



2009 Air Quality
Updating and Screening
Assessment

for

*West Lancashire
District Council*

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

April 2009

West Lancashire District Council - England

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Executive Summary

In 1995 the Environment Act provided for a national air quality strategy requiring local authorities carry out reviews and assessments of the air quality in their area for seven specific pollutants. These are; carbon monoxide (CO), benzene, 1,3-butadiene, nitrogen dioxide (NO₂), lead, sulphur dioxide (SO₂) and PM₁₀ (Particles under 10µm in diameter).

This report undertakes an analysis of new monitoring information and changes to pollution sources in West Lancashire District Council since the last Updating and Screening Assessment in 2006. The Council's 2008 Progress Report and subsequent monitoring in 2008, found exceedences of the NO₂ annual mean objective in Moor Street and a Detailed Assessment is currently being undertaken for this location. This Detailed Assessment employs the use of triplicate diffusion tubes and is currently being completed by Bureau Veritas on behalf of West Lancashire District Council. The report is due to be submitted to DEFRA in July 2009.

Should results of the Detailed Assessment establish the need for an Air Quality Management Area to be declared, Bureau Veritas will carry out a Further Assessment based on detailed dispersion modelling. West Lancashire District Council will then proceed with an Air Quality Action Plan. Further, more in depth monitoring is proposed in the Moor Street area in order to establish our awareness and trends of Nitrogen Dioxide levels.

At present there are no existing AQMAs within West Lancashire District Council. We are currently monitoring the two developments highlighted in the 2008 Progress Report, namely, the Burscough Road Retail Development and the Edge Hill College car park expansion. Both of these monitoring campaigns have been running since September 2008. The early indications are that the Air Quality Limit Values will be achieved at these locations.

This report concludes that the objectives for all seven pollutants are already met or will be met by their target years, other than for Nitrogen Dioxide. The Nitrogen Dioxide annual mean may be exceeded in Moor Street, Ormskirk, where a Detailed Assessment is being undertaken. This is on the basis of having considered changes to the emission sources, relevant exposure, new objectives and any other changes that have taken place since the third round of air quality review and assessment.

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1 Introduction

1.1 Description of Local Authority Area

West Lancashire District Council is situated in the South West of Lancashire and is bounded by the boroughs of South Ribble, Chorley and St. Helens (to the East), Knowsley (to the South), Sefton (to the South West) and Fylde (to the North).

The district consists of the main towns of Ormskirk and Skelmersdale and surrounding villages. It covers an area of 34,688 hectares and has an approximate population of 109,000. The M58 Motorway and the A59 trunk road run through the district. Figure 1 below, shows a location map of West Lancashire District Council.

There is a range of industries including chemical and paper manufacture within the district. There is one A2 and 27 part B authorised installations (not including petrol stations of which there are 13).

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.

1.3 Air Quality Objectives

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

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Previous reports submitted are:

1. Updated Screening and Assessment report. Issued May 2003 by the air quality research group of the University of the West of England on behalf of West Lancashire District Council. The report concluded that the objectives for all seven key pollutants will be met by their target Years.
2. Progress report 2004. This report continued West Lancashire District council's commitment to proceed with diffusion tube monitoring in areas identified throughout the district.
3. Updated Screening and Assessment report. Issued July 2006 by the air quality management resource centre of the University of the West of England on behalf of West Lancashire District Council.
This report concluded that the objectives for all seven pollutants are already met or will be met by their target years, other than for Nitrogen Dioxide. The assessment indicated that the Nitrogen Dioxide annual mean may be exceeded in Stanley Street, Ormskirk, where a detailed assessment is being undertaken.
4. Detailed Assessment report August 2006, prepared by West Lancashire District Council in conjunction with TRL Limited
This report utilised data from an 11-month study using a TRL continuous monitoring station located in Stanley Street, Ormskirk. The conclusion of the assessment was that the annual average was not being exceeded and the Council did not have to declare an Air Quality management area. Monitoring of this location and the nearby locality would continue to be assessed using diffusion tubes.
5. Progress report 2007. The report updated the Nitrogen Dioxide diffusion tube data for various locations but highlighted the area of Moor Street in Ormskirk as a possible area where Nitrogen Dioxide may exceed the annual average limit value. The recommendations were to continue monitoring to collate sufficient data to establish this statement.
6. Progress report 2008. On the basis of the further monitoring as recommended in the 2007 Progress report and implemented in this report it was concluded that West Lancashire District Council would need to proceed to a Detailed Assessment in the area of Moor Street, Ormskirk. This assessment is currently ongoing and will be reported to Defra in July 2009. Two new local developments at Burscough Road, Ormskirk and Edge Hill University, Ormskirk were also reported, both of which received traffic assessments and plans commissioned. The outcome of these reports indicated that there would be no detrimental implications to the environment from small increases in traffic flow. Both of these sites have been included in further monitoring using Nitrogen Dioxide diffusion tubes to verify Nitrogen Dioxide levels at these locations.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

In the year of this report there has been no automatic monitoring sites commissioned or operated by West Lancashire District Council.

2.1.2 Non-Automatic Monitoring

The following tables give details of the Non-Automatic Monitoring sites and their locations:

2006 Single Tube- Site Details

Site Name	Site Type	Grid Ref SD	Pollutants monitored	In AQMA Y/N	Relevant Exposure	Distance to kerb	Worst case location
Burscough Street	Kerbside	4147,0839	NO2	N	Y 9m to property	0.5m	Y
54 Southport Road	Intermediate	4123,0857	NO2	N	Y (facia of property)	13m	Y
Ashcroft Avenue	Urban Background	4162,0879	NO2	N	Y (facia of property)	75m	N
Edgely Drive	Urban Background	4245,0827	NO2	N	Y (facia of property)	127m	N
59 Moor Street	Kerbside	4169,0816	NO2	N	Y (1m to property)	1m	Y
Chequer Close	Motorway site	5094,0413	NO2	N	Y (facia of property)	33m to Motorway	Y
Halsall Lane	Kerbside	4108,0872	NO2	N	Y (facia of property)	5m	Y
40 Stanley Street	Kerbside	4173,0831	NO2	N	Y (facia of property)	4.5m	Y
3 Wigan Road	Kerbside	4173,0816	NO2	N	Y (facia of property)	5m	Y
49 Wigan Road	Kerbside	4189,0814	NO2	N	Y (facia of property)	2m	Y
Liverpool Road South	Kerbside	4294,1038	NO2	N	Y 1.5m to property	1m	Y

2007 Single Tube- Site Details

Site Name	Site Type	Grid Ref SD	Pollutants Monitored	In AQMA Y/N	Relevant Exposure	Distance to kerb	Worst case location
Burscough Street	Kerbside	4147,0839	NO2	N	Y 9m to property	0.5m	Y
54 Southport Road	Intermediate	4123,0857	NO2	N	Y (facia of property)	13m	Y
59 Moor Street	Kerbside	4169,0816	NO2	N	Y 1m to property	1m	Y
Chequer Close	Motorway site	5094,0413	NO2	N	Y (facia of property)	33m to Motorway	Y
Halsall Lane	Kerbside	4108,0872	NO2	N	Y (facia of property)	5m	Y
40 Stanley Street	Kerbside	4173,0831	NO2	N	Y (facia of property)	4.5m	Y
3 Wigan Road	Kerbside	4173,0816	NO2	N	Y (facia of property)	5m	Y
Liverpool Road South	Kerbside	4294,1038	NO2	N	Y 1.5m to property	1m	Y
49 Wigan Road	Kerbside	4189,0814	NO2	N	Y (facia of property)	2m	Y

2008 Single Tube-Site Details

Site Name	Site Type	Grid Ref SD	Pollutants monitored	In AQMA Y/N	Relevant Exposure	Distance to Kerb	Worst case location
Burscough Street	Kerbside	4147,0839	NO2	N	Y 9m to property	0.5m	Y
54 Southport Road	Intermediate	4123,0857	NO2	N	Y (facia of property)	13m	Y
59 Moor Street	Kerbside	4169,0816	NO2	N	Y 1m to property	1m	Y
Chequer Close	Motorway site	5094,0413	NO2	N	Y (facia of property)	33m to Motorway	Y
Halsall Lane	Kerbside	4108,0872	NO2	N	Y (facia of property)	5m	Y
40 Stanley Street	Kerbside	4173,0831	NO2	N	Y (facia of property)	4.5m	Y
3 Wigan Road	Kerbside	4173,0816	NO2	N	Y (facia of property)	5m	Y
Liverpool Road South	Kerbside	4294,1038	NO2	N	Y 1.5m tp property	1m	Y
49 Wigan Road	Kerbside	4189,0814	NO2	N	Y (facia of property)	2m	Y
Slack House Cottages	Kerbside	4225,0713	NO2	N	Y (facia of property)	4.5m	Y
Burscough Road	Kerbside	4174,0880	NO2	N	Y (facia of property)	7m	Y

2008 Triplicate Diffusion tube details for Detailed Assessment

Site Name	Site Type	Grid Ref SD	Pollutants Monitored	In AQMA Y/N	Relevant Exposure	Distance to Kerb	Worst case location
14 Wigan Road	Kerside	4174,0814	NO2	N	Y (facia of property)	5m	Y
31 Knowsley Road	Kerbside	4171,0803	NO2	N	Y (facia of property)	6.5m	Y
41 Stanley Street	Kerbside	4172,0818	NO2	N	Y (facia of property)	6m	Y
55 Moor Street	Kerbside	4168,0816	NO2	N	Y (facia of property)	2m	Y
50 Moor Street	Kerbside	4162,0815	NO2	N	Y (facia of property)	2m	Y
Junction of St Helens Rd/Moor St.	Kerbside	4159,0815	NO2	N	Y 0.2m from property	2m	Y
19b St Helens Road	Kerbside	4161,0805	NO2	N	Y (facia of property)	5m	Y
Beaconsfield Court	Kerbside	4156,0805	NO2	N	Y (facia of property)	5m	Y
16 St Helens Road	Kerbside	4161,0799	NO2	N	Y (facia of property)	6.5m	Y
75 Aughton Street	Kerbside	4125,0801	NO2	N	Y (facia of property)	4.5m	Y
Junction of Park Rd/ Aughton St	Kerbside	4137,0813	NO2	N	Y 0.2m from property	3.5m	Y

Details of QA/QC for Diffusion Tubes

The lab supplying and analysing the tubes used by West Lancashire District Council is: -

Bureau Veritas UK Ltd
Queenslie Court
139 Summerlee Street
Glasgow
G33 4DB.

The preparation method used up to and including 2008 was 10% TEA. From January 2009 this was changed to 20% TEA.

West Lancashire District Council can confirm that the above lab follows the procedures set out in the Harmonisation Practical Guidance. Results of laboratory precision through the WASP scheme for the lab placed them as a Category 1 for 2009. Diffusion tube results were not compared with the reference method in a co-location study.

The bias adjustment factor applied was taken from the Review and Assessment website, spreadsheet version number 0309, and the following factors were used: -

2006 = 0.87
2007 = 0.88
2008 = 0.83

2.2 Comparison of Monitoring Results with AQ Objectives

The results for 2006, 2007 and 2008 of single tube data and 2008 triplicate tube data used as part of our Detailed Assessment are presented below.

2.2.1 Nitrogen Dioxide

Monitoring for this pollutant has utilised Diffusion Tubes. Routine monitoring using single tubes has highlighted the need for a Detailed Assessment to be carried out in the area of Moor Street, Ormskirk. This was carried out using triplicate tubes in order to establish Nitrogen Dioxide levels at this location. The results and subsequent Detailed Assessment will be submitted to DEFRA in July 2009. Guidance taken from the Review and Assessment helpdesk advised that annual averages could be calculated as a mathematical average if a minimum of 70% data capture was achieved.

West Lancashire District Council - England

Site ID	Location	Within AQMA	Data Capture %	Annual Mean Concentrations for 2006 in ug/m ³ and adjusted for bias.
1N	Burscough Street	No	100	28.2
6N	54 Soutport Road	No	100	27.7
5N	Ashcroft Avenue	No	75	16.0
3N	Edgely Drive	No	25	N/a *
WL/1	59 Moor Street	No	100	42.9
WL/2	Chequer Close	No	100	31.1
WL/3	Halsall Lane	No	75	37.5
WL/4	40 Stanley Street	No	83	25.8
WL/5	3 Wigan Road	No	83	32.5
WL/6	Liverpool Road South	No	75	33
WL/7	49 Wigan Road	No	25	N/a **

2006 Single Diffusion Tube Monitoring Data

* The Edgely Drive site that has been providing background information levels since 1998 was taken out of operation due to its consistently low levels of Nitrogen Dioxide. A new site at Liverpool Road South, Burscough was established to provide data on the busy A59 trunk Road.

** The 49 Wigan Road site began monitoring in October of 2006, therefore only three months of data was available.

Result highlighted in red exceeds the annual mean NO₂ objective, this has been discussed in previous Progress Reports and has resulted in the current Detailed Assessment to be carried out.

West Lancashire District Council - England

Site ID	Location	Within AQMA	Data Capture 2007 %	Annual mean concentration for 2007 in ug/m ³ and adjusted for bias.
1N	Burscough Street	No	100	25.4
6N	54 Southport Road	No	92	24
WL/1	59 Moor Street	No	100	44
WL/2	Chequer Close	No	100	29.4
WL/3	Halsall Lane	No	100	33.1
WL/4	40 Stanley Street	No	92	24.9
WL/5	3 Wigan Road	No	100	31.7
WL/6	Liverpool Road South	No	100	30.1
WL/7	49 Wigan Road	No	92	34.4

2007 Single Diffusion Tube Monitoring Data

Result highlighted in red exceeds the annual mean NO₂ objective, this has been discussed in previous Progress Reports and has resulted in the current Detailed Assessment to be carried out.

West Lancashire District Council - England

Site ID	Location	Within AQMA	Data Capture 2008 %	Annual mean concentration for 2008 in ug/m ³ ans adjusted for bias
1N	Burscough Street	No	100	30
6N	54 Southport Road	No	67	21.4
WL/1	59 Moor Street	No	17	N/a *
WL/2	Chequer Close	No	92	25.3
WL/3	Halsall Lane	No	92	38.6
WL/4	40 Stanley Street	No	17	N/a *
WL/5	3 Wigan Road	No	17	N/a *
WL/6	Liverpool Road South	No	100	35
WL/7	49 Wigan Road	No	100	32.1
WL/2a	Slack House Cottages	No	33	N/a **
WL/4a	Burscough Road	No	25	N/a **

2008 Single Diffusion Tube Monitoring Data

* The sites at 59 Moor Street, 40 Stanley Road and 3 Wigan Road were moved to locations more suitable to gather data for the detailed assessment outlined in the 2008 Progress report.

** It was decided that the locations at 54 Southport Road and Chequer Close had provided sufficient data to characterise the locations and the tubes were moved to monitor the two locations outlined in the 2008 Progress report, namely Slack House Cottages (Edge Hill development) and Burscough Road (Burscough Road Development).

West Lancashire District Council - England

Site ID	Location	Within AQMA	Triplicate Tube Data capture 2008 %	Annual mean concentration for 2008 in ug/m ³ and adjusted for bias
11	14 Wigan Road	No	83	34
12	31 Knowsley Road	No	83	23.5
13	41 Stanley Street	No	83	39.5
14	55 Moor Street	No	58	34.3
15	50 Moor Street	No	83	52.7
16	Junction of St. Helens Road/Moor St.	No	83	41.3
17	19b St. Helens Road	No	75	29.2
18	Beaconsfield Court	No	33	N/a *
19	16 St. Helens Road	No	83	24.5
20	75 Aughton Street	No	83	26.6
21	Junction of Park Road/Aughton Street	No	83	35.1

2008 Triplicate Diffusion Tube Monitoring Data

* Problems were encountered with this site and meaningful results were only obtained from September 2008.

Result highlighted in red exceeds the annual mean NO₂ objective and will form part of the current Detailed Assessment.

2.2.2 PM₁₀

Previous assessments have indicated that the PM₁₀ objectives are unlikely to be exceeded at any location in the Council. There are no current monitoring site locations for PM₁₀ within West Lancashire District Council.

2.2.3 Sulphur Dioxide

Previous assessments have indicated that the Sulphur Dioxide objectives are unlikely to be exceeded at any location in the Council. There are no current monitoring site locations for Sulphur Dioxide within West Lancashire District Council.

2.2.4 Benzene

Previous assessments have indicated that the Benzene objectives are unlikely to be exceeded at any location in the Council. There are no current monitoring site locations for Benzene within West Lancashire District Council.

2.2.5 Other pollutants monitored

Previous assessments for Lead, Carbon Monoxide and 1,3-Butadiene have indicated that the pollutant objectives for these compounds are unlikely to be exceeded at any location in the Council. There are no current monitoring site locations for Lead, Carbon Monoxide and 1,3-Butadiene within West Lancashire District Council.

West Lancashire District Council has measured concentrations of Nitrogen Dioxide above the annual mean objective at a relevant location, and **has proceeded to a Detailed Assessment**, for the area of Moor Street, Ormskirk. As agreed with DEFRA, this will be submitted in July 2009.

3 Road Traffic Sources

There are no new road traffic sources to consider within West Lancashire District Council.

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

West Lancashire District 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

West Lancashire District 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.

West Lancashire District Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

West Lancashire District 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

West Lancashire District Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

West Lancashire District Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

West Lancashire District Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

West Lancashire District Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

West Lancashire District 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

West Lancashire District 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)

West Lancashire District Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

Since the previous Updated Screening Assessment in 2006, a permit was issued in October 2008 by West Lancashire District Council for the Operation of a Concrete Batching Installation, with the relevant pollutant being PM₁₀. The location of this plant is on Ringtail Place, Burscough Industrial Estate with the nearest relevant receptors being approximately 650m away. As the plant is operating within the specified permitted conditions, and there are no substantial increases in emissions, it will not be necessary to proceed to a Detailed Assessment.

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

5.1.1 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

West Lancashire District Council 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.

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

Since the previous Updated Screening Assessment in 2006, a permit has been issued by West Lancashire District Council for the Operation of a Concrete Batching Installation, with the relevant pollutant being PM₁₀. The location of this plant is on Ringtail Place, Burscough Industrial Estate with the nearest relevant receptors being approximately 650m away. As the plant is operating within the specified permitted conditions, and there are no substantial increases in emissions, it will not be necessary to proceed to a Detailed Assessment.

West Lancashire District Council 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

West Lancashire District Council confirm that there are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

West Lancashire District Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

West Lancashire District Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

West Lancashire District Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

West Lancashire District Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

West Lancashire District Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

West Lancashire District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Routine monitoring carried out by West Lancashire District Council using single diffusion tubes indicated a likely exceedance of the air quality objective limit values for Nitrogen Dioxide in the Moor Street area of Ormskirk (see Progress Reports 2007/2008).

This highlighted the need for a Detailed Assessment to be carried out. Following advice from DEFRA, this was carried out using triplicate tubes at various locations (Appendix C, maps 14-24). This meant that more accurate results could be obtained in order to define locations of exceedance of Nitrogen Dioxide levels.

West Lancashire District Council has employed the services of Bureau Veritas to carry out the subsequent Detailed Assessment, this will be submitted to DEFRA in July 2009.

8.2 Conclusions from Assessment of Sources

There are no existing AQMAs within West Lancashire District Council. We are currently monitoring the two developments highlighted in the 2008 Progress Report, namely, the Burscough Road Retail Development and the Edge Hill College car park expansion. Both of these monitoring campaigns have been running since September 2008. The early indications are that the Air Quality Limit Values will be achieved at these locations.

8.3 Proposed Actions

We are currently in the process of carrying out a Detailed Assessment in order to ascertain whether an Air Quality Management Area needs to be declared for the Moor Street area of Ormskirk. In order to develop our spatial awareness of the Moor Street area, additional triplicate tube sites have been proposed; these will allow us to further develop air quality information for this area.

9 References

LOCAL AIR QUALITY MANAGEMENT
Technical Guidance LAQM.TG(09)

AIR QUALITY REVIEW AND ASSESSMENT WEBSITE
www.uwe.ac.uk/aqm/review

Appendices

Appendix A: QA/QC Data.

Appendix B: Precision and Accuracy of Triplicate Tubes.

Appendix C: Maps of Locations.

Appendix D: 2006 NO₂ Single Tube Results.

Appendix E: 2007 NO₂ Single Tube Results.

Appendix F: 2008 NO₂ Single Tube Results.

Appendix G: 2008 NO₂ Triplicate Tube Results.

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The lab supplying and analysing the tubes used by West Lancashire District Council is: -

Bureau Veritas UK Ltd
Queenslie Court
139 Summerlee Street
Glasgow
G33 4DB.

The preparation method used up to and including 2008 was 10% TEA. From January 2009 this was changed to 20% TEA.

West Lancashire District Council can confirm that the above lab follows the procedures set out in the Harmonisation Practical Guidance. Results of laboratory precision through the WASP scheme for the lab placed them as a Category 1 for 2009. Diffusion tube results were not compared with the reference method in a co-location study.

The bias adjustment factor applied was taken from the Review and Assessment website, spreadsheet version number 0309, and the following factors were used: -

2006 = 0.87
2007 = 0.88
2008 = 0.83

QA/QC of diffusion tube monitoring

West Lancashire District Council have followed all guidance and instructions contained in LAQM.TG (09), Annex 1. Travel blanks are used in all studies.

The calculation of the average mean for the triplicate tubes used in the Detailed Assessment were obtained from Version 3 – November 2006, Checking Precision and Accuracy of Triplicate Tubes from the Air Quality Review and Assessment Website. See Appendix B.

Appendix B: Precision and Accuracy of Triplicate Tubes

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	27/02/2008	02/04/2008		33.0	38.0	36	3.5	10	31.8
2	02/04/2008	30/04/2008	42.0	43.0	46.0	44	2.1	5	5.2
3	30/04/2008	29/05/2008	35.0	41.0	41.0	39	3.5	9	8.6
4	29/05/2008	02/07/2008	42.0	36.0	39.0	39	3.0	8	7.5
5	02/07/2008	31/07/2008	36.0	37.0	32.0	35	2.6	8	6.6
6	31/07/2008	03/09/2008	33.0	32.0	34.0	33	1.0	3	2.5
7	03/09/2008	01/10/2008	50.0	45.0	50.0	48	2.9	6	7.2
8	01/10/2008	30/10/2008	41.0	39.0	38.0	39	1.5	4	3.8
9	30/10/2008	03/12/2008	45.0	44.0	40.0	43	2.6	6	6.6
10	03/12/2008	07/01/2009	53.0	57.0	49.0	53	4.0	8	9.9
11									
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	14 Wigan Road, Ormskirk
Accuracy (with 95% confidence interval) without periods with CV larger than 20%	Bias calculated using 0 periods of data Bias factor A Bias B
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	μgm^{-3}
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	μgm^{-3}
Adjusted Tubes Mean:	μgm^{-3}

Precision	10 out of 10 periods have a CV smaller than 20%
Accuracy (with 95% confidence interval) WITH ALL DATA	Bias calculated using 0 periods of data Bias factor A Bias B
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	μgm^{-3}
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	μgm^{-3}
Adjusted Tubes Mean:	μgm^{-3}

Overall survey --> Good precision

(Check average CV & DC from Accuracy calculations)

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Version 03 - November 2006

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	27/02/2008	02/04/2008	26.0	30.0	26.0	27	2.3	8	5.7
2	02/04/2008	30/04/2008	32.0	30.0	26.0	29	3.1	10	7.6
3	30/04/2008	29/05/2008	24.0	27.0	33.0	28	4.6	16	11.4
4	29/05/2008	02/07/2008	25.0	21.0	24.0	23	2.1	9	5.2
5	02/07/2008	31/07/2008	21.0	23.0	17.0	20	3.1	15	7.6
6	31/07/2008	03/09/2008	23.0	24.0	21.0	23	1.5	7	3.8
7	03/09/2008	01/10/2008	33.0	33.0	45.0	37	6.9	19	17.2
8	01/10/2008	30/10/2008	25.0	22.0	23.0	23	1.5	7	3.8
9	30/10/2008	03/12/2008	30.0	30.0	32.0	31	1.2	4	2.9
10	03/12/2008	07/01/2009	42.0	42.0	42.0	42	0.0	0	0.0
11									
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:	31 Knowsley Road, Ormskirk
Accuracy (with 95% confidence interval) without periods with CV larger than 20%	Bias calculated using 0 periods of data Bias factor A Bias B
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	μgm^{-3}
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	μgm^{-3}
Adjusted Tubes Mean:	μgm^{-3}

Precision	10 out of 10 periods have a CV smaller than 20%
Accuracy (with 95% confidence interval) WITH ALL DATA	Bias calculated using 0 periods of data Bias factor A Bias B
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	μgm^{-3}
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	μgm^{-3}
Adjusted Tubes Mean:	μgm^{-3}

Overall survey --> Good precision

(Check average CV & DC from Accuracy calculations)

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AEA Energy & Environment
From the AEA group

Checking Precision and Accuracy of Triplicate Tubes

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	27/02/2008	02/04/2008	42.0	40.0	45.0	42	2.5	6	6.3			Good	
2	02/04/2008	30/04/2008	51.0	53.0	51.0	52	1.2	2	2.9			Good	
3	30/04/2008	29/05/2008	62.0	64.0	67.0	64	2.5	4	6.3			Good	
4	29/05/2008	02/07/2008	42.0	40.0	40.0	41	1.2	3	2.9			Good	
5	02/07/2008	31/07/2008	43.0	42.0	45.0	43	1.5	4	3.8			Good	
6	31/07/2008	03/09/2008	37.0	40.0	33.0	37	3.5	10	8.7			Good	
7	03/09/2008	01/10/2008	59.0	60.0	65.0	61	3.2	5	8.0			Good	
8	01/10/2008	30/10/2008		38.0	38.0	38	0.0	0	0.0			Good	
9	30/10/2008	03/12/2008	40.0	39.0	39.0	39	0.6	1	1.4			Good	
10	03/12/2008	07/01/2009	58.0	60.0	59.0	59	1.0	2	2.5			Good	
11													
12													
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: 41 Stanley Street, Ormskirk

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B

Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Precision 10 out of 10 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B

Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Overall survey --> **Good precision**

(Check average CV & DC from Accuracy calculations)

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AEA Energy & Environment
From the AEA group

Checking Precision and Accuracy of Triplicate Tubes

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	27/02/2008	02/04/2008	42.0	41.0	46.0	43	2.6	6	6.6			Good	
2	02/04/2008	30/04/2008	50.0	36.0	49.0	45	7.8	17	19.4			Good	
3	30/04/2008	29/05/2008	47.0	44.0	44.0	45	1.7	4	4.3			Good	
4	29/05/2008	02/07/2008											
5	02/07/2008	31/07/2008	31.0	37.0	32.0	33	3.2	10	8.0			Good	
6	31/07/2008	03/09/2008	28.0	31.0	28.0	29	1.7	6	4.3			Good	
7	03/09/2008	01/10/2008	41.0	60.0		51	13.4	27	120.7			Poor Precision	
8	01/10/2008	30/10/2008	43.0	43.0	44.0	43	0.6	1	1.4			Good	
9	30/10/2008	03/12/2008											
10	03/12/2008	07/01/2009											
11													
12													
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: 55 Moor Street, Ormskirk

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B

Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Precision 6 out of 7 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B

Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Overall survey --> **Good precision**

(Check average CV & DC from Accuracy calculations)

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Checking Precision and Accuracy of Triplicate Tubes

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	27/02/2008	02/04/2008	58.0	58.0	64.0	60	3.5	6	8.6			Good	
2	02/04/2008	30/04/2008	58.0	65.0	67.0	63	4.7	7	11.7			Good	
3	30/04/2008	29/05/2008	78.0	70.0	73.0	74	4.0	5	10.0			Good	
4	29/05/2008	02/07/2008	55.0	55.0		55	0.0	0	0.0			Good	
5	02/07/2008	31/07/2008	56.0	46.0		51	7.1	14	63.5			Good	
6	31/07/2008	03/09/2008	53.0	50.0	52.0	52	1.5	3	3.8			Good	
7	03/09/2008	01/10/2008	81.0	66.0	89.0	79	11.7	15	29.0			Good	
8	01/10/2008	30/10/2008	58.0	54.0		56	2.8	5	25.4			Good	
9	30/10/2008	03/12/2008	68.0	59.0	52.0	60	8.0	13	19.9			Good	
10	03/12/2008	07/01/2009	77.0	95.0	84.0	85	9.1	11	22.5			Good	
11													
12													
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: 50 Moor Street, Ormskirk	Precision 10 out of 10 periods have a CV smaller than 20% <small>(Check average CV & DC from Accuracy calculations)</small>	Overall survey --> Good precision
--	---	---

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%

Bias calculated using 0 periods of data

Bias factor A

Bias B

Diffusion Tubes Mean: μgm^{-3}

Mean CV (Precision): μgm^{-3}

Automatic Mean: μgm^{-3}

Data Capture for periods used:

Adjusted Tubes Mean: μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA

Bias calculated using 0 periods of data

Bias factor A

Bias B

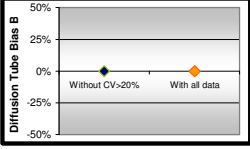
Diffusion Tubes Mean: μgm^{-3}

Mean CV (Precision): μgm^{-3}

Automatic Mean: μgm^{-3}

Data Capture for periods used:

Adjusted Tubes Mean: μgm^{-3}



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Checking Precision and Accuracy of Triplicate Tubes

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	27/02/2008	02/04/2008	50.0	45.0	51.0	49	3.2	7	8.0			Good	
2	02/04/2008	30/04/2008	52.0	52.0	50.0	51	1.2	2	2.9			Good	
3	30/04/2008	29/05/2008	48.0	52.0	52.0	51	2.3	5	5.7			Good	
4	29/05/2008	02/07/2008	41.0	44.0	43.0	43	1.5	4	3.8			Good	
5	02/07/2008	31/07/2008	39.0	44.0	35.0	39	4.5	11	11.2			Good	
6	31/07/2008	03/09/2008	37.0	41.0	39.0	39	2.0	5	5.0			Good	
7	03/09/2008	01/10/2008	50.0	66.0	56.0	57	8.1	14	20.1			Good	
8	01/10/2008	30/10/2008	50.0	48.0	54.0	51	3.1	6	7.6			Good	
9	30/10/2008	03/12/2008	54.0	53.0	50.0	52	2.1	4	5.2			Good	
10	03/12/2008	07/01/2009	65.0	65.0	67.0	66	1.2	2	2.9			Good	
11													
12													
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: St. Helens Road/Moor Street Junction, Ormskirk	Precision 10 out of 10 periods have a CV smaller than 20% <small>(Check average CV & DC from Accuracy calculations)</small>	Overall survey --> Good precision
--	---	---

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%

Bias calculated using 0 periods of data

Bias factor A

Bias B

Diffusion Tubes Mean: μgm^{-3}

Mean CV (Precision): μgm^{-3}

Automatic Mean: μgm^{-3}

Data Capture for periods used:

Adjusted Tubes Mean: μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA

Bias calculated using 0 periods of data

Bias factor A

Bias B

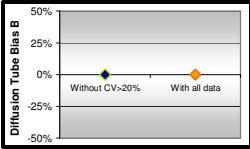
Diffusion Tubes Mean: μgm^{-3}

Mean CV (Precision): μgm^{-3}

Automatic Mean: μgm^{-3}


Data Capture for periods used:

Adjusted Tubes Mean: μgm^{-3}



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Checking Precision and Accuracy of Triplicate Tubes


AEA Energy & Environment
 From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	27/02/2008	02/04/2008	35.0	38.0	37.0	37	1.5	4	3.8			Good	
2	02/04/2008	30/04/2008											
3	30/04/2008	29/05/2008	38.0	43.0	35.0	39	4.0	10	10.0			Good	
4	29/05/2008	02/07/2008	29.0	24.0	30.0	28	3.2	12	8.0			Good	
5	02/07/2008	31/07/2008	26.0	26.0	19.0	24	4.0	17	10.0			Good	
6	31/07/2008	03/09/2008	23.0	22.0	24.0	23	1.0	4	2.5			Good	
7	03/09/2008	01/10/2008	37.0	43.0	56.0	45	9.7	21	24.1			Poor Precision	
8	01/10/2008	30/10/2008	32.0	35.0	31.0	33	2.1	6	5.2			Good	
9	30/10/2008	03/12/2008	37.0	36.0	38.0	37	1.0	3	2.5			Good	
10	03/12/2008	07/01/2009	51.0	50.0		51	0.7	1	6.4			Good	
11													
12													
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: 19b St. Helens Road. Ormskirk

Accuracy (with 95% confidence interval)
 without periods with CV larger than 20%
 Bias calculated using 0 periods of data
 Bias factor A
 Bias B

Diffusion Tubes Mean: μgm^{-3}
 Mean CV (Precision):
 Automatic Mean: μgm^{-3}
 Data Capture for periods used:
 Adjusted Tubes Mean: μgm^{-3}

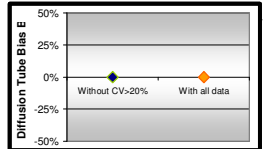
Precision 8 out of 9 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
 WITH ALL DATA
 Bias calculated using 0 periods of data
 Bias factor A
 Bias B

Diffusion Tubes Mean: μgm^{-3}
 Mean CV (Precision):
 Automatic Mean: μgm^{-3}
 Data Capture for periods used:
 Adjusted Tubes Mean: μgm^{-3}


Overall survey --> **Good precision**

(Check average CV & DC from Accuracy calculations)



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Checking Precision and Accuracy of Triplicate Tubes


AEA Energy & Environment
 From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	03/09/2008	01/10/2008	45.0	48.0	40.0	44	4.0	9	10.0			Good	
2	01/10/2008	30/10/2008	38.0	36.0	38.0	37	1.2	3	2.9			Good	
3	30/10/2008	03/12/2008	46.0	43.0	41.0	43	2.5	6	6.3			Good	
4	03/12/2008	07/01/2009	48.0	54.0	44.0	49	5.0	10	12.5			Good	
5													
6													
7													
8													
9													
10													
11													
12													
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID: Beaconsfield Court, Park Road, Ormskirk

Accuracy (with 95% confidence interval)
 without periods with CV larger than 20%
 Bias calculated using 0 periods of data
 Bias factor A
 Bias B

Diffusion Tubes Mean: μgm^{-3}
 Mean CV (Precision):
 Automatic Mean: μgm^{-3}
 Data Capture for periods used:
 Adjusted Tubes Mean: μgm^{-3}

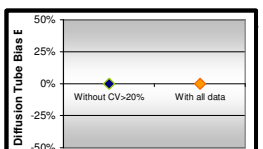
Precision 4 out of 4 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
 WITH ALL DATA
 Bias calculated using 0 periods of data
 Bias factor A
 Bias B

Diffusion Tubes Mean: μgm^{-3}
 Mean CV (Precision):
 Automatic Mean: μgm^{-3}
 Data Capture for periods used:
 Adjusted Tubes Mean: μgm^{-3}

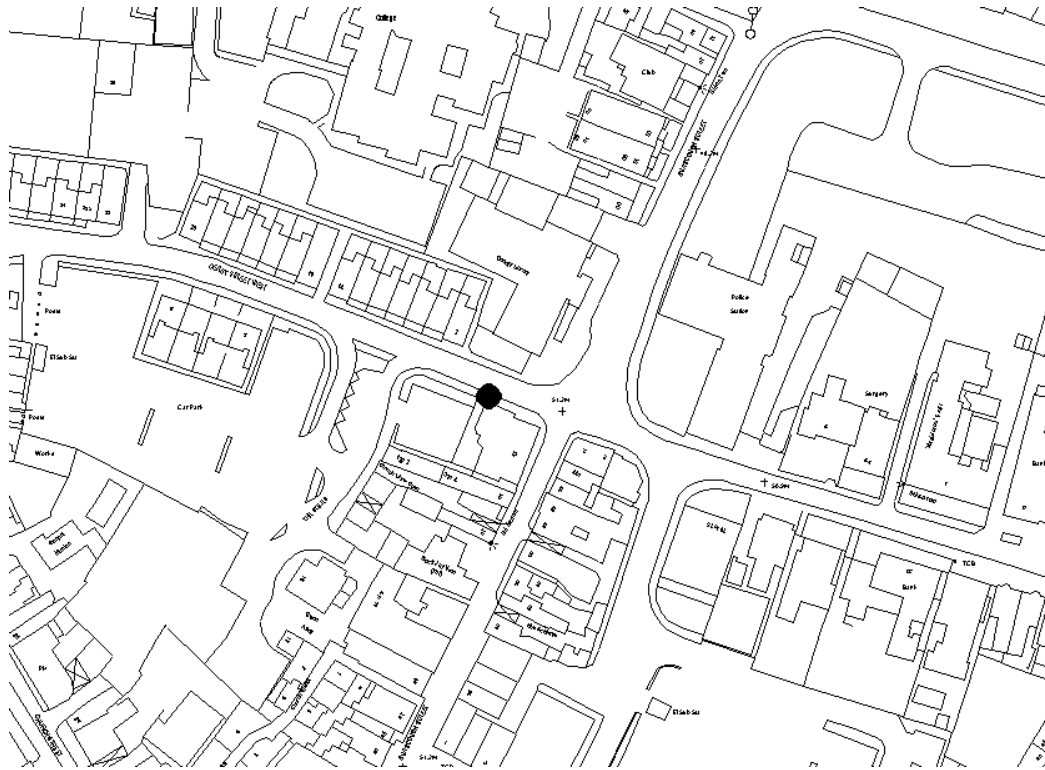
Overall survey --> **Good precision**

(Check average CV & DC from Accuracy calculations)



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Appendix C: Maps Highlighting Tube Locations

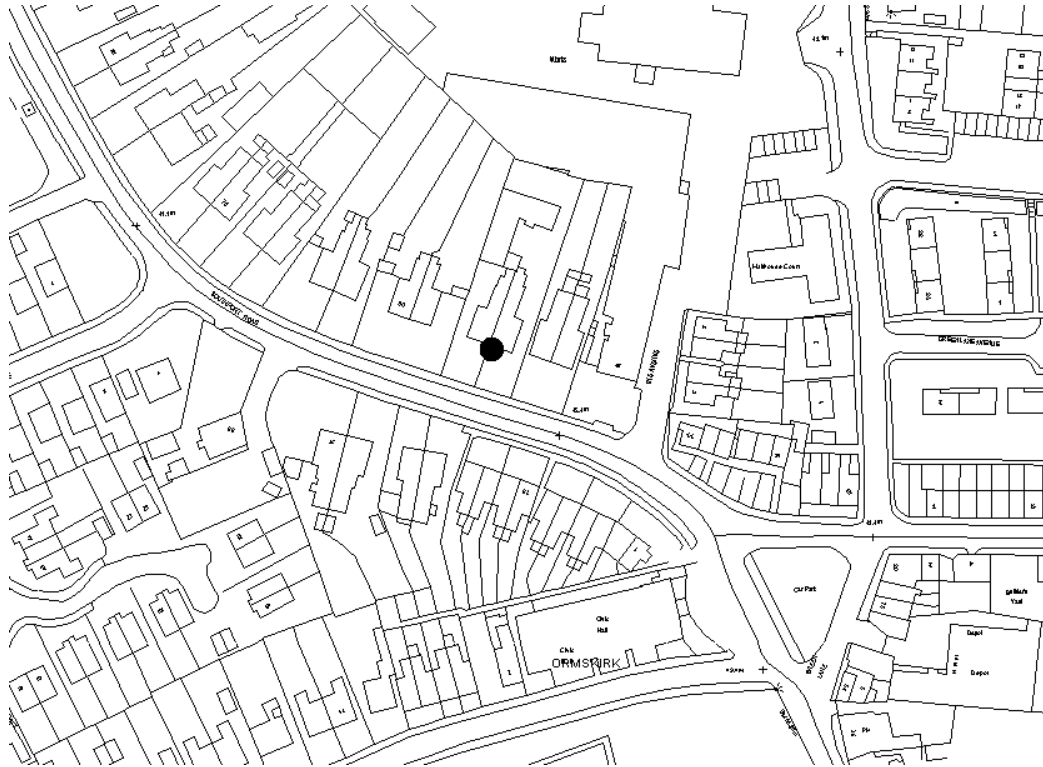


Map 1
Burscough Street

This site is located on a road sign at a height of approx. 2m and 0.5m from the kerbside of Burscough Street/ Derby Street West, which is part of the one-way system of Ormskirk town centre bringing traffic into and out of Ormskirk from the western areas of the District.

The site was originally part of the national network and has been kept at this location to monitor long-term Nitrogen Dioxide levels.

West Lancashire District Council - England



Map 2
54 Southport Road

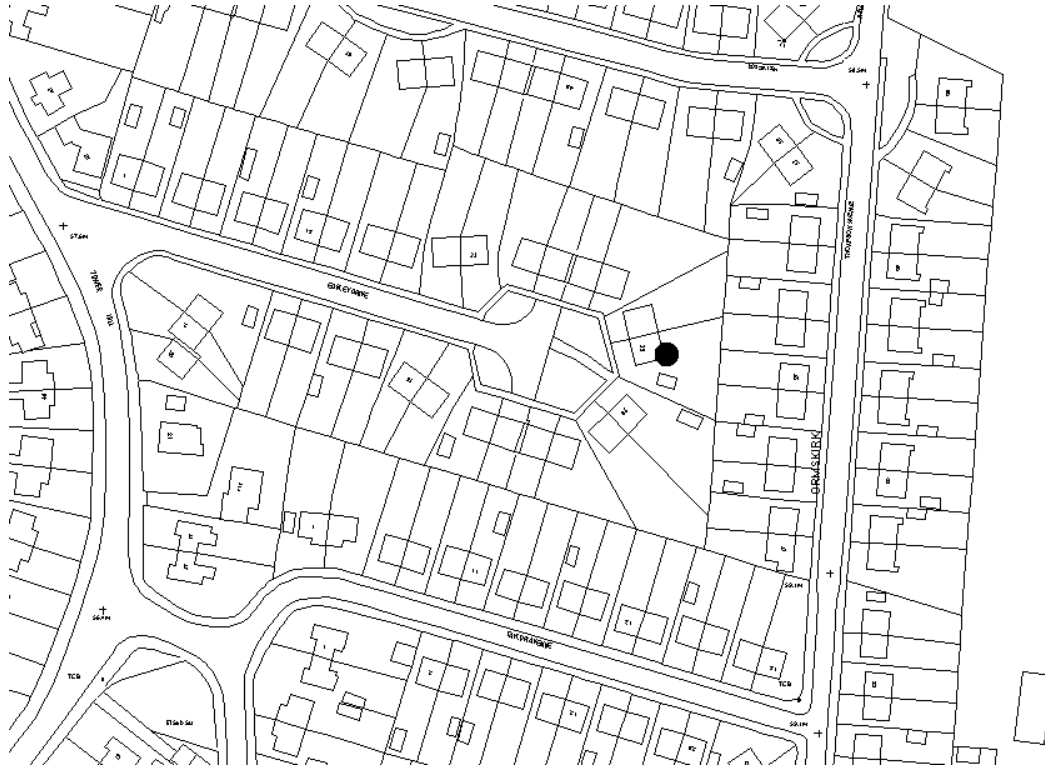
This site was originally part of the national network monitoring. The tube is located on the fascia of the property at a distance of 13m from the Kerbside of Southport Road, at a height of 2m. Southport Road is a two-way system taking traffic into and out of Ormskirk to the areas of Southport, Burscough and Liverpool. Southport Road is a canyon type road, but the properties are well set back from the road. Monitoring at this location ceased in August 2008, annual average results have been consistently below the objective value since monitoring began.



**Map 3
Ashcroft Avenue**

This site was originally part of the National Network monitoring programme as a background site. The tube is located on the fascia of the property at a distance of 75m from Burscough Road, at a height of 2m. Burscough Road takes traffic into and out of Ormskirk to the Northern areas of the District. The site was taken out of use in October 2006.

West Lancashire District Council - England



Map 4
Edgely Drive

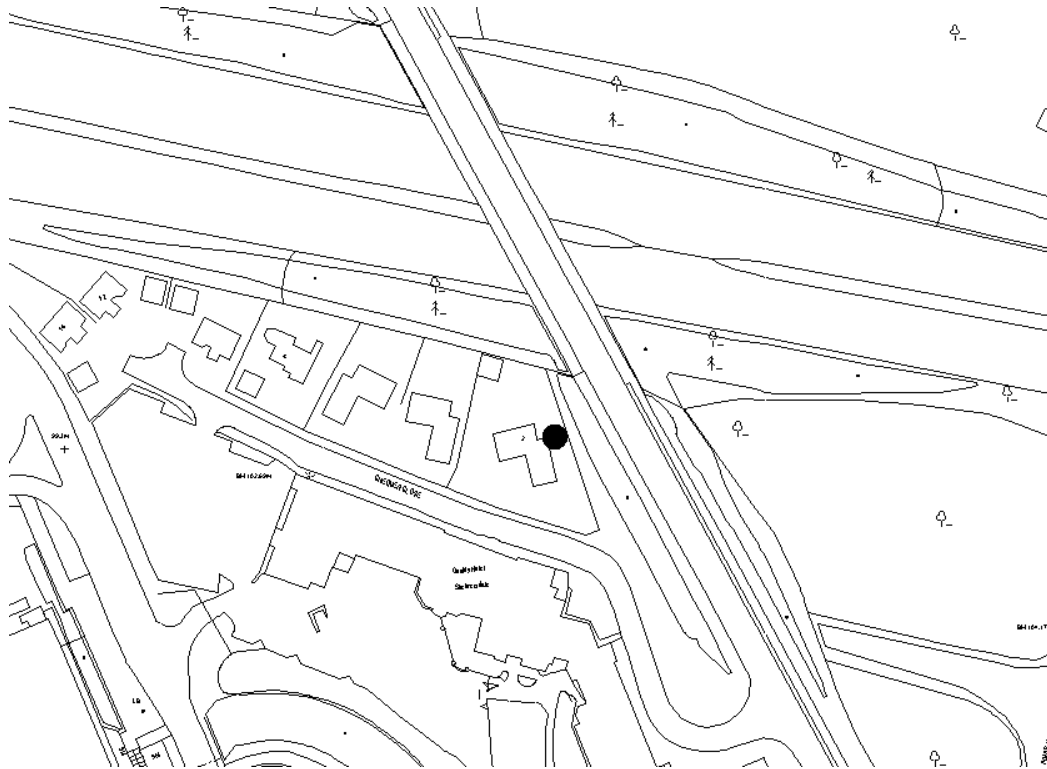
This site was originally part of the National Network monitoring programme as a background site. The tube is located on the fascia of the property at a distance of 127m from Tower Hill Road. Tower Hill Road leads on to Wigan Road and takes traffic into and out of Ormskirk to all areas. The site was taken out of use in April 2006.



Map 5
59 Moor Street

This site is located on Moor Street, Ormskirk which takes traffic into and out of Ormskirk from Skelmersdale and other areas.
The tube is located on Road traffic sign, 1m from the kerbside and 1.5m from the nearest property at a height of 2m.
The site was used to provide information on Nitrogen Dioxide levels in the Moor Street area and was taken out of use in March 2008 to relocate to a better position for the detailed assessment.

West Lancashire District Council - England



Map 6
Chequer Close

This site was chosen to provide information on Nitrogen Dioxide levels for property in the proximity of a Motorway.
The tube was located on the facade of the property, 33m from the edge of the M58 Motorway at a height of 2m.
The site was taken out of use in Sept. 2008.



Map 7
Halsall Lane

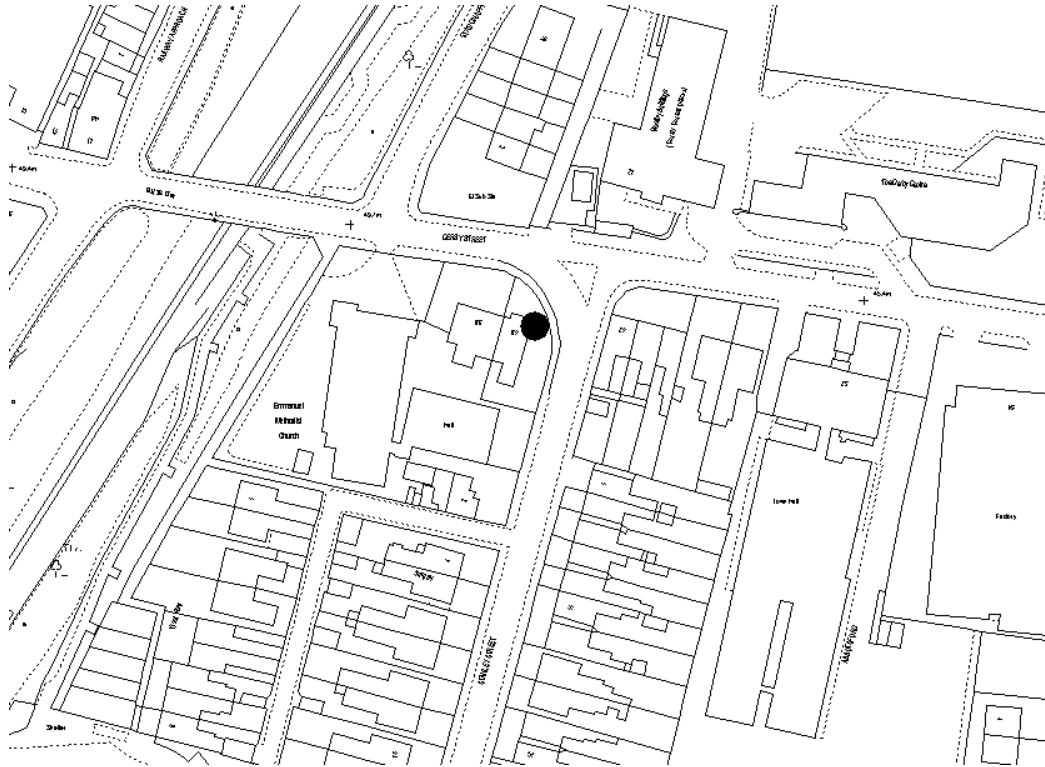
The Halsall Lane site was chosen to provide information on Nitrogen Dioxide levels at the busy Junction of Southport Road and County Road, Ormskirk. This junction takes traffic into and out of Ormskirk from all directions.

The tube was located at Site 1 until December 2007 when it was moved to Site 2 in January 2008 due to access difficulties at Site 1

At Site 1 the tube was located on the fascia of the property, 5m from the Kerbside of County Road at a height of 2.5m

At Site 2 the tube was located on the fascia of the property, 3.5m from the Kerbside of County Road, at a height of 2m.

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Map 8
40 Stanley Street

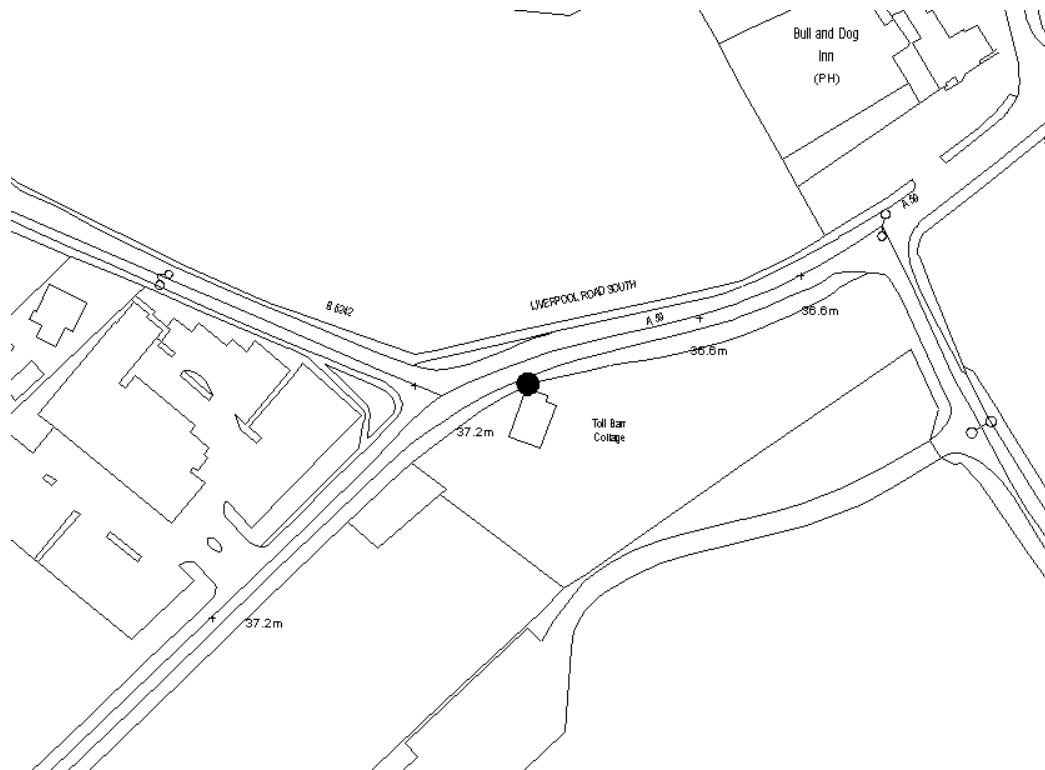
This site was chosen to further monitor the Stanley Street and Derby Street junction which takes traffic from the west and east into the one way system leading to Ormskirk town centre. The tube was located on the fascia of the property, 4.5 m from the kerbside of Stanley Street at a height of 2m. The site was taken out of use in March 2008 and relocated to 41 Stanley Street as part of the detailed assessment monitoring.



Map 9
3 Wigan Road

This site was chosen as part of the monitoring to assess the Moor Street area. Wigan Road takes traffic into and out of Ormskirk and has standing traffic at busy times. The tube is located on the facade of the property 5m from the Kerbside of Wigan Road, at a height of 2m. The site was taken out of use in March 2008 and relocated as part of the detailed assessment monitoring.

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Map 10
Liverpool Road South, Burscough

This site was chosen to assess the A59 road leading out of Ormskirk towards Burscough at its junction with the road leading to Burscough Industrial Estate.
The tube is located on a road sign, 1.5m from the nearest property and 1m from the Kerbside of the A59, at a height of 2m.

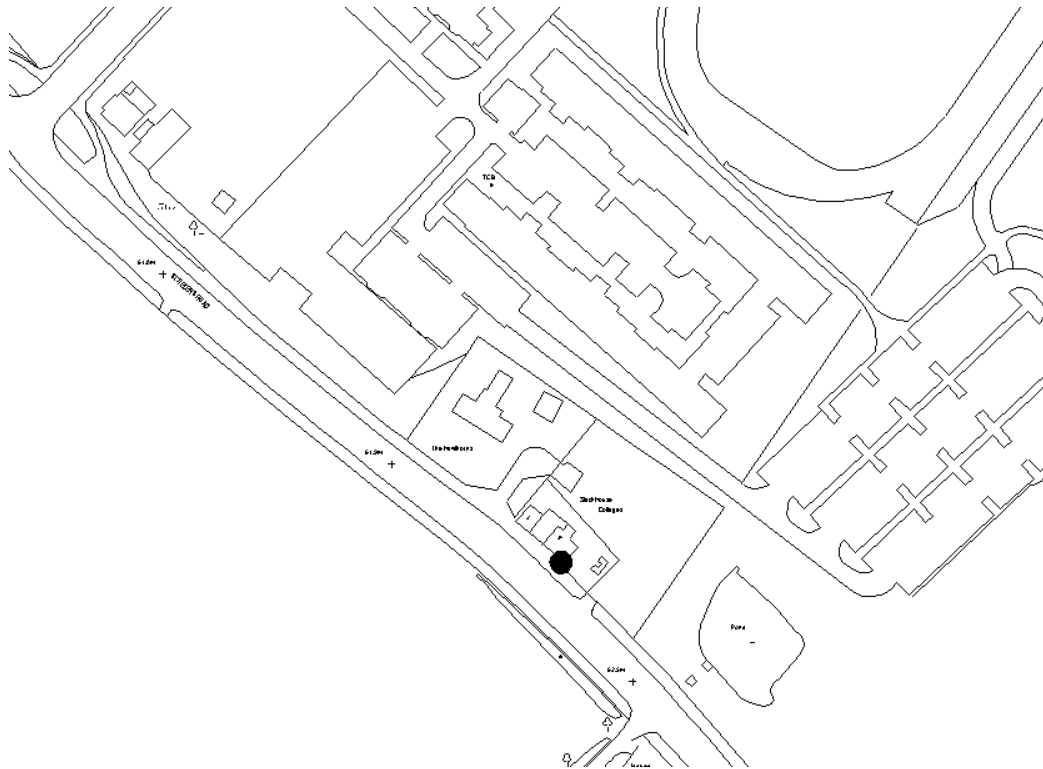
West Lancashire District Council - England



Map 11
49 Wigan Road

This site is located on Wigan Road, Ormskirk which takes traffic into and out of Ormskirk from Skelmersdale and other areas.
The tube is located on the fascia of the property, 2m from the kerbside and at a height of 2m.

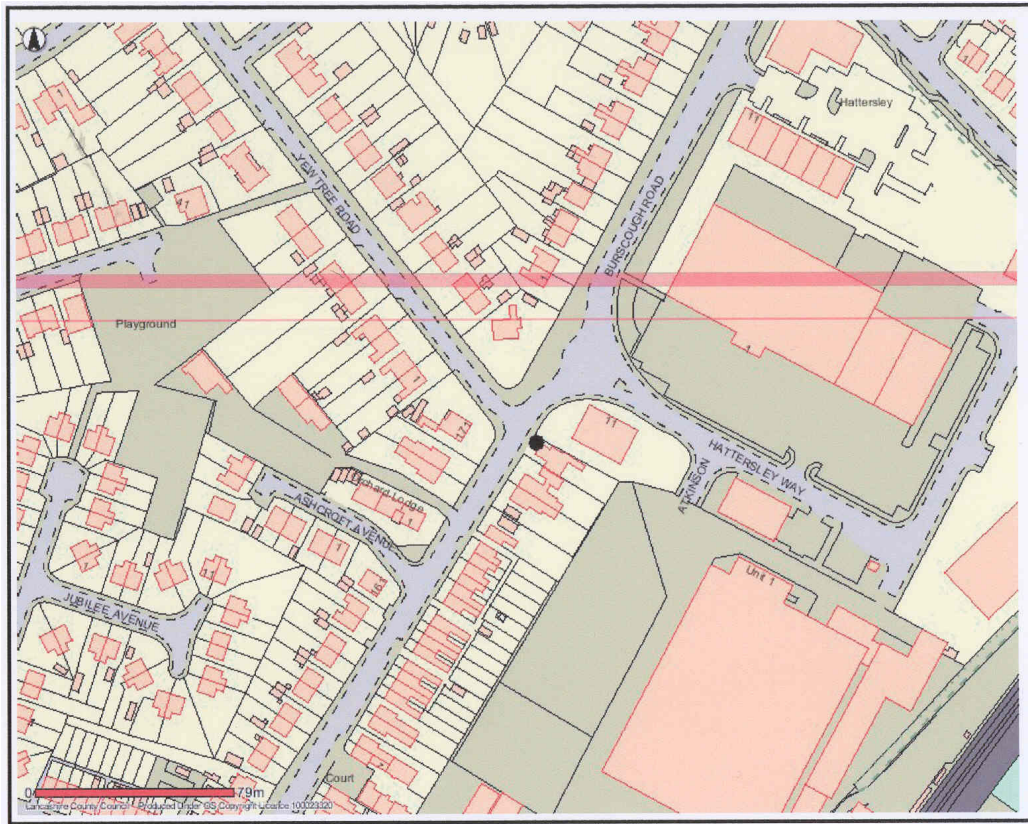
West Lancashire District Council - England



Map 12
Slack House Cottages

This site was chosen to monitor the Nitrogen Dioxide levels from a change in traffic flows from the recent development at edge Hill College, Ormskirk. The site is located on St Helens Road and takes traffic into and out of Ormskirk from the M58, The Rainford Bypass and Bickerstaffe. Monitoring began in September 2008 and is expected to continue to collect sufficient data to assess the site.

The tube is located on the fascia of the property 4.5m from the kerbside of St Helens Road and at a height of 2m.



Map 13
Burscough Road

This site was chosen to monitor the Nitrogen Dioxide levels from a change in traffic flows from the recent retail development in Burscough Road, Ormskirk. The site is located at the end of Burscough Street, which takes traffic into and out of Ormskirk from the Burscough, Tarleton and Preston areas. The tube is located on the fascia of the property 7m from the Kerbside of Burscough Street and at a height of 2m. Monitoring is expected to continue until sufficient data is collected to assess the site.

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Map 14
14 Wigan Road

The site is located on the façade of a domestic property, at a height of approximately 2m and 5m from the kerbside of Wigan Road, this is approximately 39m from the traffic lighted junction of Wigan Road and Stanley Street. Wigan Road is a busy road taking traffic into and out of Ormskirk to the areas of Westhead and Skelmersdale, and traffic often backs up at busy times of the day.

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Map 16
41 Stanley Street

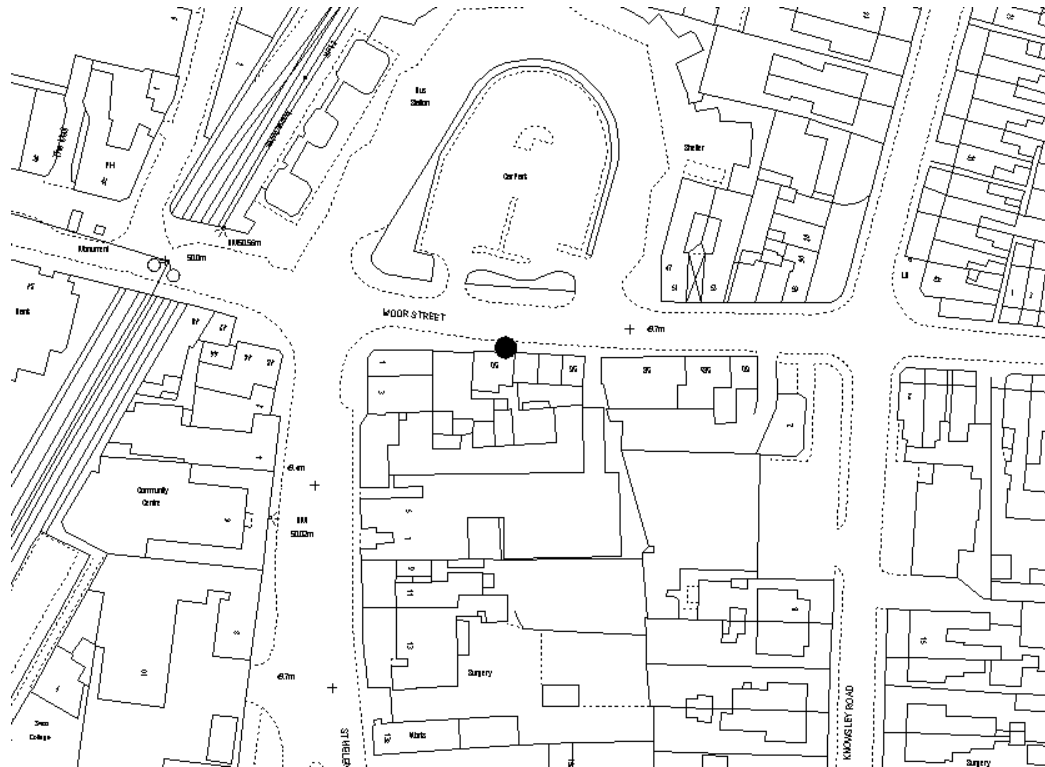
The site is located on the façade of a domestic property, at a height of approximately 2m and 6m from the kerbside of Stanley Street, 18m from the traffic lighted junction of Stanley Street and Wigan road. Stanley Street is a one-way road that is part of the town centre road system, and often has standing traffic during peak hours.



Map17
55 Moor Street

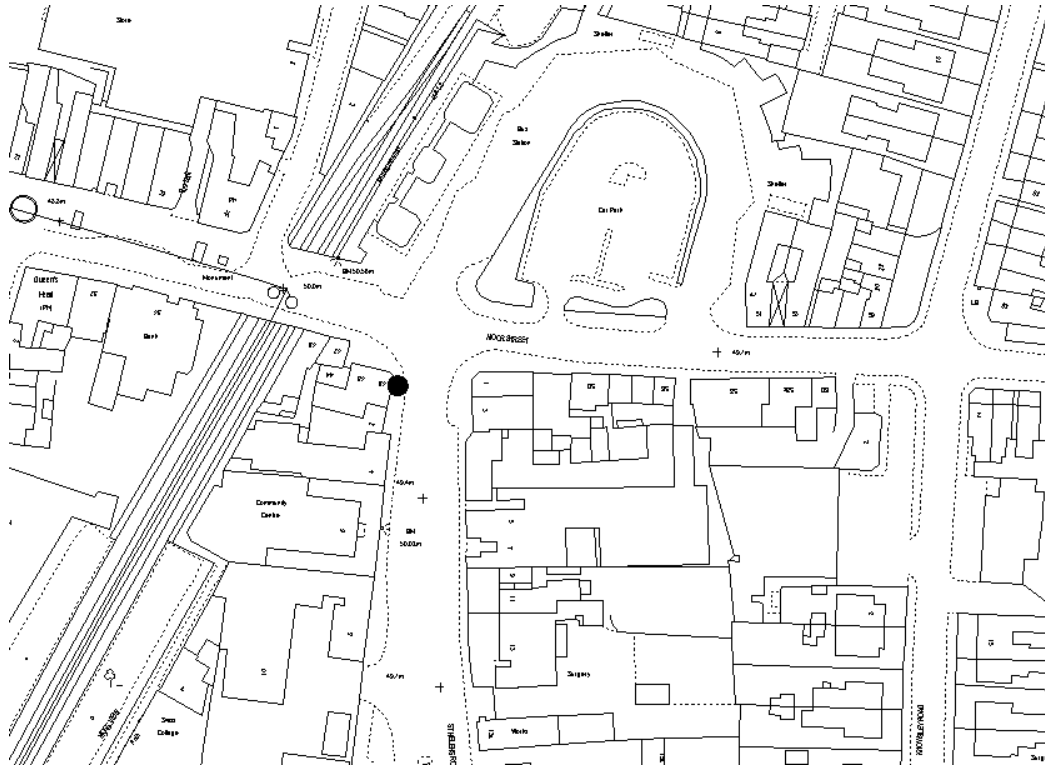
The site is located on the façade of a domestic property, at a height of approximately 3m and 2m from the kerbside of Moor Street. Moor Street takes the westbound traffic going into and through the town centre from Stanley Street, Wigan Road and St. Helens Road. Moor Street also takes the eastbound traffic leaving Ormskirk and heading for Skelmersdale and other areas. This site is set back from the traffic light junction, opposite the car park and bus depot.

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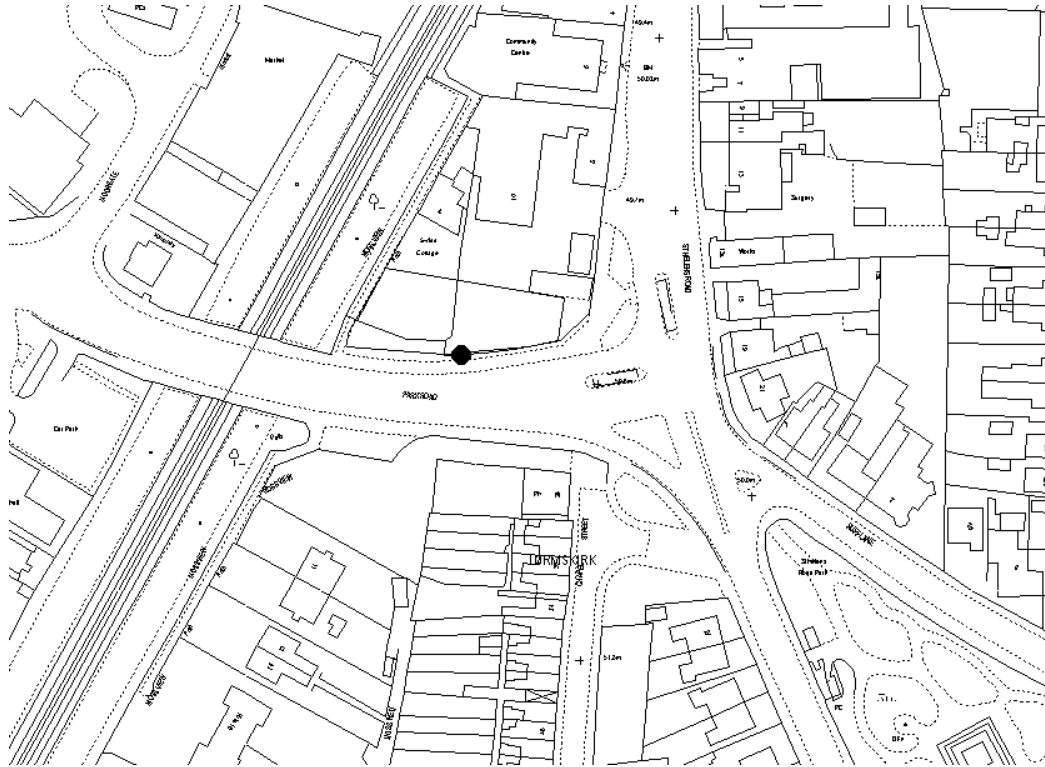
Map 18
50 Moor Street

The site is located on the façade of a domestic property, at a height of approximately 2m and 2m from the kerbside of Moor Street. This site is on the other side of Moor Street in respect of the above site and is the original site identified in the 2007 monitoring results, which lead to the detailed assessment. This site is at a traffic light junction, opposite the car park and bus depot.



Map 19
Junction of St Helens Road and Moor Street

This site is located on a road sign approximately 0.1 m from the façade of the nearest commercial building, at a height of 1.8m and 2m from the kerbside of St Helens Road. There are no domestic properties in this immediate vicinity, however the site was chosen because it was felt necessary to obtain vital Nitrogen Dioxide levels at this road Junction to complete the overall spatial nature of the detailed assessment area. This site is at a traffic light junction.



Map 21
Beaconsfield Court

The site is on the façade of a domestic property, at a height of approximately 2m and 4m from the kerbside of Park Road. Similar to the 19b St Helens Road site but this site follows the eastbound traffic through the town centre. Traffic is slow at this location but does not tend to build up to the same extent as the above site.

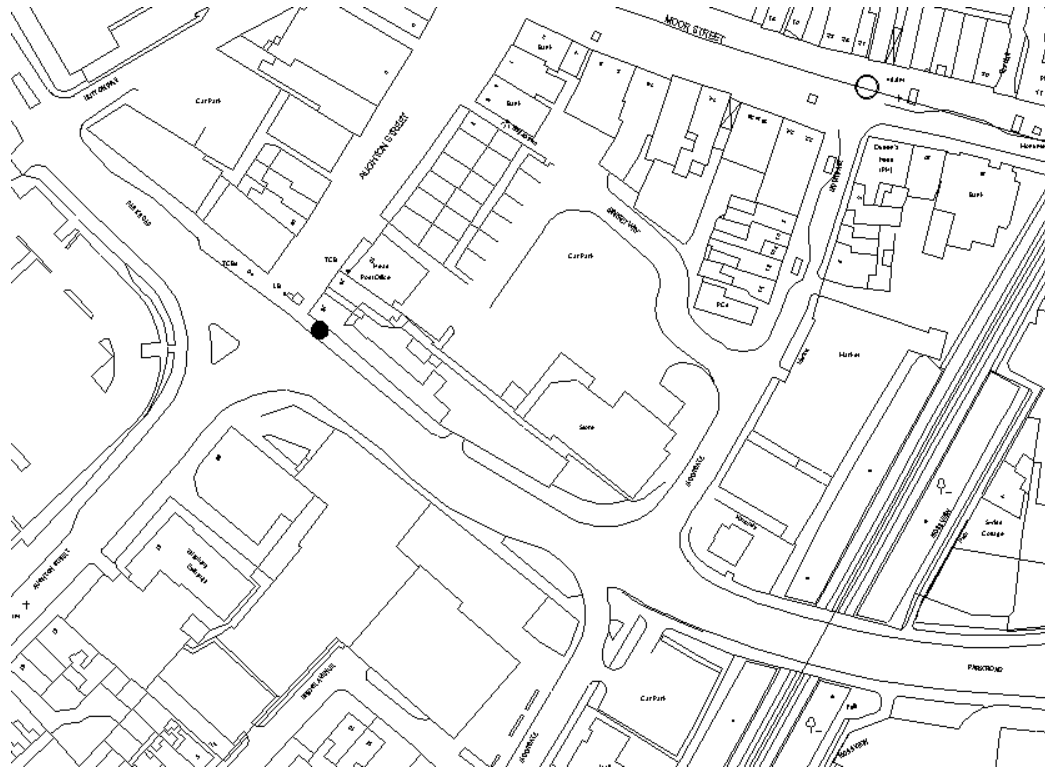
West Lancashire District Council - England



Map 22
16 St. Helens Road

The site is on the façade of a domestic property, at a height of approximately 2m and 6m from the kerbside of St Helens Road. This road takes the traffic in and out of the town centre from Edge Hill College, Skelmersdale, the M58 and the Rainford bypass. Traffic coming in to the town centre can become standing at this location during peak hours

West Lancashire District Council - England



Map 24
Junction of Park Road and Aughton Street

The site is on the façade of a building housing a number of privately owned flats, at a height of approximately 2m and 3m from the kerbside of the junction of Park Road and Aughton Street. This is a busy, traffic lighted junction in the town centre with traffic into and out of Ormskirk heading towards Liverpool, Southport and Skelmersdale.

Appendix D: 2006 NO₂ Single Tube Results

	Burscough Street	54 Southport Road	Ashcroft Avenue	Edgely Drive	59 Moor Street	Chequer Close	Halsall Lane	40 Stanley Street	3 Wigan Road
Jan 2006	43.5	44.4	29.6	24.4	47.0	38.3	45.2	37.4	46.1
Feb 2006	30.5	39.2	18.3	15.7	43.5	37.4	34.8	27.8	37.4
Mar 2006	32.2	36.5	20.0	15.7	35.7	42.6	37.4	33.9	40.0

At this point the Edgely Drive site that has been providing background information levels since 1998 was taken out of operation due to its consistently low levels of Nitrogen Dioxide. A new site at Liverpool Road South, Burscough was established to provide data on the busy A59 trunk Road.

	Burscough Street	54 Southport Road	Ashcroft Avenue	Liverpool Road South	59 Moor Street	Chequer Close	Halsall Lane	40 Stanley Street	3 Wigan Road
Apr 2006	23.5	29.6	13.1	33.1	37.4	23.5	27.0	27.8	missing
May 2006	27.8	27.0	10.4	35.7	44.4	32.2	missing	missing	26.1
Jun 2006	27.8	27.0	10.4	35.7	44.4	32.2	missing	missing	26.1
Jul 2006	28.7	29.6	12.2	36.5	30.5	33.1	missing	16.5	27.0
Aug 2006	28.7	14.8	14.8	34.8	34.8	17.4	39.2	16.5	29.6
Sep 2006	28.7	14.8	14.8	34.8	34.8	17.4	39.5	16.5	29.6

At this point the Ashcroft Avenue site that had been providing background information levels since 1998 was taken out of operation due to the consistently low levels of Nitrogen Dioxide. A new site at 49 Wigan Road was established to provide additional data on the busy Ormskirk town traffic system.

	Burscough Street	54 Southport Road	49 Wigan Road	Liverpool Road South	59 Moor Street	Chequer Close	Halsall Lane	40 Stanley Street	3 Wigan Road
Oct 2006	13.1	20.9	31.3	30.5	60.9	25.2	42.6	28.7	22.6
Nov 2006	30.5	25.2	27.0	29.6	58.3	27.0	36.5	27.0	40.0
Dec 2006	23.5	23.5	25.2	26.1	42.6	47.0	35.7	26.1	missing

All results have been adjusted for tube bias using the Defra guidance bias adjustment factor for 2006 of 0.87 as taken from the DEFRA Review and Assessment Website.

Appendix E: 2007 NO₂ Single Tube Results

	Burscough Street	54 Southport Road	59 Moor Street	Chequer Close	Halsall Lane	40 Stanley Street	3 Wigan Road	Liverpool Road South	49 Wigan Road
Jan 2007	22.9	16.7	37.8	29.0	30.8	28.2	33.4	26.4	26.4
Feb 2007	38.7	33.4	58.1	29.9	33.4	33.4	33.4	34.3	37.0
Mar 2007	21.1	29.9	40.5	31.7	38.7	27.3	32.6	31.7	27.3
Apr 2007	27.3	17.6	54.6	33.4	43.1	24.6	21.1	32.6	33.4
May 2007	20.2	17.6	37.8	26.4	37.8	22.0	29.0	27.3	31.7
Jun 2007	14.1	17.6	50.2	26.4	33.4	20.2	35.1	29.9	27.3
Jul 2007	15.8	11.1	37.8	29.0	21.1	22.0	29.0	27.3	71.3
Aug 2007	12.3	missing	23.8	17.6	15.8	15.8	22.9	15.0	missing
Sep 2007	24.6	25.5	37.0	23.8	28.2	16.7	26.4	24.6	17.6
Oct 2007	31.7	28.2	46.6	37.0	35.2	missing	35.2	32.6	31.7
Nov 2007	36.1	25.5	48.4	35.2	39.6	25.5	41.4	38.7	38.7
Dec 2007	39.6	40.5	55.4	33.4	40.5	37.8	41.4	40.5	36.1

All results have been adjusted for tube bias using Defra guidance bias adjustment for 2007 of 0.88 as taken from the DEFRA Review and Assessment Website.

Appendix F: 2008 NO₂ Single Tube Results

	Burscough Street	54 Southport Road	59 Moor Street	Chequer Close	Halsall Lane	40 Stanley Street	3 Wigan Road	Liverpool Road South	49 Wigan Road
Jan 2008	23.2	19.1	53.1	21.6	29.9	27.4	29.9	26.6	23.2
Feb 2008	46.5	37.4	75.5	34.9	46.5	39.0	44.8	44.8	40.7
Mar 2008	25.7	20.8		27.4	34.9			35.7	33.2
Apr 2008	29.9	19.9		30.7	38.2			33.2	29.1
May 2008	39.0	25.7		21.6	34.0			29.1	39.8
Jun 2008	23.2	15.8		26.6	35.7			34.9	27.4
Jul 2008	25.7	17.4		19.9	28.2			31.5	24.9
Aug 2008	19.9	14.9		19.9	missing			29.9	21.6

At this point it was decided that the locations at 54 Southport Road and Chequer Close had provided sufficient data to characterise the locations and the tubes were moved to monitor the two locations outlined in the 2008 Progress report, namely Slack House Cottages (Edge Hill development) and Burscough Road (Burscough Road Development).

The sites at 59 Moor Street, 40 Stanley Road and 3 Wigan Road were also moved to locations more suitable to gather data for the detailed assessment outlined in the 2008 Progress report.

	Burscough Street	Slack House Cottages		Burscough Road	Halsall Lane			Liverpool Road South	49 Wigan Road
Sep 2008	35.7	34.0		missing	43.2			41.5	38.2
Oct 2008	19.1	24.9		18.3	35.7			34.9	38.2
Nov 2008	29.9	32.4		30.7	45.7			39.0	38.2
Dec 2008	42.3	40.7		29.9	53.1			39.0	40.7

The results have been adjusted for tube bias using a factor of 0.83, as taken from the DEFRA Review and Assessment Website.

Appendix G: 2008 NO₂ Triplicate Tube Results

	14 Wigan Road	31 Knowsley Road	41 Stanley Street	55 Moor Street	50 Moor Street	Junction of St Helens Rd/ Moor Street	19b St Helens Road	Beaconsfield Court	16 St Helens Road	75 Aughton Street	Junction of Park Road/Aughton Street
Mar 2008	29.9	22.4	34.9	35.7	49.8	40.7	30.7		23.2	22.4	17.4
Apr 2008	36.5	24.1	43.2	37.4	52.3	42.3	missing		25.7	25.7	35.7
May 2008	32.4	23.2	53.1	37.4	61.4	42.3	32.4		20.8	33.2	48.1
Jun 2008	32.4	19.1	34.0	missing	45.7	35.7	23.2		19.1	19.1	25.7
Jul 2008	29.1	16.6	35.7	27.4	42.3	32.4	19.9		17.4	17.4	26.6
Aug 2008	27.4	19.1	30.7	24.1	43.2	32.4	19.1		18.3	19.1	24.9
Sep 2008	39.8	30.7	50.6	42.3	65.6	47.3	37.4	36.5	33.3	33.2	40.7
Oct 2008	32.4	19.1	31.5	35.7	46.5	42.3	27.4	30.7	24.1	24.9	34.0
Nov 2008	35.7	25.7	32.4	missing	49.8	43.2	30.7	35.7	27.4	29.9	44.0
Dec 2008	44.0	34.9	49.0	missing	70.6	54.8	42.3	40.7	35.7	40.7	54.0

The results in this table are the average of the triplicate tubes obtained using Version 03 "Checking precision and Accuracy of Triplicate Tubes" taken from the Defra website. They have also been corrected for tube bias using a factor of 0.83 taken from the 2008 tube bias adjustment obtained from the Defra website.