The Highland Council
Local Air Quality Progress Report 2008

TEC Services
May, 2008

1 Executive Summary

Part IV of the Environment Act 1995 introduced Local Air Quality Management, whereby local authorities have a statutory duty to carry out reviews and assessments of local air quality from time to time. Local Air Quality Management has an important role in helping to deliver the air quality objectives which are set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (January 2000) and the Air Quality (Scotland) Regulations 2000 (as amended).

The Highland Council is required to undertake a review and assessment of local air quality by the end of April 2008. The purpose of this report is to update the findings of previous reports and to assess whether any of the Air Quality Objectives are at risk of being exceeded in Highland in the coming years up to 2010.

There are seven pollutants which each local authority must assess. The assessment is carried out having regard to the directions in the Local Air Quality Management Progress Report Guidance LAQM.PRG(03).

Where an updating and screening assessment identifies a risk that an air quality objective will be exceeded at a location with relevant exposure, the local authority will be required to undertake a Detailed Assessment following the directions in Local Air Quality Management Technical Guidance LAQM. TG(03). The aim of a Detailed Assessment is to identify with reasonable certainty whether or not an Air Quality Objective will be exceeded. If a risk of failure to achieve the Air Quality Objectives is identified in a local authority area the local authority must declare an Air Quality Management Area and produce an Action Plan for that area.

The main findings of this Review and Assessment are as follows:

- Monitoring results at the Telford Street AUN site for PM10 in 2006 were significantly higher than in previous years. Although data for 2007 shows a reduction in pollutant concentration form the previous year more detailed investigation of this site in the 2009 updating and screening assessment should determine whether there is a need for the Local Authority to proceed to detailed assessment for this site.
- Modelling undertaken by The Highland Council with respect to Ord Maltings, indicates that there is not a risk of failure to comply with the air quality objectives because of emissions from this source.
- Monitoring and Modelling work is being undertaken for the ALCAN Aluminium Works at Fort William although it is not expected at this stage that there will be any breaches of objectives.
- Nitrogen dioxide levels at a site in Queensgate, Inverness exceeded the Annual Mean objective in 2007. Previous detailed assessment for Nitrogen dioxide suggested compliance with the objectives in this area of the city. Recent traffic management changes have been made which may have had an impact. All other monitoring results and information available indicate compliance with the Air Quality Objectives is likely.

2 Introduction

The UK Government published its strategic policy framework for air quality management in 1995 establishing national strategies and policies on air quality which culminated in the Environment Act 1995. The Air Quality Strategy provides a framework for air quality control through air quality standards and air quality management. These air quality standards and their objectives have been enacted through the Air Quality Regulations in 1997, 2000 and 2002. The Environment Act 1995 requires Local Authorities to undertake air quality reviews. In areas where an air quality objective is not anticipated to be met, Local Authorities are required to establish Air Quality Management Areas and implement action plans to improve air quality.

3 Progress Reports

Local Air Quality management places a requirement on a local authority to regularly review and assess local air quality and periodically submit reports on the review and assessment process. An Updating and Screening Assessment (USA) Report is required every three years.

The last USA Report was required in 2006 and another will be expected in 2009.

If a local authority is not required to proceed to Detailed Assessment following the USA a Progress Report must be published for each of the next two years, thereby ensuring continuity in the review and assessment process.

Highland Council published an Updating and Screening Assessment in 2006. The assessment concluded that there was no likelihood of a failure to achieve objectives and no requirement to proceed to a detailed assessment in the Highland Council Area. The Highland Council submitted a Progress Report in 2007. The main findings of the 2007 Progress report were as follows:

- Monitoring results at the Telford Street AUN site for PM10 in 2006 were significantly higher than in previous years. Further assessment will demonstrate whether this is a long or short term trend.
- Monitoring and Modelling was being undertaken by The Highland Council with respect to Ord Maltings, to determine whether or not there is a risk of failure to comply with the air quality objectives because of emissions from this source.
- All other monitoring results and information available indicated that compliance with the Air Quality Objectives is likely.

This Progress Report has regard to the requirements and recommendations of the Scottish Executive document LAQM.PRG(03) – Progress Report Guidance.

The aims of Progress Reports are to:

- report progress on implementing local air quality management; and
- report progress in maintaining concentrations below the air quality objectives.

This Progress Report provides information regarding:

- new monitoring results; and
- new local developments that might affect local air quality

4 Air Quality Objectives

Objectives included in the Air Quality (Scotland) Regulations 2000 and (Amendment) Regulations 2002 for the purpose of Local Air Quality Management are outlined in Figure 1 Air Quality Objectives

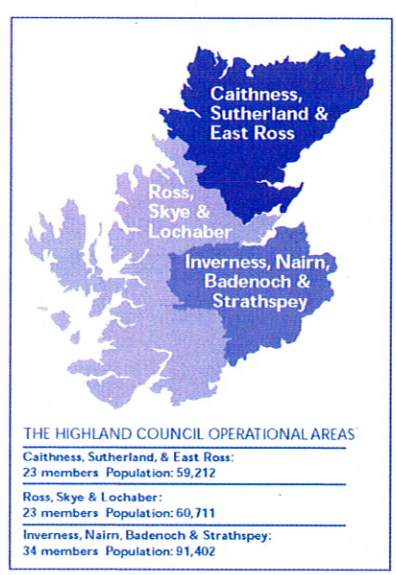
Figure 1 Air Quality Objectives

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene			
All authorities	16.25 μg/m^3	running annual mean	31.12.2003
Authorities in England and Wales only	5.00 μg/m^3	annual mean	31.12.2010
Authorities in Scotland and Northern Ireland only	3.25 μg/m^3	running annual mean	31.12.2010
1,3-Butadiene	2.25 μg/m^3	running annual mean	31.12.2003
Carbon monoxide			
Authorities in England, Wales and Northern Ireland only	10.0 mg/m^3	maximum daily running 8-hour mean	31.12.2003
Authorities in Scotland only	10.0 mg/m^3	running 8-hour mean	31.12.2003
Lead	0.5 μg/m^3	annual mean	31.12.2004
	0.25 μg/m^3	annual mean	31.12.2008
Nitrogen dioxide	200 μg/m^3 not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 μg/m^3	annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 μg/m^3 not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
All authorities	40 μg/m^3	annual mean	31.12.2004
Authorities in Scotland only	50 μg/m^3 not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
	18 μg/m^3	annual mean	31.12.2010
Sulphur dioxide	350 μg/m^3 not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
	125 μg/m^3 not to be exceeded more than 3 times a year	24 hour mean	31.12.2004
	266 μg/m^3 not to be exceeded more than 35 times a year	15 minute mean	31.12.2005

5 The Highland Council Areas

Figure 2 shows the administrative areas in the Highland Council. The Highland Council was extensively restructured in 2007. There are now three administrative areas in the Council.

Figure 2 The Highland Council Areas



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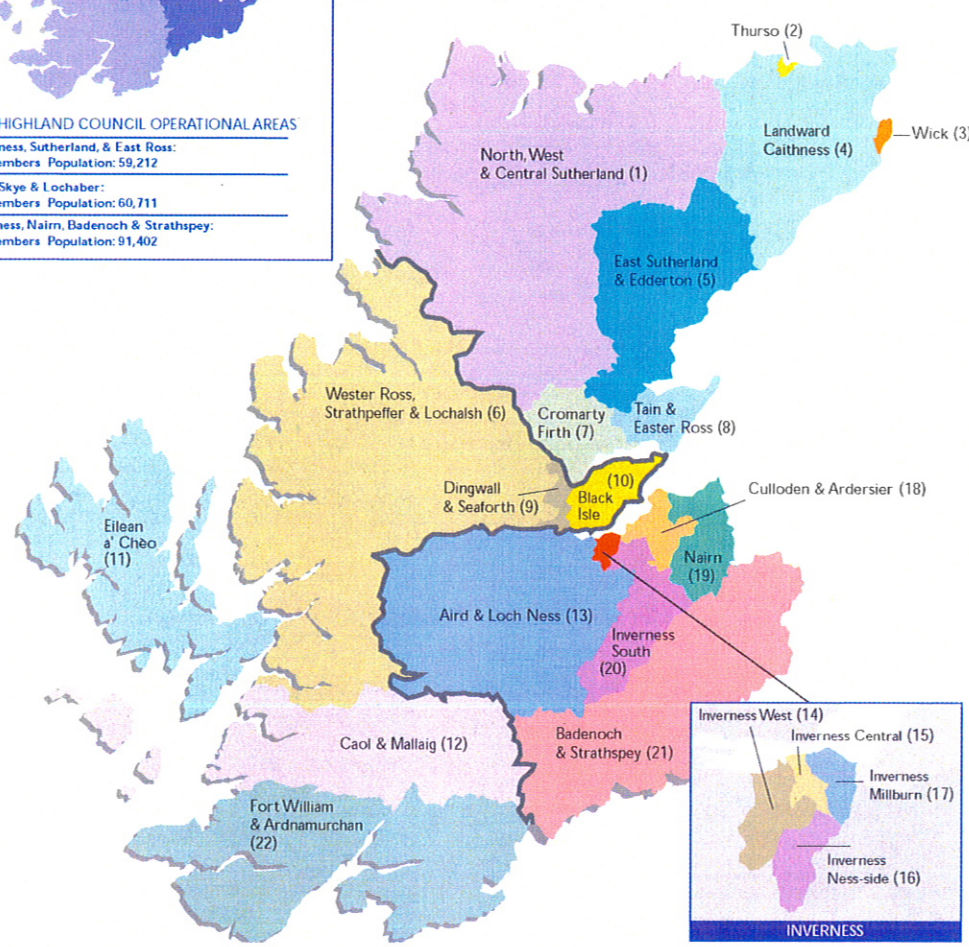
MULTI-MEMBER WARDS & OPERATIONAL AREAS

(as from May 2007)



CAITHNESS, SUTHERLAND & EASTER ROSS OPERATIONAL AREA

Ward No./ Ward Name		No. of Members	2004 Population
1	North, West & Central Sutherland	3	6,055
2	Thurso	3	7,849
3	Wick	3	7,506
4	Landward Caithness	4	9,809
5	East Sutherland & Edderton	3	7,620
7	Cromarty Firth	4	11,652
8	Tain & Easter Ross	3	8,721
	TOTAL	23	59,212

ROSS, SKYE & LOCHALSH OPERATIONAL AREA

Ward No./ Ward Name		No. of Members	2004 Population
6	Wester Ross, Strathpeffer & Lochalsh	4	11,758
9	Dingwall & Seaforth	4	11,073
10	Black Isle	4	9,468
11	Eilean a' Cheo	4	9,694
12	Caol & Mallaig	3	8,080
22	Ft William & Ardnamurchan	4	10,638
	TOTAL	23	60,711

INVERNESS, NAIRN, BADENOCH & STRATHSPEY OPERATIONAL AREA

Ward No./ Ward Name		No. of Members	2004 Population
13	Aird & Loch Ness	4	10,020
14	Inverness West	3	8,106
15	Inverness Central	4	12,672
16	Inverness Ness-Side	4	10,477
17	Inverness Millburn	3	8,657
18	Culloden & Ardersier	4	11,523
19	Nairn	4	10,809
20	Inverness South	4	7,156
21	Badenoch & Strathspey	4	11,983
	TOTAL	34	91,402

6 New Monitoring Results

The Highland Council continues to monitor pollutant concentrations at eleven sites in the district. Two of the sites are automatic stations, part of the UK AURN. The remaining nine sites utilise passive diffusion tubes.

6.1 Automatic Monitoring

6.1.1 Telford Street, Inverness

The site is adjacent to a pathway connecting Telford Street (A862) and Cameron Square Inverness. It is 4 metres from the A862. It is a predominantly residential area with a retail business park 250 metres away. Telford street is the preferred trunk route for HGVs travelling to or from the west through Inverness.

- Site address: Telford Street IV3 5LE
- OS Grid Reference: NH657457
- Site Type: Roadside
- Start Date: 17/07/2001
- Pollutants Measured: Nitrogen Dioxide; Carbon Monoxide; PM10 (measured gravimetrically by Partisol)

A diffusion tube collocation study is undertaken at this site. Ratified data from this site is available on the UK Air Quality Archive to 31/12/2007.

Results for the five complete years 2002 to 2007 are shown in Figure 3 to Figure 5. All data is obtained fully ratified from the website www.airquality.co.uk.

Figure 3 Nitrogen dioxide levels at Telford Street, Inverness

Nitrogen dioxide	2002	2003	2004	2005	2006	2007	Air Quality Objective
% data capture	97.8	98.3	98.1	97.1	99	98	
Annual Mean µg/m3	21.8	23.1	22.6	21	22	22.3	The air quality objective annual mean to be achieved by 31/12/2005 is 40 µg/m3
Number of exceedences of the hourly mean objective	0	0	0	0	0	0	The air quality objective to be achieved by 31/12/2005 is that the hourly mean concentration should not exceed 200 µg/m3 more than 18 times a year.

Figure 4 Carbon monoxide levels at Telford Street, Inverness

Carbon monoxide	2002	2003	2004	2005	2006	2007	Air Quality Objective
% data capture	65.8	93.5	95.3	97.1	99.2	97.3*	
Average Hourly Mean mg/m3	0.43	0.45	0.43	0.52	0.40	0.34	
Number of exceedences of the 8 hour running mean objective	0	0	0	0	0	0	The air quality objective is that the 8 hour running mean concentration should not exceed 10 mg/m3.

Figure 5 Particulate levels at Telford Street, Inverness

Particulate Matter (PM10)	2002	2003	2004	2005	2006	2007	Air Quality Objective
% data capture	65.8	93.4	95.3	94	90.9	86.6	
Annual Mean µg/m3	17.3	17.3	15	16.7	19.5	18.7	
2010 projected annual mean µg/m3	16.3	15.9	14.5	16.1	18.7	18.2	The air quality objective annual mean to be achieved by 31/12/2010 is 18 µg/m3
Number of exceedences of the 24 hour mean objective	1	10	1	2	5	0	The air quality objective to be achieved by 31/12/2010 is that the 24 hour mean concentration should not exceed 50 µg/m3 more than 7 times a year.

*Monitoring of Carbon monoxide at the Telford Street AUN site ended on the 30th September 2007. Capture rate shown is that for the period which was monitored in this year.

Nitrogen dioxide and Carbon monoxide

There were no exceedences of the air quality objectives for Nitrogen dioxide or Carbon monoxide at this monitoring location in 2007.

PM10

The projected annual mean concentration for 2010 has been derived from the current years monitoring data (2007) using the method described in LAQM.TG(03) Box 8.6 and the 2004 year adjustment factors.

The projected annual mean concentration for PM10 based upon the 2006 data exceeded the annual mean objective for 2010. The 2006 data showed a 20% increase over the pollutant concentrations monitored at this location in the previous four years. Monitoring through 2007 has shown a 4% reduction in the annual average PM10 concentration compared to the 2006 data. The projected annual mean concentration for 2010 based upon 2007 data is however still in excess of the objective for 2010. This area should be looked at in more detail in the Updating and Screening Assessment of 2009 and it may be necessary to go to detailed assessment for this pollutant at this location.

6.1.2 Fort William.

In June 2006 a new AUN site was established in Fort William. Monitoring commenced on the 22nd June 2006 for Nitrogen dioxide and Ozone. 2007 is the first full year of data for this site for these pollutants. In that year there were no exceedences of either objective for Nitrogen dioxide.

Monitoring for PM10 and PM2.5 as part of the Partisol Research Network took place between 27th March 2007 and 30th June 2007.

Available data for this site is summarised in Figure 6 below.

Site Summary
The site is on open ground to the north-east of Fort William town centre.

Site Address:
Camanachd Crescent, Fortwilliam

OS Grid reference: 210856 774430
Site type: Suburban
Start Date: 22/6/06
Pollutants Monitored: Nitrogen Dioxide; Ozone; PM10, PM2.5 from 27/03/07 to 30/06/07.

Figure 6 Nitrogen dioxide levels at Fort William

Nitrogen dioxide	**2006**	**2007**	**Air Quality Objective**
% data capture	42	84.8	
Annual Mean µg/m3	N/A	9.32	The air quality objective annual mean to be achieved by 31/12/2005 is 40 µg/m3
Number of excedences of the hourly mean objective	0	0	The air quality objective to be achieved by 31/12/2005 is that the hourly mean concentration should not exceed 200 µg/m3 more than 18 times a year.

Figure 7 PM10 concentration at Fort William

PM10	**2007**	**Air Quality Objective**
% data capture	42	
Annual Mean µg/m3	N/A	
2010 projected annual mean µg/m3	N/A	The air quality objective annual mean to be achieved by 31/12/2010 is 18 µg/m3
Number of exceedences of the 24 hour mean objective	1	The air quality objective to be achieved by 31/12/2010 is that the hourly mean concentration should not exceed 50 µg/m3 more than 7 times a year.

6.2 Passive Diffusion Tube monitoring

Nitrogen dioxide (NO2) is monitored on a monthly basis at a number of locations in Dingwall and Inverness using diffusion tube samplers. The four monitoring sites in Dingwall are included in the UK National Survey. The locations of all diffusion tube sites are shown in the maps in Appendix A. Nitrogen dioxide tubes using the 20% TEA in Water method are supplied and analysed by Gradko International. The Laboratory is UKAS accredited for the analysis of Nitrogen dioxide diffusion tubes. Annual mean concentrations are derived according to the advice contained in LAQM.TG(03). The following adjustments have been made to the raw data:

- Bias adjustment – A collocation study is ongoing at the AUN Site at Telford Street, Inverness. Precision and accuracy of the adata has been checked using the tool provided on the LAQM Tools website. The resulting bias factor is calculated as 0.89. The Local Authority Helpdesk provided by UWE has looked at 22 collocation studies for diffusion tubes analysed at Gradko laboratory using the 20% TEA in Water method and suggests a bias factor of 0.89 should be used. All diffusion tube results have therefore been bias adjusted using the factor 0.89.
- Period adjustment - On occasion, diffusion tubes are removed or vandalised. Figure shows the number of months of data that was captured for each site. Results for locations returning less than 9 months data have been adjusted according to the method described in Box 6.5 of LAQM.TG(03). The two background sites in Dingwall RC3 and RC4 provided the basis for the calculation of the adjustment.

Figure shows Nitrogen dioxide levels between 2004 and 2007

Figure 8 Number of months for which data was collected in 2007

IV1	IV2A	IV2B	IV3A	IV3B	IV3C	IV4A	IV4B	IV4C	IV5	RC1	RC2	RC3	RC4
7	0	9	8	8	0	8	9	8	0	12	12	12	12

Figure 9 Nitrogen dioxide levels in Inverness and Dingwall

Site	ID	Type	Annual Mean Concentration (ug/m3)			
			2007	2006	2005	2004
Telford Street, Inverness	IV4	Diffusion Tube, Roadside (collocation study)	21.7	22	22	22.6
Union Street, Inverness	IV1	Diffusion Tube, Roadside	30.2	33	34	32.1
Academy Street, Inverness	IV2A	Diffusion Tube, Roadside		36	33	29.9
Academy Street, Inverness	IV2B	Diffusion Tube, Roadside	25.9	21	22	20.2
Queensgate, Inverness	IV3A	Diffusion Tube, Roadside	46.5	35	37	35.4
Queensgate, Inverness	IV3B	Diffusion Tube, Roadside	37.2	32	27	24.5
Kenneth Street, Inverness	IV5	Diffusion Tube, Roadside		23	20	21.4
Wyvis Terrace, Dingwall	RC1	Diffusion Tube, Roadside	19.4	18	21.1	17.5
Station Road, Dingwall	RC2	Diffusion Tube, Roadside	36.1	31	35.3	27.3
Kintail Place, Dingwall	RC3	Diffusion Tube, Urban Background	7.6	7.3	8	5.9
Burns Crescent, Dingwall	RC4	Diffusion Tube, Urban Background	8.9	8.3	9.7	8.1

The annual mean NO2 concentrations for 2007 were below the annual mean objective of 40µg/m3 at all sites other than site IV3A, Queensgate, Inverness. This site showed a 30% increase in the annual average pollutant concentration when compared to the mean of the previous 3 years. IV3B, Queensgate, Inverness also showed a 33% increase.

Traffic management works are ongoing in the vicinity of this location. Study of the 2008 dataset when it becomes available will indicate if this is a continuing trend or the result of short term increased activity as a result of the above works.

Assessment of the location for the 2009 Updating and screening assessment should allow a course of action in relation to this pollutant at this location to be determined.

7 Local Developments

7.1 Glen Ord Maltings

During late 2006 and early 2007 complaints have been received by the Highland Council's Environmental Health Service about emissions from the Maltings at Glen Ord Distillery, Muir of Ord.

Dispersion Modelling has been completed for the process. Automatic monitoring at relevant exposure locations for Sulphur dioxide, Nitrogen dioxide and Carbon monoxide was also carried out at two locations in the vicinity of the Maltings with the intention of using the results to calibrate the model.

Technical difficulties experienced with the automatic monitors have meant that it has not been possible to obtain reliable monitoring data at the site. The Highland Council continues to progress this work.

BMT Cordah were engaged to carry out a dispersion modelling exercise for the Maltings emission. The modelling suggests that it is unlikely that an air quality objective will fail to be met at any location with relevant exposure in the locality of the process.

During late 2007 and early 2008 the operator of the site concluded investigations into a new stack for the malt kilns. Planning permission for this development was granted in early 2008 and the development is expected to be completed by the end of 2008.

BMT Cordah have run the new stack emissions through the dispersion model and have concluded that there is no likelihood of any breach of the air quality objectives being caused by this development.

7.2 ALCAN Aluminium Smelter – Fort William.

Recent air quality dispersion modelling for Sulphur dioxide has shown that there is the potential for exceedance of the 15 min mean objective.

Alcan are undertaking further work which involves the collation of data via a continuous monitor at premises outwith the installation, a network of diffusion tubes in the area surrounding the installation, and vegetation analyses.

The information collated will be brought to the attention of SEPA and Highland Council although, at this stage, it is thought, by Alcan, that the SO_2 standards are unlikely to be exceeded at any relevant exposure location.

7.3 Industrial Processes

The Scottish Environment Protection Agency (SEPA) has provided updated information on industrial processes in the Highland Council area.

The following new processes are identified:

1. Sureclean Ltd, 10 River Drive, Teaninich Industrial Estate, Alness – PPC/A/1016691, Disposal of waste including hazardous waste;
2. MS Industrial Services Ltd., Admiralty Base, Shore Road, Invergordon – PPC/A/1016853, Disposal of waste including hazardous waste;
3. Petley Hybrids, Portmahomack, Tain – PPC/A/1016832, rearing of pigs.

8 Planning and Policies

Information about local air quality was requested from the developer for the following planning applications:

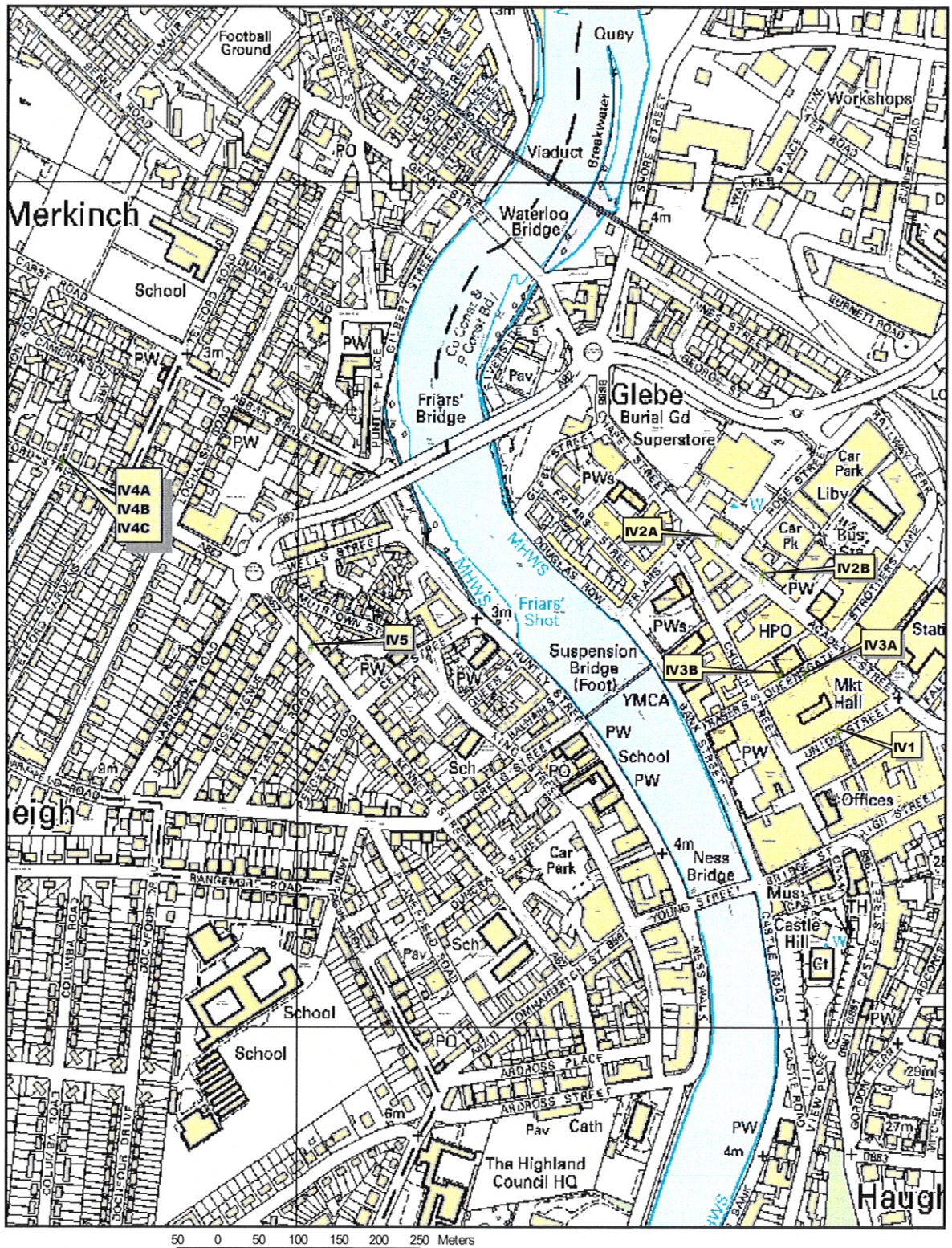
Ord Maltings, Muir of Ord – Provision of replacement stack for malt kilns.

Assessment of the possible impact of the development suggests that the development will not be significant in terms of local air quality.

9 Local Transport Plans and Strategies

The Council's Local Transport Strategy dates from 2000 and is currently under review. The new Local Transport Strategy is being produced in accordance with the Scottish Executive's guidance on Local Transport Strategies and will take account of the emerging Regional Transport Strategy and the National Transport Strategy.

- **Nitrogen dioxide diffusion tube locations – Inverness**
- **Nitrogen dioxide diffusion tube locations – Dingwall**
- **AUN Site – Fort William**



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Inverness Diffusion Tube Sites

SUPPLIED BY THE HIGHLAND COUNCIL

13th August 2007

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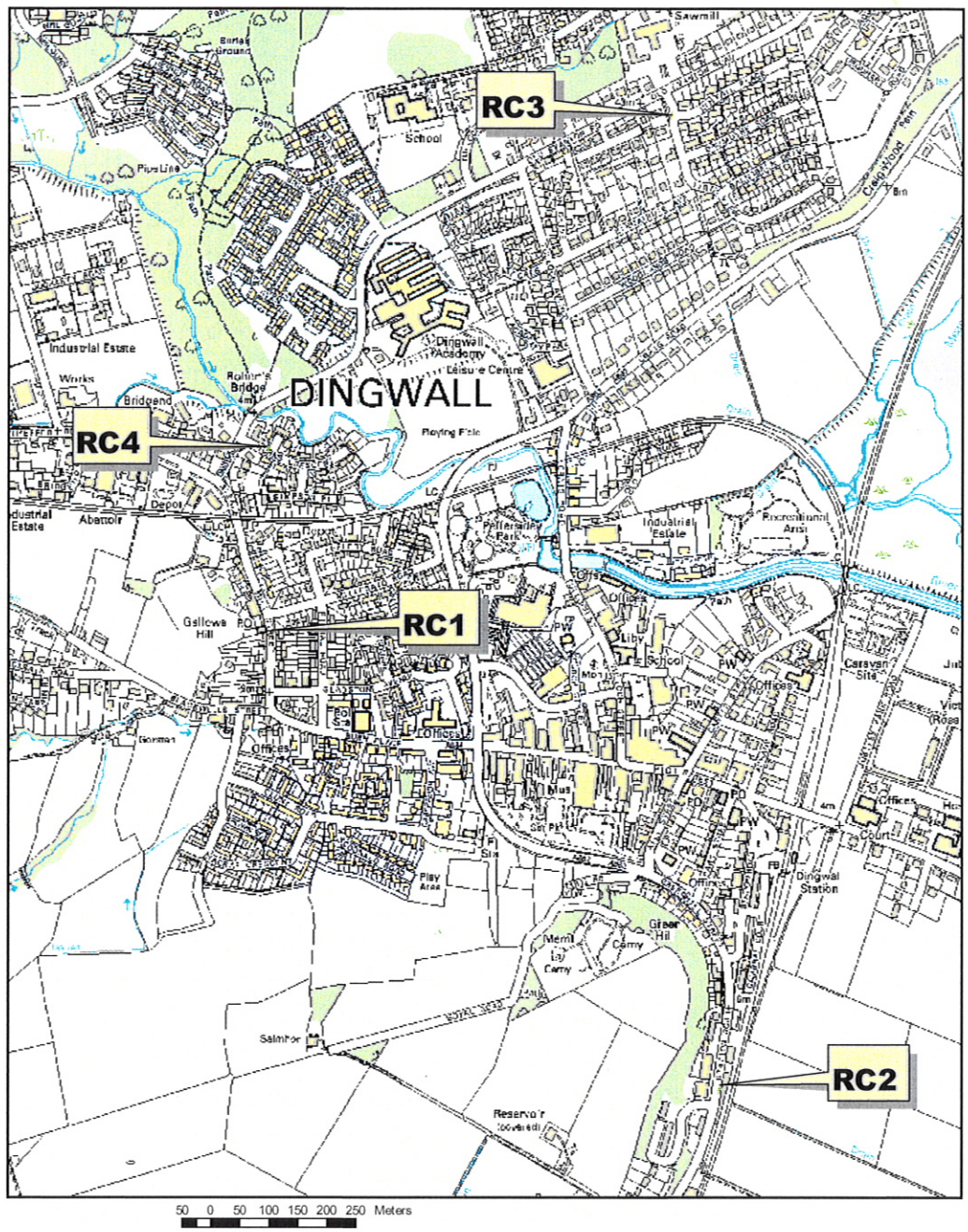

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Diffusion Tube Monitoring Locations

Dingwall

SUPPLIED BY THE HIGHLAND COUNCIL

16th June 2005

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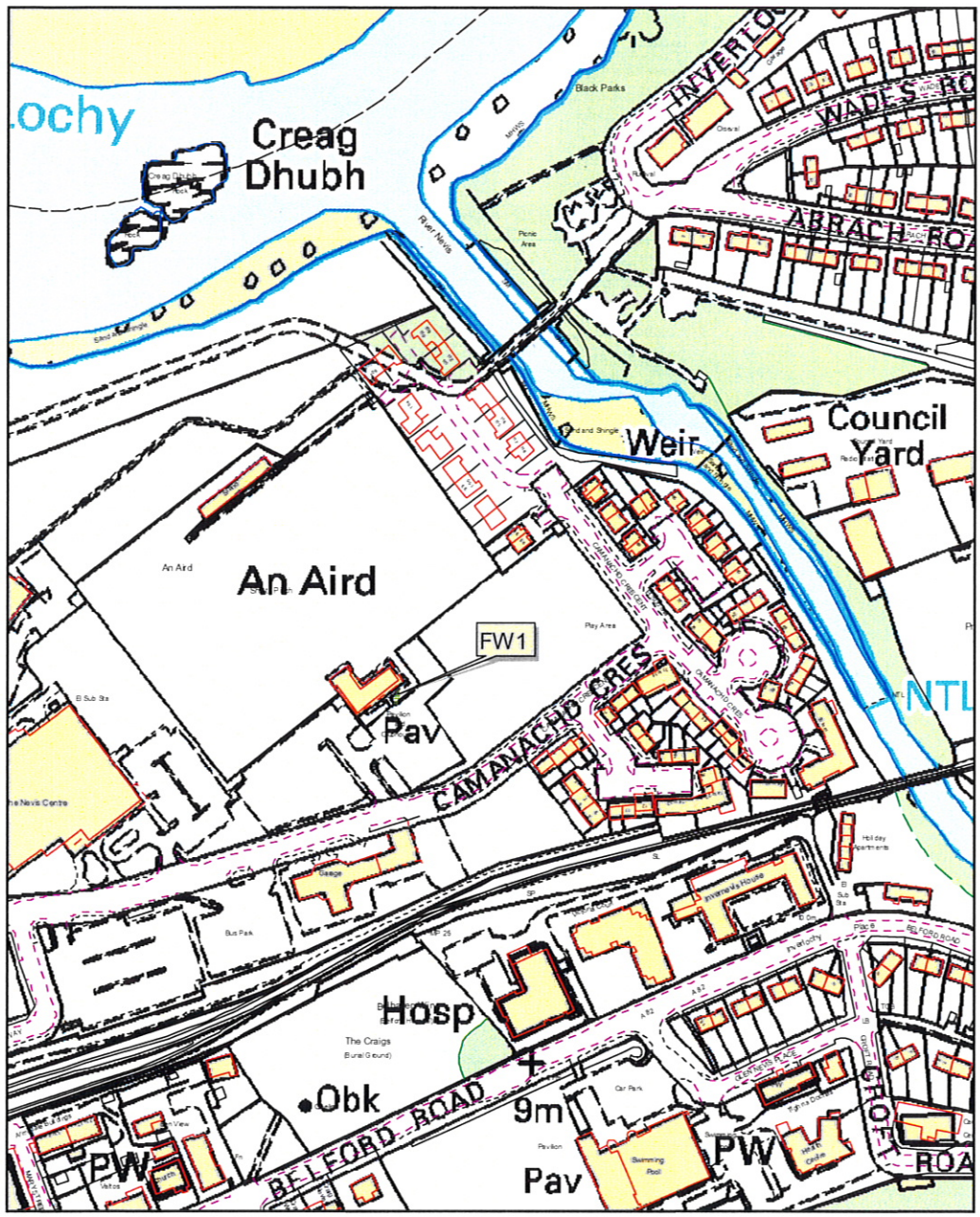
Creag Dhubh
Black Parks
River Nevis
Picnic Area
INVERLOCHY
WADE'S ROAD
ABRACH ROAD
Council Yard
Weir
An Aird
FW1
Pay Area
Pav
CAMANACHD CRES
NTL
The Nevis Centre
Bus Park
Hosp
The Craigs (Burial Ground)
Obk
9m
PW
BELFORD ROAD
Pavilion
Swimming Pool
Car Park
50 0 50 100 150 200 250 Meters
The Highland Council
Fort William AUN Site
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13th August 2007
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