



**COLERAINE
BOROUGH COUNCIL**

COLERAINE BOROUGH COUNCIL

UPDATING AND SCREENING ASSESSMENT

2005

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1.0 Executive Summary

Under The Environment (Northern Ireland) Order 2002, local authorities are obliged to regularly review and assess the air quality in their boroughs. The review and assessment plays an important role in the continuing process of Local Air Quality Management, whereby the authorities aim to achieve the Air Quality Objectives for the following seven air pollutants: carbon monoxide, benzene, 1,3- butadiene, lead, nitrogen dioxide, sulphur dioxide and particles (PM10).

The review and assessment process consists of 2 stages. The first stage, known as the updating and screening assessment (this document) identifies all relevant changes since the earlier work was carried out and then uses simple tools to check if there is a current risk of the relevant pollution objectives being exceeded. If this is the case the 2nd stage, known as the Detailed Assessment, must then be carried out. If the Detailed Assessment concludes that the relevant Air Quality Objective will be exceeded then an Air Quality Management Area must be declared.

This document addresses the current and future situation with regard to all the pollutants currently contained within the Air Quality Strategy, not just those for which there was local concern in 2005. For all of the pollutants the previous work concluded that there was no likelihood of any of the standards being breached in the relevant years. This document simply needs to confirm that nothing significant has occurred to alter those conclusions.

The main findings of the Updating and Screening Assessment are summarized below:

Carbon monoxide

There are no significant sources of carbon monoxide in the Coleraine area and there were no proposals for developments likely to emit this pollutant. A Detailed Assessment is not required for this pollutant as the objective for carbon monoxide is likely to be achieved at all locations within the Coleraine area.

Benzene

National benzene concentrations have been in decline in recent years due to regulations controlling the benzene content in petroleum, increased use of three way catalytic converters and the introduction of vapour controls at petrol stations. There are no significant sources of benzene in the Coleraine area or in neighbouring areas. A Detailed Assessment is not required for this pollutant as the objective for benzene is likely to be achieved at all locations within the Coleraine area.

1,3- butadiene

Emissions of 1,3-butadiene have been in decline in the United Kingdom in recent years mainly due to improvements in fuel quality, reductions in vehicle emissions and the increased use of catalytic converters.

There are no significant sources of 1,3-butadiene in the Coleraine area and there are no proposals for developments likely to emit this pollutant. A Detailed Assessment is not required for this pollutant as the objective for 1,3-butadiene is likely to be achieved at all locations within the Coleraine area.

Lead

The ban of leaded petrol for general sale has resulted in a national decline in lead emissions. Lead emissions are now largely restricted to industrial processes.

There are no significant sources of lead in the Coleraine area and the objective for lead is likely to be met. There is no requirement to proceed to a Detailed Assessment for lead.

Nitrogen dioxide

Coleraine Borough Council currently monitors nitrogen dioxide at 12 sites within the borough. 2005 annual mean concentration data shows that none of these sites have exceeded the national objective.

There have been no major changes to traffic flows since the last round of review and assessment. There are no significant sources of nitrogen dioxide in the Coleraine area or in neighbouring areas and there are no developments likely to emit this pollutant. There is no requirement to proceed to a Detailed Assessment for this pollutant as the objective for nitrogen dioxide is likely to be met at all locations within the Coleraine area.

Sulphur dioxide

There are no significant sources of sulphur dioxide in the Coleraine area or in neighbouring areas and there are no developments likely to emit this pollutant. The objective for sulphur dioxide is likely to be met at all locations within the Coleraine area.

Monitoring data suggest that the annual mean objective for sulphur dioxide will most likely be met.

There is no requirement to proceed to a Detailed Assessment for sulphur dioxide.

Particles (PM10).

There has been no major traffic or industrial changes since the last round of review and assessment that may impact on PM₁₀ emissions.

This Updating and Screening Assessment has identified the need to conduct a fuel survey in the areas of Castlerock and Articlave. This will provide more accurate data on solid fuel use in homes in these areas. This survey will be undertaken in 2006 and the data it provides will be used to determine whether there is a requirement to proceed to a detailed assessment for this pollutant.

2.0 Introduction

2.1 The Air Quality Issue

Although air quality has been improving in recent years in Northern Ireland, the issue continues to be important due to concern about the environment and improved scientific knowledge about pollutants and their effect on health. Councils in Northern Ireland are under a statutory obligation to review and assess air quality from time to time. This is known as local air quality management (LAQM)

2.2 Phased Approach to LAQM

Councils in Northern Ireland have already completed the first round of review and assessment of local air quality, and are now undertaking the second round. A phased approach is used to review and assess air quality. The first stage of the review and assessment process is an updating and screening assessment. This identifies any changes that have occurred since the first round which may have an affect on air quality and which require a more detailed assessment. Where an updating and screening assessment has identified a risk that an air quality objective will be exceeded at a location with relevant public exposure then the council is required to undertake a detailed assessment.

2.3 Legislative Background

2.3.1 The Environment (Northern Ireland) Order 2002

The Environment (Northern Ireland) Order 2002 introduced a statutory obligation on councils to carry out a review and assessment of their local air quality known as local air quality management (LAQM). The process requires the current and likely future quality of air to be assessed and compared against nationally prescribed air quality objectives. The process is set out in the Department of the Environment's Local Air Quality Management Technical Guidance LAQM. TG(03).

2.3.2 National Air Quality Strategy

The Environment Act 1995 – Part IV Section 80 required the Secretary of State to publish a strategy containing policies with respect to the assessment and management of the quality of air, i.e. a National Air Quality Strategy (NAQS). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in January 2000. The primary objective of the strategy is to ensure that everyone is able to enjoy a level of ambient air quality in public places which poses no significant risk to health and quality of life. It

sets out air quality objectives for 8 pollutants, the date by which they should be achieved and the policy framework which is to be adopted to achieve the objectives. Pollutants covered by the strategy are: benzene, 1,3 butadiene, carbon monoxide, lead, oxides of nitrogen, particulate matter (as PM₁₀) and sulphur dioxide.

2.3.3 Air Quality Regulations (Northern Ireland) 2003

In Northern Ireland the air quality objectives contained in the strategy are incorporated into the Air Quality Regulations (Northern Ireland) 2003. This provides the statutory basis for the system of LAQM.

Table 1: The Air Quality Regulations Objectives

<i>Pollutant</i>	<i>Air Quality objective levels*</i>	<i>Date to be achieved by</i>
(1)	(2)	(3)
Benzene	16.25µg/m ³ (5ppb) when expressed as a running annual mean	31 December 2003
	3.25µg/m ³ when expressed as a running annual mean	31 December 2010
1,3-butadiene	2.25µg/m ³ (1ppb) when expressed as a running annual mean	31 December 2003
Carbon monoxide	10mg/m ³ (8.6ppm) when expressed as a maximum daily running 8 hour mean	31 December 2003
Lead	0.5µg/m ³ when expressed as an annual mean	31 December 2004
	0.25mg/m ³ when expressed as an annual mean	31 December 2008
Nitrogen dioxide	200µg/m ³ (105ppb) when expressed as a 1 hour mean, not to be exceeded more than 18 times a year	31 December 2005
	40µg/m ³ (21ppb) when expressed as an annual mean	31 December 2005
Sulphur dioxide	35µg/m ³ (132ppb) when expressed as a 1 hour mean, not to be exceeded more than 24 times a year	31 December 2004
	125µg/m ³ (47ppb) when expressed as a 24 hour mean, not to be exceeded more than 3 times a year	31 December 2004
	266µg/m ³ (100ppb) when expressed as a 15 minute mean, not to be exceeded more than 35 times a year	31 December 2005
Particles (PM ₁₀)	50µg/m ³ when expressed as a 24 hour mean, not to be exceeded more than 35 times a year	31 December 2004
	40µg/m ³ when expressed as an annual mean	31 December 2004

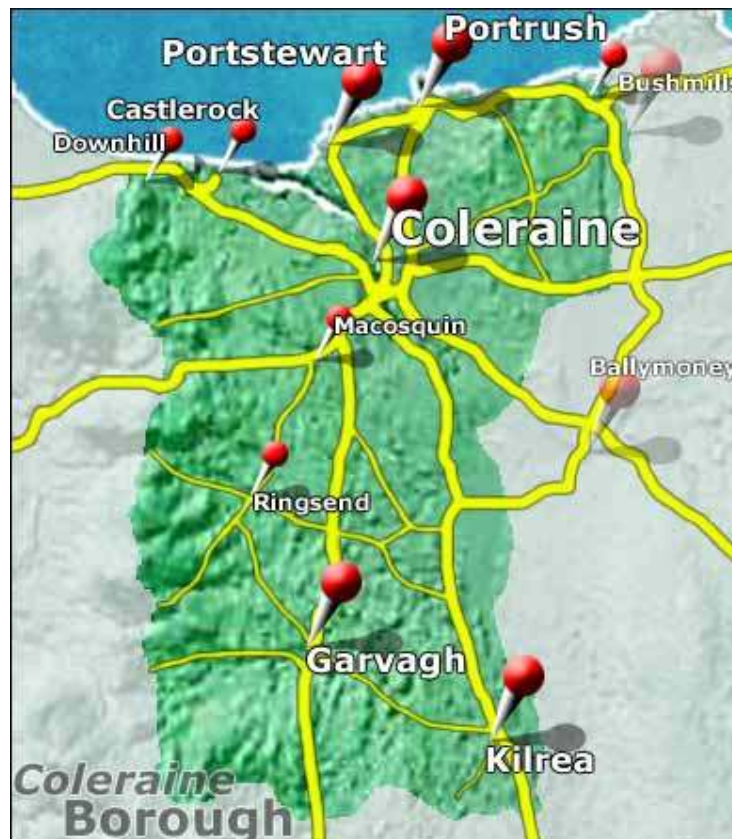
*µg/m³: micrograms per cubic metre

3.0 THE BOROUGH OF COLERAINE

The Borough of Coleraine, which covers approximately 190 square miles, has a static population of around 56,000, although large numbers of tourists swell the population during the summer months. The Borough stretches along the coastline from Downhill and Castlerock in the west to Portballintrae in the east, embracing the main coastal resorts of Portrush and Portstewart and inland to the rural towns of Kilrea and Garvagh. The River Bann borders the eastern edge of the Borough and flows through the town of Coleraine. The northern edge of the Borough is mainly coastal.

The Coleraine farmland landscape extends along the north coast from Castlerock to Portrush and southwards along the River Bann valley towards Kilrea and Garvagh. Coleraine is located on the mainline rail link from Belfast to Derry with a spur line to Portrush and is approximately 55 miles from Belfast and 35 miles from Derry.

Coleraine boasts an impressive history originating in the first known human settlement on the island some 8,000 years ago. Coleraine is also a university town, being home to the headquarters campus of Ireland's largest university, the University of Ulster.



4.0 Review and Assessment for Carbon Monoxide

Carbon monoxide (CO) is a pollutant gas generated by combustion sources. The dominant source is road transport, although domestic and other combustion processes contribute. At very high concentrations it can be a dangerous asphyxiant. Whilst outdoor concentrations do not generally reach dangerous levels, they may still have adverse health effects for vulnerable people. As CO is a component of vehicle emissions, the highest outdoor concentrations occur near busy roads.

Table 2: Air Quality Objective for Carbon Monoxide

Pollutant	Objective	To be achieved by
Carbon Monoxide	10mg/m ³ (8.6ppm) when expressed as a maximum daily running 8 hour mean	31 December 2003

4.1 Conclusion from the first round of review and assessment

The first round of Review and Assessment indicated that there were no significant sources of carbon monoxide in the Coleraine area and that there were no proposals for developments likely to emit this pollutant. It concluded that the objective for carbon monoxide would likely to be achieved at all locations within the Coleraine area.

4.2 Updating and Screening Assessment Checklist

The following checklist, derived from Technical Guidance LAQM. TG(03), has been used to determine whether or not a detailed assessment is required in respect of carbon monoxide.

	Relevant Section of Technical Guidance LAQM. TG(03)
<p>A) Monitoring data Coleraine Borough Council does not undertake any ambient carbon monoxide monitoring.</p>	See box 2.2 page 2-5
<p>B) Very Busy Roads/Junctions Local Air Quality Technical Guidance LAQM.TG(03) states that if available monitoring data suggests that the carbon monoxide objective is unlikely to be exceeded at any locations then if any exceedences are possible then these will be close to very busy roads or junctions.</p> <p>It suggests using the following criteria to define 'very busy'</p> <ul style="list-style-type: none"> • Single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day. • Dual carriageway (2 or 3-lane) roads with daily average traffic flows which exceed 120,000 vehicles per day. • Motorways with daily average traffic flows which exceed 140,000 vehicles per day. <p>Traffic census data from 'Travel and Traffic Information 2004' (Appendix 2 & 3) indicate that there are no 'very busy' roads or junctions in the Coleraine area.</p>	See box 2.2 page 2-6
<p>CONCLUSION There are no significant sources of carbon monoxide in the Coleraine area or in neighbouring areas and there are no developments likely to emit this pollutant. The objective for carbon monoxide is likely to be met at all locations within the Coleraine area.</p>	
<p>Recommendations/next steps There is no need to progress to a detailed assessment for carbon monoxide.</p>	

Note: Para 2.23 TG (03) "It is considered unlikely that any authority will need to proceed beyond the Updating and Screening Assessment for carbon monoxide".

5.0 Review and Assessment for Benzene

Benzene is a known human carcinogen (cancer causing substance), and also contributes to the formation of ground-level ozone (summer smog). The main sources of benzene emissions in the UK are petrol vehicles, petrol refining, and the fuel distribution from petrol stations without vapour recovery systems. National benzene concentrations have declined in recent years, mainly due to the increasing use of three-way catalytic converters and the introduction of vapour recovery systems in petrol stations (Stage 1 and 2 controls).

Since January 2000, EU legislation has reduced the maximum benzene content of petrol to 1%, from a previous upper limit of 5%. The European Auto-Oil programme will further reduce emissions for cars and light-duty vehicles, and emissions of benzene from the storage and distribution of petrol (LAQM.TG (03)).

Table 3: Air Quality Objectives for benzene

Pollutant	Objective	To be achieved by
Benzene	16.25µg/m ³ (5ppb) when expressed as a running annual mean	31 December 2003
Benzene	3.25µg/m ³ when expressed as a running annual mean	31 December 2010

5.1 Conclusion from the first round of review and assessment

The first round of Review and Assessment concluded that there were no significant sources of benzene in the Coleraine area or in neighbouring areas and that there were no proposals for developments likely to emit this pollutant. It stated that national policies were expected to deliver the air quality objective by the end of 2003 and that the objective for benzene was likely to be achieved in the Coleraine area.

5.2 Updating and Screening Assessment Checklist

The following checklist, derived from Technical Guidance LAQM. TG(03), has been used to determine whether or not a detailed assessment is required in respect of Benzene.

	Relevant Section of Technical Guidance LAQM. TG(03)
<p>A) Monitoring data</p> <p>Coleraine Borough Council does not undertake any monitoring of benzene.</p>	<p>See Box 3.2 Page 3-12</p>
<p>B) Very Busy Roads/Junctions</p> <p>The assessment carried out by Defra for the 2010 objective for benzene suggests there may be a few locations close to busy roads, in areas with high background concentrations, which may be at a risk of exceeding the objective.</p> <p>Local Air Quality Technical Guidance LAQM.TG(03) sets the criteria for 'very busy' roads as;</p> <ul style="list-style-type: none"> • Single carriageway roads with daily average traffic flows which exceed 80,000 vehicles per day. • Dual carriageway (2 or 3 lane) roads with daily average traffic flows which exceed 120,000 vehicles per day. • Motorways with daily average traffic flows which exceed 140,000 vehicles per day. <p>Traffic census data from 'Travel and Traffic Information 2005' (Appendix 2 & 3) indicate that there are no 'very busy' roads or junctions in the Coleraine area.</p>	<p>See Box 3.2 Pages 3-13 – 3-14</p>
<p>C) Industrial Sources</p> <p>There are no Part A or B processes (see Appendix 5) likely to release significant quantities of benzene into air, with the Coleraine area. There has been no change in this position.</p>	<p>See Box 3.2 Page 3-15</p>

<p>D) Petrol Stations</p> <p>There are no petrol stations in the Coleraine Borough area which meet all the criteria given in the Technical Guidance (LAQM.TG(04)) issued by Defra. There are no roads within the Coleraine Borough with more than 30,000 vehicles per day.</p>	<p>See Box 3.2 Pages 3-15 – 3-16</p>
<p>E) Major fuel storage depots (petrol only)</p> <p>There are no major petrol storage depots within the Coleraine area. The nearest petrol storage depot is in Maydown, Co Londonderry.</p>	<p>See Box 3.2 Page 3-16</p>
<p>CONCLUSION</p> <p>There are no significant sources of benzene in the Coleraine area and there are no proposals for developments that are likely to emit this pollutant. The objective for benzene is likely to be achieved at all locations in the Coleraine area.</p>	
<p>Recommendations/Next Steps</p> <p>There is no need to progress to a detailed assessment for benzene.</p>	

6.0 Review and Assessment for 1, 3 Butadiene

1,3-Butadiene is a suspected human carcinogen (cancer causing substance). The major source of 1,3-butadiene nationally is motor vehicle emissions, with other major sources being industrial processes (such as petrochemical and rubber processes). As with benzene, the fitting of catalytic converters to petrol vehicles reduces their emissions of 1,3-butadiene. *Recently agreed further reductions in vehicle emissions and improvements to fuel quality, including those as part of the Auto-Oil programme, are expected to further reduce emissions of 1,3-butadiene from vehicle exhausts (LAQM.TG03).*

Table 4: Air Quality Objective for 1,3 – Butadiene

Pollutant	Objective	To be achieved by
1, 3 Butadiene	2.25µg/m ³ (1ppb) when expressed as a running annual mean	31 December 2003

6.1 Conclusion from the first round of review and assessment

The first round of review and assessment concluded that there were no significant sources of 1,3-butadiene in the Coleraine area or neighbouring areas and that there were no proposals for developments likely to emit this pollutant. It stated that national policies were expected to deliver the air quality objective by 2003 and that the objective for 1,3-butadiene was likely to be achieved at all locations within the Coleraine area.

6.2 Updating and Screening Assessment Checklist

The following checklist, derived from Technical Guidance LAQM. TG(03), has been used to determine whether or not a detailed assessment is required in respect of 1, 3 Butadiene.

	Relevant Section of Technical Guidance LAQM. TG(03)
A) Monitoring data There is no monitoring of 1,3-butadiene in Coleraine Borough.	See Box 4.2 Pages 4-6 – 4-7

<p>B) New Industrial Sources</p> <p>There are no Part A or B processes (see Appendix 5) likely to release significant quantities of 1,3-butadiene into air, with the Coleraine area.</p> <p>There are no planned Part A or B processes in the Coleraine Borough area that are likely to have a significant impact on 1,3-butadiene emissions.</p>	<p>See Box 4.2 Pages 4-7 – 4-8</p>
<p>C) Industrial Sources with Substantially Increased Emissions</p> <p>There are no industrial sources with substantially increased emissions that are likely to have a significant impact on 1,3-butadiene emissions. There has been no change in this position.</p>	<p>See Box 4.2 Pages 4-8 – 4-9</p>
<p>CONCLUSION</p> <p>There are no significant sources of 1,3-butadiene in the Coleraine area or in neighbouring areas and there are no developments likely to emit this pollutant. The objective for 1,3-butadiene is likely to be met at all locations within the Coleraine area.</p>	
<p>Recommendations/Next steps</p> <p>There is no need to progress to a detailed assessment for 1,3-butadiene.</p>	

7.0 Review and Assessment for Lead

Lead has been identified as causing acute and chronic damage to the nervous system, effects on the kidneys, joints and reproductive system. Historically, the major source of lead has been motor vehicle emissions, with other major sources being metal industries and power generation. *The agreement reached between the European Parliament and the Environment Council on the Directive on the Quality of Petrol and Diesel Fuels (part of the Auto-Oil Programme) has led to the ban on sales of leaded petrol in the United Kingdom with effect from 1 January 2000. Emissions of lead are now restricted to a variety of industrial activities, such as battery manufacture, pigments in paints and glazes, alloys, radiation shielding, tank lining and piping (LAQM.TG (03)).*

Table 5: Air Quality Objectives for Lead

Pollutant	Objective	To be achieved by
Lead	0.5µg/m ³ when expressed as an annual mean	31 December 2004
Lead	0.25mg/m ³ when expressed as an annual mean	31 December 2008

7.1 Conclusion from first round of review and assessment

The first round of review and assessment concluded that there were no significant sources of lead in the Coleraine area and that the objective for lead would likely be met.

7.2 Updating and Screening Assessment Checklist

The following checklist, derived from Technical Guidance LAQM. TG(03), has been used to determine whether or not a detailed assessment is required in respect of lead.

	Relevant Section of Technical Guidance LAQM. TG(03)
<p>A) Monitoring data outside an AQMA</p> <p>Coleraine Borough Council does not undertake any ambient monitoring of lead.</p>	<p>See Box 5.2 Pages 5-6 – 5-7</p>
<p>B) New Industrial Sources</p> <p>There are no new Part A or B processes (see Appendix 5) likely to release significant quantities of lead into air, with the Coleraine area.</p>	<p>See Box 5.2 Pages 5-7 – 5-8</p>
<p>C) Industrial Sources with Substantially Increased Emissions</p> <p>There are no industrial sources with substantially increased emissions that are likely to have a significant impact on lead emissions. There has been no change in this position.</p>	<p>See Box 5.2 Page 5-8</p>
<p>CONCLUSION</p> <p>There are no significant sources of lead in the Coleraine area or in neighbouring areas and there are no developments likely to emit this pollutant. The objective for lead is likely to be met at all locations within the Coleraine area.</p>	
<p>Recommendations/Next steps</p> <p>There is no need to progress to a detailed assessment for lead.</p>	

8.0 Review and Assessment for Nitrogen Dioxide

Nitrogen dioxide is a respiratory irritant associated with both acute (short-term) and chronic (long-term) effects on human health, particularly in people with asthma. Nitrogen dioxide (NO₂) and nitric oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NO_x). All combustion processes produce NO_x emissions, largely in the form of nitric oxide, which is then converted to nitrogen dioxide, mainly as a result of reaction with ozone in the atmosphere. It is nitrogen dioxide that is associated with adverse effects upon human health.

The principal source of nitrogen oxides emissions is road transport, which accounted for about 49% of total UK emissions in 2000. Major roads carrying large volumes of high-speed traffic are a predominant source, as are conurbations and city centres with congested traffic. The contribution of road transport to nitrogen oxides emissions has declined significantly in recent years as a result of various policy measures. At a national level, urban traffic nitrogen oxides emissions were estimated to fall by about 20% between 2000 and 2005, and by 46% between 2000 and 2010 (Stedman et al, 2001). Other significant sources of nitrogen oxides emissions include the electricity supply industry and other industrial and commercial sectors. Emissions from both sources have also declined dramatically, due to the fitting of low nitrogen oxides burners, and the increased use of natural gas. Industrial sources make only a very small contribution to annual mean nitrogen dioxide levels (LAQM.TG(03)).

Table 6: Air Quality Objectives for Nitrogen Dioxide

Pollutant	Objective	To be achieved by
Nitrogen Dioxide	200µg/m ³ (105ppb) when expressed as a 1 hour mean, not to be exceeded more than 18 times a year	31 December 2005
Nitrogen Dioxide	40µg/m ³ (21ppb) when expressed as an annual mean	31 December 2005

8.1 Conclusion from first round of review and assessment

The first stage review and assessment concluded that there were 3 carriageway roads, 10 road junctions and possibly 5 busy shopping streets and 186 sensitive property facades where there may have been a risk of exceeding the objective for nitrogen dioxide. It recommended a need to undertake a detailed assessment for road traffic.

This detailed assessment of nitrogen dioxide concluded that emissions arising from road transport were not predicted to lead to an exceedance of the objective.

8.2 Update Screening and Assessment Checklist

The following checklist, derived from Technical Guidance LAQM. TG(03), has been used to determine whether or not a detailed assessment is required in respect of Nitrogen Dioxide .

A) Monitoring data outside an AQMA

Coleraine Borough Council is currently monitoring nitrogen dioxide at 12 sites around the district using passive diffusion tubes. (Three new sites were added during 2004). Monitoring sites are chosen to provide data on locations that appear to be representative of likely residential exposure and, where possible, are close to the nearest receptor to the busy road or road junction of interest. The sites are subject to periodic review. The monitoring sites referred to in this report are detailed in Appendix 11. All maps are subject to Ordnance Survey copyright.

Diffusion tubes are exposed for a month at a time before being sent for laboratory analysis. Results obtained from diffusion tubes need to be corrected for possible over or under reading. Diffusion tube analysis in 2005 was undertaken by Lambeth Scientific Services. A correction factor of 1.13 has been applied to this data. This factor is based on studies undertaken in East Hertfordshire District Council, Elmbridge Borough Council and Reigate & Banstead Borough Council. This factor was obtained from the Air Quality Review and Assessment website (University of the West of England).

Prior to November 2004 diffusion tube analysis was undertaken by Ruddock and Sherratt Analyst Laboratory. It has not been possible to derive a correction factor for this laboratory and so these results have not been corrected for any bias.

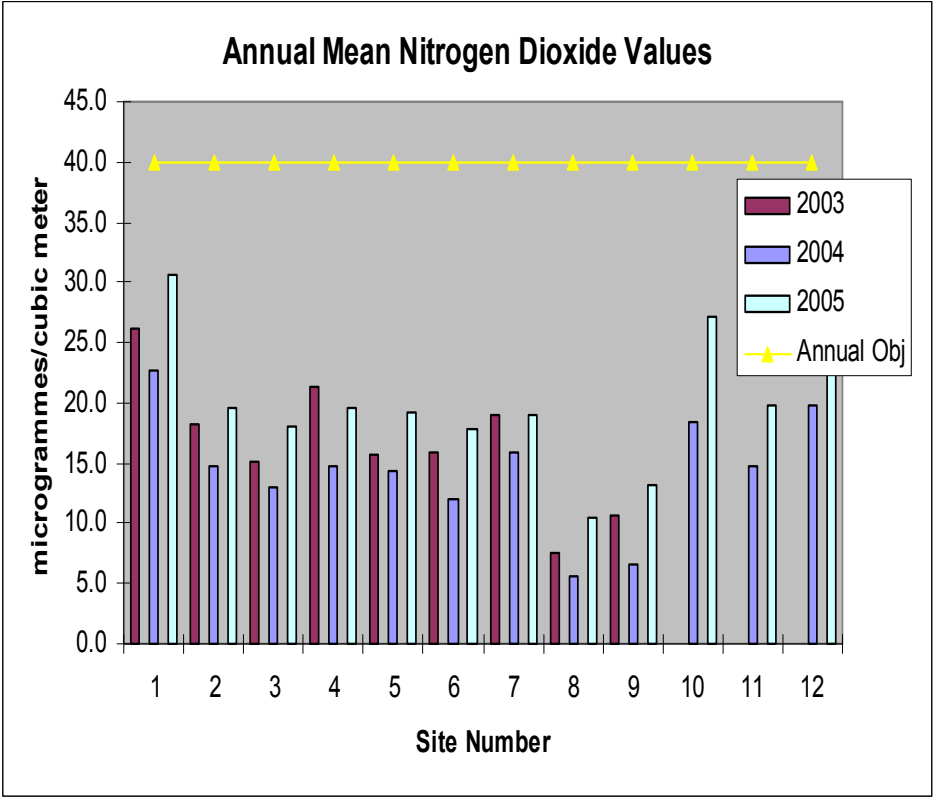
Annual mean concentrations for 2005 and, where they are available, for preceding years are shown in the table below. It should be noted that historical data is extremely limited and is insufficient to indicate any definite trends. However it can be seen that none of the annual mean concentrations for 2005 have exceeded the national objective.

Table 7: Nitrogen Dioxide Monitoring Data

Site Number	2003 ($\mu\text{g}/\text{m}^3$)	2004 ($\mu\text{g}/\text{m}^3$)	2005 ($\mu\text{g}/\text{m}^3$)
1	26.2	22.8	30.6
2	18.2	14.7	19.5
3	15.2	12.9	18.1
4	21.4	14.7	19.6
5	15.8	14.3	19.2
6	16.0	12.1	17.8
7	19.0	15.9	19.0
8	7.6	5.5	10.5
9	10.6	6.6	13.1
10	-	18.4	27.1
11	-	14.8	19.8
12	-	19.8	22.7

See Box 6.2
Pages 6-15 –
6-16

Figure 1: Annual Mean Nitrogen Dioxide Values 2003 - 2005



B) Monitoring data inside an AQMA

There are no air quality management areas within Coleraine Borough.

See Box 6.2
Pages 6-16

C) Narrow congested streets with residential properties close to the kerb

Concentrations of nitrogen dioxide are often higher when traffic is slow moving with stop/start driving, and where buildings either side reduce dispersion. Sites of narrow congested streets were considered in the first round of review and assessment and it predicted that at these locations the air quality objective would be met. There are no new sites of narrow congested streets within Coleraine Borough.

See Box 6.2
Page 6-17

<p>D) Junctions</p> <p>The first stage review and assessment concluded that there were 10 junctions with a potential risk of exceeding the objective. DMRB modelling at stage 2 concluded that emissions arising from road traffic were not predicted to exceed the objective for nitrogen dioxide. There has been no change in this position. According to LAQM.TG(03) further assessment of junctions is not required where there was a specific assessment during the first round against 2005 objectives.</p>	<p>See Box 6.2 Page 6-18</p>
<p>E) Busy streets where people may spend 1hour or more close to traffic</p> <p>The first stage review and assessment concluded that there were 5 busy streets with a potential risk of exceeding the objective. Modelling at stage 2 concluded that emissions arising from road traffic were not predicted to exceed the objective for nitrogen dioxide. According to LAQM.TG(03) if these types of location were included in the first round, then there is no need to proceed further in this round of review and assessment.</p>	<p>See Box 6.2 Page 6-19</p>
<p>F) Roads with a high flow of buses and/or HGVs</p> <p>In the first round of review and assessment there were no roads with greater than 25% proportion of buses and/or HGV's. General traffic data supplied by the Roads Service (See Appendix 2) does not identify any roads with a proportion of greater than 25% buses and/or HGV'S.</p>	<p>See Box 6.2 Page 6-20</p>
<p>G) New roads constructed or proposed since the first round of R&A</p> <p>There have been no new roads with significant traffic flows constructed or proposed since the first round of review and assessment. Appendix 9 lists recent major and minor road works undertaken in Coleraine borough. None of these are expected to have a significant effect on nitrogen dioxide levels.</p>	<p>See Box 6.2 Pages 6-21 – 6-22</p>

H) Roads close to the objective during the first round of R&A

See Box 6.2
Page 6-22

In the first round of review and assessment there were 3 roads identified as having a predicted annual mean concentration in 2005 of between $36\mu\text{g}/\text{m}^3$ and $40\mu\text{g}/\text{m}^3$. These were Millburn Road/ Union Street/ Circular Road, Coleraine Bridge/ Bridge Street and Railway Station/Union Street. Passive sampling of nitrogen dioxide was undertaken from 1st January to 31st December 2005 at these locations.

Table 8 :Monitoring Data for Roads Close to the Nitrogen Dioxide Objective in the First Round of Review and Assessment

Location	Site Number	2005 Annual Mean ($\mu\text{g}/\text{m}^3$)
Millburn Road/ Union Street/ Circular Road	1	30.6
Coleraine Bridge/ Bridge Street	6	17.8
Railway Station/Union Street	2	19.5

The monitoring site at Lower Union Street (Millburn Road/ Union Street/ Circular Road) reported the highest annual mean in 2005 of the 12 nitrogen dioxide monitoring sites within Coleraine Borough. This annual mean of $30.6\mu\text{g}/\text{m}^3$ is well below the annual mean objective of $40\mu\text{g}/\text{m}^3$.

Information on 24 hour average daily traffic figures (see Appendix 2) show that the two busiest locations surveyed are the Ring Road between B67 and A26 (19830 vehicles), and Sandleford Bridge (28250 vehicles). In 2005, Coleraine Borough Council undertook sampling of nitrogen dioxide between these two census points (site number 4). The corrected annual mean was $19.6\mu\text{g}/\text{m}^3$.

I) Roads with significantly changed traffic flows

See Box 6.2
Page 6-23

Appendix 4 details changes in traffic flows from 1999 to 2004. The percentage increase/ decrease in traffic flow are calculated for the years 2000 (the last year of review and assessment) and 2004. Where there is no data for the year 2000, data from the preceding or following year is used.

There are no roads with more than 10,000 vehicles per day that have experienced a greater than 25% increase in traffic flow, in the Coleraine area.

Road traffic data (see Appendix 4) indicates that Census Point 324 has the highest percentage increase (22.88%) in traffic flow of those roads surveyed. Census Point 324 is part of the Ring Road around Coleraine Town. Other sections of this road were also surveyed and found to have greater annual average daily traffic flow. In the last round of review and assessment these sections of the Ring Road were modelled using DMRB and none of these were predicted to have an exceedance of the annual mean or hourly average objectives for nitrogen dioxide.

Table 9: Comparison of Increase in Traffic and Predicted Nitrogen Dioxide Values.

Census Point	% increase in vehicles 1999 - 2004	AADT	Predicted NO ₂ Annual mean (µg/m ³) 2005	Predicted NO ₂ 99.8th percentile of hourly averages (µg/m ³) 2005
324	22.88%	12370	-	-
322	4.38%	19830	20.3	70.9
323	12.81%	17950	17.6	61.5

J) Bus stations

See Box 6.2
Page 6-24

The guidance recommends consideration of bus stations with relevant exposure points at less than 10m from the station complex and more than 1000 vehicle movements per day.

The Coleraine town bus station complex includes a fully enclosed public waiting area that minimises exposure. The station is located in the retail centre away from areas of likely 1-hour exposure. Furthermore, a study of bus timetables indicates that although Coleraine Bus Centre is the busiest bus station within the borough it still does not experience more than 200 bus movements on any day. Other bus stations within the borough are open in aspect but have significantly less than 200 bus movements per day.

<p>K) New Industrial Sources</p> <p>There are no new relevant industrial sources in the area likely to release significant quantities of nitrogen dioxide.</p>	<p>See Box 6.2 Page 6-25</p>
<p>L) Industrial Sources with Substantially Increased Emissions</p> <p>There are no relevant industrial sources with substantially increased emissions likely to result in significant increases in nitrogen dioxide levels (See Appendix 7). There has been no change in this position.</p>	<p>See Box 6.2 Page 6-26</p>
<p>M) Aircraft</p> <p>Eglinton airport is about 20 miles from Coleraine town centre. There are 2 airports in Belfast which are about 40 and 50 miles from Coleraine town.</p>	<p>See Box 6.2 Page 6-27</p>
<p>CONCLUSION</p> <p>There have been no major changes to traffic flows since the last round of review and assessment. There are no significant sources of nitrogen dioxide in the Coleraine area or in neighbouring areas and there are no developments likely to emit this pollutant. The objective for nitrogen dioxide is likely to be met at all locations within the Coleraine area.</p> <p>Monitoring data suggest that the annual mean objective for nitrogen dioxide will most likely be met.</p>	
<p>Recommendations/Next steps</p> <p>There is no need to progress to detailed assessment for nitrogen dioxide.</p>	

9.0 Review and Assessment for Sulphur Dioxide

Sulphur dioxide is an acute respiratory irritant, hence the short averaging time for its objective. *The main source of sulphur dioxide in the UK is power stations, which accounted for more than 71% of emissions in 2000. There are also significant emissions from other industrial combustion sources. Domestic sources now only account for 4% of emissions, but can be locally much more significant. Road transport currently accounts for less than 1% of emissions (LAQM.TG03).*

Table 10: Air Quality Objectives for Sulphur Dioxide

Pollutant	Objective	To be achieved by
Sulphur Dioxide	35µg/m ³ (132ppb) when expressed as a 1 hour mean, not to be exceeded more than 24 times a year	31 December 2004
Sulphur Dioxide	125µg/m ³ (47ppb) when expressed as a 24 hour mean, not to be exceeded more than 3 times a year	31 December 2004
Sulphur Dioxide	266µg/m ³ (100ppb) when expressed as a 15 minute mean, not to be exceeded more than 35 times a year	31 December 2005

9.1 Conclusion from first round of review and assessment

The first round of review and assessment concluded that there were no Part A or B processes with the potential to emit significant quantities of sulphur dioxide. It identified 2 significant combustion systems with thermal power rating greater than 5MW. It also identified three 1x1 km grid squares in Coleraine, one in Portstewart and one in Portrush, with more than 300 houses burning coal. It recommended a second stage review for sulphur dioxide with respect to domestic combustion and the two industrial combustion systems. Further modeling concluded that the objective for sulphur dioxide would most likely be met.

9.2 Update Screening and assessment Checklist

The following checklist, derived from Technical Guidance LAQM. TG(03), has been used to determine whether or not a detailed assessment is required in respect of sulphur dioxide.

A) Monitoring data outside an AQMA

**See Box
7.2 Pages
7-7 – 7-8**

8-port Bubbler

The use of the 8-port bubbler apparatus to measure the concentration of sulphur dioxide in the air is estimated by passing the same measured sample of filtered air through a dilute, acidified solution of hydrogen peroxide to form sulphuric acid in solution. The solution is acidified to pH 4.5, so that strongly acidic compounds will be absorbed in preference to weakly acidic compounds (such as carbon dioxide). The amount of acid in the exposed sample is determined by titration with a standard alkaline solution. The result obtained is usually a good approximation to the concentration of sulphur dioxide.

This monitoring equipment was installed within a secure location in Harpurs Hill. Prior to its siting application was made to participate in the UK SO₂ and Smoke Monitoring Network.

A suitable site to place the monitoring apparatus was sought which would be within the most dense coal burning area being secure and complying with the requirements of chapter 3 of document 20747054/001 AEA Technology "Smoke and Sulphur dioxide monitoring using the 8-port sampler".

Quality Control

Before the 8-port sampler was installed the Council applied to Netcen to have the site accepted for inclusion in the UK Smoke and Sulphur Dioxide Monitoring Network. Approval for the site was granted and the site was given the site designation Coleraine 3 and the site identification code 0786003.

The equipment was installed, and is operated and maintained in accordance with the procedures set out in the UK Smoke and Sulphur Dioxide Network instruction manual.

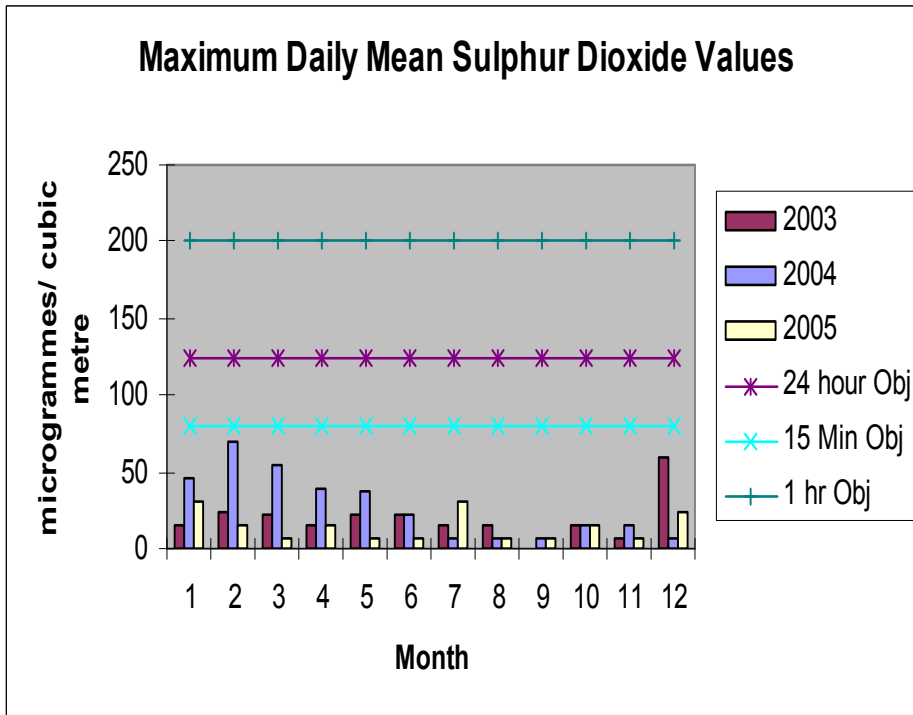
The maximum daily mean concentrations, corrected in accordance with LAQM. TG(03) are shown in the table below:

Table 11: Sulphur Dioxide Monitoring Data

Month	2003	2004	2005
Jan	15	46.25	30
Feb	23.75	70	15
March	22.5	53.75	7.5
Apr	15	38.75	15
May	22.5	37.5	7.5
June	22.5	22.5	7.5
July	15	7.5	31.25
Aug	15	7.5	7.5
Sept	-	7.5	7.5
Oct	15	15	15
Nov	7.5	15	7.5
Dec	60	7.5	23.75

LAQM. TG(03) states 'it may be assumed that the 15 minute mean objective is unlikely to be exceeded if the maximum daily mean concentration is less than 80 $\mu\text{g}/\text{m}^3$, and the 1 hour objective is unlikely to be exceeded if the maximum daily mean concentration is less than 200 $\mu\text{g}/\text{m}^3$ '

Figure 2: Maximum Daily Mean Sulphur Dioxide Values 2003 - 2005



The results indicate that it was unlikely that any of the objectives for sulphur dioxide were exceeded at this site during 2005.

B) Monitoring data inside an AQMA

There are no air quality management areas within Coleraine Borough.

See Box 7.2 Pages 7-8

<p>C) New Industrial Sources</p> <p>A review of authorised premises (See Appendix 7) indicates that there are no new relevant industrial sources in the area likely to release significant quantities of sulphur dioxide, as per checklist in Annex 2 of LAQM.TG (03). Those processes listed in Appendix 7 were identified in the first round of review and assessment and were screened out at this stage. One quarry/ roadstone process has ceased operation since the last round of review and assessment.</p>	<p>See Box 7.2 Page 7-9</p>
<p>D) Industrial Sources with Substantially Increased Emissions</p> <p>There are no relevant industrial sources with substantially increased emissions likely to result in significant increases in sulphur dioxide levels (See Appendix 7). There has been no change in this position. Those processes listed in Appendix 7 were identified in the first round of review and assessment and were screened out at this stage. Furthermore, none of the roadstone coating plants listed utilize heavy fuel oil.</p>	<p>See Box 7.2 Page 7-10</p>

E) Areas of Domestic Coal Burning

See Box
7.2 Pages
7-10 – 7-
11

In the first round of review and assessment, residential coal burning data was compiled for areas with a housing density of greater than 300 houses per 1km². In the Coleraine Borough 5 areas were identified.

- Ballysally
- Harpurs Hill
- Killowen
- Portstewart
- Portrush

A fuel usage survey undertaken in 2002 concluded that there was no need to undertake a Third Stage Assessment of SO₂ for domestic combustion in 2 of these areas as they were below the Stage I threshold for domestic coal burning.

Further modelling was undertaken by Netcen for the 3 remaining areas and the results suggested that there would not be an exceedence of the 15 minute mean SO₂ objective. As this is the most stringent SO₂ objective and it is likely that the hourly and daily SO₂ objectives would also be met. It was recommended that no further assessment be carried out.

Local Air Quality Technical Guidance LAQM.TG(03) recommends further consideration of areas where in 500m² more than 100 houses burn solid fuel as their primary source of heating.

For this round of review and assessment the areas of Articlave, Liffock, Castlerock, 2 areas in Garvagh, Mettican, Garvagh – Limavady, Kilrea, Larchfield and Macosquin (See Appendix 8) were considered. Housing counts were undertaken from maps and location visits. Information detailing the number of Housing Executive houses and heating type was obtained from the Northern Ireland Housing Executive – Heating Co-ordination Unit. The proportion of solid fuel users in private housing was obtained from the Northern Ireland Housing Condition Survey 2001 Main Report. The results of these are tabled in Appendix 10.

It is important to note that solid fuel room heaters are being replaced with more efficient gas and oil heating systems in Housing Executive stock. Private sector households are also carrying out similar works, most of which are self-financed but many are also funded by various grant schemes.

None of the areas surveyed are expected to have more than 100 houses burning solid fuel in 500m².

F) Small Boilers > 5 MW_(thermal)**See Box
7.2 Page
7-11**

In the first stage review and assessment of air quality two solid fuel or fuel oil combustion systems (>5MW) were identified:

Premises	Rating (MW)	Fuel type	% Sulphur
New University of Ulster (North building)	14.5MW	Heavy Fuel Oil	3.0
Spanboard	20MW	Heavy Fuel Oil	3.0

The stage 2 review concluded that these sources of sulphur dioxide would likely meet the air quality objective. New regulations governing the sulphur content in fuel oil mean that those boilers assessed in the first round have a lower impact on sulphur dioxide emissions than when originally assessed.

An assessment of combustion systems at the Causeway Hospital was required for this round of Updating and Screening Assessment. These include:

Causeway Hospital	Rating (MW)	Fuel type
Laboratory	0.01389MW (47400 BTU/hr)	Class D Gas Oil
2 x Hospital Boilers	2.7 MW each	Class D Gas Oil
1 de-rated Boiler	approximately 1.4 MW	Class D Gas Oil
CHP Units (3x)	0.4 MW _(thermal) each	Diesel

Estate management advised that in the worse case scenario (winter months) one boiler plus the 3 CHP Units are in use. This amounts to approximately 3.9MW.

Furthermore it is intended to convert the Causeway Hospital boilers to gas during 2006.

According to Technical Guidance LAQM.TG(03) there is no requirement to consider this source further as it is under 5 MW_(thermal).

G) Shipping

There is no source of significant shipping within the Coleraine Borough.

**See Box
7.2 Page
7-12**

<p>H) Railway Locomotives</p> <p>Diesel and coal-fired locomotives emit sulphur dioxide. Moving locomotives do not make a significant contribution to short-term concentrations and do not need to be considered further.</p> <p>The revised technical guidance includes a checklist for assessing the impact of railway locomotives by considering exposure to stationary locomotives for periods of 15 minutes or more.</p> <p>There are 2 railway lines in the Coleraine Borough area. One line runs between Coleraine town centre and Portrush. The second runs from Belfast to Londonderry stopping in Bellarena, Castlerock and Coleraine.</p> <p>Translink railway timetables indicate that Coleraine town station is the only site where locomotives may be stationary for periods of 15 minutes or more.</p> <p>The Coleraine town railway station complex is located in the retail centre and includes a fully enclosed public waiting area that minimises exposure. The nearest residential premises to the railway station is over 15 metres.</p>	<p>See Box 7.2 Page 7-13</p>
<p>CONCLUSION</p> <p>There are no significant sources of sulphur dioxide in the Coleraine area or in neighbouring areas and there are no developments likely to emit this pollutant. The objective for sulphur dioxide is likely to be met at all locations within the Coleraine area.</p> <p>Monitoring data suggest that the annual mean objective for sulphur dioxide will most likely be met.</p>	
<p>Recommendations/Next steps</p> <p>There is no need to progress to detailed assessment for sulphur dioxide.</p>	

10.0 Review and Assessment for Particulate Matter (PM10)

Particulate matter is of major health concern, as it has been linked with both increased morbidity and premature mortality. *A wide range of emission sources contribute to PM10 concentrations in the UK. These sources can be divided into 3 main categories (APEG, 1999):*

I) Primary particle emissions are derived directly from combustion sources, including road traffic, power generation, industrial processes etc. (II) Secondary particles are formed by chemical reactions in the atmosphere, and comprise principally of sulphates and nitrates. (III) Coarse particles comprise of emissions from a wide range of sources, including re-suspended dusts from road traffic, construction works, mineral extraction processes, wind-blown dusts and soils, sea salt and biological particles. The expected reduction in national particle emissions in future years is different for each source type. For example, emissions from road transport will be governed by legislation on vehicle emission standards; emissions of secondary particles will be largely governed by controls on power generation, industrial and transport SO₂ and NO_x emissions, both in the UK and in Europe; emissions of coarse particles are largely uncontrolled, and in general are not expected to decline in future years (LAQM.TG (03)).

Pollutant	Objective	To be achieved by
Particulate Matter	50µg/m ³ when expressed as a 24 hour mean, not to be exceeded more than 35 times a year	31 December 2004
Particulate Matter	40µg/m ³ when expressed as an annual mean	31 December 2004

10.1 Conclusion from first round of review and assessment

The first stage review and assessment identified 5 possible busy shopping streets and 312 sensitive property facades along 14 streets/roads. It recommended a need to undertake a second stage review and assessment for PM₁₀ for domestic combustion, road traffic sources and one industrial source.

The second stage review predicted that emissions from traffic and the industrial source were unlikely to lead to an exceedance of the PM₁₀ objectives.

In 2004 a detailed assessment was carried out for domestic fuel combustion. The modeling was undertaken at 3 locations where domestic fuel burning was common and it predicted that exceedances of the PM₁₀ objective were unlikely.

10.2 Update Screening and Assessment Checklist

The following checklist, derived from Technical Guidance LAQM. TG(03), has been used to determine whether or not a detailed assessment is required in respect of particulate matter.

	Relevant Section of Technical Guidance LAQM. TG(03)
<p>A) Monitoring data outside an AQMA Coleraine Borough Council does not undertake any monitoring of PM₁₀.</p>	See Box 8.4 Pages 8-22 – 8-23
<p>B) Monitoring data inside an AQMA There are no air quality management areas within Coleraine Borough.</p>	See Box 8.4 Page 8-23
<p>C) Junctions The first stage review and assessment concluded that there were no junctions with a potential risk of exceeding the objective. According to LAQM.TG(03) further assessment of junctions is not required where there was a specific assessment during the first round against 2005 objectives.</p>	See Box 8.4 Page 8-25
<p>D) Roads with a high flow of buses and/or HGVs General traffic data supplied by the Roads Service (See Appendix 2) does not identify any roads with greater than 20% buses and/or HGV'S.</p>	See Box 8.4 Page 8-26
<p>E) New roads constructed or proposed since the first round of R&A There have been no new roads with significant traffic flows constructed or proposed since the first round of review and assessment. Appendix 9 lists recent major and minor road works undertaken in Coleraine borough. None of these are expected to have a significant effect on PM₁₀ levels.</p>	See Box 8.4 Pages 8-27 – 8-28
<p>F) Roads close to the objective during the first round of R&A Government guidance LAQM.TG4(00) states that it is highly unlikely that the 24 hour objective for PM₁₀ will be exceeded if the annual mean concentration is below 28µg/m³, gravimetric. In stage 2 review and assessment annual means for 2004 were predicted. The highest of these was 21.9µg/m³ at Coleraine Bridge/ Bridge Street.</p>	See Box 8.4 Page 8-28

<p>G) Roads with significantly changed traffic flows</p> <p>Appendix 4 details changes in traffic flows from 1995 to 2004. There are no roads with more than 10,000 vehicles per day that have experienced a greater than 25% increase in traffic, in the Coleraine area.</p>	<p>See Box 8.4 Page 8-29</p>
<p>H) New Industrial Sources</p> <p>A review of authorised premises (See Appendix 7) indicates that there are no new relevant industrial sources in the area likely to release significant quantities of PM₁₀, as per checklist in Annex 2 of LAQM.TG (03). Those processes listed in Appendix 7 were identified in the first round of review and assessment and were screened out at this stage. One quarry and one coal process has ceased operation since the last round of review and assessment. Crocknamolt Quarry was not considered in the first round of review and assessment. It is examined further in this checklist (Section K).</p>	<p>See Box 8.4 Page 8-30</p>
<p>I) Industrial Sources with Substantially Increased Emissions</p> <p>There are no relevant industrial sources with substantially increased emissions likely to result in significant increases in levels (See Appendix 7). There has been no change in this position. Those processes listed in Appendix 7 were identified in the first round of review and assessment and were screened out at this stage.</p>	<p>See Box 8.4 Page 8-31</p>

J) Areas of Domestic Coal Burning

See Box 8.4 Page 8-32

In the first round of review and assessment, residential coal burning data was compiled for areas with a housing density of greater than 300 houses per 1km². In the Coleraine Borough 5 areas were identified.

- Ballysally
- Harpurs Hill
- Killowen
- Portstewart
- Portrush

A fuel usage survey undertaken in 2002 concluded that there was no need to undertake a Third Stage assessment of PM₁₀ for domestic combustion in 2 of these areas as they were below the Stage 1 threshold for domestic coal burning.

Further modelling was undertaken by Netcen for the remaining 3 areas and the results suggested that there would not be an exceedence of the objective.

Local Air Quality Technical Guidance LAQM.TG(03) recommends further consideration of areas where in 500m² more than 50 houses burn solid fuel as their primary source of heating.

For this round of review and assessment the areas of Articlave, Liffock, Castlerock, 2 areas in Garvagh, Mettican, Garvagh – Limavady, Kilrea, Larchfield and Macosquin (See Appendix 8) were considered. Housing counts were undertaken from maps and location visits. Information detailing the number of Housing Executive houses and heating type was obtained from the Northern Ireland Housing Executive – Heating Co-ordination Unit. The proportion of solid fuel users in private housing was obtained from the Northern Ireland Housing Condition Survey 2001 Main Report. The results of these are tabled in Appendix 10.

It is important to note that solid fuel room heaters are being replaced with more efficient gas and oil heating systems in Housing Executive stock. Private sector households are also carrying out similar works, most of which are self-financed but many are also funded by various grant schemes.

It is estimated that the areas of Castlerock and Articlave may have potentially more than 50 houses utilising solid fuel within an area of 500m². Coleraine Borough Council plan to survey these two areas in 2006 in order to gain more accurate statistics on private solid fuel use. This in turn will determine whether there is a requirement to go to a detailed assessment for PM₁₀.

<p>K) Quarries/landfill sites/opencast coal/handling of dusty cargoes at ports etc</p> <p>The only process not evaluated in the first round of review and assessment is Crocknamolt Quarry, Ballyholme Road, Portrush (authorised 2003).</p> <p>The first round of review and assessment predicted the highest background concentration of PM₁₀ in the borough in 2004 to be 18.9µg/m³. Data from 'Maps of Estimated Ambient Air Pollution in 2004 and Projections for Other Years' provided on the website http://www.airquality.co.uk/archive/laqm/tools shows the estimated annual mean background gravimetric PM₁₀ concentration in 2004 to be between 15 and 20 µg/m³. According to LAQM.TG(03) relevant exposure should be defined as within 200m of the source if the 2004 background concentration is predicted to be less than 26 µg/m³. There is no relevant exposure within 200 metres of Crocknamolt Quarry.</p>	<p>See Box 8.4 Page 8-33</p>
<p>M) Aircraft</p> <p>Eglinton airport is about 20 miles from Coleraine town centre. There are 2 airports in Belfast which are about 40 and 50 miles from Coleraine town.</p>	<p>See Box 8.4 Page 8-34</p>
<p>CONCLUSION</p> <p>There has been no major traffic or industrial changes since the last round of review and assessment that may impact on PM₁₀ emissions. Two areas have been identified as potentially having more than 50 houses within 500m² utilising solid fuel.</p>	
<p>Recommendations / Next Steps</p> <p>Coleraine Borough Council intends to conduct a fuel survey in 2006 in the areas of Castlerock and Articlave. This will provide more accurate data on solid fuel use in privately owned homes. Data from this survey will be used to calculate the effective density of coal burning houses and determine whether there is an exceedance of the criterion in the nomograms laid out in Technical Guidance LAQM.TG(03). Detailed Assessment will be undertaken in those areas where exceedances are predicted.</p>	

11.0 Conclusions

This report fulfils the statutory requirement for the Updating and Screening Assessment of the air quality in Coleraine Borough. This report has considered the sources, health effects, available data and the likelihood that the seven priority pollutants' health based Air Quality Objectives (AQO) will be met by their target dates. All seven air pollutants have been assessed according to the criteria in the technical guidance provided by Department of the Environment's Local Air Quality Management Technical Guidance LAQM. TG(03).

Having considered each pollutant in turn and presented the evidence to support the assessment of each, it is concluded that the Objectives specified in Air Quality Regulations will not be exceeded for the following pollutants:

- Carbon monoxide
- Benzene
- 1,3 – Butadiene
- Lead
- Nitrogen Dioxide
- Sulphur Dioxide

There will be no requirement to undertake a detailed assessment for these pollutants.

At the time of this report there was insufficient information available to determine whether a detailed assessment is required for Particulate Matter (PM₁₀). This Updating and Screening Assessment has identified the need to conduct a fuel survey in the areas of Castlerock and Articlave. This will provide more accurate data on solid fuel use in homes in these areas. This survey will be undertaken in 2006 and the data it provides will be used to determine whether there is a requirement to proceed to a detailed assessment for this pollutant.

Summary of Conclusions

Pollutant	Detailed Assessment Required
Carbon Monoxide	No
Benzene	No
1,3 Butadiene	No
Lead	No
Nitrogen Dioxide	No
Sulphur Dioxide	No
Particulate Matter	Fuel Survey to be undertaken to determine whether Detailed Assessment is required for domestic solid fuel burning.

11.1 Recommendations

It is recommended to conduct a fuel survey in 2006 in the areas of Castlerock and Articlave. Accurate data on fuel usage in private homes will be used to determine the density of effective coal burning households, utilising the nomogram in Technical Guidance LAQM.TG(03). If the density of solid fuel use indicates a potential exceedance of the objectives for Particulate Matter then a detailed assessment will be undertaken for this pollutant in these locations.

12.0 References

- The Environment (Northern Ireland) Order 2002
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000
- 'Traffic and Travel Information 2004', Department for Regional Development, Roads Service
- 'Air Quality Monitoring in Northern Ireland, 2003' (AEAT/ENV/R/1868 Issue 1), D.O.E. N.I. & C.E.H.O.G.
- Local Air Quality Management Policy Guidance LAQM.PGNI(03) (EHS)
- Department of the Environment's Local Air Quality Management Technical Guidance LAQM. TG(03).
- UK National Air Quality Archive, <http://www.airquality.co.uk/archive>
- Air Quality Regulations (Northern Ireland) 2003
- The Air Quality Limit Values Regulations (Northern Ireland) 2002, S.R. 2002 No.94
- The Air Quality Limit Values (Amendment) Regulations (Northern Ireland) 2002, S.R. 2002 No. 357
- Northern Ireland Housing Condition Survey 2001 Main Report, Housing Executive.
- 'Coleraine Borough Council Roads Report December 2005', Roads Service.
- 'Coleraine Borough Council Roads Report November 2004', Roads Service.
- 'District Housing Plan 2005/2006-Coleraine', NIHE.
- 'Baseline PM₁₀ and NO_x projections for PM₁₀ objective analysis', AEAT/ENV/R/0726, Stedman J R, Bush T J, Murrells T P and King K (2001).
- 'Source apportioned of airborne particulate matter in the United Kingdom. Report of the Airborne Particles Expert Group', APEG (1999)
- Air Quality Review and Assessment website – Spreadsheet of Bias Adjustment Factors, <http://www.uwe.ac.uk/aqm/review>
- Environment and Heritage Service website – Public Register of Part A and B Processes, <http://www.ehsni.gov.uk/environment/industrialPollution>

Appendix 1: **TRAFFIC CENSUS 2005**

All data has been provided by the Roads Service of the Department of the Environment.

Site location

ROAD No.	Census Point No.	Location	Channel 1	Channel 2	Grid ref. easting	Grid ref. northing
A2	311	Coleraine – Portstewart, north of B185	To Coleraine	To Portstewart	284272	434252
A2	312	Portrush – Portstewart, at Portrush	To Portrush	To Portstewart	284124	439585
A26	310	Coleraine – Ballymoney, S.E. of ring road	To Coleraine	To Ballymoney	287079	430909
A29	308	Coleraine – Limavady, at Fernlester	To Coleraine	From Coleraine	283679	430184
A29	309	Coleraine – Garvagh, south of B66	To Coleraine	To Garvagh	284700	419770
A29	313	Portrush – Ballysally roundabout	To Portrush	From Portrush	285247	435562
A29	320	Coleraine Ring Road	To Limavady	From Limavady	285153	431499
A29	322	Coleraine Ring Road, between A26-B67	To Limavady	From Limavady	286476	432478
A29	323	Coleraine Ring Road, between B67-B17	To Limavady	From Limavady	286582	432856
A29	324	Coleraine Ring Road, between B17-A29	To Limavady	From Limavady	286082	434049
A29	325	Coleraine Ring Road, between A29-B185	To Portstewart	From Portstewart	285080	435171
A37	307	Coleraine – Limavady, at Dunderg	To Coleraine	From Coleraine	283371	429646
A54	321	Coleraine – Kilrea, south of A29	To Coleraine	From Coleraine	285114	430494
A54	329	Kilrea – Coleraine, at Kilrea	To Kilrea	To Kilrea	292503	413276
B185	326	Coleraine – Portstewart, north of A29	To Coleraine	To Portstewart	283688	437401
B64	330	Garvagh Road - Kilrea	To Kilrea	From Garvagh	292172	412596


Appendix 2: **GENERAL TRAFFIC FLOW DATA**

Road No.	Census Point No.	Location	24 HR AADT	Mean Peak Hour (hour beginning)		HGV%
				<i>AM</i>	<i>PM</i>	
A2	311	Coleraine – Portstewart, north of B185	7290	450 (11)	600 (17)	2.0
A2	312	Portrush – Portstewart, at Portrush	5180	270 (11)	410 (15)	2.9
A26	310	Coleraine – Ballymoney, S.E. of ring road	15770	1170 (8)	1390 (17)	4.7
A29	308	Coleraine – Limavady, at Fernlester	16070	1410 (8)	1550 (17)	7.5
A29	309	Coleraine – Garvagh, south of B66	4890	430 (8)	470 (17)	7.0
A29	313	Portrush – Ballysally roundabout	8900	650 (8)	730 (16)	3.3
A29	320	Coleraine Ring Road, at Sandelford Bridge	28250	2630 (8)	2730 (17)	4.6
A29	322	Coleraine Ring Road, between A26-B67	19830	1730 (8)	2010 (16)	4.7
A29	323	Coleraine Ring Road, between B67-B17	17950	1230 (11)	1610 (16)	4.3
A29	324	Coleraine Ring Road, between B17-A29	12370	880 (11)	1130 (16)	2.4
A29	325	Coleraine Ring Road, between A29-B185	5900	500 (8)	570 (17)	2.7
A37	307	Coleraine – Limavady, at Dunderg	11990	1060 (8)	1140 (17)	8.2
A54	321	Coleraine – Kilrea, south of A29	6530	580(8)	560 (16)	6.3
A54	329	Kilrea – Coleraine, at Kilrea	2940	230 (8)	290 (17)	5.5
B185	326	Coleraine – Portstewart, north of A29	6440	540 (8)	570 (17)	2.9
B64	330	Garvagh Road - Kilrea	6480	450 (8)	590 (17)	3.2

Roads > 10,000 vehicles/day

Appendix 3: **DIRECTIONAL TRAFFIC FLOW DATA**

Road No.	Census Point No.	Annual Average Traffic Flow					
		24HR 5 Day			24HR 7Day		
		Ch.1	Ch.2	TOTAL	Ch.1	Ch.2	TOTAL
A2	311	3690	3430	7120	3740	3550	7290
A2	312	2310	2220	4530	2640	2550	5180
A26	310	8250	8290	16530	7830	7940	15770
A29	308	8100	8690	16800	7740	8330	16070
A29	309	2510	2500	5010	2440	2450	4890
A29	313	4440	4210	8650	4540	4360	8900
A29	320	16020	13840	29860	15170	13080	28250
A29	322	10480	11060	21540	9640	10190	19830
A29	323	9370	9170	18540	9050	8900	17950
A29	324	6320	6350	12680	6230	6140	12370
A29	325	3100	3140	6240	2970	2930	5900
A37	307	6190	6450	12640	5860	6120	11990
A54	321	3520	3370	6890	3310	3220	6530
A54	329	1520	1490	3010	1490	1460	2940
B185	326	3280	3360	6640	3180	3260	6440
B64	330	3400	3330	6730	3270	3210	6480

Junctions >10,000 vehicles/day 

Appendix 4: **COMPARISON OF ANNUAL AVERAGE DAILY TRAFFIC FLOWS FROM 1999 TO 2004**

Road No.	CP No.	AVERAGE VEHICLE COUNTS PER DAY						% Increase 1999/2000 - 2004
		1999	2000	2001	2002	2003	2004	
A2	311	-	7290	7200	6640	5290	7290	0%
A2	312	-	5860	5670	5670	6690	5180	-13.12%
A26	310	14630	14610	15060	14920	15670	15770	7.36%
A29	308	15970	16110	15310	15710	17140	16070	-0.25%
A29	309	4470	4790	4520	4580	5080	4890	2.04%
A29	313	7930	-	-	8430	8490	8900	10.89%
A29	320	25600	-	-	26940	28040	28250	9.38%
A29	322	19130	18960	19920	20600	20250	19830	4.38%
A29	323	16260	15650	16730	17030	18730	17950	12.81%
A29	324	10220	9540	10220	10770	10440	12370	22.88%
A29	325	5880	5200	5570	5570	6290	5900	11.86%
A37	307	-	-	10770	11180	11840	11990	10.18* (2001)
A54	321	5630	4980	5660	5910	6010	6530	22.74%
A54	329	2950	2950	2750	2840	2930	2940	-0.34%
B185	326	6400	-	-	6090	6460	6440	0.62%
B64	330	-	5901	-	-	6620	6480	8.94%

Roads > 10,000 vehicles/day

Appendix 5: **PART A & B AUTHORISED PROCESSES IN COLERAINE BOROUGH**

IPC No.	Site Operator Name	Site Address	Section No.	Process Type
0033/99B	Croaghan Depot	Shinny Road Macosquin COLERAINE BT51 4PS	Section 3.4	Mineral/Quarry
0050/99B	Kennedy Concrete Products Ltd	1 Letterloan Rd, Macosquin COLERAINE BT51 4PP	Section 3.1	Bulk Cement
0054/99B	Patrick Bradley Ltd	Craigall Quarry, Cullyrammer Road, KILREA	Section 3.1 & 3.4 &	Bulk cement & Mineral/Quarry & Roadstone coating
0055/99B	B Mullan & Sons (Contractors) Ltd	Cam Quarry, 19 Cam Road Macosquin COLERAINE BT51 4PX	Section 3.1 & 3.3 &	Bulk Cement, Mineral/Quarry & Roadstone coating
0067/99B	Kennedy Quarries Ltd	1 Letterloan Rd Macosquin COLERAINE BT51 4PP	Section 3.4 & 6.3	Mineral/Quarry & Roadstone coating
0098/99B	William McLoughlin & Sons Ltd	Letterloan Quarry Letterloan Road Macosquin COLERAINE BT51 4PP	Section 3.1	Bulk Cement
0191/03B	Crocknamolt Quarry	Ballyholme Road Portrush, Co. Antrim		Quarry

Appendix 6: POTENTIAL RELEASES FOR INDUSTRIAL PROCESSES

Authorisation reference	Process description	CO	Benzene	1,3-butadiene *	SO ₂ **	NOx	Lead	PM ₁₀
0033/99B	Mineral/Quarry							X
0050/99B	Bulk Cement							
0054/99B	Bulk cement & Mineral/Quarry & Roadstone coating							X
0055/99B	Bulk Cement, Mineral/Quarry & Roadstone coating							X
0067/99B	Mineral/Quarry & Roadstone coating							X
0098/99B	Bulk Cement							
0191/03B	Quarry							X

- Only if 1,3- butadiene is part of the process

** Only if process burn coal or heavy fuel oil.

Appendix 7: **Maps**

Map 1: Macosquin

Map 2: Articlave

Map 3: Kilrea

Map 4: Garvagh 1

Map 5: Garvagh 2

Map 6 : Garvagh – Limavady

Map 7: Castlerock

Map 8: Liffock

Map 9: Mettican

Appendix 8: Road Works

Major works

A37 Corridor: Gortcorbies Climbing Lane

Roads Service hopes to construct a climbing lane on the A37 Londonderry to Coleraine Road at Gortcorbies during the 2006-2007 fiscal year. The 2.3 kilometre long climbing lane starts at Drumalief Roads and continues up the west side of Keady Mountain towards Coleraine improving overtaking opportunities for Coleraine bound traffic

A37 Springwell Climbing Lane

Limavady based contractor B Mullan & Sons Ltd has completed construction of the A37 at Springwell climbing lane. The climbing lane starts at Springwell cottages and continues 2.5 kilometre up the east side of Keady Mountain improving overtaking opportunities

Relevant Minor Works

Glenkeen Road

The bend on the Glenkeen Road just east of the junction with the Agivey Road, at the Brown Trout Golf Course, is to be realigned to improve forward sight distance around the bend.

Windyhill Road

The bend, approximately 1.0km west of the Dunboe Road/Isle Road/Windyhill Road crossroads has been eased to improve forward sight distance around the bend. The carriageway was also widened and a standard verge width created from this point a distance of 500m westwards to tie into the existing widened section of Windyhill Road.

Agherton Road

The carriageway is to be widened to 6.0m and 2.5m wide verges provided from Cappagh Road eastwards for a distance of 300m.

Bushfoot Road, Portballintrae

Bushfoot Road is being widened slightly, and a footway provided, between Bushfoot Drive and Bushfoot Golf Club.

Ring Road, Coleraine

The approach lanes to Lodge Road Roundabout from Sandelford Bridge were showing signs of over-riding on the central reservation and have been widened.

Ballywillan Road, Portrush

Minor vertical realignment of the carriageway will be carried out in conjunction with a resurfacing scheme on Ballywillan Road, Portrush.

Ballymacrea Road

It is proposed to realign the 'S' bend on Ballymacrea Road 0.5km from the junction with the Ballybogey Road.

Windyhill Road

The proposed major works scheme to provide a climbing lane on the A37 Dunhill Road on the Limavady side of the mountain, may require the use of Windyhill Road as a diversionary route for a time during the works. Network Development has highlighted a number of locations that may require upgrading to accommodate the diverted traffic, with the intention of completing these in advance of the major works scheme, if necessary.

Magheraboy Road/MacIlvennon Road

It was proposed to improve the bend radius on Magheraboy Road at the junction of MacIlvennon Road to improve the forward sight distance and visibility for vehicles turning into MacIlvennon Road this financial year. However, there have been land acquisition problems, and we are now reconsidering how Magheraboy Road, which is increasing in use due to nearby development, should be improved.

Strand Road Roundabout

This scheme is now completed and included the following:-

- a) widening of all approaches to provide three lanes at each entry.
- b) reforming central island to a circular profile (previously a combination of straight sections with short sharp bends).
- c) marking the circulatory carriageway with spiral markings to guide vehicles to appropriate exit.

Killowen Street, Kyles Brae and Shuttle Hill

The design for this Traffic Calming Scheme has been completed.

Portstewart Road

Roads Service is waiting for an adjacent development to be completed in order for this scheme to be progressed. The scheme involves the widening of Portstewart Road to provide pedestrian refuges and central hatching from Agherton Road to Cappagh Road.

'Coleraine Borough Council Roads Report December 2005', Roads Service.

Dunhill Road/Drumcroone Road

It is proposed to construct a roundabout at this busy junction to facilitate traffic emerging onto Dunhill Road from Drumcroone Road. Work is scheduled to start in January 2005.

Agherton Road/Cromore Road Junction

The sight visibility exiting Agherton Road onto Cromore Road to the left is nearing completion.

Drumcroone Road/Moneycarrie Road

The provision of a right-turning lane is nearing completion at this junction just north of Garvagh. Improvements to the existing footway will be included in the scheme.

Cashel Road

The 'S' bends on the Cashel Road at the junctions of Macleary Road and Letterloan Road are to be realigned and their junctions improved. The scheme is being constructed over two financial years, and is expected to start in early 2005.

Kil-an-oge

This proposal is to increase the bend radii and thus improve the forward sight visibility around the bends on the Ballybogey Road, Portrush at The Royal Court Hotel.

Cashel Road/Shinny Road/Kinnyglass Road

This proposal is to improve sight visibility splays at this staggered crossroads.

Cashel Road (Carry Over)

Completion of the scheme to improve the 'S' bends on the Cashel Road at the junctions of Macleary Road and Letterloan Road.

'Coleraine Borough Council Roads Report November 2004', Roads Service.

Appendix 9: Domestic Solid Fuel Use

Area	Total Housing *	No. NIHE houses **	No. Private houses ****	No Solid fuel NIHE **	No. Solid Fuel Private ***	Total Solid Fuel ****	Detailed Assessment SO2	Detailed Assessment PM10
Articlave	295	55	240	29	46	75	No	To be determined by fuel survey
Castlerock	300	33	267	8	51	59	No	To be determined by fuel survey
Liffock	233	0	233	0	44	44	No	No
Mettican	76	58	18	7	3	10	No	No
Garvagh-Limavady	165	24	141	9	27	36	No	No
Garvagh 1	76	34	42	2	8	10	No	No
Garvagh 2	61	0	61	0	12	12	No	No
Kilrea	129	32	97	4	18	22	No	No
Larchfield	150	71	79	15	15	30	No	No
Macosquin	218	84	134	5	25	30	No	No

* Count from location visits

** Statistics provided by NIHE- Heating Co-ordination Unit, 2006

*** Proportion statistics taken from Northern Ireland Housing Condition Survey 2001 Main Report, Housing Executive.

'Between 1996 and 2001 the profile of Northern Ireland's dwelling stock in relation to the fuel used to drive heating systems, changed markedly:

- There was a rapid decline in the use of solid fuel heating (from 41% in 1996 to 19% in 2001).'

**** Calculated

Appendix 10: Nitrogen Dioxide Monitoring Sites

1. Lower Union Street, Coleraine
2. Upper Union Street, Coleraine
Coleraine
3. Railway Road, Coleraine
Coleraine
4. Lodge Road Roundabout, Coleraine

5. Strand Road, Coleraine
6. Dunnes Car Park,
10. Tesco Car Park,
12. Castlerock Road, Coleraine

7. Crocknamack Road, Portrush

8. Castleroe Road, Coleraine

9. N.U.U., Coleraine

11. Portstewart Road, Coleraine

Nitrogen Dioxide Tube Sites

All nitrogen dioxide tubes are located on lampposts at a height of between 1.5 and 4 metres, to deter interference by the general public.

1. Lower Union Street, Coleraine

The Lower Union Street kerbside site is located 19 metres from the junction of Millburn Road and Union Street. Union Street forms part of the one way system directing traffic through the centre of the town.

2. Upper Union Street, Coleraine

This kerbside site is located outside 41 Union Street and about 26 metres from the busy junction of Union Street and Railway Road, in the town centre.

3. Railway Road, Coleraine

This site in the town centre is located outside the Coleraine Leisure Centre. It is about 230 metres from the Coleraine Station railway and 3 metres from a bus stop.

4. Lodge Road, Coleraine

The Lodge Road site is located 4 metres from the roadside at the roundabout of the Lodge road, the Ring Road and Newbridge Road. Newbridge Road (A26) brings traffic from Belfast and the south east into Coleraine town. The Ring Road directs traffic around the outskirts of the town.

5. Strand Road, Coleraine

This Strand Road site is located less than 1 metre from the kerbside. This town centre location is 94 metres from the busy junction of Strand Road and Castlerock Road.

6. Dunnes Carpark, Coleraine

This urban centre site is located about 3 metres from Coleraine Bridge. Coleraine Bridge provides both vehicular and pedestrian access east-west across the Bann River in the town centre. The Dunnes Carpark site is about 50 metres from the main pedestrian mall and shopping precinct.

7. Crocknamack Road, Portrush

This site is located at the kerbside outside 32 Crocknamack Road. It is distanced from any major sources of nitrogen dioxide and therefore is broadly representative of urban background levels.

8. Castleroe Road, Coleraine

The Castleroe site is located outside 2 Glenara Court in the quiet residential area of Cherry Park. Cherry Park is situated approximately 3 miles from the Coleraine town centre. The Castleroe site is also located about 90 metres from Spanboard Products Ltd. As part of the process of manufacturing particleboard and related products, Spanboard combust waste wood to heat driers and thermal oil for pressing.

9. N.U.U, Coleraine

This site is located in the carpark of the New University of Ulster. It is approximately 1.5 miles from the town centre and is representative of urban background levels. It is located about 600 metres from the University railway station.

10. Tesco, Hanover Place, Coleraine

This kerbside site is located in the town centre. It is situated at the junction of Beresford Road and Blindgate Street. This busy junction forms part of the one way system around the centre of Coleraine town. This junction also connects with Mountsandal Road which brings southerly traffic into the town. Measurements began at this site in March 2004.

11. Portstewart Road, Coleraine

This kerbside site is located outside 1 Portstewart Road about 7 metres from the Portstewart Road and Millburn Road intersection. Millburn Road is the main road from Coleraine town centre to Portrush. The site on Portstewart Road is located in an urban residential area on the out skirts of the town centre. Measurements began at this site in March 2004.

12. Castlerock Road, Coleraine

The site on Castlerock Road is located less than 1 metre from the kerbside and 19 metres from the busy junction of Castlerock Road and Killowen Street. It is also about 100 metres from the junction of Castlerock Road and Strand Road. Castlerock Road handles a large portion of the west-east traffic into the town centre. Measurements began at this site in March 2004.

Site Number	Address	Grid Ref	Description
11	Portstewart Rd, Coleraine		Kerbside / Urban background
12	Castlerock Rd, Coleraine		Kerbside / Urban centre
1	Lower Union St, Coleraine	2848 4328	Kerbside / Urban centre
2	Upper Union St, Coleraine	2851 4328	Kerbside / Urban centre
3	Railway Rd, Coleraine	2852 4327	Kerbside / Urban centre
4	Lodge Rd, Coleraine	2858 4314	Roadside / Urban background
5	Strand Rd, Coleraine	2845 4325	Kerbside / Urban centre
6	Dunnes Carpark, Coleraine Bridge	2846 4325	Road side / Urban centre
7	Crocknamack Rd, Portrush	2861 4400	Kerbside / Urban background
8	Castleroe Rd, Coleraine	2859 4299	Urban industrial
9	N.U.U, Coleraine	2845 4328	Urban background
10	Tesco, Hanover Pl, Coleraine		Kerbside / Urban centre