AIR QUALITY

PROGRESS REPORT

2005

LOCAL AIR QUALITY

PROGRESS REPORT

DOWN
DISTRICT COUNCIL

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2005

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EXECUTIVE SUMMARY

This document, Progress Report 2005, is the latest in the series of air quality documents produced by Down District Council. Its purpose is to identify those matters that have changed from the last review and assessment of air quality and which might cause an air quality objective to be exceeded. The summary table indicating the results of the Progress Report is shown below.

Summary of Down District Council's Progress Report for 2005	Findings
Nitrogen dioxide	Objective achieved
Sulphur dioxide	Objective achieved
PM_{10}	Objective achieved

The next stage in the ongoing assessment of Air Quality in Down District Council will be the production of an Updating and Screening Assessment in April 2006.

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1.0 INTRODUCTION

The Environment Act 1995 and subsequent regulations introduced the framework of Local Air Quality Management (LAQM), which requires every local authority to periodically review air quality in its area. The review and assessment is conducted in order to assess whether the prescribed standards and objectives set out in the National Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000, the Air Quality Regulations 2000 and the Air Quality Regulations (Northern Ireland) Amendment Regulations 2003 are likely to be achieved. The pollutants assessed are benzene, 1,3 Butadiene, Carbon Monoxide, Lead, Nitrogen Dioxide, Fine Particles (PM_{10}), Sulphur Dioxide and Ozone. Ozone is not included in this process due to the significant transboundary nature of the pollutant, and the limited direct influence that local authorities therefore have in achieving local standards.

This Progress Report is intended to ensure continuity in the LAQM process. Its objective is to provide an annual review and update on air quality issues, including developments that might be significant to air quality. Any significant developments can then be acted upon immediately, rather than waiting for the next full round of review and assessment. The benefits to Local Authorities are set out in Box 1.1 of the Progress Report Guidance LAQM.PRGNI(04), but these include the following,

1 to provide a readily accessible source of up to date information on air quality, which may be useful to Down District Council staff for dealing with enquiries from members of the public, developers carrying out environmental assessments, and to assist in other areas such as transport and land use planning

2 to ensure continuity in maintaining, resourcing, capability and staff skills for LAQM within Down District Council.

3 helping to get maximum value from the monitoring carried out by Down District Council.

1.1 Conclusions of previous review and assessment

The first stage assessment completed in 2000 identified all significant pollutant sources within the Down District Council. This second stage review and assessment built on the first stage work and considered in detail the likely occurrence of oxides of Nitrogen(NO_2), Particulates (PM_{10})and Sulphur Dioxide (SO_2).

The assessment was undertaken using the results from passive diffusion tubes for oxides of Nitrogen, modelling and the 8-port sampler for Sulphur dioxide and from simple predictive models for particulate matter. The main conclusions of the second stage review in 2004 were that:

- There was no need for progression to the third stage review and assessment
- No Air Quality Management Areas need be declared

1.2 Aim of this report

The aim of this report is to provide recent air quality data, which can be assessed against the Air Quality Objectives, and to report on any new developments that might affect air quality in the Council area.

2.0 NEW MONITORING DATA

There have been no significant changes to air quality monitoring in Down District Council since the last air quality report in 2004. This report will only concentrate on oxides of nitrogen (NO_2), sulphur dioxide (SO_2) and particulate matter (PM_{10}). None of the other pollutants covered by the Air Quality Strategy are monitored.

2.1 Nitrogen Dioxide

The oxides of nitrogen (referred to collectively as NOx) comprise several gases, including nitric oxide (NO) and nitrogen dioxide (NO_2). In the ambient air, NO_2 is probably the most important for human health, so that data on health risks and guidelines are usually expressed in terms of NO_2 rather than NOx.

2.2 Standards and objectives for nitrogen dioxide

The national air quality objectives for nitrogen dioxide are:

- An annual average concentration of 40µg m^{-3} (21ppb)
- An hourly average of 200µg m^{-3} not to be exceeded more than 18 times in a year.

These to be achieved by 31st December 2005.

2.3 Diffusion tube monitoring sites

A survey, which monitors nitrogen dioxide at the roadside, has been ongoing since 1993 in Down District Council. The tube sites are the same as for the previous Air Quality Report, however, for convenience a map of the tube sites can be found at appendix 1.

2.4 Quality control/ quality assurance

Ruddock and Sherratt Public Analysts carried out the analysis of the diffusion tubes until November 2004. They are not included in the Air Quality Consultant's database of co-location studies, which doesn't allow calculation of a valid bias correction factor. Since November 2004

Casella CRE Air began the analysis on behalf of Eurofins. (appendix 2). This will permit a bias correction factor to be applied to the data at the time of the next air quality report.

The most important limit value and objective for nitrogen dioxide is the annual mean. The passive diffusion tubes measure the total concentration over the period when they are exposed to the atmosphere. As there is no fixed comparison with the levels in the regulations, it has been established that sites with an annual average concentration of 40ug m^{-3} or greater would be in danger of breaching the Regulations.

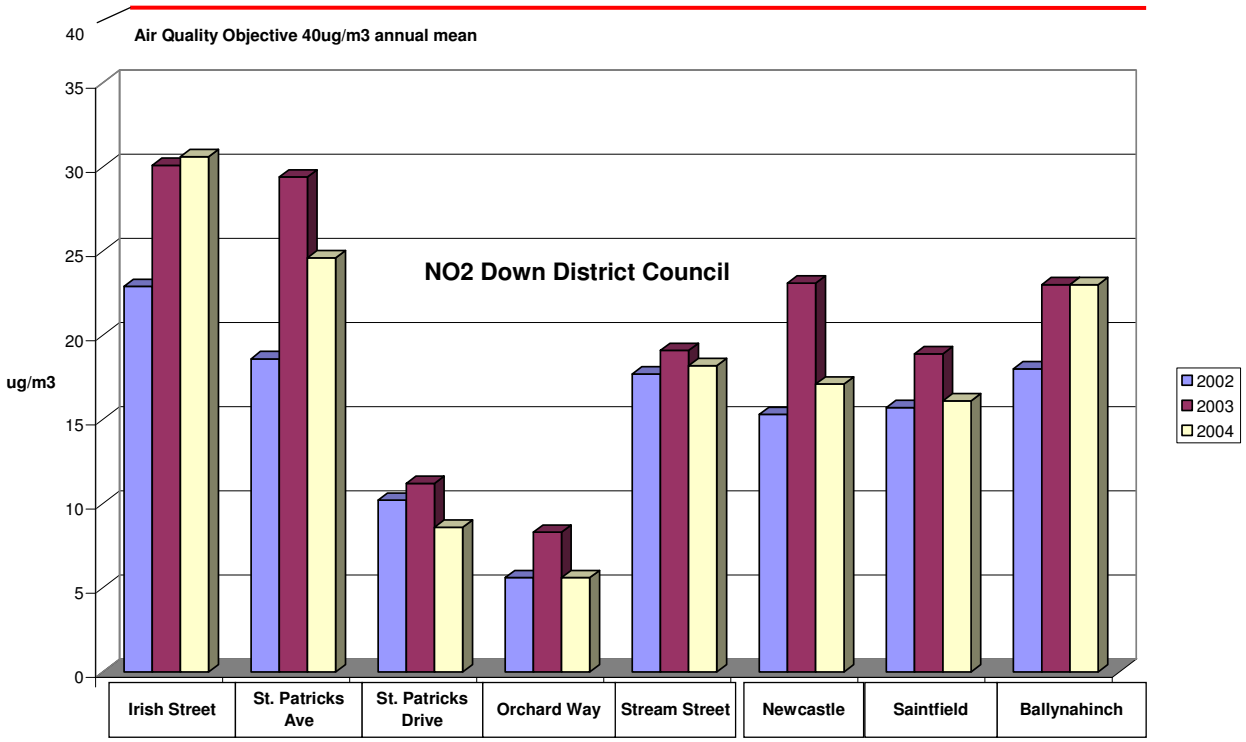
2.5 MONITORING DATA FOR NO2

Table 1 annual mean for NO2 at the diffusion tube sites

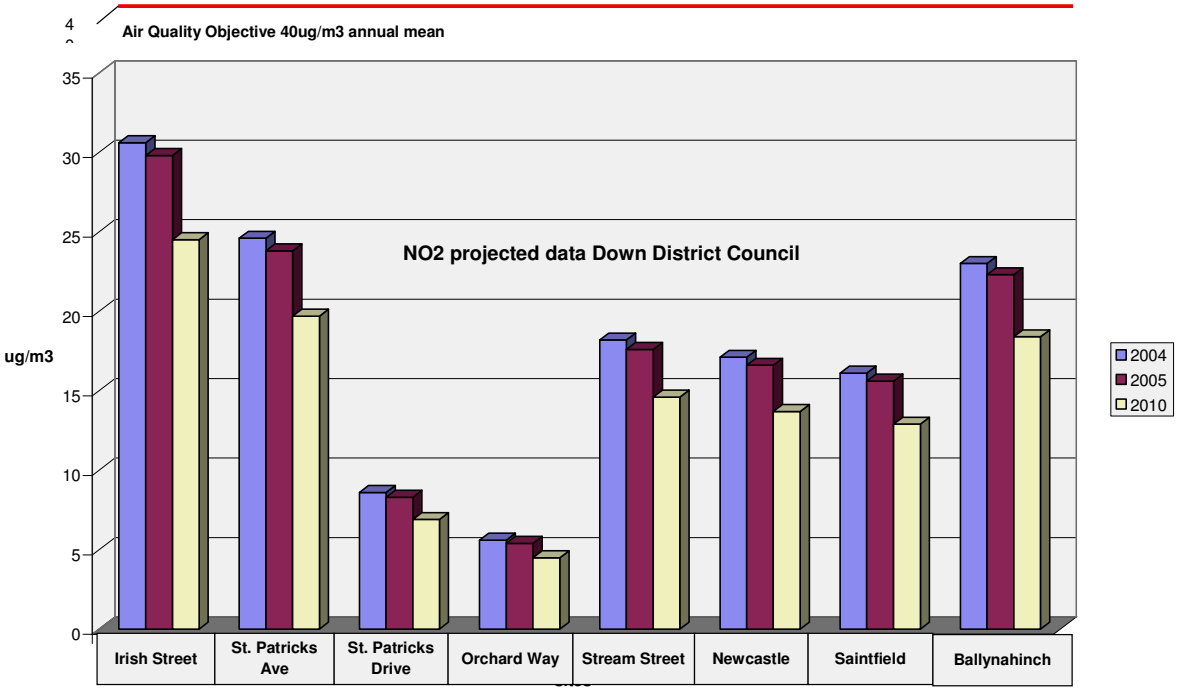
LOCATION	2002	2003	2004	projected data 2005
Irish Street, Downpatrick (DK)	22.9	30.1	30.6	29.8
St. Patricks Avenue, DK	18.6	29.4	24.6	23.8
St. Patricks Drive, DK	10.2	11.2	8.6	8.3
Orchard Way, DK	5.6	8.3	5.6	5.4
Stream Street, DK	17.7	19.1	18.2	17.6
Newcastle	15.3	23.1	17.1	16.6
Saintfield	15.7	18.9	16.1	15.6
Ballynahinch	18	23	23	22.3

The passive method of sampling for NO2 confirms that the Air Quality Objective of 40ug/m3 has been met at all sites, which is illustrated in Graph 1

GRAPH 1 SHOWING THE ANNUAL MEAN FOR NO_2 AT THE 8 ROADSIDE SITES WITHIN DOWN DISTRICT COUNCIL



GRAPH 2 SHOWING THE NO_2 PROJECTED DATA FOR 2005 AND 2010 AT THE 8 ROADSIDE SITES WITHIN DOWN DISTRICT COUNCIL



Graph 2 shows that by using the conversion factors supplied in the technical guidance LAQM.TG (03) there will be a gradual reduction in the annual levels for NO_2 levels for 2005 and 2010 over all 8 sites.

2.6 Impact of road traffic on the concentrations of nitrogen oxides

The annual traffic census report 1997 published by the DOE Roads Service stated that there were no roads within Down District Council area which had projected annual average daily traffic (AADT) flows greater than 20,000 in 2005. The Belfast Road, Downpatrick is the busiest

road in the district. Additional information was obtained from Roads Service on the AADT for the Belfast Road, Downpatrick

Table 2

24-Hour Annual Average Daily Traffic Flow

Year	Number of vehicles
1996	9440
1999	10,540
2000	10,880
2001	10,720
2002	11,390
2003	11,360
2004	11,478

The above figures would seem to indicate increasing amounts of traffic on the main road in the Down District Council area.

2.7 CONCLUSION

The measured and predicted results indicate that the air quality objectives for NO_2 will be met for 2005 and 2010, even though the amount of traffic within the district is increasing.

2.8 SULPHUR DIOXIDE (SO_2) AND PM_{10}

Sulphur dioxide (SO_2) is the pollutant primarily associated with acid rain. Gaseous at normal temperature and pressure it dissolves in water and readily oxidizes to sulphuric acid. Levels of SO_2 have reduced over recent years with a move away from widespread burning of coal in homes and factories. It is one of the main pollutants that led to the introduction of legislation controlling atmospheric pollution such as the Clean Air Order. The location of Down District Council's 8-port smoke and SO_2 monitoring equipment can be seen in appendix 1.

2.9 Standards and objectives for Sulphur Dioxide

The Air Quality Regulations (Northern Ireland) 2003 set Air Quality Objective levels for sulphur dioxide (SO_2):

- 266µg m^{-3} as a 15 minute mean to be achieved by 31st December 2005(maximum of 35 exceedances a year)
- 350µg m^{-3} as a one hour mean to be achieved by 31st December 2004 (maximum of 24 exceedances a year)
- 125µg m^{-3} as a 24 hour mean to be achieved by 31st December 2004 (maximum of three exceedances a year)

The focus of an Authority's review and assessment should be any non-occupational, near ground level outdoor location where exposures over 15 minutes are potentially likely in these locations. Effectively this could be any public area.

2.10 QUALITY CONTROL/ QUALITY ASSURANCE

Regular checks are completed in accordance with the "Instruction manual: UK Smoke and Sulphur Dioxide Networks"(AEA Technology, 1997), and the approach described in LAQM.TG1 (00).

These checks include weekly, two-monthly and six-monthly inspections of the equipment. The procedures used in sampling and analysis are as in the instruction manual.

2.11 REVIEW AND ASSESSMENT OF PM_{10}

This is a complex mixture of organic and inorganic substances. The ability of a particle to remain suspended in the air depends on its size, shape and density. Large heavy particles fall rapidly, while fine, light particles remain suspended for longer. The same properties also determine how far into the respiratory tract the particles can enter. Particles with a diameter of more than 10mm will mostly be trapped in the nose and pharynx, whereas below this size, particles can penetrate the lung and alveoli. When monitoring particulate matter, it is usual to determine the fraction of particulates most likely to be deposited in the lung. PM_{10} was measured as black smoke and converted to PM_{10} as explained in LAQM:TG (00).

2.12 Standards and objectives for particulate matter

The air quality strategy objectives to be achieved by 31st December 2004 are:

An annual average concentration of 40µg m^{-3} gravimetric

A maximum 24 hour limit of 50µg m^{-3} (gravimetric) not to be exceeded on more than 35 days in a year.

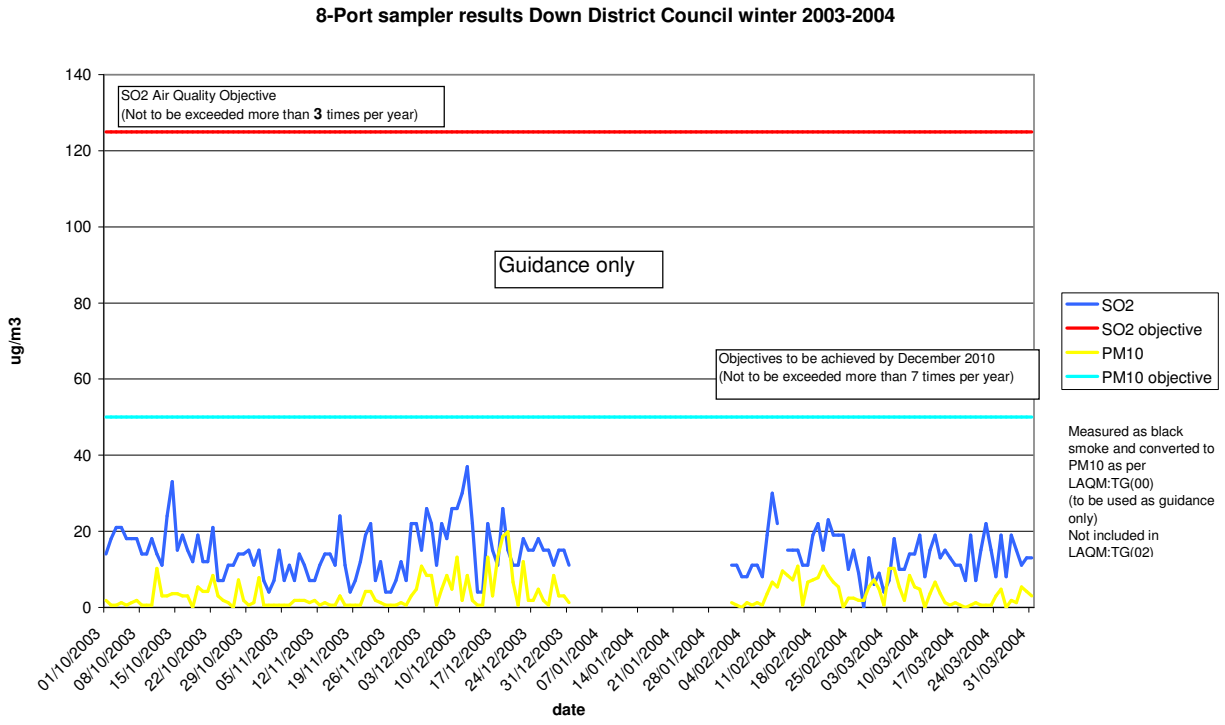
2.13 MONITORING DATA

Average SO2 AND PM10 for 2000-2004 **Table 3**

Year	Average SO2 24hr ugm3 SO2	24hr target value ugm3 SO2	Average smoke	Average as PM10 PM10 calculated from smoke as per LAQM:TG(00)	24hr target value ugm3 PM10
2000	**11**	125	7	**4**	50
2001	**10**	125	7	**4**	50
2002	**13**	125	5	**3**	50
2003	**14**	125	5	**3**	50
2004	**8**	125	5	**3**	50

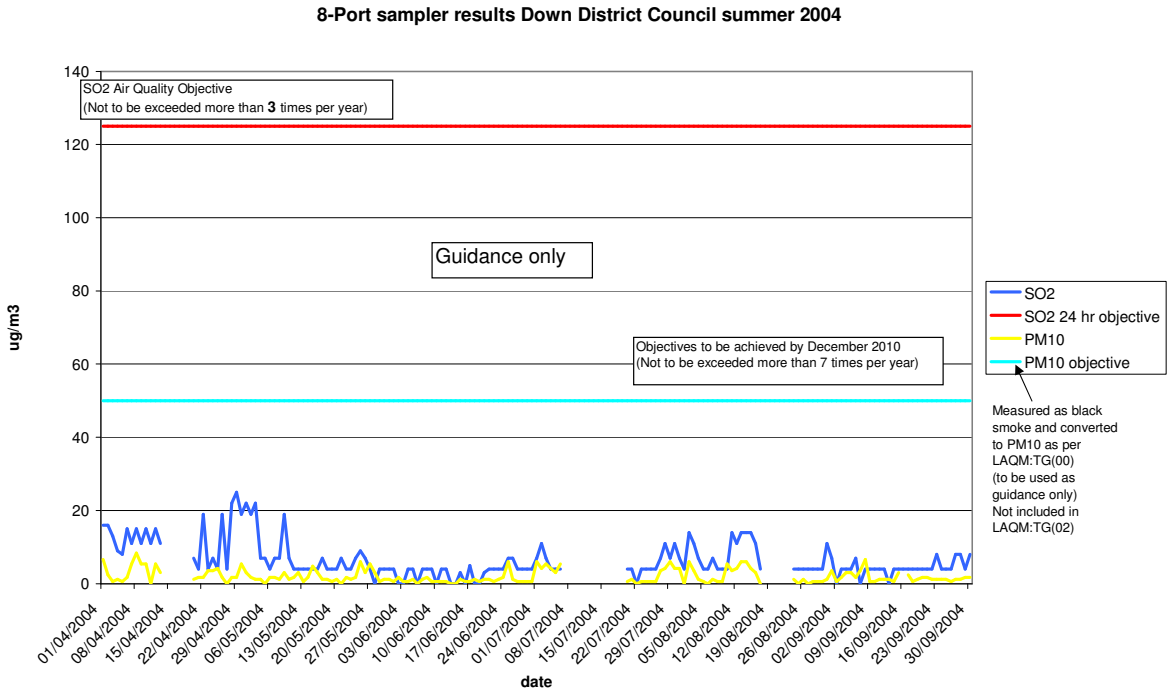
The results show that the air quality objectives for SO_2 and PM_{10} have been met. This data can be presented in graphical form.

Graph 3 showing SO_2 and PM_{10} results for winter 2003-2004



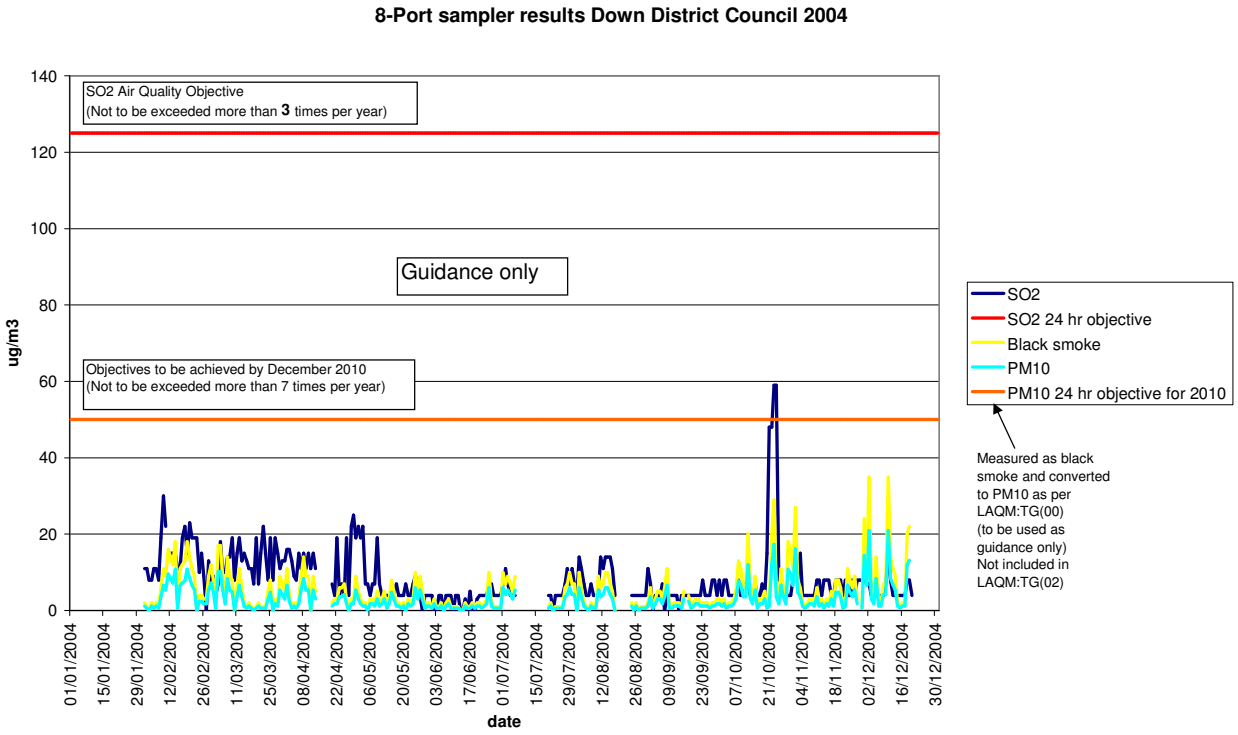
No exceedances of the air quality objectives were noted on Graph 3.

Graph 4 showing SO_2 and PM_{10} results for Summer 2004



No exceedances of the air quality objectives were noted.

Graph 5 showing the results for SO_2 and PM_{10} FOR 2004



No exceedances were noted for 2004.

2.14 CONCLUSIONS

From the above information Down District Council concludes that the Air Quality Objectives for SO_2 and PM_{10} will be met and there are no indications that levels of SO_2 or PM_{10} will rise in the Council area in the foreseeable future.

3.0 NEW LOCAL DEVELOPMENTS AND AIR QUALITY COMPLAINTS

New local developments, which may affect air quality in the Down District Council Area

3.1 there are no new part A processes, as defined under the Pollution Prevention Control regime

3.2 there are no new Part B processes, as defined under the Pollution Prevention Control regime

3.3 there are no new retail developments

3.4 there are no new mineral developments

3.5 there are no new landfill developments

3.6 there are no new mixed use developments

3.7 Other Air Quality Data

Table 4 shows a list of air quality complaints that Down District Council's Environmental Health Section investigated in 2004, along with the number of abatement notices served. As can be seen from the table air quality is perceived as being reasonably good within the Down District Council area.

Table 4 - Breakdown of Air Quality Nuisance Investigations

TYPE	NO OF COMPLAINTS	NOTICES SERVED
Domestic Smoke Complaints	22	0
Commercial Smoke Complaints	17	0
Odour Industrial/ Commercial	3	0
Odour Domestic	0	0
Odour Agricultural	1	0
Odour cause unknown	1	0
Total	**44**	**0**

4.0 CONCLUSIONS

4.1 Measured air quality within Down District Council currently meets national standards.

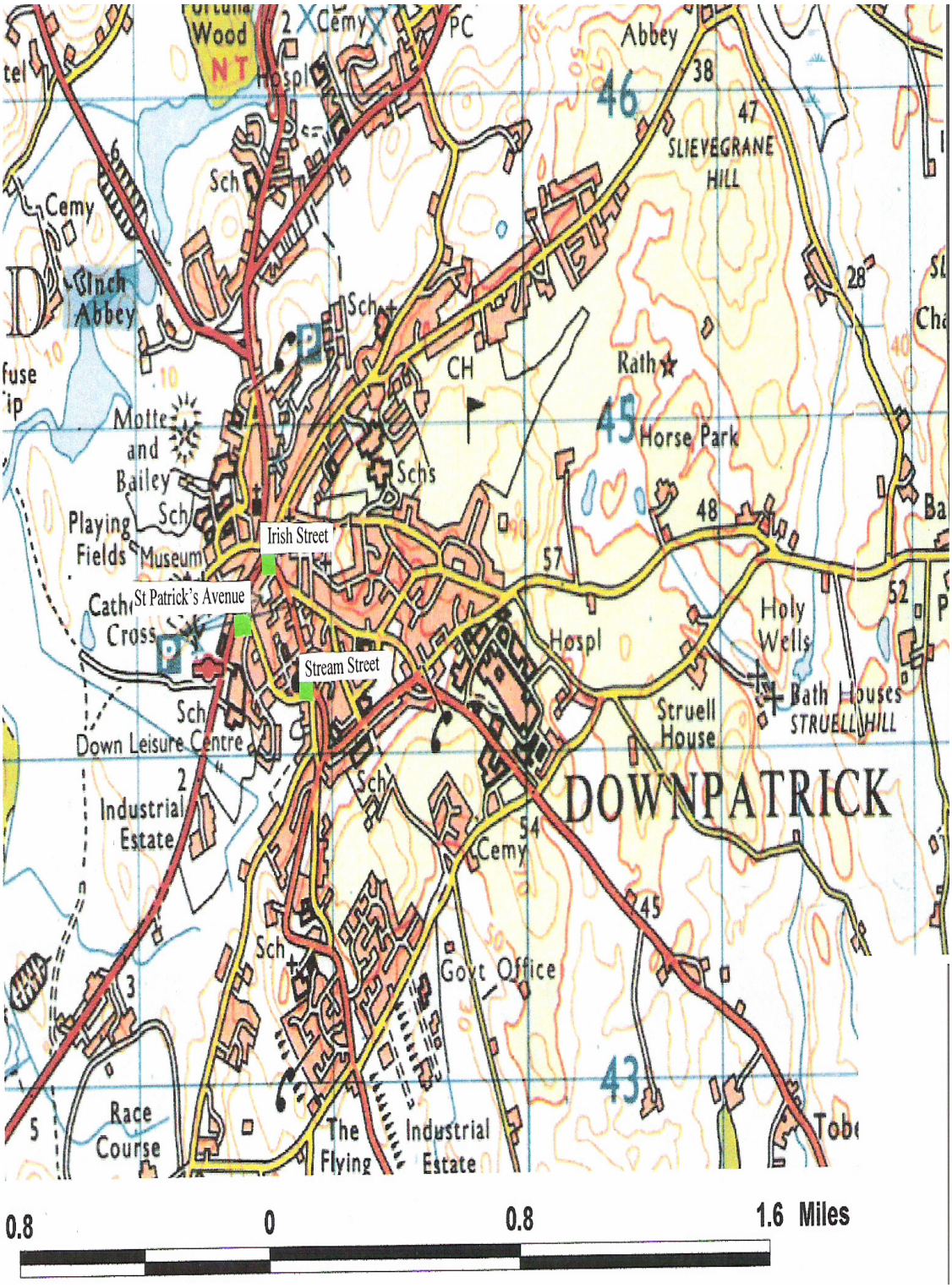
4.2 The Council has not declared an Air Quality Management Area and therefore has no current action plans.

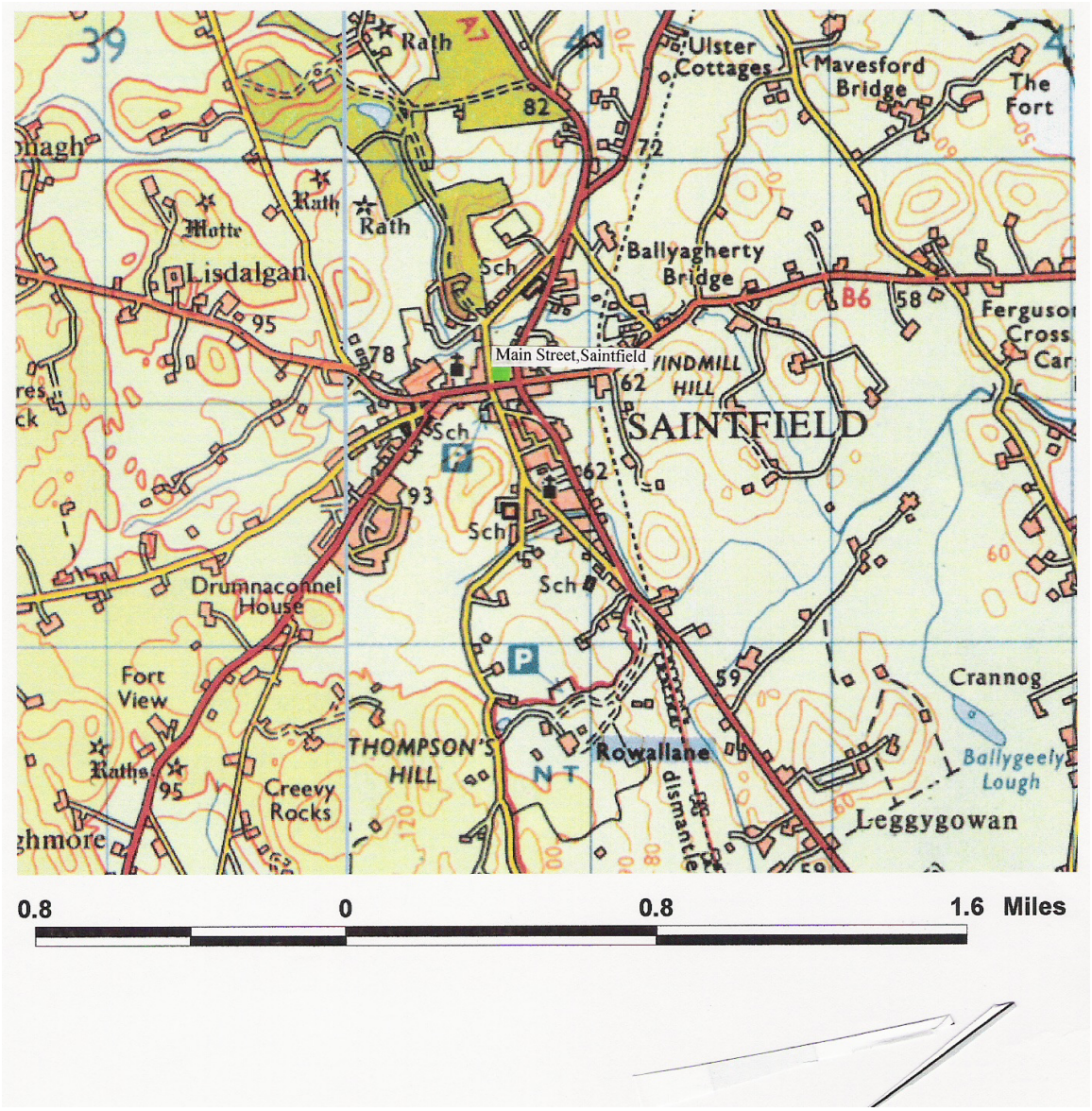
4.3 The Council does not intend to draw up a Local Air Quality Strategy at the present time but this will be reviewed annually.

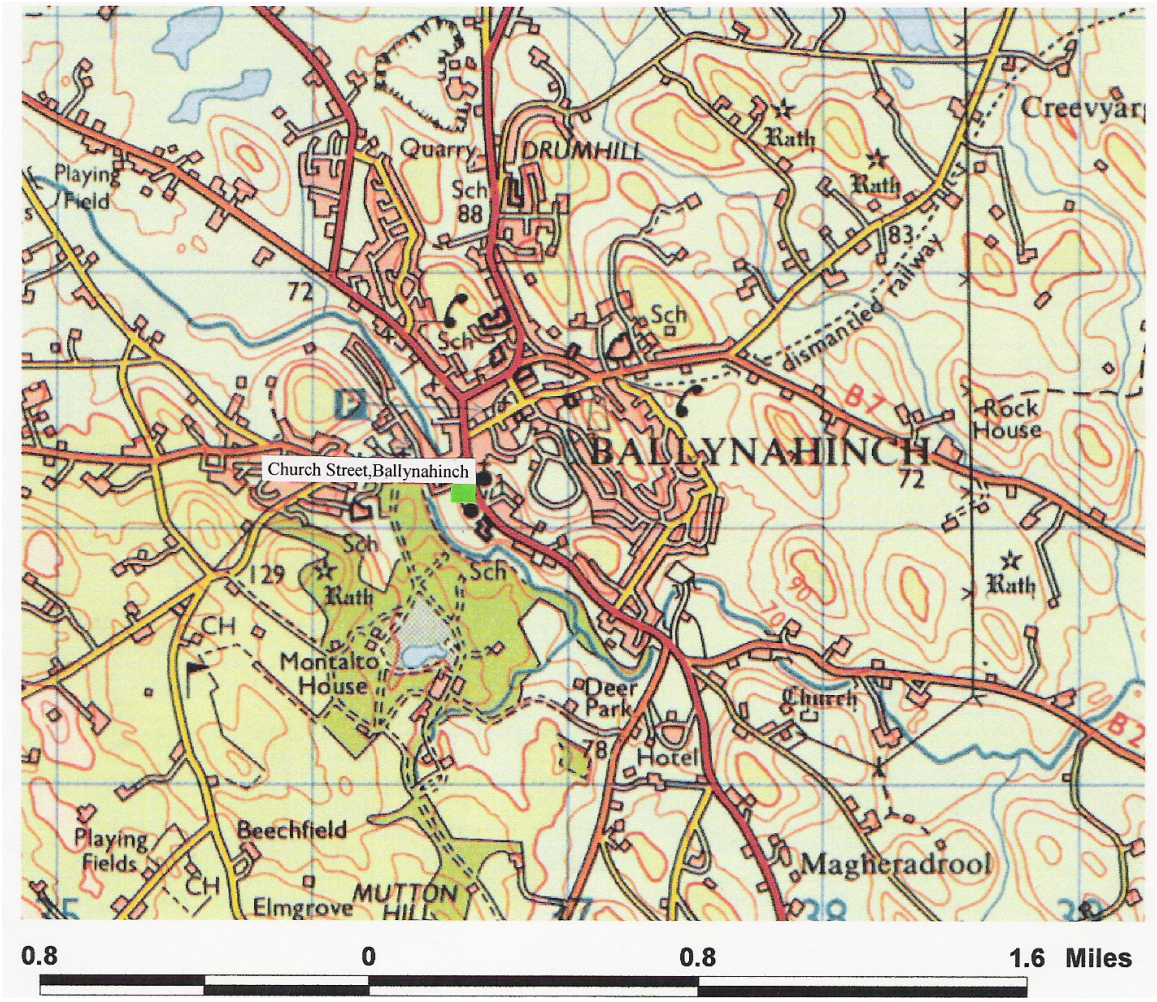
4.4 A further Updating and Screening Assessment exercise is due in April 2006

Appendix1

MAPS SHOWING LOCATIONS OF NO_2 DIFFUSION TUBES AND SMOKE/ SO_2




Rath
Ulster Cottages
Mavesford Bridge
The Fort
Motte
Rath
Rath
Lisdalgan
Ballyagherty Bridge
Sch
B6
58
95
78
Main Street,Saintfield
62
WINDMILL HILL
SAINTFIELD
Sch
93
62
Sch
Sch
Drumnaconnel House
Fort View
Raths
95
Creevy Rocks
THOMPSON'S HILL
N T
Rowallane
59
Crannog
Ballygeely Lough
Leggygowan
0.8
0
0.8
1.6 Miles


Church Street,Ballynahinch
BALLYNAHINCH
DRUMHILL
Quarry
Sch
88
Playing Field
72
Sch
Sch
dismantled railway
83
Rath
Rath
Creevyar
B7
Rock House
72
Sch
Sch
129
Rath
CH
Montalto House
Deer Park
Church
78
Hotel
Rath
Playing Fields
Beechfield
CH
Elmgrove
MUTTON HILL
Magheradrool
0.8
0
0.8
1.6 Miles

<Empty Text>


St Brigid's Cottages
Hotel
Sewage Works
Barbican Farm
Dunes
Murlough Banks
Manor House
B180
A2
Br
Hotel
Football Ground
CH
Earthwork
Main Street,Newcastle
Sch
PC
Tipperary Wood
Hotel
NEWCASTLE
Tourist Centre
Swimming Pool
Donard Park
Golfing Range
Black Rock
Swimming Pool
Greenhill (YMCA)
DRINNAHILLY
Tower
Donard Br
Sch
Mourne House
Harbour
39
36
0.8
0
0.8
1.6 Miles

APPENDIX 2

The Quality System

Casella CRE Air 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 external proficiency schemes in operation. Casella CRE Air participates in the WASP scheme organised by the Health and Safety Laboratory.

Any result from such a scheme that falls outside the relevant limits is immediately investigated and steps taken to rectify the situation. All external proficiency scheme results are also assessed by the Quality Manager at Casella.

The Quality Manager also carries out internal audits.