Local Air Quality Progress Report

June 2005

Executive Summary

A Stage 2 Local Air Quality Management Review & Assessment Report was prepared by Dungannon and South Tyrone Borough Council in August 2004 and appraised by the University of West England (UWE) on behalf of the Environment & Heritage Service. This report was accepted by the Environment & Heritage Service, with the condition that a supplementary document highlighting the impact of NO_2 emissions from road traffic in Dungannon should be submitted. The supplementary report has now been prepared and is appended to this Progress Report in appendix C. Conclusions reached in the Stage 2 Review and Assessment and the recently produced supplementary document, are that no further detailed assessments are required at this time for any of the pollutants reviewed and that there is currently no requirement for any statutory Air Quality Management Areas (AQMAs) to be declared.

Preparation of this Progress Report is the final activity prescribed in the timetable for the First Round of reviews and assessments as set out in LAQM Policy Guidance (LAQM.PGNI(03)). The report has been produced in accordance with guidance detailed in Progress Report Guidance LAQM.PRGNI(04), and summarises the findings of the LAQM activities undertaken by the Council including the currently available air quality monitoring results for 2003/2004.

The conclusion of this report confirms that for all the prescribed air pollutants, concentrations in the Borough are within the statutory limits. The Council will continue to participate fully in the ongoing LAQM Review & Assessment process, to ensure that local air quality across all parts of the Borough is managed in a way that effects compliance with health-based, statutory pollutant limits. In this context, the development of a local air quality management strategy for the Borough is currently in progress.

Contents

1.0 Introduction

1.1 Purpose and Role of Progress Reports

In 1995 the UK Government published its strategic framework for air quality management and established national strategies and policies on air quality. The Northern Ireland Environment Order came into force in January 2003 and implements the European Air Framework Directive 96/62EC and the UK Air Quality Strategy here in Northern Ireland.

Under the Local Air Quality Management (LAQM) regime, councils are required to review present local air quality, make projections on future trends and assess whether the nationally prescribed objectives are likely to be achieved. Progress reports are required to be produced in the years when the authority is not carrying out updating and screening assessments or detailed assessments of air quality.

This progress report has been prepared as part of Dungannon and South Tyrone Borough Council's responsibilities under the Environment (Northern Ireland) Order 2002 to "fill the gap" between three yearly rounds of review and assessment of local air quality. The progress report has been introduced into the local air quality management system, as a means of combating the 'stop-start' approach to environmental reporting and integrate the concepts of local air quality management into the routine of local authority operations.

It is intended that progress reports can assist the Borough councils in the following ways;

- By helping to retain a profile for LAQM within the council, including the retention of staff with knowledge of air quality issues.
- By providing a means for communicating air quality information to members and the public.
- By maximising the value of the investment in monitoring equipment.
- By making the next round of review and assessment that much easier, as there will be a readily available up-to-date source of information.
- By helping Borough councils respond to requests for up-to-date information on air quality.
- By providing information to assist in other policy areas, such as transport and land use planning.
- By providing a ready source of information on air quality for developers carrying out environmental assessments for new schemes.
- By demonstrating progress with implementation of air quality Action Plans and/or air quality strategies.
- By providing a timely indication of the need for further measures to improve air quality, rather than delaying until the next full round of review and assessment.

The overall aims of this progress report are to:

- Report progress on implementing local air quality management.
- Report progress in achieving and maintaining concentrations of prescribed pollutants below the air quality objectives.

This report has therefore been prepared in accordance with the guidelines published in Progress Report Guidance LAQM.PRGNI(04), November 2004.

1.2 Air Quality Strategy Objectives

The following air quality objectives set out in the Air Quality Regulations (NI) 2003 provide the statutory basis for the system of Local Air Quality Management.

Table 1: Air Quality Strategy Objectives

Pollutant	Objective	Measured as	To be achieved by
Benzene	3.25 µg/m^3	Running Annual Mean	31/12/2010
1,3-Butadiene	2.25 µg/m^3	Running Annual Mean	31/12/2003
Carbon monoxide	10.0 mg/m^3	Maximum daily running 8 Hour Mean	31/12/2003
Lead	0.5 µg/m^3	Annual Mean	31/12/2004
	0.25 µg/m^3	Annual Mean	31/12/2008
Nitrogen dioxide	200 µg/m^3 Not to be exceeded more than 18 times per year	1 Hour Mean	31/12/2005
	40 µg/m^3	Annual Mean	31/12/2005
Particles (PM_{10}) (gravimetric)[d]	50 µg/m^3 Not to be exceeded more than 35 times per year	24 Hour Mean	31/12/2004
	40 µg/m^3	Annual Mean	31/12/2004
Sulphur Dioxide	266 µg/m^3 Not to be exceeded more than 35 times per year	15 Minute Mean	31/12/2005
	350 µg/m^3 Not to be exceeded more than 24 times per year	1 Hour Mean	31/12/2004
	125 µg/m^3 Not to be exceeded more than 3 times per year	24 Hour Mean	31/12/2004

1.3 Conclusions of Previous Review and Assessment

PM_{10}

Stage 1 of the first round of review and assessment completed in 2002, concluded that PM_{10} emissions required a further Stage 2 assessment on the basis that it was not possible to rule out the risk of exceedences of prescribed standards at that time

Dungannon and South Tyrone Borough Council submitted its Stage 2 review and assessment report in August 2004. This was accepted and approved by the Environment & Heritage Service following an appraisal by the University of West England (Bristol). The outcome of that review and assessment with regard to PM_{10} emissions, was that there is no significant risk of exceeding the prescribed statutory limit and therefore no requirement to consider the declaration of an AQMA at that time.

SO_2

The Stage 1 review and assessment completed in 2002, concluded that SO_2 emissions required a further Stage 2 assessment on the basis that it was not possible to rule the risk of exceedences at that time.

Dungannon and South Tyrone Borough Council submitted a copy of the Stage 2 review and assessment report in August 2004. The report was accepted and approved by the Environment & Heritage Service following an appraisal by the University of West England (Bristol). The outcome of that review and assessment with regard to SO_2 emissions, is that no further study is required and that a progression to a more detailed Stage 3 assessment was not necessary at that time.

NO_2

The Stage 1 review and assessment completed in 2002, concluded that NO_2 emissions required a further Stage 2 assessment on the basis that it was not possible to rule the risk of exceedences at that time.

Dungannon and South Tyrone Borough Council submitted a copy of the Stage 2 review and assessment report in August 2004. The report was accepted and approved by the Environment & Heritage Service following an appraisal by the University of West England (Bristol). The outcome of that review and assessment with regard to NO_2 emissions at Church Street, Dungannon, was that further assessment was required for this pollutant. The Council completed a 6 month collocation study using NOx tubes supplied by Harwell Scientifics, placed in Church Street at a point of relevant exposure. Two diffusion tubes were placed at the location each month. The results of this study were used as the basis for the supplementary document.

A report on this recently completed supplementary assessment of NOx emissions in Dungannon is appended to this progress report (Appendix C) for consideration and approval by the Environment and Heritage Service.

The supplementary document concludes that exceedence of the prescribed statutory limits for NO_2 is unlikely and there is no requirement for declaration of an AQMA at this time.

2.0 New Monitoring Data

2.1 Summary of Monitoring Undertaken

Dungannon and South Tyrone Borough Council undertakes ambient monitoring of the following pollutants in its area:

- **PM_{10}** (by Automatic Air Monitoring Equipment)
- **NO_2** (by Diffusion Tube)
- **SO_2** (by Automatic Air Monitoring Equipment & Diffusion Tube)

Table 2.1 : Air Quality Monitoring In Dungannon

Pollutant	Equipment	Location	Eastings	Northings
PM_{10}	TEOM series 1400a	Lambfields	307980	359301
SO2	Fluorescent Real-Time Analyser 100A	Lambfields	307980	359301
NO2	Nitrogen Dioxide Network of diffusion tubes managed by AEA Technology	Dungannon 1N, Market Square, Dungannon BT70 1JD	H798	625
		Dungannon 3N, 4 Ardgannon, Dungannon, BT70 1HX	H796	630
		Dungannon 4N, 11 Bushvale, Dungannon BT71 6OD	H811	623
		Dungannon 5N, Howard Primary School, 2 Main Road Moygashel BT71 7OR	H812	607
NO_2	Diffusion Tube	Church Street, Dungannon, Craigavon	7982	6238
NO2	2 x Diffusion Tube (supplied by Harwell Scientifics)	Church Street, Dungannon, Craigavon	7982	6238

2.1.1 Automatic Monitoring Stations

PM_{10}

PM_{10} is the fraction of airborne particles less than 10μm in diameter. These particles can be breathed into the lungs and can carry elements hazardous to human health. PM_{10} is considered as one of the main pollutants included in the air quality objectives and is responsible for approximately 10,000 premature deaths per year in the UK. Significantly the major sources of PM10 in the UK are considered as Road Transport (25%), Power Stations (15%), Industry (13%) and Mining and Quarrying Activities (10%). Particles may also be transported from other parts of the UK and continental Europe.

There are two Air Quality Objectives associated with PM_{10} concentrations which have been derived from the EU Stage 1 limit values in the first Air Quality Daughter Directive. These limits are currently referenced in the Local Air Quality Management, Technical Guidance Document TG(03) as 40μg/m^3 annual mean and 50μg/m^3 as the 24 hour mean not to be exceeded more than 35 days per year (also see Table 1).

Changes to the current limit values are scheduled for implementation in 2010. These limit values have been set by the Department of the Environment Northern Ireland as provisional targets to be achieved by the end of 2010 and are in line with EU Stage 2 limit values to be implemented at the same. These are 20μg/m^3 as the annual mean and 50μg/m^3 as the 24 hour mean not to be exceeded more than 7 days per year. However, since these are provisional targets they have not yet been introduced as LAQM regulations. Therefore all emissions data collected is referenced to the current Air Quality Objectives.

Dungannon and South Tyrone Borough Council has a Rupprecht & Patashnick Continuous Analyser (TEOM series 1400a) located at Lambfields (see Appendix 1). The location is a council depot and is maintained by the Council. This is considered as an urban background site and is close to number of residential housing estates and surrounding road network. The R&P TEOM 1400a, measures particulate matter with a diameter of less than 10μm using a gravimetric air sampling method and can determine mean hourly concentrations. The analyser is housed in an air conditioned and secure cabin.

The daily variances of PM_{10} emissions data can be accessed remotely by both Dungannon and South Tyrone Borough Council and the Environment & Heritage Service in Belfast via a PC modem/telephone line link up. This system allow exceedences of the objective limits to be identified quickly. It also allows technical errors and equipment malfunctions to be quickly rectified as well as providing a back up data base of results.

SO_2

SO_2 is considered as one of the main air quality objectives and is an associated by-product of combustion processes. Significantly a major source of SO_2 is from Power Stations. Which contribute up to 71% of all the SO_2 emissions in the UK. Domestic fuel usage now only contributes up to 4% of the total SO_2 emissions, while road transport only accounts for 1% of the total emissions.

There are three Air Quality Objectives associated with SO_2 concentrations which are equivalent to the EU limit values in the first Air Quality Daughter Directive. These limits are currently referenced in the Local Air Quality Management, Technical Guidance Document TG(03) as a 1 hour mean of 350μg/m^3, not to be exceeded more than 24 times per year and 125μg/m^3 as the 24 hour mean not to be exceeded more than 3 times per year (see Table 1), both objectives to be reached by the end of 2004. The third limit is a 15 min mean of 266 μg/m^3, not to be exceeded more than 35 times per year, and to be complied with by the end of 2005.

Dungannon and South Tyrone Borough Council has a continuous SO_2 analyser (Fluorescent Real-Time Analyser Model 100A) located at Lambfields, Dungannon (see Appendix 1). The location is a depot owned and maintained by Dungannon and South Tyrone Borough Council. It is close to number of residential housing estates and surrounding road network. This is considered as an urban background site and is close to number of residential housing estates. The continuous analyser, measures particulate matter with a diameter of less than 10μm using a gravimetric air sampling method and can determine mean hourly concentrations. The analyser is housed in an air conditioned and secure cabin.

QA / QC

Dungannon and South Tyrone Borough Council currently has no QA/QC or Data Management contract in place for the automatic monitoring equipment located at Lambfields in Dungannon. However, the council is currently in the process of applying for grant funding from the Environment and Heritage Service for the provision of QA/QC auditing services and Data Management from a reputable supplier.

2.1.2 NO_2 Diffusion Tube Monitoring Sites

Dungannon Borough Council carries out monitoring of NO_2 by diffusion tubes at five sites within its Borough. The NO_2 diffusion tubes are prepared and analysed by Lambeth Environmental laboratories. This laboratory takes part in the NO_2 Network QA/QC Field Intercomparison. The tubes are prepared by coating the grids in a 50% v/v solution of the absorbent, triethanolamine (TEA) in water. Analysis is carried out using a colorimetric technique.

Four of the sites are included in the UK NO_2 Network, but none of the sites were co-located with an automatic NO_2 analyser. Details are given in Table 2.1.2

Dungannon Borough Council also has two Diffusion tubes collocated at Church Street. These tubes have been supplied by Harwell Scientifics and were deployed at the site in August 2004.

Table 2.1.2: Diffusion Tube Monitoring Site Details in Dungannon

Pollutant	Equipment	Location	Eastings	Northings
NO_2	Nitrogen Dioxide Network of diffusion tubes managed by AEA Technology	Dungannon 1N, Market Square, Dungannon BT70 1JD	H798	625
		Dungannon 3N, 4 Ardgannon, Dungannon, BT70 1HX	H796	630
		Dungannon 4N, 11 Bushvale, Dungannon BT71 6OD	H811	623
		Dungannon 5N, Howard Primary School, 2 Main Road Moygashel BT71 7OR	H812	607
NO_2	Diffusion Tube	Church Street, Dungannon, Craigavon	7982	6238
NO2	2 x Diffusion Tube (supplied by Harwell Scientifics)	Church Street, Dungannon, Craigavon	7982	6238

2.1.3 SO_2 Diffusion Tube Monitoring Sites

Dungannon and South Tyrone Borough Council no longer carries out monitoring of SO_2 by diffusion tubes at sites within its Borough.

2.2 NEW MONITORING

No new monitoring sites have been set up, since the previous Updating and Screening Assessment.

2.3 MONITORING RESULTS AND COMPARISON WITH AQS OBJECTIVES

2.3.1 PM_{10} (Automatic Monitoring Station)

Data Summary – Lambfields, Dungannon 1st January 2004 to 31st December 2004

Ratified data capture of 82% for PM_{10} was reported over the period 1st January to 31st December 2004. Data capture during this monitoring period did not meet the review and assessment target

of 90% for ratified data sets. Significant periods of lost data across the data set were as a result of a fault with the automatic monitoring equipment.

PM_{10} concentrations were recorded in the DoE Northern Ireland LOW band throughout the period. The DoE Northern Ireland objective value of 50 µg/m^3 based on daily gravimetric equivalent data was not exceeded during the period. The annual mean TEOM concentration of 14µg/m^3 was below the objective value of 40 µg/m^3.

Table 2.3.1 PM_{10} exceedences at Lambfields, Dungannon – 1st January 2004 to 31st December 2004

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
PM_{10} Particulate Matter (Gravimetric)	Daily Mean > 50 µg/m3	0	0
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg/m3	0	-

Data Summary – Lambfields, Dungannon 1st January 2003 to 31st December 2003

Ratified data capture of 88% for PM_{10} was reported over the period 1st January to 31st December 2004. Data capture during this monitoring period did not meet the review and assessment target of 90% for ratified data sets. There was no significant data loss across the period.

PM_{10} concentrations were recorded in the DoE Northern Ireland LOW band throughout the period. The DoE Northern Ireland objective value of 50 µg/m^3 based on daily gravimetric equivalent data was not exceeded on 25 occasions during the period. The mean TEOM concentration of 28µg/m^3 gravimetric equivalent was below the DoE Northern Ireland annual mean objective value of 40 µg/m^3.

Table 2.3.2: PM_{10} exceedences at Lambfields, Dungannon - 1st January 2003 to 31st December 2003

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
PM_{10} Particulate Matter (Gravimetric)	Daily Mean > 50 µg/m3	25	25
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg/m3	0	-

2.3.2 SO_2 (Automatic Monitoring Station)

Data Summary – Lambfields, Dungannon 1st January 2004 to 31st December 2004

Ratified data capture of 96% for SO_2 was reported over the period 1st January to 31st December 2004. Data capture during this monitoring period met the review and assessment target of 90% for ratified data sets. There was no significant data loss across the period.

SO_2 concentrations were recorded in the DoE Northern Ireland LOW band throughout the period. The maximum 15 minute mean of 237 µg/m^3 was below the DoE Northern Ireland 15 minute objective value of 266 µg/m^3. The maximum hourly mean of 116 µg/m^3 was below the DoE Northern Ireland hourly objective value of 350 µg/m^3. The maximum daily mean of 60 µg/m^3 was below the DoE Northern Ireland daily objective of 125 µg/m^3.

Table 2.3.3: SO_2 exceedences at Lambfields, Dungannon – 1st January to 31st December 2004

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-Minute Mean > 266 µg/m^3	0	0
Sulphur Dioxide	Hourly Mean > 350 µg/m^3	0	0
Sulphur Dioxide	Daily Mean > 125 µg/m^3	0	0

Data Summary – Lambfields, Dungannon 1st January 2003 to 31st December 2003

Ratified data capture of 96% for SO_2 was reported over the period 1st January 2004 to 31st December 2004. Data capture during this monitoring period met the review and assessment target of 90% for ratified data sets. There was no significant data loss across the period.

SO_2 concentrations were recorded in the DoE Northern Ireland LOW band throughout the period. The maximum 15 minute mean of 141 µg/m^3 was below the DoE Northern Ireland 15 minute objective value of 266 µg/m^3. The maximum hourly mean of 78 µg/m^3 was below the DoE Northern Ireland hourly objective value of 350 µg/m^3. The maximum daily mean of 35 µg/m^3 was below the DoE Northern Ireland daily objective of 125 µg/m^3.

Table 2.3.4: SO_2 exceedences at Lambfields, Dungannon - 1st January 2004 to 31st December 2004

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
Sulphur Dioxide	15-Minute Mean > 266 µg/m^3	0	0
Sulphur Dioxide	Hourly Mean > 350 µg/m^3	0	0
Sulphur Dioxide	Daily Mean > 125 µg/m^3	0	0

2.4.1 NO_2 (Diffusion Tube Monitoring)

NO_2 diffusion tube monitoring results have been bias corrected for 2003 and 2004.

Nitrogen Dioxide concentrations recorded by the diffusion tubes indicate that Nitrogen Dioxide concentrations currently comply with the annual mean Air Quality Strategy objective at all measurement locations. Guidance provided by DEFRA (Review and Assessment: Pollutant-Specific Guidance, LAQM. TG(03)), projects that NO_2 concentrations will reduce from current levels by the target date of 31st December 2005.
Tables 1, 2 & 3 in Appendix B, list the results for NO_2 diffusion tubes during 2003 and 2004.

3.0 New Developments – Since the First Stage Review & Assessment

3.1 Industrial Processes

3.1.1 Part A Industrial Processes

No new Part A processes were authorised for operation.
None of the existing Part A processes underwent significant changes likely to increase their emissions by 30% or more.

3.1.2 Part B Industrial Processes

No new Part B industrial processes were authorised in the Dungannon Borough. No previously existing Part B processes underwent significant changes likely to increase their emissions by 30% or more.

3.1.3 Other Industrial Processes

3.1.3.1 New landfill, Quarrying and Mineral Processes

No landfill, quarrying or mineral processes have started operation or significantly changed.

3.1.3.2 New Fuel Storage Depots

No new major fuel storage depots, either in or close to the Dungannon Borough, have been identified.

3.1.3.3 Small Boilers

Dungannon Borough Council is not aware of any significant changes to >5$MW_{(thermal)}$ fuel plants and processes.

3.1.4 Industrial Process Closures

Dungannon and South Tyrone Borough Council has not identified any process closures within the Borough.

3.2 Transport

3.2.1 New Road Developments

No new roads have been constructed or proposed.

3.2.2 Significant Changes to Existing Roads

Dungannon and South Tyrone Borough Council has identified no significant road layout changes or road works.

3.2.3 Newly Identified Public Exposure to Vehicle Emissions

No roads have been identified with annual average daily traffic flow (AADTF) greater than 10,000 vehicles per day, which have experienced large increases (25% or more) in traffic flow, since the previous Updating and Screening Report. Local Authorities are required to consider whether there are any of the following in their area, either new since the last Report, or newly identified:

1. Narrow congested streets meeting the following criteria:
   - Residential properties are within 5m of the kerb.
   - Average traffic speeds are 50kph or less.
   - The carriageway is less than 10m wide, and
   - AADTF is greater than 10,000.
2. Busy streets where people may spend 1 hour or more close to traffic (most likely in streets of shops, bars, cafes etc.), meeting the following criteria:
   - Public exposure for 1 hour or more within 5m of the kerb
   - AADT > 10,000 vehicles per day.

There are no new, or newly identified streets meeting these criteria.

3.2.4 Other Transport Sources

As well as road vehicles, public exposure to emissions from planes, buses, trains, ships etc. must also be considered.

3.2.4.1 Trains

Not applicable to the Borough of Dungannon

3.2.4.2 Airports

There are no airports in Dungannon or neighbouring authorities that have a throughput of 5 million passengers per year and/or 500,000 tonnes of freight.

3.2.4.3 Bus Stations

The main bus stations within the Dungannon Borough have less than 1000 bus movements per day. There are no newly identified bus stations with more than 1000 bus movements per day, and no bus stations where movements have increased to more than 1000 per day.

3.2.4.4 Shipping

Dungannon is inland and has no ports with more than 5,000 shipping movements per year

3.3 Residential, Commercial and Public

3.3.1 New Housing Developments

There are no significant new housing developments proposed for the Dungannon Borough area that have full planning permission granted.

3.3.2 New Commercial Developments

There are no significant new commercial developments (e.g. retail parks, office blocks, leisure centres).

3.3.3 New Public Developments

New public developments such as schools, hospitals, stations, major car parks require consideration as they may impact on local traffic flow.

No such new public developments have been confirmed.

4.0 Conclusions and Recommendations

4.1 Conclusions from New Monitoring Data

Since preparation of the Stage 2 Report of August 2004 and the Supplementary Report of June 2005, monitoring results indicate that concentrations of the most significant of the prescribed pollutants, PM_{10} NO_2 & SO_2 are unlikely to exceed the statutory limits.

This Progress Report has not identified any sources that require further assessment. Therefore at this stage there is no need for Dungannon Borough Council to proceed to a detailed assessment for any of the pollutants.

4.2 Recommendations

Passive sampling by diffusion tubes is a simple cost effective method of monitoring and checking air quality in an area, and it is recommended that the NO_2 diffusion tube monitoring be continued with the network being extended where necessary in the light of future screening exercises. The diffusion tube survey will comply with the objectives and sampling methods as set out in LAQM TG(03).

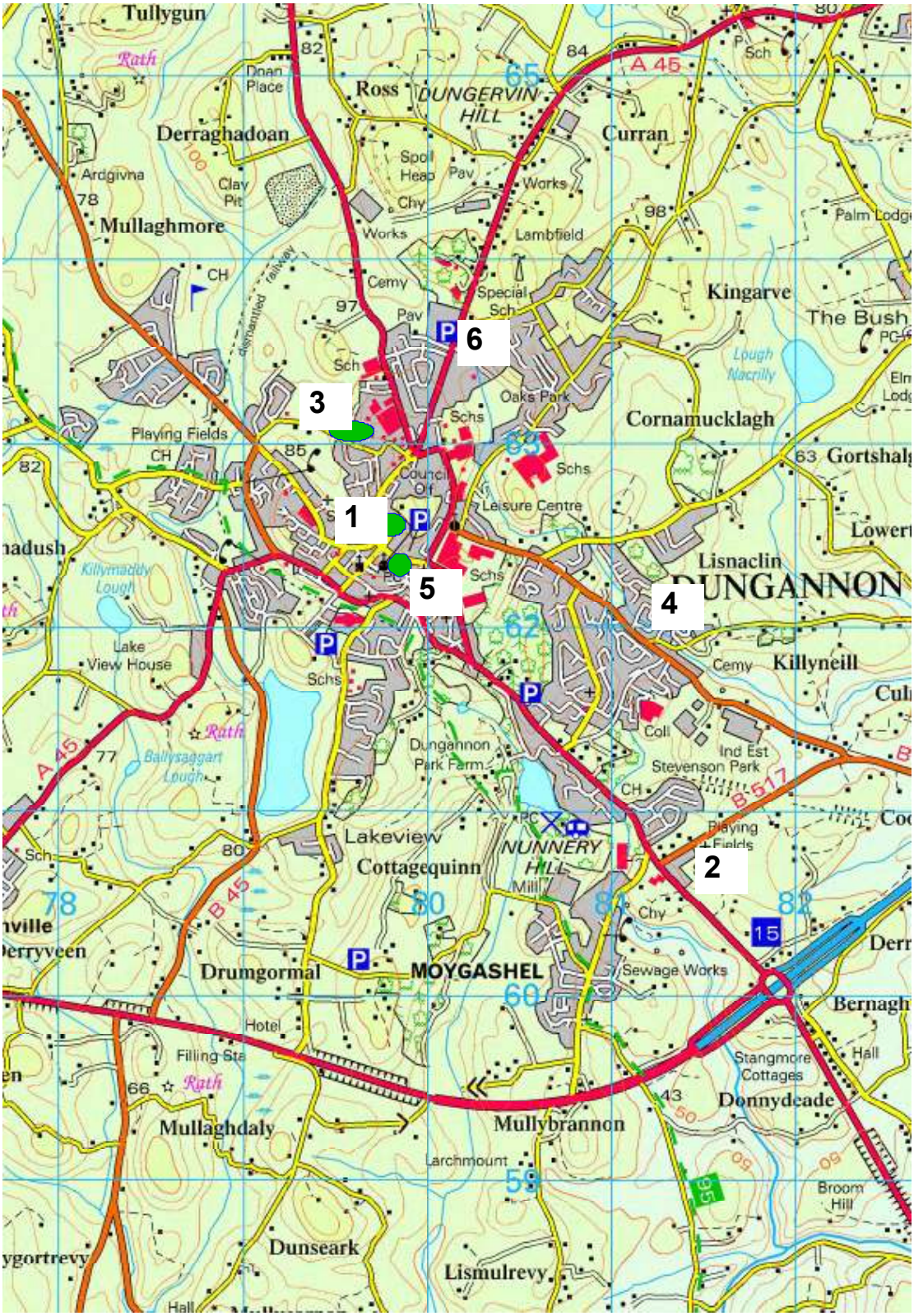
Significant capital expenditure has already been incurred for continuous automatic monitoring for PM_{10} & SO_2. Although results obtained to date would indicate that there is negligible risk of exceeding prescribed standards, it is recommended that this monitoring be continued since it would be relatively inexpensive to do so and this will add to the database of pollutant concentrations in the Borough. In due course, consideration may be given to relocation of the automatic monitors to other locations identified by future screening that have more potential to be affected by the pollutants concerned

Dungannon Borough Council is considering the future implications of Local Air Quality by developing a Local Air Quality Strategy. The Strategy is currently at the development stage and it is envisaged that proposals and recommendations highlighted in the strategy will start to be implemented in Autumn 2005.

APPENDIX A

DUNGANNON and SOUTH TYRONE BOROUGH COUNCIL

Local Air Quality Monitoring Map



KEY

1 - 5 – NOx Diffusion Tube Monitoring Locations

6 - PM_{10} & SO_2 Automatic Monitoring Location (Lambfields)

APPENDIX B

NOx DATA

DUNGANNON and SOUTH TYRONE BOROUGH COUNCIL

2003 & 2004

Dungannon NOx Diffusion Tube Results 2004

	Nitrogen Oxides in air ug/cu					
	Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**	
Jan-04	2	27	13	13	33	**36**
Feb-04	20	22	16	8	38	**41**
Mar-04	41	26	39	25	39	**42**
Apr-04	13	8	6	2	23	**25**
May-04	54	9	31	13	25	**27**
Jun-04	31	10	22	NS	32	**35**
Jul-04	15	19	10	NS	14	**15**
Aug-04	12	87	10	4	34	**37**
Sep-04	15	12	11	6	29	**31**
Oct-04	20	12	12	7	NS	**0**
Nov-04	13	19	15	8	38	**41**
Dec-04	20	18	19	8	37	**40**
Mean						**34**

Site 1	Market Square
Site 2	Howard Primary School
Site 3	Ardgannon
Site 4	11 Bushvale
Site 5	Church Street

Dungannon NOx Diffusion Tube Results 2003						
	Nitrogen Oxides in air ug/cu					
	Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**	
Jan-03	NS	43	33	21	63	66
Feb-03	31	32	31	12	45	47
Mar-03	7	18	20	20	34	36
Apr-03	8	25	10	3	26	27
May-03	16	11	8	5	47	49
Jun-03	19	31	3	7	35	37
Jul-03	14	10	10	4	40	42
Aug-03	3	4	0	0	34	36
Sep-03	21	19	18	9	64	67
Oct-03	16	14	10	5	38	40
Nov-03	22	30	18	18	60	63
Dec-03	27	26	20	13	43	45
						46

Site 1	Market Square
Site 2	Howard Primary School
Site 3	Ardgannon
Site 4	11 Bushvale
Site 5	Church Street

Table 3: Co-located NO_2 Diffusion Tubes on Church Street, Dungannon 2004 - 05						
Date	**Church Street 1**			**Church Street 2**		
	ug m3	**ppb**	**ug m3 corrected for bias**	**ug m3**	**ppb**	**ug m3 corrected for bias**
Aug-04	-	-	**0**	31.3	16.3	**22.8**
Sep-04	41.1	21.4	**30**	36.2	18.8	**26.4**
Oct-04	49.9	26	**37.4**	50.7	26.4	**38**
Nov-04	63.2	32.9	**47.4**	66.2	34.4	**49.7**
Dec-04	52.7	27.4	**39.5**	57.1	29.7	**42.8**
Jan-05	44.9	23.3	**33.2**	48.6	25.3	**36**
Mean			**38**			**36.0**

APPENDIX C

SUPPLEMENTARY REPORT ON NOx EMISSIONS FROM TRAFFIC ON CHURCH STREET

DUNGANNON and SOUTH TYRONE BOROUGH COUNCIL

2004

Dungannon & South Tyrone Borough Council

Local Air Quality Management

Stage 2 Review & Assessment

June 2005

Supplementary Report on NO_2 Concentrations in Church Street, Dungannon.

Executive Summary

The report on the second stage review and assessment of local air quality for the Borough of Dungannon and South Tyrone was submitted for review and approval in August 2004. This concluded that except for NO_2, there was no need for further detailed assessment of prescribed pollutants or declaration of Air Quality Management Areas (AQMAs) at this time. The August 2004 report concluded that additional diffusion tube monitoring should be undertaken for a minimum of 6 months to develop a more accurate picture NO_2 levels, since results of diffusion tube monitoring data available at the time conflicted significantly with predictions of NO_2 concentrations using the Design Manual for Roads and Bridges (DMRB) model. The stage 2 report was accepted, with the proviso that a supplementary report be submitted in due course, detailing the findings of the additional monitoring.

2 additional collocated diffusion tubes were placed at a position close to an existing tube at a point of relevant exposure in Church Street, between August 2004 and January 2005. The results of this additional monitoring confirm that whilst the NO_2 concentrations are significantly higher than that predicted using the DMRB model, they are below the prescribed objective limit of 40 $\mu g/m^{-3}$

This report concludes that there is no requirement for declaration of an AQMA in respect of road traffic NO_2 pollution in Church Street at this time. Therefore the overall conclusion from the stage 2 review and assessment process is that no exceedance is predicted for any of the pollutants prescribed under the local air quality management regime, and there is no requirement for any AQMAs in the Borough at this time.

Contents

1.0 Introduction

Following the completion of the Stage 1 review and assessment of local air quality in the Dungannon & South Tyrone Borough Council area, Nitrogen Dioxide (NO_2), was identified as a pollutant requiring further assessment.

Dungannon's second stage review and assessment of local air quality, completed in August 2005, highlighted the need for additional monitoring at Church Street Dungannon. In that report, the annual average kerbside concentration of NO_2 for 2005, estimated using the Design Manual for Roads and Bridges (DMRB) model, was predicted to be 22.8μg/m^3; well within the prescribed objective of 40μg/m^3. However monitoring data from a single diffusion tube located at a point of relevant in Church Street was indicating a predicted annual mean concentration of 41.7μg/m^{-3} for 2005; above the prescribed NO_2 objective limit. Therefore, in order to provide more reliable NO_2 monitoring data upon which to base future local air quality management decisions, 2 additional collocated diffusion tubes were placed close to the location of an existing diffusion monitoring tube at a point of relevant exposure in Church Street, Dungannon. (see location map at appendix 1)

This report is a supplementary document incorporating additional information on further assessment of NO_2 concentrations arising from road traffic emissions in Church Street, Dungannon. It is envisaged that this document will conclude the stage 2 Review and Assessment on local air quality for Dungannon & South Tyrone Borough Council.

2.0 Diffusion Tube Monitoring Results

The original diffusion tube located in Church Street is supplied and analysed by Lambeth Scientific Services. The additional tubes were supplied and analysed by Harwell Scientifics.

Table 1 and Table 2 show NO_2 monitoring results for Church Street, Dungannon.

Table 1: Lambeth Scientific Services – original diffusion tube site

			Annual Average	Corrected for lab bias	Projected for 2005
2004	Site 5	Church St	31	34	33.15

Table 2: Harwell Scientifics – additional 2 collocated tubes

1.1 DATE	2 Church Street 1 - Dungannon			3 Church Street 2 - Dungannon		
	µg m3	ppb	µg m3 corrected for bias	µg m3	ppb	µg m3 corrected for bias
Aug-04	-	-	**0**	31.3	16.3	**22.8**
Sep-04	44.1	21.4	**30**	36.2	18.8	**26.4**
Oct-04	49.9	26	**37.4**	50.7	26.4	**38**
Nov-04	63.2	32.9	**47.4**	66.2	34.4	**49.7**
Dec-04	52.7	27.4	**39.5**	57.1	29.7	**42.8**
Jan-05	44.9	23.3	**33.2**	48.6	25.3	**36**
3.1 MEAN			**38**			**36.0**
Projected for 2005			**37.04**			**35.1**

3.0 Quality Assurance/Quality Control

The NO_2 diffusion tube monitoring undertaken by the Council is carried out in accordance with the QA/QC standards set out in the NO_2 Diffusion Tube Network Instruction Manual, and the results of such monitoring are supplied to Netcen for inclusion in the annual report of NO_2 monitoring data. The tubes are analysed by laboratories that participate in the UK NO_2 diffusion tube network inter-comparison, and for which a bias 'correction factor' is published. As specified in tables 1 and 2, the bias factor was applied to results obtained.

4.0 Conclusion and Recommendations

The entire 12 month monitoring results for 2004 at the original diffusion tube site (Site 5 – table 1) and the results from the new collocated tubes in Church Street (Church Street 1 and Church Street 2 – table 2) indicate no predicted exceedance of the 2005 objective. The council does not intend to carry out additional modelling at this stage, and there is no intention at this stage to declare and Air Quality Management Area for road traffic NO_2 pollution in Church Street.

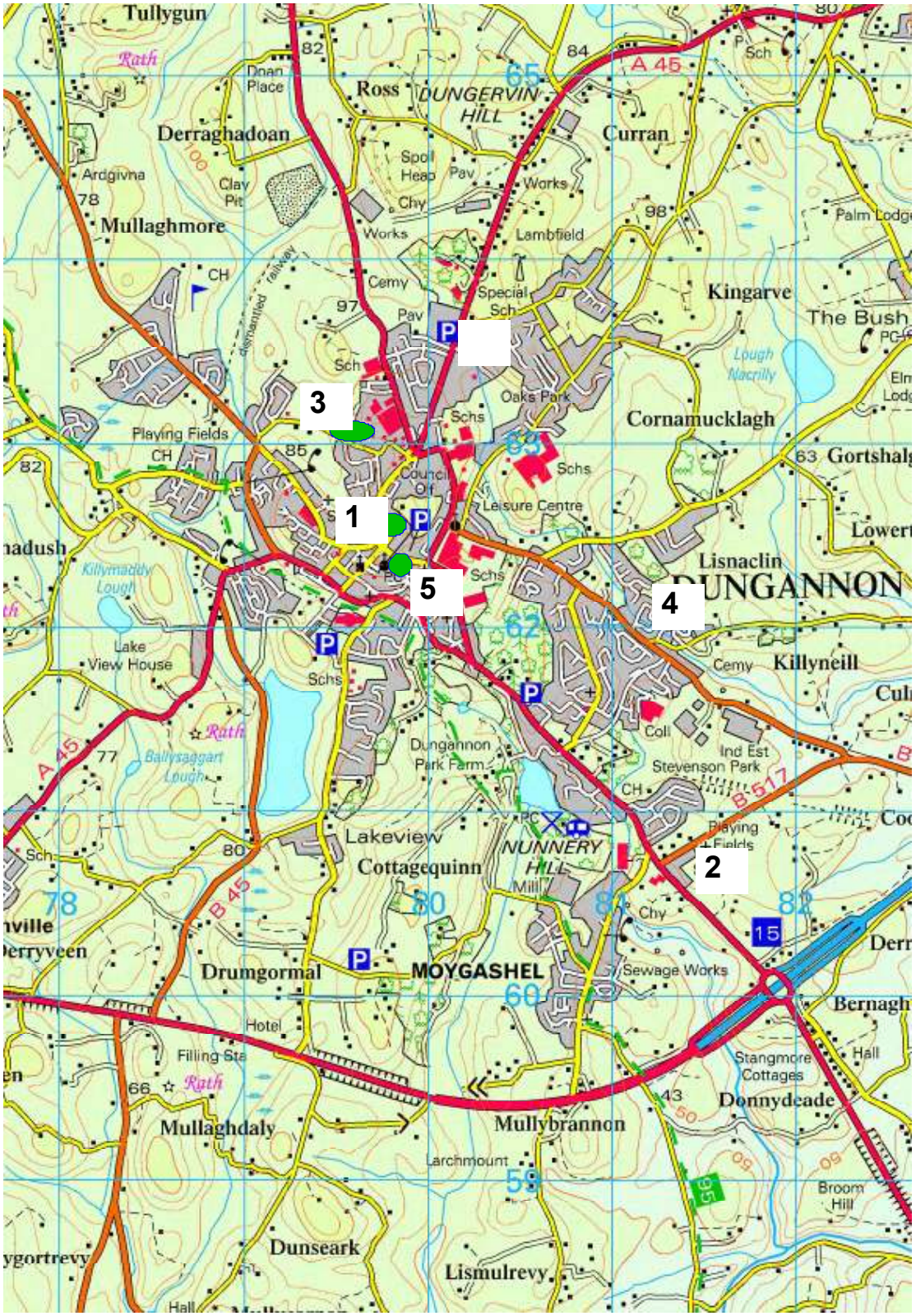
However since April 2005 the council has located 3 diffusion tubes in Church Street and will closely monitor air quality data over coming months.

The first complete round of review & assessment of local air quality in the Borough of Dungannon and South Tyrone therefore concludes that there will be no breach of any of the statutorily prescribed local air quality objectives, and there is no requirement for further detailed assessment or declaration of AQMAs at this time.

It is anticipated that the proactive management of local air quality will be addressed through participation in the ongoing statutory review and assessment process and through the implementation of a Local Air Quality Management Strategy (referred to the main Progress Report).

Appendix 1

NO_2 Diffusion Tube Locations



1 – NO_2 Diffusion Tube Monitoring Sites – Church Street, Dungannon