Dungannon and South Tyrone Borough Council

Local Air Quality Progress Report

June 2008

Executive Summary

A Detailed Assessment Report regarding emissions of Nitrogen Dioxide from road traffic at Church Street in Dungannon was prepared by Dungannon and South Tyrone Borough Council in November 2007 and appraised by the University of West England (UWE) on behalf of the Environment & Heritage Service. This report specifically highlighted that the Council would be required to declare an Air Quality Management Area (AQMA) for a section of Church Street on the boundary of Perry Street and Market Place. The report was accepted by the Environment & Heritage Service and the AQMA has duly been declared to the public and statutory partners.

Preparation of this Progress Report is the current activity prescribed in the timetable for the Third round of reviews and assessments as set out in LAQM Policy Guidance (LAQM TG(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 2007. Dungannon and South Tyrone Borough Council have not submitted a Progress Report to the EHS since 2004. The preparation of detailed assessments during past rounds of reviews exempted the Council from that particular task. In this round of assessment, all councils are expected to deliver progress reports regardless of their monitoring or assessment situation.

The conclusion of this report confirms that for all the prescribed air pollutants, concentrations in the Borough are within the statutory limits with the exception of NO2 at Church Street for which an AQMA has been declared. 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.

Borough
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 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 this time.

Dungannon and South Tyrone Borough Council submitted its Second Round Updating & Screening Assessment in June 2006. That assessment concluded that Dungannon and South Tyrone Borough Council was not required to proceed to a more detailed assessment for PM10.

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 this time.

Dungannon and South Tyrone Borough Council submitted its Second Round Updating & Screening Assessment in June 2006. That assessment concluded that Dungannon and South Tyrone Borough Council was not required to proceed to a more detailed assessment for SO2.

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 that time.

A Detailed Assessment Report regarding emissions of Nitrogen Dioxide from road traffic at Church Street in Dungannon was prepared by Dungannon and South Tyrone Borough Council in November 2007 and appraised by the University of West England (UWE) on behalf of the Environment & Heritage Service. This report specifically highlighted that the Council would be required to declare an Air Quality Management Area (AQMA) for a section of Church Street on the boundary of Perry Street and Market Place. The report was accepted by the Environment & Heritage Service and the AQMA has duly been declared to the public and statutory partners.

2.0 New Monitoring Data

2.1 Summary of Monitoring Undertaken

Dungannon and South Tyrone Borough Council undertake 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)

Table 2.1 : Air Quality Monitoring In Dungannon

Pollutant	Equipment	Location	Eastings	Northings
PM_{10}	TEOM series 1400a	Lambfields	307980	359301
SO_2	Fluorescent Real-Time Analyser 100A	Lambfields	307980	359301
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	12 x Diffusion Tube (supplied by Harwell Scientifics)*	Church Street, Dungannon	7982	6238

*Note: 12 diffusion tubes placed at Church Street until September 2007. There is currently only 3 tubes at this location.

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 a QA/QC or Data Management contract in place for the automatic monitoring equipment located at Lambfields in Dungannon. This contract is due to expire in January 2009.

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 three Diffusion tubes collocated at Church Street. These tubes have been supplied by Harwell Scientifics and were deployed at the site in August 2004. :12 diffusion tubes placed at Church Street until September 2007. The extra 9 tubes were removed at the end of the detailed assessment period. The 3 remaining tubes are located on a lamppost adjoining the façade of a building which is currently used for sheltered accommodation. This location has been judged to be the most sensitive receptor on the street and was the deciding factor for declaring an AQMA for NO2 in January 2008.
Its is likely that the diffusion tubes at this location will remain in situ for the foreseeable future and will be the main tool used to assess the success of the AQMA action plan or to determine if there has been any further deterioration in the air quality within Church Street.
At this particular point in time it has not been decided if any more diffusion tubes will be located on Church Street. Consideration may be given to further monitoring of this sort following the publication of the action plan and consultation with the Councils strategic partners.

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
NO2	12 x Diffusion Tube (supplied by Harwell Scientifics)	Church Street, Dungannon	7982	6238

2.1.3 SO_2 Diffusion Tube Monitoring Sites

Dungannon and South Tyrone Borough Council no longer carry out monitoring of SO_2 by diffusion tubes, at sites within council Borough.

2.2 NEW MONITORING

Dungannon and South Tyrone Borough Council carried out a detailed assessment of NO2 emissions from road traffic pollution in Church Street and Perry Street during 12 months from September 2006 to September 2007. This included purchasing 9 additional diffusion tubes to compliment the 3 tubes already in position at the western end of Church Street. The other 9 tubes were positioned at 3 sampling locations along the length of Church Street and Perry Street. (See Map 2 on Page 22)

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 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

DUNGANNON LAMBFIELDS
01 January to 31 December 2005

These data are customer supplied and have not been quality controlled by AEA

POLLUTANT	PM_{10}*+
Number Very High	0
Number High	0
Number Moderate	0
Number Low	4232
Maximum 15-minute mean	225 µg m^{-3}
Maximum hourly mean	121 µg m^{-3}
Maximum running 8-hour mean	69 µg m^{-3}
Maximum running 24-hour mean	40 µg m^{-3}
Maximum daily mean	40 µg m^{-3}
Average	18 µg m^{-3}
Data capture	48.8 %

* PM_{10} Indicative Gravimetric Equivalent µg m-3
+ PM_{10} as measured by a TEOM using a factor of 1.3 to give Indicative Gravimetric Equivalent
All mass units are at 20'C and 1013mb

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Exceedences	Days
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	0	-

DUNGANNON LAMBFIELDS
01 January to 31 December 2006

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	SO_2	PM_{10}*+
Number Very High	0	0
Number High	0	0
Number Moderate	0	0
Number Low	31910	8027
Maximum 15-minute mean	239 µg m^{-3}	204 µg m^{-3}
Maximum hourly mean	82 µg m^{-3}	169 µg m^{-3}
Maximum running 8-hour mean	23 µg m^{-3}	81 µg m^{-3}
Maximum running 24-hour mean	15 µg m^{-3}	59 µg m^{-3}
Maximum daily mean	14 µg m^{-3}	54 µg m^{-3}
Average	5 µg m^{-3}	20 µg m^{-3}
Data capture	93.0 %	91.4 %

* PM_{10} Indicative Gravimetric Equivalent µg m-3
+ PM_{10} as measured by a TEOM using a factor to give 1.3 for Indicative Gravimetric Equivalent
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}	0	0
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	4	4
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	0	-

DUNGANNON LAMBFIELDS
01 January to 31 December 2007

These data have been fully ratified by AEA Energy & Environment

POLLUTANT	SO_2	PM_{10}*+
Number Very High	0	0
Number High	0	0
Number Moderate	0	0
Number Low	26560	6816
Maximum 15-minute mean	141 µg m^{-3}	446 µg m^{-3}
Maximum hourly mean	53 µg m^{-3}	238 µg m^{-3}
Maximum running 8-hour mean	21 µg m^{-3}	79 µg m^{-3}
Maximum running 24-hour mean	14 µg m^{-3}	57 µg m^{-3}
Maximum daily mean	13 µg m^{-3}	49 µg m^{-3}
Average	5 µg m^{-3}	19 µg m^{-3}
Data capture	77.9 %	77.8 %

* PM_{10} Indicative Gravimetric Equivalent µg m-3
+ PM_{10} as measured by a TEOM using a factor of 1.3 to give Indicative Gravimetric Equivalent
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}	0	0
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	0	0
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	0	-

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 $>5MW_{(thermal)}$ 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

There are no new, or newly identified, locations where diesel locomotives are regularly stationary for five minutes or more and -

- There is potential for public exposure within 15m of the locomotives
- There are more than two occasions a day when diesel locomotives are stationary with engines running for more than 15 minutes.

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

Monitoring results for 2007 (running September 06 to September 07) indicate that concentrations of the prescribed pollutants, PM_{10} & SO_2 are unlikely to exceed the statutory limits. However it is likely that there will be an exceedence of the prescribed limits for NO2 at Church Street in Dungannon. A detailed assessment submitted to the EHS in November 2007 recommended the declaration of an AQMA. The EHS accepted this recommendation and an AQMA was declared for Church Street in January 2008.

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).

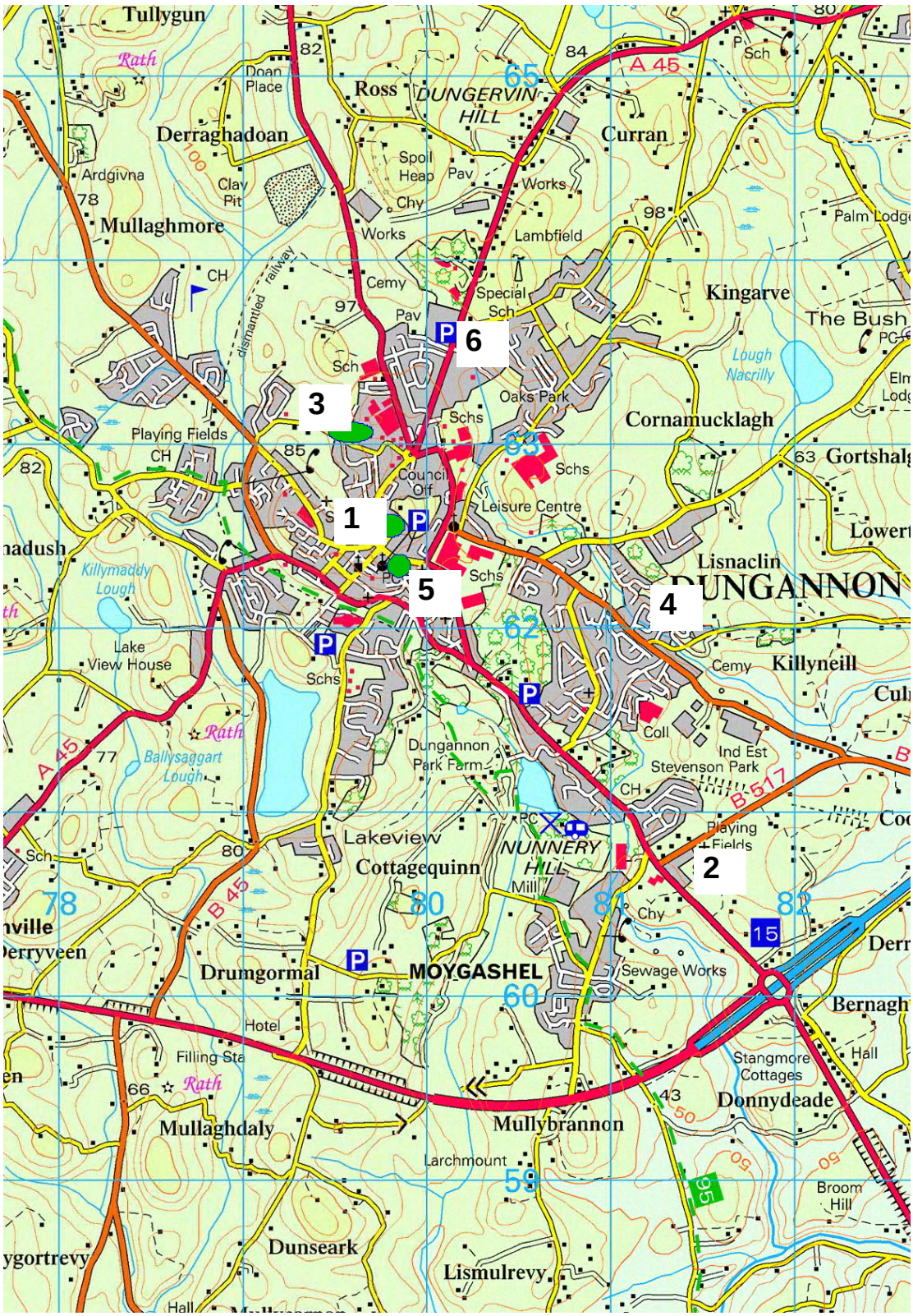
Significant capital expenditure has already been incurred for continuous automatic monitoring for PM_{10} & SO_2 for a number of years to date. Results obtained over that period would indicate that there is negligible risk of exceeding prescribed standards; it is recommended that **automatic monitoring be discontinued** at its Lambfields site in Dungannon. The Council adjudged in this instance that the cost of keeping the automatic monitoring programme in operation was inequitable compared to the prospect of their ever being a breech of the prescribed limits at this location.The Council plans to shut down all automatic monitoring operations following the expiration of the current QA/QC contract in January 2009. . 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. Also the Council will consider lending the automatic monitoring equipment to any other local authority or government department that requires it in lieu of permission granted upon it by the EHS (PEPG).

Dungannon and South Tyrone Borough Council currently has its Air Quality Management Strategy in place and is working to fulfil the objectives that were initiated as part of the Strategy. The Strategy is currently at the end of its second year since being launched in March 2006 and the council has been involved in a successful ‘Walk to School’ campaign to highlight the issues of air pollution and road traffic caused by the school run. The council is also registered on the DOE Travelwise ‘Carshare’ scheme. Since local air quality management work by the council has to date indicated that the Borough enjoys a relatively good standard of air quality, it is anticipated that the strategy will focus on protecting this position for the future

APPENDIX A

DUNGANNON and SOUTH TYRONE BOROUGH COUNCIL

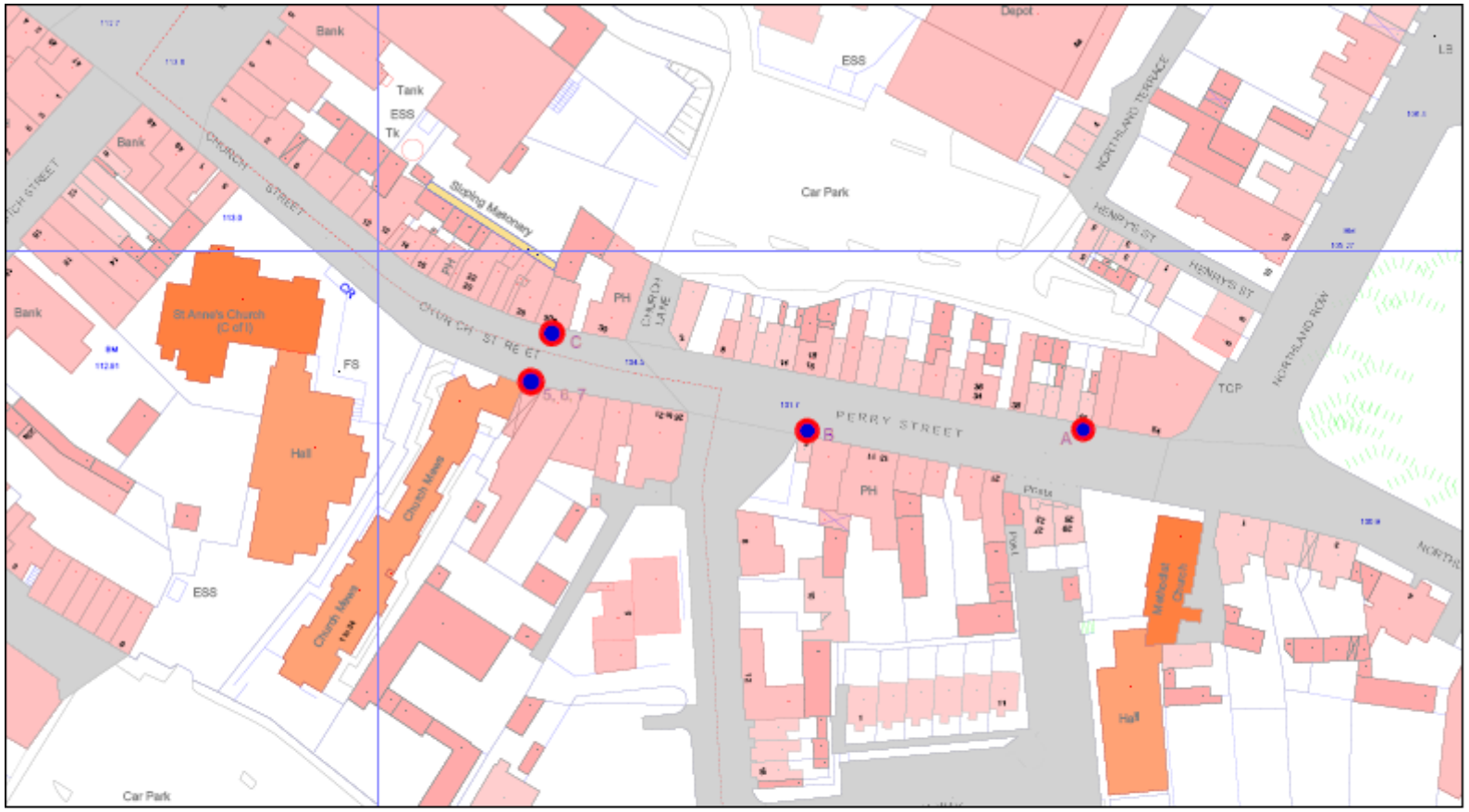
Local Air Quality Monitoring Map



MAP 1 KEY

1 - 5 – NOx Diffusion Tube Monitoring Locations

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



DUNGANNON & SOUTH TYRONE Borough Council

5, 6, 7	IH	79830, 62370
C	IH	79846, 62382
B	IH	79897, 62359
A	IH	79959, 62361

SCALE 1:1250

ORDNANCE SURVEY OF NORTHERN IRELAND

Map 2: Diffusion Tube Monitoring on Church Street and Perry Street 2007

APPENDIX B

NOx DATA

DUNGANNON and SOUTH TYRONE BOROUGH COUNCIL

2003 & 2007

GRADKO INTERNATIONAL LTD																
Dungannon Nitrogen Dioxide (NO2) Results ug/cu																
	Site 1	Site 2	Site 3	Site 4	Site 5A	Site 5B	Site 5C	Site A1	Site A2	Site A3	Site B1	Site B2	Site B3	Site C1	Site C2	Site C3
Jan-07	24.99	17.33	12.52	9.39	36.39	37.45	36.78	26.21	21.69	23.42	18.78	18.61	19.00	33.87	31.75	29.62
Feb-07	32.14	23.62	22.70	18.03	50.98	59.45	55.30	34.39	NS	29.44	31.68	32.14	28.51	38.88	38.48	47.06
Mar-07	23.52	25.48	13.08	9.07	38.92	40.02	43.71	31.72	34.05	34.96	27.76	29.39	27.30	41.52	38.01	37.92
Apr-07	23.77	25.05	13.11	7.75	55.92	49.75	48.46	32.33	32.04	32.45	25.28	27.32	28.08	44.21	38.21	41.12
May-07	25.59	22.02	9.17	6.78	40.48	51.46	44.22	28.92	30.84	25.47	20.45	21.38	22.08	36.10	34.87	35.98
Jun-07	22.47	28.84	11.03	7.64	49.36	40.01	44.57	44.66	41.54	43.31	26.90	29.74	29.47	42.85	36.80	41.18
Jul-07	21.13	21.32	7.83	5.97	43.90	46.94	39.67	27.33	28.23	28.40	18.88	20.62	20.29	33.59	35.61	36.35
Aug-07	24.73	21.25	7.69	6.67	43.81	50.59	45.06	31.90	31.56	32.76	21.36	23.02	21.14	44.84	42.50	45.12
Sep-07	23.19	0.00	9.76	8.41	42.90	38.47	37.65									
Oct-07	27.54	0.00	16.66	14.50	62.55	54.85	65.16									
Nov-07	29.48	26.76	13.61	12.16	46.69	51.26	53.35									
Dec-07	27.15	25.66	15.86	14.28	49.23	61.01	50.40									
Mean	25.48	19.78	12.75	10.05	46.76	48.44	47.03									
Bias Mean	**22.67**	**17.60**	**11.35**	**8.95**	**41.62**	**43.11**	**41.85**									

Sampling at additional sites on Church Street and Perry Street discontinued in September 2007

GRADKO INTERNATIONAL LTD												
Additional Nitrogen Oxides Monitoring at Church Street and Perry Street Sept 06 to Sept 07 (ug/cu)												
	Site 5A	Site 5B	Site 5C	Site A1	Site A2	Site A3	Site B1	Site B2	Site B3	Site C1	Site C2	Site C3
Jan-07	44	44	48	18	15	22	18	17	18	25	25	17
Feb-07	45	50	47	31	31	28	29	24	27	35	32	32
Mar-07	34	44	37	19	22	21	20	20	19	29	32	29
Apr-07	38	49	23	19	18	18	17	19	22	28	29	30
May-07	36	37	37	26	22	23	19	19	19	34	32	30
Jun-07	51	59	55	34	NS	29	32	32	29	39	38	47
Jul-07	39	40	44	32	34	35	28	29	27	42	38	38
Aug-07	56	50	48	32	32	32	25	27	28	44	38	41
Sep-07	40	51	44	29	31	25	20	21	22	36	35	36
Oct-07	49	40	45	45	42	43	27	30	29	43	37	41
Nov-07	44	47	40	27	28	28	19	21	20	34	36	36
Dec-07	44	51	45	32	32	33	21	23	21	45	43	45
Mean	43	47	43	29	28	28	23	23	24	36	35	35
Bias Mean	**43**	**46**	**42**	**28**	**27**	**28**	**22**	**23**	**23**	**35**	**34**	**34**

Dungannon Nitrogen Dioxide (NO2) in air ug/cu 2006							
	Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5A**	**Site 5B**	**Site 5C**
Jan-06	31	32	26	19	54	57	55
Feb-06	22	24	14	11	41	41	41
Mar-06	24	25	15	11	38	46	42
Apr-06	19	9	7	45	42	44	44
May-06	18	20	10	7	36	35	37
Jun-06	20	22	8	6	38	45	0
Jul-06	19	21	10	7	41	47	47
Aug-06	23	22	7	6	36	38	36
Sep-06	20	23	13	9	44	44	48
Oct-06	24	NS	16	11	45	50	47
Nov-06	26	20	14	12	34	44	37
Dec-06	26	21	15	11	38	49	23
Mean	**23**	**20**	**13**	**13**	**41**	**45**	**38**
***Bias Mean**	**22**	**20**	**13**	**13**	**40**	**44**	**37**

*Bias Factor 0.98

Triplicate Monitoring at 3 additional locations on Church Street & Perry Street begin in September 2006. Data not provided on this table due to being incomplete. See 2007 data.
Averages for new sites not collated until September 2007

Dungannon Nitrogen Dioxide(NO2) in air ug/cu 2005							
	Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**		
Jan-05	21	22	10	10	NS	-	-
Feb-05	17	20	12	8	37	-	-
Mar-05	20	17	12	10	27	-	-
Apr-05	23.85	24.78	14.65	9.30	41.17	44.10	43.95
May-05	20.29	21.01	9.54	7.76	39.87	35.65	40.25
Jun-05	21.24	17.29	8.06	NS	39.36	39.36	35.75
Jul-05	17.05	15.95	6.93	4.88	31.90	29.40	32.91
Aug-05	21.65	17.50	9.39	7.69	41.37	45.19	45.43
Sep-05	21.67	15.86	9.89	8.12	43.39	43.06	42.96
Oct-05	20.62	27.15	16.56	12.56	43.14	46.82	40.92
Nov-05	29.00	28.00	17.00	14.00	48.00	53.00	53.00
Dec-05	30.42	26.44	16.54	13.88	47.37	48.73	51.80
Mean	22.87	21.55	12.06	9.77	41.73	42.81	43.00
Bias Mean	**22.64**	**21.34**	**11.94**	**9.68**	**41.31**	**42.38**	**42.57**

Tubes provided by Gradko International from April 05 onwards

Triplicte Sampling at Site 5 begins April 05
Gradko bias factor used

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	**21**	**22**	**17**	**9**	**31**	**34**
Ratified Mean	**25**	**26**	**20**	**11**	**37**	**40**

Site 1	Market Square
Site 2	Ardgannon
Site 3	11 Bushvale
Site 4	Howard Primary School
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	NS	NS	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
Mean	**15**	**22**	**16**	**11**	**44**	**46**
Ratified Mean	**16**	**23**	**17**	**12**	**46**	**47**

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

DETAILED ASSESSMENT FOR NOx EMISSIONS FROM TRAFFIC ON CHURCH STREET

DUNGANNON and SOUTH TYRONE BOROUGH COUNCIL

2007

Dungannon and South Tyrone Borough Council

Detailed Assessment for NO_2 Diffusion Tubes on Church / Perry Street, Dungannon.

JUNE 2007

Executive Summary

Dungannon and South Tyrone Borough Council submitted their Updating and Screening Assessment to the Environment & Heritage Service in June 2006. The report concluded that the Council was not required to carry out any further detailed assessments for any of the prescribed pollutants under review.
However, a subsequent appraisal by the University of the West of England (UWE) completed on behalf of the Environment and Heritage Service, determined that the Council had used an unsuitable bias correction factor for the NO_2 diffusion tubes which are situated at a number of locations throughout Dungannon Town. The bias was not part of a suitable co-location study that was deemed effective by Air Quality Consultants, on the basis that it was not comparable with other similar co-location sites.

Following further consultation with UWE, the Council accepted that a new bias correction factor would need to be used in order to adjust the NO_2 diffusion tube results to the correct readings. As a consequence of this, it was apparent that the results obtained for one of the tubes located on Church Street was now exceeding the objective limit of 40µg/m^3.
Dungannon and South Tyrone Borough Council accepted that the new result was significant and informed the Environment & Heritage Service that a detailed assessment would be completed with regard to the exceedences on Church Street.

In order to get a more accurate representation of the extent of the NO_2 pollutant within Church Street, 9 additional diffusion tubes were placed at 3 other locations along the street (including Perry Street) to complement the 3 existing tubes, which were situated at the Northern end of the street, close to the junction with Market Square. The additional tubes were situated at the new locations for a period of six months.

Following the six month evaluation of NO_2 pollution in Church Street an estimated annual mean was determined using a ratio derived from monitoring results from 3 neighbouring local authorities (Armagh, Banbridge & Newry and Mourne). This method is detailed in Box 6.5 of LAQM TG(03). The estimated annual mean for sites A, B and C shows that there is no breach of the objective limits.
During the preparation of this report, the annual mean result for the existing NO_2 tube location on Church Street (Site 5) became available. A result of **40.42 µg/m_2** demonstrates that there is a breach the objective limits at this location.

It is therefore considered by Dungannon and South Tyrone Borough Council that an Air Quality Management Area (AQMA) **will be** declared for the northern end of Church Street.

Contents

1.0 Introduction

Dungannon and South Tyrone Borough Council submitted their Updating and Screening Assessment to the Environment & Heritage Service in June 2006. The report concluded that the Council was not required to carry out any further detailed assessments for any of the prescribed pollutants under review.
However, a subsequent appraisal by the University of the West of England (UWE) completed on behalf of the Environment and Heritage Service, determined that the Council had not used the appropriate bias correction factor for the NO_2 diffusion tubes which are situated at a number of locations throughout Dungannon Town.

UWE informed the Council in August 2006, that the bias factor which was provided by Gradko International (who also supply the Councils NO_2 diffusion tubes) was unsuitable as it had not been formulated from a reliable co-location study where the diffusion tube preparation method 20% TEA in Water had been used.

The Gradko bias factor had been determined as a result of a co-location study at Liverpool John Lennon Airport in Speke, Liverpool. However UWE advised the council that it was necessary to use a bias factor which was part of more than one co-location study.

Following further consultation with UWE, the Council accepted that a new bias correction factor would need to be used in order to adjust the NO_2 diffusion tube results to the correct readings. As a consequence of this, it was apparent that the results obtained for one of the tubes located on Church Street were now exceeding the objective limit of 40µg/m^3.

Dungannon and South Tyrone Borough Council accepted that the new result was significant and informed the Environment & Heritage Service that a detailed assessment would be completed with regard to the exceedences on Church Street.

Dungannon and South Tyrone Borough Council placed an order with Gradko International for the provision of 9 additional NO2 diffusion tubes, which were placed at three locations along Church Street and Perry Street in triplicate format.
The tubes were placed here for a duration of six months whereupon an annual mean would be determined by using the estimation ratio method as described in BOX 6.5 in Section 6-8 of LAQM TG03.

2.0 Annual Mean Estimation

The objective limit for NO2 is assessed on the basis of an annual mean result. In the majority of cases this is accurately portrayed in a predetermined programme involving 12 months of collated data. Whereby the mean result is determined over the 12 month period and the bias factor is added to adjust the result to a more accurate assessment of the pollutant levels.
In some cases this is not possible and it may be the Councils only option to complete a short term monitoring assessment. Dungannon and South Tyrone Borough Council opted to complete only six months of further sampling so that the time frame upon which the LAQM Regime was based would not slip outside the boundaries of the recommended timescales outlined in Table 1.3, section 1-8 of LAQM TG03. It would in doing so bring the council into line with the next stage of the LAQM regime with the Progress Report stage timetabled for the end of April 2007. In a situation where the Council would not have to declare an AQMA for Church / Perry Street, then they would be in the position to re-enter back into the regime at the appropriate point without any overlap or outstanding requirements expected of them.
It is possible to estimate an annual mean from a short term monitoring period. LAQM TG03 highlights this possibility in Box 6.5, section 6-8 (*Approach to the estimation of annual mean nitrogen dioxide concentrations from short-term monitoring data*).
This method of estimation produces a ratio from the annual mean NO2 concentrations from significant years for other monitoring stations within a 50 mile radius of the monitoring site being assessed.

The guidance says;

> *The adjustment is based on the fact that patterns of pollutant concentrations usually affect a wide region. Thus if a three month period is above average at one place it will almost certainly be above average at other locations in the region.*

In order to assess the annual mean concentration for the 6 month sampling period at Sites A, B, & C on Church / Perry Street, a ratio has been derived from long term monitoring locations across the Southern Group Region. The locations used to calculate the Ratio are

Site Name	Grid Ref	Site Type
Desert Lane - Armagh	54 20’33.19 N , 6 39’32.58 W	Kerbside
Springfields - Banbridge	54 21’09.87 N , 6 15’53.03 W	Kerbside
Monaghan Row - Newry	54 10’32.46 N , 6 20’11.95 W	Kerbside

Site 5 is the existing site at the northern end of Church Street.

Site Name	Grid Ref	Site Type
Church Mews Sheltered Accommodation Church Street Dungannon BT71 6Tl	54 30’13.99 N , 6 46’10.10 W	Kerbside

3.0 RESULTS

Below is the results of the triplicate sampling for the 3 locations on Church Perry Street in Dungannon. It is noticeable that levels are highest at location C in comparison with the other sampling locations (A & B) as this is closer to the junction at the northern end of Church Street. Site C is located opposite Site 5, but is on the side of the road where traffic does not become congested. These initial results demonstrated to the Council that it was unlikely that an AQMA for these locations on Church / Perry Street would be declared, following the calculation of the estimated annual mean.

Table 1: Diffusion Tube Results For 3 sites on Church / Perry Street, Dungannon September 06 to March 07 from Gradko International

Month	Site A Tube 1	Site A Tube 2	Site A Tube 3	Site B Tube 1	Site B Tube 2	Site B Tube 3	Site C Tube 1	Site C Tube 2	Site C Tube 3
September	17.99	15.28	22.12	17.95	17.45	18.09	24.98	25.11	17.04
October	30.65	31.39	27.72	28.57	23.78	27.33	34.66	32.46	31.73
November	18.61	22.47	20.68	20.18	19.79	19.00	29.12	32.20	28.73
December	19.36	18.18	18.45	17.35	18.66	22.20	27.89	29.33	29.85
January	26.21	21.69	23.42	18.78	18.61	19.00	33.87	31.75	29.62
February	34.39	NS	29.44	31.68	32.14	28.51	38.88	38.48	47.06
March	31.72	34.05	34.96	27.76	29.39	27.30	41.52	38.01	37.92
Mean	25.56	23.84	25.26	23.18	22.83	23.06	32.99	32.48	31.71
Sep 06 to Mar 07		24.89			23.02			32.39	
Bias Adjusted 0.98		24.39			22.56			31.74	

Sites A, B, & C are triplicate sites which were added to compliment the detailed assessment and to give an overview of the distribution on NO_2 pollution on the entire length of Church / Perry Street.

The tables below demonstrate how the estimated annual mean results for Sites A, B & C were determined by using NO2 data from the 2006 results of background diffusion tube monitoring locations in Armagh, Banbridge & Newry.

Table 2: Monthly Diffusion Tube Results and Annual Mean for 1 Background site in 3 Neighbouring Councils

Diffusion Tube Anuual Mean (Am) for 1 Long-Term Montoring Site in Armagh, Banbridge & Newry 2006														
Location	January	February	March	April	May	June	July	August	Spetember	October	November	December	Mean	Bias Adjusted Mean
Armagh – Desert Lane	11	18	17	11	13	12	10	NR	NR	15	14	16	14	**11**
Banbridge - Springfields	37	12	11	9	10	9	8	8	9	19	11	13	13	**17**
Newry – Monaghan Row	23	23	21	16	16	40	17	12	18	23	20	9	20	**16**

Table 3: Periodic Means (Oct 06 – Mar 07) in 3 Neighburing Councils

Diffusion Tube Periodic Mean (Pm) Armagh, Banbridge & Newry Oct 2006 to Mar 2007								
Location	October	Nov	Dec	January	February	March	Mean	Bias Adjusted Mean
Armagh – Desert Lane	15	14	16	12	20	8	14	11
Banbridge - Springfields	19	11	13	13	17	7	13	17
Newry – Monaghan Row	23	20	9	14	23	19	14	11

Table 4: Short Term Diffusion Tube Ratios

Estimated Short Term Diffusion Tube Ratio			
Location	Annual Mean 06 (**Am**)	Periodic Mean (**Pm**)	**Ratio**
Armagh – Desert Lane	11	11	1
Banbridge - Springfields	17	17	1
Newry – Monaghan Row	16	11	1.45
		Average (Ra)	**1.15**

Table 5: Estimated Annual Average for 4 Monitoring Location on Church Street

SITE	Site A 1, 2 & 3	Site B 1, 2 & 3	Site C 1, 2 & 3
Church Street 6mths	**24**	**22**	**31**
Annual Ave	**28**	**26**	**37**

Tables 3 to 6 demonstrate how the estimated annual average is calculated from the short term diffusion tube data gathered over a 6 month period at 4 sites on Church Street in Dungannon. It is clear from the results in Table 5 that Site 5 is exceeding the objective limit of 40 µg/m^3 for NO_2 emissions. Sites A, B & C are all well below the objective limit.

Table 6: 2006 NO2 Diffusion Tube Data for Site 5 (existing site at northern end of Church Street, Dungannon).

Date	Site 5A	Site 5B	Site 5C
Jan-06	54.46	57.10	55.20
Feb-06	40.79	40.74	40.91
Mar-06	37.80	46.05	42.43
Apr-06	41.87	44.39	44.27
May-06	35.58	35.13	36.83
Jun-06	37.72	44.88	0.00
Jul-06	40.72	47.26	46.71
Aug-06	36.36	38.24	36.25
Sep-06	44.01	43.74	47.59
Oct-06	45.48	50.15	47.28
Nov-06	33.87	44.05	37.11
Dec-06	37.63	48.82	23.38
Mean	**40.52**	**45.05**	**38.16**
Triplicate Mean	**41.24**		
Bias Adj	**40.42**		

Note : Bias adjustment factor derived from http// www.uwe.ac.uk/aqm/review/diffusiontube300307

Table 6 shows the annual mean for NO2 at the existing site at the northern end of Church Street (Site 5). The result of 40.42 µg/m^3 shows that there is a breach of the objective limit of 40 µg/m^3 at this location.

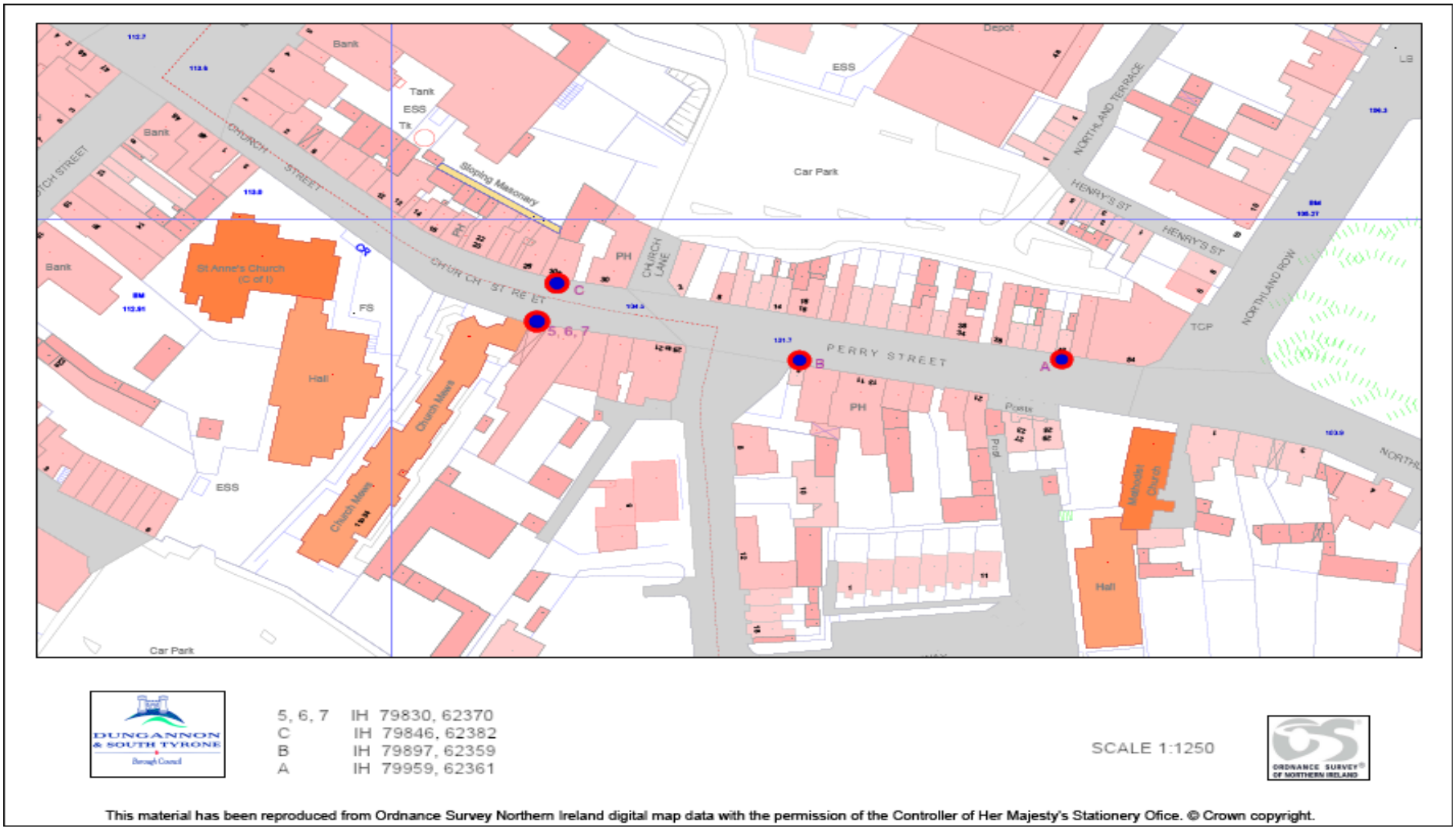
4.0 Conclusions

The results in Table 6 shows that there is a breach of the objective limit of 40 µg/m^3 at Site 5 in Church Street, Dungannon. There are no breaches of the objective limit at Sites A, B & C.

5.0 Recommendations

The estimated annual mean for Site 5 (40.42µg/m^3) is **above** the objective limit of 40 µg/m^3 and Dungannon and South Tyrone Borough Council should declare an AQMA for the northern end of Church Street. The declaration of the AQMA should be included in the agenda of the next available Council meeting following approval of this report by UWE and EHS.

APPENDICES



Appendix 1 – Sampling Locations on Church Street and Perry Street, Dunagannon

Appendix 2 – Location A. Perry Street Dungannon. (Tubes on drain pipe at O2 Shop)

Appendix 3 – Location B. Perry Street Dungannon. (Tubes behind road-sign inner post)

Appendix 4 – Location C. Church Street Dungannon. (Tubes on black lamp post).

Appendix 5 – Location 5. Existing Church Street Site. (Tubes on lamp post).