



# 2009 Air Quality Updating and Screening Assessment for Down District Council

In fulfillment of Environment (Northern Ireland) Order 2002  
Local Air Quality Management

16<sup>th</sup> October 2009

***Down District Council - Northern Ireland***

<b>Local Authority Officer</b>	<a href="#">James Campbell</a> <a href="#">Senior Environmental Health Officer</a>
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<b>Department</b>	<a href="#">Environmental Services</a>
<b>Address</b>	<a href="#">24 Strangford Road, Downpatrick</a>
<b>Telephone</b>	<a href="#">02844610824</a>
<b>e-mail</b>	<a href="mailto:james.campbell@downdc.gov.uk">james.campbell@downdc.gov.uk</a>

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## **Executive Summary**

This report has been produced as Down District Council's Update and Screening Assessment of air quality and is a direct response to statutory requirements. The Updating and Screening Assessment aims to identify any significant changes that have occurred since the previous rounds of Review and Assessment. The report has been completed with reference to the recommended template and is compliant with the Technical Guidance LAQM.TG(09).

The main conclusions from the 2009 Updating and Screening Assessment (USA) are:

- Air pollution monitoring.

The diffusion tube measurements at Irish Street junction, Downpatrick have indicated exceedances of the annual mean objective for nitrogen dioxide in both 2007 and 2008. There is relevant exposure at this location. The measurement of nitrogen dioxide at the remaining monitoring sites has shown no exceedances of air quality objectives. Down District Council are now undertaking a Detailed Assessment for NO<sub>2</sub> in the vicinity of Irish Street.

- Developments/changes within the Council District.

There have been no new developments or significant changes to existing installations and activities, within Down District Council, which require further assessment.

The required action is to complete and report the Detailed Assessment that has been initiated to assess exposure to nitrogen dioxide in the vicinity of the Irish Street junction, Downpatrick. The results of this work will inform the requirement to declare an Air Quality Management Area and to what extent the area extends.

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# 1 Introduction

## 1.1 Description of Local Authority Area

Down District Council comprises a largely rural area of around 65,000 hectares in the south east of Northern Ireland, with a population of some 68,000 (table 1).



Table 1 Population projections for Down District Council 2009- 2012  
([www.nisra.gov.uk](http://www.nisra.gov.uk), accessed 23rd September 2009)

	2009	2010	2011	2012
<b>Pop</b>	68,189	68,692	69,189	69,701

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The table shows sustained population growth for Down District Council area.

The main centres of population are located in Downpatrick, Newcastle and Ballynahinch. Agriculture and tourism form by far the most significant economic base in the area, with relatively little heavy industry. The Irish Sea and the inlet to Strangford Lough form a natural boundary for the south and east of the District. Much of this boundary has Area of Special Scientific Interest (ASSI) status. To the south of the District are the Mourne Mountains which may form the centre of Northern Ireland's first National Park. The Ards and Down Area Plan prepared under Part III of the Planning (Northern Ireland) Order 1991 will have future impacts on air quality within Down District Council. The Council has five neighbouring council areas: Ards Borough Council; Castlereagh Borough Council; Lisburn Borough Council; Banbridge District Council and Newry and Mourne District Council. In May 2011 Down District Council and Newry and Mourne District Council will become one of the new "super" Councils.

## **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 exceedences 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.

## **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 microgrammes per cubic metre  $\mu\text{g}/\text{m}^3$  (milligrammes per cubic metre,  $\text{mg}/\text{m}^3$  for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

**Table 2 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in Northern Ireland.**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
<b>Benzene</b>	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	3.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
<b>1,3-Butadiene</b>	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
<b>Carbon monoxide</b>	10.0 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
<b>Lead</b>	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
<b>Nitrogen dioxide</b>	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
<b>Particles (PM<sub>10</sub>) (gravimetric)</b>	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
<b>Sulphur dioxide</b>	350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

## **1.4 Summary of Previous Review and Assessments**

Down District Council has completed the following reviews and assessments of air quality in earlier rounds of the assessment process:

### **Stage 1 Report (DDC, 2000)**

The first stage assessment identified all significant pollutant sources with Down District Council area. The air quality objectives were unlikely to be exceeded and no detailed assessment was necessary.

### **Stage 2/3 Air quality review (DDC, 2003)**

The conclusions of this review stated that there was no need to progress to the third stage review and assessment and that no Air Quality Management Areas (AQMA'S) needed to be declared.

### **Progress report (DDC, 2005)**

The progress report concluded that NO<sub>2</sub>, SO<sub>2</sub> and PM<sub>10</sub> were not predicted to cause exceedances of the air quality objectives at relevant receptors.

### **Updating and Screening Assessment (DDC, 2006)**

The USA was carried out according to Local Air Quality Management Policy Guidance LAQM.TG(03). The assessment looked at seven pollutants and no detailed assessments were required. No AQMA's were required in Down District Council and there was no need for a detailed assessment in 2007.

### **Progress Report (EG, 2008)**

Diffusion tube monitoring indicated that the annual average objective for NO<sub>2</sub> was being exceeded at the Irish street location in Downpatrick. Down DC Officers evaluated sites with a view to installing real time monitoring equipment. There are currently no Air Quality Management Areas (AQMA'S) within the Down District Council area.

Diffusion tube measurements made in the Irish Street area during 2007 and 2008 indicated exceedances in relation to NO<sub>2</sub>. A detailed assessment involving additional diffusion tubes was commenced in late 2008 at this Irish Street location.

## **2 New Monitoring Data**

### **2.1 Summary of Monitoring Undertaken**

#### **2.1.1 Automatic Monitoring Sites**

There are no automatic monitoring sites within the Down District Council area.

#### **2.1.2 Non-Automatic Monitoring**

Down District Council carries out monitoring of NO<sub>2</sub> by diffusion tubes at fourteen sites within the District. Diffusion tube data cannot be compared directly with air quality limit values based on short-term averages; however, they can be used to help identify areas with high concentrations of NO<sub>2</sub>, which require more detailed investigation. The aim of the NO<sub>2</sub> monitoring undertaken has been to measure pollutant concentrations at busy roads and junctions especially near residential areas. The tubes are sited using guidelines from NETCEN but are not part of the monitoring network. Up to November 2004, the NO<sub>2</sub> diffusion tubes were supplied and analysed by Ruddock and Sheratt. Since then, Casella has supplied and analysed the tubes. The tubes are currently prepared using 10% TEA in water. Triplicate diffusion tubes are now located at the Irish Street junction. Additional diffusion tubes were also located at a variety of locations close to the Irish Street junction from October 2008. Further information on the diffusion tube measurements and the QA/QC arrangements are given in Appendix B. None of the sites were co-located with an automatic NO<sub>2</sub> analyser. Details are given in Table 3.

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Site Name	Site Type	Eastings	Northings	Pollutant Monitored	In AQM A?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
DOWN1	Roadside	348702	344448	NO <sub>2</sub>	N	Y	1	Y
DOWN2	Kerbside	348542	344448	NO <sub>2</sub>	N	N	1	N/A
DOWN3	B'ground	348893	345903	NO <sub>2</sub>	N	Y	1	N/A
DOWN4	Kerbside	348915	344207	NO <sub>2</sub>	N	N	1	N/A
DOWN5	Roadside	337818	331601	NO <sub>2</sub>	N	Y	0.5	Y
DOWN6	Roadside	336592	352216	NO <sub>2</sub>	N	Y	2	Y
DOWN7	B'ground	348605	344205	NO <sub>2</sub>	N	Y	1	N/A
DOWN8*	Roadside			NO <sub>2</sub>	N	Y	1	Y
DOWN9	Roadside	348702	344448	NO <sub>2</sub>	N	Y	1	Y
DOWN10	Roadside	348702	344448	NO <sub>2</sub>	N	Y	1	Y
DOWN8*	Roadside	348605	344664	NO <sub>2</sub>	N	Y	6	N
DOWN11	Roadside	348422	344646	NO <sub>2</sub>	N	Y	1	Y
DOWN12	Roadside	348664	344744	NO <sub>2</sub>	N	Y	1	Y
DOWN13	Roadside	348686	344509	NO <sub>2</sub>	N	Y	1	Y
DOWN14	Roadside	348598	344531	NO <sub>2</sub>	N	Y	1	Y
DOWN15	Roadside	348702	344609	NO <sub>2</sub>	N	Y	1	Y
DOWN16	Roadside	348735	344566	NO <sub>2</sub>	N	Y	1	Y

- Down 8 was located in Killyleagh during 2008 and relocated to English Street, Downpatrick in October 2008.

**Table 3 Details of Non- Automatic Monitoring Sites**

## 2.2 Comparison of Monitoring Results with AQ Objectives

In the following sections, statistics are presented for nitrogen dioxide (NO<sub>2</sub>), derived from the diffusion tube measurements. These statistics are compared with the objectives for the different pollutant (see table 1-1) to identify exceedances.

### 2.2.1 Nitrogen Dioxide

Nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) are often referred to as nitrogen oxides (Nox). The principal source of nitrogen dioxide is road transport. Major Roads carrying large volumes of high speed traffic are major contributors, as are city centres with congested streets. Other significant sources of nitrogen oxides emissions include power stations and domestic sources.

### Automatic Monitoring Data

Down District Council does not have any automatic monitoring sites in the Council district.

**Diffusion Tube Monitoring Data**

Down District Council currently have 14 monitoring locations for NO<sub>2</sub>, and one location uses triplicate tubes. The average result at Irish Street, Downpatrick was 49.1 µg/m<sup>3</sup> in 2008, this being measured by using triplicate tubes. However Down District Council will not be declaring an AQMA at this stage as more detailed NO<sub>2</sub> monitoring commenced in October 2008 and a full year of data will be collected prior to Detailed Assessment being submitted helping to inform future direction. There are sensitive receptors at the Irish Street location. Initial results from October 2008 indicate exceedances at Down 11 and Down 13 although the measurement period for these locations was from October 2008 to December 2008 much too short to make accurate conclusions.

A bias adjustment factor of 0.82 was used in 2008. This was taken as the weighted average of 9 studies in the bias-adjustment spreadsheet available from the LAQM page of the National Air Quality website. (<http://www.airquality.co.uk/archive/laqm/tools.php> )

There was less than 90% data capture at Down 4 and Down 5. These diffusion tubes are located in populated areas and were destroyed or stolen on 3 or more occasions during 2008. Down 8 (Killyleagh) had 89% data capture due to 1 tube being lost/stolen and then relocation of the diffusion tube from October 2008 to English Street, Downpatrick.

**Table 4 Results of Nitrogen Dioxide Diffusion Tubes**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations
				2008 (µg/m <sup>3</sup> ) Adjusted for bias
DOWN1	Irish Street(a)	N	100	49.1
DOWN2	St Patricks Avenue	N	92	36.4
DOWN3	Orchard Way	N	92	8.1
DOWN4	Stream Street	N	67	30.1
DOWN5	Newcastle	N	75	25.5
DOWN6	Ballynahinch	N	92	18.2
DOWN7	St Patricks Drive	N	100	12.7
DOWN8	Killyleagh(B)	N	89	19.4
DOWN8	English Street(C)	N	N/A	23.0
DOWN11	Church Street 50m(D)	N	N/A	58.4
DOWN12	Church Street 100m	N	N/A	36.2
DOWN13	Market Street 50m	N	N/A	58.4
DOWN14	Market Street 100m	N	N/A	29.1
DOWN15	Irish Street 50m	N	N/A	36.0
DOWN16	Irish Street 100m	N	N/A	32.4

Notes

A- average of triplicate tubes

B- Killyleagh ceased in October 2008

C- in October tube from Killyleagh was relocated to English Street, Downpatrick

D- From October 2008 additional NO<sub>2</sub> monitoring sites were commenced at sites 11,12,13,14,15, 16

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**Table 5 Results of Nitrogen Dioxide Diffusion Tubes**

Site ID	Location	Within AQMA?	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ ) Adjusted for bias		
			2006 *	2007 *	2008
DOWN1	Irish Street(a)	N	42.8	<b>47.4</b>	<b>49.1</b>
DOWN2	St Patricks Avenue	N	34.6	27.5	36.4
DOWN3	Orchard Way	N	9.6	12.7	8.1
DOWN4	Stream Street	N	21.1	31.3	30.1
DOWN5	Newcastle	N	27.4	28.7	25.5
DOWN6	Ballynahinch	N	27.6	21.8	18.2
DOWN7	St Patricks Drive	N	14.6	14.9	12.7
DOWN8	Killyleagh(b)	N	19.6	22.8	19.4
DOWN8	English Street(c)	N	N/A	N/A	23.0
DOWN11	Church Street 50m(d)	N	N/A	N/A	58.4
DOWN12	Church Street 100m	N	N/A	N/A	36.2
DOWN13	Market Street 50m	N	N/A	N/A	58.4
DOWN14	Market Street 100m	N	N/A	N/A	29.1
DOWN15	Irish Street 50m	N	N/A	N/A	36.0
DOWN16	Irish Street 100m	N	N/A	N/A	32.4

### Footnotes

\*- the bias adjustment factors were taken from the LAQM website of the National Air Quality website. In 2006 this factor was 0.87 and in 2007 it was 0.9.

a- average of triplicate tubes

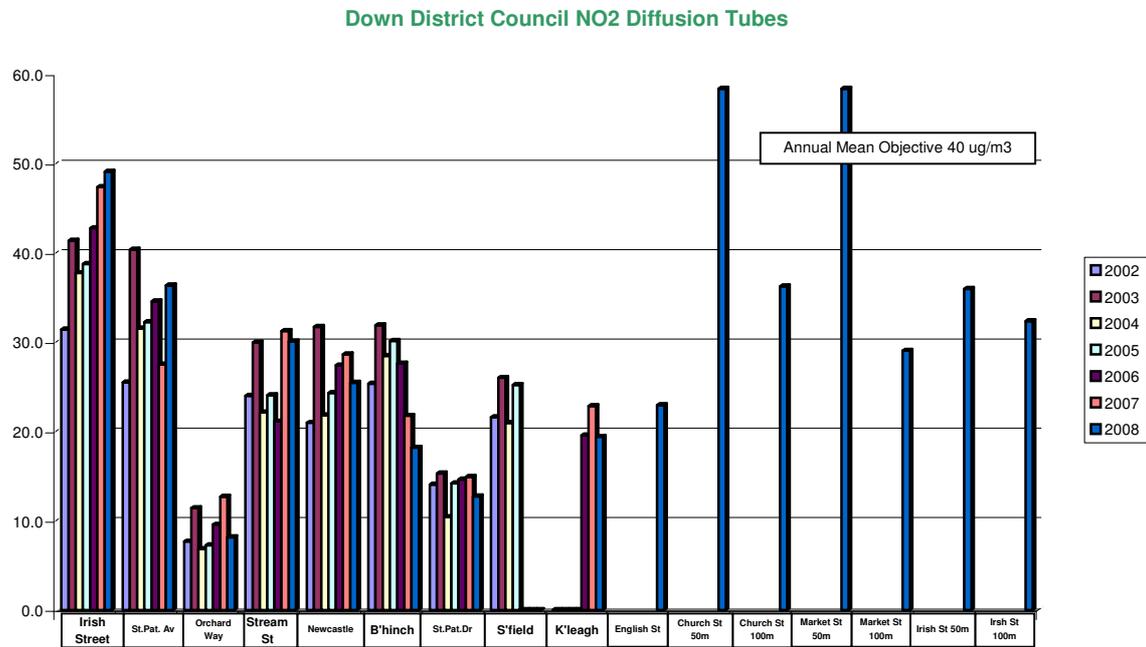
b- Killyleagh ceased in October 2008

c- in October tube from Killyleagh was relocated to English Street, Downpatrick

d- From October 2008 additional NO<sub>2</sub> monitoring sites were commenced at sites 11,12,13,14,15, 16

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Figure 1: trends in the measured annual mean NO<sub>2</sub> concentrations (in  $\mu\text{g m}^{-3}$ ) at diffusion tube sites in Down District Council area.



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### **2.2.2 PM<sub>10</sub>**

Down District Council does not carry out monitoring for PM<sub>10</sub> pollution at this time.

### **2.2.3 Sulphur Dioxide**

Down District Council ceased monitoring for Sulphur Dioxide in Ballynahinch during 2006. There were no exceedances of the air quality objectives for SO<sub>2</sub> at this site.

### **2.2.4 Benzene**

Down District Council does not carry out monitoring for Benzene at this time.

### **2.2.5 Other pollutants monitored**

Not Applicable

### **3 Road Traffic Sources**

#### **3.1 Narrow Congested Streets with Residential Properties Close to the Kerb**

This was reviewed in the 2006 Updating and Screening assessment and there has been no change since then. No further assessment is required.

Down 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.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

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

No such streets were identified in the 2006 USA and there has been no change since then. No further assessment is required.

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

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

Down District Council confirms that there are no new/newly identified roads with high flows of buses/HGV's.

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#### **3.4 Junctions**

There are no new/newly identified junctions. In previous assessments, the junction of Irish Street and Market Street, Downpatrick had been identified as busy and with relevant exposure in the Down DC area. This was assessed in the Updating and Screening Assessment 2006 using the DMRB model (DDC, 2006). The assessment indicated values well within the

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objective for NO<sub>2</sub> and PM<sub>10</sub> at that time. However, NO<sub>2</sub> levels in 2007 and 2008 indicate exceedances of this air quality objective in the vicinity of Irish Street, so it is considered necessary to carry out a Detailed Assessment for NO<sub>2</sub>. Traffic flows have not changed significantly in these periods.

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

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

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

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### **3.6 Roads with Significantly Changed Traffic Flows**

The Technical Guidance LAQM.TG(09) defines a large increase in traffic as being more than 25%. Based on the data from the annual traffic census report (Roads Service, 2007) there are no roads within the district, which meet this criteria.

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

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### **3.7 Bus and Coach Stations**

The technical guidance states that for a bus station to have significant impact on air quality there needs to be a flow of vehicles greater than 2,500 buses per day. The bus stations within the district do not meet this criteria.

Down District Council confirms that there are no relevant bus stations in the District.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

## 4 Other Transport Sources

### 4.1 Airports

Down District Council confirms that there are no airports in the District.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

### 4.2 Railways (Diesel and Steam Trains)

#### 4.2.1 Stationary Trains

Down 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.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

#### 4.2.2 Moving Trains

Down 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.

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### 4.3 Ports (Shipping)

There are no ports within Down District council area with large ships movements.

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

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## **5 Industrial Sources**

### **5.1 Industrial Installations**

There are 29 IPC processes permitted and regulated by Down District Council. Apart from five dry cleaners all the processes have been previously assessed in the USA 2006. The dry cleaners are not considered relevant for the purposes of local air quality and no further action is required. The Part A and B processes within the Down District Council area can be found on the NIEA website ([www.ni-environment.gov.uk](http://www.ni-environment.gov.uk)). Apart from the two poultry installations the processes listed in the NIEA website were covered in the 2006 USA.

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

Down 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.

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

Down 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.

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

Down 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.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

### **5.2 Major Fuel (Petrol) Storage Depots**

There are no major fuel (petrol) storage depots within the Down District Council area.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

### **5.3 Petrol Stations**

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

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### **5.4 Poultry Farms**

Exceedences of the PM<sub>10</sub> objectives can potentially occur in the vicinity of poultry farms [defined as those containing chickens (laying hens and broilers), turkeys, ducks and guinea fowl]. The technical guidance has been updated since the last round of Review and Assessment and poultry farms should be considered by all authorities. The guidance set thresholds for further assessment as:

- farms housing 400,000 birds if mechanically ventilated;
- farms housing 200,000 birds if naturally ventilated;
- farms housing 100,000 birds for any turkey unit.

And having relevant exposure within 100m of the poultry units.

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According to the public register for Integrated Pollution and Prevention Control (IPPC), there are two poultry units permitted but neither have relevant exposure.

Down District Council confirms that there are no poultry farms meeting the specified criteria.  
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NAME AND LEAVE IN.**

## **6 Commercial and Domestic Sources**

### **6.1 Biomass Combustion – Individual Installations**

Down District Council confirms that there are no biomass combustion plants in the District.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

### **6.2 Biomass Combustion – Combined Impacts**

Down District Council confirms that there are no biomass combustion plants in the District.

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### **6.3 Domestic Solid-Fuel Burning**

In previous assessments domestic solid fuel burning was considered and no exceedances were found. It is unlikely that the number of houses burning solid fuel has increased, as the use of oil is now prevalent. There are no new areas of relevant exposure within the Down District Council area.

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

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

## **7 Fugitive or Uncontrolled Sources**

Down District Council confirms that there are no potential sources of fugitive particulate matter emissions in the District.

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## **8 Conclusions and Proposed Actions**

### **8.1 Conclusions from New Monitoring Data**

There are currently no Air Quality Management Areas within the Down District Council area. The diffusion tube results at the Irish Street junction, Downpatrick indicate that there were exceedances of the annual mean objective for nitrogen dioxide in 2007 and 2008 i.e. 47.4 and 49.1  $\mu\text{gm}^{-3}$  respectively. There is relevant exposure at this location. Down District Council have now initiated a detailed assessment in the vicinity of this junction involving the use of additional NO<sub>2</sub> diffusion tubes.

No other monitoring sites within Down District Council have exceeded the air quality objectives.

### **8.2 Conclusions from Assessment of Sources**

There have been no new developments or significant changes to existing installations and activities within Down District Council area, which require further assessment.

### **8.3 Proposed Actions**

The 2009 Updating and Screening Assessment has shown the need to proceed to Detailed Assessment for NO<sub>2</sub> at the Irish Street junction, Downpatrick as current monitoring shows exceedances of the annual mean objective for nitrogen dioxide.

## **9       References**

Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: **Practical Guidance for Laboratories and Users** – AEA

EG (2008) **Eastern Group Air Quality Progress Report**. Annual report on air quality in the Eastern group of local authorities in Northern Ireland, April 2008.

DRDNI (2008) **Traffic and travel information 2007 incorporating annual traffic census and vehicle kilometres of travel**. Report prepared by the Roads Service, Northern Ireland Department for Regional Development.

TG (2009) **Part IV of the Environment Act 1995. Local Air Quality Management: Technical Guidance LAQM.TG(09)**. Guidance prepared by the Department for Environment, Food and Rural Affairs and the Devolved Administrations, February 2009.

DDC (2006) **Air Quality Update and Screening and Assessment**. DDC, May 2006.

***Council Name - Northern Ireland***

## **Appendices**

Appendix A: QA/QC Data

Appendix B: NO<sub>2</sub> Results

Appendix C: Diffusion tube locations

## **Appendix A: QA:QC Data**

### **Diffusion Tube Bias Adjustment Factors**

Up to November 2004, the NO<sub>2</sub> diffusion tubes were supplied and analysed by Ruddock and Sheratt. Since then, Casella has supplied and analysed the tubes. The tubes are currently prepared using 10% TEA in water. Casella participate in the Work Place Analysis Scheme for Proficiency (WASP) for NO<sub>2</sub>. Down District Council obtained the appropriate bias factor from the UWE Review and Assessment Website. A factor of 0.82 was taken from the drop down menus available on the excel spreadsheet matrix.

Information regarding Casella's Bias Adjustment can be viewed at:

[www.uwe.ac.uk/aqm/review/R&Asupport/diffusiotube270209.xls](http://www.uwe.ac.uk/aqm/review/R&Asupport/diffusiotube270209.xls)

Information regarding the tube precision can be viewed at:

[www.uwe.ac.uk/aqm/review/R&Asupport/tube\\_precision2008\(feb%2009\).pdf](http://www.uwe.ac.uk/aqm/review/R&Asupport/tube_precision2008(feb%2009).pdf).

### **Factor from Local Co-location Studies (if available)**

Down District Council did not use a Bias Factor from a local Co-location study. Down DC does not have an automatic NO<sub>2</sub> analyser in the district to carry out a co-location assessment.

### **Discussion of Choice of Factor to Use**

Down District Council used the Bias Factor from the UWE Air Quality Website. This was calculated by using the matrix available on the site by selecting the appropriate laboratory, year of monitoring and significant methodology.

### **PM Monitoring Adjustment**

Not applicable.

### **Short-term to Long-term Data adjustment**

Not applicable.

### **QA/QC of automatic monitoring**

Not applicable.

## Appendix B- NO<sub>2</sub> RESULTS

### LAB RESULTS FOR NO<sub>2</sub>- BIAS NOT APPLIED

	2007	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Down 1</b>	Irish Street	57.0	53.0	62.0	29.0	53.0	66.0	52.0	46.0	62.0	40.0	59.0	54.0
<b>Down 1</b>	Irish Street average	55.7	55.7	66.7	37.3	40.3	44.3	50.3	51.3	56.7	50.0	58.0	53.7
<b>Down 2</b>	St. Patricks Avenue	17.0	50.0	0.0	32.0	24.0	44.0	30.0	8.0	23.0	11.0	46.0	45.0
<b>Down 3</b>	Orchard Way	10.0	16.0	9.0	9.0	5.0	8.0	4.0	5.0	32.0	32.0	13.0	23.0
<b>Down 4</b>	Stream Street	40.0	40.0	36.0	18.0	28.0	35.0	26.0	28.0	35.0	35.0	54.0	0.0
<b>Down 5</b>	Newcastle	24.0	39.0	36.0	45.0	27.0	44.0	31.0	27.0	21.0	21.0	31.0	29.0
<b>Down 6</b>	Ballynahinch	26.0	24.0	26.0	13.0	48.0	0.0	14.0	22.0	20.0	20.0	27.0	21.0
<b>Down 7</b>	St. Patricks Drive	0.0	17.0	15.0	7.0	9.0	9.0	10.0	26.0	23.0	23.0	23.0	17.0
<b>Down 8</b>	Killyleagh	24.0	25.0	24.0	13.0	12.0	15.0	16.0	17.0	50.0	50.0	29.0	24.0
<b>Down 9</b>	Irish Street	55.0	57.0	80.0	38.0	13.0	0.0	44.0	54.0	59.0	50.0	59.0	54.0
<b>Down 10</b>	Irish Street	55.0	57.0	58.0	45.0	55.0	67.0	55.0	54.0	49.0	27.0	56.0	53.0

### LAB RESULTS FOR NO<sub>2</sub>- BIAS APPLIED

	2007	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Down 1</b>	Irish Street *	51.0	51.0	61.1	34.2	37.0	40.7	46.2	47.1	52.0	45.9	53.2	49.2
<b>Down 2</b>	St. Patricks Avenue	15.6	45.9	0.0	29.3	22.0	40.3	27.5	7.3	21.1	10.1	42.2	41.3
<b>Down 3</b>	Orchard Way	9.2	14.7	8.3	8.3	4.6	7.3	3.7	4.6	29.3	29.3	11.9	21.1
<b>Down 4</b>	Stream Street	36.7	36.7	33.0	16.5	25.7	32.1	23.8	25.7	32.1	32.1	49.5	0.0
<b>Down 5</b>	Newcastle	22.0	35.8	33.0	41.3	24.8	40.3	28.4	24.8	19.3	19.3	28.4	26.6
<b>Down 6</b>	Ballynahinch	23.8	22.0	23.8	11.9	44.0	0.0	12.8	20.2	18.3	18.3	24.8	19.3
<b>Down 7</b>	St. Patricks Drive	0.0	15.6	13.8	6.4	8.3	8.3	9.2	23.8	21.1	21.1	21.1	15.6
<b>Down 8</b>	Killyleagh	22.0	22.9	22.0	11.9	11.0	13.8	14.7	15.6	45.9	45.9	26.6	22.0

\*-AVERAGE WITH BIAS APPLIED

**LAB RESULTS FOR NO<sub>2</sub>- BIAS NOT APPLIED**

	2008	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Down 1</b>	Irish Street	63.0	59.0	65.0	30.0	57.0	66.0	50.0	47.0	64.0	62.0	55.0	73.0
<b>Down 1</b>	Irish Street average	63.0	58.7	62.0	50.7	63.0	59.0	50.7	50.3	63.5	59.7	57.7	71.7
<b>Down 2</b>	St. Patricks Avenue	49.0	48.0	42.0	39.0	43.0	0.0	33.0	39.0	41.0	45.0	45.0	58.0
<b>Down 3</b>	Orchard Way	13.0	0.0	9.0	8.0	7.0	6.0	8.0	8.0	11.0	9.0	10.0	19.0
<b>Down 4</b>	Stream Street	44.0	0.0	38.0	0.0	31.0	28.0	30.0	32.0	0.0	41.0	46.0	0.0
<b>Down 5</b>	Newcastle	34.0	30.0	28.0	31.0	41.0	0.0	0.0	29.0	0.0	22.0	27.0	34.0
<b>Down 6</b>	Ballynahinch	28.0	21.0	24.0	0.0	14.0	15.0	15.0	16.0	24.0	23.0	29.0	32.0
<b>Down 7</b>	St. Patricks Drive	17.0	18.0	14.0	11.0	14.0	12.0	11.0	11.0	16.0	19.0	18.0	23.0
<b>Down 8</b>	Killyleagh	25.0	30.0	21.0	14.0	19.0	20.0	0.0	33.0	25.0	0.0	0.0	0.0
<b>Down 9</b>	Irish Street	62.0	59.0	60.0	59.0	67.0	56.0	54.0	51.0	0.0	60.0	60.0	75.0
<b>Down 10</b>	Irish Street	64.0	58.0	61.0	63.0	65.0	55.0	48.0	53.0	63.0	57.0	58.0	67.0
<b>Down 8</b>	English Street										22.0	24.0	37.0
<b>Down 11</b>	Church Street 50m										65.0	63.0	83.0
<b>Down 12</b>	Church Street 100m										39.0	35.0	57.0
<b>Down 13</b>	Market Street 50m										59.0	70.0	82.0
<b>Down 14</b>	Market Street 100m										27.0	31.0	47.0
<b>Down 15</b>	Irish Street 50m										34.0	47.0	49.0
<b>Down 16</b>	Irish Street 100m										30.0	39.0	48.0

\*-FULL YEAR RESULTS NOT AVAILABLE FOR DOWN 8,11,12,13,14,15 and 16.

**LAB RESULTS FOR NO<sub>2</sub>- BIAS APPLIED**

	2008	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Down 1</b>	Irish Street	52.3	48.7	51.5	42.1	52.3	49.0	42.1	41.8	52.7	49.5	47.9	59.5
<b>Down 2</b>	St. Patricks Avenue	40.7	39.8	34.9	32.4	35.7	0.0	27.4	32.4	34.0	37.4	37.4	48.1
<b>Down 3</b>	Orchard Way	10.8	0.0	7.5	6.6	5.8	5.0	6.6	6.6	9.1	7.5	8.3	15.8
<b>Down 4</b>	Stream Street	36.5	0.0	31.5	0.0	25.7	23.2	24.9	26.6	0.0	34.0	38.2	0.0
<b>Down 5</b>	Newcastle	28.2	24.9	23.2	25.7	34.0	0.0	0.0	24.1	0.0	18.3	22.4	28.2
<b>Down 6</b>	Ballynahinch	23.2	17.4	19.9	0.0	11.6	12.5	12.5	13.3	19.9	19.1	24.1	26.6
<b>Down 7</b>	St. Patricks Drive	14.1	14.9	11.6	9.1	11.6	10.0	9.1	9.1	13.3	15.8	14.9	19.1
<b>Down 8</b>	Killyleagh	20.8	24.9	17.4	11.6	15.8	16.6	0.0	27.4	20.8	0.0	0.0	0.0

## Appendix C: Downpatrick NO<sub>2</sub> diffusion tube locations

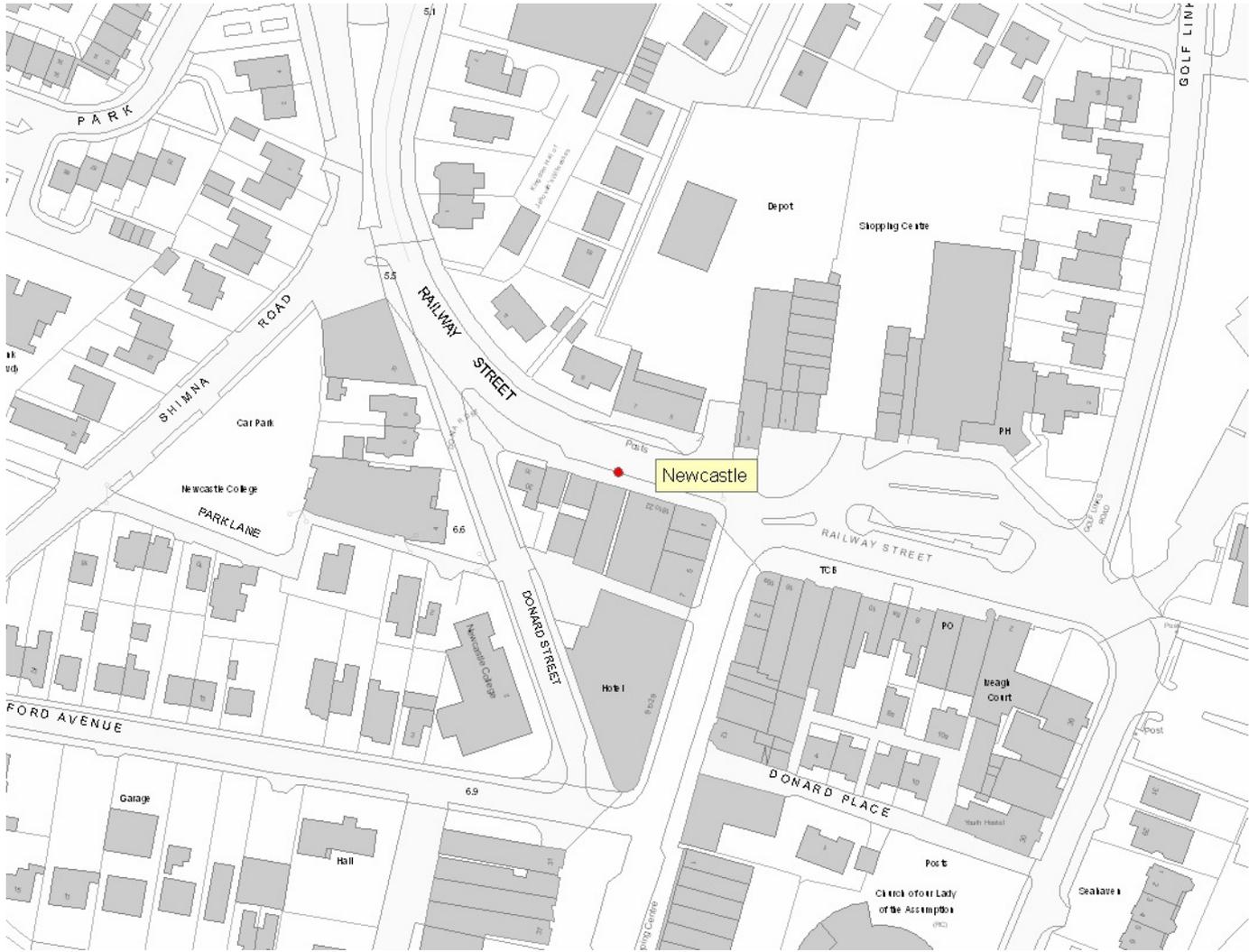


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- Site for Irish Street triplicate tubes 2 M high beside window of 1<sup>st</sup> floor apartment at 5 Irish Street
- Sites approximately 50M and 100M from existing site ( all single tubes )



Ballynahinch NO<sub>2</sub> site- ●



Newcastle NO<sub>2</sub> diffusion tube location- ●