



2016 Air Quality Annual Status Report (ASR)

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

June 2016

North Hertfordshire District Council

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Executive Summary: Air Quality in Our Area

Air Quality in North Hertfordshire District Council

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

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

Across North Hertfordshire, where monitoring is undertaken, the concentrations of nitrogen dioxide (NO₂) have been declining, which means air quality has been improving. In 2015, in all but two monitoring locations, the annual average concentration of NO₂ was found to be lower than when monitoring began at each monitoring location. The longest periods of monitoring at any location are five years.

The decline in concentrations has not been consistent across the monitoring period at each location. For example, at sixteen monitoring locations NO₂ concentrations measured in 2014 showed increases on 2013 levels and at nine of those locations the 2014 concentrations were also higher in comparison to their respective first years of monitoring.

Air quality is below the health based limits set by Government across the majority of the District, but even with the observed improvement in air quality, as measured by NO₂ concentrations, there remain two areas where the health limits are exceeded.

The two areas are in Hitchin, specifically at Stevenage Road and in the vicinity of Payne's Park. The primary source of the pollution is the exhaust emissions from petrol and diesel engine road vehicles moving through the areas.

NHDC has designated the Stevenage Road area as an Air Quality Management (AQMA) because the levels of NO₂ pollution are too high. As a result of the AQMA

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

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

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

NHDC has an Action Plan in place to identify measures that can be taken in an attempt to reduce emissions and improve air quality. The details can be found at <http://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire>

NHDC is in the process of declaring an AQMA at Payne's Park (roundabout at Park Way and Upper Tilehouse Street) Hitchin, also because the annual mean NO₂ concentrations are too high. This means that NHDC will be preparing another Action Plan to address the emissions and improve air quality in that location. In preparing that Action Plan, the opportunity will be taken to review the existing Action Plan at Stevenage Road.

As a result of the relocation of the PM₁₀ particulate matter analyser and the introduction of a PM_{2.5} particulate matter analyser to Stevenage Road, Hitchin during 2015 there is insufficient data with which to make a meaningful assessment of particulate matter pollution levels and trends.

Due to the major source of air pollution that impacts local air quality originating from road vehicle emissions there is a need to work with other professionals to enhance our management of local air quality for the following reasons:

- many vehicles using North Hertfordshire's roads will not begin or end their journeys within this District.
- commercial expansion or contraction and housing growth in and around North Hertfordshire is likely to impact upon the levels of road traffic.
- the road network within North Hertfordshire is managed either by Hertfordshire County Council (HCC) or Highways England.
- local air pollution has a direct public health impact and Hertfordshire County Council Public Health has a significant public health protection remit in the Hertfordshire.

Therefore, NHDC Environmental Health actively engages with the following partners:

- Other environmental health professionals in Hertfordshire and Bedfordshire via a working group, the Hertfordshire and Bedfordshire Air Quality Network/Forum, which meets 3 or 4 times a year. A working group at which HCC transport officers are represented.

- Public health professionals in Hertfordshire via a working group, the Public Health Air Quality Planning Group, which meets at least 4 times a year.
- Day to day working relationships with NHDC Transport Planning Officers, Strategic Planning Officers and Development Control Officers to ensure that air quality is considered within the planning regime.

Actions to Improve Air Quality

Measures from the Stevenage Road Action Plan that have been implemented during 2015 have included:

- 1) Partnership Working within the planning regime:
 - An Air Quality Policy (Policy D4) has been accepted in the Local Plan (2016-2031). This raises the profile and importance of good local air quality in general and identifies the need to protect local air quality in taking forward any future development within North Hertfordshire.
 - In support of Policy D4 an Air Quality Planning Guidance Document has been produced which provides specific guidance to developers about how they should bring forward their proposals in such a way as to mitigate their potential impact on local air quality. The guidance document has a scaled approach to the expected mitigation based on the size and nature of the proposed development and the sensitivity of its location in relation to existing air quality. However, it places an onus on developments of any size, type and location to provide a proportionate amount of air pollution mitigation even if, when taken in isolation, the development would not be anticipated to adversely impact air quality.
- 2) Partnership Working with Public Health:
 - NHDC has an active presence on the Public Health and Air Quality Working Group. Specific progress has been made in the following areas:
 - Seminars and presentations to Strategic Planning Officer Meetings, Development Control Officer Meetings, Transport Officer Meetings, Local Councillors and other interested parties

which explain the sources of poor air quality and its link to adverse public health outcomes.

- Funding to support the purchase of PM_{2.5} analyser at Stevenage Road as part of a wider project to relocate a PM₁₀ analyser to Stevenage Road and extend the presence of the existing NO₂ analyser.

3) Improve infrastructure for Low Emission Vehicles:

- Successful completion of the NHDC and Office for Low Emission Vehicle (OLEV) funded project that established five publicly available dual plug fast charge electric vehicle (EV) recharging posts in North Hertfordshire and one dual plug fast charge recharging post for NHDC use.

4) Encouraging use of Low Emission Vehicles:

- Continuation of free parking and electricity at EV recharging posts that were installed using NHDC and funds.
- Unsuccessful bid to OLEV for NHDC vehicle fleet review to assess replacement of diesel vehicles with EV and part funding of EV.

Local Priorities and Challenges

Through 2015 the focus was on implementing the measures included in the planning and development section of the Action Plan. This reflects the fact that this is an area where Local Authority environmental health can have a direct influence, through shaping local planning policies and influencing individual planning decisions. It also reflects what is considered to be the biggest challenge facing the management of local air quality in North Hertfordshire, namely population growth and the associated demand for housing. The simple premise is that the need to accommodate approximately 15,000 new homes in North Hertfordshire by 2031 will result in increased road traffic and increase pressure on already congested areas.

Neighbouring local authorities, for example Stevenage Borough Council and Luton Borough Council are also facing similar development pressures.

NHDC will continue to engage with and try to influence the decision making of our partners in Transport and Planning and continue to implement those measures that it

is able. The greatest challenge faced in doing so is anticipated to be obtaining sufficient priority for air quality issues when they are considered alongside the competing priorities that planning professionals are obliged to balance; all against a backdrop of encouraging development by removing regulations and perceived barriers to development.

How to Get Involved

The potential for the residents and businesses of North Hertfordshire to have a positive impact on air quality is considerable by choosing where practical to travel by:

- public transport
- car sharing / car clubs including e-car clubs
- more sustainable private modes of transport (i.e. not petrol or diesel engine vehicles)
- more modern models of petrol and diesel engine vehicles, which emit lower levels of pollution
- walking or cycling

Potentially useful sources of further information include:

<https://www.goultralow.com/> = Central Government website about low emission vehicles

<https://www.zap-map.com/live/> = Locations of EV charging points across UK

<http://www.hertsdirect.org/services/transtreets/ltp/live/> = HCC Local Transport Plan

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1 Local Air Quality Management

This report provides an overview of air quality in North Hertfordshire during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by North Hertfordshire District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at <https://uk-air.defra.gov.uk/aqma/>.

We propose to declare a new AQMA in the Payne's Park area of Hitchin (see Section 3).

Table 2.1 – Declared Air Quality Management Areas

| AQMA Name | Pollutants and Air Quality Objectives | City / Town | One Line Description | Action Plan |
|---------------------|---------------------------------------|-------------|--|--|
| AQMA Stevenage Road | NO ₂ annual mean | Hitchin | An area encompassing residential properties located along the south side of Stevenage Road, Hitchin. | Stevenage Road, Hitchin AQMA Action Plan - http://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire |

2.2 Progress and Impact of Measures to address Air Quality in North Hertfordshire

North Hertfordshire District Council has taken forward a number of measures during the current reporting year of 2015 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. More detail on these measures can be found in the Stevenage Road, Hitchin AQMA Action Plan (<http://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-management-areas-north-hertfordshire>).

Key completed measures are:

- *Measure 1.1. Inclusion of Air Quality in the NHDC developing Local Plan:* Policy D4 is the Air Quality Policy within the Local Plan. An Air Quality Planning Guidance Document has been produced to support Policy D4. This document emphasises the provision of air quality mitigation by developers rather than screening or more detailed assessments that typically concluded no mitigation measures are required.
- *Measure 1.2. Responding to Planning Consultations:* 2015 has seen the recommendation for electric vehicle charging points to be incorporated into housing developments. As a result a number of developments have been permitted with a condition requiring the incorporation of electric vehicle charging infrastructure.
- *Measure 1.3. Liaison on Transport Plans:* Bi-annual meeting with NHDC Principal Transport Planning Officer to ensure effective engagement with the Transport Planning process.
- *Measure 1.5. Links with the Public Health Agenda:* NHDC has an active presence on the Hertfordshire County Council (HCC) Air Quality and Public Health Working Group. Involvement with this group has resulted in awareness raising seminars and presentation to local councillors and HCC public health professionals and transport professionals. Additionally a Hertfordshire Air Quality Strategy has been produced.
<http://www.hertsdirect.org/services/healthsoc/healthherts/healthyplaces/>
- *Measure 2.1. Monitoring Local Air Quality:* Diffusion tube network maintained. Enhancement of real-time monitoring capability at Stevenage Road, Hitchin. Relocation of particulate matter (PM₁₀) analyser to the AQMA and the introduction of a PM_{2.5} analyser alongside established the NO_x analyser.
- *Measure 2.2. Annual traffic counts at Stevenage Road:* Department for Transport traffic count location identified on Stevenage Road.
- *Measure 3.1. Publicity:* There has been some publicity via NHDC Twitter, the NHDC webpages and several NHDC press releases, all of which have focussed on EV and EV charging infrastructure.

- *Measure 4.4. Installation of Electric Vehicle (EV) Charging Point Infrastructure:* Successful completion of the EV charging infrastructure project, which was part NHDC and part Office for Low Emission Vehicle (OLEV) funded. Five dual plug fast charging points installed in public car parks, plus one dual plug fast charging point installed for NHDC use. Usage data indicates regular use of the publicly available charging points, with 47 individual charging cards presented to access the charging points between January and April 2016.
- *Measure 5.1. Investigate Incorporation of Emissions Element to Parking Policy/Charges:* Agreed free parking for electric vehicles using the parking bays associated with the Charging Points.

Progress on the following measures has been slower than expected due to:

- *Measure 1.4. NHDC Community Services Links (walking & cycling promotion):* Not progressed because of resource constraints.
- *Measure 1.6. Apply for Central Government Funding:* Unsuccessful bid to DEFRA in 2014/15 for funding for extension of road traffic and air quality modelling work at Stevenage Road, Hitchin. Unsuccessful bid to OLEV in 2015 for detailed review of NHDC fleet and 75% discount on EV replacements of diesel vehicles,
- *Measure 3.2. Engage with Schools to Raise Awareness of Air Quality:* Education/teaching resource packages are established for junior and senior schools, but there is insufficient resourcing in terms of time and money to support their utilisation
- *Measure 3.3. Engage with Local Businesses:* Lack of resources has resulted in no progress. Initial discussions were had with a company advocating a rapid charging network for EV taxis across Hertfordshire, but these never came to fruition.
- *Measures 4.1. & 4.2. Support Public Transport and Cycling Infrastructure:* No progress due to limited resources.
- *Measure 4.3. Support Improved Pedestrian Links & Crossing at Stevenage Road:* No progress due to unsuccessful bid for DEFRA funding.

- *Measure 4.5. Gas or Bio-methane Refuelling Facilities for Industry:* No progress because no opportunities arose to consider their development.
- *Measure 5.2. Alternatively Fuelled Company Fleets:* No progress because of a failed bid for OLEV funding to support a review of NHDC fleet and grant towards EV replacement of diesel vehicles.
- *Measure 6.1. Alternative Route for HGV Access to Hitchin Industrial Estate:* HGV traffic survey data provided and discussed at meeting with HCC in 2014, but no progress to date because future proposals and final decision rests with Hertfordshire County Council.
- *Measures 6.2., 6.3. & 6.4. Relocation of Bus-stops, On-Street Parking Review & Stevenage Road Layout Improvements:* No progress, following unsuccessful bid for DEFRA funding to progress traffic and emissions modelling.

North Hertfordshire District Council expects the following measures to be implemented over the course of the next reporting year:

- *Measure 1.2. Respond to Planning Consultations:* It is hoped that the NHDC Air Quality and Planning Guidance Document will be adopted as a Hertfordshire and Bedfordshire wide Planning Guidance Document.
Greater utilisation of Sustainable Transport Section 106 funds for projects that have benefits for local air quality.
- *Measure 1.3. Transport Plan Liaison:* Formal response to Local Transport Plan Vision Consultation (for LTP4 – 2031-2050).
- *Measure 1.5. Link with Public Health Agenda:* Trial and anticipated establishment of an air quality notification system to the general public and the public that is most at risk from air pollution.
- *Measure 4.4. Installation of EV Charging-Point Infrastructure:* Engagement with Source East and EValu8 to investigate locations for rapid EV charging point infrastructure within Hitchin and other areas of North Hertfordshire.

- *Measure 5.2. Alternatively Fuelled Company Fleets:* Investigation of replacement of NHDC diesel vehicles with Electric Vehicles (EV) in partnership with the Energy Saving Trust.

Investigation of the potential for an EV pool car system to replace a proportion of the NHDC staff mileage that is currently undertaken in diesel or petrol engine vehicles.

North Hertfordshire's priorities for the coming year are:

- To focus on measures from the planning and development sections (1.1-1.2) of the Action Plan. This is something that reflects what is considered the biggest challenge facing the management of air quality in NHDC, namely population growth and the associated demand for housing. The simple premise being that the need to accommodate approximately 15,000 new homes in NHDC by 2031 will result in increased road traffic and increased congestion, particularly in those areas where this is already heavy traffic.

Furthermore, this is an area where a Local Authority Environmental Protection Team is able to have a direct influence by utilising its role as a consultee of the Local Planning Authority and the reference to air quality in the National Planning Policy Framework.

Therefore, NHDC will continue to emphasise its engagement with and influence in the decision making of our partners in the Planning Department to encourage the most sustainable development possible and maximise the amount of air pollution mitigation provided with such development.

- To continue to support the uptake of EV and the presence of infrastructure necessary to support EV. Action Plan Measures 4.4 and 5.2. This has the potential to reduce NO₂ emissions by replacing internal combustion engine vehicles on North Hertfordshire's roads with low or zero emission vehicles. It is also something for which existing partnerships and relationships with private and public sector experts are in place through previous projects.

Furthermore, NHDC has its own small fleet of vehicles and operates a mileage payment system for staff that utilise their own vehicles on NHDC business.

Therefore, the potential exists for NHDC to set an example to the local residents and business, by investigating the practicality of replacing internal combustion engine vehicle miles with electric vehicle miles.

- To continue to engage with the Public Health Agenda (Action Plan Measure 1.5) because it provides access to additional resources including personnel, expertise, contacts and influence across departments within Hertfordshire County Council. Specific projects identified for 2016 include:
 - Air Quality Notification System for the public, including those particularly sensitive to air pollution
 - Support and advocacy for a Hertfordshire wide Air Quality Planning Guidance Document
 - Access to professionals in Transport and Planning Departments for the purposes of raising awareness of air quality issues and influencing decision making.

Table 2.2 – Progress on Measures to Improve Air Quality

| Measure No. | Measure | EU Category | EU Classification | Lead Authority | Planning Phase | Implementation Phase | Key Performance Indicator | Target Pollution Reduction in the AQMA | Progress to Date | Estimated Completion Date | Comments |
|-------------|---|---|---|--------------------------------------|----------------|--|---|---|--|---|--|
| 1.1 | Air Quality Policy in Local Plan & supporting Guidance Document | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | North Hertfordshire District Council | Complete | Policy dependant upon Local Planning Authority (2017) Guidance Document complete | Policy in Local Plan with reference to Air Quality Planning Guidance Document | Addressing demand for car travel and increased proportion of low emission vehicles in general | Policy D4 agreed in principle. Planning Guidance Document complete | 2016/17 for Policy in Local Plan Planning Guidance Document completed | Hoping to extend the Guidance Document to be Herts and Beds wide |
| 1.2 | Responses to planning consultations | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | North Hertfordshire District Council | Complete | Ongoing | Utilisation of Planning Obligation Funds & AQ mitigation planning conditions | Addressing demand for car travel and increased proportion of low emission vehicles in general | Ongoing. Some s106 Funding obtained Planning Conditions being used | Ongoing | None |
| 1.3 | Liaison with Transport Plans | Policy Guidance and Development Control | Air Quality Planning and Policy Guidance | North Hertfordshire District Council | Complete | Ongoing | Inclusion of NHDC issues/needs in LTP4 | A number of schemes identified may impact on road layout in AQMA | Formal response to LTP4 visioning | Ongoing | None |
| 1.4 | Liaison with NHDC Community Services – walking/ cycling promotion | Promoting Travel Alternatives | Promotion of cycling and walking | North Hertfordshire District Council | Undefined | Undefined | Implemented initiatives and participation of public | In-directly | None | Undefined | None |
| 1.5 | Links with Public Health Agenda | Policy Guidance and Development Control | Regional Groups, co-ordinating programmes to develop area wide strategies to reduce emissions & improve air quality | North Hertfordshire District Council | Complete | Ongoing | Heightened awareness of air quality among key decision makers in local politics, transport, public health & planning & general public awareness | In-directly | Hertfordshire Wide Air Quality Strategy. Seminars to transport & planning professional & Councillors | Ongoing | New projects identified for 2016/17 |

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| Measure No. | Measure | EU Category | EU Classification | Lead Authority | Planning Phase | Implementation Phase | Key Performance Indicator | Target Pollution Reduction in the AQMA | Progress to Date | Estimated Completion Date | Comments |
|-------------|--|--|--|--------------------------------------|----------------|----------------------|--|--|--|---------------------------|---|
| 1.6 | Applying for Central Government Funding | Multiple depending on nature of bids | Multiple depending on nature of bids | North Hertfordshire District Council | Ongoing | Undefined | Depends on nature of bids | None currently identified, but would be targeted to AQMA | Failed bid for Defra AQ fund 2014-15. Failed OLEV bid 2015 | Not applicable | Will continue to pursue funding opportunities |
| 2.1 | Monitoring Air Quality | No Category | No Classification | North Hertfordshire District Council | Complete | Ongoing | Relevant diffusion tube network. Operational real-time analysers | Measurement to inform decision making & effectiveness of measures | NOx, PM10 & PM2.5 analysers established in AQMA | Ongoing | None |
| 2.2 | Annual Traffic Count Established within AQMA | No Category | No Classification | North Hertfordshire District Council | Complete | Complete | Annual data collection | Measurement to inform decision making & effectiveness of measures | DfT annual count location within AQMA | Ongoing | None |
| 3.1 | Utilise NHDC Media to Raise Awareness | Public Information | Via Internet Other | North Hertfordshire District Council | Ongoing | Ongoing | Publications & Online Presence | In-directly | Newspaper Articles, Tweets, Website Presence | Ongoing | None |
| 3.2 | Engage with local schools | Promoting Travel Alternatives / Public Information | School Travel Plans / Via Other Mechanisms | North Hertfordshire District Council | Ongoing | Ongoing | Engagement with School Travel Planning / Education Packs | In-directly | None / Education packs available | Not Known | None |
| 3.3 | Engage with local business to reduce fleet emissions | Freight Delivery Management / Promoting Low Emission Transport | Route Management Plans/Strategic Routing / Company Vehicle Procurement | North Hertfordshire District Council | Undefined | Undefined | Engagement of business and changes in routes and vehicle fleets | A focus on Hitchin Industrial Estate would enable HGV and LGV emissions within AQMA to be targeted | Data on HGV routes from early survey but no success in follow up | Not Known | None |
| 4.1 | Support of Public Transport Initiatives | Promoting Travel Alternatives | Other | Hertfordshire County Council | Undefined | Undefined | Undefined | In-directly | None | Not Known | None |
| 4.2 | Improve Cycling Infrastructure | Promoting Travel Alternatives | Promotion of cycling | Hertfordshire County Council | Undefined | Undefined | Increase participation in cycling | In-directly unless LTP includes specific projects in/around Hitchin | None | Not Known | None |

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| Measure No. | Measure | EU Category | EU Classification | Lead Authority | Planning Phase | Implementation Phase | Key Performance Indicator | Target Pollution Reduction in the AQMA | Progress to Date | Estimated Completion Date | Comments |
|-------------|---|-------------------------------------|---|--------------------------------------|----------------|----------------------|--|--|---|---------------------------|--|
| 4.3 | Improve Walking Infrastructure | Promoting Travel Alternatives | Promotion of walking | Hertfordshire County Council | Undefined | Undefined | Increase participation in walking | In-directly unless LTP includes specific projects in/around Hitchin | None | Not Known | None |
| 4.4 | Installation of Electric Vehicle Infrastructure | Promoting Low Emission Transport | Procuring Alternative Refuelling Infrastructure | North Hertfordshire District Council | Complete | Complete | 5 x publicly available charge points 1 x NHDC charge point | Car emissions in AQMA reduced by encouraging uptake of EV. Two charging points specifically located in Hitchin | Complete | Completed 2015 | New projects being planned |
| 4.5 | Consider Potential for Gas or Bio-methane refuelling facilities | Promoting Low Emission Transport | Procuring Alternative Refuelling Infrastructure | North Hertfordshire District Council | Undefined | Undefined | Undefined | Potential reduce HGV emissions within AQMA | None | Not Known | None |
| 5.1 | Incorporation of Emission Element to Controlled Parking Charges | Promoting Low Emission Transport | Priority Parking for LEV and Other | North Hertfordshire District Council | Ongoing | Ongoing | Provision of dedicated EV parking and free EV parking | Car emissions reduced in AQMA by incentivising EV uptake | Dedicated & free EV parking/charging bays | Complete | Annual Review |
| 5.2 | Changing NHDC Fleet | Promoting Low Emission Transport | Company Vehicle Procurement | North Hertfordshire District Council | Complete | Ongoing | Swapping out of diesel fleet vehicles with EV | In-direct | Initial review complete & reported | April 2016 | Follow-up projects planned |
| 6.1 | Investigate Alternative Route for HGV access to Hitchin Industrial Area | Freight and Delivery Management | Strategic routing for HGV | Hertfordshire County Council | Complete | Ongoing | HGV re-routed from Stevenage Road | would enable HGV emissions within AQMA to be reduced by diverting %age of HGV from the AQMA | Detailed HGV survey completed 2014 | Not Known | HCC decision, costs, knock on effects & political issues |
| 6.2 | Investigate Changes in Bus-Stop locations at Stevenage Rd | Transport Planning & Infrastructure | Public Transport Improvements | Hertfordshire County Council | Undefined | Undefined | Modelling of proposed changes | Potential to relocate emissions from buses/coaches to less sensitive locations in AQMA | None | Not Known | Was dependant on external grant |

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| Measure No. | Measure | EU Category | EU Classification | Lead Authority | Planning Phase | Implementation Phase | Key Performance Indicator | Target Pollution Reduction in the AQMA | Progress to Date | Estimated Completion Date | Comments |
|-------------|--|--------------------|--------------------------------|--------------------------------------|----------------|----------------------|-----------------------------------|---|---------------------------------|---------------------------|---|
| 6.3 | Review Parking Provision & Restrictions at Stevenage Road | Traffic Management | Parking Enforcement on Highway | North Hertfordshire District Council | Undefined | Undefined | Modelling or possible alterations | Potential to improve flow of traffic along Stevenage Road and so reduce emissions | None | Not Known | Was dependant on external grant |
| 6.4 | Investigate improvement to layout of Stevenage Road to reduce congestion | Traffic Management | Congestion Management | Hertfordshire County Council | Ongoing | Ongoing | Changes in road layout | Potential to improve flow of traffic along Stevenage Road and so reduce emissions | Initial investigation & scoping | Not Known | Is part of HCC medium term plan. May have been expedited if funding bids successful |

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

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

North Hertfordshire District Council is taking the following measures to address PM_{2.5}:

- Establishment of effective partnership working arrangements with Hertfordshire County Council Public Health. This has occurred as a result of three key drivers:
 - Increased evidence and awareness of the harm from exposure to PM_{2.5}
 - The transfer of central government funding from a central public health body to County Councils
 - The existence of the Public Health Outcome Indicator (PHOI) for the fraction of mortality attributable to particulate air pollution measured as fine particulate matter PM_{2.5}.

The outcome of this work has resulted in the formation of an Air Quality (Public Health) Planning Group. The group routinely comprises of the Chair and Vice-Chair of Hertfordshire and Bedfordshire Air Quality (H&B AQ) Working Group, a Public Health Project Manager, a Senior Public Health Analyst, a Planning and Place Health Improvement Officer and a Transport Planning Policy Officer. North Hertfordshire District Council has been particularly active in the establishment and continued activity of this Group because its Environmental Protection Officer is the Chair of the H&B AQ Working Group.

- Access to Public Health Funding for each of the ten Hertfordshire Local Authorities to purchase and establish PM_{2.5} monitoring equipment in their areas. Specific to North Hertfordshire, a Beta Attenuation Measurement (BAM) Real-Time Analyser has been installed within the Stevenage Road,

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Hitchin Air Quality Management Area. The provision of monitoring equipment was considered a priority because it was identified that there was no actual baseline data available within Hertfordshire. So the validity of the modelled value for the PHOI for Hertfordshire and its Local Authorities could not be judged nor subsequent changes measured.

North Hertfordshire District Council has not yet identified any measures targeted specifically at reducing PM_{2.5} and it is considered unlikely that any such measures will be identified over the coming years. Instead it is anticipated that:

- Measures to reduce emissions of NO_x by encouraging a move away from internal combustion engine vehicles to ultra low emission vehicles (ULEV) will reduce PM_{2.5} emissions from exhausts
- Measures to reduce road travel altogether will reduce PM_{2.5} emissions from brake and tyre wear and dust re-suspension.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

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

Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. North Hertfordshire District Council does not report on those pollutants. National monitoring results are available at <https://uk-air.defra.gov.uk/networks/network-info?view=aurn>.

North Hertfordshire District Council undertook automatic (continuous) monitoring at two closely located sites within the Stevenage Road, Hitchin Air Quality Management Area (AQMA) during 2015. Table A.1 in Appendix A shows the details of the sites.

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

One of the Stevenage Road, Hitchin monitoring sites was in place prior to 2015 and monitored oxides of nitrogen, including nitrogen dioxide. The other Stevenage Road, Hitchin monitoring station, located approximately 50m from the other site, was established in August 2015 and monitored particulate matter, both PM₁₀ and PM_{2.5}.

3.1.2 Non-Automatic Monitoring Sites

North Hertfordshire District Council undertook non-automatic (passive) monitoring of nitrogen dioxide (NO₂) at forty (40) sites during 2015. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Figure 3.1 displays the NO₂ annual mean concentrations measured along Stevenage Road, Hitchin, in relation to the Air Quality Objective (AQO). All of the monitoring points are within the boundary of the AQMA, with the exception of NH106.

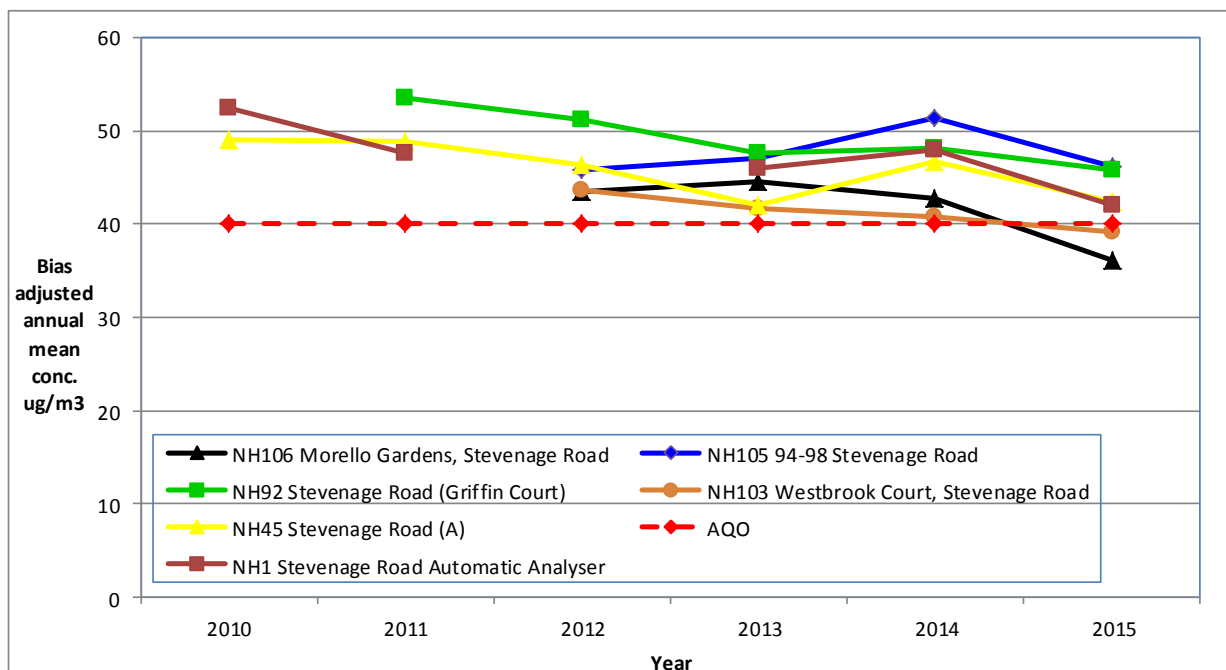


Figure 3.1: Trends in NO₂ concentrations at selected monitoring sites located at Stevenage Road, Hitchin

It is apparent from Figure 3.1 that there has been a gradual downward trend in NO₂ concentrations since the collection of data from 2010. The overall downward trend has not been uninterrupted with some monitoring locations showing an increase in 2014.

In Figure 3.1 the NH105 and NH92 annual mean average concentrations measured during 2013 and 2014 were above the 40µg/m³ air quality objective at the nearest residential properties. This was calculated to be case using the methodology approved by Defra and the same method was used for NH105 and NH92 in 2015. The outcome of the calculations are summarised below and detailed in Appendix C.

The mean annual average of 46.2µg/m³ measured at NH105 in 2015 represents 40.6µg/m³ at the point of public exposure at 94-98 Stevenage Road and hence still represents an exceedance of the air quality objective. However, the mean annual average of 45.8µg/m³ measured at NH92 in 2015 is representative of 39.4µg/m³ at 22 Stevenage Road, which is below the air quality objective for the first time since monitoring commenced in 2010.

The AQMA at Stevenage Road, Hitchin will remain in place.

Figure 3.2 displays the NO₂ annual mean concentrations from the Payne’s Park, Hitchin area, in relation to the Air Quality Objective (AQO). Currently there is no AQMA in the vicinity of Payne’s Park, Hitchin.

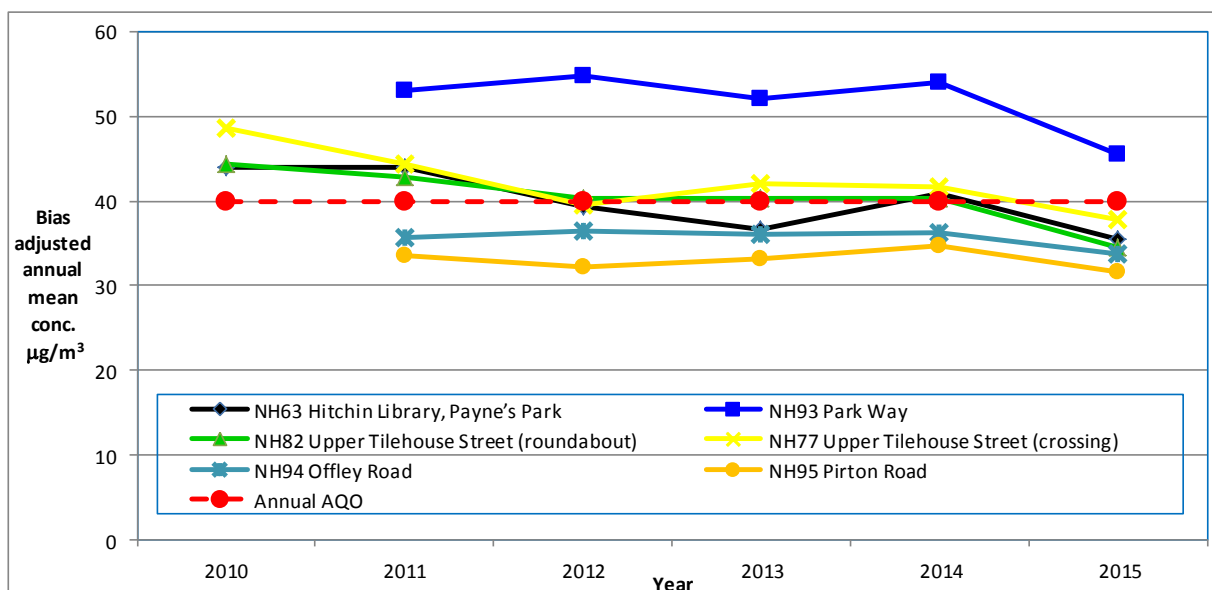


Figure 3.2: Trends in NO₂ concentrations at selected monitoring sites at Payne’s Park, Hitchin

It is apparent from Figure 3.2 that there has been a gradual downward trend in NO₂ concentrations since the collection of reliable data from 2010. The most notable decline in levels of NO₂ concentrations was measured in 2015 at NH93. The extent of that decline was much greater than that seen at any other monitoring location in Hitchin.

In Figure 3.2 the NH93 annual mean average concentrations measured during 2011 to 2014 were above the 40µg/m³ air quality objective at the nearest residential receptor (41 Upper Tilehouse Street). The same assessment was undertaken for NH93 in 2015 and despite the lower annual mean average the air quality objective was still calculated to have been exceeded.

The mean annual average of 45.5µg/m³ measured at NH93 in 2015 represents 41.6µg/m³ at the point of public exposure at 41 Upper Tilehouse Street. The decision to declare an AQMA in this area during 2016 remains valid based on the last five years of data being indicative of public exposure to elevated concentrations of NO₂ at 41 Upper Tilehouse Street.

The only readily available measure of changes to the local sources of NO₂ is traffic counts. As such the road traffic data covering the 2005 to 2015 period are illustrated in Figure 3.3.

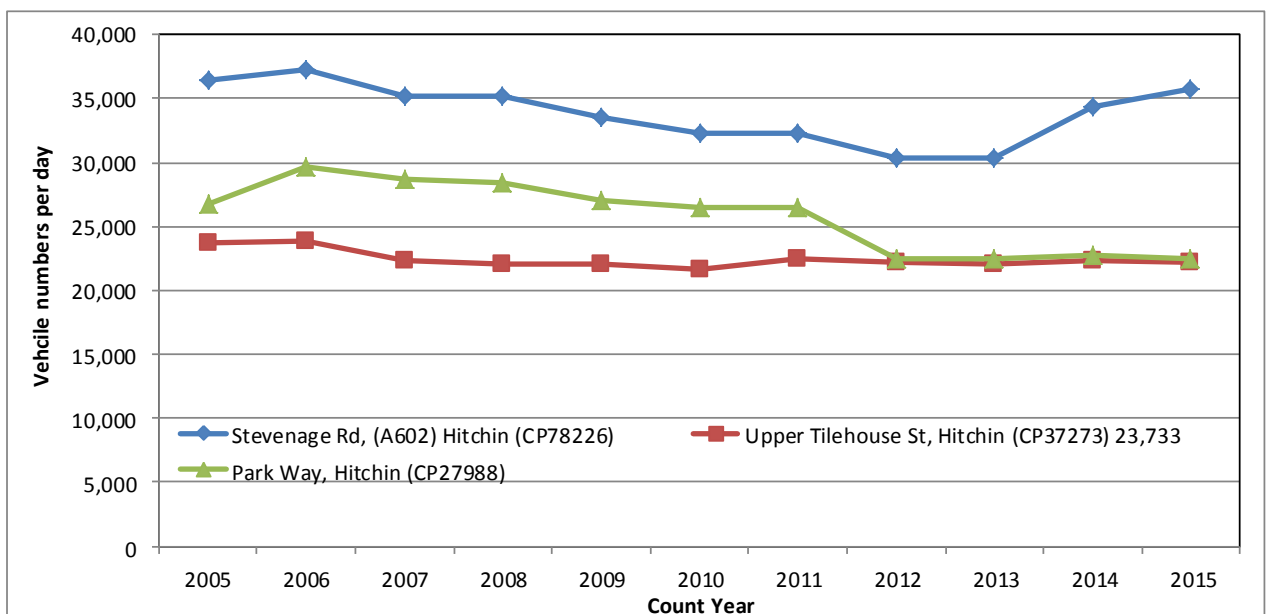


Figure 3.3: Trends in road traffic counts at the three DfT count points closest to the Stevenage Road AQMA and Payne’s Park area of Hitchin

After reducing volumes of traffic at Stevenage Road since 2005, 2014 and 2015 saw an increase in the volume of road traffic passing through the AQMA. This increase coincided with an increase in NO₂ recorded in the AQMA in 2014, but does not correlate to the reduction in NO₂ recorded in 2015. At the Payne’s Park and Upper Tilehouse Street count locations volumes of traffic have remained stable since 2012 and so the significant reduction in NO₂ measured by diffusion tube NH93 at Park Way during 2015 does not correlate to a decline in traffic.

The split of vehicles comprising the traffic counted at the three sites since 2010 are illustrated by Figures 3.4, 3.5 and 3.6. This is of interest because heavy goods vehicles (HGV) and light goods vehicles (LGV) contribute more emissions of NO₂ per vehicle compared to cars and motor-cycles. They are also far more prevalent than buses in those areas of Hitchin.

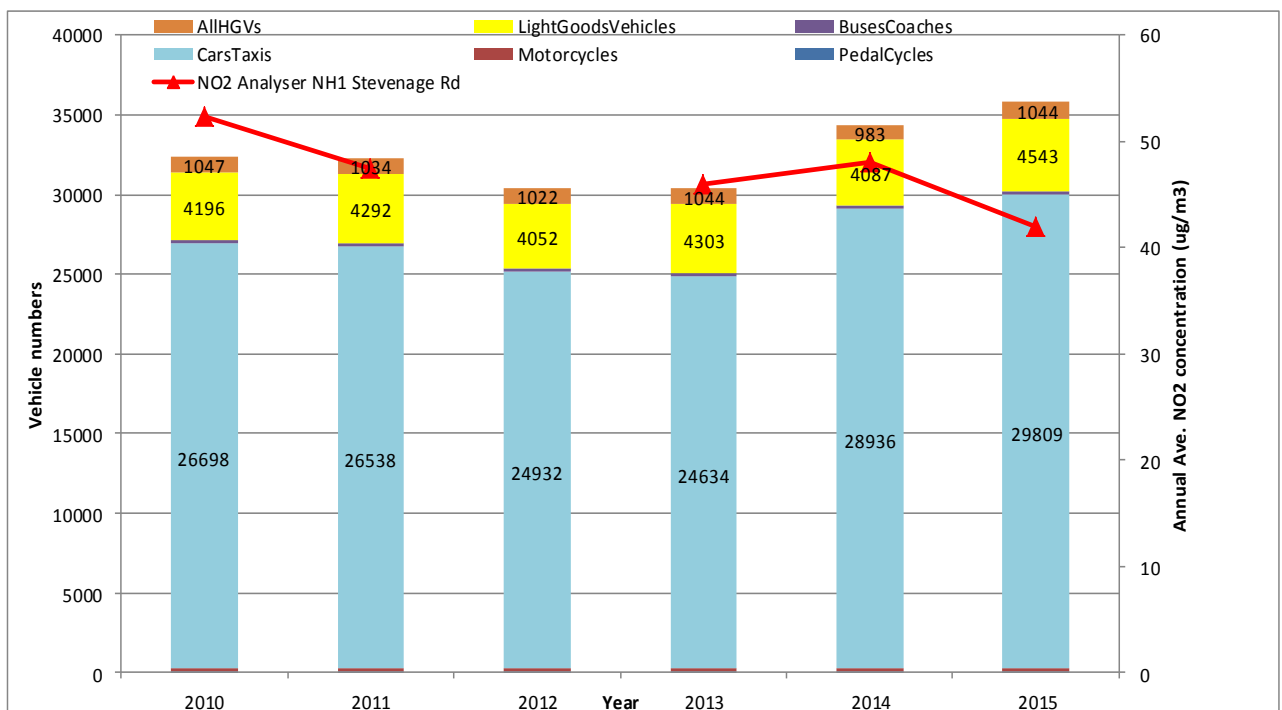


Figure 3.4: Road traffic counts at DfT count point 78226 within the Stevenage Road AQMA Hitchin compared to mean annual average NO₂ measured by the automatic analyser

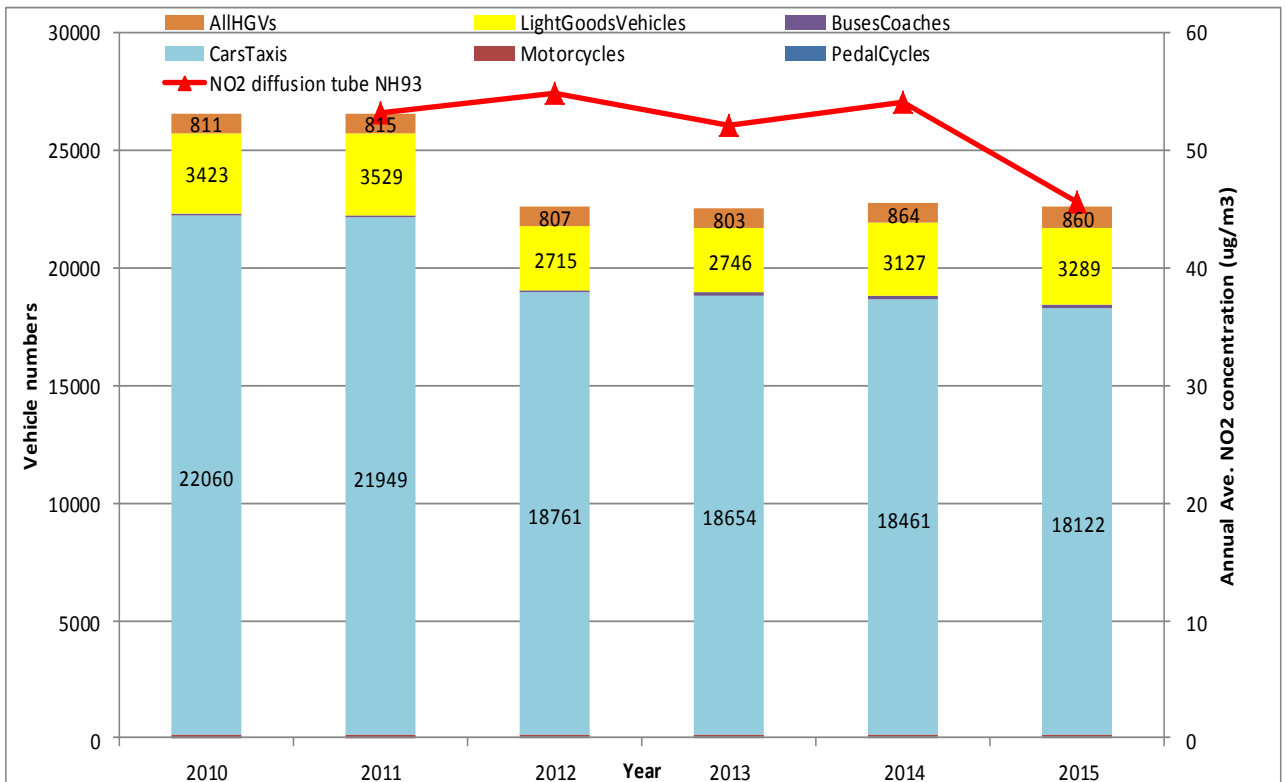


Figure 3.5: Road traffic counts at DfT count point 27988 at Park Way, Hitchin compared to the mean annual average NO₂ measured by diffusion tube NH93

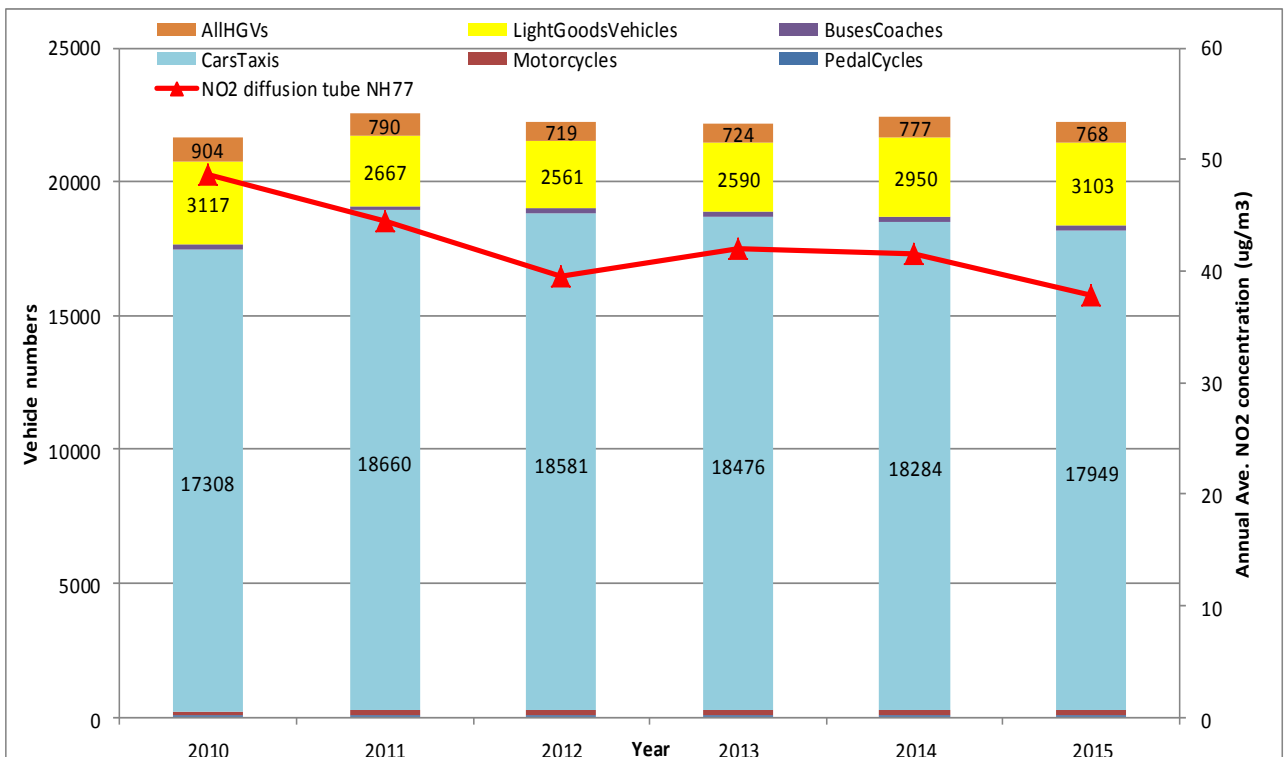


Figure 3.6: Road traffic counts at DfT count point 37273 at Upper Tilehouse Street, Hitchin compared to the mean annual average NO₂ measured by diffusion tube NH77

There is no obvious relationship between the measured NO₂ concentrations and total vehicle numbers, or the numbers of particular groups of vehicle for any of the locations considered.

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Appendix B. It should be noted that the company engaged to supply and analyse the diffusion tubes changed at the start of 2015.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year. There were no such exceedences recorded in 2015.

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations with the air quality objective of 40µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

The data capture for 2015 was only 39.7% because the monitoring site was being established during 2015. The mean average concentration recorded was 20µg/m³ and there was one exceedence of the 24hr mean concentration of 50 µg/m³.

However, because of the low data capture no meaningful comparison can be made with the air quality objectives.

2015 represented the first year of particulate matter monitoring within the AQMA at Stevenage Road, Hitchin so there has been no opportunity for analysing trends.

3.2.3 Particulate Matter (PM_{2.5})

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

The data capture for 2015 was only 39.7% because the monitoring site was being established during 2015. The mean average concentration recorded was 11µg/m³.

However, because of the low data capture no meaningful comparison can be made with the air quality objectives.

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2015 represented the first year of particulate matter monitoring within the AQMA at Stevenage Road, Hitchin so there has been no opportunity for analysing trends.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? | Monitoring Technique | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Inlet Height (m) |
|---------|--------------------|-----------|---------------|---------------|---|----------|----------------------|--|---|------------------|
| NH1 | Stevenage Road NOx | Roadside | 518740 | 228348 | NO ₂ | Y | Chemiluminescent | 11 | 2 | 1.5 |
| NH2 | Stevenage Road PM | Roadside | 518713 | 228349 | PM ₁₀ ; PM _{2.5} | Y | TEOM; BAM | 19 | 2 | 1.5 |

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

(2) N/A if not applicable.

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

| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA ? | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Tube collocated with a Continuous Analyser? | Height (m) |
|---------|------------------------------------|-----------|---------------|---------------|----------------------|-----------|--|---|---|------------|
| NH06 | Melbourn Rd, Royston | Roadside | 535906 | 240794 | NO ₂ | N | 7 | 1.1 | N | 2.10 |
| NH45 | Stevenage Rd (A) | Roadside | 518708 | 228347 | NO ₂ | Y | 19 | 2 | N | 2.00 |
| NH59 | Clothall Rd, Baldock | Roadside | 524649 | 234061 | NO ₂ | N | 11 | 3 | N | 2.00 |
| NH60 | Willian Rd, Hitchin | Roadside | 519916 | 230099 | NO ₂ | N | 29 | 1.1 | N | 2.00 |
| NH61 | Hitchin St, Baldock (nr town hall) | Roadside | 524428 | 233882 | NO ₂ | N | 35 | 2 | Y | 2.10 |
| NH63 | Hitchin Library, Hitchin | Roadside | 518160 | 229092 | NO ₂ | N | 30 | 3.5 | N | 2.00 |
| NH67 | Cadwell Court, Hitchin | Roadside | 519225 | 230553 | NO ₂ | N | 12 | 2 | N | 2.10 |
| NH69 | Grove Rd, Hitchin | Roadside | 518821 | 229993 | NO ₂ | N | 5 | 2 | N | 2.00 |

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| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA ? | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Tube collocated with a Continuous Analyser? | Height (m) |
|---------|--|-----------|---------------|---------------|----------------------|-----------|--|---|---|------------|
| NH70 | Hitchin St, Baldock (nr bus stop) | Roadside | 524298 | 233784 | NO ₂ | N | 1 | 3.5 | N | 2.10 |
| NH72 | Whitehorse St, Baldock (nr Rose & Crown) | Roadside | 524502 | 233948 | NO ₂ | N | 27 | 2 | N | 2.00 |
| NH103 | Westbrook Court, Hitchin | Roadside | 518773 | 228342 | NO ₂ | Y | 10 | 2.4 | N | 2.00 |
| NH77 | Upper Tilehouse St, Hitchin (crossing) | Roadside | 518006 | 229032 | NO ₂ | N | 5 | 1.5 | N | 2.00 |
| NH78 | West Hill, Hitchin | Roadside | 518099 | 229229 | NO ₂ | N | 4 | 2 | N | 2.00 |
| NH82 | Upper Tilehouse St, Royston roundabout | Roadside | 518129 | 229065 | NO ₂ | N | 7 | 1.5 | N | 2.00 |

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| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA ? | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Tube collocated with a Continuous Analyser? | Height (m) |
|---------|-------------------------------------|-----------|---------------|---------------|----------------------|-----------|--|---|---|------------|
| NH83 | Cambridge Rd, Hitchin (Station A) | Roadside | 519366 | 229806 | NO ₂ | N | 20 | 1 | N | 2.00 |
| NH84 | Cambridge Rd, Hitchin (Station B) | Roadside | 519328 | 229752 | NO ₂ | N | 12 | 1.3 | N | 2.00 |
| NH87 | 11 Stevenage Rd, Hitchin | Roadside | 518731 | 228362 | NO ₂ | N | 0 | 15 | N | 1.90 |
| NH88 | Church St, Baldock | Roadside | 524448 | 233898 | NO ₂ | N | 45 | 0.5 | N | 2.00 |
| NH89 | London Rd, Hitchin | Roadside | 518706 | 228293 | NO ₂ | N | 20 | 1.9 | N | 2.00 |
| NH90 | Gosmore Rd, Hitchin | Roadside | 518593 | 228304 | NO ₂ | N | 20 | 2.2 | N | 2.00 |
| NH91 | St John's Rd, Hitchin | Roadside | 518656 | 228406 | NO ₂ | N | 5 | 7.9 | N | 2.10 |
| NH92 | Stevenage Rd, Hitchin (Griffin Crt) | Roadside | 518872 | 228305 | NO ₂ | Y | 5 | 2 | N | 2.00 |

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| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA ? | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Tube collocated with a Continuous Analyser? | Height (m) |
|---------|--|-----------|---------------|---------------|----------------------|-----------|--|---|---|------------|
| NH93 | Park Way, Hitchin | Roadside | 518130 | 229036 | NO ₂ | N | 3 | 1.6 | N | 1.80 |
| NH94 | Offley Rd, Hitchin | Roadside | 517915 | 228967 | NO ₂ | N | 7 | 2.3 | N | 2.00 |
| NH95 | Pirton Rd, Hitchin | Roadside | 517886 | 228975 | NO ₂ | N | 22 | 1.3 | N | 2.00 |
| NH96 | Park St, Hitchin | Roadside | 518417 | 228624 | NO ₂ | N | 1 | 1.8 | N | 1.80 |
| NH97 | Queen St, Hitchin | Roadside | 518666 | 229149 | NO ₂ | N | 4 | 1.7 | N | 2.00 |
| NH98 | Walsworth Rd/Radcliffe Rd, Hitchin | Roadside | 519080 | 229510 | NO ₂ | N | 4 | 1.5 | N | 2.00 |
| NH99 | Nightingale Rd, Hitchin | Roadside | 518953 | 229786 | NO ₂ | N | 5 | 1.7 | N | 2.00 |
| NH100 | The Brambles/ Foxglove Way, Welwyn | Roadside | 524033 | 217620 | NO ₂ | N | 8 | 20 | N | 2.00 |

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| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA ? | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Tube collocated with a Continuous Analyser? | Height (m) |
|---------|--|-----------|---------------|---------------|----------------------|-----------|--|---|---|------------|
| NH108 | 97 Hermitage Rd, Hitchin | Roadside | 518534 | 229302 | NO ₂ | N | 3 | 0.8 | N | 2.00 |
| NH109 | 26 Hermitage Rd, Hitchin | Roadside | 518631 | 223279 | NO ₂ | N | 0 | 3 | N | 2.00 |
| NH104 | Dower Court (A), Stevenage Rd, Hitchin | Roadside | 518757 | 228334 | NO ₂ | Y | 0 | 3.3 | N | 1.80 |
| NH105 | 94-98 Stevenage Rd, Hitchin | Roadside | 519067 | 228255 | NO ₂ | Y | 7 | 3.5 | N | 2.10 |
| NH106 | Morello Gardens, Stevenage Rd, Hitchin | Roadside | 519250 | 228218 | NO ₂ | N | 5 | 1.4 | N | 2.00 |
| NH107 | Whitehill Road, Hitchin | Roadside | 518720 | 228335 | NO ₂ | N | 26 | 2.3 | N | 2.00 |

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| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA ? | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Tube collocated with a Continuous Analyser? | Height (m) |
|---------|--------------------------------------|-----------|---------------|---------------|----------------------|-----------|--|---|---|------------|
| NH110 | Stevenage Rd, AQ Analyser 1, Hitchin | Roadside | 518740 | 228348 | NO ₂ | Y | 11 | 2 | Y | 1.2 |
| NH111 | Stevenage Rd, AQ Analyser 2, Hitchin | Roadside | 518740 | 228348 | NO ₂ | Y | 11 | 2 | Y | 1.2 |
| NH112 | Stevenage Rd, AQ Analyser 3, Hitchin | Roadside | 518740 | 228348 | NO ₂ | Y | 11 | 2 | Y | 1.2 |
| NH113 | Browning Close, Royston | Roadside | 536211 | 242205 | NO ₂ | N | 0 | 22 | N | 1.80 |

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture for 2015 Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2015 (%) ⁽²⁾ | NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾ | | | | | |
|---------|-----------|-----------------|--|--|---|-------------|-------------|-------------|-------------|-------------|
| | | | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| NH1 | Roadside | Automatic | 100 | 71.2 | 52.4 | 47.5 | No data | 46 | 48 | 42 |
| NH06 | Roadside | Diffusion Tube | 100 | 92 | No data | 33.8 | 27.9 | 29.7 | 29.3 | 26.8 |
| NH45 | Roadside | Diffusion Tube | 100 | 100 | 49.1 | 48.9 | 46.3 | 42.0 | 46.6 | 42.3 |
| NH59 | Roadside | Diffusion Tube | 100 | 100 | 32.2 | 31.7 | 31.1 | 30.6 | 29.1 | 26.4 |
| NH60 | Roadside | Diffusion Tube | 100 | 100 | 37.9 | 30.7 | 30.0 | 31.5 | 29.0 | 29.5 |
| NH61 | Roadside | Diffusion Tube | 100 | 100 | 43.6 | 36.1 | 36.3 | 35.1 | 33.5 | 29.2 |
| NH63 | Roadside | Diffusion Tube | 100 | 100 | 44.0 | 43.9 | 39.4 | 36.6 | 40.8 | 35.5 |
| NH67 | Roadside | Diffusion Tube | 100 | 100 | 33.4 | 33.5 | 29.8 | 28.9 | 26.6 | 25.3 |
| NH69 | Roadside | Diffusion Tube | 100 | 83 | 38.3 | 37.7 | 31.9 | 32.2 | 28.8 | 26.9 |
| NH70 | Roadside | Diffusion Tube | 100 | 100 | 30.9 | 30.0 | 28.2 | 27.4 | 28.2 | 25.3 |
| NH72 | Roadside | Diffusion Tube | 100 | 92 | 42.1 | 38.2 | 36.9 | 31.8 | 32.7 | 30.4 |
| NH103 | Roadside | Diffusion Tube | 100 | 100 | No data | No data | 43.6 | 41.7 | 40.8 | 39.1 |
| NH77 | Roadside | Diffusion Tube | 100 | 100 | 48.7 | 44.4 | 39.5 | 42.0 | 41.6 | 37.8 |
| NH78 | Roadside | Diffusion Tube | 100 | 92 | 34.8 | 33.7 | 28.6 | 29.0 | 29.3 | 25.9 |
| NH82 | Roadside | Diffusion Tube | 100 | 92 | 44.4 | 42.8 | 40.4 | 40.3 | 40.3 | 34.5 |
| NH83 | Roadside | Diffusion Tube | 100 | 100 | No data | 35.5 | 32.7 | 32.9 | 34.1 | 30.4 |
| NH84 | Roadside | Diffusion Tube | 100 | 92 | 39.9 | 36.8 | 35.2 | 37.3 | 36.1 | 32.9 |
| NH87 | Roadside | Diffusion Tube | 100 | 100 | No data | 30.8 | 29.2 | 27.9 | 27.4 | 26.3 |
| NH88 | Roadside | Diffusion Tube | 100 | 92 | No data | 47.7 | 44.4 | 38.4 | 42.4 | 39.0 |
| NH89 | Roadside | Diffusion Tube | 100 | 100 | No data | 28.2 | 29.5 | 28.4 | 28.7 | 26.3 |
| NH90 | Roadside | Diffusion Tube | 100 | 100 | No data | 25.9 | 27.6 | 27.7 | 25.8 | 24.2 |
| NH91 | Roadside | Diffusion Tube | 100 | 83 | No data | 34.9 | 34.6 | 32.0 | 29.9 | 31.2 |
| NH92 | Roadside | Diffusion Tube | 100 | 100 | No data | 53.5 | 51.1 | 47.6 | 48.1 | 45.8 |
| NH93 | Roadside | Diffusion Tube | 100 | 100 | No data | 53.1 | 54.8 | 52.1 | 54.1 | 45.5 |
| NH94 | Roadside | Diffusion Tube | 100 | 100 | No data | 35.6 | 36.5 | 36.0 | 36.3 | 33.8 |

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| Site ID | Site Type | Monitoring Type | Valid Data Capture for 2015 Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2015 (%) ⁽²⁾ | NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾ | | | | | |
|---------|-----------|-----------------|--|--|---|---------|-------------|-------------|-------------|-------------|
| | | | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| NH95 | Roadside | Diffusion Tube | 100 | 100 | No data | 33.6 | 32.2 | 33.2 | 34.7 | 31.7 |
| NH96 | Roadside | Diffusion Tube | 100 | 100 | No data | 31.7 | 32.1 | 34.5 | 32.6 | 29.2 |
| NH97 | Roadside | Diffusion Tube | 100 | 58 | No data | 30.0 | 32.0 | 30.8 | 32.4 | 29.7 |
| NH98 | Roadside | Diffusion Tube | 100 | 100 | No data | 30.1 | 33.6 | 32.7 | 31.9 | 30.3 |
| NH99 | Roadside | Diffusion Tube | 100 | 100 | No data | 31.9 | 33.4 | 32.2 | 29.1 | 28.2 |
| NH100 | Roadside | Diffusion Tube | 100 | 92 | No data | 29.6 | 32.7 | 28.0 | 27.5 | 28.1 |
| NH108 | Roadside | Diffusion Tube | 100 | 58 | No data | No data | No data | 36.5 | 40.2 | 36.1 |
| NH109 | Roadside | Diffusion Tube | 100 | 75 | No data | No data | No data | 28.0 | 27.9 | 28.4 |
| NH104 | Roadside | Diffusion Tube | 100 | 100 | No data | No data | 33.9 | 31.5 | 30.4 | 27.9 |
| NH105 | Roadside | Diffusion Tube | 100 | 100 | No data | No data | 45.8 | 47.0 | 51.4 | 46.2 |
| NH106 | Roadside | Diffusion Tube | 100 | 100 | No data | No data | 43.5 | 44.6 | 42.7 | 36.1 |
| NH107 | Roadside | Diffusion Tube | 100 | 100 | No data | No data | 30.8 | 29.4 | 29.6 | 28.4 |
| NH110 | Roadside | Diffusion Tube | 100 | 75 | No data | No data | No data | No data | No data | 49.6 |
| NH111 | Roadside | Diffusion Tube | 100 | 83 | No data | No data | No data | No data | No data | 58.6 |
| NH112 | Roadside | Diffusion Tube | 100 | 75 | No data | No data | No data | No data | No data | 48.7 |
| NH113 | Roadside | Diffusion Tube | 100 | 83 | No data | No data | No data | No data | No data | 18.6 |

Notes: Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2015 (%) ⁽²⁾ | NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾ | | | | | |
|---------|-----------|-----------------|---|--|--|-------------------|---------|------|------|------|
| | | | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| NH1 | Roadside | Automatic | 100 | 71.2 | 7 (168.3) | 3 (85.9) | No data | 1 | 1 | 0 |

Notes: Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

(3) If the period of valid data is less than 90%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2015 (%) ⁽²⁾ | PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾ | | | | |
|---------|-----------|---|--|--|---------|---------|---------|------|
| | | | | 2011 | 2012 | 2013 | 2014 | 2015 |
| NH2 | Roadside | 100 | 39.7 | No data | No data | No data | No data | 20 |

Notes: Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

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

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

(3) All means have been “annualised” as per Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2015 (%) ⁽²⁾ | PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾ | | | | |
|---------|-----------|---|--|---|---------|---------|---------|------|
| | | | | 2011 | 2012 | 2013 | 2014 | 2015 |
| NH2 | Roadside | 100 | 39.7 | No data | No data | No data | No data | 1 |

Notes: Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

(3) If the period of valid data is less than 90%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – PM_{2.5} Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2015 (%) ⁽²⁾ | PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾ | | | | |
|---------|-----------|---|--|---|---------|---------|---------|------|
| | | | | 2011 | 2012 | 2013 | 2014 | 2015 |
| NH2 | Roadside | 100 | 37.2 | No data | No data | No data | No data | 11 |

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

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

(3) All means have been “annualised” as per Technical Guidance LAQM.TG16, valid data capture for the full calendar year is less than 75%, but greater than 50%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2015

| Site ID | NO ₂ Mean Concentrations (µg/m ³) | | | | | | | | | | | | | Annual Mean | |
|---------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------------------------------|------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Raw Data | Bias Adjusted ⁽¹⁾ | |
| | NH06 | 36.61 | 32.82 | 29.56 | 27.67 | | 23.32 | 24.8 | 27.5 | 37.34 | 29.99 | 27.68 | | | 23.2 |
| NH45 | 46.85 | 43.7 | 39.68 | 48.45 | 23.72 | 38.81 | 48.83 | 47.23 | 45.71 | 54.04 | 50.99 | 45.7 | 44.5 | 42.3 | |
| NH59 | 20.83 | 32.93 | 33.07 | 28.84 | 24.22 | 24.42 | 25.71 | 27.42 | 28.42 | 33.55 | 28.48 | 25.6 | 27.8 | 26.4 | |
| NH60 | 36.11 | 34.99 | 36.5 | 34.17 | 25.67 | 28.05 | 28.14 | 26.85 | 30.07 | 27.92 | 28.4 | 25.4 | 31.0 | 29.5 | |
| NH61 | 30.83 | 33.39 | 27.83 | 34.21 | 20.13 | 27.17 | 29.99 | 32.1 | 32.91 | 38.54 | 29.79 | 32.4 | 30.8 | 29.2 | |
| NH63 | 44.09 | 36.37 | 36.38 | 32.41 | 34.21 | 33.61 | 40.69 | 34.39 | 39.13 | 37.76 | 43.76 | 35.6 | 37.4 | 35.5 | |
| NH67 | 28.36 | 31.17 | 30.14 | 28.37 | 21.45 | 19.99 | 21.35 | 25.36 | 26.07 | 30.84 | 31.14 | 25.4 | 26.6 | 25.3 | |
| NH69 | 29.8 | 30.83 | 25.89 | 32.96 | 20.53 | | 26.11 | 25.86 | 27.27 | | 30.66 | 33.4 | 28.3 | 26.9 | |
| NH70 | 29.88 | 31.78 | 23.43 | 25.10 | 22.34 | 20.39 | 23.7 | 25.24 | 27.72 | 30.58 | 29.56 | 29.3 | 26.6 | 25.3 | |
| NH72 | 38.38 | 37.87 | 29.08 | 32.01 | 25.31 | 25.62 | 33.69 | 30.84 | 31.31 | 34.44 | | 33.4 | 32.0 | 30.4 | |
| NH103 | 50.89 | 47.73 | 40.16 | 49.64 | 31.95 | 36.21 | 34.75 | 37.11 | 42.65 | 48.45 | 39.1 | 34.6 | 41.1 | 39.1 | |
| NH77 | 39.86 | 40.03 | 37.08 | 46.53 | 31.25 | 35.31 | 42.87 | 40.6 | 40.38 | 47.62 | 39.33 | 37 | 39.8 | 37.8 | |
| NH78 | 27.13 | 32.89 | 29.88 | 31.99 | | 21.05 | 19.54 | 23.97 | 25.65 | 34.61 | 27.31 | 25.6 | 27.2 | 25.9 | |
| NH82 | 39.08 | 37.75 | 35.93 | 39.98 | 32.47 | 31.93 | 36.75 | | 37.37 | 41.66 | 34.95 | 31.5 | 36.3 | 34.5 | |
| NH83 | 36.86 | 37.31 | 30.85 | 32.94 | 26.42 | 27.32 | 26 | 28.51 | 32.25 | 39.3 | 34.04 | 32.6 | 32.0 | 30.4 | |

North Hertfordshire District Council

| Site ID | NO ₂ Mean Concentrations (µg/m ³) | | | | | | | | | | | | | |
|---------|--|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------------|------------------------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean | |
| | | | | | | | | | | | | | Raw Data | Bias Adjusted ⁽¹⁾ |
| NH84 | 38.51 | 37.3 | 29.97 | 34.77 | 30.5 | 29.53 | 33.05 | 33.55 | | 42.1 | 35.35 | 36 | 34.6 | 32.9 |
| NH87 | 32.45 | 30.85 | 29.79 | 30.46 | 22.01 | 23.05 | 23.54 | 24.12 | 28.09 | 29.86 | 29.72 | 28.5 | 27.7 | 26.3 |
| NH88 | 50.34 | 44.63 | 39.03 | 35.86 | 33.12 | 39.15 | 43.59 | 38.17 | | 38.57 | 48.52 | 41 | 41.4 | 39.0 |
| NH89 | 33.56 | 34.91 | 28.32 | 24.31 | 22.17 | 21.94 | 22.71 | 27.22 | 28 | 30.6 | 30.08 | 27.9 | 27.6 | 26.3 |
| NH90 | 24.54 | 26.89 | 23.85 | 32.50 | 22.54 | 23.14 | 23.71 | 24.05 | 29.92 | 35.1 | 12.56 | 18.1 | 25.5 | 24.2 |
| NH91 | 37.38 | 34.55 | 36.39 | 26.94 | 27.6 | 28.55 | | 31.36 | 35.68 | 33.4 | | 36.4 | 32.8 | 31.2 |
| NH92 | 56.8 | 56.27 | 46.21 | 52.58 | 41.79 | 39.85 | 43.53 | 42.49 | 55.68 | 50.59 | 50.52 | 42.4 | 48.2 | 45.8 |
| NH93 | 52.38 | 47.51 | 45.02 | 47.46 | 42.53 | 45.14 | 51.16 | 52.25 | 54.43 | 53.55 | 44.4 | 39.5 | 47.9 | 45.5 |
| NH94 | 43.59 | 38.32 | 38.9 | 34.62 | 26.11 | 33.78 | 32.84 | 33.78 | 37.31 | 38.99 | 37.95 | 31 | 35.6 | 33.8 |
| NH95 | 37.2 | 343.56 | 34.41 | 35.69 | 32.03 | 27.39 | 34.56 | 31.72 | 33.59 | 35.95 | 33.98 | 29.8 | 33.4 | 31.7 |
| NH96 | 28.35 | 34.47 | 33.35 | 34.58 | 26.68 | 30.49 | 28.3 | 29.87 | 34.75 | 38.37 | 26.56 | 22.7 | 30.7 | 29.2 |
| NH97 | 26.56 | 32.4 | | | | 28.15 | | 30.55 | | 36.58 | 29.74 | 30 | 30.6 | 29.0 (29.7 ⁽²⁾) |
| NH98 | 36.52 | 37.65 | 30.75 | 33.44 | 23.6 | 26.31 | 27.76 | 30.31 | 28.55 | 41.11 | 32.44 | 34.5 | 31.9 | 30.3 |
| NH99 | 36.26 | 35.28 | 28.92 | 29.53 | 26.75 | 26.74 | 26.18 | 21.7 | 32 | 36.19 | 28.33 | 28.9 | 29.7 | 28.2 |
| NH100 | 41.75 | 35.1.1 | 33.85 | 24.53 | 27.67 | 24.86 | 35.37 | 26.85 | 27.68 | 27.41 | | 20.6 | 29.6 | 28.1 |
| NH108 | 41.21 | 41.39 | | | | 30.21 | 35.85 | 37.71 | 36.79 | 38.16 | 41.59 | 38.7 | 38.0 | 36.1 |
| NH109 | | | | | | 28.68 | 23.55 | 23.3 | 31.16 | 35.75 | 26.57 | 25.1 | 27.7 | 26.3 (28.4 ⁽²⁾) |
| NH104 | 39.89 | 34.74 | 28.22 | 27.75 | 24.67 | 28.64 | 27.16 | 24.54 | 33.98 | 33.97 | 27.56 | 21.9 | 29.4 | 27.9 |

| Site ID | NO ₂ Mean Concentrations (µg/m ³) | | | | | | | | | | | | | |
|---------|--|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|------|-------------|------------------------------|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean | |
| | | | | | | | | | | | | | Raw Data | Bias Adjusted ⁽¹⁾ |
| NH105 | 52.45 | 50.24 | 50.94 | 50.36 | 45.51 | 41.1 | 50.63 | 44.77 | 49.03 | 51.85 | 51.72 | 45.5 | 48.7 | 46.2 |
| NH106 | 38.44 | 50.22 | 34.88 | 42.94 | 34.41 | 33.1 | 30.56 | 39.12 | 40.55 | 48.78 | 31.93 | 30.8 | 38.0 | 36.1 |
| NH107 | 40.56 | 35.29 | 29.86 | 26.76 | 24.45 | 26.06 | 26.9 | 27.55 | 30.49 | 34.03 | 31.85 | 25.1 | 9.9 | 28.4 |
| NH110 | 60.12 | 57.15 | 45.39 | 48.84 | | 41.51 | | | 47.52 | 52.18 | 73.9 | 43.3 | 52.2 | 49.6 |
| NH111 | 58.26 | 64.72 | 49.19 | 48.99 | | 44..36 | | 56.39 | 60.12 | 57.94 | 124 | 53.3 | 61.7 | 58.6 |
| NH112 | 46.02 | 51.16 | 44.32 | 46.81 | | 49.33 | | | 55.97 | 73.98 | 46.62 | 46.8 | 51.2 | 48.7 |
| NH113 | 20.55 | 24.43 | 19.31 | 21.03 | 14.48 | 15.06 | | 18.28 | 19.82 | 25.88 | | 16.9 | 19.6 | 18.6 |

(1) See Appendix C for details on bias adjustment

(2) See Appendix C for details on annualisation

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

Automatic Monitoring:

The R&P 1400a Tapered Element Oscillating Measurement (TEOM) monitor at Stevenage Road, Hitchin is subject to calibration visits and filter checks and changes on a monthly basis by NHDC staff. In addition, Enviro-Technology is 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 monitor. 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 TEOM monitor was relocated to Stevenage Road during the week starting the 3rd August 2015 and so the data collected and reported for 2015 are not suitable for comparison against any of the Air Quality Objectives.

The Met-One Smart Heated BAM 1020 PM_{2.5} monitor at Stevenage Road requires no periodic calibration checks, only a tape change approximately once every six weeks which is undertaken by NHDC staff. In addition Enviro-Technology is 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 outcome of the servicing and the associated performance of the monitor are reported to AQDM which is retained by NHDC to verify and ratify the data generated by the monitor.

The BAM 1020 monitor was installed at Stevenage Road during the week starting the 3rd August 2015 and so the data collected and reported for 2015 are not suitable for comparison against any of the Air Quality Objectives.

The Teledyne-API T200A chemiluminescence monitor at Stevenage Road is subject to calibration checks and filter checks and changes on a monthly basis by NHDC staff. In addition Enviro-Technology is 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 monitor.

The nitrogen dioxide data collected from the Stevenage Road site during 2015 only represented a valid data capture of 71.2% because of a change of service provider and associated downtime, largely during May and June 2015. As a result of a data capture below 75% the annual mean that has been reported has had to be annualised. The details of the annualisation process are included below:

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 2015.

The annualisation process is described in Box 7.9 of TG(16) and NHDC’s application of it for each of the relevant monitoring locations is summarised below.

Annualisation Factor Calculation for Stevenage Road, Hitchin Nitrogen Dioxide

Monitor (NH1). *(Monitoring Period – January–April and July–December 2015)*

| Site | Site Type | Annual Mean ($\mu\text{g}/\text{m}^3$) | Period Mean ($\mu\text{g}/\text{m}^3$) | Ratio |
|------------------------|------------|--|--|-------------|
| Sandy | Roadside | 31.5 | 32.4 | 0.972 |
| Hertsmere, Borehamwood | Background | 22.2 | 24.2 | 0.917 |
| | | | Average of ratios R(a) | 0.94 |

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

Therefore: NH1 annual mean (8.5 months) of $45\mu\text{g}/\text{m}^3$ multiplied by 0.94 produces an annualised mean of **$42.3\mu\text{g}/\text{m}^3$** .

Annualisation Factor Calculation for NH109 Diffusion Tube, Hermitage Road (26),

Hitchin. (Monitoring Period - June-December 2015)

| Site | Site Type | Annual Mean ($\mu\text{g}/\text{m}^3$) | Period Mean ($\mu\text{g}/\text{m}^3$) | Ratio |
|---------------------------|------------|--|--|-------------|
| Sandy | Roadside | 31.5 | 29.14 | 1.081 |
| Hertsmere, Borehamwood | Background | 22.2 | 20.58 | 1.079 |
| Average of ratios R(a) | | | | 1.08 |

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

Therefore: NH109 annual mean (7 months) of $26.3\mu\text{g}/\text{m}^3$ multiplied by 1.08 produces an annualised mean of **$28.4\mu\text{g}/\text{m}^3$** .

Annualisation Factor Calculation for NH97 Diffusion Tube, Queen Street, Hitchin.

(Monitoring Period – January-February, June, August and October - December 2015)

| Site | Site Type | Annual Mean ($\mu\text{g}/\text{m}^3$) | Period Mean ($\mu\text{g}/\text{m}^3$) | Ratio |
|---------------------------|------------|--|--|-------------|
| Sandy | Roadside | 31.5 | 30.66 | 1.027 |
| Hertsmere, Borehamwood | Background | 22.2 | 21.79 | 1.019 |
| Average of ratios R(a) | | | | 1.02 |

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

Therefore: NH97 annual mean (7 months) of $29.0\mu\text{g}/\text{m}^3$ multiplied by 1.02 produces an annualised mean of **$29.7\mu\text{g}/\text{m}^3$** .

Non-Automatic Monitoring:

The diffusion tubes are 50% triethanolamine (TEA) in acetone and are supplied and analysed by Gradko Limited. Gradko 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 2016 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>).

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According to the above database the bias adjustment factor for Gradko in 2015 was 0.95.

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 the methodology that is downloadable from <http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html> and which is referred to by TG(16). In all cases local background concentrations were derived from 2011 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 (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) | 15.99382 | µg/m ³ |
| Step 4 | What is your measured annual mean NO ₂ concentration (in µg/m ³)? (Note 2) | 45.8 | µg/m ³ |
| Result | The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor (Note 3) | 39.4 | 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) | 46.2 | µg/m ³ |
| Result | The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor (Note 3) | 40.6 | 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) | 45.5 | µg/m ³ |
| Result | The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor (Note 3) | 41.6 | µg/m ³ |

Note 1: In some cases "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further detail. Distances should be measured horizontally from the kerb & assume the monitor & receptor have similar elevations. Each distance should be > 0.1m & < 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement & the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in LAQM TG(16). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Supporting Evidence to Justify Declaration of an Air Quality Management Area (AQMA) at the Payne's Park Roundabout, Hitchin:

On the basis of the findings of the following reports a decision has been taken to move towards the declaration of an AQMA in the immediate vicinity of the Payne's Park Roundabout, Hitchin:

NHDC Air Quality Updated Screening and Assessment Report 2015

<http://www.north-herts.gov.uk/home/environmental-health/pollution/air-quality/air-quality-reports>

NHDC 2014 Progress Report May 2014 and

NHDC Final Version Detailed Assessment Report 2014

<http://www.hertsbedsair.net/frmFolderMappingDownload.aspx?prevDir=Local%20Authority%20Reports>

Letter from DEFRA dated 16th November 2015 and included below:

Area 2C

Nobel House
17 Smith Square
London SW1P 3JR

Email tutu.aluko@defra.gsi.gov.uk

David Carr
Environmental Protection Officer
North Hertfordshire District Council
Planning & Environment
Council Offices
Gernon Road
Letchworth
Herts SG6 3JF



16 November 2015

Dear Mr Carr

LOCAL AIR QUALITY MANAGEMENT: 2015 UPDATING AND SCREENING ASSESSMENT

Thank you for consulting the Department for Environment, Food and Rural Affairs on North Hertfordshire District Council's 2015 Updating and Screening Assessment (USA).

The Council should move to declare an AQMA at Payne's Park. We have previously responded to the situation at Payne's Park in our review of the Detailed Assessment report, as part of an additional response to the DA.

We look forward to receiving to the 2016 Air Quality Report by the end of April 2016 including a report on the progress of the Action Plan. Local authorities who have an Action Plan are required to submit an Action Plan Progress Report annually as part of the LAQM review process.

Yours sincerely

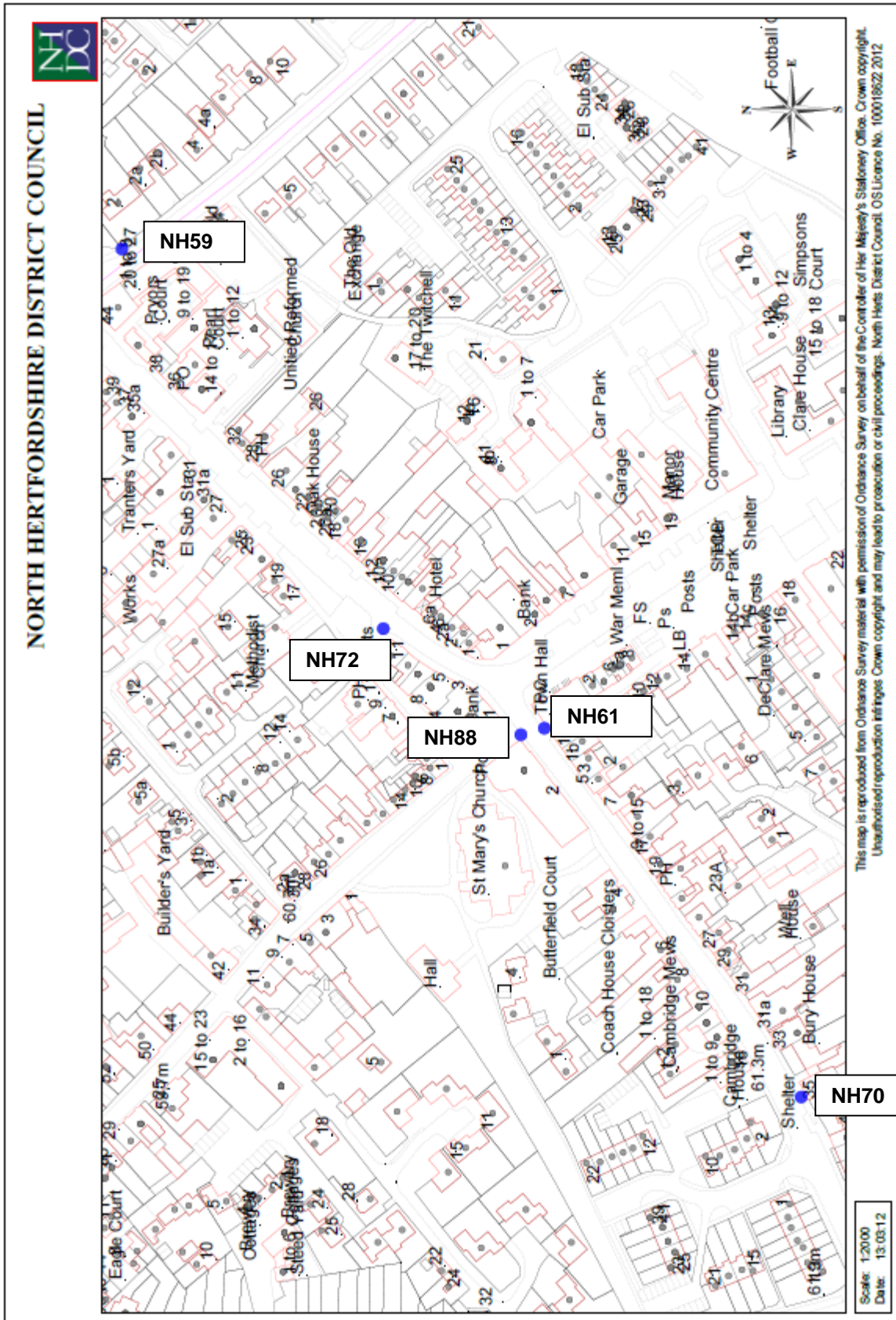
Tutu Aluko

ATMOSPHERE AND INDUSTRIAL EMISSIONS

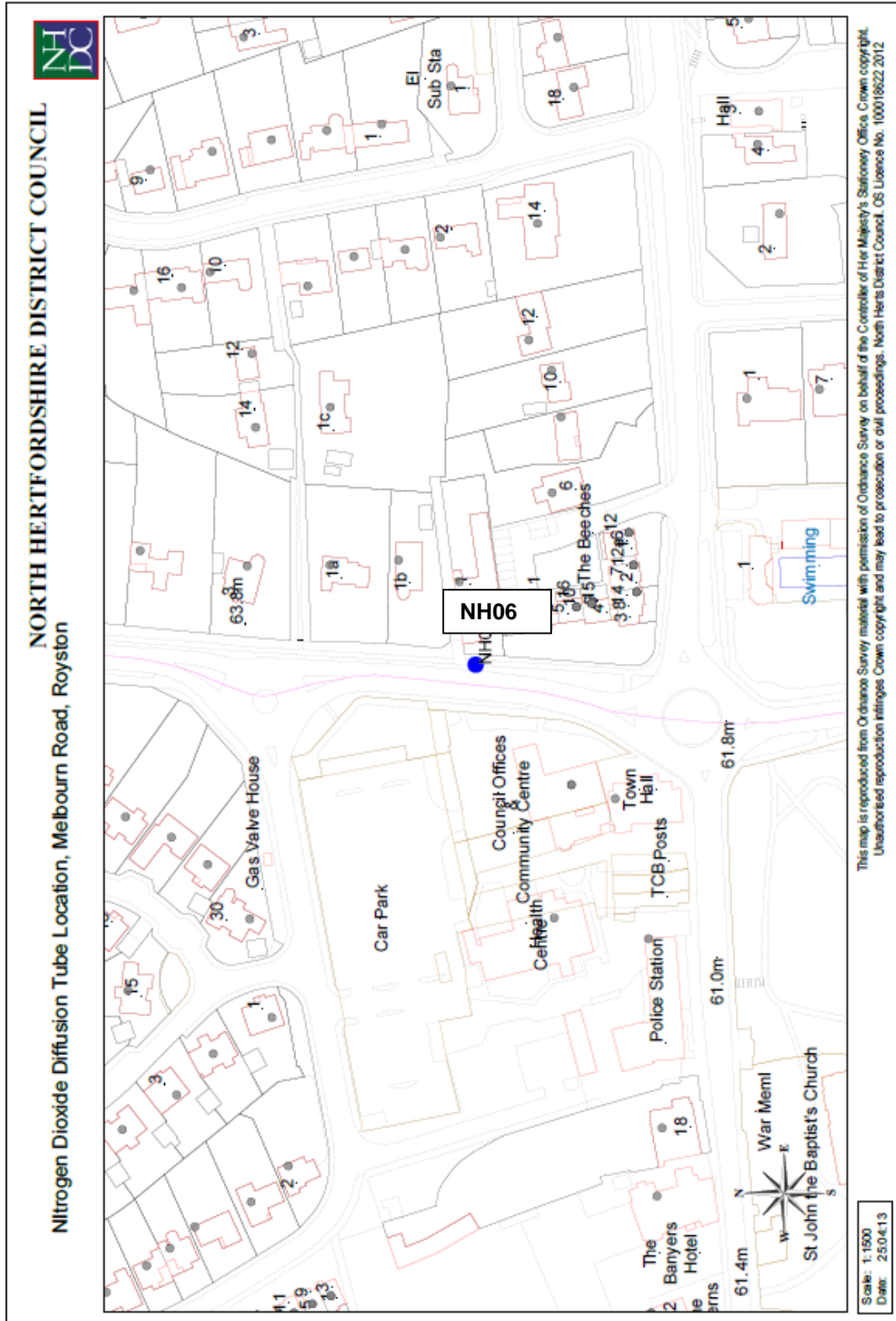
WEB: <http://uk-air.defra.gov.uk> | **TWITTER:** @defraukair

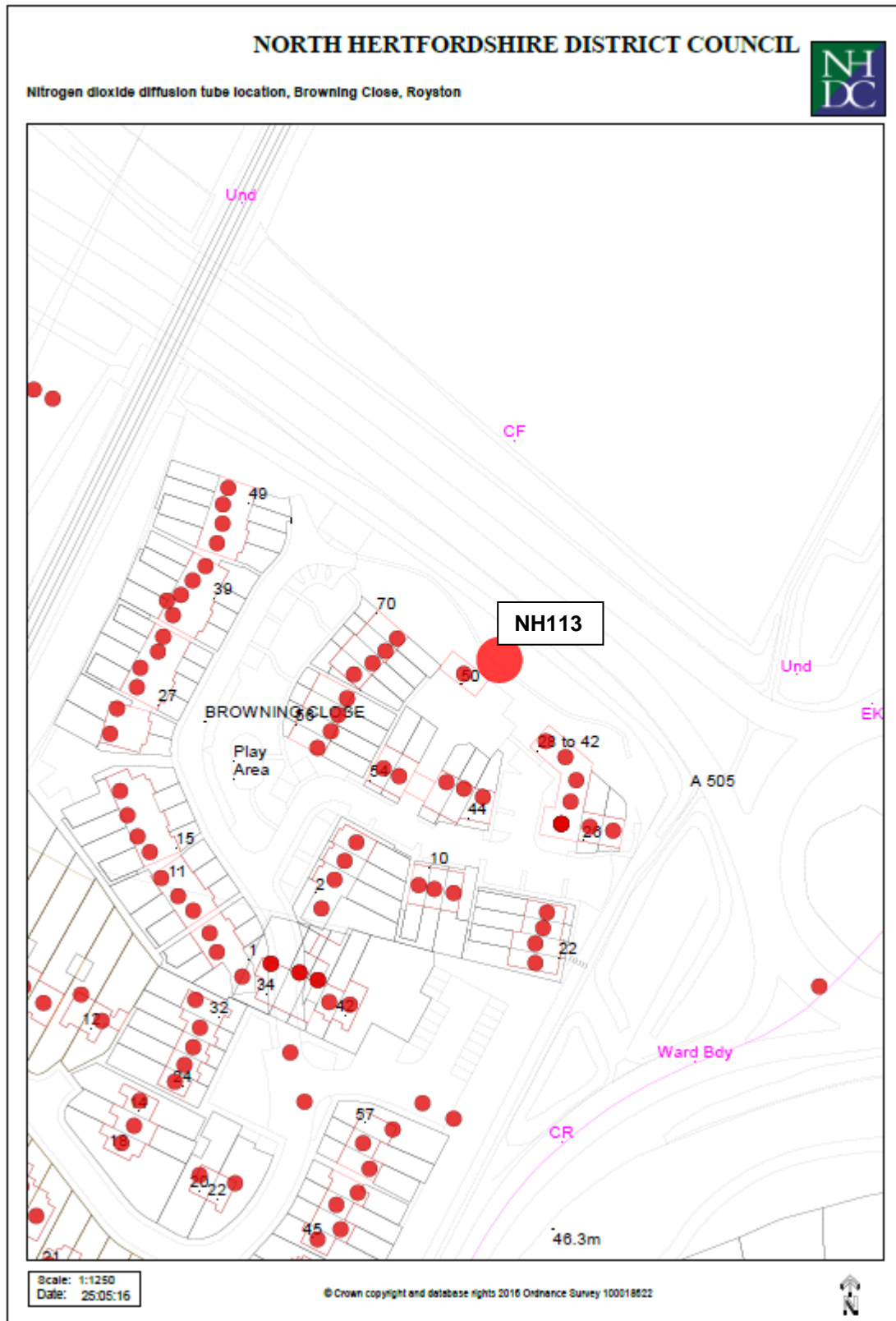
Appendix D: Map(s) of Monitoring Locations

Baldock Diffusion Tube Locations 2015:

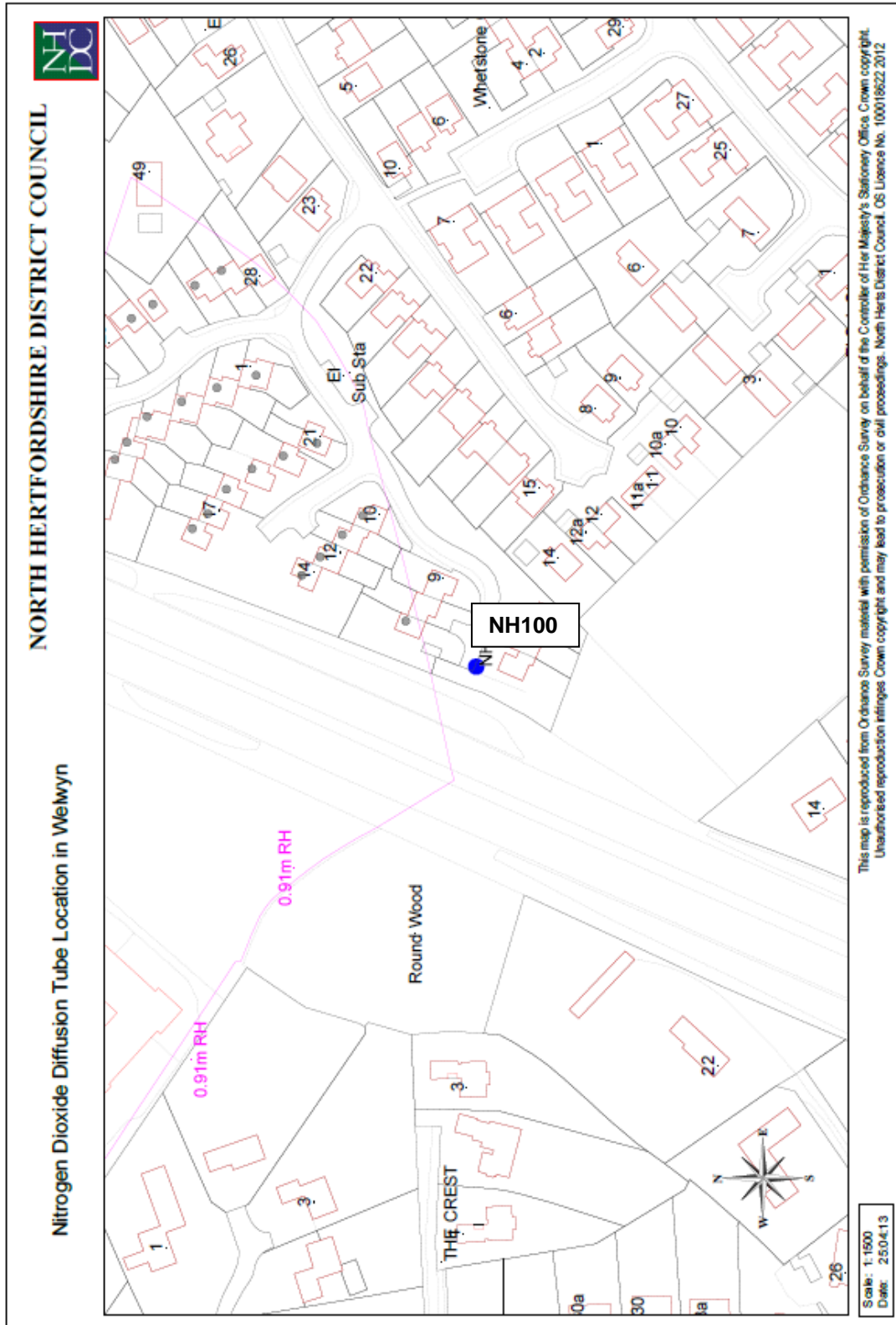


Royston Diffusion Tube Locations 2015:

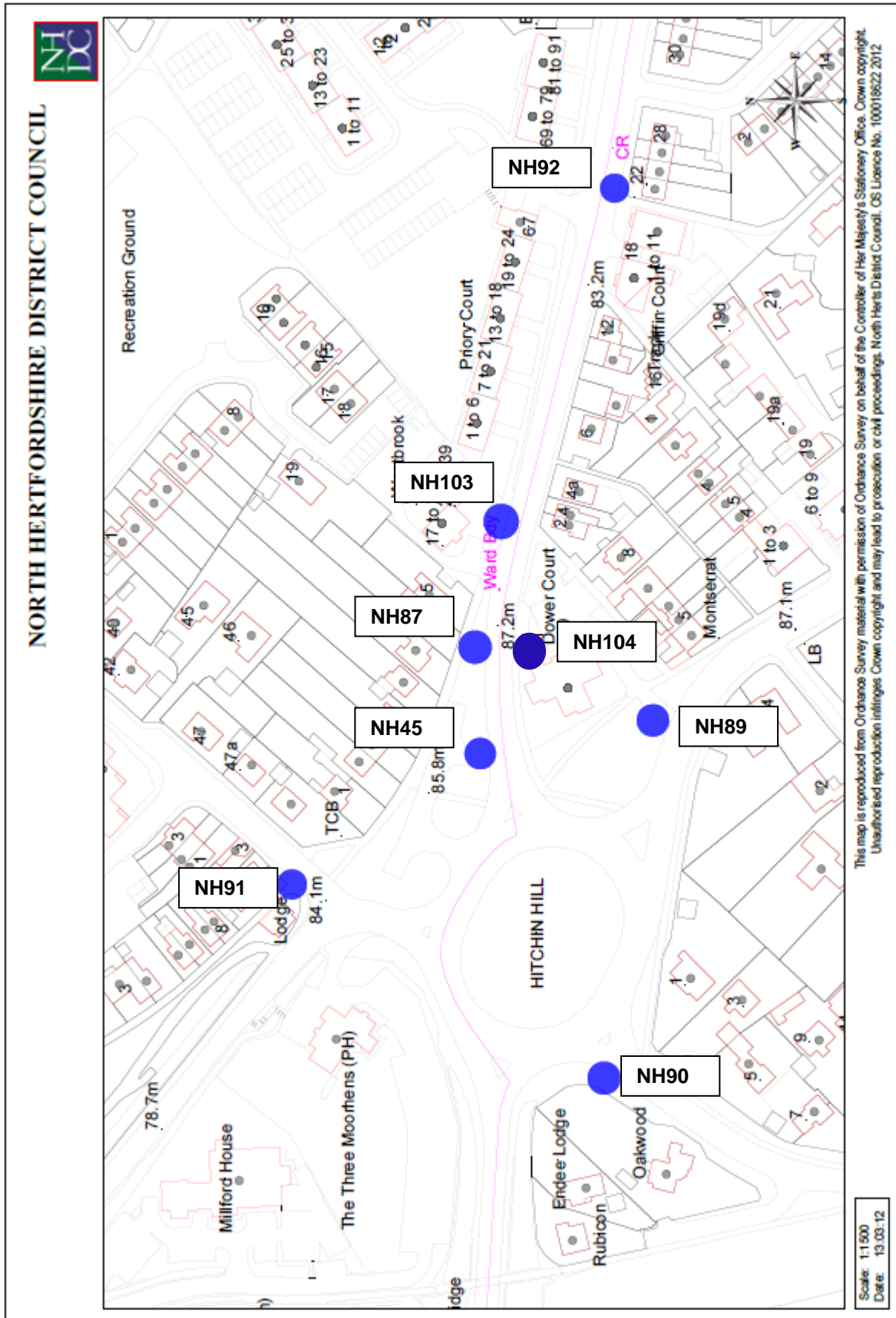




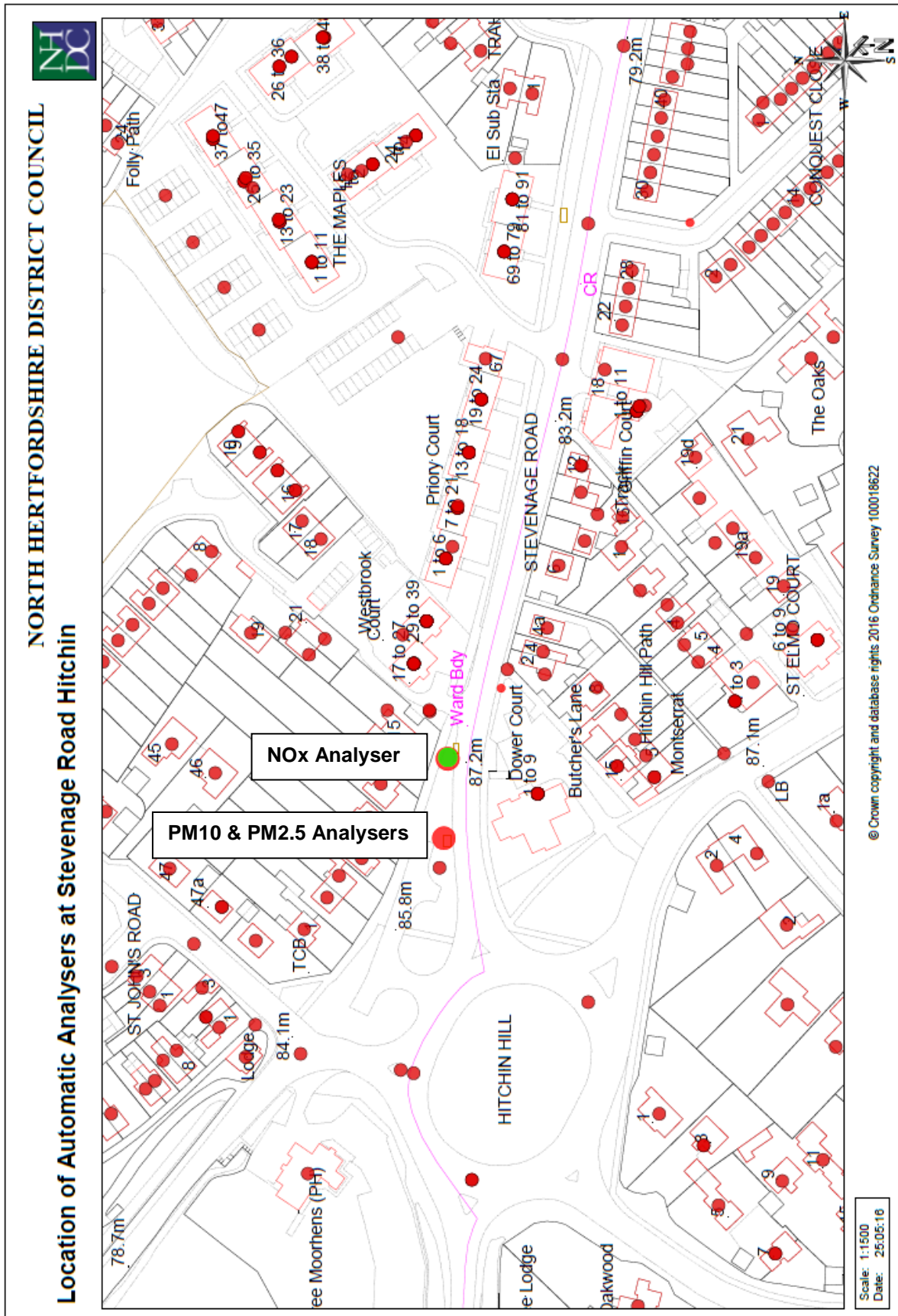
Welwyn Diffusion Tube Location 2015



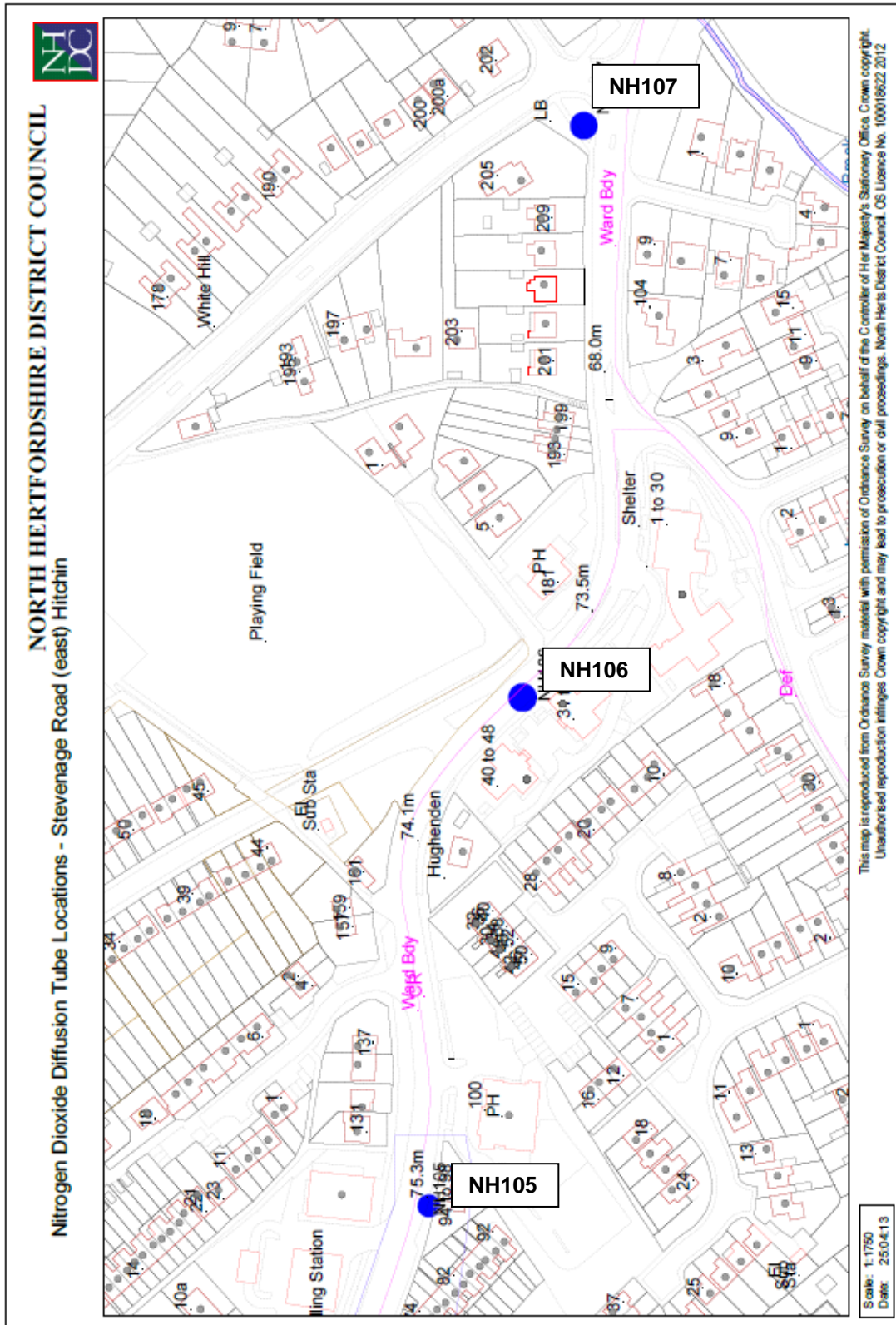
West end of Stevenage Road, Hitchin - Diffusion Tube Locations 2015



West end of Stevenage Road, Hitchin – Automatic Analyser Locations 2015



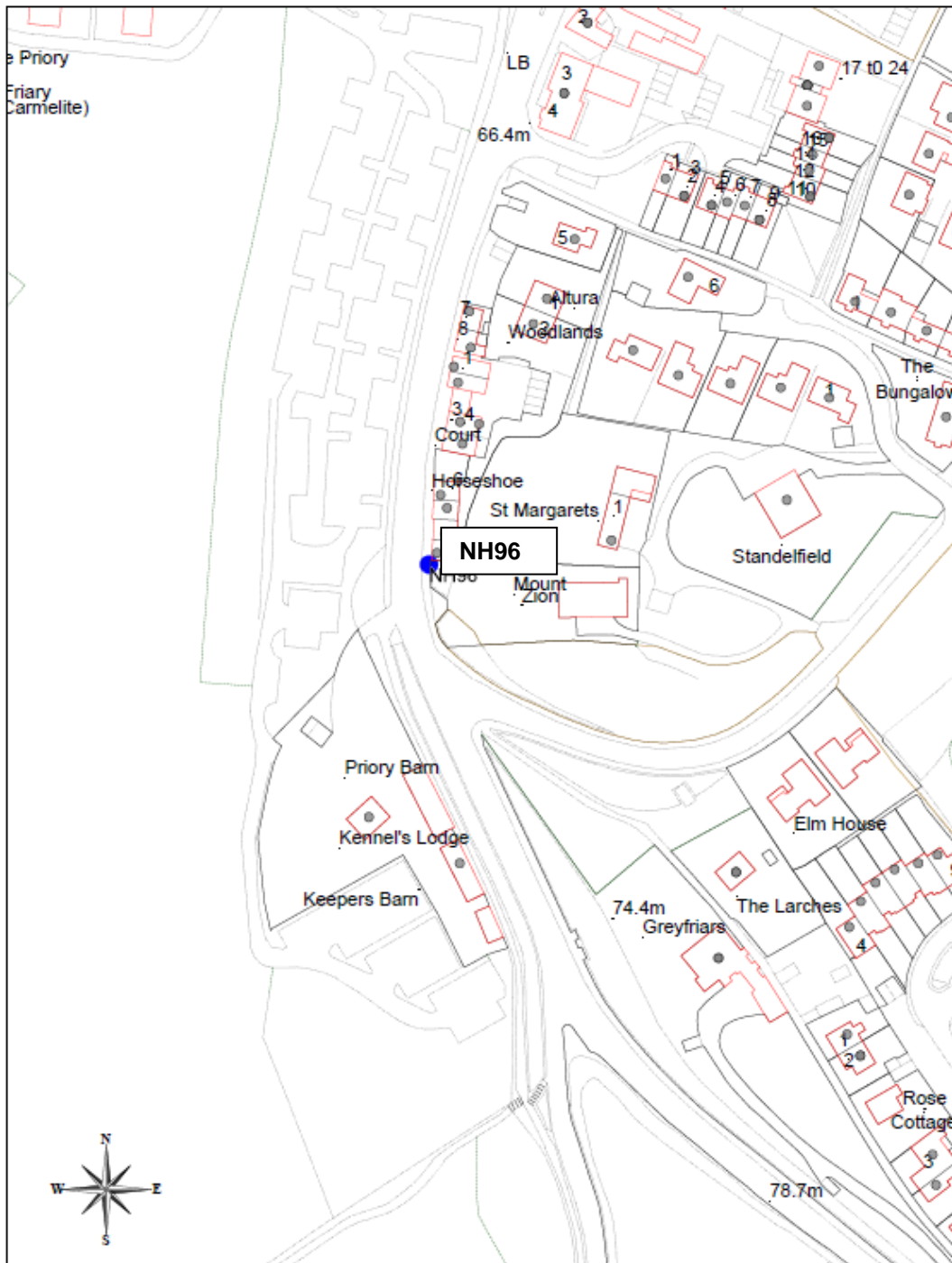
East end of Stevenage Road, Hitchin – Diffusion Tube Locations 2015



Park Street, Hitchin – Diffusion Tube Location 2015

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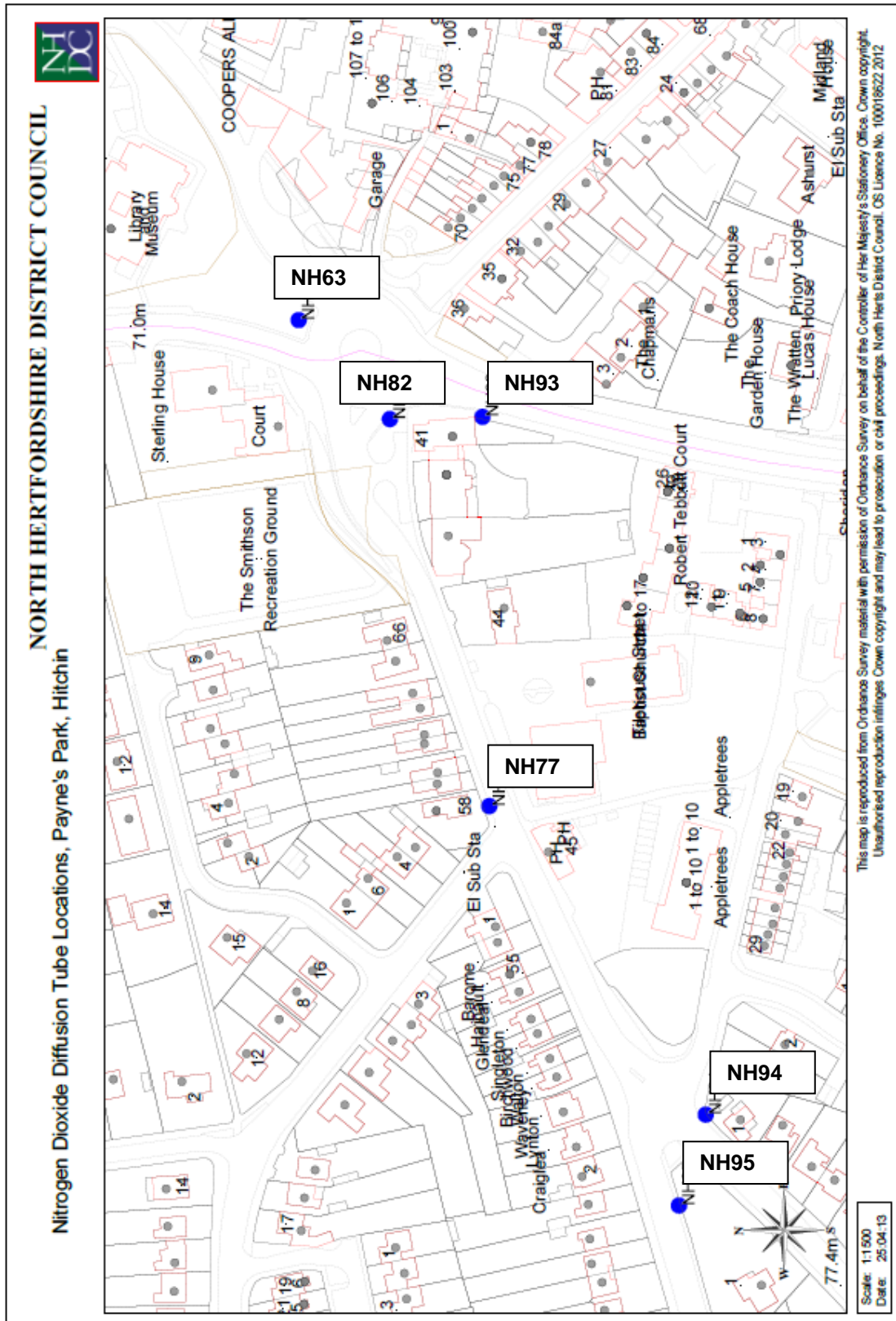
Title :- Nitrogen Dioxide Diffusion Tube Location, Park Street, Hitchin



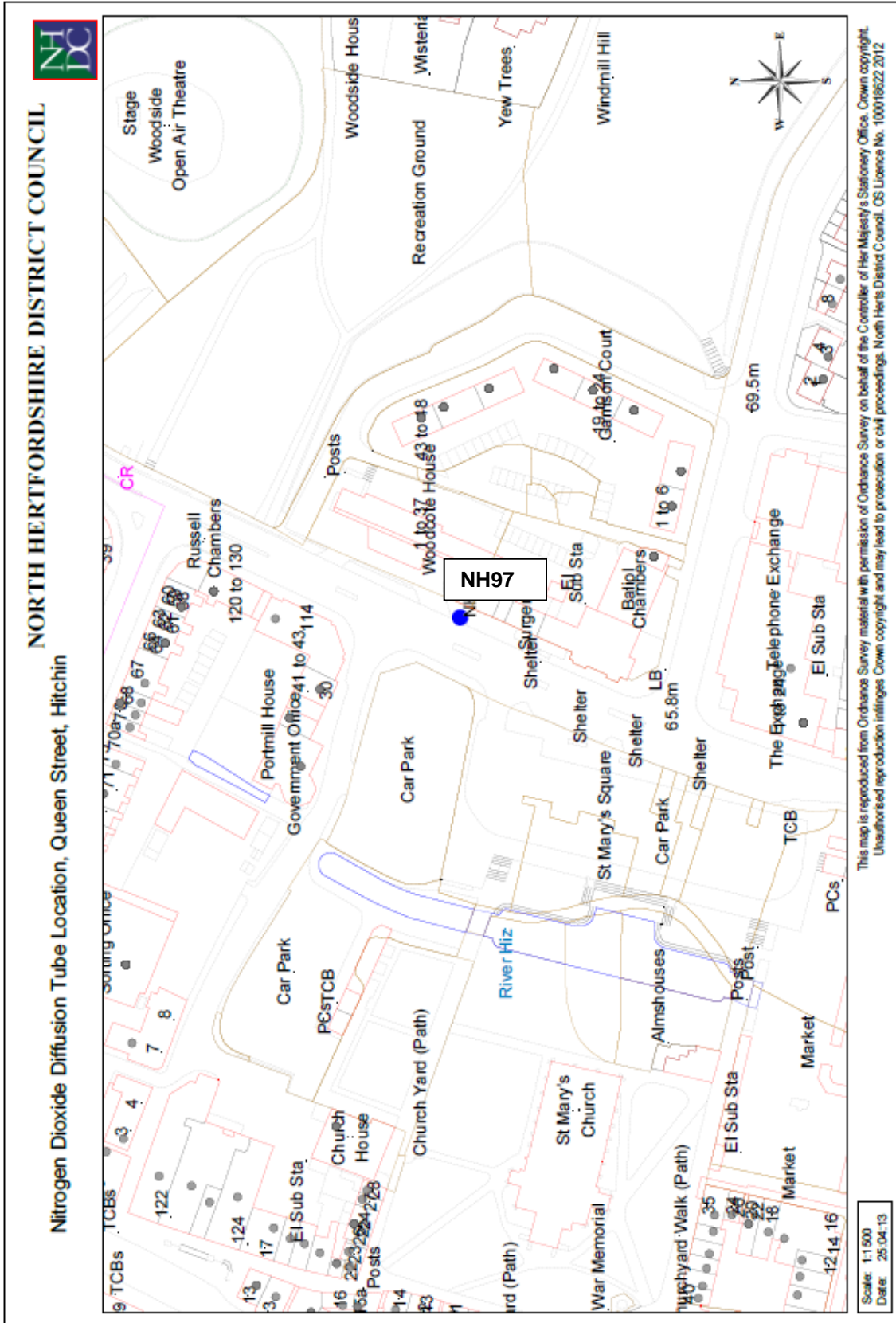
Scale: 1:1500
Date: 25.04.13

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North Herts District Council OS Licence No. 100018622 2012

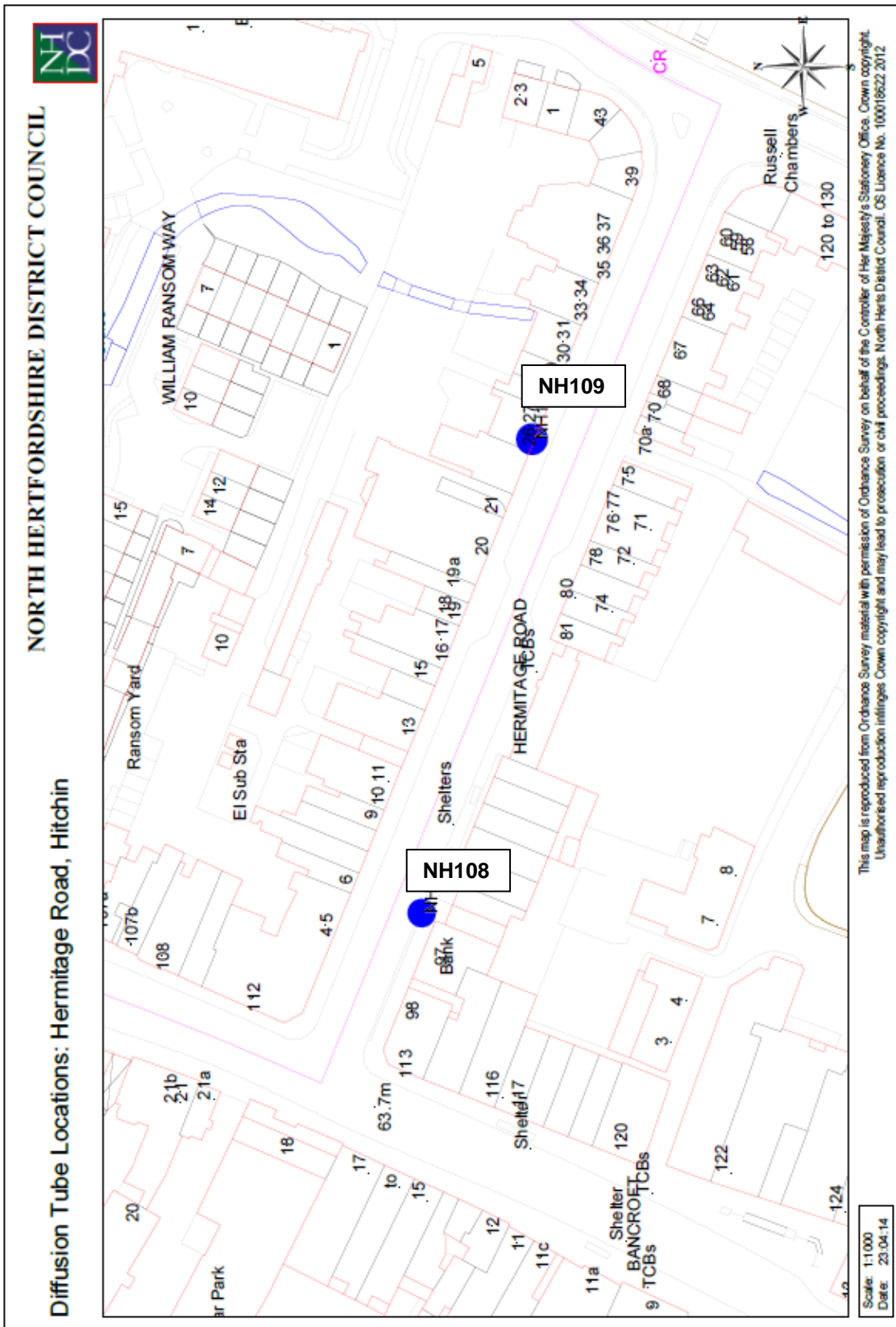
Payne's Park, Hitchin – Diffusion Tube Locations 2015



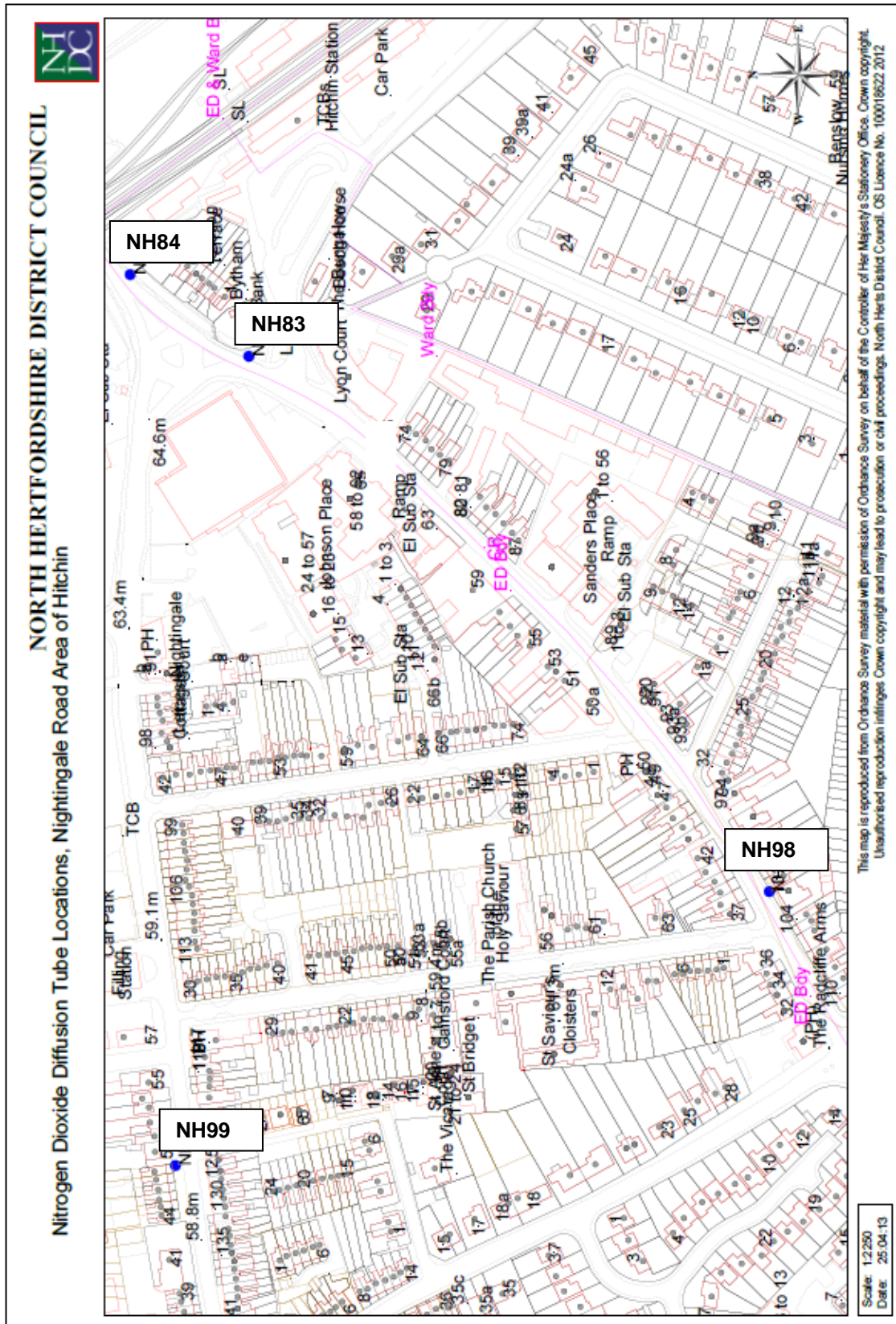
Queen Street, Hitchin – Diffusion Tube Location 2015



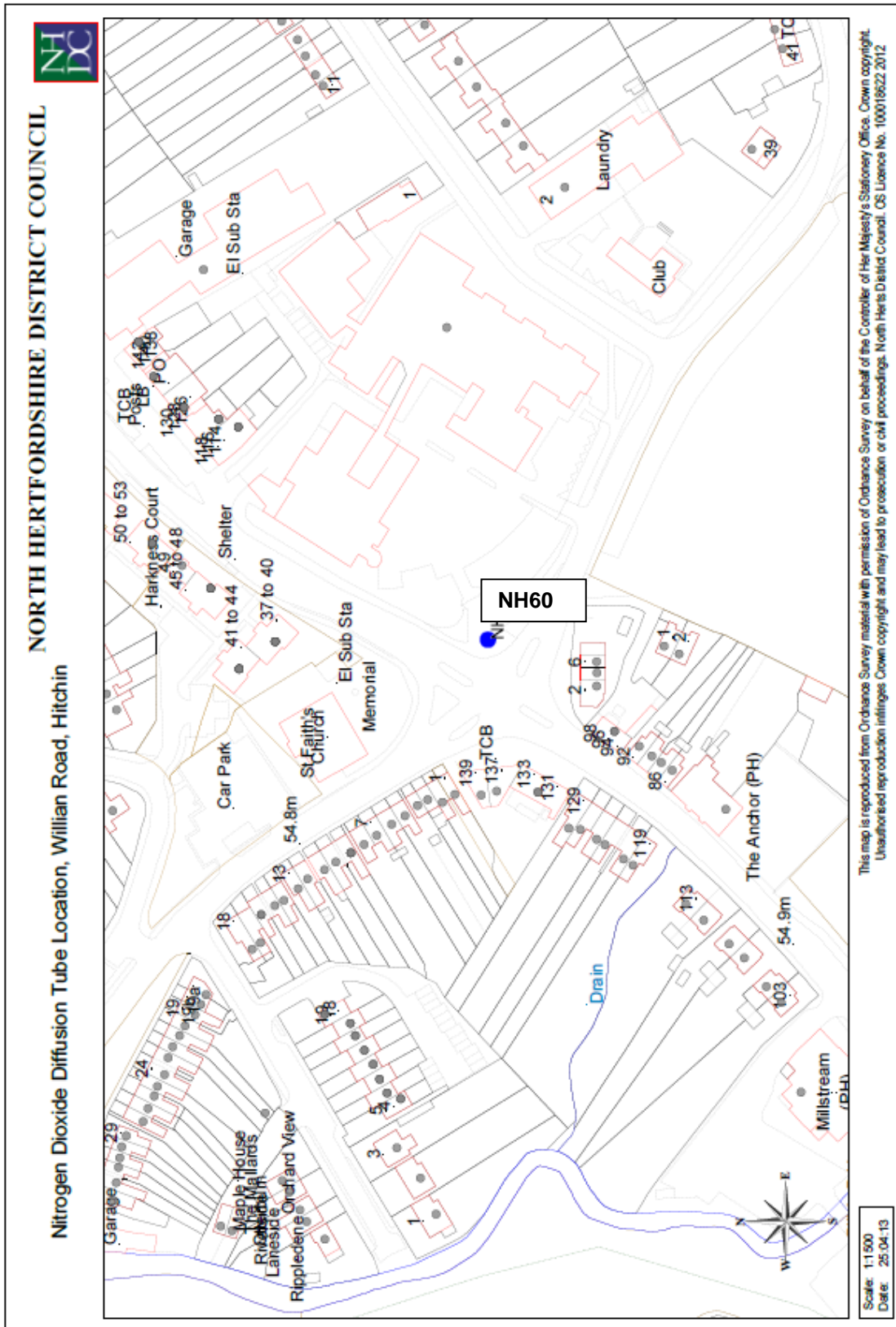
Hermitage Road, Hitchin – Diffusion Tube Locations 2015



Nightingale Road area, Hitchin – Diffusion Tube Locations 2015



Willian Road, Hitchin – Diffusion Tube Location 2015



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

| Pollutant | Air Quality Objective ⁴ | |
|--|--|----------------|
| | Concentration | Measured as |
| Nitrogen Dioxide (NO ₂) | 200 µg/m ³ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg/m ³ | Annual mean |
| Particulate Matter (PM ₁₀) | 50 µg/m ³ , not to be exceeded more than 35 times a year | 24-hour mean |
| | 40 µg/m ³ | Annual mean |
| Sulphur Dioxide (SO ₂) | 350 µg/m ³ , not to be exceeded more than 24 times a year | 1-hour mean |
| | 125 µg/m ³ , not to be exceeded more than 3 times a year | 24-hour mean |
| | 266 µg/m ³ , not to be exceeded more than 35 times a year | 15-minute mean |

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

| Abbreviation | Description |
|-------------------|---|
| AQAP | Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values' |
| AQMA | Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives |
| ASR | Air quality Annual Status Report |
| Defra | Department for Environment, Food and Rural Affairs |
| BAM | Beta Attenuation Measurement |
| DMRB | Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England |
| EU | European Union |
| EV | Electric Vehicle(s) |
| FDMS | Filter Dynamics Measurement System |
| HGV | Heavy Goods Vehicle |
| HCC | Hertfordshire County Council |
| LAQM | Local Air Quality Management |
| LGV | Light Goods Vehicle |
| NHDC | North Hertfordshire District Council |
| NO ₂ | Nitrogen Dioxide |
| NO _x | Nitrogen Oxides |
| OLEV | Office for Low Emission Vehicles |
| PHOI | Public Health Outcome Indicator |
| PM ₁₀ | Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less |
| PM _{2.5} | Airborne particulate matter with an aerodynamic diameter of 2.5µm |

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| | |
|-----------------|---|
| | or less |
| QA/QC | Quality Assurance and Quality Control |
| SO ₂ | Sulphur Dioxide |
| TEOM | Tapered Element Oscillating Measurement |
| ULEV | Ultra Low Emission Vehicle |