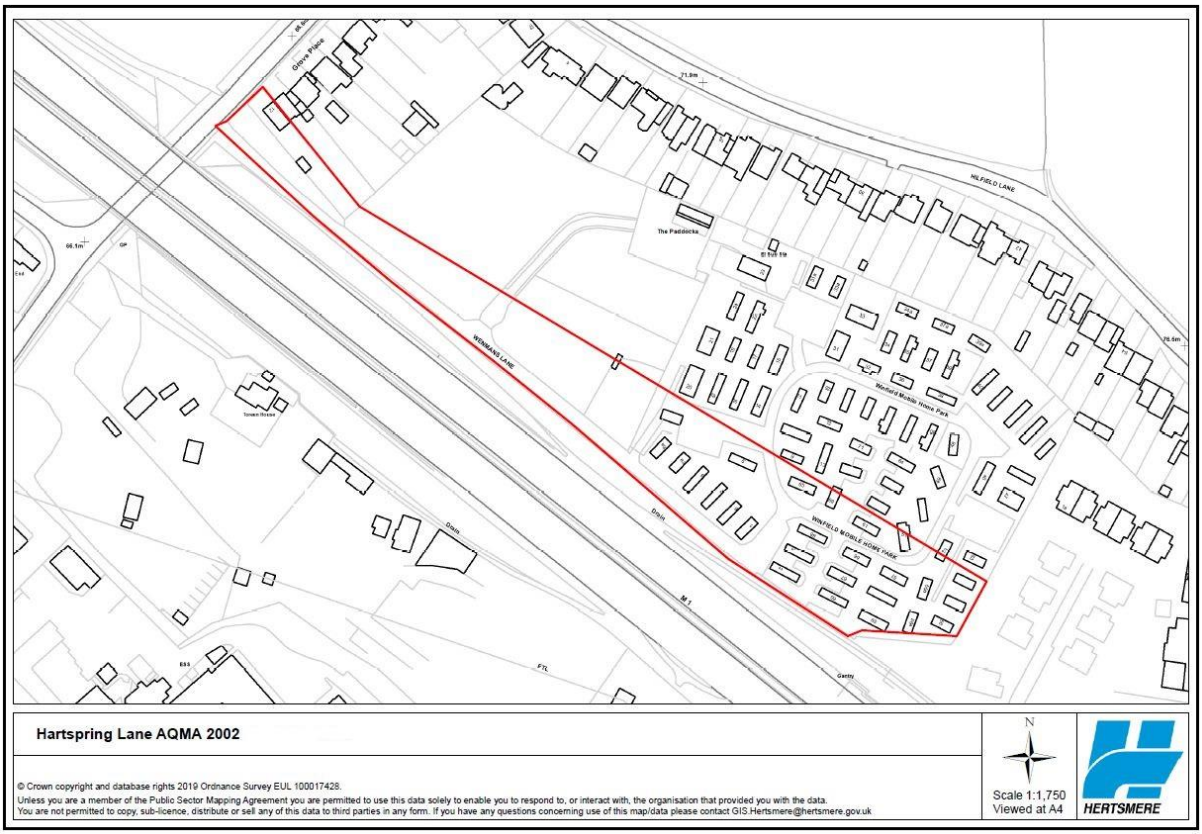

Figure 2.4: Hertsmere AQMA No 4 Hartspring Lane

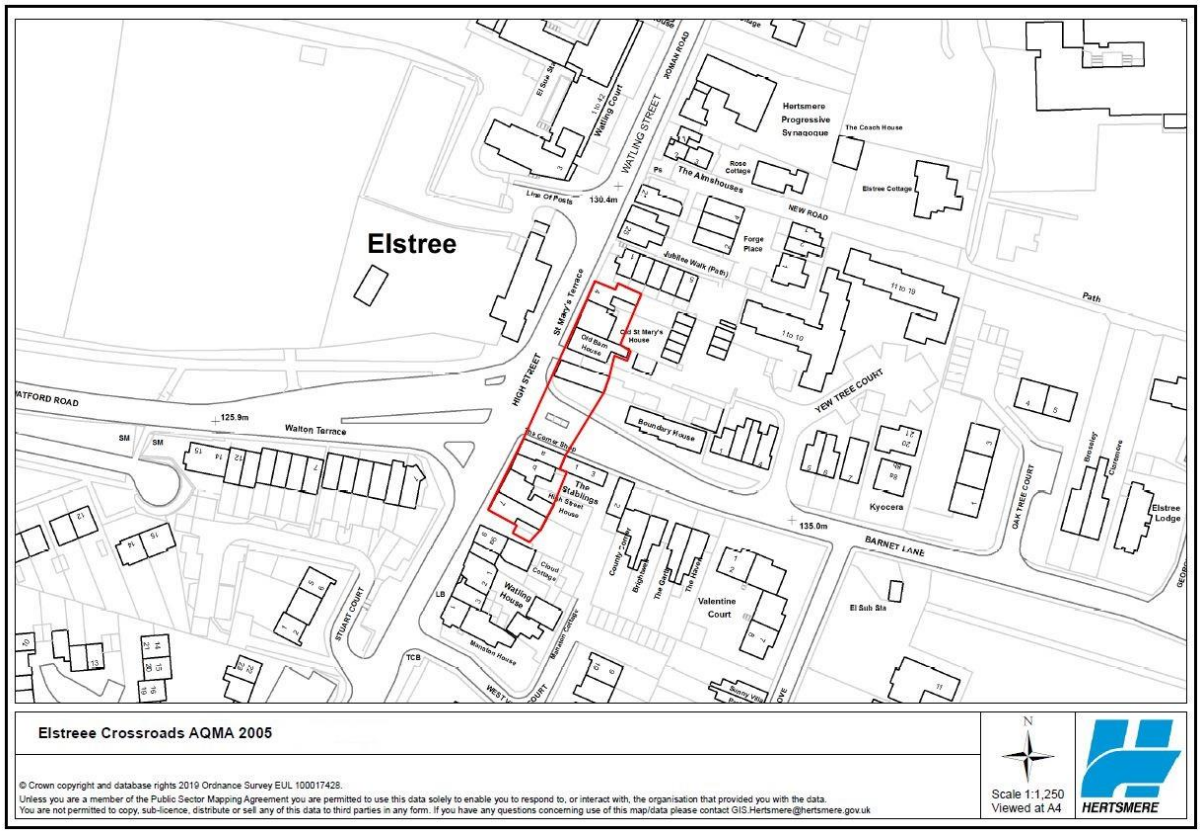

Figure 2.5: Hertsmere AQMA 5 Elstree Crossroads

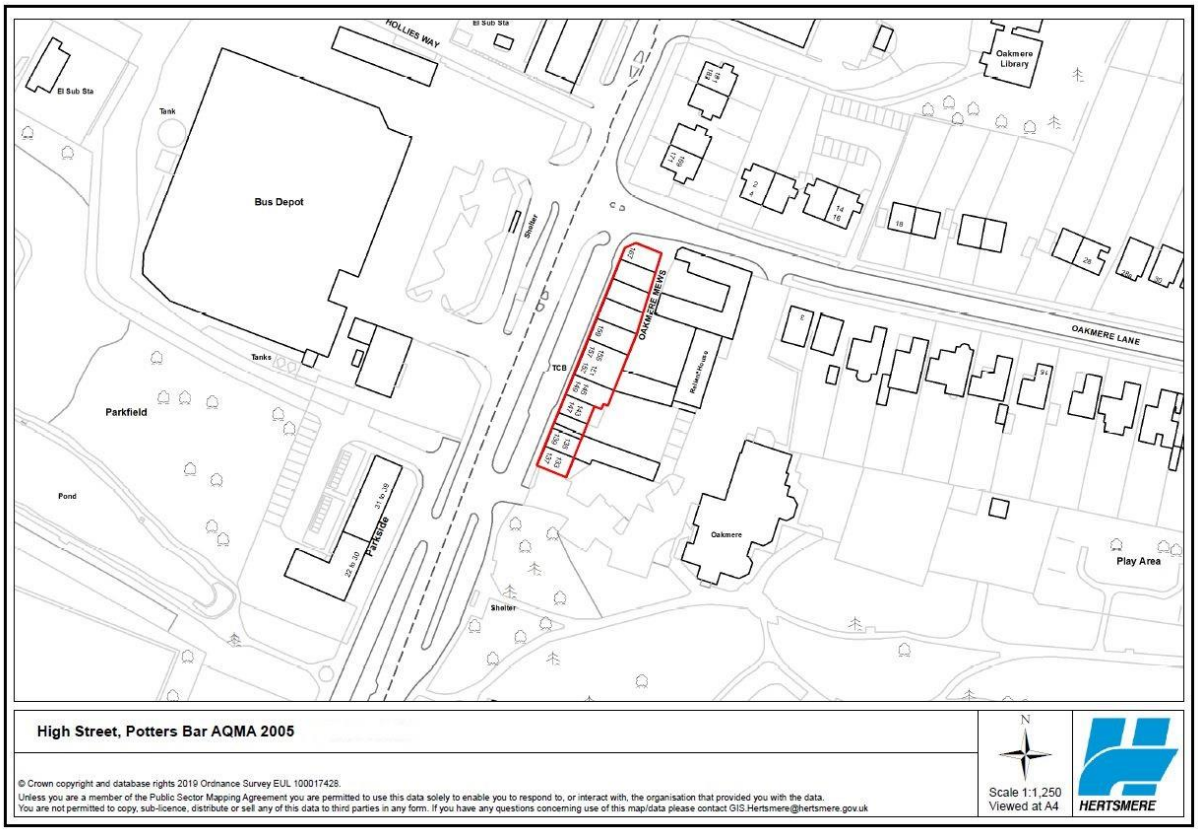

Figure 2.6: Hertsmere AQMA 6 High Street Potters Bar

Hertsmere Borough Council continue to review the declaration of two new AQMAs. Watling Street Radlett AQMA 7 and Shenley Road, Borehamwood AQMA 8 and to make changes to AQMA 4 Hartspring Lane, AQMA 5 Elstree Crossroads and AQMA 6 High Street Potters Bar. See maps below of the proposals.

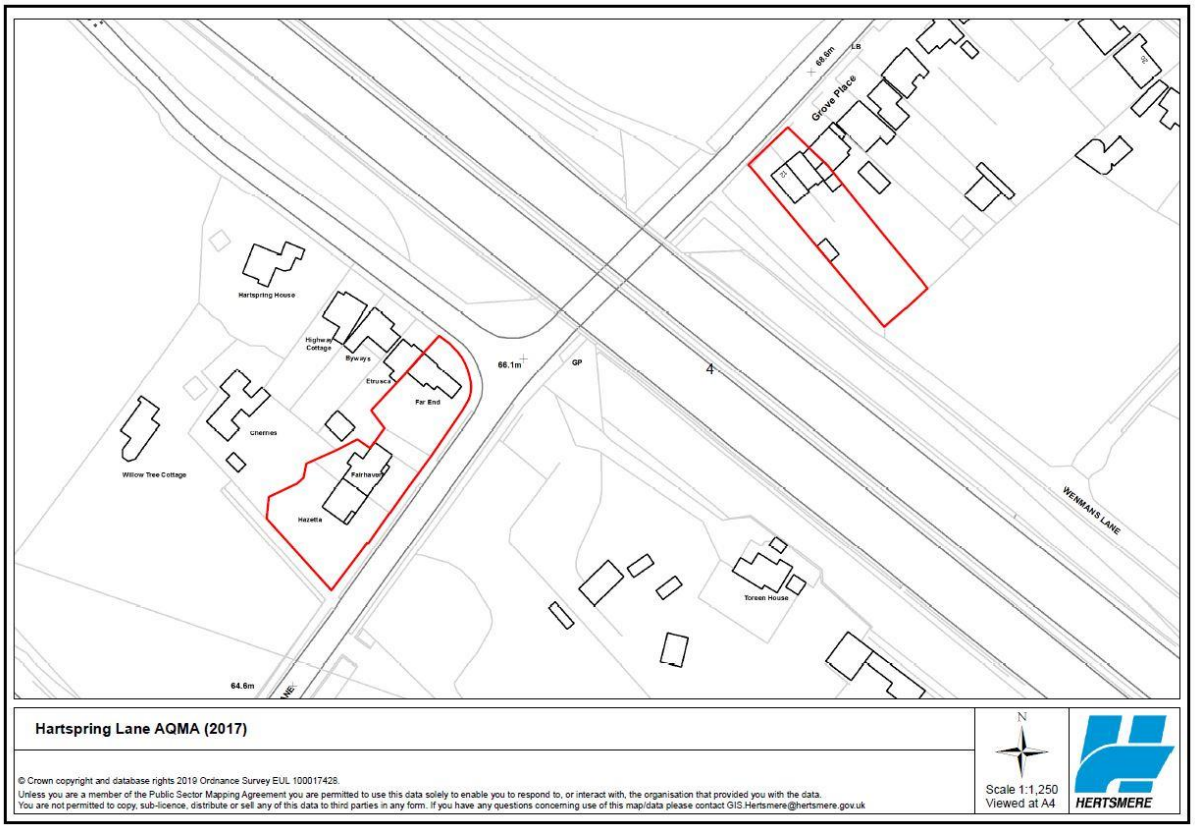

Figure 2.7: Hertsmere AQMA No. 4 Hartspring Lane Altered

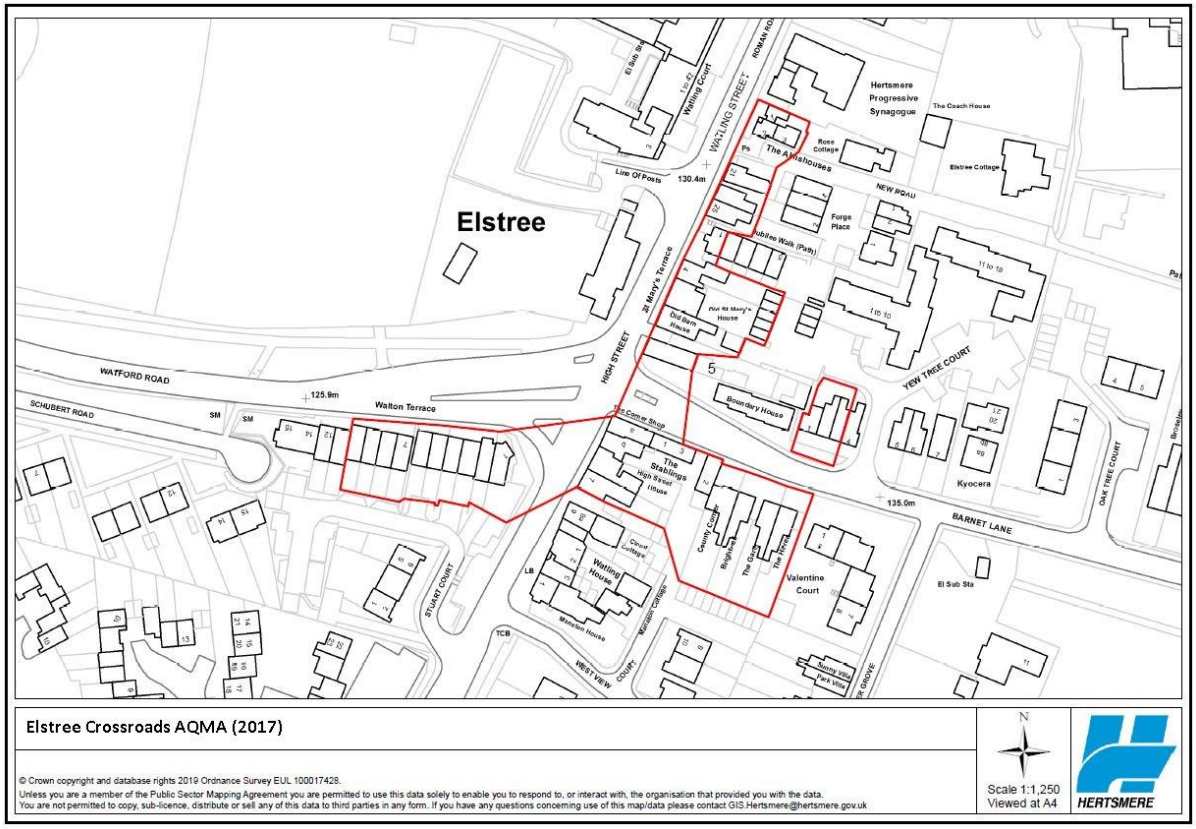

Figure 2.8: Hertsmere AQMA No. 5 Elstree Crossroads Altered

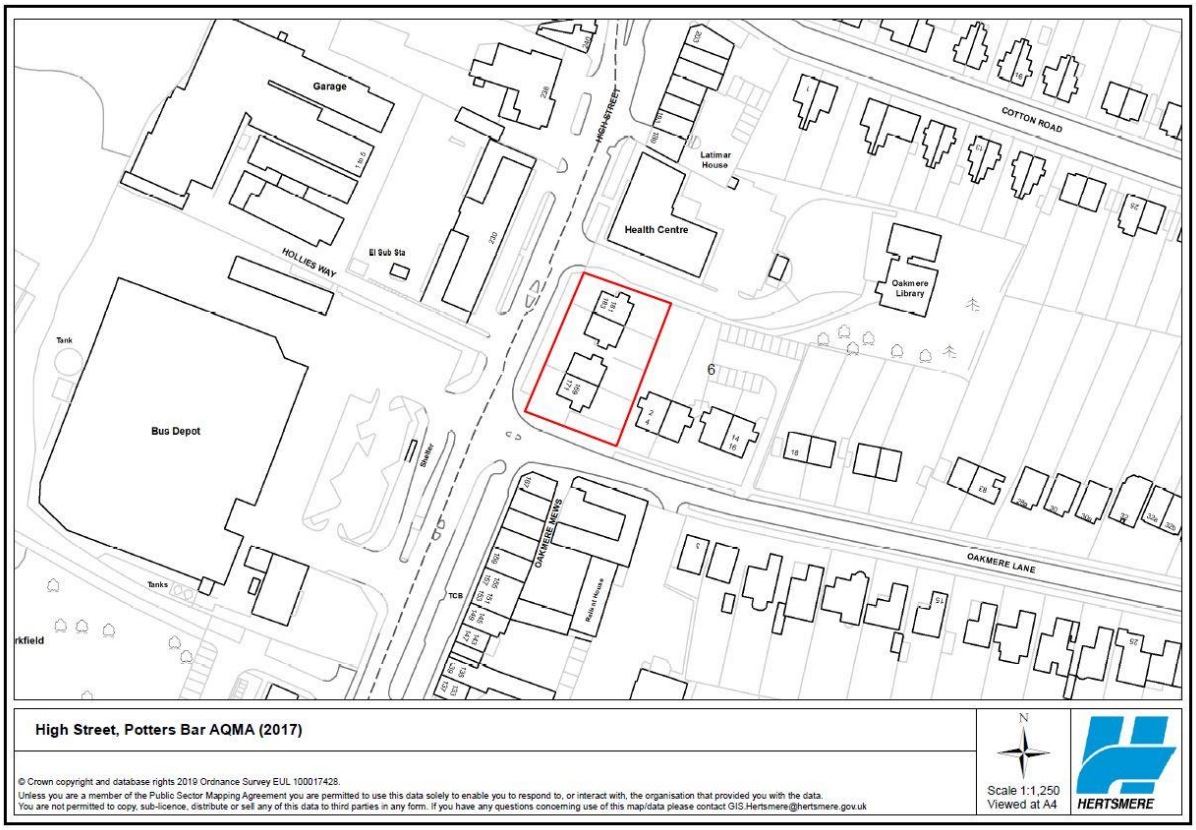

Figure 2.9 Hertsmere AQMA No 6 High Street Potters Bar Altered

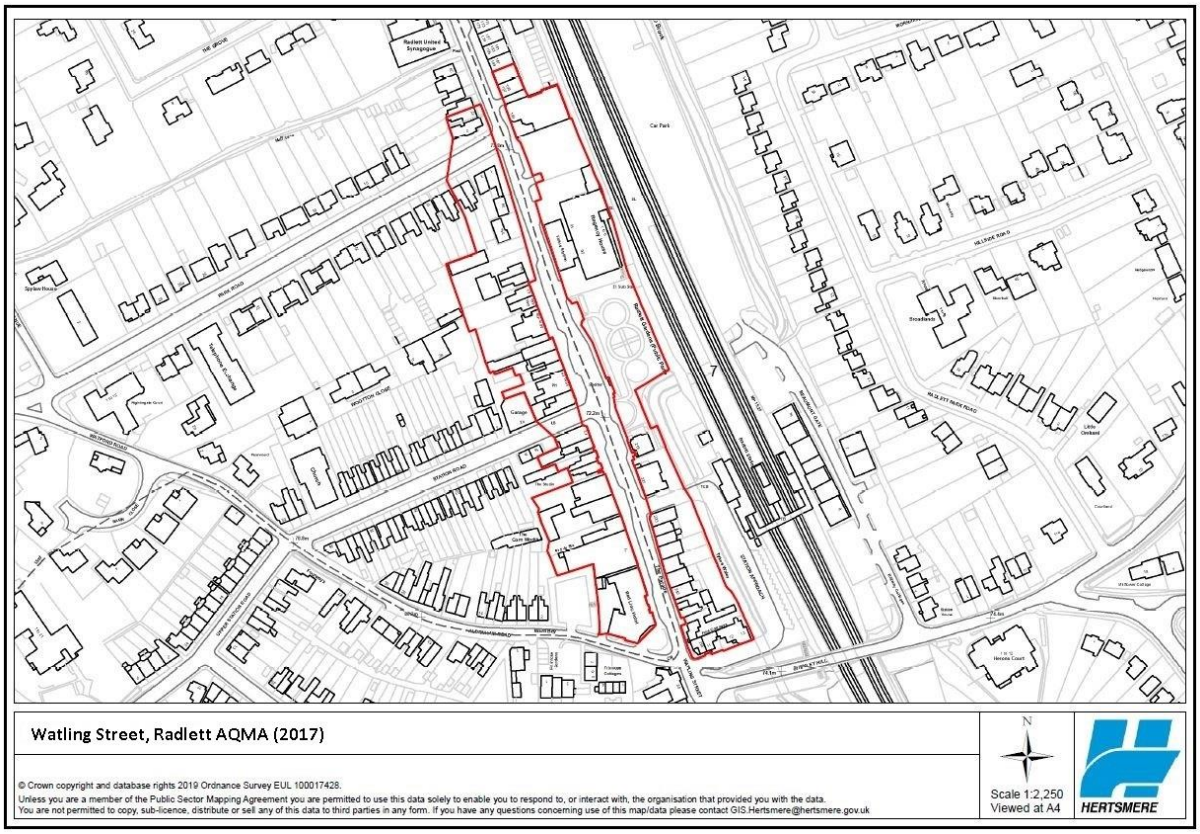

Figure 3.0 Hertsmere AQMA No 7 Watling Street Radlett Proposed

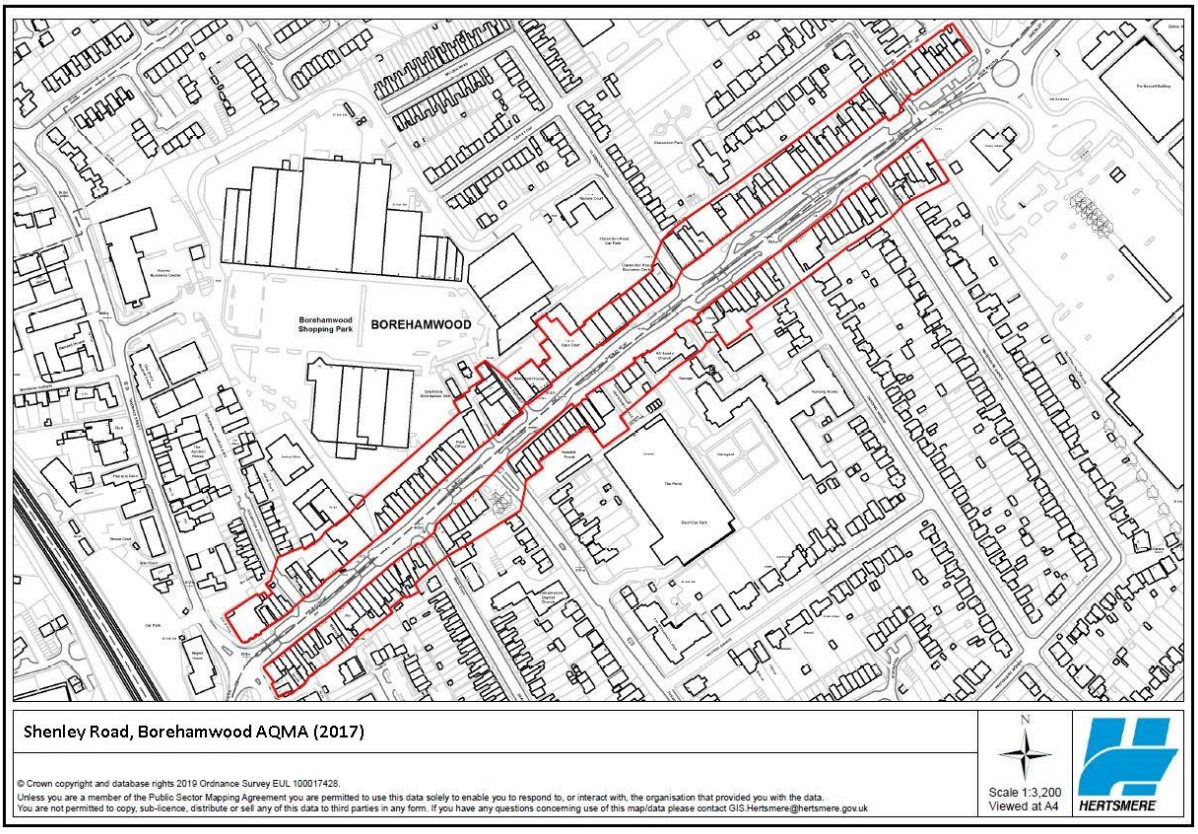

Figure 3.1: Hertsmere AQMA 8 Shenley Road, Borehamwood Proposed

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Hertsmere AQMA 1	2003	NO2 Annual Mean	Dove Lane Potters Bar	Domestic properties 23-27 Dove Lane and caravan site off A1000 Barnet Road	YES	46	µg/m3	34.6	µg/m3	Hertsmere Air Quality Action Plan	2003	
Hertsmere AQMA 2	2003	NO2 Annual Mean	St Albans Road South Mimms	One domestic property known as Charleston Paddocks, St Albans Road	YES	48	µg/m3	32.8	µg/m3	Hertsmere Air Quality Action Plan	2003	
Hertsmere AQMA 3	2003	NO2 Annual Mean	Blanche Lane South Mimms	Domestic properties 31-39 Blanche Lane South Mimms	YES	80	µg/m3	41.8	µg/m3	Hertsmere Air Quality Action Plan	2003	

Hertsmere AQMA 4	2003	NO2 Annual Mean	Hartspring Lane Bushey	Two separate areas comprising of domestic properties 12 and 11 Grove Place Hartspring Lan and Winifield Caravan Park	YES	42	µg/m3	36.7	µg/m3	Hertsmere Air Quality Action Plan	2003	
Hertsmere AQMA 5	2005	NO2 Annual Mean	Elstree Crossroads, Barnet Lane	Domestic properties along Barnet Lane and High Street in the area surrounding the crossroads between these roads.	NO	No figure available	µg/m3	38.2	µg/m3	Hertsmere Air Quality Action Plan	2003	
Hertsmere AQMA 6	2005	NO2 Annual Mean	High Street Potters Bar	Properties 133-167 High Street consisting of commercial and residential	NO	No figure available	µg/m3	35.2	µg/m3	Hertsmere Air Quality Action Plan	2003	
Hertsmere AQMA 7 Proposed	Proposed 2016	NO2 Annual Mean	Radlett Watling Street	An area encompassing residential properties along both sides of Watling Street between the junctions with Park Road	NO	44	µg/m3	37.7	µg/m3	Pending declaration	n/a	

				and Aldenham Road.								
Hertsmere AQMA 8 Proposed	Proposed 2016	NO2 Annual Mean	Borehamwood Shenley Road	An area encompassing residential properties along both sides of Shenley Road between the crossroads of Station Road and Theobald Street and the roundabout joining Shenley Road and Eldon Avenue.	NO	49	µg/m3	33.0	µg/m3	Pending declaration	n/a	

☒ **Hertsmere Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

2.2 Progress and Impact of Measures to address Air Quality in Hertsmere

Hertsmere Borough Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

Key completed measures are that all of Hertsmere public car parks now have electric car charging points and there is also an electric van for Council officers' to use. There has been ongoing liaison with planning colleagues, both on a day to day basis with regard to specific applications, and also through a presentation to planning officers with a view to writing a planning guidance document.

Hertsmere Borough Council will implement a grant funded project to be completed over the course of the next reporting year; to implement a Cleaner Air 4 Hertsmere Schools project at 24 schools in Hertsmere, involving a mixture of primary and secondary schools, all of whom border an area of poor air quality.

The principal challenges and barriers to implementation that Hertsmere Borough Council anticipates facing are in staff time for implementation, and funding for specific measures. These challenges have meant that progress on updating the Air Quality Action Plan has been slower than expected

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Hertsmere Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of the AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Wherever Pollution and or traffic issues have been identified to investigate and tackle through local communities local plans / strategies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Hertsmere Borough Council	2017/2018	2018		Low	It has been agreed that car charging points will be placed in all of Hertsmere Council car parks	2018	Funding
2	Work ,support and discuss with Highways England , neighbouring authorities to consider traffic schemes that affect AQMAs on local roads and motorways	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	Environmental Health, Highways England, Transport Departments	2017/2018	2018		Low	Implementation on going	2019	

3	Identify major fleets in the Borough to encourage cleaner vehicle technology	Promoting low emission vehicles	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	Environmental Health Transport	On-going	2019		Reduced vehicle emissions	Implementation on going	2019	
4	Support Hertfordshire County Council with its aim to encourage alternative modes of transport through various initiatives and through Travel Wise events	Promoting Travel Alternatives	School Travel Plans	Hertfordshire County Council & Environmental Health	2017-2018	2018		Low	Hertsmere have joined with Hertfordshire County Council to work with Living Streets to encourage schools to promote a walking programme. With Air Quality included	2018 - 2019	
5	Hertsmere continue to support projects Watling Chase Community Forest Natural England	Promoting Travel Alternatives	Promotion of walking	Environmental Health	On-going	2018		Low	Hertsmere has some cycle, pedestrian and horse routes open	2019	Need to investigate further to see if Hertsmere can support these projects further
6	Air Quality to be taken into account when considering all planning applicatio	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Environmental Health and Planning	On-going	2018		Low	Dealt with in the Core Strategy Development Plan Document 2009 Planning Officers to take into consideration AQMAs	2018	

	ns particularly near and around AQMAs and adoption of air quality in specific planning guidance										
7	The Council will look for evidence that developers have taken appropriate measures to minimise pollution	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	Environmental Health, Planning and Building Control	On- going	2019		Low	Planning produce supplementary planning guides which contain guidance on odour smoke and dust	2019	Environmental Health enforces the Control of Pollution Act on construction sites.
8	The Council will offer £50 reduction for Private Hire and Hackney Carriage vehicle license fees for use of alternative fuels	Promoting Low Emission Transport	Taxi emission incentives	Environmental Health and Licensing Team Promoted at Officers Forum	On-going	2018		Low	Have had an increase from 1 vehicle to 6	2018	
9	Environmental Health will begin an on-going campaign	Promoting Low Emission Transport	Other	Environmental Health	2017 - 2018	2018		Low	To promote during school activities with Living Streets	2019	

	to discourage the excessive idling of vehicle engines										
10	Environmental Health continues to provide comprehensive control over Part B processes and industry where power exists	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	Environmental Health	On-going	2018		Low	All inspections have been carried out with a satisfactory outcome	2018	
11	Improved information and advice to residents and companies in the area about problems caused by bonfires. Encourage residents to compost waste	Public Information	Via other mechanisms	Environmental Health	On-going	2018		.	In the last year Hertsmere have dealt with 140 complaints regarding bonfires.	2018	
12	The Council continue to monitor air quality to the	Policy Guidance and Development Control	Other policy	Environmental Health	On-going	2017		Low	Hertsmere also use diffusion tubes for data and they are reviewed every year	2018	

	existing quality. Hertsmere now have two AQMS one at Manor Way, roadside and the other that has just been moved to Brook Road Bowling Club background										

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Hertsmere Borough Council is part of the Herts and Beds Air Quality group that works closely with Public Health England. Public Health monitors $PM_{2.5}$ as a health outcome and funded monitors for the local authorities in the Hertfordshire area. Hertsmere already monitor $PM_{2.5}$ at both real time air quality sites. Results from the monitoring show that $PM_{2.5}$ is not a significant issue.

Contained within the AQAP and the Hertfordshire Local Transport Plan (Hertfordshire County Council, 2011 currently being updated[4]) is a variety of measures aimed at managing emissions from road traffic on local roads and motorways. Measures intended to tackle road traffic pollutant emissions (including $PM_{2.5}$ emissions) include a variety of traffic management actions (strategic highway improvements to improve traffic flow and measures intended to reduce idling) and the promotion of low emission travel alternatives (e.g cycling, walking, electric vehicles) See Table 2.2 for further information.

[4] see https://www.hertfordshire.gov.uk/about-the-council/consultations/transport-and-highways/proposal-to-introduce-local-transport-plan-ltp4.aspx for details

3.0 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with the objectives.

Hertsmere Borough Council undertook automatic (continuous) monitoring at both roadside and background sites during 2017. The background automatic monitoring site was relocated from Hertswood secondary school to the Borehamwood bowling club in May 2017. Table A.1 in Appendix A shows the details of all three monitoring sites. National monitoring results are available at http://www.airqualityengland.co.uk

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Hertsmere Borough Council undertook non- automatic (passive) monitoring of NO_2 at 54 sites during 2017. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. It should be noted that direct comparison between years should be undertaken with caution, as the 2017 data has been distance corrected (in addition to being annualised and bias adjusted) on request by Defra. This makes the concentrations appear much lower in some instances. For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Measured concentrations at the automatic monitoring sites are below the annual mean air quality objective in 2017. Concentrations are also below the objective at 53 diffusion tube monitoring sites. At four of these diffusion tube monitoring sites and at one of the automatic monitoring sites concentrations were previously above the objective in 2016. Air quality conditions at most of these monitoring sites have improved in 2017.

Following distance correction, concentrations are, however, above the annual mean air quality objective at one diffusion tube monitoring site in 2017. This site (HM61) is located in AQMA 3 Blanche Lane, South Mimms where concentrations have previously been measured above the objective. It is therefore recommended that AQMA 3 remains declared. No exceedances of the annual 1- hour mean objective were measured at the roadside or the background automatic monitoring stations.

Measured annual mean concentrations for the past five years are presented in Figure A1. There is a slight downwards trend in measured concentrations over this period, indicating that air quality conditions within the borough are improving

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3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

The measured concentrations are below the annual and daily mean air quality objectives at both the roadside and background automatic monitoring sites in 2017.

Measured annual mean concentrations for the past five years are presented in Figure A2. There are no clear trends in the monitoring results for the past five years.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years.

The measured concentrations are below the annual mean air quality objective at both the roadside and the background automatic monitoring sites in 2017. The concentrations are also below the $PM_{2.5}$ UK objective for 2020 (25 µg/m^3 as an annual mean).

Measured annual mean concentrations for the past five years are presented in Figure A3. There are no clear trends in the monitoring results for the past five years.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
H1	Hertsmere Borehamwood Manor Way	Roadside	520290	197087	NO2, PM10, PM2.5	NO	Chemiluminescent; FDMS	10.9	6	2.5
H2	Hertsmere Borehamwood Hertswood School (closed 23/05/17)	Urban background	520156	197364	NO2; PM 10 PM 2.5	N0	Chemiluminescent FDMS	40	n/a	4.0
H3	Hertsmere Borehamwood Bowling Club (open 24/05/17)	Urban Background	519694	197248	NO2, PM10, PM2.5	NO	Chemiluminescent; FDMS	86	n/a	2.5

Notes:

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

(2) N/A if not applicable.

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
HM39	117 Shenley Road, Borehamwood	Roadside	519418	196681	NO2	YES (3)	7	1.3	NO	2.1
HM40	17 Essex Road Borehamwood	Urban Background	519281	196779	NO2	NO	5.3	2.1	NO	2.1
HM41	39 Theobald Street Borehamwood	Roadside	519022	196612	NO2	NO	6.4	1.9	NO	2.3
HM45/46/47	Hertsmere Background AQMS	Urban Background	520156	197364	NO2	NO	86	108	YES	3
HM48	Elstree Cross Rd 1 Nursery High St	Roadside	517846	195346	NO2	NO	4.4	1.9	NO	2
HM49	Elstree Cross Rd 2 Barnet Lane	Roadside	517861	195226	NO2	NO	5.9	1.1	NO	2
HM50	Elstree Cross Rd 3 High Street	Roadside	517802	195249	NO2	YES	9.5	1.2	NO	2
HM52	Elstree Cross Rd 5 Walton Terrace	Roadside	517744	195247	NO2	YES (3)	1.8	1.8	NO	2
HM53	Caldecote Lane Bushey Heath	Urban Background	515581	195094	NO2	NO	0.2	0	NO	2.1
HM54	19 High Road Bushey	Kerbside	514596	194396	NO2	NO	4.5	0.5	NO	2.1

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
HM55	Highwood Ave garages Bushey	Urban Background	512770	197834	NO2	NO	29	0	NO	2
HM57	Hartspring Lane 11 Grove Place Bushey	Roadside	513517	197819	NO2	YES	9.2	1.8	NO	2
HM58	Pegmire Lane Bushey	Roadside	513966	197615	NO2	NO	2.5	0.5	NO	2
HM59	7 Aldenham Grove Radlett	Urban Background	516570	200159	NO2	NO	6.8	0	NO	2
HM60	Bell Lane (1 Council Cottages)	Roadside	518586	202939	NO2	NO	13.6	8.8	NO	1.9
HM61	31 Blanche Lane South Mimms	Other	522037	200670	NO2	YES	14.6	14.6	NO	1.9
HM62	24 The Broadway Potters Bar	Roadside	524943	201153	NO2	NO	12.5	3.1	NO	1.9
HM63	27 Dove Lane Potters Bar	Other	526079	200026	NO2	NO	19.2	29.1	NO	2
HM64	Bus Garage 1 (outside Holly House)	Roadside	526208	201454	NO2	NO	23.3	2.1	NO	2
HM65	Hatfield Rd Potters Bar High Street	Roadside	526252	201597	NO2	NO	7.7	2.8	NO	2.1
HM66	Bus Garage 2 Potters Bar	Roadside	526245	201458	NO2	NO	5.9	3	NO	2.1
HM67	Bus Garage 3 Potters Bar	Roadside	526211	201402	NO2	YES	0.5	11.3	NO	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
HM69	Southgate Road Potters Bar	Roadside	526034	200832	NO2	NO	15	3.1	NO	2
HM70	9 Park Ave Potters Bar	Roadside	526402	200457	NO2	NO	9.2	1.5	NO	2
HM71	2 Park Rd 1 Radlett	Roadside	516291	200035	NO2	YES (3)	4.3	1.5	NO	2.1
HM74/75/76	301 Watling St Radlett	Roadside	516456	199624	NO2	NO	9.2	6.6	NO	2
HM79/80/81	7 The Broadway Potters Bar	Roadside	524988	201118	NO2	NO	12.2	1.7	NO	2
HM82/83/84	10 Baker St	Roadside	524922	201088	NO2	NO	9.6	0.6	NO	2
HM85	16 Andrew Close Shenley	Urban Background	518592	200948	NO2	NO	2.3	0	NO	2.1
HM86	Charleston Paddocks South Mimms	Other	522970	199959	NO2	YES	32.8	10.5	NO	1.8
HM93	103 Baker Street Potters Bar	Roadside	524573	200633	NO2	NO	12.9	1.4	NO	2.2
H99/100/101	84 High Street Bushey	Roadside	513209	195257	NO2	NO	1.9	2.4	NO	2.1
HM102	Aldenham Road Bushey Red Lion	Kerbside	516385	199761	NO2	YES (3)	4	0.5	NO	1.9
HM105	Elstree Park Borehamwood	Urban Background	520738	195271	NO2	NO	10.7	36.1	NO	2
HM108/109/110	Hartspring Lane Bushey Hazetta House	Roadside	513419	197727	NO2	YES (3)	11.1	0.5	NO	1.8

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
HM111	9 Blanche Lane South Mimms	Roadside	521980	200567	NO2	NO	21.1	1.2	NO	1.9
HM114	Parkside Potters Bar	Roadside	526164	201363	NO2	NO	16.3	9.5	NO	1.9
HM117/118/119	44 High Street Bushey	Roadside	513101	195286	NO2	NO	4.3	2.3	NO	2
HM120/121/122	Todd Close Borehamwood	Urban Background	520181	197150	NO2	NO	33.1	36.4	NO	1.9
HM123/124/125	Elstree Way Borehamwood	Roadside	520263	197130	NO2	NO	34.5	3.6	NO	1.9
HM126	63 Elstree Hill North	Roadside	517903	195552	NO2	NO	13.8	2.4	NO	2.1
HM129	Allum Lane Elstree	Roadside	517907	195864	NO2	NO	6.3	1.5	NO	2.1
HM132	Watling Mansions Radlett	Roadside	516520	199450	NO2	NO	13.8	8.3	NO	2
HM135	Winfield Park Bushey	Other	513755	197599	NO2	YES (3)	4.7	20.8	NO	2
HM136	Baker Court Police Station Borehamwood	Roadside	519802	197597	NO2	NO	7.3	2	NO	1.9
HM137	Baker Court Brook Road Borehamwood	Roadside	519706	197041	NO2	NO	10.7	2.2	NO	2
HM138	209 Shenley Road Borehamwood	Roadside	519644	196865	NO2	YES (3)	3.1	0.8	NO	2
HM139	140 Shenley Road Borehamwood	Kerbside	519589	196794	NO2	YES (3)	4	2	NO	1.9

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
HM140	Shenley Road Furzehill Road Borehamwood	Kerbside	519308	196574	NO2	YES (3)	2.5	0.9	NO	1.9
HM141	42 Shenley Road Borehamwood	Roadside	519213	196495	NO2	YES (3)	4.5	0.8	NO	1.9
HM142	2a Hillfield Lane Bushey	Roadside	513587	197872	NO2	NO	13	5.7	NO	1.8
HM143	12 Watling Street Radlett	Roadside	516229	200201	NO2	NO	8.2	1.4	NO	2
HM144	Hatfield Road 2 Potters Bar	Roadside	526210	201753	NO2	NO	7.5	3.4	NO	1.9
HM145	The Causeway Potters Bar	Roadside	526409	201715	NO2	NO	17	1.4	NO	1.9

Notes:

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

(2) N/A if not applicable.

(3) Proposed or altered AQMA.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013	2014	2015	2016	2017
Hertsmere Borehamwood Roadside (H1)	Roadside	Automatic		53.82	-	**44.1**	**43.2**	33	35
Hertsmere Hertswood School (H2)	Urban Background	Automatic		39.03	28.2	31.5	27.8	24	27.0
Hertsmere Borehamwood Bowling Club (H3)	Urban Background	Automatic		35.43	-	-	-	-	18.0
HM39	Roadside	Diffusion Tube		100	**52**	**51.8**	**45.7**	**49.1**	**46.6**
HM40	Urban Background	Diffusion Tube		83.3	27	26.1	21.6	24.9	23.2
HM41	Roadside	Diffusion Tube		100	36	35.4	29.8	34.5	34.2
HM45/46/47	Urban Background	Diffusion Tube		100	27	25.5	20.1	22.1	21.2
HM48	Roadside	Diffusion Tube		100	**49**	**48.2**	37.7	**40.5**	38.8
HM49	Roadside	Diffusion Tube		91.7	**59**	**56.1**	**52.2**	**56.7**	**51.6**
HM50	Roadside	Diffusion Tube		100	**59**	**53.9**	**53.3**	**55.4**	**54.4**
HM52	Roadside	Diffusion Tube		100	**40**	**44.2**	35.8	39.6	39.6
HM53	Urban Background	Diffusion Tube		91.7	22	21.3	18.4	21.5	20.4
HM54	Kerbside	Diffusion Tube		100	31	26.9	23.3	27.6	25.9
HM55	Urban Background	Diffusion Tube		100	24	23	20.8	24.3	22.5
HM57	Roadside	Diffusion Tube		100	**46**	**46.8**	**41.6**	**45.1**	**46.6**
HM58	Roadside	Diffusion Tube		83.3	28	27.4	24.4	26.7	29.6
HM59	Urban Background	Diffusion Tube		100	19	17.6	16.8	19.5	18.3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013	2014	2015	2016	2017
HM60	Roadside	Diffusion Tube		100	33	30.5	28.9	30.8	29.9
HM61	Other	Diffusion Tube		100	**45**	**46.5**	**43.3**	**46.6**	**48.4**
HM62	Roadside	Diffusion Tube		100	**44**	**40.1**	34.7	**41.7**	**40.4**
HM63	Other	Diffusion Tube		100	36	**40.1**	34.1	37.8	38.6
HM64	Roadside	Diffusion Tube		100	**48**	**47.2**	**41.8**	**49**	**53.1**
HM65	Roadside	Diffusion Tube		100	**45**	**44.9**	38.3	**42.6**	**50**
HM66	Roadside	Diffusion Tube		100	38	38.6	34.3	38.2	**40.7**
HM67	Roadside	Diffusion Tube		91.7	39	36.1	30.4	34.8	35.2
HM69	Roadside	Diffusion Tube		100	**51**	**48.2**	**43.7**	**49.4**	**46.7**
HM70	Roadside	Diffusion Tube		100	32	34	30.1	33.2	34.5
HM71	Roadside	Diffusion Tube		100	**51**	**47.5**	**40.1**	**44.9**	**46.6**
HM74/75/76	Roadside	Diffusion Tube		91.7	**44**	37.6	31.6	33.3	33
HM79/80/81	Roadside	Diffusion Tube		100	38	37.4	32.7	34.3	37.8
HM82/83/84	Roadside	Diffusion Tube		100	**43**	35.2	29.9	34.6	38.9
HM85	Urban Background	Diffusion Tube		100	26	25.8	21.3	24.1	23.9
HM86	Other	Diffusion Tube		100	**43**	**46.7**	**41.8**	**43.1**	**45.4**
HM93	Roadside	Diffusion Tube		100	29	31.7	26	29.1	28.8
HM99/100/101	Roadside	Diffusion Tube		91.7	**56**	**43.2**	38.6	**44.1**	**40.2**
HM102	Kerbside	Diffusion Tube		91.7	**58**	**52.4**	**47.2**	**51.3**	**49.5**
HM105	Urban Background	Diffusion Tube		100	33	29.7	26.6	31.3	28.3
HM108/109/110	Roadside	Diffusion Tube		100	**69**	**64.5**	**55.9**	**62.1**	**58.8**
HM111	Roadside	Diffusion Tube		100	31	33.5	24.3	28.1	25.8
HM114	Roadside	Diffusion Tube		100	37	34.5	30.8	35.2	34.2
HM117/118/119	Roadside	Diffusion Tube		91.7	**50**	**44.5**	35.6	**40.1**	39.8
HM120/121/122	Urban Background	Diffusion Tube		100	29	31.6	25.3	31.7	26.9
HM123/124/125	Roadside	Diffusion Tube		50	**46**	**47.1**	38.2	**42.2**	39.1
HM126	Roadside	Diffusion Tube		100	**41**	38.3	32.5	36.9	36.4

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2013	2014	2015	2016	2017
HM129	Roadside	Diffusion Tube		100	36	37.5	33.5	33.1	32.7
HM132	Roadside	Diffusion Tube		100	37	32.7	29	31.2	28.8
HM135	Other	Diffusion Tube		100	34	37.1	34.3	35.8	36.3
HM136	Roadside	Diffusion Tube		91.7				31	28.9
HM137	Roadside	Diffusion Tube		83.3				31.3	32.4
HM138	Roadside	Diffusion Tube		83.3				35.1	32
HM139	Kerbside	Diffusion Tube		91.7				**43.7**	37.9
HM140	Kerbside	Diffusion Tube		100				**46.5**	**44.1**
HM141	Roadside	Diffusion Tube		100				**46**	**42.7**
HM142	Roadside	Diffusion Tube		91.7				34.7	34.1
HM143	Roadside	Diffusion Tube		91.7				**60**	**54.5**
HM144	Roadside	Diffusion Tube		100				31.5	33.4
HM145	Roadside	Diffusion Tube		100				38.7	39.3

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

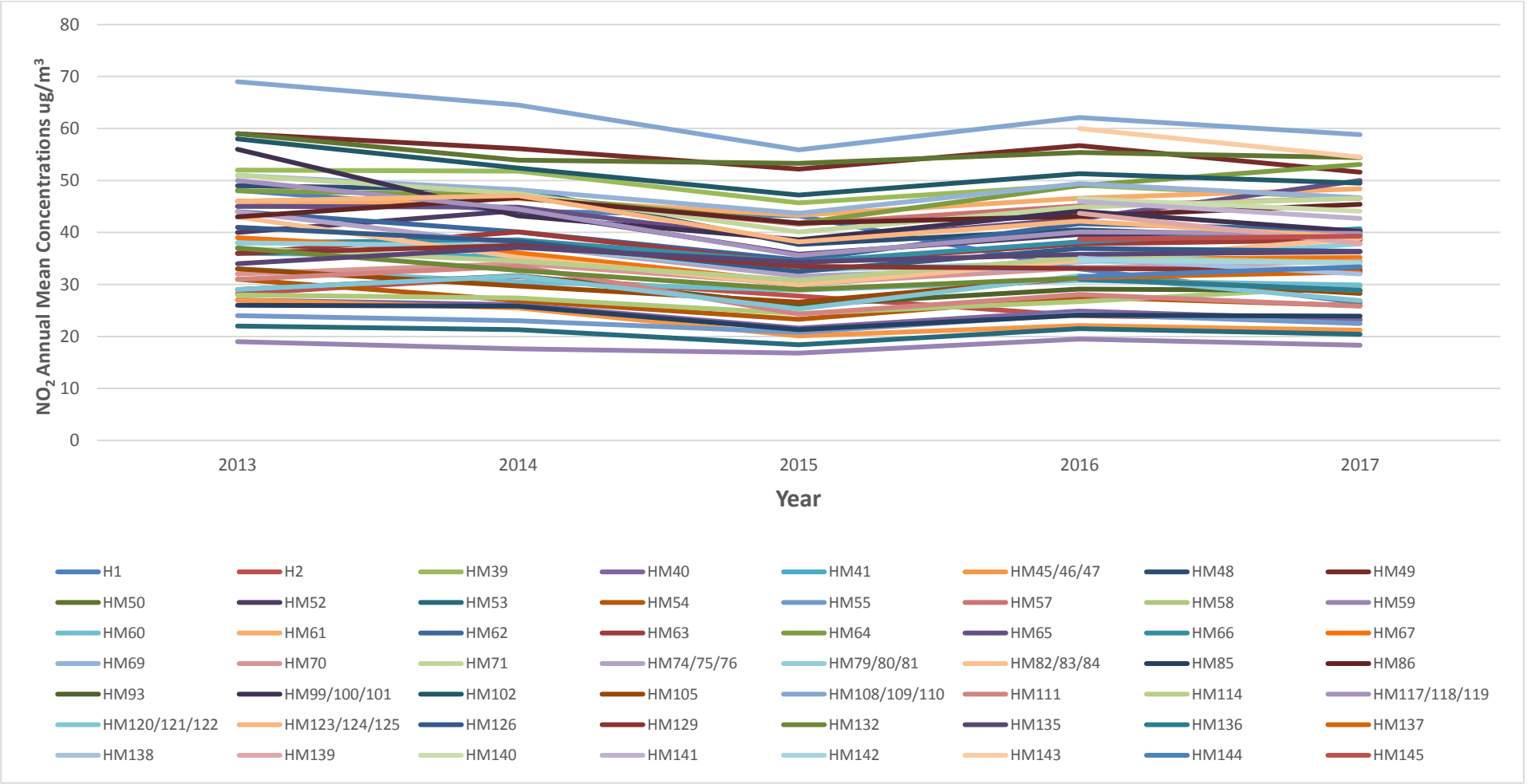


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2013	2014	2015	2016	2017
Hertsmere Borehamwood Roadside (H1)	Roadside	Automatic	53.82	53.82	N/A	0 (166)	0	2	1 (150)
Hertsmere Hertswood School (H2)	Urban Background	Automatic		39.03	0 (96)	0	0	0	0
Hertsmere Borehamwood Bowling Club (H3)	Urban Background	Automatic		35.43	-	-	-	-	0

Notes:

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

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

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

Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2013	2014	2015	2016	2017
Hertsmere Borehamwood Roadside (H1)	Roadside	45.50	45.50	-	21	21.8	19	20
Hertsmere Hertswood School (H2)	Urban Background		38.81	-	16	14.7	14	18
Hertsmere Borehamwood Bowling Club (H3)	Urban Background		59.42	-	-	-	-	13

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold.**

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.2 – Trends in Annual Mean PM_{10} Concentrations

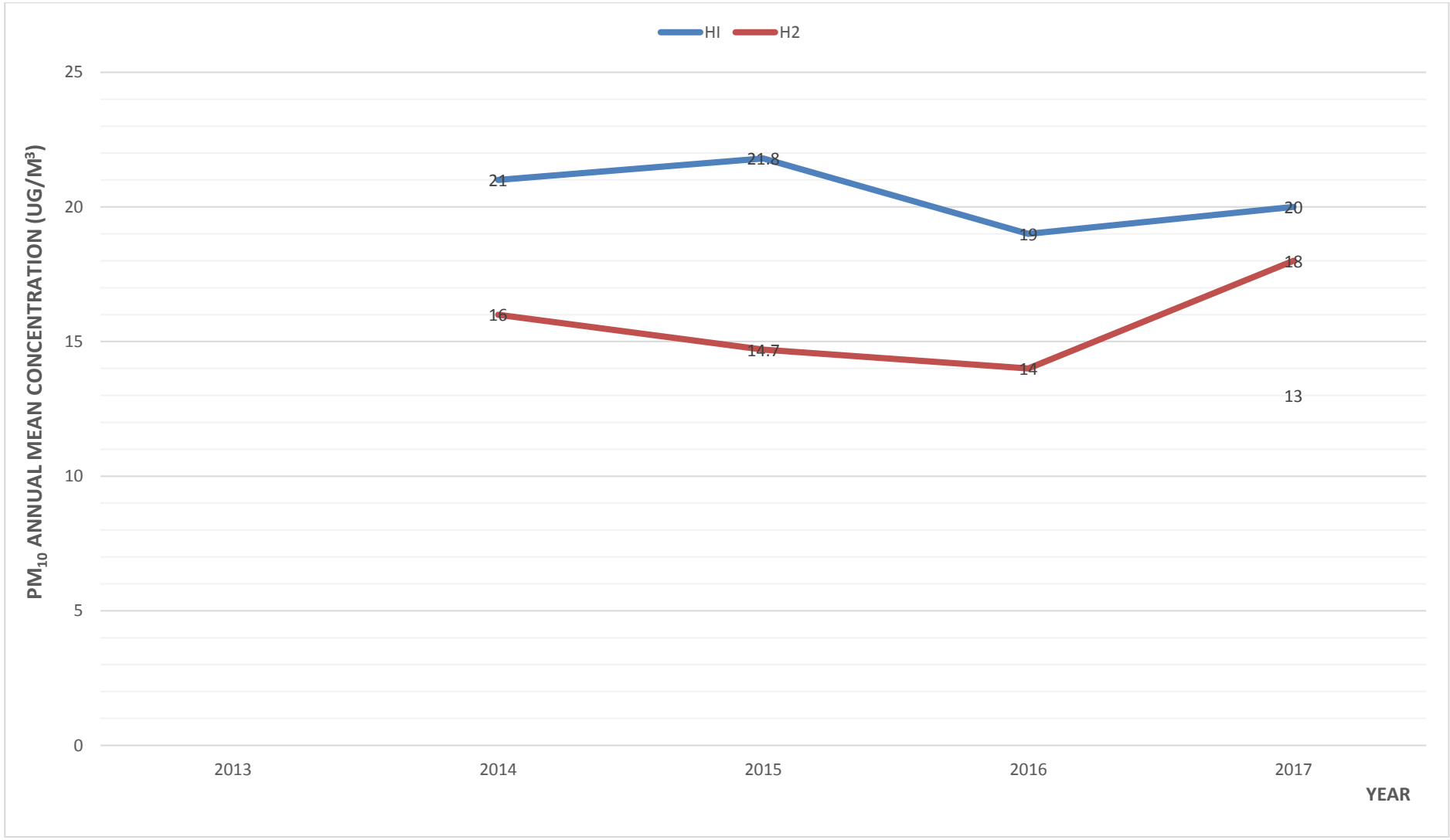


Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2013	2014	2015	2016	2017
Hertsmere Borehamwood Roadside (H1)	Roadside	45.5	45.5	-	1 (42)	8	5	4
Hertsmere Hertswood School (H2)	Urban Background		38.81	1 (38)	5	4	1	3
Hertsmere Borehamwood Bowling Club (H3)	Urban Background		59.4	-	-	-	-	0

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold.**

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	$PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$) (3)				
				2013	2014	2015	2016	2017
Hertsmere Borehamwood Roadside (H1)	Roadside	45.66	45.66	-	15.3	12	12	15
Hertsmere Hertswood School (H2)	Urban Background		38.82	-	11.4	9	10	12
Hertsmere Borehamwood Bowling Club (H3)	Urban Background		59.34	-	-	-	-	8

☒ **Annualisation has been conducted where data capture is <75%**

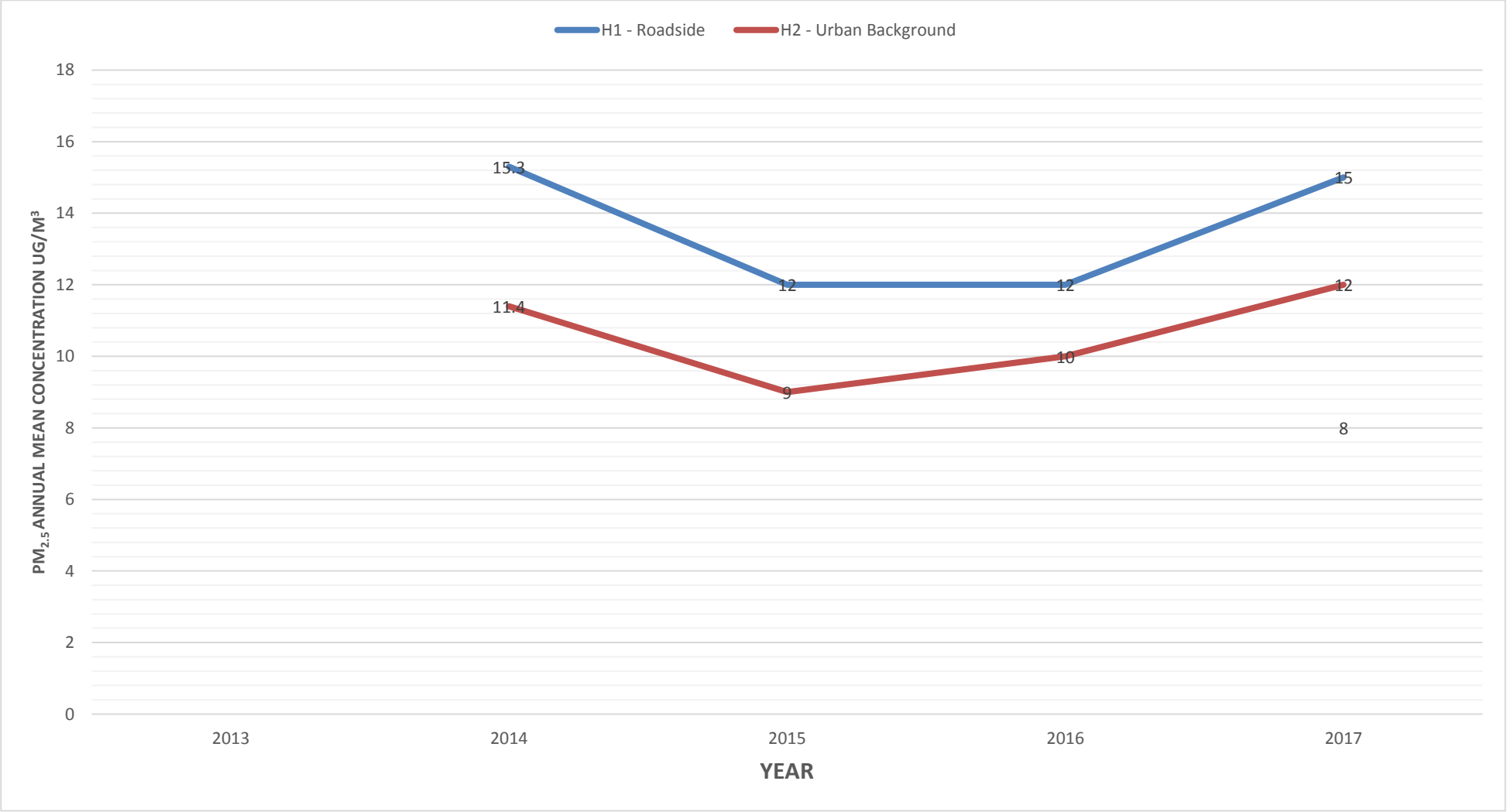
Notes:

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2017

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.89) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
HM39	70.2	55.9	51.6	50.6	46.7	51.5	40.5	42.6	46.0	45.9	59.3	67.5	52.4	**46.6**	35.8
HM40	48.6	34.7	27.0	22.6	23.5	19.6	18.0	18.8	23.0	24.9	N/A	N/A	26.1	23.2	23.2
HM41	58.12	42.34	35.93	40.39	34.49	35.44	30.32	29.32	37.25	32.66	44.63	40.08	38.4	34.2	34.2
HM45/46/47	49.02	32.84	25.47	20.5	20.48	9.57	15.65	17.67	20.03	22.18	28.41	24.67	23.9	21.2	21.2
HM48	58.25	45.32	43.16	40.06	45.87	43.41	36.46	36.39	43.38	44.06	45.3	41.15	43.6	38.8	33.3
HM49	89.09	59.96	52.41	53.13	N/A	55.63	48.37	49.14	53.32	55.51	67.89	53.71	58.0	**51.6**	39.2
HM50	96.37	61.43	56.57	56.32	68.06	57.09	48.65	51.74	59.08	55.47	59.29	63.35	61.1	**54.4**	38.2
HM52	70.47	48.73	44.35	43.81	35.57	43.7	35.95	36.76	43.52	42.15	45.14	43.86	44.5	39.6	36.3
HM53	45.24	28.19	22.45	18.14	N/A	14.96	15.17	16.92	20.1	19.04	26.64	24.6	22.9	20.4	20.4
HM54	52.67	37.39	28.39	26.97	28.64	22.24	20.64	22.46	26.68	21.84	33.36	28.57	29.1	25.9	25.9
HM55	47.92	31.1	22.97	20.89	22.93	19.48	16.26	21.85	21.21	22.61	29.75	26.26	25.3	22.5	22.5
HM57	69.91	74.44	57.11	51.41	43.54	50.56	43.32	34.98	47.41	47.37	55.16	53.85	52.4	**46.6**	36.7
HM58	49.21	34.04	34.22	26.07	24.21	25.87	N/A	N/A	29.36	30.26	38.46	39.89	33.2	29.5	29.6
HM59	36.49	24.68	21.19	16.37	16.29	15.21	14.68	15.95	19.04	18.81	25.07	23.23	20.6	18.3	18.3
HM60	50.02	33.46	38.65	36.2	26.53	26.79	25.05	26.89	27.76	30.15	43.84	38.34	33.6	29.9	29.9

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.89) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
HM61	71.05	48.31	63.88	53.89	41.88	51.17	47.29	48.04	52.13	53.83	59.58	61.98	54.4	**48.4**	**41.8**
HM62	67.17	50.83	44.42	46.48	38.22	44.68	38.06	37.52	41.7	42.25	44.73	48.49	45.4	**40.4**	31.6
HM63	68.32	47.41	47.21	34.5	39.97	44.74	37.55	34.7	37.11	42.95	39.91	46.21	43.4	38.6	34.6
HM64	73.57	50.1	48.43	56.41	48.74	71.73	48.77	47.95	51.6	69.65	79.39	69.7	59.7	**53.1**	33.4
HM65	72.66	47.44	55.63	52.05	48.74	56.55	43.67	47.91	44.67	68.07	67.6	69.8	56.2	**50.0**	39.8
HM66	66.88	51.87	35.92	43.12	37.28	43.05	34.65	37.81	37.11	53.63	56.47	50.71	45.7	**40.7**	34.8
HM67	54.24	38.51	55.81	36.72	35.4	33.66	28.51	N/A	32.44	38.2	42.97	39.31	39.6	35.2	35.2
HM69	70.07	52.72	44.98	53.64	43.84	48.62	43.61	46.87	47.85	60.05	58.53	58.79	52.5	**46.7**	37.1
HM70	54.47	42.19	37.32	32.05	30.07	37.41	29.47	31.1	38	37.68	48.27	47.99	38.8	34.5	34.5
HM71	70.06	52.09	56.73	51.33	41.15	68.74	36.25	45.96	46.16	46.43	60.97	53.18	52.4	**46.6**	37.7
HM74/75/76	58.7	42.37	57.79	33.71	34.23	32.71	28.8	26.94	32.08	32.6	40.73	38.69	37.1	33.0	33.0
HM79/80/81	60.78	42.65	50.67	37.29	38.62	34.78	30.99	30.92	34.85	47.69	52.11	47.59	42.4	37.7	29.1
HM82/83/84	65.93	49.65	40.41	46.36	33.75	44.26	38.79	39.25	44.05	37.65	41.24	43.14	43.7	38.9	28.9
HM85	51.08	26.7	28.19	22.11	19.87	19.29	16.39	19.31	24.57	24.7	36.01	35.06	26.9	23.9	23.9
HM86	72.73	55.04	55	46.68	41.91	44.93	42.65	47.81	48.45	38.87	59.45	57.92	51.0	**45.4**	32.8
HM93	52.29	32.81	39.56	28.05	24.02	27.13	24.54	25.25	30.7	30.23	36.52	37.49	32.3	28.7	28.8
HM99/100/101	68.37	45.37	42.73	45.8	40.84	42.79	41.3	40.35	39.39	38.34	49.46	46.04	45.1	**40.2**	36.9
HM102	86.01	N/A	50.14	55.48	48.26	52.2	44.5	41.35	53.22	55.97	61.42	63.3	55.6	**49.5**	37.0
HM105	55.41	42.96	30.31	26.08	30.89	24.86	22.5	24.02	27.32	29.85	33.84	33.83	31.8	28.3	28.3
HM108/109/110	96.78	70.62	75	61.15	66.37	63.99	56.67	50.9	60.76	62.85	59.73	67.76	66.1	**58.8**	38.7

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.89) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
HM111	50.05	35.57	26.91	25.37	30.22	26.4	22.18	22.17	27.34	22.52	31.53	28.19	29.0	25.8	25.8
HM114	57.95	41.45	38.58	37.94	33.18	36	31.43	31.42	31.09	36.41	46.47	38.79	38.4	34.2	34.2
HM117/118/119	67.36	45.96	38.39	48.56	44.78	48.24	36.57	36.95	38.38	35.05	52.11	44.52	44.7	39.8	34.1
HM120/121/122	54.44	33.13	31.57	22.55	25.95	23.17	20.44	22.96	27.36	31.69	35.35	34.13	30.2	26.9	26.9
HM123/124/125	69.03	49.46	47.16	45.66	N/A	N/A	N/A	41.04	N/A	43.11	46.08	45.39	48.8	39.1	26.4
HM126	61.78	47.09	33.35	37.52	40.76	36.72	31.85	36.4	40.23	35.67	47.09	41.87	40.9	36.4	28.3
HM129	49.74	37.45	33.61	33.46	29.42	34.85	34.35	32.62	34.63	39.17	43.43	37.77	36.7	32.7	32.7
HM132	52.82	33.82	29.66	30.79	31.31	27.61	26.43	23.85	29.68	27.07	38.77	35.24	32.3	28.7	28.8
HM135	57.48	43.48	43.07	37.05	29.8	36.55	29.05	42.73	37.19	38.05	49	45.88	40.8	36.3	34.9
HM136	43.28	36.39	33.21	30.77	30.96	29.58	26.49	26.44	31.89	31.88	37.02	N/A	32.5	28.9	28.9
HM137	58.07	41.81	31.71	31.9	32.04	N/A	25.69	N/A	30.33	32.31	39.95	40.08	36.4	32.4	32.4
HM138	N/A	N/A	36.58	33.71	34.7	36.2	30.68	31.52	34.34	34.74	43.1	43.27	35.9	32.0	32.0
HM139	67.68	46.54	41.38	35.28	47.24	42.52	32.31	33.03	37.45	N/A	43.06	42.45	42.6	37.9	33.1
HM140	68.75	52.02	50.61	44.28	61.93	49.55	44.37	38.56	43.03	43.49	50.32	48.71	49.6	**44.1**	37.6
HM141	70.84	57.32	46.89	42.74	46.27	45.67	38.65	41.84	45.09	42.07	44.23	54.49	48.0	**42.7**	34.2
HM142	55.24	39.84	N/A	32.01	32.67	32.54	30.18	34.74	33.89	37.85	45.15	46.69	38.3	34.1	34.1
HM143	87.15	63.84	N/A	62.77	55.57	52.64	54.19	40.24	56.42	56.53	70.51	73.08	61.2	**54.5**	38.6
HM144	58.11	43.38	38.22	32.04	31.1	31.8	28.17	32.32	31.56	39.29	46	38.34	37.5	33.4	33.4
HM145	67.15	44.25	50.53	38.09	39.46	41.17	34.37	36.07	39.73	34.03	56.85	48.71	44.2	39.3	28.4

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

New Pollution Sources and Developments

Changed and new sources of pollution have been investigated and any changes to existing sources or new sources are listed below:

New or Existing Source	Screening Assessment Required?
Narrow Congested Streets with residential properties close to the kerb	No
Busy Streets where people may spend 1-hour or more close to traffic	No
Roads with a high flow of buses and/or HGV	No
Junctions	Elstree Way/ Manor Way Borehamwood. New exposure introduced. Tubes read high but AQMS not. Shenley Road joining AQMA. Monitoring will continue.
New roads constructed since the last round of Review and Assessment	No
New roads constructed since the last round of Review and Assessment	No
Bus and coach stations	No
Railway (diesel and steam trains)	No
Industrial installations (new installations and those with significantly increased emissions)	1 Dry Cleaners, 2 Paint &Body sprayers, 1 mobile crusher. None will impact on air quality objectives.
Major petrol storage depots	No
Petrol Stations	No
Poultry farms	No
Biomass combustion (including domestic solid-fuel burning for PM10)	Three farms within Hertsmere have biomass boilers, but no assessments undertaken. It is considered unlikely due to their position in relation to exposure, that there will be issues in relation to the air quality objectives.
CHP installations	No
Domestic solid-fuel burning (SO2)	No
Quarries, landfill sites, opencast coal mining, waste transfer sites, materials handling (i.e. ports, major construction sites)	No
New Developments	Hertsmere Local Plan is about to be consulted on. No specific new developments relevant to local air quality.

QA/QC of Real Time Sites

Air quality measurements from automatic monitoring stations operated by Hertsmere Council in 2017 were validated and ratified to the standards described in the Local Air Quality Management – Technical Guidance LAQM TG(16) by Air Quality Data Management (AQDM). In addition, site H3 Borehamwood Bowling Club was adopted into AURN in October 2017.

QA/QC of Diffusion Tube Monitoring

Diffusion Tube Annualisation

One triplicate diffusion tube site (HM123/124/125) has lower than 75% data capture. Annualisation for 2017 has been undertaken using the continuous monitoring site approach detailed within Box 7.10 within LAQM (TG16). The factor applied to diffusion tube results are detailed within Table C1.

Table C1: 2017 Diffusion Tube Annualisation

		London Haringey Priory Park South	London N. Kensington	London Bloomsbury AURN
HM123/124/125	**Annual Mean(µg/m^3)**	24.5	32.8	37.8
	Period Mean (µg/m^3)	27.9	36.4	40.9
	Ratio	0.88	0.90	0.93
	Annualisation Factor	**0.90**		

Bias Adjustment

For 2017, the national bias-adjustment factor for Gradko International is 0.89 (National Diffusion Tube Bias Adjustment Factor Spreadsheet 03/18, see Figure C3). There was a single co-location study conducted in 2017 at Borehamwood Background automatic monitoring site. A local bias adjustment factor has not been calculated as the data capture for the real time site was too low. It is anyway considered more appropriate to apply the national bias adjustment factor (0.89) in order to be consistent with other air quality reports, and as the national bias adjustment factor is based on a significantly greater number of studies than the local bias adjustment factor.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/18

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 2018
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@uk.bureauveritas.com or 0800 0327953

Analysed By[1]	Method	Year[5]	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	2017	UB	Bracknell Forest Borough Council	11	19	16	23.0%	G	0.81
Gradko	20% TEA in water	2017	R	Bracknell Forest Borough Council	12	47	39	21.7%	G	0.82
Gradko	20% TEA in water	2017	R	Brighton & Hove City Council	11	51	50	1.6%	G	0.98
Gradko	20% TEA in water	2017	R	Wokingham Borough Council	11	39	37	4.6%	G	0.96
Gradko	20% TEA in water	2017	UC	Southampton City Council	11	31	29	5.3%	G	0.95
Gradko	20% TEA in water	2017	R	Preston City Council	12	31	26	23.3%	G	0.81
Gradko	20% TEA in water	2017	R	Monmouthshire County Council	9	42	33	26.6%	G	0.79
Gradko	20% TEA in water	2017	R	Cheshire West and Chester	11	36	36	1.4%	G	0.99
Gradko	20% TEA in water	2017	UI	Crawley Borough Council	12	28	28	-1.2%	G	1.01
Gradko	20% TEA in water	2017	R	Borough Council of King's Lynn & West Norfolk	12	29	25	16.0%	G	0.86
Gradko	20% TEA in water	2017	R	Bath & North East Somerset	12	45	45	-0.2%	G	1.00
Gradko	20% TEA in water	2017	R	NOTTINGHAM CITY COUNCIL	12	38	41	-6.6%	G	1.07
Gradko	20% TEA in water	2017	R	Lancaster City Council	12	35	32	9.7%	G	0.91
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	12	54	52	3.3%	S	0.97
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	11	35	33	7.0%	G	0.93
Gradko	20% TEA in water	2017	R	Thurrock Borough Council	9	33	29	14.3%	G	0.87
Gradko	20% TEA in water	2017	UB	Thurrock Borough Council	11	30	28	8.0%	S	0.93
Gradko	20% TEA in water	2017	R	Dudley MBC	12	50	50	0.8%	G	0.99
Gradko	20% TEA in water	2017	UB	Dudley MBC	12	24	19	26.6%	G	0.79
Gradko	20% TEA in water	2017	R	City of Lincoln Council	12	42	31	33.2%	G	0.75
Gradko	20% TEA in water	2017	R	Gedling Borough Council	12	35	31	10.1%	G	0.91
Gradko	20% TEA in water	2017	R	Gateshead Council	12	36	37	-2.7%	G	1.03
Gradko	20% TEA in water	2017	R	Gateshead Council	12	29	25	17.5%	G	0.85
Gradko	20% TEA in water	2017	R	Gateshead Council	12	34	35	-5.3%	G	1.06
Gradko	20% TEA in water	2017	R	LB Hounslow	12	65	54	22.2%	G	0.82
Gradko	20% TEA in water	2017	R	LB Hounslow	12	59	53	10.6%	G	0.90
Gradko	20% TEA in water	2017	B	LB Hounslow	11	28	30	-6.0%	G	1.06
Gradko	20% TEA in water	2017	R	LB Hounslow	11	43	34	28.8%	G	0.78
Gradko	20% TEA in water	2017	B	LB Hounslow	9	38	33	14.9%	G	0.87
Gradko	20% TEA in water	2017	R	LB Hounslow	11	52	42	24.4%	G	0.80
Gradko	20% TEA in water	2017	UB	Liverpool	11	20	17	15.2%	G	0.87
Gradko	20% TEA in water	2017	R	North Ayrshire Council	12	26	21	23.2%	G	0.81
Gradko	20% TEA in water	2017	R	South Gloucestershire Council	12	25	23	10.3%	G	0.91
Gradko	20% TEA in water	2017	KS	Marylebone Road Intercomparison	12	101	79	28.6%	G	0.78
Gradko	20% TEA in water	2017		Overall Factor[3] (34 studies)				Use		0.89

Figure C3: National Bias Adjustment Factor

Diffusion Tube QA/QC

Nitrogen dioxide analysis procedures are compliant with the Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for users and laboratories (February 2008). The diffusion tubes are supplied and analysed by Gradko utilising the 20% TEA in water preparation method. Gradko maintains a UKAS accredited quality system with fully documented in house methods for all analysis procedures. The concentration of nitrogen dioxide is determined for exposed diffusion tubes using method GLM 9. Gradko was assessed as part of the Workplace Analysis Scheme for Proficiency (WASP). In WASP AIR-PT-Rounds 18 to 22 (January 2017 to October 2017) Gradko was 100% satisfactory in all WASP trials.

Distance Correction

29 of the diffusion tube sites required distance correction. The concentrations at these sites have therefore been distance corrected to the nearest exposure using the NO_2 fall-off with distance calculator available on the LAQM Support website (https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html). Table C2 below shows the sites, parameters used for the fall-off with distance calculator and estimated concentration at the façade. Estimated background concentrations at each of the monitoring sites have been determined for 2017 using Defra's

background maps. These cover the whole of the UK on a 1x1 km grid and are published for each year from 2013 until 2030.

Table C2: Diffusion tube sites for Distance Correction

Monitoring site	Distance from monitoring site to kerb (m)	Distance from receptor to kerb (m)	Background concentration (µg/m^3)	Monitored concentration at site (µg/m^3)	Distance corrected concentration (µg/m^3)
HM39	1.3	8.3	19.304	46.6004	35.8
HM48	1.9	6.3	18.9637	38.804	33.3
HM49	1.1	7	18.9637	51.6378	39.2
HM50	1.2	10.7	18.9637	54.379	38.2
HM52	1.8	3.6	18.9637	39.605	36.3
HM57	1.8	11	22.60151	46.636	36.7
HM61	14.6	29.2	26.6377	48.416	41.8
HM62	3.1	15.6	19.57537	40.406	31.6
HM63	29.1	48.3	25.87644	38.626	34.6
HM64	2.1	13	19.6881	53.133	33.4
HM65	2.8	10.5	19.6881	50.018	39.8
HM66	3.0	8.9	19.6881	40.673	34.8
HM69	3.1	18.1	25.87644	46.725	37.1
HM71	1.5	5.8	16.46062	46.636	37.7
HM79/80/81	1.7	13.9	19.57537	37.7449	29.1
HM82/83/84	0.6	10.2	19.57537	38.9019	28.9
HM86	10.5	32.8	22.16445	45.39	32.8
HM99/100/101	2.4	4.3	17.53323	40.1568	36.9
HM102	0.5	4.1	17.27091	49.484	37
HM108/109/110	0.5	11.6	22.60151	58.7845	38.7
HM117/118/119	4.3	8.6	17.53323	39.783	34.1
HM123/124/125	3.6	38.1	19.3469	39.0888	26.4
HM126	2.4	16.2	18.9637	36.401	28.3
HM135	20.8	25.5	22.60151	36.312	34.9
HM139	2	8.17	19.304	37.914	33.1

Monitoring site	Distance from monitoring site to kerb (m)	Distance from receptor to kerb (m)	Background concentration (µg/m^3)	Monitored concentration at site (µg/m^3)	Distance corrected concentration (µg/m^3)
HM140	0.8	10.29	19.304	44.144	37.6
HM141	0.65	4.69	19.304	42.72	34.2
HM143	1.35	13.52	16.46062	54.468	38.6
HM145	1.4	7.97	19.6881	39.338	28.4

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Appendix D: Map(s) of Monitoring Locations and AQMAs

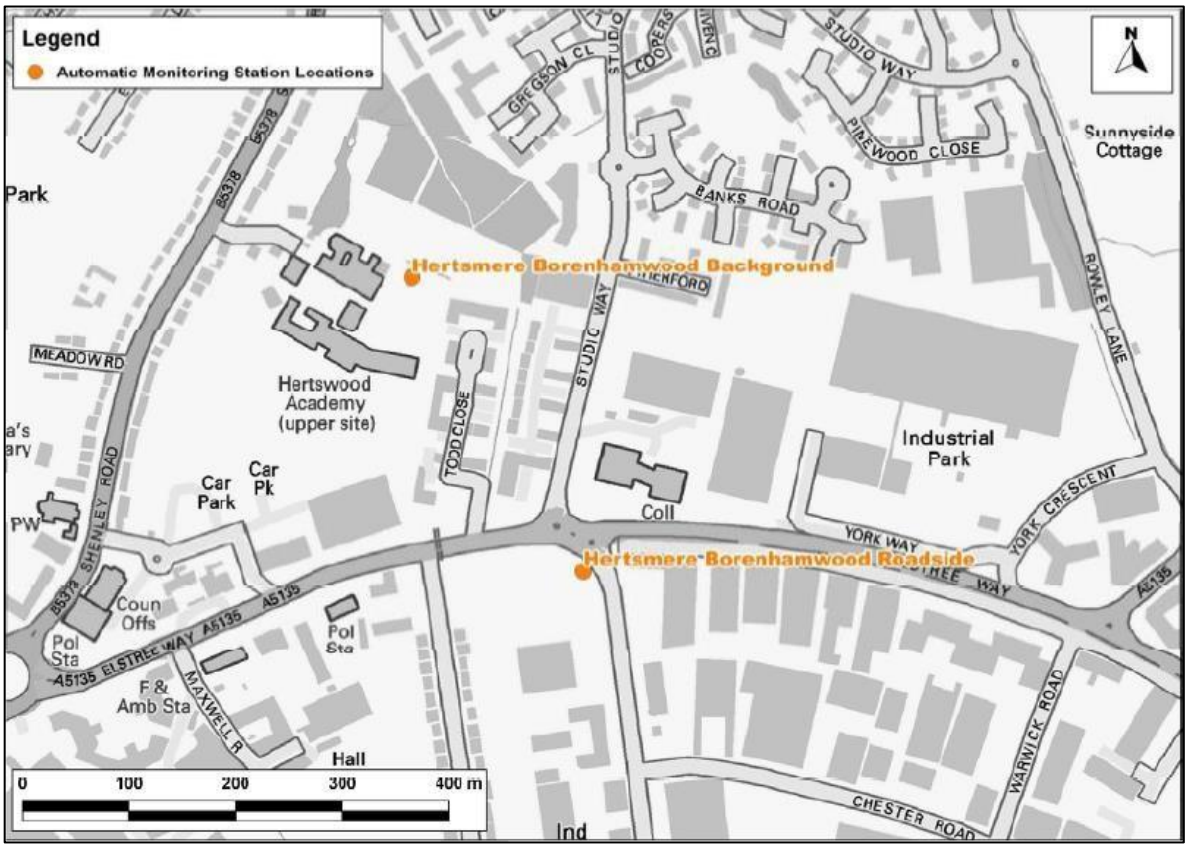

Figure D.1: Hertsmere Automatic Monitoring Station Locations

N.B The background automatic monitoring station was relocated from Hertswood secondary school to the Borehamwood Bowling club in May 2017.

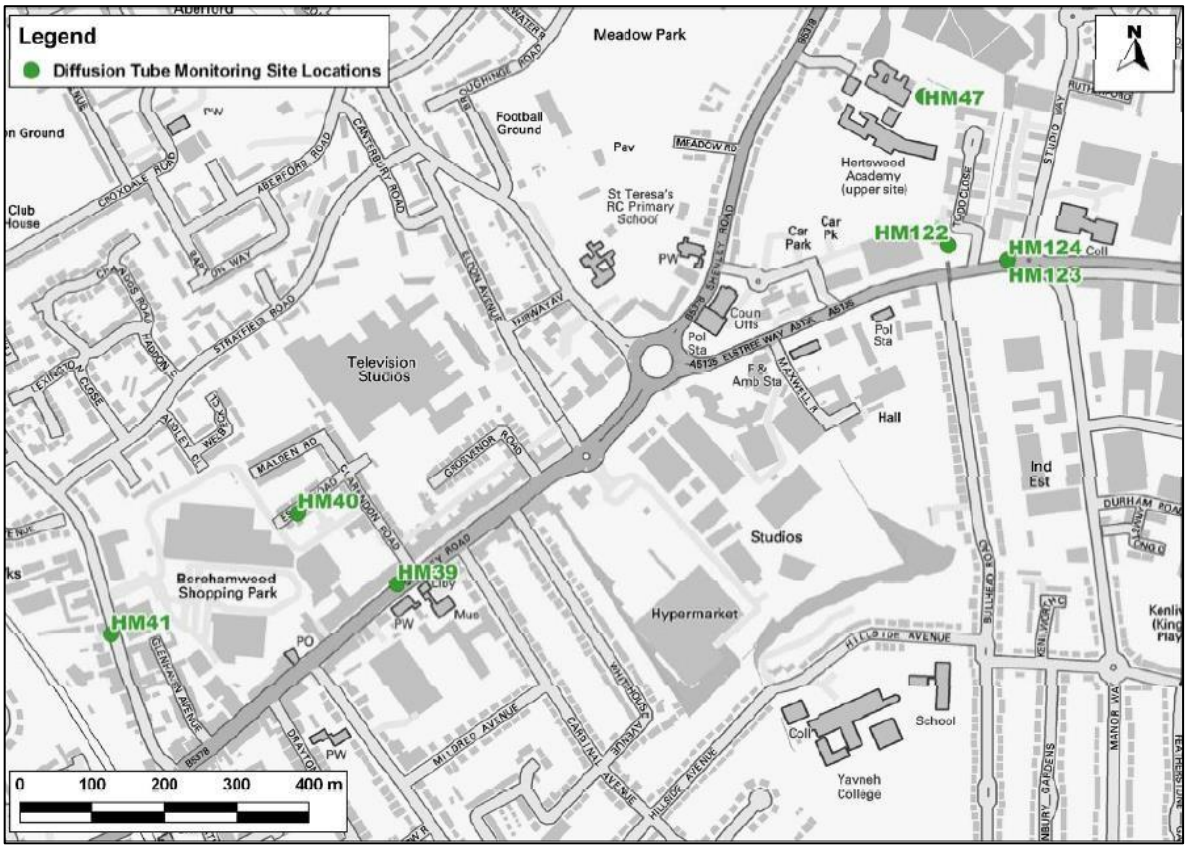

Figure D.2: Hertsmere Diffusion Tube Monitoring Site Location, Borehamwood Centre.

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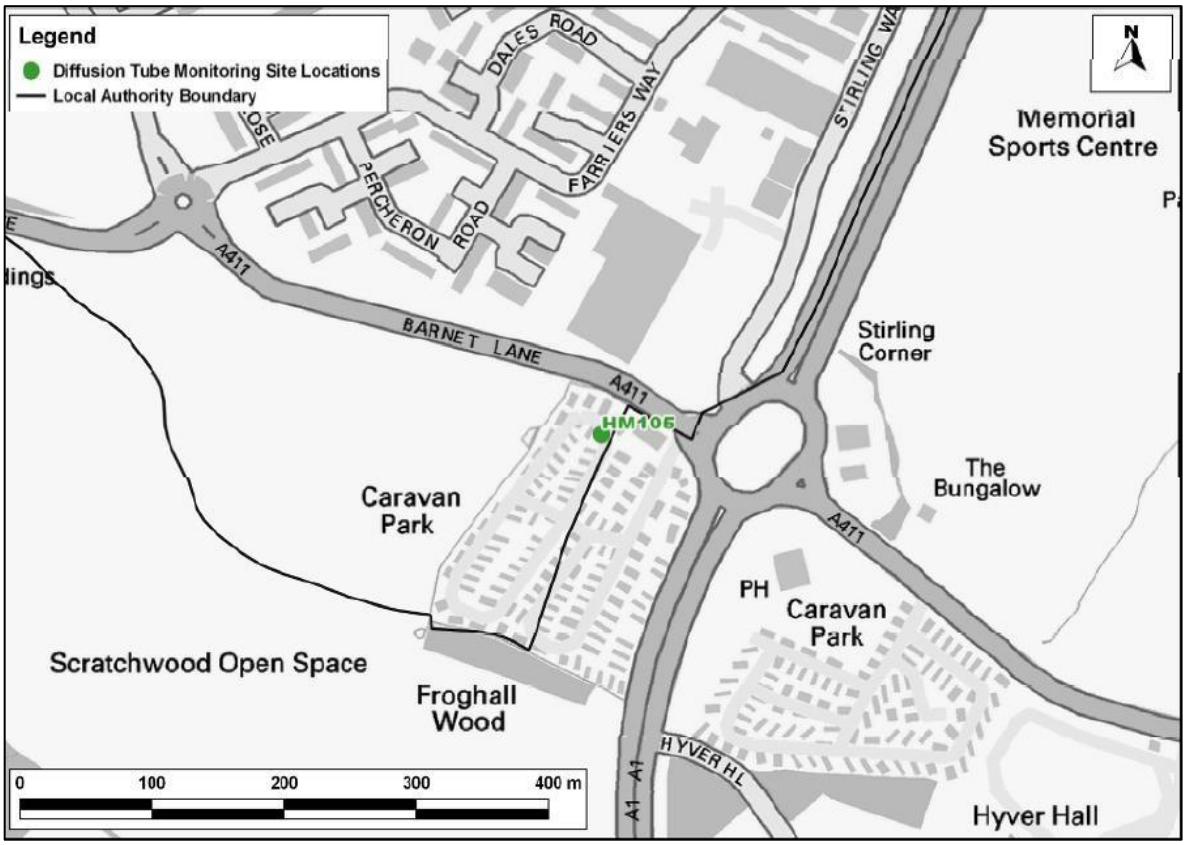

Figure D.3: Hertsmere Diffusion Tube Monitoring Site Location, Borehamwood South.

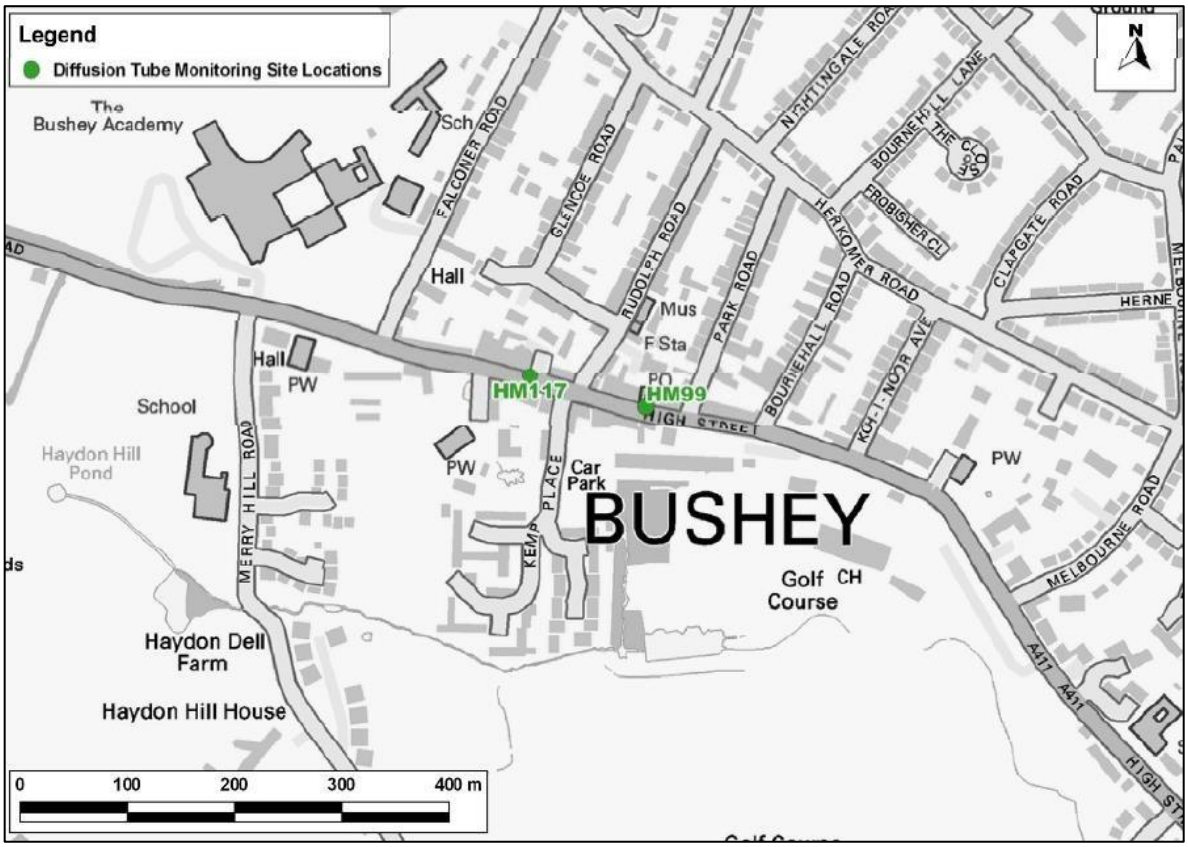

Figure D.4: Hertsmere Diffusion Tube Monitoring Site Locations, Northwest Bushey

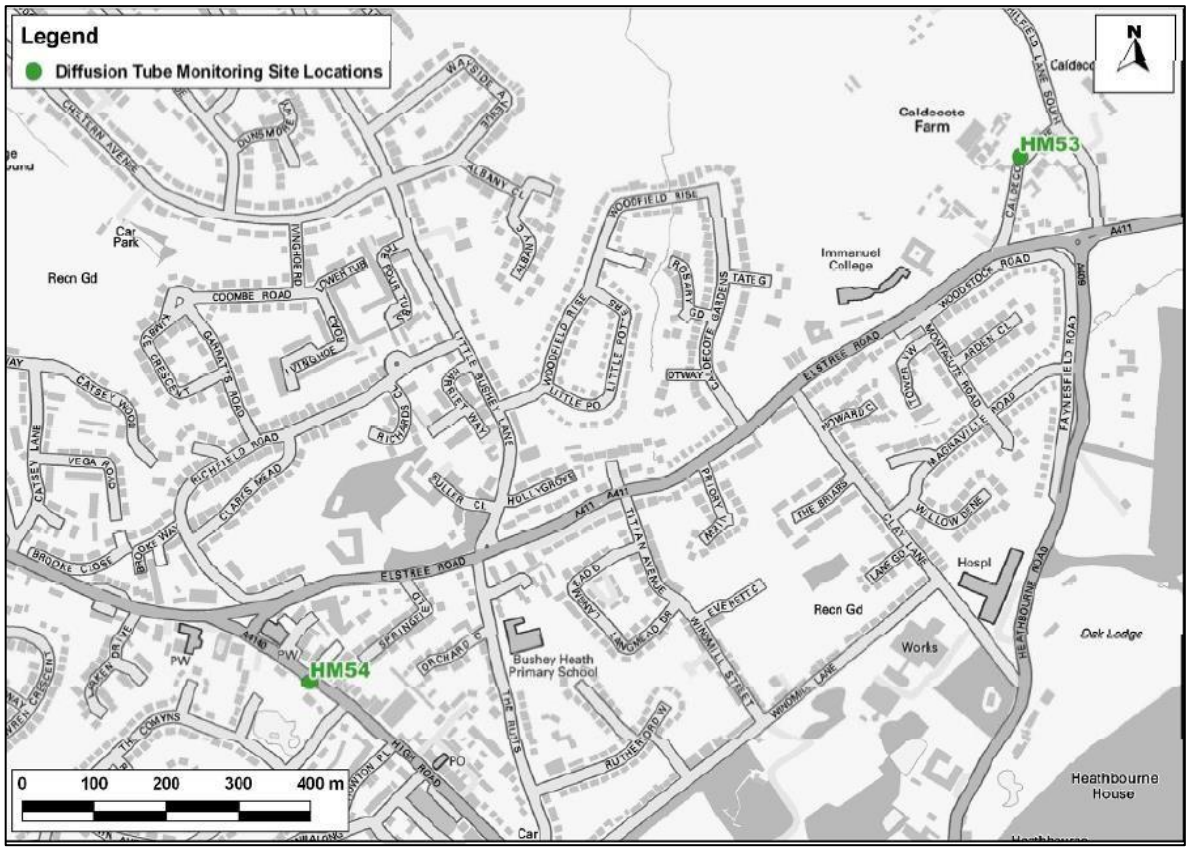

Figure D.5: Hertsmere Diffusion Tube Monitoring Site Locations, Southeast Bushey

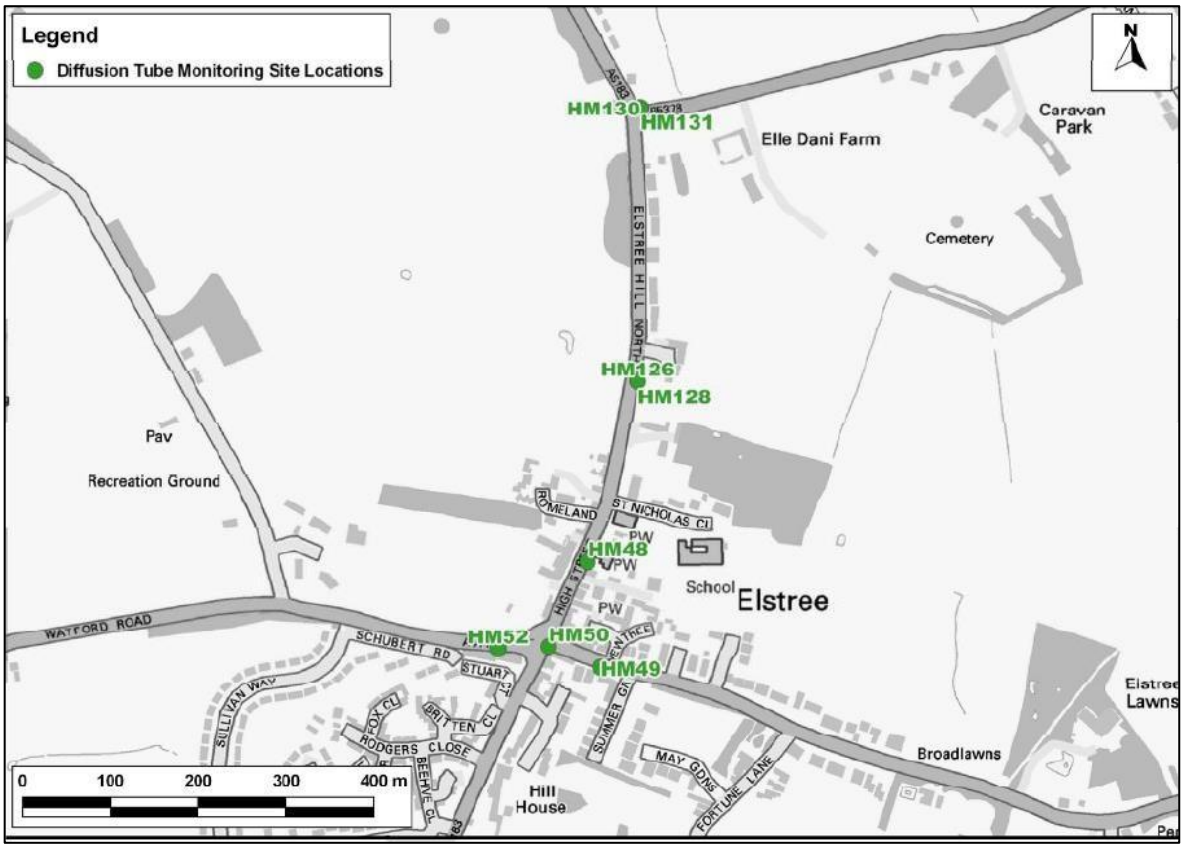

Figure D.6: Hertsmere Diffusion Tube Monitoring Site Locations, Elstree

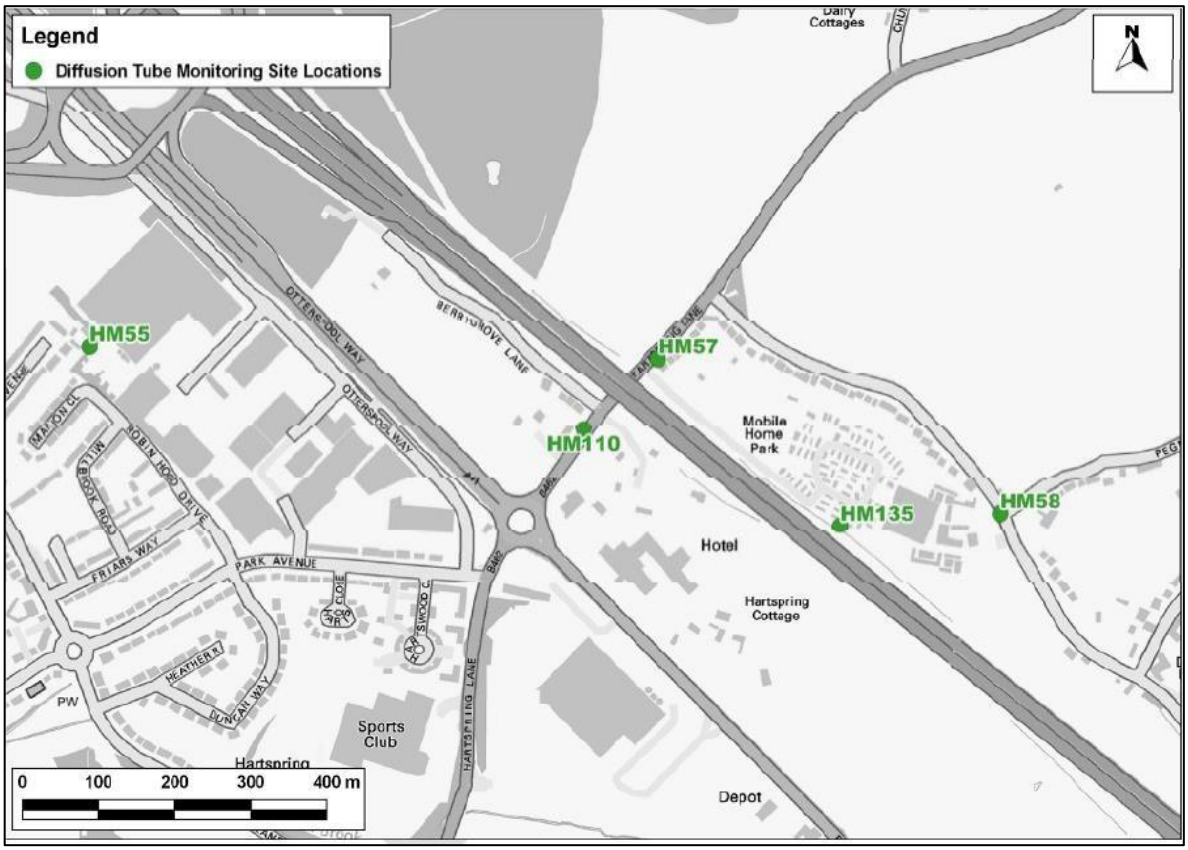

Figure D.7: Hertsmere Diffusion Tube Monitoring Site Locations, M1 near Aldenham

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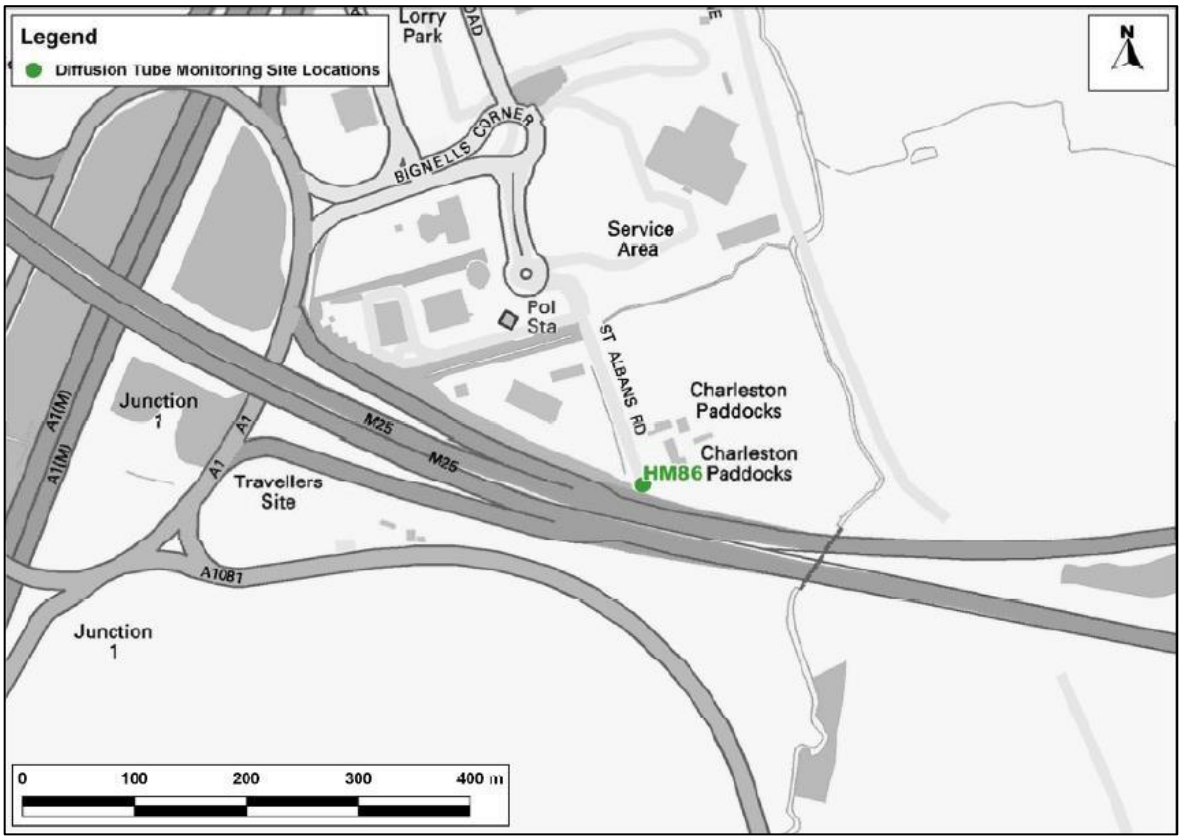

Figure D.8: Hertsmere Diffusion Tube Monitoring Site Location, M25 near junction 1 A1, South Mimms.

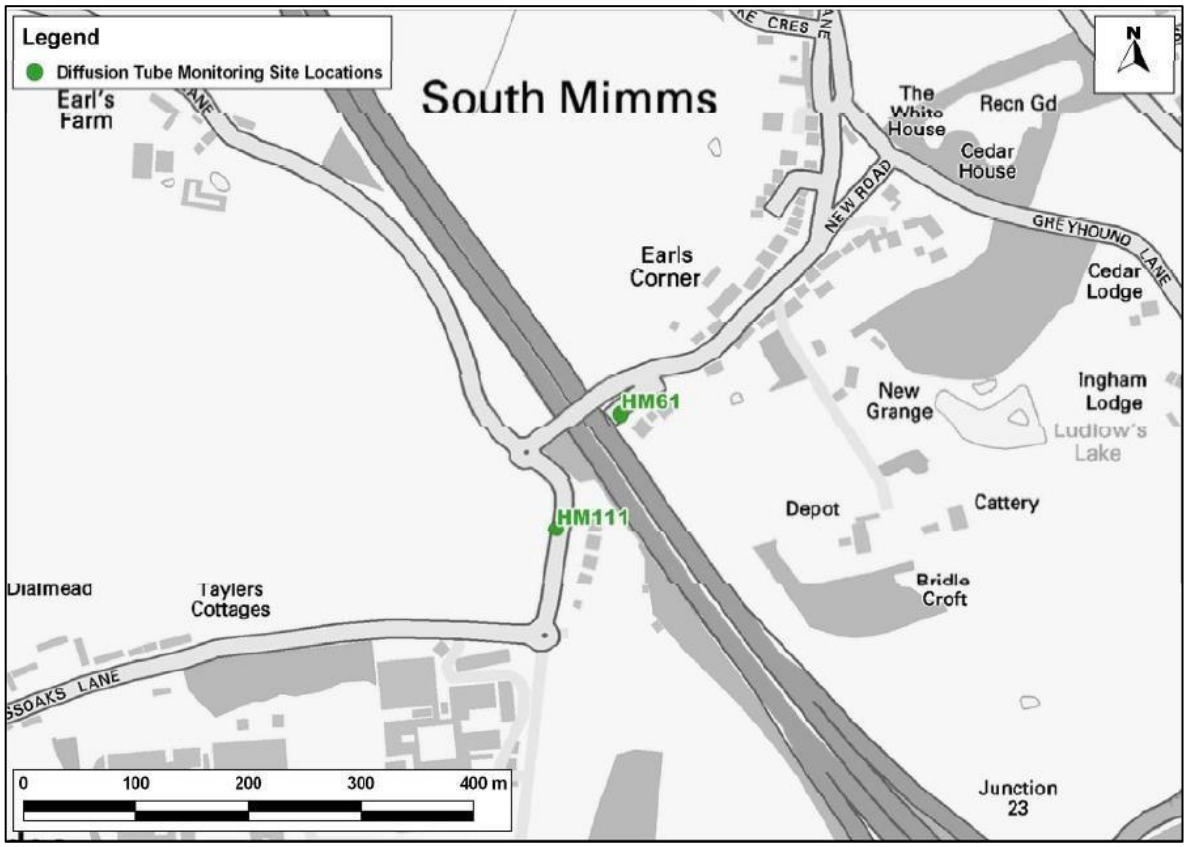

Figure D.9: Hertsmere Diffusion Tube Monitoring Site Locations, M25 near Junction 23 South Mimms.

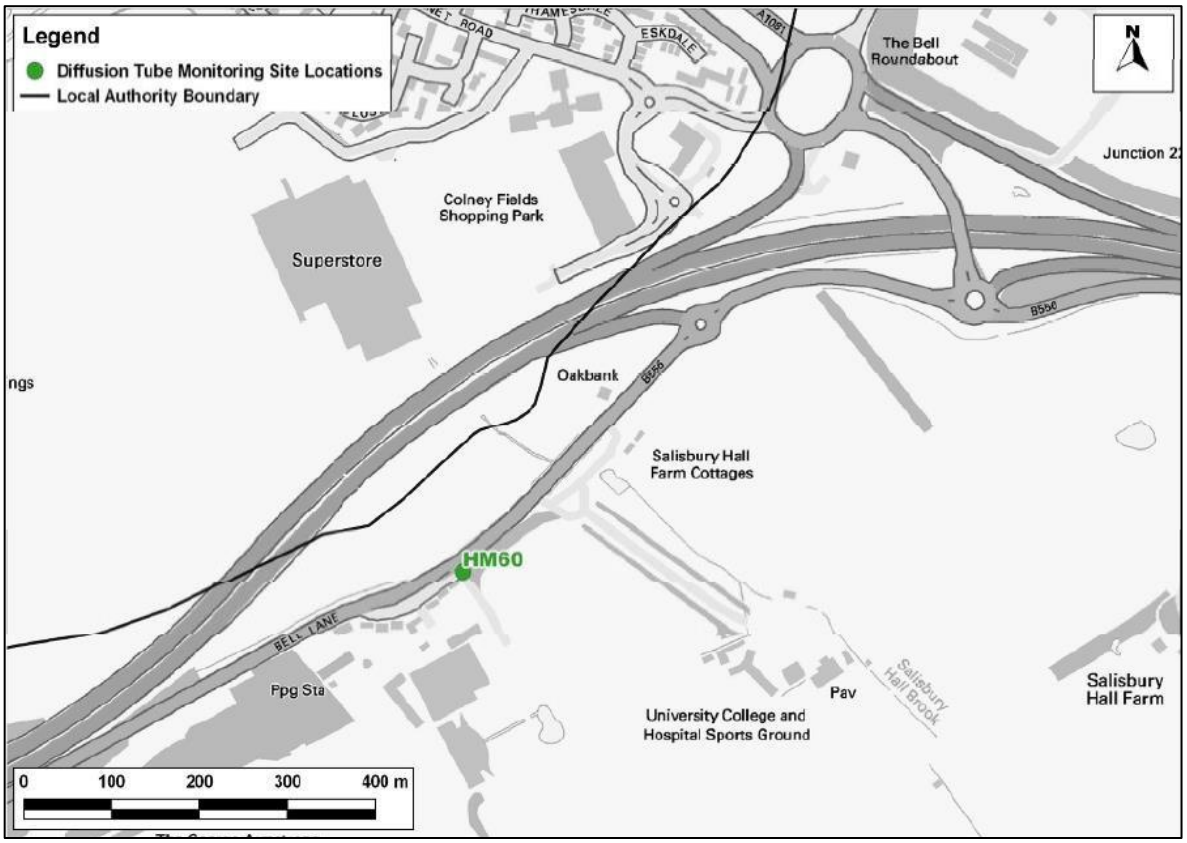

Figure D.10: Hertsmere Diffusion Tube Monitoring Site Location, M25 near Junction 22

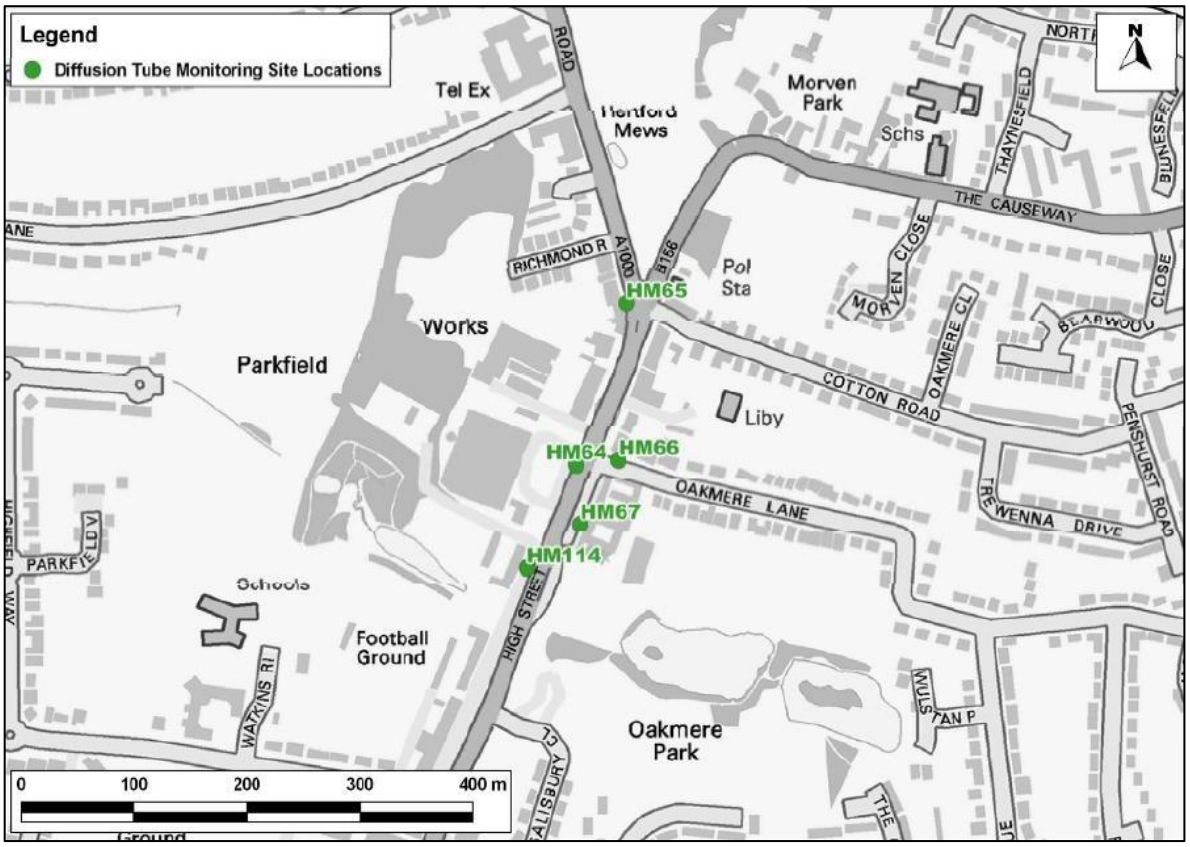

Figure D.11: Hertsmere Diffusion Tube Monitoring Site Locations, Potters Bar Centre

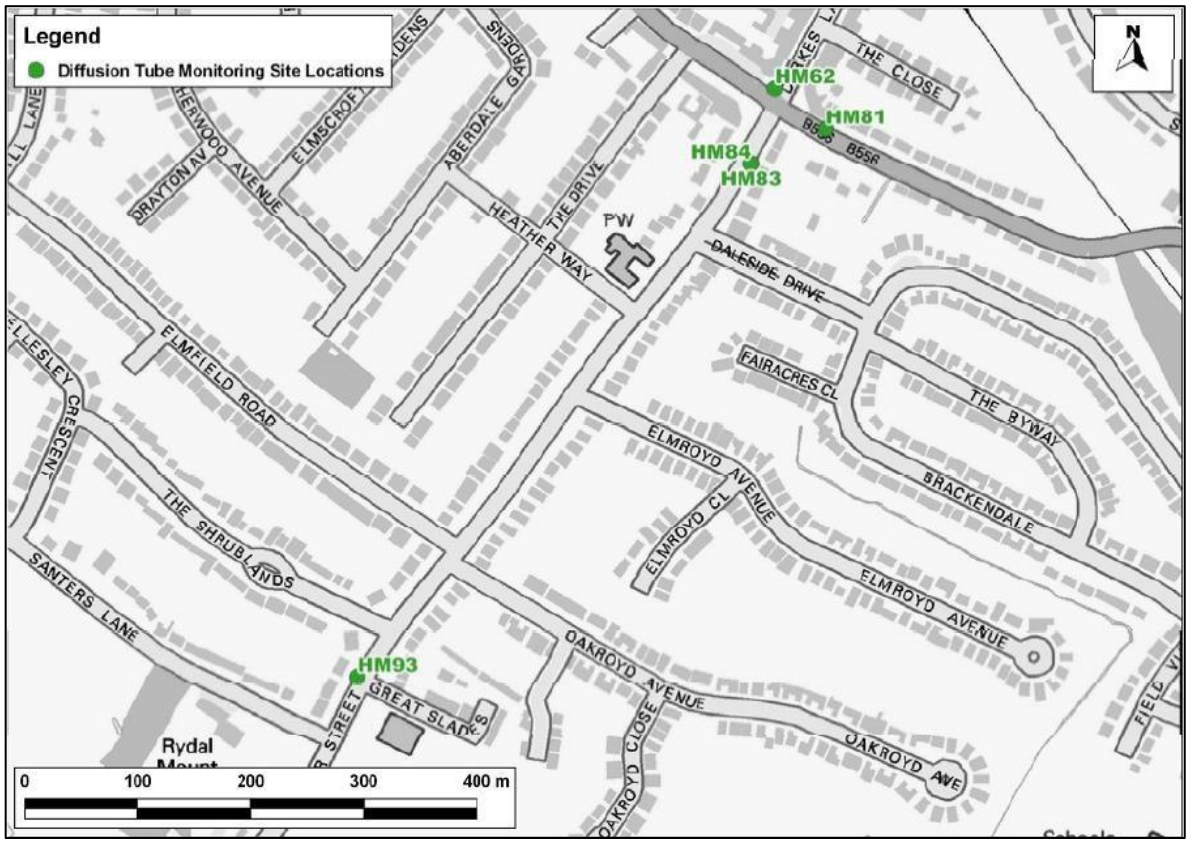

Figure D.12: Hertsmere Diffusion Tube Monitoring Site Locations, Potters Bar South west.

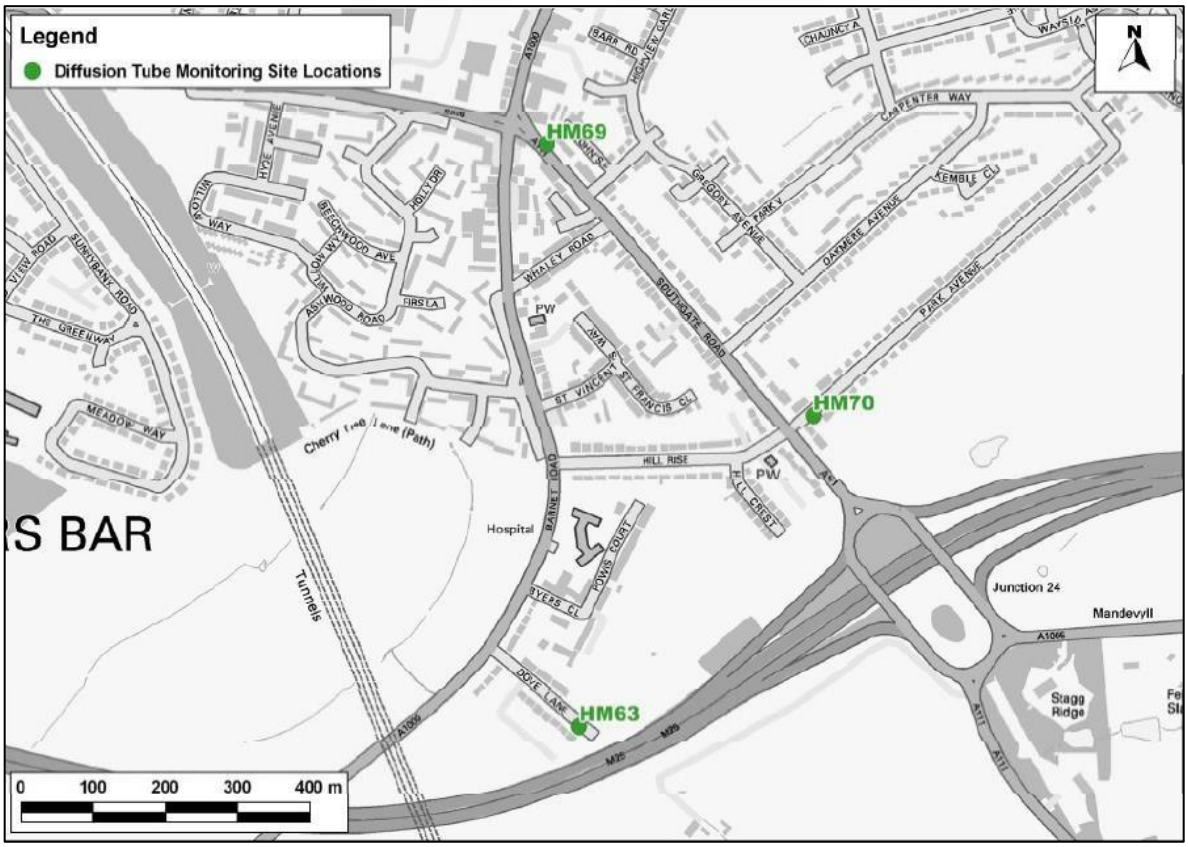

Figure D.13: Hertsmere Diffusion Tube Monitoring Site Locations, Potters Bar South, near M25

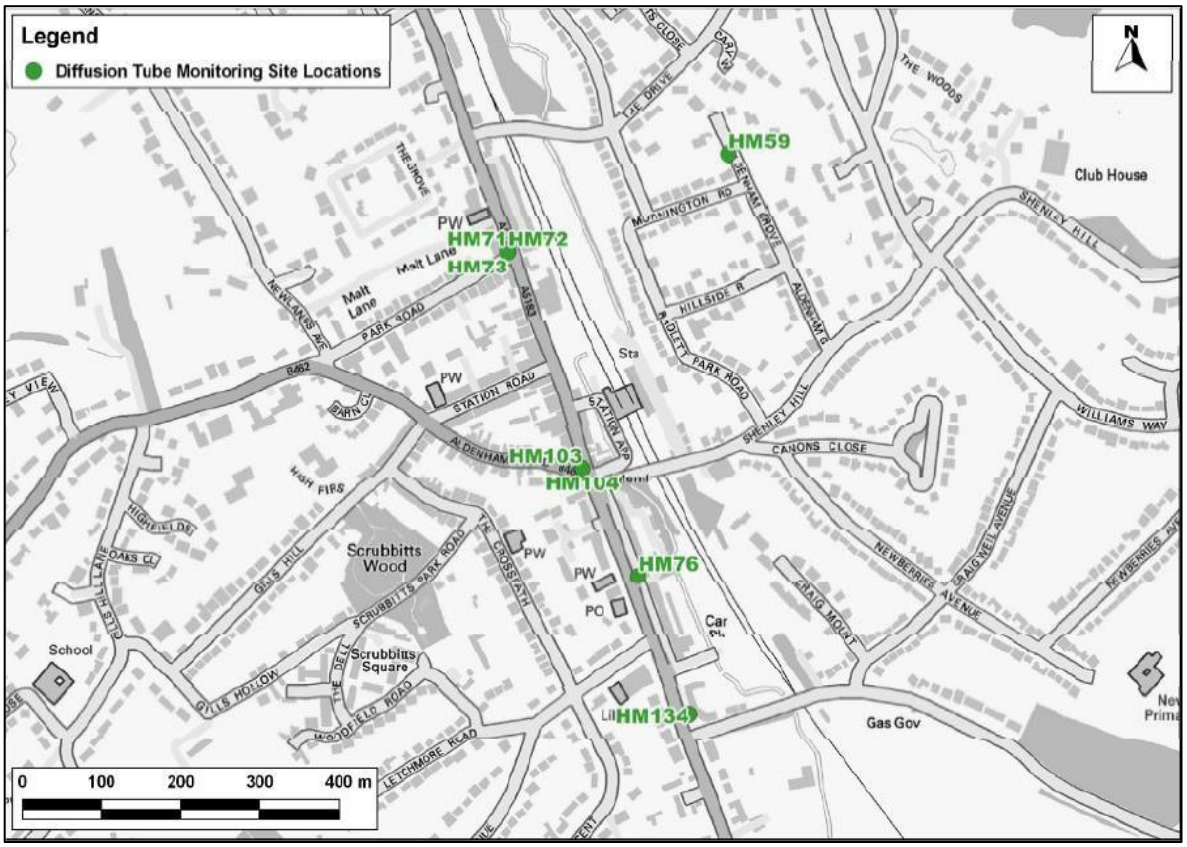

Figure D.14: Hertsmere Diffusion Tube Monitoring Site Locations, Radlett

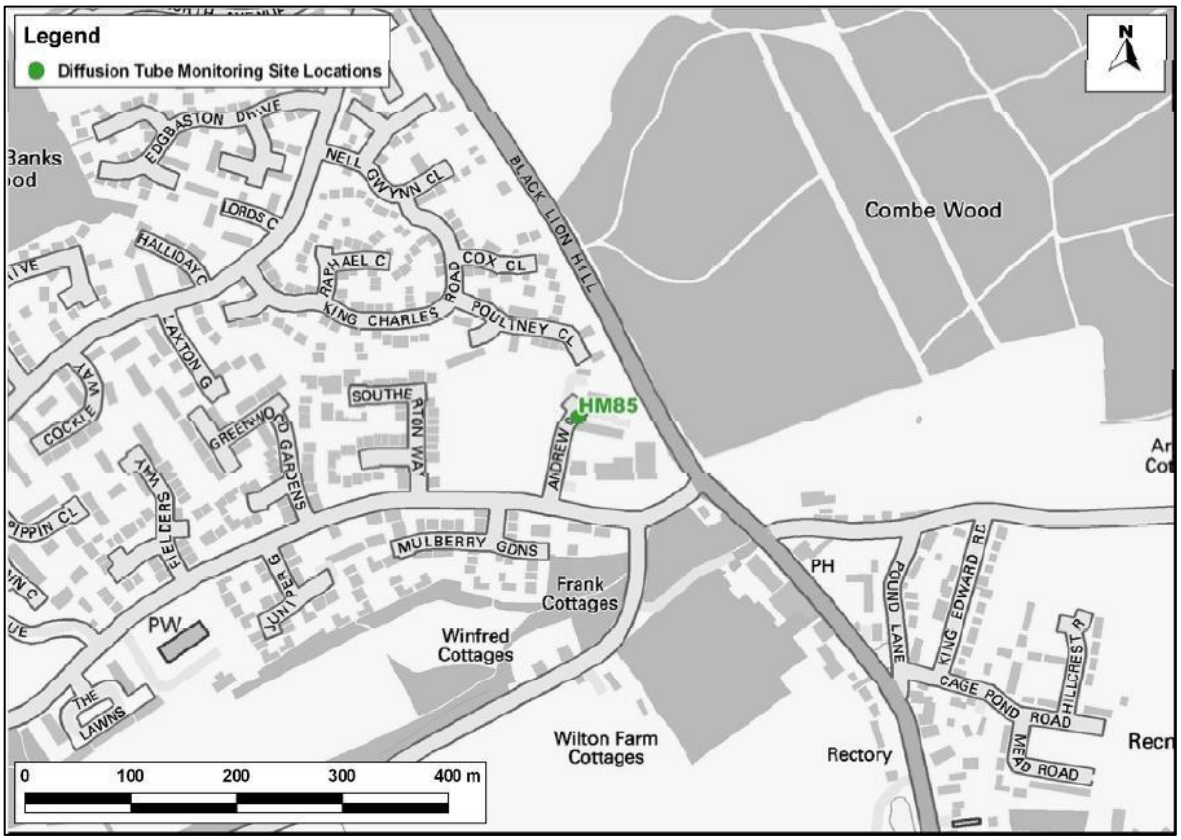

Figure D.15: Hertsmere Diffusion Tube Monitoring Site Location, Shenley

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[5]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[5] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
…	…

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