North Ayrshire Council

Local Air Quality Management

Progress Report: 2005

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Chapter 1: Introduction

1.1: Summary of National Air Quality Strategy and Local Air Quality Management (LAQM)

In order to tackle the problem of poor air quality the Environment Act 1995 put in place measures at both national and local level. However, there is a significant local dimension to air quality, with emissions varying dramatically in different areas, depending on geography, industry and traffic. Local Air Quality Management aims to ensure that solutions are tailored to local needs. The National Air Quality Strategy requires all local authorities to develop an integrated approach to local air quality management, ensuring that all air quality is considered alongside issues such as transport and land use planning. Local authorities must provide the public with information and forecasts on local air quality, consulting on any action that may be required as a result of poor air quality within their area.

Air quality assessments carried out by Local Authorities should act as benchmarks against which future progress in making improvements to air quality in their areas can be measured.

It should be stressed that, to fully appreciate the standard of local air quality, this progress report should be read in conjunction with the various local air quality management reports already completed by North Ayrshire Council.

The current phased approach towards air quality is summarised in Table 1.1.

Table1. 1.1 – Summary of Phased Approach Towards Air Quality

Level of Assessment	Objective	Approach
Updating and Screening Assessment	To identify those matters that have changed since the last review and assessment, which might lead to a **risk** of an air quality objective being exceeded.	Use a checklist to identify significant changes that require further consideration. Where such changes are identified, then apply simple screening tools to decide whether there is sufficient risk of an exceedance of an objective to justify a Detailed Assessment.
Detailed Assessment	To provide an accurate assessment of the **likelihood** of an air quality objective being exceeded at locations with relevant exposure. This should be sufficiently detailed to allow the designation or amendment of any necessary AQMAs.	Use quality-assured monitoring and validated modelling methods to determine current and future pollutant concentrations in areas where there is a significant risk of exceeding an air quality objective.

The recommended timescale for submission of reviews and assessments and Progress Reports are detailed in Table 1.1.2.

Table 1.1.2 - Recommended Timescale

LAQM ACTIVITY	COMPLETION DATE	WHICH AUTHORITIES
Updating and Screening Assessment	End of May 2003	All authorities[a]
Detailed Assessment	End of April 2004	Those authorities[a] which have identified the need for a Detailed Assessment in their May 2003 Updating and Screening Assessment
Progress Report	End of April 2004	Those authorities[a] which have identified no need for a Detailed Assessment in their May 2003 Updating and Screening Assessment
Progress Report	End of April 2005	All authorities
Updating and Screening Assessment	End of April 2006	All authorities
Detailed Assessment	End of April 2007	Those authorities which have identified the need for a Detailed Assessment in their April 2006 Updating and Screening Assessment
Progress Report	End of April 2007	Those authorities which have identified **no need** for a Detailed Assessment in their April 2006 Updating and Screening Assessment
Progress Report	End of April 2008	All authorities
Updating and Screening Assessment	End of April 2009	All authorities
Detailed Assessment	End of April 2010	Those authorities which have identified the need for a Detailed Assessment in their April 2009 Updating and Screening Assessment
Progress Report	End of April 2010	Those authorities which have identified **no need** for a Detailed Assessment in their April 2009 Updating and Screening Assessment

a. All local authorities except those in Northern Ireland and London local authorities that have designated AQMAs. London local authorities that have designated AQMAs will be expected to submit an Updating and Screening Assessment by the end of 2003 or earlier if possible, and to complete Detailed Assessments (where required) by the end of 2004.

1.2: Air Quality Objectives

Table 1.2.1, below shows the Air Quality Objectives required under the Air Quality Regulations 2000 and the Air Quality (Scotland) Amendment Regulations 2002.

Table 1.2.1: UK Air Quality Objectives

POLLUTANT	AIR QUALITY OBJECTIVE CONCENTRATION	MEASURED AS	DATE TO BE ACHIEVED BY
BENZENE			
All authorities	**16.25 μg/m^3**	Running annual mean	31.12.2003
English and Welsh Authorities only	5.00 μg/m^3	Annual mean	31.12.2010
Scottish and N Ireland Authorities only	**3.25 μg/m^3**	Running Annual Mean	31.12.2010
1,3 BUTADIENE	**2.25 μg/m3**	Running Annual mean	31.12.2003
CARBON MONOXIDE	**10.0 mg/m^3**	Maximum Daily Running 8-hour Mean	31.12.2003
LEAD	**0.5 μg/m^3** **0.25 μg/m^3**	Annual Mean Annual Mean	31.12.2004 31.12.2008
NITROGEN DIOXIDE	**200 μg/m^3** not to be exceeded more than 18 times per year	1 Hour Mean	31.12.2005
	40 μg/m^3	Annual Mean	31.12.2005
PARTICLES (PM10)			
All authorities	**50 μg/m^3** not to be exceeded more than 35 times a year	24 Hour Mean	31.12.2004
	40 μg/m^3	Annual Mean	31.12.2004
Scottish Authorities 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

The Environment Act 1995 makes a requirement for Local Authorities to review and assess air quality in their areas. The Air Quality Regulations 1997 provided National Air Quality objectives for 7 key pollutants, local authorities must assess whether these objectives are liable to be met. Any Local Authority, which identifies any areas where objectives are not likely to be met, must declare an Air Quality Management Area.

1.3 Findings of Previous Reviews and Assessments

The **first stage** of review and assessment was carried out in **1998** and conclusions for North Ayrshire were as follows: -

1. The air quality objectives for 6 of the 7 specified parameters namely benzene, 1,3-butadiene, carbon monoxide, lead, PM_{10} and sulphur dioxide are all likely to be achieved by 2005.

2. There is insufficient information at this stage to conclude that the nitrogen dioxide standard will be achieved in the vicinity of several local industrial sources and therefore North Ayrshire will be progressing to a second stage review and assessment for nitrogen dioxide.

The **second stage** review and assessment carried out in **2000** concluded as follows:-

1. The air quality objective for nitrogen dioxide are likely to be met by the end of 2005, it will, therefore not be necessary to proceed to a stage three review and assessment.
2. It would be prudent to undertake a limited programme of diffusion tube monitoring adjacent to the A78 at Auchengate sawmill to confirm the level of nitrogen dioxide at that location.

The enactment of the Air Quality (Scotland) Amendment Regulations 2002 reduced the Objective Levels for many of the pollutants. As part of the phased approach for review and assessment introduced by the regulations North Ayrshire Council carried out an **Updating and Screening Assessment** in 2003 and published a Progress Report in 2004 to identify whether there were areas of relevant public exposure at risk of exceedences of the new objectives.

No areas of relevant public exposure in North Ayrshire were identified by these assessments as being at risk of exceeding the objectives for any of the 7 pollutants. There was, therefore, no reason to proceed with a detailed assessment for any pollutant.

The monitoring programme has continued and this is a **progress report on local air quality in North Ayrshire to date**. The locations of monitoring points are indicated in Table 1.3.1 and Figs. 1.3.1-1.3.2.

2.0 Pollutant Specific Assessments

2.1 Benzene

No recent monitoring of benzene has been undertaken. However, previous reviews have concluded that:

1. There was no significant industrial source of benzene located either within North Ayrshire or neighbouring areas which is likely to adversely affect air quality within North Ayrshire.

2. There was no need to proceed to a detailed assessment for benzene.

Since the updating and screening assessment carried out in 2003 there has been no evidence of any change to benzene production or release in North Ayrshire. Similarly, there has been no development likely to result in any increase in benzene levels at locations where there could be **relevant public exposure.** Consequently, a detailed assessment for benzene remains unnecessary.

2.2 1,3-Butadiene

No monitoring of 1,3-Butadiene has been undertaken. However, previous reviews concluded that:

1. There was no significant industrial sources of 1,3-Butadiene located either within North Ayrshire or neighbouring areas which is likely to adversely affect air quality in North Ayrshire.

2. There was no need to proceed to a detailed assessment for 1,3-Butadiene.

Since the updating and screening assessment carried out in 2003 there has been no evidence of any change to 1,3-Butadiene production or release in North Ayrshire. Similarly, there has been no development likely to result in any increase in 1,3-Butadiene levels at locations where there could be **relevant public exposure.** Consequently, a detailed assessment for 1,3-Butadiene remains unnecessary.

2.3 Carbon Monoxide

During 2004 no carbon monoxide monitoring was carried by North Ayrshire Council. An automatic analyser is operated in partnership with Inverclyde Council, each authority now siting it in their area for twelve-month periods. In 2004 this equipment was sited in Inverclyde.

Previous reviews concluded that:

1. There is no significant carbon monoxide source, industrial or road transport, located either within North Ayrshire or neighbouring areas which are likely to adversely affect air quality in North Ayrshire.

2. There is no need to proceed to a detailed assessment for carbon monoxide.

Since the updating and screening assessment carried out in 2003 there has been no evidence of any change to carbon monoxide production or release in North Ayrshire. Similarly, there has been no development likely to result in any increase in carbon monoxide levels at locations where there could be **relevant public exposure.** Consequently, a detailed assessment for carbon monoxide remains unnecessary.
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2.4 Lead

No monitoring of lead has been undertaken. However, previous reviews concluded that:

1. There was no significant industrial sources of lead located either within North Ayrshire or neighbouring areas which is likely to adversely affect air quality in North Ayrshire.

2. There was no need to proceed to a detailed assessment for lead.

Since the updating and screening assessment carried out in 2003 there has been no evidence of any change to lead production or release in North Ayrshire. Similarly, there has been no development likely to result in any increase in lead levels at locations where there could be **relevant public exposure.** Consequently, a detailed assessment for lead remains unnecessary.

2.5 Nitrogen Dioxide

In North Ayrshire monitoring of nitrogen dioxide by passive diffusion tubes has been undertaken regularly since 1993, after earlier involvement in the two short national surveys.

The aim of the nitrogen dioxide monitoring undertaken so far in North Ayrshire has been to measure pollutant concentrations at busy roads and junctions especially near residential areas. Monitoring has also been undertaken at sites where the continuous frontage of buildings provides a canyon effect and allows pollutant levels to accumulate.

Four of the monitoring sites in the Irvine Cross area became part of the National Nitrogen Dioxide Diffusion Tube Survey in 1998.

The results of monitoring since 1998 are summarised graphically in Figure 2.5.1: Irvine Town Centre and Figure 2.5.2: Outlying Areas and also in tabular form (see Table 2.5.1: Irvine Town Centre and Table 2.5.2: Outlying Areas). They show that for the existing sites nitrogen dioxide levels remain low at all sites except in Irvine Town Centre. However, levels have fallen over the past year. This is considered to be due to the traffic management scheme that re-routed some public transport along Bank Street, Irvine. Additional diffusion tubes sites are now located in Bank Street, Irvine to monitor the effects of this traffic there.

All the corrected Annual Mean results for 2004 meet the air quality objective with the exception of the kerbside monitoring site at 79 High Street, Irvine. This site is located adjacent to two busy bus stops. Here the bias corrected Annual Mean Concentration is 45.6μg/m^3. This indicates that for 2005, when the "year correction factors" are applied, the projected kerbside nitrogen dioxide level at 79 High Street, Irvine is 44.5μg/m^3 thus exceeding the Air Quality Objective for 2005. However, the projected nitrogen dioxide Annual Mean Concentration for 2005 at the façade of the building, where there is a **relevant exposure to the public**, is predicted to meet the Air Quality Objective.

As shown in Figure 2.5.1: Irvine Town Centre and Figure 2.5.2: Outlying Areas and also in Table 2.5.1: Irvine Town Centre and Table 2.5.2: Outlying Areas above, when the "year correction factors" are applied, all predicted Annual Mean levels for 2010 shall meet the Air Quality Objective.

Previous reviews concluded:

1. DMRB screening shows that there are no areas within North Ayrshire, which are likely to fail the objective due to Road Traffic. The annual mean nitrogen dioxide levels over a short length of High Street, Irvine, however, are marginally in excess of the annual mean objective in 2002. When the "year correction factors" are applied, as allowed in the guidance, all Annual Mean levels for 2005 should meet the Air Quality Objective. It is believed also that the traffic management scheme, already proposed by North Ayrshire Council will minimise the risk of any further increase.

2. Passive monitoring for nitrogen dioxide should continue in High Street, Irvine to assess the effect of the proposed traffic management scheme.

3. There are no significant industrial sources of nitrogen dioxide within North Ayrshire.

4. There is no requirement to proceed to a detailed assessment for nitrogen dioxide.

Since then, passive monitoring of nitrogen dioxide has indicated that although there has been some reduction in the concentration of NO_2, presumably due to the traffic management scheme, there is a localised kerbside area of High Street, Irvine that currently and for the end of 2005 is predicted to be subject to an annual mean concentration of nitrogen dioxide level in excess of 40 μg/m^3. However, this is **not** an area of **relevant public exposure**. Consequently, a detailed assessment for nitrogen dioxide remains unnecessary. Monitoring of nitrogen dioxide will continue across North Ayrshire.

2.6 Particulate Matter PM_{10}

PM_{10} Monitoring within North Ayrshire

No continuous PM_{10} monitoring was carried out by North Ayrshire Council in 2004.The equipment is operated in partnership with Inverclyde Council, each authority now siting it in their area for twelve-month periods. In 2004 the equipment was sited in Inverclyde.

Previous reviews concluded that:

1. There are no industrial sources within North Ayrshire, which are liable to cause any exceedance in either the 2004 or 2010 objectives for PM_{10}.

2. Screening using the DMRB model indicates that road traffic will not cause any exceedences of the objectives for PM_{10}.

3. There is no requirement to proceed to a detailed assessment for PM_{10}.

4. The 2004 review exercise showed that the projected Annual Mean PM_{10} Concentrations for 2004 and 2010 are 21.39 ug/m^3 and 19.75ug/m^3 respectively.

Since the updating and screening assessment carried out in 2003 there has been no evidence of any increase in PM_{10} production or release in North Ayrshire, as the result of either fixed sources or road traffic. Similarly, there has been no development likely to result in any increase in PM_{10} levels at locations where there could be relevant public exposure.

Measurement of PM_{10} undertaken in High Street, Irvine during 2003 suggested that, whilst the predicted estimated annual mean concentration for 2004 (21.39μg/m^3) shall be well below the Air Quality Objective, for 2010 it is predicted to be 19.75μg/m^3, marginally exceeding the much reduced Air Quality Objective 18μg/m^3. However, as with nitrogen dioxide, these results were obtained when there was heavy public transport traffic in the area. Since then a traffic-management scheme has been put in place to disperse this traffic. It is anticipated, therefore, that the annual mean concentration of PM_{10} shall reduce significantly in future years. Additionally, this monitoring location is **not** in a area of **relevant public exposure**. Consequently, a detailed assessment for PM_{10} remains unnecessary.

2.7 Sulphur Dioxide

Since 2001 monitoring of sulphur dioxide has continued using 8-Port sampling technology in three schools in the Dreghorn / Springside area. However, due to lack of space the unit in Greenwood Academy was removed mid-2003. Similarly, the unit in Springside Primary was removed in June 2004. Consequently, monitoring of sulphur dioxide continues only at Dalry and Dreghorn.

Monitoring results obtained since 1998 for the various sites are represented graphically in Figure 2.7.1.

Previous reviews concluded that:

1. The extensive smoke control programme undertaken by Cunninghame District Council has improved sulphur dioxide levels in the area due to the shift to natural gas and electricity.

2. The extensive historical and current monitoring programmes for sulphur dioxide in North Ayrshire has covered every urban area and results indicate the air quality standard continues to be met.

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

4. The rail link serving North Ayrshire is electrified therefore there are very few diesel-powered passenger trains each day. Goods trains on the network are diesel-powered. There are no major stockyards apart from those serving Hunterston coal terminal. These, however, are not within 15 metres of a relevant location Neither are there any stations or signal junctions where diesel locomotives are likely to be stationary for 15 minutes or more within 15 metres of a relevant exposure.

Since the updating and screening assessment carried out in 2003 there has been no evidence of any change to sulphur dioxide production or release in North Ayrshire. Similarly, there has been no development likely to result in any increase in sulphur dioxide levels at locations where there could be **relevant public exposure.** Consequently a detailed assessment for sulphur dioxide remains unnecessary.

3.0 Conclusions

3.1 With the exception of nitrogen dioxide all guideline limits for the National Air Quality Standards shall be met for 2004.

3.2 With regard to nitrogen dioxide, it is predicted that a highly localised area of High Street, Irvine shall continue to be subject to concentration levels in excess of the guideline limit for the annual mean (40μg/m^3) national air quality standard at the end of 2005. However, this is **not** an area of **relevant public exposure.** Consequently, a detailed assessment for nitrogen dioxide remains unnecessary. It also is predicted that by the end of 2010 all areas will meet the guideline limit for the annual mean national air quality standard for nitrogen dioxide.

3.3 With regard to PM_{10}, whilst the predicted estimated annual mean concentration for 2004 (21.39μg/m^3) shall be well below the U.K. Air Quality Objective, for 2010 it is predicted to be 19.75μg/m^3, marginally exceeding the much reduced Scottish Air Quality Objective of 18μg/m^3. However the monitoring location is **not** in an area of **relevant public exposure**. Consequently a detailed assessment for particulate matter PM_{10} remains unnecessary.

3.4 A traffic management plan has being implemented for Irvine Town Centre. This should secure reductions in both nitrogen dioxide and PM_{10} levels in the area.

3.5 Passive sampling shall continue in the area to monitor ambient levels of nitrogen dioxide. Additionally, since April 2005 the TEOM particulate monitor has been re-sited in the area. It will remain there for twelve months. At the end of that period the effects of the traffic management scheme can be further assessed.

3.6 There is no need to proceed to a detailed assessment for any of the seven air pollutants.

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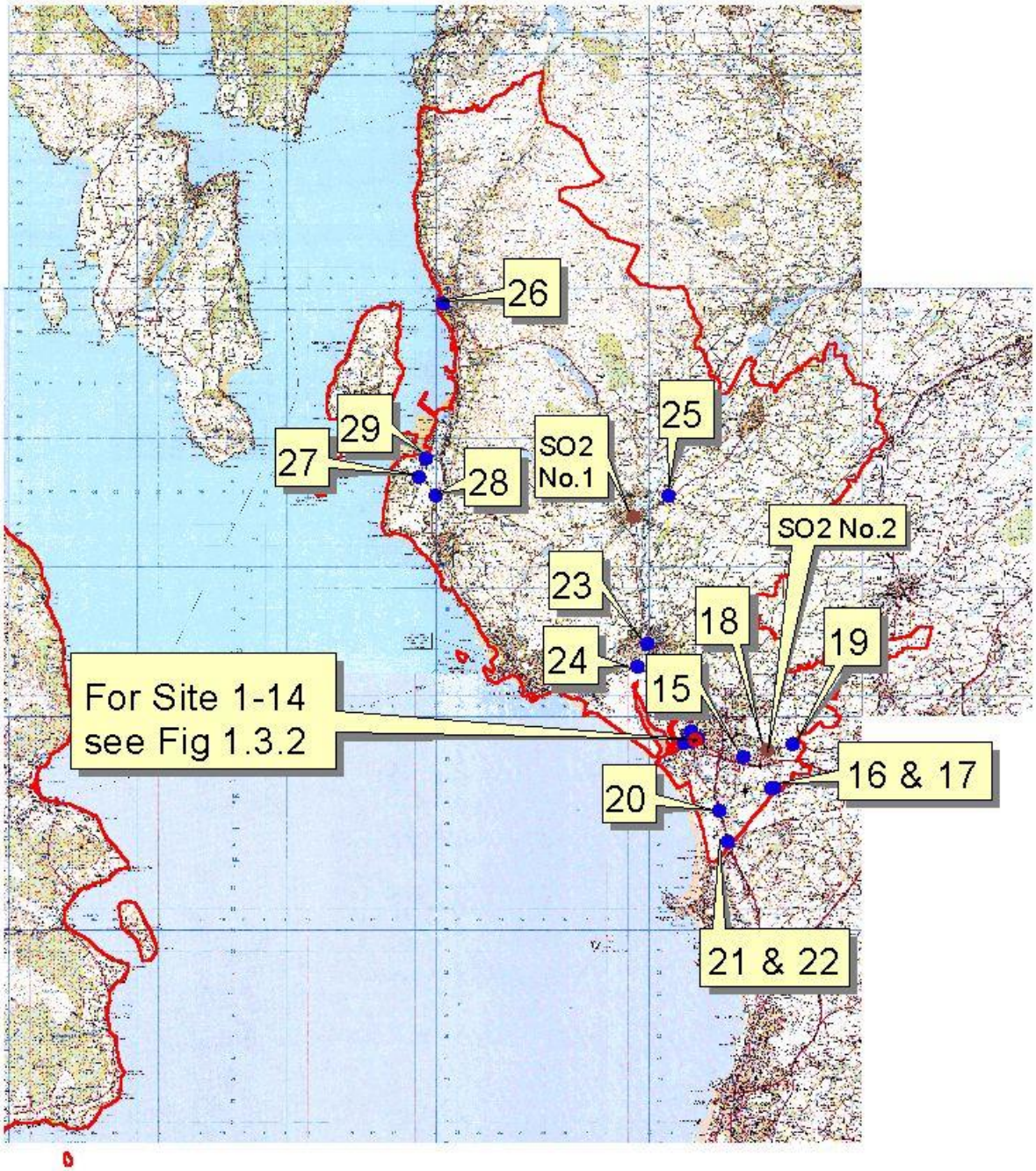
Appendix

Fig. 1.3.1 North Ayrshire : Local Air Quality Monitoring Locations

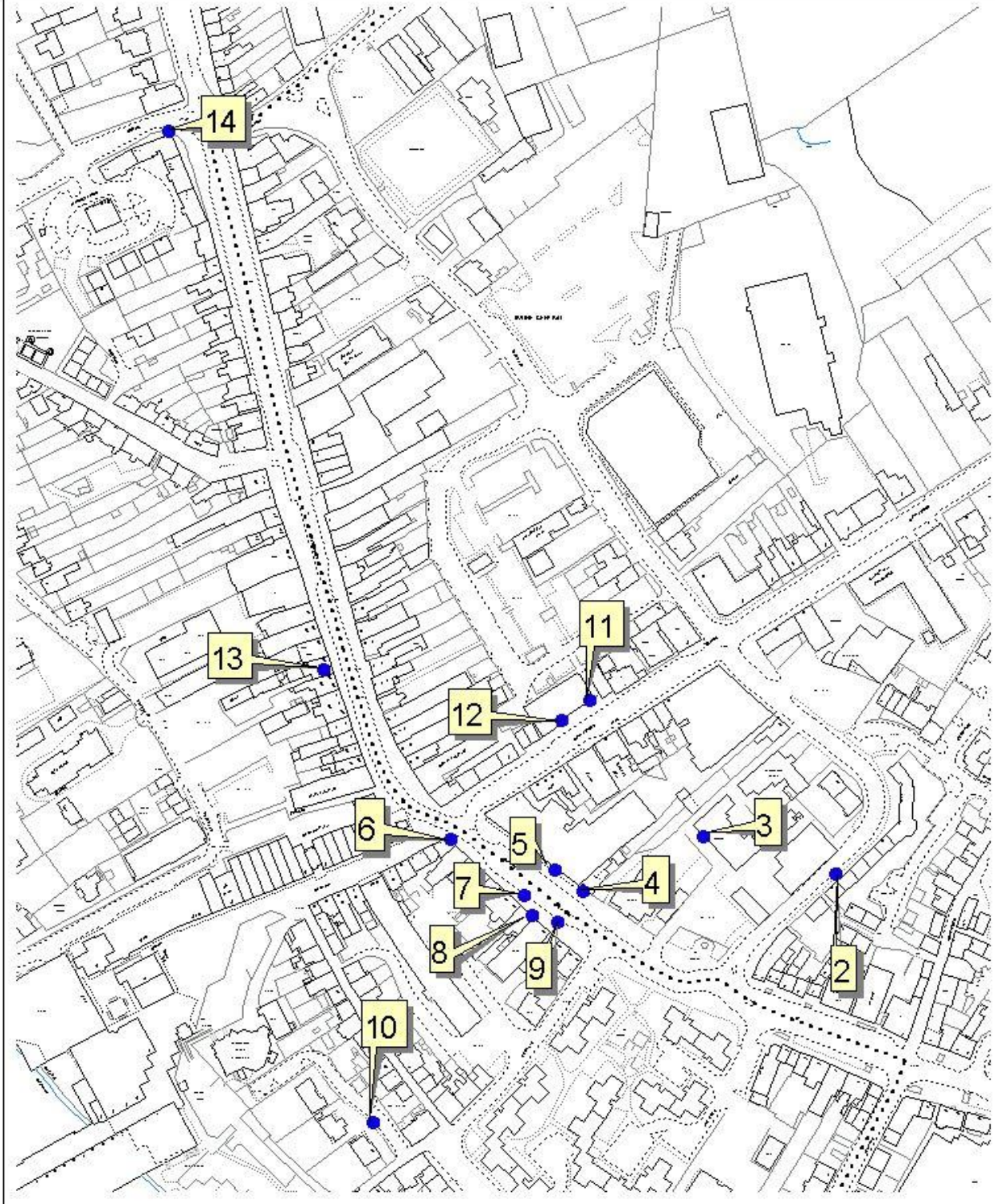


Sulphur dioxide locations.shp
Groundhog.shp
Nitrogen dioxide tube locations.shp
NAC Boundary

N

1:250000

Fig.1.3.2 North Ayrshire : Local Air Quality Monitoring - Irvine Cross



Nitrogen Dioxide tube locations

N

1:2500

TABLE 1.3.1 LOCAL AIR QUALITY MONITORING SITES 2003-2004

NITROGEN DIOXIDE TUBE SITES	NORTH AYRSHIRE
SITE NAME	
(1) CUNNINGHAME HOUSE, IRVINE	1ST FLOOR EAST WING
(2) 35 EAST ROAD, IRVINE	LAMPPOST OPP. POLICE STN GARAGE
(3) IRVINE POLICE STATION	DRAIN PIPE POLICE STN. OPP. TOWNHOUSE
(4) 74 HIGH STREET, IRVINE	LAMPOST OUTSIDE MAMA'S CAFÉ
(5) 70 HIGH STREET, IRVINE	LAMPOST OUTSIDE KWIKSAVE
(6) 97 HIGH STREET, IRVINE	LAMPOST OUTSIDE RS.McCOLLS
(7) 79 HIGH STREET, IRVINE (LOBSTER POT)	LAMPPOST OUTSIDE LOBSTER POT
(8) 75 HIGH STREET, IRVINE (OK JOES)	DRAINPIPE OK JOE'S RESTAURANT
(9) 65 HIGH STREET, IRVINE (GROUND HOG)	LAMPPOST/ TRAILER, 65 HIGH ST IRVINE
(10) 34 KIRKGATE IRVINE	LAMPPOST HALF WAY UP HILL KIRKGATE
(11) INDIGO SUN, BANK ST, IRVINE	DRAINPIPE RIGHT HAND CORNER OF SHOP
(12) KING WORLD TRAVEL, 19 BANK ST, IRVINE	DRAINPIPE LEFT HAND CORNER OF SHOP
(13) 147 HIGH STREET, IRVINE	ON DRAINPIPE LEFT HAND SIDE OF SHOP
(14) EGLINTON STREET IRVINE	DRAINPIPE CNR EGLINTON ST /CASTLE RD
(15) GREENWOOD ACADEMY, DREGHORN	LAMP POLE MAIN GATE
(16) MAIN STREET DRYBRIDGE	LAMPPOST OPPOSITE OLD SCHOOL SITE
(17) SHEWALTON MOSS, DRYBRIDGE	LAMPPOST ENTRANCE TO ESTATE
(18) PRIMARY SCHOOL DREGHORN	LAMPPOST OPPOSITE PRIMARY SCHOOL
(19) MAIN ROAD SPRINGSIDE	LAMPOST CNR STATION RD/SPRINGHILL TERR
(20) AUCHENGATE (BRIDGE)	PEDESTRIAN BRIDGE NORTH OF PAPER MILL
(21) AUCHENGATE (HOUSE)	HOUSE BEHIND AUCHENGATE SAWMILL
(22) AUCHENGATE (ROAD)	ROAD IN AUCHENGATE SAWMILL
(23) DALRY ROAD KILWINNING	LAMPPOST DOWN FROM TRAFFIC LIGHTS
(24) BYREHILL KILWINNING	GRID REF NS 229520 642319
(25) HIGHFIELD HAMLET DALRY	LAMPPOST AT CNR CYCLE TRACK TO GLENGARNOCK
(26) LARGS MAIN STREET	LAMPPOST AT PEDESTRIAN CROSSING
(27) GOLDENBERRY FARM ROAD	SOUTH OF HUNTERSTON POWER STATION
(28) SEAMILL/HUNTERSTON ROAD(LAYBY)	LAYBY A78 SEAMILL TO HUNTERSTON
(29) HUNTERSTON ROAD/CYCLE TRACT	JUNCT. CYCLE TRACK / HUNTERSTON PWR STN ROAD
SULPHUR DIOXIDE 8-PORT SAMPLERS	
SITE NAME	
(1)PUBLIC HALL, AITKEN STREET, DALRY	GROUND FLOOR STOREROOM
(2) PRIMARY SCHOOL, DREGHORN	1ST FLOOR RESOURCE ROOM
MOBILE AIR QUALITY MONITORING UNIT (GROUNDHOG) CO, NO_2 AND PM_{10}.	
SITE NAME	
GROUNDHOG, 65 HIGH STREET, IRVINE.	KERBSIDE