COOKSTOWN DISTRICT COUNCIL

UPDATING AND SCREENING ASSESSMENT - 2006

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Executive Summary

Local Air Quality Management by Local Authorities was introduced as a Statutory Duty by the Environment (Northern Ireland) Order 2002 and subsequent Regulations. Under this legislation District Councils are required to review the present quality of air, and the likely future quality of air to assess whether the nationally presented objectives are likely to be achieved.

The first stage of Cookstown District Councils Review and assessment of air quality which identifies the main sources of seven key pollutants was published in August 2001.

This was followed by the second and third stage Review and Assessment published in 2004, which further scrutinized three pollutants which were potentially of concern, namely nitrogen dioxide, sulphur dioxide and particulates. This report concluded that it was unlikely that the air quality objectives would be exceeded, and that it was not necessary for Cookstown District Council to declare any Air Quality Management Areas.

This Updating and Screening Report looks at any changes that may have occurred since the First Stage Review which may have affected the seven presented pollutants, and identifies if more detailed assessments are required.

The Updating and Screening Assessment has concluded that for each of the seven key air pollutants the air quality objectives are likely to be met and that a more detailed assessment is not required.

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1.0 Introduction

1.1 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).

1.2 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.

2.0 Legislative Background

2.1 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).

2.2 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 PM_{10}) and sulphur dioxide.

2.3 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.

The Air Quality Regulations specify the following objectives

Table 1 – Objectives Specified by Air Quality Regulations (NI) 2003

Pollutant	**Air Quality objective levels***	**Date to be achieved by**
(1)	(2)	(3)
Benzene	16.25ug/m^3 (5ppb) when expressed as a running annual mean	31 December 2003
	3.25ug/ m^3 when expressed as a running annual mean	31 December 2010
1.3- butadiene	2.25ug/ 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	0.5ug/ 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	200ug/m^3 (105ppb) when expressed as a 1 hour mean, not to be exceeded more than 18 times a year	31 December 2005
	40ug/ m^3 (21ppb) when expressed as an annual mean	31 December 2005
Sulphur dioxide	35ug/ m^3 (132ppb) when expressed as a 1 hour mean, not to be exceeded more than 24 times a year	31 December 2004
	125ug/ m^3 (47 ppb) when expressed as a 24 hour mean, not to be exceeded more than 3 times a year	31 December 2004
	266ug/ 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})	50ug/ m^3 when expressed as a 24 hour mean, not to be exceeded more than 35 times a year	31 December 2004
	40ug/ m^3 when expressed as an annual mean	31 December 2004

*ug/m^3 micrograms per cubic metre

3.0 The Administrative Area of Cookstown District Council

The Cookstown District Council area is situated in the central Mid-Ulster area of Northern Ireland. It shares it boundaries with Magherafelt District Council to the north, Omagh District Council to the west, and Dungannon and South Tyrone Borough Council to the south. Its eastern boundary is the shoreline of Lough Neagh.

The area has a population of 32,000 and covers 235 square miles. Much of the population of the District is located in the town of Cookstown which is central to the area. There are also a number of rural villages in the district, Moneymore, Stewartstown, Coagh, Ardboe and Pomeroy.

The area is easily accessible and is a convenient distance from Northern Ireland's two main motorways, the M1 and M2. The main A29 north-south route bisects the district. The major airports and harbours in Northern Ireland are all within 1 hour's drive of Cookstown.
Agriculture and the agri-food business are strong contributors to the areas economy. However, the district also boasts a number of key industrial employers.

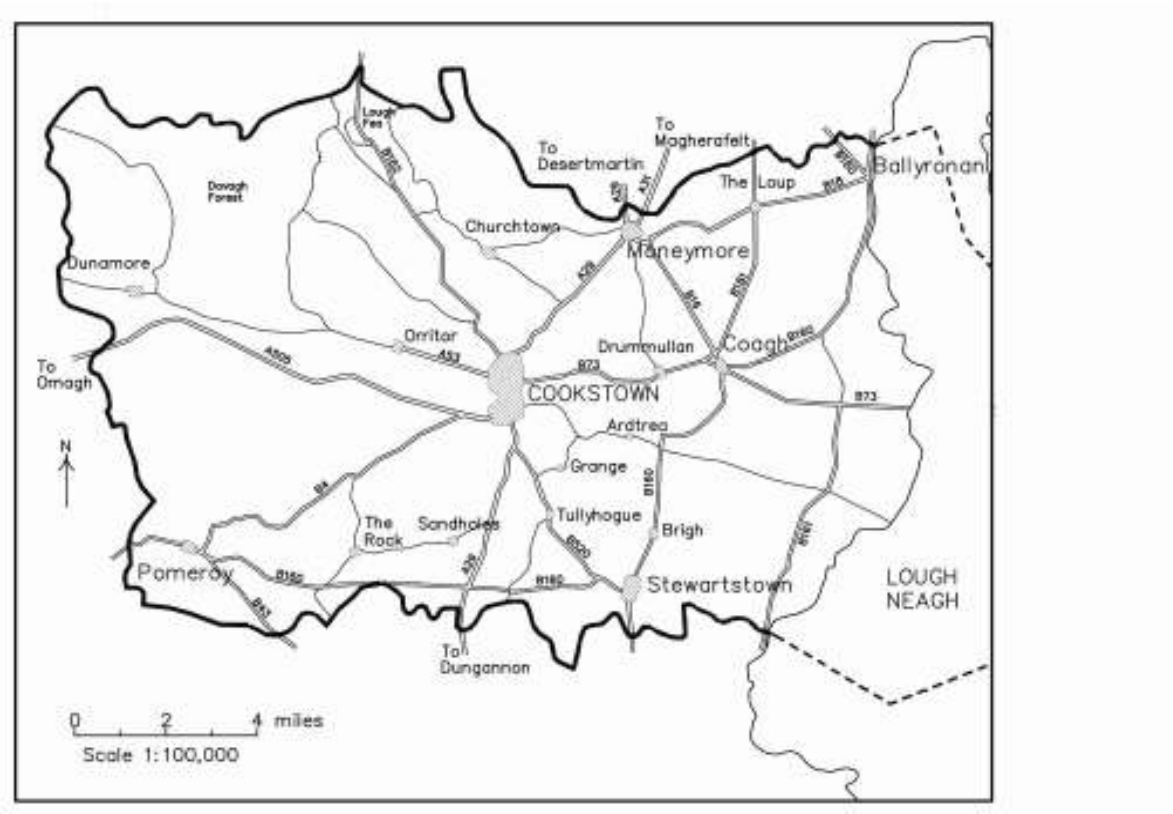


Figure 1 – Map Showing Cookstown District Council Area

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 (such as may occur inside a building with a faulty heating appliance), 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 – Showing Carbon Monoxide Objectives

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 concluded that there were no significant sources of carbon monoxide in the Cookstown area and that there were no proposals for developments likely to emit this pollutant. The objective for carbon monoxide was likely to be achieved at all locations in the Cookstown area and there was no need to undertake a second stage review and assessment.

4.2 Update Screening Assessment

4.2.1 Monitoring data

Carbon monoxide is not monitored locally within the Cookstown District Council area.

4.22 Very Busy Roads/Junctions

There are no very busy roads or junctions in the Cookstown District. Very busy is defined as
• Single carriageway road with daily average traffic flow exceeding 80,000 vehicles per day
• Dual carriageway (2 or 3 lane) roads with daily average traffic flows which exceed 120,000 vehicles per day

4.3 Conclusion

The assessment has indicated that the objective for carbon monoxide is unlikely to be exceeded at any location in the Cookstown area.

4.4 Recommendation

There is no need to undertake a detailed 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 control).

Since January 2000, EU legislation has reduced the maximum benzene content of petrol to l %, 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 – Showing Benzene Objectives

Pollutant	**Objective**	**To be achieved by**
Benzene	*l6.25ug/m*^{3} (5ppb) when expressed as a running annual mean	31 December 2003
Benzene	*3.25 ug/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 Cookstown area and there were no proposals for developments likely to emit the pollutant. Road transport represents the most significant source this pollutant. National policies were expected to deliver the air quality objective for the end of 2003. The objective for benzene was likely to be achieved at all locations in the Cookstown area and there was no need to undertake a second stage review and assessment.

5.2 Update Screening and Assessment

5.2.1 Monitoring data

Benzene is not monitored locally within the Cookstown District Council area.

5.2.2 Very Busy Roads/Junctions

There are no very busy roads or junctions in the Cookstown District. Very busy is defined as
• Single carriageway road with daily average traffic flow exceeding 80,000 vehicles per day
• Dual carriageway (2 or 3 lane) roads with daily average traffic flows which exceed 120,000 vehicles per day

5.2.3 Industrial Sources

There are no petrochemical or other significant works that emit sufficient benzene within the Cookstown District or in neighbouring authorities to consider for the purpose of this assessment.

5.2.4 Petrol Stations

There are 4 petrol stations within the District which have a throughput of greater than 1000 m3; however none of these have a busy road nearby. A busy road is considered to be one with more than 30,000 vehicles per day. In addition there is no exposure within 1Om of any of the pumps at the service stations in question. As no petrol station meets all of the above criteria there is no requirement to assess this source further. A list of the petrol stations with a throughput of greater than 1000 m3 can be found in Appendix 2.

5.2.5 Major fuel storage depots (petrol only)

There are no major fuel storage depots in the Cookstown District Council area.

5.3 Conclusion

The assessment has indicated that the objective for benzene is unlikely to be exceeded at any location in the Cookstown area.

5.4 Recommendation

There is no need to undertake a detailed assessment for benzene.

6.0 Review and Assessment for 1, 3 Butadiene

13-Butadiene is a suspected human carcinogen (cancer causing substance). The major source of 13-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 reductions in vehicle emissions and improvements to fuel quality (in the framework of the Auto-Oil programme), are expected to further reduce emissions of 1 ,3-butadiene from vehicle exhausts (LAQM .TG(O3)).

Table 4 – Showing 1,3-Butadiene Objectives

Pollutant	**Objective**	**To be achieved by**
1, 3 Butadiene	*2.25ug/m*^{3} (1ppb) when expressed as a running annual mean	31December 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 Cookstown or neighbouring areas and there were no proposals for developments likely to emit this pollutant. Road transport represented the most significant source of 1-3 butadiene however national policies were expected to deliver the air quality objective by 2003. The objective for 1-3 butadiene was likely to be achieved at all locations within the Cookstown area and there was no need to undertake a second stage review and assessment of 1-3 butadiene.

6.2 Update Screening and assessment

6.2.1 Monitoring data

1,3-Butadiene is not monitored locally within Cookstown District Council area.

6.2.2 New Industrial Sources

There are no new industrial processes within Cookstown District Council area, or in neighbouring authorities, to consider for the purpose of this assessment.

6.2.3 Industrial Sources with Substantially Increased Emissions

There are no industrial sources with substantially increased emissions to consider for the purpose of this assessment.

6.3 Conclusion

The assessment has indicated that the objective for 1,3-butadiene is unlikely to be exceeded at any location in the Cookstown area.

6.4 Recommendation

There is no need to undertake a detailed assessment for 1,3-butadiene.

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 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 – Showing Lead Objectives

Pollutant	**Objective**	**To be achieved by**
Lead	*0.5ug/m^3* when expressed as an annual mean	31 December 2004
Lead	0.25ug/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 Cookstown or neighbouring areas and there were no developments likely to emit this pollutant.
The objective for lead was likely to be achieved at all locations within the Cookstown area and there was no need to undertake a second stage review and assessment for lead.

7.2 Update Screening and assessment

7.2.1 Monitoring data outside an Air Quality Management Area

Lead is not monitored locally within the Cookstown District Council area.

7.2.2 New Industrial Sources

There are no new industrial processes within the Cookstown District Council area, or in neighbouring authorities, to consider for the purpose of this assessment.

7.2.3 Industrial Sources with Substantially Increased Emissions

There are no industrial sources with substantially increased emissions to consider for the purpose of this assessment.

7.3 Conclusion

The assessment has indicated that the objective for lead is unlikely to be exceeded at any location in the Cookstown area.

7.4 Recommendation

There is no need to undertake a detailed assessment for lead.

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 (NO_2) and nitric oxide (NO) are both oxides of nitrogen, and are collectively referred to as nitrogen oxides (NOx). All combustion processes produce NOx 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 (LAQM.TG (03)). 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.

Table 6 – Showing Nitrogen Dioxide Objectives

Pollutant	**Objective**	**To be achieved by**
Nitrogen Dioxide	200ug/m^3 (1O5ppb) when expressed as a 1 hour mean, not to be exceeded more than 18 times a year	31 December 2005
Nitrogen Dioxide	40ug/m^3 (2lppb) when expressed as an annual mean	31 December 2005

8.1 Conclusion from first round of review and assessment

Cookstown District Council's first stage review and assessment of air quality concluded that it was necessary to proceed to a second stage review and assessment for nitrogen dioxide due to the following:

There are four single carriageway road junctions exceeding the threshold.

There are three sections of dual carriageway road, and two dual carriageway road junctions with sensitive properties where there may be a risk of exceeding the objective.
There is one Part A process (Blue Circle Cement) which requires further consideration at second stage review.

The conclusions from the Stage 2 Review and Assessment identified that air quality objectives from Nitrogen Dioxide from industrial and vehicular sources were unlikely to be exceeded, and a third stage review was not required.

8.2 Update Screening and assessment

8.2.1 Monitoring data outside an Air Quality Management Area

Monthly average concentrations of NO_2 have been measured with diffusion tubes located in the Cookstown District since 1999. In April 2002 the diffusion tubes were relocated to five different sites where pollutant concentrations were expected to be highest, as concluded in the Stage 1 Review and Assessment Report. Diffusion tubes are subject to variance and bias (over read or under read) based on the methods of preparation and analysis by individual laboratories. A number of studies are carried out each year on NO_2 tubes prepared and analysed by Lambeth Scientific Services to determine bias adjustment. The most recent studies were carried out in 2005 giving a bias factor of 1.13 compared to concentrations obtained from co-located automatic analysers. The factor of 1.13 has therefore been applied to the measured result to take account of the variance. The location of the NO_2 tubes can be seen in the map included as Appendix 1.

The annual average concentrations for 2005 from available data is shown in Table 7 below.

Table 7 Annual Average NO_2 Concentrations Measured 2005

Location	Manual Average Measured 2005 NO_2 concentraton ppb		Annual Average 2005 NO_2 Concentration ($\mu g/m_3$)	
	Pre-bias Result	Bias Corrected Result	Pre-bias Result	Bias Corrected Result
Z1 High Street Moneymore	14.6	16.52	28.3	32.07
Z2 William Street Cookstown	13.37	15.11	25.75	29.10
Z3 James Street Cookstown	12.38	13.98	23.62	26.69
Z4 Church Street Cookstown	12.38	13.99	23.90	27.00
Z5 Killyman Street Cookstown	11.50	12.96	25.80	29.15

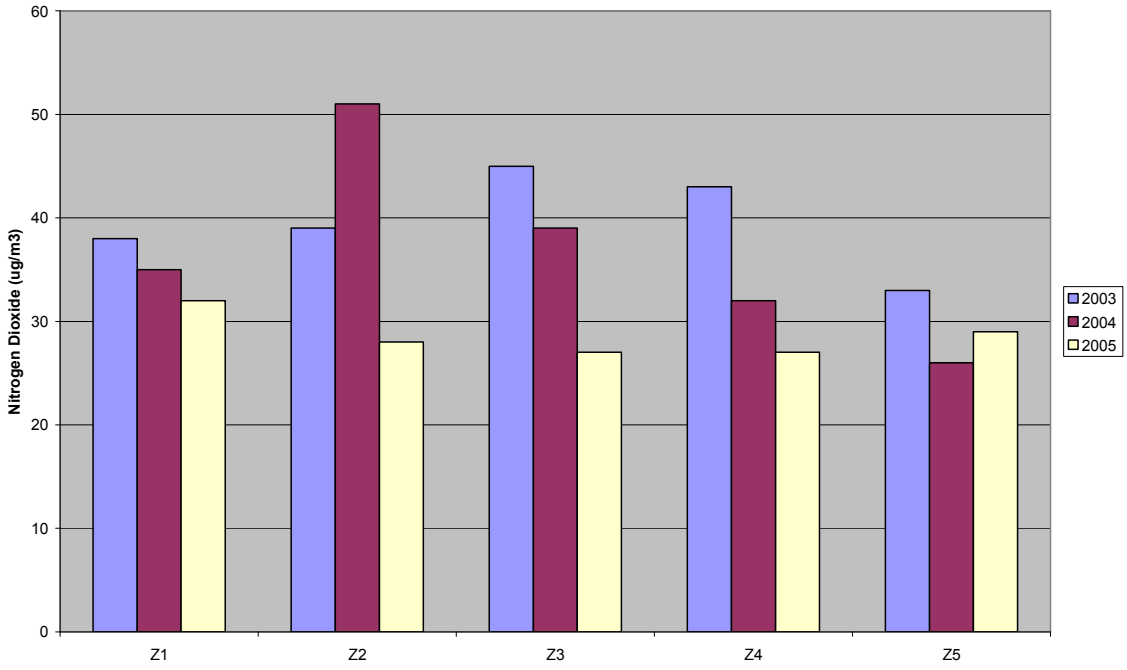
Photograph 1 – Showing NO_2 Monitoring Tube (Z1) Located at High Street, Moneymore

USA Assessment NO_2

The levels monitored by the diffusion tubes in 2005 did not exceed the objective for Nitrogen Dioxide of 21 ppb (40 $uglm^3$) and therefore the areas monitored have remained within the nitrogen dioxide objectives for 2005.

The figure overleaf compares the annual average NO_2 concentrations obtained from the diffusion tubes during 2003, 2004 and 2005 at each monitoring site.

Figure 2 – Comparison of Measured NO_2 Concentration in the period 2003-2005



The chart shows that there has been no significant increases in 2005. There would appear to be a steady decrease in levels since 2003, but three years is too short a monitoring period to establish a meaningful trend.

8.2.2 Monitoring data inside an Air Quality Management Area

There is no air quality management area for nitrogen dioxide within the Cookstown District.

8.2.3 Narrow congested streets with residential properties close to the kerb

No streets within the Cookstown District meet all of the screening criteria given in guidance LAQM.TG(03). The main street in Cookstown does not have residential properties close to the side of the kerb.

8.2.4 Junctions

Junctions were considered during the first round of review and assessment, and findings indicated that it was unlikely that 1 hour mean or the annual mean objective would be exceeded for NO_2.

8.2.5 Busy streets where people may spend 1 hour or more close to traffic

The major shopping areas in the Cookstown District are William Street and James Street where most of the major stores are located. Kerbside monitoring from these locations shows that the NO_2 levels are substantially below the objective for these areas.

8.2.6 Roads with High flow of buses and/or heavy goods vehicles

There are no roads within the District with a high flow of buses and or HGV's based on local knowledge. The technical guidance defines a high flow as having greater than 25% HGV within 10m of relevant exposure.

8.2.7 New Roads constructed or proposed since the previous round of review and assessment

No new roads have since been constructed or proposed since the first round of review and assessment.

8.2.8 Roads with significantly changed traffic flows, or new relevant exposure

Within the Cookstown District no roads with more than 10,000 vehicles per day have experienced on increase in traffic of more than 25% since the first round of review and assessment

8.2.9 Bus Stations

Within the Cookstown District there are no bus stations with a flow of buses of more than 1,000 buses per day.

8.2.10 New Industrial Sources

There are no new industrial sources of nitrogen dioxide in or close to the boundaries of the Cookstown District. Industrial Services considered are given in Appendix 2.

8.2.11 Industrial Sources with substantially increased emissions

There are no industrial sources with substantially increased emissions with the Cookstown District.

8.2.12 Aircraft

There are no airports or airfields within the Cookstown District.

8.3 Conclusion

The assessment has indicated that the conclusion drawn from the first round of review and assessment remains valid, and has indicated that the annual mean and hourly objective for nitrogen dioxide are unlikely to be exceeded.

8.4 Recommendation

There is no need to undertake a detailed assessment for nitrogen dioxide.

9.0 Review and Assessment for Particulate Matter (PM_{10})

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 PM_{10} concentrations in the UK. Research studies have confirmed that 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 resuspended 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 SO_2 and NO_2 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)).

Table 8 Showing PM_{10} Objectives

Pollutant	Objective	To be achieved by
Particulate Matter (PM_{10})	50ug/m_3 when expressed as a 24 hour mean, not to be exceeded more than 35 times a year	31 December 2005
Particulate Matter (PM_{10})	40 ug/m_3 when expressed as an annual mean	31 December 2004

9.1 Conclusion from first round of review and assessment

Cookstown District Council's first stage review and assessment of air quality concluded that it was necessary to proceed to a second review and assessment for particulate matter due to there being one Part A process where the maximum emission rate of PM_{10} exceeded the emission threshold determined from the monogram. There were also sixteen sections of single carriageway roads, seven road junctions, and four sections of dual carriageway road with sensitive properties.

As part of the second stage review and assessment NETCEN air quality consultants were commissioned to assess the impact of road traffic and industry. NETCEN concluded that emissions from traffic and industrial sources were all predicted to meet the PM_{10} objectives in 2004, and therefore a stage 3 Review and Assessment was not necessary for this pollutant.

In 2004 a detailed assessment was carried out for domestic fuel combustion. The modeling was at two $1Km^2$ areas where domestic fuel burning was common, and it predicted that exceedences of the PM_{10} objective were unlikely.

9.2 Update Screening and Assessment

There are no relevant industrial sources identified in the first round of review and assessment which have substantially increased nitrogen dioxide emissions

9.2.1 Monitoring data outside an Air Quality Management Area

9.2.2 Monitoring of PM_{10} Using Real Time Automatic Analyser

Real time monitoring equipment, namely a TEOM Series 1400a Ambient Particulate (PM_{10}). Monitor was installed in a secure location at Gortalowry House, Church Street, Cookstown in December 2003. Prior to siting advice was sought on the suitability of the location from NETCEN, AEA Air Quality Consultants. The site is within the 1 x 1 km grid square identified in the Stage 1 Risk and Assessment Report as having the highest concentration of coal burning properties in the Cookstown District. Since January 2005 the Data Management and QAQC has been managed by NETCEN.

Photograph 2 – Showing TEOM Ambient Particulate (PM_{10}) Monitor Located at Gortalowry House, Cookstown

Results

Monitoring results from 1 January 2005 – 31 December 2005 are summarized in the tables below:-

Table 9 Showing monitoring results for PM_{10} from January – December 2005

Pollutant **PM_{10}**	
Number very high	0
Number high	0
Number moderate	41
Number low	8417
Maximum 15 minute mean	315 ugm^{-3}
Maximum hourly mean	211 ugm^{-3}
Maximum running 8-hour mean	108 ugm^{-3}
Maximum running 24-hour mean	61 ugm^{-3}
Maximum daily mean	56 ugm^{-3}
Average	16 ugm^{-3}
Data capture	96.2%

Table 10 – Showing Exceedences of PM_{10} Objectives January – December 2005

Pollutant	**Air Quality Regs (NI) 2003**	**Exceedences**	**Days**
PM_{10} Particulate matter (gravimetric)	Daily mean >50 ugm^{-3}	6	6
PM_{10} Particulate matter (gravimetric)	Annual mean >40 ugm^{-3}	0	0

The above tables detail the concentrations of PM_{10} measured at the Gortalowry House site including information on the health based bandings into which the levels can be categorized. When air pollution is rated as Low effects are unlikely to be noted even by those who are sensitive to air pollution. When moderate, sensitive people may notice mild effects but these are unlikely to need action. When high sensitive people may notice significant effects, and when very High, effects on sensitive people may worsen.

As can be seen from the results there were no results registered for the very High or High bandings.

The concentrations measured did not exceed the annual mean of 40 ugm^{-3}. Six daily mean measurements were above 50 ugm^{-3}. The daily mean standard for PM_{10} is 50 ugm^{-3} not to be exceeded more than 35 times in a year. Therefore the daily mean objective was not exceeded. The location of the automatic air quality monitoring station can be seen in the map located at Appendix 2.

9.2.3 Monitoring data inside an Air Quality Management Area

There is no air quality management area for particulate matter within the Cookstown district.

9.2.4 Junctions

Junctions were considered during the first round of review and assessment and DMRB modeling predicted that concentrations of PM_{10} would be well below the annual mean objective. There has been no significant increase in traffic since the first round which would merit further assessment of junctions.

9.2.5 Roads with a High flow of buses or HGV's

General traffic data does not identify any roads with greater than 20% buses and/or HGV's.

9.2.6 New Roads Constructed or Proposed since the first round of Review and Assessment

No new roads have been constructed or proposed since the first round of review and assessment.

9.2.7 Roads close to the objective during the first round of Review and Assessment

Government Guidance LAQM.TG4(00) states that it is highly unlikely that the 24 hour objective for PM_{10} will be exceeded if the annual mean concentration is below 28 ugm^{-3} gravimetric. In the stage 2 Review and Assessment annual means were predicted. The highest of these was 25.2 ugm^{-3} at the Drum Road, Cookstown.

9.2.8 Roads with significantly changed traffic flows

Within the Cookstown district no roads of more than 10,000 vehicles per day have experienced on an increase in traffic of more than 25% since the first round of review and assessment.

9.2.9 New Industrial Sources

A review of authorized premises indicates that there are no new relevant sources in the area likely to release significant quantities of PM_{10}. One process is undergoing authorization, and this assessment will be undertaken at this stage.

9.2.10 Industrial Sources with Substantially Increased Emissions

There are no relevant industrial sources identified in the first round of review and assessment which have substantially increased nitrogen dioxide emissions either within the Cookstown district or close to its boundries. Industrial sources considered are shown in Appendix 2. The modeling work carried out as the Stage 3 Assessment for the first round of review and assessment determined that there would not be an exceedence of the mean PM_{10} objective, and recommended that no further assessment of domestic sources was required, and it was not necessary to declare an air quality management area for domestic sources. The real time monitoring carried out since January 2004 has verified the model for domestic emissions in the area of highest density domestic coal burning in Cookstown. Subsequent monitoring data will be reviewed in future review and assessment reports.

A review of the first round results has however shown the need to focus on the density of the houses burning coal over a smaller area of 500 x 500m, and this is reflected in the updated Technical Guidance LAQM.TG(03). Significant coal burning would be considered to be more than 50 houses burning coal as their primary source of heating in an area this size.

Professional judgement was used to identify several areas in which significant coal burning may be an issue. The areas considered were Rockview (Moneymore), Bridgend (Coagh), Ardstewart (Stewartstown), Parkview (Pomeroy).

Information supplied by the Northern Ireland Housing executive relating to the types of heating sources within their housing stock, and the relevant monogram within LAQM.TG(03) were used to determine the risk of exceeding the 24 hours mean PM_{10} objective in 2004. None of the above areas are likely to be a significant area of domestic fuel burning.

9.2.11 Quarries/Landfill site/open cast coal etc

There are no new landfill sites, quarries or other sources of fugitive emissions of PM_{10} which have nearby relevant exposure.

9.2.12 Aircraft

There are no airports in the Cookstown district.

9.3 Conclusion

The assessment has indicated that both the daily and the annual mean for particulate matter are unlikely to be exceeded at any location in the Cookstown Area.

9.4 Recommendation

There is no need to undertake a detailed assessment for particulate matter.

10.0 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.TGO3).

Table 11 Showing Objectives for Sulphur Dioxide

Pollutant	**Objective**	**To be achieved by**
Sulphur Dioxide	*35ug/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	125ug/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	266ug/m^3 (100ppb) when expressed as a 15 minute mean, not to be exceeded more than 35 times a year	31 December 2005

Cookstown District Councils first stage review and assessment of air quality concluded that it was necessary to undertaken a 2nd stage review and assessment for sulphur dioxide due to the presence of one Part A process, and there was one significant combustion system with a thermal power rating >5MW. There were also two 1 x 1 km grid squares in Cookstown with significant domestic coal burning.

As part of the second stage review and assessment AEAT air quality consultants were commissioned to assess the impact of industry. They concluded that there were no predicted exceedences of the strategy objectives in the Cookstown District, and there was no need to proceed to a stage 3 review and assessment for this pollutant.

10.1 Local continuous monitoring of sulphur dioxide

Real time monitoring equipment, namely a Monitor Europe ML 9805 B Sulphur Dioxide analyzer was installed within the Gortalowry House complex, Church Street, Cookstown in December 2003. Prior to installation advice was sought on the suitability of the location from NETCEN, AEA Technologies air quality consultants. The site is within the 1 x 1 km grid square identified in the Stage 1 Risk and Assessment Report as having the highest proportion of coal burning properties within the Cookstown District. Since January 2005 the Date Management and QAQC has been managed by NETCEN. The location of the real time monitor can be seen in the map included in Appendix 1 of this report.

Photograph 3 – Showing Real time monitoring equipment for SO2 and PM_{10} located at Gortalowry House, Cookstown.

10.2.1Sulphur Dioxide Results

Table 12 Monitoring Results from January – December 2005

Number very high	0
Number high	0
Number moderate	0
Number Low	34,002
Max 15 minute mean	48 ugm^{-3}
Max hourly moon	37 ugm^{-3}
Max running 24 hour mean	12 ugm^{-3}
Max daily mean	10 ugm^{-3}
Average	2 ugm^{-3}
Date Capture	97.1%

Table 13 Exceedences of Objectives for Sulphur Dioxide from January – December 2005

Pollutant	**Air Quality Regulations (NI) 2003**	**Exceedences**	**Days**
Sulphur Dioxide	15 minute mean >266ugm^{-3}	0	0
Sulphur Dioxide	Hourly mean >350ugm^{-3}	0	0
Sulphur Dioxide	Daily mean >125 ugm^{-3}	0	0

The tables above show that the air pollution did not rate as very high, high or moderate throughout the twelve months but consistently low. When pollution is rated as low, effects are unlikely to be noted, even by those who are sensitive to air pollution.

The second table shows that the concentrations of sulphur dioxide monitored did not exceed the 15 minute mean, the hourly mean or the daily mean throughout the year.

10.2.2 Monitoring data inside on Air Quality Management Area

There is no air quality management area for sulphur dioxide within the Cookstown district.

10.2.3 New Industrial Sources

There are no new industrial processes within the Cookstown District Council area, or in neighbouring authorities to consider for the purposes of assessment.

10.2.4 Industrial sources with substantially increased Emissions

There are no sources with substantially increased emissions to consider for the purposes of this assessment. Industrial sources considered are given in Appendix 2.

10.2.5 Area of Domestic Coal Burning

Earlier modelling work had determined that no further assessment of domestic sources was required, and it was not necessary to declare an air quality management area for domestic sources.

This review however considered the density of houses burning coal over a smaller area of 500m x 500m. Professional judgement was used to identify several areas in which significant coal burning may be an issue. Data supplied by the Northern Ireland Housing Executive indicated that in all these cases there were less than 100 houses in the 500m x 500m area likely to be burning solid fuel as their primary source of heating.

10.2.6 Small Boilers >5MW

In the first stage review and assessment of air quality one solid fuel or fuel oil combustion system (>5MW) was identified at Dale Farm foods. The stage two review concluded that this source of sulphur dioxide would be likely to meet the air quality objective. New regulations governing the sulphur content in fuel mean that those boilers assessed in the first round have a lower impact on sulphur dioxide emissions than when originally assessed.

10.2.7 Shipping

There is no source of significant shipping within the Cookstown District.

Railway Locomotives

There are no railway lines running within the Cookstown district.

Conclusion

The assessment has indicated that both the annual mean and hourly objective 15 minute mean for sulphur dioxide are unlikely to be exceeded at any location is the Cookstown district.

Recommendation

There is no need to undertake a detailed assessment for sulphur dioxide.

11.0 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	No

Although the Updating and Screening Assessment assessment has not identified any pollutants that require a detailed assessment, work is ongoing in monitoring SO_2, PM_{10} and NO_2 at various locations in Cookstown and Moneymore. The NO_2 tubes were relocated in August 2005 and the automatic air quality monitoring station for SO_2 and PM_{10} has been running since December 2003. The site for the automatic monitoring station was chosen in order to be closest to the areas of Cookstown which would have the highest concentration of the pollutants. It is important that monitoring continues at these sites to enable comparisons between years and analysis of trends to be carried out.

12.0 References

The Environment (Northern Ireland) Order 2002

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000

Department of the Environment's Local Air Quality Management Technical Guidance LAQM. TG(03).

Air Quality Regulations (Northern Ireland) 2003

Local Air Quality Management Policy Guidance LAQM.PGNI(03) (EHS)

Lame Borough Council First Stage Review and Assessment of Air Quality 2001

Air Quality Review and Assessment Stage 2 AEAIENV/R/1 010

Air Quality Review and Assessment Stage 3 — Domestic Fuel Combustion. Report produced for Lame

Borough Council Netcen/ED49246/lssue 1 /AEAT/ENV/R/1 642 January 2004

Traffic and Travel Information 2004 incorporating Annual Traffic Census and Vehicles Kilometres of Travel, Department of Regional Development, Roads Service

APPENDICES

Appendix 2

Part A/Part B Processes in Cookstown

PROCESS	NAME & ADDRESS
Quarry & Roadstone Coating	Corvanaghan Quarry Corvanaghan Road COOKSTOWN
Quarry & Roadstone Coating	Northstone NI Ltd – previously Farrens Ltd, 31 Magherafelt Road, Moneymore
Roadstone Coating	MP Colemans Brigh Quarry, Brigh Road Stewartstown
Quarry & Cement Manufacturer	Lafarge Cement Ltd – previously Blue Circle 29 Sandholes Road Cookstown
Quarry Process (Quarry)	Milburn Concrete c/o 231 Orritor Road Cookstown
Intensive Poultry	A Purvis 50 Ballynafeagh Road Stewartstown
Intensive Poultry	H Sinnamon 33 Lurganeden Road Pomeroy
Intensive Poultry	D Nugent 127 Limehill Road Pomeroy
Intensive Poultry	N Hammond 7 Annaghone Road Stewartstown
Intensive Poultry	V Johnston 20 Aghaford Road Pomeroy
Intensive Poultry	S Mullin 20 Cavanoneill Road Kildress Cookstown
Intensive Poultry	D & G Rafferty 110 Limehill Road Dungannon
Intensive Poultry	P Swaile 10 Ballynakilly Road Sandholes Cookstown

Part C Processes in Cookstown

Process	Name & Address	BEN	1-3 BUT	LEAD	CO	SO_2	NO_2	PM_{10}
Coal Process	Lissan Coal Co. 16 Churchtown Road Cookstown							X
Petrol Stations	1. Safeway Petrol Station Sweep Road Cookstown 2. Milburn Service Station 2 Lissan Road Cookstown 3. A29 Service Station Dungannon Road Cookstown 4. Crossroads Fuels 33 Drumenny Road Coagh							
Bulk Cement	1. R J Donaghy & Sons 71B Lissan Road Cookstown 2. Creagh Concrete 93 Kilmascally Road Ardboe 3. R S Concrete 20 Ballynasollus Road Tulnacross Cookstown							
Animal Feed	T Hutchinson & Sons 4 Ballygillen Road Cookstown							
Timber Processes	1. Trade Mouldings Cookstown Business Park Sandholes Road Cookstown 2. CNC Components (UK Ltd) 45 Ruskey Road Coagh, Cookstown 3. Northern Mouldings Ltd 69 Drum Road Cookstown 4. BA Kitchen Components Ltd Derryloran Ind. Estate Sandholes Road Cookstown							