Sunderland City Council

LOCAL AIR QUALITY MANAGEMENT REVIEW AND ASSESSMENT

PROGRESS REPORT 2007

Summary

Sunderland City Council have been reviewing and assessing the air quality within Sunderland for several years under the Local Air Quality Management System introduced by the Environment Act 1995 and subsequent Regulations.
Under LAQM Local Authorities must assess air quality and compare measured levels of seven specified pollutants to the Air Quality Objectives (Table 1). If an objective is exceeded then the Local Authority must declare an Air Quality Management Area (AQMA) at relevant locations affected.
As yet Sunderland City Council have not had to declare an AQMA although several 'hotspot' locations have been identified during the course of the Review and Assessment process which have been further investigated during Detailed Assessments.
In 2006, Sunderland City Council undertook an Updating and Screening Assessment (USA) of Air Quality which is carried out every three years. The conclusions of this assessment were that Sunderland City Council will not proceed to a detailed assessment for any of the seven pollutants, as it is unlikely that any of the objectives will be exceeded.

The 2007 Progress Report aims to present new monitoring data, look at any significant trends in the data and to log any major changes that could potentially affect air quality so that they may be considered more thoroughly during the next USA.

The 2007 Progress Report confirms that the Sunderland has currently no areas of likely exceedance of the Air Quality Objectives. However, due to a number of proposed long-term, major developments the characteristics of the City and its transport corridors may change and Air Quality will remain an area for continued assessment and review.

Table 1 Standards and Objectives for Specific Pollutants

Objectives laid down in Regulations for the purposes of LAQM			
Pollutant	Objective Concentration	Measured as	To be achieved by
Benzene	16.25ug/m^3 (5ppb)	running annual mean	31 Dec 2003
1,3-Butadiene	2.25ug/m^3 (1ppb)	running annual mean	31 Dec 2003
Carbon Monoxide	11.6mg/m^3 (10ppm)	running 8 hour mean	31 Dec 2003
Lead	0.5ug/m^3 0.25ug/m^3	annual mean annual mean	31 Dec 2004 31 Dec 2008
Nitrogen Dioxide	200ug/m^3 (105ppb) not to be exceeded more than 18 times a year	1 hour mean	31 Dec 2005
	40ug/m^3 (21ppb)	annual mean	31 Dec 2005
Particles (PM_{10})	50ug/m^3 not to be exceeded more than 35 times a year	24 hour mean	31 Dec 2004
	40ug/m^3	annual mean	31 Dec 2004
Sulphur dioxide	350ug/m^3 (132ppb) not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125ug/m^3 (47ppb) not to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004
	266ug/m^3 (100ppb) not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005

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Monitoring Data

All data presented in this report have been ratified. Details of Sunderland City Council's QA/QC procedures are detailed in Appendix 2 of this document

1.Carbon Monoxide

OBJECTIVE: maximum daily running 8-hour mean of 10mg/m^3

Sunderland City Council has continued to monitor levels of carbon monoxide at their urban background site (Puma Centre) although all previous reports have shown that monitored concentrations are well below the objective. Table 1.1 below show that this trend has continued in 2006 with no 8-hour running averages exceeding the objective. Further details on of Sunderland City Council's automatic monitoring sites can be found in Appendix 1 of this document.

Table 1.1

Station	**Site type**	**Annual mean mg/m^3**	**Number of exceedances of maximum daily running 8 hour mean**	**Maximum value mg/m^3**	**Minimum value mg/m^3**	**% Data Capture**
Puma Centre	Urban Background	0.16	None	5.6	0.0	96.2
Otto Terrace	Roadside	0.4	None	1.6	0.0	57.4

2. Benzene

Objective: Annual mean of 5μg/m^3 by 2010.

Diffusion tube monitoring has continued to take place at four locations across Sunderland situated at 3 receptors that are both close to a petrol station and a reasonably busy road and at the Puma Centre as a background site (see Appendix 1 for site details). The results from this monitoring are shown in Table 2.1. Correction factors have been applied to the annual means to compare the data against the 2010 objective. The results show that the annual means are well below both the current and the 2010 objective.

Table 2.1

Site Name	Annual Average 2006 (µg/m3)	Estimated Annual Average 2010 (µg/m3)
Puma Centre	0.65	0.57
237 Queen Alexandra Road	1.02	0.90
43 The Broadway	2.08	1.82
Fieldview Nursing Home	0.75	0.66

3. Nitrogen Dioxide

OBJECTIVE: Annual Mean of 40µg/m^3 by 2005
1-hour mean of 200µg/m^3 not to be exceeded more than 18 times per year by 2005

Nitrogen Dioxide concentrations have been monitored in four locations with automatic analysers; Trimdon Street, Puma Centre, Chester Road and Mary Street. Maps and further specifications of these sites can be found in Appendix 1 of this report. A summary of the data for the calendar year 2006 is displayed in Table 3.1 and demonstrates that both the annual and hourly objectives were met in 2006 at these locations.

Table 3.1

Station	**Site type**	**Annual mean µg/m^3**	**Number of exceedances of 1-hour mean**	**Maximum value µg/m^3**	**Minimum value µg/m^3**	**% Data Capture**
Puma Centre	Urban Background	19.3	None	128.7	0.27	86.2
Trimdon Street	Kerbside	31.9	None	153.7	0.0	67.5
Mary Street	Roadside	38.0	None	270.0	0.34	96.0
Chester Road	Roadside	33.9	1	214.9	0.06	97.9

Sunderland City Council has also continued to monitor Nitrogen Dioxide using Diffusion Tubes across the authority. There are now 49 sites monitored and these are detailed in Appendix 11 of this report. The nitrogen dioxide diffusion tubes are supplied and analysed by Gradko International and use a preparation of 50% TEA in Acetone. Diffusion tubes are sited in triplicate at two of the automatic monitoring stations; Trimdon Street and Puma Centre to allow a bias adjustment factor to be calculated.
The bias adjustment used for the 2006 data set was derived from the Review and Assessment website and the decision to use the combined bias adjustment factors is that our survey consists of a wide range of tube locations such as on lampposts, building

facades and in the open. The two sites where co-location occurs differ from some of these locations and data capture of the continuous analysers at both is below 90%. Therefore, following advice given on the Review and Assessment website it has been decided that the combined bias adjustment factor rather than a locally obtained bias factor will be used. The bias adjusted annual averages are shown in figures 3.2 and 3.3.

Figure 3.2

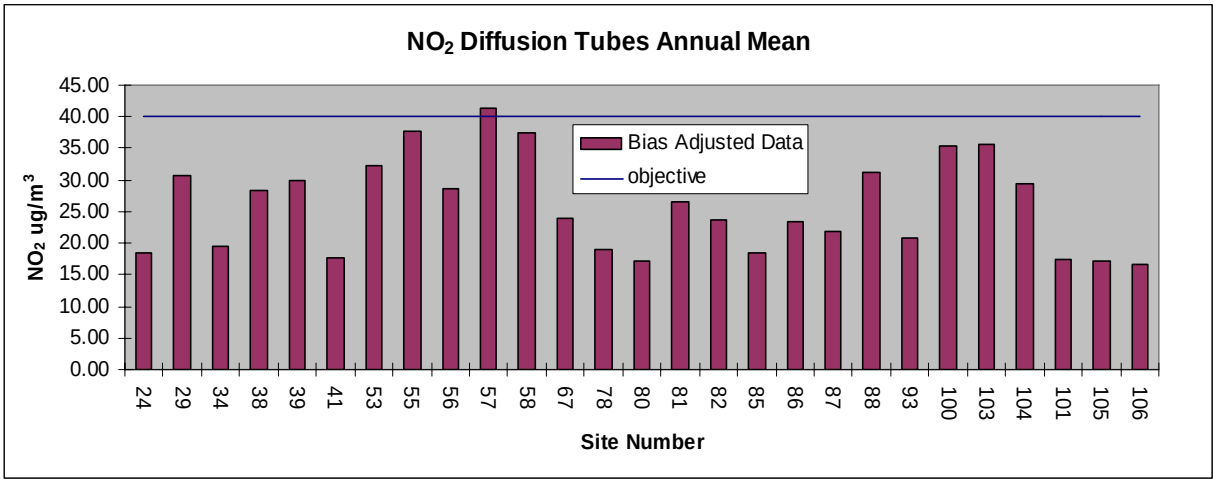
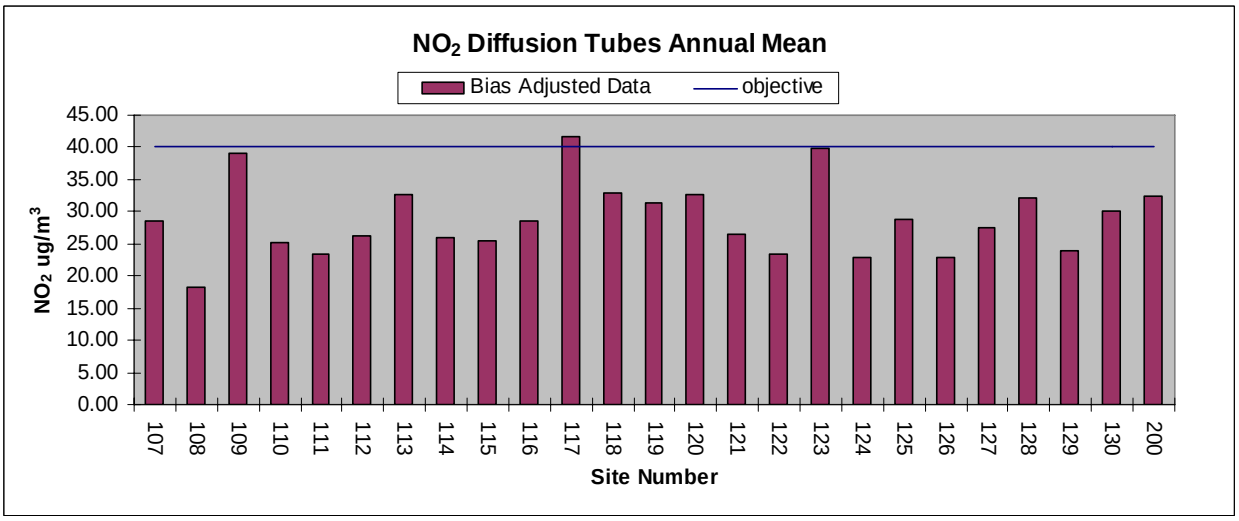


Figure 3.3



The results show that two of the sites exceed the annual mean objective of 40µg/m^3. These are site number 57, situated in North Bridge Street and site number 117, situated in Holmeside. Both tubes are situated at approximately 2.5 metres on the building façade. The relevant receptor in the case of North Bridge Street is a flat at the first floor level. In Holmeside there is not a relevant receptor at the location of the tube. It was put into position to monitor levels due to expected development of the area known as the Holmeside Triangle. As yet there have been no planning applications granted for this area but this department will ensure that suitable Air Quality Assessments are carried out in connection with any development introducing new receptors to the area.

In North Bridge Street, the rise in concentrations is largely attributable to diverted traffic. North Bridge Street as its name suggests carries traffic northbound from the Wearmouth Bridge. From March 2005 to October 2006 the other main Wear crossing and route out of the city centre, Queen Alexandra Bridge, was closed in the North bound direction whilst

being painted. Consequently road users used the Wearmouth Bridge and North Bridge Street to continue the journeys northwards. Data obtained from the Tyne & Wear Traffic and Accident Data Unit (TADU) confirms this. Table 3.4 contains the north bound traffic count data from the permanent counter located in North Bridge Street.

Table 3.4

Date of count (week commencing)	Volume of traffic (averaged over 7 days)
17th January 2005	19,118
30th January 2006	30,284
29th January 2007	22,783

The traffic figures show that there was a 58% increase in traffic between January 2005 when the Queen Alexandra Bridge was open and January 2006 when it was closed. The figures for January 2007 are also shown to demonstrate that the volume of traffic has fallen again since the reopening of the Queen Alexandra Bridge. Sunderland City Council have decided that on the basis of the traffic counts, that the concentrations measured in North Bridge Street have been affected by the diverted traffic and are not representative of typical conditions. They will not therefore proceed to a detailed assessment of Nitrogen Dioxide for this site.

However, after receiving advice from the Local Authority Support Helpdesk on the positioning of tubes when the receptor is at first floor level, this department have decided to site another tube at the level of the first floor window to allow a more accurate assessment of the concentrations. In addition we also propose to site several more tubes in the vicinity where there are relevant receptors in order to gather more data on North Bridge Street. The results of this monitoring will be presented in the Progress Report 2008. A third tube, site no. 123 is very close to the objective with an annual average of 39.7µg/m^3. This tube is situated on the façade of a terraced hose close to the junction of Chester Road and Ormonde Street. Located at this junction is an automatic analyser whose site name is Chester Road. The automatic site should represent worst case exposure as it is situated on one of the four corners of the junction whereas the diffusion tube is situated approximately 20 metres away from the centre of the junction on a property in Chester Road. The annual average for the automatic analyser is 33.9 µg/m^3 as reported in Table 3.1 and it is believed that this data is more robust than the diffusion tube data. Sunderland City Council has already carried out a Detailed Assessment of this junction in their 2005 report that concluded that an AQMA should not be declared. It is the opinion of Sunderland City Council that this site should not be the subject of a further Detailed Assessment and that the automatic monitoring site should remain in position to monitor the concentrations of NO_2 at this location for the foreseeable future.

4. PM_{10}

OBJECTIVE: 24 hour mean of 50µg/m^3 not to be exceeded more than 35 times a year by 2004.
Annual mean of 40µg/m^3 by 2004.
Provisional 2010 objective
24 hour mean of 50 µg/m^3 not to be exceeded more than 7 times per year.
Annual mean of 20 µg/m^3

Continuous monitoring of PM_{10} has continued to be carried out at two sites using TEOM samplers within Sunderland. Trimdon Street site is a kerbside site situated on a 5-arm junction in the city centre. Puma Centre, Silksworth is an urban background site. Further details on Sunderland City Council's automatic monitoring sites can be found in Appendix 1. A summary of the latest data is shown in table 4.1. The results of the monitoring show that both the annual and 24-hourly objective were met at both sites.

Table 4.1

Station	**Site type**	**Annual mean µg/m^3**	**Number of exceedances of 24-hour mean**	**Maximum value µg/m^3**	**Minimum value µg/m^3**	**% Data Capture**
Puma Centre	Urban Background	18	1	77	0.0	87.7
Trimdon Street	Kerbside	27	1	56	10	81.4

5. Sulphur Dioxide

OBJECTIVE: 15-minute mean of 266µg/m^3 not to be more Than 35 times per year by 2005
1-hour mean of 350µg/m^3 to be exceeded no more than 24 times per year by 2005
24-hour objective of 125µg/m^3 to be exceeded no more than 3 times per year by 2004.

Sulphur dioxide has been monitored for many years within Sunderland and the results have shown ambient concentrations have declined. A major factor in this decline has been a reduction of the use of coal due to implementation of Smoke Control Orders within the City.

Sunderland City Council concluded from the last round of R & A that all objectives would be met and did not proceed to a detailed assessment of sulphur dioxide and has continued to assess sulphur dioxide concentrations.

Table 5.1

Station	Site type	Annual mean µg/m^3	Number of exceedences of 15 minute mean	Maximum value µg/m^3	Minimum value µg/m^3	% Data Capture
Puma Centre	Urban Background	5.5	None	140.1	0.0	93.0
Otto Terrace	Roadside	3.5	None	34.6	0.0	84.6

The results of the monitoring are displayed in tables 5.1,5.2 and 5.3 for the three objectives.

Table 5.2

Station	Site type	Annual mean µg/m^3	Number of exceedences of 1-hour mean	Maximum value µg/m^3	Minimum value µg/m^3	% Data Capture
Puma Centre	Urban Background	5.5	None	61.3	0.1	94.6
Otto Terrace	Roadside	3.5	None	40.8	0.0	86.1

Table 5.3

Station	Site type	Annual mean µg/m^3	Number of exceedences of 24 hour mean	Maximum value µg/m^3	Minimum value µg/m^3	% Data Capture
Puma Centre	Urban Background	5.3	None	39.3	0.7	95.6
Otto Terrace	Roadside	3.5	None	13.9	0.0	83.6

In addition Sunderland also has an AURN site based in John Street in the city centre which measures SO_2. Results from the national air quality archive reported than none of the three objectives were exceeded in 2006.

6. Ozone

OBJECTIVE:	Daily maximum 8-hour running mean of 100µg/m3 not to be exceeded on more than 10 days

Although ozone is not prescribed for Local Air Quality Management due to its transboundary nature, the exceedence statistics collected from the AURN adopted site based at the Puma Centre in Silksworth has been included below in table 6.1.
In addition the table also lists the results of ozone monitoring stations within the national network situated in the North East of England. The results show that all of the sites recorded more days of exceedences than the objective.

Table 6.1 *(national air quality archive website)*

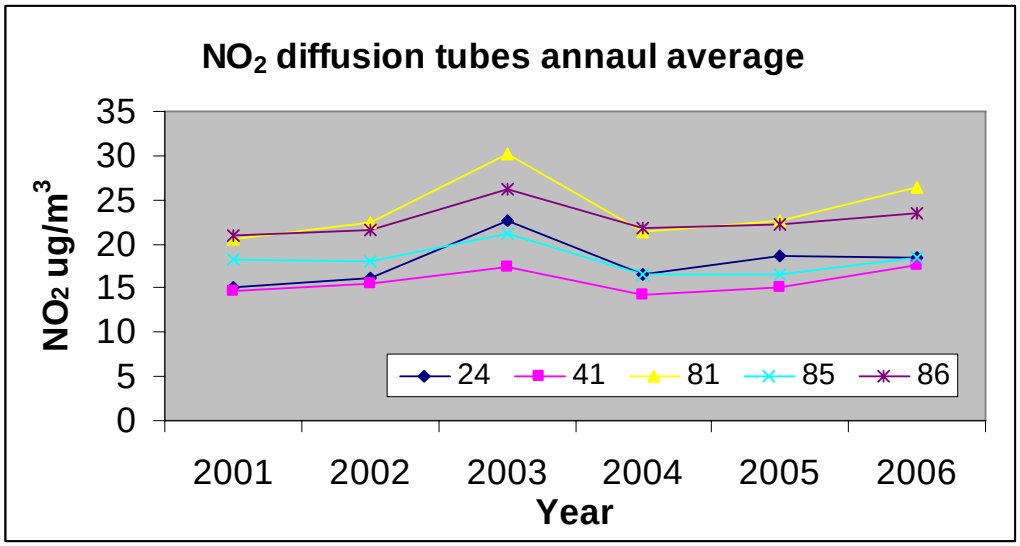
List of monitoring sites with exceedences in 2006	
Site	**Number of Exceedences**
Middlesbrough	22
Newcastle Centre	16
Redcar	21
Sunderland Silksworth	20

7. Trends in Air Quality Data in Sunderland

Trends in NO_2

Several diffusion tube sites in Sunderland have been running for over 5 years and so to investigate the trend in NO_2 in Sunderland 5 sites have been selected and plotted in figure 7.1. The legend of the bar chart refers to the site locations which are detailed in Appendix 1.
There is good correlation between the five sites even though they are situated in background and roadside locations. There is an obvious peak in 2003 which can be attributed to the climatic conditions of that year which had an effect on pollution across the UK. Levels in 2004 fell back to similar concentrations to those observed in 2001 and 2002. During 2005 and 2006 concentrations of NO_2 have risen again but it is uncertain whether this will be a continuing trend.

Figure 7.1



New Local Developments

This section of the Progress Report deals with changes that have taken place that may affect air quality. The types of developments that were considered are

- New industrial processes, i.e. Part A, A2 or B
- New developments with an impact on air quality, especially those that will significantly change traffic flows. Only developments that have been granted planning permission are included
- New landfill sites, quarries that have been granted planning permission, and which have nearby relevant exposure.

This Progress Report will log these changes so that they can be considered more thoroughly during the next full round of review and assessment.

	Development	**Description**	**Source of information**
1.	New Part B Process Nissan, Washington Road	Petroleum	Sunderland City Council
2.	New Part B Process Tesco Express, Silksworth Rd	Petroleum	Sunderland City Council
3.	New Part B Process Amman Asphalt, Port of Sunderland	Roadstone Coating	Sunderland City Council

Planning Applications

Sunderland's former Vaux Brewery site has been the subject of a dispute between regeneration company Sunderland Arc and Tesco, which owns the land. Both had submitted outline planning for the site which included Air Quality Assessments that concluded that air quality objectives would not be exceeded as a result of the development.

Sunderland Arc's proposals to build offices, hotels and apartments on the site were approved by the Secretary of State for the Department for Communities and Local

Government in March 2007. This department will therefore work closely with the planning department to provide comments on the full planning application when it is submitted. A new diffusion tube site (130) has also been commissioned in the area to measure current levels of NO_2.

Local Air Quality Strategy

The Tyne & Wear Authorities have now completed the Air Quality Strategy for Tyne & Wear which was prepared on their behalf by Air Quality Consultants.

Conclusions

The monitoring data collected has indicated that the Air Quality Objectives were met in 2006 at relevant locations. Sunderland City Council has therefore decided not to proceed to a Detailed Assessment for any of the specified pollutants.

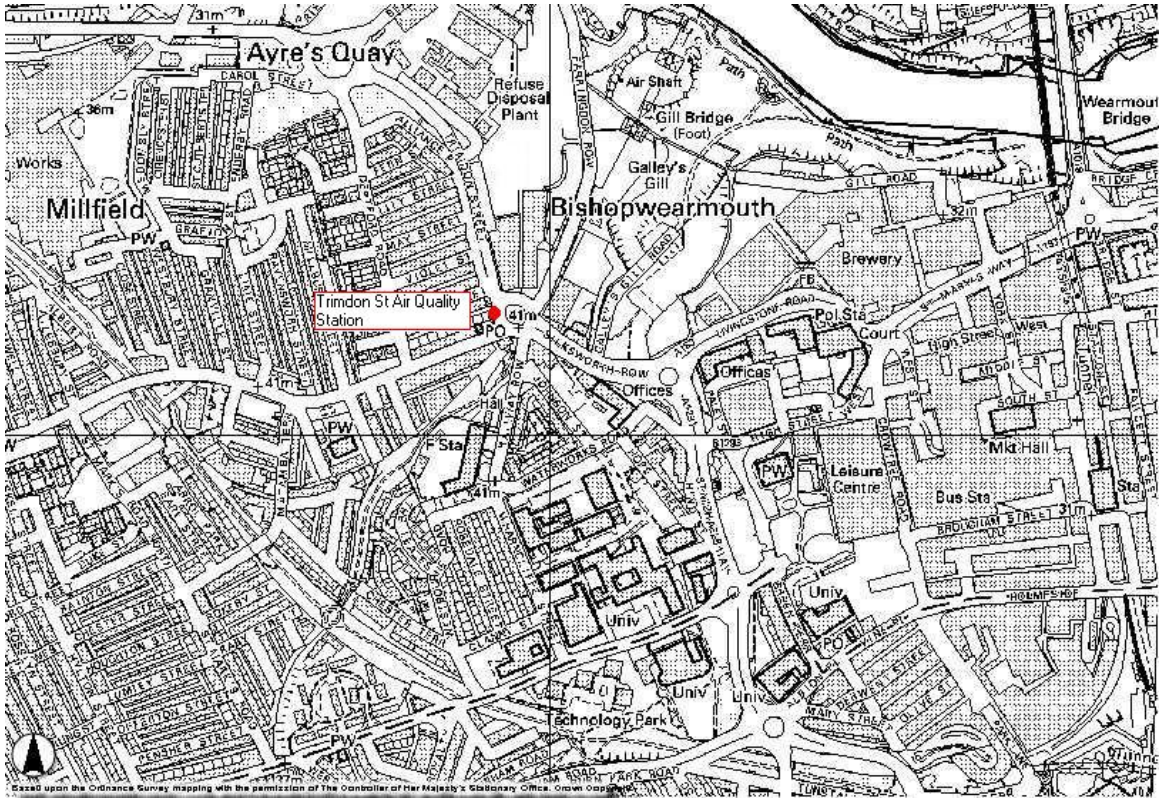
Appendix 1

Monitoring Site Descriptions

Automatic Monitoring Stations Site Description

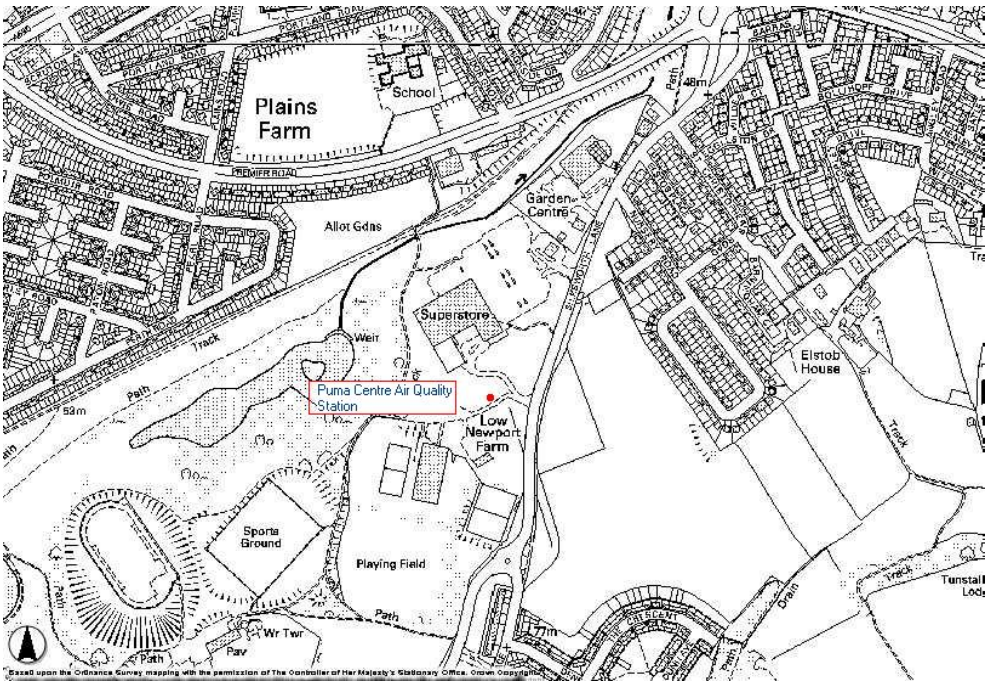
Trimdon Street Station

Trimdon Street Air Quality Station is a kerbside site on a busy 5-arm roundabout in the city centre. It can be classified as a Kerbside (U1) site according to LAQM (TG03) and is 0.5m from the edge of the road.
Traffic Flow past the station on the major link (Silksworth Row to Trimdon Street) is approximately 26,000 AADT. There are also two additional traffic links on the roundabout that have an AADT of 10,555 and 1,160. The station has been in place since Sept 2000 and measures NO_x, PM_{10}, and Wind Speed & Direction.



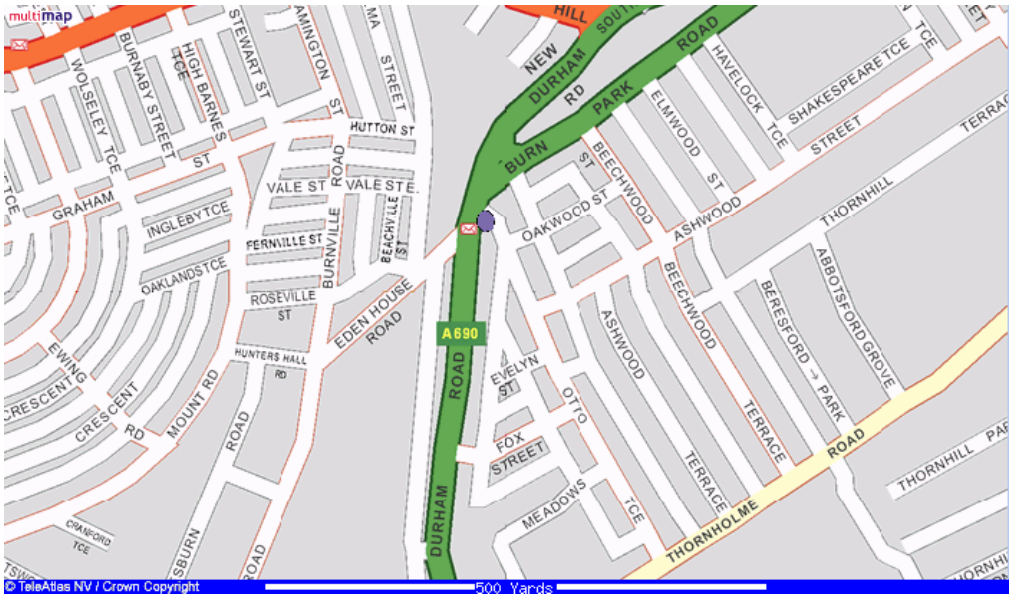
Puma Centre Station

The Puma Centre Air Quality station is situated in the grounds of the Silksworth Sports Complex on the sports centre access road adjacent to Silksworth Lane. It can be classified as an Urban Background site (U4) according to LAQM TG (03). Traffic flows on Silksworth Lane, which is the closest 'busy' road, are approx. 12,000 AADT
The station has been in place since September 2001 and measures NO_x, PM_{10}, SO_2, CO, O3 and Wind Speed & Direction. The station has also been adopted into the AURN network for O_3 and NO_x.



Otto Terrace

This site was monitored for 12 months between March 2005 and March 2006. The air quality station used is shared between the local authorities of the Tyne & Wear Air Quality Group and each authority receives the station for approximately 9 months each in turn. The site is on a main road the A690 leading to the city centre. It can be classified as a Roadside site according to LAQM TG (03). The station measures NO_x, PM_{10}, SO_2 and CO.



Sunderland Nitrogen Dioxide Diffusion Tube Sites 2006

Tube No.	Site Address	Back ground or Roadside	Grid Reference Easting	Northing
24	3 Rothley, Fatfield, Washington	R	431568	554800
29	Arndale House, St Mary's Way	R	439508	557151
34	209 Newcastle Road, Fulwell	R	439266	559212
38	17 Parkside South, East Herrington	B	435714	552473
39	15 John Street, Central	R	439835	556978
41	The Golden Lion, Lion Place, South Hylton	B	434997	556811
53	166 Chester Road, Millfield	R	438568	556566
55	25 Eden Vale, Thornholme	R	438690	556135
56	101 Southwick Road, Southwick	B	439101	558282
57	5/6 Northbridge Street, Monkwearmouth	R	439664	557829
58	6 Beatrice Terrace, Shiney Row	R	432634	552616
67	39 Ferryboat Lane, Hylton Castle	R	432634	552616
76	8 Burn Hope Road, Barmston, Washington	B	431705	556786
77	31 Mendip Drive, Lambton, Washington	R	430040	555002
78	Highfield Hotel, 101 Durham Rd East Rainton	R	433338	547848
80	Dame Dorothy Primary School, Monkwearmouth	B	440178	557937
81	47 Howick Park, Monkwearmouth	R	439690	557638
82	20 Marlborough Road, Hastings Hill	R	435097	555166
83	The Wavendon, Wavendon Cres, High Barnes	R	437009	555802
84	B.P.Filling Station, Wessington Way	R	435664	557816
85	North Moor Housing Office, Nth Moor Lane	R	437043	554207
86	2 Alice Street, Thornholme	R	439466	556484
87	Dicken's Street, Southwick	R	438095	558354
88	Hind's Street, Central	R	439160	556995
93	34A Durham Road, Middle Herrington	R	436290	553566
94	8 Vine Place Central	R	439423	556738
100	Air Quality Station, Trimdon Street	R	438928	557151
101	Puma Centre, Silksworth Lane	B	438116	554462
102	Lamppost, AQ Station, Station Road, Hetton	R	435278	547463
107	Lamp post, Morningside, Rickleton	R	428629	553809
108	The Touks, Peareth Hall Rd, Donwell	R	429555	558545
109	23 Newcastle Road	R	439648	558120
110	94 Fulwell Road	R	439901	558514
111	237 Queen Alexandra Rd	R	438453	555507
112	43 The Broadway	R	436746	555726
113	Lamp post junction of Durham Rd /Premier Rd	R	437446	554989
114	University Creche, Chester Road	R	439190	556823
115	4, Mowbray Alms Houses	R	439333	556936
116	9 Derwent Street	R	439451	556718

117	3, Holmside, City Centre	R	439495	556795
118	27 Bridge Street	R	439696	557205
119	4 Athenaeum Street	R	439792	556921
120	Gillespies, John Street	R	439806	557063
121	12 Windsor Terrace	R	440702	554722
122	University Flats, High Street East	R	440121	557255
123	263 Chester Road	R	437943	556341
124	35 Rydal Mount	R	435494	557711
125	45 Station Road Hetton	B	435422	547026
126	24 Crake Way	R	437978	556337
127	Chester Road ROMON	R	439695	557314
128	Echo Building	R	439939	557089
129	West Sunniside	R	439542	557293
130	St Mary's Car Park Matlock Street	R	439031	557114
200	Embassy House, 2 Silksworth Row	R	428823	554825

Benzene Diffusion Tubes Sites 2006

Tube No.	Site Address	Back ground or Roadside	Grid Reference Easting	Northing
B1	Puma Centre, Silksworth Lane	B	438116	554462
B2	237 Queen Alexandra Road	R	438453	555507
B3	43 The Broadway	R	436746	555726
B4	Blank			
B5	Fieldview Nursing Home, Thompson Rd	R	438869	559078

Appendix 2

QA/QC

QA/QC of Diffusion Tubes

Laboratory Accreditation

Sunderland diffusion tubes are supplied and analysed by Gradko International Ltd, Winchester, Hampshire.
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.

Nitrogen Dioxide Diffusion Tube Procedure

This procedure used in Sunderland is identical to the UK NO_2 Diffusion Tube Network procedure produced by AEA Technology for DEFRA.

- The calendar year is divided into 12 'pollution months', which contain either 4 or 5 weeks for which the tubes will be exposed.
- Change over occurs on a Tuesday to avoid bank holidays. Every effort is made to change tubes on the specified date but if this is not possible then tubes are changed $\pm$ 2 days.
- Tubes are stored in airtight bags in a refrigerator until used.
- A 'blank' control tube is left in the refrigerator during the exposure period and not exposed.
- Tubes are labelled with a unique ID number.
- Tubes are transported to site in snap seal bags.
- At each site the date and time of start of the exposure period is recorded and with the absorbent end cap uppermost, the bottom cap is removed and the tube is clipped into the holder.
- The tube is mounted vertically with its open end downwards.
- At the end of the exposure period tubes are removed and end cap replaced. The date and time are recorded.
- The tubes are then transported back to the office and refrigerated in an airtight bag until they are sent to the lab for analysis which is as soon as possible.

Benzene Diffusion Tube Procedure

- Tubes are exposed for the same periods as nitrogen dioxide tubes.
- Tubes are stored in airtight bags at room temperature in a clean environment.
- A 'travel blank' is left at the office and not exposed.
- Tubes are not labelled directly but put into individually labelled snap seal bags and transported to site.
- Caps (marked with a red spot) are removed using a spanner and a diffuser cap is placed on the tube in its place.
- The tube is mounted vertically with diffuser cap facing downwards and the date and time recorded.

- At the end of the exposure period the diffuser cap is removed and the brass cap is put back onto the tube making sure the bottom of the PTFE seal is in-line with the groove on the tube.
- The cap is tightened with a spanner and tube placed in labelled snap seal bag. The date and time are recorded.
- Caps should be retightened with spanner in case of temperature change when returning to the office.
- Tubes are sent to lab for analysis as soon as possible.

QA/QC of Continuous Analysers

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

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 Casella.
- Local Authority staff visits the air quality sites at least once every 2 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 2-3 days 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.
- During the fortnightly visit to the station by council staff, span and zero air gases of known concentration are passed through the analyser to check their response and this data id used to rescale the data. 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 is reviewed daily to ensure that

- Telecommunications to the station are operational
- The air quality station is operational
- Individual analysers are operational
- 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 blocks in order to provide a final ratified data set.
Sunderland City Council has a contract with Sunderland University to carry out this work and produce reports on a quarterly and annual basis. Sunderland University carries out this process in accordance with LAQM TG (03).