1. INTRODUCTION.

Clean air is essential to a good quality of life. Poor air quality can cause or worsen many health problems and is linked to a number of respiratory illnesses and cancers.

Antrim Borough Council's work on air quality is driven by the statutory duty placed on district councils to manage air quality. Over the years the local air quality management process has required a number of technical reports to be prepares and submitted to the Department of the Environment.

The local air quality management (LAQM) system was introduced by the Environment (Northern Ireland) Order 2002 and subsequent Regulations. Under this legislation District councils are required to review the present quality of air and the likely future quality of air and assess whether the nationally prescribed objectives are likely to be achieved.

The Government published the Air Quality Strategy for England, Scotland, Wales and Northern Ireland in 2000. This set objectives for seven pollutants prescribed for district council management and control. The seven pollutants are:

- Carbon Monoxide
- Benzene
- 1,3-Butadiene
- Lead
- Nitrogen Dioxide
- Particulates
- Sulphur Dioxide

LAQM forms a key part of the Government and Devolved Administration's strategies to achieve the air quality objectives.

The timetable for LAQM is set out in the DOE publication LAQM. PGNI(03), Local Air Quality Management Policy Guidance, and district councils are expected to submit progress reports in 2008.

This Progress Report follows on from the Progress Report submitted in 2007 and Updating and Screening Assessment (USA), submitted in 2006 as part of the second round of review and assessment.

Progress Reports should assist district councils with the LAQM process in a number of ways, including:

- Helping to retain a profile for LAQM within the council
- Providing a means for communicating air quality information to the public
- Making the next round of review and assessment easier (due in 2009)
- Providing a timely indication of the need for further measures to improve air quality

The objective of the Progress Report is to provide continuity in the Local Air Quality Management process by reporting any potential changes in air quality that may occur between the three yearly review and assessment of air quality whilst reporting on progress of local air quality management and achieving concentrations below the air quality objectives.

This report takes into account EHS guidance LAQM.PRGNI(04) and Development Control: Planning for Air Quality Guidance published by NSCA, November 2004.

2. SUMMARY OF FINDINGS FROM PREVIOUS REVIEW AND ASSESSMENT WORK.

The cornerstone of the LAQM process is the review and assessment of air quality. This is a statutorily required process whereby local air quality monitoring and modelling results are compared to the national air quality standards and objectives (see Appendix 2). Where objectives are breached or are predicted to be breached, an Air Quality Management Area (AQMA) is declared. An Action Plan must then be produced stating how the district council will drive air quality towards the objective.

The first round of review and assessment which was completed in 2004 concluded that:

1. The risk of the objectives for the following pollutants being exceeded was negligible:

Carbon Monoxide, Benzene, 1,3 butadiene, Lead, Nitrogen Dioxide, PM10

2. As the result of the prevalence of the use of solid fuel for domestic heating, the 15 minute mean objective for sulphur dioxide is likely to be breached in the Greystone and Ballycraigy housing estates.

The first round of the Review and Assessment process resulted in the following measures:

1. The declaration of an AQMA (see Appendix 3)
2. The installation of a continuous real-time sulphur dioxide analyser within the AQMA.

The second round of air quality review and assessment commenced with the USA which was completed in June 2006. This updated the review and assessments previously undertaken for all the pollutants identified in the Air Quality Regulations. The USA concluded that, other than within the Air Quality Management Area declared after the first round of review and assessment, there is no risk of exceeding any of the air quality objectives and that a detailed assessment is not required for the current round of review and assessment.

The following actions were recommended:

1. The production of an action plan for the AQMA setting out the measures to be introduced in pursuit of the air quality objectives.
2. Continued monitoring of the road networks for nitrogen dioxide with passive diffusion tubes.
3. Monitoring with diffusion tubes the vicinity of Belfast International Airport to assess the contribution of air traffic to ambient nitrogen dioxide concentrations.

In 2007 a Progress Report was submitted which concluded that there had not been any significant changes in local circumstances to indicate possible exceedences of the air quality objectives and that the conclusions of the USA were still valid.

3. POLLUTANTS

3.1 Progress on Benzene emissions

Objective: Annual Mean – 3.25µg/m^3 by 2010

Benzene is a known carcinogen which also contributes to ground-level ozone. The main sources of benzene in the UK are petrol vehicle exhausts, petrol refining and fuel distribution from filling stations without vapour recovery systems. Nationally benzene emissions are reducing and a number of national policy measures already in place or planned for future years will continue to reduce emissions.

Since January 2000, EU legislation has reduced the maximum benzene content of petrol to 1%, from a previous upper limit of 5%. The European Auto-Oil programme will further reduce emissions from cars and light-duty vehicles, and emissions from storage and distribution of petrol are controlled by vapour recovery systems.

Antrim Borough Council currently regulates these recovery systems through permits issued under the Pollution Prevention and Control Regulations (NI) 2003. Permits are in force at 10 sites throughout the district. In June 2006 a permit was issued for a new installation at the Junction One complex.

Estimates of annual mean background concentrations for the Antrim Borough Council area, based on I kilometre grid squares, are available on the internet at www.airquality.co.uk. The highest estimated background concentrations for the Antrim area are 0.597 µg/m^3 for 2003 and 0.531µg/m^3 for 2010.

Where background levels are low, exceedences of current and future air quality objectives are only likely to occur where local circumstances have a major impact i.e. industrial processes handling, storing or emitting benzene,

very busy roads in high background areas, petrol stations with large throughputs and major fuel storage depots. There are no existing or planned sites of this nature in the Antrim area.

3.2 Progress on 1,3-Butadiene emissions

Objective: Annual Mean – 2.25µg/m^3 by 2010.

1,3-Butadiene is a suspected human carcinogen. The major source of 1,3-Butadiene nationally is motor vehicle emissions, with other significant sources being industrial processes (such as petrochemical and rubber processes). As with benzene, emissions are continually decreasing. With the main source being vehicle exhausts, the gradual reduction in vehicle emissions due to more environmentally friendly vehicles and cleaner fuels will maintain this trend.

Estimates of annual mean background concentrations for the Antrim Borough Council area, based on I kilometre grid squares, are available on the internet at www.airquality.co.uk. The highest estimated background concentration for the Antrim area is 0.121µg/m^3 for 2003.

Where background levels are low, exceedences of current and future air quality objectives are only likely to occur where local circumstances have a major impact i.e. industrial processes handling, storing or emitting 1.3-Butadiene. There are no existing or planned sites of this nature in the Antrim area.

3.3 Progress on Carbon Monoxide emissions

Objective: Maximum Daily Running 8 Hour Mean – 10mg/m^3 by 2003

Road transport is the main source of carbon monoxide in the UK and the highest outdoor concentrations occur near busy roads. Annual emissions of CO have been falling steadily since the 1970s and are expected to continue to do so.

Estimates of annual mean background concentrations for the Antrim Borough Council area, based on I kilometre grid squares, for the year 2001 are available on the internet at www.airquality.co.uk. Background levels for the Antrim area range from 0.147mg/m^3 to 0.302mg/m^3. Adjusting the maximum concentration for the year 2003, using the methodology set out in Technical Guidance LAQM.TG(03) gives a maximum corrected background level = 0.302 x 0.826 = 0.249mg/m^3.

Technical Guidance LAQM.TG(03) advises that where the 2003 background concentration is below 1mg/m^3 and there are no “very busy” roads or junctions then the maximum 8 hour running mean is very unlikely to be exceeded in this year or in future years. “Very busy” roads are single carriageways with an

AADT >80,000 vehicles and dual carriageways with an AADT > 120,000 vehicles. Within the Antrim Borough Council area there are no roads or junctions that fall into this category and no roads or junctions with the potential to become very busy.

3.4 Progress on Nitrogen Dioxide emissions

Objective: Annual Mean – 40µg/m^3 by 2010.
1 Hour Mean - 200µg/m^3 <18 exceedences per annum by 2005

Nitrogen dioxide (NO_2) and nitric oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NOx). All combustion processes produce NOx emissions, largely in the form of NO, which is then converted to NO_2 mainly as a result of reactions with ozone in the atmosphere. Exposure to high concentrations of nitrogen dioxide is reported to sensitise asthmatics to allergens such as irritant chemicals, house dust mites and pollen.

The principal source of NOx emissions is road transport, which accounted for 49% of total UK emissions in 2000. The contribution of road transport to NOx emissions has declined significantly in recent years as a result of various national policy measures, and further reductions are expected up until 2010 and beyond.

Nationally, a large proportion of the detailed assessments performed by local authorities were due to potential exceedences of the annual mean objective citing road transport as the predominant source.

3.4.1 Monitoring sites for 2007

While real time monitoring does not occur locally, Antrim Borough Council currently monitors nitrogen dioxide at 8 sites around the district using passive diffusion tubes. The diffusion tube are supplied and analysed by Bureau Veritas.

Diffusion tubes represent a simple and cost-effective method of monitoring air quality in an area, to give a good general indication of average pollution concentrations. They are particularly useful for assessment against annual mean objectives.

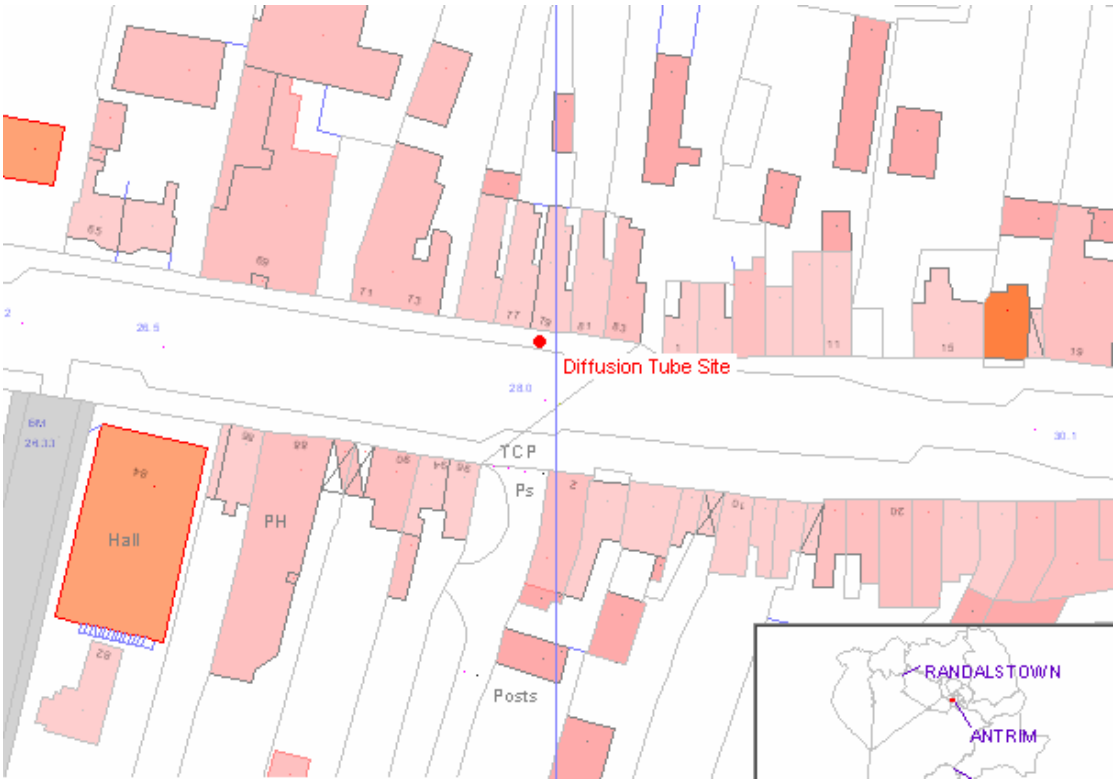
Monitoring sites are chosen to provide data on locations that appear to be representative of likely residential exposure and, where possible, are close to the nearest receptor to the busy road or road junction of interest. The sites are subject to periodic review and where sufficient data has been gathered, some of the diffusion tubes are relocated to new locations.

Results obtained from diffusion tubes need to be corrected for possible over or under reading. Deriving a correction factor by comparing the diffusion tube results with those obtained from a continuous real time analyser can do this.

The Council does not operate a continuous analyser and therefore a co-location study has not been undertaken to determine a specific local bias adjustment factor. However, bias adjustment factors for various labs are available on the review and assessment website and this gives a correction factor of 0.9 for the year 2007. This value has been used in this report. The bias corrected nitrogen dioxide concentration is obtained by multiplying the measured concentration by the correction factor.

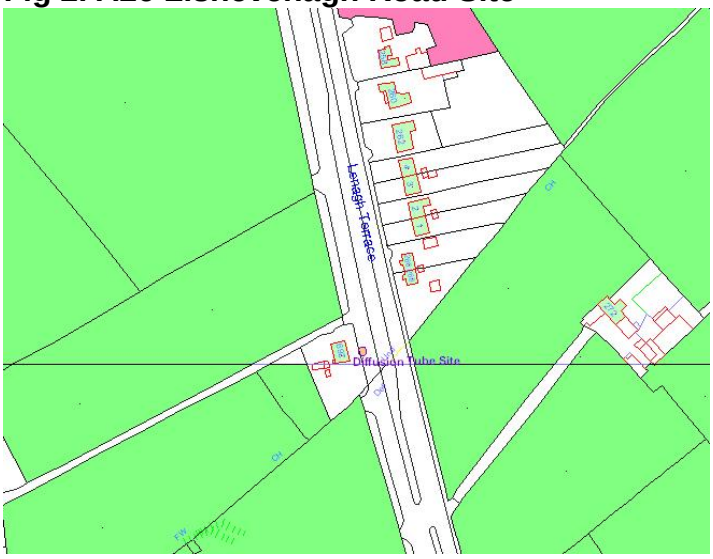
The monitoring sites referred to in this report are shown in the following maps. Details are also shown in Appendix 4. All maps are subject to Ordinance Survey copyright.

Fig 1. Fountain Street Site



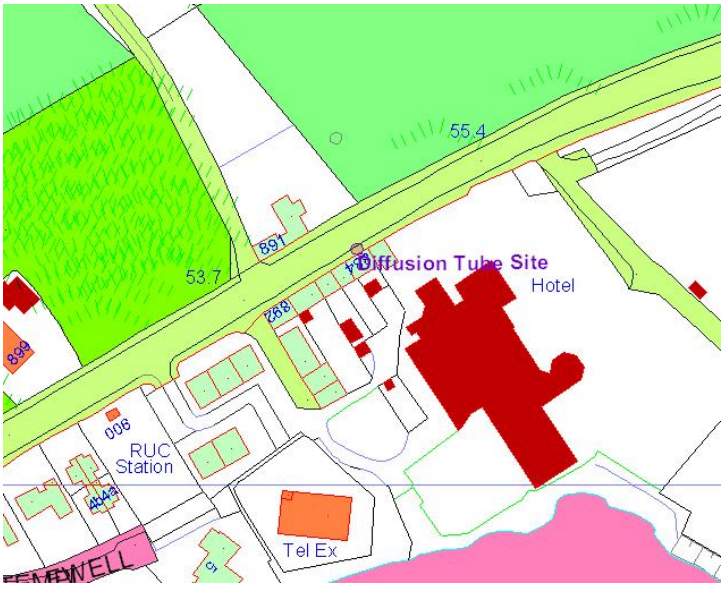
Fountain Street is the main traffic route through Antrim town and has fairly high traffic flows. The site monitors the nearest dwelling to traffic lights.

Fig 2. A26 Lisnevenagh Road Site



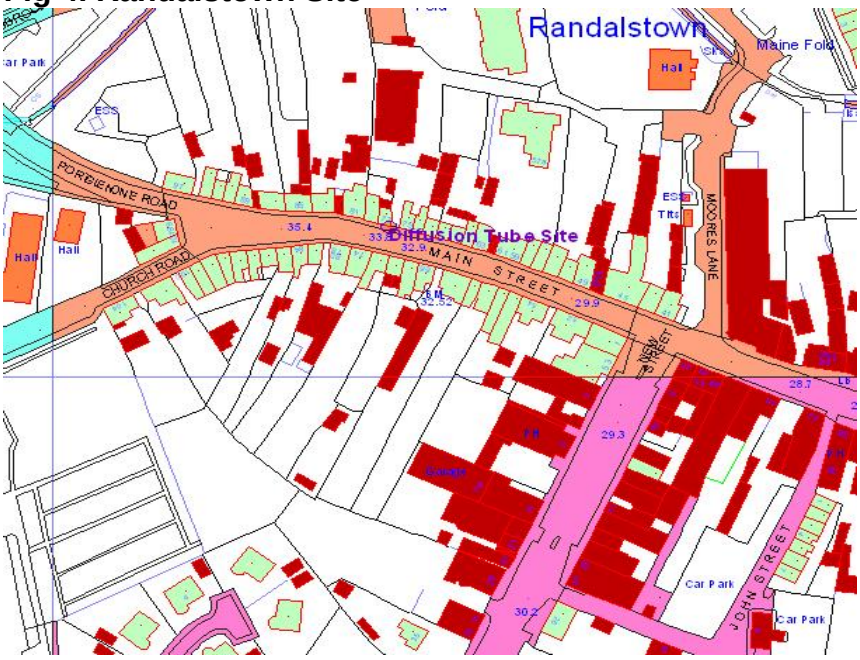
The Lisnevenagh Road is to the North of the Dunsilly roundabout and is a dual carriageway connecting Antrim with Ballymena. This site was set up to monitor concentrations close to the nearest dwelling to this busy road after Design Manual for Roads and Bridges (DMBR) modelling carried out for the Second Stage Review and Assessment predicted an exceedence of the objective at this property. This site is located outside 267 Lisnevenagh Road.

Fig 3. Templepatrick Site



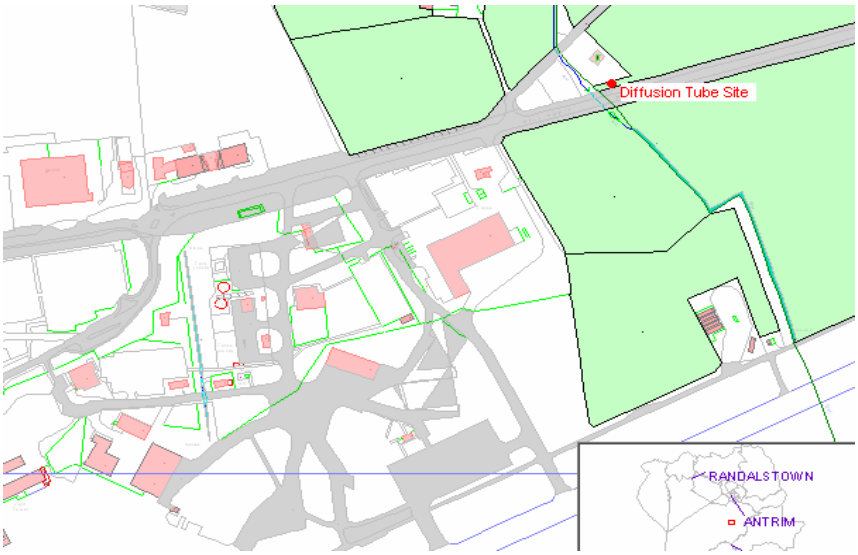
The site in Templepatrick is located on a lamppost in front of the Templeton Hotel. The site is very close to the facade of a residential property. Templepatrick is on the main route between the M2 motorway and Belfast International Airport and experiences high traffic flows. This site has been in operation for 7 years.

Fig 4. Randalstown Site



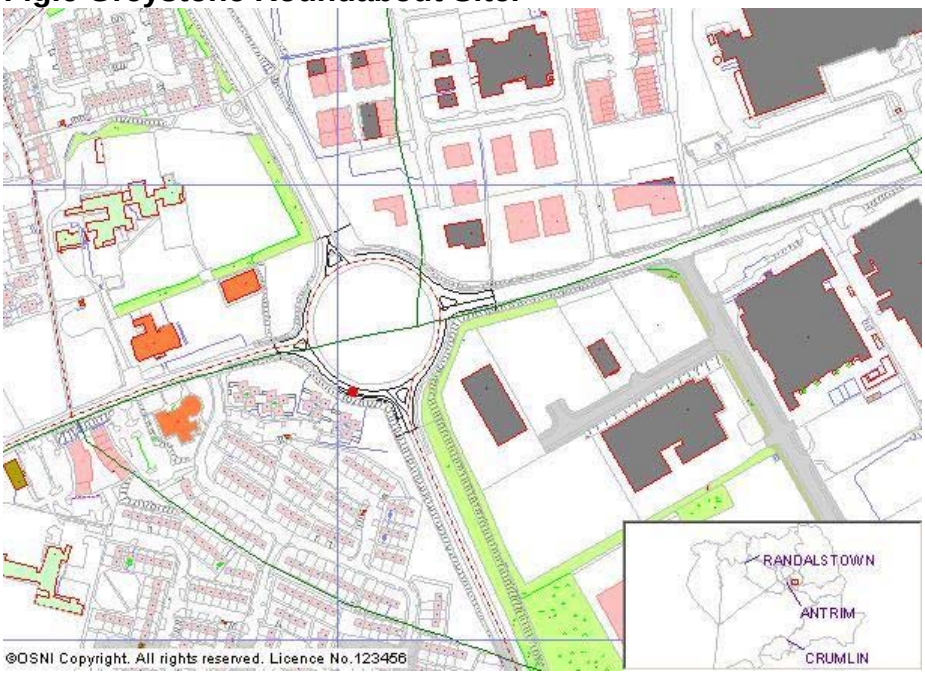
This site is located in front of a residential property on Main Street. The street is narrow at this location and traffic can be slow moving during periods of the day. This site has been operational for six years. The narrow street and high buildings here could give rise to raised concentrations because of the canyon effect.

Fig 5. Ballyrobin Road Site



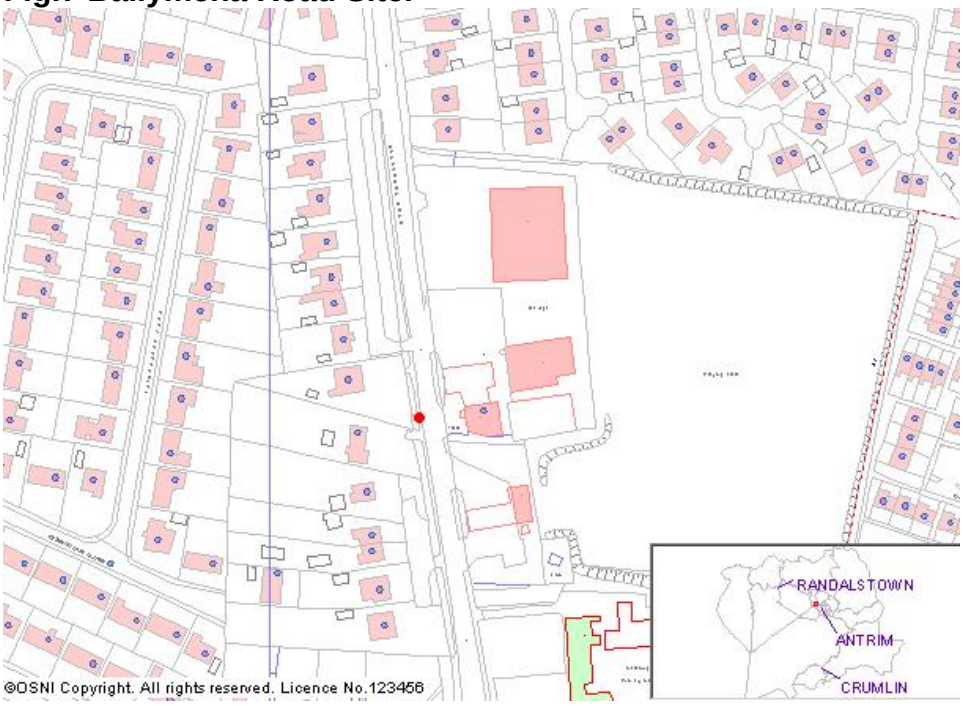
The USA found that passenger numbers at Belfast International Airport had crossed the 5mppa screening threshold set out in LAQM. TG(03). Although it was concluded that the objective was unlikely to be exceeded it was proposed that monitoring should be carried out to establish a greater picture of the concentrations in this area. This site is near to the nearest property to the airport.

Fig.6 Greystone Roundabout Site.



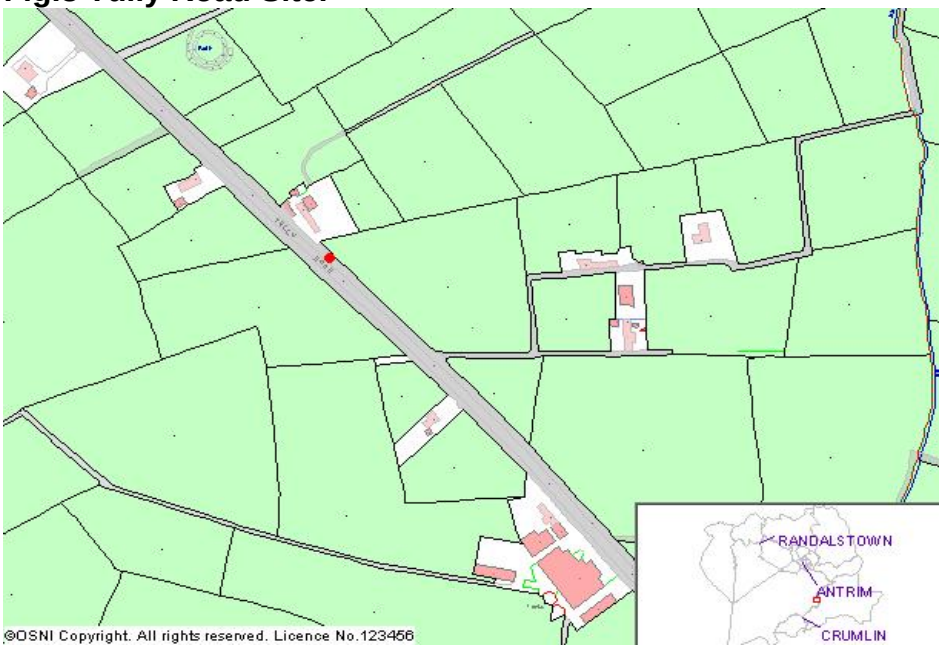
This site is in front of residential properties close to a busy roundabout leading to the M2 motorway.

Fig.7 Ballymena Road Site.



The Ballymena road is the main arterial route between Antrim town centre and the new Junction One retail development.

Fig.8 Tully Road Site.



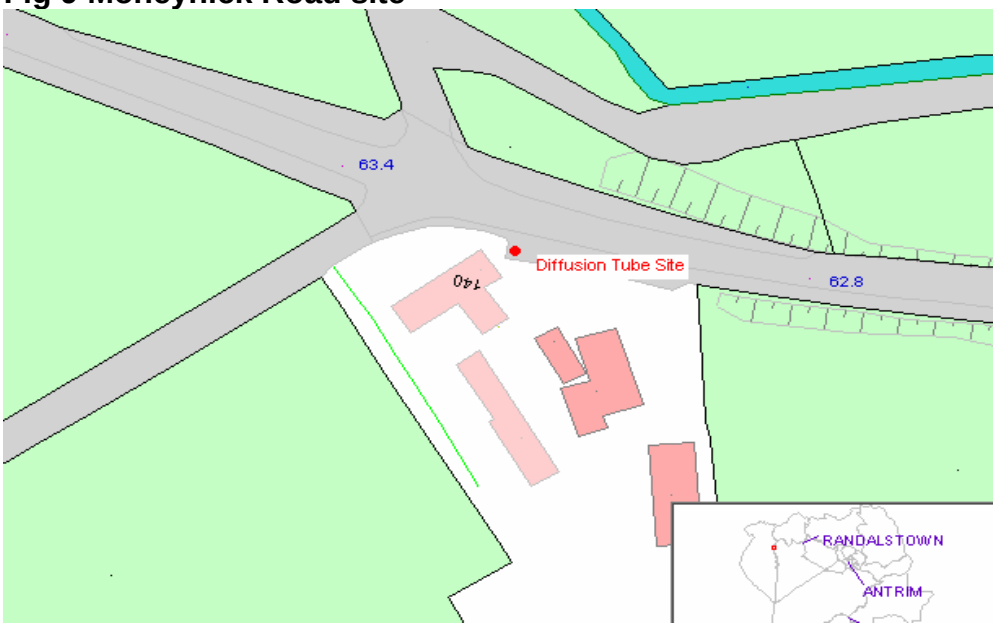
Tully Road is a single carriageway with an AADT of 20000 (2005). The monitoring site is close to the nearest roadside receptor.

3.4.2 Discontinued Monitoring Sites

Moneynick Road Site

The site was chosen to monitor close to a dwelling at a busy road between the M2 motorway and Toome village. This location was monitored throughout 2006; the annual bias corrected mean being 24.92µg/m^3. This was significantly below the objective of 40µg/m^3 and therefore the site was discontinued and the tube relocated.

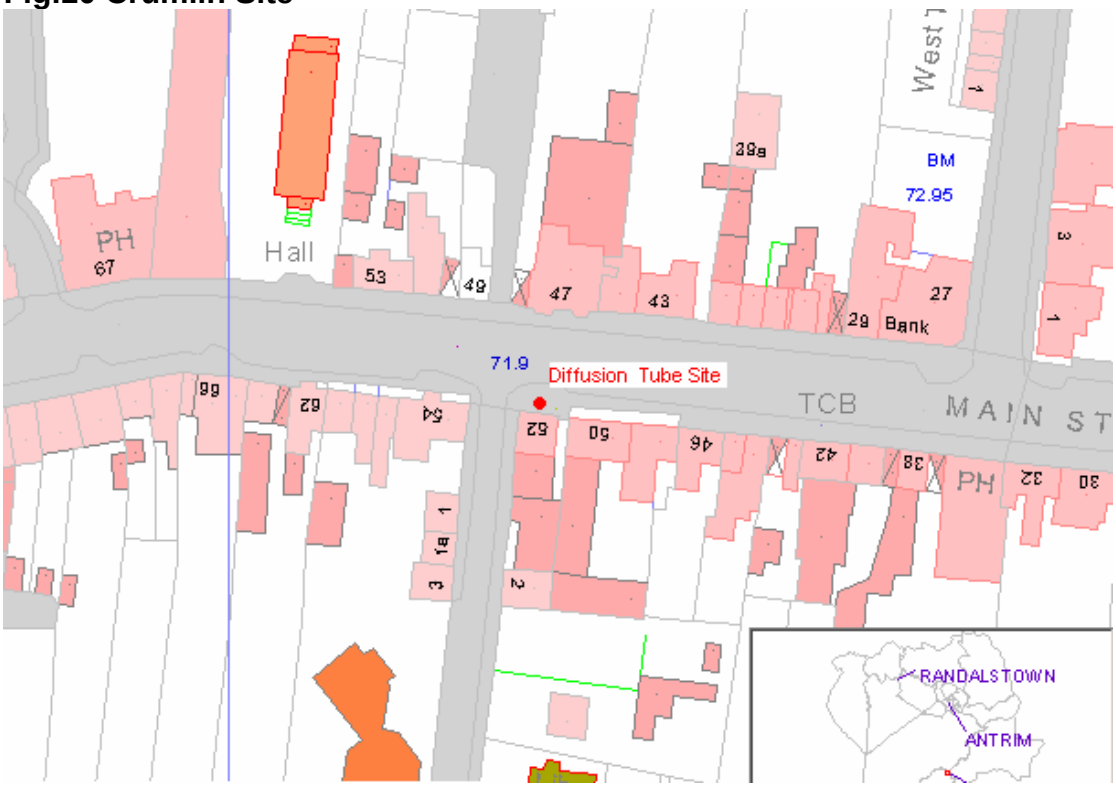
Fig 9 Moneynick Road site



Crumlin Site

This site was chosen to monitor the impact of traffic in Crumlin village. This site was monitored throughout 2006 and the bias corrected annual mean was 24.39µg/m^3. As this was well under the objective this site was discontinued and the tube relocated.

Fig.10 Crumlin Site



3.4.3 QA/QC for nitrogen dioxide diffusion tubes

The nitrogen dioxide diffusion tubes used in this study were supplied and analysed by Bureau Veritas and the preparation method is 10% TEA in water.

Bureau Veritas has a defined quality system, which forms part of the UKAS accreditation that the laboratory holds. All accredited methods are fully documented. UKAS assessors visit on an annual basis and review all aspects of the analysis, from sample handling to analysis and reporting. As a condition of accreditation, the laboratory is required to participate in any suitable proficiency schemes in operation.

Antrim Borough Council QA/QC.

Our QA/QC procedure is to ensure that when a tube batch is received they are stored in a refrigerator. On the day of sampling they are removed from the fridge and installed. Laboratory blanks are retained in the fridge and are taken out only when the exposed tubes are being returned to the laboratory.

When tubes are collected from sampling sites they are immediately packaged and sent to the laboratory for analysis.

3.4.4 Monitoring Results for 2007

Table 1 Nitrogen Dioxide Monitoring Results 2007

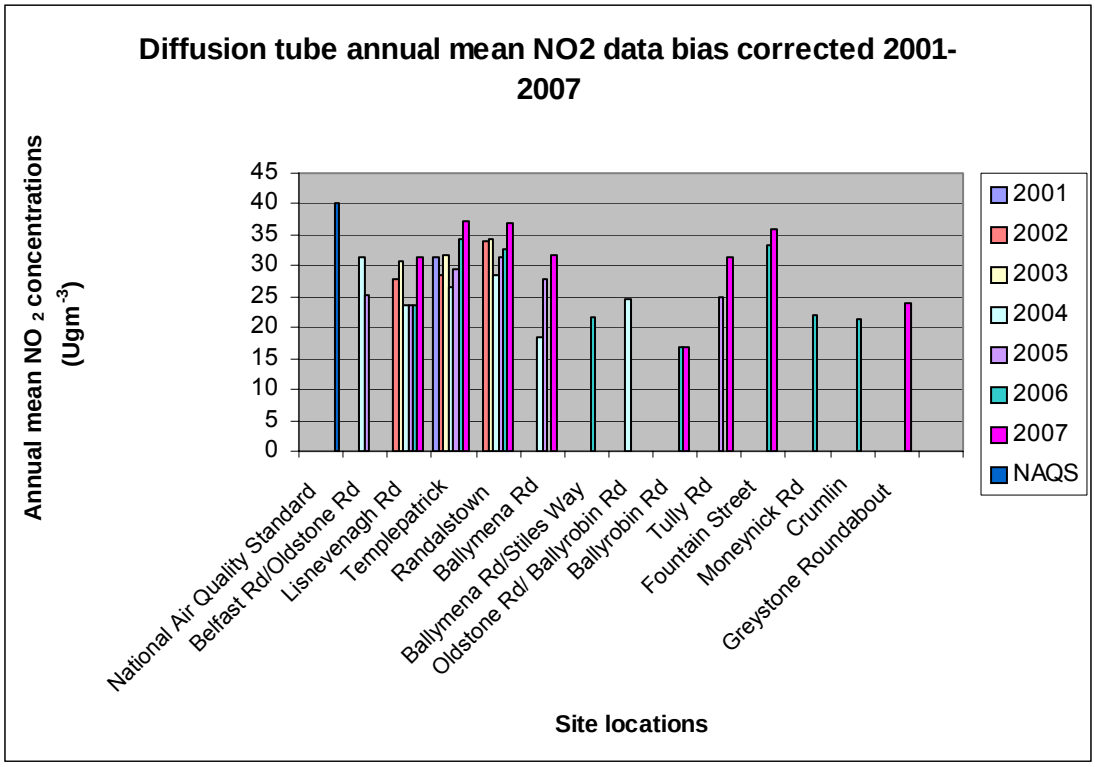
Location	Measured annual mean Concentration ($\mu g/m^3$)	Corrected annual mean Concentration ($\mu g/m^3$)
Fountain Street	39.75	35.78
Lisnevenagh Rd	34.75	31.28
Templepatrick Village	41.40	37.26
Randalstown, Main St	41.17	37.05
Ballyrobin Road	18.73	16.85
Greystone Roundabout	26.55	23.89
Ballymena Road	35.09	31.58
Tully Road	35.00	31.50

Annual mean concentration trends

Of the nitrogen dioxide diffusion tube monitoring locations on Antrim, 3 have been in operation for 5 or more years. These are as follows

- Lisnevenagh Road
- Templepatrick Village
- Randalstown, Main Street

Annual mean concentrations for 2007 and, where they are available, for preceding years are shown in the graph below. Although the increases have not been uniform, the graph shows that concentrations at most sites have risen over time. This rise would appear to suggest that traffic levels are increasing, possibly reflecting the continuing population growth within the population centres of the borough. None of the sites exceed the national objective although results from the Fountain Street, Templepatrick and Randalstown sites are close to it. Monitoring will continue at these three sites and although some of the other sites may be discontinued the findings have highlighted the need to continue monitoring the roads networks at key locations.



3.5 Progress on Fine Particles (PM10) Emissions

Objective: Annual Mean - 40µg/m^3 by 2010.
24 Hour Mean - 50µg/m^3 <35 exceedences per annum by 2005

There is a variety of emission sources that contribute to PM10 concentrations grouped into three areas. Primary emissions directly from combustion processes, secondary particles formed by chemical reactions in the atmosphere and course particles from a variety of sources such as quarries, wind blown and traffic dusts and construction activities.

The expected reduction in national particle emissions in future years is different for each source type. For example, emissions from road transport will be governed by legislation on vehicle emission standards; emissions of secondary particles will be largely governed by controls on power generation, industrial and transport SO_2 and NOx emissions, both in the UK and in Europe; emissions of coarse particles are largely uncontrolled, and in general are not expected to decline in future years

The council does not monitor PM10 concentrations however estimates of annual mean background concentrations for the Antrim Borough Council area are available on the internet. These are:

- 2005 annual mean background range 9.6 – 16.2 µg/m^3.
- 2010 annual mean background range 9.1 – 15.2 µg/m^3.

For exceedences to occur within the Antrim Borough Council area the impact of any local source will have to be significant. No new large industrial processes are planned for the district and none of the district's roads are described as "very busy" now or with the potential to become so. Other local emission sources include landfill sites and construction sites. No significant local sources have come on stream since the completion of the Updating and Screening Assessment and there have been no complaints about dust in relation to these sites within the last year.

3.6 Progress on Lead emissions

Objectives: Annual Mean – 0.5µg/m^3 by 2004.
Annual Mean – 0.25µg/m^3 by 2008.

Lead has been identified as causing acute and chronic damage to the nervous system, effects on the kidneys, joints and reproductive system. Historically, the major source of lead has been motor vehicle emissions, with other major sources being metal industries and power generation. The agreement reached between the European Parliament and the Environment Council on the Directive on the Quality of Petrol and Diesel Fuels has led to the ban on sales of leaded petrol in the United Kingdom with effect from 1 January 2000.

Since the ban on sales of leaded petrol, the major sources of lead emissions are restricted to specific industrial sources such as foundries or other non-ferrous metal production sites. Only areas in the vicinity of these types of industrial sites are deemed to be at risk. There are no current or planned sites that emit significant quantities of lead within the Antrim Borough Council area.

3.7 Progress on Sulphur Dioxide emissions

Objectives: 15 minute mean – 265µg/m^3 < 35 exceedences by 2005.
1-hour mean – 350µg/m^3 , < 24 exceedences by 2004.
24-hour mean – 125µg/m^3 <3 exceedences by 2004.

Sulphur dioxide is an acute respiratory irritant, hence the short averaging time for its objective. The main source of sulphur dioxide in the UK is power generation, which accounted for more than 71% of emissions in 2000. There are also significant emissions from other industrial combustion sources. Road transport currently accounts for less than 1% of emissions.

Nationally, domestic sources now only account for 4% of emissions, but can be locally much more significant. Antrim, like many other areas of Northern Ireland has historically been highly dependent on solid fuel for domestic heating and the first round of review and assessment identified two housing estates in Antrim town where significant solid fuel burning takes place and where there was a significant risk of the 15 minute mean objective being exceeded. As a result of the review and assessment process an Air Quality

Management Area (AQMA) taking in the two estates was declared in October 2004.

Antrim Borough Council has been monitoring levels of SO2 using a real time analyser since December 2004. The monitoring station is located in the Greystone housing (see map) which is within the AQMA.

Fig 7. Sulphur Dioxide Real Time Analyser Site

Monitoring data from the Greystone monitoring station for year 2007 is shown below.

ANTRIM GREYSTONE ESTATE
01 January to 31 December 2007

These data are provisional from 01/10/2007 and may be subject to further quality control

POLLUTANT	SO_2
Number Very High	0
Number High	0
Number Moderate	1
Number Low	34724
Maximum 15-minute mean	271 µg m^{-3}
Maximum hourly mean	122 µg m^{-3}
Maximum running 8-hour mean	73 µg m^{-3}
Maximum running 24-hour mean	52 µg m^{-3}
Maximum daily mean	39 µg m^{-3}
Average	7 µg m^{-3}
Data capture	99.4 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	1	1
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0

These data are also shown in the form of a graph in Appendix 5.

Data capture at the site is good at 99.4% and although the station is located within an AQMA, albeit not within the area of projected highest concentration, results are promising and well within the objectives to be achieved.

There have been no new developments in the Antrim Borough or in the surrounding area that might adversely affect local air quality with respect to sulphur dioxide. The recent availability of natural gas within Antrim town is expected to have a beneficial affect as fuels with higher sulphur contents are replaced by gas. The gas roll out programme is at an early stage and the availability of gas is still limited. It is therefore concluded that the findings of the Updating and Screening assessment are still valid and that outside the AQMA the sulphur dioxide objectives are unlikely to be exceeded.

3.7.1 Progress within the AQMA

Antrim Borough Council declared an AQMA in October 2004 because of projected exceedences of the 15 minute mean objective as a result of high levels of solid fuel burning in two housing estates in Antrim town. In October 2006 Antrim Borough Council submitted a draft Air Quality Action Plan to the Environment and Heritage Service (EHS). The draft plan set out the measures that are proposed to be taken in pursuit of achieving the air quality standards for sulphur dioxide within the AQMA and the timescale for implementing such measures.

The EHS made a number of recommendations in relation to the draft plan amongst which was a recommendation that further air quality dispersion modelling should be conducted to evaluate the effect of the planned actions. Environmental Consultants, AEA Energy & Environment were commissioned to carry out the recommended study and on receipt of their report a revised action plan was submitted. Confirmation that the plan had been accepted by appraisers appointed by the Department of the Environment was received in October 2007 and it was formally adopted by Antrim Borough Council the same month.

3.7.2 Progress with Action Plan measures.

The Action Plan, which is reproduced in Appendix 8, proposed the following measures.

- Bringing forward the planned NIHE heating conversion scheme.

NIHE is a relevant authority under the Air Quality Regulations (NI) 2003 and has a major role to play in implementing the heating conversion scheme within the shortest reasonable time. The NIHE owns a large number of domestic properties within the Antrim Borough Council area, including a significant number of the dwellings contained within the housing estates that make up the AQMA.

Within the AQMA there are 232 solid fuel burning dwellings in NIHE ownership that are eligible under the scheme for conversion to natural gas. Conversion of these will provide a significant reduction in emissions of sulphur dioxide.

Whilst the conversion scheme is due to approach completion by 2010 throughout the Antrim area, it was felt necessary to prioritise the AQMA in a more proactive manner in order to reflect the need to reduce sulphur dioxide concentrations therein. Agreement was made with NIHE to ensure that the NIHE conversion programme reflects the geographical location of the AQMA and consequently Ballycraigy was the first estate in Antrim town to benefit from the conversion scheme.

An emissions reduction scenario modelling study carried out for action planning purposes has established that a 50% conversion rate in conjunction with the demolition of flats mentioned below will be sufficient to ensure that the objectives will be met within the AQMA. Details of the scenario modelling are set out in Appendix 6 to this report.

- Demolition of flats at Chain Walk, Ballycraigy.

Chain Court consists of two blocks of flats and is located within the Ballycraigy housing estate and therefore within the AQMA. All 33 of the flats that make up Chain Court have solid fuel heating.

These flats were due for demolition in any event but it was agreed that NIHE would bring forward the scheme. Although the reasons for demolition do not relate to air quality, the proposed action will have the effect of removing 33 potential solid fuel burners from the AQMA and as such is deemed to be appropriate for inclusion in the air quality action plan.

- Promotion of Warm Homes Scheme and other energy efficiency schemes

Several schemes, such as the Warm Homes Scheme and Warmer Ways to Better Health Project, are available to assist owner-occupiers and tenants of private landlords in installing new central heating systems and insulation measures in their homes in order to improve energy efficiency. Householders who are in receipt of certain benefits or meet other income related criteria may qualify for free conversion to oil or natural gas and/or insulation measures through one of the schemes. The range of insulation measures available include cavity wall insulation, loft insulation, hot water tank jacket, oil burner

jacket, reflective radiator panels and draught proofing to windows and doors, as well as energy saving advice.

In addition to the above schemes, the Energy Savings Trust runs an Insulation Cash-Back Scheme available to all owner-occupiers and private landlords, regardless of income levels or whether or not the householder is in receipt of benefits. The scheme offers £150 cash back for cavity wall insulation and £75 cash back for loft insulation.

Promotion of the above-mentioned schemes contributes towards providing improved air quality and increased energy efficiency in homes through conversion to less polluting fuels and through reduced fuel use. The schemes are of particular benefit to those householders who would otherwise lack the financial means to undertake the conversion or insulation measures and who will not benefit from the NIHE conversion scheme.

In order to promote these schemes Council staff carried out door-to-door visits to all owner-occupied and privately rented properties within the AQMA. A questionnaire was completed with the householders of these properties during the visits in order to assess their eligibility for inclusion in any of the schemes available. Eligible householders were referred to the appropriate body for inclusion in the applicable scheme.

- Introducing guidance relating to bonfires.

Each year Antrim Borough Council receives a number of complaints in relation to the burning of waste materials. The Council routinely uses the relevant powers available under the Clean Air (Northern Ireland) Order 1981 and other legislation in order to control and prohibit further instances of burning.

There are also a number of traditional bonfire sites within the Antrim area. The Council subscribes to the guidance contained in the Interagency Working Group on Bonfires (2004). This guidance is the latest available for use within district councils and other relevant authorities.

The Council has established a Bonfires Committee made up of representatives of the Council, Police Service of Northern Ireland, Housing Executive and Fire Brigade as well as representatives of the community groups associated with the traditional bonfire sites within the borough. The committee aims to achieve greater control over the traditional bonfires with a subsequent reduction of the environmental damage, including emissions of sulphur dioxide, caused by them and is seen as a valid means of information dissemination.

Council funding is available to community groups who adhere to preset criteria, designed to control the size, siting and content of bonfires. This provides an incentive to bonfire organisers to reduce the number of tyres present in bonfires, hence reduce the emission of pollutants to air, in particular sulphur dioxide.

- Include air quality considerations in responses to Planning Service.

Local planning decisions have the potential to affect local air quality significantly and development control is an important tool in the improvement of air quality. In Northern Ireland responsibility for planning control is exercised by the Department of the Environment, through the Planning Service. District Council Environmental Health Departments are consultees within the planning process and procedures currently exist whereby comments are forwarded to Planning Service in relation to material matters that are relevant to applications for planning permission.

One of the principle means of avoiding an increase in emissions of sulphur dioxide over an area source such as the AQMA is to control emissions from new developments. The Environmental Health Section will ensure that air quality considerations are included in consultation responses to ensure that developments in or close to the AQMA do not lead to a deterioration of air quality and that all potential mitigation measures are considered. In considering planning applications the Section will be guided by the recommendations contained within the National Society for Clean Air 2004 document – Development Control: Planning for Air Quality.

Action Plan measure and body responsible	**Original timescale**	**Progress with measure**	**Outcome to date**	**Comments**
Conversion of NIHE owned solid fuel burning properties to natural gas. (Northern Ireland Housing Executive)	Ballycraigy 2007/2008 Greystone 2008/2009	The conversion scheme has been completed for Ballycraigy.	Natural gas central heating has been installed in 119 properties. The conversion rate is better than the 50% rate that was modelled.	There were 232 dwellings within the two estates that make up the AQMA eligible for conversion. 119 have been converted to date. The scheme has not yet reached the Greystone estate so the possibility of exceedences of the objectives within this

				part of the AQMA remains.
Promotion of the Warm Homes Scheme and other energy efficiency schemes. (Antrim Borough Council)	Ballycraigy 2006/2007 Greystone 2007/2008	This measure has now been completed. All privately owned and privately rented dwellings have been surveyed and qualifying households directed to the appropriate scheme.	A complete breakdown of the referrals for energy efficiency measures is set out in section *3.7.2.1,* below.	This measure has now been completed. The impact upon sulphur dioxide emissions is hard to assess, however in addition to the 11 dwellings that have been converted from solid fuel another 85 households have benefited through improved energy efficiency, by way of increased insulation or more efficient heating systems.
Bringing forward the planned demolition of two blocks of solid fuel burning flats at Chain Walk, Ballycraigy. (Northern Ireland Housing Executive)	2007/2008	The first block of flats has been demolished. The second block is empty awaiting demolition	This measure has removed 33 potentially solid fuel burning properties from the AQMA	

Introducing guidance relating to bonfires	2006/2007	The council has established links with representatives of 9 of the 11 traditional bonfires. In 2007 tyres were absent from 5 bonfires and one group decided to replace the large tradition bonfire with a small token structure which was burnt in its place.	Because the representatives of the largest bonfire, which is sited within the AQMA have not yet engaged with the committee, the impact within the AQMA will have been minimal.	The committee has become well established and it is hoped that the remaining bonfire groups will join in 2008. The main aim in the next year will be the removal of tyres from all bonfires.
Include air quality considerations in responses to Planning Service.	2006/2007	No planning applications have been received for developments in or around the AQMA	N/A	The AQMA lies within a mature residential area. It is not anticipated that, except for infill housing, many planning applications will be received.

3.7.2.1 Breakdown of energy efficiency schemes:

- **Warm Homes** - Provides insulation measures only.
- **Warm Homes Plus** - Provides insulation measures and a replacement Oil Fired Central Heating System (OFCH) or Gas Fired Central Heating System (GFCH) where the current boiler is over 15 years old or a new OFCH/GFCH system where there is no central heating, solid fuel, or Economy 7 heating. For the purposes of this document the Warm Homes Plus Scheme has been separated into replacement OFCH systems and new OFCH systems.

- **Warmer Ways to Better Health Option 1** – Provides insulation measures and a new OFCH/GFCH system where there is currently no central heating, solid fuel, or Economy 7 heating.
- **Warmer Ways to Better Health Option 2** - Provides insulation measures and a replacement OFCH/GFCH system where the current OFCH/GFCH boiler is over 15 years old.
- **Warmer Ways to Better Health Option 3** - Provides insulation measures only.

Please note in an area where natural gas is available it will be installed under the above mention energy efficiency schemes as opposed to OFCH

The table overleaf provides a breakdown of referrals made to each of the energy efficiency schemes in the Ballycraigy and Greystone estates following door-to-door visits.

Scheme	Ballycraigy	Greystone
Warm Homes	16	35
Warm Homes Plus (Replacement OFCH/GFCH)	2	1
Warm Homes Plus (New OFCH/GFCH)	0	1
Warmer Ways to Better Health Option 1	4	6
Warmer Ways to Better Health Option 2	10	5
Warmer Ways to Better Health Option 3	10	6

The table below provides a breakdown of proposed measures to be taken under the energy efficiency schemes following the door-to-door visits in the Ballycraigy and Greystone estates.

Measures	Ballycraigy	Greystone
Insulation Only	26	41
Replacement of old existing OFCH/GFCH System	12	6
New OFCH/GFCH System to replace solid fuel etc	4	7

There have been no new developments in the Antrim Borough or in the surrounding area that might affect local air quality with respect to sulphur dioxide. It is therefore concluded that the findings of the Updating and Screening Assessment are still valid and that outside the AQMA the sulphur dioxide objectives are unlikely to be exceeded.

4. NEW LOCAL DEVELOPMENTS.

4.1 New industrial developments

No industrial processes (Part A, B or C) commenced operation or changed significantly during the period under review

No new landfill, quarrying and mineral processes have commenced in the last year and there have been no complaints about existing processes.

4.2 New residential and commercial developments

All planning applications are considered by the Environmental Health Section and, where necessary, air quality is reviewed as part of that consultation process.

a) Residential and commercial developments with a significant risk of impacting on air quality (planning approval containing air quality related conditions):

None Identified.

b) Residential and commercial developments with a lower risk of impacting on air quality (planning approval not containing air quality related conditions although locations near to existing busy roads or sensitive locations):

Identified in the table below.

Location	Description	Relevant Pollutants	Source of Information	Comments
Enkalon Industrial Park	Warehouse development of 35 units	NO_2 PM10	Planning Application T/2006/0676	Potential for increased traffic
"Carnbeg Village" Kilbeg Road, Antrim.	47 Houses	NO_2 PM10	Planning Application T/2006/0888	Potential for increased traffic on Ballymena Road
46-48 Belfast Rd, Antrim.	Residential development of 20 units	NO_2 PM10 Benzene	Planning Application T/2005/0612	Increased traffic on Belfast Rd
Junction 1, Ballymena Rd, Antrim.	Commercial/industrial development	NO_2 PM10	Planning Application T/2006/0441	Potential for increased traffic on Belfast Road.
Junction 1, Ballymena Rd, Antrim.	Multi screen cinema	NO_2 PM10	Planning Application T/2007/0308	Potential for increased traffic on Ballymena Road.
Junction 1 Ballymena Rd, Antrim.	14 Business units	NO_2 PM10	Planning Application T/2006/0887	Potential for increased traffic on Ballymena Road.
Adjacent to	Housing	NO_2 PM10	Planning	Potential for

Massereene Gdns and Casthe Park, Ballymena Rd, Antrim.	development		Application T/2005/1000	increased traffic on Ballymena Road.

A number of these approved developments have the potential to add to the traffic levels on Ballymena Road, Antrim. A nitrogen dioxide diffusion tube monitoring site has been established beside this roadway and data has been collected over three years. We would propose to retain this site in future years and to take a closer look at this road as part of next years USA.

4.3 New Transport Developments

No new roads have been agreed for 2007 and there were no significant changes to the existing road systems.

5. SUMMARY OF KEY POINTS AND FUTURE ACTIONS

This progress report indicates:

■ The conclusions of the 2005 Updating and Screening Assessment continue to be valid.

■ There have not been any significant changes in local circumstances to indicate possible exceedences of the air quality standards and objectives.

■ The main sources of pollutants in the Antrim Borough Council area continue to be nitrogen dioxide from road traffic and sulphur dioxide from domestic sources.

■ Nitrogen dioxide and sulphur dioxide need to continue to be monitored in key locations, with particular reference to the objectives.

■ Significant progress has been made in implementing the Action Plan within the two housing estates that make up the Council's AQMA. The Council is not yet in a position to rescind the AQMA.

■ Progress in implementation of the action plan will be included in future Progress Reports

■ The next air quality report will be an updating and screening assessment which is due in April 2009.

Further information concerning this report or local air quality issues in general may be obtained from Trevor Stewart, Lead Environmental Health Officer (Environmental Protection) on 028 94436 3113 or e-mail trevor.stewart@antrim.gov.uk

Appendix 1 Timetable for Progress Reports within Review and Assessment System

LAQM Activity	Completion Date	Which Authorities ?
Progress Report	April 2005	All District Councils
Updating and screening assessment	April 2006	All District Councils
Detailed assessment	April 2007	Those District Councils which have identified the need for one in their April 2006 updating and screening assessment
Progress Report	April 2007	Those District Councils which identified that there was no need for a detailed assessment in their April 2006 updating and screening assessment
Progress Report	April 2008	All District Councils
Updating and screening assessment	April 2009	All District Councils
Detailed assessment	April 2010	Those District Councils which have identified the need for one in their April 2009 updating and screening assessment
Progress report	April 2010	Those District Councils which have identified that there was no need for a detailed assessment in their April 2009 updating and screening assessment

Appendix 2. Proposed Objectives included in the Air Quality Regulations (NI) 2003 for the purpose of Local Air Quality Management.

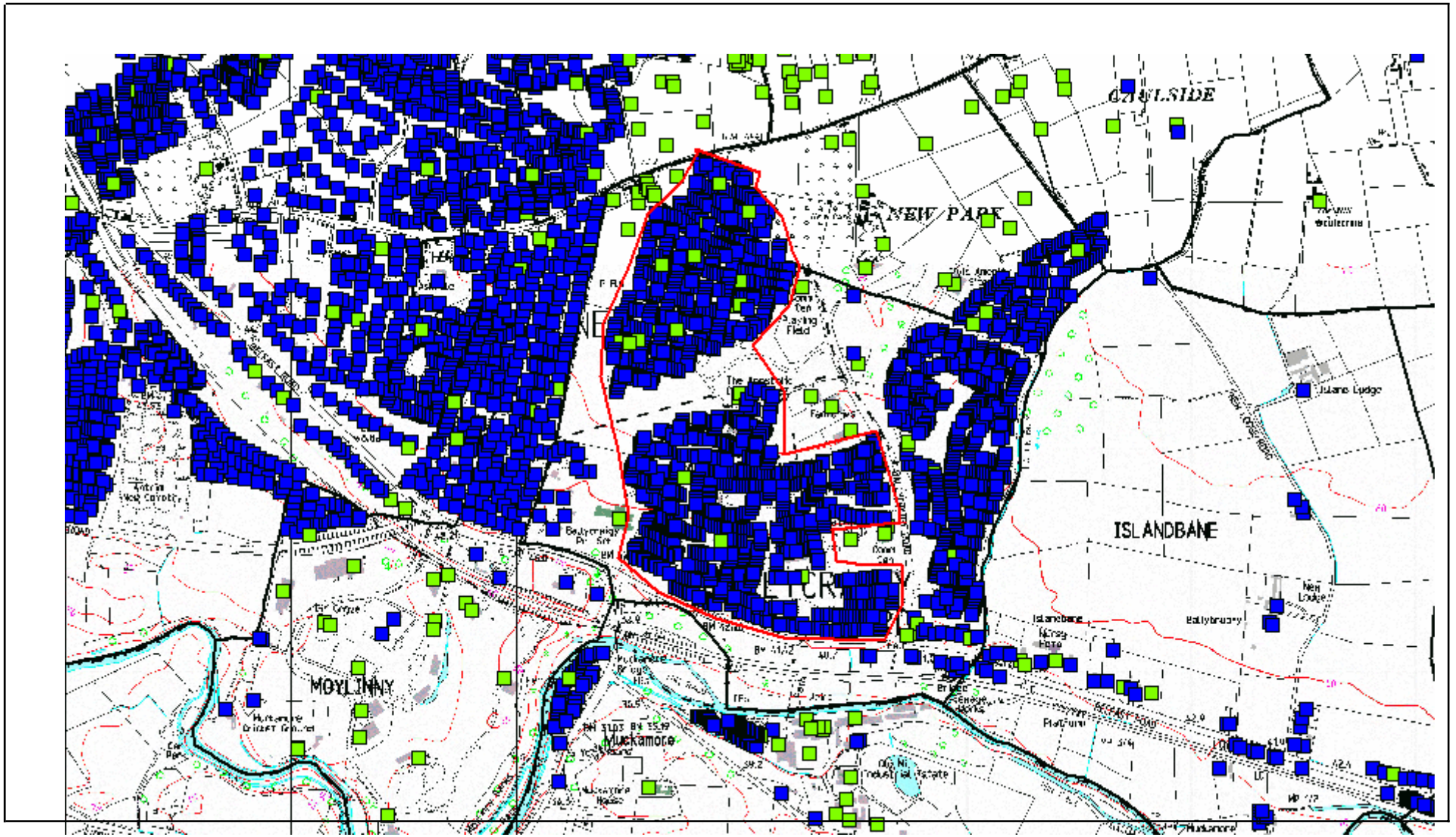
Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 μgm^{-3}	Running annual mean	31.12.2003
	3.25 μgm^{-3}	Running annual mean	31.12.2010
1,3 Butadiene	2.25 μgm^{-3}	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mgm^{3}	Maximum daily running 8-hour mean	31.12.2003
Lead	0.5 μgm^{-3}	Annual mean	31.12.2003
	0.25 mgm3	Annual mean	31.12.2008
Nitrogen Dioxide[1]	200 μgm^{-3} no to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 μgm^{-3}	annual mean	31.12.2005
Particles (PM_{10})[2] **Gravimetric**[3]	50 μgm^{-3} not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 μgm^{-3}	annual mean	31.12.2004
Sulphur Dioxide	350 μgm^{-3} not to be exceeded more than 24 times per year	1 hour mean	31.12.2004
	125 μgm^{-3} not to be exceeded more than 3 times per year	24 hour mean	31.12.2004
	266 μgm^{-3} not to be exceeded more than 35 times per year	15 minute mean	31.12.2005

Notes

1. The objectives for nitrogen dioxide are provisional.
2. There are likely to be new particles objectives for 2010, not in regulation at present, expected after the review of the EU's first Air Quality Daughter Directive (2004).
3. Measured using the European gravimetric transfer standard or equivalent.

Appendix 3

Title: ANTRIM AIR QUALITY MANAGEMENT AREA
Scale: 1:24,500



Description:
AIR QUIALITY AREA SHOWN IN RED

Appendix 4 Nitrogen Dioxide Diffusion Tube Sites

Address	Grid Ref	Description	Dist. To Road (m)	Dist. To nearest Dwelling (m)
Fountain Street, Antrim	315197 386539	Lamp post close to house	1.5	0.3
Lisnevenagh Road	313254 391205	Telegraph pole outside dwelling	3	4
Templepatrick Village	322992 385675	Lamp post at house facade	1.5	1.5
Randalstown Main Street	308113 390461	Lamp post in front of dwelling	1.5	0.3
Ballymena Road	314670 387541	Lamp post outside residential property	3	8
Ballyrobin Road at airport	315786 381225	Street furniture at side of road	3	15
Moneynick Road	302863 389504	Road sign in front of dwelling	1	7
Main Street, Crumlin	315256 376160	On lamp post at street junction	1.5	0.5

Appendix 5: Data from Sulphur dioxide monitoring station 2007

Produced by AEA Energy & Environment on behalf of Antrim Borough Council

ANTRIM GREYSTONE ESTATE
01 January to 31 December 2007

These data are provisional from 01/10/2007 and may be subject to further quality control

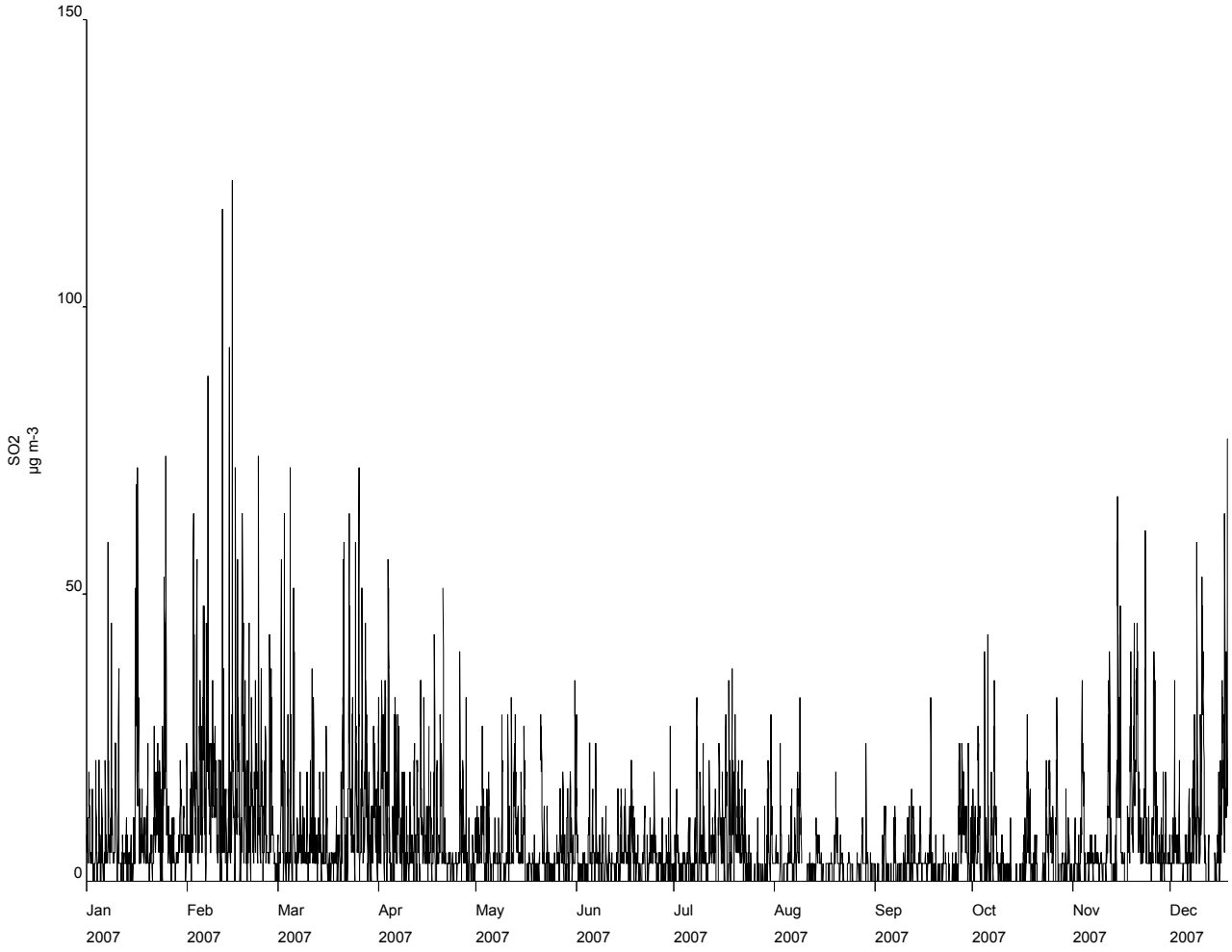
POLLUTANT	SO_2
Number Very High	0
Number High	0
Number Moderate	1
Number Low	34724
Maximum 15-minute mean	271 µg m^{-3}
Maximum hourly mean	122 µg m^{-3}
Maximum running 8-hour mean	73 µg m^{-3}
Maximum running 24-hour mean	52 µg m^{-3}
Maximum daily mean	39 µg m^{-3}
Average	7 µg m^{-3}
Data capture	99.4 %

All mass units are at 20'C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	1	1
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0

Produced by AEA Energy & Environment on behalf of Antrim BC

Antrim Greystone Estate Air Monitoring
Hourly Mean Data for 01 January to 31 December 2007



Appendix 6: Emissions Reduction Scenario Study for SO2

In April 2006, AEA Energy & Environment carried out the re-verification of the modelling results obtained in the “Air Quality Review and Assessment – Stage 4” for Antrim Borough Council. The re-verification study predicts that the 99.9%ile 15 minute mean SO2 objective is likely to be exceeded in Antrim.

AEA Energy & Environment has carried out scenario testing to determine the predicted SO2 levels following emissions reduction in the two areas of exceedences. This will consist of 50% NIHE heating conversion and the demolition of the flats at Chaine Court, Ballycraigy.

The modelling approach undertaken within this scenario testing is consistent with Stage 4 and the re-verification report. Table 1 shows the way the model results were and have been adjusted using monitoring data from Antrim’s monitoring station.

The model adjustment factor used here is based on Monitoring/(Modelled + Background). This approach takes into account the uncertainty of the two modelling approaches (1x1km UK Background maps using empirical model and 25m resolution using DISP). By adding up modelled and background, we are adjusting both uncertainties rather than only adjusting the domestic modelling and leaving background unadjusted. This way, we are also taking into account other sources that may arise in the local area that might not be included in the background data like traffic. Experience with point source ADMS and DISP modelling has placed great confidence is this approach. This approach is consistent with the uncertainties reported by Stedman et al. in UK air quality modelling for annual reporting 2003 on ambient air quality assessment under Council Directives 96/62/EC, 1999/30/EC and 2000/69/EC (http://www.airquality.co.uk/archive/reports/cat05/0501121424_dd12003mapsrep4.pdf).

Table 1: - Model adjustment for 15 minute average

SO_2 monitoring data = (15.568 * (SO2 background (monitoring period) + SO_2 modelled) - 23.673) × f [99.9th %ile of 15 min mean]			
Monitoring data [1]	**Background [2]**	**Modelled**	**Adjustment factor f**
178	**2.09**	**6.50**	**1.62**

[1] 99.9%ile 15 minute mean at Antrim (99.0% data capture)
[2] Background SO2 data (Excluding sources modelled explicitly – 0.94 ugm^{-3})

Figure 1 shows the predicted 99.9 percentile 15 minute mean SO_2 concentration for Antrim’s study area. The reverification of the modelling study predicted that the maximum 99.9 percentile 15 minute mean SO_2 within Antrim’s grid is above the 266 μgm^{-3} objective level.

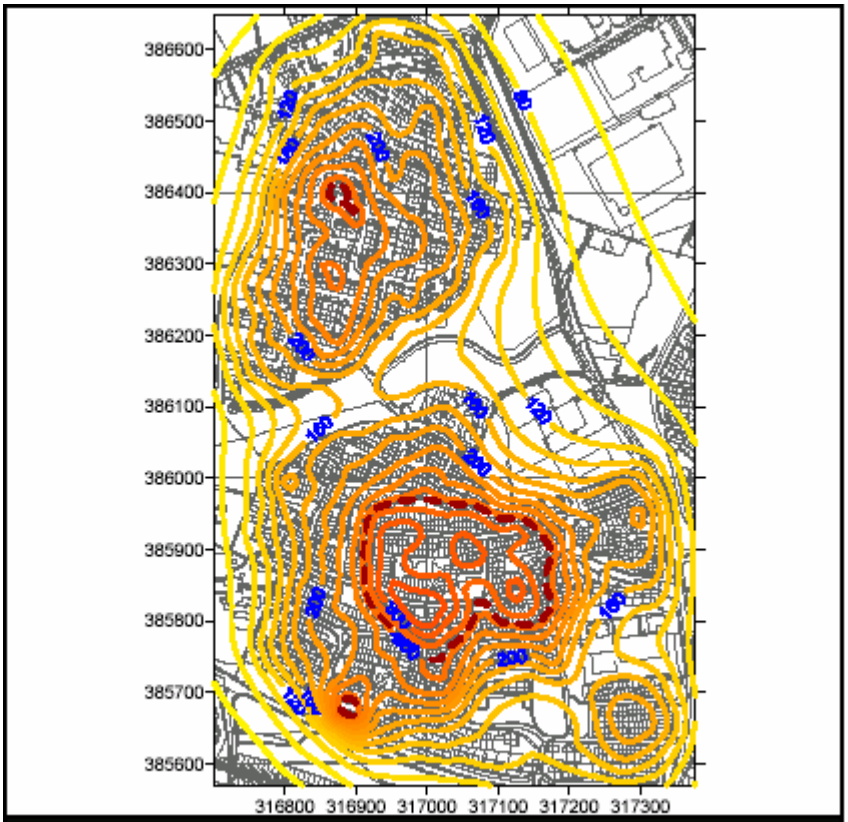


Figure 1 – Map of predicted 99.9%ile of 15 minuture mean SO_2 concentrations (Verified with Antrim's monitoring station in 2005).

AEA Energy & Environment has carried out fuel domestic modelling for the including the following changes:

- Demolition of the flats at Chaine Court, Ballycraigy, and
- 50% NIHE heating conversion to gas

The emissions reduction has been calculated to be 22% compared to the current estimations. Most of this reduction of emissions is due toto the conversion of NIHE properties to gas. The reduction in emissions following the implementation of both changes has been modelled and results plotted in figure 2. Figure 2 shows the predicted scenario 99.9 percentile 15 minute mean SO_2 concentration for Antrim's study area. *The scenario of the modelling study predicted that the maximum 99.9 percentile 15 minute mean SO2 within Antrim's grid is below the 266 μgm^{-3} objective level.* Highest modelled result is 260 μgm^{-3} in a very small area.

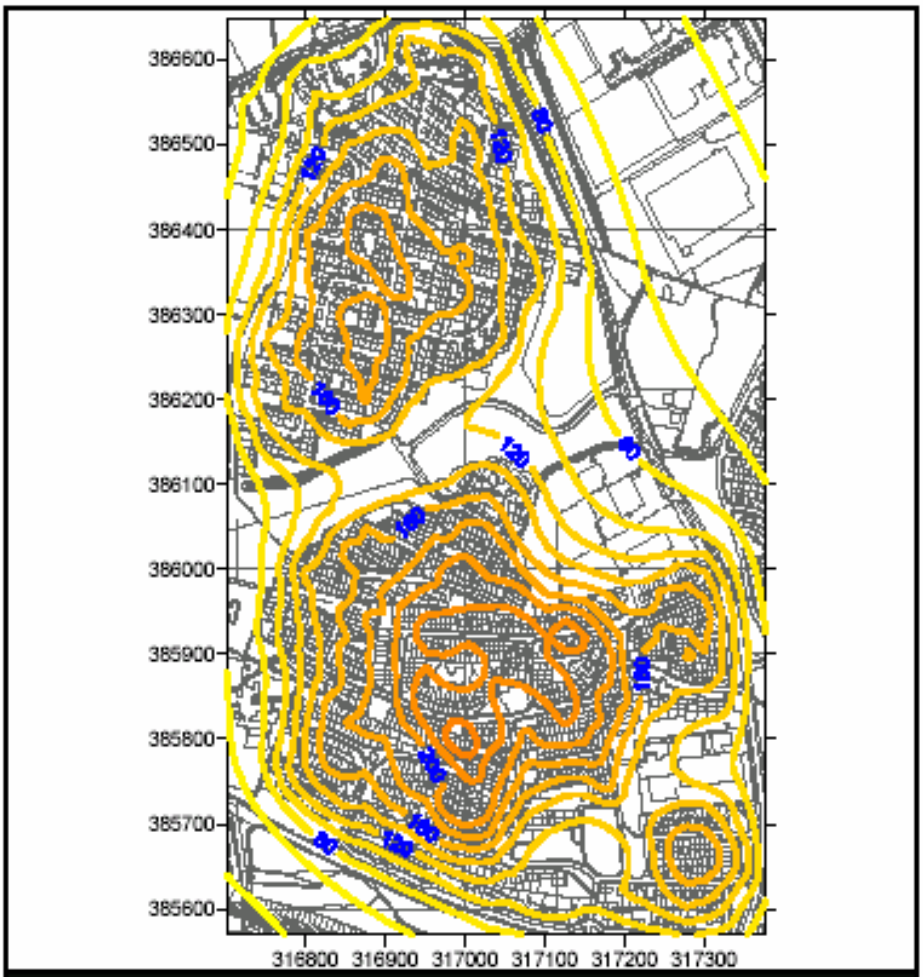


Figure 2 – Scenario map of predicted 99.9%ile of 15 minute mean SO_2 concentrations (adjusted following as per verification results).

The scenario of the modelling study predicts no exceedence in the SO2 15 minute objective level if the demolition of the flats at Chaine Court and a 50% heating conversion within NIHE properties in the area. We recommend that monitoring of SO_2 is continued to ascertain if this is confirmed in the measurement data.