



2014 Air Quality Progress Report for Welwyn Hatfield Borough Council

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

May 2014

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Executive Summary

The role of the local authority Review and Assessment process is to identify any relevant areas where it is considered that the government's air quality objectives for relevant air pollutants will be exceeded. The Welwyn Hatfield Borough Council has previously undertaken the earlier rounds of Review and Assessment of local air quality management and not needed to designate any part of its area as an Air Quality Management Area as none of the objectives have been exceeded where relevant public exposure is present.

This report concerns the 2013 Air Quality Progress Report in the Welwyn Hatfield Borough Council area and has re-examined pollution sources in the area in accordance with Defra LAQM guidance (released February 2009). The data period covered is 1st January 2013 – 31st December 2013.

The report identifies that:

Measured air quality within Welwyn Hatfield is currently below the set objectives at all of the monitored sites and therefore currently meets the national standards. Therefore, no detailed assessments are required at this stage.

The Council has not declared an Air Quality Management Area. Despite this we have identified that there is a need to expand upon the monitoring that is currently being undertaken. The authority is currently updating the district plan and within that has developed a core strategy consisting of land for housing outside of urban areas. This strategy proposes a number of new housing developments with a target date of 2020.

In last year's report we identified that we needed to expand our monitoring areas in line with our core strategy. We have followed through with this plan by locating 16 new diffusion tubes across the borough. Locations have been relevant to any proposed developments. At this stage we have over 6 months of data but not a full year so we are unable to report a yearly result on the newly located sites. The results for the newly located tubes have been biased adjusted regardless of the fact that we do not have a full years worth of data.

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1 Introduction

1.1 Description of Local Authority Area

The Borough of Welwyn Hatfield is located in southern Hertfordshire and covers the two towns of Welwyn Garden City and Hatfield, along with numerous smaller settlements and rural areas. Both towns, set within the London green belt, still retain their own identities. Welwyn Garden City has a famous heritage being a Garden City and designated New Town. Both towns also act as dormitories for residents who work in London.

The total area covered by the Council is just over 129km², with a population of approximately 108,300 (2008 estimate). The main employment in the area is service related, although there is some industry. Each of the towns has a railway station on the East Coast Main Line and they are close to the A1 road for access to London and the rest of the country via road.

There are a few minor industrial processes that are regulated by the Council and three larger industrial processes regulated by the Environment Agency (including a waste transfer site) in the Council's area.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the 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 LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m ³	Running annual mean	31.12.2003
	5.00 µg/m ³	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m ³	Annual mean	31.12.2004
	0.25 µg/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM₁₀) (gravimetric)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

The Council undertook previous rounds of Review and Assessment of air quality. The main issue with respect to local air quality was found to be road traffic emissions (NO₂ and PM₁₀) emanating from vehicles, but it was considered that the air quality objectives would be met where there was relevant exposure and that it was not necessary to designate an Air Quality Management Area (AQMA) in the Borough.

The conclusions from the 2011 progress report were: The monitoring undertaken with sufficient data capture within the Borough confirmed that the annual mean nitrogen dioxide objective has not been exceeded.

A new monitoring site was established at Lockleys in March 2010 this site has produced high readings but has only been established for 8 months.

The update and screen assessment undertaken in 2012 concluded the following: In 2011 the Council monitored at one location continuously and 6 other locations across the Borough using diffusion tubes. The monitoring results within the Borough confirmed that the annual mean nitrogen dioxide objective was not exceeded at roadside and background locations where there is relevant exposure.

The progress report in 2012 concluded the following:

Monitoring results show that we do not have any exceedances in the air quality objectives at this current time. In the past we have had issues with equipment malfunctions and people stealing diffusion tubes because they were not adequately secured. The past two years have seen a change and we have been able to establish a regular amount of data capture. The diffusion tubes are now secured properly so data capture has increased significantly.

Looking at the data for our automatic monitors the levels have decreased in recent years. We are making efforts to try and relocate the analysers to a more appropriate location. We are currently trying to seek funding to enable us to do this. The intention, if the funds allow would be to relocate the analyser to a relevant exposure site. Our current site is not presenting a relevant exposure at this present time due to the height at which it is located. Looking ahead, the analysers will stay in their current location but we would like to change this in the coming years.

The bias adjusted diffusion tube results have remained relatively constant apart from one location, being the New Barnfield site. There has been a marked increase at this location during 2012. We believe this to be a direct result of increased HGV traffic flows which has a direct effect on the monitoring location as the diffusion tube is at the kerbside. However, the location does not provide a relative exposure because there are no houses in close proximity. Our intention is to introduce another diffusion tube in the local area which will give a relative exposure level so we can gather capture more data.

Based on these findings from monitoring in the Borough, the Council does not need to undertake a Detailed Assessment as no new potential or actual exceedences at relevant locations were established.

This report follows the technical guidance (TG09) produced for this round of Review and Assessment. It therefore fulfils this part of the continuing LAQM process.

The results, from following this methodology, are that the Council has not identified an additional risk of the air quality objectives for the LAQM pollutants: nitrogen dioxide, particles (PM₁₀) carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide, being exceeded anywhere in the Council's area. Thus the Council need not proceed beyond the updating and screening assessment for these pollutants.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

The Council operates a continuous site at the Council Offices in Welwyn Garden City monitoring oxides of nitrogen (including nitrogen dioxide) and Ozone. The site was opened in 1998 and is classified as an urban background site. We are part of the Herts and beds air quality network. <http://www.hertsbedsair.net/> Data can be obtained from the website. The automatic analysers are serviced every six months by Enviro Technology*.

We use Air Quality Data Management to handle and process the data for us. They undertake the following process:

*It must be noted that the maintenance contract with Enviro Technology was not renewed in April 2014. We are currently in the process of making changes the automatic analysers which will be detailed later in the report.

Validation

This process operates on data during the data collection stage. All data are continually screened algorithmically and manually for anomalies. There are several techniques designed to discover spurious and unusual measurements within a very large dataset. These anomalies may be due to equipment failure, human error, power failures, interference or other disturbances Automatic screening can only safely identify spurious results that need further manual investigation.

Raw data from the gaseous instruments (e.g. NO_x, O₃, SO₂ and CO) are scaled into concentrations using the latest values derived from the manual and automatic calibrations. These instruments are not absolute and suffer drifts. Both the zero baseline (background) and the sensitivity change with time. Regular calibrations with certified gas standards are used to measure the zero and sensitivity. However, these are only valid for the moment of the calibration since the instrument will continue to drift. Raw measurements from particulate instruments (e.g. PM₁₀ and PM_{2.5}) generally do not require scaling into concentrations. The original raw data are always preserved intact while the processed data are dynamically scaled and edited.

Ratification

This is the process that finalises the data to produce the measurements suitable for reporting. All available information is critically assessed so that the best data scaling is applied and all anomalies are appropriately edited. Generally this operates at three, six or twelve month intervals. However, unexpected faults can be identified during the instrument routine services or independent audits which are often at 6-monthly intervals. In practice, therefore, the data can only be fully ratified in 12-month or annual periods. The data processing performed during the three and six monthly cycles helps build a reliable dataset that is finalised at the end of the year.

There is a diverse range of additional information that can be essential to the correct understanding and editing of data anomalies. These may include

- the correct scaling of data
- ignoring calibrations that were poor e.g. a spent zero scrubber
- closely tracking rapid drifts or eliminating the data
- comparing the measurements with other pollutants and nearby sites
- corrections due to span cylinder drift
- corrections due to flow drifts for the particulate instruments
- corrections for ozone instrument sensitivity drifts
- eliminating measurements for NO₂ conversion inefficiencies
- eliminating periods where calibration gas is in the ambient dataset
- identifying periods where instruments are warming-up after a powercut
- identification of anomalies due to mains power spikes
- correcting problems with the date and time stamp
- observations made during the sites visits and services

The identification of data anomalies, the proper understanding of the effects and the application of appropriate corrections requires expertise gained over many years of operational experience. Instruments and infrastructure can fail in numerous ways that significantly and visually affect the quality of the measurements. There are rarely simple faults that can be discovered by computer algorithms or can be understood without previous experience.

Further information about air quality data management, expert data ratification and examples of bad practices are given on the Air Quality Data Management (AQDM) website <http://www.aqdm.co.uk>.

Figure 2.1 Map(s) of Automatic Monitoring Sites (if applicable)

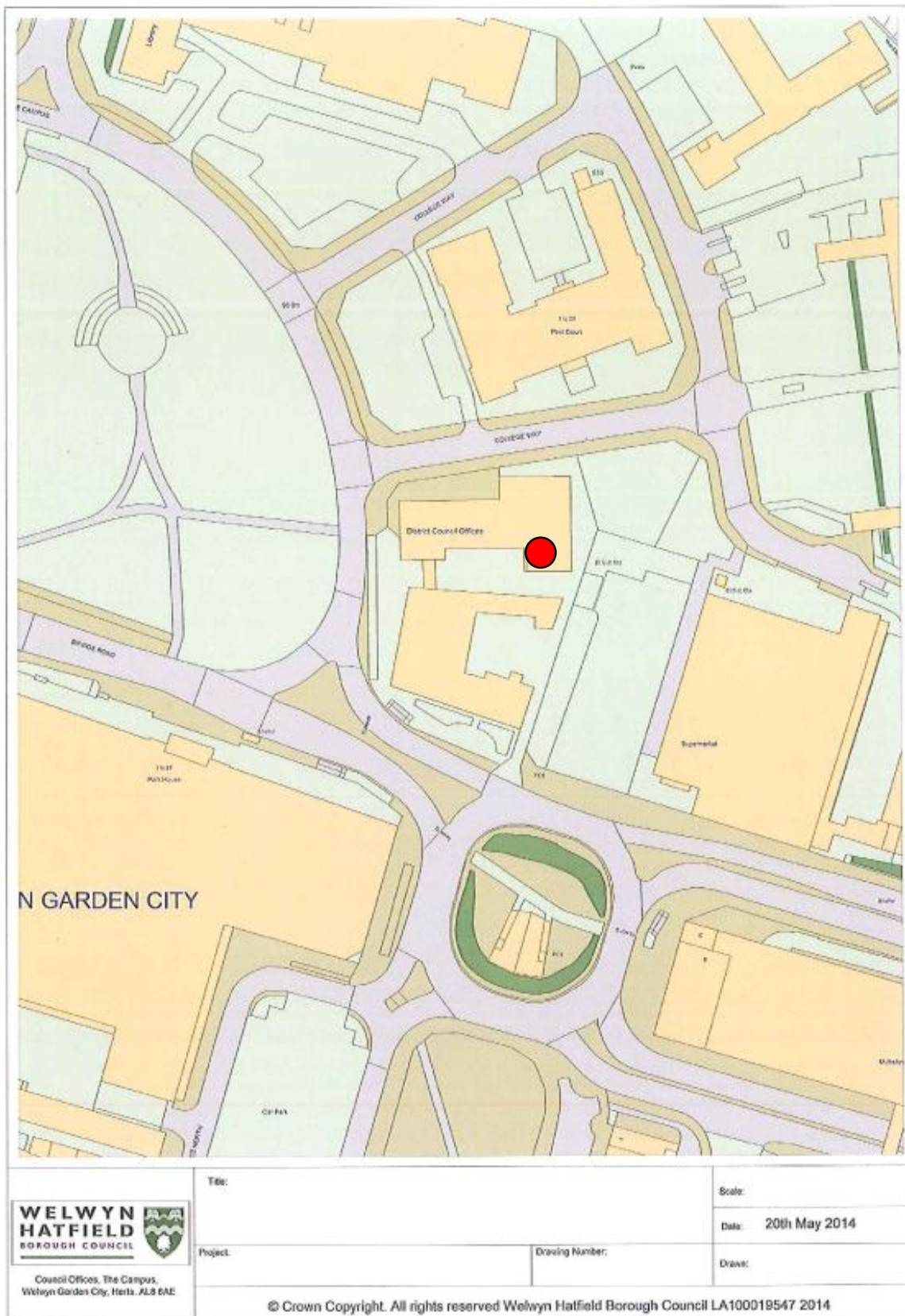


Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
WH1	Council offices	Urban background	523852	213228	Approx 10m	NO2,03	N	FDMS	N	20m	N

Non-Automatic Monitoring Sites

The Council undertakes the monitoring of nitrogen dioxide (NO₂) using non-continuous methods of measurement.

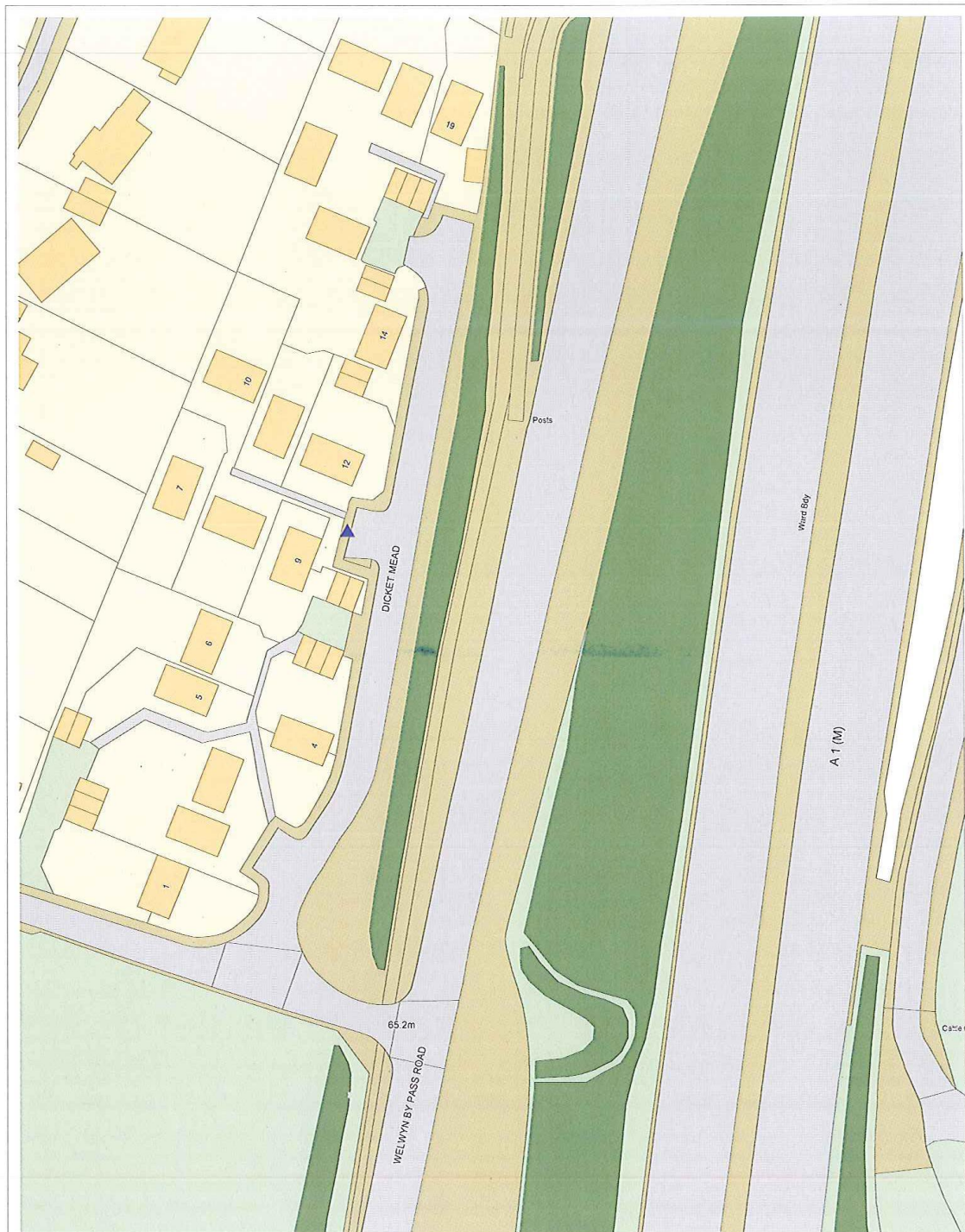
The NO₂ diffusion tubes are exposed at 16 locations. A co-location study has not been undertaken. The details of the monitoring sites are provided in Table 2.2. The monitoring point at Lockleys in Welwyn was established in March 2010.

Monitoring using diffusion tubes has advantages over continuous monitoring in that it is far cheaper and therefore more sites can be established and assessed. The main disadvantage is that the method is less precise and accurate than continuous monitoring. The recommended methods to reduce these errors include the use of good QA/QC practices and bias adjustment factors that are derived from co-location studies between continuous analysers and diffusion tubes.

The bias adjustment factor for each year reported has been obtained from the default bias adjustment factors (based on the April 2014 spreadsheet derived from the government's Review and Assessment website). The default factors are based on statistical analyses of reported data provided by other local authorities. The factors used for all years indicate that the diffusion tube results over estimate continuously monitored concentrations

Map(s) of Non-Automatic Monitoring Sites (if applicable)

WH1 Dicket Mead, Welwyn (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Project:

Scale:

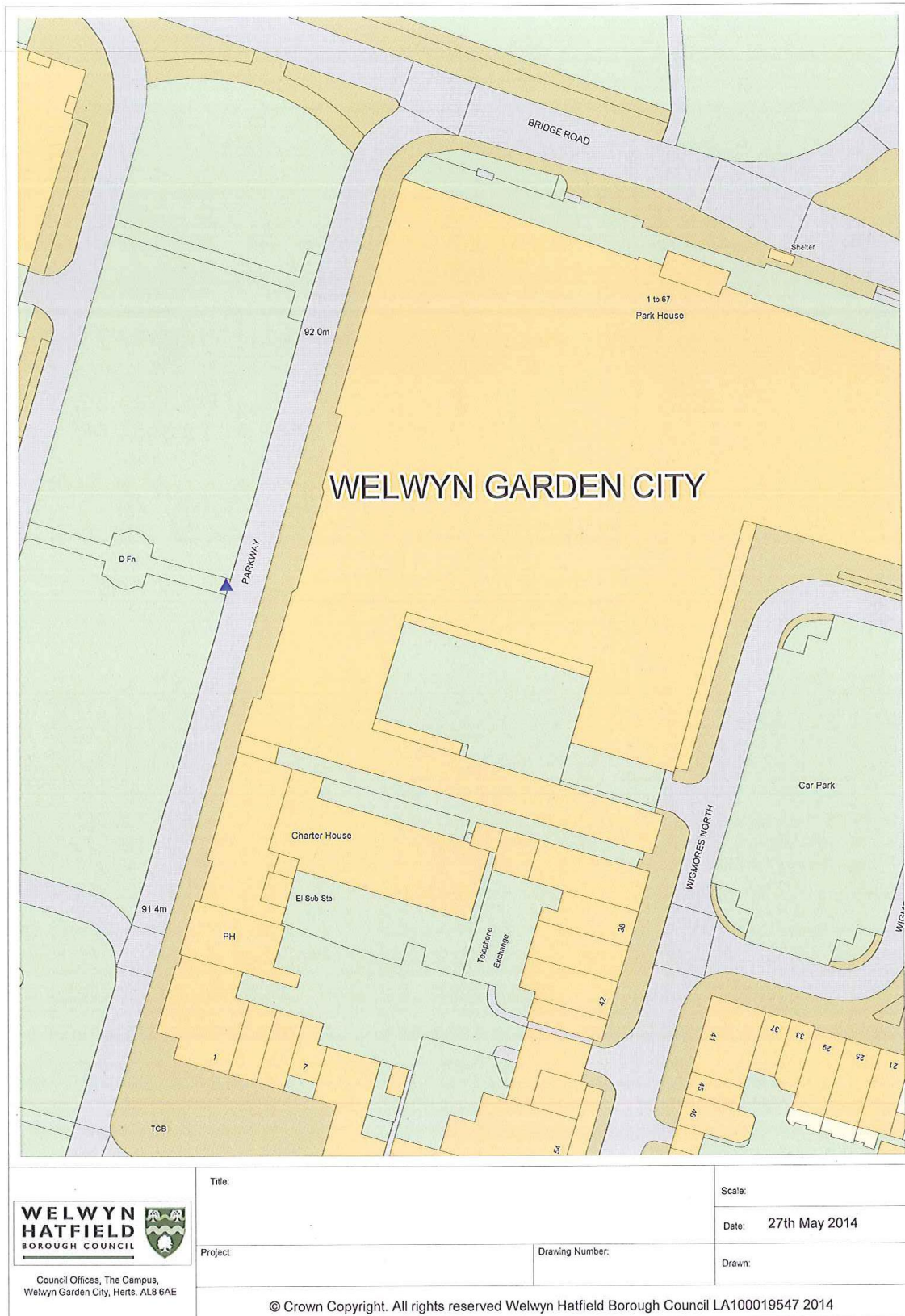
Date: 27th May 2014

Drawing Number:

Drawn:

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WH2 Parkway, Welwyn Garden City (Urban Background)



WH3 Great North Road, Bell Bar (Kerbside)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Scale:

Date: 27th May 2014

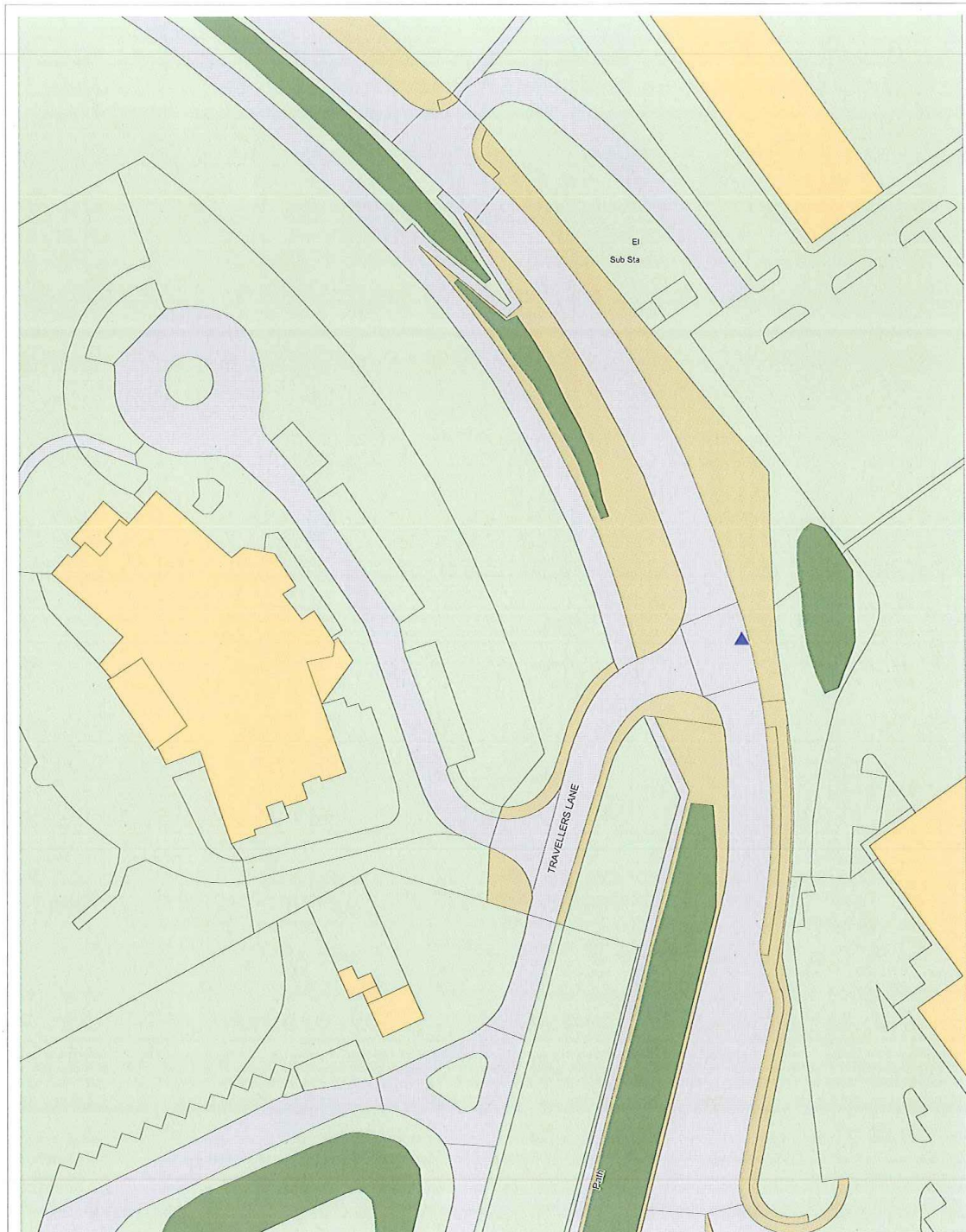
Project:

Drawing Number:

Drawn:

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WH4 New Barnfield, Hatfield (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Scale:

Date: 27th May 2014

Project:

Drawing Number:

Drawn:

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WH5 Coopers Lane Road, Northaw (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Scale:

Date: 27th May 2014

Project:

Drawing Number:

Drawn:

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WH6 Bradgate, Cuffley (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Scale:

Date: 27th May 2014

Project:

Drawing Number:

Drawn:

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WH7 Parkhouse Court, Hatfield (Urban Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Scale:

Date: 27th May 2014

Project:

Drawing Number:

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WH8 Far End, Hatfield (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

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Drawing Number:

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WH9 Mount Pleasant Close, Hatfield (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Scale:

Date: 27th May 2014

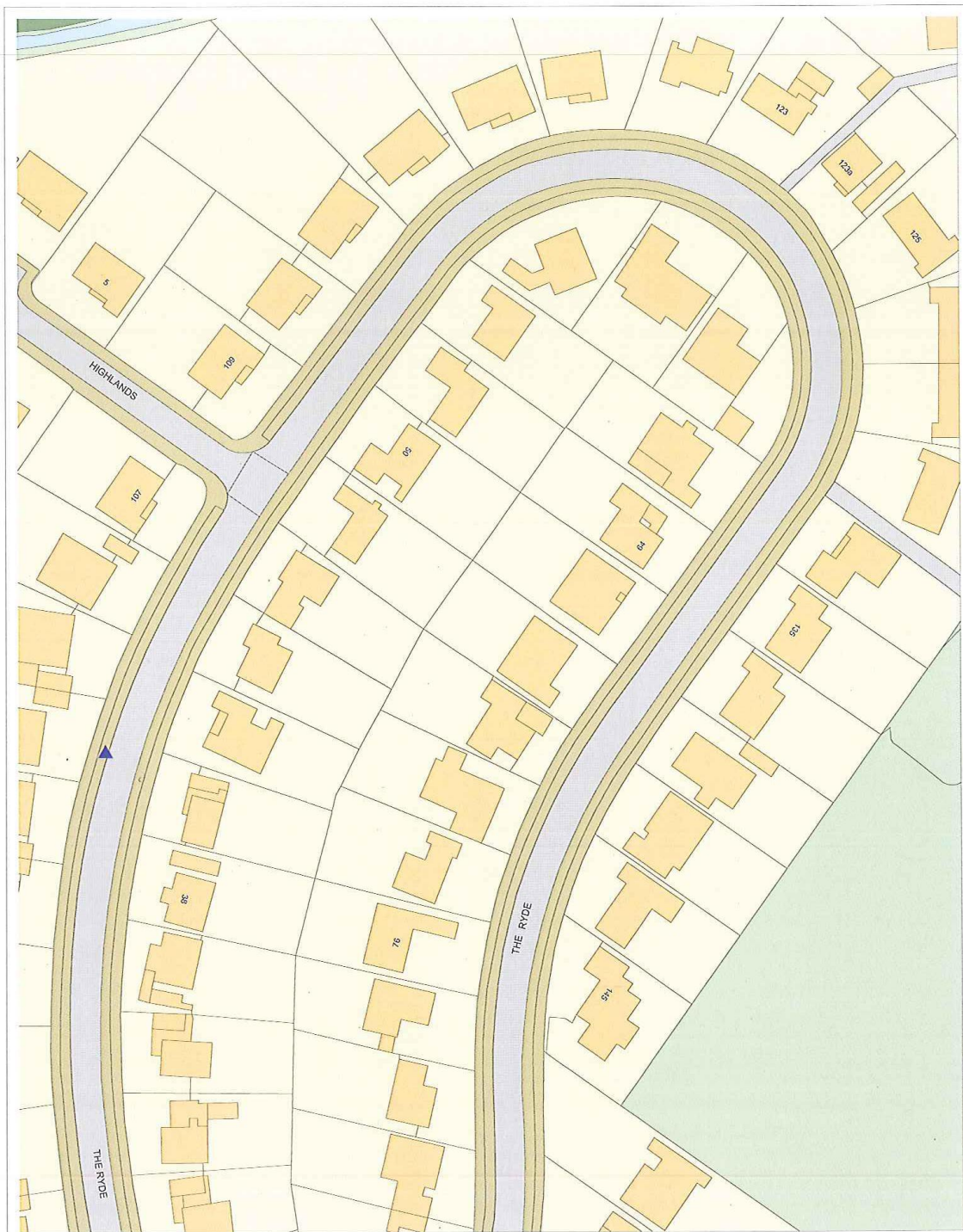
Project:

Drawing Number:

Drawn:

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WH10 The Ryde, Hatfield (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Scale:

Date: 27th May 2014

Project:

Drawing Number:

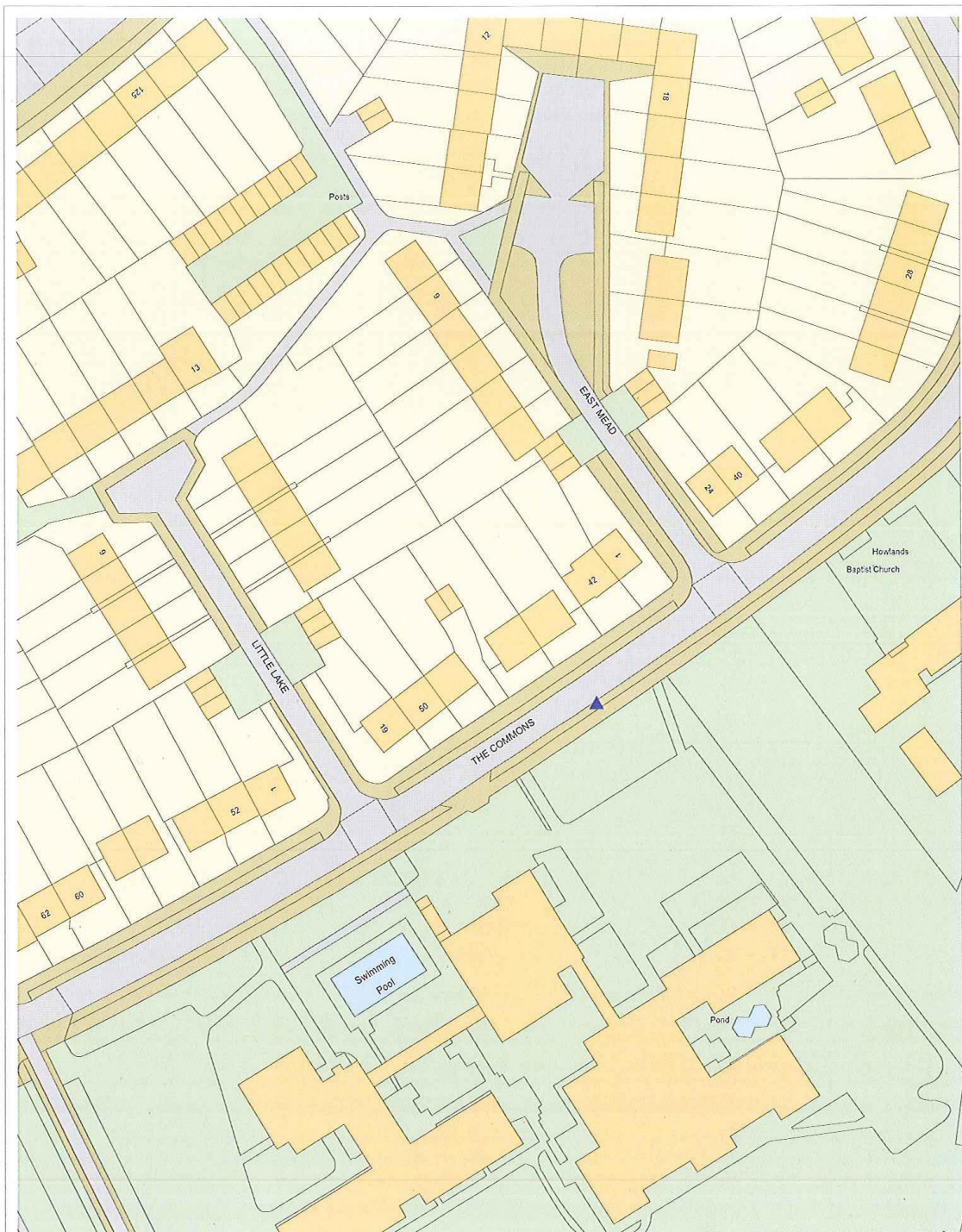
Drawn:

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WH11 Thistle Grove, WGC (Background)



WH12 The Commons, WGC (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL9 6AE

Title:

Scale:

Date: 27th May 2014

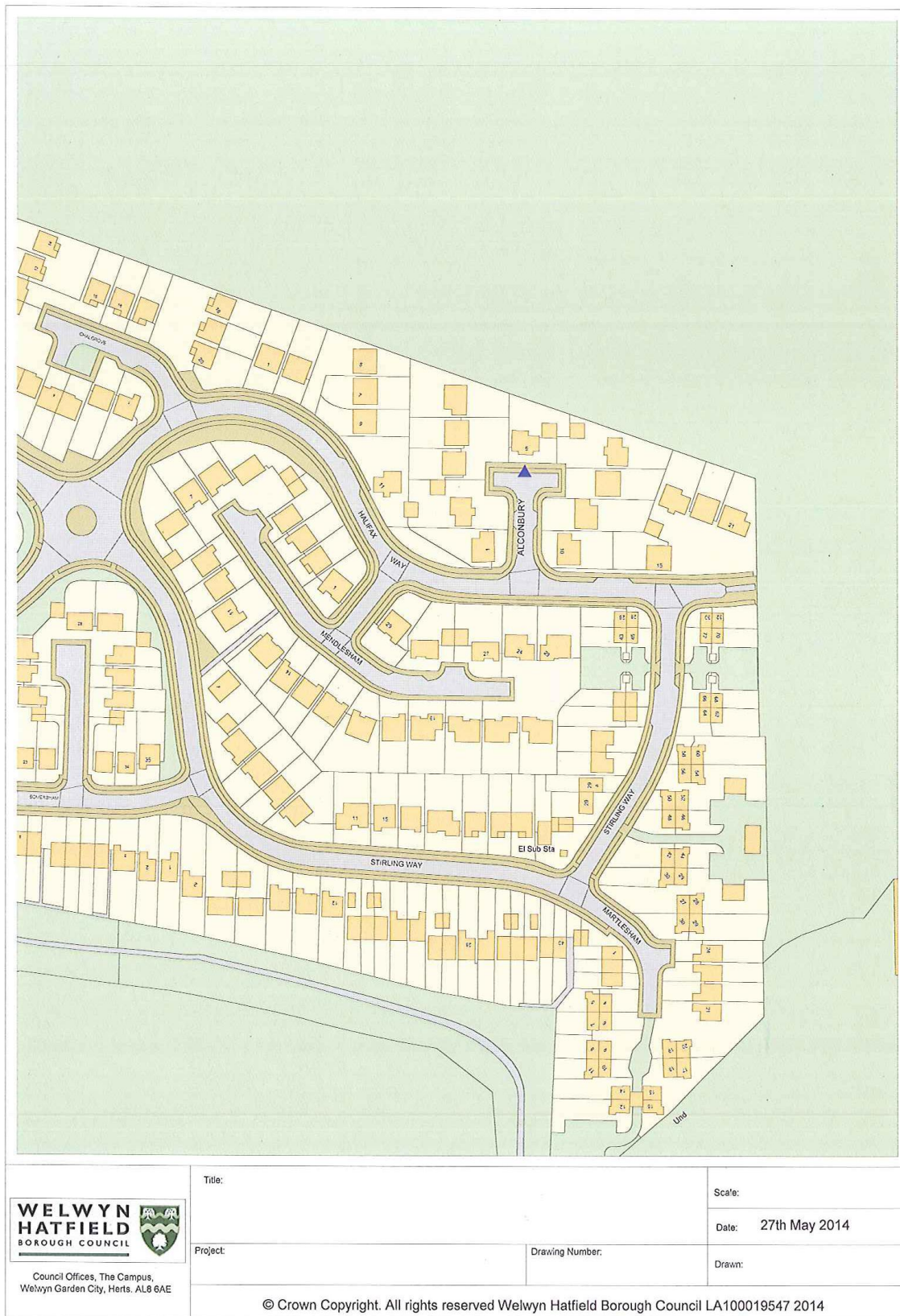
Project:

Drawing Number:

Drawn:

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WH13 Alconbury, WGC (Background)



WH14 Green Lanes, Hatfield (Kerbside)



WH15 Great North Road, Hatfield (Background)



Council Offices, The Campus,
Welwyn Garden City, Herts. AL8 6AE

Title:

Scale:

Date: 27th May 2014

Project:

Drawing Number:

Drawn:

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WH16 The Runway, Hatfield (Background)



Table 2.2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
WH1	Dicket Mead, Welwyn	Background	523442	216316	2.5	NO ₂	N	N	Y (1m)	2m	Y
WH2	Parkway, WGC	Urban background	523656	213133	2.5	NO ₂	N	N	N	2m	N
WH3	Great North Rd, Bell Bar	Kerbside	524991	205525	2.5	NO ₂	N	N	N	2m	N
WH4	New Barnfield, Hatfield	Background	522863	206489	2.5	NO ₂	N	N	N	1m	N
WH5	Coopers Lane Road, Northaw	Background	529402	200929	2.5	NO ₂	N	N	N	1m	N
WH6	Bradgate, Cuffley	Background	529933	203654	2.5	NO ₂	N	N	Y(13m)	1m	N
WH7	Parkhouse Court, Hatfield	Urban Background	521575	208645	2.5	NO ₂	N	N	Y(20m)	2m	Y
WH8	Far End, Hatfield	Background	522609	206718	5.5	NO ₂	N	N	Y(20m)	1m	Y

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Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
WH9	Mount Pleasant Close, Hatfield	Background	523519	209890	2.5	NO ₂	N	N	Y(10m)	2m	Y
WH10	The Ryde, Hatfield	Background	523377	209858	2.5	NO ₂	N	N	Y(10m)	2m	Y
WH11	Thistle Grove, WGC	Background	526249	211617	2.5	NO ₂	N	N	Y(7m)	1m	N
WH12	The Commons, WGC	Background	525852	211187	2.5	NO ₂	N	N	Y(15m)	1m	N
WH13	Alconbury, WGC	Background	527150	212966	2.5	NO ₂	N	N	Y(7m)	1m	Y
WH14	Green Lanes, Hatfield	Kerbside	522013	209707	2.5	NO ₂	N	N	Y(13m)	2m	Y
WH15	Great North Road, Hatfield	Background	522604	210859	2.5	NO ₂	N	N	Y(30m)	2m	Y

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Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
WH16	The Runway, Hatfield	Background	521052	208998	2.5	NO ₂	N	N	Y(10m)	2m	N

2.2 Comparison of Monitoring Results with Air Quality Objectives

The Council opened its continuous site at its offices in 1998. The site is classified as a background site and the results are shown in Table 2.3 and table 2.4. The annual and hourly mean concentrations for this period are below the objective.

Since 2011 we have had consistent capture at all of our current sites. The bias adjusted annual mean showed that there had been a marked increase at the New Barnfield site in 2013. As a direct result of this last June we introduced another monitoring location nearby (Far End) that represents a more relevant exposure.

There has been a previous monitoring location at Lockley's Welwyn which showed high bias adjusted results after 8 months of monitoring. However, we had to move the location of the tube as we had received complaints from a local resident regarding air quality and it was deemed that this location was more representative of relevant exposure. We will consider monitoring at Lockleys again to obtain a true background level.

2.2.1 Nitrogen Dioxide (NO₂)Table 2.3 Results of Automatic Monitoring for NO₂: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period (2013)%	Valid Data Capture 2012 % ^b	Annual Mean Concentration (µg/m ³)				
					2009* ^c	2010* ^c	2011* ^c	2012* ^c	2013 ^c
WH1	Urban Background	N	99.3	94	29	31	25	26	24

In bold, exceedence of the NO₂ annual mean AQS objective of 40µg/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 six months the maximum data capture for the full calendar year would be 50%)

^c Means should be “annualised” as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), if valid data capture is less than 75%

* Annual mean concentrations for previous years are optional

Table 2.4 Results of Automatic Monitoring for NO₂: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % ^a	Valid Data Capture 2012 % ^b	Number of Hourly Means > 200µg/m ³				
					2009* ^c	2010* ^c	2011* ^c	2012* ^c	2013 ^c
WH1	Urban Background	N	99.3	94	0	0	0	0	0

In bold, exceedence of the NO₂ hourly mean AQS objective (200µg/m³ – not to be exceeded more than 18 times per year)

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

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

^c If the data capture for full calendar year is less than 90%, include the 99.8th percentile of hourly means in brackets

* Number of exceedences for previous years is optional

Table 2.5 Results of NO₂ Diffusion Tubes 2013

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months)	2013 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) – Bias Adjustment factor = $(^{0.80})$
WH1	Dicket Mead, Welwyn	Background	N	N	12	27
WH2	Parkway, Welwyn Garden City	Urban Background	N	N	12	27
WH3	Great North Road, Bell Bar	Kerbside	N	N	12	30
WH4	New Barnfield	Background	N	N	12	34
WH5	Coopers Lane Road, Northaw	Background	N	N	12	24
WH6	Bradgate, Cuffley	Background	N	N	11	20
WH7	Parkhouse Court, Hatfield	Urban Background	N	N	7	34
WH8	Far End, Hatfield	Background	N	N	7	23
WH9	Mount Pleasant Close, Hatfield	Background	N	N	6	23

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months)	2013 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) – Bias Adjustment factor = $(^{0.80})$
WH10	<i>The Ryde, Hatfield</i>	<i>Background</i>	<i>N</i>	<i>N</i>	<i>7</i>	<i>25</i>
WH11	<i>Thistle Grove, WGC</i>	<i>Background</i>	<i>N</i>	<i>N</i>	<i>7</i>	<i>21</i>
WH12	<i>The Commons, WGC</i>	<i>Background</i>	<i>N</i>	<i>N</i>	<i>5</i>	<i>21</i>
WH13	<i>Alconbury, WGC</i>	<i>Background</i>	<i>N</i>	<i>N</i>	<i>7</i>	<i>18</i>
WH14	<i>Green Lanes, Hatfield</i>	<i>Kerbside</i>	<i>N</i>	<i>N</i>	<i>7</i>	<i>34</i>
WH15	<i>Great North Road, Hatfield</i>	<i>Background</i>	<i>N</i>	<i>N</i>	<i>6</i>	<i>19</i>
WH16	<i>The Runway, Hatfield</i>	<i>Background</i>	<i>N</i>	<i>N</i>	<i>6</i>	<i>26</i>

In bold, exceedence of the NO₂ annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

Underlined, annual mean > 60 $\mu\text{g}/\text{m}^3$, indicating a potential exceedence of the NO₂ hourly mean AQS objective

^a Means should be “annualised” as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), if full calendar year data capture is less than 75%

^b If an exceedence is measured at a monitoring site not representative of public exposure, NO₂ concentration at the nearest relevant exposure should be estimated based on the “NO₂ fall-off with distance” calculator (<http://laqm.defra.gov.uk/tools-monitoring-data/no2->

[falloff.html](#)), and results should be discussed in a specific section. The procedure is also explained in [Box 2.3 of Technical Guidance LAQM.TG\(09\)](#) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=30>).

Table 2.6 Results of NO₂ Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m ³) - Adjusted for Bias ^a				
			2009 (Bias Adjustment Factor = XX)	2010 (Bias Adjustment Factor = XX)	2011 (Bias Adjustment Factor = XX)	2012 (Bias Adjustment Factor = 0.79)	2013 (Bias Adjustment Factor = 0.80)
WH1	Dicket Mead, Welwyn	N	N/A	N/A	N/A	26	27
WH2	Parkway, Welwyn Garden City	N	N/A	31.82	29.4	30	27
WH3	Great North Road, Bell Bar	N	30.85	28.98	32.1	32	30
WH4	New Barnfield	N	N/A	N/A	27.8	34	34
WH5	Coopers Lane Road, Northaw	N	23.64	25.44	25.3	26	24
WH6	Bradgate, Cuffley	N	21.15	25.44	23.2	23	20
WH7	Parkhouse Court, Hatfield	N	N/A	N/A	N/A	N/A	34
WH8	Far End, Hatfield	N	N/A	N/A	N/A	N/A	23

Site ID	Site Type	Within AQMA?	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) - Adjusted for Bias ^a				
			2009 (Bias Adjustment Factor = XX)	2010 (Bias Adjustment Factor = XX)	2011 (Bias Adjustment Factor = XX)	2012 (Bias Adjustment Factor = 0.79)	2013 (Bias Adjustment Factor = 0.80)
WH9	<i>Mount Pleasant Close, Hatfield</i>	N	N/A	N/A	N/A	N/A	23
WH10	<i>The Ryde, Hatfield</i>	N	N/A	N/A	N/A	N/A	25
WH11	<i>Thistle Grove, WGC</i>	N	N/A	N/A	N/A	N/A	21
WH12	<i>The Commons, WGC</i>	N	N/A	N/A	N/A	N/A	21
WH13	<i>Alconbury, WGC</i>	N	N/A	N/A	N/A	N/A	18
WH14	<i>Green Lanes, Hatfield</i>	N	N/A	N/A	N/A	N/A	34
WH15	<i>Great North Road, Hatfield</i>	N	N/A	N/A	N/A	N/A	19
WH16	<i>The Runway, Hatfield</i>	N	N/A	N/A	N/A	N/A	26

In bold, exceedence of the NO₂ annual mean AQS objective of 40 $\mu\text{g}/\text{m}^3$

Underlined, annual mean > 60 $\mu\text{g}/\text{m}^3$, indicating a potential exceedence of the NO₂ hourly mean AQS objective

^a Means should be “annualised” as in Box 3.2 of TG(09) (<http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38>), if full calendar year data capture is less than 75%

Summary of Compliance with AQS Objectives

Welwyn Hatfield Borough Council has examined the results from monitoring in the Welwyn Hatfield area. Concentrations are all below the objectives, in all cases. A detailed assessment is therefore not necessary.

3 New Local Developments

3.1 Road Traffic Sources

The diffusion tube location at New Barnfield has shown an increase in the annual mean concentration and this due to the fact that the traffic flows have changed in the area. The increase has been down to HGV movements and it has had a clear effect on the air quality levels. As a direct result of this we will be increasing the monitoring in this location to determine whether the levels continue to increase.

It is clear from this year's data capture in the same location that the air quality levels have not increased in the past 12 months. One of the new closely located tubes (Far End) was sited here to ascertain the relevant exposure levels as this site is within close proximity to houses. Although we do not have a full 12 months of data capture I have presented the information that I have available. This cannot be considered to be fully reliable until we have 12 months worth of data.

3.2 Other Transport Sources

None

3.3 Industrial Sources

None

3.4 Commercial and Domestic Sources

As part of a proposed development at Ponsbourne Park, Newgate Street there is the intention of installing a vegetable oil burner. Following on from the application questions were raised with the applicant regarding impacts on air quality. Information shows that it will have no affect but concerns have been raised by local residents. We will take this into consideration and if the development goes ahead we will look at monitoring in this location.

3.5 New Developments with Fugitive or Uncontrolled Sources

None

4 Local / Regional Air Quality Strategy

Welwyn Hatfield Borough Council has not produced a local air quality strategy as our monitoring has shown that we are not exceeding the air quality objectives. We feel that the air quality in the Borough is seen to be at an acceptable level. However, we have identified that we need to increase our proactive monitoring to gather more data so we can have a clearer picture of the air quality in a broader location set. Welwyn Hatfield Borough Council has recently produced a core strategy which proposes a significant number of new housing developments at various locations across the Borough. These developments are within a timescale of 2015 to 2020. As of June 2013 we increased our diffusion tube monitoring sites by adding a further 16 locations in order to obtain a better understanding the air quality within the borough.

5 Planning Applications

We do not currently have any planning applications that cause concern with regards to air quality.

6 Air Quality Planning Policies

The Council's District Plan was adopted in April 2005. The plan includes the following section:

Air Quality

5.46 The maintenance of high air quality is a major factor affecting quality of life. Major developments, road related development, traffic levels and some types of industry can increase emissions which reduce air quality. The Environment Act 1995 places a duty on local authorities to review and assess air quality in their districts. Those areas that are expected to exceed national guidelines in the year 2005 will be deemed Air Quality Management Areas (AQMA's) and the local authority must devise a strategy to reduce pollution concentrations. The review is underway in Welwyn Hatfield District, but it is unlikely that any AQMA's will be identified. However, provision is made in the following policy to cover the possibility.

Policy R18 - Air Quality

The Council will have regard to the potential effects of a development on local air quality when determining planning applications. Consideration will be given to both the operational characteristics of the development and to the traffic generated by it. Any development within areas designated as Air Quality Management Areas must have regard to guidelines for ensuring air quality is maintained at acceptable levels as set out in the Air Quality Strategy.

7 Local Transport Plans and Strategies

A new Local Transport Plan (LTP3) for Hertfordshire has now been published, and covers the period 2011-2031

<http://www.hertsdirect.org/services/transtreets/tranpan/ltp/>

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

8 Climate Change Strategies

The latest copy of the Welwyn Hatfield Climate Change Strategy was published in January 2010 it includes 10 key themes Energy Efficiency, Water, Biodiversity, Planning, Waste and Recycling, Procurement, Transportation, Community Engagement, Health, and Adaptation. The Themes on Transportation and Health have direct links to Air Quality. In terms of Transportation the strategy states “The Council has a role in the development and implementation of transport policy, both in its role as local planning authority (see Key Theme 4 Planning) and in partnership working with Hertfordshire County Council. Activities involve supporting local bus services, providing free bus passes, promoting cycling and walking, operating parking enforcement, and new parking control schemes. In addition the Council operates numerous car parks across the borough.” The Council takes the links between Air Quality and Health very seriously in respect of the likely effects of Climate Change which are predicted to result in elevated Ozone levels during hotter drier summers. In this respect the following is included within the strategy. “As founder members of the Herts Beds Air monitoring network we will continue to provide real time data on air quality within the Borough of Welwyn Hatfield”

9 Implementation of Action Plans

Welwyn and Hatfield Borough Council has not produced an action plan because the air quality objectives have not been exceeded.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The monitoring results show that we do not have any exceedances in the air quality objectives at this current time. In the past we have had issues with equipment malfunctions and people stealing diffusion tubes because they were not adequately secured. The past two years have seen a change and we have been able to establish a regular amount of data capture. The diffusion tubes are now secured properly so data capture has increased significantly.

We have been able to gather a satisfactory amount of data capture with the new locations but there have been some issues. As expected with newly located tubes it has raised some interest and there have been instances where tubes have been stolen or turned upside down.

Looking at the data for our automatic monitors the levels have decreased in recent years and this could have a direct relation to the changes in climate. The data capture from the automatic analyser for 2013 shows that the levels have decreased again. However, due to the fact that the monitors are located on the roof of our building the levels are not representative of relevant exposure.

In the last few months the gas cylinder that is used to calibrate our NO₂ analyser expired. In April 2014 we purchased a new cylinder to replace it but the cylinder turned out to be contaminated so it was returned to the supplier. It seemed timely to reassess the relevance and cost effectiveness of maintaining the analysers in their current location. After discussions with DEFRA we have decided to take the analysers out of service for the time being until we can make arrangements to re-locate them to a more appropriate location.

The bias adjusted diffusion tube results have remained relatively constant when comparing the results from 2012. The previous increase that was noted at the New Barnfield site has not increased any further this year. I feel that it is beneficial to continue monitoring at the six original sites so we can keep a track on any changes or trends that may appear in future years.

At the time of writing this report we do not have a full 12 months of data capture for the 10 newly located sites. Despite this I have no immediate concerns from the data that has been captured thus far but this could of course change in the months to come. It is important that we re-evaluate the air quality levels at this site once we have a full years worth of data.

10.2 Conclusions relating to New Local Developments

None

10.3 Other Conclusions

Ozone Monitoring Data

Ozone is measured from the continuous site at the Council Offices using an API 400 UV Absorption Analyser.

There is currently no AQS Objective for O₃. There was however a Provisional Strategy Objective to be met by 31 December 2005.

Table 2.6 Provisional Strategy Objective for Ozone

Pollutant	Concentration	Measured as	Date to be Achieved by
Ozone	100 µg/m ⁻³ not to be exceeded more than 10 times a year	Daily maximum of running 8 hour mean	31.12.2005

During the time period 1.01.2013 and 31.12.2013 there were nineteen exceedences of this standard measured within Welwyn Hatfield. Results from Ozone monitoring within Welwyn Hatfield provide a valuable source of data to the Herts & Beds Air Quality network <http://www.hertsbedsair.net/> which enables the public to access the information.

Air Quality Related Complaints

The table below shows a list of air quality related complaints that Welwyn Hatfield Council's Environmental Health team investigated from 1st January – 31st December 2013.

Table 2.7 Air Quality Complaints

Type	No of Complaints
Domestic Smoke Complaints	70
Commercial Smoke Complaints	28
Domestic Fumes & Gases	3
Dust Complaints	7
Odour Domestic and Commercial	24
Total	132

10.4 Proposed Actions

The new monitoring data contained in this report has not identified the requirement to undertake a detailed assessment of Air Quality within the area. The low data capture that we have had previous issues with has now been resolved as the diffusion tubes have been mounted and secured appropriately. We will continue to monitor the new diffusion tube locations and monitor the results. For the next reporting year we will have a full 12 month capture period which will provide an accurate idea of the levels of pollution in these areas.

11 References

Welwyn Hatfield Air Quality progress report 2011, 2013

Welwyn Hatfield Update and Screening Assessment 2012

Herts and Beds Air Quality Network – <http://www.hertsbedsair.net/>

Air Quality Data Management <http://www.aqdm.co.uk> – Validation and Ratification process

Defra, 2009a. Local Air Quality Management, Technical guidance LAQM.TG09. Defra, London.

Hertfordshire County Council Local Transport Plan (LTP3)
<http://www.hertsdirect.org/services/transtreets/tranpan/ltp/>

Welwyn Hatfield Borough Council Climate Change Strategy 2010

Welwyn Hatfield Borough Council District Plan 2005

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The bias adjustment factor for 2013 was obtained from the National Diffusion Tube Bias Adjustment Factor Spreadsheet (Ref 03/14).

Year	Bias adjustment factor
2004	0.88
2005	0.88
2006	0.79
2007	0.82
2008	0.80
2009	0.83
2010	0.85
2011	0.83
2012	0.79
2013	0.80

QA/QC of automatic monitoring

The Council operates a continuous site at the Council Offices in Welwyn Garden City monitoring oxides of nitrogen (including nitrogen dioxide) and Ozone. The site was opened in 1998 and is classified as an urban background site. We are part of the Herts and beds air quality network. <http://www.hertsbedsair.net/> Data can be obtained from the website. The automatic analysers are serviced every six months by Enviro Technology.

We use Air Quality Data Management to handle and process the data for us. The undertake the following process:

Validation

This process operates on data during the data collection stage. All data are continually screened algorithmically and manually for anomalies. There are several techniques designed to discover spurious and unusual measurements within a very large dataset. These anomalies may be due to equipment failure, human error, power failures, interference or other disturbances Automatic screening can only safely identify spurious results that need further manual investigation.

Raw data from the gaseous instruments (e.g. NO_x, O₃, SO₂ and CO) are scaled into concentrations using the latest values derived from the manual and automatic calibrations. These instruments are not absolute and suffer drifts. Both the zero

baseline (background) and the sensitivity change with time. Regular calibrations with certified gas standards are used to measure the zero and sensitivity. However, these are only valid for the moment of the calibration since the instrument will continue to drift. Raw measurements from particulate instruments (e.g. PM10 and PM2.5) generally do not require scaling into concentrations. The original raw data are always preserved intact while the processed data are dynamically scaled and edited.

Ratification

This is the process that finalises the data to produce the measurements suitable for reporting. All available information is critically assessed so that the best data scaling is applied and all anomalies are appropriately edited. Generally this operates at three, six or twelve month intervals. However, unexpected faults can be identified during the instrument routine services or independent audits which are often at 6-monthly intervals. In practice, therefore, the data can only be fully ratified in 12-month or annual periods. The data processing performed during the three and six monthly cycles helps build a reliable dataset that is finalised at the end of the year.

There is a diverse range of additional information that can be essential to the correct understanding and editing of data anomalies. These may include

- the correct scaling of data
- ignoring calibrations that were poor e.g. a spent zero scrubber
- closely tracking rapid drifts or eliminating the data
- comparing the measurements with other pollutants and nearby sites
- corrections due to span cylinder drift
- corrections due to flow drifts for the particulate instruments
- corrections for ozone instrument sensitivity drifts
- eliminating measurements for NO2 conversion inefficiencies
- eliminating periods where calibration gas is in the ambient dataset
- identifying periods where instruments are warming-up after a powercut
- identification of anomalies due to mains power spikes
- correcting problems with the date and time stamp
- observations made during the sites visits and services

The identification of data anomalies, the proper understanding of the effects and the application of appropriate corrections requires expertise gained over many years of operational experience. Instruments and infrastructure can fail in numerous ways that significantly and visually affect the quality of the measurements. There are rarely simple faults that can be discovered by computer algorithms or can be understood without previous experience.

Further information about air quality data management, expert data ratification and examples of bad practices are given on the Air Quality Data Management (AQDM) website <http://www.aqdm.co.uk>.

QA/QC of diffusion tube monitoring

Our diffusion tubes are analysed by ESG (Environmental Scientifics Group)

The samples have been analysed in accordance with ESG's standard operating procedure HS/WI/1015 issue 15. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes For Ambient NO₂ Monitoring: Practical Guidance.'

The tubes were prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. All samples were received in good condition, unless otherwise stated in the comments field of results table. Please note:

As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11°C, the reported values **have** been adjusted to 20°C to allow for direct comparison with EU limits.

The reported results have not been bias adjusted.

This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. Any further calculations and assessments requiring exposure details and conditions fall outside the scope of our accreditation. In the WASP intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, ESG currently holds the highest rank of a **Satisfactory** laboratory.

Appendix B: Other Information

Table 2.8 List of Current LAPPC Permits

PG 6/34b (06) - Respraying of Road Vehicles	
Garden City Coachworks	Fiddlebridge Lane, Hatfield, Hertfordshire, AL10 9SP
Squire Furneaux Saab	36 Brownfields, Welwyn Garden City, Hertfordshire, AL7 1AN
Brooks and Stratton	14 Burrowfield, Welwyn Garden City, Hertfordshire, AL7 4SN
Welspray Accident Repair Centre	12 Southfield, Welwyn Garden City, Hertfordshire, AL7 4ST
WS Coachworks, Wright Signs And Coachworks Ltd	Travellers Lane, Welham Green, Hatfield, Hertfordshire, AL9 7HF
Uk Assistance Accident Repair Centre	Unit 1, North Park, Great North Road, Hatfield, Hertfordshire, AL9 5JN
PG 6/46 (11) - Dry cleaning	
Lady Valet Dry Cleaners	25 Station Road, Cuffley, Potters Bar, Hertfordshire, EN6 4HX
Johnsons Dry Cleaners	43 Fretherne Road, Welwyn Garden City, Hertfordshire, AL8 6NY
Swift Dry Cleaners	8 The Arcade, Hatfield, Hertfordshire, AL10 0JY
Charlies Valet	1 Bradmore Green, Brookmans Park, Hatfield, Hertfordshire, AL9 7QW
Charlies Cleaning	8 Parkhouse Court, Hatfield, Hertfordshire, AL10 9RQ
Brookmans Park Dry Cleaning Company	87 Bradmore Green, Brookmans Park, Hatfield, Hertfordshire, AL9 7QT
Welwyn Dry Cleaners	37 Wigmores North, Welwyn Garden City, Hertfordshire, AL8 6PG
PG 3/14 (04) - Lime Processes	
Sika (UK) Ltd	Watchmead, Welwyn Garden City, Hertfordshire, AL7 1BQ
Gilbertson and Page Ltd	45-55 Brownfields, Welwyn Garden City, Herts. AL7 1LF
PG 3/16 (04) - Mobile Crushing and Screening	
Redhead Demolition Co Ltd	2c Blenheim Court, Brownfields, Welwyn Garden City, Hertfordshire, AL7 1AN

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B P Mitchell, Haulage Contractors Ltd	Burnside, Hertford Road, Hatfield, Hertfordshire, AL9 5RB
PG 1/14 (06) - Unloading of Petrol into Storage at Petrol Stations	
Bell Bar Service Station	Great North Road, Hatfield, Hertfordshire, AL9 6DB
Tesco Stores Ltd	Tesco Stores Ltd - Petrol Station, Tesco Stores Ltd, Great North Road, Hatfield, Hertfordshire, AL9 5JY
Nodeway Service Station	Welwyn By Pass Road, Welwyn, Hertfordshire, AL6 9HP
Asda Stores Ltd	98 Town Centre, Hatfield, Hertfordshire, AL10 0JW
Eastbridge Service Station	Bridge Road East, Welwyn Garden City, Hertfordshire, AL7 1LE
Morrisons Petrol Station	40 Black Fan Road, Welwyn Garden City, Hertfordshire, AL7 1RY
Total Petrol Station	Stanborough Road, Welwyn Garden City, Hertfordshire, AL8 6XA
Esso Service Station	51-53 London Road, Woolmer Green, Knebworth, Hertfordshire, SG3 6JB
Tesco Stores Ltd	Cirrus Building A, Falcon Way, Welwyn Garden City, Hertfordshire, AL7 1AB
PG 1/1 (04) - Waste Oil Burners less than 0.4MW	
L J Whiteman & Son	27A Hyde Way, Welwyn Garden City, Hertfordshire, AL7 3UQ
Mark Tempest Autocentre	Unit, 1 Garden Court, Welwyn Garden City, Hertfordshire, AL7 1BH
Cuzner & White	32 Brownfields, Welwyn Garden City, Hertfordshire, AL7 1AN
Aylmer Motor Works	Old Coach Stations, Great North Road, Brookmans Park, Hatfield, Hertfordshire, AL9 6NA
Ashcroft Autocare	8 Little Ridge, Welwyn Garden City, Hertfordshire, AL7 2BH

