2015 Updating and Screening Assessment for Sunderland City Council

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

Date June 2015

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Executive Summary

The Air Quality Strategy establishes the framework for air quality improvements. Measures agreed at the national and international level are the foundations on which the strategy is based. It is recognised, however, that despite these measures, areas of poor air quality will remain, and these will best be dealt with using local measures implemented by the LAQM regime. The role of the local authority review and assessment process is to identify those areas where the air quality objectives are being or are likely to be exceeded. Experience has shown that such areas may range from single residential properties to whole town centres.

Sunderland City Council have been assessing the air quality in their area for over 10 years through the Review and Assessment framework and this is the fourth Updating and Screening Assessment that has been undertaken. A major change to the approach to Updating and Screening Assessment is that the assessment is now carried out on a source-by-source basis, rather than considering each pollutant in turn.

Sunderland City Council takes a pro-active stance on LAQM and although we have not had to declare an Air Quality Management Area within our boundaries, considerable effort and funding has been put into monitoring the air quality in Sunderland. We were also very pleased to have one of our automatic monitoring stations adopted into the National Automatic Urban Network in 2004. The station which is situated at the Tennis centre on the Silksworth Sports Complex now monitors NO_x, Ozone and $PM_{2.5}$ for the AURN along with PM_{10} for the purposes of LAQM. This year we have had an additional AURN site commissioned on Wessington Way (A1231) which is one of the main roads into Sunderland. The site monitors NO_x and will be a valuable addition to our sources of data. Data from this site will be included in the next Progress Report.

Data presented in the Progress Report 2014 supported the need for a Detailed Assessment for NO2 identified in the Progress Report 2013. Data for the DA has been collected during 2014 and is continuing during 2015.

Sunderland City Council's next course of action will therefore be to report the data collected in a Detailed Assessment for Nitrogen Dioxide at the Wheatsheaf Gyratory in June 2015.

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1 Introduction

1.1 Description of Local Authority Area

Sunderland is one of five Local Authorities making up the conurbation of Tyne & Wear that covers an area of 54,006 hectares, with a population of 1.134 million. The conurbation centres around two major rivers with a mixture of large urban and rural areas.

A substantial rail and road network covers the region, which includes a number of motorways and trunk roads, primary roads, principal roads and other classified and non-classified routes. A comprehensive network of bus services operates in Tyne & Wear, as well as a Metro light rail network. Both regional and national rail systems and freight also operate. Passenger ferries and freight shipping services operate from the Port of Tyne and cargo traffic enters and leaves the Port of Sunderland.

Cars form the bulk of traffic on the roads - car ownership in Tyne & Wear increased by about 44% between 1980 and 1996, broadly in line with national trends. If existing trends continue, further substantial increases in car ownership can be anticipated. This, together with the expected increase in commercial traffic will lead to greater pressure on the road system. As car ownership grows congestion becomes worse. Businesses are especially concerned about rising expenses caused by traffic jams. Regions remote from London, like the North-East, are particularly affected. As a result, large urban areas – including Tyne and Wear – have been instructed by the Department of Transport to set congestion targets. The target for Tyne and Wear is to limit congestion so that, by 2011, travellers experience a maximum 7% increase in average journey time per person mile on 16 key corridors throughout Tyne and Wear. This compares with an expected 12% growth in traffic on these roads during this period.[1]

Air quality in Tyne & Wear may also be influenced by sources external to the region, notably power generation and metal refining activities. The region is bounded to the east by the North Sea, which is considered to be a source of natural particulates - sea salt- that contribute to the overall particulate level in the region.

1.2 Purpose of 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.

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

1.3 Air Quality Objectives

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

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particles (PM_{10}) (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

Name of Report	Date Produced	Brief Outcome
First Stage Air Quality Review & Assessment for Tyne & Wear *(jointly with the Tyne & Wear authorities)*	1998	Identified that 6 of the 7pollutants with Air Quality Objectives needed further investigation. 1, 3 Butadiene was eliminated.
Final Stage Review and Assessment (*stages 2 & 3 jointly with South Tyneside Council*)	2000	Undertook an Urban Emissions Inventory and a computer model using ADMS- Urban. Concluded all objectives will be met by the specified dates.

Updating & Screening Assessment 2003 (*Sunderland only*)	2003	Proceeded to a detailed assessment for NO2 based on NO2 diffusion tubes and DMRB screening model.
Detailed Assessment of Air Quality (All Tyne & Wear Authorities)	Jan 2005	Concluded that AQMA's should be declared at two sites in Sunderland.
Supplementary Detailed Assessment of Air Quality (Sunderland only)	June 2005	Reversed findings of DA and concluded the AQMA's were not required due to new continuous analyser data and removal of a receptor due to redevelopment.
Updating & Screening Assessment 2006 (*Sunderland only*)	2006	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Progress Report (*Sunderland only*)	2007	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Progress Report (*Sunderland only*)	2008	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Updating & Screening Assessment 2009 *(Sunderland only)*	2009	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Progress Report *(Sunderland only)*	2010	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Progress Report *(Sunderland only)*	2011	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Updating & Screening Assessment	2012	Concluded that it was necessary to proceed to a DA for NO_2 at relevant locations
Progress Report	2013	Concluded that it was necessary to proceed to a DA for NO_2 at relevant locations
Progress Report	2014	Concluded that it was necessary to proceed to a DA for NO_2 at relevant locations

The Updating and Screening Assessments (USA) carried out as part of the second round of Review and Assessment of air quality in the Sunderland region identified a number of locations where the UK Air Quality Objectives were at risk of being exceeded. In 2005, a Detailed Assessment (DA) was carried out to determine whether it was likely that the objectives will be exceeded at these locations, in order to determine the need for any Air Quality Management Areas (AQMA's).

The DA concluded that there was a risk of the annual mean objective for nitrogen dioxide to be exceeded at two locations, Trimdon Street Roundabout and Chester Road/Ormonde Street, and that Air Quality Management Areas (AQMA's) should be

declared. Since publication of the Detailed Assessment report, additional information on measured nitrogen dioxide concentrations at the Chester Road/Ormonde Street junction was made available. The results from three months continuous monitoring at this location, along with the full 12 months data from a diffusion tube monitoring site indicated that the annual mean nitrogen dioxide objective would be achieved by a reasonable margin in 2005.

In addition, further information was obtained relating to the second potential area of exceedence of the annual mean nitrogen dioxide objective at Trimdon Street Roundabout. The area of potential exceedence covered one receptor known as Embassy House. The property was purchased by the City of Sunderland as part of a large development plan and was demolished soon after. Since there were no receptors in the area of potential exceedence there was no requirement for the declaration of an Air Quality Management Area.

The 2012 USA identified that there was a risk of the UK Air Quality Objectives being exceeded in one location. Sunderland City Council has therefore proceeded to a Detailed Assessment at relevant locations. The DA has been interrupted due to contractual issues with the service contractor. Data collection has now restarted and will be completed at the beginning of June 2015. This USA will provide data collected during 2014.

Currently Sunderland City Council has no AQMA’s within its boundary.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

During 2014, pollutants have been monitored at 3 sites within Sunderland. Trimdon Street and Silksworth (Puma Centre) are long term sites which have been in operation for several years. In addition, there has been a new site at Dunn House to collect data for our Detailed Assessment of NO_2. Sites have been routinely visited by Local Authority officers once a fortnight for roadside sites and once every 4 weeks for urban background sites. A calibration check was performed at these visits and provided to our data management company who used it to rescale the data. Sites are serviced every 6 months when they are also calibrated. Ferndale Terrace and Northern Way sites have now ceased as the monitoring period of 12 months has ended.

Map(s) of Automatic Monitoring Sites

Figure 2.1 Location of Trimdon St Automatic Monitoring Station

Figure 2.2 Location of Silksworth (Puma Centre) Automatic Monitoring Station.

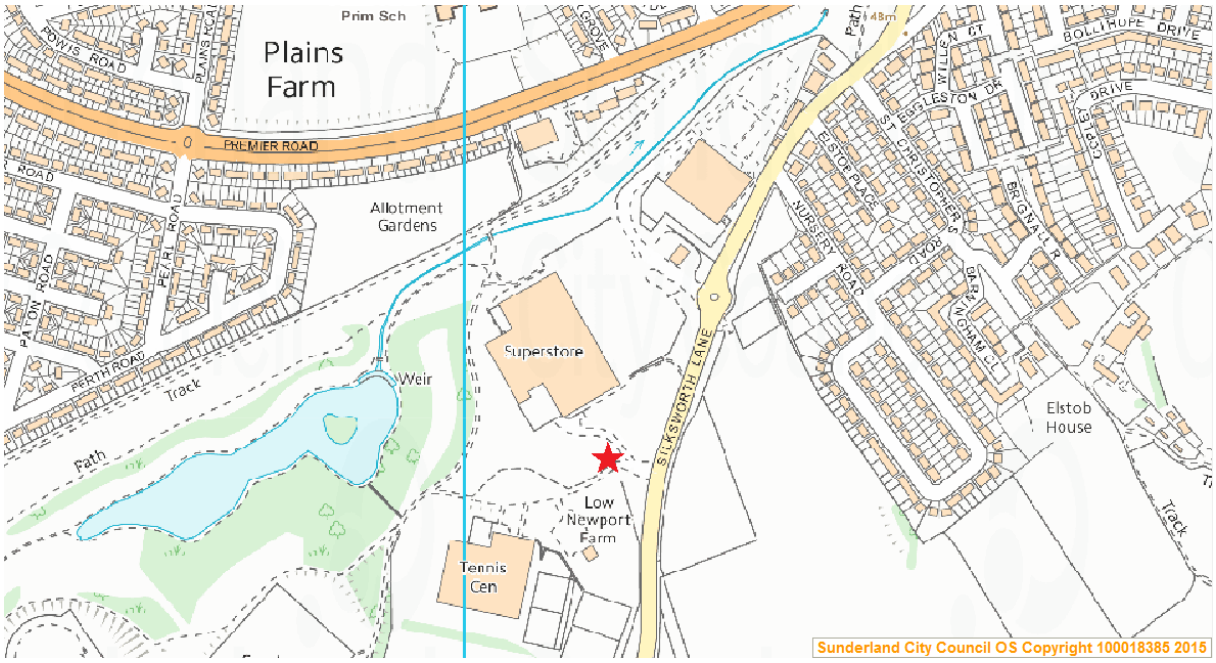


Figure 2.3 Location of Dunn House Automatic Monitoring Station.

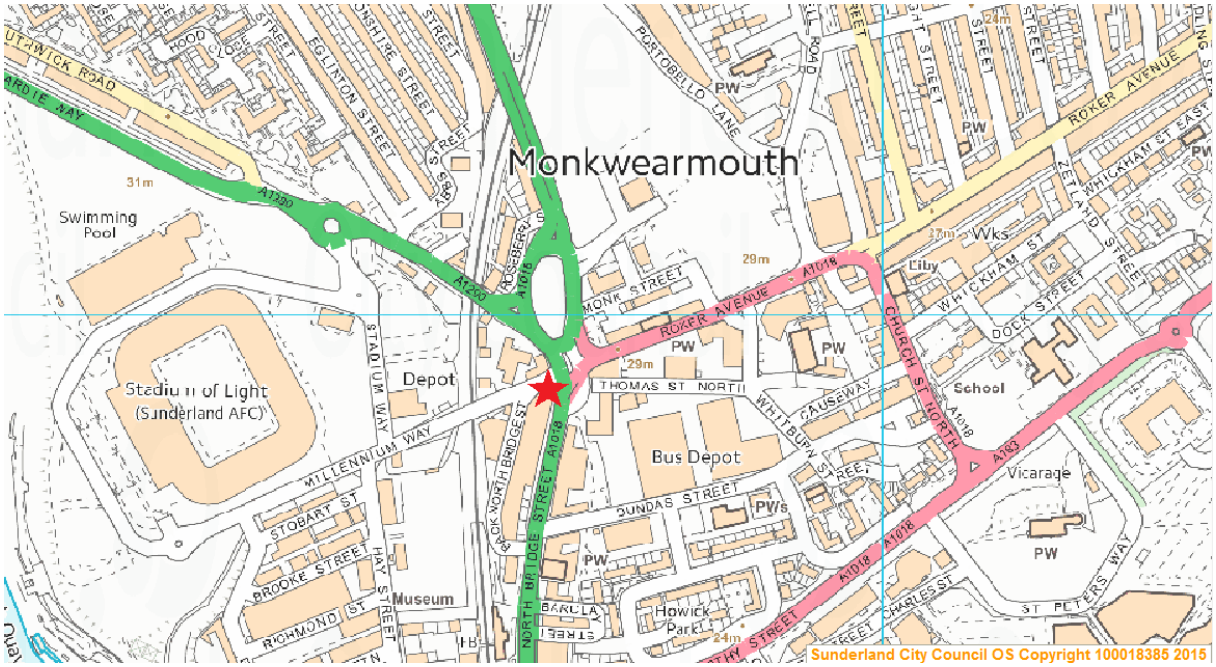


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
CM 1 **Trimdon St**	Kerbside	438928	557151	NO_X	N	Chemiluminescence, TEOM	Y (3m)	0.5	Y
CM 2 **Silksworth**	Urban background	438116	554462	NOx, PM_{10},$PM_{2.5}$, O_3	N	Chemiluminescence, TEOM, FDMS	No	0.5 but 10m to nearest busy road	N
CM 3 **Dunn House**	Roadside	439661	557921		N	Chemiluminescence	Yes (1m)	4.5	Y

2.1.2 Non-Automatic Monitoring Sites

Nitrogen Dioxide has been measured using passive diffusion tubes for several years throughout Sunderland and the number of sites is currently 37. The vast majority of the tubes are located on busy roads and there are two co-located sites where diffusion tubes in triplicate are sited at automatic stations. These are at Trimdon Street and the Puma Centre, Silksworth. Wherever possible the tubes are located on the façade of buildings that are relevant receptors such as residential properties.

The monitoring of Benzene concentrations has ceased due to continually insignificant results. Details of the QA/QC procedures and the laboratory used to analyse the tubes are contained in Appendix A.

Diffusion tube precision can be described as the ability of a measurement to be consistently reproduced, i.e., how similar the results of duplicate or triplicate are to each other. Bias represents the overall tendency of the diffusion tubes to depart from the true value, i.e., to under or over-read relative to the reference method (the chemiluminescence analyser).

A database of bias adjustment factors determined from Local Authority co-location studies throughout the UK has been collated by the Local Air Quality Management Helpdesk. Using orthogonal regression, combined bias adjustment factors have been calculated for each laboratory, year and preparation method combination for which data are available.

The National Bias adjustment database was used to calculate a bias adjustment factor. The correct laboratory, preparation method and year of study were selected from the data base to produce an adjustment factor of 0.91.

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Number	Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
29	Arndale House, St Mary's Way	Roadside	X439508 Y557151	NO_2	No	0.5m	Y
38	17 Parkside Sth, E. Herrington	Roadside	X435714 Y552473	NO_2	Yes 0m	10m	Y
39	15 John Street	Urban Centre	X439835 Y556978	NO_2	No	3m	N
53	166 Chester Road	Roadside	X438568 Y556566	NO_2	Yes 0m	4m	Y
55	25 Eden Vale	Roadside	X438690 Y556135	NO_2	Yes 0m	2m	Y
56	101 Southwick Road	Roadside	X439101 Y553282	NO_2	Yes 0m	2m	Y
57	5/6 Nbridge St, Monkwearmouth	Kerbside	X439664 Y557829	NO_2	Yes 0m	1m	Y
58	6 Beatrice Tce, Shiney Row	Kerbside	X432634 Y552616	NO_2	Yes 0m	1m	Y
86	2 Alice Street	Roadside	X439466 Y556484	NO_2	Yes 0m	2m	Y
88	Hinds Street	Roadside	X439160 Y556995	NO_2	No	1m	Y
94	Chaplin's PH, Mary St.	Kerbside	X439423 Y556738	NO_2	Yes 0m	0.5m	Y
100	Trimdon St AQ Station	Kerbside	X438927 Y557151	NO_2	Yes 3m	0.5m	Y
101	Puma Centre, Silksworth Ln	Urban Background	X438116 Y554462	NO_2	No	0.5m	N
103	Trimdon St AQ Station	Kerbside	X438927 Y557151	NO_2	Yes 3m	0.5m	Y
104	Trimdon St AQ Station	Kerbside	X438927 Y557151	NO_2	Yes 3m	0.5m	Y
105	Puma Centre, Silksworth Ln	Urban Background	X438116 Y554462	NO_2	No	0.5m	N
106	Puma Centre, Silksworth Ln	Urban Background	X438116 Y554462	NO_2	No	0.5m	N
109	23 Newcastle Rd	Roadside	X439648 Y558120	NO_2	Yes 0m	2m	Y
111	237 Queen Alexandra Rd,	Roadside	X438453 Y555507	NO_2	Yes 0m	5m	Y
113	181 Durham Road	Roadside	X437446 Y554989	NO_2	Yes 0m	5m	Y
116	9 Derwent St	Urban Centre	X439451 Y556718	NO_2	Yes 0m	1m	Y
117	3, Holmeside	Roadside	X439495 Y556795	NO_2	No	1m	N

Site No	Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location
118	27 Bridge St	Roadside	X439696 Y557205	NO_2	Yes 0m	2m	Y
119	4 Athenaeum St	Roadside	X439792 Y556921	NO_2	Yes 0m	2m	Y
120	Gillespie's PH	Roadside	X439806 Y557063	NO_2	No	2m	N
121	16 Windsor Tce, Grngetwn	Roadside	X440702 Y554722	NO_2	Yes 0m	3m	Y
123	263 Chester Rd	Roadside	X437943 Y556341	NO_2	Yes 0m	4m	N
125	45 Station Rd	Roadside	X435417 Y547025	NO_2	Yes 0m	1m	Y
128	Echo Building	Roadside	X439707 Y557312	NO_2	Yes 10m	10m	Y
129	West Sunniside	Roadside	X439938 Y557089	NO_2	Yes 5m	1m	Y
130	St Mary's Car Park	Roadside	X439538 Y557292	NO_2	No	1m	Y
131	Chaplin's PH 2nd Tube	Kerbside	X439397 Y556666	NO_2	Yes 3m	0.5m	Y
132	Dunn House, N Bridge St.	Kerbside	X439661 Y557901	NO_2	Yes 3m	1m	Y
133	26 Northern Way	Roadside	X438153 Y558344	NO_2	Yes 3m	2m	Y
134	Southwick Road /Thompson	Roadside	X438563 Y558517	NO_2	Yes 3m	2m	Y
135	Merle Terrace	Roadside	X437561 Y557538	NO_2	Yes 3m	2m	Y
136	1 Morningside Rickleton	Roadside	X428269 Y553809	NO_2	Yes 5 m	0.5m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Nitrogen dioxide was monitored at three locations across the city at automatic sites. Sunderland City Council continued to monitor at our two long standing sites at Trimdon Street and at Silksworth. We also began monitoring at Dunn House to provide the data for our Detailed Assessment. Monitoring at Dunn House began in July 2014 and continued to the end of November 2015. Unfortunately we then were unable to collect further data due to contractual issues with our Equipment Support

and Data Management provider. The 5 months of data gathered have been annualised and the results shown below in table 2.3. We have decided to collect a further three months of data which began in March 2015. The final results of the Dunn House Data will be provided in our Detailed Assessment. The data capture has also been affected at Trimdon St and Silksworth due to the same contractual issues. The annual mean objective was met at all three sites (table 2.3). There were no exceedences of the hourly NO_2 objectives at any of the three sites (table 2.4).

Table 2.3 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective of 40 μg/m^3

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2014 % [b]	Annual Mean Concentration μg/m^3				
					2010* [c]	2011* [c]	2012* [c]	2013* [c]	2014 [c]
CM 1 Trimdon St	Kerbside	N	82.5	61.8	N/A	36.4	35.3	33.5	38.9
CM 2 Silksworth	Urban background	N	n/a	88%	16	16	18	16	16
CM 3 Dunn House	Roadside	N	94.5	39.4	N/A	N/A	N/A	N/A	34.7

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
*Annual mean concentrations for previous years are optional.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2014 % [b]	Number of Exceedences of Hourly Mean (200 μg/m^3)				
					2010* [c]	2011* [c]	2012* [c]	2013* [c]	2014 [c]
CM1	Kerbside	N	82.5	61.8	N/A	0	0	0	0
CM2	Urban Background	N	n/a	88	0	0	0(80 μg/m^3)	0(80 μg/m^3)	0(76 μg/m^3)
CM3	Roadside	N	94.5	39.4	N/A	N/A	N/A	N/A	0

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).
[c] If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets
*Number of exceedences for previous years are optional.

Diffusion Tube Monitoring Data

The results of the diffusion tube data for NO_2 were that the annual objective of 40µg/m^3 was met at all locations.

Figure 2.4 below shows the annual averages for tubes from selected locations across the city. These have been plotted for the last 5 years to investigate trends in NO_2 within Sunderland. The 5 sites show a strong visible correlation even though some are road side and some are classed as background sites. The annual averages can also be seen to generally increase from 2010 reaching a peak in 2012 and then have fallen again in 2013 and 2014 which would indicate that NO_2 levels are being affected by additional factors apart from traffic. It is hoped that this general decreasing trend continues and that it is attributable to engine technology improvements as newer cars are purchased across the region.

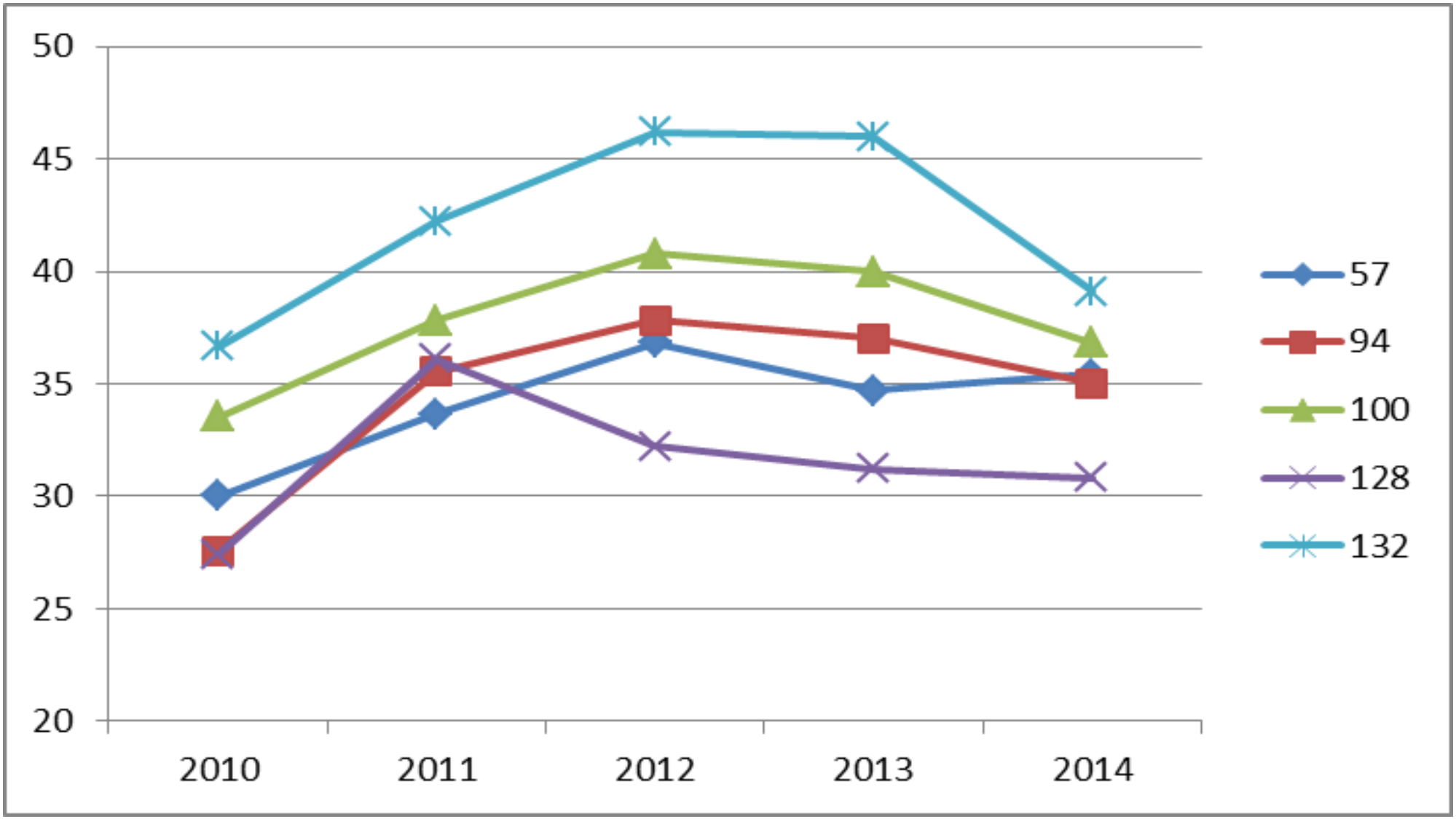
Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91) 2014 (μg/m^3)
29	Arndale House, St Mary's Way	Roadside	N	N	10	N	N	23.63
38	17 Parkside Sth, E. Herrington	Roadside	N	N	12	N	N	28.91
39	15 John Street	Urban Centre	N	N	12	N	N	22.20
53	166 Chester Road	Roadside	N	N	11	N	N	27.18
55	25 Eden Vale	Roadside	N	N	12	N	N	30.61
56	101 Southwick Road	Roadside	N	N	10	N	N	25.76
57	5/6 Nbridge St, Monkwearmouth	Kerbside	N	N	9	N	N	35.38
58	6 Beatrice Tce, Shiney Row	Kerbside	N	N	12	N	N	32.69
86	2 Alice Street	Roadside	N	N	12	N	N	20.26
88	Hinds Street	Roadside	N	N	6	N	N	28.31
94	Chaplin's PH, Mary St.	Kerbside	N	N	9	N	N	35.05
100	Trimdon St AQ Station	Kerbside	N	Y	12	N	N	36.85
103	Trimdon St AQ Station	Urban Background	N	Y	12	N	N	37.19
104	Trimdon St AQ Station	Kerbside	N	Y	11	N	N	37.07

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91) 2014 ($\mu g/m^3$)
101	Puma Centre, Silksworth Ln	Kerbside	N	Y	10	N	N	16.68
105	Puma Centre, Silksworth Ln	Urban Background	N	Y	10	N	N	16.17
106	Puma Centre, Silksworth Ln	Urban Background	N	Y	10	N	N	15.34
109	23 Newcastle Rd	Roadside	N	N	3	N	N	32.27
111	237 Queen Alexandra Rd,	Roadside	N	N	11	N	N	19.32
113	181 Durham Road	Roadside	N	N	11	N	N	27.02
116	9 Derwent St	Urban Centre	N	N	11	N	N	25.91
117	3, Holmeside	Roadside	N	N	11	N	N	35.70
118	27 Bridge St	Roadside	N	N	12	N	N	24.01
119	4 Athenaeum St	Roadside	N	N	12	N	N	26.09
120	Gillespie's PH	Roadside	N	N	11	N	N	24.90
121	16 Windsor Tce, Grngetwn	Roadside	N	N	12	N	N	26.17
123	263 Chester Rd	Roadside	N	N	12	N	N	35.58
125	45 Station Rd	Roadside	N	N	12	N	N	25.81
128	Echo Building	Roadside	N	N	10	N	N	30.78

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91) 2014 (μg/m^3)
129	West Sunniside	Roadside	N	N	12	N	N	20.22
130	St Mary's Car Park	Roadside	N	N	12	N	N	24.03
131	Chaplin's PH 2nd Tube	Kerbside	N	N	9	N	N	32.96
132	Dunn House, N Bridge St.	Kerbside	N	N	11	N	N	39.05
133	26 Northern Way	Roadside	N	N	12	N	N	31.34
134	Southwick Road/Thompson	Roadside	N	N	10	N	N	30.25
135	Merle Terrace	Roadside	N	N	12	N	N	24.14
136	1 Morningside Rickleton	Roadside	N	N	12	N	N	21.91

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



2.2.2 PM_{10}

PM_{10} is measured at two locations in Sunderland at present. Both sites use a TEOM to collect these measurements. The data has been corrected for both sites using the Volatile Correction Model. This was carried out on our behalf by SupportingU who collected and ratified our data for the period. Unfortunately as mentioned in the NO_2 chapter we have had contractual issues with our ESU and data management provider and so this has affected our data capture at both sites. The data capture for the period of monitoring completed was however good being over 90% at both sites. The means were annualised as described in Box 3.2 of TG(09).Both sites met the annual objective of 40 µg/m^3 and the 24-hour mean of less than 35 exceedences of 50 µg/m^3 per year.

Table 2.7 Results of Automatic Monitoring of PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2014 %[b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration 40μg/m^3				
						2010*[c]	2011*[c]	2012*[c]	2013*[c]	2014[c]
CM1	Kerbside	N	91.2	68.3	Y	18	20	22.1	21.6	21.3
CM2	Urban Background	N	93.4	62.2	Y	15	15	15.6	15.3	13.9

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
* Optional

Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour mean Objective (50μg/m^3 not to be exceeded more than 35 times per year.)

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2014 %[b]	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 μg/m^3)				
						2010*[c]	2011*[c]	2012*[c]	2013*[c]	2014[c]
CM1	Kerbside	N	91.2	68.3	Y	0	16	10	3	6
CM2	Urban Background	N	93.4	62.2	Y	0	0	0	3	2

[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 data capture is less than 90%, include the 90th percentile of 24-hour means in brackets
* Optional

2.2.3 Sulphur Dioxide

Sulphur Dioxide monitoring has taken place at the AURN Monitoring Station in Silksworth (CM2) for several years. This site, operating since 2004, had been part of the National Network operated on behalf of the UK Government. However due to a national decline in the pollutant, Sulphur Dioxide monitoring has now ceased.

The main source of this pollutant is fossil fuel combustion. SO_2 emissions in the UK have decreased substantially since 1990, due to reductions in the use of coal, gas and oil, and also to reductions in the sulphur content of fuel oils and DERV (diesel fuel used for road vehicles). The fall in emissions is reflected by a corresponding fall in ambient concentration, (*Air Pollution in the UK 2012* Published by the Department for Environment, Food and Rural Affairs, September 2013).

2.2.4 Benzene

Results from Benzene diffusion tube monitoring in the past has also been well below the Air Quality Objectives and as a result is no longer carried out.

2.2.5 Other pollutants monitored

PM2.5 is measured at CM2 Silksworth AURN site. The results of which are reported at http://uk-air.defra.gov.uk/ . In 2014 the annual mean for the site was 10µg/m^3 which is below the UK objective of 25 µg/m^3.

2.2.6 Summary of Compliance with AQS Objectives

Sunderland City Council has examined the results from monitoring across the City. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment. We will complete the Detailed Assessment currently being undertaken for the Wheatsheaf Gyratory although the data already collected gives a good indication that the objective is not being breached and there will not be a need to declare an AQMA. In addition the data from the diffusion tube at this location has measured below the objective during 2014 with an annual mean of 39.1µg/m^3.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

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

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

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

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

Sunderland City Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Sunderland City Council confirms that there are no new/newly identified busy junctions/busy roads.

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

Information was provided regarding the Sunderland Strategic Transport Corridor in the previous Updating and Screening Assessment dated 2012. The project aims to create a continuous dual carriageway from Land at Nissan to the Port of Sunderland. The project will be implemented in 5 phases. Phase 1, the realignment of St Mary's Way, is currently underway. Work on Phase 2, the new Wear Bridge, is due to start imminently and was discussed in the USA 2012. One year's worth of data was collected at two continuous monitoring locations (reported in the progress report 2014) to establish base line conditions and one year of monitoring is planned upon the completion of the bridge to validate the modelling undertaken during the planning app stage.

Phase 3 of the Sunderland Strategic Transport Corridor (SSTC) comprises the part of road linking the south end of the proposed new Wear bridge with St Michael's Way is currently in the Pre Application stage of planning. The Environmental Health Team as Consultees in the planning process has been consulted and have requested an Air Quality Assessment to be carried out. The results of this will be presented in the next Progress report.

Sunderland City Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with Significantly Changed Traffic Flows

Sunderland City Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

The main bus station within the City of Sunderland is situated in the city centre on Park Lane which is a busy shopping area. There are approximately 6250 bus movements per day at the bus station. There are no residential dwellings within 10 metres of the bus station. However, it is likely that members of the public might reasonably be expected to spend 1-hour or longer in the vicinity of the bus station. Therefore DMRB was used to predict the annual mean for NO_2 and PM_{10} for 2005 at relevant locations and the results showed that the objectives would be met. This was reported for the 2003 USA and the situation has not changed.

Sunderland City Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Sunderland City Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

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

4.2.2 Moving Trains

Table 5.1 of LAQM.TG(09) provides a list of lines with a substantial number of diesel passenger trains per day. None of these locations fall within Sunderland.

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

4.3 Ports (Shipping)

Sunderland City Council confirms that there are no ports or shipping that meets the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

Since the last USA in 2012, several new industrial installations have begun to operate within the Sunderland City Council district. Some of these have been noted in previous Progress Reports and will now be assessed in this report. A summary of these installations are shown below.

Name of Installation	Address	Type of Industry	Potential Pollutant Releases	Part A/B
Sunderland Tyre & Exhaust Centre	6 The Parade, Sunderland, Tyne and Wear SR2 8NT	Waste Oil Burner	NO_x and PM_{10}	B
JC Atkinson & Son Ltd	Sedling Road, Washington, Tyne and Wear NE38 9BZ	Manufacture of Timber and Wood based Products	PM_{10}	B
Karting NE	Warden Law Motorsports Centre, Sunderland, Tyne and Wear SR3 2PR	Waste Oil Burner	NO_x and PM_{10}	B
Tyneside Minimix Concrete	Springwell Road, Gateshead, Tyne and Wear NE9 7SQ	Bulk Cement	PM_{10}	B
Sainsbury's Supermarket	Wessington Way SUNDERLAND SR5 3JG	Petroleum Process	Benzene	B
Spectrum Brands Uk Ltd	Unit 2A Stephenson Road Washington Tyne And Wear NE37 3HW	Coating Process	VOC's	B

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

Sunderland confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority AND for which an air quality assessment has been carried out.

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

An assessment of existing installations has been carried out using information from process operators and Council Officers that visit industrial processes as part of the LA-IPPC and LA-PPC regime.

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

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

The new installations which have begun to operate since the last round of review and assessment are detailed in table 5.1 above. These installations have applied for and received a permit to operate from Sunderland City Council under the Environmental Permitting Regulations 2010. Sunderland City Council have deemed their applications duly made and they are now subject to the inspection regime of LA-IPPC or LA-PPC as applicable.

Two of the installations on the list are for waste oil burners which are used in vehicle repair shops to reuse old engine oil to create a source of heat. The appliances are

inspected annually by Sunderland City Council and any complaints of dark smoke investigated promptly. Due to the size of these appliances and the quantities of oil used it is not considered that these will give rise to significant pollutant emissions.
The emissions from Tyneside mini mix cement process are considered to be PM_{10} only and are controlled by the permit conditions. There have also been no complaints about dust from nearby residents.
Spectrum Brands UK operates a coating process. The emissions associated with this process are VOC's and the site has a thermal oxidiser to meet the emission limits set down in their permit. They must undertake annual emissions monitoring as a condition of the permit and the reports submitted so far show that the emission limits are being met comfortably.

JC Atkinson is a timber process which may has the potential to produce particulate emissions. Arrestment plant has been fitted in order to prevent this occurring and the site permit states that there should be no visible emissions of particulate matter from the whole site. It is not considered that this process will give rise to significant pollution emissions.

Sunderland has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.2 Major Fuel (Petrol) Storage Depots

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

5.3 Petrol Stations

It has been concluded that there are no petrol stations within Sunderland that have an annual throughput of more than 2000m^3 of petrol and are near a road with more than 30,000 vehicles per day and have relevant exposure within 10m of the pumps.

Sunderland confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

Sunderland confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

One new individual Biomass boiler that meets the criteria of being between 50kW and 20MW has been installed in Sunderland since the last Updating and Screening Assessment. The appliance is an ETA 199kW Hack Pellet Boiler installed in a commercial premises in Washington.

The method detailed in Box 5.8: D.1a Biomass combustion – Individual installations of TG(09) has been used to assess the plant and this showed that it is not necessary to proceed to a detailed assessment for this source.

Sunderland has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Apart from the Biomass appliance identified above there are thought to be very few small biomass combustion appliances throughout Sunderland and those that do exist are not located in one high density area but spread throughout the Local Authority area. It is therefore not necessary to proceed to a detailed assessment for this source.

Sunderland has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

Sunderland confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Sunderland confirms that there are no new potential sources of fugitive particulate matter emissions in the Local Authority area since the last round of review and assessment.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Sunderland City Council has no existing AQMA's within its boundary. Monitoring has continued across the city focusing on potential known hotspots and areas where new development could introduce new receptors.

The results from the automatic NO_2 monitoring data were that both the annual and hourly mean was met at all sites. The results from the non-automatic monitoring were that the annual mean was met at all sites.
Both sites monitoring PM_{10} automatically met the objectives for the annual and 24-hour mean.

As discussed in the automatic data section, a Detailed Assessment is currently underway at Dunn House/ Wheatsheaf Gyratory and was delayed by the liquidation of our ESU and data management provider. A further three months data has been collected in addition to the five months already collected. The data will be provided shortly in a Detailed Assessment.

8.2 Conclusions from Assessment of Sources

The assessment of sources has not identified any new or significantly changed sources that could potentially lead to an exceedence of the Air Quality Objectives. The largest potential impact on the Sunderland area in the future will likely come from the Sunderland Strategic Transport corridor and updates on the assessment of this will be presented in future Progress Reports.
There have been several new industrial sources introduces since the last USA and these have been assessed and described in section 5. It has been concluded that these new industrial sources are not likely to exceed air quality objectives.

8.3 Proposed Actions

This Updating and Screening Assessment has not identified the need to proceed to a Detailed Assessment for any pollutant. Sunderland Council is in the process of producing the Detailed Assessment that was identified from the last round. The monitoring for this Assessment has very recently been completed and the report will be produced in the very near future.

Sunderland City Council's next course of action will be to submit the 2016 Progress Report and the Detailed Assessment for the Wheatsheaf Gyratory.

9 References

Department for Environment, Food and Rural Affairs, 2009, *Local Air Quality Management Technical Guidance* LAQM.TG (09).

Appendices

Appendix A: QA/QC Data

Appendix A: QA/QC Data

Diffusion Tube Bias Adjustment Factors

Sunderland City Council diffusion tubes are supplied and analysed by Gradko International Ltd, Winchester, Hampshire. The preparation method used is 20% TEA and acetone.

The bias adjustment factor of 0.91 was obtained from the Spreadsheet version 9 – 14.

PM Monitoring Adjustment

PM_{10} is monitored at two locations using TEOM instruments. The data has been adjusted using the volatile correction model (VCM) accessed at http://www.volatile-correction-model.info/ .

Short-term to Long-term Data Adjustment

All of the data collected during 2014 has had to be adjusted due to not having a full data set for the year. We were able to collect 9 months data, January to September for Trimdon Street and Silksworth and 5 months for Dunn House. I have chosen sites that are in the AURN network for this adjustment. The calculations are shown in the tables below.

Trimdon St (CM1) NO_2

Site	Site Type	Annual Mean	Period Mean	Ratio
Newcastle Centre	Urban Centre	32	30.49	1.05
Silksworth Sunderland	Urban Background	16	14.79	1.08
			Average	1.065

Trimdon St (CM1) PM_{10}

Site	Site Type	Annual Mean	Period Mean	Ratio
Newcastle Centre	Urban Centre	12	12.95	0.93
Silksworth Sunderland	Urban Background	17	16.85	1.01
			Average	0.97

Dunn House (CM3) NO_2

Site	Site Type	Annual Mean	Period Mean	Ratio
Newcastle Centre	Urban Centre	32	31.23	1.02
Silksworth Sunderland	Urban Background	16	16.13	0.99
			Average	1.005

QA/QC of Automatic Monitoring

The QA/QC procedures of Sunderland are based on the AUN Site Operator's manual along with training received from our original equipment suppliers, Casella Measurement.

The fundamental aims of a quality assurance/ control programme are:

- The data obtained from measurement systems should be representative of ambient concentrations existing in each area.
- Measurements must be accurate, precise and traceable.
- Data must be comparable and reproducible.
- Results must be consistent over time.

An appropriate level of data capture is required throughout the year.

Equipment Maintenance

- Automatic analysers are serviced every 6 months by a qualified engineer under a contract with SupportingU
- Local Authority staff visits the air quality sites at least once every 4 weeks during which a check of the equipment is made to ensure it is all working within normal parameters. Filters are also changed during this visit.
- If a problem occurs then a call-out is instigated to the service centre and an engineer will normally visit site within 48-hours to correct the fault.

Calibration

- Each day a calibration response check is undertaken by the logger, this check does not re-calibrate the instrument. The calibration system uses certified gas cylinders of a known concentration, to produce an expected response from the analyser.
- Calibration reports stored in the logger will retain expected zero and span gas responses and the actual measured zero and span gas responses.
- Computer software collects and stores these calibration reports and also calculates a zero correction and span response scaling factor which can be applied to the data if required.
- At the 6-month service the instruments are re-calibrated to the site cylinder certificated value.
- Gas cylinder pressures are regularly checked at routine visits to ensure they are replaced before they run out completely.

When a cylinder is replaced the new certified values are entered into the logger.

Data Validation

Data from all of Sunderland City Council's automatic monitoring sites are collected via modem by SupportingU. SupportingU are under contract with Sunderland City Council to validate and ratify the data. Monthly reports of the data are produced by SupportingU and e-mailed to Sunderland City Council. The data is also displayed on a website that members of the public can freely access. The website address is http://www.wecare4air.co.uk/
SupportingU review data daily to ensure that

- Telecommunications to the station are operational
- The air quality station is operational
- Individual analysers are operational
- Air quality exceedences are identified
- Operational information such as TEOM filter loading, does not invalidate data
- Obvious data errors are identified

Data Ratification

In addition to the initial data screening process (validation), data are further scrutinised in monthly blocks in order to provide a final ratified data set.

The software that collects the data is used to rescale the data using the factor calculated from the monthly calibration check. Data is then reviewed for erroneous data such as:

- Daily calibration spikes
- Routine or service visit errors
- Analyser faults
- Site faults, such as power outages

When data is satisfactory, it is compared to other local sites. This provides a check to ensure data is realistic.

QA/QC of diffusion tube monitoring

Gradko has full U.K.A.S. accreditation for compliance with ISO-IEC 17025 for laboratory management system. Its accuracy and consistency of analytical methods is regularly monitored using external proficiency schemes such as

- Workplace analysis scheme for proficiency (W.A.S.P.)
- Laboratory Environmental Analysis Proficiency (L.E.A.P.)

In addition regular cross-checks are carried out with other U.K.A.S. accredited labs using certified standard solutions.

According to the *WASP – Annual Performance Criteria for NO_2 Diffusion Tubes used in Local Air Quality Management (LAQM), January 2012 – December 2013, and Summary of Laboratory Performance in Rounds 116-123 and rounds 117-124*

published in April 2014, Gradko International were deemed to have a good performance and 100% of samples were satisfactory over the period. Gradko International also follows the procedures set out in the Harmonisation Practical Guidance.