



2015 Air Quality Updating and
Screening Assessment for
North Hertfordshire District Council

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

September 2015

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Executive Summary

As required by Part IV of the Environment Act 1995 North Hertfordshire District Council (NHDC) has undertaken the 2015 Local Air Quality Management Updating and Screening Assessment (USA) of air quality for the district.

This USA report is a review of air pollution measurement data compared to the national air quality objectives for human health. In addition the report is a review of any new or existing potential sources of air pollution and an assessment of their potential impacts on air quality for the population of the district.

NHDC assessed new and existing sources of air pollution from within the district and did not identify any new, or previously unrecognised existing, sources that were likely to be responsible for national air quality objectives for human health being exceeded.

NHDC monitored appropriate locations within the district in 2014 and with the exception of two areas of the district the air quality objectives were not exceeded. Therefore, although the majority of the population of the district is not exposed to air pollution at a level above the national air quality objectives for human health there are two areas where this does not appear to be the case. The two areas are identified below.

The mean annual average air quality objective for nitrogen dioxide in 2014 was exceeded at **Stevenage Road, Hitchin**. This is consistent with the findings of all of the Local Air Quality Management reporting since the 2010 Progress Report and is consistent with the area having been designated an Air Quality Management Area in 2013.

The mean annual average air quality objective for nitrogen dioxide was exceeded at the north end of **Park Way, Hitchin**, at the Payne's Park roundabout. This monitoring location was introduced for the first time in March 2011 following the 2011 Detailed Assessment Report and in all subsequent years the objective was exceeded at that location. A 2014 Detailed Assessment Report was undertaken to investigate whether an Air Quality Management Area (AQMA) should be designated as a result of the nitrogen dioxide concentrations in the area. It concluded that although concentrations were close to exceeding objectives at 41 Upper Tilehouse Street the case for an AQMA was not strong enough. However, as at August 2015 this conclusion under question by Defra and their consultant, so it may yet become necessary to extend the Stevenage Road AQMA to include 41 Upper Tilehouse Street, or to designate a new AQMA at 41 Upper Tilehouse Street.

NHDC will continue to:

- monitor air quality in its District
- implement measures identified in its Action Plan for the AQMA at Stevenage Road, Hitchin
- take whatever action is agreed as necessary with regard to the air quality issue at 41 Upper Tilehouse Street, Hitchin.

Table of contents

	Executive Summary	2
1	Introduction	7
1.1	Description of Local Authority Area	7
1.2	Purpose of Report.....	8
1.3	Air Quality Objectives	8
1.4	Summary of Previous Review and Assessments	10
2	New Monitoring Data	13
2.1	Summary of Monitoring Undertaken	13
2.1.1	Automatic Monitoring Sites	13
2.1.2	Non-Automatic Monitoring Sites	17
2.2	Comparison of Monitoring Results with AQ Objectives	33
2.2.1	Nitrogen Dioxide	33
2.2.2	PM ₁₀	40
2.2.1	Sulphur Dioxide.....	41
2.2.2	Benzene.....	41
2.2.3	Other pollutants monitored	41
2.2.4	Summary of Compliance with Air Quality Strategy Objectives	43
3	Road Traffic Sources	44
3.1	Narrow Congested Streets with Residential Properties Close to the Kerb	44
3.2	Busy Streets Where People May Spend 1-hour or More Close to Traffic	45
3.3	Roads with a High Flow of Buses and/or HGVs.	45
3.4	Junctions	45
3.5	New Roads Constructed or Proposed Since the Last Round of Review & Assessment	45
3.6	Roads with Significantly Changed Traffic Flows.....	45
3.7	Bus and Coach Stations	45
4	Other Transport Sources.....	46
4.1	Airports.....	46
4.2	Railways (Diesel and Steam Trains)	47
4.2.1	Stationary Trains.....	47
4.2.2	Moving Trains	47
4.3	Ports (Shipping)	47
5	Industrial Sources.....	48
5.1	Industrial Installations	48
5.1.1	New or Proposed Installations for which an Air Quality Assessment has been undertaken	48
5.1.2	Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been introduced.....	48

5.1.3	New or Significantly Changed Installations with No Previous Air Quality Assessment...	48
5.2	Major Fuel (Petrol) Storage Depots	48
5.3	Petrol Stations.....	48
5.4	Poultry Farms.....	48
6	Commercial and Domestic Sources	49
6.1	Biomass Combustion – Individual Installations	49
6.2	Biomass Combustion – Combined Impacts.....	49
6.3	Domestic Solid-Fuel Burning	49
6.4	Fugitive or Uncontrolled Sources.....	49
7	Conclusions and Proposed Actions.....	50
7.1	Conclusions from New Monitoring Data	50
7.2	Conclusions from Assessment of Sources	50
7.3	Proposed Actions.....	51
8	References.....	52

List of Tables

Table 1.1: Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England	9
Table 1.2: Summary of Previous Review and Assessments	10
Table 2.1: Details of Automatic Monitoring Sites	15
Table 2.2: Details of Non-Automatic Monitoring Sites	32
Table 2.3: Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective	34
Table 2.4: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective	34
Table 2.5: Results of Nitrogen Dioxide Diffusion Tubes in 2014	35
Table 2.6: Results of Nitrogen Dioxide Diffusion Tube Monitoring in Baldock since 2010: Comparison with Annual Mean Objective (40µg/m ³)	36
Table 2.7: Results of Nitrogen Dioxide Diffusion Tube Monitoring near Payne's Park since 2010: Comparison with Annual Mean Objective (40µg/m ³)	37
Table 2.8: Results of Nitrogen Dioxide Diffusion Tube Monitoring near Stevenage Road (Hitchin Hill Roundabout) Hitchin since 2010: Comparison with Annual Mean Objective (40µg/m ³)	39
Table 2.9: Results of Automatic Monitoring of PM ₁₀ : Comparison with Annual Mean Objective	42
Table 2.10: Results of Automatic Monitoring of PM ₁₀ : Comparison with 24 hour Mean Objective	42
Table 3.1: AADF Traffic Flows on A505 through Baldock (2005 - 2013)	44
Table 3.2: AADF Traffic Flows in the Payne's Park Area of Hitchin (2005 – 2014)	44
Table 3.3: AADF Traffic Flow on Stevenage Road, Hitchin (2008 – 2013)	44

List of Figures

Figure 1.1: North Hertfordshire District Council	7
Figure 1.2: AQMA Boundary at Stevenage Road, Hitchin as designated in 2012	12
Figure 2.1: Nitrogen Dioxide Automatic Monitoring Site: Stevenage Road, Hitchin	13
Figure 2.2: Nitrogen Dioxide & PM ₁₀ Automatic Monitoring Site: Payne's Park Roundabout, Hitchin	14

North Hertfordshire District Council

Figure 2.3: Nitrogen Dioxide Diffusion Tube Locations in Baldock	18
Figure 2.4: Nitrogen Dioxide Diffusion Tubes Locations in Royston	19
Figure 2.5: Nitrogen Dioxide Diffusion Tube Location in Welwyn	20
Figure 2.6: Nitrogen Dioxide Diffusion Tube Locations at the western end of Stevenage Road, Hitchin	21
Figure 2.7: Nitrogen Dioxide Diffusion Tube Locations at the eastern end of Stevenage Road, Hitchin	22
Figure 2.8: Nitrogen Dioxide Diffusion Tube Location at Park Street, Hitchin	23
Figure 2.9: Nitrogen Dioxide Diffusion Tube Locations at the Payne's Park Area of Hitchin	24
Figure 2.10: Nitrogen Dioxide Diffusion Tube Location, Queen Street, Hitchin	25
Figure 2.11: Nitrogen Dioxide Diffusion Tube Locations at Hermitage Road, Hitchin	26
Figure 2.12: Nitrogen Dioxide Diffusion Tube Locations at the Nightingale Road Area of Hitchin	27
Figure 2.13: Nitrogen Dioxide Diffusion Tube Location at West Hill, Hitchin	28
Figure 2.14: Nitrogen Dioxide Diffusion Tube Location at Grove Road, Hitchin	29
Figure 2.15: Nitrogen Dioxide Diffusion Tube Location at Cadwell Court, Hitchin	30
Figure 2.16: Nitrogen Dioxide Diffusion Tube Location at Willian Road, Hitchin	31
Figure 2.17: Trends in NO ₂ Concentrations from Diffusion Tubes at Baldock (2010-2014)	36
Figure 2.18: Trends in NO ₂ Concentrations from Diffusion Tubes near Payne's Park, Hitchin (2010-2014)	37
Figure 2.19: Trends in NO ₂ Concentrations from Diffusion Tubes near Stevenage Road (Hitchin Hill Roundabout) Hitchin that have exceeded the AQO (2010-2014)	40
Figure 2.20: Trends in PM10 Concentrations from the TEOM at Payne's Park (Hitchin Library) Hitchin (2010-2014)	41

Appendices

Appendix 1: Quality Assurance / Quality Control (QA/QC) Data	54
Appendix 2: Calculations for Reduction of Nitrogen Dioxide with Distance from the Kerb	57
Appendix 3: Nitrogen Dioxide Diffusion Tube Results 2014	60
Appendix 4: Traffic Count Locations	62

1 Introduction

1.1 Description of Local Authority Area

The district of North Hertfordshire is predominantly rural, covering 144.9 square miles, with the bulk of its 127,000 population (as estimated from the 2011 census) located in four main centres, namely Hitchin, Letchworth, Baldock and Royston.

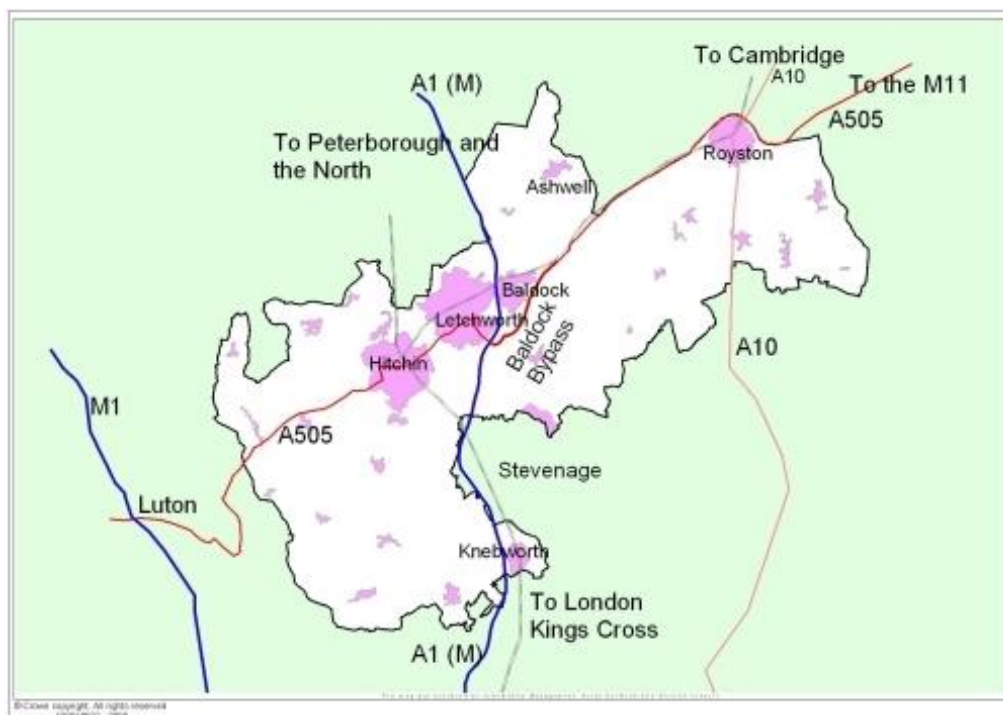


Figure 1.1: North Hertfordshire District

The main source of air pollution in the district is road traffic emissions from major roads notably the A1(M), A505 and A602. In terms of traffic congestion the most significant locations are associated with the A505 through Baldock and the A602 and A505 through Hitchin.

Other local pollution sources, including commercial, industrial and domestic sources will also contribute to background pollution concentrations, as will similar sources from further afield.

1.2 Purpose of 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.

The objective of this Updating and Screening Assessment (USA) is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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 microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (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 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, 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 summarises all previous local air quality management reports.

Table 1.2 Summary of Previous Review and Assessments

Round / Reports	Date	Description / Outcomes
1st Round	1999 – 2003	Assessments concluded that all pollutant levels complied with Air Quality Objectives (AQO).
2nd Round: USA Progress Reports	2003 2004 & 2005	AQO not exceeded. AQO not exceeded.
3rd Round: USA	2006	Diffusion tube data indicated the annual NO ₂ AQO was exceeded at Stevenage Road, Hitchin, Payne's Park, Hitchin & Whitehorse Street, Baldock.
Detailed Assessment	2007	Concluded that no evidence of need for an Air Quality Management Area (AQMA) at the Hitchin sites. But recommended enhancing the monitoring network in those areas. Concluded that NO ₂ concentrations at Whitehorse Street, Baldock would exceed the annual AQO, but that because the Baldock By-Pass opened in 2006 the decision about an AQMA should be postponed until its impact could be assessed.
Progress Report	2008	Due to low data capture at the three areas of concern it was not possible to provide conclusive evidence about whether AQO were exceeded.
4th Round: USA	2009	Concluded that NO ₂ data showed the annual AQO was exceeded at: <ul style="list-style-type: none"> - Whitehorse St, (A505) Baldock - Payne's Park (A505) roundabout, Hitchin - Stevenage Road/Hitchin Hill (A602), Hitchin - Nightingale Road (A505), Hitchin And that a Detailed Assessment was needed for each.
Detailed Assessment	2010	Concluded that the AQO was not exceeded in any of the 4 areas. However, DEFRA considered that the data collected was not robust enough required NHDC to undertake another Detailed Assessment in 2011.
Progress Report	2011	Concluded that no new areas were at risk of AQO being exceeded. Confirmed that there was justification for a Detailed Assessment of the 4 areas previously identified as being at risk.
Detailed Assessment	2011	Concluded that there was relevant exposure above the annual AQO for NO ₂ at properties on the south of Stevenage Road, Hitchin (Figure 1.2) and that an AQMA should be designated. Concluded that the AQO was not exceeded at points of relevant exposure at Nightingale Road, Hitchin and the Payne's Park roundabout, Hitchin. Concluded that there was inconclusive evidence of the AQO being exceeded at Whitehorse Street, Baldock.

Table 1.2 Summary of Previous Review and Assessments (continued)

Round / Reports	Date	Description / Outcomes
4th Round (continued)	2011	In September 2011 DEFRA accepted the conclusions of the 2011 Detailed Assessment and advised NHDC to proceed with the process of designating an Air Quality Management Area at Stevenage Road.
5th Round USA	2012	Confirmed relevant exposure above the annual AQO for NO ₂ at properties on the south side of Stevenage Road (A602), Hitchin within the AQMA. Identified a location of relevant exposure above the annual AQO for NO ₂ at Park Way (A602) on the Payne's Park roundabout, Hitchin; a location that had previously not been assessed as such.
Progress Report	2013	Reiterated the NO ₂ pollution issues identified in 2012 at Stevenage Road Hitchin and Park Way Hitchin.
AQMA Action Plan	2013	In support of the AQMA designation at Stevenage Road an Action Plan was finalised in September 2013
Progress Report	2014	Confirmed the NO ₂ pollution issues identified in 2012 at the AQMA at Stevenage Road Hitchin and the elevated concentrations at Park Way (Payne's Park area) and recommended that a Detailed Assessment be undertaken for the Payne's Park area.
Detailed Assessment	2014	Concluded that the evidence of the NO ₂ air quality objective being exceeded at receptors was not strong enough to declare an Air Quality Management Area in the Payne's Park area.

The 2014 Detailed Assessment was submitted to Defra on the 9th March 2015 and feedback was received on the 6th July 2015 stating that the report was not accepted because:

- The air quality on the nearest façade of the property (41 Upper Tilehouse Street) to the diffusion tube measuring the highest nitrogen dioxide concentration does not appear to have been modelled. The feedback required further explanation and recommended that the NO₂ fall off with distance calculation be carried out again.

The above feedback has been acted on in the following ways:

- Appendix 2 contains the NO₂ fall off with distance calculation for diffusion tube NH93 and 41 Upper Tilehouse Street, Hitchin. This contradicts the modelling in showing an exceedance.
- AQC who undertook the Detailed Assessment Monitoring provided the necessary technical information related to the modelling which was forwarded to Defra by NHDC.

A further response from Defra was awaited at the time of finalising this report.

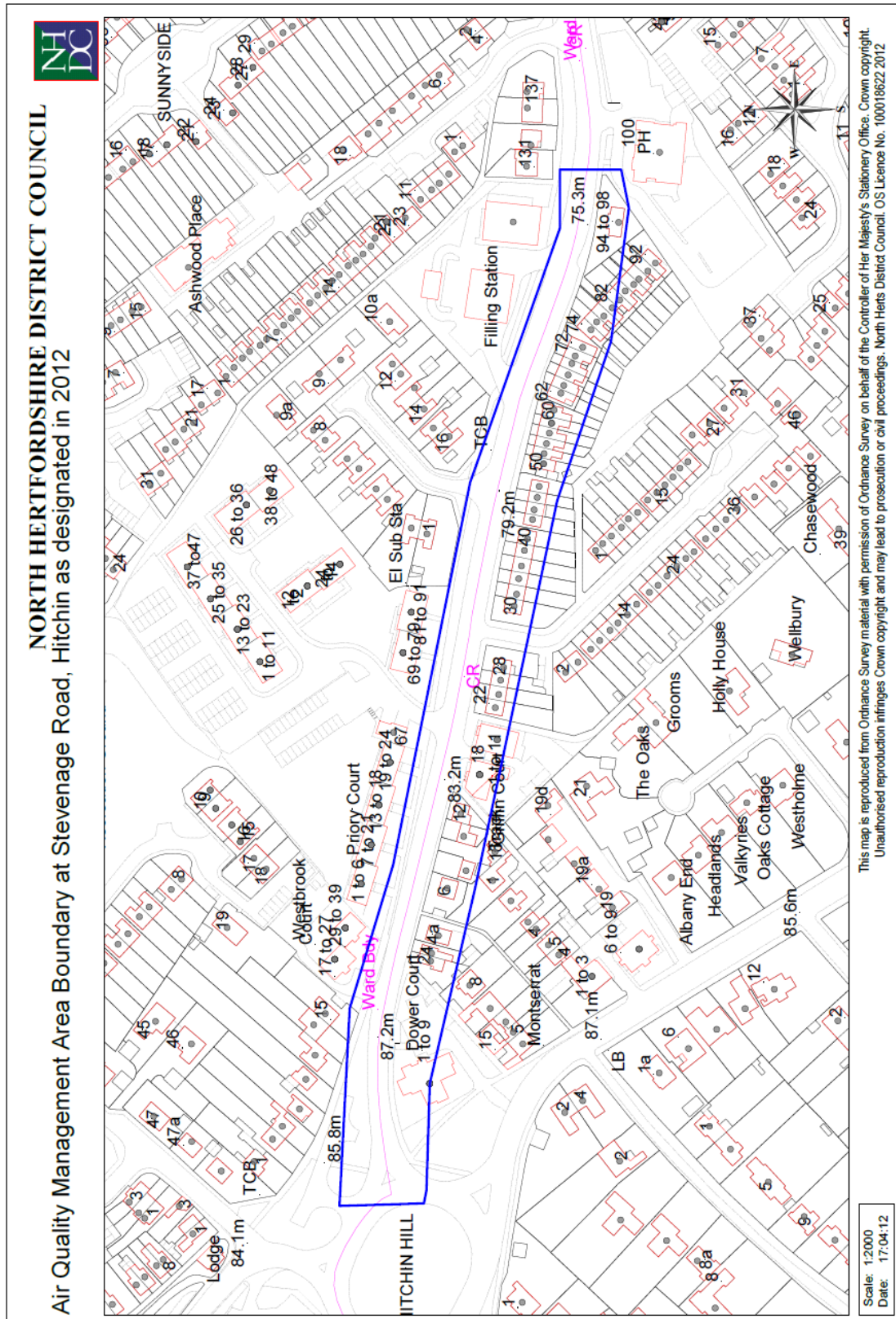


Figure 1.2: Air Quality Management Area at Stevenage Road, Hitchin

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

North Hertfordshire District Council operated automatic monitoring analysers at 2 monitoring sites during 2014. Figures 2.1 and 2.2 illustrate the locations of these sites and Table 2.1 contains the detail of the analysers at each monitoring site.

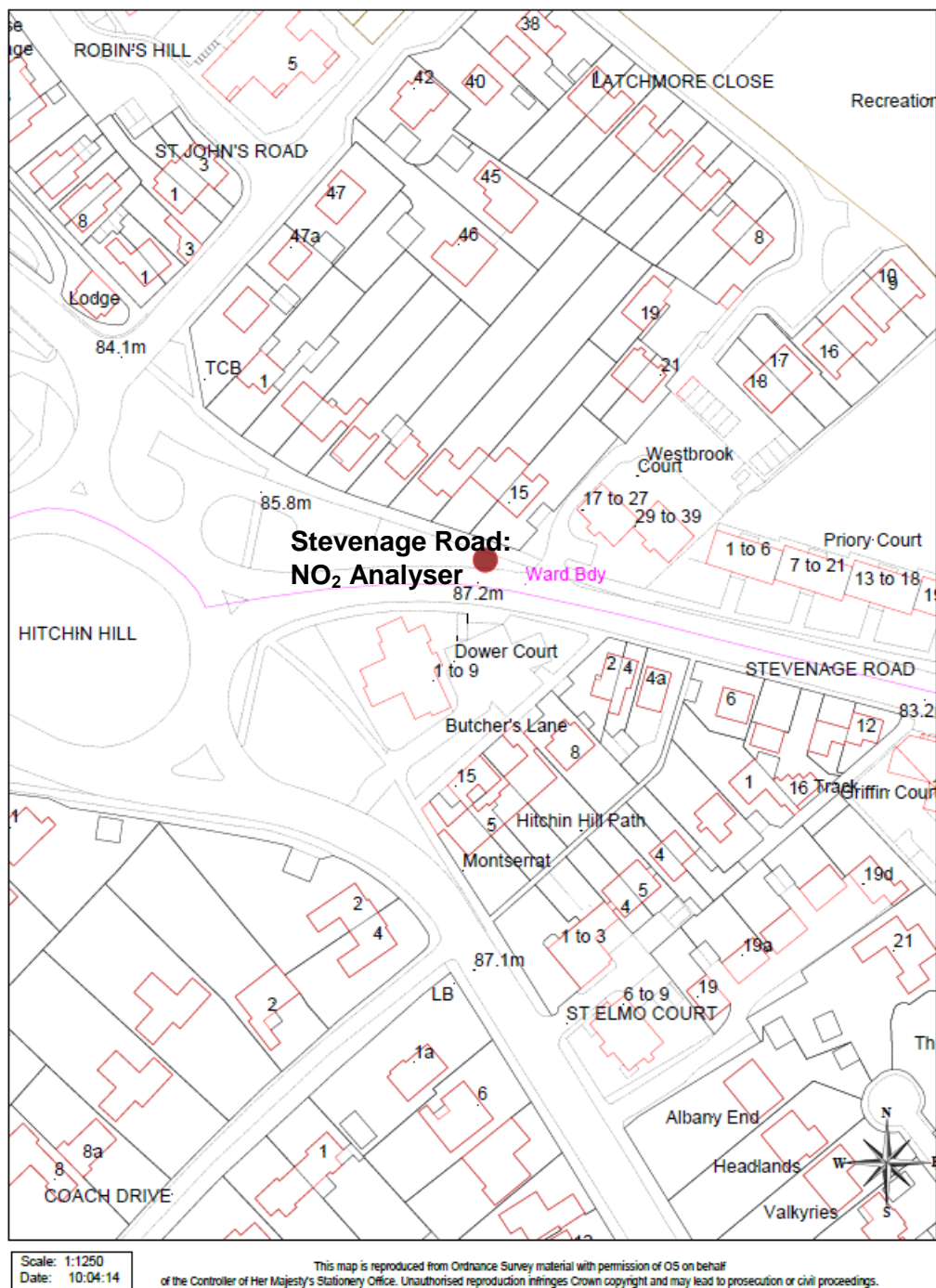
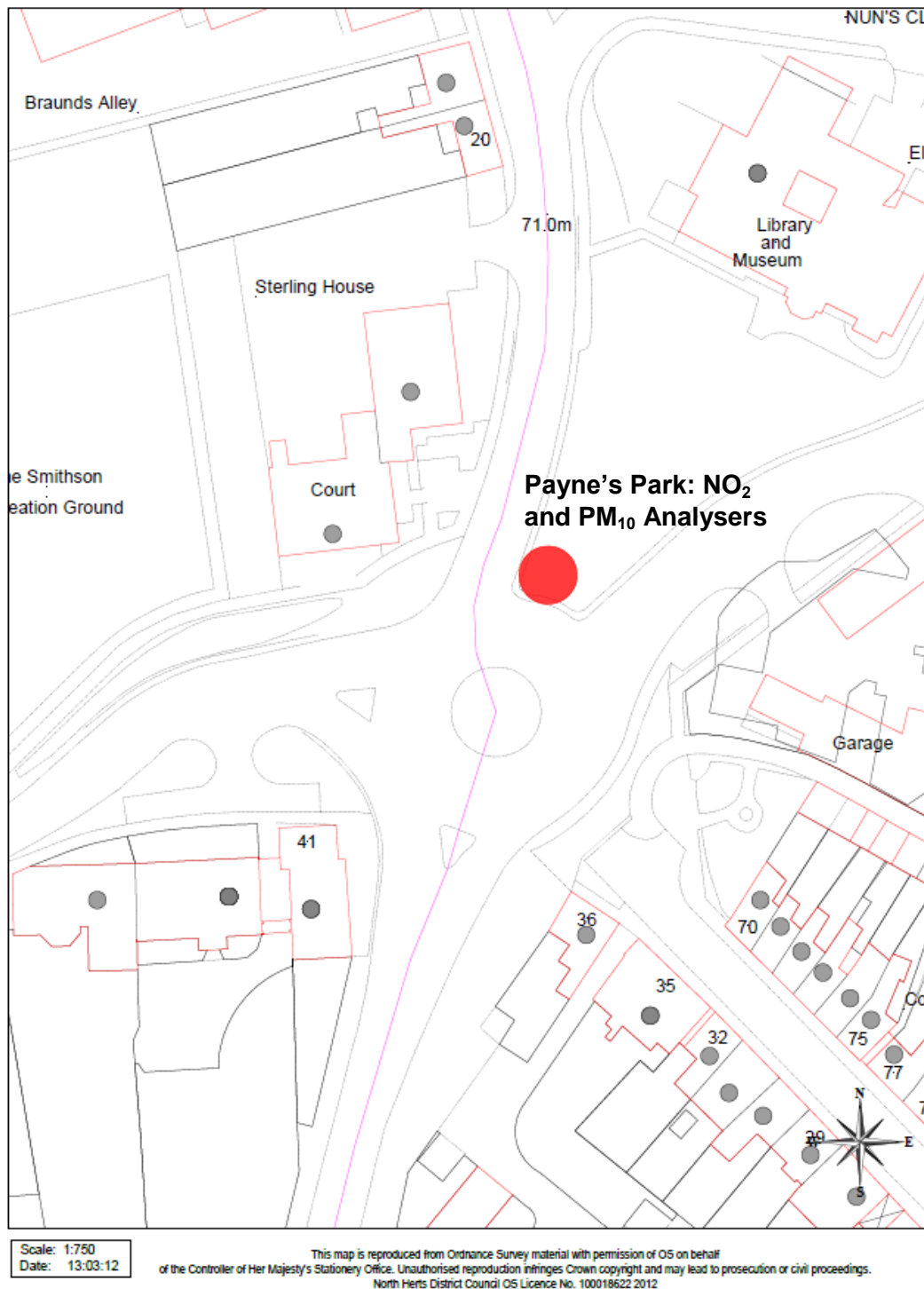


Figure 2.1: Nitrogen Dioxide Automatic Monitoring Site: Stevenage Road, Hitchin



**Figure 2.2: Nitrogen Dioxide and Particulate Matter (PM₁₀) Automatic Monitoring Site:
Payne's Park Roundabout, Hitchin**

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The Payne's Park, Hitchin automatic monitoring site has housed a TEOM analyser, measuring PM₁₀ since 2010 and the NO_x and NO₂ analyser was operating at the site from the 19th April 2011.

The Stevenage Road, Hitchin, automatic monitoring site has, since 1st January 2011, contained a chemiluminescence analyser that measures NO_x and NO₂.

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure?	Distance to kerb of nearest road	Worst-case exposure?
Payne's Park, Hitchin	Road-side	518161, 229092	NO ₂ & PM ₁₀	N	NO ₂ API M200A Chemiluminescence PM ₁₀ TEOM	Y (27m)	3m	N
Stevenage Road, Hitchin	Road-side	518740, 228348	NO ₂	Y	NO ₂ ML 8941B Chemiluminescence	Y (15m)	3m	Y

The R&P 1400a Tapered Element Oscillating Measurement (TEOM) analyser at Payne's Park is subject to calibration visits and filter checks and changes on a fortnightly basis by NHDC staff. In addition, TRL was employed to undertake two service/maintenance visits (one minor and one major service) and to respond in the event of any maintenance issues encountered during daily operation. The calibration readings are reported to AQDM which is retained by NHDC to verify and ratify the data generated by the analyser. This process includes the application of the volatile correction model (VCM) and the results of the data reported have had this applied and have been demonstrated as equal to the gravimetric equivalent.

The API M200A analyser at Payne's Park is subject to calibration checks and filter checks and changes on a fortnightly basis by TRL staff. In addition TRL was employed to undertake two service/maintenance visits (one minor and one major service) and to respond in the event of any maintenance issues encountered during daily operation. The calibration readings were reported to AQDM which is retained by NHDC, as part of the larger Hertfordshire and Bedfordshire Air Quality Network, to verify and ratify the data generated by the analyser. The analyser operated for the whole year.

The ML 8941B analyser at Stevenage Road is visited on a fortnightly basis by TRL staff to carry out calibration visits and filter checks and changes. The calibration readings are reported to Air Quality Data Management (AQDM) which is retained by NHDC to verify and ratify the data generated by the analyser. The ratification process is carried out to the Hertfordshire and Bedfordshire Air Quality Network (HBAQN) Standard, which is as per AURN recommended procedures. In addition TRL was engaged to undertake two services and on-site calibration (one minor service and one major service) visits in a year.

Additional Quality Assurance and Quality Control (QA/QC) information is included within Appendix 2.

2.1.2 Non-Automatic Monitoring Sites

North Hertfordshire District Council undertook non-automatic monitoring using nitrogen dioxide (NO₂) diffusion tubes at 37 locations across the district during 2014 and the number and location of tubes was unchanged from 2013. The locations of these monitoring points are shown by Figures 2.3 – 2.16 and the monitoring location details are summarised in Table 2.2.

The diffusion tubes are 50% triethanolamine (TEA) in acetone and were supplied and analysed by Environmental Services Group (ESG) at Harwell Scientific Services. ESG/HSS follows the procedures set out in the Harmonisation Practical Guidance. ESG/HSS also participates in the AIR Proficiency testing (PT) scheme, which has recently replaced the Workplace Analysis Scheme for Proficiency (WASP). ESG/HSS is currently ranked as a Category Good laboratory.

No co-location study has been undertaken in the district. Data from the diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location database. The bias adjustment factor has been taken from the March 2015 version of the Diffusion Tube Bias Adjustment Factors spreadsheet available from the Defra Review and Assessment website (<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>).

According to the above database the bias adjustment factor for Harwell Scientific Services in March 2015 was 0.81.

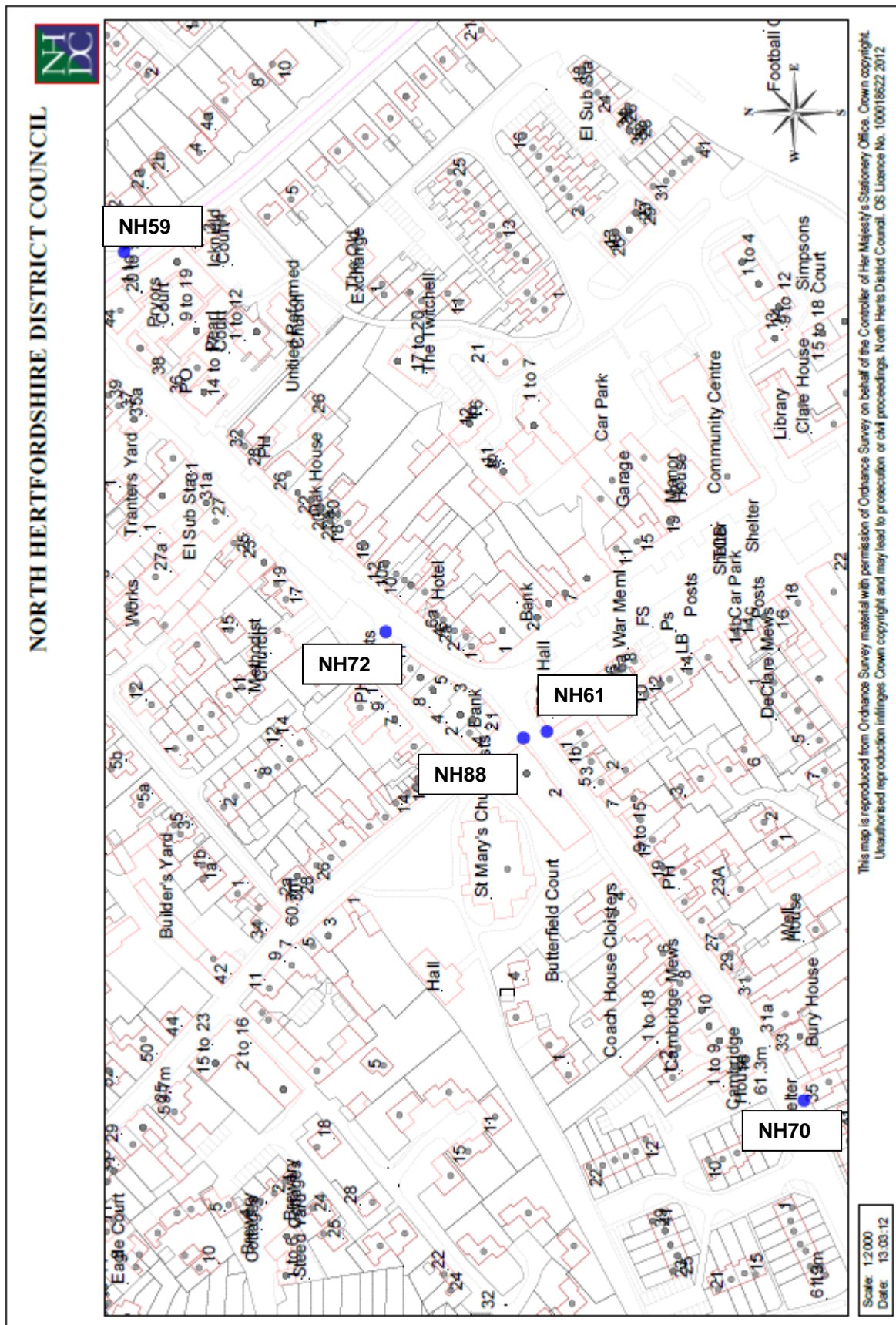


Figure 2.3: Nitrogen Dioxide Diffusion Tube Locations in Baldock

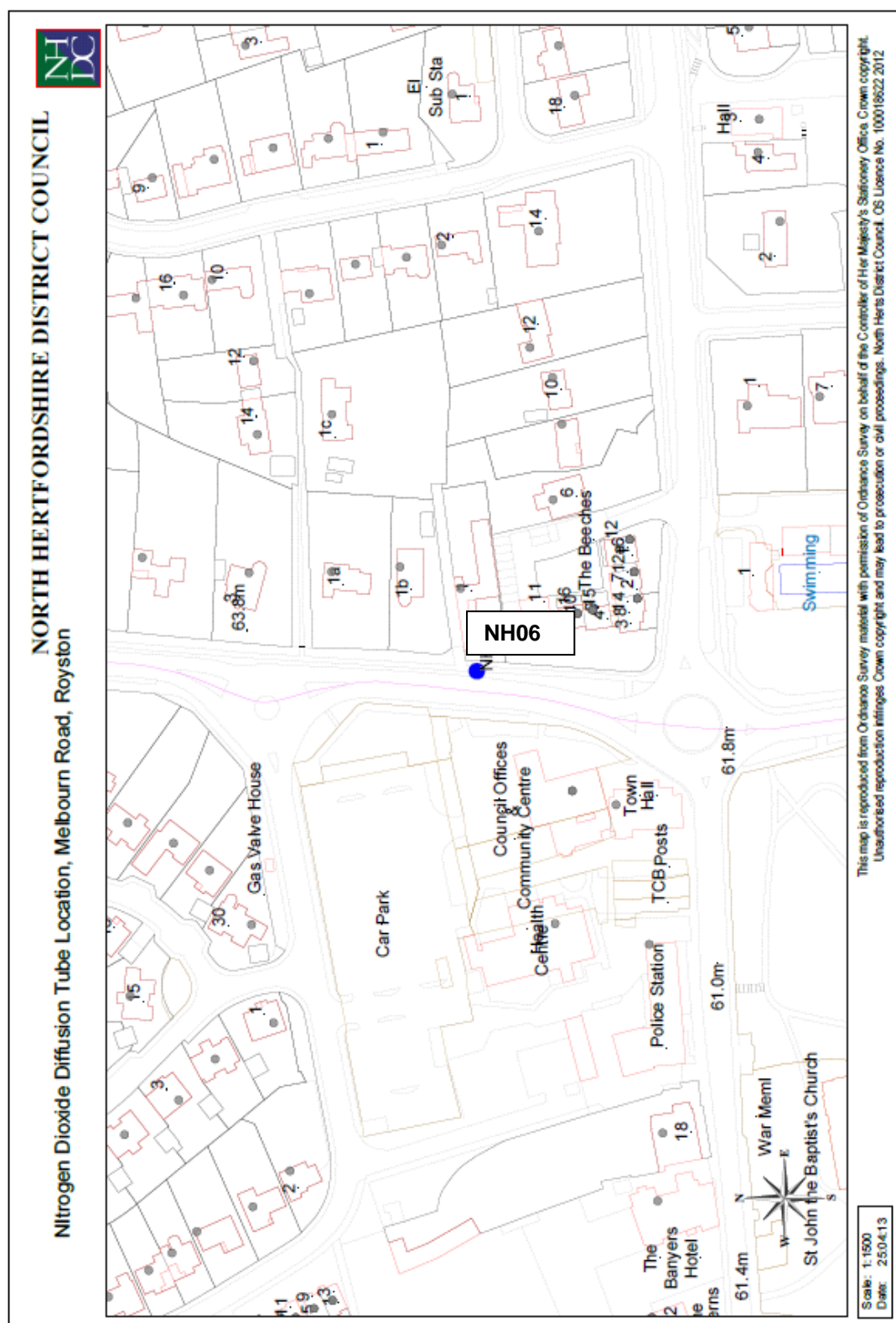


Figure 2.4: Nitrogen Dioxide Diffusion Tube Location in Royston

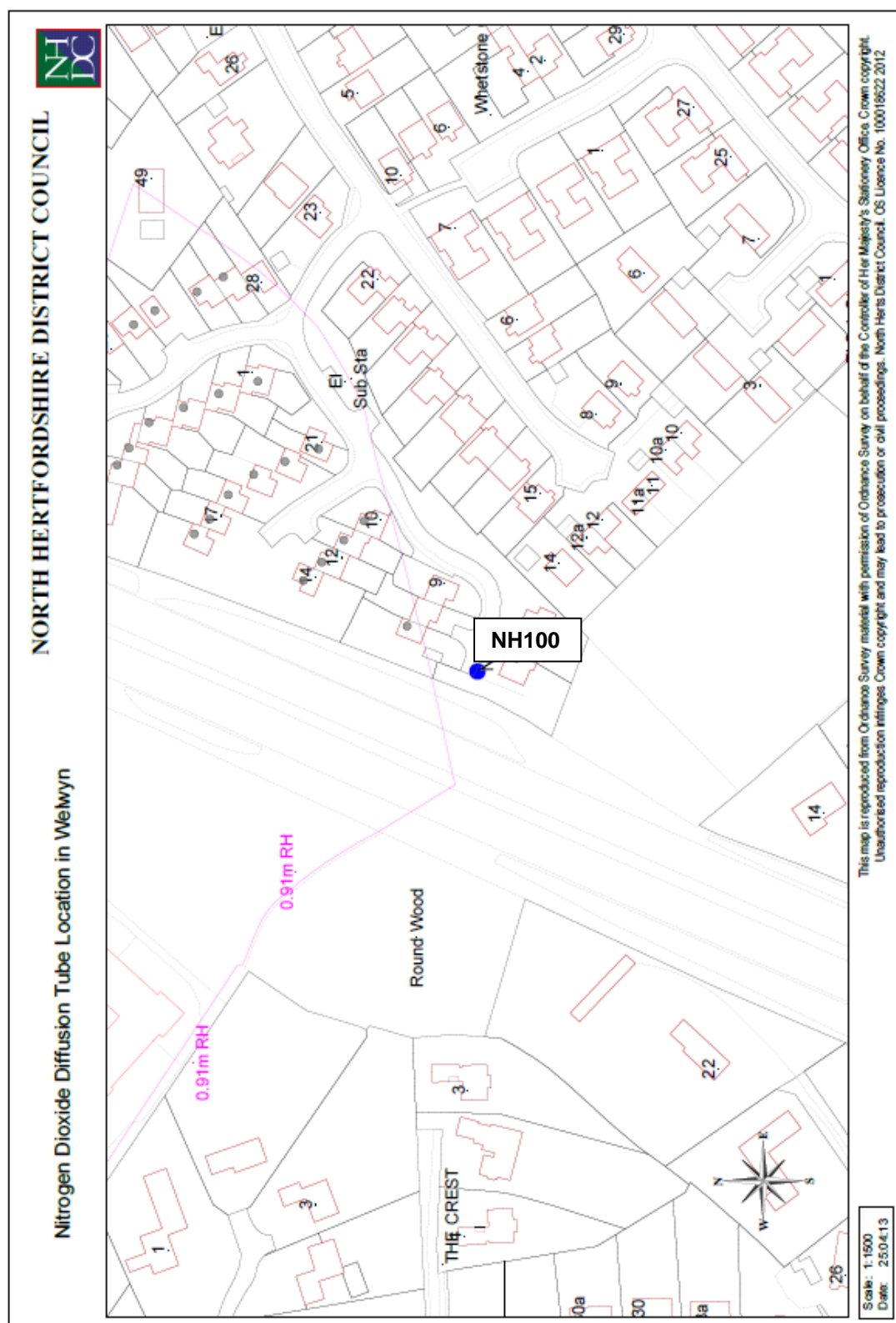


Figure 2.5: Nitrogen Dioxide Diffusion Tube Location in Welwyn

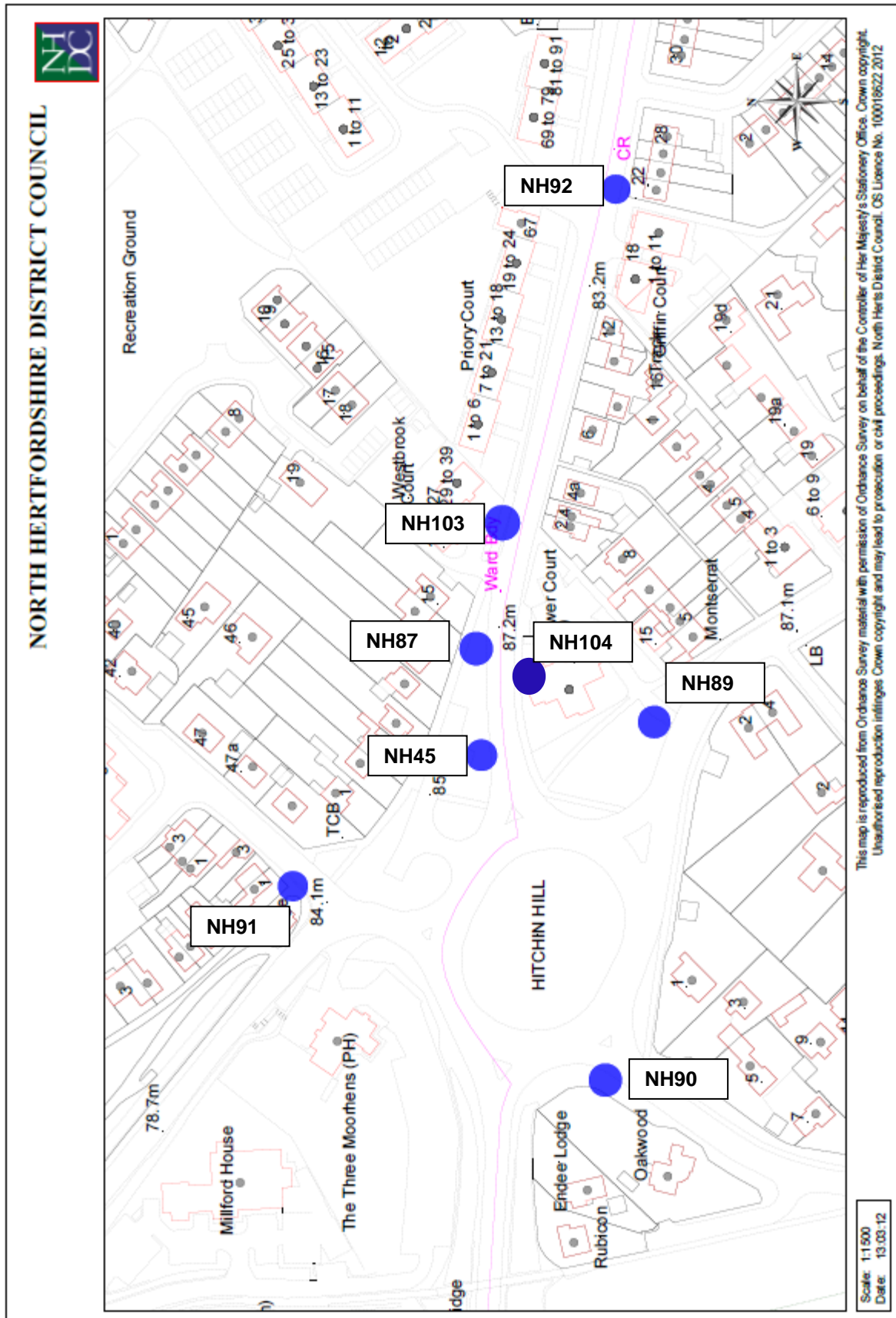


Figure 2.6: Nitrogen Dioxide Diffusion Tube Locations at the western end of Stevenage Road, Hitchin

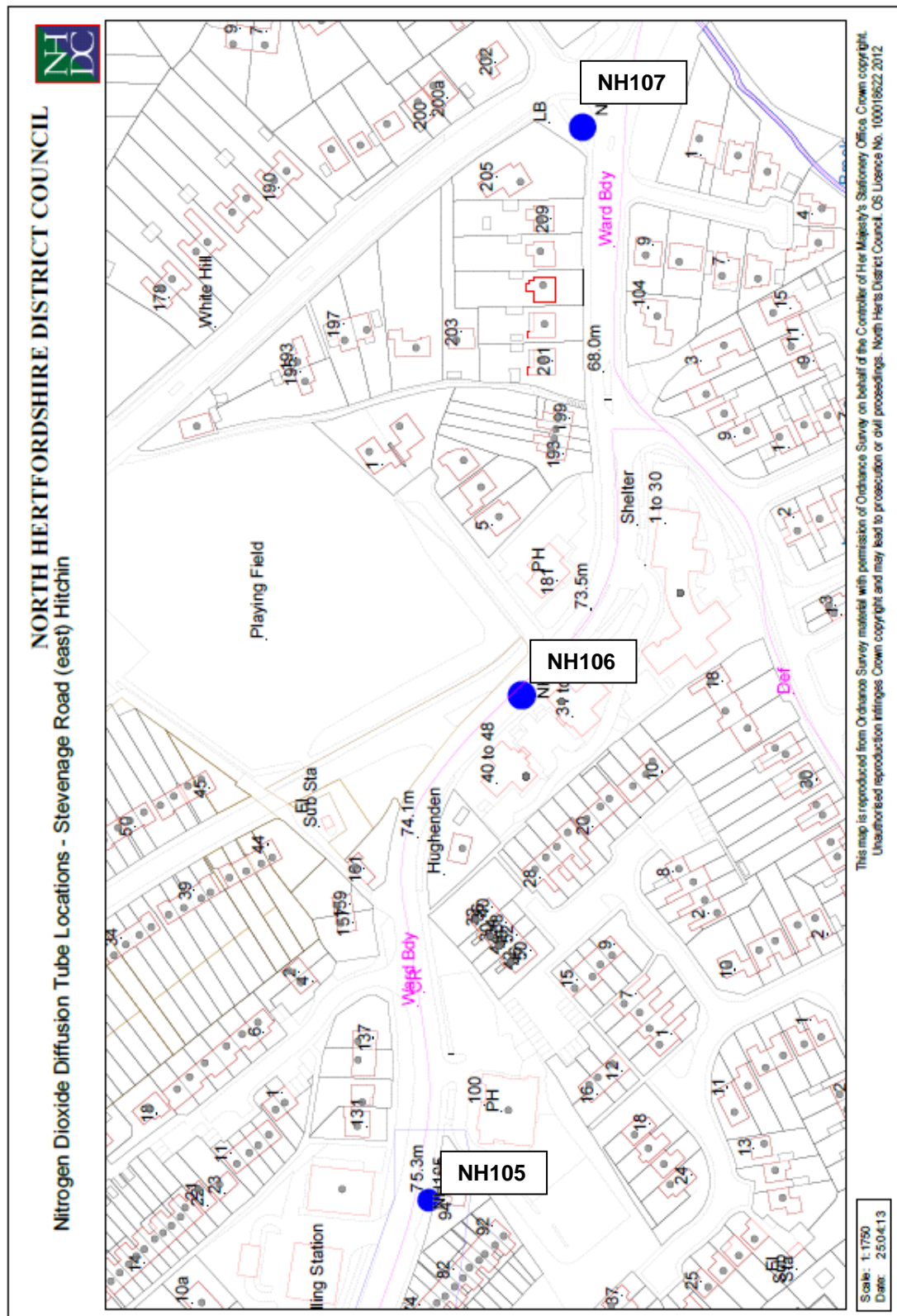


Figure 2.7: Nitrogen Dioxide Diffusion Tube Locations at the eastern end of Stevenage Road, Hitchin

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Title :- Nitrogen Dioxide Diffusion Tube Location, Park Street, Hitchin

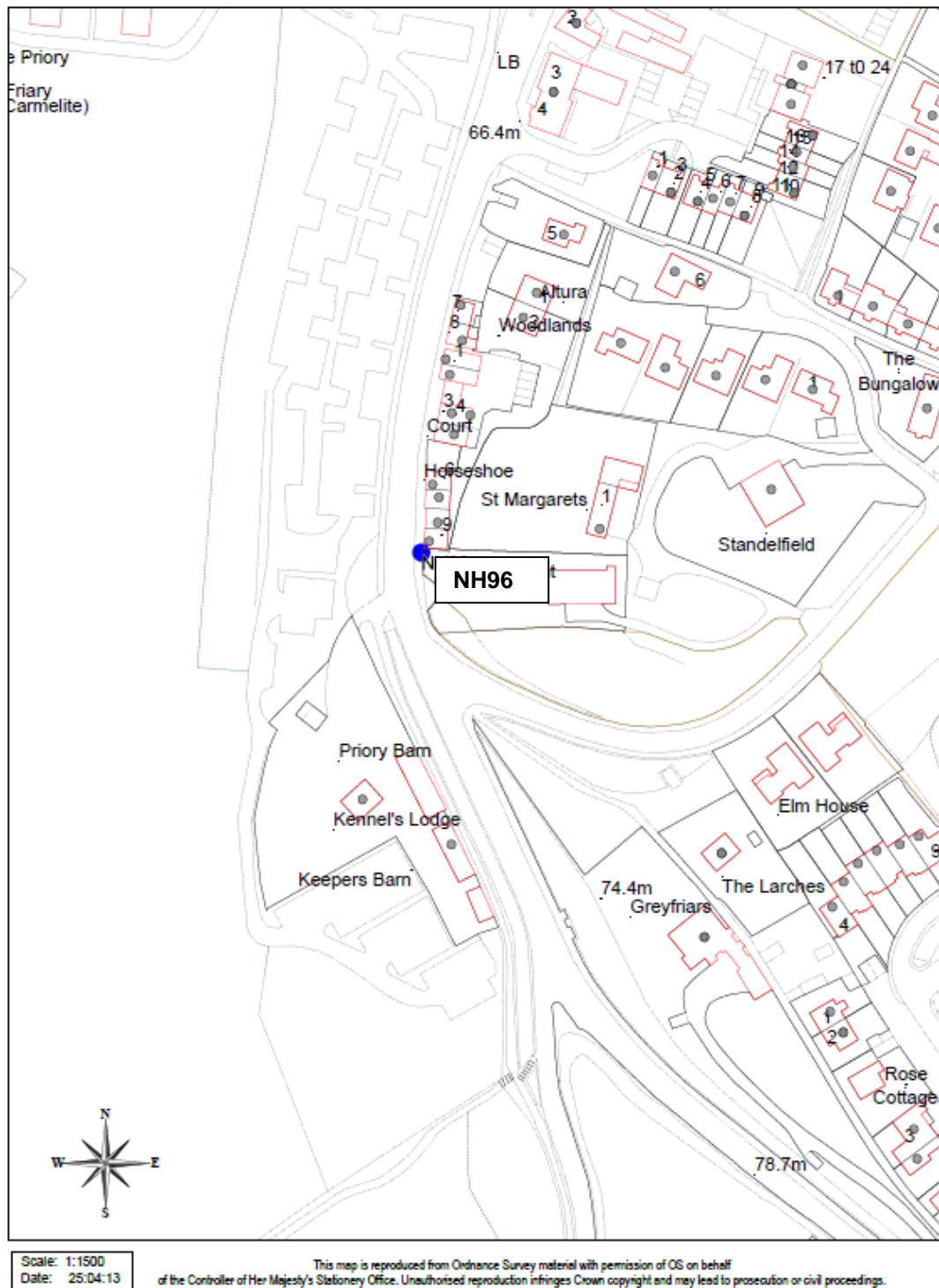


Figure 2.8: Nitrogen Dioxide Diffusion Tube Location at Park Street, Hitchin

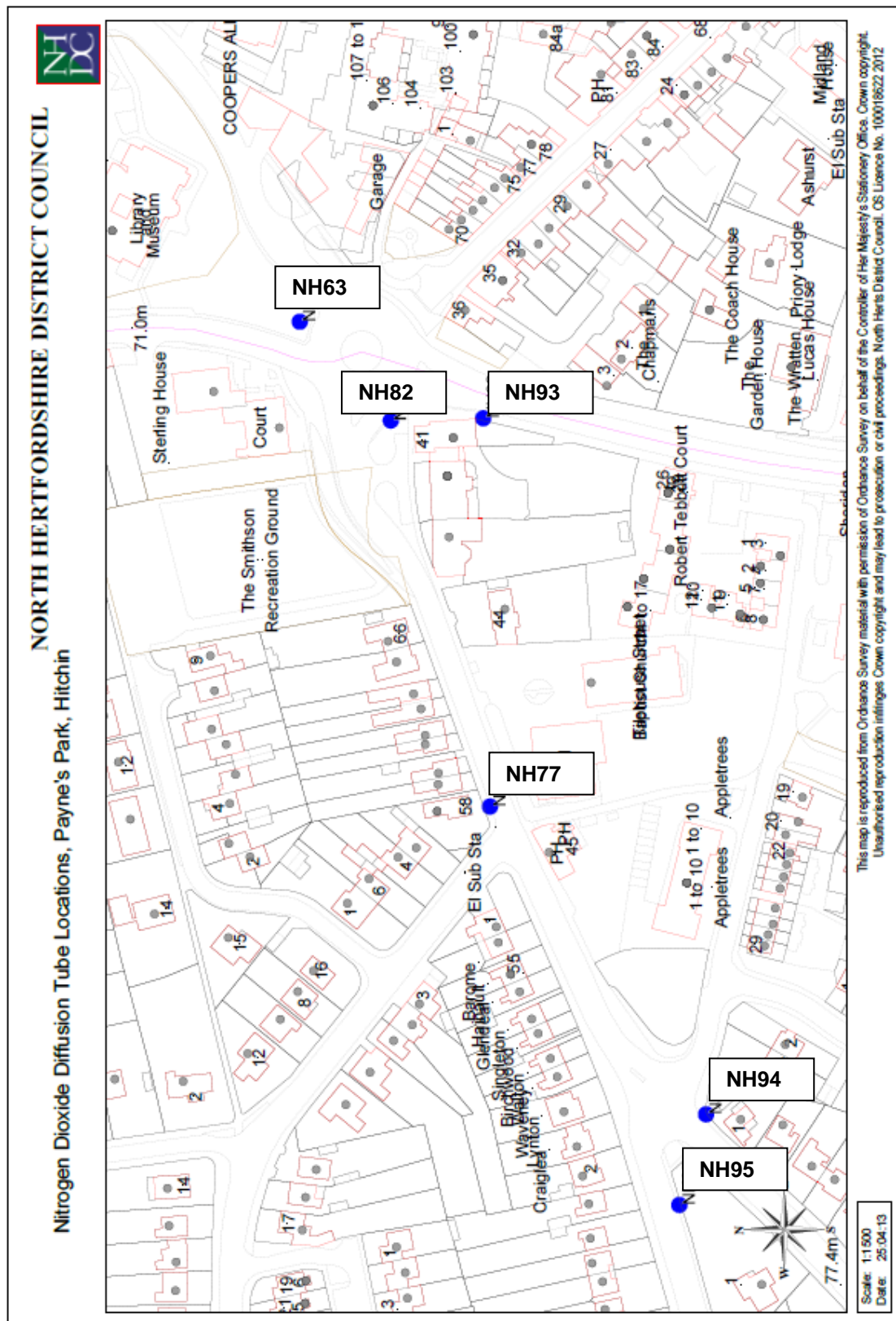


Figure 2.9: Nitrogen Dioxide Diffusion Tube Locations at the Payne's Park area of Hitchin

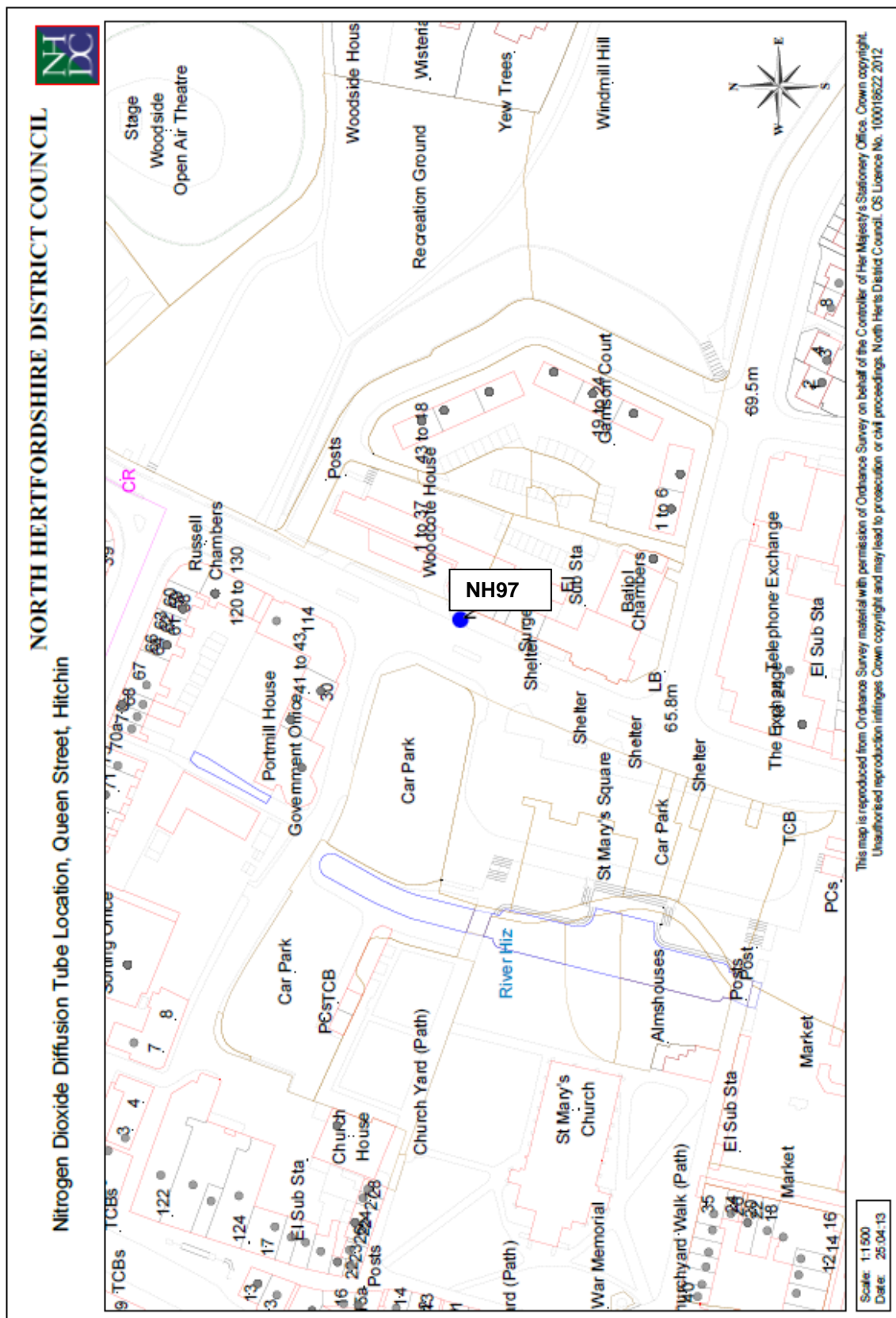


Figure 2.10: Nitrogen Dioxide Diffusion Tube Location, Queen Street, Hitchin

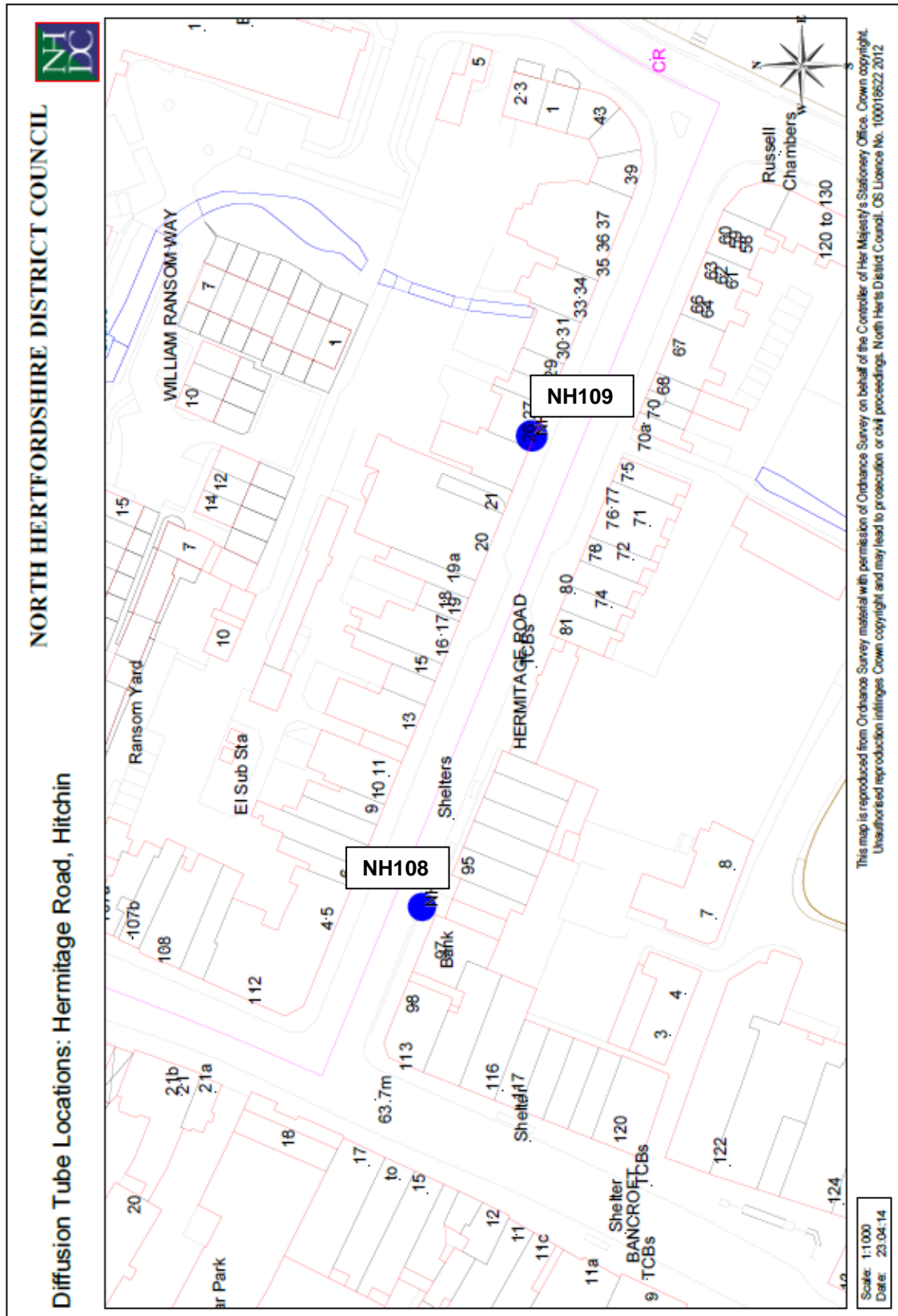


Figure 2.11: Nitrogen Dioxide Diffusion Tube Locations at Hermitage Road, Hitchin

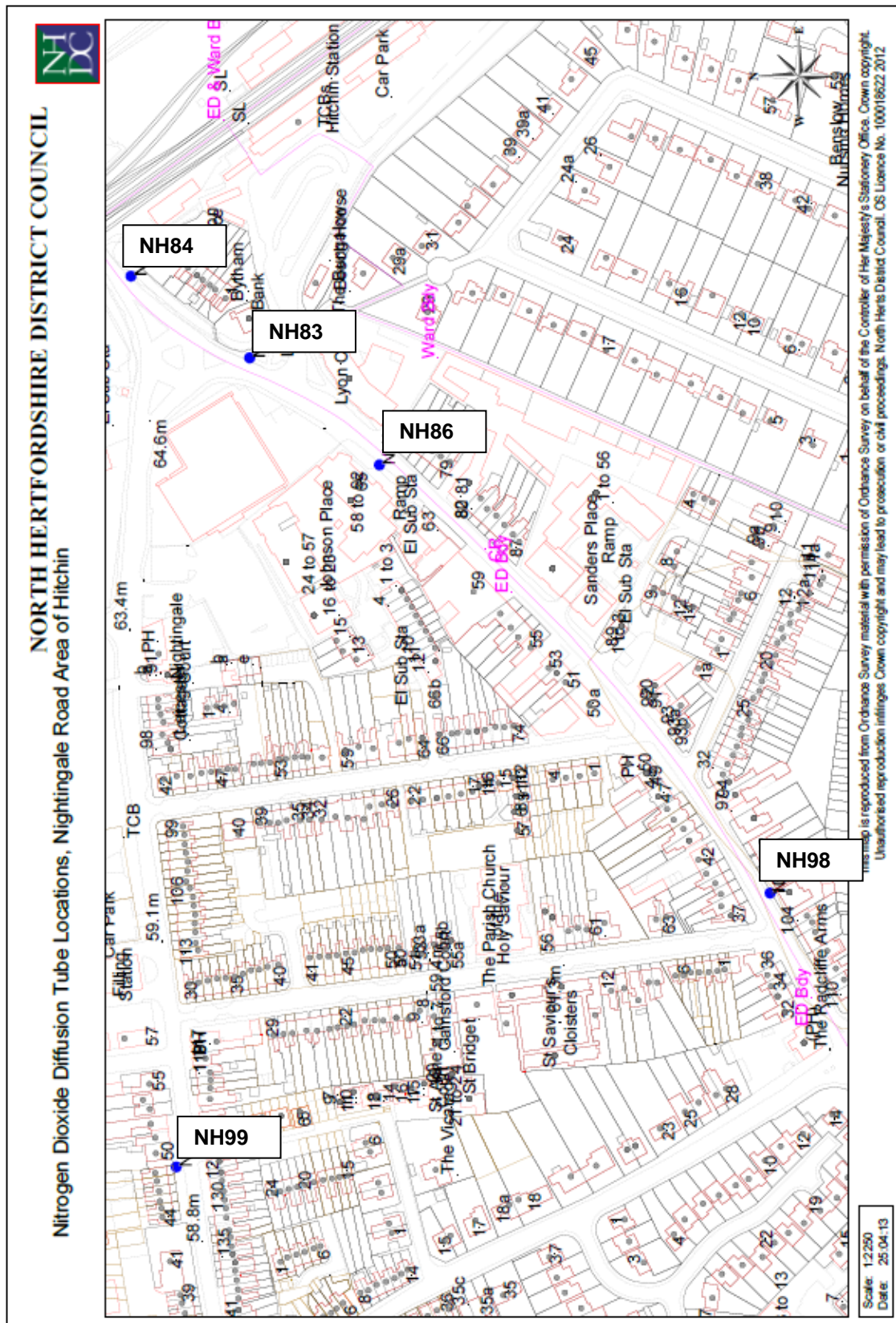


Figure 2.12: Nitrogen Dioxide Diffusion Tube Locations at the Nightingale Road area of Hitchin

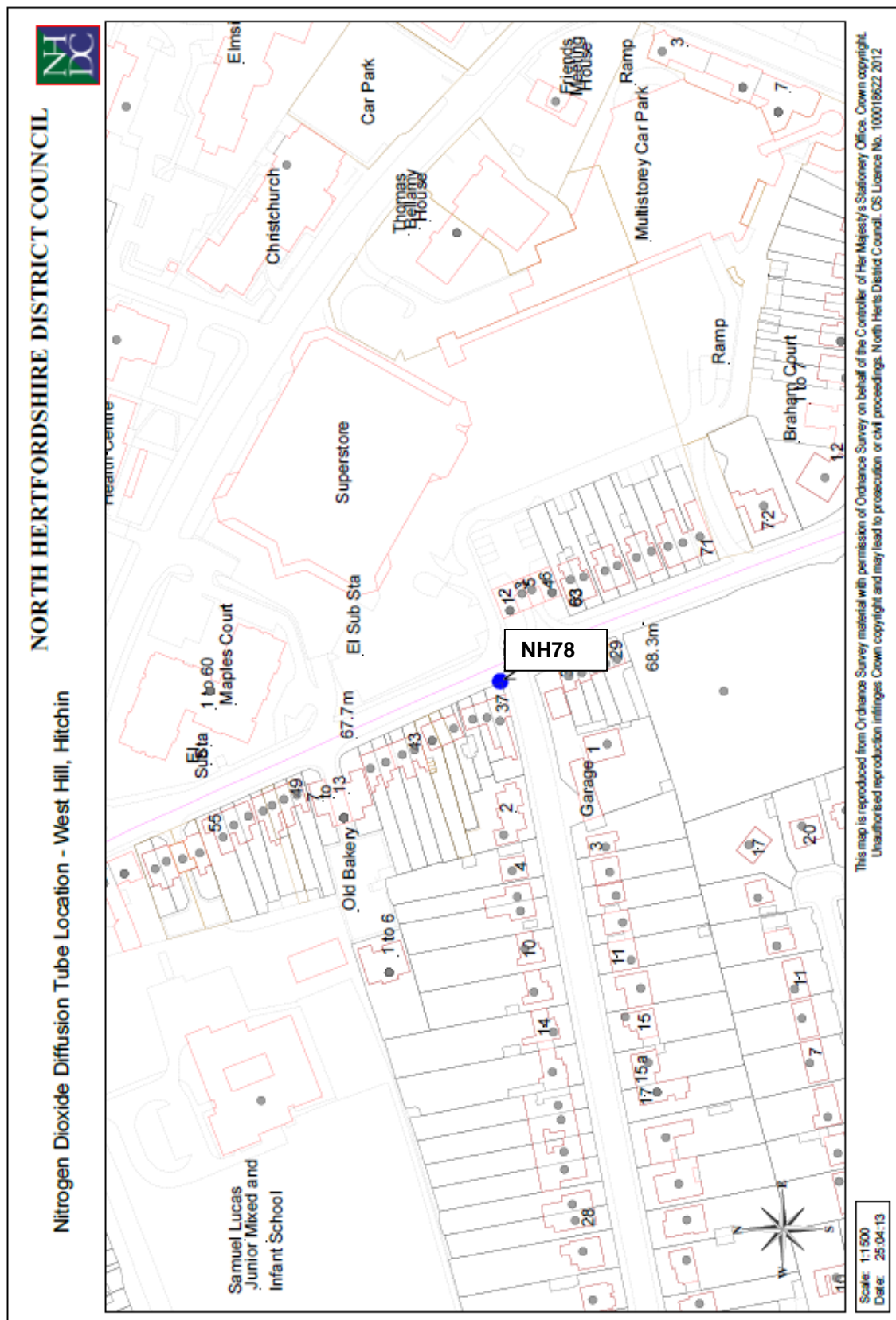


Figure 2.13: Nitrogen Dioxide Diffusion Tube Location at West Hill, Hitchin

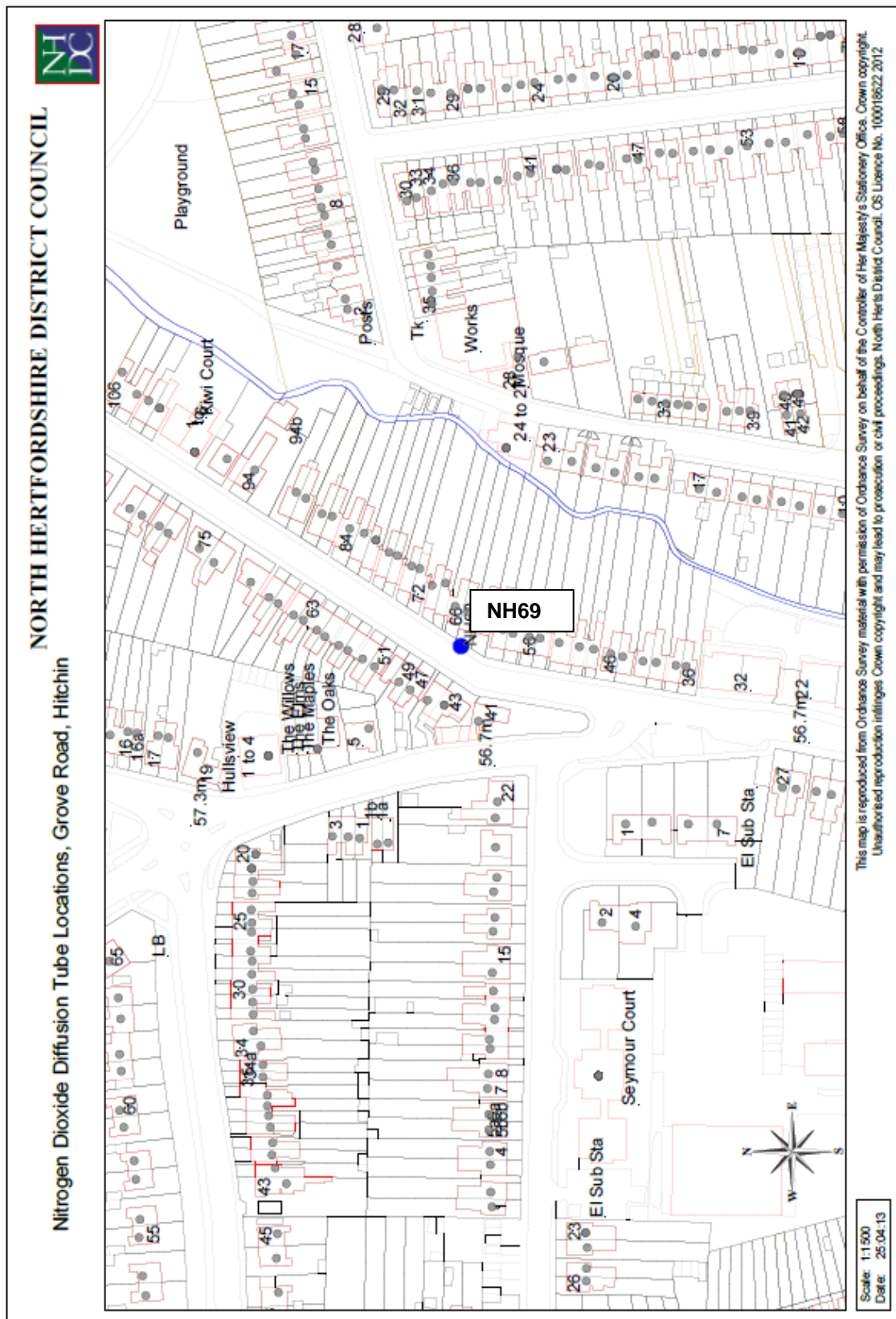


Figure 2.14: Nitrogen Dioxide Diffusion Tube Location at Grove Road, Hitchin

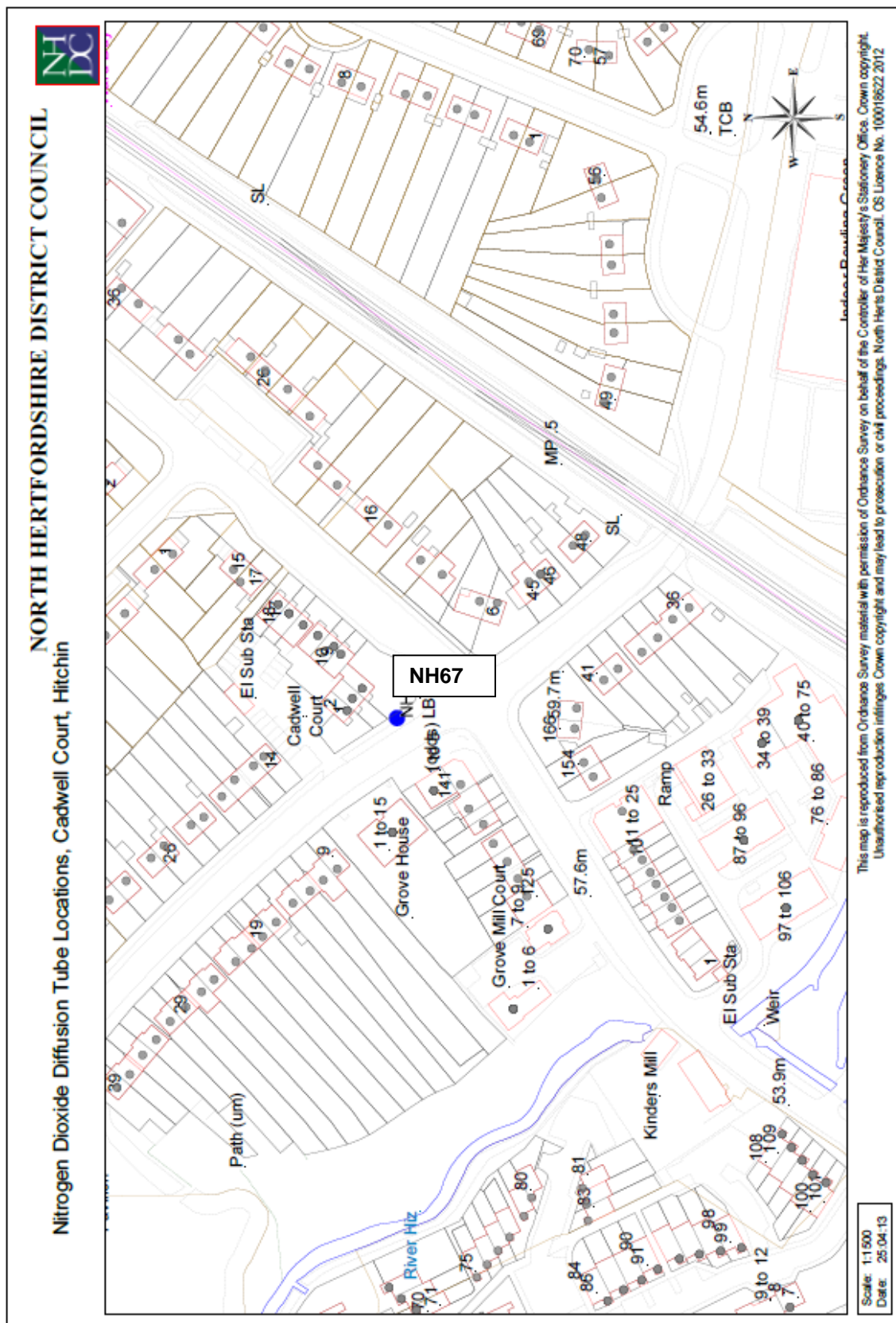


Figure 2.15: Nitrogen Dioxide Diffusion Tube Location at Cadwell Court, Hitchin

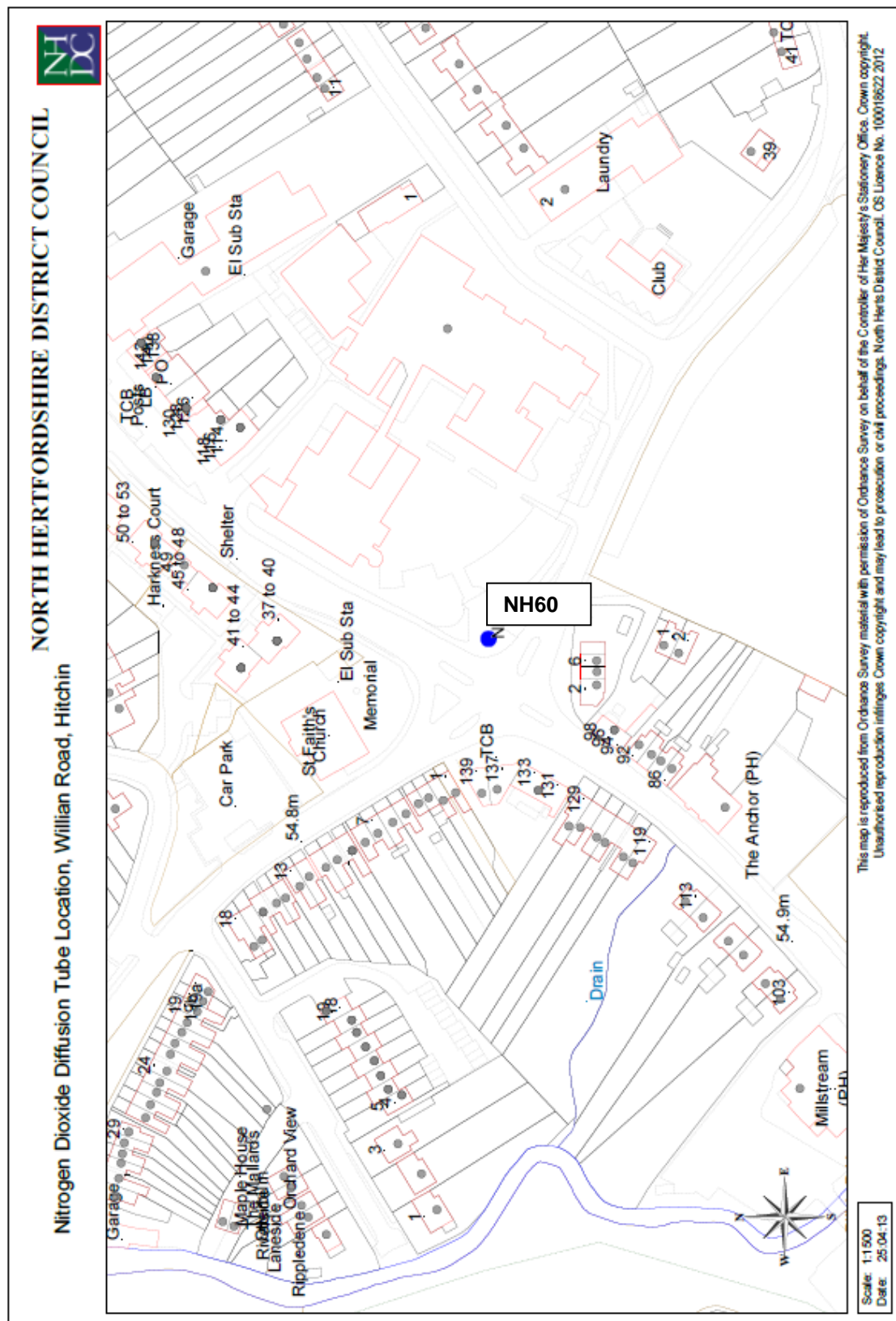


Figure 2.16: Nitrogen Dioxide Diffusion Tube Location at Willian Road, Hitchin

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref.	Pollutants Monitored	In AQMA?	Relevant Exposure	Distance to kerb of nearest road	Worst-case exposure
Melbourn Rd, opp. Town Hall Royston (NH06)	Roadside	535906, 240794	Nitrogen Dioxide	No	Y (7m)	1.1m	N
The Brambles/Foxglove Way, Welwyn (NH100)	Roadside	524033, 217620	Nitrogen Dioxide	No	Y (8m)	20m	Y
Clothall Road, Baldock (NH59)	Roadside	524649, 234061	Nitrogen Dioxide	No	Y (11m)	3m	N
Hitchin St, nr Town Hall, Baldock (NH61)	Roadside	524428, 233882	Nitrogen Dioxide	No	Y (35m)	2m	Y
Hitchin St, nr Bus Stop, Baldock (NH70)	Roadside	524298, 233784	Nitrogen Dioxide	No	Y (1m)	3.5m	Y
Whitehorse St (nr Rose & Crown), Baldock (NH72)	Roadside	524502, 233948	Nitrogen Dioxide	No	Y (27m)	2m	Y
Church St, Baldock (NH88)	Kerbside	524448, 233898	Nitrogen Dioxide	No	Y (45m)	0.5m	Y
Hitchin – Hermitage Road 97 (NH108)	Kerbside	518534, 229302	Nitrogen Dioxide	No	Y (3m)	0.8m	Y
Hitchin – Hermitage Road 26 (NH109)	Roadside	518631, 223279	Nitrogen Dioxide	No	Y (0m)	3m	Y
Willian Rd, Hitchin (NH60)	Roadside	519916, 230099	Nitrogen Dioxide	No	Y (29m)	1.1m	N
Cadwell Court, Hitchin (NH67)	Roadside	519225, 230553	Nitrogen Dioxide	No	Y (12m)	2m	Y
Grove Rd, Hitchin (NH69)	Roadside	518821, 229993	Nitrogen Dioxide	No	Y (5m)	2m	Y
Walsworth Rd, Hitchin (NH86)	Roadside	519278, 229691	Nitrogen Dioxide	No	Y (5m)	3m	Y
Cambridge Rd (Station A), Hitchin (NH83)	Roadside	519366, 229806	Nitrogen Dioxide	No	Y (20m)	1m	Y
Cambridge Rd (Station B), Hitchin (NH84)	Roadside	519328, 229752	Nitrogen Dioxide	No	Y (12m)	1.3m	Y
Walsworth Rd/Radcliffe Rd, Hitchin (NH98)	Roadside	519080, 229510	Nitrogen Dioxide	No	Y (4m)	1.5m	Y
Nightingale Rd, Hitchin (NH99)	Roadside	518953, 229786	Nitrogen Dioxide	No	Y (5m)	1.7m	Y
West Hill, Hitchin (NH78)	Roadside	518099, 229229	Nitrogen Dioxide	No	Y (4m)	2m	Y
Hitchin Library, Hitchin (NH63)	Roadside	518160, 229092	Nitrogen Dioxide	No	Y (30m)	3.5m	N
Upper Tilehouse St (crossing) Hitchin (NH77)	Roadside	518006, 229032	Nitrogen Dioxide	No	Y (5m)	1.5m	Y
Upper Tilehouse St (roundabout) Hitchin (NH82)	Roadside	518129, 229065	Nitrogen Dioxide	No	Y (7m)	1.5m	Y
Pirton Road, Hitchin (NH95)	Roadside	517886, 228975	Nitrogen Dioxide	No	Y (22m)	1.3m	Y
Offley Road, Hitchin (NH94)	Roadside	517915, 228967	Nitrogen Dioxide	No	Y (7m)	2.3m	Y
Park Way, Hitchin (NH93)	Roadside	518130, 229036	Nitrogen Dioxide	No	Y (3m)	1.6m	Y
Queen Street, Hitchin (NH97)	Roadside	518666, 229149	Nitrogen Dioxide	No	Y (4m)	1.7m	Y
Park Street, Hitchin (NH96)	Roadside	518417, 228624	Nitrogen Dioxide	No	Y (1m)	1.8m	Y
St John's Road, Hitchin (NH91)	Roadside	518656, 228406	Nitrogen Dioxide	No	Y (5m)	7.9m	Y
London Road, Hitchin (NH89)	Roadside	518706, 228293	Nitrogen Dioxide	No	Y (20m)	1.9m	Y
Gosmore Road, Hitchin (NH90)	Roadside	518593, 228304	Nitrogen Dioxide	No	Y (20m)	2.2m	Y
Stevenage Rd (A), Hitchin (NH45)	Roadside	518708, 228347	Nitrogen Dioxide	Yes	Y (19m)	2m	Y
Dower Crt (A), Stevenage Rd, Hitchin (NH104)	Roadside	518757, 228334	Nitrogen Dioxide	Yes	Y (0m)	3.3m	Y
11 Stevenage Rd, Hitchin (NH87)	Roadside	518731, 228362	Nitrogen Dioxide	No	Y (0m)	15m	Y
Westbrook Court, Hitchin (NH103)	Roadside	518773, 228342	Nitrogen Dioxide	Yes	Y (10m)	2.4m	Y
Stevenage Rd (Griffin Court), Hitchin (NH92)	Roadside	518872, 228305	Nitrogen Dioxide	Yes	Y (5m)	2m	Y
94-98 Stevenage Road, Hitchin (NH105)	Roadside	519067, 228255	Nitrogen Dioxide	Yes	Y (7m)	3.5m	Y
Morello Gardens, Stevenage Rd, Hitchin (NH106)	Roadside	519250, 228218	Nitrogen Dioxide	No	Y (5m)	1.4m	Y
Whitehill Road, Hitchin (NH107)	Roadside	518720, 228335	Nitrogen Dioxide	No	Y (26m)	2.3m	N

2.2 Comparison of Monitoring Results with AQ Objectives

North Hertfordshire District Council monitors for nitrogen dioxide (NO₂) and particulate matter (PM₁₀) and the results of the monitoring are reported in comparison to relevant Air Quality Objectives (AQO) in Sections 2.2.1 and 2.2.2.

2.2.1 Nitrogen Dioxide

NHDC operated two automatic monitoring sites during 2014 and managed a network of 37 diffusion tubes.

Automatic Monitoring Data

The analyser at the Payne's Park, Hitchin (Hitchin Library) site was operating from the 18th April 2011, with the first full day of data collection the 19th April 2011. Table 2.3 shows that at this site no AQO were exceeded and that the data capture for 2014 was 97%. The site is a roadside site located on the north side of a busy roundabout with housing to the east and south.

The analyser at the Stevenage Road, Hitchin site was operating from the 8th February 2013 and throughout 2014, having previously been operating at the same site between 13th April 2010 and the 12th September 2011. Table 2.3 shows that the annual mean AQO was 48µg/m³ and so exceeded in AQO for 2014. For reference, data capture for the 2014 monitoring period was 95.7%. The Stevenage Road site is a roadside site located on the north side of Stevenage Road. It is within 15m of the nearest residential receptor, 15 Stevenage Road. As such and according to the method in Box 2.3 of TG (09) the predicted concentration at the nearest receptor in 2014 is calculated to be 31.9µg/m³ (Appendix 2).

Table 2.3 also shows the trends in annual means for both automatic NO₂ monitoring sites and Table 2.4 shows the equivalent for both monitoring sites for the 1-hour mean objective.

Diffusion Tube Monitoring Data

Eleven of the thirty-seven diffusion tubes returned annual mean averages that exceeded the AQO of 40µg/m³ (Table 2.5). Those eleven tubes were located in four areas of the district, three in Hitchin and one in Baldock. All of the results have been bias adjusted using the March 2015 version of the National Diffusion Tube Bias Adjustment Spreadsheet and the adjustment factor specific to Harwell Scientific Services.

Table 2.3 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for 2014 period of monitoring % ^a	Valid Data Capture 2014 % ^b	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2010 ^c	2011 ^c	2012 ^c	2013 ^c	2014 ^c
Payne's Park Roundabout, Hitchin	Roadside	N	97	97	N.A	35	36	35	38
Stevenage Road, Hitchin	Roadside	Y	95.7	95.7	52.4 *	47.5 *	No data	46	48

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

* annualised mean because monitoring was carried out for less than 9 months of the year

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2014 % ^b	Number of Exceedences of Hourly Mean ($200 \mu\text{g}/\text{m}^3$)				
					2010 ^c	2011 ^c	2012 ^c	2013 ^c	2014 ^c
Payne's Park Roundabout, Hitchin	Roadside	N	97	97	N.A	N.A	N.A	0	0
Stevenage Road, Hitchin	Roadside	Y	95.7	95.7	7 (168.3)	3 (85.9)	No data	1	1

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

^c If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	Location	Site Type	Within AQMA?	Data Capture		Annual mean conc. 2014 ($\mu\text{g}/\text{m}^3$) (bias adjusted) ^c
				Monitoring Period (%) ^a	2014 (%) ^b	
NH06	Melbourn Rd, opp. Town Hall Royston	Roadside	No	100	100	29.3
NH100	The Brambles/Foxglove Way, Welwyn	Roadside	No	100	100	27.5
NH59	Clothall Road, Baldock	Roadside	No	91.7	91.7	29.1
NH61	Hitchin St, nr Town Hall, Baldock	Roadside	No	100	100	33.5
NH70	Hitchin St, nr Bus Stop, Baldock	Roadside	No	100	100	28.2
NH72	Whitehorse St (nr Rose & Crown), Baldock	Roadside	No	100	100	32.7
NH88	Church St, Baldock	Kerbside	No	91.7	100	42.4
NH108	Hitchin – Hermitage Road 97	Kerbside	No	83.3	83.3	27.9
NH109	Hitchin – Hermitage Road 26	Roadside	No	83.3	83.3	40.2
NH60	Willian Rd, Hitchin	Roadside	No	100	100	29.0
NH67	Cadwell Court, Hitchin	Roadside	No	100	100	26.6
NH69	Grove Rd, Hitchin	Roadside	No	83.3	83.3	28.8
NH86	Walsworth Rd, Hitchin	Roadside	No	91.7	91.7	27.1
NH83	Cambridge Rd (Station A), Hitchin	Roadside	No	100	100	34.1
NH84	Cambridge Rd (Station B), Hitchin	Roadside	No	100	100	36.1
NH98	Walsworth Rd/Radcliffe Rd, Hitchin	Roadside	No	91.7	91.7	31.9
NH99	Nightingale Rd, Hitchin	Roadside	No	91.7	91.7	29.1
NH78	West Hill, Hitchin	Roadside	No	100	100	29.3
NH63	Hitchin Library, Hitchin	Roadside	No	91.7	91.7	40.8
NH77	Upper Tilehouse St (crossing) Hitchin	Roadside	No	66.7	66.7	41.6 (annualised)
NH82	Upper Tilehouse St (roundabout) Hitchin	Roadside	No	100	100	40.3
NH95	Pirton Road, Hitchin	Roadside	No	100	100	34.7
NH94	Offley Road, Hitchin	Roadside	No	75	75	36.3
NH93	Park Way, Hitchin	Roadside	No	91.7	91.7	54.1
NH97	Queen Street, Hitchin	Roadside	No	91.7	91.7	32.4
NH96	Park Street, Hitchin	Roadside	No	91.7	91.7	32.6
NH91	St John's Road, Hitchin	Roadside	No	100	100	29.9
NH89	London Road, Hitchin	Roadside	No	100	100	28.7
NH90	Gosmore Road, Hitchin	Roadside	No	91.7	91.7	25.8
NH45	Stevenage Rd (A), Hitchin	Roadside	Yes	100	100	46.6
NH104	Dower Crt (A), Stevenage Rd, Hitchin	Roadside	Yes	100	100	30.4
NH87	11 Stevenage Rd, Hitchin	Roadside	No	100	100	27.4
NH103	Westbrook Court, Hitchin	Roadside	Yes	75	75	40.8
NH92	Stevenage Rd (Griffin Court), Hitchin	Roadside	Yes	100	100	48.1
NH105	94-98 Stevenage Road, Hitchin	Roadside	Yes	91.7	91.7	51.4
NH106	Morello Gardens, Stevenage Rd, Hitchin	Roadside	No	91.7	91.7	42.7
NH107	Whitehill Road, Hitchin	Roadside	No	100	100	29.6

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year. ^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.) ^c Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year. **Bias adjustment rate for Harwell Scientific Services for 2014 (source: March 2015 bias adjustment spreadsheet) = 0.81**

Three of the four areas where AQO were exceeded are areas that have been regularly exceeded in previous years; an area along the B656 through Baldock, the A602 at Stevenage Road, Hitchin and the area around Payne's Park, Hitchin. The other area was in Hitchin town centre, Hermitage Road, which had diffusion tubes located there for the first time in 2013.

One of the five diffusion tubes in **Baldock** returned an exceedance of the annual AQO (Table 2.5 & 2.6) in 2014. The tube is located at a kerbside site (**NH88**) at the end of Church Street, opposite the Town Hall building. The 2014 capture rate was 91.7% and the bias adjusted annual average was **42.4 $\mu\text{g}/\text{m}^3$** . This location has exceeded the annual AQO in three of the previous four years, but considered over the five year period for which data are available the diffusion tube data for Baldock indicates a downward trend in NO₂ concentrations (Table 2.6 & Figure 2.17).

Table 2.6: Results of NO₂ Diffusion Tube Monitoring in Baldock since 2010: Comparison with Annual Mean Objective (40 $\mu\text{g}/\text{m}^3$)

Site ID	Site Location	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) (bias adjusted)				
		2010	2011	2012	2013	2014
NH59	Clothall Road	32.2	31.7	31.1	30.6	29.1
NH72	Whitehorse Street (nr Rose & Crown)	42.1	38.2	36.9	31.8	32.7
NH61	Whitehorse Street (nr Town Hall)	43.6	36.1	36.3	35.1	33.5
NH88	Church Street	50.7	48.8	44.4	38.4	42.4
NH70	Hitchin Street (nr bus stop)	30.9	30.0	28.2	27.4	28.2

2010 bias adjustment factor = 0.85
2013 bias adjustment factor = 0.80

2011 bias adjustment factor = 0.84
2014 bias adjustment factor = 0.81

2012 bias adjustment factor = 0.79

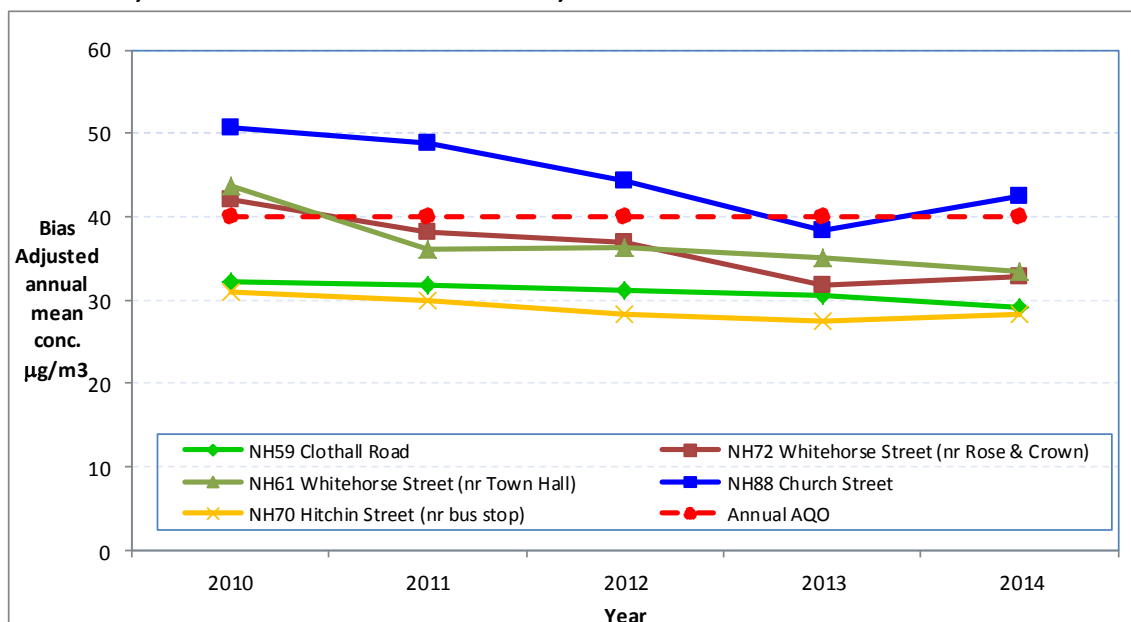


Figure 2.17: Trends in NO₂ Concentrations from Diffusion Tubes: Baldock (2010-2014)

Six diffusion tubes were located at, or on roads feeding into, the **Payne's Park roundabout area** of **Hitchin**. Four of those tubes, all roadside locations, returned annual mean averages

that exceeded the AQO (Table 2.5 & 2.7). The Hitchin Library tube (**NH63**), and the Upper Tilehouse Street tubes (**NH82**) and (**NH77**) measured **40.8 $\mu\text{g}/\text{m}^3$** , **40.3 $\mu\text{g}/\text{m}^3$** and **41.6 $\mu\text{g}/\text{m}^3$** respectively. These three tubes have regularly measured exceedences of the AQO since 2010 (Table 2.7). The other tube to indicate an exceedence of the AQO, with **54.1 $\mu\text{g}/\text{m}^3$** measured in 2014, is the Park Way (**NH93**) tube, which was added to the network in 2011. Table 2.7 shows that this tube has measured an exceedence of the AQO every year.

Figure 2.18 illustrates that there has been a slight downward trend in NO₂ concentrations or a stability over the five years of available data.

Table 2.7: Results of NO₂ Diffusion Tube Monitoring near Payne's Park, Hitchin since 2010: Comparison with Annual Mean Objective (40 $\mu\text{g}/\text{m}^3$)

Site ID	Site Location	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) (bias adjusted)				
		2010	2011	2012	2013	2014
NH63	Hitchin Library, Payne's Park	44.0	43.9	39.4	36.6	40.8
NH93	Park Way	no data	53.1	54.8	52.1	54.1
NH82	Upper Tilehouse Street (roundabout)	44.4	42.8	40.4	40.3	40.3
NH77	Upper Tilehouse Street (crossing)	48.7	44.4	39.5	42.0	41.6*
NH94	Offley Road	no data	35.6	36.5	36.0	36.3
NH95	Pirton Road	no data	33.6	32.2	33.2	34.7

2010 bias adjustment factor = 0.85
2013 bias adjustment factor = 0.80

2011 bias adjustment factor = 0.84
2014 bias adjustment factor = 0.81

2012 bias adjustment factor = 0.79
* = annualised

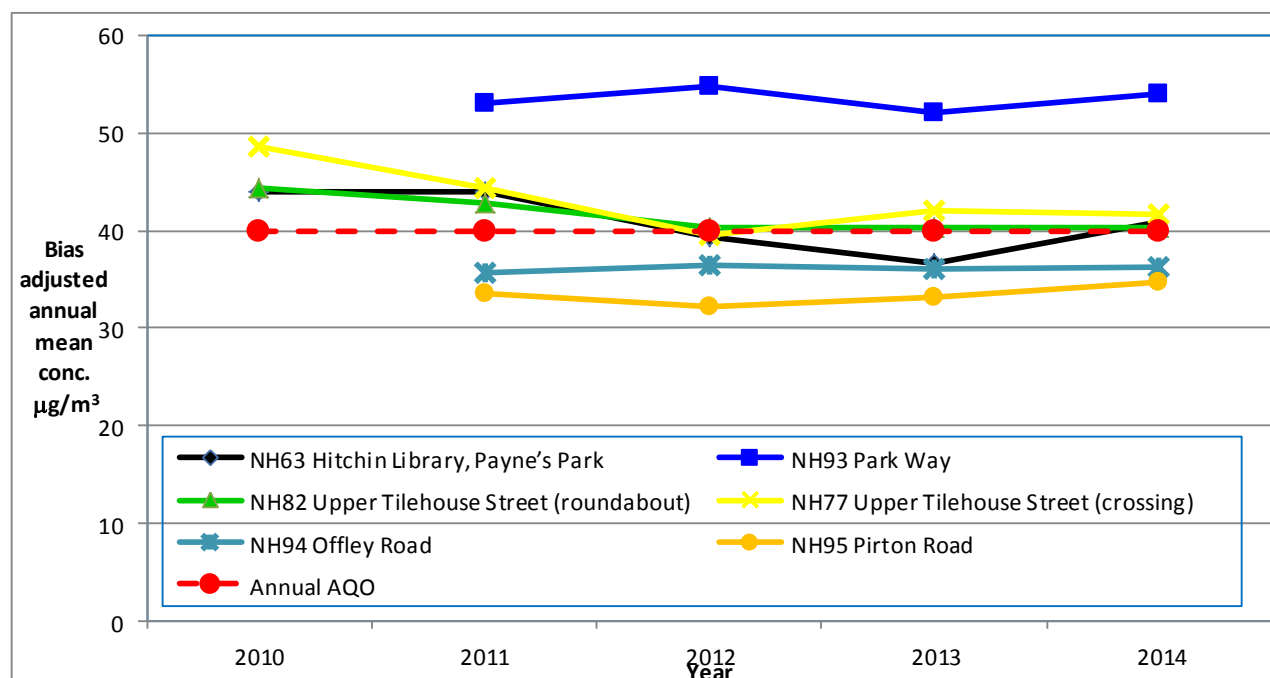


Figure 2.18: Trends in NO₂ Concentrations from Diffusion Tubes near Payne's Park, Hitchin (2010-2014)

According to the method in Box 2.3 of TG (09) the predicted concentration at the nearest receptor for NH77 is calculated to be 35.3 $\mu\text{g}/\text{m}^3$ compared to the 41.6 $\mu\text{g}/\text{m}^3$ (Appendix 2).

According to the method in Box 2.3 of TG (09) the predicted concentration at the nearest receptor for NH93 is calculated to be **49 $\mu\text{g}/\text{m}^3$** compared to the 54.1 $\mu\text{g}/\text{m}^3$ (Appendix 2). This indicates a notable exceedance of the relevant AQO. Accompanying this was air pollution modelling work centred on the area around the Payne's Park roundabout that was undertaken by AQC for the 2014 Detailed Assessment. This used the diffusion tube data from 2013. It quantified a NO₂ concentration that was below the AQO at the northern façade but indicated an exceedance at the south-eastern façade of the residential property at 41 Upper Tilehouse Street.

On the basis of the detailed assessment work it was decided not to designate a new AQMA, or to extend the Stevenage Road AQMA, but rather to rely on the Action Plan Measures targeted for Stevenage Road to improve the air quality at the Payne's Park roundabout too. However, as indicated in earlier sections of this report Defra has questioned this approach and at the time of finalising this report NHDC is waiting for a further recommendation from Defra.

Eleven diffusion tubes were located at, or on roads; including the **Stevenage Road**; feeding into, the **Hitchin Hill roundabout area of Hitchin**. At six of the diffusion tube locations NO₂ was measured at less than the annual AQO (Table 2.5 & Table 2.8).

At the other five diffusion tube locations the measurements exceeded the annual AQO, two of which were on the north side and three on the south side of the road.

NH45 is a roadside diffusion tube positioned to the north of Stevenage Road, 19m from flats. The 2014 annual average concentration from this location was **46.6 $\mu\text{g}/\text{m}^3$** and has exceeded the AQO every year since monitoring began in 2010 (Table 2.8). According to the method in Box 2.3 of TG (09) the predicted concentration at the nearest property in 2014 is calculated to be 31.9 $\mu\text{g}/\text{m}^3$ (Appendix 2).

NH103 is a roadside diffusion tube positioned to the north of Stevenage Road 10m from flats. The 2014 annual average concentration from this location was **40.8 $\mu\text{g}/\text{m}^3$** and has exceeded the AQO every year since monitoring began in 2012 (Table 2.8).

NH92 is a roadside diffusion tube positioned on the south side of Stevenage Road, near Griffin Court and is 5m from houses. The 2014 annual average concentration from this location was **48.1 $\mu\text{g}/\text{m}^3$** and has exceeded the AQO every year since monitoring began in

2011 (Table 2.8). According to the method in Box 2.3 of TG (09) the predicted concentration at the nearest property in 2014 is calculated to be **41.2µg/m³** (Appendix 2).

NH105 is a roadside diffusion tube located on the south side of Stevenage Road 7m from houses at 94-98 Stevenage Road. The 2014 annual average concentration from this location was **51.4µg/m³** and has exceeded the AQO every year since monitoring began in 2012 (Table 2.8). According to the method in Box 2.3 of TG (09) the predicted concentration at the nearest property in 2014 is calculated to be **44.8µg/m³** (Appendix 2).

NH106 is a roadside diffusion tube located on the south side of Stevenage Road 5m from the Morello Gardens flats. The 2014 annual average concentration from this location was **42.7µg/m³** and has exceeded the AQO every year since monitoring began in 2012 (Table 2.8). According to the method in Box 2.3 of TG (09) the predicted concentration at the nearest property in 2014 is calculated to be **33.9µg/m³** (Appendix 2).

Over the five year period there has been a slight downward trend in the concentrations at locations where the AQO has been exceeded, with the exception being an increase in concentrations at the monitoring location near 94-98 Stevenage Road (Figure 2.19).

Table 2.8: Results of NO₂ Diffusion Tube Monitoring near Stevenage Road (Hitchin Hill roundabout), Hitchin since 2010: Comparison with Annual Mean Objective (40µg/m³)

Site ID	Site Location	Annual Mean Concentration (µg/m ³) (bias adjusted)				
		2010	2011	2012	2013	2014
NH107	Whitehill Road	no data	no data	30.8	29.4	29.6
NH106	Morello Gardens, Stevenage Road	no data	no data	43.5	44.6	42.7
NH105	94-98 Stevenage Road	no data	no data	45.8	47.0	51.4
NH92	Stevenage Road (Griffin Court)	no data	53.5	51.1	47.6	48.1
NH103	Westbrook Court, Stevenage Road	no data	no data	43.6	41.7	40.8
NH87	11 Stevenage Road	no data	30.8	29.2	27.9	27.4
NH104	Dower Court (A), Stevenage Road	no data	no data	33.9	31.5	30.4
NH45	Stevenage Road (A)	49.1	48.9	46.3	42.0	46.6
NH91	St John's Road	no data	34.9	34.6	32.0	29.9
NH89	London Road	no data	28.2	29.5	28.4	28.7
NH90	Gosmore Road	no data	25.9	27.6	27.7	25.8

2010 bias adjustment factor = 0.85

2011 bias adjustment factor = 0.84

2012 bias adjustment factor = 0.79

2013 bias adjustment factor = 0.80

2014 bias adjustment factor = 0.81

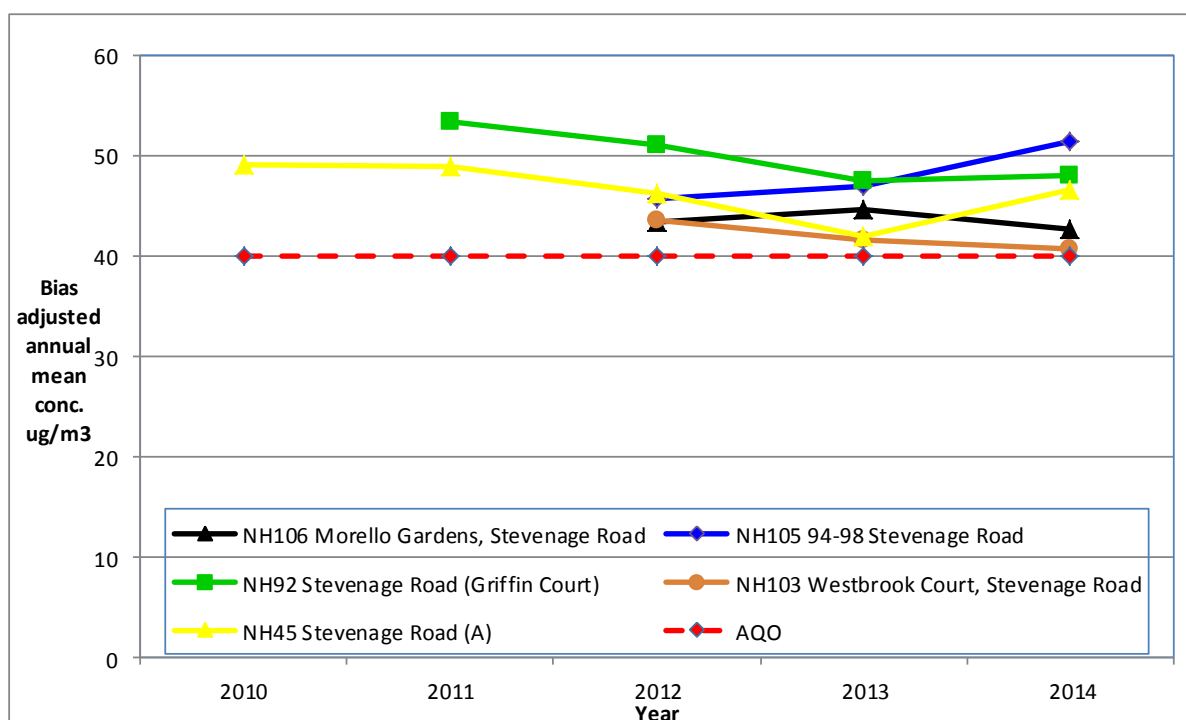


Figure 2.19: Trends in NO₂ Concentrations from Diffusion Tubes near Stevenage Road (Hitchin Hill roundabout), Hitchin that have exceeded the AQO (2010-2014)

2.2.2 PM₁₀

In 2014 NHDC had a TEOM automatic analyser operating at its one monitoring site for particulate matter.

The monitoring site is at Payne's Park, Hitchin (Hitchin Library) and the TEOM has been operating from there since March 2010. Table 2.9 shows that at this site no AQO were exceeded and that the data capture as a percentage of the calendar year was 97.2%.

AQDM has run the volatile correction model (VCM) on the 2014 data, which allows the correction of TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by the instrument. The resulting corrected measurements have been demonstrated as equal to the gravimetric equivalent and applied to all PM₁₀ data listed in this document.

The reported annual average mean of 21µg/m³ with 7 exceedences of the daily mean of 50µg/m³ does not demonstrate any breaches of the AQO (Table 2.10).

The results from 2014 are lower than have been recorded since 2010 (Figure 2.20).

2.2.1 Sulphur Dioxide

Sulphur dioxide is not monitored within North Hertfordshire.

2.2.2 Benzene

Benzene is not monitored within North Hertfordshire.

2.2.3 Other pollutants monitored

No other pollutants are monitored within North Hertfordshire.

Table 2.9 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent	Annual Mean Concentration µg/m ³				
						2010	2011	2012	2013	2014
Hitchin Library	Roadside	N	98.3	98.3	Y	22	26	24	23	21

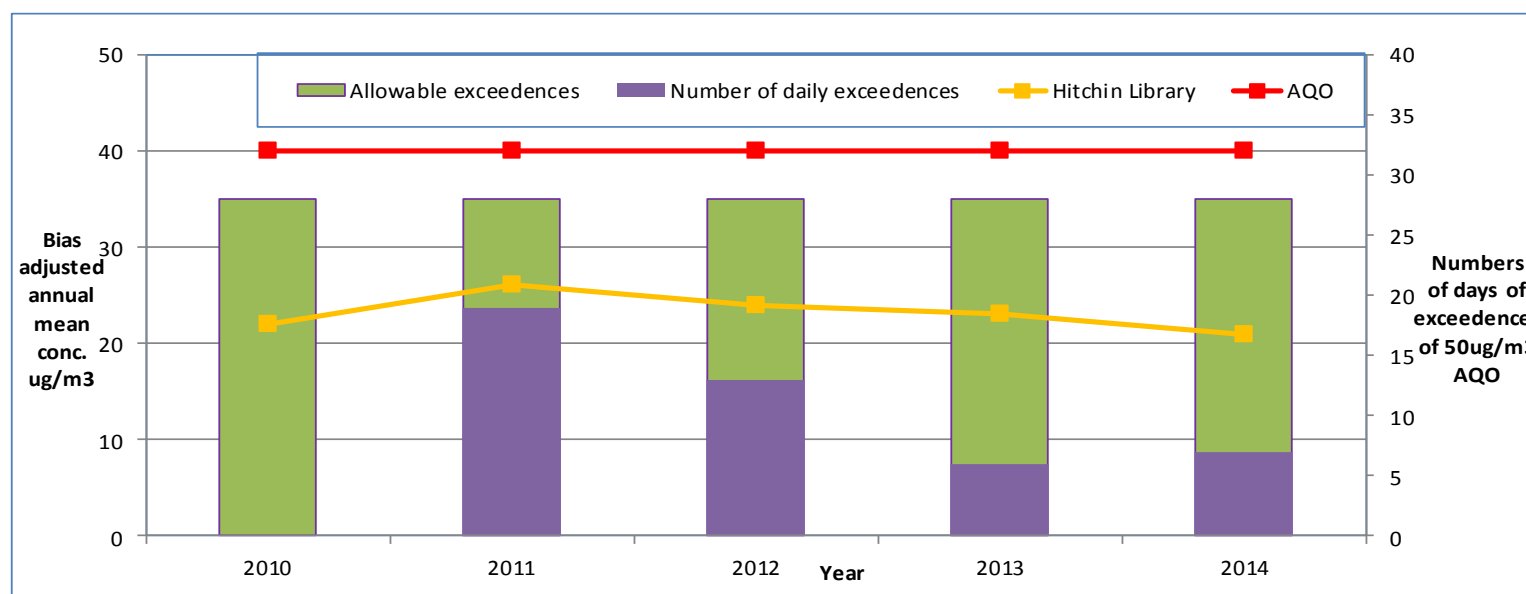
^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

Table 2.10 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2011 % ^b	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 µg/m ³)				
						2010	2011	2012	2013	2014
Hitchin Library	Roadside	N	98.3	98.3	Y	0	19	13	6	7

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

Figure 2.20: Trends in PM₁₀ Concentrations from the TEOM at Payne's Park (Hitchin Library) Hitchin (2010-2014)

2.2.4 Summary of Compliance with Air Quality Strategy Objectives

North Hertfordshire District Council has measured concentrations of nitrogen dioxide above the annual mean objective at five roadside diffusion tube locations on Stevenage Road, Hitchin, two of which measured concentrations representative of the AQO being exceeded at a relevant location (a residential property) at Stevenage Road. This is an area that was designated as an Air Quality Management Area (AQMA) in September 2013 and the 2014 data indicate that this designation remains relevant.

North Hertfordshire District Council has measured concentrations of nitrogen dioxide above the annual mean objective at four roadside diffusion tube locations in the Payne's Park area of Hitchin, one of which measured concentrations representative of the AQO being exceeded at a relevant location (residential property) at Upper Tilehouse Street. This is an area that was subject to a Detailed Assessment in 2011 and 2014 but neither assessment was judged to have provided definitive evidence to justify the designation of the area as an AQMA, although the 2014 modelling indicated a possible exceedance at the south east façade of 41 Upper Tilehouse Street. A calculation based on a diffusion tube result supported that indication, finding that the annual mean average NO₂ would be exceeded at the southern façade of 41 Upper Tilehouse Street. Nonetheless a decision was taken not to declare an AQMA at Payne's Park, but to take into account that the location is directly linked to Stevenage Road where an AQMA, with its associated Action Plan and Measures, is in place. This decision was based on the expectation that any improvements made for Stevenage Road, would also benefit the Payne's Park area.

North Hertfordshire District Council has measured concentrations of nitrogen dioxide above the annual mean objective at one kerbside diffusion tube location in Baldock (Hitchin Street) and one kerbside location in Hitchin (Hermitage Road), although the nearest neighbouring roadside locations measured concentrations that were not above the AQO.

3 Road Traffic Sources

NHDC has obtained traffic count information from the Department for Transport (DfT) and Hertfordshire County Council between 2005 and 2014 for roads in its district. Maps identifying count locations are included as Appendix 4.

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

The narrowest of NHDC's congested streets is Hitchin Street leading into Whitehorse Street (**B656**) in **Baldock**. Annual Average Weekday Traffic Flow (AAWD) traffic counts from two locations along this road in Baldock are included in Table 3.1. The data illustrate a trend of a gradual decline in usage since completion of the Baldock By-Pass in 2006.

Table 3.1 AAWD Flows on the A505 through Baldock (2005 – 2013)

Location	AAWD Traffic Flows								
	2005	2006	2007	2008	2009	2010	2011	2012	2013
Letchworth Rd, Baldock (712)	14,728	17,492	16,706	15,620	15,041	14,174	14,251	14,068	no data
Whitehorse St, Baldock (700)	19,065	13,449	11,727	11,808	11,624	10,509	10,708	10,142	10,324

SOURCE: Hertfordshire County Council

Annual Average Daily Flow (AADF) traffic data for the **Payne's Park roundabout** area of **Hitchin** (**A505**, **B656**, **A602**) is available for Moormead Hill (**A505**) and Park Way (**A602**) (Table 3.3).

Table 3.2 AADF Traffic Flows in the Payne's Park area of Hitchin (2005 – 2014)

Location	AADF Traffic Flows									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Upper Tilehouse St Hitchin (CP37273)	23,733	23,864	22,382	22,118	22,027	21,636	22,468	22,204	22,124	22,365
Park Way, Hitchin (CP27988)	26,813	29,613	28,764	28,445	27,017	26,516	26,522	22,516	22,430	22,693

SOURCE: Department for Transport

AADF traffic data for **Stevenage Road, Hitchin (A602)** is shown in Table 3.3.

Table 3.3 AADF Traffic Flow on Stevenage Road, Hitchin (2005 – 2014)

Location	AADF Traffic Flows									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Stevenage Rd, Hitchin (CP78226)	36,421	37,240	35,241	35,220	33,520	32,353	32,276	30,360	30,350	34,391

SOURCE: Department for Transport

North Hertfordshire District Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

North Hertfordshire District Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

North Hertfordshire District Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

North Hertfordshire District Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review & Assessment

North Hertfordshire District Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

North Hertfordshire District Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

North Hertfordshire District Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

There are no airports within the Local Authority area, although Luton Airport's runway is within 1,500m of the village of Breachwood Green in the south west of the District. Between 2003 and 2009 automatic and passive air quality monitoring was undertaken at a location in Breachwood Green directly under a flight path into Luton Airport. The monitoring never identified a breach of air quality monitoring objectives for nitrogen dioxide or particulate matter (PM₁₀) and so was decommissioned in 2009.

Luton Airport currently has a capacity of 10million passengers per annum. The airport identifies the main north-south road access as the M1 and from the east as the A602 and A505 road network. The A602 and A505 road network passes through the south of the district of North Hertfordshire including Hitchin.

There are no new airports in the area, but planning permission (12/01400/FUL) has been granted for the expansion of the passenger capacity of Luton Airport from 10million to 18million passengers per annum by 2028.

An Environmental Statement was completed by the applicants in support of their application and that document included a traffic assessment and an air quality assessment. However, neither assessment considered the impact of the proposed development on the district of North Hertfordshire, despite the A505/A602 road network through the south of Hitchin, which includes the Stevenage Road AQMA, having been identified within the planning application as a main route of road traffic access to Luton Airport, second only to the M1. For this reason, alongside a number of technical planning considerations, the Local Planning Authority at NHDC responded to the consultation with an objection.

In November 2013, the Secretary of State issued a holding direction to Luton Borough Council preventing them from determining the application at that time. However, it was confirmed on the 1st May 2014 that the Secretary of State for Communities and Local Government has not decided to "call in" the planning application.

Permission was granted on the 23rd June 2014 with no conditions or Section 106 considerations of relevance to the mitigation of the impact of increased road traffic on the A505/A602 road network through North Hertfordshire and in particular through Hitchin.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

North Hertfordshire District Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

North Hertfordshire District Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

North Hertfordshire District Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been undertaken

North Hertfordshire District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been introduced

North Hertfordshire District Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

North Hertfordshire District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

North Hertfordshire District Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

North Hertfordshire District Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

North Hertfordshire District Council confirms that there are no biomass combustion plants in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

North Hertfordshire District Council confirms that there are no biomass combustion plants in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

North Hertfordshire District Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

6.4 Fugitive or Uncontrolled Sources

North Hertfordshire District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

The new monitoring data have shown that no new areas have been identified where AQO have been exceeded. The new data have confirmed that the annual average AQO for nitrogen dioxide is exceeded along the south side of Stevenage Road and at a single property on the west side of Park Way / south side of Upper Tilehouse Street.

Dispersion modelling as part of a Detailed Assessment (2011) determined that an AQMA was warranted along the Stevenage Road, Hitchin and the new NO₂ data has been consistent with the data upon which that designation was based.

Dispersion modelling as part of a Detailed Assessment (2014) indicated that concentrations of NO₂ were fractionally below the AQO at the north facing facade of 41 Upper Tilehouse Street at the junction of Park Way and Upper Tilehouse Street. However, it also highlighted a possible exceedance at the south-eastern facade of 41 Upper Tilehouse Street. The diffusion tube results adjusted for reductions with distance from the kerbside to the nearest facade indicated that at the south facing facade of 41 Upper Tilehouse Street the AQO is being exceeded. Further advice is being sought from Defra prior to deciding whether an AQMA should be designated at 41 Upper Tilehouse Street, or whether it is reasonable to rely on the measures being implemented within the Action Plan for the Stevenage Road AQMA.

The diffusion tube data from along the **B656 through Baldock** were consistent with the previous data and returned an annual average below the relevant AQO. However, it should be noted that there is increasing residential occupation of Hitchin Street, Baldock with conversions and redevelopments of former commercial buildings into living accommodation. Therefore, it is considered important to maintain the monitoring of both air quality and traffic levels in that area.

7.2 Conclusions from Assessment of Sources

There have been no new likely sources of emissions to air which are likely to lead to further detailed assessments. The major roads in the district have not shown notable increases in traffic flows compared to equivalent data reported in the 2009 USA. The only possible exception to this is the 4,000 increase (Table 3.3) recorded at the Stevenage Road (CP78226) count point from 2013 to 2014 and so will be kept under observation.

7.3 Proposed Actions

Where possible and within current staffing and budget limits the measures within the Action Plan for the AQMA at Stevenage Road, Hitchin will continue to be implemented.

Air quality monitoring will continue across the District using diffusion tubes and will, at Stevenage Road, Hitchin continue to be supported by a real-time nitrogen dioxide analyser and be supplemented by the introduction of a real-time particulate matter (PM₁₀) analyser and a real-time particulate matter (PM_{2.5}) analyser.

With regard to the nitrogen dioxide exceedance measured by diffusion tube NH93 close to 41 Upper Tilehouse Street, Hitchin the following actions are proposed:

- Continue monitoring using diffusion tubes and maintain a watch on annual trends in both concentrations and levels of traffic in the vicinity
- Act upon the recommendations of Defra with regards to the determination of an Air Quality Management Area at the site
- Otherwise rely on the implementation of the measures identified in the Stevenage Road AQMA Action Plan to address the NO₂ concentrations

8 References

DEFRA. March 2015. *Diffusion Tube Bias Adjustment Factors*. (<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>)

DEFRA. 2014. *Local Air Quality Management Technical Guidance (LAQM. TG(09))*.

Appendices

Appendix 1: Quality Assurance / Quality Control (QA/QC) Data

Appendix 2: Calculations of Reduction for Nitrogen Dioxide with Distance from the
Kerb

Appendix 3: Nitrogen Dioxide Diffusion Tube Results 2014

Appendix 4: Traffic Count Locations

Appendix 1: Quality Assurance/Quality Control Data

Factor from Local Co-location Studies (if available)

North Hertfordshire District Council undertakes no co-location studies.

Diffusion Tube Bias Adjustment Factors

Data from the diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location database. The bias adjustment factor has been taken from the March 2015 version of the Diffusion Tube Bias Adjustment Factors spreadsheet available from the Defra Review and Assessment website (<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>).

The diffusion tubes are 50% triethanolamine (TEA) in acetone and are supplied and analysed by Environmental Services Group (ESG) at Harwell Scientific Services. ESG/HSS follows the procedures set out in the Harmonisation Practical Guidance. ESG/HSS also participates in the Workplace Analysis Scheme for Proficiency (WASP) and is currently ranked as a Category Satisfactory laboratory. This information was used in selecting the below bias adjustment factor.

Data from the diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location database. The bias adjustment factor has been taken from the March 2014 version of the Diffusion Tube Bias Adjustment Factors spreadsheet available from the Defra Review and Assessment website (<http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>).

According to the above database the bias adjustment factor for ESG/HSS in 2014 was 0.81.

Short-term to Long-term Data adjustment (Annualisation)

Where it has only been possible to carry out monitoring at a location, whether automatic or non-automatic, at a site for less than 12 months the results need to be adjusted to enable an estimate of the annual mean for that location to be calculated.

It should be noted that a minimum 6 month period is necessary for this process to be valid. There were no monitoring locations where less than 6 months data were collected during 2014.

North Hertfordshire District Council

The annualisation process is described in Box 3.2 of TG(09) and NHDC's application for each of the relevant monitoring locations of it is summarised below.

Annualisation Factor Calculation for Upper Tilehouse Street (crossing) Diffusion Tube (NH77).

Monitoring Period – January–June and November–December 2014 (inclusive)

Site	Site Type	Annual Mean ($\mu\text{g}/\text{m}^3$)	Period Mean ($\mu\text{g}/\text{m}^3$)	Ratio
East Herts, Sawbridgeworth	Background	19	20.1	0.95
Hertsmere, Borehamwood	Background	25	27.5	0.91
			Average of ratios R(a)	0.93

(Source: <http://www.hertsbedsair.net/>)

Therefore: NH77 annual mean (8 months) of $44.7\mu\text{g}/\text{m}^3$ multiplied by 0.93 produces an annualised mean of **$41.6\mu\text{g}/\text{m}^3$** .

QA/QC of automatic monitoring

The ML8941B analyser (Stevenage Road) has calibration checks and filter checks and changes undertaken on a fortnightly basis by TRL staff. The calibration readings were reported to Air Quality Data Management (AQDM). This company is retained by NHDC, as part of the larger Herts and Beds Air Quality Network, to verify and ratify the data generated by the analyser. The ratification process is carried out as per AURN recommended procedures. In addition TRL is engaged to undertake two service and on-site calibration visits in a year, one minor service and one major service.

The API M200 analyser and the R&P 1400a Tapered Element Oscillating Measurement (TEOM) analyser (Hitchin Library) are subject to calibration checks and filter checks and changes on a fortnightly basis by NHDC staff. In addition TRL was employed to undertake an annual service/maintenance visit and to respond in the event of any maintenance issues encountered during daily operation. The calibration readings were reported to AQDM. This company is retained by NHDC, as part of the larger Herts and Beds Air Quality Network, to verify and ratify the data generated by the analyser. This process includes the application of the volatile correction model (VCM) and the results of the data reported have had this applied and been demonstrated as equal to the gravimetric equivalent.

As with most accurate measurement equipment, the API M200 and ML8941B must be calibrated to determine its function. Calibration is simply the testing of equipment against a known quantity to determine whether it produces expected results. In the case of both nitrogen dioxide analysers, calibration takes the form of two routines:

- a) The response of the analyser to high concentrations of nitric oxide is assessed by a “span calibration”. Simply, a nitric oxide (at a known high concentration) is passed into the analyser and the result produced by it is noted.
- b) The response of the analyser to sample containing no oxides of nitrogen (NO_x) is assessed by passing air which has been “scrubbed” clean of NO_x (“zero air”) into the analyser and thus conduct a “zero calibration” and the analysed result noted.

The analyser should produce a result, which is close to the absolute concentration at both ends of the scale - the span range.

Span and zero calibrations are conducted regularly by the NO_x analyser automatically and stored in the data-logger for periodic inspection. To ensure a consistently high quality assurance standard, the NO_x analyser is calibrated, for both zero and span, every 10 - 14 days and the result used for validation.

For a host of reasons analysers, such as the API M200, do not always produce calibration results that are exactly in line with the anticipated levels during both the span and zero calibration operation. This does not mean that the data produced must be discarded because it is not accurate. “Calibration drift” is common and can be compensated by the use of a scaling calculation; any under/over reading by the analyser is distributed over the span range so that the data produced routinely is altered to reflect any inaccuracy.

The result of rescaling is to ensure that data from the analyser is accurate at the concentrations encountered routinely. Rescaling is not conducted by North Hertfordshire District Council, but is undertaken by AQMA under contract at both sites. Rescaling takes place after every manual calibration to ensure a robust data set.

PM Monitoring Adjustment

The analyser is Tapering Element Oscillating Microbalance (TEOM) continuous PM_{10} analyser. The analyser has a heated manifold to prevent condensation of water vapour, which may lead to a loss of volatile particles. The measured concentrations of these analysers have been corrected using the Volatile Correction Model (VCM).

LAQM.TG (09) sets out the calculation required for TEOM results using the VCM to estimate gravimetric equivalent. This replaces the use of the previous 1.3 factor. Data for 2012 has been corrected using the VCM model by AQDM.

Appendix 2: Calculations for Reduction of Nitrogen Dioxide with Distance from Kerb

The calculation of the reduction of nitrogen dioxide with distance from the kerb was undertaken in line with Box 2.3 of TG(09). In all cases local background concentrations were derived from 2008 mapping (the most current available at the time of completion of the report) sourced from <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>

Diffusion Tube (NH45) Stevenage Road (A), Hitchin

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	3	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	21	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	(Note 2)	15.98511	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	(Note 2)	48	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	(Note 3)	31.9	µg/m ³

Diffusion Tube (NH92) Stevenage Road (Griffin Court) Hitchin

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	(Note 2)	15.98511	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	(Note 2)	48.1	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	(Note 3)	41.2	µg/m ³

Diffusion Tube (NH105) Stevenage Road (94-98) Hitchin

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	3.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	7	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	(Note 2)	15.98511	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	(Note 2)	51.4	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	(Note 3)	44.8	µg/m ³

Diffusion Tube (NH106) Stevenage Road (Morello Gardens) Hitchin

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.4	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	6.4	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	(Note 2)	15.98511	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	(Note 2)	42.7	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	(Note 3)	33.9	µg/m ³

Automatic Analyser (Stevenage Rd) Stevenage Road, Hitchin

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	3	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	18	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	(Note 2)	15.98511	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	(Note 2)	48	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	(Note 3)	33.2	µg/m ³

Diffusion Tube (NH93) Park Way, Hitchin

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.6	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	3	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	(Note 2)	17.94208	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	(Note 2)	54.1	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	(Note 3)	49.0	µg/m ³

Diffusion Tube (NH77) Upper Tilehouse Street (crossing), Hitchin

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	(Note 2)	17.94208	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	(Note 2)	41.6	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	(Note 3)	35.3	µg/m ³

Appendix 3: Nitrogen Dioxide Diffusion Tube Results 2014

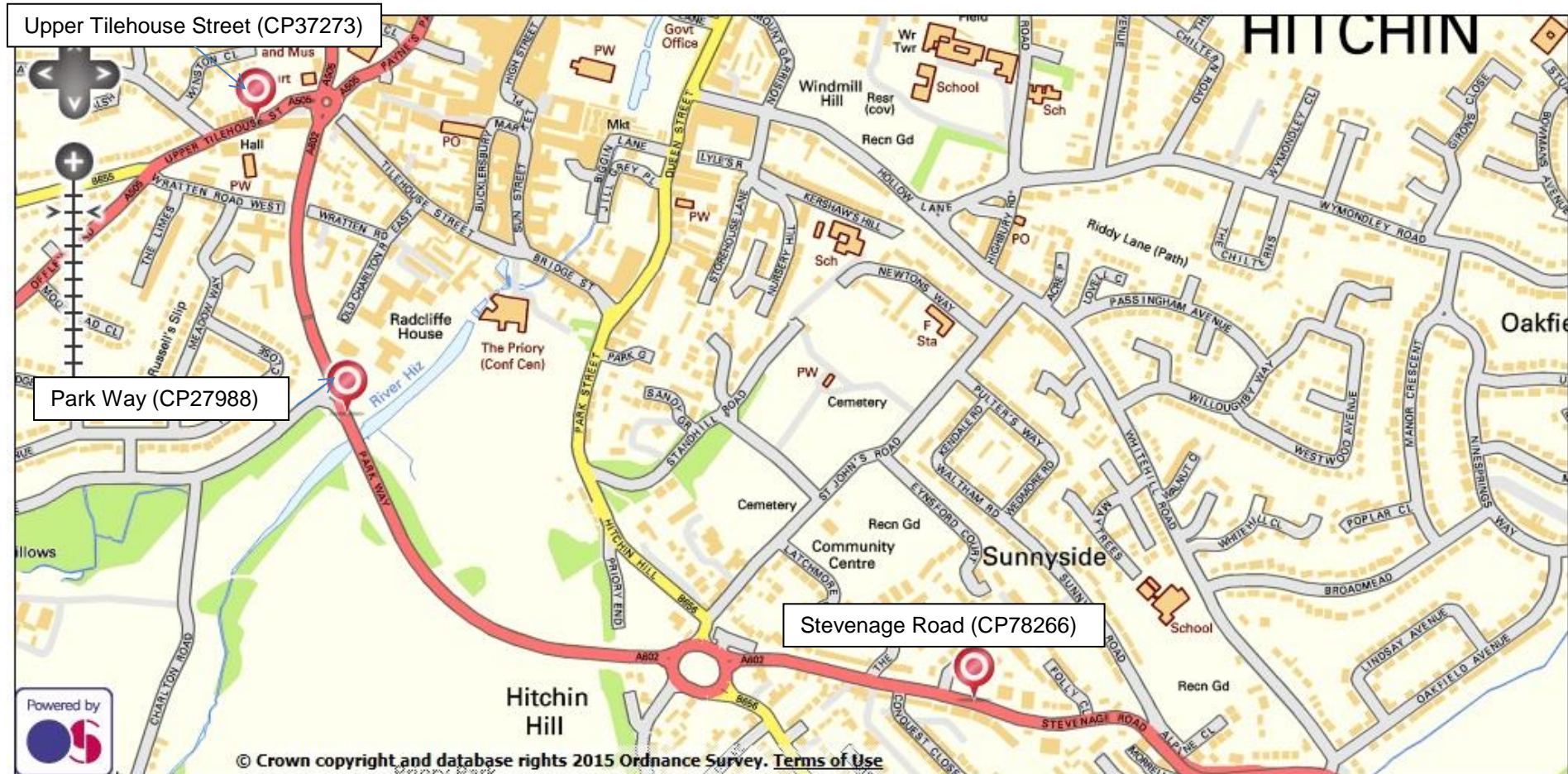
NH Code	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave	Bias	Annualised
NH06	Melbourn Road, Opposite Town Hall, Royston	39.1	40.8	40.4	40.4	33.2	27.4	30.6	27.5	37	38.3	46.2	32.8	36.1	29.3	not needed
NH45	Stevenage Road A, Hitchin	76.4	69.5	63.1	34.8	54.6	40.1	39.2	48.6	53.9	62.8	74.5	73	57.5	46.6	not needed
NH59	(NH04a) Clothall Road, Baldock	44.8	42.7	37.9	31.4	32.1	31.5	33.7	29.9		38.5	46.3	25.8	35.9	29.1	not needed
NH60	(NH13a) Willian Road, Hitchin	41.4	35.7	44	28.5	29.2	23.9	27.9	33.4	39.6	32.8	46.3	46.5	35.8	29.0	not needed
NH61	(NH53a) Whitehorse Street, Baldock (nr town hall)	58.1	48.2	44.4	36.1	32.5	31.6	35.3	30.7	39.9	46.9	48.8	43.3	41.3	33.5	not needed
NH63	(NH02a) Library Hitchin	61	57.6	57.6	39.4	43.9		38	41.5	45.7	52.7	50.4	65.9	50.3	40.8	not needed
NH67	Cadwell Court, Hitchin	36.4	46.4	40.8	24.6	25.9	20.9	18.8	23.6	30.5	37.5	53.2	35.4	32.8	26.6	not needed
NH69	64 Grove Road, Hitchin	48.9	43.7	45.3	26.6	23.2	26.5	21.3		31.3	36.7	51.8		35.5	28.8	not needed
NH70	Nr Bus Stop Hitchin Street Baldock	37.3	37.8	42.5	32.6	29.1	28.4	25.3	26.3	33.1	37.6	39.5	48	34.8	28.2	not needed
NH72	Opp Rose Crown, Whitehorse Street, Baldock	50.2	52.3	45.7	36.8	30.7	24.6	23.8	32.1	38.4	43.2	49.5	56.5	40.3	32.7	not needed
NH103	Westbrook Court, Hitchin	64.5	55.7	64.8	52.5	41.8	34.2	39.3	42				58.6	50.4	40.8	not needed
NH77	Upper Tilehouse Street, Hitchin (traffic lights)	57.1	51.4	60.3	57.1	47.9	47.3					64.9	55.7	55.2	44.7	41.6
NH78	West Hill, Hitchin	50.3	52.1	43.5	28.9	28.8	21.3	24.7	21.5	31.7	34.7	59.7	36.2	36.1	29.3	not needed
NH82	Upper Tilehouse Street, Nr Roundabout	60.5	58	58.4	40.6	47.2	43	44.1	42.4	45	54.1	63.3	40	49.7	40.3	not needed
NH83	Hitchin Station, Roundabout A	57	50.2	50.1	36.3	27.6	31.1	34.1	31.2	42.6	42.9	50.5	51.8	42.1	34.1	not needed
NH84	Hitchin Station, Roundabout B	64.8	51.4	53.2	37.5	34.9	39.1	32.4	32.6	47.9	40.6	56.4	43.6	44.5	36.1	not needed
NH86	Walsworth Rd, Hitchin (Nr Station)	42.9	36.8		30.8	26.3	19.6	25.2	28.9	40.2	32.3	44.4	41	33.5	27.1	not needed
NH87	11 Stevenage Road, Hitchin	50.9	42.6	38.4	29.7	23.6	21.3	16.7	29.8	34	34.9	43.9	40.7	33.9	27.4	not needed
NH88	Church St, Baldock (Opp. Town Hall)	54.8	58.5	61.8	34.5	48.8		37	46.9	45.3	52.8	58.5	77.3	52.4	42.4	not needed
NH89	London Road, Hitchin	49.2	44.4	43	25.3	29.9	19.7	17.9	26.8	34	40.1	51.4	44	35.5	28.7	not needed
NH90	Gosmore Road, Hitchin	35.3	31	35.5		26.2	25.6	27.6	25.9	39.7	28.8	43.8	30.6	31.8	25.8	not needed
NH91	St John's Road, Hitchin	53.7	51.1	46.7	27.4	22.8	20.8	28	31.9	30.3	46.3	42.9	40.6	36.9	29.9	not needed
NH92	Stevenage Road (Griffin), Hitchin	67.4	72.5	58.6	56.9	45.1	45.4	52.5	49.5	58.3	67.5	70.1	69.3	59.4	48.1	not needed
NH93	Park Way, Hitchin	74.6	66.4	85.7	70.3	70.1		61.4	48.9	68	58.7	70.1	60.2	66.8	54.1	not needed
NH94	Offley Road, Hitchin	41.6	52.3	63	36.5	36.8		38.9	37			47.9	49	44.8	36.3	not needed
NH95	Pirton Road, Hitchin	44.3	44	52.2	39.8	40.9	32.1	38.2	36.8	44.1	43.9	61.5	36.4	42.9	34.7	not needed
NH96	Park Street, Hitchin	44.3	42.2	47.2	32.5	40.3	37.5	36.7	33.3	42.5		49.1	36.6	40.2	32.6	not needed
NH97	Queen Street, Hitchin	52.7	46.3	47.3	33.8	36.3	28.3	30.6		36.3	39	52.9	36.9	40.0	32.4	not needed
NH98	Walsworth/Radcliffe Road, Hitchin	52	53.4	50.6	36.5	25.7	29.3	25.5	28	33.6	47	52.2		39.4	31.9	not needed
NH99	Nightingale Road, Hitchin	43.3	44	47.2	29.7	25.3	28.1	27.4	25.9	37.9	39.9		47.1	36.0	29.1	not needed
NH100	Foxglove Way, Welwyn	36.6	45.9	39	33.3	30.4	22.7	29.6	39.3	32.9	38.1	35.7	23.7	33.9	27.5	not needed
NH108	Hitchin - Hermitage Road (97)	42.7	36.8	44.5	35.8	24.6	24.5	28.7	27.7	41.3	37.9			34.5	27.9	not needed
NH109	Hitchin - Hermitage Road (26)	63.8	57.4	59.7	44	40.6	27.4	35.6	40.5			60.2	66.6	49.6	40.2	not needed

North Hertfordshire District Council

NH Code	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave	Bias	Annualised
NH104	Dower Court (A), Stevenage Road, Hitchin	33.4	38.7	47.9	38	34	26.4	36.8	38.6	34.1	37.9	40.2	43.9	37.5	30.4	not needed
NH105	94-98 Stevenage Road, Hitchin	82.2	68	70.4	52.6	52.9		52.2	49.9	63	62	71.4	73.1	63.4	51.4	not needed
NH106	Morello Gardens, Stevenage Road, Hitchin	54.6	49.7	61	43	52		38.8	44.5	61.5	55.9	76.1	43	52.7	42.7	not needed
NH107	Whitehill Road, Hitchin	50.1	41	46.2	33.5	27.5	19.1	26	26.4	34.8	31.9	55.6	46.6	36.6	29.6	not needed

Appendix 4: Traffic Count Locations

Hitchin Traffic Count Locations (Source: DfT)



Baldock Traffic Count Locations (Source: HCC)

