2014 Air Quality Progress Report for Argyll and Bute Council

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

April 2014

Local Authority Officer	Malcolm Chattwood
Department	Planning and Regulatory Services
Address	Kilmory, Lochgilphead PA31 8RT
Telephone	01546 604421
e-mail	malcolm.chattwood@argyll-bute.gov.uk
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Signature	
	Alan Morrison Regulatory Services Manager

Executive Summary

The continuing work to assess local air quality within Argyll and Bute Council has established that there is no requirement to progress to a Detailed Assessment for any pollutants and that:-

(a) Diffusion tube monitoring results indicate that the 2004 annual mean objective for nitrogen dioxide (NO_2) continues to be met

A review of planning applications submitted in 2013 did not reveal any developments with the potential to significantly affect local air quality. There were no new permitted processes opened in 2013 with the capacity to affect local air quality. No new landfill sites or quarries opened with relevant public exposure.

Conclusions

1. There is no requirement for Argyll and Bute Council to progress to Detailed Assessment. In the course of our work we have identified this position through objective monitoring and assessment of development.

A review of NO_2 diffusion tube monitoring sites will be carried out during 2014 and the outcome will be reported in the 2015 Updating and Screening Assessment.

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1 Introduction

1.1 Description of Local Authority Area

The Argyll and Bute Council area covers approximately 6900 square kilometres and borders upon Stirling, Highland, West Dunbartonshire, and Perth and Kinross Councils. Much of the land area is occupied by mountain and moorland, particularly in the north eastern portion. Off the coastline lie a large number of islands, 25 of which are inhabited. The principal islands are Bute, Islay, Mull, Luing, Jura, Coll, Lismore, Iona, Colonsay and Gigha, and the main settlements are located at Bowmore, Campbeltown, Dunoon, Lochgilphead, Oban, Rothesay, Tobermory, Tarbert, Inveraray and Helensburgh.

The combination of mountain, moorland, coastline, particularly the long indented sea lochs, as well as several large fresh water lochs, give the area a distinctive character. The designations of several National and Regional Scenic Areas and the Loch Lomond and the Trossachs National Park reflect this.

Industries

Industries tend to be related to the natural assets of the area. Forestry and agriculture are prevalent inland, whilst in coastal areas there are a large number of distilleries, fish farms and fishing businesses. Tourism makes a significant and important contribution to the Argyll and Bute economy.

Those industries that are regulated by the Scottish Environmental Protection Agency (SEPA) because of their potential to cause pollution i.e. prescribed processes in terms of the Pollution Prevention & Control (Scotland) Regulations 2012, are mapped in Appendix C.

Population

The average population density of Argyll and Bute is less than 13 people per square kilometre with 75% of the population living in areas classified by the Scottish Government as either 'remote rural' or 'remote small towns' (Table 1.1)[1].

Table 1.1 6 Fold Classification of Population Distribution

Scottish Government Urban-Rural classification	Population living within classification	% total population	% of total land area
1: Large urban areas	0.0	0.0	0.0
2: Other urban areas	15,994	17.2	0.1
3: Accessible small towns	0.0	0.0	0.0
4. Remote small towns	27,977	30.0	0.6
5: Accessible rural	6,856	7.6	2.8
6: Remote rural	40,523	45.2	96.5
Total	**91,350**	**100.0**	**100.0**

Over 47,000 people live in the six main population centres of Campbeltown, Dunoon, Helensburgh, Lochgilphead, Oban and Rothesay (Table 1.2). Around 17% of the population live on islands with 97% living within 10km of the coast.

Table 1.2 Main Population Centres and their Population and Classification

Town	Population	Scottish Government Urban-Rural classification
Campbeltown	4810	Remote small town
Dunoon	9400	Remote small town
Helensburgh	15430	Other urban area
Lochgilphead/Ardrishaig	3560	Remote rural area
Oban	8180	Remote small town
Rothesay	4750	Remote small town
Total	**46130**	

Road Network and Transport

The topography of the area, together with the relatively dispersed population, means that the majority of transport movements involve long road journeys. Most of the main roads follow the coastline and have to make long detours around the head of extensive sea lochs. The only towns served by the rail network are Oban and Helensburgh. Throughout the area heavy reliance is therefore placed upon road transport, both by the resident population and visitors. Between 1995 and 1997, 82% of the 1.8 million trips made into the Argyll, the Isles, Loch Lomond, Stirling and the Trossachs Tourist Board area were made by road transport. Summertime traffic flows are consequently higher than those experienced during the winter months.

Regular car ferry services connect the larger islands and there are numerous smaller car and passenger ferries serving the smaller islands. In addition, ferry services operate between mainland settlements for commuter, freight and tourist traffic, for example Dunoon to Gourock. The main ferry terminals are located at Hunter's Quay (Dunoon), Oban, Rothesay and Kennacraig.

Airports operating scheduled flights between island and mainland communities are found at Coll, Colonsay, Tiree, Campbeltown, Islay and Oban.

A map showing the location of ferry terminals and airports is included in Appendix C.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) 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.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

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 1.3 Air Quality Objectives included in Regulations for the purpose of LAQM in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	3.25 µg/m^3	Running annual mean	31.12.2011
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 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
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2011
	18 µg/m^3	Annual mean	31.12.2011
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

1.4 Summary of Previous Review and Assessments

Table 1.4 Summary of Previous Reports

Report	Date	Outcome
First Stage Assessment	1998	Further assessment of NO_2 & SO_2 required
Second Stage Assessment (USA)	2003	Detailed assessments required for PM_{10} and SO_2 in relation to the combustion of solid fuel in Tarbert. Further assessment recommended for Port Ellen Maltings.
Detailed Assessment – PM_{10} & SO_2 from solid fuel combustion in Tarbert	2005	Indicated compliance with PM_{10} & SO_2 objectives.
Further Assessment for industrial process at Port Ellen	2005	Recommended monitoring for CO at Port Ellen
Progress Report	2005	Recommended monitoring for CO at Port Ellen
Updating & Screening Assessment	2006	Continue monitoring PM_{10} related to solid fuel combustion at Tarbert and detailed assessment for CO at Port Ellen Maltings
Progress Report & Detailed Assessment	2007	Detailed assessment reported Port Ellen Maltings should comply with CO objective.
Progress Report	2008	Continued monitoring indicates compliance with NO_2, CO & PM_{10} objectives
Updating & Screening Assessment	2009	Continued monitoring indicates compliance with NO_2 CO & PM_{10} objectives
Progress Report	2010	Continued monitoring indicates compliance with NO_2 CO & PM_{10} objectives
Progress Report	2011	Continued monitoring indicates compliance with NO_2 CO & PM_{10} objectives
Updating & Screening Assessment	2012	Continued monitoring indicates compliance with NO_2 & PM_{10} objectives
Progress Report	2013	Continued monitoring indicates compliance with NO_2 objectives

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Previous reports have reported on the Council's monitoring of PM_{10} in Tarbert in support of the assessment of domestic coal combustion. Following the completion of a Detailed Assessment[3] a review of monitoring in 2011 concluded that there was continuing compliance with the PM_{10} objectives. Accordingly, the PM_{10} monitor at Tarbert was decommissioned in June 2012 and there is now no continuous monitoring of any pollutants in Argyll and Bute.

2.1.2 Non-Automatic Monitoring Sites

Argyll and Bute Council undertakes monitoring of nitrogen dioxide using diffusion tubes at 10 sites throughout the district. The diffusion tubes are sited mainly on roads which are perceived to be subject to the highest concentrations due to traffic flow and are perhaps associated with other features such as street canyons. Details of current sites are provided in Table 2.1 and QA/QC procedures are included in Appendix A.

Table 2.1 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure?	Distance to kerb of nearest road	Does this location represent worst-case exposure?
N1	George Street 1, Oban	Roadside	185921	729942	NO_2	N	N	Y (5m)	2m	Y
N2	George Street 2, Oban	Roadside	185870	730319	NO_2	N	N	Y (4m)	9m	Y
N3	George Street 3, Oban	Roadside	185880	730250	NO_2	N	N	Y (4m)	9m	Y
N4	Argyll Street, Dunoon	Roadside	217324	676984	NO_2	N	N	Y (6m)	3m	Y
N5	Main St, Campbeltown	Roadside	171918	620330	NO_2	N	N	Y (1m)	3m	Y
N6	Colchester Sq, Lochgilphead	Roadside	186222	687940	NO_2	N	N	Y (10m)	2m	Y
N7	Inverneil	Rural B'ground	186048	729293	NO_2	N	N	Y (3m)	N/A	Y
N8	East Princes St, Helensburgh	Roadside	229809	682326	NO_2	N	N	Y (12m)	2m	N
N9	Main Road, Cardross	Roadside	234350	677771	NO_2	N	N	Y (6m)	2m	Y
N10	Sinclair Street Helensburgh	Roadside	231925	704478	NO_2	N	N	Y (3m)	2m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Diffusion Tube Monitoring Data

The annual concentrations from diffusion tube monitoring sites (adjusted for bias) are presented in Table 2.3 and a monthly breakdown of results is included in Appendix B. The annual mean concentrations for NO_2 diffusion tubes (adjusted for bias) for the years 2009 to 2013 are presented in Table 2.4 and are shown in graphical format in Appendix B.

Following interference with the Lochgilphead site the tube was moved to a more secure site which is also closer to sensitive receptors and representative of residential property in the area. The results from June 2012 onwards reflect this change and a general increase in readings has been noted due to the more sheltered nature of the site.

Trend lines have been plotted on the graphs where the duration of monitoring and results rendered it meaningful. Table 2.2 summarises the trends none of which are significantly upward. All sites are significantly below the prescribed 40$\mu g/m^3$ prescribed annual mean.

Table 2.2 NO_2 Diffusion Tube Trends to 2013

Site ID	Location	Trend
N1	George Street 1, Oban	Down
N2	George Street 2, Oban	Slightly up
N3	George Street 3, Oban	Slightly down
N4	Argyll Street, Dunoon	Slightly down
N5	Main St, Campbeltown	Very slightly down
N6	Colchester Sq, Lochgilphead	Not plotted
N7	Inverneil	Level
N8	East Princes St, Helensburgh	Down
N9	Main Road, Cardross	Level
N10	Sinclair Street, Helensburgh	Slightly down

Table 2.3 Results of NO_2 Diffusion Tubes 2013

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2013	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.99) 2013 (μg/m^3)
N1	George Street 1, Oban	Roadside	N	N	12 months	N/A	N	22.7
N2	George Street 2, Oban	Roadside	N	N	11 months	N/A	N	26.9
N3	George Street 3, Oban	Roadside	N	N	11 months	N/A	N	26.3
N4	Argyll Street, Dunoon	Roadside	N	N	12 months	N/A	N	18.3
N5	Main St, Campbeltown	Roadside	N	N	12 months	N/A	N	16.5
N6	Colchester Sq, Lochgilphead	Roadside	N	N	12 months	N/A	N	19.5
N7	Inverneil	Rural B'ground	N	N	12 months	N/A	N	2.9
N8	East Princes St, Helensburgh	Roadside	N	N	12 months	N/A	N	14.3
N9	Main Road, Cardross	Roadside	N	N	10 months	N/A	N	16.0
N10	Sinclair Street Helensburgh	Roadside	N	N	12 months	N/A	N	19.7

Table 2.4 Results of NO_2 Diffusion Tubes (2009 to 2013) (See also Figures in Appendix B)

Site ID	Location	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
				2009 (Bias Adjustment Factor = 1.23)	2010 (Bias Adjustment Factor = 1.10)	2011 (Bias Adjustment Factor = 0.94)	2012 (Bias Adjustment Factor = 0.95)	2013 (Bias Adjustment Factor = 0.99)
N1	George Street 1, Oban	Roadside	N	30.5	25.6	23.9	22.9	22.7
N2	George Street 2, Oban	Roadside	N	24.9	24.7	24.1	24.1	26.9
N3	George Street 3, Oban	Roadside	N	27.6	28.0	21.2	22.2	26.3
N4	Argyll Street, Dunoon	Roadside	N	18.5	17.9	15.0	15.0	18.3
N5	Main St, Campbeltown	Roadside	N	25.5	22.2	17.8	17.5	16.5
N6	Colchester Sq, Lochgilphead	Roadside	N	11.8	9.1	10.1	23.4	19.5
N7	Inverneil	Rural B'ground	N	3.1	3.0	2.5	2.6	2.9
N8	East Princes St, Helensburgh	Roadside	N	24.1	19.8	15.6	13.3	14.3
N9	Main Road, Cardross	Roadside	N	20.6	19.4	14.2	13.8	16.0
N10	Sinclair Street Helensburgh	Roadside	N	n/a	21.7	19.2	19.4	19.7

2.2.2 Summary of Compliance with AQS Objectives

Argyll and Bute Council has examined the results from diffusion tube monitoring in the district. Concentrations indicate compliance with the objectives at all sites and therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

Since the last Updating and Screening Assessment there has only been one change to the road network that would be considered to potentially affect air quality. A new supermarket was opened in 2013 on the outskirts of Helensburgh. Due to the relatively small scale of the development and its situation it is not thought that there will be a risk of exceedence of an AQS objective and the site will be considered in the next round of Review and Assessment.

3.2 Other Transport Sources

No new significant transport sources (other than related to road traffic) have been identified since the last Updating and Screening Assessment.

3.3 Industrial Sources

The only newly identified industrial source is the petrol station associated with a new supermarket on the outskirts of Helensburgh. The site will be considered in the next Updating and Screening Assessment.

3.4 Commercial and Domestic Sources

Since the 2013 Progress Report was prepared planning permission for a number of biomass boilers has been granted for schemes in excess of 100kW net thermal input. These individual installations are listed below.

Table 3.1 New biomass boilers >100kW

Site	Rating kW	Stack Height m	Building Height m	Effective Stack Height m	Stack Diameter m
Midton Acrylics, Lochgilphead	165	8.2	4.9	5.5	0.25
Aros Trust Headquarters, Blarbuie Road, Lochgilphead	199	12.6	11.2	2.3	0.25
Cowal Community Hospital, Argyll Street, Dunoon	398	15.6	14.7	1.4	0.35
Campbeltown Hospital, Ralston Road, Campbeltown	398	10.0	6.5	6.7	0.35
Burnside Court, Oban	199	12.5	10	4.2	0.25
Islay Hospital, Bowmore, Isle Of Islay	195	5.0	3.5	2.5	0.25
Former Garage Building, Torrisdale Castle	170	5.5	4.8	1.2	0.25
Castle Lachlan, Strachur	130	5.5	4.9	1.1	0.25
Jeanie Deans Unit, East King Street, Helensburgh	Not confirmed				
Dunstaffnage Mains Farm, Dunbeg, Oban	398	11	3.2	11	0.35

There are no areas where the combined effect of biomass installations is deemed to be significant.

3.5 New Developments with Fugitive or Uncontrolled Sources

There are no new potential major sources of fugitive or uncontrolled emissions of particulate matter. There are a number of new unmetalled access roads associated with forestry extraction or windfarm construction that are of a temporary nature and are hard surfaced with graded and rolled aggregate. These roads are invariably remote, inherently damp and do not threaten to cause breaches of PM_{10} objectives. The Council does not propose to carry out individual assessments of these sources unless particular circumstances indicate that it would be appropriate.

Argyll and Bute Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

- Waitrose supermarket, Craigendoran, Helensburgh (roads & petrol station)
- The sites granted planning permission for the installation of biomass boilers listed in Table 3.1.

These will be taken into consideration in the next Updating and Screening Assessment in 2015.

4 Air Quality Planning Policies

The potential impact of air quality in relation to development planning is covered by Argyll and Bute Council Local Plan Policy ENV 1 – Development Impact on the General Environment. Development plans with a potential significant impact on air quality are raised at the pre-application stage or identified from the weekly planning lists by Environmental Health staff for further assessment. There are no planning applications currently pending that would be likely to affect air quality significantly.

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

The results from the ongoing nitrogen dioxide diffusion tube monitoring exercise and reference to Appendix B shows that no significant rising trends are apparent or that any measured concentrations are close to the annual mean objective.

5.2 Conclusions relating to New Local Developments

Further consideration will be given to new biomass plant listed in Table 3.1 in the 2015 Updating and Screening Assessment. None of the installations described in this report give rise for the need to undertake a Detailed Assessment

5.3 Proposed Actions

The 2014 Progress Report has not identified any need to proceed to a Detailed Assessment for any pollutant. A review of NO_2 diffusion tube monitoring sites will be undertaken in the last quarter of 2014.

The matters considered by this Progress Report will be considered and presented in the Updating and Screening Assessment in April 2015.

6 References

(1) http://www.scotland.gov.uk/Topics/Statistics/About/Methodology/UrbanRuralClassification

(2) http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

(3) Argyll and Bute Council, Local Air Quality Management Progress Report and Detailed Assessment, April 2011

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Nitrogen dioxide diffusion tubes are supplied and analysed by Glasgow Scientific Services. The laboratory scored 100% in the latest WASP assessment dated December 2013. The preparation method used is 20% TEA in water and the 2013 bias adjustment factor of 0.99 was obtained from Spreadsheet Version 03_14[2]. No local co-location studies were available to produce bias adjustment factors.

QA/QC of diffusion tube monitoring

The NO_2 diffusion tubes are supplied and analysed by Glasgow Scientific Services and prepared by using 20% TEA in water. The duration of exposure is normally the 4/5 week period suggested by the calendar provided by Defra. Glasgow Scientific Services have adopted the procedures for preparation and analysis contained in the document "Diffusion Tubes for Ambient NO_2 Monitoring:- Practical Guidance." Section 3 of this document also provides the basis for the operation of the Council's diffusion tube network.

A bias adjustment factor was applied to the annual mean NO_2 concentrations for 2013. The factor of 0.99 was obtained from Spreadsheet Version Number 03_14 downloaded from http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Appendix B: Monitoring Results and Graphs

Table B.1 Monthly Nitrogen Dioxide Diffusion Tube Monitoring Results

2013	George St 1 Oban	George St 2 Oban	George St 3 Oban	Lochgilphead	Campbeltown	Mid Argyll Rural	Dunoon	East Princess St Helensburgh	Sinclair St Helensburgh	Cardross
January	17.2	24.7	22.4	22.6	25.7	4.7	25.6	27.1	22.9	*
February	21.3	22.2	21.4	24.1	21.1	4.0	19.9	22.0	27.2	22.8
March	22.2	18.1	23.0	21.5	19.9	2.0	19.0	16.3	17.6	17.3
April	24.1	26.0	28.6	14.7	16.9	2.2	18.0	12.1	15.4	*
May	26.9	31.9	29.6	19.3	17.3	1.6	16.0	11.8	19.5	12.4
June	27.4	31.6	25.0	20.0	19.4	2.0	22.4	15.2	21.0	15.8
July	20.0	32.2	25.6	12.7	14.4	1.7	14.5	11.2	15.7	13.1
August	24.4	*	25.7	16.1	14.0	2.1	13.5	9.2	15.8	12.9
September	13.7	21.6	*	26.2	17.1	8.8	24.2	13.0	18.6	12.9
October	24.9	29.7	30.0	24.1	17.9	2.6	21.3	16.2	18.5	17.3
November	29.5	32.7	32.7	24.9	20.0	1.6	22.4	25.2	31.2	25.0
December	23.6	27.8	28.2	14.2	13.9	1.7	11.9	11.3	18.2	15.9
Notes: *= no result										

Figure 1 Graph of Annual NO2 trends – Mid-Argyll Area

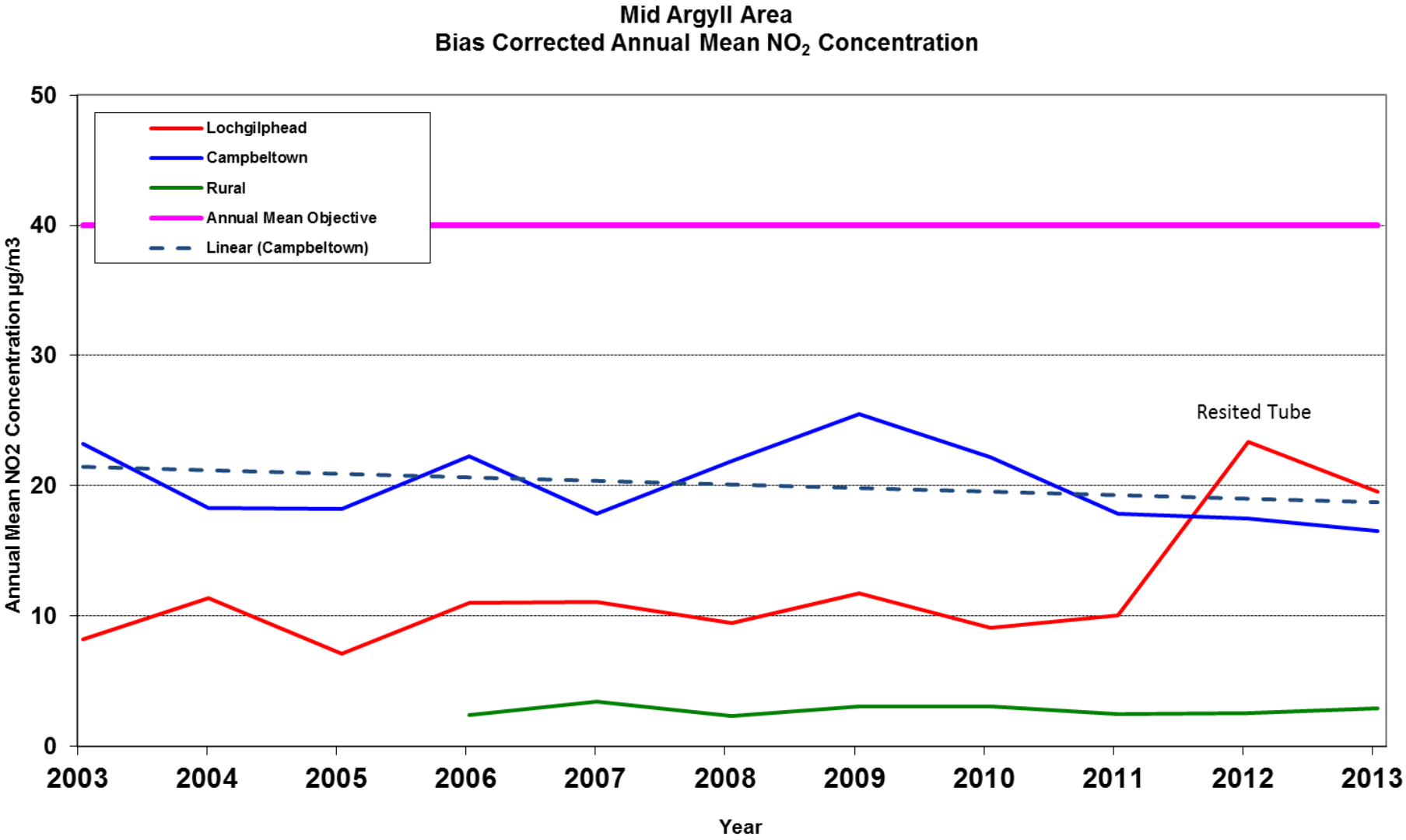


Figure 2 Graph of Annual NO2 trends – Bute and Cowal Area

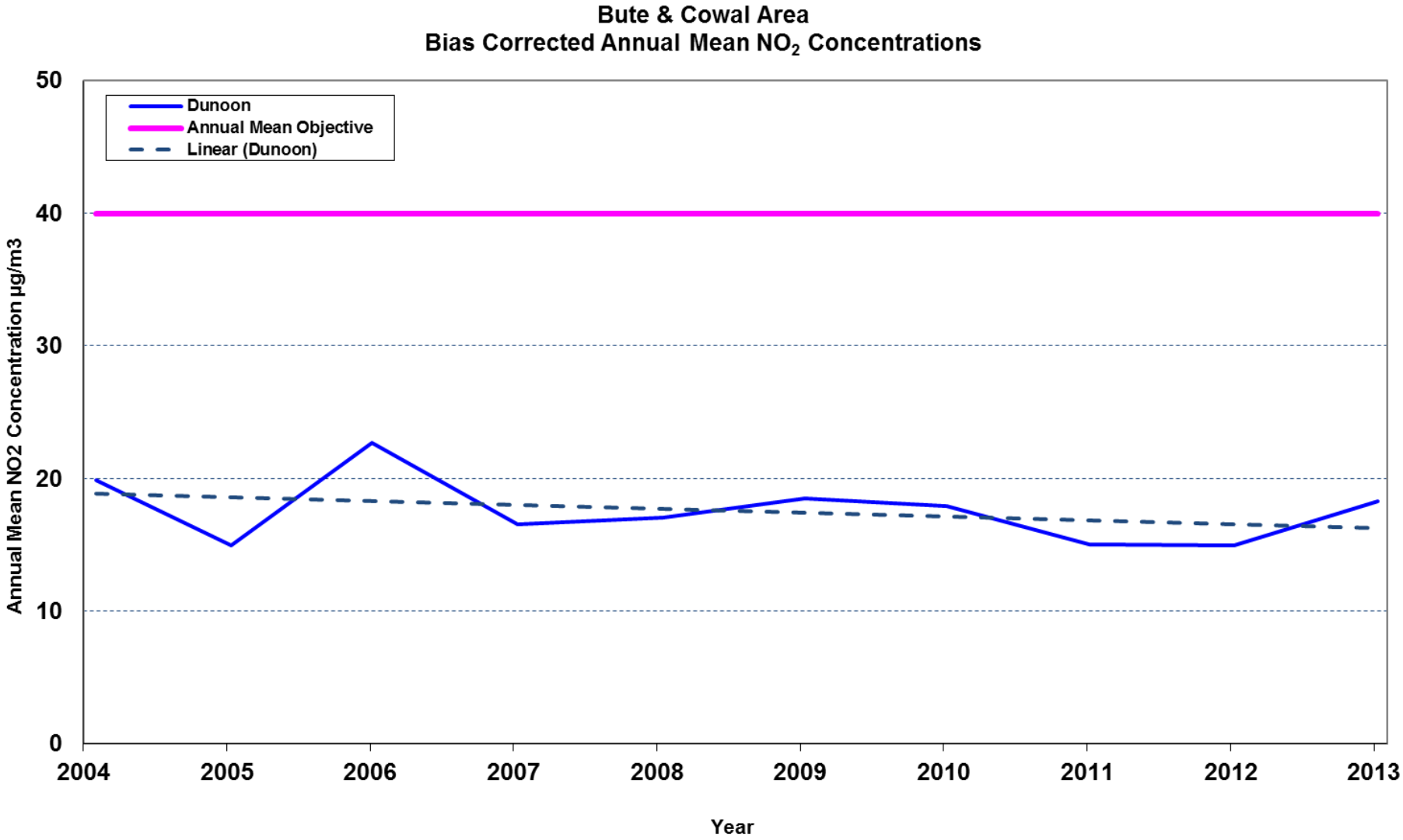


Figure 3 Graph of Annual NO2 trends – Oban, Lorn & Isles Area

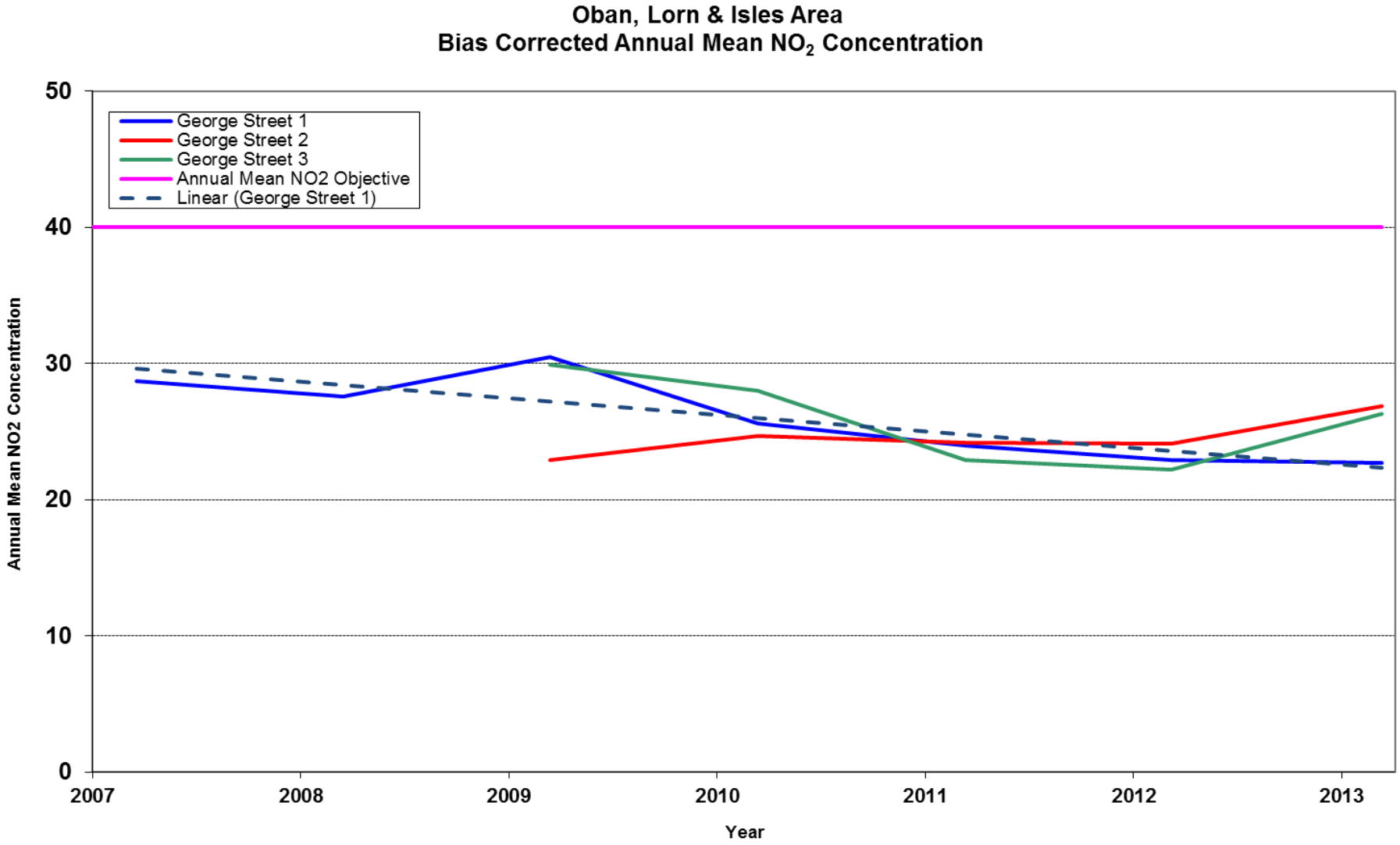
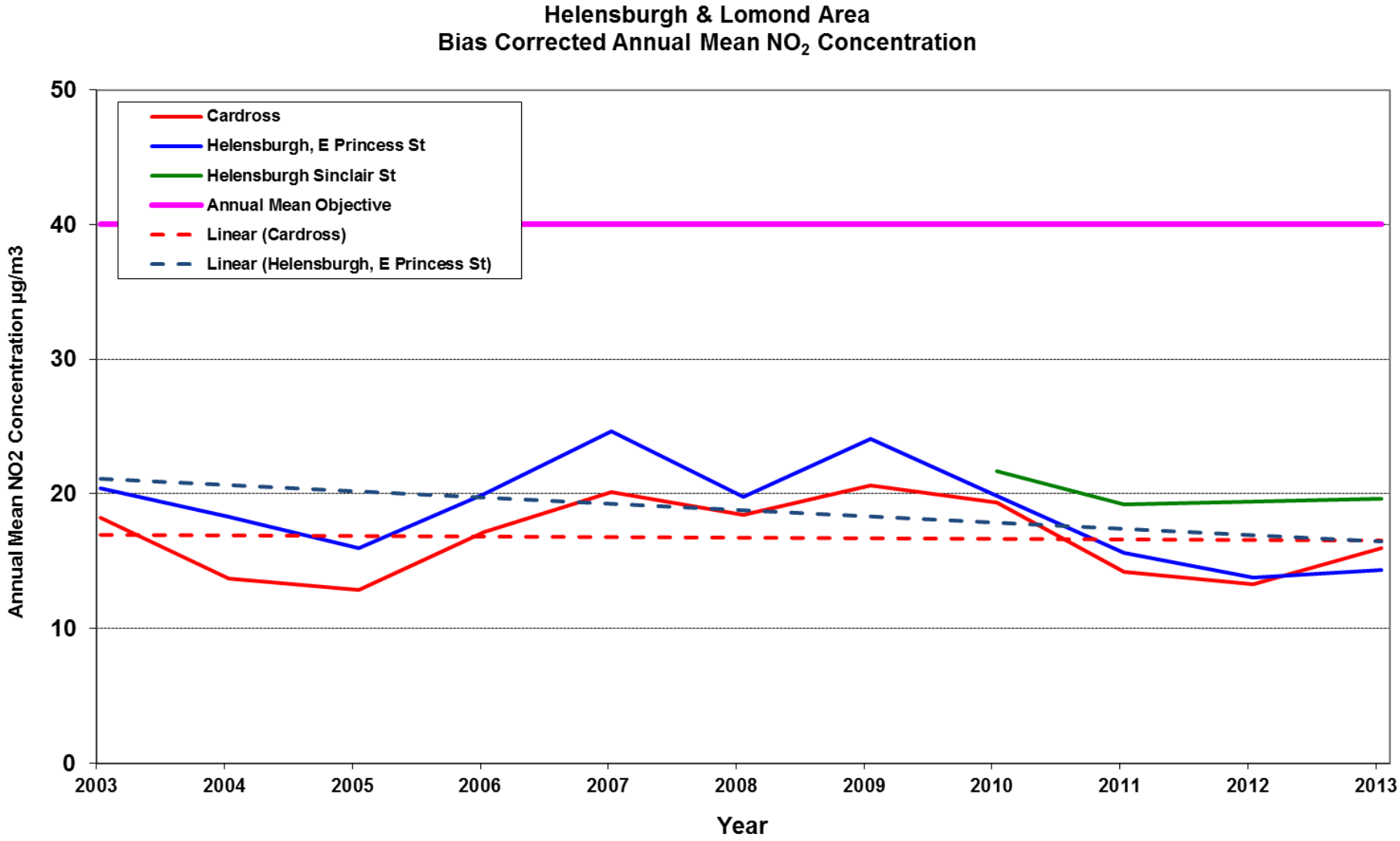


Figure 4 Graph of Annual NO2 trends – Helensburgh and Lomond Area



Appendix C: Maps

Figure 5 Map of Population Distribution & A Roads

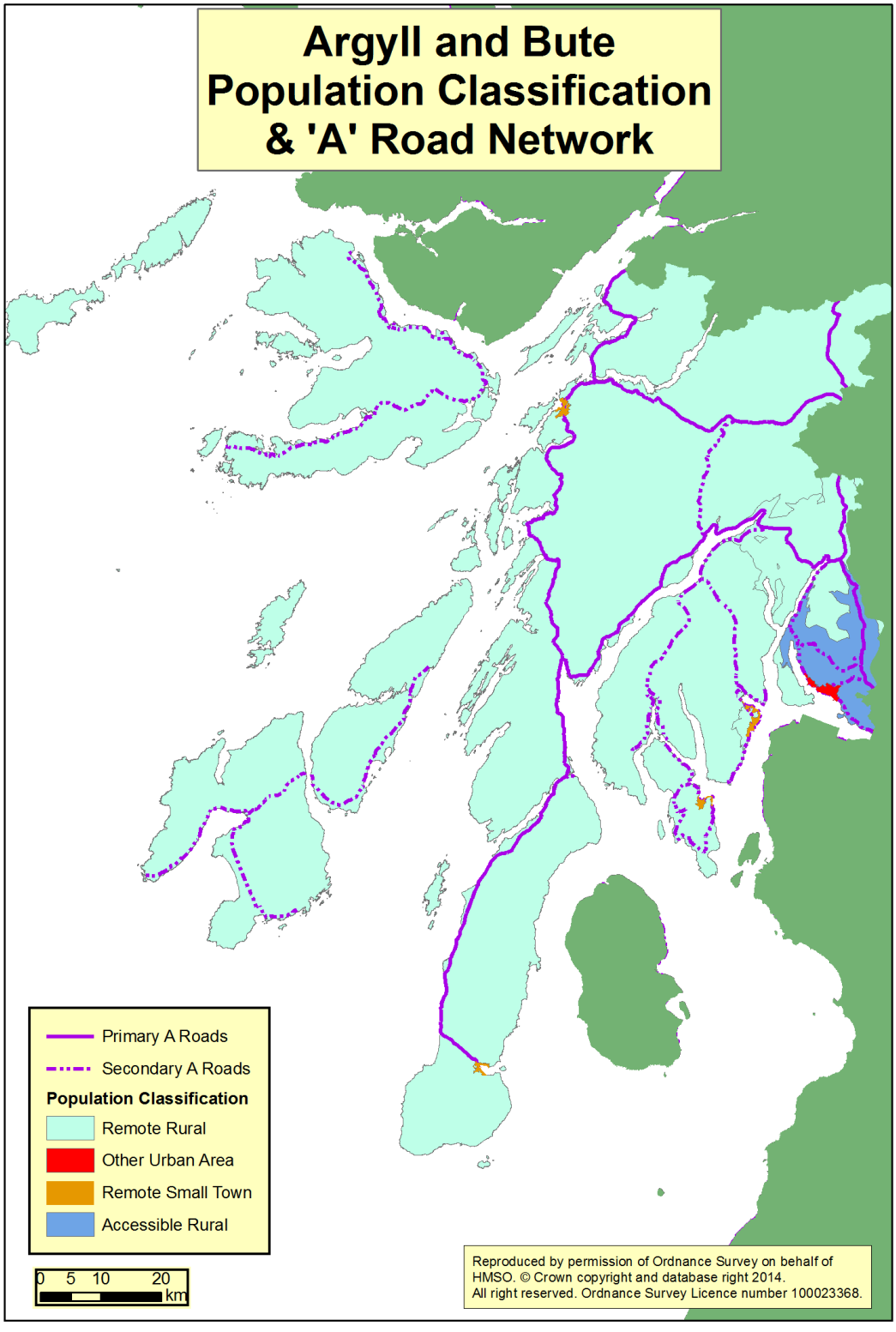


Figure 6 Map of Major Settlements

Figure 7 Map of Railways, Major Ports & Airports

Figure 8 Map of Monitoring Locations

Figure 9 Map of Diffusion Tube Sites, Oban

Figure 10 Map of Diffusion Tube Sites, Helensburgh

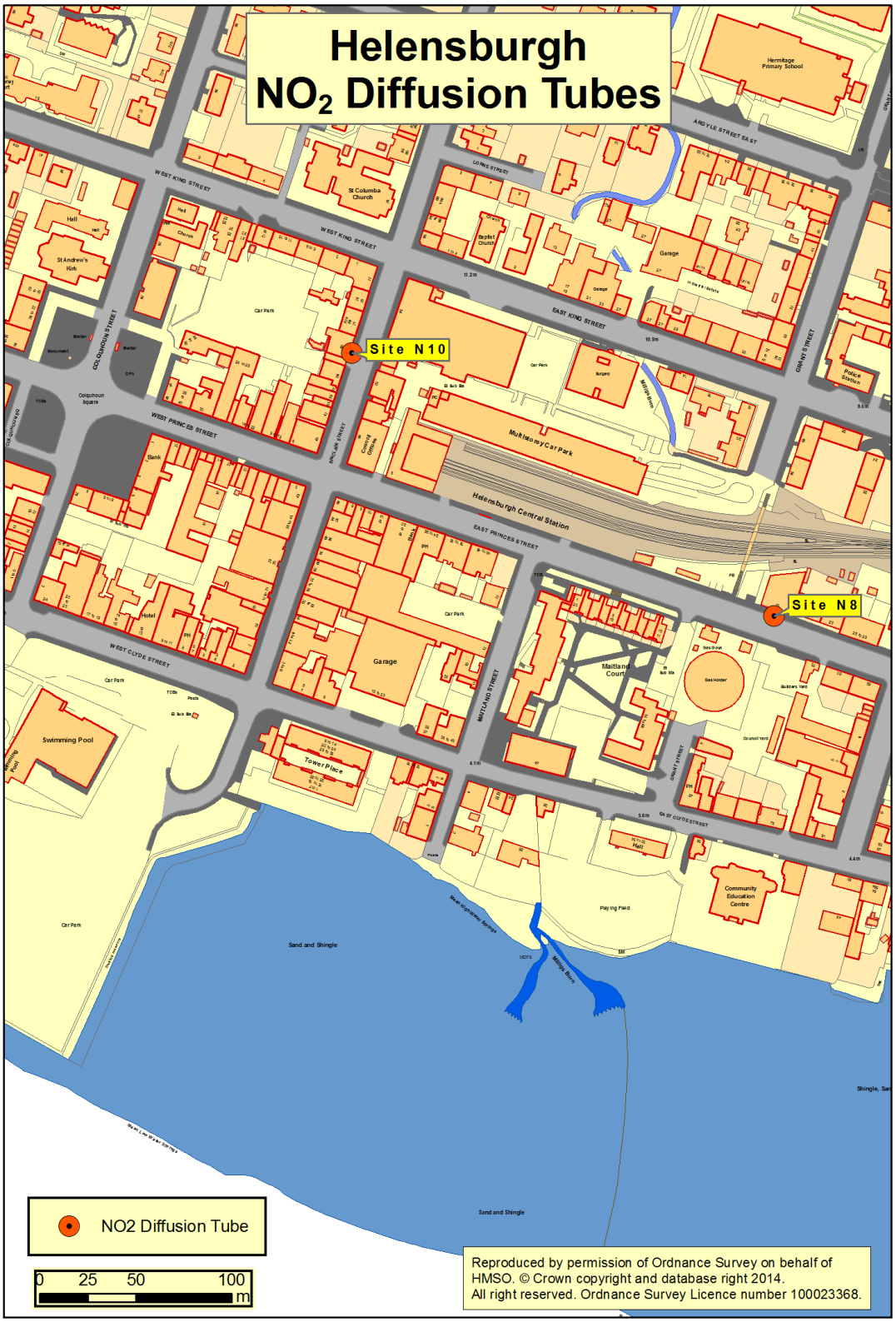


Figure 11 Map of PPC Installations