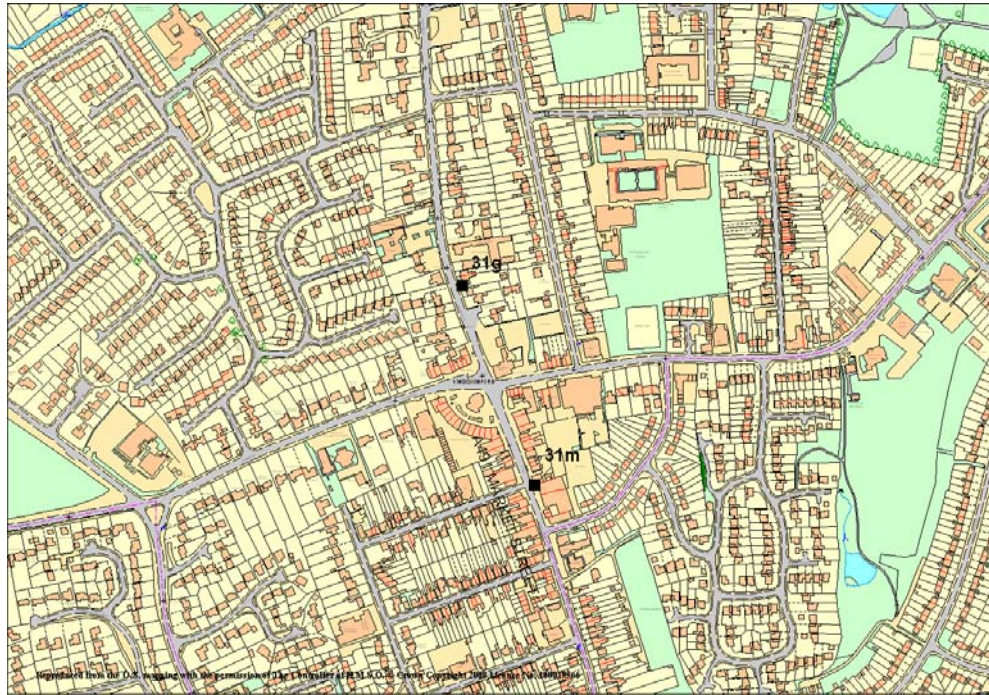


2.15. Kingswinford

2.15.1. Monitoring Locations

Monitoring for NO₂ continued throughout 2007 at two roadside locations (Figure 30, Table 15).

Figure 30 Monitoring locations in Kingswinford



2.15.2. Results

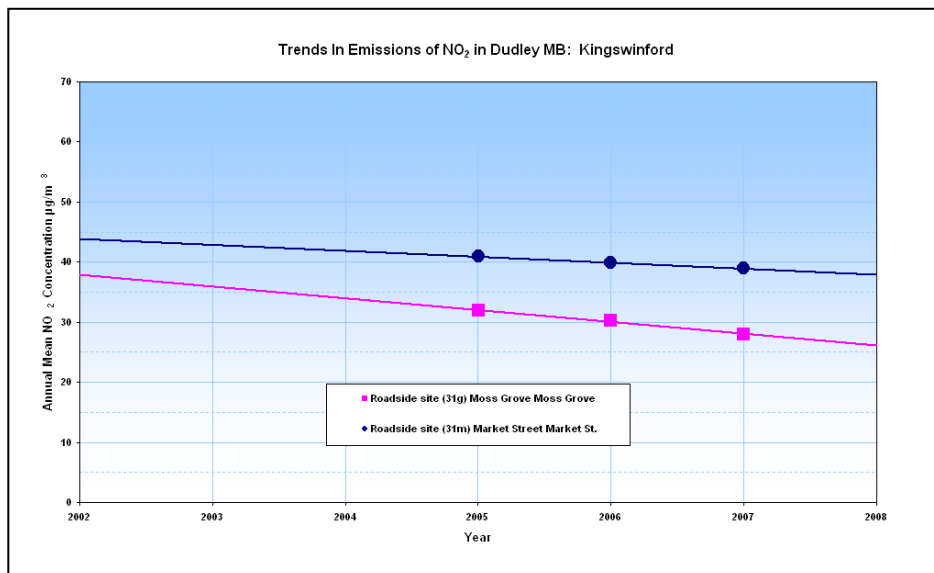
Table 15 2007 NO₂ Monitoring Results For Kingswinford

Site Ref	Description	Cat	Easting	Northing	2007 NO ₂ µg/m ³		
					Min	Max	Ave
31g	Moss Grove	R	388615	288958	25	31	28
31m	Market St.	R	388696	288735	36	42	39

Figures show bias adjusted values with 95% confidence level.

Figures in **bold type** denote **exceedences, probable exceedences or possible exceedences** with relevant exposure.

2.15.3. Trends

Figure 31 Monitored NO₂ Trends In Kingswinford

The two roadside sites in this area have indicated downward trends since 2004.

2.15.4. Discussion

No exceedences of the annual mean NO₂ objective are being recorded in this area and no new sites have been added to the survey.

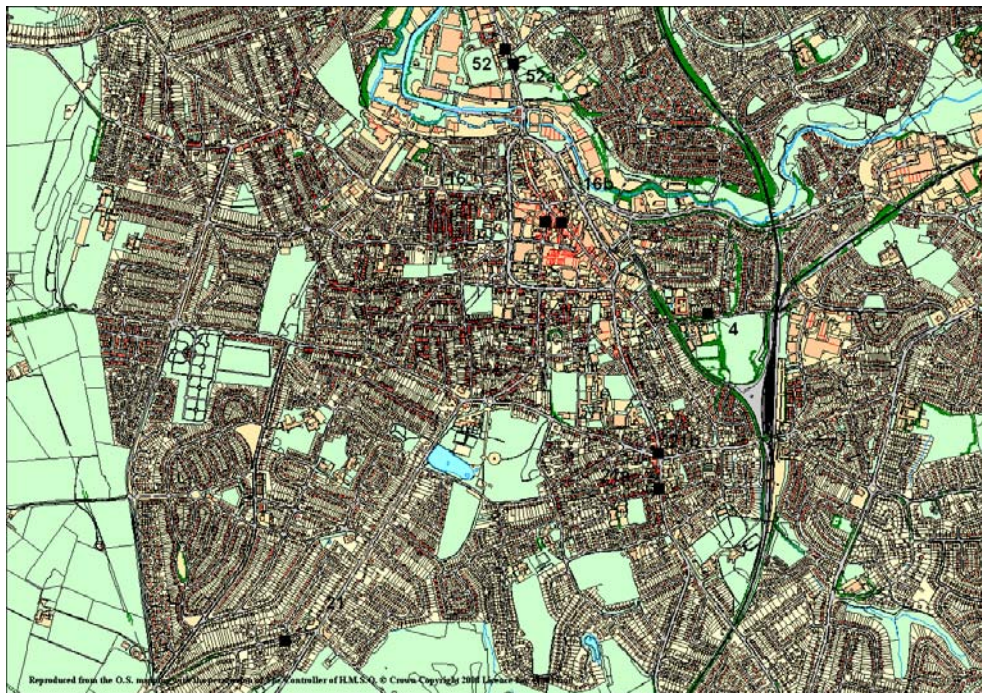
2.15.5. Proposed Actions

No further action is required at present.

2.16. Stourbridge

2.16.1. Monitoring Locations

Monitoring for NO₂ continued throughout 2007 at three roadside locations (Figure 30, Table 16).

Figure 32 Monitoring locations in Stourbridge

2.16.2. Results

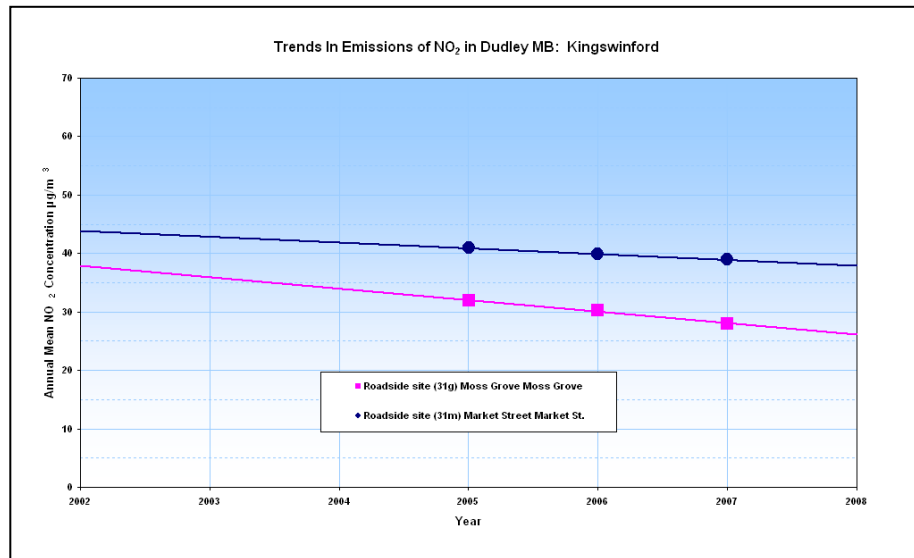
Table 16 2007 NO₂ Monitoring Results For Stourbridge

Site Ref	Description	Cat	Easting	Northing	2007 NO ₂ µg/m ³		
					Min	Max	Ave
4	Junction Rd.	B	390717	283980	20	22	21
21	Greyhound Lane	B	389022	282654	17	19	18
21a	Hagley Rd./Heath Lane	R	390536	283273	35	41	38
21b	Heath Lane	R	390535	283415	36	42	39
16b	High St.	R	390141	284350	32	38	35
16c	High St.	R	390259	284202	33	39	36

Figures show bias adjusted values with 95% confidence level.

Figures in **bold type** denote **exceedences, probable exceedences or possible exceedences with relevant exposure.**

2.16.3. Trends

Figure 33 Monitored NO₂ Trends In Stourbridge

The two longest running roadside sites in this area have demonstrated static trends since 2002.

2.16.4. Discussion

No exceedences of the annual mean NO₂ objective have been recorded in this area and no new sites have been added to the survey.

2.16.5. Proposed actions

No further action is required at present.

3. New Monitoring Results-Fine Particulate Matter

3.1. Rationale

Airborne suspended particulate matter (PM) may be either primary or secondary in its origins. Primary particles are those directly emitted to the atmosphere from sources such as road traffic, coal burning, industry, windblown soil and dust and sea spray. On the other hand, secondary particles are particles formed within the atmosphere by chemical reaction or condensation of gases, and the major contributors are sulphate and nitrate salts formed from the oxidation of SO₂ and NO_x respectively.

Some PM may travel vast distances, such as sand from the Sahara desert, or smoke from forest fires in central Russia, that may reach the UK under certain weather conditions.

Studies in the USA suggest that moderate increases in the levels of PM may be associated with increased morbidity and mortality from heart and lung disease. Particles with sizes between 4µm and 10µm diameter are trapped by mucus in the airways, and those less than 4µm can reach deep into the air sacs in the lungs. Particle pollution of <2.5µm diameter comes mainly from vehicles and is responsible for elevated levels during pollution episodes.

The current UK Air Quality Objective for PM₁₀ is 50µg/m³ as a 24 hour mean with 35 allowable exceedences per year (which was due to be achieved by the end of 2004). There is also second objective, an annual mean of 40µg/m³, which was due to be achieved by the same date (Appendix 1).

The latest revision to the Air Quality Strategy has also introduced target values for PM_{2.5}. This includes the concept of exposure reduction, since PM_{2.5} is understood to have no safe limit for health it is beneficial to reduce levels at all locations, not just hotspots that break a set limit. The new targets are therefore a 25ug/m³ 'cap' for hotspots and a 15% reduction in PM_{2.5} levels in all urban locations by 2020. There are currently no proposals for PM_{2.5} to be monitored under LAQM.

Dudley MBC's air quality monitoring stations are equipped with Tapered Element Oscillating Microbalances (TEOMs), which measure PM₁₀ levels. They record hourly data from which 24-hour averages are calculated. The DETR announced during January 1999 that due to its operating temperature of 50⁰C the TEOM underestimates particle concentrations by 30% at the UK PM₁₀ standard of 50µg/m³ when compared to the European Standard Gravimetric Method and the latest objectives refer to data collected in this way.

Research into the correct treatment of PM₁₀ data measured using TEOMs is still ongoing. The exact relationship appears to be complex in that it is site specific and seasonal. The monitoring method must therefore be reported with the results. As a consequence the results from Dudley MBC's TEOMs have been increased by a default correction factor of 1.3 in order to provide a "gravimetric-equivalent result". Although it has now been shown that the application of a simple adjustment factor is not sufficient to enable TEOM data to be considered equivalent to the European reference method, DEFRA consider that TEOM data multiplied by 1.3 can still be used as an indicative measurement for the purpose of LAQM.

Guidance provided by DEFRA's helpdesk currently advises that TEOM measurements should only fall under closer scrutiny when measured results fall close to the objective. It is not possible to precisely define what "close to the objective" means, but as an approximate guide, it is likely to be in the range of 30 to 40 days exceedence as measured by the TEOM multiplied by 1.3. In this case, more robust and reliable PM₁₀ data are required and Local Authorities faced with this situation are advised to consider upgrading their equipment as soon as is practicable, or consider restructuring their local networks so that analysers that meet the equivalence criteria are sited at the most critical locations.

3.2. Results

PM₁₀ concentrations are currently monitored at Central Dudley, Cradley and Illey. Data collected during 2007 are summarised in Table 17 together with information from all available preceding years.

At the Dudley's urban centre station, the highest figures in recent years were recorded during 2003 but still met current government objectives. 7 day's exceedence of 50µg/m³ were recorded during 2007, well below the 35 allowed under the current objective; an annual mean of 20.9 µg/m³ was also recorded for PM₁₀, also meeting the government objective. The data capture rate was relatively poor during 2007 due to a number of ongoing technical problems which have since been resolved.

The Brierley Hill Roadside station was discontinued during 2006 due to the impending implementation of the action plan. Up until that point, PM₁₀ levels were higher than the Central Dudley urban centre station (as would be expected) and again peaked during 2003.

Monitoring at a second roadside location in Cradley commenced during 2005 so only two full year's data have been recorded at this location. 27 days exceedences of 50µg/m³ were recorded during 2006 and 2007 together with annual mean PM₁₀ concentrations of 31.8 and 31.0µg/m³. These figures therefore meet current government objectives and do not fall within the range of borderline values where additional further confirmation using a gravimetric equivalent method would be advisable.

A full year's PM₁₀ data has not yet been recorded at the rurally located station in Illey, but early indications suggest that measured concentrations are likely to be very low and will provide a good indication of background PM₁₀ present within the borough.

Table 17 Summary of PM₁₀ Concentrations in Dudley Borough

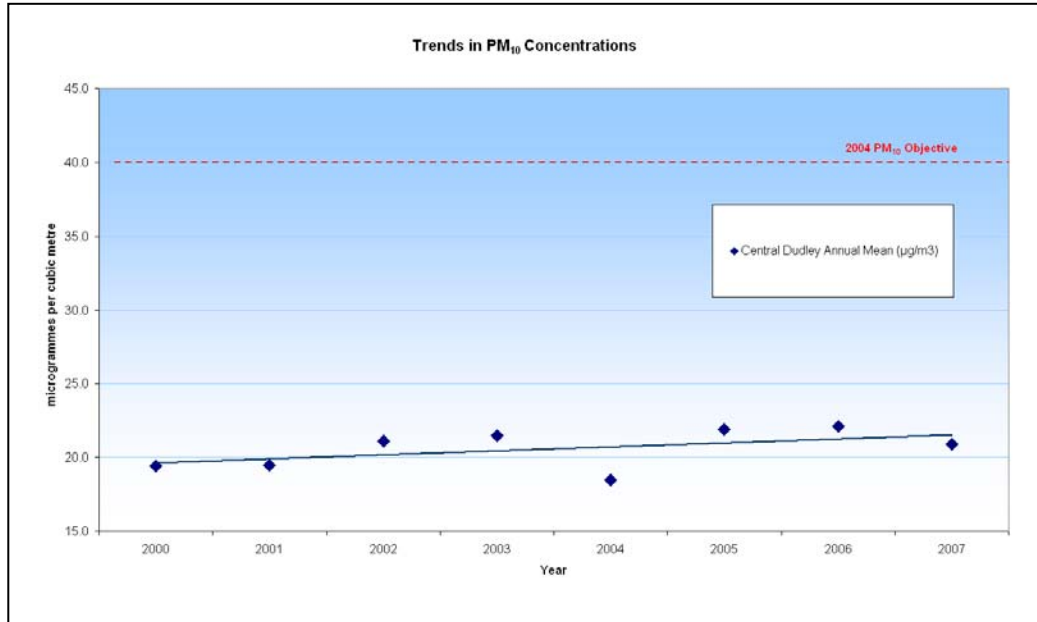
Year	TEOM x 1.3															
	Central Dudley								Brierley Hill				Cradley			Illey
	2000	2001	2002	2003	2004	2005	2006	2007	2003	2004	2005	2006 ¹	2005 ²	2006	2007	2007 ³
Annual Mean ($\mu\text{g}/\text{m}^3$)	19.4	19.5	21.1	21.5	18.5	21.9	22.1	20.9	30.5	26.8	25.8	28.5	30.5	31.8	31.0	17.8
Max Daily Mean ($\mu\text{g}/\text{m}^3$)	70.5	91.1	74.8	75.1	52.2	55.1	79.6	91.2	79.8	64.2	76.5	80.9	67.2	117.4	107.1	83.6
36th Highest Daily Mean ($\mu\text{g}/\text{m}^3$)	31.5	32.6	34.2	40.3	31.4	33.3	34.6	29.9	48.0	39.5	36.7	40.2	34.0	46.6	47.0	27.5
No. of Days Exceedence of $50\mu\text{g}/\text{m}^3$	6	6	9	14	1	4	7	7	33	12	6	10	8	27	27	4
% data capture	98.0	99.0	84.4	95.4	98.3	97.1	97.7	71.3	96.7	99.0	97.2	90.3	99.6	98.8	98.5	98.5
Annual Objective for 31/12/2004 ($\mu\text{g}/\text{m}^3$)	40															
Daily Objective for 31/12/2004 ($\mu\text{g}/\text{m}^3$) Not to be Exceeded more than 35 times per year	50															

Notes

1. Partial year up to Oct 2006
2. Partial year from Mar 2007 onwards
3. Partial year from May 2005 onwards

3.3. Trends

Figure 34 Trends In PM₁₀ Concentrations In Dudley Borough



The longest running site in Dudley is the urban centre site in Ednam road which has shown a slight upward trend since 2000.

3.4. Discussion

No exceedences of the PM₁₀ objectives are currently being recorded at any of the stations, though further monitoring will be required to establish whether the upward trend noted at Ednam Road will be reflected at roadside locations.

3.5. Proposed Actions

In the light of current scientific knowledge, it is proposed that the present PM₁₀ monitoring regime is maintained using existing TEOM instrumentation. Should daily exceedences of 50µg/m³ PM₁₀ start to exceed 30 days per year on a regular basis, further action may be required to monitor using gravimetric equivalent methodology. Further investigation will be undertaken as and when this situation arises.

As the new PM_{2.5} objectives are monitored as part of the national network, there is no requirement for Dudley MBC to commence monitoring of this pollutant at present.

4. **New Monitoring Results-Ozone**

4.1. Rationale

Ozone is a naturally occurring gas, generated in the stratosphere by the action of ultraviolet light from the sun on oxygen molecules. At that level it has a beneficial effect on health by filtering out harmful ultra violet radiation, which can cause skin cancer.

At the same time as concern is raised over the depletion of stratospheric ozone, anxiety has been expressed over possible raised levels in the lower atmosphere. At low levels, ozone is produced by reactions between atmospheric oxygen, sunlight and certain pollutants, mainly oxides of nitrogen or hydrocarbons, predominantly produced by motor vehicles and industry. Ozone is produced, and travels over wide areas but under certain circumstances where heavy traffic occurs and in association with strong sunlight, sufficient ozone, together with other chemical pollutants, may be generated to cause people to feel irritant effects, a situation sometimes referred to as photochemical smog.

The effects of high concentrations of ozone may be noticeable as a slight irritation of the eyes and nose. Attention has to be especially paid to effects on the lung function since these could be responsible for short-term, acute and longer-term chronic damage to health. Research has shown that exposure to high levels of O₃ (500-1000ppb) for several hours leads to damage to the airway lining followed by an inflammatory reaction.

The NAQS originally quoted an Air Quality Objective for ozone of 100 µg/m³ (50ppb) expressed as the daily maximum of 8-hour running means, with 10 allowable exceedences per year, to be achieved by 31st December 2005 (Appendix 1).

For the purposes of LAQM, ozone is not included in the Air Quality Strategy regulations. This is due to the nature of ozone formation and its persistence. Ozone can take several days to form and once produced can then persist for several days, and over this period ozone and its precursors may have travelled large distances. This means that ozone formation resulting from activities in one country will influence ozone concentrations in other countries, and this makes ozone pollution a transboundary problem.

Therefore, action on regional and global scales will be most effective in tackling this problem and this objective is not included in Regulations for the purposes of LAQM.

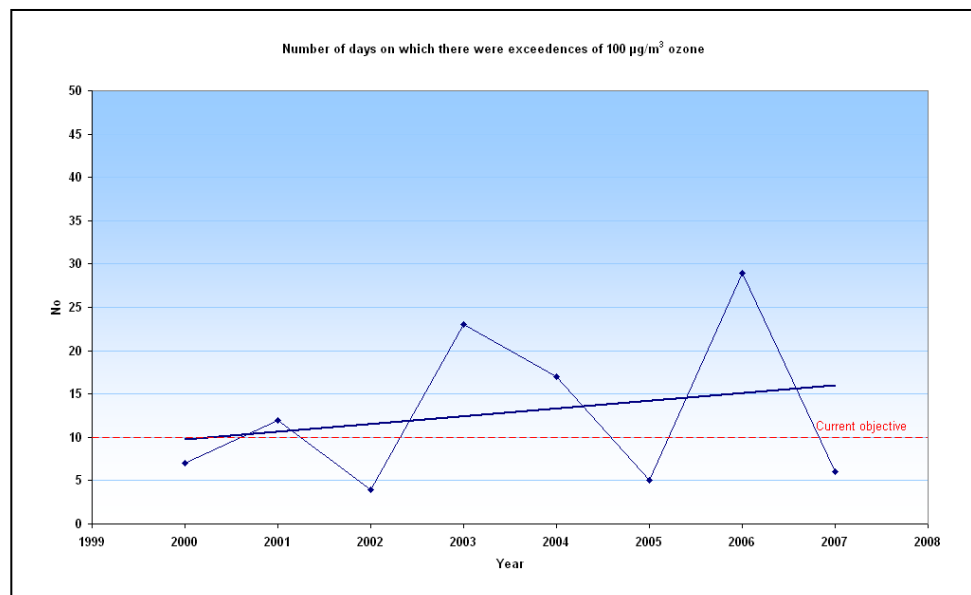
Under Dudley MBC's general review of Air quality, ground level ozone concentrations are measured at the Central Dudley automatic monitoring station by an ultra violet absorption analyser, which provides data every 15-minutes. From this, 8 hour rolling averages are calculated which relate directly with the National Objective for December 2005 of $100 \mu\text{g}/\text{m}^3$ (50ppb) as the daily maximum of 8 hour rolling means.

4.2. Results

Data collected during the last eight years is summarised in Table 18. It should be noted that figures recorded during 2007 were subject to an overall level of data capture of 79.2% due to technical difficulties experienced during June, November and December.

4.3. Trends

Figure 35 Ozone trends in Central Dudley



There has been a notable upward trend since 2000 in the number of days exceedence of $100 \mu\text{g}/\text{m}^3$; the 10 day objective was exceeded in 2001, 2003, 2004 and 2006. It is not possible to draw any firm conclusions for 2007 due to the non availability of data for extended periods during June, November and December.

Table 18 Summary of Ozone Concentrations in Central Dudley

Parameter	Year							
	2000	2001	2002	2003	2004	2005	2006	2007*
Max 8 hour running mean $\mu\text{g}/\text{m}^3$	133.5	197.4	118.1	160.6	154.9	115.3	199.5	128.0
Date of Max 8 hour running mean	02/06/00	02/06/01	02/06/02	09/08/03	08/08/04	27/05/05	19/07/06	15.04.07
11 th highest 8 hour running mean	123.3	140.8	109.6	153.3	141.5	106.6	171.4	107.8
Date of 11 th highest 8 hour running mean	17/06/00	26/06/02	02/06/02	15/07/03	08/06/04	27/05/05	02/07/06	09.06.07
Number of 8 Hour running means greater than $100 \mu\text{g}/\text{m}^3$	74	89	24	131	109	18	274	32
Number of days on which there were exceedences of $100 \mu\text{g}/\text{m}^3$	7	12	4	23	17	5	29	6

*NB Partial data set included for information only. Overall data capture rate for 2007=79.2%

4.4. Discussion

Increasing ozone trends have been recorded both locally throughout the WM conurbation and nationally and are linked to a number of factors including changes in climate and vehicle emission technology.

4.5. Proposed Actions

Dudley MBC proposes to continue monitoring ozone for the foreseeable future as part of its general air quality review programme.

5. New Local Developments

5.1. Introduction

Any new development within the borough that will significantly affect traffic flows may have subsequent effects on air quality. These effects, along with emissions from newly registered industrial processes, will need to be identified for consideration during the 2009 USA.

5.2. Industrial Developments

An inventory of local industrial sources of air pollution has been compiled for use in air quality dispersion modelling applications. The inventory is reviewed and updated on a regular basis and a major revision of this database is currently being undertaken as part of a wider WM exercise which is due for completion by the end of 2008. This work is being undertaken with the assistance of funding obtained under DEFRA's Air Quality Grant Programme 2007/08 and progress is being reported independently by the joint WM Air Quality Group.

Table 19 contains an inventory of all newly registered processes relevant to Dudley MBC's LAQM programme that have been registered since the 2006 USA; these will need to be fully considered during the 2009 assessment.

Table 19 Newly Registered Processes Relevant to Dudley MBC

Location	Description	Type	LAQM Pollutants	Source
Grafham Carbons, Foxyards, Bean Rd, West Midlands	Waste	A1	SO ₂ , NO ₂ , CO, PM ₁₀	Environment Agency
MES Environmental Ltd., Lister Rd., Dudley	Waste	A1	NO ₂ , CO, PM ₁₀	Environment Agency
Niagra LaSalle UK Ltd., Peartree Lane, Dudley, West Midlands	Metal	A1	NO ₂ , CO, PM ₁₀	Environment Agency
CM Metals, Pedmore Road, Dudley DY2 ORT	Non-ferrous metals	B	NO ₂ , CO, PM ₁₀	Dudley MBC
Albion Water Heaters Ltd, 4 Shelah Road, Halesowen B63 3PG	Di-isocyanate	B	PM ₁₀	Dudley MBC
Stourbridge Crystal Services, Delph Road Industrial Estate, Brierley Hill DY5 2TW	Glass	B	PM ₁₀	Dudley MBC
Lustre Anodising Co, Cannon Business Park, Gough Road, Coseley	Acid Processes	B	NO ₂	Dudley MBC
Trimat Ltd., Hurst Business Park, Narrowboat Way, Brierley Hill.	Coating	B	NO ₂ , CO, PM ₁₀	Dudley MBC
Staffordshire Crystal, Pedmore Road, Brierley Hill DY5 1TJ	Glass	B	PM ₁₀	Dudley MBC
Ezeeee-Fill Ltd., Darkhouse Lane, Coseley WV14 8XH.	Animal & plant treatment	B	SO ₂	Dudley MBC
Vanguard Foundry, Engine Lane, Lye DY9 8QT	Iron & Steel	B	PM ₁₀	Dudley MBC
Brettel & Shaw Ltd., Vulcan Wks, Hayes Lane, Lye DY9 8QT. PB/100.	Non-ferrous metals	B	NO ₂ , PM ₁₀	Dudley MBC
Accumix Concrete Ltd., The Yard Oakdale Trading Estate, Kingswinford PB/111	Cement and lime	B	PM ₁₀	Dudley MBC
QB Motorcycles, 89/91 High St., Quarry Bank DY5 2AD	Waste oil burners (<0.4MW)	B	NO ₂ , PM ₁₀	Dudley MBC

5.3. Transport Developments

Dudley MBC has been actively involved in the production of a borough wide Transport Strategy. A draft consultation report has been compiled with a view to publishing a formal document during 2008. The strategy will provide local focus on a number of LTP2 themes including AQ, making more efficient use of the existing road network, developing public transport,

promoting smarter choices including cycling and walking, planning, parking and road safety issues.

Consultation with Dudley MBC Highways Engineers has led to the following transport developments being identified as having the potential to have a significant effect upon air quality; these will need to be fully assessed during the 2009 USA:

- 5.3.1. Construction of the Brierley Hill Sustainable Access Network. Further details are given in Section 6 of this report.
- 5.3.2. Burnt Tree Island Junction improvements
- 5.3.3. Investigation of modifications to the A4101 and A4123
- 5.3.4. Urban Traffic Control Enhancements
- 5.3.5. Proposals for the development of a number of Priority Investment Corridors are under consideration including:
 - A458 Stourbridge-Quinton
 - A461 Burnt Tree-Wollaston
 - A491 Wall Heath-Hagley
 - A459 Halesowen-Dudley
 - A4036 (A461-A491)
 - A4100 Cradley-Brierley Hill
 - A456 Halesowen
 - B4171- Russells Hall Hospital
 - Reconstruction of Halesowen Bus Station (associated with redevelopment of the Cornbow Centre) and proposals for the implementation of new 20mph zones within the town centre.

5.4. Air Quality & Development Control

Dudley MBC's Environmental Protection team reviews all new planning applications for significant environmental impacts including those relating to air quality. Specific guidelines for developers have been drafted based on guidance provided by Environmental Protection UK, Development Control: Planning For Air Quality (2006). Links to the relevant websites are provided below:

[Development Control: Planning For Air Quality \(2006\)](#)

[Dudley MBC Draft Guidelines- Air Quality and Development Control](#)

It is proposed that these guidelines will be developed into formal guidance for council officers during 2008 followed by the adoption of an appropriate supplementary planning document.

5.5. Residential and Commercial Developments

Planning applications for all new residential and commercial developments are screened to identify any that are likely to:

- Create new areas of exceedence of any air quality objectives
- Cause a significant increase in pollutant concentrations in areas where air quality objectives are being currently breached
- Introduce new residential receptors into areas where air quality objectives are being currently breached

A summary of recent developments falling into these categories is provided in Table 20. These will be fully considered during the compilation of the next USA.

Table 20 New Developments With Potential Air Quality Impacts

Location	Type of Development	Ref	Type	Decision	Comments
Dudley Rd., Halesowen	Erection of 4 dwellings.	P07/0090	Full	Approved	Mitigation requested.
Stourbridge Rd., Halesowen	Erection of 5 dwellings.	P07/0132	Full	Approved	No adverse comments with respect to AQ.
Stourbridge	Erection of 44 dwellings.	P07/0410	Full	Approved	Mitigation requested.
Stourbridge Rd., Halesowen	Erection of 23 dwellings.	P07/0442	Full	Approved	Mitigation requested.
Halesowen	Redevelopment of bus station.	P07/0506	Full	Approved	Amendment to previous application. No adverse comments with respect to AQ.
Stourbridge Rd., Halesowen	Erection of 24 dwellings.	P07/0619	Outline	Refused	Mitigation requested.
Dudley St., Sedgley	Conversion to first floor residential dwelling.	P07/0669	Full	Refused	Refusal recommended on AQ grounds. Proposed development lies within former Sedgley AQMA and is an area of known exceedence within the new Dudley Borough AQMA.
Stourbridge Rd., Halesowen	Erection of 12 dwellings.	P07/0699	Full	Approved	Mitigation requested.
Birmingham St., Dudley	Conversion of commercial to 8 apartments plus erection of four townhouses.	P07/0709	Outline	Refused	Air quality assessment requested as development site lies in close proximity to bus station. No adverse AQ impacts were identified.

Table 20 New Developments With Potential Air Quality Impacts

Location	Type of Development	Ref	Type	Decision	Comments
Northfield Rd., Netherton	Erection of 15 apartments.	P07/1521	Outline	Refused	No adverse comments with respect to AQ.
High St., Quarry Bank	Extension with provision of upper floor flats to rear.	P07/1594	Full	Approved	No adverse comments with respect to AQ.
Wolverhampton St., Dudley	Change of use to involving creation of first floor residential dwellings.	P07/1622	Full	Pending	Mitigation scheme recommended.
Stourbridge	Redevelopment of bus station.	P07/1782	Full	Refused	No adverse comments with respect to AQ.
High St. Sedgley	Conversion of first floor offices to residential dwellings.	P07/2001	Full	Refused	No adverse comments with respect to AQ. Application refused on noise grounds.
High St., Amblecote	Twenty four dwellings.	P07/2020	Full	Pending	No adverse comments with respect to AQ.
Northfield Rd., Netherton	Four Dwellings.	P07/2064	Full	Approved	No adverse comments with respect to AQ.
Wolverhampton St., Dudley	Twelve retail units with residential above.	P07/2213	Full	Refused	Air quality assessment requested.
High Oak, Pensnett	Shop with residential above.	P07/2311	Full	Approved	Approved with conditions. Mitigation scheme required.
Former Ridge Hill Hospital, Wordsley	Residential- 75 houses/ 69 apartments	P08/240	Outline	Pending	Air quality assessment requested.

5.6. Local Regeneration Projects

A number of local regeneration projects are currently being undertaken within the borough which may have potential air quality impacts. Areas under consideration include:

- The North Priory Estate
- Cradley
- Pensnett High Street
- Dudley South Gateway
- Shell Corner

Options for the mitigation of air quality impacts are being fully discussed during the consultation phase.

6. Implementation of Action Plans

6.1. Brierley Hill

- 6.1.1. Dispersion modelling undertaken during preparation of the original AQAP indicated that construction of the Brierley Hill SAN combined with execution of Dudley MBC's green travel plans would reduce average NO₂ concentrations within the AQMA to meet the 2005 annual mean NO₂ objective. However, there have been substantial delays in commencing the construction of the SAN due to funding and compulsory purchase issues.
- 6.1.2. Dudley MBC's previous AQAP Progress report confirmed that these difficulties had since been resolved and predicted a start date of April 2007. The Council can now confirm that work is well underway with a revised completion date of October 2008. Individual elements associated with the original action plan including the construction of the SAN are summarised in Table 21.
- 6.1.3. There has been notable success with encouraging modal shift in the schools who have adopted Travel Plans. This is mainly due to awareness being raised initially within the school community, and then as more work is carried out sustainable travel becomes more readily accepted. Dudley MBC has also been successful in securing grants from the DfT for 19 schools for walking initiatives. These are payable over 3 years and provide £1000 a year to schools with Walking Buses and £500 per year for schools who organise walking programmes such as *Walk on Wednesdays*.

- 6.1.4. Dudley MBC will commence further work with a small selection of these schools during 2008 which will be invited to participate in the diffusion tube monitoring programme. This will help to raise awareness on air quality issues and the links with vehicle usage. Dudley MBC will also be developing its emission data base in conjunction with the other WM Authorities which will enable quantification of air quality benefits associated with the schools meeting their travel plan targets.
- 6.1.5. In accordance with the requirements of PPG 13, Dudley MBC has historically limited its requests for company travel plans via the DC process to all major developments comprising jobs, shopping, leisure and services. The guidance also provides a mechanism for requesting plans from similar smaller developments which would generate significant amounts of travel in, or near to, AQMAs. Expansion of the AQMA to cover the whole Borough will therefore increase the catchment area for requesting compulsory travel plans via the DC process. The issue of the Parking and Travel Planning Supplementary Planning Documents will support activities in this area. Dudley MBC is also proposing to carry out specialised training in the implementation of residential travel plans during 2008 which will be used to offset air quality impacts of larger developments and synergic impacts of small development clusters.
- 6.1.6. Once the parallel route is completed, Dudley MBC will continue to monitor AQ in the Brierley Hill area to confirm the improvements predicted in the original action plan. The purchase of a new dedicated chemiluminescent NO₂ analyser which will be permanently located within the former Brierley Hill AQMA is presently under investigation.
- 6.1.7. Any further improvements required to improve and maintain AQ in the Brierley Hill area will be undertaken as part of the wider Borough action plan which is currently in preparation. This will supersede the original Brierley Hill AQAP once it becomes operational.

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

	Action Plan Measure/Target	Original Timescale	Progress With Measure	Outcome To Date	Comments
1	<p>Construction of Parallel Route</p> <ul style="list-style-type: none"> • Provision of signalised junctions: High Street South Mill Street Level Street Dudley Road • Changes to junction alignments • Construction of pedestrian crossing facilities • Provision of bus priority measures • Construction of new carriageway between High St., Mill St., Level Street, Dudley Rd. • Improved access to rear of properties along High Street and Brier Special School • Provision of formal pedestrian crossing facilities 	2006/2007	Under construction	No outcome to date	Completion now due Oct '08. Air quality monitoring within the original AQMA will be carried out before, during and after completion of the project to enable quantification of air quality improvements

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

	Action Plan Measure/Target	Original Timescale	Progress With Measure	Outcome To Date	Comments
2	<p>Construction of Waterfront Way Link</p> <ul style="list-style-type: none"> • Construction of new section of public highway between Waterfront Way and the A4036 Pedmore Road • Associated junction improvements for pedestrians, cyclists and public transport • Provision of new access route to Round Oak Rail • Provision of new access route to Waterfront car park 	2006/2007	Under construction	No outcome to date	See point 1
3	<p>Improvement of junctions on High Street</p> <ul style="list-style-type: none"> • Five ways junction High St./Moor St/Mill St./Cottage St. • High St./Level St./Bank St. 	2006/2007	Work in progress	No outcome to date	See point 1

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

	Action Plan Measure/Target	Original Timescale	Progress With Measure	Outcome To Date	Comments
4	<p>Improvement of junctions on Pensnett Rd.</p> <ul style="list-style-type: none"> • Brockmoor High St / John St/Bank St / Pensnett Rd. • Pensnett Road / Hickman Rd • Bryce Rd / Pensnett Rd junction 	2006/2007	<p>In progress</p> <p>Complete</p> <p>In progress, completion delayed due to technical problems.</p>	No outcome to date	See point 1

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
5	Increased roundabout capacity at Waterfront Way / Waterfront West	2006/2007	Under construction	No outcome to date	See point 1
6	Parking improvements on Brierley Hill High Street	2006/2007	Parking Standards and Travel SPD adopted March 2007.	No outcome to date	Further improvements will be carried out once the SAN becomes operational. Parking decriminalisation is scheduled for introduction in July 2008 and will help to minimise illegal parking within the original AQMA.

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
7	<p>Construction of Wednesbury to Brierley Hill Midland Metro extension.</p> <p>Development of a Black Countrywide metro system is a key priority within the Black Country Transport Strategy.</p>	2007/2008	On hold	No outcome to date	Unlikely to progress until the WM bid for TIF funding and Brierley Hill's bid for strategic centre status issues are resolved.
8	<p>Addition of Bus Showcase routes</p>	None given	Upgrade of route 311/313 Stourbridge to Walsall passing through the Brierley Hill AQMA is now complete.	Too early to quantify changes in patronage or any AQ improvement	Trialling of selective vehicle detection (SVD) to decrease bus queuing at major junctions will commence during the early part of 2008.

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
9	Improvements to bus stops	None given	Some work has been carried out as part of the Showcase project	No outcome to date	Further work will be carried out as part of the SAN project
10	Bus only access/bus priority measures	None given	See point 8	No outcome to date	Trialling of selective vehicle detection (SVD) to decrease bus queuing at major junctions will commence during the early part of 2008.

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
11	Addition of bus/metro interchange facilities on Mill Street	2007/2008	On hold	No outcome to date	Unlikely to progress until the WM bid for TIF funding and Brierley Hill's bid for strategic centre status issues are resolved.
12	Addition of cycle lanes/improved cycle parking	2006/2007	Not started	No outcome to date	Completion now due Oct '08.
13	Pedestrianisation of Cottage St.	2006/2007	Not started	No outcome to date	Completion now due Oct '08.
14	Improvements to High St crossing facilities	2006/2007	Not started	No outcome to date	Completion now due Oct '08.
15	Widening/resurfacing of pathways and pedestrian signage improvements.	2006/2007	Not started	No outcome to date	Completion now due Oct '08.

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
16	Improved pedestrian linkages- High St-Waterfront, High St-Merry Hill, Waterfront-Merry Hill, Mill St-Cottage St Metro terminus	2006/2007	Not started	No outcome to date	Completion now due Oct '08.
17	Improved cyclist facilities including provision of new paths, improvements in parking and signage	2006/2007	Not started	No outcome to date	Completion now due Oct '08.
18	Improved environmental and security measures including provision of high quality street furniture on Brierley Hill High Street, provision of CCTV and improved lighting	2006/2007	Not started	No outcome to date	Completion now due Oct '08.
19	Introduction of car parking charges at the Merry Hill and Waterfront Developments.	None given	Not started	No outcome to date	The centre owner is considering introducing car parking charges during 2009.

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
20 a	Implementation of Travel Plans Voluntary	None given	There has been no additional progress in the implementation of any further voluntary travel plans within the Brierley Hill AQMA since the 2006 Action Plan Progress	It has not been possible to measure AQ benefits associated with existing Travel Plans or other <i>soft</i> measures operating within the AQMA, but Dudley MBC are introducing plans to rectify this situation in future (see comments).	During 2007, Dudley MBC has worked with a further 8 companies in setting up new voluntary travel plans on a Borough Wide basis and has also requested a limited number via planning applications, including nearby Russell's Hall Hospital. There are also plans to introduce compulsory car parking fees for the first time during 2009 at the Merry Hill Centre and this is

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
20a	Implementation of Voluntary Travel Plans Contd...		report. Further discussions are scheduled for May 2008.		likely to have a positive effect on the utilisation of public transport. Dudley MBC has now acquired EMIT software which will enable quantification of AQ benefits associated with software measures once the local emissions data base has been updated. The latter project is currently being undertaken on a regional scale across the WM with funding from DEFRA and will be completed in Dec '08

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
20b	Implementation of Safer Routes To School Travel Plans	Targeted for adoption in 100% schools by 2011.	During 2007, a further 17 schools were enrolled into the SRS programme.	AQ benefits are as yet unquantified but see point 20a.	A total of 61 out of 113 schools (54%) are now recruited including one school within the AQMA and all five of the schools in the immediate vicinity of the AQMA. A further 23 schools will be completing travel plans during 2008 and the remaining 19 schools will need to be completed by 2011.
20c	Implementation of Residential Travel Plans	Non given	Non adopted so far.	No outcome to date.	Dudley MBC adopted its Parking Standards and Travel Plans SPD in March 2007. This

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
20c	Implementation of Residential Travel Plans contd..				document has been prepared as part of the Council's LDF. Its purpose is to set out detailed guidance on the way the Council expect parking and travel plan policy in the Dudley Unitary Development Plan to be applied in particular circumstances or areas. It is envisaged that the publication of this document in conjunction with the declaration of a Borough wide AQMA will increase the number of

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
20c	Implementation of Residential Travel Plans contd..				travel plans which can be requested via the planning process. The council is currently considering the provision of internal training on residential travel planning during 2008 to enhance the likelihood of further opportunities in this area.
21	Additional LTP Targets	LTP2 contains a provisional target of reducing NO ₂ levels by 1% between 2005 and 2011 in areas where NO ₂	(a) Brierley Hill High Street has been monitored since the declaration of	There has been an increase of 12% in NO ₂ at this site between Jan '05 &	It should be noted that there has been a recent increase in traffic congestion at this site associated with the temporary SAN construction works. It is

Table 21 Progress Update For Implementation of The Brierley Hill Action Plan Including The SAN Construction Project

Action Plan Measure/Target		Original Timescale	Progress With Measure	Outcome To Date	Comments
21	Additional LTP Targets Contd...	exceeds the national objective.	the AQMA.	Nov '07. A second LTP2 site in nearby High Street, Quarry Bank has shown a smaller increase of 1% over the 3½ year period but is still 12µg/m ³ above the annual mean objective (Fig 36).	anticipated that NO ₂ levels will reduce quickly once the new road becomes operational in 2008.

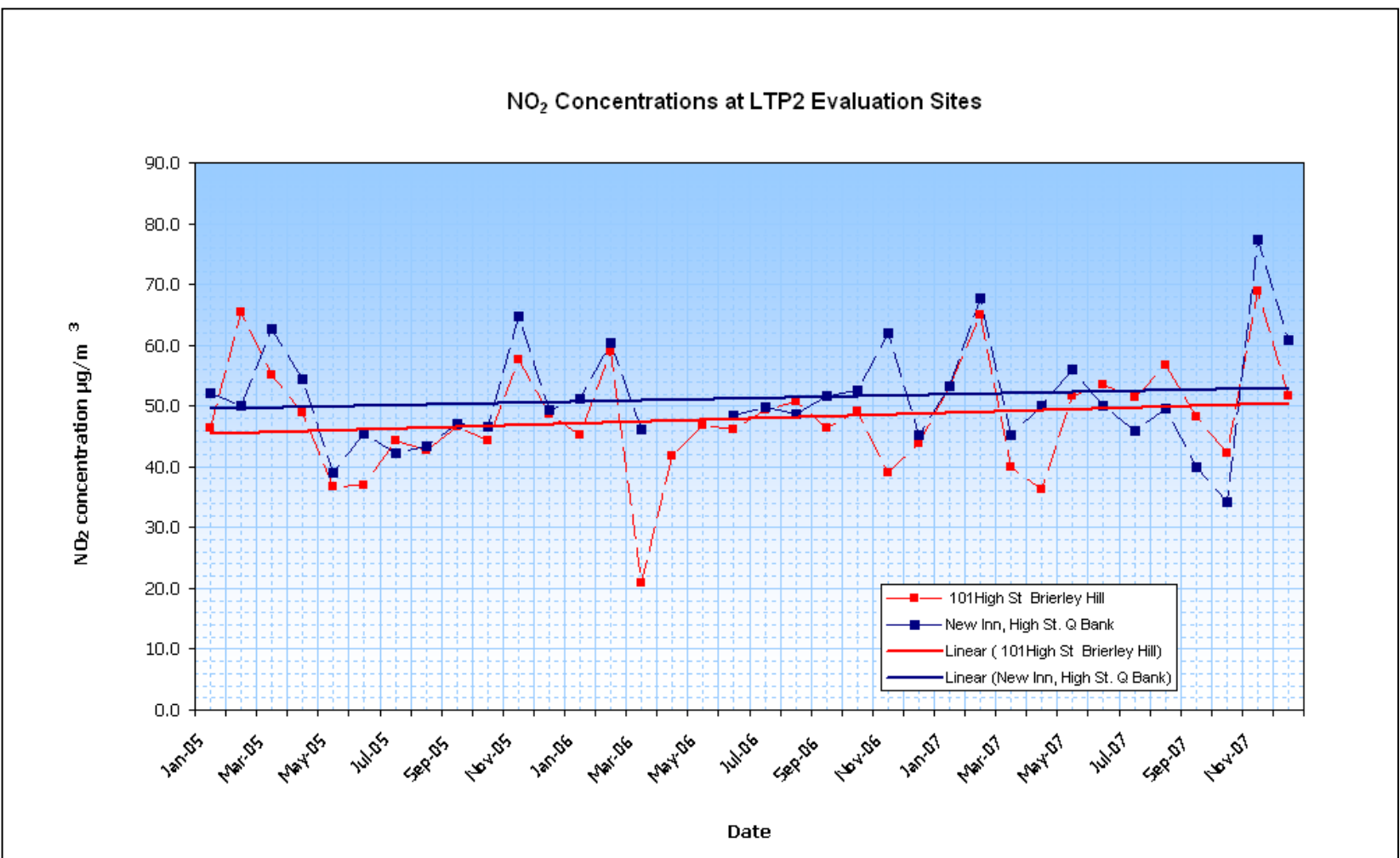


Figure 36 NO₂ Concentrations at LTP2 Sites In Brierley Hill and Quarry Bank

7. Development of a Local Air Quality Strategy

- 7.1. The LAQM Policy Guidance documents LAQM.PG (03) and LAQM.PG(S) (03) strongly recommend that Local Authorities which do not have AQMAs but do have areas close to the exceedence levels should consider drawing up a local air quality strategy. Therefore, there is a clear need to address air quality considerations in the wider context.
- 7.2. Although Dudley MBC has not previously published a Local Air Quality strategy, it recognises that LAQM is a rapidly developing area. Management of local air quality issues has naturally evolved in parallel with understanding of local air quality problems, and this has been made possible by investment in improved modelling and monitoring technology. Systems for integrating air quality issues into the planning and development control process and WM LTP2 are now being established and this further re-enforces the need for producing a formal Air Quality Strategy for Dudley.
- 7.3. It is therefore envisaged that a Local Air Quality Strategy will be published following completion of the borough wide action plan which clearly states Dudley MBC's position on air quality issues. The strategy will outline the council's aims and objectives in improving local air quality and the policies which will be needed to deliver these improvements and their integration into the various planning functions, including land-use (development planning and control), transport, economic, environmental and sustainable development (including climate change). The strategy will be updated on a regular basis to reflect changes in local and national policy, e.g. revisions to NAQS, national air quality objectives etc.

8. Conclusions and Further Work

- 8.1. Further to the identification of new areas of confirmed and possible exceedence of the annual mean NO₂ objective identified in the 2007 Detailed Assessment, Dudley MBC has now completed the declaration of a new Borough wide AQMA.
- 8.2. The Dudley Borough AQMA order was sealed on 6th December 2007 and there is now a statutory requirement to produce a borough wide AQAP (AQAP) in parallel with a Stage 4 Assessment during 2008. The AQAP can be developed in parallel with the Borough declaration to ensure it addresses any relevant points raised during the Borough declaration consultation programme. The document will need to consolidate ongoing actions within the Brierley Hill and Sedgley AQMAs and illustrate how broad initiatives contained within WM LTP2 and Dudley MBC's emerging Transportation

Strategy will be developed across the Borough to deliver more wide ranging AQ benefits.

- 8.3. A Stage 4 assessment will be used to closely examine and confirm the monitored exceedences of the annual mean objective and predicted exceedences of the hourly NO₂ objective in Halesowen Road, Netherton. Detailed source apportionment work and/or more detailed monitoring will be required in order to identify key focus areas of the emerging borough wide AQAP. These are likely to include Netherton, Wordsley and Cradley where significant exceedences of the annual mean NO₂ objective and increasing trends at some of the roadside locations have been observed.
- 8.4. The borough AQAP will also need to tackle reducing pollutant levels in a number of other areas where exceedences have been confirmed in this report, including Quarry Bank, Pensnett, Sedgley, Lye, Halesowen, Dudley and Lower Gornal.
- 8.5. The existing air quality monitoring programme in Brierley Hill will be continued before, during and after completion of the SAN project in order to enable direct quantification of any air quality improvements. This work will be required to identify any additional measures required after the completion of the SAN which will then be included as part of the new borough wide AQAP. The purchase of a new dedicated chemiluminescent NO₂ analyser which will be permanently located within the former Brierley Hill AQMA is presently under investigation.
- 8.6. Dudley MBC will continue with the execution of these existing actions until the launch of the new AQAP, which will consolidate the list of ongoing measures which are already having positive AQ impacts as well as introducing further initiatives generated during the consultation process.
- 8.7. Dudley MBC is actively committed to the integration of AQ issues into the development control (DC) planning system and further guidance documents are currently in preparation.
- 8.8. There has been notable success with encouraging modal shift in the schools who have adopted Travel Plans. This is mainly due to awareness being raised initially within the school community, and then as more work is carried out sustainable travel becomes more readily accepted. Dudley MBC will commence further work with a small selection of these schools during 2008 which will be invited to participate in the diffusion tube monitoring programme. This will help to raise awareness on air quality issues and the links with vehicle usage.

- 8.9. Dudley MBC will also be developing its emission data base in conjunction with the other WM Authorities which will enable quantification of air quality benefits associated with the schools meeting their travel plan targets.

Appendix 1 Air Quality Objectives reproduced from The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007).

National air quality objectives and European Directive limit and target values for the protection of human health								
Pollutant	Applies	Objective	Concentration measured as ¹⁰	Date to be achieved by and maintained thereafter	European obligations	Date to be achieved by and maintained thereafter	New or existing	
Particles (PM ₁₀)	UK	50µg.m ⁻³ not to be exceeded more than 35 times a year	24 hour mean	31 December 2004	50µg.m ⁻³ not to be exceeded more than 35 times a year	1 January 2005	Retain existing	
	UK	40µg.m ⁻³	annual mean	31 December 2004	40µg.m ⁻³	1 January 2005		
	Indicative 2010 objectives for PM ₁₀ (from the 2000 Strategy and 2003 Addendum) have been replaced by an exposure reduction approach for PM _{2.5} (except in Scotland – see below)							
	Scotland	50µg.m ⁻³ not to be exceeded more than 7 times a year	24 hour mean	31 December 2010				Retain existing
	Scotland	18µg.m ⁻³	annual mean	31 December 2010				
Particles (PM _{2.5}) Exposure Reduction	UK (except Scotland)	25µg.m ⁻³	annual mean	2020	Target value 25µg.m ⁻³ ¹²	2010	New (European obligations still under negotiation)	
	Scotland	12µg.m ⁻³		2020	Limit value 25µg.m ⁻³	2015		
	UK urban areas	Target of 15% reduction in concentrations at urban background ¹¹		Between 2010 and 2020	Target of 20% reduction in concentrations at urban background	Between 2010 and 2020		
Nitrogen dioxide	UK	200µg.m ⁻³ not to be exceeded more than 18 times a year	1 hour mean	31 December 2005	200µg.m ⁻³ not to be exceeded more than 18 times a year	1 January 2010	Retain existing	
	UK	40µg.m ⁻³	annual mean	31 December 2005	40µg.m ⁻³	1 January 2010		
Ozone	UK	100µg.m ⁻³ not to be exceeded more than 10 times a year	8 hour mean	31 December 2005	Target of 120µg.m ⁻³ not to be exceeded more than 25 times a year averaged over 3 years	31 December 2010	Retain existing	

Appendix 1 Air Quality Objectives reproduced from The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007).

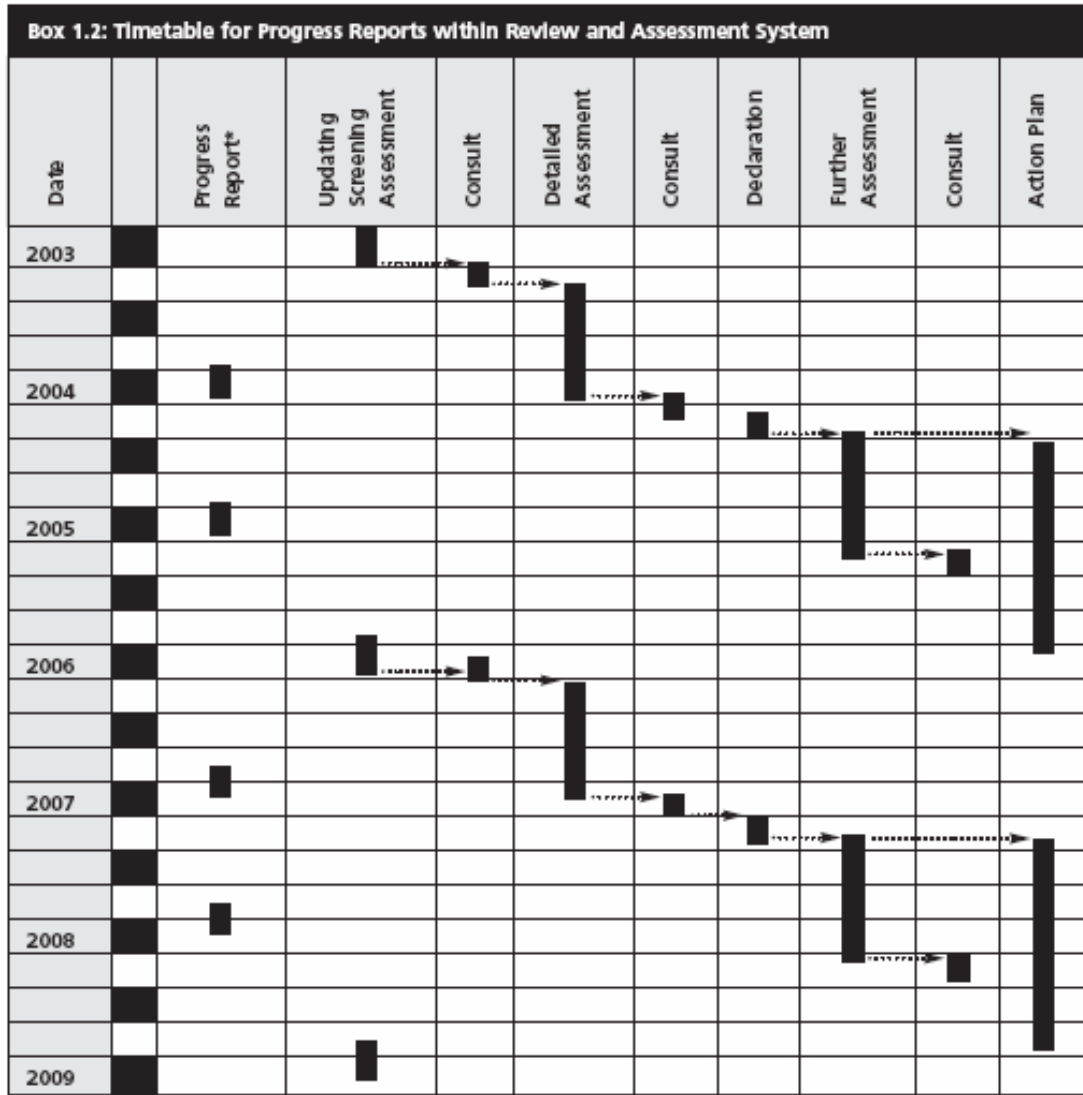
National air quality objectives and European Directive limit and target values for the protection of human health							
Pollutant	Applies	Objective	Concentration measured as	Date to be achieved by and maintained thereafter	European obligations	Date to be achieved by and maintained thereafter	New or existing
Sulphur dioxide	UK	266 $\mu\text{g.m}^{-3}$ not to be exceeded more than 35 times a year	15 minute mean	31 December 2005			Retain existing
	UK	350 $\mu\text{g.m}^{-3}$ not to be exceeded more than 24 times a year	1 hour mean	31 December 2004	350 $\mu\text{g.m}^{-3}$ not to be exceeded more than 24 times a year	1 January 2005	
	UK	125 $\mu\text{g.m}^{-3}$ not to be exceeded more than 3 times a year	24 hour mean	31 December 2004	125 $\mu\text{g.m}^{-3}$ not to be exceeded more than 3 times a year	1 January 2005	
Polycyclic aromatic hydrocarbons	UK	0.25 ng.m^{-3} B[a]P	as annual average	31 December 2010	Target of 1 ng.m^{-3}	31 December 2012	Retain existing
Benzene	UK	16.25 $\mu\text{g.m}^{-3}$	running annual mean	31 December 2003			Retain existing
	England and Wales	5 $\mu\text{g.m}^{-3}$	annual average	31 December 2010	5 $\mu\text{g.m}^{-3}$	1 January 2010	
	Scotland, Northern Ireland	3.25 $\mu\text{g.m}^{-3}$	running annual mean	31 December 2010			
1,3- butadiene	UK	2.25 $\mu\text{g.m}^{-3}$	running annual mean	31 December 2003			Retain existing
Carbon monoxide	UK	10 mg.m^{-3}	maximum daily running 8 hour mean/in Scotland as running 8 hour mean	31 December 2003	10 mg.m^{-3}	1 January 2005	Retain existing
Lead	UK	0.5 $\mu\text{g.m}^{-3}$	annual mean	31 December 2004	0.5 $\mu\text{g.m}^{-3}$	1 January 2005	Retain existing
		0.25 $\mu\text{g.m}^{-3}$	annual mean	31 December 2008			

Appendix 1 Air Quality Objectives reproduced from The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007).

National air quality objectives and European Directive limit and target values for the protection of human health							
Pollutant	Applies	Objective	Concentration measured as	Date to be achieved by and maintained thereafter	European obligations	Date to be achieved by and maintained thereafter	New or existing
National air quality objectives and European Directive limit and target values for the protection of vegetation and ecosystems							
Nitrogen oxides	UK	30 $\mu\text{g.m}^{-3}$	annual mean	31 December 2000	30 $\mu\text{g.m}^{-3}$	19 July 2001	Retain existing in accordance with 1 st Daughter Directive
Sulphur dioxide	UK	20 $\mu\text{g.m}^{-3}$	annual mean	31 December 2000	20 $\mu\text{g.m}^{-3}$	19 July 2001	Retain existing in accordance with 1 st Daughter Directive
	UK	20 $\mu\text{g.m}^{-3}$	winter average	31 December 2000	20 $\mu\text{g.m}^{-3}$	19 July 2001	
Ozone: protection of vegetation & ecosystems	UK	Target value of 18,000 $\mu\text{g m}^{-3}$ based on AOT40 to be calculated from 1 hour values from May to July, and to be achieved, so far as possible, by 2010	Average over 5 years	1 January 2010	Target value of 18,000 $\mu\text{g m}^{-3}$ based on AOT40 to be calculated from 1 hour values from May to July, and to be achieved, so far as possible, by 2010	1 January 2010	New EU target

Appendix 2

Review Timetable



Reproduced from DEFRA Progress Report Guidance LAQM.PRG(03) Section 1.06

Appendix 3 Quality Assurance/Quality control of monitoring data

Three automatic air quality monitoring stations are currently operated by Dudley MBC:

- Urban background, No. 7 Ednam Road, Dudley
- Roadside, Cradley Labour Club, Windmill Hill, Cradley
- Rural, Bartley Green Football Club, Illey

All three stations monitor for NO_x, NO, NO₂, and PM₁₀, whilst Ednam Road also records O₃ levels. The API and TEOM analysers are housed in an air-conditioned environment, and are operated according to the manufacturers' instructions. The API analysers are calibrated once every two weeks. The calibration is performed with zero air from the analyser's internal zero air generators and certificated gas cylinders supplied by Air Liquide. 15-minute averaged data is collected and scaled using the determined calibration factors. Data obtained from the TEOMs is scaled using the recommended factor of 1.3. All instruments are serviced at 6-monthly intervals by engineers from Environmental Technology plc, and are covered by that firm's service contract.

Diffusion tubes are obtained from, and analysed by Gradko Ltd. and are prepared using 20%TEA in water. They are exposed according to the calendar issued by NETCEN for the NO₂ Diffusion Tube Network.

For NO₂, scaling factors are determined by co-locating triplicate tubes with the automatic analysers, and calculating factors according to the method described in TG (03). Where appropriate nationally determined scaling factors are available from the NO₂ bias questionnaire operated on behalf of DEFRA by Air Quality Consultants, these are used. Otherwise the average of the three factors from all three monitoring stations is applied.

Appendix 4

Summary of Nitrogen Dioxide Monitoring Sites

No	Ref	Type	Easting	Northing	Height metres	Distance from kerb m	Distance from façade m	Relevant exposure
1	17b	B	393909	293821	2.7	N/A	N/A	Yes
2	20	R	394117	293687	3.2	1.3	0.3	Yes
3	13	B	391109	294007	2.2	N/A	0.01	Yes
4	32	R	391853	293650	3	2.6	0.9	Yes
5	32a	R	391830	293680	3	2.1	0.5	Yes
6	32b	R	391836	293694	3.1	2.7	0.4	Yes
7	32e	R	391823	293791	3.3	2.9	0.1	No
8	32f	R	391827	293834	2.9	1.2	0.3	Yes
9	32h	R	391764	293673	3	1.7	-1.5	Yes
10	32j	R	391696	293634	3.1	2	0.4	Yes
11	32n	R	391964	293500	3	3.2	0.3	Yes
12	32r	R	391867	293840	2.8	4.1	0.15	Yes
13	54	R	391159	290740	3	2.4	0.4	Yes
14	54a	R	391107	290757	3.1	2.6	0.6	Yes
15	54b	R	391102	290709	2.8	2.2		Yes
16	56	R	391183	291078	2.9	1.5	0.15	Yes
17	35	B	394683	289715	1.7	N/A	0.16	No
18	35a	R	395064	289514	3.1	2.2	0.5	Yes
19	36	B	393994	289735	2	N/A	N/A	No
20	5c	R	394389	290236	2.8	1.6	0.4	None found
21	5l	R	393990	290340	3.2	3	0.4	No
22	5mx	UC	394469	290257	3.2	22	2.6	No
23	5my	UC	394564	290341	3.2	5.5	11.8	No
24	5r	UC	394431	290434	3.1	1.7	1.5	No
25	5s	UC	394456	290411	3	1.6	0.5	No
26	5t	UC	394483	290404	3	0.8	0.5	Yes
27	5u	UC	394514	290382	3	1.4	-	Yes
28	5w	UC	394530	290358	3	1.7	0.15	Yes
29	10	B	394291	290460	3	30	-	Yes
30	24	B	398863	283989	2	N/A	0.01	Yes
31	24a	R	397833	285840	3.1	2.6	0.4	Yes
32	24c	R	397638	286103	2.8	2.4	0.15	Yes
33	24d	R	397796	285859	3	2.4	0.2	Yes
34	24e	R	397792	285882	3	3	0.4	Yes

Appendix 4

Summary of Nitrogen Dioxide Monitoring Sites

No	Ref	Type	Easting	Northing	Height metres	Distance from kerb m	Distance from façade m	Relevant exposure
35	19b	R	396476	283356	2.8	8.9	0.3	Yes
36	19c	R	396504	283331	2.8	8	0	Yes
37	19d	R	396492	283261	3	2.9	0.15	Yes
38	19e	R	396459	283206	3.4	2.8	0.15	Yes
39	19f	R	396485	283238	3.1	2.4	0.15	Yes
40	19g	R	396900	284140	2.8	4.2	0.15	Yes
41	15	R	396350	283771	3.3	3	0.15	Yes
42	15a	R	396392	283752	3	2.4	0.15	Yes
43	15b	R	396063	283921	2.3	1.5	0.2	Yes
44	3	B	394686	284295	2.2	N/A	N/A	Yes
45	3a	R	394550	284373	2.8	4.3	0.15	Yes
46	3b	R	394495	284412	2.9	4.8	0.15	Yes
47	3c	R	394506	284423	3	4	0.15	Yes
48	3d	R	394423	284504	2.4	3.9	0.15	Yes
49	3e	R	394384	284543	2.6	2.7	0.15	Yes
50	3g	R	394349	284571	2.4	0.9	0.15	Yes
51	3gx	R	394349	284571	3.3	2.1	0.15	Yes
52	3r-t	R	394243	284626	2	3.5	10	No
53	18	B	395134	282662	1.8	N/A	0.1	Yes
54	11	R	392172	284482	3.0	2.3	0.05	No
55	11b	R	392248	284426	3.2	1.4	0.15	Yes
56	11c	R	392297	284409	3	2.4	0.15	Yes
57	50	R	392124	284537	3.3	3	-	Yes
58	50ax	R	392133	284610	2.9	3.2	0.15	Yes
59	50c	R	392089	284387	3.2	2.7	-	No
60	50d	R	392087	284310	3.2	4	0.15	Yes
61	50e	R	392005	284145	2.9	2.8	0.2	Yes
62	50j	R	392029	284196	3	2.8	0.15	Yes
63	50x	R	392042	284247	3.3	10.8	0.15	Yes
64	51	B	392155	284348	2	N/A	0.15	Yes
65	4	B	390717	283980	2	N/A	0.15	Yes
66	21	B	389022	282654	1.5	N/A	0.01	Yes
67	21a	R	390536	283273	3	3.5	0.7	Yes
68	21b	R	390535	283415	3	2		Yes
69	2	B	390932	285888	1.5	N/A	0.01	Yes

Appendix 4

Summary of Nitrogen Dioxide Monitoring Sites

No	Ref	Type	Easting	Northing	Height metres	Distance from kerb m	Distance from façade m	Relevant exposure
70	52	R	389913	285055	1.7	4.8	0.1	Yes
71	52a	R	389945	284995	3.3	3.3	-	Yes
72	53	R	389593	285841	3.2	1.9	0.4	Yes
73	16b	R	390141	284350	2.6	1.3	0.1	Yes
74	16c	R	390259	284202	3	3.3	0.25	None found
75	34a	R	389135	286893	3.0	3.2	0.3	Yes
76	34aX	R	389135	286893	3.7	3.2	0.3	Yes
77	34c	B	389105	286877				Yes
78	34d	R	389171	286798	3.1	2.6		Yes
79	22	B	390016	288426	1	N/A	10.5	Yes
80	31g	R	388615	288958	2.1	5.7	0.15	Yes
81	31m	R	388696	288735	2.9	2.9	0.15	Yes
82	29	B	391075	288467	1.5	25	5	Yes
83	33	R	390989	289254	2.2	6	0	Yes
84	33a	R	391037	289244	3	9.9	0	Yes
85	33b	R	391077	289235	3.1	8	-0.5	Yes
86	33c	R	391077	289235	2.6	6.8	-0.5	Yes
87	33d	R	391110	289208	2.7	6.8	0.15	Yes
88	33e	R	391051	289208	2.8	3.6	0.8	Yes
89	33f	R	390993	289231	2.8	4.8(4)	0.15(-.5)	Flats above
90	33g	R	390986	289195	3	5.7	0.15	Yes
91	33h	R	391155	289210	3	7.6	0.15	Yes
92	33k	R	390870	289328	3.1	4.2	0.15	Yes
93	33p	R	391022	289223	2.9	3.8	0	Yes
94	37	R	391721	289272				Flats above
95	60	B	395215	287554	3	N/A	0.15	Yes
96	27b	R	394429	288239				Yes
97	27c	R	394439	288070				Yes
98	27d	R	394453	288051				Yes
99	27e	R	394510	287991				Yes
100	27f	R	394484	287962				Yes
101	27g	R	394417	288178	2.7	1.5	0.15	Yes
102	27gx	R	394417	288171	2.7	1.5	0.15	Yes
103	27j	R	394417	288169	2.7	1.6	0.15	Yes

Appendix 4

Summary of Nitrogen Dioxide Monitoring Sites

No	Ref	Type	Easting	Northing	Height metres	Distance from kerb m	Distance from façade m	Relevant exposure
104	27k	R	394416	288123	3.1	2.5	4	Yes
105	27n	R	394435	288201	3.2	5	0.15	Yes
106	27p	R	394471	288032	2.9	2.7	0.15	Yes
107	27q	R	394411	288046	2.9	1.4	0.15	Yes
108	30	R	393125	286009	3.5	2.7	0.15	Yes
109	30ax	R	393092	286038	3	5.8	-	Yes
110	30dx	R	393038	286060	2.8	3.4	0.15	Yes
111	30eX	R	392974	286071	2.8	2.3	0.15	Yes
112	30g	R	392951	286098	2.9	2.3	0.15	Yes
113	30m	R	393162	285997	3	2.4	0.15	Yes
114	14	R	391845	287081	3.1	4.8	0.5	Yes
115	14a	R	391859	287232	3	3.1	0.15	Yes
116	14b	R	391870	287188	2.9	1	2	None found
117	14d	R	391863	287104	2.8	2.1	0.05	Yes
118	41c	R	319644	287607	2.6	5.8	0.15	Yes
119	42	R	391806	287383	3.1	1.7	2.1	Yes
120	42ax	R	391696	287482	2.9	3.5	0.15	Yes
121	42bx	R	391630	287609	3.3	9	0.15	Yes
122	43	R	391913	287554	2.9	3.7	5	Yes
123	43a	R	391869	287397	3.1	3.4	0.5	Yes
124	43b	R	391894	287470	3.1	4.3	3.8	Yes
125	45	R	391861	286992	3	2	3.8	No
126	45b	R	391899	286932	3	1.8	1.3	No
127	45c	R	391919	286896	2.8	1.9	0.2	No
128	46a	R	391810	287033	3.2	1.6	0.05	Yes
129	47	R	391838	286954	2.8	3.8	0.15	Yes
130	47b	R	391815	286923	2.7	3.5	0.15	Yes
131	47d	R	391821	286892	2.8	5.4	0.15	Yes
132	49	B	391694	287307	3.1			Yes
133	49b	B	392016	287051	3.2	12	N/A	No

Produced By:

Dudley Metropolitan Borough Council,
Directorate of the Urban Environment,
Environmental Protection Services,
Claughton House,
Blowers Green Road,
Dudley,
DY2 8UZ

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For Further Information, Please Contact:

Tim Glews, Environmental Protection Manager, Tel (01384) 814606,
Lynda Fawthrop, Principal Environmental Health Officer, Tel (01384) 814629
Glyn Hodgkiss, Scientific Officer, Tel (01384) 818133, or:
Richard Gunning, Scientific Officer, Tel (01384) 812533