Mid Ulster District Council



2015 Updating and Screening Assessment for Mid-UIster District Council

In fulfilment of the Environment (NI) Order 2002 Local Air Quality Management

November 2015

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Executive Summary

Magherafelt Area

An Air Quality Management Area (AQMA) was declared in the former of Magherafelt District Council area in February 2012 at Church Street and lower King Street. Based on monitoring data, concentrations within these areas continue to exceed the objective limit of 40ug/m³ for NO2 and as a result the AQMA should remain.

As a result of new school premises and new traffic movements adjacent to the AQMA, additional sites continue to be monitored. To date these concentrations outside the AQMA are all below the objectives, with the exception of one site.

Construction of the A31 Magherafelt by-pass has now commenced. The by-pass will consist of a 5.9km single carriageway to the east of Magherafelt town. This Department is confident that the use of the by-pass will result in a reduction of NO2 levels, enabling the potential revocation of the AQMA.

There are no other issues of concern which need to be highlighted in this report.

Dungannon Area

Diffusion Tube monitoring at 10 locations within Dungannon and South Tyrone Borough Council's area has demonstrated that there are **2** sites where NO₂ levels exceeded the objective limit of 40ug/m³; namely Newell Road, Dungannon and Charlemont Street in Moy. There are already Air Quality Management Areas in place for these 2 sites. Action Plans for the existing AQMAs at Newell Road, Dungannon and Charlemont Street, Moy were submitted in January 2015.

As was stated in the Progress Report in 2014 the Air Quality Management Areas at Church Street (Dungannon) and Stewartstown Road (Coalisland) had not breached the air quality objective for the previous three years. As a result these 2 AQMAs were revoked by Dungannon & South Tyrone Borough Council in November 2014.

Cookstown Area

Diffusion tube monitoring at 8 locations in the former Cookstown District Council area did not demonstrate any exceedences of the objective limit of 40ug/m³. Routine monitoring of the 8 locations in Cookstown and Moneymore will continue under Mid Ulster District Council.

Contents

1	Intro	oduction	1
	1.1	Description of Local Authority Area	1
	1.2	Purpose of Report	2
	1.3	Air Quality Objectives	3
	1.4	Summary of Previous Review and Assessments	4
2	Mor	nitoring Data	13
	2.1	Summary of Monitoring Undertaken	13
	2.2	Comparison of Monitoring Results with Air Quality Objectives	26
3	Roa	d Traffic Sources	34
	3.1	Narrow Congested Streets with Residential Properties Close to the Kerb	34
	3.2	Busy Streets Where People May Spend 1-hour or More Close to Traffic	34
	3.3	Roads with a High Flow of Buses and/or HGVs.	34
	3.4	Junctions	34
	3.5	New Roads Constructed or Proposed Since the Last Round of Review and As	sessment
		34	
	3.6	Roads with Significantly Changed Traffic Flows	35
	3.7	Bus and Coach Stations	35
4	Oth	er Transport Sources	36
	4.1	Airports	36
	4.2	Railways (Diesel and Steam Trains)	36
	4.3	Ports (Shipping)	36
5	Indu	ustrial Sources	37
	5.1	Industrial Installations	37
	5.2	Major Fuel (Petrol) Storage Depots	37
	5.3	Petrol Stations	37
	5.4	Poultry Farms	37
6	Con	nmercial and Domestic Sources	38
	6.1	Biomass Combustion – Individual Installations	38
	6.2	Biomass Combustion – Combined Impacts	38
	6.3	Domestic Solid-Fuel Burning	38
7	Fug	itive or Uncontrolled Sources…	39
8	Cor	clusions and Proposed Actions	40
	8.1	Conclusions from New Monitoring Data	40
	8.2	Conclusions from Assessment of Sources	41
	8.3	Proposed Actions	41

9	References		43
10	Appendices		45
	Appendix 1	QA/QC Data	
	Appendix 2	Area designated as Air Quality Management Area	
	Appendix 3	Non-automatic monitoring sites in AQMA	
	Appendix 4	Nitrogen dioxide diffusion tube monthly data for 2014	

1 Introduction

1.1 Description of Local Authority Area

Mid-Ulster District Council is a local authority that was established on 1 April 2015 as a part of Local Government re-organisation in Northern Ireland. It amalgamates the three former Councils of Cookstown, Dungannon and South Tyrone, and Magherafelt.

Mid Ulster District Council, as the name suggests, is located centrally within the province. It straddles the two counties of Tyrone and Derry/ Londonderry. The District runs from Swatragh in the north to Fivemiletown in the south and from the Sperrin Mountains in the west to the shores of Lough Neagh in the east. Mid Ulster is the seventh largest of the eleven new council districts.

The district covers an area of some 1714 km² and serves a population of over 141,000 people. One third of the Council's population lives in urban areas while two thirds inhabit rural areas. The District has the fastest population growth when compared with the other 10 Council areas. The population increased by 18.7% from 2001 to 2013 compared with the Northern Ireland average of 8.3%.

Mid Ulster's employment sector is concentrated in the manufacturing, engineering, construction and agri-food industries.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in the Environment (Northern Ireland) Order 2002, the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedances are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in Northern Ireland are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (milligrams per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of
LAQM in Northern Ireland

	Air Quality	Date to be	
Pollutant	Concentration	Measured as	achieved by
Benzene	16.25 µg/m³	Running annual mean	31.12.2003
Denzene	3.25 μg/m³	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m³	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.5 µg/m³	Annual mean	31.12.2004
Lead	0.25 µg/m³	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m³	Annual mean	31.12.2005
Particles (PM10) (gravimetric)	50 μg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m³	Annual mean	31.12.2004
	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Magherafelt District Council

Magherafelt District Council in February 2001 submitted a "1st Stage Review and Assessment of Air Quality". Using DETR guidance documents, the Review and Assessment considered pollutants of concern to determine whether or not a Second Stage Review and Assessment was required. The results of the 1st Stage Review and Assessment are summarised below.

POLLUTANT	2 ND STAGE REVIEW AND ASSESSMENT NEEDED
Carbon Dioxide	No
Benzene	No
1,3 Butadiene	No
Lead	No
Nitrogen Dioxide	Yes
Sulphur Dioxide	Yes
PM10	Yes

Table 1.2 – Magherafelt District Council Second Stage Review

A "2nd Stage Review and Assessment of Air Quality" was submitted in April 2004. The pollutants highlighted above were subject to further scrutiny and the conclusion of the report in part prepared by NETCEN was that there was no need to proceed to a Stage 3 Review and Assessment for SO2, NO2 or PM10.

A "Progress Report on Air Quality Management" was submitted in April 2005. A previous NETCEN report predicted an exceedance of the air quality objective for nitrogen dioxide in 2005 at site 6, however it was stated that the proposed A6 Toome by-pass would ease the weight of traffic on that road significantly and that an exceedance would not be likely. The 2005 report confirmed that the by-pass takes the bulk of traffic away from its original route thus reducing the impact of traffic on receptors close to the monitoring location. Results for site 6 showed a significant lowering of the annual average concentration in 2004 as opposed to the previous results. The new route runs through an area of open land in which there are no nearby receptors at present. Air quality objectives for SO2 and PM10 continued to be met.

An 'Air Quality Update and Screening Assessment' report was submitted in April 2006. This report concluded that there was no necessity to carry out a Detailed Assessment in respect of NO2, SO2 or PM10.

A "Progress Report on Air Quality Management" was submitted in April 2007. A review and assessment of pollutants showed the air quality objectives for NO2, SO2 and PM10 continued to be met throughout the district of Magherafelt.

A "Local Air Quality Management Grant Evaluation Form" was submitted in April 2008. Results for site 1 showed a clear exceedance for NO2 and therefore this department were advised to undertake a Detailed Assessment.

A "Progress Report on Air Quality Management" was submitted in August 2008. Due to the exceedance to the NO2 standard set for site 1, it was the intention of this department to provide an additional tube in the vicinity of the nearest residential property for comparison purposes.

A "Local Air Quality Management Grant Evaluation Form" was submitted in April 2009. Results for previous years showed a clear exceedance at site 1 for NO2 and so an additional tube (site 8) was provided in the vicinity of the nearest residential property for comparison purposes (from 4th September 2008). Results showed that levels of this pollutant met with standards set. Monitoring therefore ceased at site 1 as properties in the vicinity of this tube are now commercial or available for commercial use.

An 'Air Quality Update and Screening Assessment' report was submitted in May 2009. This report concluded that there was a necessity to carry out a Detailed Assessment in respect of NO2 at site 2.

A "Local Air Quality Management Grant Evaluation Form" and a "Progress Report on Air Quality Management" were submitted in July 2010. Additional sites were identified in the area surrounding site 2 in order to gain a comprehensive overview of the air quality standard in this area.

A "Detailed Assessment for NO2 Levels on Church Street and King Street, Magherafelt" was submitted March 2011 (amended September 2011) to the Air and Environmental Quality Unit of the Department of the Environment. This concluded that there were exceedances at site 2, 9 and 10 with other locations in this vicinity close to the objective limit. A recommendation to declare an AQMA was made.

A "Local Air Quality Management Grant Evaluation Form" was submitted in May 2011. This highlighted that a Detailed Assessment had been submitted however the final outcome had not been decided.

A "Local Air Quality Management Grant Evaluation Form" was submitted in March 2012. This highlighted that an AQMA had been formally declared.

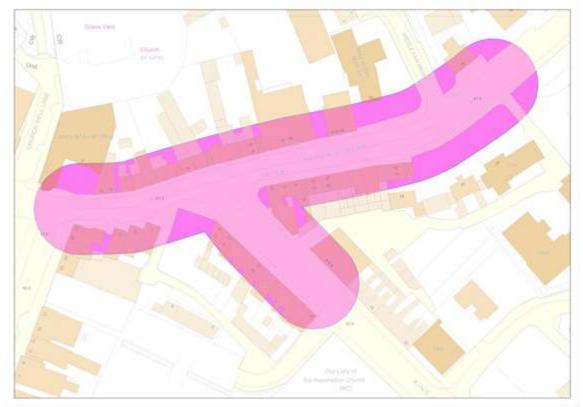
An 'Air Quality Update and Screening Assessment' report was submitted in May 2012. This report concluded that an AQMA had been formally declared and that an Action Plan would be submitted.

A "Local Air Quality Management Grant Evaluation Form" was submitted in May 2013. This highlighted that an Action Plan would be submitted to DOENI and that monitoring commenced at additional sites adjacent to the AQMA as a result of new school premises and new traffic movements.

An 'Air Quality Progress Report' was submitted in December 2013. This highlighted that an Action Plan would be submitted to DOENI and that monitoring commenced at additional sites adjacent to the AQMA as a result of new school premises and new traffic movements.

An 'Air Quality Progress Report' was submitted in May 2014. This highlighted that an Action Plan would be submitted to DOENI and that monitoring commenced at additional sites adjacent to the AQMA as a result of new school premises and new traffic movements. This highlighted that an Action Plan would be submitted to DOENI and that monitoring at additional sites adjacent to the AQMA would continue to be monitored to establish if the designated area requires to be extended.

Fig 1.1- AQMA in former Magherafelt BC area.



Dungannon and South Tyrone District Council

 Table 1.3 Summary of Previous Review and Assessment Report completed by

 Dungannon and South Tyrone Borough Council

Report Type	Date	Exceedences	Detailed Assessment Required	AQMA's Declared
Initial Review and Assessment	Jan 2001	None	Yes	None
Reappraisal of Traffic Pollution Modelling	Jan 2004	None	No	None
Report of the Second and Third Stage R&A of Local Air Quality	Aug 2004	None	No	None
Progress Report	June 2005	None	Yes	None
Review and Assessment: Supplementary Report on NO2 concentrations in Church Street Dungannon	June 2005	None	No	None
Updating and Screening Assessment	June 2006	Yes	Yes	None
Further Assessment of NO2 levels in Church Street	September 2007	Yes	No	Yes
Progress Report	June 2008	Yes	No	Already declared
Updating and Screening Assessment	April 2009	Yes	No	Already declared
AQMA Action Plan and Progress Report	July 2010	Yes	Yes	
Progress Report	May 2011	Yes	Yes	Yes (3)
Detailed Assessment	July 2011	Yes		Yes
Updating and Screening Assessment	May 2012	Yes	No	No
Progress Report	May 2013	Yes	No	No
Progress Report	May 2014	Yes	No	No

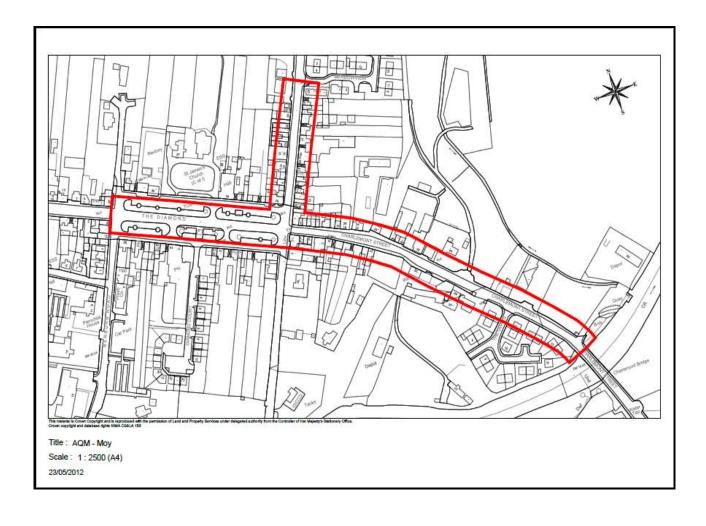
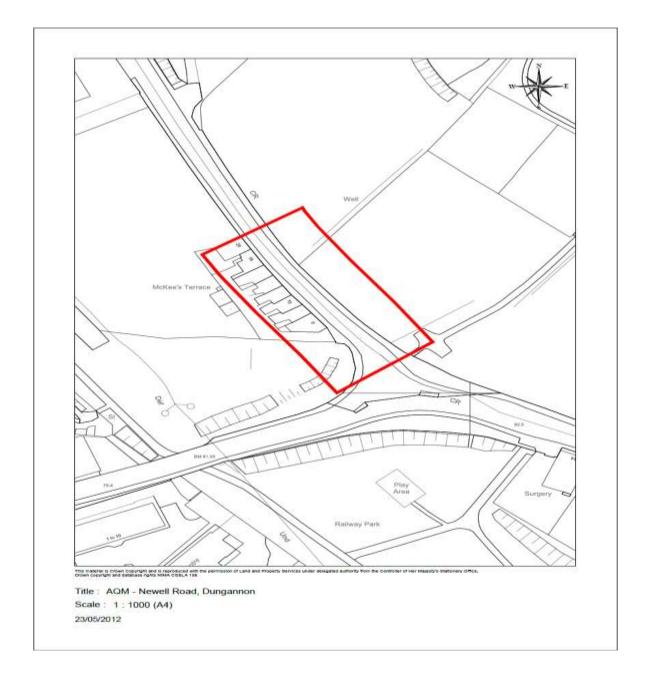


Figure 1.2 Map of AQMA Boundaries Dungannon



Cookstown District Council

The first round review and assessment of air quality was completed in 2004. It involved a 3-stage approach, the findings of which are contained in two reports:

Table 1.4

Summary of first stage review and assessment in Cookstown.

Pollutant	Significant Sources	Recommendations
Carbon Monoxide	No significant Sources	No further assessment
Benzene	No significant Sources	No further assessment
1–3 Butadiene	No significant Sources	No further assessment
Lead	No significant sources	No further assessment
Nitrogen Dioxide	 Four single carriageway road junctions exceeding average threshold Two dual carriageway junctions exceeding 10,000 vpd and sensitive properties within 10 metres Three dual carriageway sections exceeding 10,000 vpd and sensitive properties within 10m One Part A process in Cookstown 	Proceed to 2 nd stage
Sulphur Dioxide	 One Part A process One Thermal combustion system At least 2 1x1km grid squares with potentially more than 300 houses burning coal 	Proceed to 2 nd stage
PM10	 At least 16 sections of single carriageway roads and 7 road junctions exceeding 5000 vehicles per day and with sensitive properties within 2m (single carriageway) or 10m (dual carriageway) Four dual carriageway sections exceeds 5000 vpd with sensitive properties within 10 metres One significant Part A process 	Proceed to 2 nd stage

(2) 2nd/3rd Stage Review and Assessment Report – August 2004.

Conclusions and Recommendations of the 2nd/3rd Stage Report are given below.

- Air quality objectives for SO2 and PM10 are likely to be met and therefore there is no need to designate an air quality management area for these pollutants.
- Existing monitoring of the SO2 and PM10 will continue using real-time analysers, in order to provide data to verify the detailed dispersion modelling predictions resulting in the above conclusions.
- Air quality objectives for NO2 are expected to be met at locations of relevant public exposure i.e. building facades of residential properties, despite exceedances of the annual mean objective at three kerbside sites. An air quality management area for NO2 is therefore not being designated for this pollutant.
- Predicted concentrations of NO2 at a number of building facades of residential properties are close, but not exceeding air quality objectives. Further monitoring of NO2 will be carried out using diffusion tubes. These will be located on the facades of residential properties closest to the kerbside sites where exceedances of the NO2 annual mean objective have been identified.

3) Update and Screening Assessment Reports

Table 1.5 Summary of Cookstown D.C USA Reports.

Pollutant	USA Report 2006 USA Report 2009		USA Report 2012	Recommendation	
Carbon Monoxide	The objective for CO is unlikely to be exceeded at any location in the Cookstown area.	The objective for CO is unlikely to be exceeded at any location in the Cookstown area.	The objective for CO is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Carbon Monoxide.	
Benzene	The objective for Benzene is unlikely to be exceeded at any location in the Cookstown area	The objective for Benzene is unlikely to be exceeded at any location in the Cookstown area.	The objective for Benzene is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Benzene.	
1 – 3 Butadiene	The objective for 1-3 Butadiene is unlikely to be exceeded at any location in the Cookstown area.	The objective for 1-3 Butadiene is unlikely to be exceeded at any location in the Cookstown area.	The objective for 1-3 Butadiene is unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for 1-3 Butadiene.	
Lead	The objective for Lead is unlikely to be exceed at any location in the Cookstown area.	The objective for Lead is unlikely to be exceed at any location in the Cookstown area.	The objective for Lead is unlikely to be exceed at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Lead.	
Nitrogen Dioxide	The assessment indicated that the conclusion drawn from the 1 st round of review and assessment remains valid, and has indicated that the annual menu and hourly objective for Nitrogen Dioxide are unlikely to be exceeded.	The assessment indicated that the conclusion drawn from the 1 st round of review and assessment remains valid, and has indicated that the annual menu and hourly objective for Nitrogen Dioxide are unlikely to be exceeded.	. The assessment indicated that the conclusion drawn from the 1 st round of review and assessment remains valid, and has indicated that the annual menu and hourly objective for Nitrogen Dioxide are unlikely to be exceeded.	There is no need to undertake a detailed assessment for Nitrogen Dioxide.	
Particulate Matter PM ₁₀	The assessment has indicated that both the daily and the annual mean for particulate matter are unlikely to be exceeded at any location in Cookstown area.	The assessment has indicated that both the daily and the annual mean for particulate matter are unlikely to be exceeded at any location in Cookstown area.	The assessment has indicated that both the daily and the annual mean for particulate matter are unlikely to be exceeded at any location in Cookstown area.	There is no need to undertake a detailed assessment for PM ₁₀ .	
Sulphur Dioxide SO2	The assessment has indicated that both the annual mean and hourly objective 15 minute mean for Sulphur Dioxide are unlikely to be exceeded at any location in the Cookstown area.	The assessment has indicated that both the annual mean and hourly objective 15 minute mean for Sulphur Dioxide are unlikely to be exceeded at any location in the Cookstown area.	The assessment has indicated that both the annual mean and hourly objective 15 minute mean for Sulphur Dioxide are unlikely to be exceeded at any location in the Cookstown area.	There is no need to undertake a detailed assessment for Sulphur Dioxide.	

2 Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automatic monitoring sites within Mid Ulster District Council area

2.1.2 Non-Automatic Monitoring Sites

Former Magherafelt District Council Area

Table 2.1.a Details of Non - Automatic Monitoring Sites in former Magherafelt District Council area.

Magher	afelt Office						
Site Name	Site Type	OS Grid Ref.	Pollutants Monitored	In AQMA?	Relevant Exposure	Distance to Kerb of nearest Road	Worst Case Location
2	Main route through town	X 8977 Y9073		Y	Y (1m)	1.5m	Y
3	Adj traffic lights	X8531 Y9043	NO ₂	N	Y (1m)	1m	Υ
4	Off main Rd leading to Cul de sac	X8989 Y9078	NO ₂	Y	Y(10m)	1m	N
5	Roadside	X9251 Y9318	NO ₂	N	Y(0m)	1m	Y
6	Adj to main arterial route	X9887 Y9085	NO ₂	N	Y(25m)	1m	Y
7	Moderately used route to town centre	X8982 Y9069	NO ₂	Y	Y(15m)	1m	Y
8	Nearest residential property to site 1.	X8960 Y9046	NO ₂	N	Y(0m)	1m	Y
9	Adj. roundabout off town centre	X8974 Y9073	NO ₂	Y	Y(10m)	1m	N
10	Adj. roundabout off town centre	X8979 Y9074	NO ₂	Y	Y(0m)	1m	Υ
11	Moderately used route to town centre	X8979 Y9071	NO ₂	Y	Y(15m)	1m	Ν
12	Main route through town	X8989 Y9075	NO ₂	Y	Y(15m)	1m	N
13	Main route through town	X8989 Y9077	NO ₂	Y	Y(5m)	1m	Y
14	Main route through town	X8995 Y9083	NO ₂	N	Y(5m)	1m	Y
15	Moderately used route to town centre	X8994 Y9084	NO ₂	N	Y(10m)	1m	Υ
16	Moderately used route to town centre	X8993 Y9089	NO ₂	N	Y(5m)	1m	Y
17	Main route through town	X8997 Y9082	NO ₂	N	Y(3m)	1m	Y
18	Main route through town	X8999 Y9085	NO ₂	Ν	Y(3m)	1m	Y
19	Main route through town	X9003 Y9087	NO ₂	Ν	Y(3m)	1m	Y
20	Main route through town	X9004 Y9089	NO ₂	N	Y(20m)	1m	Y
21	Main route through town	X9008 Y9093	NO ₂	Ν	Y(20m)	1m	Y
22	Main route through town	X9013 9097	NO ₂	N	Y(20m)	1m	Y

Former Dungannon And South Tyrone Borough Council

Dungannon and South Tyrone Borough Council carried out monitoring of NO₂ by diffusion tubes at 10 sites within the borough during 2014. The NO₂ diffusion tubes were prepared and analysed by Environmental Sciences Group (ESG) Didcot. Environmental Sciences Group (ESG) Didcot was contracted to supply and analyse the diffusion tubes from the beginning of January 2013. This laboratory takes part in the NO₂ Network QA/QC Field Inter-comparison survey. ESG's diffusion tubes are prepared by coating the grids in 50% TEA in Acetone. Analysis is carried out using a colorimetric technique.

None of the sites were co-located with an automatic NO₂ analyser. Details are given in Table 2.1.2a.

Diffusion Tube Bias Adjustment Factors

The NO₂ diffusion tubes were prepared and analysed by Harwell Scientifics (ESG) from the beginning of April 2011. This laboratory takes part in the NO₂ Network QA/QC Field Intercomparison survey. Harwell Scientifics (ESG) diffusion tubes are prepared by coating the grids in 50% TEA in Acetone. Mid Ulster District Council obtained the appropriate bias factor from the Defra Website. A factor of 0.81 was taken from the drop down menus available on the excel spreadsheet matrix.

Factor from Local Co-location Studies (if available)

Dungannon and South Tyrone Borough Council did not use a Bias Factor from a local Co-location study. Dungannon and South Tyrone Borough Council do not have an automatic NO₂ analyser in the borough to carry out a co-location assessment.

Discussion of Choice of Factor to Use

Dungannon and South Tyrone Borough Council used the Bias Factor from the Defra Website. This was calculated by using the matrix available on the site by selecting the appropriate laboratory, year of monitoring and significant methodology.

Dungannon and South Tyrone Borough Council used a bias factor for 2014 (0.81) QA/QC of diffusion tube monitoring (See Appendix A for Harwell Scientifics (ESG) WASP data)

Dungannon Of	fice							
Site Name	Site Type	OS Grid Ref.	Pollutants Monitored	In AQMA?	Is monitoring co-located with a continuous analyser? (Y/N)	Relevant Exposure	Distance to Kerb of nearest Road	Worst Case Location
Dunclare Way	Urban Background		NO ₂	N	N	Y	<2m	Y
Ardgannon	Urban Background		NO2	N	N	Y(<10)	<5m	Y
Church Street	Roadside		NO₂	N	N	Y(<1)	1m	Y
Newell Road	Roadside		NO₂	N	N	Y(<1)	1m	Y
Charlemont St. Moy	Roadside		NO ₂	N	Ν	Y(<1)	1m	Y
Killyman St. Moy	Roadside		NO ₂	N	N	Y(<1)	1m	Y
The Quays Moy	Urban Background		NO ₂	N	N	Y(<5)	<5m	Y
Stewartstown Rd, Coalisland	Roadside		NO2	N	N	Y(<5)	<5m	Y
Clogher	Roadside		NO2	N	Ν	Y(<5)	<5m	Y
Fivemiletown	Roadside		NO₂	N	N	Y(<5)	<5m	Υ

Table 2.1.b Details of Non- Automatic Monitoring Sites in Former Dungannon & South Tyrone Borough Council Area

Former Cookstown District Council

The Council monitors Nitrogen dioxide at 8 sites around the district using passive diffusion tubes. Diffusion tubes represent a simple and cost-effective method of monitoring air quality in an area, to give a good general indication of average pollution concentrations. They are particularly useful for assessment against annual mean objectives.

Monitoring sites are chosen to provide data on locations that are likely to give a worst case scenario of air quality in this particular area. These should be representative of likely residential exposure and, where possible, are close to the nearest receptor from the busy road or road junction of interest. The sites are subject to periodic

review and where sufficient data has been gathered, some of the diffusion tubes are

relocated to new locations.

Table 2.1.c Details of Non-Automatic Monitoring Sites in Cookstown District	
Council Area	

Cookstown Office							-	
Site Name	Site Type	OS Grid Ref.	Pollutants Monitored	In AQMA?	Is monitoring co-located with a continuous analyser? (Y/N)	Relevant Exposure	Distance to Kerb of nearest Road	Worst Case Locatior
Lawford St Moneymore	Roadside	X 285770 Y 383510	NO2	N	N	Y	<1m	Y
William Street Cookstown	Kerbside	X 281071 Y 378445	NO ₂	N	N	Y	6m	Y
James Street Cookstown	Roadside	X 281053 Y 378197	NO ₂	N	N	Y	7m	Y
Church Street Cookstown	Kerbside	X 281121 Y 377537	NO ₂	N	N	Y	<1m	Y
Killymoon Street, Cookstown	Kerbside	X 281225 Y 376939	NO ₂	N	N	Y	7m	Y
Smith Street Moneymore	Kerbside	X 285813 Y 383458	NO ₂	N	N	Y	1m	Y
Stonard Street Moneymore	Kerbside	X 285759 Y 383333	NO2	N	N	Y	1m	Y
Conyngham Street,Moneymore	Kerbside	X 285874 Y 383341	NO ₂	N	N	Y	1m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Not applicable to Mid Ulster District Council.

2.1.2 Non-Automatic Monitoring Sites Diffusion Tube Monitoring Data

Former Magherafelt District Council

Site ID	OS Grid Ref	Within	Data Capture %	Annual Mean
		AQMA		Concentrations
				2014 (µg/m³)
				Adjusted for bias
2	X 8977 Y9073	Y	100	47*
3	X8531 Y9043	N	100	33
4	X8989 Y9078	Y	100	20
5	X9251 Y9318	N	25	25
6	X9887 Y9085	N	25	24
7	X8982 Y9069	Y	100	24
8	X8960 Y9046	N	25	24
9	X8974 Y9073	Y	100	42*
10	X8979 Y9074	Y	100	49*
11	X8979 Y9071	Y	92	30
12	X8989 Y9075	Y	100	30
13	X8989 Y9077	Y	75	26
14	X8995 Y9083	N	75	22
15	X8994 Y9084	N	75	20
16	X8993 Y9089	N	75	19
17	X8997 Y9082	N	75	31
18	X8999 Y9085	N	75	33
19	X9003 Y9087	N	75	32
20	X9004 Y9089	N	75	42*
21	X9008 Y9093	N	75	38
22	X9013 9097	N	75	25

Table 2.2.a Results of Nitrogen		n Tubos 2014 ir	Magherafelt DC
Table 2.2.a Results of Millogen	i Dioxide Dinusio	n Tubes 2014 li	i Magneralett DC.

Analysis of the diffusion tubes was carried out by Gradko International Limited. An Air Quality Management Area has been declared in the District of Magherafelt on 14th February 2012 in respect of Church Street and lower King Street. This area has been shown on the map in Appendix 2 with monitoring sites on the map in Appendix 3. Monthly data for 2014 can be found in Appendix 4. Results for sites 2-4, 7 and 9-22 are calculated based on the national database bias adjustment factor of 0.91 for Gradko International Limited, spreadsheet version 03/15. Results for sites 5, 6 and 8 are calculated based on 3 months data and the local study (Belfast) bias adjustment factor of 0.95, spreadsheet version 03/15. Sites 5, 6 and 8 were decommissioned April 2014.

Site	OS Grid	Within	Annual N	Aean Concer	ntrations (µg/	′m³). Adjusteo	for bias
ID	Ref	AQMA	2010	2011	2012	2013	2014
2	X 8977	Y					
	Y9073		37	47*	48*	44*	47*
3	X8531 Y9043	N	38	32	33	30	33
4	X8989 Y9078	Y	18	19	19	19	20
5	X9251 Y9318	N	20	23	23	20	25
6	X9887 Y9085	N	20	21	21	23	24
7	X8982 Y9069	Y	22	24	23	23	24
8	X8960 Y9046	N	34	25	26	22	24
9	X8974 Y9073	Y	54*	38	41*	42*	42*
10	X8979 Y9074	Y	59*	51*	50*	50*	49*
11	X8979 Y9071	Y	40*	30	30	29	30
12	X8989 Y9075	Y	39	31	32	33	30
13	X8989 Y9077	Y	N/A	N/A	N/A	25	26
14	X8995 Y9083	N	N/A	N/A	N/A	21	22
15	X8994 Y9084	N	N/A	N/A	N/A	19	20
16	X8993 Y9089	N	N/A	N/A	N/A	18	19
17	X8997 Y9082	N	N/A	N/A	N/A	29	31
18	X8999 Y9085	N	N/A	N/A	N/A	31	33
19	X9003 Y9087	N	N/A	N/A	N/A	34	32
20	X9004 Y9089	N	N/A	N/A	N/A	41*	42*
21	X9008 Y9093	N	N/A	N/A	N/A	37	38
22	X9013 9097	Ν	N/A	N/A	N/A	24	25

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes 2010 – 2014 in Magherafelt DC

Analysis of the diffusion tubes in 2010 was carried out by Gradko International Limited. Results are calculated based on the national database bias adjustment factor of 0.90.

Analysis of the diffusion tubes in 2011 was carried out by Gradko International Limited. Results are calculated based on the national database bias adjustment factor of 0.89.

Analysis of the diffusion tubes in 2012 was carried out by Gradko International Limited. Results are calculated based on the national database bias adjustment factor of 0.97. An Air Quality Management Area was declared in the District of Magherafelt on 14th February 2012 in respect of Church Street and lower King Street. This area has been shown on the map in Appendix 2 with monitoring sites on the map in Appendix 3.

Analysis of the diffusion tubes in 2013 was carried out by Gradko International Limited. Results are calculated based on the national database bias adjustment factor of 0.95 (extracted from Spreadsheet Version Number 03/14).

Analysis of the diffusion tubes in 2014 was carried out by Gradko International Limited. Results for sites 2-4, 7 and 9-22 are calculated based on the national database bias adjustment factor of 0.91 for Gradko International Limited (extracted from Spreadsheet Version Number 03/15). Results for sites 5, 6 and 8 are calculated based on 3 months data and the local study (Belfast) bias adjustment factor of 0.95 (extracted from Spreadsheet Version Number 03/15).

Former Dungannon and South Tyrone Borough Council

Site ID	Site Type	Within	Data	Triplicate	Confirm if	Annual Mean
		AQMA	Capture	or co-	data has	Concentrations
			%	located	been	2014 (µg/m³)
					distance	Adjusted for bias
					corrected	
Dunclare Way	Urban	Y	100	N	Y	7
	Background					
Ardgannon	Urban	Ν	100	N	Y	11
	Background					
Church Street	Roadside	Y	100	Triplicate	Y	36
Newell Road	Roadside	Ν	100	Triplicate	Υ	52*
Charlemont St.	Roadside	Ν	100	Triplicate	Y	55*
Моу						
Killyman St.	Roadside	Y	100	Triplicate	Y	25
Моу						
The Quays	Urban	Ν	100	Triplicate	Y	8
Моу	Background					
Stewartstown	Roadside	Y	100	Triplicate	Y	33
Rd, Coalisland						
Clogher	Roadside	Y	100	Triplicate	Y	33
Fivemiletown	Roadside	Y	100	Triplicate	Y	23

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes in 2014 in Dungannon.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes 2010 – 2014 in Dungannon & South Tyrone BC

Site ID	Site Type	Within AQMA						
			2010	2011	2012	2013	2014	
Market Square	Roadside	Y	26	22	22	20	N/A	
Ardgannon	Roadside	Ν	13	6	12	12	12	
Church Street Mews	Roadside	Y	43*	39	37	37	36	
Church St. Takeaway	Background	Ν	36	25	30	30	N/A	
Church Street	Background	Ν	29	27	24	26	N/A	
St. Annes								
Church St Junction	Roadside	Y	47*	44*	45*	44*	N/A	
Newell Road	Roadside	Ν	56*	46*	55*	52*	52*	
Charlemont St., Moy	Roadside	Y	60*	55*	56*	56*	55*	
Dungannon Rd, Coalisland	Roadside	Y	40	37	34	35	N/A	
Stewartstown Rd, Coalisland	Roadside	Y	48*	40	35	34	33	

Former Cookstown District Council

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes in 2014

Cookstown Office	Cito Turo	Within	Data	Datawith	Confirm if	
Site ID	Site Type	-	Data	Data with		Annual Mean
		AQMA	Capture	<9 months	data has	Concentrations
			%	has been	been	2014 (µg/m³)
				annualised?	distance	(Bias adjustment
					corrected	factor = 0.92)
Lawford St	Roadside	Ν	100	N/A	N	34
Moneymore						
William Street	Kerbside	Ν	100	N/A	N	25
Cookstown						
James Street	Roadside	Ν	92	N/A	Ν	30
Cookstown						
Church Street	Kerbside	Ν	100	N/A	N	26
Cookstown						
Killymoon Street,	Kerbside	N	100	N/A	N	33
Cookstown						
Smith Street	Kerbside	Ν	100	N/A	N	26
Moneymore						
Stonard Street	Kerbside	N	100	N/A	N	31
Moneymore						
Conyngham	Kerbside	N	92	N/A	N	16
Street,Moneymore						
*Indicates exceeder		•	•	•	•	•

Site ID	Site Type	Within AQMA	Annual Mean Concentrations (μg/m ³). Adjusted for bias				
			2012	2013	2014		
Lawford St	Roadside	N	35	31	34		
Moneymore							
William Street	Kerbside	N	23	23	25		
Cookstown							
James Street	Roadside	Ν	34	28	30		
Cookstown							
Church Street	Kerbside	N	28	23	26		
Cookstown							
Killymoon Street,	Kerbside	N	32	29	33		
Cookstown							
Smith Street	Kerbside	N	27	22	26		
Moneymore							
Stonard Street	Kerbside	N	34	32	31		
Moneymore							
Conyngham	Kerbside	N	N/A	16	16		
Street,Moneymore							

Table 2.7 Results of Nitrogen Dioxide Diffusion Tubes (2012 to 2014)

The results were adjusted for bias using figures obtained from the DEFRA Website under the Local Air Quality Management Section. The website lists the bias adjustment figures that should be applied to the diffusion tubes based on individual laboratories and the type of analysis undertaken. The overall 2014 figure for Gradko Laboratories and the 20% TEA method in water was 0.92. This is based on 22 studies. This was the figure used as it seemed most representative of the method in general.

The website can be found at the following address:

http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

As can be seen from the results listed in Table 2.5 the bias adjusted factors were well below the air quality objective of

40 ugm-3. As a result of this, the department does not intend to declare an AQMA based on this result. When compared to the previous two years the results would seem to be roughly similar especially with regard to the 2012 results.

Automatic Monitoring Data

Mid Ulster District Council does not have any automatic monitoring sites.

2.2.2 PM₁₀

Mid Ulster District Council does not monitor for PM10 within the District.

2.2.3 Sulphur Dioxide

Mid Ulster District Council does not monitor for Sulphur Dioxide within the District.

2.2.4 Benzene

Mid Ulster District Council does not monitor for Benzene within the District.

2.2.5 Other pollutants monitored

Mid Ulster District Council does not monitor for any other pollutant within the District.

2.2.6 Summary of Compliance with AQS Objectives

Mid Ulster District Council has examined the results from monitoring in the district. Concentrations outside of the AQMA's are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Mid Ulster District Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Mid Ulster District Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Mid Ulster District Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Mid Ulster District Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Mid Ulster District Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Mid Ulster District Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Mid Ulster District Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Mid Ulster District Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Mid Ulster District Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Mid Ulster District Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 **Ports (Shipping)**

Mid Ulster District Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Mid Ulster District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Mid Ulster District Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Mid Ulster District Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Mid Ulster District Council confirms that there are no petrol stations meeting the specified criteria.

5.4 **Poultry Farms**

Mid Ulster District Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 **Biomass Combustion – Individual Installations**

Mid Ulster District Council confirms that there are no new biomass combustion plant in the District.

6.2 **Biomass Combustion – Combined Impacts**

Mid Ulster District Council confirms that there are no new biomass combustion plant in the District.

6.3 Domestic Solid-Fuel Burning

Mid Ulster District Council confirms that there are no areas of significant domestic fuel use in the District.

7 Fugitive or Uncontrolled Sources...

Mid Ulster District Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 **Conclusions and Proposed Actions**

8.1 Conclusions from New Monitoring Data

Former Magherafelt District Council

Recent routine monitoring of NO2 levels in an area of Magherafelt town in part of Church Street and King Street have shown levels of exceedence of the standard set in Technical Guidance document LAQM.TG(09). A document entitled 'Detailed Assessment for NO2 Levels on Church Street and King Street, Magherafelt September 2011' was submitted to DOENI with the conclusion that there was a breach of the objective limit of 40ug/m³ in this location, and recommending that the council should declare an AQMA as required by legislation and the technical guidance. The findings of the Detailed Assessment have been reviewed by the Air and Environmental Quality Unit of DOENI and the conclusions and recommendation accepted. An Air Quality Management Area has been formally declared in the District of Magherafelt on 14th February 2012 in respect of Church Street and lower King Street. This area has been shown on the map in Appendix 2.

To date concentrations within the AQMA continue to exceed the objective for NO2 at sites 2, 9 & 10 and as a result the AQMA should remain. The concentration at site 20 exceeds the objective for NO2 since monitoring commenced in 2013. All other concentrations outside of the AQMA are all below the objectives. As a result of historic results, monitoring at sites 5,6 & 8 ceased on 2nd April 2014.

Former Dungannon & South Tyrone Borough Council

Monitoring at 10 locations within Dungannon and South Tyrone Borough Council's area has demonstrated that there are **2** sites where NO_2 levels exceeded the objective limit of $40ug/m^3$; Newell Road, Dungannon and Charlemont Street in Moy.

There are already Air Quality Management Areas in place for these 2 sites. Action Plans for the existing AQMAs at Newell Road, Dungannon and Charlemont Street, Moy were submitted in January 2015.

As was stated in the Progress Report in 2014 the Air Quality Management Areas at Church Street (Dungannon) and Stewartstown Road (Coalisland) had not breached the air quality objective in 3 consecutive years (2011, 2012, & 2013). These 2 AQMAs were revoked by Dungannon & South Tyrone Borough Council in November 2014.

No detailed assessments are required for NO₂ at this time.

Cookstown District Council

Cookstown District Council has no Air Quality Management Areas currently declared in the District. Air quality monitoring data for the 2014 year does not indicate the need to declare an AQMA at this time.

8.2 Conclusions from Assessment of Sources

Magherafelt DC

An Air Quality Management Area has been declared in the District of Magherafelt on 14th February 2012 in respect of Church Street and lower King Street. This area has been shown on the map in Appendix 2 and should remain in place.

Dungannon & South Tyrone BC

This Updating and Screening Assessment has determined that there are no impacts on local air quality from the assessment of sources in sections 3,4,5,6 & 7 of this Updating and Screening Assessment.

Cookstown DC

The assessment of new and existing sources did not identify any potential exceedances of air quality objectives in the district. This department does not therefore intend to conduct detailed assessments or declare any AQMA's based on the assessment of these sources.

8.3 **Proposed Actions**

Magherafelt DC

DOENI has accepted the content and conclusions of Detailed Assessment MDC/DA/02 submitted in September 2012. An AQMA has been formally declared (14th February 2012) and an Action Plan is to be submitted.

As a result of new school premises and new traffic movements adjacent to the AQMA, additional sites (13-22) continue to be monitored to establish if the designated area requires to be extended.

Construction of the A31 Magherafelt by-pass has now commenced. The by-pass will consist of a 5.9km single carriageway to the east of Magherafelt town. The Department for Regional Development has commissioned an Environmental Statement. In the section dealing with Environmental Impacts and Mitigation, the following is included regarding air quality;

'The EIA has demonstrated that many more people would benefit from reductions in concentrations of key pollutants with implications for local air quality and human health than would experience increases as a result of the diversion of strategic traffic from the existing road through the town to the proposed by-pass. It has also

demonstrated that the increases would result in concentration markedly below levels established as an indicator of risk to human health.

The evaluation of emissions of nitrous oxides, particulates and carbon monoxide as a contributor to regional air quality has concluded these would be small and not significant in the context of overall emissions'.

Magherafelt District Council concurs with the views expressed above and is confident that the use of the by-pass will result in a reduction of NO2 levels leading to improved health outcomes and enabling the AQMA to be revoked. Monitoring will continue at the current locations to ensure that future decisions are based on sufficient and robust evidence.

Dungannon & South Tyrone BC

This Updating and Screening Assessment has not identified the need to proceed to a detailed assessment. No new additional monitoring is required and the next course of action to be completed by Mid Ulster District Council is to submit a Progress Report in April 2016.

Cookstown DC

This Updating and Screening Assessment has not identified the need to proceed to a detailed assessment for any pollutant. This department's next course of action is to submit a Progress Report in 2016.

9 References

- i. The Environment (Northern Ireland) Order 2002
- ii. Air Quality Regulations (Northern Ireland) 2003
- iii. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000
- iv. DEFRA Local Air Quality Management Technical Guidance LAQM.TG(09)
- v. Magherafelt District Council 1st Stage Review and Assessment of Air Quality 2001
- vi. Magherafelt District Council 2nd Stage Review and Assessment of Air Quality 2002
- vii. Magherafelt District Council Progress Report on Air Quality Management 2005
- viii. Magherafelt District Council Air Quality Update and Screening Assessment 2006
- ix. Magherafelt District Council Progress Report on Air Quality Management 2007
- x. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2008
- xi. Magherafelt District Council Progress Report on Air Quality Management 2008
- xii. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2009
- xiii. Magherafelt District Council Air Quality Update and Screening Assessment 2009
- xiv. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2010
- xv. Magherafelt District Council Progress Report on Air Quality Management 2010
- xvi. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2011
- xvii. Magherafelt District Council Detailed Assessment for NO2 Levels on Church Street and King Street, Magherafelt 2011
- xviii. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2012

- xix. Magherafelt District Council Air Quality Update and Screening Assessment 2012
- xx. Magherafelt District Council Local Air Quality Management Grant Evaluation Form 2013
- xxi. Magherafelt District Council Air Quality Progress Report 2013
- xxii. Magherafelt District Council Air Quality Progress Report 2014
- xxiii. Cookstown District Council 1st Stage Review and Assessment August 2001
- xxiv. Cookstown District Council 2nd/3rd Stage Review and Assessment Report-August 2004.
- xxv. Cookstown District Council Updating and Screening Assessment August 2006
- xxvi. Cookstown District Council Updating and Screening Assessment Aug 2009
- xxvii. Cookstown District Council Updating and Screening Assessment Aug 2012
- xxviii. Cookstown District Council Progress Report 2007
- xxix. Cookstown District Council Progress Report 2008
- xxx. Cookstown District Council Progress Report 2010
- xxxi. Cookstown District Council Progress Report 2011
- xxxii. Cookstown District Council Progress Report 2013

10 Appendices

Appendix 1:	QA/QC Data
Appendix 2:	Area designated as Air Quality Management Area
Appendix 3:	Non-automatic monitoring sites in AQMA
Appendix 4:	Nitrogen dioxide diffusion tube monthly data for 2014

Appendix 1: QA/QC Data

Magherafelt District Council

Diffusion Tube Bias Adjustment Factors

Gradko International Limited, St. Martins House, 77 Wales Street, Winchester, Hampshire, SO23 0RH have supplied and analysed our NO2 diffusion tubes from 2007.

2010 results are calculated based on the national database bias adjustment factor of 0.90. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

2011 results are calculated based on the national database bias adjustment factor of 0.89. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

2012 results are calculated based on the national database bias adjustment factor of 0.97.Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

2013 results are calculated based on the national database bias adjustment factor of 0.95. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

2014 results for sites 2-4, 7 and 9-22 are calculated based on the national database bias adjustment factor of 0.91. Results for sites 5, 6 and 8 are calculated based on 3 months data and the local study (Belfast) bias adjustment factor of 0.95. Bias adjustment factors were obtained from the Air Quality Review and Assessment website.

Factor from Local Co-location Studies (if available)

Not applicable to Magherafelt District Council.

Discussion of Choice of Factor to Use

Guidance on the most suitable bias adjustment factor to be applied was taken from Technical Guidance.

PM Monitoring Adjustment

Not applicable to Magherafelt District Council, see section 1.4 of this report.

Short-term to Long-term Data adjustment

Short-term data obtained by Magherafelt District Council was not adjusted to long-term data.

QA/QC of automatic monitoring

Not applicable to Magherafelt District Council.

QA/QC of diffusion tube monitoring

Gradko International Limited is assessed annually by UKAS to establish conformance of the Laboratory Quality Procedures to the requirements of ISO/IEC 17025 Standard and have continually demonstrated a good performance in the WASP scheme for analysis of NO2 diffusion tubes, operated by the Health and Safety Laboratory.

Dungannon & South Tyrone BC

QA:QC Data and Gradko WASP Data

Diffusion Tube Bias Adjustment Factors

The NO₂ diffusion tubes were prepared and analysed by Environmental Sciences Group (ESG) Didcot from the beginning of January 2013. This laboratory takes part in the NO₂ Network QA/QC Field Intercomparison survey. ESG's diffusion tubes are prepared by coating the grids in 50% TEA in Acetone. Dungannon and South Tyrone Borough Council obtained the appropriate bias factor from the DEFRA Website. <u>http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html</u> A bias factor of **0.81** was taken from the drop down menus available on the excel spreadsheet matrix (version number 03/15).

Factor from Local Co-location Studies (if available)

Dungannon and South Tyrone Borough Council did not use a Bias Factor from a local Co-location study. Dungannon does not have an automatic NO₂ analyser in the borough to carry out a co-location assessment. Also, although a co-location factor may be available from neighbouring councils, it was felt that the national bias factor was drawn from a greater range of sites and could therefore be considered overall more representative of the sites monitored in the borough.

Discussion of Choice of Factor to Use

Dungannon and South Tyrone Borough Council used the Bias Factor from the Defra Website. <u>http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html</u>. This was calculated by using the matrix available on the site by selecting the appropriate laboratory, year of monitoring and significant methodology.

QA/QC of diffusion tube monitoring

Table 1: Laboratory summary performance for WASP NO2 PT Rounds 121-124 and AIR NO₂ PT rounds AR001, 3, 4 and 6

WASP Round WASP R121 R122 R122 WASP R122 WASP R124 AIR PT AR001 AIR PT AR003 AIR PT AR004 AIR PT AR004 AIR PT AR006 AIR PT AR016 AIR PT AR016 AIR PT AR016 AIR PT AR016 AIR PT AR016 <	percentage (%) of results subr	percentage (%) of results submitted which were subsequently determined to be satisfactory based upon a z-score of $\leq \pm 2$ as defined above.						fined above.	
Round conducted in the period 2013 April - String 2013 September 2013 December 2013 March 2014 2015 Ediaburgh Scientific Services 100 % 100 % 100 %	WASP Round						AR003		
Cardiff Scientific Services 100 % <th1< td=""><td>Round conducted in the period</td><td></td><td>September</td><td>December</td><td></td><td></td><td></td><td>November</td><td>February</td></th1<>	Round conducted in the period		September	December				November	February
Edinburgh Scientific Services 100 % 75 % 100 % <th< td=""><td>Aberdeen Scientific Services</td><td>100 %</td><td>100 %</td><td>NR [2]</td><td>75 %</td><td>100 %</td><td>100 %</td><td>100 %</td><td></td></th<>	Aberdeen Scientific Services	100 %	100 %	NR [2]	75 %	100 %	100 %	100 %	
Environmental Services Group, Didcot [1] 100 %	Cardiff Scientific Services	100 %	100 %	100 %	100 %	NR [2]	NR [2]	NR [2]	
Didcot [1] Did % 100 %	Edinburgh Scientific Services	100 %	75 %	100 %	100 %	100 %	100 %	100 %	
Glasgow Scientific Services 25 % 100 % 1	Didcot [1]	100 %	100 %	100 %	??	100 %	100 %	100 %	
Gradko International [1] 100 % 100	Exova (formerly Clyde Analytical)	NR [2]	NR [2]	NR [2]	50 %	NR [2]	NR [2]	NR [2]	
Kent Scientific Services 75 % 100 % 100 % 100 % NR [2]	Glasgow Scientific Services	25 %	100 %	100 %	100 %	100 %	100 %		
Kirklees MBC 100 %				100 %		100 %			
Lambeth Scientific Services 0 % 50 % 75 % 25 % 50 % 100 % 100 % Milton Keynes Council 100 % 75 % 75 % 75 % 100 % 100 % 75 % Northampton Borough Council 100 % 100 % 100 % 100 % 0 % 0 % Somerset Scientific Services 100 % 75 % 100 % 100 % 100 % 100 % South Yorkshire Air Quality 100 % 100 % 100 % 100 % 100 % 100 % 100 % Staffordshire Council 100 % 100 % 100 % 100 % 100 % 100 % 100 % Tayside Scientific Services (formerly Dundee CC) 100 % 100 % 100 % 100 % 100 % 100 % 100 %	Kent Scientific Services	75 %	100 %	100 %	100 %	NR [2]	NR [2]	NR [2]	
Milton Keynes Council 100 % 75 % 75 % 100 % 100 % 75 % Northampton Borough Council 100 % 100 % 100 % 100 % 0 % 0 % Somerset Scientific Services 100 % 75 % 100 % 100 % 100 % 0 % 0 % South Yorkshire Air Quality Samplers 100 %	Kirklees MBC	100 %	100 %	100 %	100 %	100 %	100 %	100 %	
Northampton Borough Council 100 % 100 % 100 % 100 % 0 % 0 % Somerset Scientific Services 100 % 75 % 100 % <td>Lambeth Scientific Services</td> <td>0 %</td> <td></td> <td>75 %</td> <td></td> <td>50 %</td> <td>100 %</td> <td>100 %</td> <td></td>	Lambeth Scientific Services	0 %		75 %		50 %	100 %	100 %	
Somerset Scientific Services 100 % 75 % 100 % <th1< td=""><td>Milton Keynes Council</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th1<>	Milton Keynes Council								
South Yorkshire Air Quality Samplers 100 %	Northampton Borough Council	100 %	100 %	100 %	100 %	100 %	0 %	0 %	
Samplers 100 %	Somerset Scientific Services	100 %	75 %	100 %	100 %	100 %	100 %	100 %	
Tayside Scientific Services (formerly Dundee CC) 100 % 100 % 100 % NR [2] 100 % 100 %		100 %	100 %	100 %	100 %	100 %	100 %	100 %	
(formerly Dundee CC) 100 % 100 % 100 % 100 % NR [2] 100 % 100 %	Staffordshire County Council	100 %	100 %	100 %	100 %	100 %	25 %	100%	
West Yorkshire Analytical Services 100 % 50 % 100 % 75 % 75 % 100 % 75 %		100 %	100 %	100 %	100 %	NR [2]	100 %	100 %	
	West Yorkshire Analytical Services	100 %	50 %	100 %	75 %	75 %	100 %	75 %	

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent WASP/AIR NO₂ PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of $\leq \pm 2$ as defined above.

[1] Participant subscribed to two sets of test samples (2 x 4 test samples) in each WASP PT round.

[2] NR Not reported.

Cookstown DC: QA:QC Data

Diffusion Tube Bias Adjustment Factors

The diffusion tube analysis for the Council in 2014 was carried out by Gradko International, Wincester, Hampshire, England. The tubes were exposed for a month at a time before being sent for laboratory analysis. The preparation method used was an absorbent of %20 TEA (Triethanolamine)/Water. Analysis was carried out by U.V. Spectrophotometry using a UVSO4 Camspec M550.

The results were adjusted for bias using figures obtained from the DEFRA Website. under the Local Air Quality Management Section. The website lists the bias adjustment figures that should be applied to the diffusion tubes based on individual laboratories and the type of analysis undertaken. The overall 2014 figure for Gradko Laboratories and the 20% TEA method in water was 0.92. This is based on 22 overall co-location studies. This was the figure used as it seemed most representative of the method in general.

The website can be found at the following address: http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiontube290909.xls

Factor from Local Co-location Studies (if available)

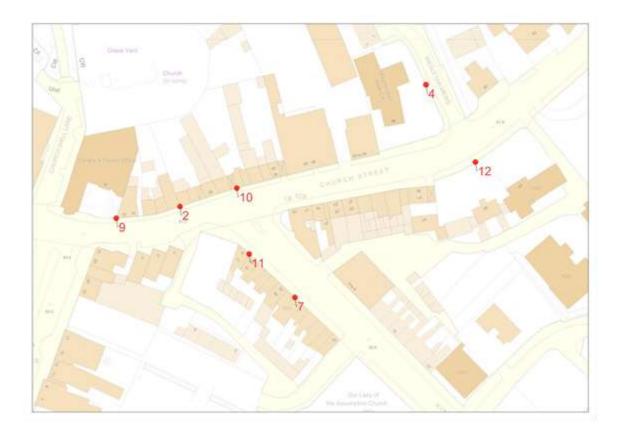
This factor is not available in the Cookstown District.

Discussion of Choice of Factor to Use

Given that no locally available relevant co-location studies were available it was decided to use the national overall lo-location figure of 0.92 as this was representative of 22 separate co-location studies and was thought to represent a good 'average' figure.

1) Appendix 2: Non-automatic monitoring sites

Non Automatic Monitoring Sites in AQMA in Magherafelt



Non Automatic Monitoring Sites in Dungannon

1. Dunclare Way



2. <u>Ardgannon</u>



3. Church Street



4. Newell Road



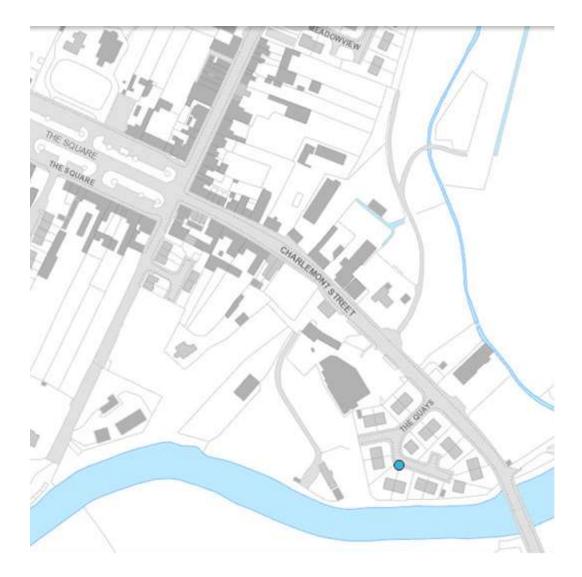
5. Charlemont St, Moy



6. Killyman Street, Moy



7. The Quays, Moy



8. Stewartstown Road, Coalisland

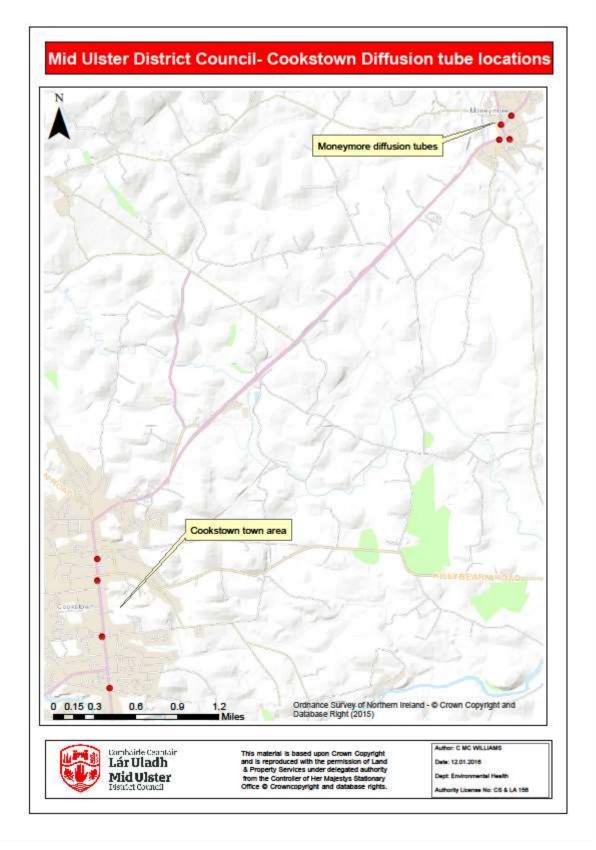


9. Main Street, Clogher

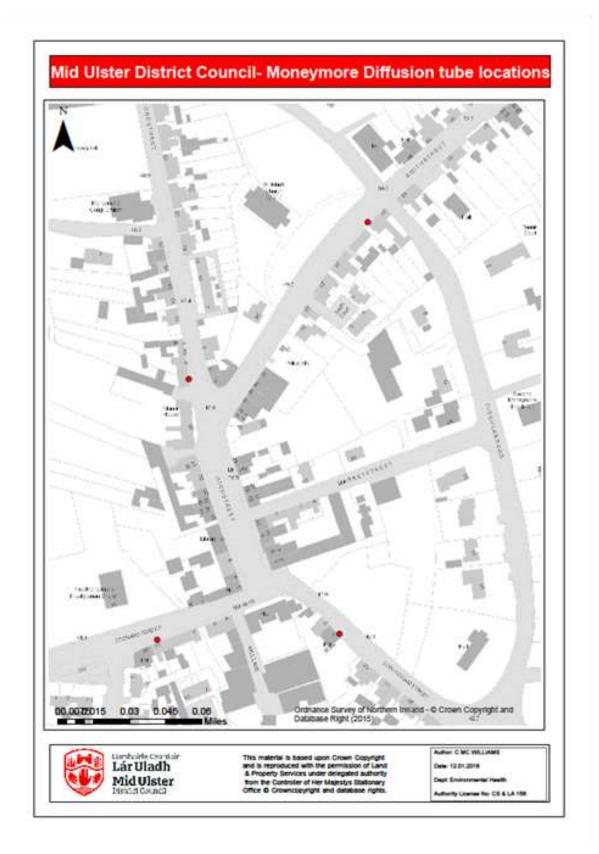


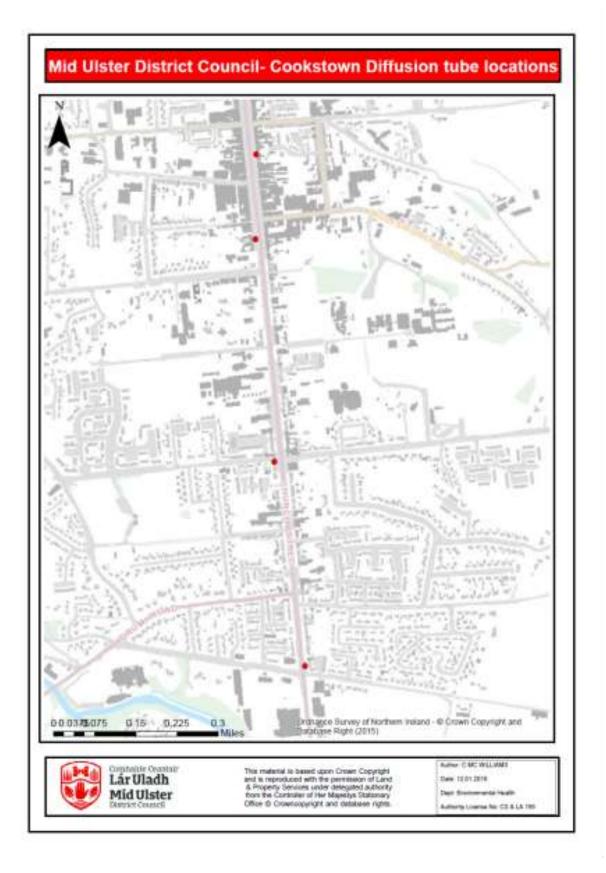
10. Main Street, Fivemiletown





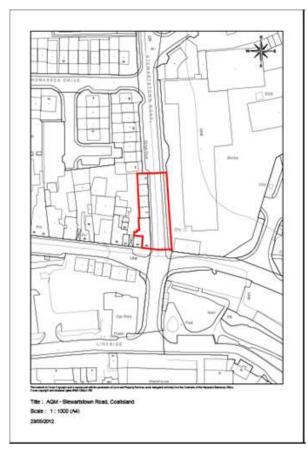
Non Automatic Monitoring Sites in Cookstown











3) Appendix 4:

Nitrogen dioxide diffusion tube monthly data for 2014





(A stivision of Gradko International J 0L) St. Martins House, 77 Wales Street Winchester, Humpshire SO23 0001 (e),: 01962 860331 [ax: 01962 841339] e-malledi@usionio/gradko.co.ch.

LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V. SPECTROPHOTOMETRY

REPORT NUMBER 100497R BOOKING IN REFERENCE 100497 DESPATCH NOTE SOR012 CUSTOMER Meghers

ICO497 SOR012155 Magherafelt District Council Alth: Susan Martin Environmental Health Dept, 50 Ballyrunan Road, Magherafalt, Co Londonderry, 945 GEN

DATE SAMPLES RECEIVED 00/02/2014

		Exposure Data					TOTAL
				Time			0.000
Location	Sample Number	Date On	Date Off	(hr.)	ի նոյեղ	bbp ,	pg NO ₂
2	284721	02/01/2014	05/02/2014	816.00	45.63	23.82	271
Э	284722	02/01/2014	05/02/2014	316.00	38.62	19.11	2 17
.1	284723	02/01/2014	05/02/2014	816.00	32.76	17.10	194
5	284724	02/01/2014	05/07/2014	816.00	27.79	14.51	1.65
2 3 4 3 6 7	284725	02/01/2014	05/07/2014	816.00	23.50	12.42	1 11
7	284726	02/01/2014	05/02/2014	816.00	31.00	16.19	1 84
8	284727	02/01/2014	05/02/2014	816.00	27.30	14.25	1 62
9	284728**	02/01/2014	05/02/2014	816.00	\$6.05	29.26	3.52
10	284729	02/01/2014	05/02/2014	816.00	48.10	25.11	2.85
11	284730	02/01/2014	05/02/2014	810.00	36,78	19.19	2.18
12	284731	02/01/2014	05/02/2014	616.CC	31.64	16.51	1.68
15	254732	02/01/2014	05/02/2014	518 00	35.55	18.55	2.11
14	254733	C2/C1/2014	05/02/2014	516 00	53.71	17.59	2.00
15	284734	02/01/2014	05/02/2014	816.00	25.65	13.49	1.53
16	28473a	02/01/2014	05/02/2014	816.00	33.3B	17.42	1.99
17	254736	C2/01/2014	05/02/2014	\$16.00	56 93	20.32	2.31
18	254737	02/01/2014	05/02/2014	816.00	35.01	19,84	2.25
19	284738	02/01/2014	05/02/2014	616.00	35.22	18.38	2.09
20	284/39	02/01/2014	05/02/2014	816 00	45.63	23.81	2.71
21	254740	02/01/2014	05/02/2014	816 00	42.10	21.87	2.50
22	284741	02/01/2014	05/02/2014	816.00	32 63	17 Ç3	1.94
Labataki	ny Glack			816 00	C.*2	D.06	0/007
E00.1 000	a la marca de la compañía de la comp			Acres and	12412263	0.000	

Comment: Results are not blank subtracted

Tubes marked " were diluted to read within our UKAS accredited calibration range.

Results have been corrected to a temperature of 293 K (20°)

The Diffection Tubes have been tested within the cope of Gradka Laternariand Lut. Laboratory Quality Procedures valualities and assessments invaluing the exponent procedures and performance of the direction of the exponent of the exponent of the exponent of the exponent of the direction of the exponent of th





SI, Martins House, 77 Wales Strept Winehester, Basmodrice SO22 0R11 art: 01962 S60331 http://1962/841339 e-mail:r000.signadlanco.ak

	LABORATORY	ANALYSIS REPO	DRT
Qverall NLU.	5.2% +/-	Limit of Detection	D.C10µgNO2
Tube Precaration 2	0% TEA / Water		
Analysed on UVC5 C	Samspec M550		
		Analyst Name	Laure Digby
Date of Analysis	10/02/2014	Date of Report	10/02/2014

Analysis carried out in accordance with documented in-house Laboratory Method. GLM7

And an and an an an and a strength of the stre	Grad	hu International Ltd
Form 1.QF235 Issue 4 - September 2012	Report Number 100497R	Page 2 of 2
Candles International Ltd., This report is not to be expendite	ced, except in hill, without the written permission of G	escho International I rd.
using trajector data shall be indicated by an asteristy. Any-		
involving the exposure procedures and perform provided by		
The DilEssion Tubes have been fested within the verify of the		

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Signed

Lore conferen Lie antienticity of the Augustust L. Gates, Laboratory Supervisor

REPORT OFFICIALLY CHECKIN

aticity of these results





(A division of Gradian Informational 13(1) St. Martin- Hanze, 77 Walas Strees Winchester, Hampshire SO23 0811 rets (1962) 960331 [fax: 01962 341339] o-mail: diffusion/ggradko.co.uk

T ABORATORY ANALYSIS REPORT NITROBEN DIDXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

REPORT NUMBER 101022R BOOKING IN REFERENCE 101022 DESPATCH NOTE SUSON2155 CUSTOMER Maghersfelt District Council Adm: Suson Martin Environmental Health Owpt. 50 Ballyronan Road, Maghersfelt Col Lenconderry BT4b 6EN

DATE SAMPLES RECEIVED 15/C3/2014

		Exposure Data					TOTAL
				Time			
Location	Sample Number	Date On	Date Off	(hr.)	µgim ⁹ *	pbp .	ug NO2
2	268405**	05/02/2014	12/03/2014	840 OC	54 43	53 63	S.93
23	298407	05/02/2014	12/03/2014	840.00	38 95	20 33	2.38
	298408	05/02/2014	12/03/2014	840.0C	28.24	14 74	1.72
4 5	298409	05/02/2014	12/03/2014	840 OC	27 S*	14 25	1.67
G	298410	05/02/2014	12/03/2014	£40 0C	26 02	13 58	1.69
7	298411	05/02/2014	12/03/2014	840.0C	28 50	14 68	1.74
	298412	05/02/2014	12/03/2014	540 OC	27.17	14 18	1.66
อ 9	298415**	05/02/2014	12/03/2014	840 OC	58 07	50.31	3.55
10	298414	05/02/2014	12/03/2014	840 OC	53 43	27 85	3.26
11	298415	05/02/2014	12/05/2014	54C 0C	42 23	22.04	2.58
12	298416	05/02/2014	12/03/2014	546 00	58.03	19 85	2.82
13	290417	05/02/2014	12/03/2014	840.00	36 97	19 30	2.28
14	298418	05/02/2014	12/03/2014	84C 00	28.42	14 83	1.74
15	298419	05/02/2014	12/05/2014	54C 00	29.38	15 34	1.79
30	298420	05/02/2014	12/03/2014	840.00	35 92	16 14	1.89
17	298421	05/02/2014	12/03/2014	84C 00	41.77	21 00	2,55
·8	238422	05/02/2014	12/05/2014	540 00	43.50	22.70	2.66
19	298423	05/02/2014	12/03/2014	84C 00	40.86	25 32	2,49
20	298424	05/02/2014	12/03/2014	84C 00	69 69	31 10	3.64
21	238425	05/02/2014	12/03/2014	540 00	45 71	25.42	2,97
22	258426	05/02/2014	12/03/2014	640 00	37.21	19 42	2 27
Laborato				640 00	C.13	0 37	0.005

Comment: Results are not blank subtracted

Tubee marked " were diluted to read within our UKAS accredited calibration range.

Results have been corrected to a temperature of 293 K (20°)

The Hilborne Tubes have been corrected to a temperature of and wide of The Hilborne Tubes have been control within the correct Gradies to communal 1 (). I above may fundicy Procedures calculations and assessments toward on the exposure proceedings and periods are defined for the Grad we not without the source of a K-S mareditation. Thus e-results obtained using regime is and the initiated by an arterist. Any process concerning the data at the source of should be directed to the Labovaney Manager Gradies Encentrational 1.61. This report is any to be reproduced, every in both, without the original periods and the initiation of the form 1.01.250 (see 4 – september 2012 Report Number 20102.23). Page 1 of 2



Gradico Internetional Ltd This signalure confirms the outbendicity of these results fl-gat-Signed...... L. Gates, Leburatory Supervisor



3et: 01952 860331 fax: 01962 841339 e-mail: diffusion-Agradico.ep.ol.



LABORATORY ANALYSIS REPORT

	A DE	A ART TANK A CARD APPEND	and the second
Overali M.U.	5.2% +/-	Limit of Detection	0.010ugNO2
Tube Preparation : 20% 7	TEA / Water		
Analysed on UV05 Cains	pec M550		
		Analyst Name	Lauré Digby
Date of Analysis	24/05/2014	Date of Report	25/03/2014
Analysis carried out in a GLM7	accordance with documented in-h	ouse Laboratory Method	

The Diffusion Toby, have been based within the senge of Gradko Intermotional Ltd. Laboratory Quality Procedures calculations and associations involving the support procedures and periods good like by the client are not within the scope of our UKAS accorditation. These regards obtained using exposure procedures and periods good like and according the data in the report should be directed by an observe being regards obtained the indicated by an observed. Any metric concerning the data in this report should be directed by an observe being regards obtained and the indicate being regards on the report of a control to obtain the report should be directed by the control of the data in the report should be directed by the control of the data in the report should be directed by the control of the data in the report should be directed by the control of the data in the report should be directed by the control of the data in the report should be directed by the control of the data in the report should be directed by the data in the report should be directed by the data in the report should be directed by the data in the report of the data in the report should be directed by the data in the report should be directed by the data in the report should be directed by the data in the report should be directed by the data in the report should be directed by the data in the report should be directed by the data in the report should be directed by the data in the report of the data in the report



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(A division of Gradko International 13.6.) St. Martine House, 77 Wales Street Winebester, Bumpshire SO23 0RH (cl.: 01962 560331 – fac: 01962 841309 – e-mail/diffusion/aggm/dkaccoak.

LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY REPORT NURBER 19123'R

BOOKING IN REFERENCE DESPATCH NOTE CUSTOMER

I01231 SOR015052 Magherafelt District Council, Adm: Susan Marlin Environmental Health Dept, 50 Ballyronian Road, Magherafelt Co Lonconderry, BT45 GEN

DATE SAMPLES RECEIVED 03/04/2014

			Ехровиге Data		Time			TOTAL
Location	Sa	mple Number	Dala Ón	Date Off	(hr.)	µgim ⁶ •	ррю 1	μg NO 2
2		312828	12/08/2014	02/04/2014	504.00	49 37	25.77	181
3		312829	12/03/2014	32/04/2014	504.00	34.36	17.93	1 26
4		312830	12/03/2014	52/04/2014	504.D0	19.46	10.15	0.71
ā		312831	12/03/2014	02/04/2014	504.00	24.68	12.98	0.91
6		312832	12/08/2014	32/04/2014	504.00	25 44	13.26	0.93
7		512633	12/03/2014	02/04/2014	504.00	24.04	12.55	9.88
8		312634	12/03/2014	02/04/2014	504 00	22.65	11.77	9.83
S		312835	12/03/2014	02/04/2014	504 00	45 15	23.67	1.66
10		312836	12/08/2014	02/04/2014	504 00	53 88	25.12	1.97
11		312837	12/03/2014	02/04/2014	504 00	30.48	15.91	1.12
12		\$12838	12/03/2014	02/04/2014	504.00	36.31	18.95	1.33
13		312839	12/03/2014	02/04/2014	504.00	30.29	15.01	1.11
14		312840	12/03/2014	02/04/2014	504.00	26.29	13.72	0.96
15		312841	12/03/2014	02/04/2014	504.00	24.27	12.67	0.69
16		312842	12/03/2014	02/04/2014	504.00	23.24	12.13	0.85
17		312843	12/03/2014	02/04/2014	504.00	36.52	19.06	1.34
18		\$12844	12/03/2014	02/04/2014	504.00	39.29	20.c1	1.44
19		312845	12/03/2014	02/04/2014	504.00	13 91	6.B3	0.62
20		312846	12/03/2014	02/04/2014	504.00	42.40	22.17	1.56
21		312847	12/03/2014	02/04/2014	504.00	38.30	19.99	1.40
77		312848	12/03/2014	02/04/2014	604 CO	29.74	15.52	1.09
ı	aboratory Blank				504.00	0.25	013	0 009

Comment: Results are not blank subtracted

Tubes 312631, 312834 and 312632 were received without white caps on. Results may be compromised.

The Diffusion Tuber have been reveal within the scope of Gradian International Ltd. Laboratory Quality Procedures rate datains and issues ments invulving the exposure procedures and periods provided by the them are not within the waye of our UKAS accordination. These results charined using exposure data shall be indicated by an averable. Any queries encreming the data in this report should be directed in the Laboratory Manager Gradian International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradian International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradian International Ltd. The report is not to be reproduced, except in full, without the written permission of Gradian International Ltd. This report is not to be reproduced, except in full, without the written permission of Gradian International Ltd. The report is not to be reproduced, except in full, without the written permission of Gradian International Ltd. The report is not used to be reproduced, except in full.









LABORATORY ANALYSIS REPORT

Results have been con	racted to a temperature of 293 K (2)	ንዓ	
Overall M.U.	5 2% +/-	Limit of Detection	0.010µ.3NO2
Tube Preparation : 20%	TEA / Water		
Analysed on LMO5 Cam	spec M550		
		Analyst Name	Laura Digby
Date of Analysia	09/04/2014	Date of Report	09/04/2014

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

(el.: 01962 N50011 free: 01962 N41559 e-mailediffusion/egradio.co.uk

The Diffusion Tales have been extent within the scope of Gradks International 1.64. Extension Quality Proceedines calculations and investments involve to the exposure procedures and posteries. Any quarties concerning the data in this report should be streamed to the Unterstand Manager Crafter International Ltd. This report is not to be reproduced, except in fail, without the written permittion of Gradks International Ltd. This report is not to be reproduced, except in fail, without the written permittion of Gradks International Ltd. The sequence of Quality Proceedings of the stream o

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Hatis

L. Gates, Laboratory Supervisor

Signed





(A division of Crandka International Ltd.) 56 Marcins House, 77 Wales Street Winchester: Hampshire SU23 0401 rel, 01962 860331 Sec. 01962 841259 e-mail:diffusiono/gradba.com/k

LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

Excess 1180

REPORT NUMBER 101536 BOOKING IN REFERENCE 101536 DESPATCH NOTE SORC15 CUSTOMER Waghers Environm

IO1586 SOR015022 Nagherafelt District Countol Alun, Busan Martin Environmental Hoalth Depl, 50 Bellyronen Road, Magherafelt Co Loncondeny. RT45 SCN

DATE SAMPLES RECEIVED 01/05/2014

	Data					TOTAL
	2010-00 Million		Time			
Sample Number	Date On	Date Off	(hr.)	ր ն լա _{ջ է}	ppb *	µg NO;
53E160	02/04/2014	30/04/2014	672.00	49.19	25.67	2.40
536161	02/04/2014	30/04/2014	672.00	34.92	18.22	1.71
336162	02/04/2014	30/04/2014	672.00	22.03	11.50	1.08
336163	02/04/2014	SD/04/2014	672.00	26.32	13.21	1.24
536164	02/04/2014	\$3/04/2014	672.00	38.31	19.99	1.07
336185	02/04/2014	30/04/2014	672.00	56.51	28.49	2.76
336*66	02/04/2014	30/D4/2014	672.00	31.00	16,18	1,51
336167	02/04/2014	30/04/2014	672.00	30.50	15.92	1.49
536168	02/04/2014	30/04/2014	672.00	24.00	12.53	1.17
336*89	02/04/2014	30/04/2014	672.30	23 97	12.51	1.17
338170	02/04/2014	30/84/2014	672.00	18.96	9.91	Ç.93
336171	02/04/2014	52/04/2014	672 00	20.10	10.49	6.98
356172	02/04/2014	30/04/2014	672.00	31.26	16.32	1.53
336173	02/04/2014	30/04/2014	872 00	53 19	17.32	1.62
336174	02/04/2014	SD:04/2014	672 00	33 73	17.6C	1.65
356175	02/04/2014	30/04/2014	872 32	40.28	21.02	1 97
335176	02/04/2014	30/04/2014	872 00	40.74	21.26	1.95
338177	02/04/2014	30/04/2014	672 X	28 13	13.64	1.28
Black			872 00	C.12	3.05	0.006
	536160 536161 338162 338163 536164 536166 338166 338166 338166 338161 536188 338170 336171 356172 336173 336174 356175 356175 356176	S36160 02/04/2014 S36161 02/04/2014 S36162 02/04/2014 S36163 02/04/2014 S36164 02/04/2014 S36165 02/04/2014 S36166 02/04/2014 S36165 02/04/2014 S36166 02/04/2014 S36167 02/04/2014 S36168 02/04/2014 S36178 02/04/2014 S36171 02/04/2014 S36172 02/04/2014 S36173 02/04/2014 S36174 02/04/2014 S36176 02/04/2014 S36177 02/04/2014 S36174 02/04/2014 S36177 02/04/2014 S36178 02/04/2014 S36177 02/04/2014 S38177 02/04/2014	S36160 32/04/2014 S0/04/2014 S36161 52/04/2014 S0/04/2014 S36162 52/04/2014 S0/04/2014 S36163 52/04/2014 S0/04/2014 S36164 52/04/2014 S0/04/2014 S36165 52/04/2014 S0/04/2014 S36166 52/04/2014 S0/04/2014 S36166 52/04/2014 S0/04/2014 S36166 52/04/2014 S0/04/2014 S36166 52/04/2014 S0/04/2014 S36167 02/04/2014 S0/04/2014 S36168 52/04/2014 S0/04/2014 S36170 02/04/2014 S0/04/2014 S36171 02/04/2014 S0/04/2014 S36172 02/04/2014 S0/04/2014 S36173 02/04/2014 S0/04/2014 S36174 02/04/2014 S0/04/2014 S36175 02/04/2014 S0/04/2014 S36176 02/04/2014 S0/04/2014 S36176 02/04/2014 S0/04/2014 S36176 02/04/2014	Sample Number Date On Date Off (hr.) S36160 02/04/2014 30/04/2014 672.00 336161 02/04/2014 30/04/2014 672.00 336162 02/04/2014 30/04/2014 672.00 336163 02/04/2014 30/04/2014 672.00 336164 02/04/2014 30/04/2014 672.00 336165 02/04/2014 30/04/2014 672.00 336166 02/04/2014 30/04/2014 672.00 336165 02/04/2014 30/04/2014 672.00 336166 02/04/2014 30/04/2014 672.00 336165 02/04/2014 30/04/2014 672.00 336166 02/04/2014 30/04/2014 672.00 336167 02/04/2014 30/04/2014 672.00 336170 07/04/2014 30/04/2014 672.00 336173 02/04/2014 30/04/2014 672.00 336173 02/04/2014 30/04/2014 672.00 336176 02/04/2014 30	Sample Number Date On Date Off (hr.) µµm ^{3 r} S36160 02/04/2014 30/04/2014 672.00 46.19 336161 02/04/2014 30/04/2014 672.00 34.92 338162 02/04/2014 30/04/2014 672.00 26.32 338162 02/04/2014 30/04/2014 672.00 26.32 536163 02/04/2014 30/04/2014 672.00 26.32 536164 02/04/2014 30/04/2014 672.00 36.31 336165 02/04/2014 30/04/2014 672.00 36.51 336165 02/04/2014 30/04/2014 672.00 36.51 336165 02/04/2014 30/04/2014 672.00 24.50 336165 02/04/2014 30/04/2014 672.00 24.50 336165 02/04/2014 30/04/2014 672.00 24.50 336170 02/04/2014 30/04/2014 672.00 23.97 336172 02/04/2014 30/04/2014 672.00 31.86 </td <td>Sample Number Date On Date Off (hr.) µ9/m⁵ Ppb * S36160 02/04/2014 50/04/2014 672.00 48.49 25.67 336161 02/04/2014 50/04/2014 672.00 34.92 18.22 338162 02/04/2014 50/04/2014 672.00 22.03 11.50 336163 02/04/2014 50/04/2014 672.00 26.32 13.21 536164 02/04/2014 50/04/2014 672.00 36.31 18.90 336165 02/04/2014 50/04/2014 672.00 36.51 29.49 326166 02/04/2014 50/04/2014 672.00 36.51 29.49 326166 02/04/2014 30/04/2014 672.00 31.00 16.16 326167 02/04/2014 30/04/2014 672.00 24.00 12.53 306169 02/04/2014 30/04/2014 672.00 24.00 12.53 306170 02/04/2014 30/04/2014 672.00 20.10 10.49</td>	Sample Number Date On Date Off (hr.) µ9/m ⁵ Ppb * S36160 02/04/2014 50/04/2014 672.00 48.49 25.67 336161 02/04/2014 50/04/2014 672.00 34.92 18.22 338162 02/04/2014 50/04/2014 672.00 22.03 11.50 336163 02/04/2014 50/04/2014 672.00 26.32 13.21 536164 02/04/2014 50/04/2014 672.00 36.31 18.90 336165 02/04/2014 50/04/2014 672.00 36.51 29.49 326166 02/04/2014 50/04/2014 672.00 36.51 29.49 326166 02/04/2014 30/04/2014 672.00 31.00 16.16 326167 02/04/2014 30/04/2014 672.00 24.00 12.53 306169 02/04/2014 30/04/2014 672.00 24.00 12.53 306170 02/04/2014 30/04/2014 672.00 20.10 10.49

Comment: Results are not blank subtracted

Results have been corrected to a temperature of 293 K (20°)

Overall M.U. 5 2% (4-Tube Preparation : 20% TEA / Water

Analysec or UV05 Carreped M650

The Diffusion Tubes Law, breadepart within the scope of Gradist International List. Laboratory Quality Procedures and unions and insegments incubing the exposure pearstree pearstrees and provide by the client are not within, the score atom Crack accordination. These results obtained using exposure data shall be indicated by an asteristic Any generics concerning the data in this export stonals be described in the Enhancement Mining Cracks International List. This export is not to be reproduced, every in full, without the written permission of Gradka International List. This export is not to be reproduced, every in full, without the written permission of Gradka International List. The results of the Report Number 1015868 Page 1 of 2

Limit of Detection



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I., Gal	es, Laboratory Separater

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LABORATORY ANALYSIS REPORT

		Analyst Name	Laura Digby	
Date of Analysia	07/05/2014	Date of Report	07/05/2014	
Analysis carried out in acc GLM7	cordance with documented in-h	ouse Laboratory Method		

The Diffusion. Tubes have been toyled within the scope of Gradike International 1.60.1 aburdary Quality Peneadures colculutions and assessments involving the exposure proceeding of an electron provided by the client are not within the scope of or electron by Second and periods intrined using exposure data shall be indicated by an assessment. Are quarker concerning the data in this report stand to theated to the Laboratory Manager Gradike International 1.60. This report is not in the reproduced, except in fall, without the prefitte provide international 1.60. This report is not in the reproduced, except in fall, without the prefitte provide international 1.60. The provide the out in the reproduced, except in fall, without the prefitte provide international 1.60. The provide the out in the reproduced, except in fall, without the prefitte provide and Crashin International 1.60. The provide the out in the reproduced, except in fall, without the prefitte provide and the transmittent of the term of the prefitte provide and the prefitte provide and the prefitte provide and the prefitte previde and the prefitte previde and the prefitte previde and the prefitte previde and the prefitte previdence of the previde and the prefitte previde and the previde Gradko International Ltd This rightsure configure the exthenistic of these results

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Alaters Supervisor

L Gates, Laboratory Supervisor

Signed





(A division of Gradico International Ltd.) St. Martins Huuse, 77 Wales Street Winchester, Hampshiry SO23 0R11 (cl.) 01962 860331 [fax: 01962 841339] a-mailediffusion@gradice.co.uk.

LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY REPORT NUMBER 102056R

BOOKING IN REFERENCE DESPATCH NOTE GUSTOWER

102056 SOR015032 Magnerofett District Council Attn: Susan Martin Environmental Health Dept. 50 Bellyronan Road. Magheratett, Co Londonderry. 8145 3EN

DATE SAMPLES RECEIVED 30/05/2014

Localion Se		Exposure Dela	Date Off	Time (hr.)	µg/m³∙	• dad	TOTAL µg NO ₂
	Sample Number	Date On					
2 3 4 7	351232	30/04/2014	25/05/2014	872.00	47 77	24.93	2 33
3	351233	30/04/2014	25/05/2014	872.0D	29 82	15.62	4.46
4	351234	30/04/2014	28/06/2014	872.00	19 90	10.39	C.97
7	\$51235	30/04/2014	25/06/2014	872.00	24 01	12.53	1,17
9	351236	30/04/2014	25/06/2014	872.0D	42.3/	22.10	2.07
10	351237	30/04/2014	28/06/2014	672.00	50.68	28.46	2.48
11	351235	30/04/2014	28/05/2014	672.00	29.27	16.27	1 45
12	351239	30/04/2014	28/06/2014	872.00	26.91	14.04	1 31
13	351240	30/04/2014	25/06/2014	672.00	25.13	13.12	1 2 3
14	351241	30/04/2014	28/05/2014	672.00	22.10	11.54	1 08
15	351242	30/04/2014	28/06/2014	872.00	20.09	10.43	0.96
15	351243	30/04/2014	28/06/2014	672.00	15.18	249	0.89
17	351244	30/04/2014	28/05/2014	672.00	81 27	18.32	1 53
18	351245	30/04/2014	28/05/2014	672.00	34.57	18.04	169
19	351246	30/04/2014	28/06/2014	872.00	37.71	19.68	184
20	351247	30/04/2014	28/05/2014	872.00	35.19	19.93	1.87
21	351248	30/04/2014	28/06/2014	672.00	40,54	21.16	1 98
22	351249	35/04/2014	28/06/2014	672.00	25.52	13.32	1 25
_aboratory	y Blank			672.00	C 14	2.07	6.007

Comment: Results are not blank subtracted

Tube 351241 was recrired crack. Results may be compromised.

Results have been connected to a temperature of 293 K (20°)

Overall M.U. 5 2% -/- Limit of Detection

Tribe Preparation : 20% TEA/ Water

The Puffusion Tubes have been tested within the scope of Gradike International Ltd. Laboratory Quality Procedures rated atom and associated as a neurophysical end as a neurophysical data in this cope of our UKAS accreditation. How results obtained using exposure data in this report should be directed to the Caloredory Matchew Gradike International Ltd. Figure 1.04326 Essay 1. September 2012 Report Number 1020568 Page 1 nf 2



Gradio International Ltd The signature control of automaticity of these results Signed..... L. Const, Laboratory Supervised

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LABORATORY ANALYSIS REPORT

Analysis Carried out in accordance with documented in-house Laboratory Method GLM7

The Diffusion Tuber have been tested within the scope of Gradko Information 1.10. Coloratory Quality Procedures calculations and association involving the exposure procedures calculations and association in the scope of our US AS accordination. These exacts obtained using exacts and the followed by an according by the effect are not within the scope of our US AS accordination. These exacts obtained using exacts and the followed by an according by the effect are not within the scope of our US AS accordination. These exacts obtained using exacts and the followed by an according to the effect are not within the scope of our US AS accordination. These exacts obtained using exacts and the followed by an according to the exact within the scope of our US AS accordination. These exacts of the task of the followed by an according to the exact within the scope of our US AS accordination. These exacts of Manager Gradko International Ltd. This report is not to be represedue of exacts within the written permission of Gradko International Ltd. This report is not to be represedue of exacts with written permission of Gradko International Ltd. The report is not to be represedue of exacts with written permission of Gradko International Ltd. Power 1.06 32h Issue 4... September 2012 Report Number 10205618 Page 2 of 2 Gradko International Ltd.

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(A division of Gradue International Ltd.) 56. Martins House, 27 Wales Screet Winchester, Hampshite SOM 0R11 (el.: 01962 86033) hep-th/92841359 c-mail. https://doi.org/10.1006/ 101922860331

LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTONETRY

REPORT NUMBER IC2481R BOOKING IN REFERENCE IC2481 DESPATCH NOTE SORD151 CUSTDMER Magherei

IC2481 SORD15052 Maghersfelt District Council Adm: Susem Martin Environmentsl Health Dept, 50 Bellyronen Road, Maghersfelt, Co Londonderry, BT45 & EN

DATE SAMPLES RECEIVED 02/07/2014

		Exposure Data					TOTAL
				Time			
Location	Sample Number	Dete On	Date Off	(hr.)	µg(m ² *	ppb *	ING NO2
2	367337**	28/05/2014	01/07/2014	816 00	55.99	29 22	3.32
3	367338	20:05/2014	01/07/2014	316.0C	30.90	16.13	1.83
4	367.339	28/05/2014	01/07/2014	616.DC	13.56	7.08	0.80
2 3 4 7	367340	28/06/2014	01/07/2014	516 00	\$1.01	10.97	1.25
g	367 341	28/05/2014	01/07/2014	810.00	42 31	22 06	2.51
10	367342**	28/05/2014	01/07/2014	516 00	57 38	29.95	3.40
11	367343	28/05/2014	01/07/2014	818.00	27.95	14.58	1.66
12	567 544	28/05/2014	01/07/2014	818 00	57 97	14.60	1.66
13	367345	28/05/20/14	01/07/2014	816 00	20.99	10.95	1.24
14	367346	28/05/2014	01/07/2014	816 00	18 17	\$.48	1.08
15	557 347	28/05/2014	01/07/2014	816 00	16 93	8.84	1.00
16	567 548	28/05/2014	31/97/2014	8-6.00	15 72	7.1ē	0.81
17	367349	28/06/2014	01/07/2014	816 00	28.22	14.73	1.87
18	367350	28/05/2014	01/07/2014	816.00	36.92	19.27	2.19
19	567351	28/05/2014	01/07/2014	818.00	46.04	24.03	2.73
20	387552	28/05/2014	01/07/2014	816.00	44 77	25.37	2.66
21	367350	28/06/2014	01/07/2014	816.00	43.78	2128	7.42
22	357354	28/05/2014	01/07/2014	816.0D	29.46	10.68	1.21
Laboratory	Blank			81 0 .00	C 02	C 01	0.001

Comment: Results are not blank subtracted

Tubes marked " were diluted to read within our UKAS accredited calibration range.

Results have been corrected to a temperature of 293 K (20°)

Overall M.U. 5.2% +/- Limit of Detection Tube Preparation 20% TER / Water

The Difference Tubes have been tested within the scope of Gradian Differencial Ltd. Laboratory (Durlity Procedures calculations and assessments archiving the exposure procedures and neurody provided by the obtaining the main within the scope of our UK to accreditation. These results obtained using exposure data shall be indicated by an asterish. Any queries concerning the data in this report should be directed to the Eulopeatory. Manager Gradian International Ltd. This report is not to be exponentical, except in the written permission of Gradian termational Ltd. Form 1.0132b Issue 4 – September 2012 Report Number 10248118 Page 1 of 2



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(A division of Gradko International Ltd.) St. Martins House, 77 Wales Steert Winchester, Hampshire SO23 0RH Letz 01962 860331 fax: 01962 841339 e-mail:diffusion/@gradko.co.uk

LABORATORY ANALYSIS REPORT

Analysist or UV05 Carrisper: M55D Analysis Laure Digby
Date of Analysis 07/07/2014 Date of Report 07/07/2014
Analysis carried out in accordance with documented in-house Laboratory Rethod
GLM7

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form LQI 32b lassoy 4-september 2012	Report Number 102481R	Page 2 of 2
Gradky Incomptional Ltd. This report is not to be expended	weil, except in full, without the written permission of (Gearthe International Ltd.
isting expressive three alcall be indicated by an insteriols. Any		
involving the exposure principaries and pariods provided by	y fan diene are not within the scope of our 1.6.45 seco	eritation. Those results obtained
he Diffusion Tubes have been tested within the worp of f		

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L. Gaces, Laboratory Supervisor

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1.ABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY REPORT NUMBER 102%1R

BOOKING IN REFERENCE DESPATCH NOTE CUSTOMER

192961 SOR015032 Magherafelt District Douncil Atto: Suean Martin Environmismal Hearth Dept 50 Ballyruman Ruád, Magherafelt Co Londondeiny, DT45 BEN

DATE SAMPLES RECEIVED 01/09/2014

			Exposure Date					TOTAL
					Time			
	Location	Sample Number	Date On	Date Off	(h r .)	ագրա, , , ,	ppb *	NO:
2 3 4 7		402512	01/07/2014	30/07/2014	698.00	45.63	23.81	2.31
Э		402613	01/07/2014	30/07/2014	695.00	33.63	17.24	1.87
4		402514	01/07/2014	30/07/2014	696.00	17.76	9.27	C 95
7		402515	01/07/2014	30/07/2014	898.00	26.90	10.01	1.06
9		402515	01/07/2014	30/07/2014	606.00	*8.85	20.25	1.95
10		402517	01/07/2014	30/07/2014	696.00	49.21	25.63	2.45
11		402515	01/07/2014	30/07/2014	895.00	21.14	14.48	140
12		402519	01/07/2014	36/07/2014	696.00	27.89	4.55	1 41
13		402520	01/07/2014	30/07/2014	696.00	20,10	10.51	1 02
14		40252	01/07/2014	30/07/2014	696.00	16.64	8.68	C 64
15		402522	01/07/2014	30/07/2014	696.00	12.15	6.36	0.52
16		402523	01/07/2014	30/07/2014	695.00	-3.22	6.90	O 87
11		402524	01/07/2014	30/07/2014	696.00	23.66	12.35	1 2 0
18		402525	01/07/2014	30/07/2014	895.0D	30.60	15.97	1 55
19		402526	01/07/2014	30/07/2014	695.00	33.83	17.66	171
20		402527	01/07/2014	30/07/2014	696.00	41.84	21 84	2 12
21		402528	91/97/2014	30/07/2014	696.00	35.44	18.50	1 79
22		402529	01/07/2014	36/07/2014	896.00	22.96	11.98	1 18
	_aboratory	Plank			696.00	0.02	0.01	0.001

Comment: Results are not blank subtracted Results have been corrected to a temperature of 293 K (20°) Overall M.U. 5.2% +/-

Overall M.U. 5.2% +/-Tube Precention 20% TEA / Water

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Limit of Detection

Analysed on UV05 Camsped M55C

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The Diffusion Tubes have been tested within the server of Gradian International Left Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the effect are near within the server of nur UEAS accordination. These results obtained using exposure data shall be incinted by an acteristic Arg queeies concerning the data in this reparts could be directed to the failure of the failed by the effective execution of the data in this reparts should be directed to the failed by the effective execution of the data in this reparts should be directed to the failed by the effective execution of the data in this reparts should be directed to the failed by the effective execution of the second of the permission of Gradian International Ltd. Commuted Directed by the effective execution of the transmitter of the effective of the effective



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This signal su	re conditions the availability of these results
Signed	the caters
1	. Gaus, Laboratory Supervisor

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LABORATORY ANALYSIS REPORT

		Analyst Name	Laura Digoy
Date of Analysis	07/05/2014	Date of Report	57/05/2014
Analysis carried out in act GLM7	ordance with documented in-h	ouse Laboratory Mothod	

The Diffusion Tubes have been instead within the scope of Gradion international Ltd. Laboratory Quality Protedures calculations and access interview involving the exposure procedures and particula provided by the entry international Ltd. Laboratory Quality Protedures calculations and access interview involving the exposure procedures and particula provided by the entry international Ltd. Laboratory Quality Protectures calculations and access interview of the data on the scope of our TEAS increation international Ltd. This expects and particula provided by the entry formation and access interview of the data on the termination of Gradian International Ltd. Form 1.01.32b Issue (= september 2012) Report Number 1029518 Page 2.012

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Großto International Lat This signamme confirms the anthemicity of these results Signed. Signed L. Gates, Laboratory Supervised





(A division of Gradko International 17d.) St. Martus Rouse, 77 Wales Street Witchester, Hampshire SO23 0811 rel: 01962 860331 - Eaxt 01962 841339 - e-mail:diffusion@gradko.co.uk

LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY REPORT NUMBER 1000668

BOOKING IN REFERENCE DESPATCH NOTE CUSTOMER

103396 SOR015032 Meghersfelt District Counci: Altr: Susan Martin Environmental Health Dext, 50 Ballyrunan Rosc Megherafelt, Co Londonderry BT45 6EN

DATE SAMPLES RECEIVED 29/06/2014

		Exposure Data					TOTAL
Location	Sample Number	Date On	Date Off	Time (hr.)	μg/m ⁴ ~	рры °	µg NO ₂
2	388513	30/07/2014	27/08/2014	672 00	50.85	26.54	2.48
з	366614	30/07/2014	27/08/2014	672.00	35.97	18.78	1.76
4	386516	30/07/2014	27/08/2014	672 00	14.02	7.32	0.68
7	388516	30/07/2014	27/08/2014	672.00	23.32	12.17	1.14
9	3865^7	30/07/2014	27/08/2014	672.00	43 39	22.65	2.12
*G	355516	30/07/2014	27/08/2014	672.00	55 67	29.05	2.72
57	395519	50/07/2014	27/08/2014	672.00	29 BS	15.48	1.45
12	358520	30/07/2014	27/08/2014	672.00	34 23	17 07	1.67
13	358521	S0/07/2014	27/08/2014	672.00	25.98	13.50	1.27
14	358522	50/07/2014	27/08/2014	672.00	15.76	a.23	0.77
15	358523	30/07/2014	27/08/2014	672.00	13 59	7.39	0.66
16	358524	30/07/2014	27/08/2014	672.00	11.19	5.84	0.55
17	358525	30/07/2014	27/08/2014	672.00	28.05	14.64	1.37
18	358526	50/07/2014	27/08/2014	672.00	31.31	16.34	1.53
19	358527	50/07/2014	27/06/2014	672.00	34 69	15 10	1.69
20	358528	30/07/2014	27/08/2014	672.00	45 23	23 60	2.21
21	358529	50/07/2014	27/08/2014	672.00	38.48	20.08	1.38
22	558530	50/07/2014	27/08/2014	672.00	23.09	12 05	1.13
Laboratory	Bank			672.00	0.10	0.05	0.005
Comment: Results are not bi Results have been corrected		K (20°)					
Overall M.U.	7,8% +/-		Limit of Deb	ection	0 (917) igi	NQs	
Tube Proparation - 20% TEA /	Water						
Analyses on UV 04 Camsper I	M550						

The Diffestion Tubes have been tested within the assign of Grudlon International Ltd. Laboratory Quality Procedures enfoulneions and assessments mentring the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. These results along exposure data stud to indicated by an asteristic Any queries romenting the data in this report should be detected to the Laboratory Mininger Gradko International Ltd. This report is nor robe reproduced, except in full, without the written permission at Gradko International Ltd. To cm 1.01/326 (see 4 – September 2012). Report Number 103386R Page 1 of 2



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This signifure confirms the automobily of these results
Signed Signed
L. Gates, Laboratory Supervisor





(A division of Gradius International Ltd.) St. Martins Rouse, 27 Wales Street Winchester, Humpshite SO22 0000 rel: 01962 860331 - fax: 01962 841339 - e-mail:diffusion.org/mike.co.uk

LABORATORY ANALYSIS REPORT

		Analyst Name	Chelsea Gemmell
Date of Analysis	05/09/2014	Date of Report	05/09/2014
Analysis carried out in a	ccordance with documented in GLM7	house Laboratory Mathod	

The Diffusion Tubes have been found within the score of fundior tolers around 1.00.1 obtaining Ousdity Procedures calculations and assessment in alsing the exposure principarty and periods provided by the effect around within the score of 6.55 accerdination. These results and assessment using exposure data shall be indicated by an exterink. Any garries concerning the data in this septent should be directed in the 1 above any Monoger Gradice International Ltd. This report is not to be reprovingent, exception but, without the written permission of Cradike International Ltd. For av1.015526 from + - Suptember 2612 Report Number 105386R Page 2 will 2

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(A division of Grailko International Ltd.) SL Martine House, 77 Wates Street Windowsker, Using shire 5022 0KH tel; 41962 864331 fax: 01962 841329 c-mailadifluctures graduation.

LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY REPORT NUMBER ICOSOBR

BOOKING IN REFERENCE IC3539 **DESPATCH NOTE**

SORD15032 ALCH NOTE SORDISCIE CUBTOMER Magherafett Diatric: Council Atth. Susan Martin Environmental Health Dect, 50 Bellyrona: Road, Magherafet, Collumitorcemy BT45 6EN

DATE SAMPLES RECEIVED 03:10/2014

		Exposure Data		Time			TOTAL
Location	Sample Number	Date On	Dale Off	(hr.)	hđyw _{a ×}	ррь *	μα NO2
2	437221	27/08/2014	02/10/2014	864.99	47 45	24,77	2 98
3	437222	27/08/2014	C2/1C/2C14	884.00	\$4.61	18.0€	2 17
4	43/223	27/08/2014	02/10/2014	864.00	12.84	10.25	1 23
7	437224	27/08/2014	02/10/2014	684.00	24 12	12.65	1.51
9	437225	27/08/2014	02/10/2014	864.00	35.66	18.61	2 24
15	437220	27/08/2014	02/16/2014	834.00	45.71	22.81	2.74
11	437227	27/08/2014	02/16/2014	064 00	51.65	16.52	1.09
12	437228	27/08/2014	02/10/2014	064.00	34.76	10.15	2 . 8
14	437229	27/08/2014	C2/1C/2C14	864.00	22.51	11.76	1.41
15	43723C	27/08/2014	62/10/2014	664 00	20.07	10.47	* 26
16	437231	27/08/2014	02/10/2014	064.00	19.11	5.96	- 20
17	437252	27/08/2014	02/10/2014	864.00	24.78	14.49	1.74
16	497233	27/08/2014	02/10/2014	864.00	33.35	17.41	2.09
19	437234	27/08/2014	02/10/2014	064.00	\$2.00	16.70	2.01
20	437236	27/08/2014	02/10/2014	B\$4.00	34.59	18.05	2 7
21	437236	27/08/2014	02/10/2014	864.00	39.04	20.38	2.45
22	497237	27/08/2014	02/10/2014	864.00	26.70	13.93	66.1
ascratory Bl	ark			864 90	0.02	0.01	0 001
omment: Results are not blån	k subiracied						
esults have been corrected to		K (20")					
verall M.U.	5.2% 1/-		Limit of Del	oction	0 Q10pc	NOS	
be Preparation : 20% TEA / Wa	in the second second				0.0000000122		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
nalysed on UV05 Camsted M59	10		Analyst Nar	THE	Laura D	gby	
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rin 1.01.326 Jasue 1 - September	2012	FCC	purt Namb	01.10252		Statistics and Party of Statistics	gelot2
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LABORATORY ANALYSIS REPORT

Date of Analysis

07/10/2014

Date of Report

08/10/2014

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

The Oil fusing Tubes have been fields within the score of Conduct International 13d. Informationy Onality Procedures calculations and accessments involving the expressive procedures and accessments disting the expressive durant. KAN recreditation. These results distinguing expressive dura the KAN recreditation. These results distinguing expressive dura that will be indicated by an arise risk. Any uncervise meaning the dura in this report should be directed by an arise risk. Any uncervise meaning the dura in this report should be directed by an arise risk. Any uncervise meaning the dura in this report should be directed by an arise risk. Any uncervise meaning the dura in this report should be directed by an arise risk. Any uncervise meaning the dura in this report should be directed by an arise risk. Any uncervise meaning the dura in the vertex account of the dura be directed by an arise risk. Any uncervise mean light the dura in the vertex account of the dura be directed by an arise risk. Any uncervise mean of the dura in the vertex account of the dura be dura by the effect of the Laboratory Manager time dura be represented as the second of the vertex account of the vertex account of the dura be represented as the dura be written premision of Gradua by the report of the dura be represented as the dura be written premision of Gradua by the dura be represented as the dura by th

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(A division of Gradios International Ltd.) St. Martine House, 77 Witter Street Wittehester, Rampshire SO23 0RB (el.; 019)2 860531 – East 01962 841359 – e-mail:0000slon@gradka.co.uk

LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY REPORT NUMBER 104378R

BOOKING IN REFERENCE 104378

VG IN REFERENCE DESPATCH NOTE CUSTOMER Magherafelt District Council Adm: Susan Marlin Environmental Health Dept Magherofelt, Go Londonderry, BT45 GEN

-

DATE SAMPLES RECEIVED 28/10/2014

Sample Number 151908 451909 451910 451911 451912 451915 451914 451915	Date Dn 02/10/2014 02/10/2014 02/10/2014 02/10/2014 02/10/2014 02/10/2014 02/10/2014	Date Off 28/10/2014 28/10/2014 28/10/2014 28/10/2014 28/10/2014 28/10/2014	Time (br.) 624.00 624.00 624.00 624.00 624.00	µgim ⁸ * 56.4* 38.84 24.96 28.20 55.12	29 44 20 27 13 03 14 72	ца NO2 2.56 1.76 1.13 1.28
451909 451910 451911 451912 451913 451913 431914	02/10/2014 02/10/2014 07/10/2014 02/10/2014 02/10/2014	28/10/2014 28/10/2014 28/10/2014 28/10/2014	624.00 624.00 624.00 624.00	38.84 24.96 28.20	20 27 13 03 14 72	1.76 1.13
431910 451911 451912 451913 431913	02/10/2014 02/10/2014 02/10/2014 02/10/2014	28/10/2014 28/10/2014 28/10/2014	624.00 624.00 624.00	24.96 28.20	13 03 14 72	1.13
451911 451912 451915 451914	02/10/2014 02/10/2014 02/10/2014	28/10/2014 28/10/2014	624.00 624.00	28.2C	14 72	
451912 451915 451914	62/10/2014 02/10/2014	28/10/2014	624.00			1 78
451915 451914	02/10/2014			EE 41		1.20
451914		28/10/2014		00,12	28 77	2.60
	02/10/2014		624.00	58.53	30 55	2.65
461915		28/10/2014	e24.00	37.11	19 37	1.68
	02/10/2014	28/10/2014	624,00	37.24	19.44	1.69
451915	02/10/2014	28/10/2014	624.00	20.76	13.97	1.21
451917	D2/10/2014	28/10/2014	e24.00	28.9C	15 08	1.31
451915	02/10/2014	28/10/2014	824.CO	24.57	12 52	1.11
451919	02/10/2014	28/10/2014	624.00	23.50	12 29	1.07
451920	D2/10/2014	28/10/2014	624.00	38.07	19 57	1.73
451921	02/10/2014	28/10/2014	624.00	37.72	19 69	1.71
451922	02/10/2014	28/10/2014	624.CO	32.82	17 13	1.49
451923	02/10/2014	28/10/2014	624.CO	48.02	25 98	2.16
451824	22/10/2014	28/10/2014	624.00	43.34	22 62	1.97
451925	52/10/2014	28/10/2014	824.CD	31.20	16 <u>29</u>	1.42
ć			624.00	0.22	0.12	0.0-0
이야한 감독은 감독하는 것을 다 가지 않는다.	K (20°)					
5 2% +/-		Limit of Det	ection	0.010 g	NO;	
2010/01/01/01/21				2.429.0007655		
predicts prior deal by by an asterists, Aug. (is and to be reproduc-	the client are no neries craves the ed. except in ful	at with in the sp og the chain in c 1, without the s	ope al our t his regert x cristen pery	98 AS nevreil bould he dires nission of Gra	itarion, Th eteil to the alko farter	nive results ultrained Tobaritary Manage.
	451816 451917 451918 451920 451920 451920 451921 451922 451923 451925 451925 451925 451925 451925	451916 02/10/2014 451917 02/10/2014 451918 02/10/2014 451919 02/10/2014 451920 02/10/2014 451921 02/10/2014 451921 02/10/2014 451923 02/10/2014 451923 02/10/2014 451925 02/10/2014 451925 02/10/2014 451925 02/10/2014 451925 02/10/2014 451925 02/10/2014 451925 02/10/2014 451925 02/10/2014 451925 02/10/2014	451816 02/10/2014 28/* 0/2014 451917 02/10/2014 28/* 0/2014 451918 02/10/2014 28/* 0/2014 451919 02/10/2014 28/* 0/2014 451920 02/10/2014 28/* 0/2014 451921 02/10/2014 28/* 0/2014 451923 02/10/2014 28/* 0/2014 451923 02/10/2014 28/* 0/2014 451925 02/10/2014 28/* 0/2014 45195 02/10/2014 28/* 0/2014 45195 02/10/2014 28/* 0/2014 45195 02/10/2014 28/* 0/2014 451	451816 02/10/2014 28/* 0/2014 624.00 451917 02/10/2014 28/* 0/2014 624.00 451918 02/10/2014 28/* 0/2014 624.00 451918 02/10/2014 28/* 0/2014 624.00 451919 02/10/2014 28/* 0/2014 624.00 451919 02/10/2014 28/* 0/2014 624.00 451920 02/10/2014 28/* 0/2014 624.00 451921 02/10/2014 28/* 0/2014 624.00 451923 02/10/2014 28/* 0/2014 624.00 451923 02/10/2014 28/* 0/2014 624.00 451925 02/10/2014 28/* 0/2014 624.00 451925 02/10/2014 28/* 0/2014 624.00 451925 02/10/2014 28/* 0/2014 624.00 451925 02/10/2014 28/* 0/2014 624.00 451925 02/10/2014 28/* 0/2014 624.00 451925 02/10/2014 28/* 0/2014 624.00 451925 02/10/2014 28/* 0/2014 624.00 4 52/% 4/- Limit of Detection 624.00 5 5% 4/- Limit of Detection 624.00 5 5% 4/- Limit of Detection </td <td>451816 02/10/2014 28/10/2014 624.00 20.76 451917 02/10/2014 28/10/2014 624.00 28.90 451918 02/10/2014 28/10/2014 624.00 24.57 451918 02/10/2014 28/10/2014 624.00 23.56 451920 02/10/2014 28/10/2014 624.00 38.07 451921 02/10/2014 28/10/2014 624.00 37.72 451921 02/10/2014 28/10/2014 624.00 37.72 451923 02/10/2014 28/10/2014 624.00 48.62 451923 02/10/2014 28/10/2014 624.00 48.62 451925 02/10/2014 28/10/2014 624.00 48.62 451925 02/10/2014 28/10/2014 624.00 43.34 451925 02/10/2014 28/10/2014 624.00 31.20</td> <td>451916 02/10/2014 28/10/2014 624.00 20.76 13.97 451917 02/10/2014 28/10/2014 624.00 28.90 15.08 451918 02/10/2014 28/10/2014 624.00 24.57 12.52 451918 02/10/2014 28/10/2014 624.00 23.56 12.29 451920 02/10/2014 28/10/2014 624.00 38.07 19.87 451921 02/10/2014 28/10/2014 624.00 38.07 19.87 451921 02/10/2014 28/10/2014 624.00 38.07 19.87 451921 02/10/2014 28/10/2014 624.00 38.07 19.87 451923 02/10/2014 28/10/2014 624.00 38.02 25.08 451925 52/10/2014 28/10/2014 624.00 43.34 22.62 451925 52/10/2014 28/10/2014 624.00 31.20 16.29 4 624.00 0.22 0.12 451925 52/10/2014 28/10/2014 824.00 31.20 16.29 4 52/50/10/2014 28/10/2014 824.00 0.22 0.12</td>	451816 02/10/2014 28/10/2014 624.00 20.76 451917 02/10/2014 28/10/2014 624.00 28.90 451918 02/10/2014 28/10/2014 624.00 24.57 451918 02/10/2014 28/10/2014 624.00 23.56 451920 02/10/2014 28/10/2014 624.00 38.07 451921 02/10/2014 28/10/2014 624.00 37.72 451921 02/10/2014 28/10/2014 624.00 37.72 451923 02/10/2014 28/10/2014 624.00 48.62 451923 02/10/2014 28/10/2014 624.00 48.62 451925 02/10/2014 28/10/2014 624.00 48.62 451925 02/10/2014 28/10/2014 624.00 43.34 451925 02/10/2014 28/10/2014 624.00 31.20	451916 02/10/2014 28/10/2014 624.00 20.76 13.97 451917 02/10/2014 28/10/2014 624.00 28.90 15.08 451918 02/10/2014 28/10/2014 624.00 24.57 12.52 451918 02/10/2014 28/10/2014 624.00 23.56 12.29 451920 02/10/2014 28/10/2014 624.00 38.07 19.87 451921 02/10/2014 28/10/2014 624.00 38.07 19.87 451921 02/10/2014 28/10/2014 624.00 38.07 19.87 451921 02/10/2014 28/10/2014 624.00 38.07 19.87 451923 02/10/2014 28/10/2014 624.00 38.02 25.08 451925 52/10/2014 28/10/2014 624.00 43.34 22.62 451925 52/10/2014 28/10/2014 624.00 31.20 16.29 4 624.00 0.22 0.12 451925 52/10/2014 28/10/2014 824.00 31.20 16.29 4 52/50/10/2014 28/10/2014 824.00 0.22 0.12



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Time signal	ture confirms the authenticity of these results
	Strate-3
signed	1. Gates, Laboratory Reparetour





		Analyst Name	Laura Digby
Date of Analysia	u3/11/2014	Date of Report	04/11/2014
Analysis carried out in a	eccordance with documented in GLM7	-house Laboratory Method	

The Hattanian Tones have been traced within the scope of Grudka International Ltd. Laboratory Quality Procedures calculations and assessments involving the appointe pracent new and particle provided by the client are not within the score of our UKAS accordination. These coulds will be informed to the client of an anternational to the client of the c Furm I.OF.12b Issue 4 Suptember 2013 Report Number 104378R Page 2 of 2 Gradio International Lea This signaline coultrain the mitheratioly of them results Signed.

Sigred

L. Gates, Laboratory Supervisor

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(A division of Gradko International Ltd.) St. Martins House, 27 Wales Street Windhester, Humpshire 802.3 0RH 101: 04962 860231 (arX) 04962 841339 (e-mail:diffusion@gradko.crodk)

LABORATORY ANALYSIS REPORT NITRIGEN DIGXIDE IN DIFFUSION TUBES BY D.V.SPECTROPHOTOMETRY

REPORT NUMBER 105084R BOOKING IN REFERENCE 105084 DESPATCH NOTE SOR0150 CUSTOMER Magheret

13084 SOR015032 Magherefelt Dlathet Council Ath: Susen Martin Environmental Health Dept SD Bellyroner Roed, Magherefelt, Co Londonderry BT45 6EN

DATE SAMPLES RECEIVED 05/12/2014

	Sample	Exposure Data					TOTAL
Location	ation Number		Date Off	Time (hr.)	րց/տ՝ •	ppb *	μg NO ₂
2	417213	28/10/2014	04/12/2014	865.00	45.12	23.65	2.91
3	417214	28/10/2014	04/12/2014	655 00	37.81	18.73	2.44
4	417215	28/10/2014	04/12/2014	695 00	25.68	13.40	1.68
7	417216	28/10/2014	04/12/2014	886.00	28.86	15.06	1.86
9	417217	28/10/2014	04/12/2014	BB8.00	38.38	20.03	2.48
10	41/218**	28/10/2014	04/12/2014	00800	59.06	31.24	3.38
11	417219	28/10/2014	04/12/2014	008.00	36.35	10.97	2.35
12	417220	28/10/2014	04/12/2014	868.00	37.21	19.42	2.40
13	417221	28/10/2014	04/12/2014	868.00	33.14	17.30	2.14
14	417222	28/10/2014	04/12/2014	665.00	26.99	14,09	1.74
15	417223	28/10/2014	04/12/2014	868.00	28.44	14.84	1.84
18	417224	28/10/2014	04/12/2014	868 00	26.21	13.68	1.69
17	417225	28/10/2014	04/12/2014	658 00	33.40	17,43	2.16
15	417226	28/10/2014	04/12/2014	858.00	33.27	17.36	2.15
19	417227	28/10/2014	04/12/2014	888 DO	27.19	14.19	1.76
20	417228	28/10/2014	04/12/2014	688.00	42.28	22.07	2.73
2'	417229	28/10/2014	04/12/2014	858 DO	4D 20	20.98	2.59
22	417230	28/16/2014	04/12/2014	658 00	27.04	14.11	1.75

Latoratory Blank

Comment: Results are not blank subtracted

Tubes marked ** were diluted to read within our UKAS accredited calibration range.

Results have been corrected to a temperature of 293 K (20")

Overall MLU. 5.2% +/-

Tube Preparation : 20% TEA (Water

The Diffusion Tubes have been teach within the scope of Gradiko International Util Andronators Quality Procedures calculations and assessments involving the exposure procedures and periods previded for the client for nor within the scope of our UKAS previded for the fadorators. Manager Gradiko International Lul. This report is not or be reproduced, except in full, without the vertex or periods or of Gradiko International Lul. This report is not or be reproduced, except in full, without the vertex or periods or of Gradiko International Lul. This report is not or be reproduced, except in full, without the vertex or periods or of Gradiko International Lul. This report is not or be reproduced, except in full, without the vertex or periods or of Gradiko International Lul. This report 2012 Report Number 105964R Page 1 of 2

CO 888

Limit of Detection 0.010µgNO2

0.11



Gradko International Ltd
using a confirmating patienticity of these reads
10 ⁻¹ -
Forte-(
L. Gates, Laboratory Supervisor

0.05 0.007





LABORATORY ANALYSIS REPORT

Analysed on UV05 Camspec MS50

Date of Analysis

10/12/2014

Data of Report

Analyst Name

Laura Digby

Analysis carried out in accordance with documented in-house Laboratory Blethod GLN7

The Diffusion Tubes have been tested within the scope of Grands	to International Ltd. Laboratory Quality Process	rrevicalculations and assessments.
its of ing the exposure procedures and periods provided by the	client are not within the scope of our USAS accre	ditation. These results abailord
iting exposure data shall be indicated by an asterida. Any quari	its concerning the down in this report should build.	rected to the Laboraruzy Manager-
Craitlas Enreenational Ltd. This report in not to bure produced, a	except in full, without the written permission of G	rudka International I-fd.
form EQUED byor 4 - toptember 2012	Report Number 105064R	Page 2 of 2

REPORT OFFICIALLY CHECKED

Gradice deternational Ltd This repeature confirms the authenticity of these results Signed T, Gabes, Laburatory Supervisor





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LABORATORY ANALYSIS REPORT NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY REPORT NUMBER J00257R

BOOKING IN REFERENCE Jan257 DESPATCH NOTE CUSTOMER

SOR015032 Magnerafelt District Council: Arth: Susan Martin Environmental Health Dept, 50 Bellyronan Road, Magneratelt, ColLondonderry, **BT45 9EN**

DATE SAMPLES RECEIVED 12/01/2015

	Sample	Exposure Data		100000			TOTAL
Location	Number	Date On	Date Off	Time (hr.)	nðiu) _{3 Y}	r dqq	µg NO₂
2	464827**	D4/12/2014	05/01/2015	840.00	58.70	30.64	3.58
2 3 4 7 9	464828	04/12/2014	08/01/2015	840.00	42.87	22 27	2.60
۷	464829	04/12/2014	05/01/2015	840.00	26 27	13.68	6D
7	484830	D4/12/2014	D8/D1/2015	840.00	33.6B	17 86	2.07
9	46483* **	04/12/2014	D8/D1/2016	840.00	54.12	38.25	3.3D
1C	464832**	04/12/2014	08/01/2015	840.00	57 35	29.93	3.6D
11	464833	D4/12/2014	08/01/2016	840.00	39.51	20-82	2.41
12	484834	04/12/2014	05/01/2016	840.00	38.69	20 19	2.35
13	464835	04/12/2014	05/01/2016	840.00	29.5*	15 58	*.82
14	464835	D4/12/2014	08/01/2015	e40.00	29.32	15 30	79
15	484837	04/12/2014	06/01/2015	840.00	23.21	12 12	42
16	434833	04/12/2014	58/51/201a	840.CD	22.80	11 90	1.39
17	464839	04/12/2014	08/01/2015	840.CO	43.48	22 65	2.85
18	464840	04/12/2014	08/01/2015	840.CO	41.14	21 47	2 51
19	464841	04/12/2014	08/01/2015	840.00	45.76	23 88	2.79
20	464842**	04/12/2014	08/01/2018	840.00	72.33	37 75	4.42
21	464843 **	04/12/2014	05/01/2016	840.00	49.97	26 35	3.05
22	464844	64/12/2014	08/01/2015	840.00	00.22	1577	65
Laboratory	Bank			840.CD	0.02	0.01	0.CC1

Commoni: Results are not blank subtracted Tubes marked ** were diluted to read within our UKAS accredited calibration range. Reaults have been corrected to a temperature of 293 K (20°)

Overall M.U. 5.2% +/ Limit of Detection 0.010.igNO₂ Tube Preparation 120% TEA / Water

The Diffusion Tubes have been insted within the score of Gradko International Lith Laboratory Outside Proceedings calculations and assessments involving the exposure principalities and precisely prior deal by the effective on within the bearing of our 106 SS assessments in 2009 control and set set of the deal of the

REPORT OFFICIALLY CERCILED

Gredito International Lat This algorithms confirms the authorithmy of these receipt Hartis L. Gales, Laboratory Supervisor Signed





LABORATORY ANALYSIS REPORT

Analysed on UV05 Carrispec I	M550	Analyst Name	Laure Digby
Date of Analysis	15/01/2015	Date of Report	15/01/2015

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

DEBORT ARMA LET V AUD YUR	This signature on	radios Taternational Tat Africa the authoriticity of these randos
form I-QF32h Issue 4 - September 2012	Report Number 300257R	Page 2 nF 2
asing exposure data shall be indicated by an asterick. Any Gradies Informational 1 Ed. This report is not to be reprod		
nordring the exposure procedures and periods provided (
The Diffusion Tubes have been tested within the scope of		



flyater.

L. Gales, Laboratory Supervisor

Signed.

Dungannon & South Tyrone Borough Council

NO2 DIFFUSION	TUBE RESULT	S 2014 (µg/	/m³)							
	Dunclare Way	Clogher	Church St	Fivemiletown	The Quays, Moy	Killyman Street, Moy	Newell Road	Moy Hill, Moy	Ardgannon	Stewartstown Road (Coalisland)
JANUARY	12	34	50	31	12	33	59	74	21	54
FEBRUARY	10	40	46	30	9	31	62	72	15	45
MARCH	11	-	48	30	12	35	65	65	14	45
APRIL	8	38	-	27	10	31	62	68	13	39
MAY	7	42	-	27	9	31	66	67	11	42
JUNE	5	47	33	25	8	27	67	53	9	19
JULY	5	36	33	19	6	25	55	59	-	33
AUGUST	8	45	39	24	10	28	66	71	8	20
SEPTEMBER	11	52	50	37	13	37	76	-	15	26
OCTOBER	9	42	42	19	11	32	71	65	13	47
NOVEMBER	17	42	50	40	17	40	61	76	22	56
DECEMBER	10	33	53	29	8	27	63	76	16	60
AVERAGE	9	41	44	28	10	31	64	68	14	41
Bias Adjusted										
Ave (0.81)	7	33	36	23	8	25	52	55	11	33

Cookstown District Council												
Diffusion Tube Location												Bias Adjusted Average (0.92)
Lawford Street	42	41	38	37	38	32	33	34	37	39	37	37
William Street	29	28	26	31	28	28	26	21	27	31	24	25
James Street	39	40	35	32	31	30	32	24	30	N/A	37	30
Church Street	29	35	32	29	32	26	26	22	29	36	17	26
Killymoon Street	38	36	38	31	29	33	27	31	37	42	45	32
Smith Street	27	30	30	32	29	24	25	21	29	31	32	26
Conyngham Street	N/A	40	23	17	18	15	15	17	18	22	22	19
Stonard Street	22	19	42	45	40	28	36	31	41	45	36	32

Diffusion Tube Results Cookstown District Council 2014