

North Hertfordshire District Council

Progress Report 2011

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

April 2011

DOCUMENT INFORMATION

Local Authority:

North Hertfordshire District Council Council Offices Gernon Road Letchworth Garden City Hertfordshire SG6 3JF

Project Manager:David CarrTelephone:01462 474263Email:david.carr@north-herts.gov.uk

Document Status and Approval Schedule

Issue	Status	Description	Prepared by	Reviewed by
0	Draft	Prepared	David Carr	Shayne Crowe
	report		20/04/2011	28/04/2011
1	Final	Issued to DEFRA	David Carr	Shayne Crowe
	Report		28/04/2011	28/04/2011

TABLE OF CONTENTS

EXECU	UTIVE SUMMARY	v-vi
1	INTRODUCTION	1
1.1 1.2 1.3 1.4 1.4	DESCRIPTION OF LOCAL AUTHORITY AREA PURPOSE OF PROGRESS REPORT AIR QUALITY OBJECTIVES	1 1 2 2 2 2 4
2.	NEW MONITORING DATA	5
2.1 2. 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2	SUMMARY OF MONITORING UNDERTAKEN 1.1 Automatic Monitoring Sites 1.2 Non-Automatic Monitoring Sites COMPARISON OF MONITORING RESULTS WITH AIR QUALITY OBJECTIVES 2.1 Nitrogen Dioxide 2.2 Particulate Matter (PM ₁₀) 2.3 Sulphur Dioxide 2.4 Benzene 2.5 Other Pollutants 2.6 Summary of Compliance with Air Quality Strategy Objectives	
3	NEW LOCAL DEVELOPMENTS	17
3.1 3.2 3.3 3.4 3.5	ROAD TRAFFIC SOURCES Other Transport Sources Industrial Sources Commercial and Domestic Sources New Developments with Fugitive or Uncontrolled Sources	
4.	LOCAL AIR QUALITY STRATEGY	19
5.	PLANNING APPLICATIONS	19
6.	AIR QUALITY PLANNING POLICIES	20
7.	LOCAL TRANSPORT PLANS AND STRATEGIES	20
8.	CLIMATE CHANGE STRATEGIES	21
9.	IMPLEMENTATION OF ACTION PLANS	21
10.	CONCLUSIONS AND PROPOSED ACTIONS	21
10.1 10.2 10.3	CONCLUSIONS FROM NEW MONITORING DATA CONCLUSIONS RELATING TO NEW LOCAL DEVELOPMENTS PROPOSED ACTIONS	
11.	REFERENCES	22

APPENDICES

APPENDIX 1 Quality Assurance / Quality Control (QA/QC)	23
APPENDIX 2 Site Location Maps for Diffusion Tube Network	26
APPENDIX 3 Monthly Diffusion Tube Data	37
APPENDIX 4 Fall off in Nitrogen Dioxide Concentrations with Distance from Roads	38

FIGURES

Figure 1.	North Hertfordshire District	1
Figure 2.	Location of NOx Automatic Monitoring Site, Stevenage Road, Hitchin	6
Figure 3.	Location of PM10 Automatic Monitoring Site, Paynes Park, Hitchin	7
Figure 4.	Location of NOx Automatic Monitoring Site, Hitchin Street, Baldock	8

TABLES

Table 1	Air Quality Objectives for Local Air Quality Management in England	2
Table 2	Details of Automatic Monitoring Sites	9
Table 3	Details of Non-Automatic Monitoring Sites	10
Table 4	Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective $(40\mu g/m^3)$ and Hourly Mean Objective $(200\mu g/m^3)$	11
Table 5	Results of Non-Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective $(40 \mu g/m^3)$	13
Table 6	Results of Automatic Monitoring for Particulate Matter: Comparison with Annual Mean Objective $(40 \mu g/m^3)$	16
Table 7	Results of Automatic Monitoring for Particulate Matter: Comparison with 24-Hour Mean Objective $(50 \mu g/m^3)$	16
Table 8	Summary of Areas with Annual Mean Concentrations recorded above the relevant Air Quality Objective	21

Executive Summary

Part IV of the Environment Act 1995 places a statutory duty on Local Authorities to review and assess the air quality within their area and take account of the Government guidance when undertaking such work. This Progress Report is a requirement of the fourth round of review and assessment (the "Fourth Round") for Local Authorities.

The Progress Report 2011 has been undertaken in accordance with Technical Guidance LAQM.TG(09) (1).

The Progress Report 2011 provides an update on air quality issues for North Hertfordshire District Council since the Detailed Assessment of Air Quality that was undertaken in 2010 (2). It considers all new monitoring data and assesses the data against the Air Quality Objectives as well as considering any development changes that may have an impact on air quality, as well as updating on any relevant strategy and policy changes.

However, it should be noted that the Progress Report 2011 does not provide a detailed assessment of the areas of North Hertfordshire District Council that were identified in the 2010 Detailed Assessment Report $_{(2)}$ and that were required by Defra to be subjected to a further Detailed Assessment. Therefore, it is important that:

- this Progress Report is considered alongside North Hertfordshire District Council's 2011 Detailed Assessment Report (3); and
- that it is the findings of the 2011 Detailed Assessment Report (3) that will be used to determine whether any Air Quality Management Areas are to be declared.

NHDC used an automatic analyser to monitor for particulate matter (PM10) in one location, Paynes Park/Upper Tilehouse Street (Hitchin Library) roundabout, Hitchin. There was no evidence of the relevant Air Quality Objectives for PM10 being exceeded during 2010

NHDC used two automatic analysers and 31 diffusion tubes to measure nitrogen dioxide (NO_2) across the district.

Exceedences of the mean annual average were identified in the following locations:

- Letchworth (A6141) = (NH64) Letchworth Gate
- Welwyn (A1M) = (NH34) Gwynfae Close
- **Baldock (A505)** = (NH61),(NH72),(NH88) Hitchin St, Whitehorse St, Church St
- Hitchin (A505/B656) = (NH83) Cambridge Road
- Hitchin (A505/A602)=(NH63),(NH77),(NH82) Paynes Park, Upper Tilehouse St
- **Hitchin (A602)** = (NH45),(NH76),(NH87) Stevenage Road

There is sufficient information and understanding of the Letchworth and Welwyn areas, without needing to progress to a Detailed Assessment, to be satisfied that there will not be relevant public exposure to NO_2 at concentrations above the relevant Air Quality Objective.

However, the data collected for the other locations, Baldock and the three Hitchin sites, confirms that there is a need for Detailed Assessment of those locations because of exceedences of the annual mean average Air Quality Objective for NO_2 of $40\mu g/m^3$.

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 116,908 population (as estimated from the 2001 census) located in the four main centres of Hitchin, Letchworth, Baldock and Royston.



Figure 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 pollution sources, including commercial, industrial and domestic sources will also contribute to background pollution concentrations.

1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment (USA) Reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

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

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1. This table shows the objectives in units of microgrammes per cubic metre $\mu g/m^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1 also includes the number of permitted exceedences in any year (where applicable).

Pollutant	Objective	Concentration measured as	Date to be achieved by
Benzene	16.25 μg/m³	running annual mean	31.12.2003
	5.00 μg/m³	annual mean	31.12.2010
1,3-Butadiene	2.25 μg/m³	running annual mean	31.12.2003
Carbon monoxide	10 mg/m ³	maximum daily running 8 hour mean	31.12.2003
Lead	0.5 μg/m ³	annual mean	31.12.2004
	0.25 μg/m ³ annual mean		31.12.2008
Nitrogen dioxide	200 μg/m ³ , not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 μg/m ³	annual mean	31.12.2005
Particles (PM ₁₀)	50 μg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
(gravimetric)	40 μg/m ³	annual mean	31.12.2004
	350 μg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide	125 μg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 μg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

Table 1 – Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

1.4 Summary of Previous Review and Assessments

1.4.1 First, Second and Third Round of Review and Assessment

Between 1999 and 2003 NHDC undertook its **First Round** of Review and Assessment of air quality. The assessments concluded that all pollutant levels complied with the Air Quality Objectives and no further assessment was required.

The **Second Round** of Review and Assessment began with a USA in 2003. The report concluded that there was still no risk of exceeding the Air Quality Objectives. As NHDC did not have to proceed to a Detailed Assessment, an annual air quality Progress Report was required in the following years until the Third Round of Review and Assessment. The annual air quality Progress Reports for 2004 and 2005 concluded that the Air Quality Objectives were still being met and no further action was required.

The **Third Round** of Review and Assessment began with a USA in 2006 (published in April 2007), which provided an update with respect to air quality issues within the district since the previous round. There were a number of changes made to the technical guidance for the Review and Assessment process since the Second Round, which were taken into account for this assessment.

Having considered each pollutant at this stage it was concluded that the air quality objectives for benzene, 1,3-butadiene, carbon monoxide, lead and sulphur dioxide were still being met and so there continued to be no need to undertake a Detailed Assessment, or to consider any Air Quality Management Areas (AQMA) for those pollutants. However, updated monitoring data for 2005 showed that **three** diffusion tube locations exceeded the nitrogen dioxide (NO₂) annual mean Air Quality Objective.

Two of the locations were in Hitchin:

- Stevenage Road (A602), near the Hitchin Hill roundabout
- Park Way (A602) and Upper Tilehouse Street (A505) near the Paynes Park roundabout

Although those diffusion tube locations were considered to be kerbside site and therefore not relevant to public exposure, the estimated concentrations at the facades of nearby properties showed that there was still a risk of exceeding the NO₂ annual mean Air Quality Objective at those properties.

The third location was in Baldock:

• Hitchin Street (A505), Whitehorse Street (A505) and High Street roundabout.

Although no monitoring data was available for particulate matter (PM_{10}), the predicted concentrations based on the Design Manual for Roads and Bridges (DMRB) screening tool showed that the daily mean PM_{10} Air Quality Objective was likely to be exceeded at the Park Way and Upper Tilehouse Street area of Hitchin.

Therefore, it was recommended that Detailed Assessment be carried out for these areas.

For the two Hitchin sites the 2007 Detailed Assessment $_{(4)}$ concluded that it was not necessary to declare an AQMA, but it was recommended that additional diffusion tubes be installed at these locations to confirm the findings of the dispersion modelling.

For the Baldock site the 2007 Detailed Assessment ₍₄₎ predicted that nitrogen dioxide concentrations would exceed the annual mean objective along the Whitehorse Street, Baldock, part of the A505 and recommended the declaration of an AQMA for some properties on that street, Hitchin Street and High Street. However, the opening

of the Baldock By-Pass in March 2006 provided a reason to reassess that recommendation on the basis of one of its aims being to reduce traffic volumes on Baldock's roads. For this reason no AQMA was declared and no Air Quality Action Plan was required, although additional monitoring would be undertaken.

The 2008 Progress Report $_{(5)}$ compared the data from the updated diffusion tube network, as recommended by the 2007 Detailed Assessment, against the relevant Air Quality Objectives. Due to low data capture at the three areas of concern it was not possible to provide conclusive evidence regarding the exceedence of the annual mean objective for NO₂. Therefore, any decisions relating to the need for further Detailed Assessment and AQMA declarations were deferred until the Fourth Round of Review and Assessment.

1.4.2 Fourth Round of Review and Assessment

The Fourth Round of Review and Assessment began with a USA in 2009 $_{(6)}$. The USA 2009 concluded that NHDC should progress to Detailed Assessments in 2010 for annual mean NO₂ at the following four locations:

- Hitchin Street(A505)/Whitehorse Street(A505), Baldock
- Upper Tilehouse Street(A505)/Park Way(A505), Hitchin
- Hitchin Hill roundabout (A602), Hitchin
- Nightingale Road (A505), Hitchin

The conclusion of the 2010 Detailed Assessment $_{(2)}$ was that the annual mean, although close to the objective, was not being exceeded at the four locations of concern. However, the data collected during 2009 was considered by Defra to be insufficient to enable a robust enough conclusion to be reached as to the declaration, or otherwise, of an AQMA at any of those locations. Therefore, Defra required that NHDC undertake a further Detailed Assessment in 2011 (3), with diffusion tube data collection in 2010 supplemented with two real-time NO₂ analysers and a PM₁₀ analyser. The 2011 Detailed Assessment (3) is being reported alongside this 2011 Progress Report.

2. New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

NHDC had three automatic monitoring sites operating during 2010.

A NO₂ analyser located at Hitchin Street, (A505), Baldock. The analyser is a Horiba APNA360 and has been collecting data from October 2009. At the time of reporting the analyser is still operating at Whitehorse Street, Baldock.

Calibration visits and filter checks and changes are undertaken on a fortnightly frequency by NHDC staff. The calibration readings are reported to the Environmental Research Group (ERG) at Kings College which is retained by NHDC to verify and ratify the data generated by the analyser. The ratification process is carried out to the Herts and Beds Air Quality Network (HBAQN) Standard, which is as per AURN recommended procedures. In addition Horiba is engaged to undertake two service and on-site calibration visits in a year, one minor service and one major service.

A NO_2 analyser located at Stevenage Road, (A602), Hitchin, with TRL retained by NHDC to manage the analyser. The analyser has been collecting data since April 2010. At the time of reporting the analyser is still operating at Stevenage Road, Hitchin, but the lease is currently not anticipated to be extended after the end of April 2011.

The analyser is an API 200A and is visited for calibration and filter checks and changes on a fortnightly basis by TRL staff. Any additional maintenance or servicing is undertaken as required during those visits. TRL verify and ratify the data generated by the analyser. The data are logged as 15 minute means and on a weekly basis data are examined to establish validity. Data are ratified as per AURN recommended procedures.

A Tapered Element Oscillating Measurement (TEOM) PM₁₀ analyser is located at the Paynes Park (Hitchin Library) roundabout, (Park Way-A602, Upper Tilehouse Street-A505) site. The analyser has been collecting data at that location since March 2010 having been moved from its previous location at Breachwood Green. At the time of reporting the analyser is still operating at the Paynes Park roundabout site.

Monitoring for PM₁₀ at Breachwood Green stopped in September 2009.

Calibration visits and filter checks and changes are undertaken on a fortnightly frequency by NHDC staff. In addition Supporting U is 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 are reported to ERG 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.

Additional Quality Assurance and Quality Control (QA/QC) information is included within Appendix 1.



Figure 2: NOx Automatic Monitoring Site, Stevenage Road, Hitchin



Figure 3: PM₁₀ Automatic Monitoring Site, Paynes Park (Hitchin Library), Hitchin



Figure 4: NOx Automatic Monitoring Site, Whitehorse Street (A505), Baldock

Site Name	Site Type	OS Grid Ref.	Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure	Distance to kerb of nearest road	Worst- case exposure
Stevenage Rd,	Road	518737	Nitrogen	Chemilum-	No	Y (15m)	3m	Y
Hitchin	-side	228350	Dioxide	inescence				
Paynes Park,	Road	518161	PM ₁₀	FDMS	No	Y (30m)	3m	N
Hitchin	-side	229092						
Hitchin Street,	Road	524456	Nitrogen	Chemilum-	No	Y (35m)	2m	Y
Baldock	-side	233889	Dioxide	inescence				

Table 2: Details of Automatic Monitoring Sites

2.1.2 Non-Automatic Monitoring Sites

NHDC undertakes monitoring with non-automatic methods using nitrogen dioxide (NO₂) diffusion tubes at a range of locations across the district. The diffusion tubes are 50% triethanolamine (TEA) in acetone and they 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 for the past five quarterly rounds received a Good rating in both old and new criteria.

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 April 2011 version of the Diffusion Tube Bias Adjustment Factors spreadsheet available from the Defra Review and Assessment website (<u>http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html</u>).

According to the above database the bias adjustment factor for Harwell Scientific Services in 2010 was 0.85.

During 2010 NHDC had a network of 31 diffusion tubes and they are detailed in Table 3, with site location maps provided in Appendix 2. This represents an increase of three diffusion tubes from 2009, when the network comprised 28 tubes. None of the 2009 tube locations were changed.

One of the new tubes was located at Walsworth Road, Hitchin (NH86). This tube was added to provide additional data in an area that was identified by the 2010 Detailed Assessment as being a concern.

One of the new tubes was located at Stevenage Road, Hitchin (NH87). This tube was added to provide additional data in an area that was identified by the 2010 Detailed Assessment as being a concern. It should also be noted that this diffusion tube was co-located with the Stevenage Road, Hitchin automatic monitoring site described in Table 2.

One of the new tubes was located at Church Street, Baldock (NH88). This tube was added to provide additional data in an area (Hitchin Street/Whitehorse Street, Baldock) that was identified by the 2010 Detailed Assessment as being a concern.

Table 3: Details of Non-Auton	natic Monitoring Sites
--------------------------------------	------------------------

Site Name	Site Type	OS Grid Ref.	Pollutants Monitored	In AOMA2	Relevant	Distance to kerb	Worst-case
Town Hall Melbourn Bd, Boyston (NH06)	Boadside	535867 240730	Nitrogen Dioxide	No.	V (55m)		N
Baldock St. Boyston (NH81)	Roadside	535512 240700	Nitrogen Dioxide	No	V (7m)	1m	V
Letchworth Gate Letchworth (NH64)	Roadside	522764 231825	Nitrogen Dioxide	No	V (74m)	3m	N
Waysbrook Letchworth (NH80)	Kerbside	522709 231799	Nitrogen Dioxide	No	V (13m)	0.7m	V
Havgarth Knebworth (NH62)	Roadside	525200 219859	Nitrogen Dioxide	No	Y (15m)	2m	V V
Gwynfae Close Welwyn (NH34)	Kerbside	523910 217358	Nitrogen Dioxide	No	Y (32m)	0.5m	N
Grosvenor Boad, Baldock (NH09)	Roadside	524709 234168	Nitrogen Dioxide	No	Y (12m)	3m	Y
High Street Baldock (NH73)	Roadside	524486 233856	Nitrogen Dioxide	No	Y (19m)	6m	Y
Hitchin St. pr. 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
Weston Bd, Baldock (NH85)	Roadside	524200 233685	Nitrogen Dioxide	No	Y (40m)	2.5m	N
Hitchin St. (Puddleducks), Baldock (NH71)	Roadside	524375, 233844	Nitrogen Dioxide	No	Y (7m)	4m	Y
Whitehorse St (nr Bose&Crown) Baldock	Roadside	524502 233948	Nitrogen Dioxide	No	Y (27m)	2m	Ŷ
(NH72)		02.002, 2000.0			. ()		
Whitehorse St(nr Church) Baldock (NH75)	Kerbside	524502, 233948	Nitrogen Dioxide	No	Y (2m)	0.5m	Y
Clothall Rd, Baldock (NH59)	Roadside	524649, 234061	Nitrogen Dioxide	No	Y (11m)	3m	Y
Church St, Baldock (NH88)	Kerbside	524448, 233898	NitrogenDioxide	No	Y (45m)	0.5m	Y
Willian Rd, Hitchin (NH60)	Roadside	519916, 230099	Nitrogen Dioxide	No	Y (29m)	1.1m	N
Nr 40 Byron Close, Hitchin (NH68)	Roadside	519587, 229835	Nitrogen Dioxide	No	Y (8m)	1.1m	Y
Meadowbank, Hitchin (NH66)	Roadside	519555, 229909	Nitrogen Dioxide	No	Y (12m)	2m	Y
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	NitrogenDioxide	No	Y (5m)	3m	Y
Cambridge Rd (Station A), Hitchin (NH84)	Roadside	519366, 229806	Nitrogen Dioxide	No	Y (20m)	1m	Y
Cambridge Rd (Station B), Hitchin (NH83)	Roadside	519328, 229752	Nitrogen Dioxide	No	Y (12m)	1.3m	Y
West Hill, Hitchin (NH78)	Roadside	518099, 229229	Nitrogen Dioxide	No	Y (4m)	2m	Y
Upper Tilehouse St (crossing) Hitchin	Roadside	518006, 229032	Nitrogen Dioxide	No	Y (5m)	1.5m	Y
(NH77)							
Upper Tilehouse St (roundabout) Hitchin	Roadside	518129, 229065	Nitrogen Dioxide	No	Y (7m)	1.5m	Y
(NH82)							
Hitchin Library, Hitchin (NH63)	Roadside	518160, 229092	Nitrogen Dioxide	No	Y (30m)	3.5m	N
Dower Crt, Stevenage Rd, Hitchin (NH76)	Roadside	518757, 228334	Nitrogen Dioxide	No	Y (10m)	2m	Y
Stevenage Rd (A), Hitchin (NH45)	Roadside	518708, 228347	Nitrogen Dioxide	No	Y (19m)	2m	Y
Stevenage Rd (B), Hitchin (NH87)	Roadside	518737, 228348	NitrogenDioxide	No	Y (15m)	3m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

NHDC monitors nitrogen dioxide (NO₂) and particulate matter (PM₁₀) and the monitoring data collected during 2010 is summarised in this Progress Report. However, levels of NO₂ measured in a number of areas of the district required NHDC to undertake a Detailed Assessment of air quality in those areas. Therefore, the detailed consideration and interpretation of those data are included within the 2011 Detailed Assessment report (3).

2.2.1 Nitrogen Dioxide

NHDC uses diffusion tubes (31 locations) to provide annual averaged (bias corrected) concentrations within the district and at two locations automatic (chemiluminescence) monitors are used.

Data from the following locations have confirmed potential public exposure to NO₂ above the relevant Air Quality Objectives (AQO) and so have been considered more comprehensively in the NHDC 2011 Detailed Assessment report (3).

- Baldock (A505) = (NH61),(NH72),(NH88) Hitchin St, Whitehorse St, Church St •
- Hitchin (A505/B656) = (NH83) Cambridge Road
- Hitchin (A505/A602)=(NH63),(NH77),(NH82) Paynes Park, Upper Tilehouse St
- **Hitchin (A602)** = (NH45),(NH76),(NH87) Stevenage Road

Automatic Monitoring Data

An APNA360 NO₂ analyser is located on Hitchin Street, Baldock, housed within Baldock Town Hall. The site is considered to be a roadside site and began collecting data in October 2009.

An API200A NO₂ analyser is located on Stevenage Road, Hitchin, housed within a roadside enclosure. The site is considered to be a roadside site and began collecting data in April 2010.

Site ID	Site Location	In	Relevant	Data capture for	Data capture	Annual Mean	No. of			
		AQMA?	Exposure	monitoring	for full	Concentration	Exceedences of			
			-	period ^a %	calendar year	^c (μg/m ³)	hourly mean ^d			
				-	2010 ^b %		(µg/m ³)			
	Stevenage	No	Yes	96	68	52.4	7 (168.25)			
	Rd, Hitchin						. ,			
	Hitchin Street	No	Yes	96	96	32	0			
ипр	Baldock									

Table 4: Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective (40 $\mu g/m^3$) and Hourly Mean Objective (200 $\mu g/m^3$)

^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 6 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 ^d If the period of valid data is less than 90% of a full year, include the 99.8% percentile of hourly means in brackets.

Table 4 indicates that the annual mean air quality objective of $40\mu g/m^3$ was significantly exceeded at the Stevenage Road, Hitchin monitoring location during 2010. From Table 2 it can be seen that nearest relevant exposure (façade of a house) is only 20m from the monitoring location so there is considered to be a reasonable possibility of public exposure above the annual mean air quality objective.

Therefore, the Stevenage Road area of Hitchin has been considered more fully within the 2011 Detailed Assessment report (3).

Table 4 also shows that there were 7 exceedences of the 1hour mean NO_2 concentration of $200\mu g/m^3$ at the Stevenage Road, Hitchin site. It should be noted that because the capture rate for the calendar year was below 90% it is not possible to state whether >18 permitted exceedences would have been recorded over the calendar year. However, the 99.8th percentile (168.25 $\mu g/m^3$) is reported which is below the $200\mu g/m^3$ objective and so is less statistically suggestive that >18 exceedences would be expected, than would a 99.8th percentile value that was greater than $200\mu g/m^3$.

Table 4 indicates that the annual mean air quality objective of $40\mu g/m^3$ was not exceeded at the Hitchin Street, Baldock monitoring location during 2010 and that there were also no exceedences of the 1hour mean NO₂ concentration of $200\mu g/m^3$.

Non-Automatic Monitoring Data

Of the 31 diffusion tube monitoring locations operating during 2010 the majority were positioned in areas of Hitchin (15 tubes) and Baldock (10 tubes) that had been identified as having potential air quality issues during earlier monitoring rounds. The other 6 tubes were located close to heavily trafficked roads in four other towns within the district.

Table 5 summarises those data. All data presented have been bias adjusted and where necessary, because of less than 9 months available data, annualised. It should be noted that at one location (Town Hall, Melbourn Road, Royston [NH06]) only five months of data was collected and so the data for this site have not been presented in Table 5. It has, however, been included in Appendix 3. The tube will be more securely positioned and kept active for 2011.

As a result of un-reliable tube collection and transfer documentation from NHDC to the laboratory for January and February 2010 the highest data capture rate that can be reported for the full calendar year is 83%. Therefore, the data from the recovered and analysed tubes from January and February 2010 have been removed as being potentially invalid rather than included in the data reported simply to enable a higher capture rate to be reported.

For all other diffusion tubes; excepting the three diffusion tubes newly installed for 2010 (NH86, NH87, NH88); where capture rates are reported that fall below 83% the reason is stolen or vandalised tubes.

The three diffusion tubes new to the monitoring network in 2010 were in place in May 2010. The best monitoring period capture rate was 88%, representing one missing diffusion tube, the worst monitoring period capture rate was 75% representing two missing tubes.

Site ID	Site Location	In AQMA?	Relevant Exposure	Data capture for 2010 monitoring period ^a %	Data capture full calendar yr 2010 ^b %	Annual Mean Concentration ^c (μg/m ³) 2010
NH81	Baldock St Boyston	No	Y (7m)	83	83	28.5
NH64	Letchworth Gate, Letchworth	No	Y (74m)	83	83	40.4
NH80	Waysbrook, Letchworth	No	Y (13m)	83	83	23.5
NH62	Haygarth Knebworth	No	Y (15m)	75	75	25.5
NH34	Gwynfae Cls Welwyn	No	Y (32m)	83	83	41.2
NH09	Grosvenor Rd, Baldock	No	Y (12m)	83	83	29.4
NH73	High St, Baldock	No	Y (19m)	83	83	29.1
NH61	Hitchin St, nr Town Hall, Baldock	No	Y (35m)	67	67	43.6
NH70	Hitchin St, nr Bus Stop, Baldock	No	Y (1m)	83	83	30.9
NH85	Weston Rd Baldock	No	Y (40m)	75	75	33.9
NH71	Hitchin St, (Puddleducks), Baldock	No	Y (7m)	83	83	30.7
NH72	Whitehorse St (nr Rose&Crown), Baldock	No	Y (27m)	67	67	42.1
NH75	Whitehorse St (nr Church) Baldock	No	Y (2m)	75	75	34.7
NH59	Clothall Rd Baldock	No	Y (11m)	83	83	32.2
NH88	Church St, Baldock	No	Y (45m)	75	50	50.7
NH60	Willian Rd, Hitchin	No	Y (29m)	75	75	37.9
NH68	Nr 40 Byron Close, Hitchin	No	Y (8m)	83	83	29.1
NH66	Meadowbank, Hitchin	No	Y (12m)	75	75	30.8
NH67	Cadwell Court, Hitchin	No	Y (12m)	83	83	33.4
NH69	Grove Rd, Hitchin	No	Y (5m)	67	67	38.3
NH86	Walsworth Rd, Hitchin	No	Y (5m)	75	50	34.8
NH84	Cambridge Rd (Station A), Hitchin	No	Y (20m)	83	83	39.9
NH83	Cambridge Rd (Station B), Hitchin	Νο	Y (12m)	67	67	48.8
NH78	West Hill, Hitchin	No	Y (4m)	83	83	34.8
NH77	Upper Tilehouse St (crossing) Hitchin	Νο	Y (5m)	75	75	48.7
NH82	Upper Tilehouse St (roundabout) Hitchin	No	Y (7m)	83	83	44.4
NH63	Hitchin Library, Hitchin	No	Y (30m)	75	75	44.0
NH76	Dower Crt, Stevenage Rd, Hitchin	No	Y (10m)	83	83	42.2
NH45	Stevenage Rd (A), Hitchin	No	Y (19m)	75	75	49.1
NH87	Stevenage Rd (B), Hitchin	No	Y (15m)	88	58	54.4

Table 5: Results of Non-Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective (40 µg/m³)

^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 6 months the maximum data capture for the full calendar year would be 50%) [°] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full

year Bias (annual bias correction factor) = **0.85**

R(a) for sites with <9 months data (as per Box 3.2 of TG(09) = see Appendix 1

Table 5 shows that there are twelve locations across the district where the diffusion tube results demonstrated that annual mean NO_2 concentrations were in exceedence of the $40\mu g/m^3$ air quality objective. These exceedences can be geographically grouped as below and a brief discussion about each group of exceedence is included later in this section.

- Letchworth (A6141) = (NH64) Letchworth Gate
- Welwyn (A1M) = (NH34) Gwynfae Close
- Baldock (A505) = (NH61),(NH72),(NH88) Hitchin St, Whitehorse St, Church St
- Hitchin (A505/B656) = (NH83) Cambridge Road
- Hitchin (A505/A602)=(NH63),(NH77),(NH82) Paynes Park, Upper Tilehouse St
- Hitchin (A602) = (NH45),(NH76),(NH87) Stevenage Road

Letchworth (A6141)

Diffusion tube NH64 located at Letchworth Gate, a busy road "A road" joining and crossing the A1M at junction 9, returned an annual mean of 40.4μ g/m³. However, the nearest receptor to this location is housing on Waysbrook, 74m to the west. Diffusion tube NH80 located at Waysbrook is 59m closer to the same receptor and returned an annual mean of 23.5 μ g/m³ indicating a substantial reduction in NO₂ concentrations away from the Letchworth Gate "A road". Therefore, there is no likelihood of relevant public exposure above the relevant AQO at these Letchworth locations.

(A1M) Welwyn

Diffusion tube NH34 located at Gwynfae Close is approximately 0.5m from the A1M, which is raised above the level of Gwynfae Close by a substantial embankment. Tube NH34 returned an annual mean of 41.2μ g/m³. The nearest relevant location of exposure is a house 32m from the tube. The procedure specified in Box 2.3 of TG(09) has been applied to the annual mean of 41.2μ g/m³ and results in an annual mean concentration of 19.1μ g/m³ which indicates no likelihood of an exceedence of the relevant AQO at Gwynfae Close. (Calculation is included as Appendix 4). However, a location a greater distance from the A1M but closer to a relevant receptor has been selected during 2011 to allow further consideration of the possible impact of the A1M on public exposure to NO₂ concentrations.

Baldock (A505)

Diffusion tube NH61 located on the south side of Hitchin Street (A505) **Baldock** returned an annual mean of $43.6\mu g/m^3$, on the opposite side of the same road, but 1.5m closer to the kerb, diffusion tube NH88 returned an annual mean of $50.7\mu g/m^3$. Respectively the two tubes are located within 18m and 15m of the roundabout joining the High Street to the Hitchin Street part of the A505 and the Whitehorse Street part of the A505. On the Whitehorse Street side of the roundabout and within 50m of that roundabout diffusion tube NH72 returned an annual mean of $42.1\mu g/m^3$.

However, the automatic analyser which is located approximately 3m (first floor window) above NH61 and directly opposite NH88 returned an annual mean of $32\mu g/m^3$. The automatic analyser had 96% data capture, compared to rates of 67%, 67% and 50% for the diffusion tubes. Therefore, the result from the automatic analyser provides some reassurance that, in the area of the Hitchin Street, High Street and Whitehorse Street roundabout in Baldock, there is no public exposure to NO₂ that exceeds the relevant AQO. However, this was one of the areas of the district that was identified as requiring a Detailed Assessment of 2010 data, so it is discussed more fully in the NHDC 2011 Detailed Assessment report (3).

Hitchin (A505/B656)

Diffusion tube NH83 positioned on Cambridge Road/Walsworth Road immediately south of the A505/B656 roundabout by Hitchin railway station returned an annual mean concentration of $48.8\mu g/m^3$. Tube NH84 positioned on Cambridge Road, immediately to the north of the same roundabout, returned an annual mean concentration of $39.9\mu g/m^3$. The nearest relevant public exposure is a group of houses located between approximately 12m and 20m from the two tubes.

The procedure specified in Box 2.3 of TG(09) has been applied to the annual mean of 48.8μ g/m³ and results in an annual mean concentration of 31.9μ g/m³, which indicates the absence of an exceedence of the relevant AQO at the Station Terrace group of properties. However, this was one of the areas of the district that was identified as requiring a Detailed Assessment of 2010 data, **so it is discussed more fully in the NHDC 2011 Detailed Assessment report** (3).

Hitchin (A505/A602)

The highest annual mean average recorded by the three diffusion tubes located in this area was $48.7\mu g/m^3$ at NH77 located on Upper Tilehouse Street, 100m east of the B655 and A505 roundabout and 120m west of the Paynes Park (Hitchin Library) roundabout (A602-A505). NH82 located near to where Upper Tilehouse Street feeds into the Paynes Park roundabout recorded an annual mean average of $44.4\mu g/m^3$ and tube NH63 on the opposite side of the same roundabout returned a result of $44.0\mu g/m^3$. These data suggest the potential for public exposure to NO₂ above the relevant AQO in the area because housing is located within 5m of NH77 and 7m of NH82.

The procedure specified in Box 2.3 of TG(09) has been applied to the annual mean of $48.7\mu g/m^3$ from NH77 and results in an annual mean concentration of $37.8\mu g/m^3$. The same procedure applied to the annual mean of $44.4\mu g/m^3$ from NH82 results in an annual mean concentration of $33.1\mu g/m^3$. The same calculation was not run for NH63 as it is in an equivalent location to NH82, returned a comparable annual mean concentration and is further from a relevant public receptor.

The above manipulation of the data from the three diffusion tubes in this area indicates an absence of an exceedence of the relevant AQO at the residences around the Paynes Park roundabout and those along Upper Tilehouse Street.

However, it is important to recognise that, this was one of the areas of the district that was identified as requiring a Detailed Assessment of 2010 data, so **the data has been more fully considered and discussed in the NHDC 2011 Detailed Assessment report** (3).

Hitchin (A602)

The highest annual mean average recorded by the three diffusion tubes located in this area was $54.4\mu g/m^3$ at NH87 located on the Stevenage Road approximately 60m from the Hitchin Hill (A602/B655) roundabout. NH45 located on the same side of Stevenage Road approximately 30m from the same roundabout recorded an annual mean average of $49.1\mu g/m^3$. The other diffusion tube in the area was NH76 located on the opposite side of Stevenage Road approximately 80m from the roundabout and the annual mean average was $42.2\mu g/m^3$.

It is recognised that the location of NH76 is not ideal being attached to a large diameter road-sign post and in very close proximity to vegetation, both of which are likely to impede air flow and cause an under reporting of the actual NO_2

concentration. For this reason the data manipulation of the reported NO_2 concentrations focuses on that from NH87 and NH45.

These data indicate the potential for public exposure to NO₂ above the relevant AQO in the area because housing is located within 15m of NH87 and 19m of NH45. Also of interest is that NH87 is co-located with the Stevenage Road automatic monitor (NH_trl) and the annual mean average from that monitor was 52.4μ g/m³ and so very close to the 54.4μ g/m³ diffusion tube annual mean.

The procedure specified in Box 2.3 of TG(09) has been applied to the annual mean of $54.4\mu g/m^3$ from NH87 and results in an annual mean concentration of $35.5\mu g/m^3$. The same procedure applied to the annual mean of $49.1\mu g/m^3$ from NH45 results in an annual mean concentration of $29.5\mu g/m^3$.

The above manipulation of the data from the diffusion tubes in this area indicates an absence of an exceedence of the relevant AQO at the residences along Stevenage Road and around the Hitchin Hill roundabout. However, it is important to recognise that, this was one of the areas of the district that was identified as requiring a Detailed Assessment of 2010 data, so the data has been more fully considered and discussed in the NHDC 2011 Detailed Assessment report (3).

It is important to note that the procedures specified in Box 2.3 of TG(09) and which have been applied for the purposes of this Progress Report are not considered suitably robust for use in data interpretation for the purposes of a Detailed Assessment. Therefore, the conclusions for each of the areas dealt with in NHDC's 2011 Detailed Assessment report have precedence over the interpretations reported here.

2.2.2 Particulate Matter (PM₁₀)

NHDC monitors PM_{10} using a TEOM automatic monitor (reference NH4) that is located by the Hitchin Library (Paynes Park) A602/A505 roundabout. The data generated indicates that no relevant AQO is being exceeded in that area.

Automatic Monitoring Data

A Rupprecht and Patashnick 1400a TEOM is located in a roadside housing positioned in the grounds of Hitchin Library close to the A602/A505 roundabout. The site is a roadside site and began collecting data in March 2010.

	Objective (+0 µg/m)									
Site ID	Site Location	In AQMA?	Relevant Exposure	Data capture for monitoring period ^a %	Data capture for full calendar year 2010 ^b %	Annual Mean Concentration ^c (μg/m ³)				
NH4	Hitchin Library Roundabout	Νο	Yes	92	75	22				

Table	6:	Results	of	Automatic	Monitoring	for	PM ₁₀ :	Comparison	with	Annual	Mean
Objec	tive	e (40 μg/n	n³)		_			-			

^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 6 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

The data in Table 6 shows that the annual mean concentration of PM_{10} is less than the Air Quality Objective of $40\mu g/m^3$.

		,				
Site ID	Site Location	In AQMA?	Relevant Exposure	Data capture for monitoring period ^a %	Data capture for full calendar year 2010 ^b %	Number of exceedences of daily mean objective (50μg/m ³) If data capture <90% include the 90%ile of daily mean in brackets
NH4	Hitchin Library Roundabout	No	Yes	92	75	0

Table 7: Results of Automatic Monitoring for PM_{10} : Comparison with 24-Hour Mean Objective (50 μ g/m³)

^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 6 months the maximum data capture for the full calendar year would be 50%)

The data in Table 7 shows that there were no exceedences of the daily mean objective of $50\mu g/m^3$.

The volatile correction model (VCM) has been applied to all results obtained from the TEOM. This model 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. The Environmental Research Group at Kings College London has applied the correction model to all PM₁₀ data listed in this document.

2.2.3 Sulphur Dioxide

NHDC does not monitor sulphur dioxide.

2.2.4 Benzene

NHDC does not monitor benzene.

2.2.5 Other Pollutants

NHDC does not monitor any other air pollutants.

2.2.6 Summary of Compliance with Air Quality Strategy Objectives

NHDC has measured concentrations of nitrogen dioxide above the annual mean objective at relevant locations and will need to proceed to a Detailed Assessment for the following areas to be assessed.

- Hitchin St, Whitehorse St, Baldock (A505) (Tubes NH61, NH72, NH88)
- Cambridge Road, Hitchin (A505/B656) (Tube NH83)
- Paynes Park, Upper Tilehouse St Hitchin (A505/A602) (Tubes NH63, NH77, NH82)
- Stevenage Road, Hitchin (A602) (Tubes NH45, NH76, NH87)

3. New Local Developments

3.1 Road Traffic Sources

NHDC has not identified any of the following since the last Updating and Screening Assessment in 2009:

- Narrow congested streets with residential properties close to the kerb.
- Busy Streets where people spend one hour or more close to traffic
- New Junctions
- New Roads constructed or proposed

- Roads with significantly changed traffic flows
- Bus or coach stations

However, because of a recently approved planning permission NHDC has identified a **road that is likely to be subject to a high flow of HGVs.** The road in question is Wilbury Hills Road, which runs north/south past the eastern edge of Letchworth Garden City, before becoming Stotfold Road. A new and permanent access for construction and subsequently maintenance is to be built off Stotfold Road making it the main access road for construction vehicles serving the Hitchin Rail Curve project permitted under planning permission 09/01840/1SU. This project is the development of approximately 2.265 kilometres of new electrified single track railway on a short length of disused embankment and viaduct to carry the new railway over the East Coast Main Line and on a new embankment.

The construction period is expected to be 117 weeks. An Environmental Statement supported the application and included a consideration of the impact of the construction and operational phases of the development. This was included within Volume 3 of the Environmental Statement (7) and concluded that there would be no significant impacts.

The operational phase was not specifically assessed because the track is electrified.

The construction phase was assessed using DMRB methodology with houses on Wilbury Hills Road identified as the sensitive receptor and 2012 selected as the year anticipated to be the peak construction year. The anticipated increase in heavy goods vehicles (HGVs) is anticipated to be 125 movements in each direction, representing 250 movements per day more, on average over the course of the year. Using the Defra background predictions for NO₂ and PM₁₀ for 2012 as a baseline the predicted increase in NO₂ was 6% up from 14.9µg/m³ to 15.8µg/m³ and the increase in PM10 was negligible up from 17.8µg/m³ to 17.9µg/m³.

3.2 Other Transport Sources

NHDC has not identified any of the following since the last Updating and Screening Assessment in 2009.

- Airports
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential relevant exposure within 15m
- Locations with a large number of movements of diesel locomotives and potential for long-term exposure within 30m
- Ports for shipping

3.3 Industrial Sources

NHDC has not identified any of the following since the last Updating and Screening Assessment in 2009.

- Industrial installations: new or proposed for which an air quality assessment has been carried out.
- Industrial installations: existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- Major fuel storage depots storing petrol
- Petrol stations

• Poultry farms

However, two new small waste oil burners have been installed as vehicle repair garages, one on Orchard Road, Royston and the other on Whinbush Road, Hitchin.

3.4 Commercial and Domestic Sources

NHDC has not identified any new commercial or domestic sources since the last Updating and Screening Assessment in 2009.

3.5 New Developments with Fugitive or Uncontrolled Sources

NHDC has not identified any new fugitive or uncontrolled sources since the last Updating and Screening Assessment in 2009.

4. Local Air Quality Strategy

NHDC is a member of the Hertfordshire and Bedfordshire Air Quality Network (<u>http://www.hertsbedsair.org.uk/hertsbeds/asp/home.asp</u>) which participates in the air alert programme (<u>http://www.airalert.info/HertsBeds/</u>).

NHDC does not have a Local Air Quality Strategy.

5. Planning Applications

The following sites are significant developments that have recently been permitted.

•	Hitchin Rail Curve, Hitchin	2.265km of electrified single track railway
---	-----------------------------	---

 Land of Coombelands, Royston
 59 residential unit development comprising 11 flats and 48 houses

The following sites are significant developments that are underway.

•	Paynes Park, Hitchin	148 residential unit development comprising 132 flats and 16 houses.
•	Pixmore Avenue, Letchworth	250 residential unit development comprising 109 flats and 141 houses
•	Ivy Farm, Baldock Road Royston	81 residential unit development, all houses

The Hitchin Rail Curve development has been considered in Section 3.1 of this report.

The Paynes Park development is in an area that has been identified in Section 2.2 as requiring a Detailed Assessment.

The other developments may result in traffic on local roads increasing but they are qualitatively assessed as unlikely to result in a significant impact upon air quality.

6. Air Quality Planning Policies

NHDC has adopted its District Local Plan No. 2 with alterations in 1996. This was in the process of being replaced with a Local Development Framework (LDF) which is a series of documents setting out the statutory development and planning framework for the NHDC. The Development Policies document within this framework proposes a "Protecting Amenity" development policy that is worded as follows:

"We will permit development proposals which do not cause unacceptable harm to the amenity of existing residents, occupiers and surrounding land. Such harm may arise from many sources, including (but not limited to):

- 1. traffic generation
- 2. noise
- 3. overlooking
- 4. pollution (including light pollution) and
- 5. overbearing

Where such harm would be caused, we may permit development if measures are included to mitigate the harm to an acceptable level. Where amenity of proposed developments would be affected by an existing use, the development will need to incorporate measures to mitigate the harm to an acceptable level."

The Development Policies document also proposes a "Transport hierarchy of users" policy that is worded as follows:

"Development that is designed and located to promote fewer and shorter distance journeys, provides quality spaces for people and to accommodate the needs of all modes of travel in accordance with the following priority ordered user hierarchy will be supported:

- 1. Pedestrians, especially the mobility impaired
- 2. Cyclists and where appropriate horse riders
- 3. Passenger transport
- 4. All forms of other motor vehicles

This hierarchy does not suggest that transport modes lower down the list of priority will be ignored when development is designed, rather it requires the needs of those further up the list must be considered first."

7. Local Transport Plans and Strategies

Hertfordshire County Council has recently published its new Local Transport Plan (LTP3) for 2011-2031, which sets out the transport strategy for Hertfordshire (over the next 20 years). The Plan covers all modes of transport including walking, cycling, public transport, car based travel and freight and takes account of the effect of transport on wider aspects including the economy, environment, climate change and social inclusion.

Within NHDC the Hitchin Urban Transport Plan 2011 has recently been adopted and consultation is currently underway on the Letchworth and Baldock Urban Transport Plan 2011.

8. Climate Change Strategies

NHDC published its Climate Change Strategy in June 2009 and it is available on the Council's website.

9. Implementation of Action Plans

NHDC is assessing the need to declare Air Quality Management Areas in four areas of the district in its 2011 Detailed Assessment report $_{(3)}$. However, prior to 2011 no AQMA have been identified and so there has been no need to develop an Action Plan to improve air quality.

10. Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The new monitoring data for 2010 has confirmed the need to undertake a Detailed Assessment of air quality in four areas of the district, with a view to assessing whether to declare Air Quality Management Areas.

Table 8	3: Su	mmary	of Areas v	vith .	Ann	ual	Mea	an C	oncer	ntrations	s reco	rded	abov	e t	he
relevar	nt Ai	r Quality	/ Objective	e											
		_			-							-	-		

Area of Concern and Points	relevant Monitoring	Annual Mean NO ₂ Concentration $(\mu g/m^3)$. AQO for NO ₂ = 40 $\mu g/m^3$
Hitchin Street 8	Tube NH61	43.6
Whiteborge Street	Tube NH72	42.1
Baldock (A505)	Tube NH88	50.7
Daldock (ASUS)	Analyser NH5	32
Cambridge Road	Tube NH83	48.8
Hitchin (A505/B656)	Tube NH84	39.9
Paynes Park & Upper	Tube NH63	44.0
Tilehouse Street	Tube NH77	48.7
Hitchin (A505/A602)	Tube NH82	44.4
	Tube NH45	49.1
Stevenage Road	Tube NH76	42.2
Hitchin (A602)	Tube NH87	54.4
	Analyser NH_trl	52.4

10.2 Conclusions relating to New Local Developments

The construction phase of the approved Hitchin Rail Curve development will result in a reduction in air quality, in terms of NO₂, along Wilbury Hills Road, Letchworth. The extent of the reduction in air quality has been assessed by the applicant as not being significant in respect of exceeding or getting close to exceeding the annual mean average. However, this assessment is based on the following two estimations.

- estimated background NO₂ concentrations in the absence of no actual monitoring data in that area; and
- on the standard practice of predicting NO₂ concentrations using the year adjustment calculator. This calculator is based on the expectation of falling

 NO_2 concentrations, however recent research has indicated that the forecast reductions are not occurring $_{\mbox{\tiny (8)}}.$

There are not expected to be significant reductions in air quality associated with the recently approved applications for housing identified in Section 5. The Paynes Park 148 unit residential development was permitted in 2005 and is nearing completion. This is likely to be of some significance due to its location on the north exit of the Paynes Park (A505)/Upper Tilehouse Street (A602) (Hitchin Library) roundabout.

10.3 Proposed Actions

NHDC is in the process of completing a 2011 Detailed Assessment $_{(3)}$ for the four areas of the district identified as exceeding the annual mean AQO for NO₂ based on the new monitoring data collected during 2009.

Alongside this Detailed Assessment the NHDC diffusion tube network has been adjusted to obtain more data in the following three areas:

- Cambridge Road, Hitchin (A505/B656)
- Paynes Park, Upper Tilehouse St Hitchin (A505/A602)
- Stevenage Road, Hitchin (A602)

Associated with this adjustment of the diffusion tube network is the placement of an automatic NO_2 monitor on the Paynes Park/Upper Tilehouse Street (Hitchin Library) roundabout.

Additionally, the diffusion tube network has been increased by two tubes to enable two tubes to be located along the Wilbury Hills Road. This is being undertaken to provide some baseline data for that area prior to the start of the construction phase of the Hitchin Rail Curve scheme.

11. References

- 1. Defra. 2009. Local Air Quality Management Technical Guidance LAQM.TG(09)
- 2. NHDC. April 2010. LAQM Detailed Assessment Report 2010
- 3. NHDC. April 2011. LAQM Detailed Assessment Report 2011
- 4. NHDC. April 2007. LAQM Detailed Assessment Report 2007
- 5. Bureau Veritas (for NHDC). January 2009. LAQM Progress Report 2008
- 6. Bureau Veritas (for NHDC). June 2009. Updating and Screening Assessment (USA) Report 2009.
- Arup (for Network Rail). September 2009. Hitchin (Cambridge Junction) Environmental Statement. Volume 3. Main Report – Assessment of Environmental Impact (ref. 123448/08/EV/REP/003).
- 8. Kings College London, University of Leeds and AEA (for Defra). 3rd March 2011. Trends in NOx and NO₂ Emissions and Ambient Measurements in the UK.

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

1. Automatic Monitoring

1.1 Calibration

As with most accurate measurement equipment, the APNA 360 and AP1 200A 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 as 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 NOx analyser automatically and stored in the datalogger 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.

Due to the nature of particulate matter and the working of the TEOM, the instrument cannot be calibrated routinely. Quality of the output data is assured by regular servicing and diagnostic of the TEOM by its supplier.

1.2 Rescaling

However, for a host of reasons, analysers such as the APNA 360 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 The Environmental Research Group (ERG) under contract at the Baldock site and by TRL at the Stevenage Road, Hitchin site. ERG is an environmental research body associated with Kings College London and is a non-profit organisation, which runs a number of large monitoring networks such as The Herts and Beds Network. TRL is an environmental consultancy that has a specialism in air quality. Rescaling takes place after every manual calibration to ensure a robust data set.

1.3 Data ratification

Whilst calibration can identify problems with the functioning of NOx analyser, it cannot be relied upon to indicate the responsiveness of the equipment on a day to day basis. Data ratification is basically the examination of the data produced by both the TEOM and NOx analysers on a daily basis and the comparison with other analysers locally to determine whether there is anything unusual about the data generated. Data ratification is conducted by (ERG), under contract for the TEOM and the analyser at Baldock and by TRL for the analyser

at Stevenage Road, Hitchin, to ensure that any isolated fault with either analyser is identified as quickly as possible.

1.4 Servicing

Complex equipment such as the analysers require regular maintenance to ensure that they function reliably. Horiba Ltd is contracted to service the analyser at Baldock, TRL the analyser at Stevenage Road, Hitchin and Suporting U the TEOM on a programmed basis. However, routine inspection and maintenance of the station is a responsibility of North Hertfordshire District Council and takes place every 10 -14 days.

1.5 TEOM – 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 2010 has been corrected using the VCM model by ERG.

2. Diffusion Tubes

2.1 Laboratory Analysis

NHDC undertakes monitoring with non-automatic methods using nitrogen dioxide (NO₂) diffusion tubes at a range of locations across the district. The diffusion tubes are 50% triethanolamine (TEA) in acetone and they 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 for the past five quarterly rounds received a Good rating in both old and new criteria.

2.2 Bias Adjustment

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 April 2011 version of the Diffusion Tube Bias Adjustment Factors spreadsheet available from the Defra Review and Assessment website (http://lagm.defra.gov.uk/bias-adjustment-factors/national-bias.html).

According to the above database the bias adjustment factor for Harwell Scientific Services in 2010 was 0.85.

2.3 Annualisation of Nitrogen Dioxide Data (Automatic & Non-Automatic)

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. Where monitoring is available for less than 6 months it should not be used to draw conclusions on the air quality in an area. The annualisation process is described in Box 3.2 of TG(09) and NHDC's application of it is summarised below.

Site	Annual mean (ugm-3)	Period Mean (ugm-3)	Ratio (ugm-3)
Stevenage, Lytton Way	31	29.1	1.065292096
St Albans, Fleetville	24	22	1.090909091
E.Herts, Sawbridgeworth	31	1.065292096	
	1.07		

Adjustment for Data Collected: March – December 2010

Adjustment for Data Collected: March - November 2010

	Annual mean (ugm-3)	Period Mean (ugm-3)	Ratio (ugm-3)
Stevenage, Lytton Way	31	27	1.148148148
St Albans, Fleetville	24	20.4	1.176470588
E.Herts, Sawbridgeworth	31	27.4	1.131386861
		Average of ratios - R(a)	1.15

Adjustment for Data Collected: June - December 2010

	Annual mean (ugm-3)	Period Mean (ugm-3)	Ratio (ugm-3)
Stevenage, Lytton Way	31	30	1.033333333
St Albans, Fleetville	24	22	1.090909091
E.Herts, Sawbridgeworth	31	1.061643836	
	Average of ratios - R(a)	1.06	

Adjustment for Data Collected: July – December 2010

	Annual mean (ugm-3)	Period Mean (ugm-3)	Ratio (ugm-3)
Stevenage, Lytton Way	31	31.9	0.971786834
St Albans, Fleetville	24	23.2	1.034482759
E.Herts, Sawbridgeworth	31	30.4	1.019736842
		Average of ratios - R(a)	1.01

Adjustment for Data Collected: April - December 2010

	Annual mean (ugm-3)	Period Mean (ugm-3)	Ratio (ugm-3)
Stevenage, Lytton Way	31	28.9	1.07266436
St Albans, Fleetville	24	21.5	1.11627907
E.Herts, Sawbridgeworth	31	28.7	1.080139373
		Average of ratios - R(a)	1.09



Appendix 2: Site Location Maps for Diffusion Tube Network





















Appendix 3: Diffusion Tube Data

Code	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave	Annualised	Bias
NH06	Town Hall, Royston	90.0	59.0	57.0	50.0	47.0		40.6		49.6				48.8	insufficient	data
NH09	Grosvenor Road, Baldock			36.0	32.0	24.0	27.2	28.9	27.6	36.5	44.0	42.0	48.0	34.6	no need	29.4
NH34	Gwynfa Close, Danesbury		65.0	35.0	53.0	45.6	44.8	46.3	37.4	44.3	54.0	58.0	66.0	48.4	no need	41.2
NH45	Stevenage Road A, Hitchin		62.0	70.0	53.0		36.9	45.7	42.7	60.1	72.0	76.0	64.0	57.8	no need	49.1
NH59	(NH04a) Clothall Road, Baldock	53.0	43.0	40.0	36.0	30.6	33.9	29.6	29.7	31.4	45.0	49.0	54.0	37.9	no need	32.2
NH60	(NH13a) Willian Road, Hitchin			37.0	48.0	42.8	40.5	33.7		36.9	51.0	53.0	58.0	44.5	no need	37.9
NH61	(NH53a)Whitehorse St, Baldock (nr town hall)			52.0	57.0	48.4		35.0	33.6	47.0		55.0	54.0	47.8	51.3	43.6
NH62	(NH54a) London Road, Knebworth			26.0	22.0	18.2	15.8	24.0		30.5	40.0	42.0	52.0	30.1	no need	25.5
NH63	(NH02a) Library Hitchin		47.0	52.0	49.0		38.5	43.2	37.2	51.2	61.0	67.0	67.0	51.8	no need	44.0
NH64	(NH03a) Letchworth Gate		61.0	50.0	54.0	49.3	33.9	31.2	29.7	41.6	60.0	65.0	61.0	47.6	no need	40.4
NH66	Meadowbank, Hitchin	70.0	38.0	49.0	33.0	21.2		28.1	24.5	37.8	40.0	45.0	48.0	36.3	no need	30.8
NH67	Cadwell Court, Hitchin	80.0	45.0	40.0	38.0	35.5	27.4	27.0	28.5	40.0	47.0	54.0	56.0	39.3	no need	33.4
NH68	40 Byron Close, Hitchin			40.0	37.0	20.6	24.1	25.8	24.0	30.7	42.0	47.0	51.0	34.2	no need	29.1
NH69	64 Grove Road, Hitchin			43.0	42.0	31.0		25.5	28.1	39.6	50.0	54.0		39.2	45.1	38.3
NH70	Nr Bus Stop Hitchin Street Baldock	49.0	37.0	40.0	36.0	29.4	24.7	29.1	27.2	36.8	42.0	49.0	49.0	36.3	no need	30.9
NH71	Puddleducks Hitchin St Baldock	53.0	43.0	33.0	34.0	46.7	25.7	23.9	24.2	32.9	43.0	45.0	53.0	36.1	no need	30.7
NH72	Opp Rose Crown, Whitehorse Street, Baldock	61.0	50.0	47.0	41.0	34.0		33.8		47.9	53.0	52.0	60.0	46.1	49.5	42.1
NH73	os Satchells, High Street, Baldock	46.0	37.0	36.0	28.0	24.4	24.7	29.8	27.1	36.8	44.0	42.0	49.0	34.2	no need	29.1
	Near UnRef Church, Whitehorse Street,															
NH75	Baldock	56.0	52.0	49.0	39.0	29.5	27.5		27.1	42.8	49.0	52.0	51.0	40.8	no need	34.7
NH76	Dower Court, Hitchin	85.0	54.0	33.0	51.0	48.9	48.4	38.1	42.3	37.8	59.0	64.0	74.0	49.7	no need	42.2
NH77	Upper Tilehouse Street, Hitchin (traffic lights)	97.0	60.0	57.0	63.0	53.1	44.9		43.4	55.7	66.0	68.0	65.0	57.3	no need	48.7
NH78	West Hill, Hitchin			44.0	49.0	33.1	27.8	27.0	28.0	31.5	51.0	57.0	61.0	40.9	no need	34.8
NH80	Waysbrook, Near Letchworth Gate		38.0	26.0	28.0	18.2	15.8	13.4	15.7	25.3	34.0	48.0	52.0	27.6	no need	23.5
NH81	Morrisons, Baldock Street, Royston	68.0	38.0	34.0	32.0	29.0	25.6	22.1	22.3	31.8	42.0	45.0	52.0	33.6	no need	28.5
NH82	Upper Tilehouse Street, Nr Roundabout	92.0	59.0	55.0	54.0	27.7	46.0	46.1	44.1	52.9	60.0	64.0	72.0	52.2	no need	44.4
NH83	Hitchin Station, Roundabout A	98.0	65.0	41.0	50.0	47.8	45.0	41.9		41.9	63.0	68.0		49.8	57.4	48.8
NH84	Hitchin Station, Roundabout B	97.0	58.0	49.0	46.0	46.4	40.7	36.0	40.3	33.7	55.0	59.0	63.0	46.9	no need	39.9
NH85	Weston Way, Baldock	50.0	42.0	41.0	33.0	25.3	28.6	35.1		43.2	48.0	51.0	54.0	39.9	no need	33.9
NH86	Walsworth Rd, Hitchin (Nr Station)	х	х	х	х		25.4	28.2		32.7	44.0	50.0	51.0	38.6	40.9	34.8
NH87	Stevenage Road B, Hitchin	х	Х	Х	Х		61.4	60.5	53.4	57.3	45.0	71.0	73.0	60.2	64.0	54.4
NH88	Church St, Baldock (Opp. Town Hall)	х	Х	Х	Х			50.9	43.6	59.4	67.0	68.0	66.0	59.2	59.7	50.7
KEY	x = no tubes designated in that location	blank	no tubes designated in that location blank = tube missing when due for collection													

Jan/Feb data considered unreliable Bias (as at April 2011) = 0.85

Appendix 4: Fall off in Nitrogen Dioxide Concentrations with Distance from Road

Stevenage Road (A), Hitchin - NH45

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	2
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	21
Step 3	What is the local annual mean background NO ₂ concentration (in μ g/m ³)?	(Note 2)	13.57953
Step 4	What is your measured annual mean NO ₂ concentration (in μ g/m ³)?	(Note 2)	49.1
Result	The predicted annual mean NO ₂ concentration (in μ g/m ³) at your receptor	(Note 3)	29.5
	Stevenage Road (B), Hitchin – NH87		
		(Nists	

Step 1	How far from the KERB was your measurement made (in metres)?	1)	3
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	18
		(Note	
Step 3	What is the local annual mean background NO ₂ concentration (in μ g/m ³)?	2)	13.57953
		(Note	
Step 4	What is your measured annual mean NO ₂ concentration (in μ g/m ³)?	2)	54.4
		(Note	
Result	The predicted annual mean NO ₂ concentration (in μ g/m ³) at your receptor	3)	35.5

Upper Tilehouse Street, Hitchin – NH82

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.5
· · ·		,	L
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	8.5
Step 3	What is the local annual mean background NO ₂ concentration (in μ g/m ³)?	(Note 2)	14.6842
Step 4	What is your measured annual mean NO ₂ concentration (in μ g/m ³)?	(Note 2)	44.4
Result	The predicted annual mean NO ₂ concentration (in μ g/m ³) at your receptor	(Note 3)	33.1
	<u>Upper Tilehouse Street, Hitchin – NH77</u>		
Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.5
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	6.5
Step 3	What is the local annual mean background NO ₂ concentration (in μ g/m ³)?	(Note 2)	14.6842
Step 4	What is your measured annual mean NO ₂ concentration (in μ g/m ³)?	(Note 2)	48.7
Result	The predicted annual mean NO ₂ concentration (in μ g/m ³) at your receptor	(Note 3)	37.8

Cambridge Road, Hitchin - NH83

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.3
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	13.3
Step 3	What is the local annual mean background NO ₂ concentration (in μ g/m ³)?	(Note 2)	14.6842
Step 4	What is your measured annual mean NO ₂ concentration (in μ g/m ³)?	(Note 2)	48.8
Result	The predicted annual mean NO ₂ concentration (in μ g/m ³) at your receptor	(Note 3)	31.9

Gwynfa Way, Welwyn - NH34

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	0.5
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	32
Step 3	What is the local annual mean background NO $_2$ concentration (in μ g/m ³)?	(Note 2)	11.1383
Step 4	What is your measured annual mean NO ₂ concentration (in μ g/m ³)?	(Note 2)	41.2
Result	The predicted annual mean NO ₂ concentration (in μ g/m ³) at your receptor	(Note 3)	19.1