Report produced for The Moray Council by BMT Cordah Ltd

2009 Air Quality Updating and Screening Assessment for *The Moray Council*

In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

20th May 2009

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Executive Summary

A review of pollutant monitoring data and atmospheric emissions sources within the Moray Council area has been undertaken. The assessment compared the available monitoring data to national air quality standards in order to identify any existing exceedences of the standards.

Data was gathered from various national and local sources with regards to atmospheric emissions from: road traffic; rail; aircraft; shipping; industrial processes; intensive farming operations; domestic properties; biomass plants; and dusty processes. The screening methods outlined in the technical guidance were used to determine the likelihood that a particular source would result in an exceedence of national air quality standards.

The review of emission sources identified no sources that were likely to result in an exceedence of the NAQS objectives. Moray council will consider monitoring NO_2 concentrations close to the new industrial biomass CHP plant in Rothes.

The NO_2 concentrations measured by Moray Council during 2008 were below the NAQS annual mean objective for NO_2 at all monitoring locations. However, measured NO_2 concentrations at West Park Court in Elgin were close to the objective in 2008. In recognition of the high NO_2 levels measured in Elgin, the trend of increasing NO_2 concentrations and the increased traffic flows, Moray Council will undertake additional monitoring of NO_2 in Elgin and fully consider the air quality impacts of any new developments or traffic management proposals for the area.

It is concluded that Moray Council do not need to proceed to a detailed assessment for any pollutant.

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1 Introduction

1.1 Description of Local Authority area

The Moray Council area is located on the north-east coast of Scotland between Inverness and Aberdeen. The Council area is bordered to the south and east by the Aberdeenshire Council area and to the north and west by the Highland Council area. The northern border of the Moray Council area is the Moray Firth and the North Sea coast. A map of the Moray Council area is presented in Figure 1 in Appendix A.

The Spey valley divides the Council area in a south-west to north east direction. The southern half of the Council area is dominated by the glens of the Grampian mountain range and includes large areas of forest and moorland. The northern part of the Council area is relatively flat with large expanses of agricultural and coastal grassland.

As is the case for the majority of the UK there is a dominance of south-westerly winds, although there is a significant proportion of easterly winds and south-easterly winds indicating the influence of weather systems in the North Sea and Moray Firth. The mean temperature is approximately 8°C in the lowland areas but below 5°C in the upland areas to the south. The area has low to medium rainfall and hours of sunshine compared to the rest of the UK, however, there is a greater than average number of days when snow is on the ground (> 60 in upland areas and between 5 and 20 in coastal areas).

The population of the Moray Council area is approximately 88,000 with the majority residing in the towns of Elgin, Forres, Fochabers, Keith, Buckie, Aberlour, and Lossiemouth. A large proportion of the Moray population are still involved in the traditional industries of farming, forestry and fishing. The industrial and commercial areas are primarily located in the north of the Council area in Elgin, Keith, Fochabers, Buckie and Lossiemouth. Notable companies operating in the area are Walkers and Baxters both of which produce and package foodstuffs and the textile company Johnstons. The other notable operations in the area are the two RAF bases at Lossiemouth and Kinloss and the numerous distilleries operating in Rothes, Dufftown, Keith and the surrounding upland areas.

The transport network within Moray comprises a mainline passenger rail route passing east-west through the north of the Council area and the A96 trunk road linking Aberdeen, Elgin and Inverness. There are also several small harbours and ports located along the Moray Council coast which are used by small fishing boats and leisure craft.

1.2 Purpose of report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

1.3 Air quality objectives

The air quality objectives applicable to LAQM in Scotland are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97), the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre μg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in Scotland.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene			
	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	3.25 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide (CO)	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide (NO_2)	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
	50 $\mu g/m^3$, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 $\mu g/m^3$	Annual mean	31.12.2010
Sulphur dioxide (SO_2)	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of previous review and assessments

The Moray Council have undertaken regular reviews of air quality; the submitted reports are listed in Table 1.1.

Table 1.1 Details of local air quality reviews submitted by the Moray Council

Date submitted	Report	Conclusions
May 2003	Updating and Screening Assessment[1]	Additional information on domestic fuel burning and quarry emissions required. DMRB screening tool identified requirement for assessment of PM_{10} at 3 busy junctions
January 2004	Updating and Screening Assessment Supplementary Report[2]	No further assessment of domestic fuel burning or quarries required Relevant public exposure at 2 busy junctions only.
November 2004	Air Quality Study in the vicinity of RAF Kinloss and Lossiemouth[3]	No identified exceedences of NAQS
May 2005	Progress Report[4]	No predicted exceedences of NAQS
August 2005	Detailed Assessment of Road Traffic Particulate Emissions[5]	Assessment of short-term monitoring data and modelled road traffic emissions indicated it was unlikely there would be an exceedence of PM_{10} objectives
June 2006	Updating and Screening Assessment[6]	No predicted exceedences of NAQS
May 2007	Progress Report[7]	No predicted exceedences of NAQS
April 2008	Progress Report[8]	No predicted exceedences of NAQS

The Detailed Assessment of particulate emissions from road traffic was carried out due to the identification of the potential for exceedence of the 2010 annual mean objective at two adjacent busy road junctions in Elgin. The monitoring and detailed modelling undertaken indicated that it was unlikely that the objective would be exceeded.

The air quality study in the vicinity of RAF Kinloss and RAF Lossiemouth was carried out due to concerns raised by local residents with regards to aircraft operations and air quality. Monitoring carried out over a 6 month period indicated that it was unlikely that any air quality standards would be exceeded.

No AQMAs have been declared within the Moray Council area and previous review and assessments have concluded that there is no potential for exceedence of the NAQS objectives for CO, benzene, 1,3-butadiene, lead, NO_2, SO_2 or PM_{10} within Moray Council area.

[1] Moray Council LAQM Updating and Screening Assessment 2003, BMT Cordah Ltd Report Ref: MOR_005, May 2003
[2] Supplementary Report to the Updating and Screening Assessment, BMT Cordah Ltd Report Ref: MOR_008, January 2004
[3] Air Quality study in the vicinity of RAF Lossiemouth and RAF Kinloss, BMT Cordah Ltd Report Ref: MOR_007, November 2004
[4] Moray Council LAQM Progress Report 2005, BMT Cordah Ltd Report Ref: E_MOR_010, May 2005
[5] Detailed Assessment of Road Traffic Particulate Emissions, BMT Cordah Ltd Report Ref: MOR_009, August 2005
[6] Moray Council LAQM Updating and Screening Assessment 2006, BMT Cordah Report Ref: E_MOR_011, April 2006
[7] Moray Council LAQM Progress Report 2007, BMT Cordah Report Ref: E_MOR_012, April 2007
[8] Moray Council LAQM Progress Report 2008, BMT Cordah Report Ref: G_MOR_013, May 2008

2 New monitoring data

2.1 Summary of monitoring undertaken

During 2008 Moray Council monitored NO_2 at several locations throughout the council area using passive sampling methods. No other pollutant monitoring was undertaken by the Council.

Recorded NO_2 concnetrations have been ratified for erroneous results with all spurious readings removed. Finally results have been corrected using where the laboratory bias correction factors. Details of the quality control and data correction processes carried out are reported in Sections 2.1.3.

Comparison of measured NO_2 concentrations with relevant air quality standards are discussed in Sections 2.2.1.

2.1.1 Automatic monitoring sites

Moray Council do not currently operate any automatic monitoring sites

2.1.2 Non-automatic monitoring

Moray Council monitor NO_2 using a network of thirteen passive diffusion tubes located within five major towns in the council area. The monitoring sites represent public exposure and areas of high pollution concentrations at a variety of kerbside, roadside and urban background locations. Maps detailing the locations of the non-automatic monitoring sites are presented in Figures 2 and 3 in Appendix A.

The NO_2 concentrations recorded within Moray Council area since the last round of review and assessment are presented in Table 2.1.

Table 2.1 Details of non- automatic monitoring sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location ?
Elgin 1	Kerbside	NJ212626	NO_2	N	Y(< 5m)	1m	Y
Elgin 2	Kerbside	NJ224627	NO_2	N	Y (< 2m)	1m	Y
Elgin 3	Roadside	NJ223627	NO_2	N	Y (< 5m)	2m	Y
Elgin 4	Urban Background	NJ223626	NO_2	N	Y (< 5m)	5m	N
Elgin 5	Kerbside	NJ223618	NO_2	N	Y (< 5m)	1m	Y
Elgin 6	Kerbside	NJ221628	NO_2	N	Y (< 5m)	1m	Y
Fochabers 1	Kerbside	NJ345588	NO_2	N	Y (< 2m)	2m	Y
Fochabers 2	Urban Background	NJ343587	NO_2	N	Y (< 2m)	5m	N
Forres	Roadside	NJ034587	NO_2	N	Y (< 5m)	2m	Y
Keith 1	Kerbside	NJ433507	NO_2	N	Y (< 5m)	2m	Y
Keith 2	Kerbside	NJ432507	NO_2	N	Y (< 5m)	2m	Y
Lossie 1	Urban Background	NJ224702	NO_2	N	Y (< 2m)	5m	N
Lossie 2	Kerbside	NJ235709	NO_2	N	Y (< 2m)	1m	Y

2.2 Comparison of monitoring results with air quality objectives

The concentrations of NO_2 measured in the Moray Council area during 2008 and the trends in NO_2 concentrations are presented in Section 2.2.1.

2.2.1 Nitrogen dioxide

Moray Council maintain a network of thirteen NO_2 diffusion tube monitoring sites, it does not undertake any automatic monitoring for NO_2 or any co-location studies. The QA/QC procedures followed by the Council and the laboratory and details of the bias correction factors used are presented in Appendix B.

Diffusion tube monitoring data

The 2008 annual mean NO_2 concentrations measured within Moray Council area are presented in Table 2.3a.

Table 2.3a Results of nitrogen dioxide diffusion tubes

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations	
				2008 (µg/m^3) Raw data	2008 (µg/m^3) Adjusted for bias
Elgin 1	Lamp Post West Park Court	N	92	**41**	36
Elgin 2	Jctn East & Maisondieu Rd	N	100	31	27
Elgin 3	99-101 Maisondieu Road	N	100	18	16
Elgin 4	26-28 Priory Place	N	83	11*	10*
Elgin 5	Main street New Elgin	N	100	22	20
Elgin 6	Queen Street Roundabout	N	100	23	18
Fochabers 1	50A High Street	N	100	39	34
Fochabers 2	Sunndach George Street	N	100	7	6
Forres	Tolbooth, High Street	N	100	20	17
Keith 1	106 Moss Street	N	92	32	28
Keith 2	87 Moss Street	N	92	31	27
Lossie 1	1 Merrayton Court	N	83	7*	6*
Lossie 2	27 James Street	N	100	7	6

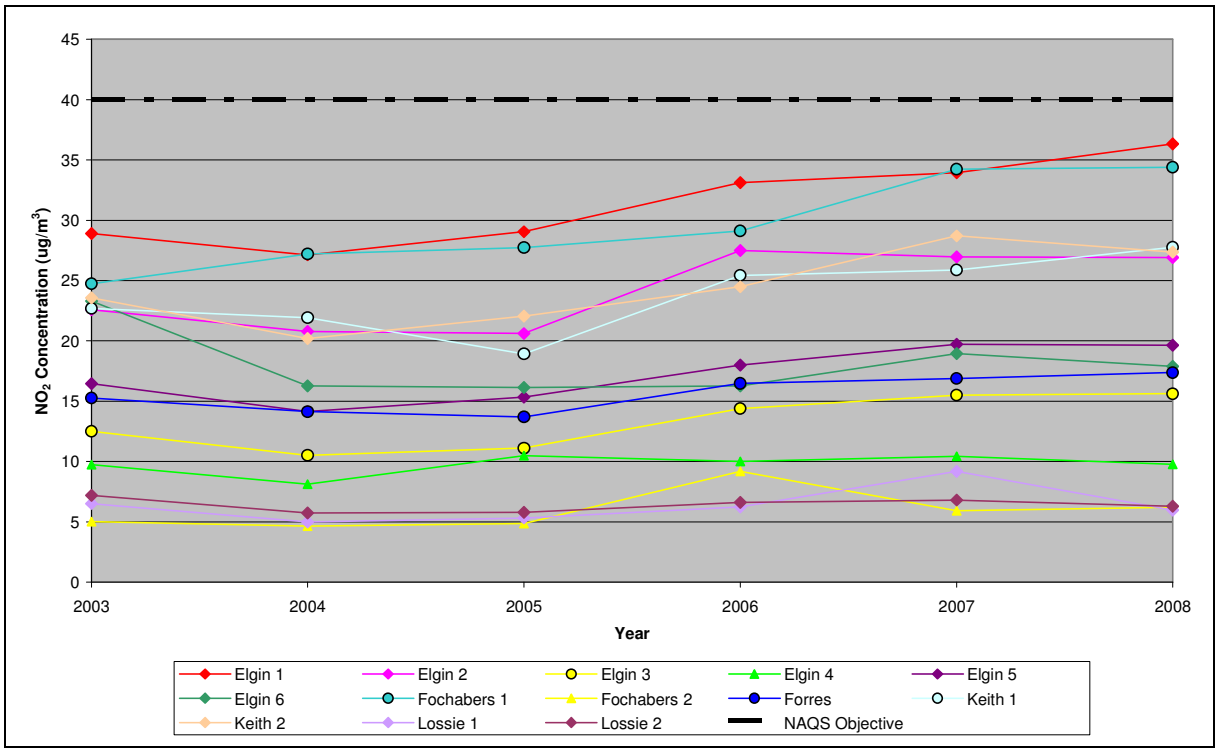
* Less than 90% data capture

The results presented in Table 2.3a indicate that except for the monitoring sites Elgin 4 and Lossie1, all sites recorded a greater than 90% data capture rate during 2008. No exceedences of the 2005 annual mean NAQS objective for NO_2 were recorded during 2008.

The highest concentrations recorded in Moray Council area since the last U&SA were at West Park Court at the western end of the High Street in Elgin and at the High Street in Fochabers. These are both kerbside locations on the busy A96(T). It is expected that the high levels of NO_2 at the High Street in Fochabers will reduce following completion of the A96(T) by-pass.

A graph showing NO_2 concentrations measured within the Moray Council area since 2003 are presented in Chart 1.

Chart 1: Annual mean NO_2 concentrations in Moray Council area



Typically, measured NO_2 concentrations within the Moray Council area have not followed national trends set out in the technical guidance, which implies a decrease in NO_2 concentrations. Since 2003, measured NO_2 concentrations have increased by approximately 12%, with one site, Fochabers 1, increasing by 39%.

The results indicate that eight of the thirteen sites show a significant positive (> 0.7) correlation between year and annual mean NO_2 concentrations since 2003.This indicates that there has been a definite increase in NO_2 concentrations at monitoring sites within the Moray Council area over the past six years.

Due to the location of the diffusion tubes sites, which are predominantly at kerbside or roadside sites the increase in NO_2 concentrations is likely to be due to increases in road traffic emissions.

The NO_2 concentration measured in 2008 at West Park Court in Elgin is within 10% of the 2005 annual mean NAQS objective for NO_2. In consideration of the regional trend of increasing NO_2 concentrations it is identified that attention needs to be drawn to reducing and managing emissions of NO_2 within Elgin to reduce the potential for exceedence of the objective. It is therefore considered necessary that the air quality impacts of any new industrial, commercial or biomass developments or any traffic management schemes proposed for Elgin are fully considered before implementation. The Moray Council also intends to undertake additional monitoring of NO_2 at areas of relevant exposure along busy roads in Elgin.

2.2.2 Other pollutants

The Moray Council does not currently monitor any other pollutants at any location.

2.3 Background pollutant concentrations

The UK air quality archive provides a national database of background concentrations for pollutants listed in the National Air Quality Strategy. In 2008, the national predictions of background concentrations were updated using the 2006 national atmospheric emissions inventory data. The predicted changes to the national background concentrations are presented below.

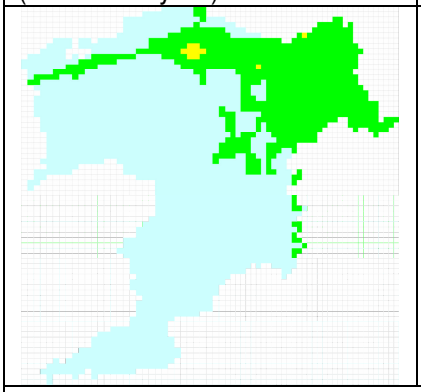
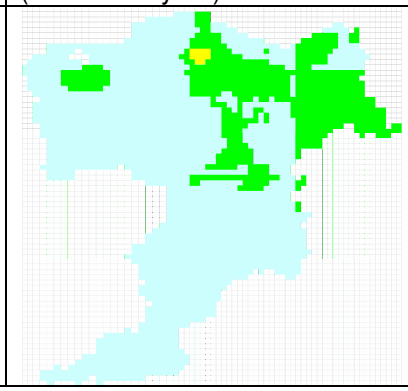
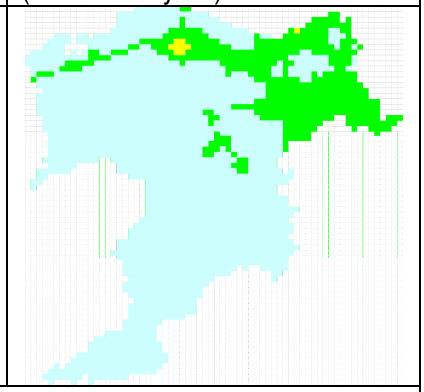
2.3.1 Nitrogen dioxide

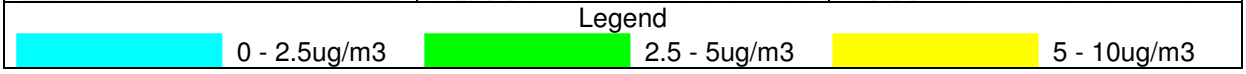
The background NO_2 concentrations for the Moray Council area are presented in Tables 2.4a and 2.4b.

Table 2.4a Predicted annual mean background concentrations of NO_2 ($\mu g/m^3$)

Predicted concentration	Maximum	Mean	Minimum
2008 Annual mean concentration (2006 base year)	8.5	2.2	1.3
2010 Annual mean concentration (2004 base year)	7.8	2.1	1.2
2010 Annual mean concentration (2006 base year)	6.3	1.3	0.9
Change in predicted background concentrations (%)	-19	-38	-25

Table 2.4b Predicted annual mean background concentration maps of NO_2 ($\mu g/m^3$)

2008 annual mean NO_2 concentration (2006 base year)	2010 annual mean NO_2 concentration (2004 base year)	2010 annual mean NO_2 concentration (2006 base year)
		



The maps of estimated NO_2 background concentrations indicate that the highest background concentrations are experienced in the northern coastal areas of Moray and along the A96 trunk road where there is a greater population density. The highest estimated background NO_2 concentrations are predicted in Elgin.

The maximum 2008 background concentrations of NO_2 are significantly below the annual mean NAQS objective for NO_2 of 40$\mu g/m^3$, accounting for less than 20% of the objective.

The change in the emissions base from 2004 to 2006 has resulted in a decrease in the estimated background concentrations of NO_2. The change is most significant in the central areas of the Moray Council area.

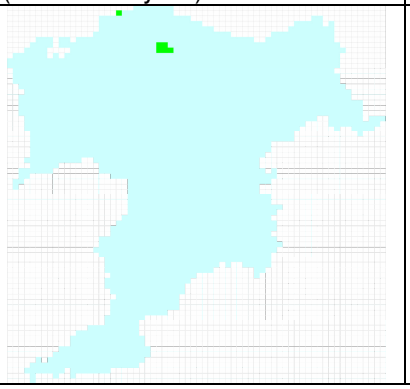
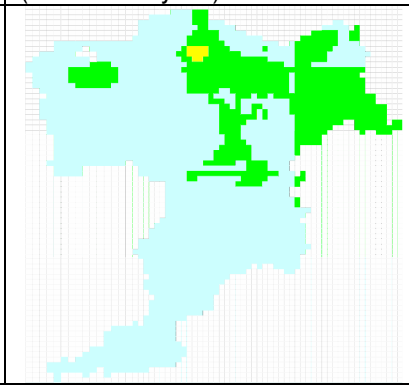
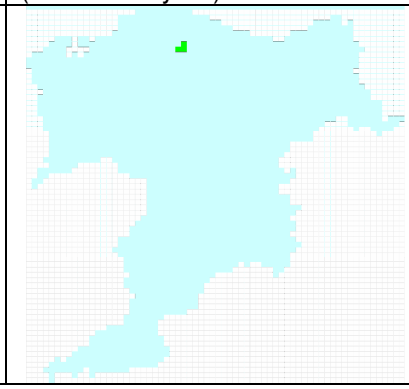
2.3.2 PM_{10}

The background PM_{10} concentrations for the Moray Council area are presented in Table 2.5a and 2.5b.

Table 2.5a Predicted annual mean background concentrations of PM_{10} ($\mu g/m^3$)

Predicted concentration	Maximum	Mean	Minimum
2008 Annual mean concentration (2006 base year)	9.6	7.6	7.0
2010 Annual mean concentration (2004 base year)	12.7	8.9	8.1
2010 Annual mean concentration (2006 base year)	9.4	7.5	6.9
Change in predicted 2010 background concentrations (%)	-26	-16	-15

Table 2.5b Predicted annual mean background concentration maps of PM_{10} ($\mu g/m^3$)

2008 annual mean PM_{10} concentration (2006 base year)	2010 annual mean PM_{10} concentration (2004 base year)	2010 annual mean PM_{10} concentration (2006 base year)
		
Legend 0 - 9ug/m3	9 - 11ug/m3	11 - 13ug/m3

The maps of estimated PM_{10} background concentrations indicate that the highest background concentrations are experienced in the northern coastal areas of Moray where there is a greater population density. The highest estimated background PM_{10} concentrations are predicted in Elgin.

The maximum 2008 background concentrations of PM_{10} are significantly below the annual mean NAQS objective for PM_{10} of $40\mu g/m^3$, accounting for less than 24% of the 2004 objective.

The 2010 annual mean NAQS objective of $18\mu g/m^3$, however; is significantly lower than the 2004 objective. The maximum 2010 background concentration of PM_{10} within the Moray Council area is $9.4\mu g/m^3$ which accounts for less than 55% of the 2010 objective

The change in the emissions base from 2004 to 2006 has resulted in a decrease in the estimated background concentrations of PM_{10}. The change is most significant in the north central and eastern areas of Moray Council area.

3 Road traffic sources

Updated traffic count data for 2008 was obtained from Transport Scotland and Moray Council Roads Department. The data was reviewed to identify any roads with significant increases or new sections of road that have not previously been assessed that fit the screening criteria.

3.1 Narrow congested streets with residential properties close to the kerb

Moray Council have previously identified sections of the A96(T) in Fochabers as having restricted width and residential properties close to the kerb. DMRB assessments and NO_2 diffusion monitoring in Fochabers have indicated that these locations are not likely to result in an exceedence of NAQS objectives.

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

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

No busy streets have previously been identified where people may spend 1-hour or more close to traffic. The majority of towns within Moray Council are small and it is unlikely that people would spend long periods of time within 5m of the road traffic. A large part of the main shopping area in Elgin is pedestrianised and all shopping areas are located away from the busy A96(T).

Moray Council has assessed new/newly identified busy streets where people may spend 1 hour or more close to traffic, that were not assessed in previous rounds of Review and Assessment, and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.3 Roads with a high flow of buses and/or HGVs.

No roads have previously been identified as having high flows of Buses and/or HGVs. The 2008 traffic data for the area was assessed and it was concluded that there are no roads where the combined traffic flow of HGVs and buses accounts for more than 20% of the total traffic flow. It is therefore concluded that there is no requirement to proceed to a detailed Assessment.

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

3.4 Junctions and busy roads

Moray Council has previously identified two busy junctions that required further assessment. A Detailed Assessment was carried out in 2005 which confirmed that it was unlikely that the NAQS objectives would be exceeded due to the emissions from road traffic.

Several locations along the A96(T) in Elgin, Keith, Mosstodloch, Forres and Fochabers were identified in previous assessments as having traffic flows greater than 10,000 AADT. The DMRB screening assessments undertaken indicated that there was unlikely to be an exceedence of NAQS objectives at these locations.

Moray Council Roads department has identified five roads in Elgin where the road traffic flow is greater than 10,000 AADT which have not previously been assessed (Hay St, Main St, Newmill Rd, North St and the A941 at the railway bridge). A DMRB screening assessment was undertaken for each road, results for which are presented in Appendix C. The DMRB screening assessments indicate that road traffic emissions are unlikely to result in exceedences of NAQS objectives at locations 2m or further from the roads.

Moray Council confirms that there are no new/newly identified busy junctions/busy road has assessed new/newly identified junctions meeting the criteria in Section A.4 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.5 New roads constructed or proposed since the last round of review & assessment

The Fochabers / Mosstodloch by-pass has been in the planning process for the past 10 years and the final scheme was granted planning permission following a public inquiry and pending updated environmental mitigation plans. Construction of the road was due to commence in 2008 and would comprise:

- 5.1km of new trunk road;
- 2.8km of side roads;
- 2 bridges; and
- 4 pedestrian/cycle underpasses.

Completion of the by-passes is due by 2010 and is expected to result in reduced congestion, improved air quality, noise and general environment along the main streets in Fochabers and Mosstodloch. These are locations identified in previous assessments as being narrow and congested streets with properties close to the kerbside. The environmental assessments conducted as part of the planning application and public inquiry submissions, monitoring data and DMRB screening assessments have indicated that NAQS objectives are unlikely to be exceeded at any nearby receptors.

Moray Council has assessed new/newly identified junctions meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with significantly changed traffic flows

No new areas of relevant exposure have been identified with respect to road traffic emissions. A review of road traffic data for the period 2006 to 2008 indicated that the greatest percentage increase in road traffic flow was 4.9% on the A96 at Forres, and the greatest decrease was -4.8% on the A95 at Ballindalloch.

The review of updated road traffic data indicates that there have been no roads with significantly changed traffic flows greater than 10,000 AADT.

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

3.7 Bus and coach stations

There is one bus station within the Moray Council area located in Elgin. There is relevant exposure within 10m of the bus station; however information gathered on bus movements in previous years indicated that there were less than 1000 bus movements per day.

There has been no significant change in bus operations since the last round of review and assessment. It is therefore concluded that there is no need to proceed to a Detailed Assessment.

Moray Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other transport sources

4.1 Airports

There are two RAF airbases located within the Moray Council area. The nearest commercial airport, Inverness Airport, which is located 18km to the east of the Moray Council area within the Highland Council area.

Inverness airport is further than 1km from any relevant public exposure within Moray Council area and therefore requires no further assessment.

There are areas of relevant public exposure surrounding the two RAF bases. A study of particulate, NO_2 and VOC concentrations in the vicinity of RAF Lossiemouth and RAF Kinloss located in Moray Council area was completed in 2004. Monthly monitoring of NO_2 concentrations was undertaken at six sites around the two air bases between November 2003 and April 2004. The highest measured NO_2 concentrations were found at roadside locations in Lossiemouth and Kinloss. Measured NO_2 concentrations were below the 2005 annual mean NAQS objective for NO_2.

Moray Council confirms that there are no airports in the Local Authority area requiring further assessment.

4.2 Railways (diesel and steam trains)

Moray Council has previously assessed emissions from diesel and steam locomotives. Two operational rail lines were identified:

1. the mainline linking Aberdeen to Inverness passes east to west through the council area with stations at Keith, Elgin and Forres; and
2. a part time passenger route operating between Keith and Dufftown via Drummuir. The line is a heritage railway operated by Keith and Dufftown Railway which reopened in 2001 and operates diesel locomotives.

4.2.1 Stationary trains

There are three mainline stations and three stations on the Keith and Dufftown heritage railway. No other goods loops or depots were identified.

It was confirmed by ScotRail in the 2003 U&SA that the trains using the main line were predominantly diesel but that there were no locations where trains would regularly be stationary for periods of more than 15-minutes.

A maximum of six journeys a day are scheduled on the heritage railway between Friday and Sunday during the summer months. There are no properties within 15m of the stations or depots used along the route and it is unlikely that visitors to the Keith and Dufftown Railway will be exposed to locomotive emissions for periods of greater than 15-minutes.

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

4.2.2 Moving trains

The railway lines experiencing a high number of diesel locomotive movements were identified in the Technical Guidance TG(09). None of the lines identified pass through or close to the Moray Council area.

The background concentration of NO_2 across the Moray Council area is below 25µg/m^3 and therefore no further assessment of NO_2 emissions from moving trains is required.

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

4.3 Ports (shipping)

Moray Council has previously reviewed emissions from shipping and has a responsibility for six harbours within the Council area: Buckie, Burghead, Cullen, Findochty, Hopeman and Portknockie. Lossiemouth also has an operational harbour and there is a small harbour, pier and ship building yard at Findhorn.

Technical guidance states that where shipping movements exceed 5,000 per year and there is relevant exposure within 250m of the berths and main areas of manoeuvring or shipping movements exceed 15,000 per year and there is relevant exposure within 1km of the berths and main areas of manoeuvring then there is the potential for an exceedence of the 15-minute SO_2 NAQS objective. The review of shipping movements should be confined to large ships such as cross-channel ferries and container ships.

There are residential areas within 250m of each of the harbours in Moray indicating that there is relevant exposure.
The types of shipping vessels used in each harbour are identified in Table 4.1.

Table 4.1 Shipping activity in Moray Council area

Harbour	Ship types
Buckie Harbour	small fishing and commercial vessels
Burghead	small fishing and commercial vessels
Cullen Harbour	recreational vessels
Findhorn Harbour	recreational vessels
Findochty Harbour	small fishing and recreational vessels
Hopeman Harbour	recreational vessels
Lossiemouth Harbour	small fishing and commercial vessels
Portknockie Harbour	small fishing and recreational vessels

The harbours and ports in Moray Council area are small and have no significant shipping movements. The review of shipping should be confined to cross-channel ferries, Ro-Ro, container ships and cruise liners therefore no further assessment of emissions from shipping is required.

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

5 Industrial sources

5.1 Industrial installations

The Scottish Environment Protection Agency (SEPA) were contacted to determine if there had been any new or significantly changed industrial processes in the area.

The register of Pollution Prevention and Control (PPC) processes includes six Part A PPC processes and forty one Part B processes that are operated in Moray Council area. The regulated processes comprise:

- 1 animal carcass incineration and knackering process;
- 9 cement, quarrying, crushing and screening processes;
- 1 coating activities facility;
- 1 crematorium;
- 4 dry cleaners;
- 1 horse and pet crematorium;
- 2 intensive farming (poultry) operations;
- 1 landfill;
- 14 petrol vapour recovery facilities;
- 1 roadstone coating process;
- 1 surface treatment of metals operation;
- 3 timber processing facilities;
- 2 vegetable matter processing facilities; and
- 2 vehicle re-spraying facilities;

5.1.1 New or proposed Installations for which an air quality assessment has been carried out

There are no new or proposed Part A processes since the last round of Review and Assessment. There are two new Part B processes which have submitted applications to operate but are currently awaiting authorisation permits from SEPA. The two processes are:

1. A road-stone coating plant at Netherglen Quarry, Ennstone Thistle Ltd; and
2. A horse and pet crematorium at Douglasbrae, Keith operated by Isla equine and pet crematorium.

Discussions with SEPA have indicated that the road stone coating plant will emit NO_2, SO_2, CO and PM_{10} via a 27m stack. Emission limits for the plant have been determined for PM_{10}, CO and NO_X have been taken from the *Secretary of States Process Guidance Note PG 3/15a (04) Roadstone Coating Processes*. The emissions of SO_2 will be controlled through the *Sulphur Content of Liquid Fuels (Scotland) Regulations 2007.* The nearest residential properties are approximately 500m to the south and 500m to the west of the site. SEPA confirmed it was unlikely that the emissions from the site will result in an exceedence of NAQS objectives at locations of relevant public exposure.

The nearest properties to the proposed pet crematorium at Douglasbrae are approximately 400m to the north and 500m to the south-east. Full details of the predicted emissions were not available for review. It is expected that the facility will increase emissions of combustion gases and PM_{10} from the site. SEPA confirmed it was unlikely that the process will result in the exceedence of NAQS objectives at locations of relevant public exposure.

Moray Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.2 Existing installations where emissions have increased substantially or new relevant exposure has been introduced

The Combination of Rothes Distillers has been granted planning permission to install and operate a CHP plant at its site in Rothes. The installation will result in an increase in emissions from the site. The air quality impact submitted with the planning application included an atmospheric dispersion modelling assessment which included background sources. The assessment which included NO_2 and PM_{10} concentrations concluded that emissions from the development, in combination with other local sources, were unlikely to result in an exceedence of the NAQS objectives.

Moray Council has assessed industrial installations with substantially increased emissions, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.3 New or significantly changed installations with no previous air quality assessment

Due to the re-organisation of the regulatory framework, dry cleaners are now required to have a PPC part B permit. The four dry cleaners located in Moray Council area are not new installations but are now listed as regulated processes. No previous air quality assessments exist for the facilities. The dry cleaning processes are required to provide an inventory of chemicals stored and calculate the fugitive emissions based upon the weight of chemical input into the process, the weight of fabric cleaned and the weight of waste chemical send for disposal. There is a variety of chemicals used in the process but none are included within the NAQS. It is therefore, unlikely that these types of operations will result in an exceedence of NAQS objectives.

Moray Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.2 Major fuel (petrol) storage depots

Major fuel depots were reviewed in the 2003 and 2006 U&SAs. It was identified that there were no major fuel depots for petrol located within Moray. The updated list of major fuel depots was requested from the LA Support desk. The closest major fuel depot is located in Inverness approximately 20km from the Moray Council area. It is confirmed that there are no Major petrol storage depots within the Council area

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

5.3 Petrol stations

Moray Council has previously assessed all petrol stations in the area. There have been no new petrol stations which have commenced operation since the last review and assessment. There are no roads within Moray Council area where the road traffic flow is greater than 30,000 AADT. It is therefore

unlikely that any petrol station located within Moray Council area will have the potential to exceed the 2010 annual mean NAQS objective for benzene.

Moray Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry farms

In 2007, Moray Council identified two intensive farming (poultry) operations that are regulated under a PPC Part A regulations. The operators were contacted to determine the locations of the poultry units relative to the nearest receptors. One farm reported that it houses less than 100,000 birds and information on the other farm was unavailable.

Moray Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and domestic sources

A review of small boiler and biomass plants operated within the Moray Council area was undertaken. Information on biomass boilers was sought from NHS Grampian, Moray Council planning department and the Scottish Biomass Support Scheme.

6.1 Biomass combustion – individual installations

NHS Grampian confirmed that it does not operate any oil, gas or coal fired boiler systems with a capacity greater than 5MW (thermal). It also confirmed that it does not currently operate any biomass boilers.

Moray Council confirmed that they do not operate any oil, gas or coal fired boiler systems with a capacity greater than 5MW (thermal). It also confirmed that it does not currently operate any biomass boilers.

A review of planning applications indicated that planning permission has been granted for a CHP plant using a combined fuel source of raw timber and waste products from the whisky distilling process. The air quality impact assessment submitted with the planning application included an atmospheric dispersion modelling assessment which included background sources. The assessment which included NO_2 and PM_{10} concentrations concluded that emissions from the development, in combination with other local sources, were unlikely to result in an exceedence of the NAQS objectives.

Two biomass schemes were identified as receiving biomass support grants from the Scottish Government. A further two applications for biomass boilers at residential / farm locations were identified from the planning register. The biomass plants identified are:

- Blairs Farm, Altyre Estate, Forres;
- Marcassie Farm Project, Rafford;
- Morriston House, Knock, Huntly; and
- Easterton Farm, Birnie, Elgin.

No information on boiler size, type, stack height, or emissions were available for the four farm / residential biomass plants identified. The applications were for biomass boilers serving individual properties in remote locations it is therefore unlikely that the biomass plants will have significant emissions.

Moray Council has assessed the small boiler and biomass combustion plants in the area, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass combustion – combined impacts

The proposed biomass plant in Rothes is not in a location identified as having a high density of solid fuel burning. The village does have some solid fuel burning for domestic heating however as there is mains gas in the village solid fuel is mainly used as a secondary heating source. Four other industrial emitters (distillers) operate in the village, however, the air quality assessment undertaken as part of the planning application for the site accounted for background concentrations in the village. The air quality assessment indicated it was unlikely that there would be any exceedence of the NAQS objectives due to emissions from the CHP plant in combination with other local sources.

The remaining four biomass boilers located within the Moray Council area are in locations of low housing and commercial property density, where there are less than five properties within a 1km^2

area. Using the method outlined in the technical guidance the total annual PM_{10} emissions for any $500m^2$ including the biomass boiler locations will be less than 25kg (if classed as domestic) or less than 2300kg (if classed as commercial). The background concentration of PM_{10} is below $12ug/m^3$ and therefore the emissions from each $500m^2$ are significantly below the threshold for a Detailed Assessment.

Moray Council has assessed the small boiler and biomass combustion plants in the area, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic solid-fuel burning

Moray Council have previously assessed areas of domestic solid fuel burning. Previous assessments identified six towns and villages (Burghead, Duffus, Findhorn, Garmouth, Hopeman and Tomintoul) as having no-mains gas supply and more than 100 properties in a $500m^2$ area.

Further investigation of fuel use in these locations using census data, council house surveys, correspondence with coal merchants and local knowledge has indicated that the primary heating fuel being a mixture of LPG, electricity and solid fuels. It was therefore concluded that it was unlikely that emissions from domestic fuel burning would result in an exceedence of national air quality standards.

There have been no significant changes to the fuel type used in domestic heating since the previous assessment was carried out and it is therefore concluded that there is no requirement to assess domestic fuel emissions further.

Moray Council has assessed areas of significant domestic solid fuel use, and concluded that it will not be necessary to proceed to a Detailed Assessment.

7 Fugitive or uncontrolled sources

Moray Council has previously assessed dust emitting processes. Previous assessments have considered emissions from four landfill sites, nine quarry sites, one waste transfer site and three mobile crushing operations. It was determined that dust emissions from theses processes and sites had not resulted in dust nuisance complaints and were unlikely to result in an exceedence of national air quality standards for PM_{10}.

There have been no new sources of fugitive and uncontrolled dust identified in the Moray Council area.

Moray Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area which require Detailed Assessment.

8 Conclusions and proposed actions

8.1 Conclusions from new monitoring data

The new monitoring data indicated that concentrations of NO_2 are below NAQS objectives. The monitoring sites represent areas of relevant exposure in urban areas at both background locations and close to busy roads.

In 2008, the measured concentrations of NO_2 at the western end of the High Street in Elgin were close to the annual mean NAQS objective.

There are no AQMAs in Moray Council area and no requirement for a Detailed Assessment was identified.

8.2 Conclusions from assessment of sources

The major developments and changes to emission sources identified in the area comprise:

- a CHP plant in Rothes;
- four biomass boilers at remote farm locations;
- a new distillery process at RoseIsle Maltings;
- a pet crematorium in Keith;
- a roadstone coating process at Netherglen Quarry; and
- five busy urban roads in Elgin that have traffic flows exceeding 10,000 AADT.

The review of sources of atmospheric pollution within Moray Council area did not identify any sources likely to result in an exceedence of NAQS objectives that required further assessment.

8.3 Proposed actions

The updating and Screening Assessment considered new monitoring data and a review of all emissions sources in the area. It is concluded that there is no requirement to proceed to a Detailed Assessment for any pollutant.

Due to industrial developments in Rothes, Moray Council will consider additional monitoring of NO_2 to confirm predictions of air quality assessments.

Due to the high levels of NO_2 measured at the west end of Elgin High Street, the increased levels of road traffic within the Elgin area and the regional trend of increasing NO_2 concentrations, Moray Council will undertake additional monitoring of NO_2 within Elgin.

The next air quality requirement by Moray Council is the submission of a Progress Report in April 2010.

Appendices

Appendix A: Figures

Appendix B: QA/QC Data

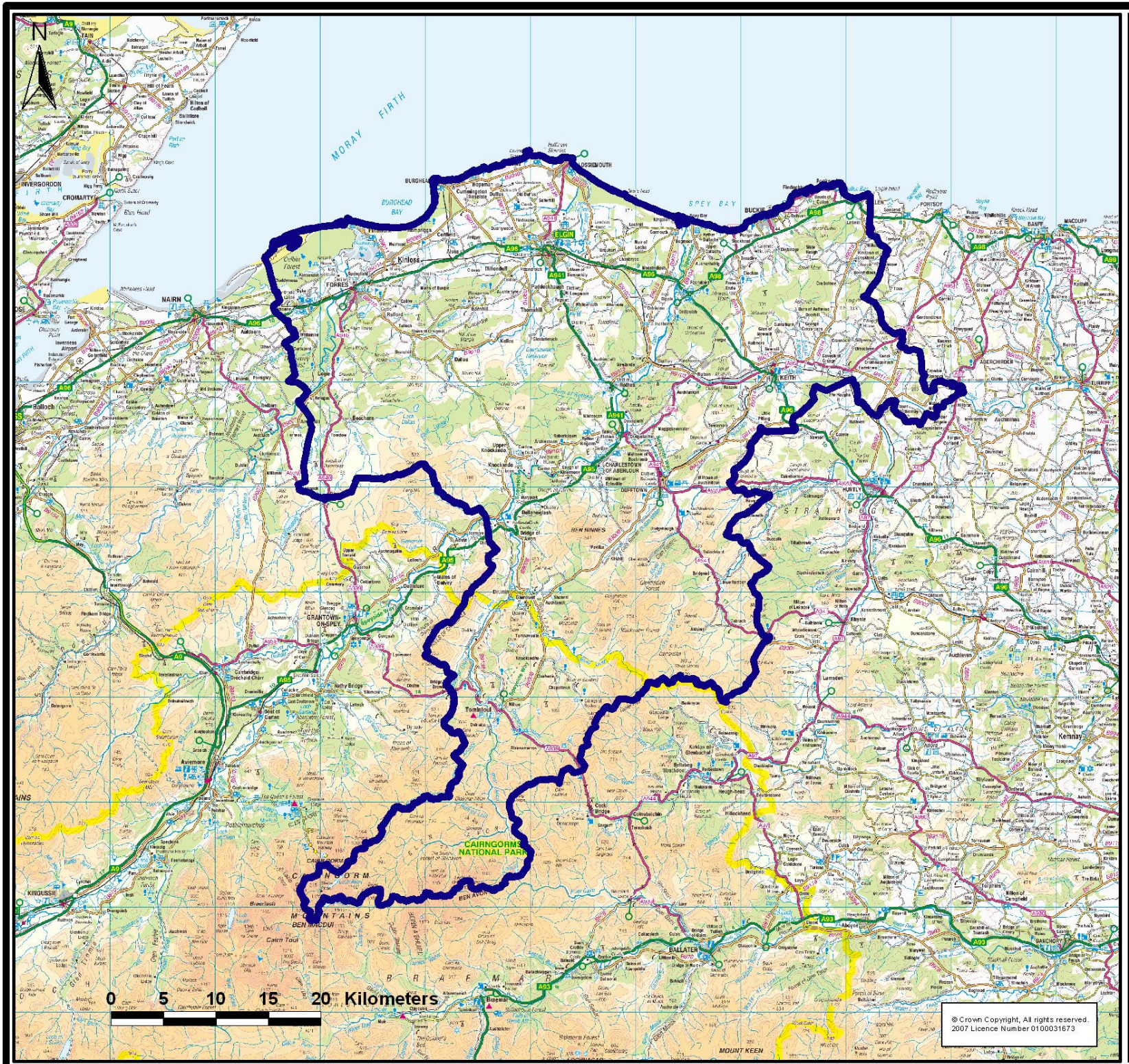
Appendix C: DMRB Calculations

Appendix A: Figures

Figure 1: Moray Council area

Figure 2: NO_2 monitoring sites in Elgin

Figure 3: NO_2 monitoring sites in Keith, Fochabers, Forres and Lossiemouth



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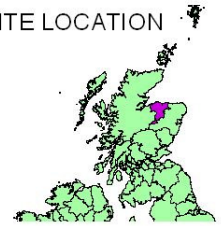

LEGEND

Moray Council boundary

NOTES

Project No. G_MOR_014	
Project title LAQM Updating and Screening Assessment	
Figure no. 1	
Figure title Moray Council area	
Scale 1:350,000	Projection GB NGR
Datum OS	Date 30/04/2009

Client

The Moray Council

BMT Cordah Limited
Unit 119 Pentagon Business Centre
36 Washington Road, Glasgow, G3 8AZ
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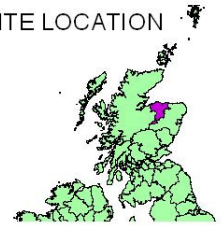
SITE LOCATION



LEGEND

▲ NO2 monitoring locations

NOTES

Project No. G_MOR_014	
Project title LAQM Updating and Screening Assessment	
Figure no. 2	
Figure title Location of NO2 monitoring sites in Elgin	
Scale 1:25,000	Projection GB NGR
Datum OS	Date 30/04/2009

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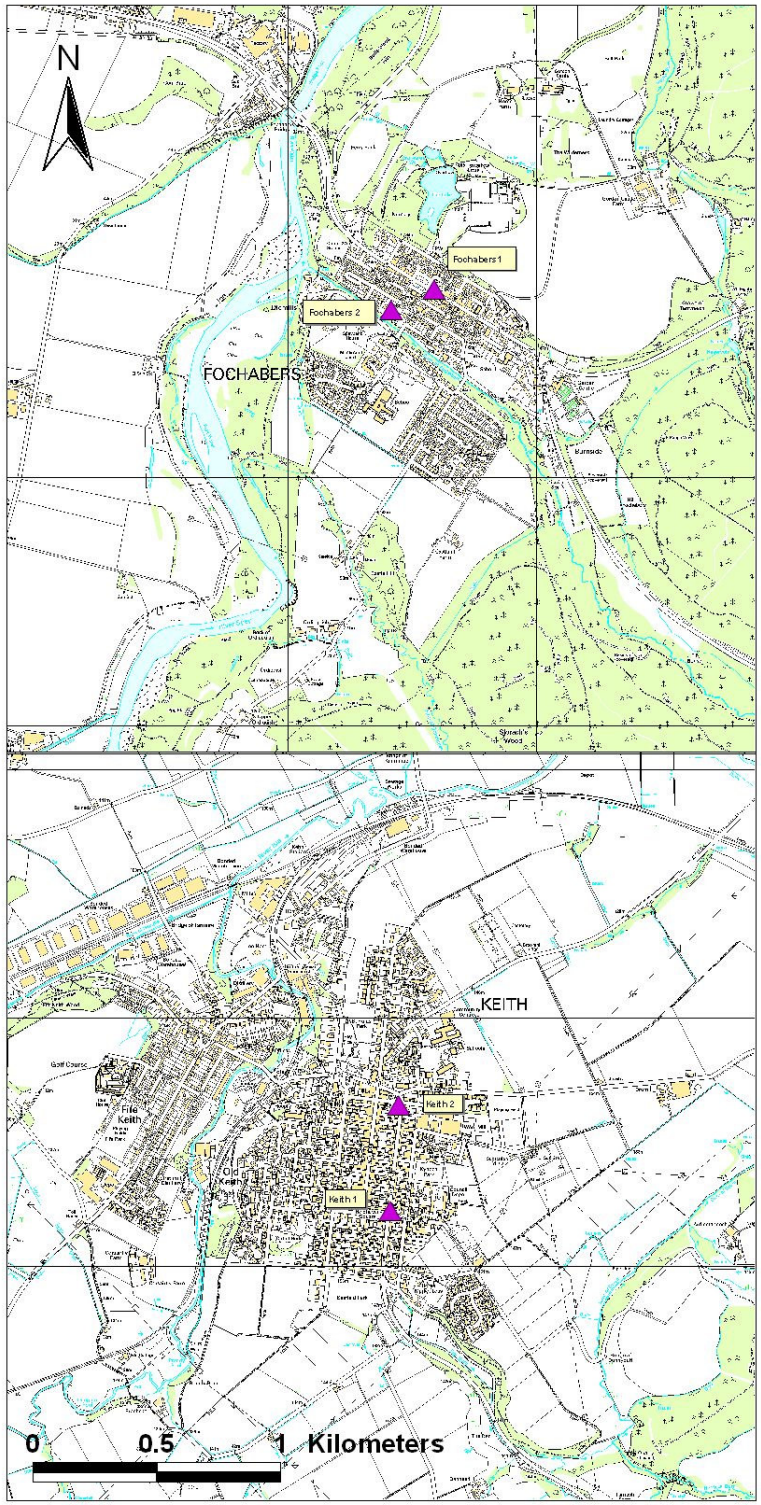

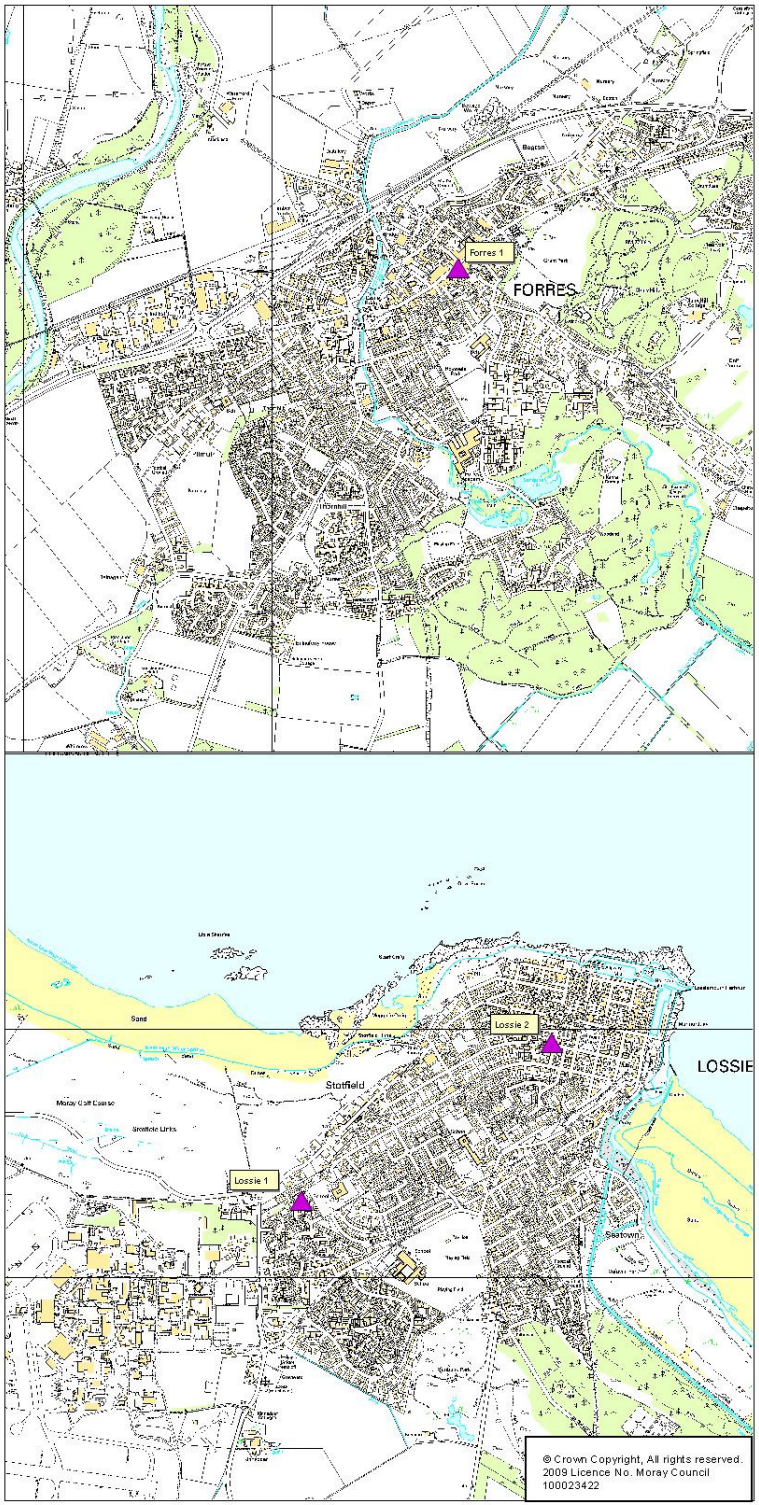

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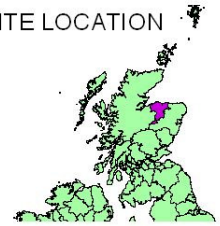

LEGEND

▲ NO2 monitoring locations

NOTES

Project No. G_MOR_014	
Project title LAQM Updating and Screening Assessment	
Figure no. 3	
Figure title Location of NO2 monitoring sites in Keith Fochabers, Forres and Lossiemouth	
Scale 1:10,000	Projection GB NGR
Datum OS	Date 30/04/2009

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Appendix B: QA:QC of monitoring data

Diffusion Tube Bias Adjustment Factors

The laboratory analysis of the passive diffusion tubes used by the Council is undertaken by Aberdeen City Council public analyst. Aberdeen City Council public analyst is a UKAS accredited laboratory with documented Quality Assurance/Quality Control (QA/QC) procedures for diffusion tube analysis. The laboratory prepares the diffusion tubes using the 20% triethanolamine (TEA) in water method.

Aberdeen City Council public analyst participates in the AEA inter-comparison scheme, with bias correction factors calculated and applied annually. The laboratory analyses results from co-location studies at various locations throughout Aberdeen City and Aberdeenshire.

The laboratory co-location factors are presented in Table B.1.

Table B.1 Details of the 2008 bias correction factors for NO_2 diffusion tubes

Site Name	Study duration	Tube precision	Bias correction factor
Overall factor from Aberdeen City Council public analyst co-location studies			0.88

Factor from Local Co-location Studies (if available)

Moray Council does not undertake any co-location studies and therefore uses the bias correction factor provided by Aberdeen City Council public analyst.

Discussion of Choice of Factor to Use

As Moray Council does not undertake its own co-location study the diffusion tube concentrations have been corrected using the laboratory bias. The 2008 laboratory bias correction factors provided by Aberdeen City Council public analyst are presented in Table 2.2.

Short-term to Long-term Data adjustment

Moray Council has not undertaken any short-term monitoring of pollutants which requires adjustment to calculate long-term mean concentrations.

QA/QC of diffusion tube monitoring

The laboratory results for co-location studies are presented in Table B.2.

Table B.2 Results of the AEA Technology Intercomparison Study

Method To undo your selection, choose (All) from the pop-up list	Year[5] To undo your selection, choose (All)	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m3)	Automatic Monitor Mean Conc. (Cm) (µg/m3)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
50% TEA in Acetone	2008	K	AEA Tech Intercomparison	10	135	118	14.3%	G	**0.88**

Appendix C: DMRB Calculations

Input Data

Pollutant	benzene	1,3-butadiene	CO	NO_X	NO_2	PM_{10}
Background concentration (ug/m^3)	0.16	0.03	80	10.8	9.0	9.6

Link number	Road name	Distance from link centre to receptor (m)	Traffic flow & speed		Traffic composition		
			AADT (combined, veh/day)	Annual average speed (km/h)	Road type (A,B,C,D)	Total % LDV (<3.5t GVW)	Total % HDV (>3.5t GVW)
1	A941, Hay St	2,5,10m	12487	48	A	93.5	6.5
2	A941, Main St	2,5,10m	11010	44	A	92.7	7.3
3	A941, North St	2,5,10m	16175	47	A	94.8	5.2
4	A941, Railway Bridge	2,5,10m	20972	44	A	93.5	6.5
5	Newmill Rd	2,5,10m	10731	48	B	92.5	7.5

Verification

Monitoring of pollutants is not available for locations along the assessed roads therefore no verification of the DMRB screening predictions has been undertaken.

Results

Road name	Receptor location (m)	CO *	Benzene	1,3-butadiene	NO_x	NO_2 *	PM_{10}	
		Annual mean mg/m^3	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Days >50$\mu g/m^3$
A941, Hay St	10m	0.14	0.22	0.10	29.79	14.65	11.56	0.00
	5m	0.15	0.23	0.11	31.84	15.17	11.77	0.00
	2m	0.15	0.23	0.11	31.84	15.17	11.77	0.00
A941, Main St	10m	0.14	0.22	0.10	28.65	14.36	11.47	0.00
	5m	0.14	0.23	0.11	30.58	14.85	11.67	0.00
	2m	0.14	0.23	0.11	30.58	14.85	11.67	0.00
A941, North St	10m	0.15	0.24	0.11	30.78	14.96	11.77	0.00
	5m	0.16	0.25	0.12	32.96	15.50	12.01	0.00
	2m	0.16	0.25	0.12	32.96	15.50	12.01	0.00
A941, Railway Bridge	10m	0.17	0.27	0.16	36.66	16.33	12.35	0.00
	5m	0.18	0.29	0.17	39.45	16.98	12.65	0.00
	2m	0.18	0.29	0.17	39.45	16.98	12.65	0.00
Newmill Rd	10m	0.13	0.21	0.10	28.14	14.23	11.35	0.00
	5m	0.14	0.22	0.10	30.01	14.71	11.54	0.00
	2m	0.14	0.22	0.10	30.01	14.71	11.54	0.00