2014 Air Quality Progress Report for **Swindon Borough Council**

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

April 2014

Author Details and Contents Amendment

Local Authority Officer	Oxana Waite, David Rudland
Department	Environmental Health
Address	Wat Tyler House, Beckhampton Street, Swindon, SN1 2JH
Telephone	01793 445501
e-mail	owaite@swindon.gov.uk
Report Reference number	SBC AQPR2014
Date of Issue	April 2014

Executive Summary

Under the Environment Act 1995, Part IV local authorities are required to review and assess local air quality on a regular basis. A review of air quality involves consideration of the levels of pollutants in the air for which objectives are prescribed in Regulation[1], and estimations of likely future levels. The assessment considers whether estimated concentrations for the relevant future period are likely to exceed the levels set in the objectives.

This Progress Report provides an update on local monitoring data acquired since the previous Progress Report and screens for various potential sources of pollution within the Borough's administrative area in accordance with the Local Air Quality Management Technical Guidance 2009 (LAQM.TG09).

Swindon Borough Council currently does not have any Air Quality Management Areas declared within its area.

This report provides an assessment of monitoring data collected between March 2013 and March 2014.

The report identifies four areas where measured concentrations of nitrogen dioxide exceeded screening levels. These areas are as following:

1. Swindon 12 - Swindon Bus Station

2. Swindon 14 - Kingshill Rd/Clifton St
   Swindon 18 - Val. Sample – Kingshill
   Swindon 19 - Val. Sample 2 Kingshill Rd/Clifton St

3. Swindon 23 - 37 Devizes Rd
   Swindon 23 - 37 Devizes Rd
   Swindon 23 - 37 Devizes Rd

4. Swindon 25 - F/O 68 Cheney Manor Rd (Rodbourne Rd)

However a detailed assessment is deemed not required for any of these areas. Although concentrations of nitrogen dioxide at two areas, Devizes Road and Cheney Manor Road, marginally (1%) exceeded the Air Quality Standards when data is adjusted for distance to the receptor (the point of exposure), concentrations are expected to improve once ongoing redevelopment in these areas is complete. Reduction in concentrations of Nitrogen Dioxide at Devizes Road is anticipated now a new through "diversionary" route through Wichelstowe is open. If after completing existing and planned regeneration at Rodbourne Road at Cheney Manor in 2015 the existing concentrations of Nitrogen Dioxide remain, Detail Assessment will be undertaken and further actions proposed.

Swindon Borough Council will carry out a further LAQM Progress Report in 2015.

[1] 1 The Air Quality Standards Regulations 2010

Table of Contents

List of Tables

List of Figures

Appendices

1 Introduction

1.1 Description of Local Authority Area

Swindon is a large town and unitary borough authority located within Wiltshire in South West England. It is midway between Bristol, approximately 40 miles to the west and Reading, approximately 40miles to the east. Swindon Railway Station is on the main line from London, Paddington to Bristol and South Wales. Swindon Borough Council has been a unitary authority independent of the rest of Wiltshire since 1997. Swindon was identified as one of the towns to be expanded for the reception of population and industry from the Greater London area under the Town Development Act 1952 and this led to a major increase in its population. Current population estimates show the population of the Swindon urban area as 174,000 with around 206,000 as the Borough wide estimate, which includes the satellite towns of Highworth and Wroughton and annexed villages Bishopstone, Blunsdon St Andrew, Castle Eaton, Chiseldon, Hannington, Inglesham, South Marston, Stanton Fitzwarren and Wanborough.

The town located between two junctions (15 and 16) of the M4 motorway and is on the main rail line to London. Thamesdown and Stagecoach are the main Swindon bus operators. Swindon Borough Council recognises its responsibility to the environment, realizing the impact it creates upon the planet, but are fully committed to minimise this whilst becoming as sustainable as possible. The Council achieves this via the principles of One Planet Living; using a fair share of Earth's resources. Swindon is one of the locations for innovative schemes such as car share and cycle for life.

Major employers include the Honda car production plant in South Marston (where a hydrogen filling station is located); BMW/Mini (formerly Pressed Steel Fisher) in Stratton; B & Q South West Distribution Centre; Dolby Labs; WH Smith's distribution centre and headquarters. The computer company Intel has its European head office on the south side of the town and, Alcatel-Lucent Technologies head office is on the west side. Insurance and financial services companies such as Nationwide Building Society and Zurich Financial Services, the energy company RWE which includes the well-known retail brand nPower, the fuel card and fleet management company Arval, pharmaceutical companies such as Canada's Patheon and the United States-based Cardinal Health have their UK divisions headquartered in the town. Swindon also has the registered Head Office of the National Trust.

1.2 Purpose of Progress Report

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

Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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

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

1.3 Air Quality Objectives

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

Table 1-1: Air Quality Objectives included in regulations for the purpose of LAQM in England

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

1.4 Summary of Previous Review and Assessments

Swindon Borough Council has prepared Updating and Screening Assessment and Progress Reports as set out in table 1.2 below. Swindon Borough Council currently has no Air Quality Management Areas (AQMA) within its administrative area.

In 2013 Detailed Assessment Report and Air Quality Progress Report have been prepared.

Table 1-2: Previously submitted Reports

Report	Year	Comments
Updating and Screening Assessment	2003	No identified exceedance of objectives
Local Air Quality Progress Report	2004	Identified a risk of exceedance of the annual mean standard at Kingshill Road site (also recognised that a Detailed Assessment report is required to be submitted to the Department of Environment, Food & Rural Affairs (DEFRA) in April 2005)
Local Air Quality Progress Report / Detailed Assessment for Nitrogen Dioxide	2005	It's been confirmed that there is no risk that the objective standard for Nitrogen Dioxide will be breached and there is no intention to declare an Air Quality Management Area in this locality. The average value at the location being 37.2 $\mu g/m^3$.
Local Air Quality Updating & Screening Assessment 2006 [Round 3]	compiled April 2006	Although an average Annual Mean value of 39.5 $\mu g/m^3$ for the year 2005 was falling marginally beneath the objective standard for Nitrogen Dioxide, it was not intended to declare an Air Quality Management Area in the locality at the time.
Updating and Screening Assessment, [Round 4]	2009 (& combined Progress Report 2008)	Identified that a Detailed Assessment will be required due to the nitrogen dioxide annual mean objective being exceeded at the following locations: **Kingshill Road**, including: - 186 Kingshill Road. - Kingshill Road / Clifton Street. - Kingshill Road / Clifton Street Validation 2. - Kingshill Road / Clifton Street Validation 3. - F/O 63 Kingshill Road. **37 Devizes Road**
2011 Air Quality Progress Report	(Combined Data 2009 & 2010)	A Detailed Assessment will be required due to an exceedance of the nitrogen dioxide annual mean objective at the following locations: **Kingshill Road**, including: - 186 Kingshill Road.

		- Kingshill Road / Clifton Street. - Kingshill Road / Clifton Street Validation 2. - Kingshill Road / Clifton Street Validation 3. - F/O 63 Kingshill Road. **37 Devizes Road** A Detailed Assessment will be required for nitrogen dioxide (annual mean) at four locations due to moving locomotives. The four locations are: No. 2 Stratton Road, Stratton St Margaret; No. 31 Sandgate, Stratton St Margaret; No. 35 Sandgate, Stratton St Margaret; and Selina House, 192 Oxford Road, Stratton St Margaret.
Air Quality Updating and Screening Assessment	2012	A Detailed Assessment will be concluded following this report conducted due to an exceedance of the nitrogen dioxide annual mean objective at the following locations: • Kingshill Road, including: - 186 Kingshill Road - Kingshill Road / Clifton Street - Kingshill Road / Clifton Street Validation 2 - Kingshill Road / Clifton Street Validation 3 - F/O 63 Kingshill Road • 37 Devizes Road A Detailed Assessment for NO_2 will be required at two representative locations due to moving locomotives at - No. 2 Stratton Road, Stratton St Margaret; - No. 31 Sandgate, Stratton St Margaret
Detailed Assessment Report	2013	Real-time and diffusion tube monitoring work undertaken in 2012 has indicated that concentrations of nitrogen dioxide exceeded annual mean objective at the point of measurement along the section of the A4289 between Kingshill, Bath Road and Devizes Road at Old Town, Swindon. Having corrected for receptor exposure the estimated concentrations at point of exposure are at or below the annual mean objective value. Therefore, the declaration of an Air Quality Management Area

		(AQMA) along this section of the A4289 was deemed not necessary. Meanwhile, measures are already in place that are likely to reduce traffic levels on this route and thus concentrations of nitrogen dioxide.
Air Quality Progress Report	2013	Since the previous assessment the latest monitoring data suggests an overall decrease in Nitrogen Dioxide in the Borough. Previously it was suggested that detailed assessment should be carried out at a location near to the railway to assess the impact of locomotive movements, but this was not taken forward due to consistent compliance with AQ targets at this point. The relocation of 4 monitoring stations was suggested for implementation in Spring 2014 as natural evolution and improvement of monitoring in the Borough.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

This section provides a summary of the air quality monitoring results that have become available since the previous report. For this reporting year Swindon Borough Council monitored nitrogen dioxide using a continuous analyser and diffusion tubes. The continuous monitoring station is located at Bath Road Car Park and it is co-located with triplicate diffusion tubes. The data for automatic monitoring is only available for a period of 6 months, since the contract with the supplier was not renewed after that time.

The routine calibration of the continuous monitoring station is performed around 6 times a year by the Council personnel responsible for data collection. Calibration and routine services are carried out by Enviro Technology Services Plc.

The Automatic Analyser (ML 9841 NO_x Chemiluminescence Analyser) was installed in Swindon in spring 2011 for the AQ/QC purposes. It is housed in an air conditioned cabin and commenced operation in August 2011. Figure 2-1 shows the location of the monitoring station along a busy route between two areas of Kingshill Road and Devizes Road where elevated concentrations of Nitrogen Dioxide have been recorded over the last 5 years. For general information about the site please see Table 2.1.

3 years records are available from Table 2-2. It should be noted that for the current report data is only available for 6 months the data capture is available over 95% for the measurement period (Table 2-2).

Daily data capture for the site was 96% in 2012-2013 and 98% in 2013 for the available period. Data was collected remotely using a GSM modem link (https://www.dataview247.com/Default.ltr.aspx).

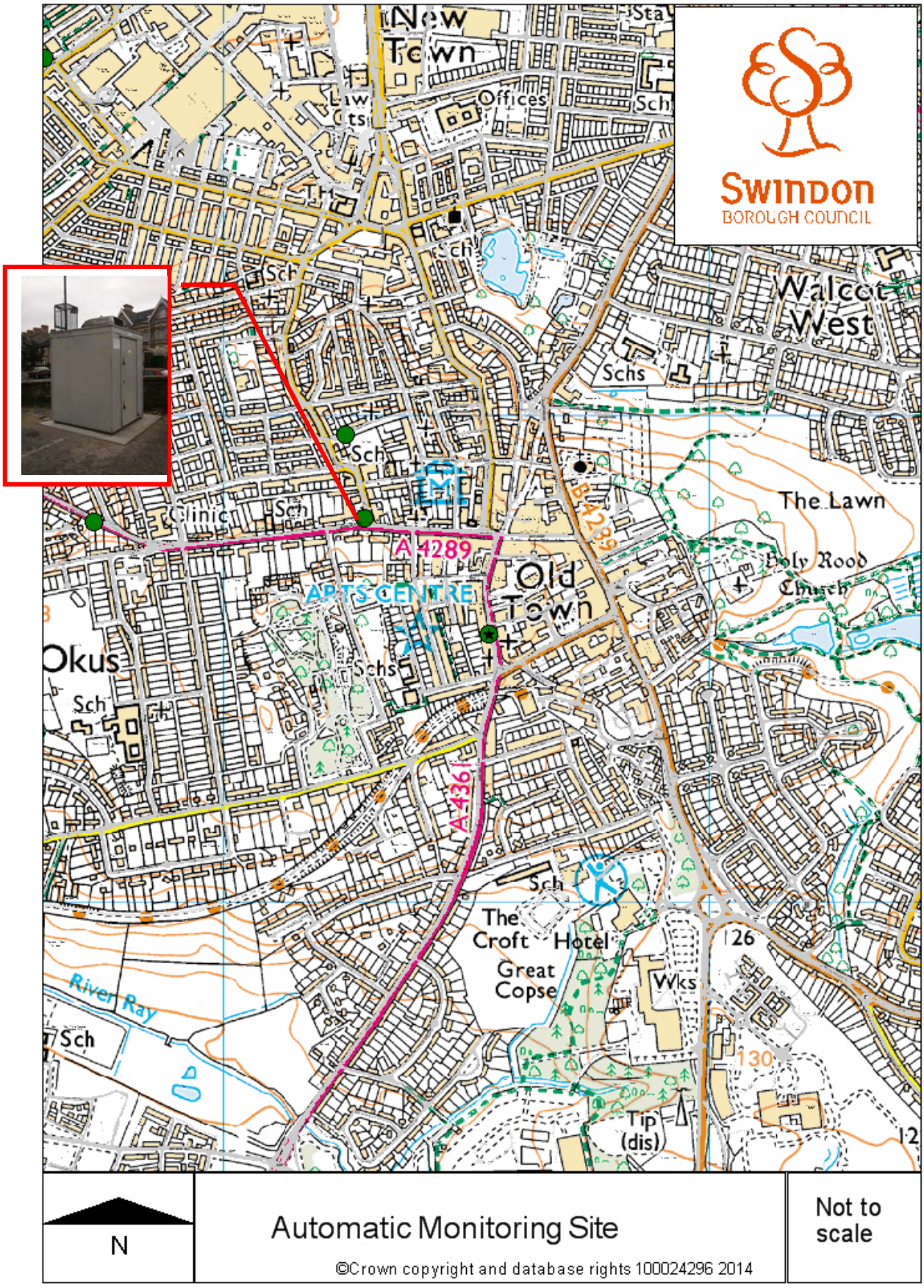


Figure 2-1: Automatic Monitoring Site

Table 2-1: Details of Automatic Monitoring Sites

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?
Bath Road	Roadside	415290	183790	2.5	NO_x	N	Automatic Telemetry	Y (17.8m)	5.5	Y

Table 2-2: Results of Automatic Monitoring for NO2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Data capture for monitoring period, %			Annual Mean Concentration (µg/m^3)		
			2011-2012	2012-2013	2013-2014	2011-2012[a]	2012-2013	2013-2014[b]
Bath Road	Roadside	No	81	95	98	34.8	39.6	35.3

[a] data capture is for the 8 months monitoring period only

[b] data capture is for the 6 months (March-September 2013) only

2.1.2 Non-Automatic Monitoring Sites

Swindon Borough Council measures nitrogen dioxide using 26 passive diffusion tubes at sites throughout the district. The locations of the monitoring sites can be seen in Figure 2.2.

The tubes are supplied and analysed by Environmental Scientifics Group (ESG) in Didcot prepared using 50% TEA in acetone nitrogen dioxide diffusion. The diffusion tubes are collected and analysed according to the published time table available on the LAQM pages. In the WASP intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes. ESG is currently ranked as a Category Good laboratory. Please see Appendix 1 for QA/QC Statement.

Table 2.2 provides details of Nitrogen Dioxide Non-Automatic Monitoring Sites. Three tubes (S2,S4 and S8) have been co-located with the air quality monitoring station in Bath Road.

Since co-location studies were available only for the period 6 months, a decision has been made to use the National Bias Factor, as well as to keep consistency with previous years. The diffusion tube bias adjustment factor is generated from the National Bias Adjustment Factor spread sheet. It is available on the Review and Assessment website (v07/13). The following bias adjustment factor has been applied to the data presented in this report:

- 2013: 0.80

The tubes at all locations throughout Swindon have a monthly exposure period. All of the 2013 diffusion tube data has been annualised as required according to the guidance in LAQM.TG (09). Table 2-3 below provides site description information for all the monitoring sites in 2013.

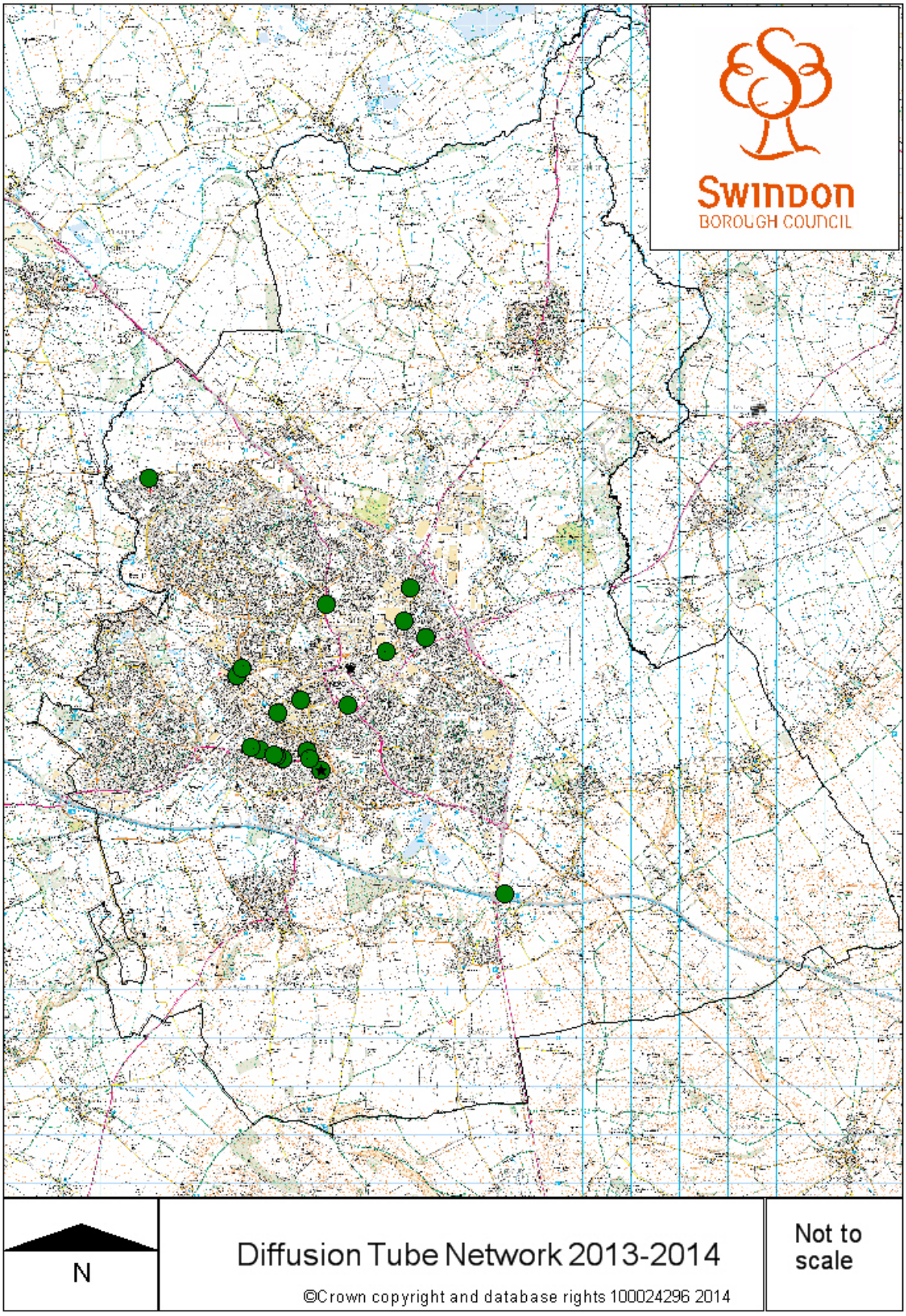


Figure 2-2: Location of Non-Automatic Monitoring Sites

Table 2-3: Details of Non- Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure), m*	Distance to kerb of nearest road *(N/A if not applicable), m*	Does this location represent worst-case exposure?
Swindon 1	Road Side	414629	184737	NO_2	N	N	47.2	2.5	Y
Swindon 2	Road Side	415290	183790	NO_2	N	Y	17.8	5.5	Y
Swindon 4	Road Side	415290	183790	NO_2	N	Y	17.8	5.5	Y
Swindon 5	Road Side	414258	183972	NO_2	N	N	2.6	2	Y
Swindon 6	Road Side	416089	184907	NO_2	N	N	6.0	6	Y
Swindon 8	Road Side	415290	183790	NO_2	N	Y	17.8	5.5	Y
Swindon 9	Railway Side	417714	186316	NO_2	N	N	15.3	13.1	Y
Swindon 11	Kerb Side	415251	183961	NO_2	N	N	8.4	0.2	Y
Swindon 12	Road Side	415119	185026	NO_2	N	N	N, 72	4.7	Y
Swindon 13	Road Side	419344	180994	NO_2	N	N	2.3	2	Y
Swindon 14	Road Side	414733	183783	NO_2	N	N	17	1.4	Y
Swindon 15	Road Side	414076	184041	NO_2	N	N	2.9	1.2	Y
Swindon 16	Road Side	415650	186992	NO_2	N	N	12.6	3	Y
Swindon 17	Road Side	413797	185505	NO_2	N	N	7.4	7.1	Y
Swindon 18	Road Side	414733	183783	NO_2	N	N	17	1.4	Y
Swindon 19	Road Side	414733	183783	NO_2	N	N	17	1.4	Y
Swindon 20	Road Side	414596	183848	NO_2	N	N	8.7	2	Y
Swindon 21	Road Side	414552	183885	NO_2	N	N	6	2	Y
Swindon 22	Railway Side	416878	186018	NO_2	N	N	5	3	Y
Swindon 23	Road Side	415547	183552	NO_2	N	N	4.6	1.8	Y
Swindon 23	Road Side	415547	183552	NO_2	N	N	4.6	1.8	Y
Swindon 23	Road Side	415547	183552	NO_2	N	N	4.6	1.8	Y
Swindon 24	Road Side	417259	186661	NO_2	N	N	13.7	1.8	Y
Swindon 25	Road Side	413886	185672	NO_2	N	N	12.6	2.4	Y
Swindon 26	Road Side	411973	189625	NO_2	N	N	16.7	0.7	Y
Swindon 27	Road Side	417399	187354	NO_2	N	N	2.6	1.9	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

For automatic monitoring the yearly data capture was 50%, when the period capture was 98% (see Table 2.2).

Since the data from automatic monitoring for Nitrogen Dioxide is only available for 3 years (5 years data is recommended by Defra), the trend cannot be acknowledged at this point. No exceedance of 1-hour objective of 200 µg/m^3 was recorded over the period from 5 March to 2 September 2013.

Diffusion Tube Monitoring Data

Monthly results can be seen in Appendix 2.

The results for the diffusion tubes which exceeded the Air Quality Objective were adjusted for the distance to the receptor (where possible). The Devizes Road site remained over the objective level by 0.3 µg/m^3; this is discussed in the 2013 detailed assessment report.

No sites recorded levels of above 60 µg/m^3 and therefore all are unlikely to exceed the hourly objective level.

The exceedance of concentrations of Nitrogen Dioxide at F/O 68 Cheney Manor Rd (Rodbourne Rd) will not be subjected to detailed assessment due to major regeneration project carried out in this area for the next 2 years.

Please see Figure 2-2 for locations of NO_2 diffusion tube monitoring sites. Further description and the annual results of key areas are shown in Table 2-3.

Table 2-4: Results of NO2 Diffusion Tubes 2013

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%)	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.80 [b]
S1	Swindon 1- GWR Museum, Faringdon Rd	Roadside	N	N	100	36.43
S2	Swindon 2 - Bath Rd Car Park	Roadside	N	Triplicate and Co-located	100	24.20
S4	Swindon 4 - Bath Road Car Park	Roadside	N	Triplicate and Co-located	100	25.37
S5	Swindon 5 - 186 Kingshill Rd	Roadside	N	N	100	36.22
S6	Swindon 6 - Chalet School, Queens Drive	Roadside	N	N	100	32.44
S8	Swindon 8 - Bath Rd Car Park	Roadside	N	Triplicate and Co-located	100	25.43
S9	Swindon 9 - S/O 31 Sandgate	Rail side	N	N	92.3	22.79
S11	Swindon 11 - South St, Swindon	Roadside	N	N	92.3	16.69
S12	Swindon 12 - Swindon Bus Station	Roadside	N	N	92.3	**41.77**
S13	Swindon 13 - Meadow Way, Badbury Wick	Roadside	N	N	100	29.37
S14	Swindon 14 - Kingshill Rd/Clifton St	Roadside	N	Triplicate	100	**44.79**
S15	Swindon 15 - Westcott Place	Roadside	N	N	100	31.43
S16	Swindon 16 - Cricklade Rd	Roadside	N	N	84.6	32.25
S17	Swindon 17 - Bruce St Bridges S/O 1 Bruce St	Roadside	N	N	92.3	26.12
S18	Swindon 18 - Val. Sample – Kingshill	Roadside	N	Triplicate	100	**45.85**
S19	Swindon 19 - Val. Sample 2 Kingshill Rd/Clifton St	Roadside	N	Triplicate	100	**45.38**

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (%)	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.80 [b]
S20	Swindon 20 - S/O 130 Kingshill Rd	Roadside	N	N	100	19.36
S21	Swindon 21 - F/O 63 Kingshill Rd	Roadside	N	N	100	32.18
S22	Swindon 22 - S/O 2 Stratton Road	Railside	N	N	15.4[a]	32.40
S23	Swindon 23 - 37 Devizes Rd	Roadside	N	N	92.3	**46.67**
S23	Swindon 23 - 37 Devizes Rd	Roadside	N	N	92.3	**45.61**
S23	Swindon 23 - 37 Devizes Rd	Roadside	N	N	92.3	**44.75**
S24	Swindon 24 - Swindon Rd, Stratton F/O Baptist Ch	Roadside	N	N	100	27.40
S25	Swindon 25 - F/O 68 Cheney Manor Rd (Rodbourne Rd)	Roadside	N	N	100	**44.79**
S26	Swindon 26 - Corner of Dorney Ave & Tadpole Ln	Roadside	N	N	92.3	18.64
S27	Swindon 27 - F/O 66 Ermin St	Roadside	N	N	100	30.49

[a]Due to difficult access to the monitoring point and previous regular meet of air quality objectives at this location the monitoring station is now been moved to 37 Farrier Close (please see Table 9.1 and Appendix 3).

[b]In bold, exceedance of the NO_2 annual mean AQS objective of 40µg/m^3

Table 2-5: Results of NO2 Diffusion Tubes (2009 to 2013)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m^3						
			2007* (Bias Adjustment Factor = 0.77)	2008* (Bias Adjustment Factor = 0.87)	2009* (Bias Adjustment Factor = 0.79)	2010* (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.82)	2012 (Bias Adjustment factor =0.79)	2013 (Bias Adjustment factor =0.80)
S1	Roadside	N	32.4	**40.2**	38.8	**45.9**	39.7	35.95	36.43
S2	Roadside	N	17.4	19.2	14.6	18.1	28.07	26.16	24.20
S3	Urb.Bkgnd.	N	21.4	21.7	-	-	-	-	
S4	Roadside	N	19.9	21.7	15.6	20.3	29.56	22.36	25.37
S5	Roadside	N	33.7	39.5	33.1	39.1	34.74	32.17	36.22
S6	Roadside	N	33.7	36.9	39.5	30.3	37.16	29.27	32.44
S7	Urb.Bkgrnd.	N	20.9	27.1	-	-	29.43	-	-
S8	Roadside	N	31.9	34.7	26.1	31.9	24.4	25.99	25.43
S9	Rail side	N	16.8	18.7	13.1	14.1	29.56	21.60	22.79
S10	Roadside	N	38.5	-	-	-	-	-	
S11	Roadside	N	20.8	22.8	18.3	20.8	18.6	17.11	16.69
S12	Roadside	N	**49.2**	**51.8**	**42.1**	**48.8**	**45.48**	38.46	**41.77**
S13	Roadside	N	33.3	39	31.5	33.2	35.93	29.77	29.37
S14	Roadside	N	36.7	**45.5**	38.3	**45.6**	**45.4**	**41.38**	**44.79**
S15	Roadside	N	34.5	37.7	31.5	37.3	35.79	31.44	31.43
S16	Roadside	N	36.8	38.8	32.5	**40.4**	34.73	31.44	32.25

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m^3						
			2007* (Bias Adjustment Factor = 0.77)	2008* (Bias Adjustment Factor = 0.87)	2009* (Bias Adjustment Factor = 0.79)	2010* (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.82)	2012 (Bias Adjustment factor =0.79)	2013 (Bias Adjustment factor =0.80)
S17	Roadside	N	31.1	34.4	27.6	34.4	27.4	25.88	26.12
S18	Roadside	N	37.6	**44.8**	39.4	**46.2**	**42.57**	**42.14**	**45.85**
S19	Roadside	N	37.8	**43.8**	38.7	**45.6**	**43.9**	**41.67**	**45.38**
S20	Roadside	N	20.5	25.9	19.5	27.2	22.74	22.74	19.36
S21	Roadside	N	35.2	**40.7**	32.3	38.9	38.95	31.46	32.18
S22	Railside	N	19.4	20.8	19.3	21.4	27.32	23.06	32.40
S23	Roadside	N	**47.1**	**52.1**	**45.8**	**54.9**	**50.97**	**44.61**	**46.67**
S23	Roadside	N	-	**52.4**	**45.6**	**57**	**50.17**	**45.36**	**45.61**
S23	Roadside	N	-	**51.4**	**44.6**	**55.6**	**52.15**	**45.45**	**44.75**
S24	Roadside	N	-	36.2	25.1	34.2	32.08	25.38	27.40
S25	Roadside	N	-	20	12	13.8	**44.47**	**42.49**	**44.79**
S26	Roadside	N	-	27.1	18.4	23.6	20.31	17.88	18.64
S27	Roadside	N	-	28.2	19.8	25.3	32.47	26.60	30.49

Site Removed

Relocated (Railside)

Relocated (Rodbourne Rd)

Relocated (Ermin St)

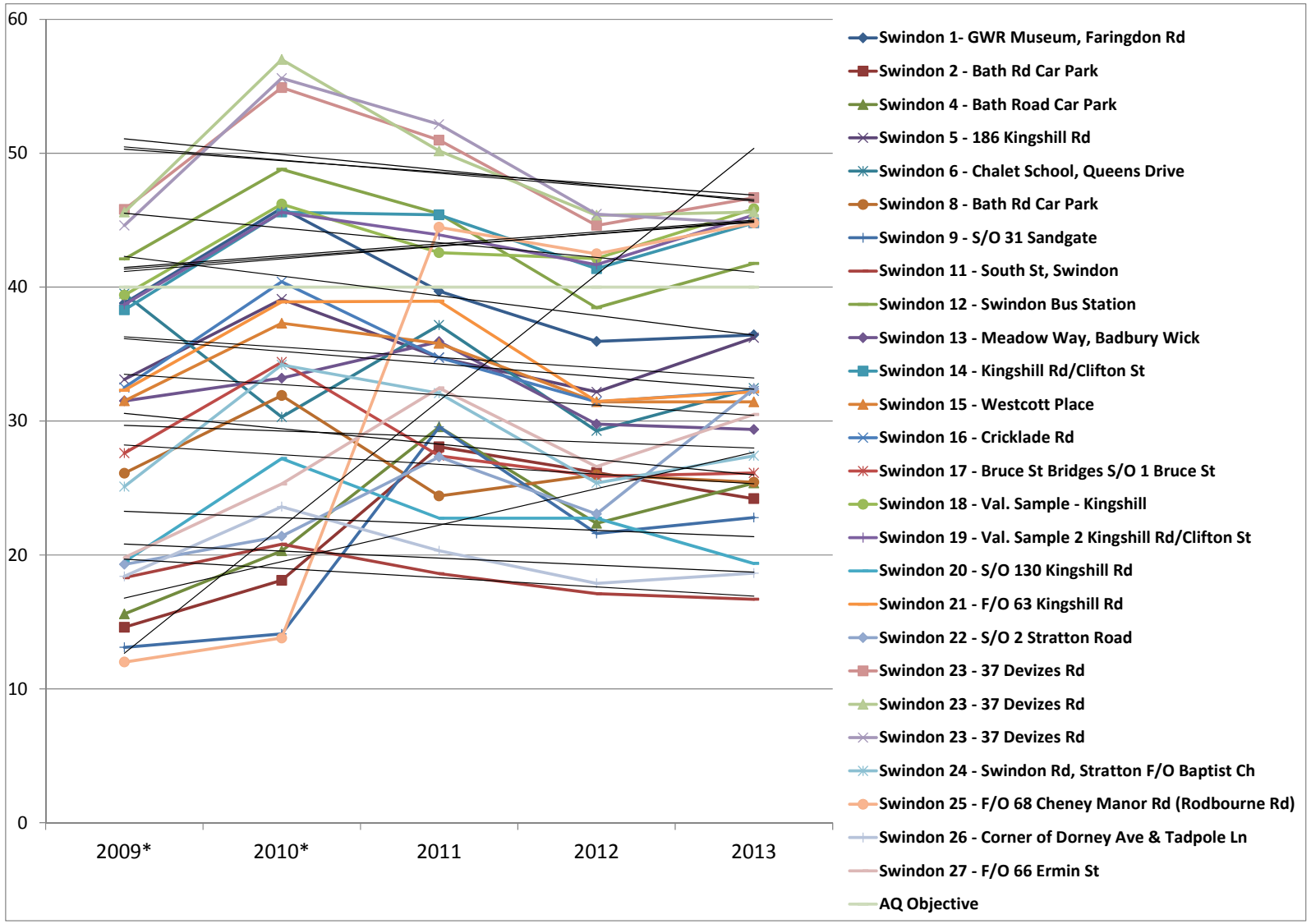


Figure 2-3: Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

Figure 2.4 shows a trend chart of NO_2 annual mean results over the past 5 years. At the majority of locations trends (shown in black) indicate overall reduction in concentration of Nitrogen Dioxide at monitoring locations. However at Kingshill Road/Clifton Street and Cheney Manor (Rodbourne Road) the trends are positive.

In the first instance, at Kingshill Road, it can be explained by the complexity of the location, where tall walls on both sides arrange a canyon at the top of the steep hill. The traffic joining from Clifton Street, as well on Kingshill, additionally created by recent redevelopment at Regent Circus contributes into fluctuations in readings at this location.

Location 25, currently at Cheney Manor (Rodbourne Road) site was relocated there in 2011 from Portmore Close, therefore a 5 year trend is not available. Also the readings from the previous location were low, which have contributed to an apparent misleading positive trend at this location. As it was mentioned in the previous report, although exceedance of the objective at the current site was acknowledged, it was not taken to detailed assessment due to forthcoming major alterations to the road layout with anticipated variations in Nitrogen Dioxide emissions.

The results for the diffusion tubes which exceeded the Air Quality Objective level (Table 2-1) were adjusted for the distance to the receptor using calculator, accessible from DEFRA website http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html.

Table 2-6: Mean and distance adjusted concentrations of NO2 in the areas of concern

Site	Annual mean concentrations			
	Adjusted for bias ($\mu g/m^3$)		Concentration at the receptor, using bias adjusted annual concentration of NO_2	
	2012-13	**2013-14**	**2012-13**	**2013-14**
Swindon 12 - Swindon Bus Station*	38.46	**41.77**		
Swindon 14 - Kingshill Rd/Clifton St	**41.38**	**44.79**	29.2	30.8
Swindon 18 - Val. Sample - Kingshill	**42.14**	**45.85**	29.5	31.3
Swindon 19 - Val. Sample 2 Kingshill Rd/Clifton St	**41.67**	**45.38**	29.3	31.0
Swindon 23 - 37 Devizes Rd	**44.61**	**46.67**	39.7	**41.2**
Swindon 23 - 37 Devizes Rd	**45.36**	**45.61**	40.3	**40.3**
Swindon 23 - 37 Devizes Rd	**45.45**	**44.75**	40.3	39.7
Mean of triplicate, located at Devizes Road			**40.1**	**40.4**
Swindon 25 - F/O 68 Cheney Manor Rd (Rodbourne Rd)	**42.49**	**44.79**	**33.1**	**40.2**

*The receptor is more than 20m further from the kerb than the monitoring station, calculation for distance could only be modelled for those located closer than 50m. As a result is was suggested to relocate the monitor closer to the receptor.

No sites recorded levels of above 60 µg/m^3 and therefore none are unlikely to exceed the hourly objective level.

Monthly results can be seen in Appendix 2.

The outcome of this assessment is discussed in section 2.2.6 below.

2.2.2 Particulate Matter (PM_{10})

Swindon Borough Council does not monitor for PM_{10} within its administrative area.

The Council's previous Updating and Screening Assessment: for Particulate Matter indicates that "no exceedances of the objective standards (previously specified), arising from either industrial or road traffic sources are predicted to occur within the Swindon Borough Council area." This has remained unchanged since the last round of Review and Assessment.

2.2.3 Sulphur Dioxide (SO_2)

Swindon Borough Council does not monitor for SO_2 within its administrative area.

The Council's previous Updating and Screening Assessment stated: "The Updating & Screening Assessment for Sulphur Dioxide" indicates that "no exceedances of the objective standards (previously specified), arising from either industrial or road traffic sources are predicted to occur within the Swindon Borough Council area." This has remained unchanged since the last round of Review and Assessment.

2.2.4 Benzene

Swindon Borough Council does not monitor for Benzene within its administrative area. The Council's previous Updating and Screening Assessment stated: "The Updating & Screening Assessment for Sulphur Dioxide indicates that no exceedances of the objective standards (previously specified), arising from either industrial or road traffic sources are predicted to occur within the Swindon Borough Council area." This has remained unchanged since the last round of Review and Assessment.

2.2.5 Other Pollutants Monitored

Swindon Borough Council does not monitor for Lead, Carbon Monoxide or 1,3 Butadiene within its administrative area. The Council's previous Updating and Screening Assessment stated: "The Updating & Screening Assessment for Sulphur Dioxide indicates that no exceedances of the objective standards (previously specified), arising from either industrial or road traffic sources are predicted to occur within the Swindon Borough Council area." This has remained unchanged since the last round of Review and Assessment.

2.2.6 Summary of Compliance with AQS Objectives

Swindon Borough Council has examined the results from monitoring in the Borough.

The mean of the triplicate tubes at Devizes Road in 2012/13 was calculated at 40.1 µg/m^3, when in 2013/14 it was 40.4 µg/m^3, which is only 1% above the threshold. An alternative route for traffic has been opened however it has so far been difficult to assess the effect of this on the A4289 since there have been a number of disruptions to the new route:

- Mill Lane (between Wharf Road and Foxham Way) was shut between 24/07/13 and 28/02/14.
- Mill Lane (between Foxham Way and Old Town) was shut between 02/12/13-20/12/13 and again between 02/01/14-10/02/14
- Foxham Way was shut between 02/12/13 and 20/12/13 and again between 02/01/14-10/02/14
- Foxham Way was operating under temporary traffic signals during construction works between 10/02/14-28/02/14
- Mill Lane (between Foxham Way and Old Town) was operating under temporary traffic signals during construction works between 10/02/14-28/02/14.

An AQMA was not declared and there is no need to proceed to a Detailed Assessment. A new supermarket opened in April 2014 at Foxham Way so further road closures (of the alternative route) are not expected, and it is anticipated that the next year monitoring results for the A4289 section should show improvement.

As with the last year, the traffic flow within the area monitored at tube location Swindon 25 (F/O 68 Cheney Manor Rd (Rodbourne Rd)) is quite likely to have increased due to on-going town centre regeneration projects and northern expansion of housing projects. The southern link (Great Western Way) of this route is due to undergo significant realignment over the next few months (the earliest construction phase starting 18/10/2013, with the latest phase scheduled to finish by 05/06/2015) with the intention of reducing congestion and improve monitoring results. However, it is recognised that during the construction phase there will be additional negative impact on local air quality and Nitrogen Dioxide readings are likely to be higher temporarily. A detailed assessment of this site would be necessary should post completion of this project levels continue to exceed annual objectives.

3 New Local Developments

3.1 Road Traffic Sources

3.1.1 Bus and Coach Stations

The relocation of the Bus Station is proposed as part of the town centre regeneration programme. However monitoring in the bus station area will be continued albeit that the monitoring tube will be moved closer to appropriate receptors (See Table 9.1 and Appendix 3). This has been assessed and is likely to result in reduction in congestion and levels of emissions. It is proposed that model verification monitoring be conducted on completion of each phase. Swindon Borough Council has assessed newly proposed bus stations, and concluded that it will not be necessary to proceed to a Detailed Assessment at this stage.

3.2 Other Transport Sources

3.2.1 Railways (Diesel and Steam Trains)

Stationary Trains

There will be occasions when diesel trains will be awaiting access to the main station and to the railway sidings at the east of the station, depending on operational necessity.

Additional manoeuvres are anticipated to and from the new sidings of the High Operations Output Base (HOOB), constructed in late 2013/early 2104 on the site of the former down goods yard alongside the Transfer Bridge Industrial Estate, and as part of the Network Rail Great Western Main Line Electrification Project. Some increase in stationary and moving trains is expected during the civil engineering phase of the electrification project. In order to verify possible changes in ambient conditions a decision been made to relocate one of the existing railway passive monitoring stations at S/O Stratton Road to the fence by 37 Farriers Close (Table 9.1 and Appendix 3).

Moving Trains

Swindon station is located on the Great Western Main Line with heavy traffic of diesel passenger trains and assumed exposure areas within 30m of the track side (Table 5.1 TG09). However measurements at railways locations in the Borough suggest that there is no current exeedance of the nitrogen dioxide objectives and that there is no need for a detailed assessment for nitrogen dioxide. In the longer term the electrification scheme aims to reduce the number of diesel operating trains along the line, replacing them with electric trains with a consequent reduction in nitrogen dioxide emissions.

4 Planning Applications

Please see below a list of proposed major developments in Swindon with anticipated effect on local traffic and consequently air quality.

Proposed Major Developments:

- New Eastern villages (Application Pending Consideration) – including Rowborough and South Marston Village expansion lays to the east of A419 and south of South Marston village and extending east to Rowborough Farm, across Old Vicarage Lane. It extends to some 162 hectares and comprises:
    - About 6,000 dwellings at the New Eastern Villages (south of the A420)
    - About 1,500 dwellings at Rowborough
    - 500 dwellings at South Marston
    - High quality public realm
    - Transport links
    - Sports and leisure facilities
    - About 40ha of employment land
    - 2.5ha within B1a use-class
    - 7.5ha within B1b/c or B2 use-class, and
    - 30 ha within B8 use-class
    - A maximum of 12,000m2 of retail and complementary uses
    - A new learning campus, comprising of an 8-form entry secondary school, a special for children with profound, multiple and severe learning difficulties
    - 3 new 2-form entry primary schools
    - Community facilities
    - A health care facility with GP, dentist and pharmacy at the District Centre
    - infrastructure and utilities provision, including car parking; and ground remodelling, engineering works and demolition within the site.

- Kingsdown is allocated for mix-use development and shall provide
    - A total of 1,650 dwellings;
    - A mixed use local centre (not more than 1000m^2)
    - A 2-forms of entry primary school and a children centre
    - A contribution towards the delivery of 2 forms of entry secondary school places off-site
    - Sports and leisure facilities

Outline Application Approved:

- Wichelstowe is allocated for mix-use development and shall provide
    - up to 4,500 homes,
    - 12.5ha of employment land within Use Class B1 and B2,
    - A total of 4 local centres with one food store with 2,00-2,500 m^2 floorspace
    - A total of 3 (2-forms of entry) primary schools (or an additional 6-forms-of-entry)

- A secondary school
- Public open space
- High quality public realm
- Community facilities including:
  - A leisure centre
  - Buildings to use by the community, service providers and for worship
  - Police/emergency service point
  - Healthcare facilities
- park and ride, roads, sewers and associated works

- A mix use urban extension at Tadpole Farm, Tadpole Lane, Blunsdon, St. Andrews, Swindon was granted outlined Planning permission on 11th September, 2012. The development comprises of following:

  - 1,695 residential dwellings,
  - 5 ha of employment providing up to 20,000 m^2 GPA of Class B1 commercial use
  - 2.2 ha or primary school site capable of accommodating a 2 form entry school and preschool (class D2)
  - A local centre with a convenience store up to 400 m^2 (Class A1), 8 shops up to 600 m^2 (Class A1-A5) and community users up to 700 m^2 (Class D1 & D2)
  - A public house up to 604 m^2 (Class A4) including 70-80 new parking spaces
  - Public open space, recreational facilities and allotments
  - Provision of two points of access onto Tadpole Lane and a third point of access onto the "old" A419.
  - Associated infrastructure including roads, haul way etc.

- Commonhead – land is allocated for a mixed-use development. It is located to the east of Day House Lane and is separated from nearby Coate Water Country Park by about 70 ha of land. It comprises:

  - up to 890 dwellings,
  - 15ha of employment land within Use Class B1 and/or B2,
  - a local centre of a maximum of 1000 m^2 retail floorspace
  - primary school (or 1 form-of-entry) incorporating community facilities
  - contribution towards the delivery of 1 form of entry secondary school places off-site
  - sport, leisure and community facilities
  - high quality public realm
  - 5.5ha of land for the extension to the Great Western Hospital.

Developments, located in Wiltshire but on the border of Swindon Borough Council with a possible effect on the air quality within the Borough:

- Ridgeway Farm, includes up to 700 dwellings, one form entry primary school, provision of new buildings and/or new extension to existing secondary school buildings to accommodate additional pupil places at Bradon Forest Secondary School; provision of over 10 hectares of green infrastructure and public open space including the provision of interpretation boards within the community

forest planting within the site; leisure, sport and recreation contribution; NEAP and LEAP (Neighbourhood Area Equipped for Play and Local Area Equipped for Play); healthcare contribution; library and cemetery.

- Moredon Bridge includes 200 dwellings with additional 50 proposed.

5 Air Quality Planning Policies

The SB Local Plan 2011 forms a statement of Swindon Borough Council's planning policies and used as a basis for decision making on planning applications. The Plan covers the period from 2006. There is an emerging Local Plan 2026, which should be finalised after May 2014. The current 2006 Local Plan covers the areas of Emissions and Transport. Policy ENV25 (EN7 in the emerging Local Plan) suggests that "development that is likely to lead to emissions such as noise, light, vibration, smell, fumes, smoke, soot, ash, dust, grit or toxic substances that may adversely affect existing development and vulnerable wildlife habitats, shell only be permitted where such emissions are controlled to a point where there is no significant loss of amenity for existing land uses, or habitats". The main point of the transport policy is to "minimise the need to travel, especially by car". In the emerging Local Plan the Transport policies are set out to:

- "Improve key transport gateways and corridors;
- Provide good access to Swindon Town Centre and key destinations;
- Reduce severance caused by transport corridors and the dominance of the car on the streetscene;
- Minimise the environmental impact from transport (for example, vehicle emissions);
- Minimise congestion and therefore journey time, noise and air quality;
- Promote healthy lifestyles and travel choices and maximise opportunities to walk and cycle;
- Support good public transport provision; and
- Encourage innovative transport initiatives for rural areas."

These outlined in Policy TR1: Sustainable Transport Networks and TR2: Transport and Development.

6 Local Transport Plans and Strategies

The most recent Swindon Local Transport Plan 3: 2011-2026 was published in April 2011, covering 15 years transport overview for the Borough.

There are three main objectives comprising the development of the strategy including:

- Deliver a vibrant local economy: the economic prosperity of the town has been a key to attracting employers and therefore employees. It is also important for the existing and future retail opportunities;
- Improve the sense of place: highway dominated environments were identified as a key issue. Improvement to pedestrian and cycle permeability, by reducing the conflict between motorised traffic and other road users will help to redress the balance; and
- Reduce the need to travel: reducing the distances and need to travel provide greater choice while maintaining life chances.

It is recognises transport as a “major source of air pollutants which can have a detrimental impact on the air quality of an area, in turn leading to negative effects on human health”. This contributed into local transport strategy to be based on:

- Raising awareness of air quality issues particularly in relation to new developments
- Continued assessment of air quality
- Reducing vehicle use by promoting public transport, walking, cycling and car sharing
- Encouraging use of lower emission vehicles
- Better management of the highway network to reduce congestion, smooth the traffic flow and direct traffic on to the most appropriate roads

Swindon Transport Strategy then translated above in it key elements, which are: Rapid Transit Network, orbital bus route, Car Parking including Park and Ride; improved pedestrian and cycle networks and facilities, town centre improvements; highway improvements; and personalised travel planning for new residential developments.

The objectives of the Strategy are to deliver a vibrant local economy, improve the sense of place and reduce the need to travel. Ultimately this involves improving Swindon’s transport system today, and for the future.

7 Climate Change Strategies

Swindon Borough Council has no Climate Change Strategy, but is committed to the One Planet Living initiative with its overarching green policy (in line with recommendation 12 of the Economic, Environmental and Sustainability (EES) Overview and Scrutiny Committee).

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

This report has concluded the following:

- This assessment has indicated that there were measured exceedances of the Nitrogen Dioxide annual mean objective at a number of locations during 2013.
- At locations where the Nitrogen Dioxide annual mean objective was exceeded, concentrations were adjusted for the distance to the receptor. As a result only two areas – the A4289 Devizes Road to Kingshill Road at Clifton Street and Rodbourne Road at Cheney Manor - came close to the objective at 40.4 and 40.2 $\mu g/m^3$ respectively but neither were deemed significantly in excess of the objective to warrant the declaration of an Air Quality Management Area or to proceed to a Detailed Assessment.
- It is anticipated that traffic levels will decrease on the A4289 Devizes Road to Kingshill Road at Clifton Street because of new alternative route opened via Foxham Way in the Wichelstowe district. It has not yet been possible to assess the effect this will have on the A4289 because the new road was not fully open during the monitoring period.
- At Cheney Manor forthcoming major road realignments are expected to have appositive effect on traffic levels and thus local Nitrogen Dioxide concentrations.
- The trend at the majority of the monitoring points shows decrease in Nitrogen Dioxide concentrations.
- This year's monitoring has indicated several locations where tubes are to relocated to maximise their effectiveness (see section 9.3). In particular the tube placed at the Bus Station is to be relocated nearer to appropriate receptors.
- There are no issues regarding the 1-hour objective for Nitrogen Dioxide.

8.2 Conclusions relating to New Local Developments

There are currently no AQMA's within Swindon Borough Council's Administrative Area. There are proposals currently being processed for development over the coming years in addition to those identified in the previous Progress Report 2011 which include the construction of several residential premises, commercial light industrial, a large scale recreational facility and biomass installations. The impact of each proposal will be assessed prior to approval and considered in the next round of assessment following grant of planning permission and completion of the developments. Proposed sites also include new road layouts, an indoor ski centre, a waste to energy plant and the redevelopment of the Abbey Stadium (Speedway).

8.3 Proposed Actions

Since there is only 1% exceedance of Nitrogen Dioxide at the receptors, there is no need to proceed to a Detailed Assessment. However, a development a local air quality strategy suggested as the next step.

The locations of certain passive monitors were relocated on 19.03.2014, as shown in Table 8.1. For more details please see Appendix 3.

Table 8-1: Revised locations of monitors

Location pre-19.03.14	**Location Post- 19.03.14**
Swindon 20, 130 Kingshill Road	to South Marston (Lock Farm) on the "Public Footpath" sign. High 2.44m, distance to the kerb 12.5m, distance from the monitoring point to the cottage 19.7 m. Distance kerb-receptor 31.1m
Swindon 16, 422 Cricklade Road	to 496 Cricklade Road, on a streetlight 2.45 m above the ground level. 2.9m to the kerb and 2.6 m to the receptor. Distance kerb-receptor 5.5m.
Swindon 11, South Street	to Streetlight by 55A Devizes Road. 2.48m above the ground, 2.4 m to the kerb side, Distance kerb-receptor 2.4m
Swindon 12, Swindon Bus Statiion	to Streetlight next to 74 Manchester Road, 2.62 above the ground, 2.4m to the kerb. Distance kerb-receptor 2.5 m.
Swindon 22, fence next to the railway sidings. Garage at 2 Stratton Road	to 37 Farrier Close, Fence next to railway sidings, 1.64m above the ground. Distance kerb-receptor 2.4m

9 References

DEFRA (2009) Local Air Quality Management Technical Guidance, (LAQM .TG (09 LAQM Helpdesk accessible from http://laqm.defra.gov.uk/

National Diffusion Tube Bias Adjustment Factor Spread Sheet accessible from http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Swindon Core Strategy and Generic Development Control Policies Swindon Borough Council April 2007, downloaded from http://www.swindon.gov.uk/ep/ep-planning/forwardplaning/ep-planning-localdev/Documents/core_strategy_issues___options_-_main_document.pdf

Swindon Local Transport Plan 3: 2011-2026, Main Strategy, April 2011, Swindon Borough Council downloaded from http://www.swindon.gov.uk/ep/ep-planning/forwardplaning/ep-planning-localdev/Documents/Swindon%20Local%20Transport%20Plan%203%202011%20–%202026%20(SBC,%202011).pdf on 15 March 2014

Environmental Enforcement Planning Procedures (Air Quality Impact Assessments) Swindon Borough Council

Swindon Borough Council (2013) Air Quality Detailed Assessment Report, 2013

Appendices

Appendix 1: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The nitrogen dioxide diffusion tube data has been adjusted using factors generated by the National Bias Adjustment Factor Database (Version Number 03/14) which is available on the LAQM Helpdesk Website. The decision in favour of National Bias Factor has been made to keep consistency with previous years, as well as concerns of accuracy of the data. This based on the result of poor precision of the period of 05/03/2013 and 20/03/2014 and below 100% data capture.

Swindon Borough Council's nitrogen dioxide diffusion tubes were supplied and analysed by ESG Group, Didcot and use 50% TEA in acetone.

The bias adjustment factor used was 0.80

QA/QC of diffusion tube monitoring

Environmental Scientifics Group has advised the following.

- The manufacture and analysis of NO_2 diffusion tubes is covered by our UKAS accreditation
- The method meets the requirements laid out in DEFRA's "Diffusion Tubes For Ambient NO_2 Monitoring: Practical Guidance."
- The laboratory has taken part in the WASP proficiency scheme since its inception, and carries the highest ranking of 'Satisfactory' as well achieving 100% for all rounds on the DEFRA LAQM summaries since the
- adoption of the harmonised method in 2009 (rounds 105-124)
- ESG have achieved <10% CoV in all years since 2009 at the independently run Marylebone Road Intercomparison scheme
- In 2013, 6000+ internal quality control samples were analysed in conjunction with the diffusion tubes, achieving a analytical repeatability of 2.3% (at 95% confidence)

Appendix 2: Results of Nitrogen Dioxide Diffusion Tubes (2013 to 2014, 12 Months)

Site	05/03/2013 - 03/04/2013	03/04/2013- 30/04/2013	30/04/2013- 04/06/2013	04/06/2013- 02/07/2013	02/07/2013- 31/07/2013	31/07/2013- 30/08/2013	30/08/2013- 27/09/2013	27/09/2013 - 30/10/2013	30/10/2013- 28/11/2013	28/11/2013- 17/12/2013	17/12/2013- 22/01/2014	22/01/2014- 20/02/2014	20/02/2014 - 20/03/2014	Data capture, %	Counts	Mean	Bias adjusted, factor 0.8
Swindon 1- GWR Museum, Faringdon Rd	39.8	47.4	43.2	37.2	37.8	42.3	47.8	43.6	57.8	59.6	46.4	36.3	52.8	100	13	45.54	36.43
Swindon 2 - Bath Rd Car Park	27.6	25.3	22.2	23.4	25.8	21.8	34.3	34.4	42.6	37.3	31	29.9	37.7	100	13	30.25	24.20
Swindon 4 - Bath Road Car Park	38.3	27.9	26.4	21.4	24.6	24	33.9	35.1	39.8	46.3	29.9	24.9	39.7	100	13	31.71	25.37
Swindon 5 - 186 Kingshill Rd	60.1	39.2	42.3	27.7	32.9	34.9	44.5	42.2	56.4	62.8	46.8	48.7	50	100	13	45.27	36.22
Swindon 6 - Chalet School, Queens Drive	29	34.4	30.8	33.7	32.2	38.5	48.2	44.3	47.4	57.6	44.5	39.3	47.2	100	13	40.55	32.44
Swindon 8 - Bath Rd Car Park	39.8	26.7	23.2	23.4	23.4	25.7	33.8	35	45.8	38.5	31.8	30.7	35.5	100	13	31.79	25.43
Swindon 9 - S/O 31 Sandgate	31	20.1	18.5	19.3		35.9	27.8	25.7	39.1	29	21.6	43	30.9	92.3	12	28.49	22.79
Swindon 11 - South St, Swindon	25.2		15.9	12.5	11.9	13.9	21	22.1	29.9	32.2	19.5	21.3	24.9	92.3	12	20.86	16.69
Swindon 12 - Swindon Bus Station	51.2	49.5	48.3	40.5	55.1	48	55.8	51.3	56	65.4	55.3	50.1		92.3	12	52.21	**41.77**
Swindon 13 - Meadow Way, Badbury Wick	28.8	34.6	32.2	30.2	30.5	37.8	39.4	41.5	47.4	47	39.5	21.9	46.5	100	13	36.72	29.37
Swindon 14 - Kingshill Rd/Clifton St	54	50.9	45.2	41.3	51.5	55.1	64.3	60.2	62.1	68	53.8	51.4	70.1	100	13	55.99	**44.79**
Swindon 15 - Westcott Place	48.9	39.6	34.2	22.8	34.8	29.3	40.2	39	47.9	58.1	35.5	34.9	45.6	100	13	39.29	31.43
Swindon 16 - Cricklade Rd	48.2		37.5	29	31.1	31.1	43.8	38.5	59.3	51.8	34.5	38.6		84.6	11	40.31	32.25
Swindon 17 - Bruce St Bridges S/O 1 Bruce St	42.3	33.8	30.9	25.5	29.5	8.8	35.4		46.9	44	26.7	29	39	92.3	12	32.65	26.12
Swindon 18 - Val. Sample - Kingshill	45.3	49.1	44.8	45.4	55.6	55.3	62.7	57.2	67.8	76.7	55.8	61	68.3	100	13	57.31	**45.85**
Swindon 19 - Val. Sample 2 Kingshill Rd/Clifton St	42	55.1	44.9	44.9	54.3	50.9	63.3	59.2	72.1	78	61.4	45.5	65.8	100	13	56.72	**45.38**
Swindon 20 - S/O 130 Kingshill Rd	34.3	23	21.5	18	14.4	18.9	22.1	23.6	36.7	32.7	21	20	28.4	100	13	24.20	19.36
Swindon 21 - F/O 63 Kingshill Rd	39.1	37.7	28	32.8	40.4	34.8	51.1	43.8	43.1	58.3	35.2	30.2	48.4	100	13	40.22	32.18
Swindon 22 - S/O 2 Stratton Road	41.8		39.2											15.4	2	40.50	32.40
Swindon 23 - 37 Devizes Rd	39.9	50	54.7	48	50.9	50.2	68.8	58	82.9	78.8		53.6	64.2	92.3	12	58.33	**46.67**
Swindon 23 - 37 Devizes Rd	37.2	50.7	57.5	44.6	51.4	47.5	69	52.3	75.1	80		51	67.8	92.3	12	57.01	**45.61**
Swindon 23 - 37 Devizes Rd	40.2	52.8	50.6	43.1	47.9	45.2	72	55.2	76.5	68.9		48	70.8	92.3	12	55.93	**44.75**
Swindon 24 - Swindon Rd, Stratton F/O Baptist Ch	43.5	29.6	19.8	24	26.2	23.9	31.7	38.2	47.9	50.7	34.5	31.1	44.1	100	13	34.25	27.40
Swindon 25 - F/O 68 Cheney Manor Rd (Rodbourne Rd)	65.8	53.7	42.7	42.5	50.9	45.1	56.2	58.8	75.7	69.7	56.7	47.6	62.4	100	13	55.98	**44.79**
Swindon 26 - Corner of Dorney Ave & Tadpole Ln	31.8	19.6	19.5	18	20.5	17.2	27.3	25.7	29.6	32.3	21.9	16.2		92.3	12	23.30	18.64
Swindon 27 - F/O 66 Ermin St	41.2	36.6	34	30.2	30.8	33.5	42.1	36	42.8	44.7	40	34.3	49.3	100	13	38.12	30.49

Appendix 3: New monitoring locations

Based on the finding of the current report it is suggested:

1. Previously, the monitoring station Swindon 11 located at South St (Figure 9-1), where measured concentrations of Nitrogen Dioxide consistently met the Air Quality Targets. Considering that initially it was set to monitor the effect caused by the bus depot, which it now screened by 3m fence, causing misrepresentative effect.

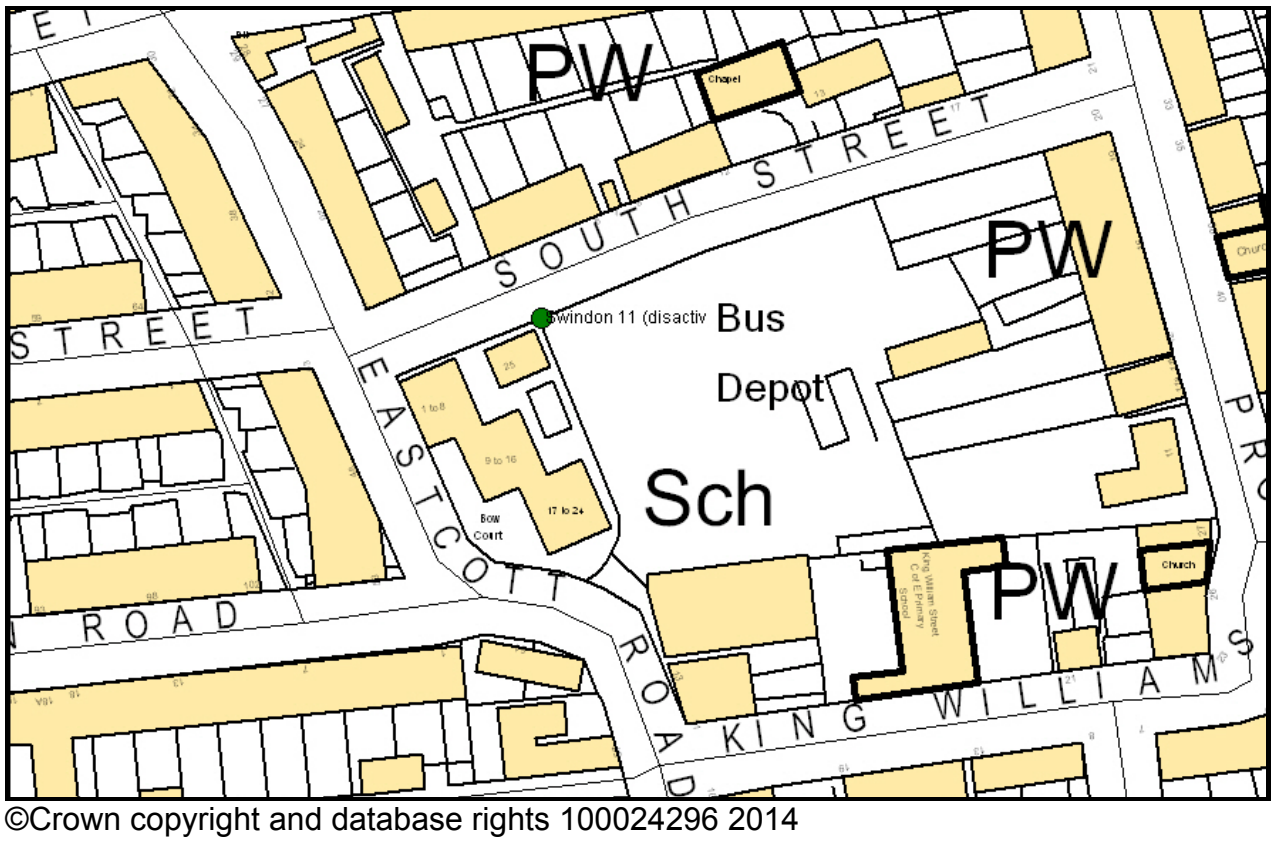


Figure 9-1: Former S11 location at South Street

At the same time fairly busy Eastcott Road is 37m further from the location lead to real-time monitor and triplicate of passive devises, which in many cases measures the worst-case scenario of the area. Therefore this station is suggested to be relocated to Devizes Road area as an additional referensing monitoring point (Figure 9-2).

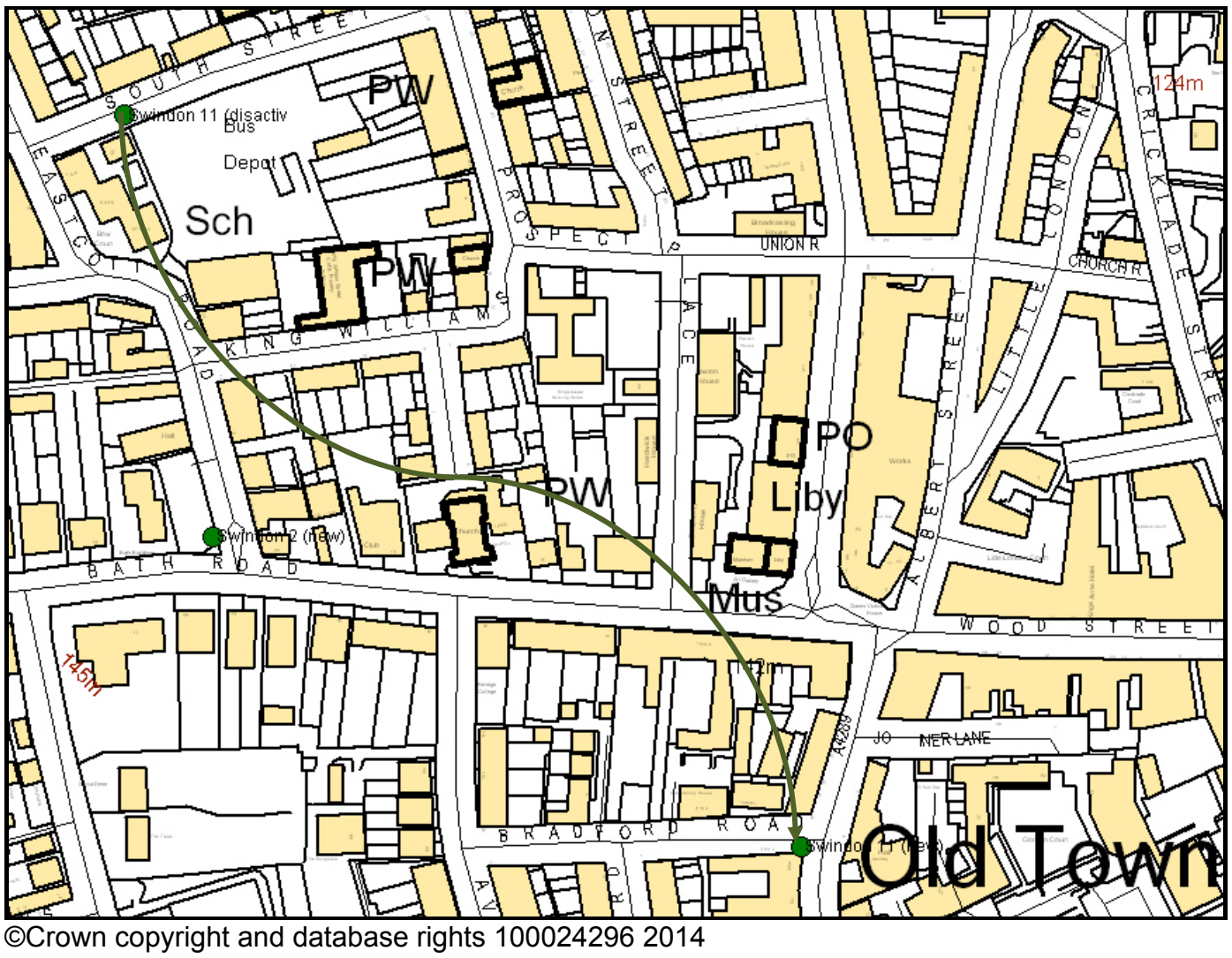


Figure 9-2: Relocation Swindon 11 monitoring Station to Devizes Road area

2. As it was mentioned before, there are plans to relocate Swindon 12, Bus Station. However as the overall concern in this area remains, therefore it is suggested to move the location of the tubes towards receptors, i.e. residential properties along Manchester Road until new facilities will be built and fully operational.

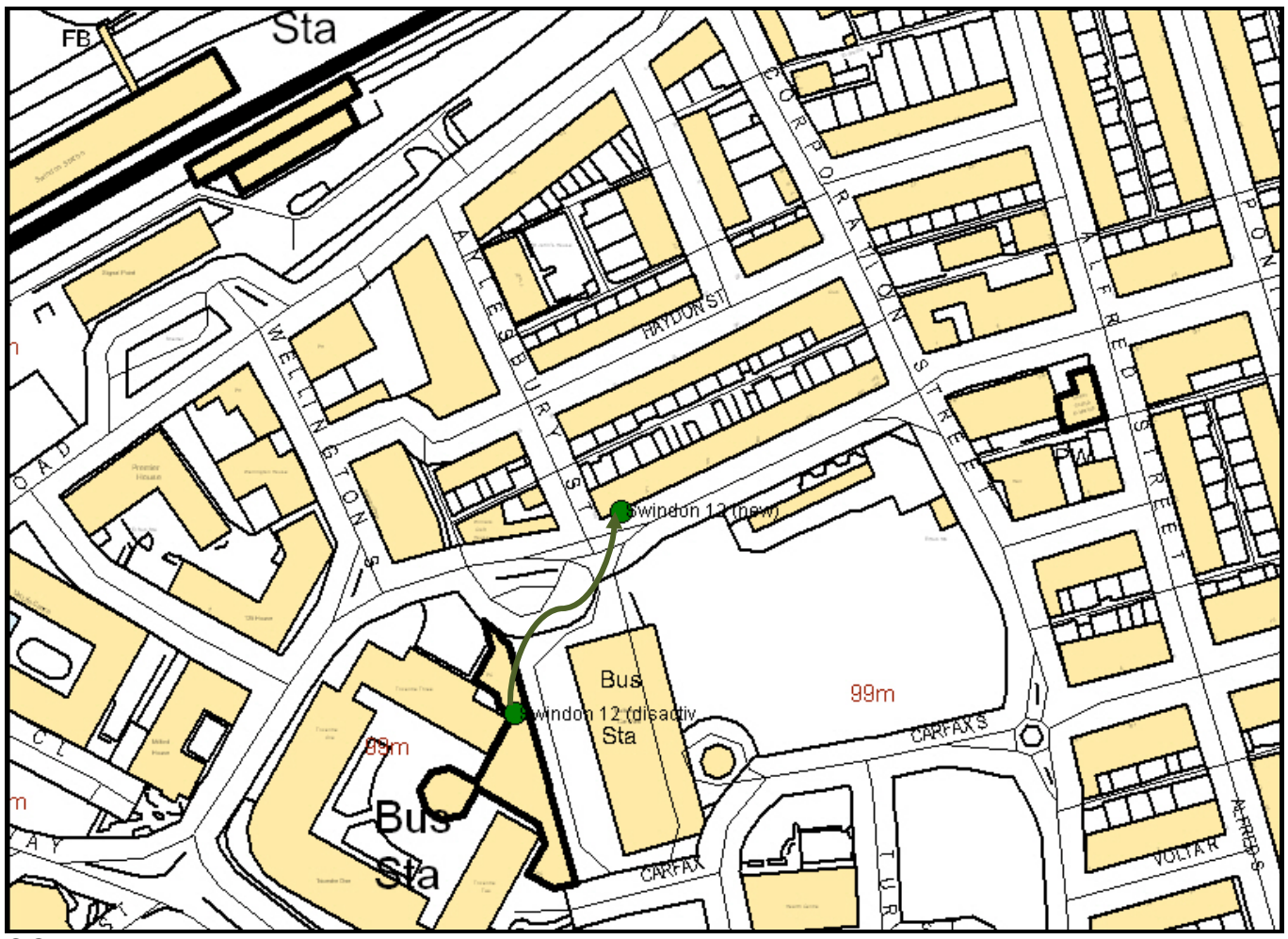


Figure 9-3: Relocation of Swindon 12, Bus Station towards receptors at Manchester Road

3. The monitoring station Swindon 16 at Cricklade Road (Figure 9-4) is not explicitly representing the worst case scenario of the area. The road at this point is fairly wide and air flows freely. When bias adjusted, it is well below AQ objectives (31.44 µg/m^3 for 2012-2013).

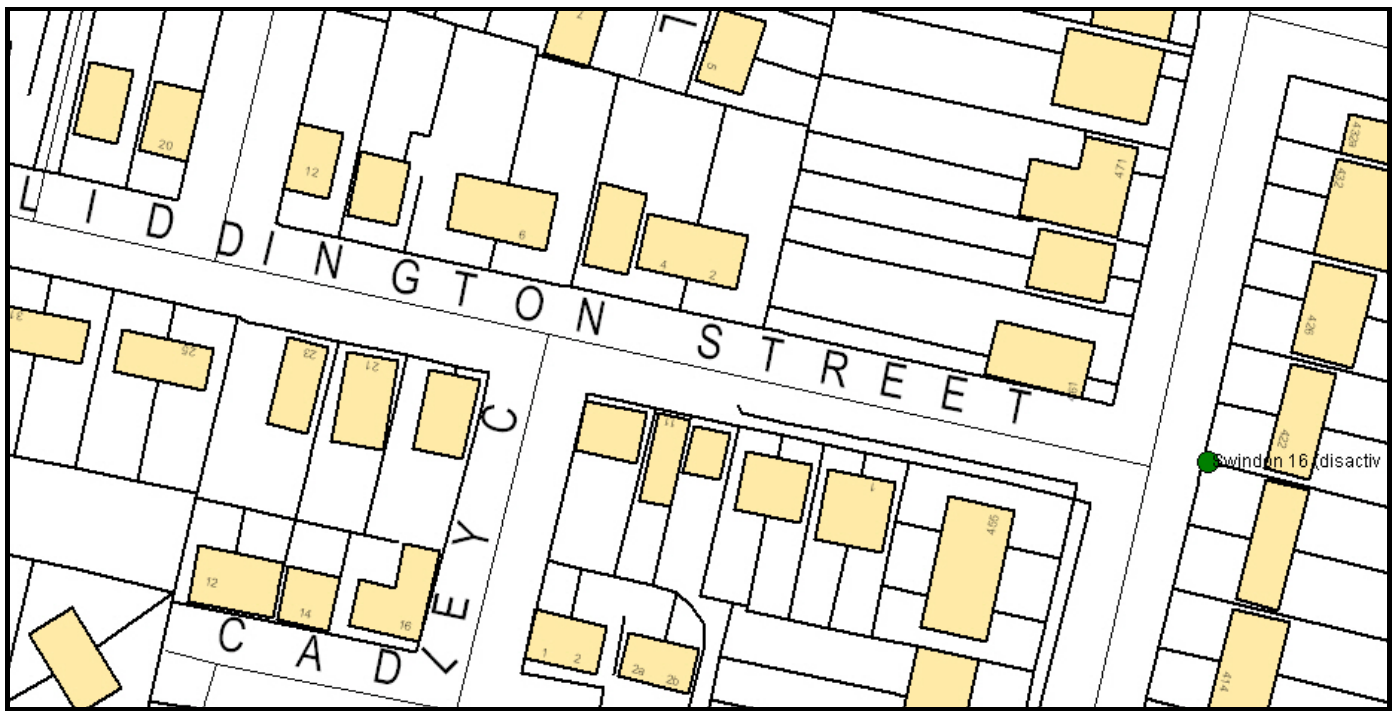
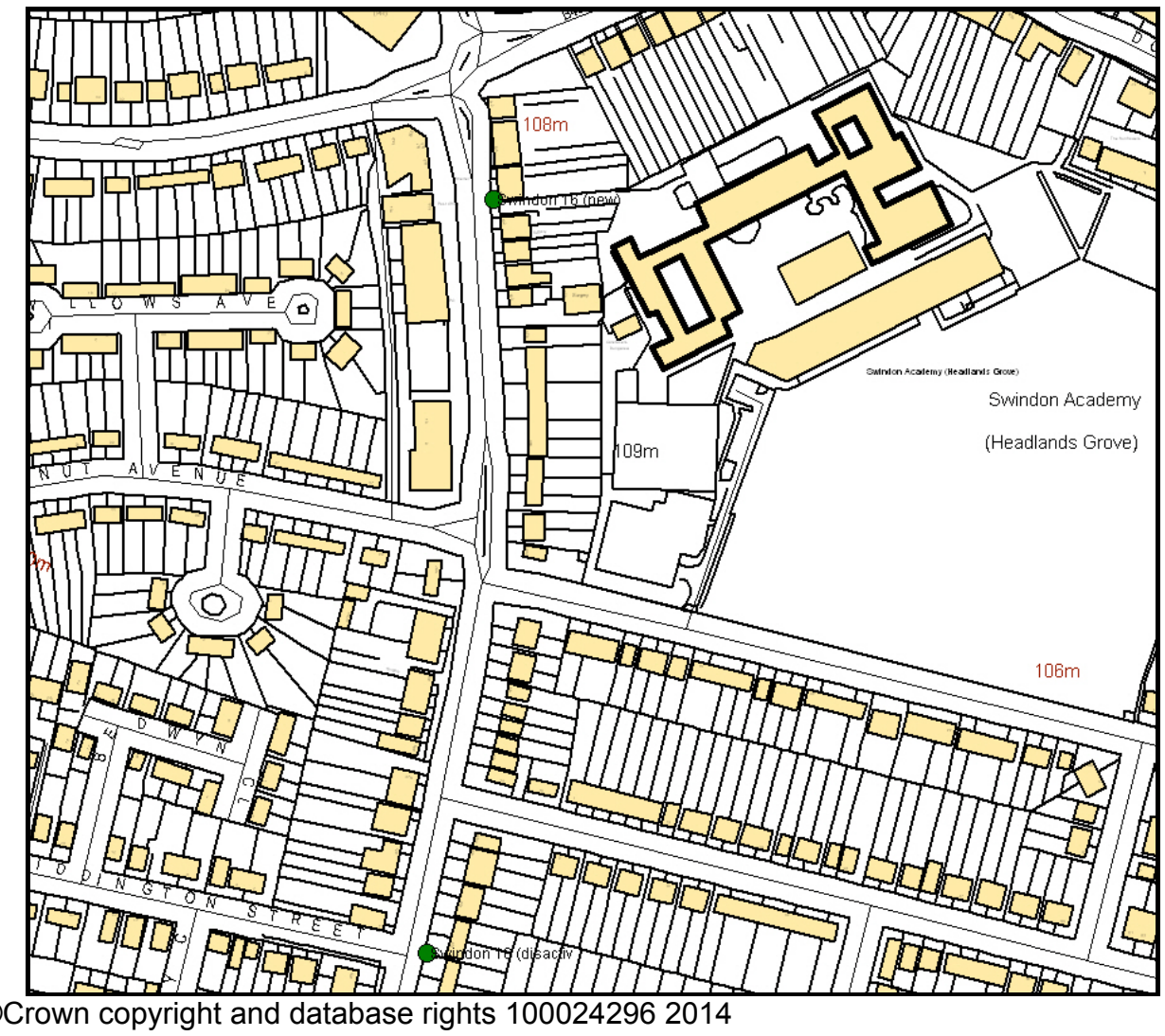


Figure 9-4: Previous location Swindon 16 monitoring station at Cricklade Road

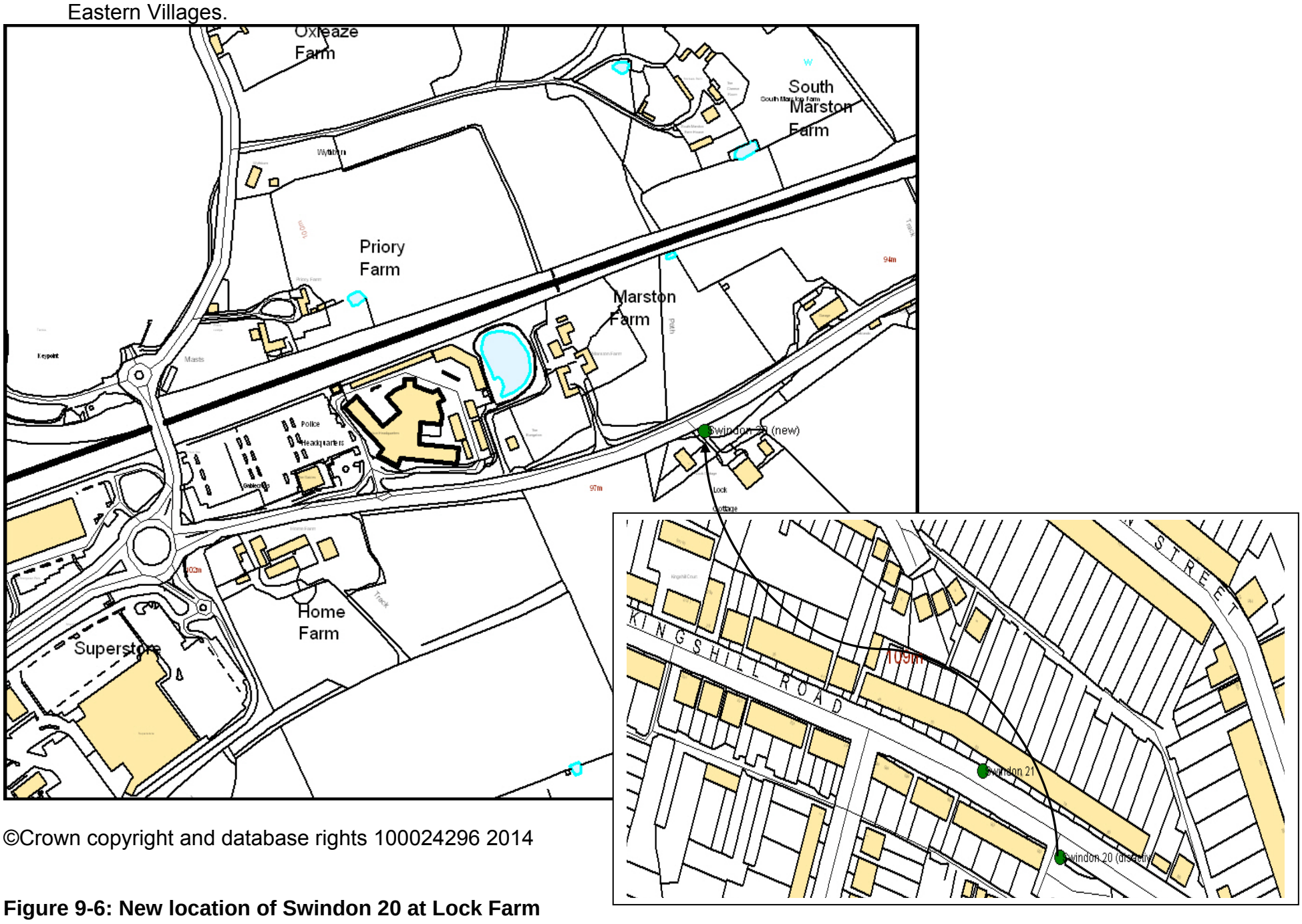
At the same time, the worst case scenario of the area can be considered to be near double roundabout linking Whitworth and Beechcroft Roads at Croft Road around Nos 480 to 510, where houses are creating a canyon effect. Therefore it is suggested to relocate the monitor as below (Figure 9-5).



©Crown copyright and database rights 100024296 2014

Figure 9-5 Rolocation of Swindon 16 at Cricklade Road towards Moonrakers Roundabout, linking Whitworth and Beechcroft Roads at Croft Road

4. Since concentrations of Nitrogen Dioxide at location Swindon 20 (Side of 130 Kingshill Road) have been consistently meeting AQ objectives, it was decided to move this monitoring station to a new location at Side of 130 Kingshill Road to Lock Farm, along A420. This has been done in March 2014 ready for a new monitoring period. The location was chosen to monitor background concentrations in the vicinity on the new major proposed planning applications in South Marston and Eastern Villages.



©Crown copyright and database rights 100024296 2014

Figure 9-6: New location of Swindon 20 at Lock Farm

5. To relocate a monitoring station Swindon 22 - S/O 2 Stratton Road to 37, Farriers Close to monitor possible effect of locomotive movements anticipated as a result of new cement depot (Figure 9-7).

Figure 9-7 Relocation of the monitoring station Swindon 22 - S/O 2 Stratton Road to 37, Farriers Close