



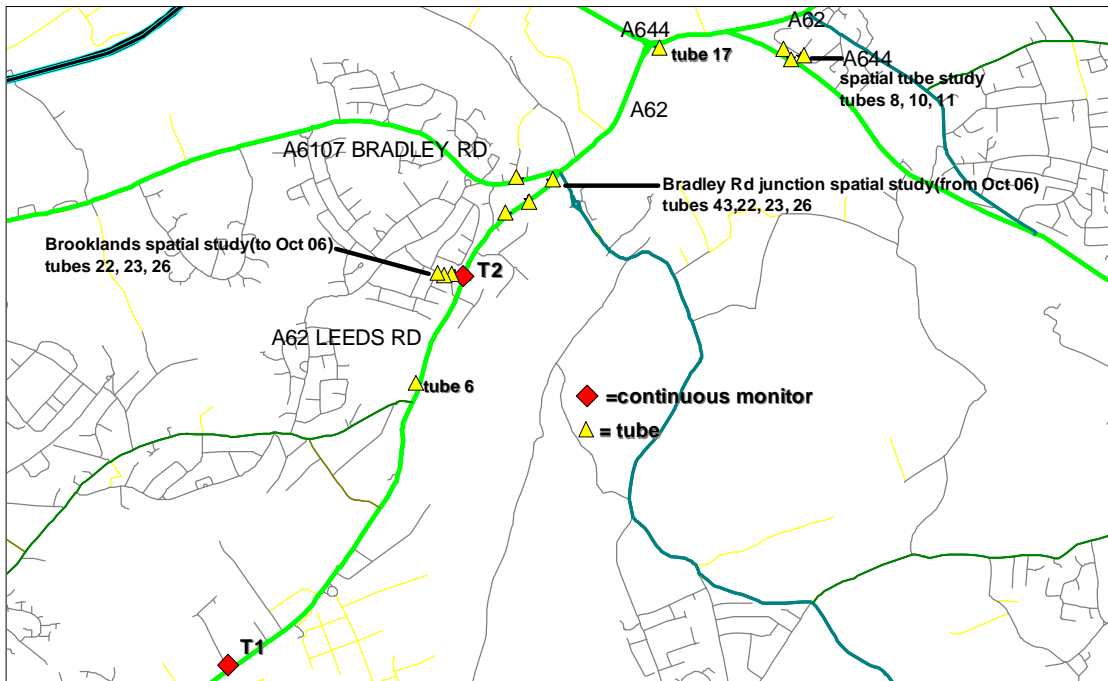
**LEEDS RD/BRADLEY RD,
HUDDERSFIELD**

**DETAILED ASSESSMENT OF AIR
QUALITY**

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AREA OF STUDY



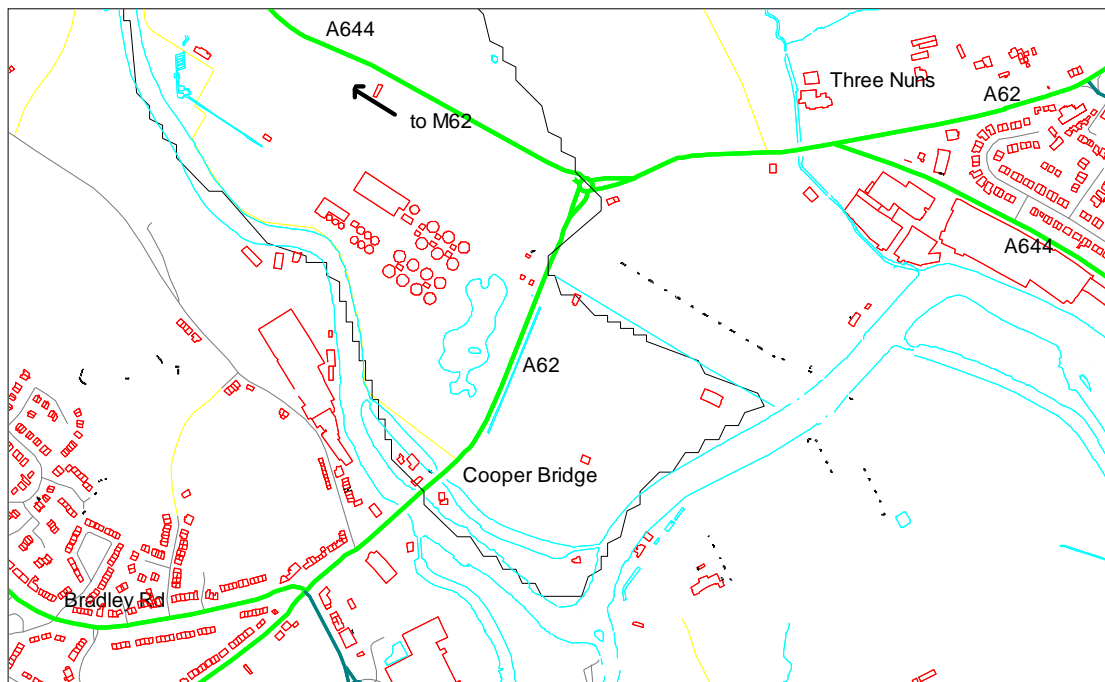
The width of the map is 4.75km

CHARACTERISTICS OF THE AREA OF STUDY

This section of the A62 is part of the main Dewsbury – Huddersfield corridor which follows the valley of the River Colne. The A644 northbound links the A62 to junction 25 of the M62.

The section of road where the A644 and A62 combine is known locally as “Cooper Bridge” and the “Three Nuns”

The road from the eastern side of the Three Nuns to the west of the Leeds Rd/Bradley Rd junction is congested at morning and evening peak hour traffic. In the daytime congestion can also occur.



Parts of the corridor have two storey terraced housing which faces on to the road, although none of the terrace facades stretch unbroken for long distances and few sections of the road have terraces on each side of the road facing each other.

The corridor used to serve industrial and commercial sites along its length. In the last 10 years several of the larger companies in the corridor have closed or considerably reduced their operations. Many sites have redeveloped as show rooms or business parks. There remain three sites with stack emissions of any significance:

The Yorkshire Water sewage sludge incinerator

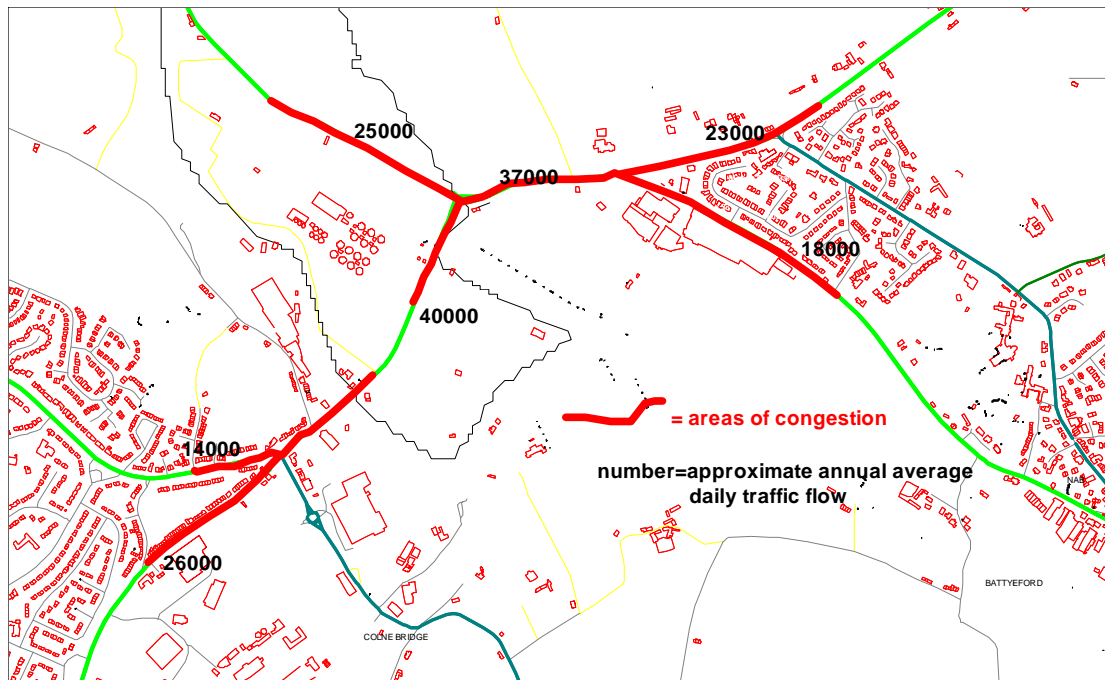
The combined heat and power plant at the Syngenta/Avecia site

The stacks at the John Cotton Nunbrook Mill site

The particular area of concern is the junction of the A6107 Bradley Rd with the A62 Leeds Rd. There are also two isolated households at Rose Cottage near the Three Nuns which form part of this Detailed Assessment.

ROAD TRAFFIC AND CONGESTION

The map below identifies those areas where there is always congestion at the a.m. and p.m. peak hour traffic flows and where congestion can occur throughout the day depending on local circumstances.



The figures shown for annual average daily traffic flows are compiled from various traffic counts and surveys and are approximate for the purposes of this Detailed Assessment. They should not be used for the purposes of any site specific traffic assessment. (The information used in deriving these figures comes from comprehensive traffic counts dating back to 1996)

The actual length of each area of congestion can vary dramatically and the area shown represents those that can be present throughout the day.

The level of traffic on the A62 between Trailer 1 at Old Fieldhouse Lane and Brooklands and then the Bradley Rd junction is essentially the same.

Average speed data during peak hour flows

(These figures are derived from data collected from vehicles fitted with GPS and using a programme called CJAMS.)

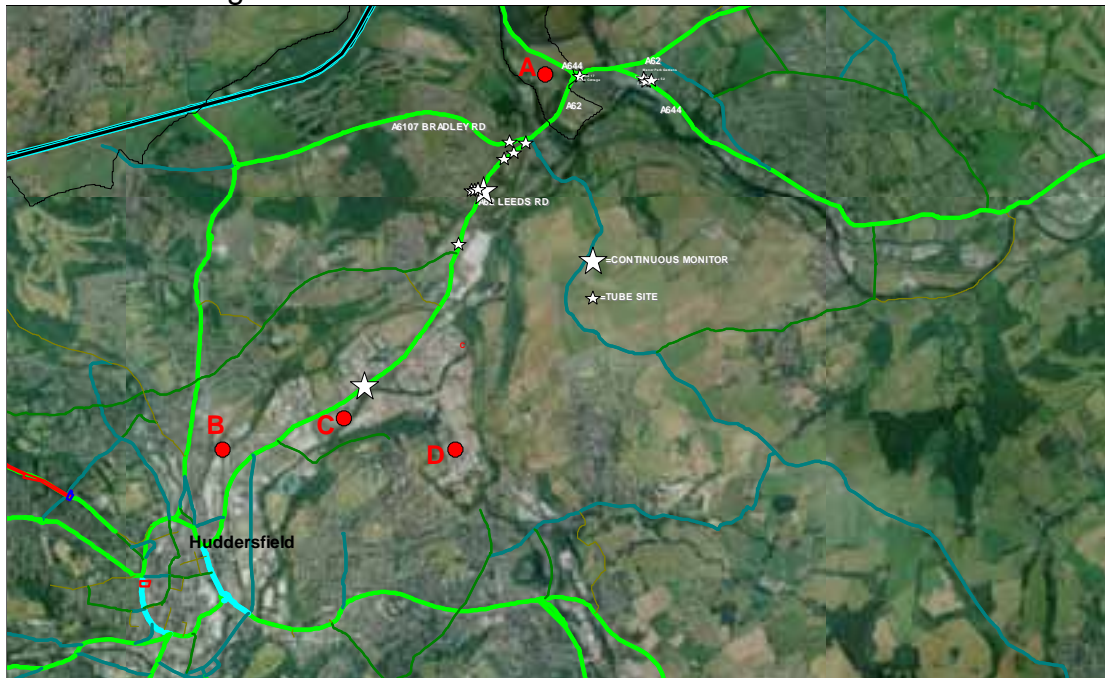
A62 eastbound to A6107 junction – 8mph (reverse direction – 22mph)

A6107 southbound to A62 junction – 7mph (reverse direction – 20mph)

Westbound link of A62/A644 adjacent to Rose Cottage – estimated at 10mph

INDUSTRIAL STACK EMISSIONS

The main point sources of NO_x are shown below. They are shown in relation to the monitoring stations in the same area.



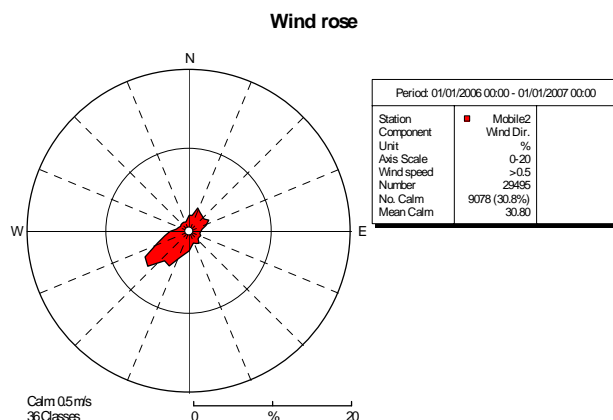
A: Yorkshire Water Sewage Sludge plant
(Part A installation <100t NO_x per year)

B: SITA municipal waste to energy plant
(Part A installation <100t NO_x per year)

C: Peacock Works iron foundry
(Part B process – cupola batch iron melting, not significant)

D: HMC combined heat and energy plant
(Part A installation <100t NO_x per year)

Below is shown the wind rose for 2006 from the continuous monitoring station at Brooklands (Trailer 1 is not used because of interference from adjacent housing in its wind direction measurements). NO₂ contributions affecting relevant receptors from these stack emissions would be measured by the monitoring network

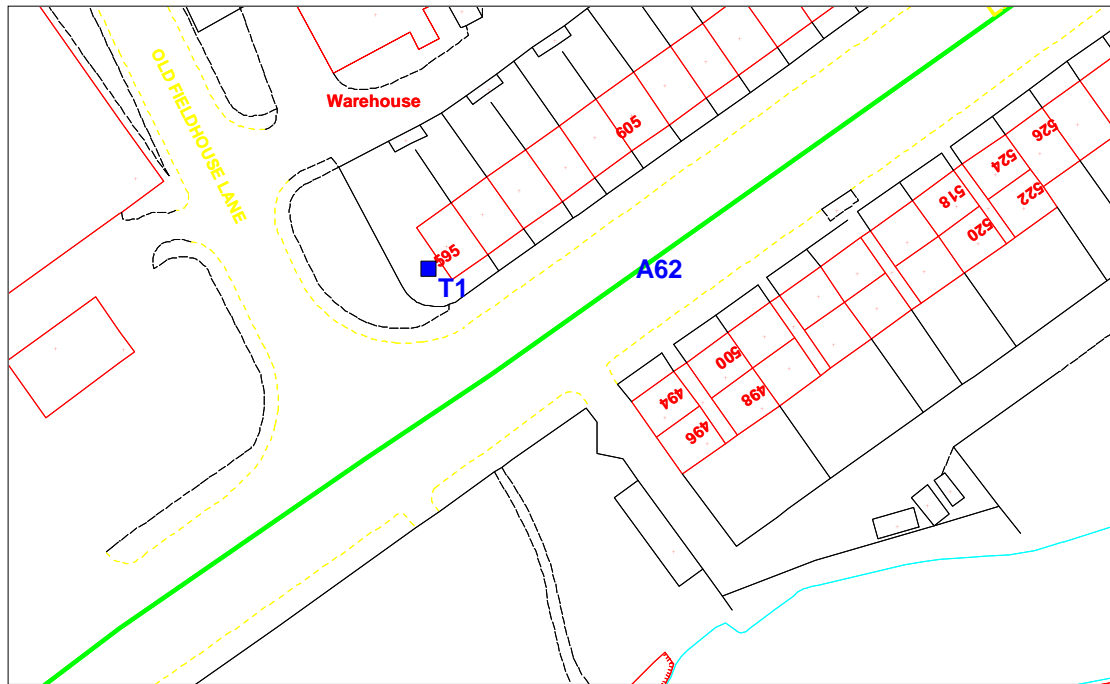


MONITORING RESULTS

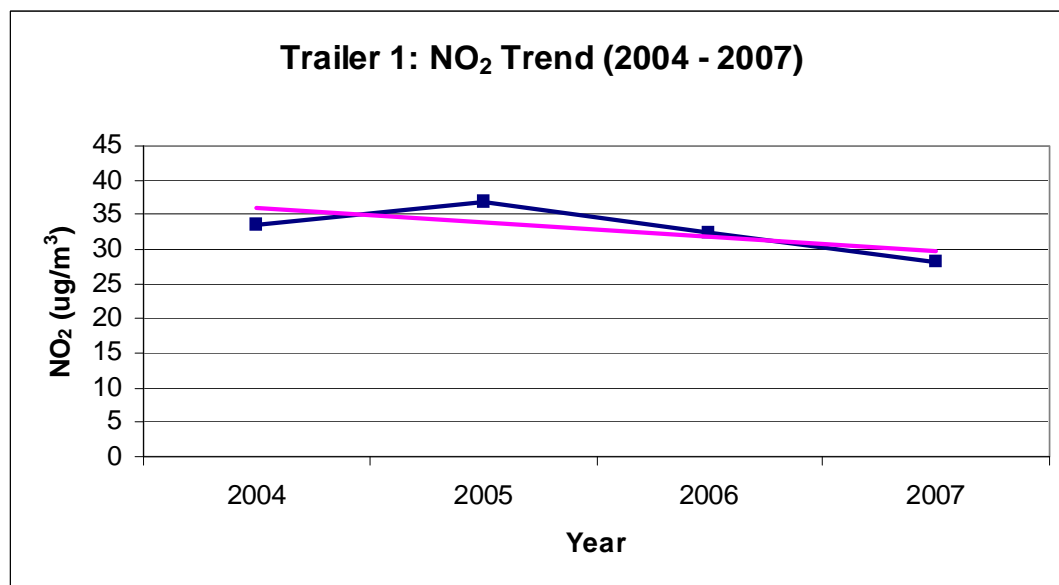
Trailer 1

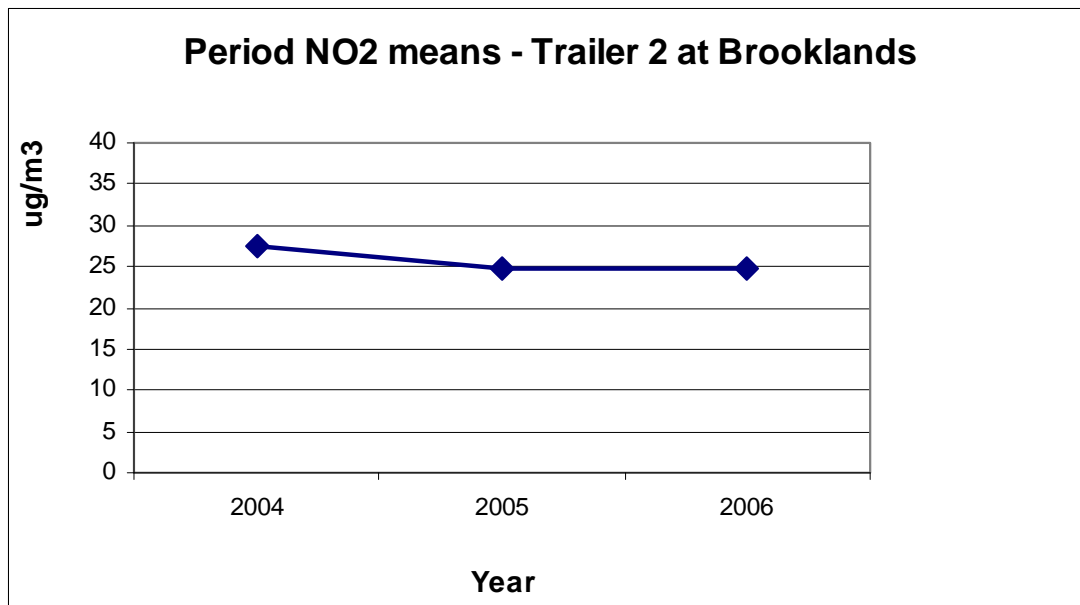
At junction of Old Fieldhouse Lane and Leeds Rd Huddersfield
(NOx, PM10, O3, SO2, CO)(Roadside, U2, 8.5m from kerbside)
Represents relevant local exposure at the adjacent dwelling.

The position of Trailer 1 is shown in the map below



The last 4 years annual average NO₂ concentrations are shown in the graph below:





Trailer 2 was sited at Brooklands from 27/7/04 to 24/10/06

NO2 Tube results and NO2 spatial studies

Brooklands-Leeds Rd spatial study



The tubes in this study were put in place for the whole of 2005 and until October 2006. The average for 2006 therefore is a ten month average. The results for this set of tubes are:

Year	Tube 22	Tube 23	Tube 26
2005	24 μgm^{-3}	28 μgm^{-3}	27 μgm^{-3}
2006	30 μgm^{-3}	27 μgm^{-3}	24 μgm^{-3}

The continuous monitoring results from Trailer 2 for both 2005 and 2006 were 24.75 μgm^{-3} and 24.71 μgm^{-3} respectively.

Leeds Rd – Bradley Rd spatial study



The tubes in this study were put in place in October 2006 and therefore an annual average NO₂ reading is available for 2007. The results for this set of tubes are:

Tube No	2007 average $\mu\text{g}\text{m}^{-3}$	Distance of tube from house facade
43	73	3.5m
22	44	12m
23	53	4m
26	53	4m

Guidance is given by the University of West England Air Quality Resources centre (UWE) website (Frequently Asked Questions) to estimate the drop off in NO₂ levels from roadside monitoring locations to building façades. UWE's guidance indicates that the following factors based on distance adjustments can be applied to kerbside results to estimate roadside or building façade values:

2 to 5 metres = 0.95 **5 - 10 metres = 0.90** **10 - 20 metres = 0.75**
 This would give the following adjusted annual mean values.

Tube No	adjusted average $\mu\text{g}\text{m}^{-3}$	house
43	69	1259 Leeds Rd
22	33	44 Bradley Rd
23	50	1197 Leeds Rd
26	50	1227 Leeds Rd

However houses 28 -32 Bradley Rd which are closer to the traffic lights than 44 Bradley Rd have facades which are 4m from kerbside and therefore applying the same adjustment these houses would be exposed to annual average NO₂ levels of 41.8 $\mu\text{g}\text{m}^{-3}$

Manor Park Spatial study and Rose Cottage



The tubes in this study were put in place in October 2006 and therefore an annual average NO₂ reading is available for 2007. The results for this set of tubes are:

Tube No	2007 average $\mu\text{g}\text{m}^{-3}$	Distance of tube from roadside
17	48	6m
52	26	32m
53	28	17m
54	62	0m

Conclusions

This focus of this detailed assessment is on the Leeds Rd/Bradley Rd junction and Rose Cottage. The air monitoring resources have been deployed to give a good indication of where the NO₂ annual average objective will be exceeded where there are relevant receptors. The summary of the monitoring studies' conclusions are presented here:

Trailer 1 Old Fieldhouse Lane/ Leeds Rd

This part of Leeds Rd has the same traffic levels and composition as Leeds Rd at the Bradley Rd/Leeds Rd junction and the equipment is alongside an end terrace house. It is also located at the access road to the main Huddersfield bus depot, and in the early morning it has queuing idling buses waiting to access Leeds Rd. Whilst the average traffic speed may be slow it is usually free flowing depending on the junction traffic lights. The monitoring results indicate that the NO₂ annual average objective will not be exceeded.

Trailer 2 Brooklands/Old Fieldhouse Lane

The same observations about traffic levels and composition apply as for Trailer 1. The monitoring results indicate that the NO₂ annual average objective will not be exceeded.

Brooklands Spatial Study

The results for 2006 indicate the expected drop-off in NO₂ levels as distance increases from kerbside. The 2005 results are atypical, and are thought to be influenced by construction traffic which took place in that year, particularly the site office which was located near tube 23

Manor Park Gardens Spatial Study

The results of the 2007 study indicate high kerbside readings with a rapid drop off at the residential houses. The adjacent John Cottons industrial site has been the subject of a longstanding investigation relating to nuisance from its emissions. The tube study indicates that NO_x emissions from the plant do not significantly impact on the housing estate and that these receptors will not be subject to exceedence of the NO₂ annual average air quality objective.

The Rose Cottage tube results indicate that the two households here will be subject to exceedence of the NO₂ annual average air quality objective.

Leeds Rd/Bradley Rd Spatial Study

These results indicate that exceedence of the NO₂ annual average air quality objective will be experienced by houses along a length of Leeds Rd running to the traffic lights and along a shorter length of Bradley Rd running to the traffic lights at the junction.

The continuous monitoring results indicate that where traffic is relatively free flowing, even at low speeds, the NO₂ levels do not exceed the NO₂ annual average air quality objective. The tube results indicate that where there are traffic queues throughout the day, rather than just at peak hours, then this will

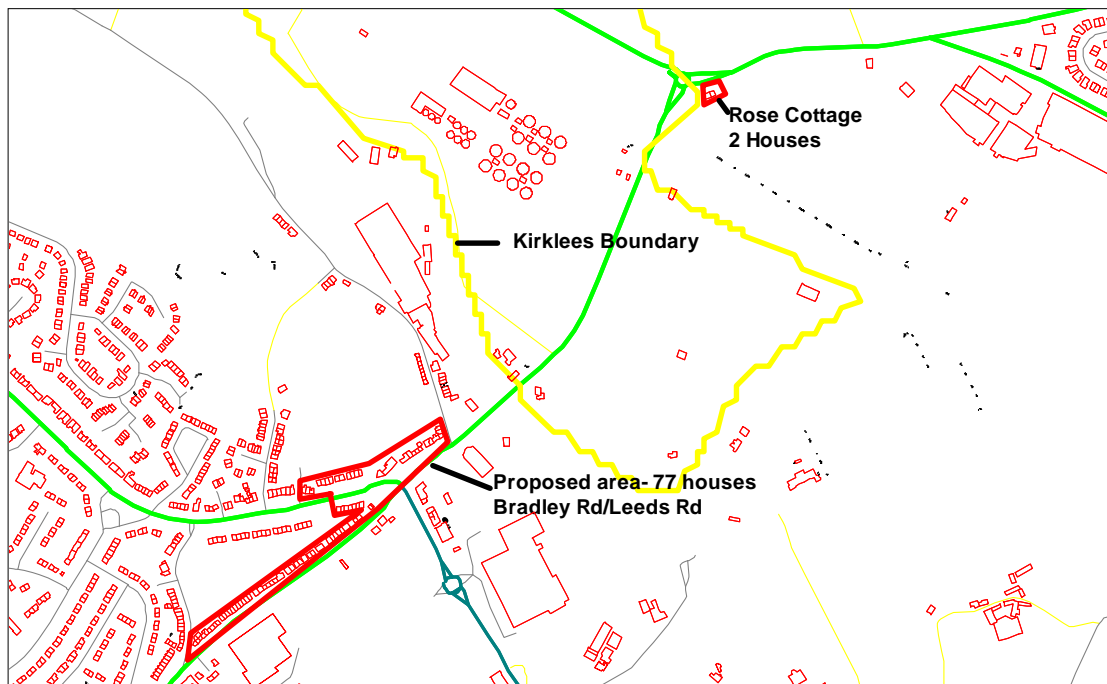
result in exceedence of the NO2 annual average air quality objective. Therefore the key factor in determining the extent of the exceedences in this locality is the traffic queue length throughout the day. Observation indicates that at times other than peak hours the queue along Bradley Rd does not extend beyond Lower Quarry Rd, and along Leeds Rd it does not go beyond Oak Rd. At peak times queue length can extend much further.

Proposed Air Quality Management Area: Leeds Rd Bradley Rd junction and Rose Cottage.

On the basis of the monitoring results it is proposed to declare an Air Quality Management Area that includes the following properties:

- 1171 to 1285 Leeds Rd (odds)
- 1-3 (odds) & 2-32 (evens) Bradley Rd
- and 1 & 2 Rose Cottage,
- totalling 79 properties

This area would have the following geographical boundary:



APPENDIX I

MONITORING: EQUIPMENT METHODS AND QUALITY CONTROL

Automatic continuous monitoring.

The equipment in all stations is supplied by Horiba and specifications are:

NO_x/NO₂ ambient monitor APNA-360 type approved chemoluminescent analyzer

The equipment is maintained under a service contract with the equipment supplier Horiba and is operated by council officers trained by Horiba in all aspects of the monitoring process including routine site operations, field calibration and data ratification.

Automatic calibration takes place every 72 hours.

The quality control/quality assurance procedures have been subject to a comprehensive audit as by external auditors as part of this Council's EMAS accreditation and ISO9001 quality assurance accreditation.

Data is downloaded twice daily from each station via modem connection to the central computer at Environmental Services Headquarters
All data is filtered and ratified prior to acceptance in the ratified database.
Trend graphs of automatic calibration are maintained and manual calibrations are undertaken if the trend graphs indicate any drift in calibration.

In normal circumstances each station is visited at least once per week for on site equipment checks. All site visits, manual calibrations and maintenance operations are recorded.

The gases used for manual and automatic calibration checks are supplied by Air Liquide Ltd and are traceable to European Accreditation DIN EN ISO 900. The tolerance of the NO₂ and NO in air mixes is plus or minus 5%.

NO₂ diffusion tubes

The in-house laboratory service of Kirklees Scientific Services produces and analyse their own NO₂ diffusion tubes. This service is also offered to other local authorities.

The laboratory participates in the "WASP" scheme ("Workplace Analysis Scheme for Proficiency") and the labs performance in this scheme is classified as acceptable.

In addition the uncertainties of the NO2 tube measurement method are further characterised by comparing the measurements made by tubes on the mobile stations with measurements made by the continuous analysers for the same periods.

The relationship of these values is shown in the table below:

Year	tube 1	tube 2	tube 3	analyser	Tube bias
2005	31.9	31.3	28.4	37.21	1.22
2006	34.56	40.32	37.44	37.45	0.91
2007	33.33	31.94	33.32	33.7	0.84