2014 Air Quality Progress Report for Hertsmere Borough Council

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

January 2015

Hertsmere Borough Council

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Report Reference number	HertsmerePR2014
Date	January 2015

Executive Summary

The UK Government published its strategic policy framework for air quality management in 1995 establishing national strategies and policies on air quality, which culminated in the Environment Act, 1995. The Air Quality Strategy provides a framework for air quality control through air quality management and air quality standards. These and other air quality standards and their objectives have been enacted through the Air Quality Regulations in 1997, 2000 and 2002. The Environment Act 1995 requires Local Authorities to undertake air quality reviews. In areas where an air quality objective is not anticipated to be met, Local Authorities are required to establish Air Quality Management Areas (AQMA's) and to implement action plans to improve air quality.

Hertsmere Borough Council has completed the first, second, third and fourth round of air quality review and assessments. The Local Authority have now entered the fifth round of review and assessment, in which sources of emissions to air are to be reassessed to identify whether the situation has changed since the fourth round, and if so, what impact this may have on predicted exceedences of the air quality objectives.

Each Local Authority must produce a Progress Report by the end of April 2014 covering monitoring data for the 2013 calendar year. This progress report follows the guidance provided in the Local Air Quality Management (LAQM) PG (09) and the LAQM TG (09). The report provides the latest nitrogen dioxide monitoring results for Hertsmere Borough Council and further information that might have an effect on local air quality.

The 2014 Progress Report concludes that the air quality objectives for benzene, 1,3-butadiene, carbon monoxide, lead, particulates (PM10) and sulphur dioxide will be met. There is no requirement to undertake a detailed assessment for these pollutants.

However, the Progress Report has shown exceedances of annual mean nitrogen dioxide (NO_2) concentrations continue to occur in Hertsmere's six AQMA's and at a number of other relevant locations in the Borough.

The 2013 monitoring data has supported the need for Detailed Assessments of NO_2 to take place at HM39 117 Shenley Road and HM99/100/101 84 High Street 1/2/3,

Bushey and HM117/118/119 44 High Street 1/2/3, Bushey that was identified in the 2012 Updating and Screening Assessment.

The recommendations of the 2007 and 2010 Detailed Assessments were re-considered in the 2013 Progress Report and the actions below remain outstanding and are supported by the most recent monitoring data.

- Declare AQMA's at The Broadway, Potters Bar (HM62 and HM82/83/84 will be contained in this AQMA) and Park Road/Watling Street Junction, Radlett (HM71/72/73 will be contained in this AQMA).
- Amend AQMA 6 High Street, Potters Bar to a more relevant location;
- Amend and expand AQMA 5 at Elstree Crossroads so the new AMQA reaches HM48, HM49 and HM52.

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1 Introduction

1.1 Description of Local Authority Area

The area of Hertsmere Borough Council is in the south of Hertfordshire and combines attractive countryside with thriving towns and villages. The London Borough of Barnet, The London Borough of Harrow, The London Borough of Enfield, St Albans City and District Council, Welwyn Hatfield Borough Council, Watford Borough Council and Three Rivers District Council border it. Hertsmere covers an area of 39 square miles; the 100,000 people who live in Hertsmere are concentrated in the Borough's four main towns of Elstree & Borehamwood, Bushey, Potters Bar and Radlett. Hertsmere boasts expansive beautiful Green Belt countryside dotted with attractive villages and wide tracts of unspoilt agricultural landscape.

The M1, M25 and A1(M)/A1 all intersect the Hertsmere Borough Council area and consequently much of Hertsmere's poor air quality is traffic related.

In the Hertsmere Borough Council area there are two permits issued by the Environment Agency for synthetic bone manufacture at a bone substitute synthesis facility within the Borough. The permitted installations include emissions to air and all emissions to air are required to meet the insignificant criteria as assessed using the H1 assessment tool and therefore contribute less than 1% of the long term environmental standard.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedences are considered likely, the local authority must then 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.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Table 1.2 Previous Reports

Year	Round	Report	Outcome
2006	3	Updating and Screening Assessment	No further actions
2007	3	Detailed Assessment	AQMA to be declared at The Broadway, Potters Bar for $N0_2$. This was picked up from a previous report.
2008	3	Progress Report	Joint 2007 and 2008. Catch up on late reports.
2009	4	Updating and Screening Assessment	Recommended that Detailed Assessment for NO2 be carried out to determine extension of Elstree Crossroads and Hartspring Lane AQMA's. Also Detailed Assessment at High Street/Southgate Road, Potters Bar; Watling Street/Aldenham Road, Radlett and Watling Street/Park Road, Radlett.
2009	4	Revised Action Plan	Some points concluded and some points dropped.
2010	4	Detailed Assessment	Consider possible extension of Elstree Crossroads AQMA after undertaking additional monitoring. Amend the AQMA at High Street near the bus station and the junction of the High Street with The Causeway, Potters Bar. Continue monitoring at junction of Barnet Road /Southgate Road /High Street, Potters Bar. Consider declaring an AQMA in Radlett to include the junctions of Watling Street/ Aldenham Road and Watling Street/ Park Road. Consider expanding the AQMA at Hartspring Lane, Bushey.
2010	4	2010 Progress Report	Continue additional monitoring of NO_2 at relevant receptor locations at High Street Bushey and Watling Street/Aldenham Road junction Radlett. Implement the outcomes of the 2010 Detailed Assessment.

2011	4	2011 Progress Report	Review the necessity to declare an AQMA at the Broadway, Potters Bar following the recommendations of the 2007 Detailed Assessment. Implement the outcomes of the 2010 Detailed Assessment. Consider the need for a Detailed Assessment for NO_2 at Shenley Road, Borehamwood in the 2012 Updating and Screening Assessment.
2012	5	2012 Updating and Screening Assessment	Carry out a Detailed Assessment for NO_2 at Shenley Road, Borehamwood. Carry out a Detailed Assessment for NO_2 at Bushey High Street. Relocate the monitoring at Hartspring Lane. Implement the outcomes of the 2010 Detailed Assessment. Declare an AQMA at The Broadway Potters Bar.
2013		2013 Progress Report	Carry out a Detailed Assessment for NO_2 at HM39 Shenley Road, Borehamwood, HM99/100/101 84 High Street 1/2/3, Bushey and HM117/118/118 44 High Street 1/2/3, Bushey. Declare AQMA's at The Broadway, Potters Bar and Park Road/Watling Street Junction, Radlett. Amend AQMA 6 High Street, Potters Bar to a more relevant location; amend and expand AQMA 5 at Elstree Crossroads.

Figures of existing AQMA's are shown below

Figure 1.1 Hertsmere AQMA 1

An area comprising the domestic properties 23 –27 Dove Lane and the caravan site Brookes Place off the A1000 Barnet Road, near the M25.

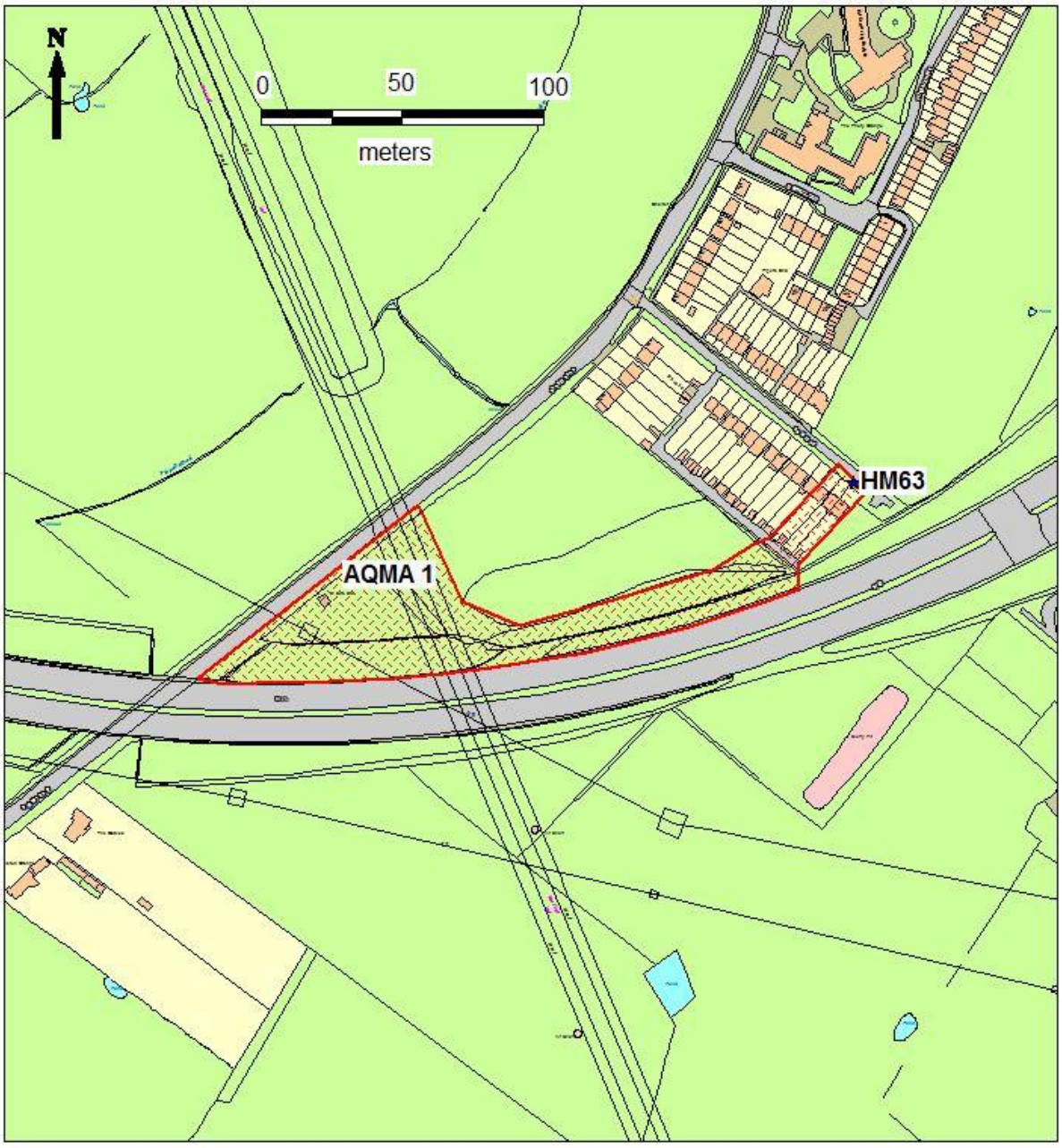


Figure 1.2 Hertsmere AQMA 2

An area comprising the domestic property known as Charleston Paddocks, St Albans Road, South Mimms, Potters Bar, near the M25.

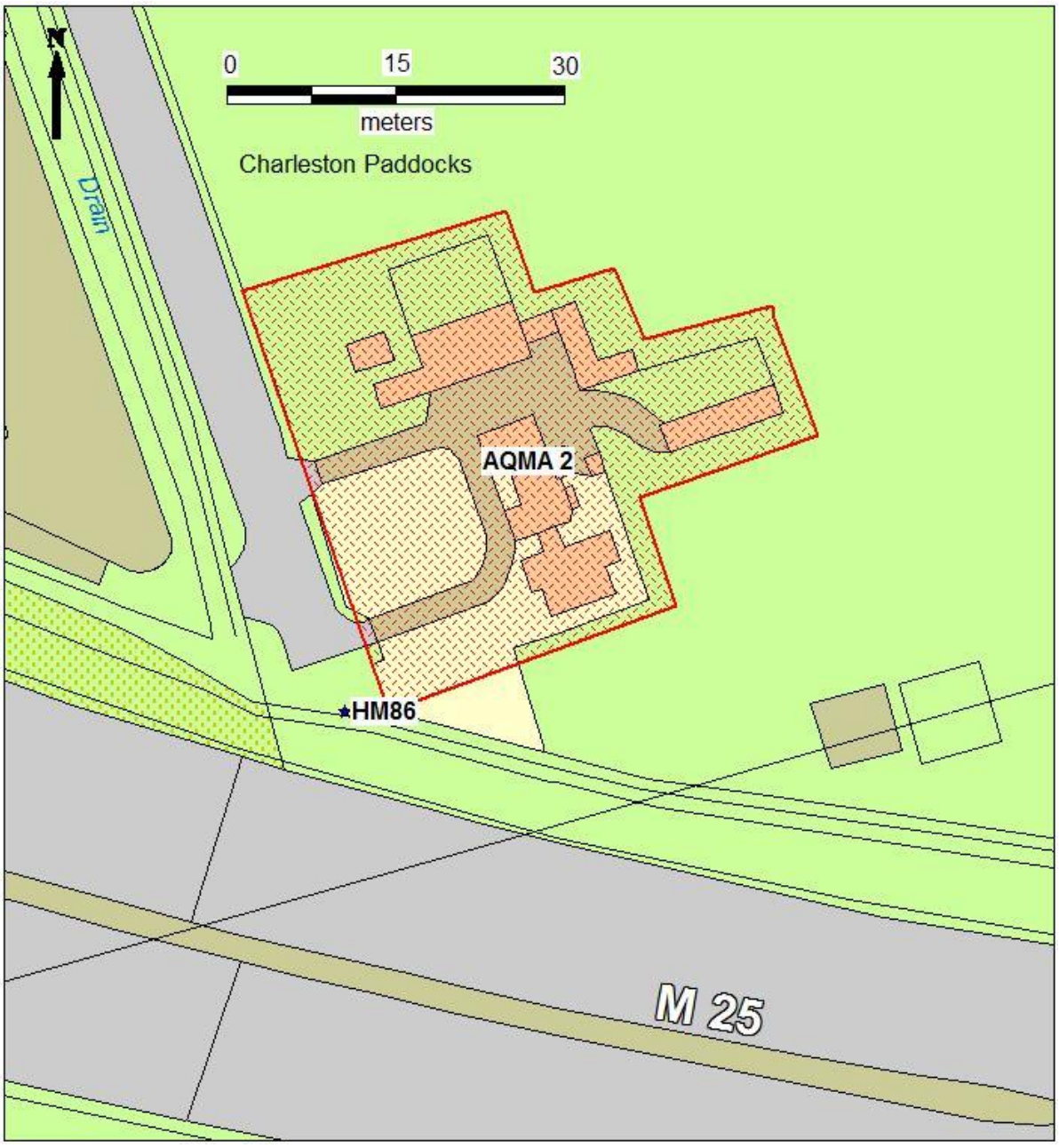


Figure 1.3 Hertsmere AQMA 3

An area comprising properties 31 – 39 Blanche Lane South Mimms near the M25.

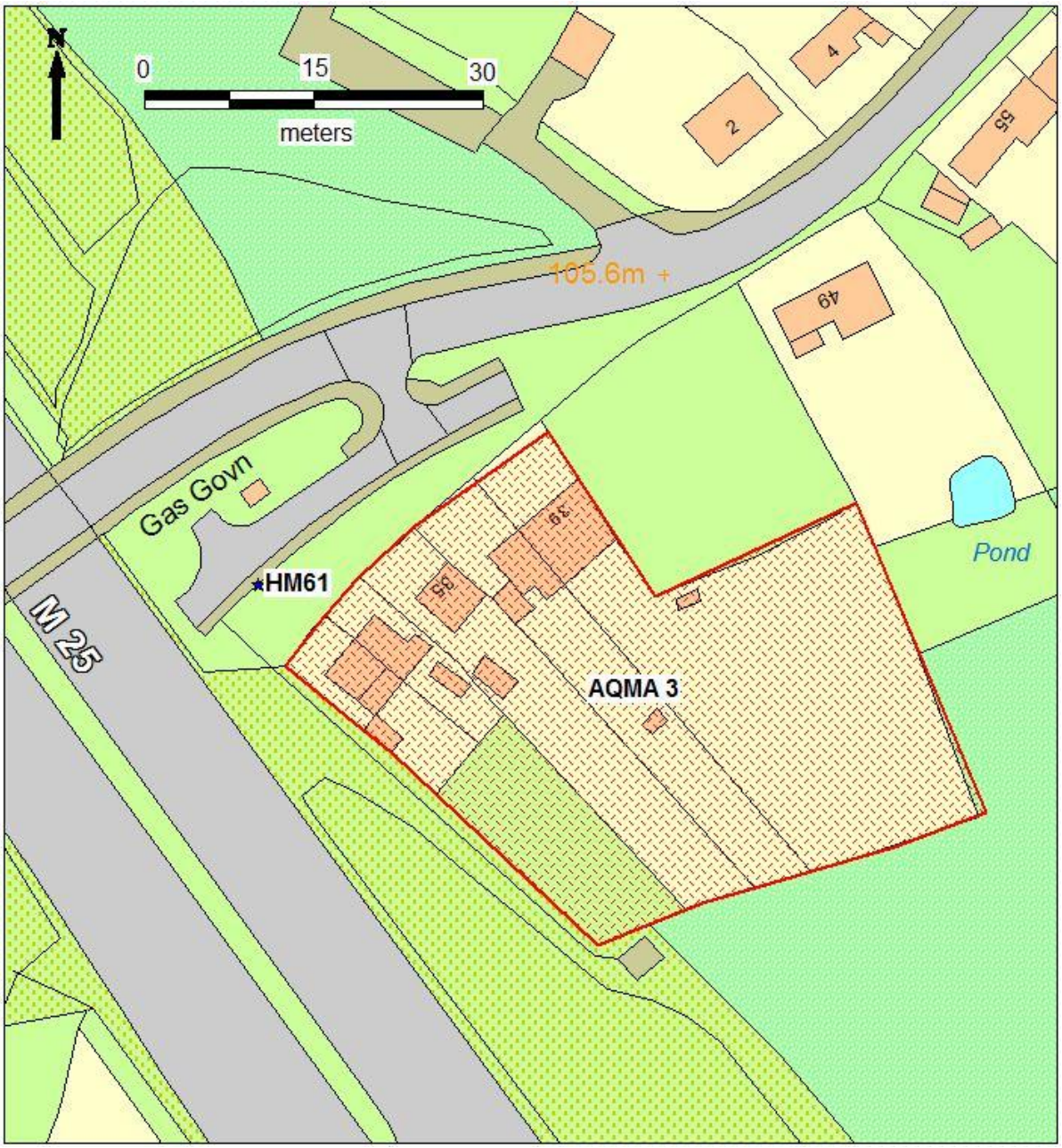


Figure 1.4 Hertsmere AQMA 4

An area comprising the domestic properties 12 Grove Place, Hartspring Lane, Aldenham and caravans numbered 1, 2, 3, 4, 7, 8, 55, 56, 57, 58 and 60 within Winfield Caravan site, Hartspring Lane, near the M1 at Bushey.

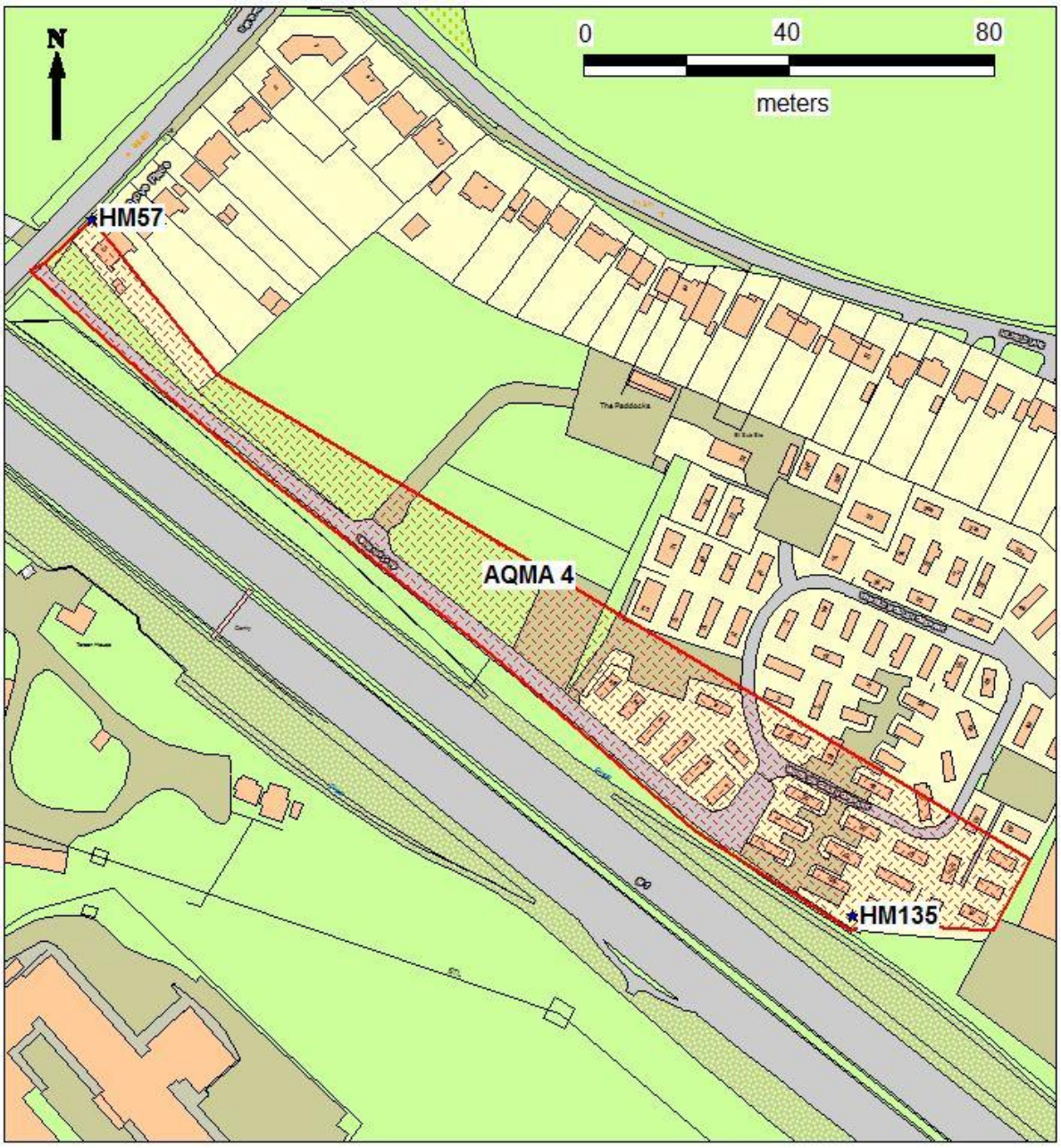


Figure 1.5 Hertsmere AQMA 5

An area comprising domestic dwellings within eight properties on the east side of the A5183 High Street, Elstree either side of the junction with the A411 Barnet Lane.

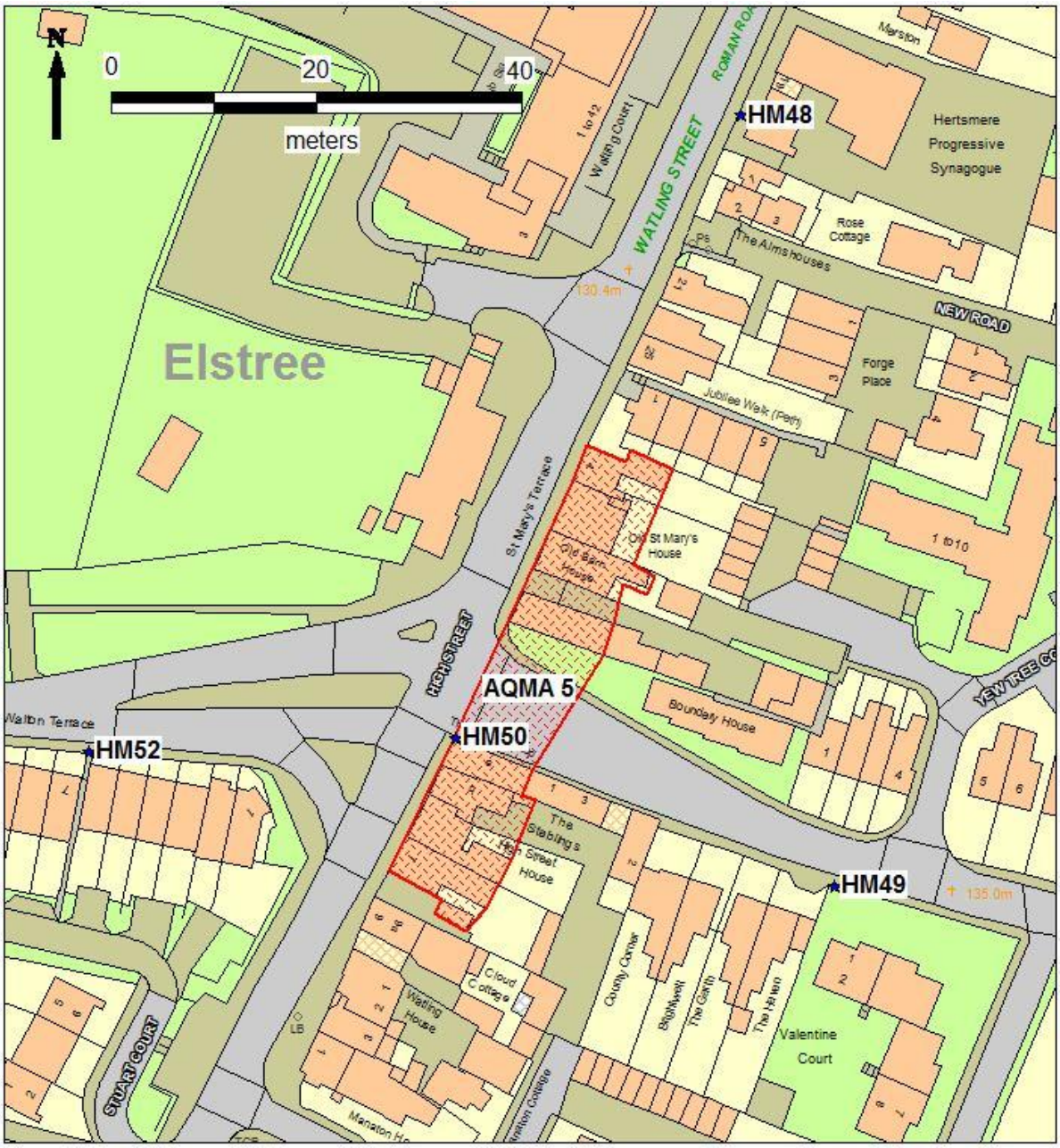
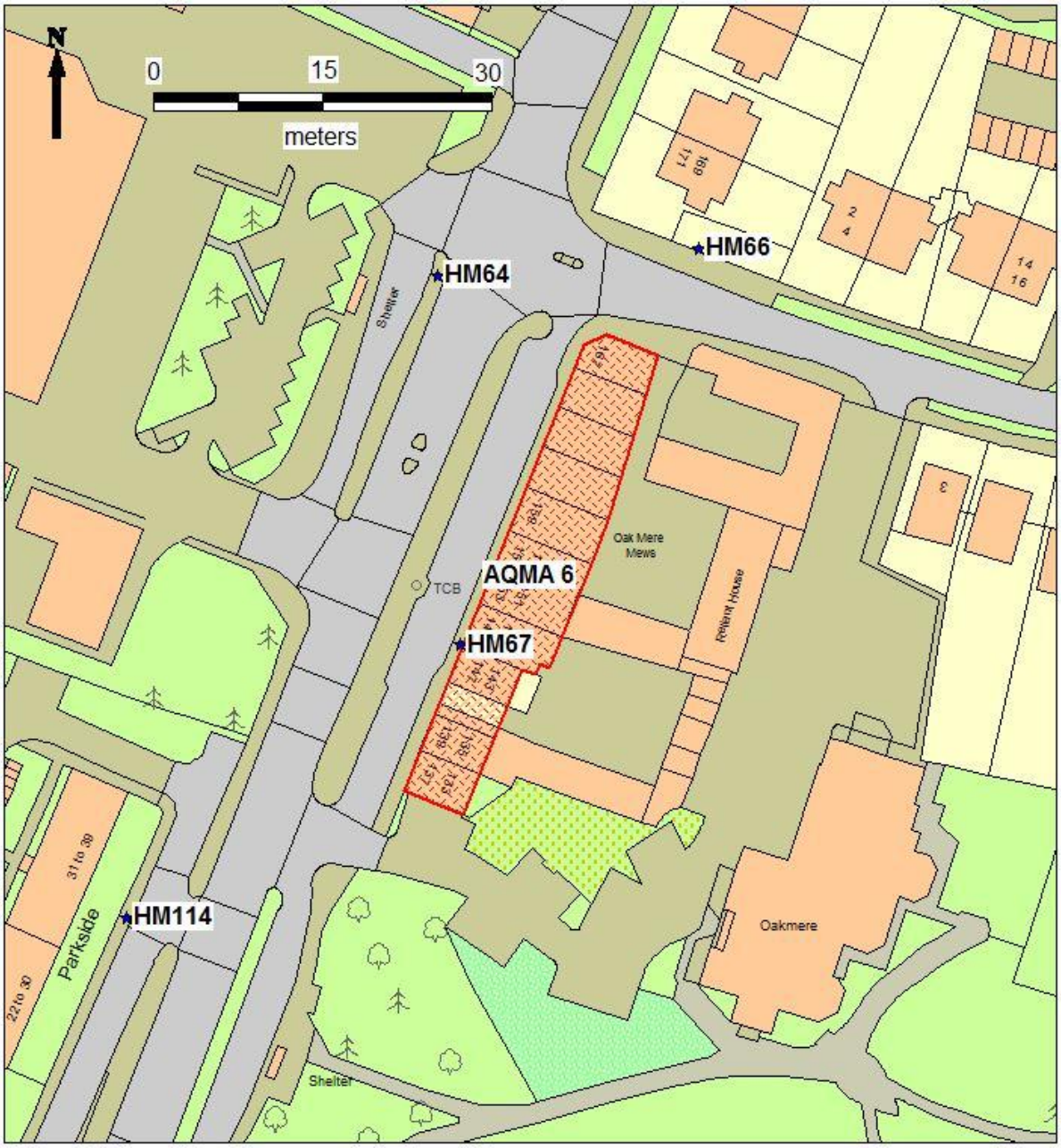


Figure 1.6 Hertsmere AQMA 6

An area comprising domestic dwellings within properties between numbers 133 to 167 High Street on the east side of the High Street opposite the bus station Potters Bar.



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

In November 2013, Hertsmere Borough Council reopened the urban background continuous monitoring site at Hertswood Upper School, Thrift Farm Lane, Borehamwood. The site was closed in March 2011 due to budget constraints but Section 106 funding allowed new equipment to be installed and the site reopened. The site now monitors NO_2, PM10 and PM2.5. However, due to the short time peiod that data has been collected no results will be included in this report.

Figure 2.1 Map of Automatic Monitoring Site

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Hertswood Upper School, Borehamwood	Urban Background	520147	197357	NO_2 PM10 PM2.5	N	FDMS	N	N/A	N

2.1.2 Non-Automatic Monitoring Sites

Hertsmere Borough Council undertook monitoring of NO_2 using seventy-two diffusion tubes at forty-four locations. There are fourteen triplicate sites across the Borough.

The diffusion tubes are supplied and analysed by Gradko utilising 20% Triethanolamine (TEA) in water preparation method. Gradko participate in the Workplace Analysis Scheme for Proficiency (WASP) for NO_2 diffusion tube analysis and the Annual Field Inter-Comparison Exercise. The lab follows the procedures set out by the Harmonisation Practical Guidance.

Since the closure of Hertsmere's continuous monitoring station in 2011 Hertsmere no longer has a co-locational study in place and consequently a local bias adjustment factor for 2013 cannot be calculated. Therefore the bias adjustment factor for 2013 has been taken from the LAQM national bias adjustment spreadsheet for Gradko diffusion tubes using the 20% Triethanolamine (TEA) in water preparation method. For 2013 this was 0.95 based on twenty-four studies (update March 2014 v03_14-Final-v2).

A map showing the extent of the monitoring within the Hertsmere Borough Council area is shown below in Figure 2.2.

Figure 2.2 Map of Non-Automatic Monitoring Sites

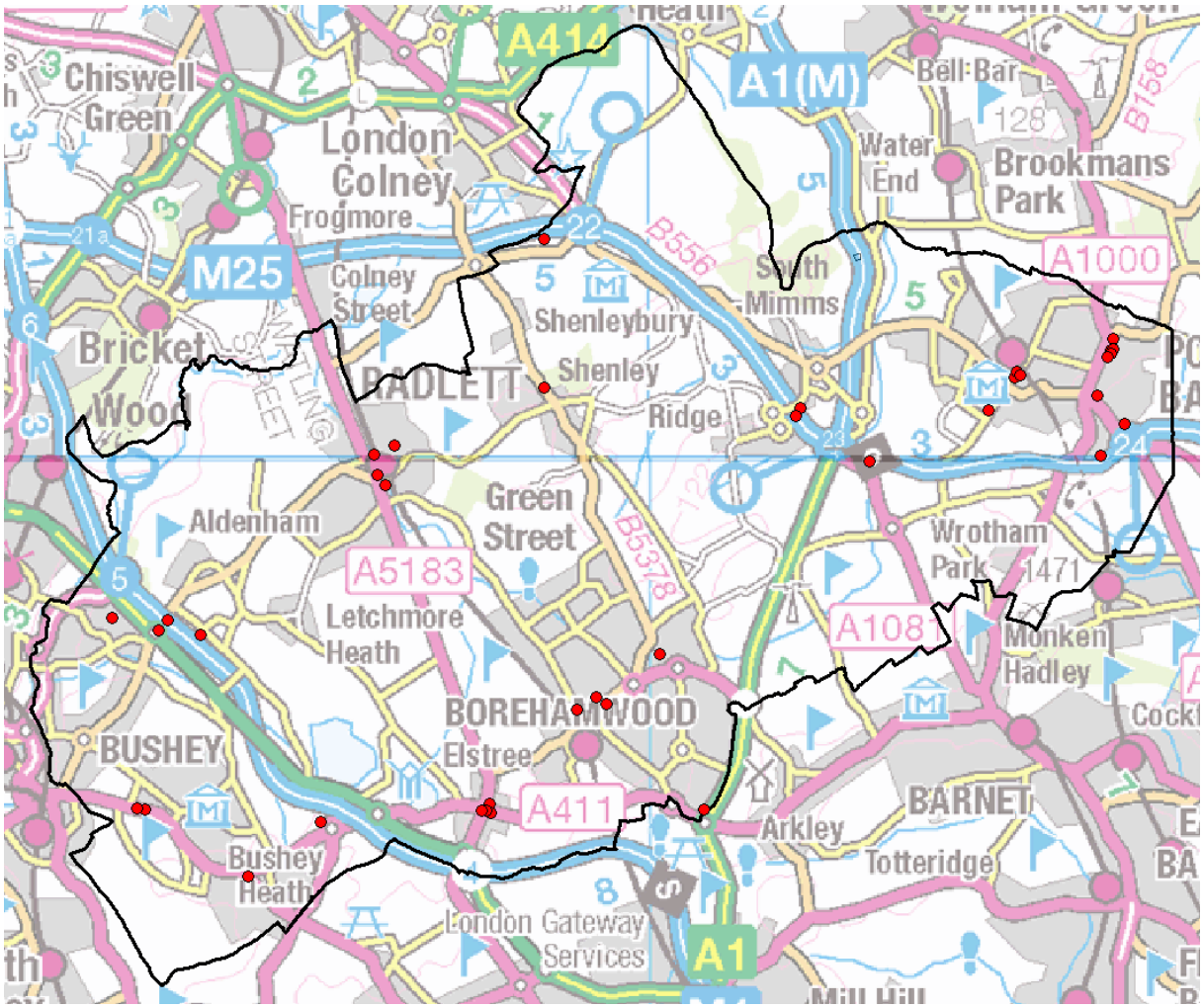


Table 2.2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure from Monitoring Site (m) (N/A if not applicable)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
HM39	117 Shenley Road Borehamwood	Roadside	519418	196681	2.1	NO_2	N	7.0	1.3	Y
HM40	17 Essex Road Borehamwood	Roadside	519281	196779	2.1	NO_2	N	5.3	2.1	Y
HM41	39 Theobald Street Borehamwood	Roadside	519022	196612	2.3	NO_2	N	6.4	1.9	Y
HM45	AQMS 1	Urban background	520147	197357	3.0	NO_2	N	N/A	N/A	N
HM46	AQMS 2	Urban background	520147	197357	3.0	NO_2	N	N/A	N/A	N
HM47	AQMS 3	Urban background	520147	197357	3.0	NO_2	N	N/A	N/A	N
HM48	Elstree Crossroads 1 (Nursery High Street)	Roadside	517846	195346	2.0	NO_2	N	4.4	1.9	Y
HM49	Elstree Crossroads 2 (The Haven Barnet Lane)	Roadside	517861	195226	2.0	NO_2	N	5.9	1.1	Y
HM50	Elstree Crossroads 3 (High Street/Barnet Lane)	Roadside	517802	195249	2.0	NO_2	Y	9.5	1.2	Y
HM52	Elstree Crossroads 5 (6 Walton Terrace)	Roadside	517744	195247	2.0	NO_2	N	1.8	1.8	Y
HM53	Caldecote Lane Bushey Heath (stables)	Urban Background	515581	195094	2.1	NO_2	N	0.2	N/A	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure from Monitoring Site (m) (N/A if not applicable)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
HM54	19 High Road Bushey	Kerbside	514596	194364	2.1	NO_2	N	4.5	0.5	Y
HM55	Highwood Avenue Garages Bushey	Urban Background	512770	197834	2.0	NO_2	N	N/A	N/A	N
HM57	Hartspring Lane (11 Grove Place) Bush	Roadside	513517	197819	2.0	NO_2	Y	9.2	1.8	Y
HM58	Pegmire Lane Aldenham (junction with Hilfield Lane	Kerbside	513966	197615	2.0	NO_2	N	2.5	0.5	Y
HM59	7 Aldenham Grove Radlett	Kerbside	516570	200159	0	NO_2	N	6.8	N/A	Y
HM60	Bell Lane London Colney (1 Council Cottages)	Roadside	518586	202939	1.9	NO_2	N	13.6	8.8	Y
HM61	31 Blanche Lane South Mimms	Motorway	522038	200670	1.9	NO_2	Y	14.6	14.6	Y
HM62	24 The Broadway Potters Bar	Roadside	524943	201154	1.9	NO_2	N	12.5	3.1	Y
HM63	27 Dove Lane Potters Bar	Motorway	526079	200026	2.0	NO_2	Y	19.2	29.1	Y
HM64	Bus Garage 1 Potters Bar (outside Bus Garage)	Roadside	526208	201454	2.0	NO_2	N	23.3	2.1	Y
HM65	Hatfield Road Potters Bar (250-252 High Street)	Roadside	526252	201597	2.1	NO_2	N	7.7	2.8	Y
HM66	Bus Garage 2 Potters Bar (Oakmere Lane)	Roadside	526245	201458	2.1	NO_2	N	5.9	3.0	Y
HM67	Bus Garage 3 Potters Bar (147 High Street)	Roadside	526211	201402	2.0	NO_2	Y	0.5	11.3	Y
HM69	Southgate Road Potters Bar (Abbey House)	Roadside	526034	200832	2.0	NO_2	N	15	3.1	Y
HM70	9 Park Avenue Potters Bar	Roadside	526402	200457	2.0	NO_2	N	9.2	1.5	Y
HM71	2 Park Road Radlett 1	Roadside	516291	200035	2.1	NO_2	N	4.3	1.5	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure from Monitoring Site (m) (N/A if not applicable)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
HM72	2 Park Road Radlett 2	Roadside	516291	200035	2.1	NO_2	N	4.3	1.5	Y
HM73	2 Park Road Radlett 3	Roadside	516291	200034	2.1	NO_2	N	4.3	1.5	Y
HM74	301 Watling Street Radlett 1	Roadside	516456	199624	2.0	NO_2	N	9.2	6.6	Y
HM75	301 Watling Street Radlett 2	Roadside	516456	199624	2.0	NO_2	N	9.2	6.6	Y
HM76	301 Watling Street Radlett 3	Roadside	516456	199624	2.0	NO_2	N	9.2	6.6	Y
HM79	7 The Broadway Potters Bar 1	Roadside	524988	201118	2.0	NO_2	N	12.2	1.7	Y
HM80	7 The Broadway Potters Bar 2	Roadside	524988	201118	2.0	NO_2	N	12.2	1.7	Y
HM81	7 The Broadway Potters Bar 3	Roadside	524988	201118	2.0	NO_2	N	12.2	1.7	Y
HM82	10 Baker Street Potters Bar 1	Kerbside	524922	201088	2.0	NO_2	N	9.6	0.6	Y
HM83	10 Baker Street Potters Bar 2	Kerbside	524922	201088	2.0	NO_2	N	9.6	0.6	Y
HM84	10 Baker Street Potters Bar 3	Kerbside	524922	201088	2.0	NO_2	N	9.6	0.6	Y
HM85	16 Andrew Close Shenley	Urban Background	518592	200948	0	NO_2	N	2.3	2.1	Y
HM86	Charleston Paddocks South Mimms	Motorway	522970	199959	0	NO_2	Y	40.1	10.1	Y
HM93	103 Baker Street Potters Bar	Roadside	524573	200633	2.2	NO_2	N	12.9	1.4	Y
HM99	84 High Street 1, Bushey	Roadside	513209	195257	2.1	NO_2	N	1.9	2.4	Y
HM100	84 High Street 2, Bushey	Roadside	513209	195257	2.1	NO_2	N	1.9	2.4	Y
HM101	84 High Street 3, Bushey	Roadside	513209	195257	2.1	NO_2	N	1.9	2.4	Y
HM102	Aldenham Road 1, Radlett (Red Lion)	Kerbside	516385	199761	1.9	NO_2	N	4.0	0.5	Y
HM103	Aldenham Road 1, Radlett (Red Lion)	Kerbside	516385	199761	1.9	NO_2	N	4.0	0.5	Y
HM104	Aldenham Road 1, Radlett (Red Lion)	Kerbside	516385	199761	1.9	NO_2	N	4.0	0.5	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure from Monitoring Site (m) (N/A if not applicable)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
HM105	Elstree Park 1	Roadside	520738	195271	2.0	NO_2	N	10.7	36.1	Y
HM108	Hartspring Lane 1, Bushey (Hazetta House)	Kerbside	513419	197727	1.8	NO_2	N	11.1	0.5	Y
HM109	Hartspring Lane 2, Bushey (Hazetta House)	Kerbside	513419	197727	1.8	NO_2	N	11.1	0.5	Y
HM110	Hartspring Lane 3, Bushey (Hazetta House)	Kerbside	513419	197727	1.8	NO_2	N	11.1	0.5	Y
HM111	9 Blanche Lane 1, South Mimms	Roadside	521980	200567	1.9	NO_2	N	21.1	1.2	Y
HM114	Parkside 1, Potters Bar	Roadside	526164	201363	1.9	NO_2	N	16.3	9.5	Y
HM117	44 High Street, Bushey 1	Roadside	513101	195286	2.0	NO_2	N	4.3	2.3	Y
HM118	44 High Street, Bushey 2	Roadside	513101	195286	2.0	NO_2	N	4.3	2.3	Y
HM119	44 High Street, Bushey 3	Roadside	513101	195286	2.0	NO_2	N	4.3	2.3	Y
HM120	Mills Court, Todd Close 1	Roadside	520181	197150	1.9	NO_2	N	33.1	36.4	Y
HM121	Mills Court, Todd Close 2	Roadside	520181	197150	1.9	NO_2	N	33.1	36.4	Y
HM122	Mills Court, Todd Close 3	Roadside	520181	197150	1.9	NO_2	N	33.1	36.4	Y
HM123	Studio Plaza, Elstree Way 1	Roadside	520263	197130	1.9	NO_2	N	34.5	3.6	Y
HM124	Studio Plaza, Elstree Way 2	Roadside	520263	197130	1.9	NO_2	N	34.5	3.6	Y
HM125	Studio Plaza, Elstree Way 3	Roadside	520263	197130	1.9	NO_2	N	34.5	3.6	Y
HM126	63 Elstree Hill North 1	Roadside	517903	195552	2.1	NO_2	N	13.8	2.4	Y
HM127	63 Elstree Hill North 2	Roadside	517903	195552	2.1	NO_2	N	13.8	2.4	Y
HM128	63 Elstree Hill North 3	Roadside	517903	195552	2.1	NO_2	N	13.8	2.4	Y
HM129	Allum Lane/Elstree Hill North 1	Roadside	517907	195864	2.1	NO_2	N	6.3	1.5	Y
HM130	Allum Lane/Elstree Hill North 2	Roadside	517907	195864	2.1	NO_2	N	6.3	1.5	Y
HM131	Allum Lane/Elstree Hill North 3	Roadside	517907	195864	2.1	NO_2	N	6.3	1.5	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure from Monitoring Site (m) (N/A if not applicable)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
HM132	Watling Mansions, Watling Street 1	Roadside	516520	199450	2.0	NO_2	N	13.8	8.3	Y
HM133	Watling Mansions, Watling Street 2	Roadside	516520	199450	2.0	NO_2	N	13.8	8.3	Y
HM134	Watling Mansions, Watling Street 3	Roadside	516520	199450	2.0	NO_2	N	13.8	8.3	Y
HM135	Winfield Park	Motorway	513756	197600	2.0	NO_2	N	4.7	20.0	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Diffusion Tube Monitoring Data

The nitrogen dioxide diffusion tube data are summarised in the table below. The full raw dataset (monthly values) is included in Appendix B.

Table 2.3 Results of NO_2 Diffusion Tubes 2013

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%) [a]	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.96 [b]
HM39	117 Shenley Road Borehamwood	Roadside	N	-	100%	52
HM40	17 Essex Road Borehamwood	Roadside	N	-	100%	27
HM41	39 Theobald Street Borehamwood	Roadside	N	-	92%	36
HM45/46/47	AQMS 1/2/3	Urban background	N	Triplicate	100%	27
HM48	Elstree Crossroads 1 (Nursery High Street)	Roadside	N	-	100%	49
HM49	Elstree Crossroads 2 (The Haven Barnet Lane)	Roadside	N	-	100%	59
HM50	Elstree Crossroads 3 (High Street/Barnet Lane)	Roadside	Y (AQMA 5)	-	100%	59
HM52	Elstree Crossroads 5 (6 Walton Terrace)	Roadside	N	-	100%	40
HM53	Caldecote Lane Bushey Heath (stables)	Urban Background	N	-	100%	22
HM54	19 High Road Bushey	Kerbside	N	-	100%	31

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%) [a]	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.96 [b]
HM55	Highwood Avenue Garages Bushey	Urban Background	N	-	100%	24
HM57	Hartspring Lane (11 Grove Place) Bushey	Roadside	Y (AQMA 4)	-	100%	46
HM58	Pegmire Lane Aldenham (junction with Hilfield Lane	Kerbside	N	-	100%	28
HM59	7 Aldenham Grove Radlett	Kerbside	N		100%	19
HM60	Bell Lane London Colney (1 Council Cottages)	Roadside	N	-	100%	33
HM61	31 Blanche Lane South Mimms	Motorway	Y (AQMA 3)	-	100%	45
HM62	24 The Broadway Potters Bar	Roadside	N	-	100%	44
HM63	27 Dove Lane Potters Bar	Motorway	Y (AQMA 1)	-	100%	36
HM64	Bus Garage 1 Potters Bar (outside Bus Garage)	Roadside	N	-	100%	48
HM65	Hatfield Road Potters Bar (250-252 High Street)	Roadside	N	-	100%	45
HM66	Bus Garage 2 Potters Bar (Oakmere Lane)	Roadside	N	-	100%	38
HM67	Bus Garage 3 Potters Bar (147 High Street)	Roadside	Y (AQMA 6)	-	92%	39
HM69	Southgate Road Potters Bar (Abbey House)	Roadside	N	-	100%	51
HM70	9 Park Avenue Potters Bar	Roadside	N	-	100%	32

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%) [a]	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.96 [b]
HM71/72/73	2 Park Road Radlett 1/2/3	Roadside	N	Triplicate	100%/ 100%/ 100%	51
HM74/75/76	301 Watling Street Radlett 1/2/3	Roadside	N	Triplicate	100%/ 92%/ 100%	44
HM79/80/81	7 The Broadway Potters Bar 1/2/3	Roadside	N	Triplicate	100%/ 100%/ 100%	38
HM82/83/84	10 Baker Street Potters Bar 1/2/3	Kerbside	N	Triplicate	92%/ 100%/ 92%	43
HM85	16 Andrew Close Shenley	Urban Background	N	-	100%	26
HM86	Charleston Paddocks South Mimms	Motorway	Y (AQMA 2)	-	100%	43
HM93	103 Baker Street Potters Bar	Roadside	N	-	100%	29
HM99/100/101	84 High Street 1/2/3, Bushey	Roadside	N	Triplicate	92%/ 92%/ 75%	56
HM102/103/104	Aldenham Road 1/2/3, Radlett (Red Lion)	Kerbside	N	Triplicate	83%/ 83%/ 83%	58
HM105	Elstree Park 1	Roadside	N	-	100%	33
HM108/109/110	Hartspring Lane 1/2/3, Bushey (Hazetta House)	Kerbside	N	Triplicate	100%/ 100%/ 100%	**69**
HM111	9 Blanche Lane 1, South Mimms	Roadside	N	-	100%	31
HM114	Parkside 1, Potters Bar	Roadside	N	-	92%	37
HM117/118/119	44 High Street, Bushey 1/2/3	Roadside	N	Triplicate	92%/ 83%/ 92%	50
HM120/121/122	Mills Court, Todd Close 1/2/3	Roadside	N	Triplicate	100%/ 100%/ 100%	29
HM123/124/125	Studio Plaza, Elstree Way 1/2/3	Roadside	N	Triplicate	83%/ 92%/ 100%	46

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%) [a]	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.96 [b]
HM126/127/128	63 Elstree Hill North 1/2/3	Roadside	N	Triplicate	100%/ 100%/ 100%	41
HM129/130/131	Allum Lane/Elstree Hill North 1/2/3	Roadside	N	Triplicate	100%/ 100%/ 100%	36
HM132/133/134	Watling Mansions, Watling Street 1/2/3	Roadside	N	Triplicate	100%/ 100%/ 100%	37
HM135	Winfield Park	Motorway	N	-	58%	34 [a]

In red and shaded red, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

In red, borderline results of NO_2 annual mean AQA objective, >36µg/m^3

Bold, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] Annualised mean as data capture less than 75% of full calendar year

The 2013 diffusion tube data show twenty-one sites are exceeding the annual mean objective for NO_2 of 40µg/m^3 and eight sites are considered to be borderline i.e. they are within 10% of objective (above 36µg/m^3).

These eight sites that are considered to be borderline are:

HM41	39 Theobald Street, Borehamwood
HM63	27 Dove Lane, Potters Bar
HM66	Bus Garage 2, Potters Bar (Oakmere Lane)
HM67	Bus Garage 3, Potters Bar (147 High Street)
HM79/80/81	7 The Broadway, Potters Bar 1/2/3
HM114	Parkside 1, Potters Bar
HM129/130/131	Allum Lane/Elstree Hill North 1/2/3
HM132/133/134	Watling Mansions, Watling Street 1/2/3

Of the sites exceeding the annual mean objective for NO_2 there were four within or adjacent to existing AQMA's and seventeen outside of existing AQMA's. The four sites within existing AQMA's that are exceeding the annual mean objective for NO_2 are:

HM50	Elstree Crossroads 3 (High Street/Barnet Lane)
HM86	Charleston Paddocks South Mimms
HM61	31 Blanche Lane South Mimms
HM57	Hartspring Lane (11 Grove Place) Bushey

The seventeen sites outside of existing AQMA's that have relevant exposure and are exceeding the annual mean objective for NO_2 are:

HM39	117 Shenley Road, Borehamwood
HM48	Elstree Crossroads 1 (Nursery High Street)
HM49	Elstree Crossroads 2 (The Haven Barnet Lane)
HM52	Elstree Crossroads 5 (6 Walton Terrace)
HM62	24 The Broadway Potters Bar
HM64	Bus Garage 1 Potters Bar (outside Bus Garage)
HM65	Hatfield Road Potters Bar (250-252 High Street)
HM69	Southgate Road Potters Bar (Abbey House)
HM71/72/73	2 Park Road Radlett 1/2/3
HM74/75/76	301 Watling Street Radlett 1/2/3
HM82/83/84	10 Baker Street Potters Bar 1/2/3
HM99/100/101	84 High Street 1/2/3, Bushey
HM102/103/104	Aldenham Road 1/2/3, Radlett (Red Lion)
HM108/109/110	Hartspring Lane 1/2/3, Bushey (Hazetta House)
HM117/118/119	44 High Street, Bushey 1/2/3
HM123/124/125	Studio Plaza, Elstree Way 1/2/3
HM126/127/128	63 Elstree Hill North 1/2/3

In order to calculate a correct representation of public exposure NO_2 concentrations at the nearest relevant exposure were estimated using the NO_2 fall-off with distance calculator for these sites. Results of this calculation are shown in Table 2.4.

Table 2.4 Fall-off with Distance Calculator Results

Site	Distance from kerb to site (m)	Distance from kerb to receptor (m)	Local annual mean background NO_2 concentration ($\mu g/m^3$)	Measured annual mean background NO_2 concentration ($\mu g/m^3$) at site	Predicted annual mean NO_2 concentration ($\mu g/m^3$) at receptor
HM39	1.3	8.3	19.96	52	39.4
HM48	1.9	6.3	19.96	49	40.9
HM49	1.1	7.0	19.96	59	44.2
HM52	1.8	3.6	19.96	40	36.8
HM62	3.1	15.6	19.96	44	33.9
HM64	2.1	25.4	19.96	48	31.4
HM65	2.8	10.5	19.96	45	36.6
HM69	3.1	18.1	19.96	51	36.7
HM71/72/73	1.5	5.8	19.96	51	41.8
HM74/75/76	6.6	15.8	19.96	44	37.2
HM82/83/84	0.6	10.2	19.96	43	31.1
HM99/100/101	2.4	4.3	19.96	56	50.9
HM102/103/104	0.5	4.5	19.96	58	43.2
HM108/109/110	0.5	11.6	19.96	69	41.7
HM117/118/119	2.3	6.6	19.96	50	42.3
HM123/124/125	3.6	38.1	19.96	46	29.3
HM126/127/128	2.4	16.2	19.96	41	31.2

These fall-off with distance results show that in five locations the predicted annual mean NO_2 is below the annual mean objectives at the receptor, but, in twelve locations the predicted annual mean NO_2 is still above or borderline to the annual mean objective at the receptor. These twelve locations are discussed below:

HM39; this site has previously identified as needing to undergo a Detailed Assessment and this action remains outstanding.

HM48, HM49 and HM52; these sites are close to AQMA 5 at Elstree Crossroads and when the AQMA is extended it will reach these sites.

HM62 and HM82/83/84; these sites are situated in an area known as The Broadway and the 2007 Detailed Assessment identified this area as an emerging AQMA. When the AQMA is declared these sites will be included within it.

HM65; this site was considered as part of the 2010 Detailed Assessment and although it is close to AQMA 6 it was not considered necessary to extend the AQMA to this site. However, as the annual mean objective is now being exceeded at this site this may need to be reviewed in future should the exceedances continue.

HM69; although monitoring results are above the annual mean objective fall-off with distance calculations indicate the annual mean objective is being met at the nearest residential receptor. This site is not located with an AQMA.

HM71/72/73; the 2010 Detailed Assessment identified that a new AQMA should be declared at the junction of Park Road and Watling Street, Radlett. The declaration of this AQMA remains outstanding but it will include sites HM71/72/73.

HM74/75/76; although monitoring results are above the annual mean objective fall-off with distance calculations indicate the annual mean objective is being met at the nearest residential receptor.

HM99/100/101; this site has previously identified as needing to undergo a Detailed Assessment and this action remains outstanding.

HM108/109/110; this site acts as additional monitoring for AQMA 4 as it is in close proximity to the AQMA. It is being used to determine whether the AQMA will need to be extended in future, although during 2013 the annual mean (69µg/m^3) was much higher than previous years so by looking at the longer term trends it is not thought that the AQMA needs to be extended at this stage. It is noted that where the annual mean objective is over 60µg/m^3 analysis of UK continuous NO_2 monitoring data has shown that the hourly mean NO_2 objective, of 18 hourly means over 200µg/m^3, may be exceeded.

In order to consider changes in NO2 concentrations over a longer time period, results from the previous five years of monitoring are shown below.

Table 2.5 Results of NO_2 Diffusion Tubes (2009 to 2013)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2009 (Bias Adjustment Factor = 0.9)	2010 (Bias Adjustment Factor = 0.92)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.97)	2013 (Bias Adjustment Factor = 0.96)
HM39	Roadside	N	52	57	47	55	52
HM40	Roadside	N	29	28	25	29	27
HM41	Roadside	N	36	36	33	37	36
HM45	Urban background	N	29	26	24	25	27
HM48	Roadside	N	39	45	40	50	49
HM49	Roadside	N	42	48	52	59	59
HM50	Roadside	N	53	55	52	62	59
HM52	Roadside	Y	55	55	37	40	40

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2009 (Bias Adjustment Factor = 0.9)	2010 (Bias Adjustment Factor = 0.92)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.97)	2013 (Bias Adjustment Factor = 0.96)
HM53	Urban Background	N	24	25	21	22	22
HM54	Kerbside	N	31	32	28	32	31
HM55	Urban Background	N	24	26	21	25	24
HM57	Roadside	Y	43	47	44	51	46
HM58	Kerbside	N	31	29	31	29	28
HM59	Kerbside	N	21	21	19	23	19
HM60	Roadside	N	32	35	32	35	33
HM61	Motorway	Y	47	49	47	50	45
HM62	Roadside	N	42	46	45	43	44
HM63	Motorway	Y	43	41	43	42	36
HM64	Roadside	N	50	49	52	56	48
HM65	Roadside	N	47	47	50	49	45
HM66	Roadside	N	39	41	41	46	38
HM67/68	Roadside	Y	39	43	39	42	39
HM69	Roadside	N	47	55	55	53	51
HM70	Roadside	N	36	34	37	39	32
HM71/72/73	Roadside	N	47	49	45	49	51
HM74/75/76	Roadside	N	37	39	35	37	44
HM79/80/81	Roadside	N	41	42	33	36	38
HM82/83/84	Kerbside	N	38	39	38	40	43
HM85	Urban Background	N	25	27	24	24	26
HM86	Motorway	Y	42	52	55	55	43
HM93	Roadside	N	36	30	32	31	29
HM99/100/101	Roadside	N	47	49	46	50	56
HM102/103/104	Kerbside	N	37	40	37	39	58
HM105/106/107	Roadside	N	31	33	30	31	33
HM108/109/110	Kerbside	N	32	44	40	47	69
HM111/112/113	Roadside	N	31	35	29	30	31
HM114/115/116	Roadside	N	41	40	37	40	37
HM117/118/119	Roadside	N	36	45	40	46	50

In red and shaded exceedence of the NO_2 annual mean AQS objective of 40µg/m^3.

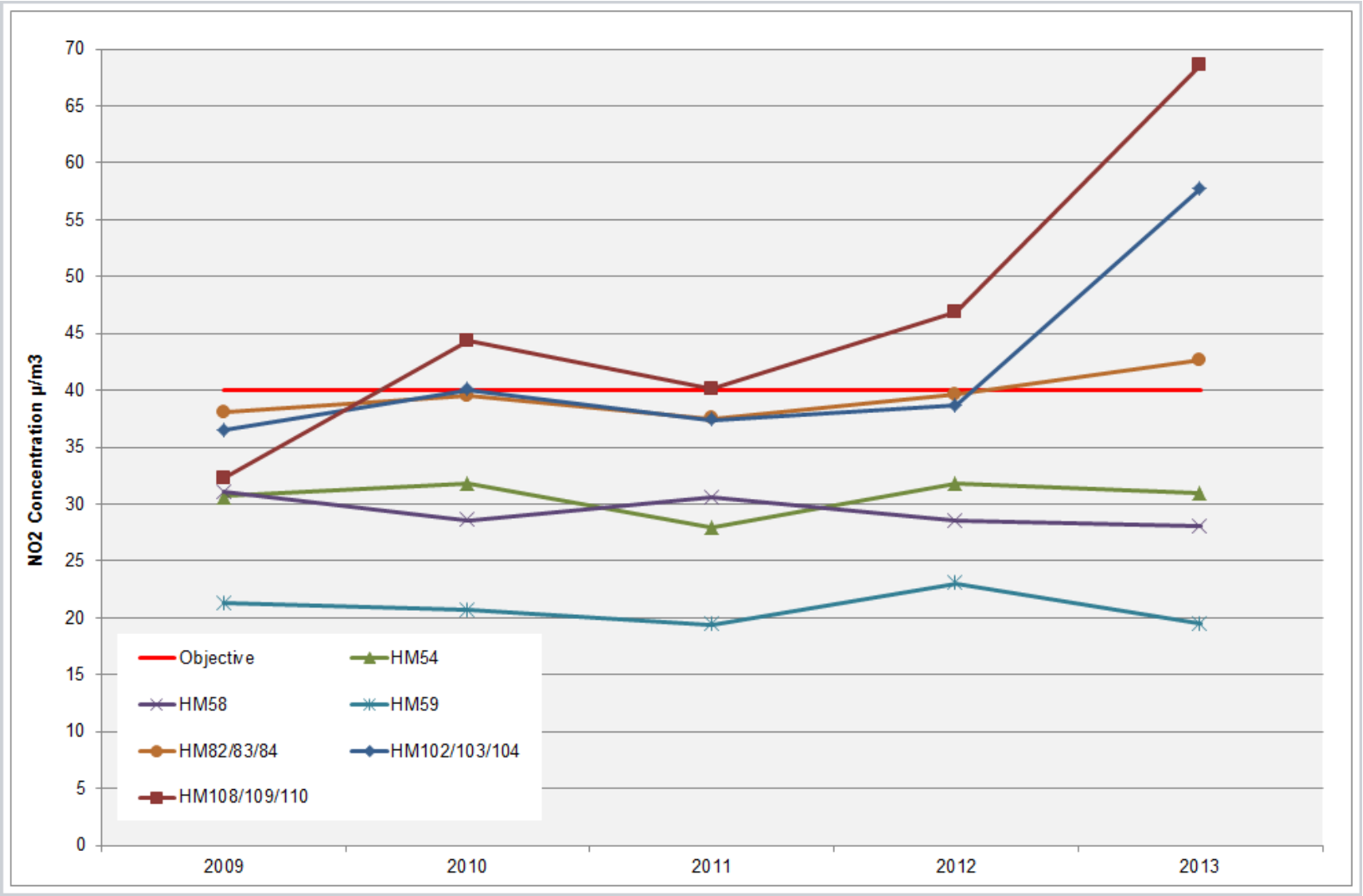


Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Kerbside Monitoring Sites

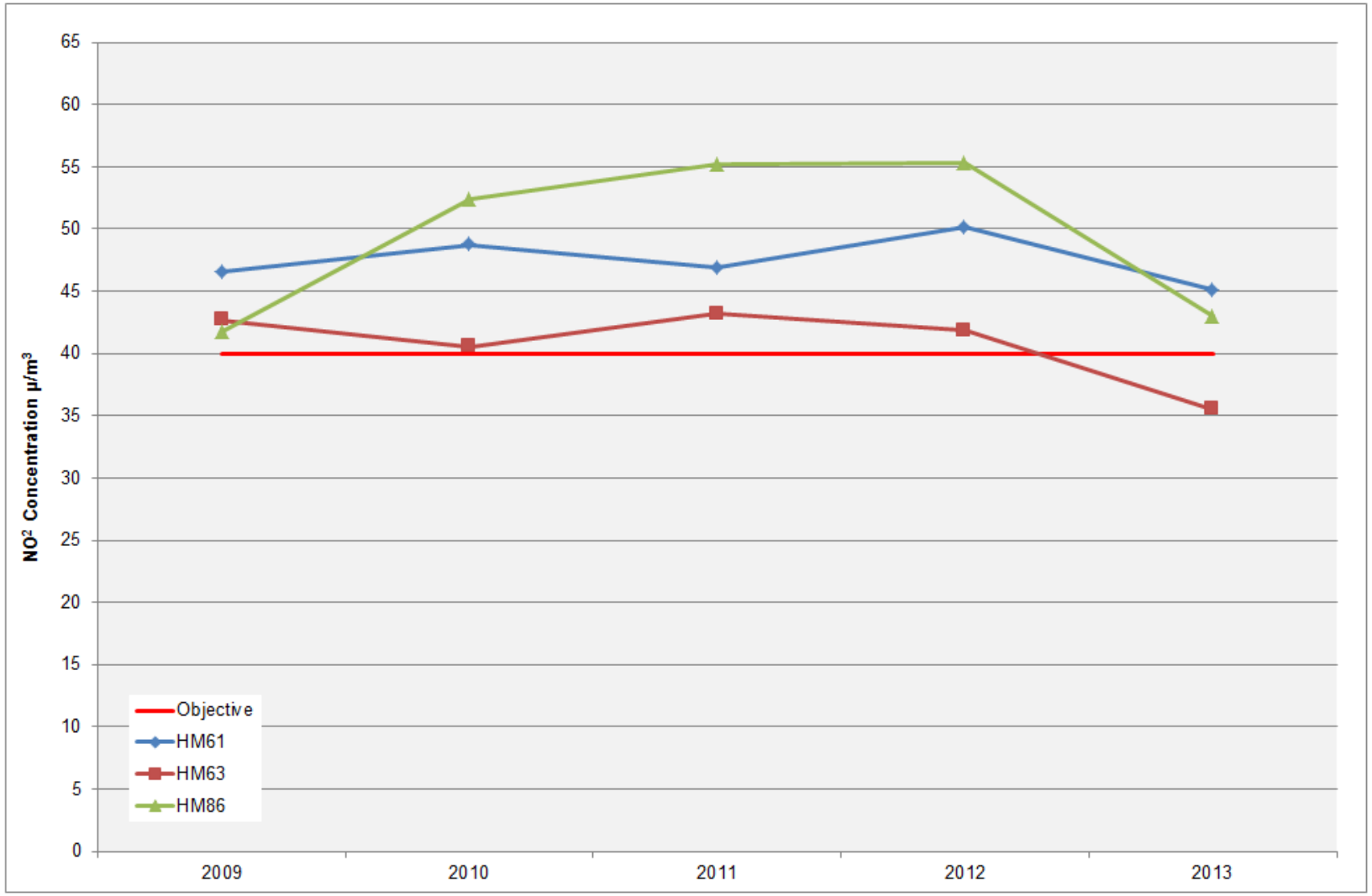


Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Motorway Monitoring Sites

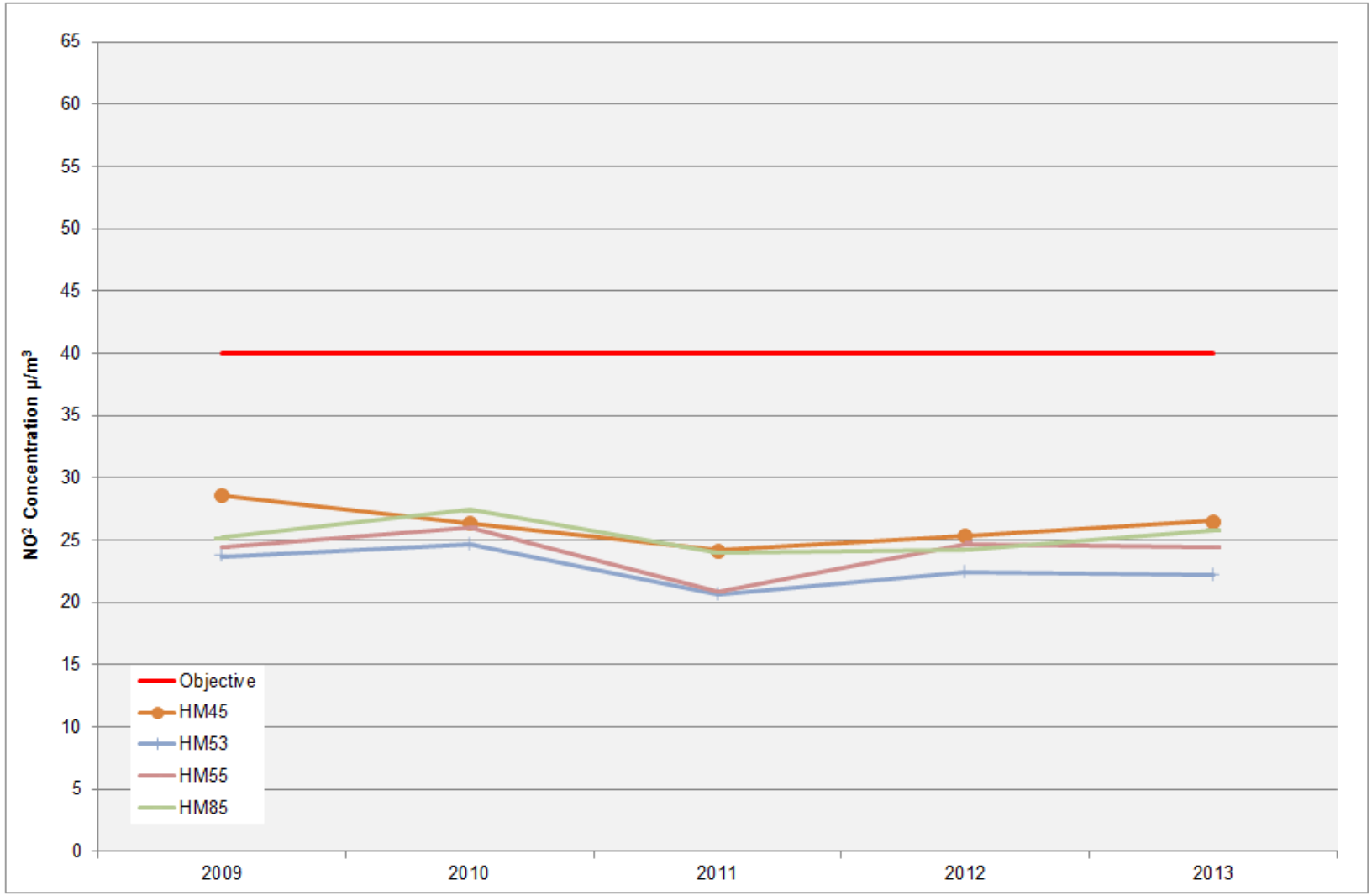


Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Background Monitoring Sites

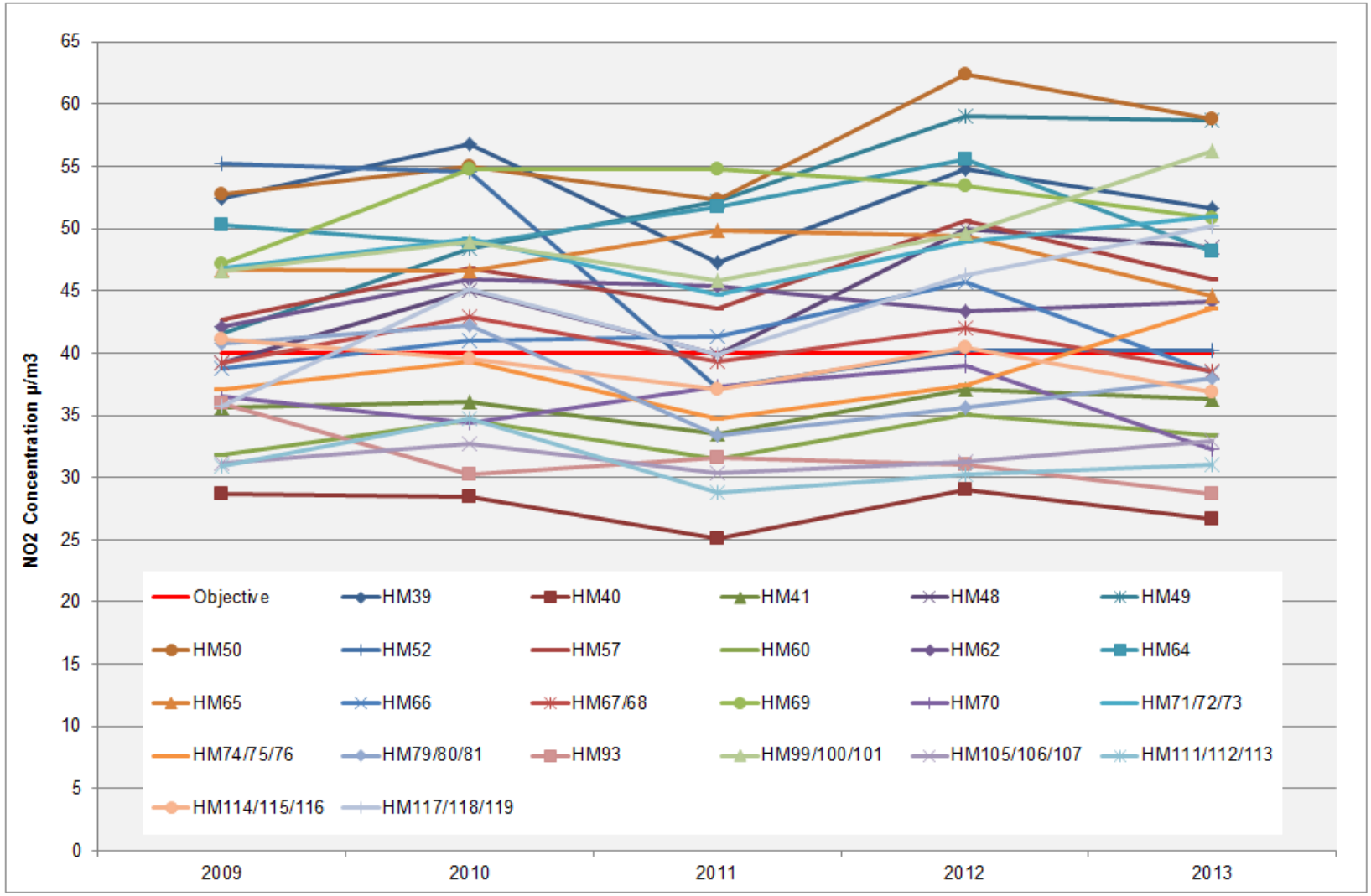


Figure 2.6 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Roadside Monitoring Sites

2.2.2 Particulate Matter (PM_{10})

Hertsmere Borough Council does not undertake monitoring of particulate matter.

2.2.3 Sulphur Dioxide (SO_2)

Hertsmere Borough Council does not undertake monitoring of sulphur dioxide.

2.2.4 Benzene

Hertsmere Borough Council does not undertake monitoring of benzene.

2.2.5 Other Pollutants Monitored

Odour and dust complaints are handled by the Environmental Health Pollution Team as reactive complaints.

2.2.6 Summary of Compliance with AQS Objectives

Hertsmere Borough Council has measured concentrations of NO_2 above the annual mean objective at relevant locations outside of the AQMAs and **will need to proceed to a Detailed Assessment**, for Shenley Road, Borehamwood and High Street, Bushey areas.

3 New Local Developments

3.1 Road Traffic Sources

Hertsmere Borough Council confirms that there are no new or newly identified road traffic sources which may have an impact on air quality within the Local Authority Area.

3.2 Other Transport Sources

Hertsmere Borough Council confirms that there are no new or newly identified other transport sources which may have an impact on air quality within the Local Authority Area.

3.3 Industrial Sources

Hertsmere Borough Council confirms that there are no new or newly identified industrial sources which may have an impact on air quality within the Local Authority Area.

3.4 Commercial and Domestic Sources

Hertsmere Borough Council confirms that there are no new or newly identified commercial and domestic sources which may have an impact on air quality within the Local Authority Area.

3.5 New Developments with Fugitive or Uncontrolled Sources

Hertsmere Borough Council confirms that there are no new or newly identified new developments with fugitive or uncontrolled sources which may have an impact on air quality within the Local Authority Area.

Hertsmere Borough Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Hertsmere Borough Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Planning Applications

During 2013 there were two planning applications approved in the Hertsmere area that could impact upon air quality management. These are detailed below.

Application Number	**TP/13/0752**
Received Date:	2 April 2013
Approval Date:	12 June 2013
Location:	Potters Bar Police Station, The Causeway, Potters Bar, EN6 5HB
Proposal:	Demolition of existing single storey extension & erection of two storey rear extension; Change of use of ground floor to D1 use; Change of use of outbuilding to B1(a) use; Conversion of first floor & loft into residential accommodation to include 1 x 1 bedroom flat, 1 x 2 bedroom flat & 1 x studio; Alterations to roof to include 4 x dormer windows; Associated landscaping & vehicle parking
Comment:	This development takes place in an area that has previously been identified as potentially having poor air quality. But monitoring has not been undertaken as there were no sensitive receptors. Therefore when development is completed air quality monitoring will need to commence.

Application Number	**TP/13/1583**
Received Date:	3 July 2013
Approval Date:	13 September 2013
Location:	Brookes Place, Barnet Road, Potters Bar
Proposal:	Variation of condition 1 attached to planning permission reference TP/12/0786 to allow an increase in the number of pitches and caravans (25 pitches accommodating a total of 39 caravans of which no more than 28 shall be static caravans/mobile homes).
Comment:	This site is within an AQMA and had already been given permission for expansion in 2012 and this approval gives permission for a further increase in numbers. The potential increase in the number of sensitive receptors has been noted.

5 Air Quality Planning Policies

A new Core Strategy was adopted in January 2013, this will form part of the Local Plan along with the forthcoming Site Allocations and Development Management Policies Document which will include a section on Air Quality.

6 Local Transport Plans and Strategies

Hertfordshire County Council Local Transport Plan

Hertfordshire County Council published their third Local Transport Plan (LTP3) in April 2011 which covers the period 2011-2031.

This new Local Transport Plan sets out the transport strategy for Hertfordshire (over the next 20 years), the goals and challenges to be met, and outlines a programme of transport schemes and initiatives (interventions). The various interventions are to be delivered over the short, medium and longer term but the present uncertainties over funding mean their timing cannot be assured. Targets have also been set so that progress towards meeting the strategy objectives can be measured.

The Plan covers all modes of transport - including walking, cycling, public transport, car based travel and freight - and takes account of the effect of transport on wider aspects including the economy, environment, climate change and social inclusion. The Plan makes reference to Challenge 3.2 “Improve the health of individuals by encouraging and enabling more physically active travel and access to recreational areas and through improving areas of poor air quality which can affect health”.

Hertsmere Borough Council is committed to supporting Hertfordshire County Council in delivering the LTP3.

Borehamwood and Elstree Urban Transport Plan

Hertfordshire County Council, in partnership with Hertsmere Borough Council, appointed AECOM to undertake the development of the Urban Transport Plan (UTP) for Borehamwood, Elstree and Well End.

The purpose of the Borehamwood and Elstree UTP is to develop a range of schemes and interventions, across all modes of transport, to address existing problems across the area. The UTP identifies a number of transport improvement schemes for further consideration over the life of the plan to help deal with existing and possible future traffic issues.

The Urban Transport Plan was endorsed by Hertfordshire County Council Highways and Waste Cabinet Panel in September 2013.

Schemes in the plan will be developed over the life of the plan subject to funding being available.

7 Implementation of Action Plans

Hertsmere Borough Council are continuing to implement the 2003 Air Quality Action Plan. An update on this will be submitted separately.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Air quality objectives for benzene, 1,3-butadiene, carbon monoxide, lead, particulates (PM 10) and sulphur dioxide will be met. There is no requirement to undertake a detailed assessment for these pollutants.

The 2013 diffusion tube data show twenty-one sites are exceeding the annual mean objective for NO_2 of 40µg/m^3. Of the sites exceeding the annual mean objective for NO_2 there were four within or adjacent to existing AQMA's and seventeen outside of existing AQMA's. Fall-off with distance results show that in five locations the predicted annual mean NO_2 is below the annual mean objectives at the receptor, but, in twelve locations the predicted annual mean NO_2 is still above or borderline to the annual mean objective at the receptor. All twelve of these locations were considered and actions outstanding from previous reports are relevant to the exceedances found and no additional actions are proposed. Outstanding actions are listed in 8.3.

There were no monitoring results within AQMA's that were below the air quality objective such that is may have been appropriate to revoke an AQMA.

8.2 Conclusions relating to New Local Developments

Hertsmere Borough Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

8.3 Proposed Actions

The 2013 monitoring data has supported the need for Detailed Assessments of NO_2 to take place at HM39 117 Shenley Road and HM99/100/101 84 High Street 1/2/3, Bushey and HM117/118/119 44 High Street 1/2/3, Bushey that was identified in the 2012 Updating and Screening Assessment.

The recommendations of the 2007 and 2010 Detailed Assessments were re-considered in the 2013 Progress Report and the actions below remain outstanding and are supported by the most recent monitoring data.

- Declare AQMA's at The Broadway, Potters Bar (HM62 and HM82/83/84 will be contained in this AQMA) and Park Road/Watling Street Junction, Radlett (HM71/72/73 will be contained in this AQMA).
- Amend AQMA 6 High Street, Potters Bar to a more relevant location;
- Amend and expand AQMA 5 at Elstree Crossroads so the new AMQA reaches HM48, HM49 and HM52.

9 References

- Local Air Quality Management Technical Guidance LAQM.TG(09) February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and the Department of the Environment Northern Ireland
- Local Air Quality Management Policy Guidance LAQM.PG(09) February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and the Department of Environment Northern Ireland
- Hertsmere Borough Council 2013 Local Air Quality Management Annual Progress Report
- Hertsmere Borough Council Updating and Screening Assessment 2012
- Hertsmere Borough Council 2011 Local Air Quality Management Annual Progress Report
- Hertsmere Borough Council 2010 Local Air Quality Management Annual Progress Report
- Hertsmere Borough Council Action Plan 2009
- Hertsmere Borough Council Updating and Screening Assessment 2009
- Hertsmere Borough Council 2008 Local Air Quality Management Annual Progress Report
- Hertsmere Borough Council 2007 Local Air Quality Management Annual Progress Report

Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Appendix B: Diffusion Data 2013

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Hertsmere Borough Council uses Gradko for the supply and analysis of NO2 diffusion tubes. The tube preparation used is the utilising 20% Triethanolamine (TEA) in water preparation method.

The bias adjustment factor for 2013 data has been taken from the LAQM national bias adjustment spreadsheet for Gradko diffusion tubes using the 20% Triethanolamine (TEA) in water preparation method. For 2013 this was 0.95 based on twenty-four studies (update March 2014 v03_14-Final-v2).

Factor from Local Co-location Studies (if available)

A co-location study was not available.

Discussion of Choice of Factor to Use

A national bias adjustment factor was used due as no co-location study was undertaken.

PM Monitoring Adjustment

No PM monitoring was undertaken by Hertsmere Borough Council.

Short-term to Long-term Data adjustment

The results for HM135 Winfield Park were adjusted to represent the annual mean as data was only available for seven months of the twelve month monitoring period. The calculation of the ratio used is shown below.

Table A.1 Short-Term to Long-Term Monitoring Data Adjustment

Site	Annual Mean ($\mu g/m^3$)	Period Mean ($\mu g/m^3$)	Ratio
HM57	48.351	59.252	0.816
HM108	70.251	78.738	0.892
HM109	68.111	76.202	0.894
HM110	67.673	77.781	0.870
		Average	**0.868 (3dp)**

QA/QC of Automatic Monitoring

No automatic monitoring was undertaken.

QA/QC of Diffusion Tube Monitoring

Gradko participate in the Workplace Analysis Scheme for Proficiency (WASP) for NO_2 diffusion tube analysis and the Annual Field Inter-Comparison Exercise. The lab follows the procedures set out by the Harmonisation Practical Guidance.

The precision of diffusion tubes was calculated using data from tubes HM45/HM46/HM47, which are triplicate tubes. The precision was found to be 'good' as the coefficient of variation (CV) of the tubes for eight or more periods was less than 20%, and the average CV of all monitoring periods was less than 10% (8.8%).

Appendix B: Diffusion Tube Data for 2013

Code	Site	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
HM39	117 Shenley Road Borehamwood	44.33	61.28	67.59	40.07	63.25	56.28	55.22	54.86	58.29	48.66	65.61	37.24
HM40	17 Essex Road Borehamwood	41.18	33.29	33.92	20.53	21.07	18.53	22.05	22.58	26.84	32.64	31.96	32.32
HM41	39 Theobald Street Borehamwood	70.23	39.91	40.56	29.77	34.37	18.18	34.76	32.77	38.71		44.70	36.21
HM45	AQMS 1	44.04	29.44	28.98	19.00	17.63	15.55	19.76	20.42	26.70	28.21	30.25	31.98
HM46	AQMS 2	39.49	30.14	25.85	19.74	18.75	13.76	18.71	21.17	26.62	20.53	34.14	54.50
HM47	AQMS 3	42.54	29.15	30.44	17.34	17.94	18.71	20.78	21.33	27.60	28.47	32.01	33.25
HM48	Elstree Crossroads 1 (Nursery High Street)	59.74	62.29	68.02	48.42	45.82	44.64	58.75	54.83	47.70	42.63	55.28	25.09
HM49	Elstree Crossroads 2 (The Haven Barnet Lane)	73.69	80.29	69.31	44.57	62.44	32.89	67.24	55.10	53.61	50.58	81.62	70.12
HM50	Elstree Crossroads 3 (High Street/Barnet Lane)	80.76	60.49	54.66	56.42	59.20	47.79	66.13	55.55	47.80	52.82	81.09	79.78
HM52	Elstree Crossroads 5 (6 Walton Terrace)	49.64	43.75	49.69	35.75	35.12	33.16	38.44	38.47	43.73	36.57	51.98	51.15
HM53	Caldecote Lane Bushey Heath (stables)	34.87	28.37	30.67	13.43	19.03	18.45	18.13	18.02	24.75	21.65	25.39	27.76
HM54	19 High Road Bushey	45.11	39.35	41.97	28.95	28.22	25.17	26.76	22.36	32.10	30.15	38.19	32.20
HM55	Highwood Avenue Garages Bushey	36.24	31.26	31.48	20.09	20.59	18.20	24.32	20.85	25.72	23.45	31.09	25.72
HM57	Hartspring Lane (11 Grove Place) Bush	57.27	50.16	40.84	44.05	32.37	42.02	53.35	47.80	52.47	43.60	56.13	60.14
HM58	Pegmire Lane Aldenham (junction with Hilfield Lane)	42.92	33.88	31.64	21.68	23.53	21.52	23.96	25.84	34.31	28.92	33.37	33.44
HM59	7 Aldenham Grove Radlett	30.42	21.34	24.49	14.89	15.78	14.80	16.82	16.06	20.70	20.81	26.10	23.99
HM60	Bell Lane London Colney (1 Council Cottages)	37.03	46.68	39.03	29.58	36.26	28.06	20.87	26.84	38.24	31.71	50.04	37.66
HM61	31 Blanche Lane South Mimms	54.52	46.23	37.79	36.25	48.16	33.77	45.76	30.65	63.11	50.19	52.74	70.72

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HM62	24 The Broadway Potters Bar	55.98	48.38	50.09	32.57	43.84	42.15	42.05	31.65	50.17	46.29	60.07	54.89
HM63	27 Dove Lane Potters Bar	51.41	42.23	41.22	32.31	32.84	29.09	32.96	33.13	39.37	39.74	35.01	39.34
HM64	Bus Garage 1 Potters Bar (outside Bus Garage)	56.16	58.24	43.82	35.10	58.35	38.66	61.14	45.72	65.41	54.06	65.26	25.79
HM65	Hatfield Road Potters Bar (250-252 High Street)	56.52	54.59	41.71	37.56	49.82	38.51	47.31	42.80	45.79	48.92	49.66	49.60
HM66	Bus Garage 2 Potters Bar (Oakmere Lane)	54.25	44.31	33.26	34.00	39.85	30.80	35.13	35.28	42.09	40.53	49.67	46.46
HM67	Bus Garage 3 Potters Bar (147 High Street)	51.69	43.53	38.94	29.91	34.69	33.86		35.56	37.04	43.98	44.96	51.99
HM69	Southgate Road Potters Bar (Abbey House)	63.51	62.29	50.05	38.92	70.12	44.21	46.17	46.64	57.17	54.42	57.55	51.86
HM70	9 Park Avenue Potters Bar	47.25	42.12	31.47	26.97	28.02	20.33	31.36	32.29	38.51	33.27	45.34	30.32
HM71	2 Park Road Radlett 1	61.38	57.97	47.68	40.24	60.33	42.01	61.26	42.51	52.76	47.09	69.17	56.96
HM72	2 Park Road Radlett 2	60.36	50.88	42.91	37.51	47.51	42.14	54.53	42.89	51.08	47.03	65.02	59.04
HM73	2 Park Road Radlett 3	58.07	54.53	39.97	36.71	48.18	38.00	47.22	41.55	52.59	44.86	74.23	59.61
HM74	301 Watling Street Radlett 1	53.40	47.17	58.96	34.34	32.58	40.13	40.96	33.75	44.68	39.98	55.60	62.70
HM75	301 Watling Street Radlett 2	53.21		71.88	37.30	35.08	37.35	43.41	33.11	40.63	36.31	51.11	39.33
HM76	301 Watling Street Radlett 3	49.20	14.84	59.89	37.26	41.40	40.55	40.80	33.40	39.62	38.14	56.08	50.45
HM79	7 The Broadway Potters Bar 1	51.55	44.55	44.32	32.10	33.86	34.62	36.53	28.85	37.21	36.22	50.70	40.48
HM80	7 The Broadway Potters Bar 2	48.26	41.15	41.87	33.32	35.23	29.82	37.50	29.85	39.31	38.44	42.36	33.28
HM81	7 The Broadway Potters Bar 3	46.99	46.94	40.84	29.82	32.55	29.35	29.82	28.71	36.71	32.74	48.17	44.57
HM82	10 Baker Street Potters Bar 1	48.15	51.04	47.28	32.43	34.80	40.89	40.56	33.28	44.61		44.40	50.22
HM83	10 Baker Street Potters Bar 2	54.57	45.90	43.38	33.97	34.66	38.65	54.78	30.50	43.66	47.60	54.54	37.06

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HM84	10 Baker Street Potters Bar 3	47.37	49.27	54.89	32.47		42.40	26.90	31.35	46.73	47.75	50.14	36.75
HM85	16 Andrew Close Shenley	39.54	33.39	31.42	20.33	20.17	18.27	20.49	20.27	29.13	27.34	35.20	29.87
HM86	Charleston Paddocks South Mimms	59.78	49.84	35.64	34.76	43.34	30.45	39.92	46.69	49.04	49.14	51.68	53.00
HM93	103 Baker Street Potters Bar	44.63	35.64	34.25	26.06	6.83	14.48	28.68	24.16	33.66	34.09	40.93	38.84
HM99	84 High Street 1, Bushey	57.09	61.64	82.27	54.31	56.66	46.27		46.91	55.92	51.17	72.54	62.60
HM100	84 High Street 2, Bushey	56.20	72.93	51.16	42.38	46.07	42.56		48.43	49.48	48.04	77.77	63.79
HM101	84 High Street 3, Bushey		54.71	73.51	39.53	48.67	44.37		48.06	57.00		72.38	59.49
HM102	Aldenham Road 1, Radlett (Red Lion)	61.20	46.40	50.27	47.67	70.44	51.62	57.55	49.87	70.42		77.41	
HM103	Aldenham Road 1, Radlett (Red Lion)	72.85	60.68	56.62	52.00	42.39	50.75	61.78	49.21	58.14		75.87	
HM104	Aldenham Road 1, Radlett (Red Lion)	73.38	72.33	50.80	38.52	61.92	52.24	36.68	49.81	60.52		74.95	
HM105	Elstree Park 1	50.24	41.64	39.68	29.65	25.93	26.92	30.52	29.34	31.67	34.38	37.73	38.50
HM108	Hartspring Lane 1, Bushey (Hazetta House)	58.06	91.85	82.65	65.37	72.65	60.10	58.42	57.68	74.31	57.27	89.80	74.85
HM109	Hartspring Lane 2, Bushey (Hazetta House)	55.19	79.57	85.35	57.26	82.75	59.13	52.71	57.50	61.17	60.08	68.84	97.77
HM110	Hartspring Lane 3, Bushey (Hazetta House)	57.65	80.01	74.38	54.75	78.59	59.47	64.97	57.05	79.96	50.90	79.89	74.44
HM111	9 Blanche Lane 1, South Mimms	43.33	41.91	38.69	27.75	27.96	29.44	34.35	26.92	29.90	30.10	33.93	28.29
HM114	Parkside 1, Potters Bar	49.84	47.98	40.52	30.90		33.09	36.87	34.59	39.49	39.09	42.77	31.61
HM117	44 High Street, Bushey 1	57.06	56.35	47.79	34.66	43.26	50.65	54.75		51.53	41.95	55.58	49.66
HM118	44 High Street, Bushey 2	62.00	54.90	48.02	37.85	5.52		53.17		55.63	45.60	69.44	47.92
HM119	44 High Street, Bushey 3	70.46	60.33	44.24	40.84	55.84	50.06	47.58		51.39	42.49	68.35	51.64

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HM120	Mills Court, Todd Close 1	38.74	31.44	28.60	25.22	23.84	19.33	21.14	26.60	29.60	30.42	32.60	35.87
HM121	Mills Court, Todd Close 2	40.11	32.12	31.54	22.33	23.77	21.18	26.80	25.79	31.43	30.46	34.74	30.88
HM122	Mills Court, Todd Close 3	43.19	30.16	30.01	21.87	20.32	21.23	25.79	25.81	30.42	28.93	35.24	37.73
HM123	Studio Plaza, Elstree Way 1	52.01	48.98	41.64	34.32	41.82	37.85			51.61	46.23	17.54	61.33
HM124	Studio Plaza, Elstree Way 2	52.18	49.47	39.12	34.01	30.84	44.46		48.76	52.83	50.88	49.82	63.08
HM125	Studio Plaza, Elstree Way 3	54.75	55.57	38.25	31.62	37.54	33.77	49.05	51.29	54.29	53.34	44.62	62.03
HM126	63 Elstree Hill North 1	51.23	47.25	39.66	30.54	33.79	35.44	38.61	34.45	41.81	34.63	69.31	39.52
HM127	63 Elstree Hill North 2	50.59	44.39	43.70	31.44	37.86	33.96	42.88	33.93	46.38	31.89	55.66	47.08
HM128	63 Elstree Hill North 3	49.10	42.77	38.56	31.22	32.84	35.99	40.13	37.36	43.44	32.59	61.28	49.20
HM129	Allum Lane/Elstree Hill North 1	43.29	37.12	30.48	26.87	34.84	35.08	43.96	31.49	39.32	37.10	44.96	38.54
HM130	Allum Lane/Elstree Hill North 2	44.92	35.93	32.67	25.67	35.51	37.78	39.60	30.95	36.12	36.77	41.03	36.40
HM131	Allum Lane/Elstree Hill North 3	45.05	38.72	32.46	31.53	26.03	38.85	42.82	30.62	34.58	40.35	41.33	34.02
HM132	Watling Mansions, Watling Street 1	42.51	41.57	44.26	28.38	34.02	32.11	34.87	30.07	33.20	31.66	51.06	35.32
HM133	Watling Mansions, Watling Street 2	45.35	49.09	50.88	29.22	7.84	30.43	37.86	29.55	33.63	37.98	39.14	35.81
HM134	Watling Mansions, Watling Street 3	45.86	42.73	51.02	28.68	28.28	29.76	34.15	27.79	39.26	36.08	48.19	38.68
HM135	Winfield Park						28.81	34.48	36.38	46.59	41.26	48.18	54.12