

Annual Progress Report (APR)



2019 Air Quality Annual Progress Report (APR) for
Inverclyde Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

June 2019

Local Authority Officer	Andrew Lansdowne
Department	Environmental & Public Protection
Address	The James Watt Building 105 Dalrymple Street Greenock PA15 1HU
Telephone	01475 714207
E-mail	Andrew.Lansdowne@inverclyde.gov.uk
Report Reference number	Inverclyde Council Progress Report 2019
Date	June 2019

Executive Summary: Air Quality in Our Area

Air Quality in Inverclyde Council

Inverclyde Council currently monitors the levels of NO₂ throughout the area with a diffusion tube network of 17 sites. There is also an Automatic Air Quality Monitoring Station which records the levels of NO₂, PM₁₀, PM_{2.5} and PM₁ at East Hamilton Street, Greenock.

The results have consistently shown NO₂ and PM₁₀ levels to be below the Air Quality Objectives therefore there has been no requirement to proceed to a Detailed Assessment for any of the pollutants. There has also never been an Air Quality Management Area declared within Inverclyde.

There have been no significant changes to the existing road network identified that could have a negative impact on air quality or any new domestic or industrial sources since the previous report in 2018.

Actions to Improve Air Quality

Inverclyde Council is currently working in conjunction with Strathclyde Partnership for Transport (SPT) in aiming to achieve reduced emissions from road traffic emissions and to support the development of projects that improve traffic management and accessibility, especially for people walking and cycling, within the town centres and between transport hubs and key destinations.

The target set for reducing the Council's carbon emissions is 16% by 2021/22 from a 2007/08 baseline.

Local Priorities and Challenges

Inverclyde Council does not have any specific priorities or challenges for the coming year. Statutory monitoring will continue and the next report to be submitted will be the 2020 Air Quality Annual Progress Report.

How to Get Involved

Air Quality information and Inverclyde Council's Air Quality Annual Progress Reports can be found at the following link on the Inverclyde Council website, www.inverclyde.gov.uk/environment/environmental-health/air-quality ⁽¹⁾

Up to date monitoring results from the automatic monitoring station can be found on the Scottish Air Quality website, www.scottishairquality.scot/ ⁽²⁾

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Inverclyde Council	i
Actions to Improve Air Quality	i
Local Priorities and Challenges	i
How to Get Involved	ii
1. Local Air Quality Management	5
2. Actions to Improve Air Quality	6
2.1 Air Quality Management Areas	6
2.2 Cleaner Air for Scotland	6
2.2.1 Transport – Avoiding travel – T1	6
2.2.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2	9
3. Air Quality Monitoring Data and Comparison with Air Quality Objectives	12
3.1 Summary of Monitoring Undertaken	12
3.1.1 Automatic Monitoring Sites	12
3.1.2 Non-Automatic Monitoring Sites	12
3.2 Individual pollutants	12
3.2.1 Nitrogen Dioxide (NO ₂)	12
3.2.2 Particulate Matter (PM ₁₀)	13
3.2.3 Particulate Matter (PM _{2.5})	13
3.2.4 Sulphur Dioxide (SO ₂)	14
3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene	14
4. New Local Developments	15
4.1 Road Traffic Sources	15
4.2 Other Transport Sources	15
4.3 Industrial Sources	15
4.4 Commercial and Domestic Sources	15
4.5 New Developments with Fugitive or Uncontrolled Sources	15
5. Conclusions and Proposed Actions	16
5.1 Conclusions from New Monitoring Data	16
5.2 Conclusions relating to New Local Developments	16
5.3 Proposed Actions	16
Appendix A: Monitoring Results	17
Appendix B: Full Monthly Diffusion Tube Results for 2018	24

Appendix C: Supporting Technical Information / Air Quality Monitoring

Data QA/QC	26
Appendix D: Maps of Monitoring Locations in Inverclyde.....	28
Glossary of Terms	34
References	35

List of Tables

Table 1.1 – Summary of Air Quality Objectives in Scotland	5
Table A.1 – Details of Automatic Monitoring Sites	17
Table A.2 – Details of Non-Automatic Monitoring Sites	18
Table A.3 – Annual Mean NO ₂ Monitoring Results	20
Table A.4 – 1-Hour Mean NO ₂ Monitoring Results	22
Table A.5 – Annual Mean PM ₁₀ Monitoring Results	22
Table A.6 – 24 Hour Mean PM ₁₀ Monitoring Results	23
Table A.7 – Annual Mean PM _{2.5} Monitoring Results	23
Table B.1 – NO ₂ Monthly Diffusion Tube Results for 2018	24

1. Local Air Quality Management

This report provides an overview of air quality in Inverclyde Council during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Progress Report (APR) summarises the work being undertaken by Inverclyde Council to improve air quality and any progress that has been made.

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO ₂)	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)	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
Particulate Matter (PM _{2.5})	10 µg/m ³	Annual mean	31.12.2020
Sulphur dioxide (SO ₂)	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
Benzene	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	10.0 mg/m ³	Running 8-Hour mean	31.12.2003
Lead	0.25 µg/m ³	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

Inverclyde Council currently does not have any AQMAs.

2.2 Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland's legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available at <http://www.gov.scot/Publications/2015/11/5671/17>. Progress by Inverclyde Council against relevant actions within this strategy is demonstrated below.

2.2.1 Transport – Avoiding travel – T1

Inverclyde has excellent transport connections, with the A8 and A78 trunk roads running through the area, it also has two train lines with fourteen stations, all of which connect Inverclyde with the rest of the Glasgow city-region and beyond. A number of bus companies also operate across Inverclyde, while four ferry services provide connections to various locations in Argyll and Bute.

Inverclyde is also connected by a comprehensive core path network and National Cycle Network routes NCN75 and NCN753, which provide active travel connections to Renfrewshire and Glasgow and Ayrshire.

The Council has identified the need to tackle climate change by cutting transport emissions, reducing the need to travel by car and prioritising sustainable travel modes in its Local Development Plan ⁽³⁾ which was published in 2014.

One of the key objectives in the current Plan is to ensure future developments promote the use of active travel and public transport. It states that planning can improve connectivity and promote sustainable travel by locating new development near active travel and public transport networks, thereby offering people the choice of walking, cycling or using public transport to reach their place of work and local services.

This is also a key theme of the Transport Outcomes Report for Inverclyde 2018⁽⁴⁾ which was published by Strathclyde Partnership for Transport in partnership with Inverclyde Council. It identifies one of the strategic outcomes as 'Achieving Reduced Emissions' by progressing regeneration and place making projects in Greenock and Port Glasgow, with SPT providing funding to support the development of projects that improve traffic management and accessibility, especially for people walking and cycling, within the town centres and between transport hubs and key destinations. This will help to create a healthier population and environment achieved through an improved range and choice of sustainable travel options to encourage individuals to make more trips by walking, cycling and public transport and through supporting cleaner technologies and fuels. Promoting more sustainable travel modes and behaviours supports improved air quality and supports place making initiatives for town centres.

SPT continues to support the regional car sharing scheme, SPT JourneyShare, which had 6,200 active members in 2018 - a 3% increase on the previous year. Inverclyde Council is developing a new Cycling Action Plan and SPT will support the delivery of the Strategy in future years through the capital programme as projects are brought forward.

The Council's original Carbon Management Plan (2007) set a target to reduce carbon emissions from the Council's operations by 15% by the end of financial year 2012/13, using financial year 2007/08 emissions as a baseline. This target was surpassed a year early in 2011/12, with a reduction of 15.9% achieved by the end of the Plan period. The Council then devised a new Carbon Management Plan with a carbon reduction target of 12% by end 2016/17. The plan sought to reduce carbon emissions from the following sources:

- **Energy use in buildings**
- **Energy use for street lighting**
- **Fuel use for fleet transport**
- **Business travel miles**
- **Water use in buildings**
- **Municipal waste**

The Council reduced its carbon emissions by 13.7% over the period 2007/08 to 2016/17.

To continue the process of tackling climate change, the Council has released a Climate Change Plan ⁽⁵⁾. The reason for changing the name from Carbon Management Plan to Climate Change Plan is that this Plan will consider both climate change mitigation and adaptation. The previous Carbon Management Plans were concerned only with mitigation through reducing the Council's carbon emissions. This Climate Change Plan seeks to not only address carbon reduction but to also look at how the Council can adapt to current and future climate change.

In terms of carbon emissions, the Climate Change Plan will continue to target the sources mentioned above. The previous Carbon Management Plans set reduction targets for each of the sources but since carbon is significantly more heavily weighted against some sources, this Plan has adopted a single overall target. The target set for reducing the Council's carbon emissions is 16% by 2021/22 from a 2007/08 baseline.

2.2.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2

The Council's strategic approach to climate change mitigation and adaptation incorporates the following:

Support from Services

To help embed climate change mitigation and adaptation practices throughout the Council, a 'Climate Change and Energy Group' meets regularly. The Group is made up of representatives from Legal and Property Services, ICT, Finance, Regeneration and Planning, and Environmental and Commercial Services. The Group is chaired by the Head of Legal and Property Services and meets bi-monthly to discuss progress against the objectives set out in the Climate Change Plan.

Buildings

Buildings are one of the largest sources of carbon emissions for the Council. The Council continuously reviews its building portfolio to determine opportunities for rationalising and improvement. This is with a view to ensure operations are carried out from only the required number of energy efficient buildings. Energy and water consumption in buildings is monitored via automatic meter reading equipment and Building Energy Management System software.

Street lighting

The Council is currently implementing a programme to replace existing street lamps with Light Emitting Diode (LED) lamps. LED lamps use much less electricity and provide a better quality of light output. The Council further considers possibilities for reducing operation time and dimming lamps.

Fleet management

The Council refreshes its vehicles every five to seven years to ensure they are operationally and fuel efficient. It has purchased 4 electric vehicles and has installed 7 electric vehicle charging points bringing the total number for Public use throughout Inverclyde to 17, there are also a further 3 electric vehicle charging points within a

Council depot for council vehicles only. A driver training programme has been established which incorporates fuel efficient driving. The Council has invested in in-vehicle tracking software to improve management of routes and determine vehicles that may be surplus to requirements.

Waste

Alongside energy use, waste is one of the largest sources of carbon for the Council. The Council has implemented a large waste minimisation and recycling programme in terms of both infrastructure and promotion. The programme included kerbside recycling for various types of waste, education on how to reduce and recycle waste and generating energy from waste. The Council continues to develop ways to further divert waste from landfill.

Climate change awareness

Incorporated in the Green Charter policy is the education of staff on issues concerning climate change. The issues are communicated through a variety of media such as the staff intranet and training software. A number of workshops have been provided to staff on measures they can take to conserve energy and water. Climate change and energy lessons are provided to school pupils to inform them about climate change issues and encourage them to minimise their impacts on climate change.

Continuous improvement

The Climate Change Plan is a working document whereby the Council will continue to develop programmes to reduce its carbon emissions and adapt to climate change. In meetings of the Climate Change and Energy Group, existing projects are evaluated and new projects proposed.

Climate change awareness programmes are ongoing and subject to refinement. The Council regularly attends events concerning climate change, environmental sustainability and utilities with public sector colleagues. Moreover, the Council is represented on the Steering Group of the Sustainable Scotland Network. The Council also works with Resource Efficient Scotland and its utility suppliers to improve monitoring and efficiency.

Inverclyde Council also published guidance in 2015 to supplement the Local Development Plan policy for renewable energy. The document states that the Council will support development required for the generation of energy from renewable sources unless any economic, environmental and social benefits of the proposal are outweighed by significant adverse effects upon a set criteria, air quality being a key consideration.

3. Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

Inverclyde Council undertook automatic (continuous) monitoring at one site during 2018. Table A.1 in Appendix A shows the details of this site. National monitoring results are available at <http://www.scottishairquality.scot/>⁽²⁾.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Inverclyde Council undertook non- automatic (passive) monitoring of NO₂ at 17 sites during 2018. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

The data from the Automatic Monitoring Site shows no exceedances of the hourly mean objective or the annual mean objective in 2018. There were also no exceedances of the annual mean objective at the 17 non-automatic monitoring sites.

In previous years, both automatic and non-automatic monitoring has shown all sites to have concentrations below the annual mean objective with the exception of one diffusion tube at East Hamilton Street, prior to the installation of the automatic monitor.

Data from the diffusion tube located at the nearest residential property at East Hamilton Street has also consistently shown lower values than the diffusion tubes located at the roadside.

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 18µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 7 times per year.

The data from the Automatic Monitoring Site shows no exceedances of the annual mean or daily mean objectives for 2018.

There have been no exceedances of the annual mean or the daily mean since PM₁₀ monitoring was first introduced at the East Hamilton Street site in 2014..

3.2.3 Particulate Matter (PM_{2.5})

Table A.7 in Appendix A shows the ratified and adjusted monitored PM_{2.5} annual mean concentrations for 2018 with the air quality objective of 10µg/m³.

The data from the Automatic Monitoring Site shows no exceedances of the annual mean objectives for 2018.

3.2.4 Sulphur Dioxide (SO₂)

Inverclyde Council does not monitor for SO₂.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

Inverclyde Council does not monitor for Carbon Monoxide, Lead and 1,3-Butadiene

4. New Local Developments

4.1 Road Traffic Sources

Inverclyde Council confirms that there are no road traffic sources that have not been considered in previous rounds of Review and Assessment.

4.2 Other Transport Sources

There are no airports located in Inverclyde and there have been no significant changes in the Shipping Port operations.

4.3 Industrial Sources

There are no new or proposed industrial installations for which an air quality assessment has been carried out in 2018. Inverclyde Council is not aware of any significant changes to existing installations or the introduction of new relevant exposure.

4.4 Commercial and Domestic Sources

There have been no new planning applications approved for the installation of biomass combustion plants since the previous round of Review and Assessment in 2018.

4.5 New Developments with Fugitive or Uncontrolled Sources

Inverclyde Council has not identified any new potential sources of fugitive or uncontrolled particulate matter

5. Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

The 2018 monitoring data has shown that all sites within the NO₂ diffusion tube monitoring network, measured below the annual mean objective of 40 µg/m³.

The automatic monitoring station at East Hamilton Street, Greenock, recorded no exceedances of the hourly and annual mean Objectives for NO₂. The PM₁₀ levels were below the annual mean Objective and there were no exceedances of the daily mean. The PM_{2.5} were below the annual mean Objective.

5.2 Conclusions relating to New Local Developments

Inverclyde Council has not identified any changes to the existing road infrastructure since the last round of Review and Assessment. There have been no biomass plants, industrial installations or fugitive sources identified that are considered likely to impact on local air quality.

5.3 Proposed Actions

Inverclyde Council will continue to monitor NO₂ levels throughout the area using diffusion tubes.

The automatic air quality monitoring station will continue to monitor NO₂, PM₁₀ and additionally PM_{2.5} and PM₁ at East Hamilton Street. The site will be included in the Automatic Urban and Rural Network (AURN) and data available on the Scottish Air Quality website.

The collocation study will continue at the East Hamilton Street with data from the automatic monitoring station used in combination with the three NO₂ diffusion tubes to develop a local bias adjustment factor.

The next report to be submitted will be the 2020 Air Quality Annual Progress Report.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
Inverclyde Greenock A8	Roadside	229365	675700	NO ₂ , PM ₁₀ , PM _{2.5} , PM ₁	N	TEOM	12	2.5	1.8

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Details of Non-Automatic Monitoring Sites

Carwood Court	Roadside	229503	675400	NO ₂	N	Y(13.5m)	5m	N
Brown Street, PG	Roadside	231699	674620	NO ₂	N	Y (1m)	1m	N
Bridge of Weir Rd	Roadside	235824	669909	NO ₂	N	Y(1m)	1m	N
East Hamilton Street (1)	Roadside	229365	675700	NO ₂	N	Y(12m)	2.5m	Y
East Hamilton Street (2)	Roadside	229365	675700	NO ₂	N	Y(12m)	2.5m	Y
East Hamilton Street (3)	Roadside	229365	675700	NO ₂	N	Y(12m)	2.5m	Y
East Hamilton Street (property)	Roadside	229301	675712	NO ₂	N	Y (0m)	14.25m	N
Dellingburn St	Roadside	228422	675735	NO ₂	N	Y(3.5m)	5m	N
Dalrymple St	Roadside	228311	675993	NO ₂	N	Y(15m)	3m	N
Inverkip St	Roadside	227563	676246	NO ₂	N	Y(1m)	2.5m	N
Dunlop St	Roadside	226827	675622	NO ₂	N	Y (4m)	2m	N
Nelson St	Roadside	227092	676134	NO ₂	N	Y(1m)	5m	N

Inverclyde Council

Inverkip Rd	Roadside	224441	675224	NO ₂	N	Y(15m)	4m	N
Larkfield Rd	Roadside	224869	675757	NO ₂	N	Y(3m)	2m	N
Main St, WB	Roadside	219407	668573	NO ₂	N	Y(1m)	2m	N
Kempock St,	Roadside	224097	677910	NO ₂	N	Y(1m)	1m	N
Cardwell Rd	Roadside	224664	677168	NO ₂	N	Y(3m)	4m	N
Newark St	Roadside	225460	677501	NO ₂	N	Y(1m)	5m	N
Brougham St	Roadside	227242	677032	NO ₂	N	Y(7m)	5.5m	N
MacDougall St	Roadside	229605	675593	NO ₂	N	Y(13m)	3m	N

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
Inverclyde Greenock A8	Roadside	Automatic	99.6	27.0	28.0	28.0	28.0	32
Carwood Court	Roadside	Diffusion Tube	100	9.8	10.2	10.6	9.8	10.5
Brown Street, PG	Roadside	Diffusion Tube	100	19.0	19.1	20.8	18.1	17.7
Bridge of Weir Rd	Roadside	Diffusion Tube	100	15.2	14.8	16.1	15.1	14.0
East Hamilton Street (1)	Roadside	Diffusion Tube	100	34.3	29.4	34.1	34.7	31.6
East Hamilton St (2)	Roadside	Diffusion Tube	100	31.8	31.3	34.1	36.0	35.1
East Hamilton St (3)	Roadside	Diffusion Tube	100	30.3	31.5	29.7	35.0	33.9
East Hamilton St (property)	Roadside	Diffusion Tube	100	19.8	21.0	21.7	22.0	20.4
Dellingburn St	Roadside	Diffusion Tube	100	30.1	33.2	34.3	33.5	29.3
Dalrymple St	Roadside	Diffusion Tube	100	23.9	21.5	23.4	22.5	23.8
Inverkip St	Roadside	Diffusion Tube	100	31.9	28.9	27.5	27.4	27.6
Dunlop St	Roadside	Diffusion Tube	100	17.4	16.3	18.3	19.2	16.1

Site ID	Site Type	Monitoring Type	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
Nelson St	Roadside	Diffusion Tube	100	28.9	26.4	25.3	26.4	24.9
Inverkip Rd	Roadside	Diffusion Tube	100	19.5	19.7	19.9	19.7	18.9
Larkfield Rd	Roadside	Diffusion Tube	100	16.8	17.7	18.2	20.5	17.0
Main St, WB	Roadside	Diffusion Tube	100	14.4	14.3	13.6	14.1	12.7
Kempock St,	Roadside	Diffusion Tube	100	18.2	20.0	14.4	14.7	14.6
Cardwell Rd	Roadside	Diffusion Tube	100	24.1	26.0	22.8	24.7	25.3
Newark St	Roadside	Diffusion Tube	100	14.7	16.4	15.1	19.9	15.2
Brougham St	Roadside	Diffusion Tube	100	15.1	21.8	20.7	24.9	24.7
MacDougall St	Roadside	Diffusion Tube	100	20.0	20.8	23.0	21.2	21.5

Notes: Exceedences of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedence of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(16)⁽⁸⁾ if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site Name	Site Type	Monitoring Type	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
				2014	2015	2016	2017	2018
Inverclyde Greenock A8	Roadside	Automatic	99.6	0	0	0	0 (99)	0

Notes: Exceedences of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site Name	Site Type	Monitoring Type	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
Inverclyde Greenock A8	Roadside	Automatic	99.9	16	15	11	10	12

Notes: Exceedences of the PM₁₀ annual mean objective of 18µg/m³ are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per LAQM.TG(16)⁽⁸⁾, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site Name	Site Type	Monitoring Type	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾ ⁽³⁾				
				2014	2015	2016	2017	2018
Inverclyde Greenock A8	Roadside	Automatic	99.9	0	2	0	0	0

Notes: Exceedences of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 7 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 98.1st percentile of 24-hour means is provided in brackets

Table A.7 – Annual Mean PM_{2.5} Monitoring Results

Site Name	Site Type	Monitoring Type	Valid Data Capture 2018 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
Inverclyde Greenock A8	Roadside	Automatic	99.9	xxx	xxx	xxx	5	6

Notes: Exceedences of the PM₁₀ annual mean objective of 10µg/m³ are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per LAQM.TG(16)⁽⁸⁾, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO₂ Monthly Diffusion Tube Results for 2018

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
Carwood Court	18.8	16.2	16.6	13.2	12.2	2.7	6.8	6.0	6.4	11.1	16.3	19.9	12.2	9.6
Brown St.	24.3	26.4	29.7	24.0	21.9	5.5	10.4	9.2	11.1	2.0	51.0	31.1	20.6	16.2
Bridge of Weir Rd.	22.4	22.0	23.7	16.4	17.2	4.3	9.3	8.2	9.6	14.8	23.9	23.7	16.3	12.9
E. Ham St.	40.8	42.1	42.4	43.0	41.1	2.3	31.4	27.8	25.9	55.6	41.4	47.0	36.7	29.0
E. Ham St. 2	49.9	41.8	46.7	44.2	44.4	35.3	31.7	28.0	32.9	46.6	43.5	44.6	40.8	32.2
E. Ham St. 3	42.3	39.4	51.5	44.1	48.5	20.5	36.9	32.7	24.5	43.1	41.3	48.3	39.4	31.1
E. Ham St. (prop)	28.4	31.2	28.6	27.8	22.1	9.6	14.1	12.5	20.0	26.7	29.2	33.8	23.7	18.7
Dellingburn St.	47.4	45.4	30.2	41.9	34.1	10.1	26.8	23.7	30.6	38.4	39.5	40.2	34.0	26.9
Dalrymple St.	34.0	32.3	34.0	28.9	33.2	11.1	15.0	13.3	17.4	28.4	44.2	40.0	27.7	21.8
Inverkip St.	40.4	42.4	45.2	38.3	30.9	12.2	17.3	15.3	24.2	36.0	41.9	41.7	32.2	25.4
Dunlop St.	28.3	21.0	18.0	24.7	20.2	4.0	14.0	12.4	12.5	16.4	27.5	25.6	18.7	14.8
Nelson St.	35.0	36.8	41.5	34.9	32.9	9.8	19.4	17.2	19.4	26.0	36.8	37.5	28.9	22.9
Inverkip Rd.	30.4	23.9	27.0	25.6	16.1	10.7	17.6	15.6	17.2	21.4	26.8	30.8	21.9	17.3
Larkfield Rd.	25.2	26.6	24.9	19.9	18.4	5.0	17.4	15.4	13.5	22.1	23.2	25.4	19.8	15.6
Main St. WB	18.1	18.2	19.5	18.7	11.8	8.9	12.2	10.8	10.3	12.5	18.4	18.0	14.8	11.7
Kempock St.	22.2	19.6	22.7	16.9	21.3	15.3	10.0	8.9	8.3	12.3	22.4	23.6	17.0	13.4

Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
Cardwell Rd.	35.6	33.6	32.7	31.4	27.1	22.2	27.2	24.1	21.9	27.0	32.3	38.4	29.5	23.3
Newark St.	24.9	20.7	18.1	18.2	17.3	10.4	13.5	11.9	11.9	15.6	20.0	29.9	17.7	14.0
Brougham St.	30.5	32.4	36.7	31.5	29.2	20.2	23.1	20.5	25.4	24.8	33.5	36.8	28.7	22.7
MacDougall St.	28.6	31.4	42.4	27.8	27.6	24.4	16.4	14.5	16.0	18.7	25.5	27.1	25.0	19.8

(1) See Appendix C for details on bias adjustment

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

Glasgow Scientific Services supply and analyse the NO₂ diffusion tubes on a monthly basis. The preparation method used for NO₂ diffusion tubes is 20% TEA in Water. The Laboratory has adopted the procedures for preparation and analysis of the diffusion tubes contained in the document 'Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance' ⁽⁶⁾

There are 3 diffusion tubes currently located at the automatic monitoring site at East Hamilton Street.

The National Bias adjustment factor of 0.86 for 2018 was obtained from the Scottish Air Quality website ⁽⁷⁾. The Local Bias adjustment factor of 0.79 was obtained from the DEFRA website and also using monthly period mean data from the Scottish Air Quality website. ⁽⁹⁾ For the purposes of this report, the Local Bias adjustment factor of 0.79 has been used (with 95% confidence interval accuracy using 11 periods of data with 'good' precision overall).

PM Monitoring Adjustment

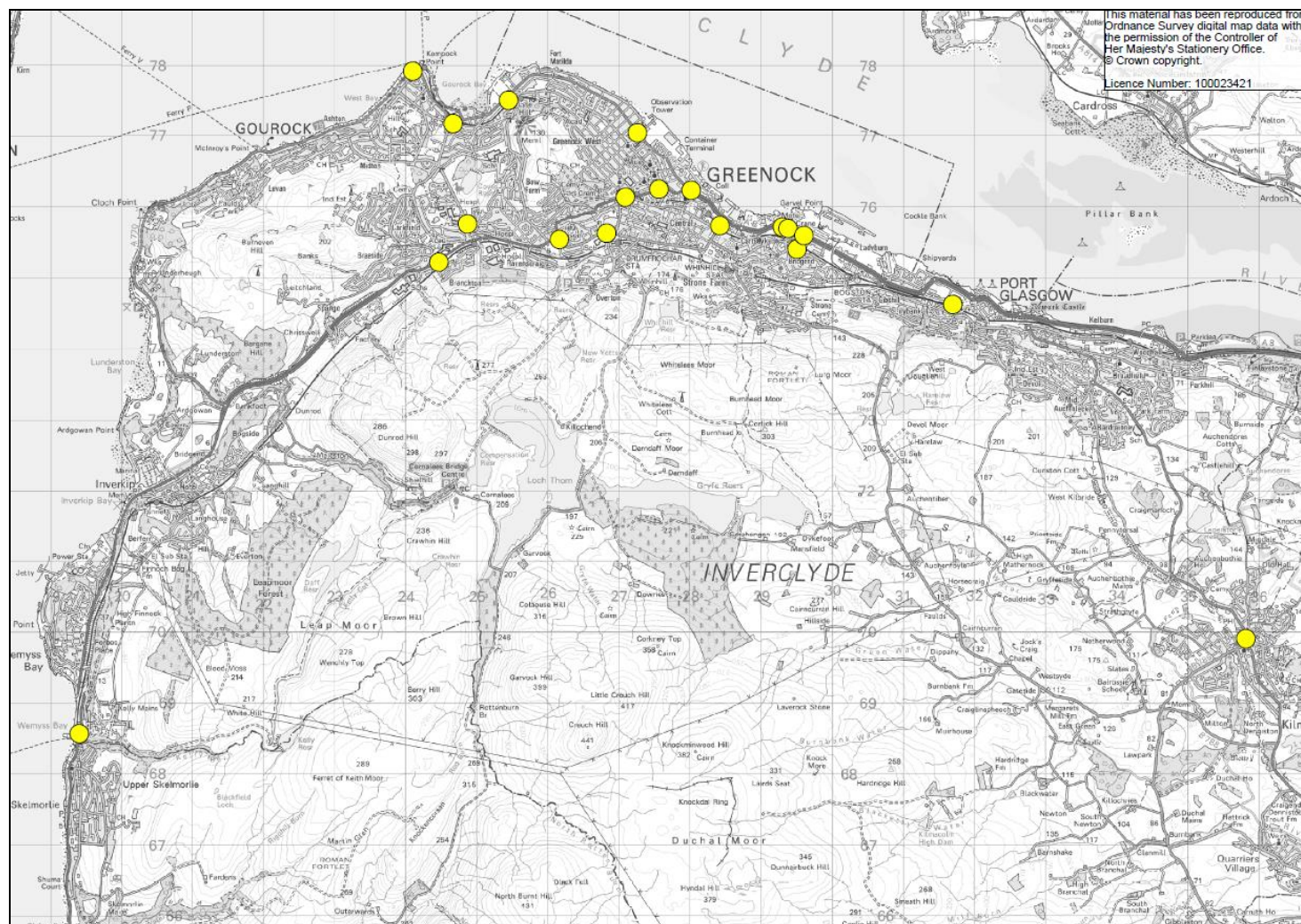
The PM₁₀ data contained in this report has been obtained from the Scottish Air Quality website ⁽²⁾. The data provided is the VCM corrected data from the TEOM within at the automatic monitoring site at East Hamilton Street, Greenock.

QA/QC of automatic monitoring

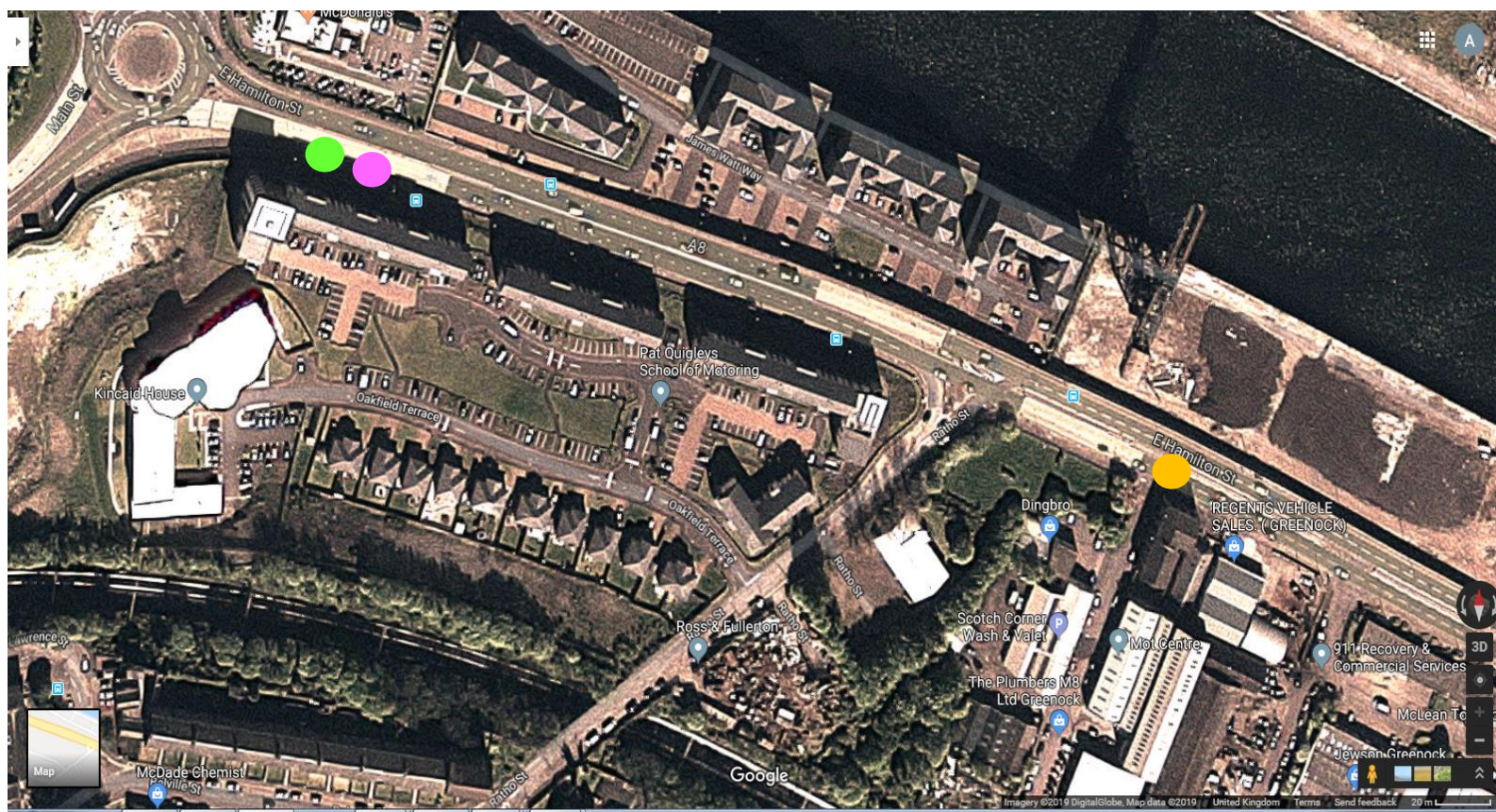
The automatic monitoring site at East Hamilton Street contains one NO_x/NO₂ analyser and one TEOM Ambient Particulate Monitor. Throughout 2018 site audits and calibrations were undertaken by Ricardo AEA and services carried out every 6 months by Air Monitors. Fortnightly manual calibrations were carried out by Inverclyde Council.

The site is included in the UK Automatic Urban and Rural Network (AURN) and the data is available through the Scottish Air Quality website⁽²⁾

Appendix D: Maps of Monitoring Locations in Inverclyde

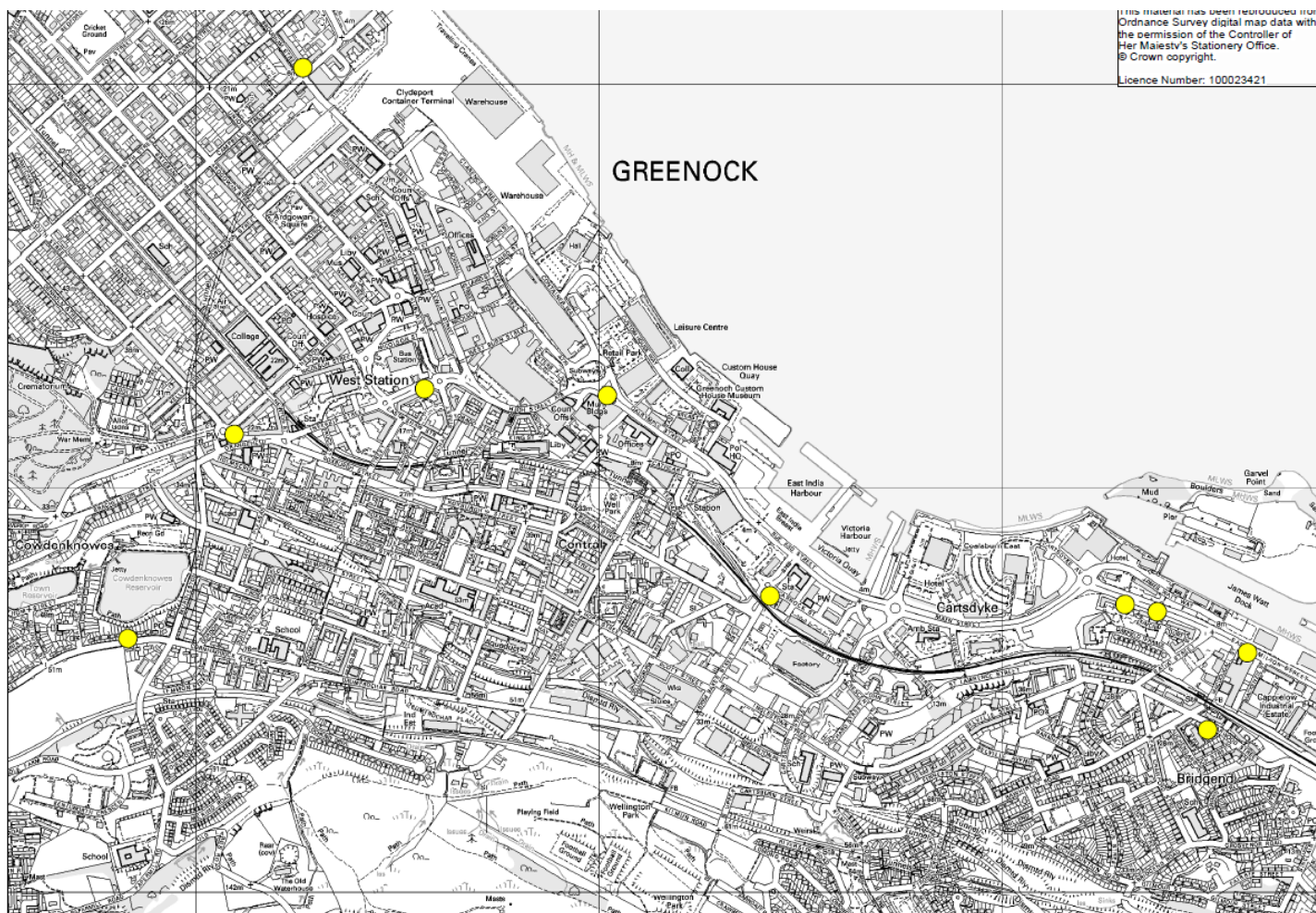


Map of Automatic Air Monitoring Site and Collocation study at East Hamilton Street

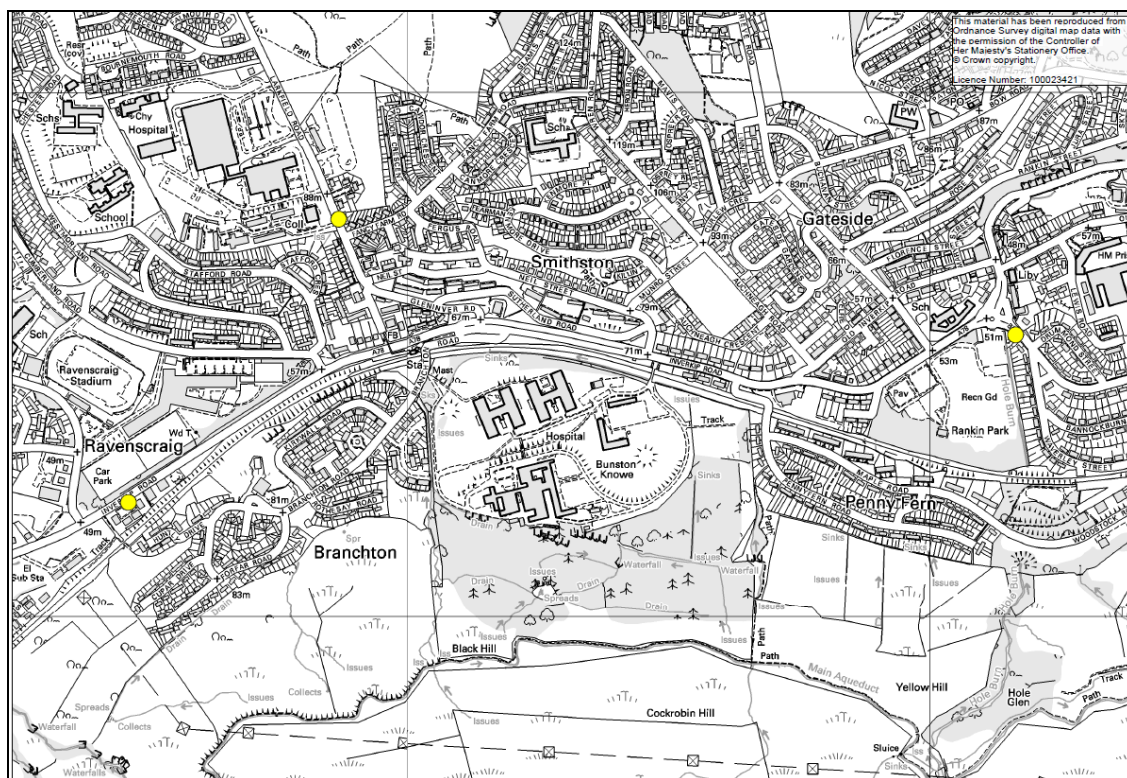


- NO₂ diffusion tube at façade of nearest property (East Hamilton Street)
- Automatic Air Quality Monitor with 3 x NO₂ diffusion tubes (East Hamilton Street)
- 1 x NO₂ diffusion tube (MacDougall Street)

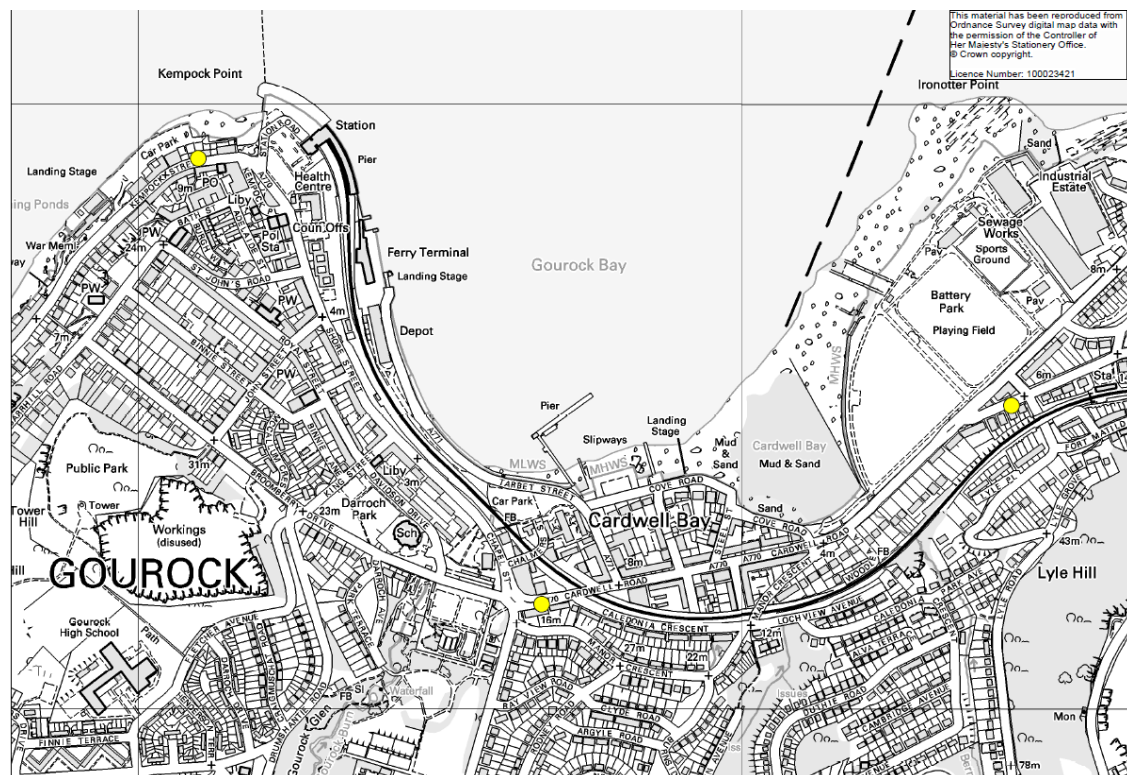
Map of NO₂ Diffusion Tube Monitoring Network: Greenock Central



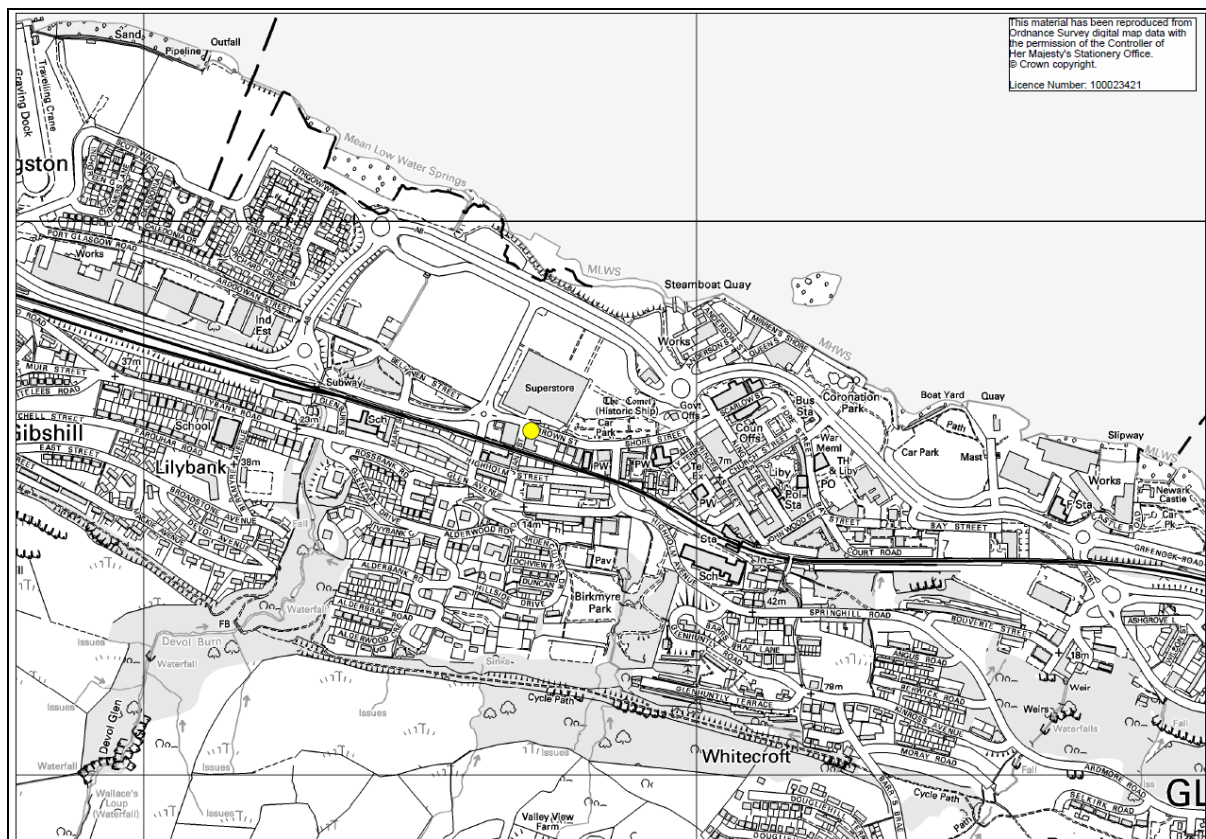
Map of NO₂ Diffusion Tube Monitoring Network: Greenock South



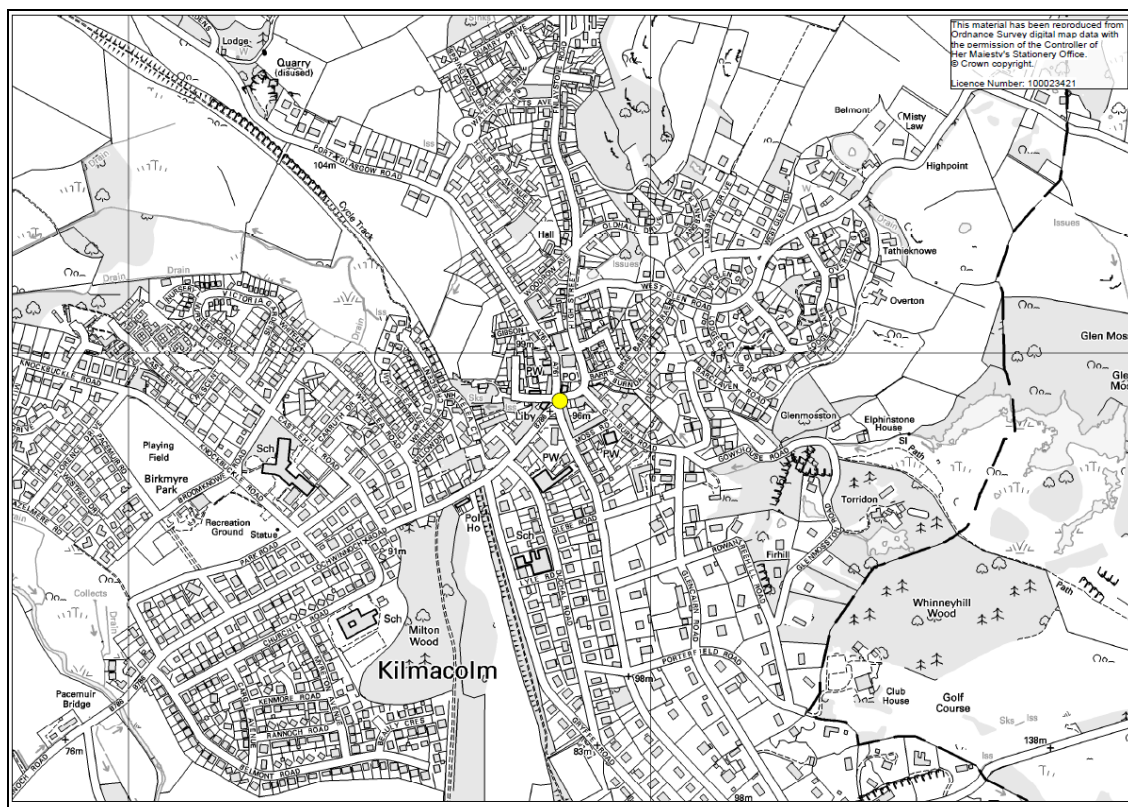
Map of NO₂ Diffusion Tube Monitoring Network: Gourock/Greenock West



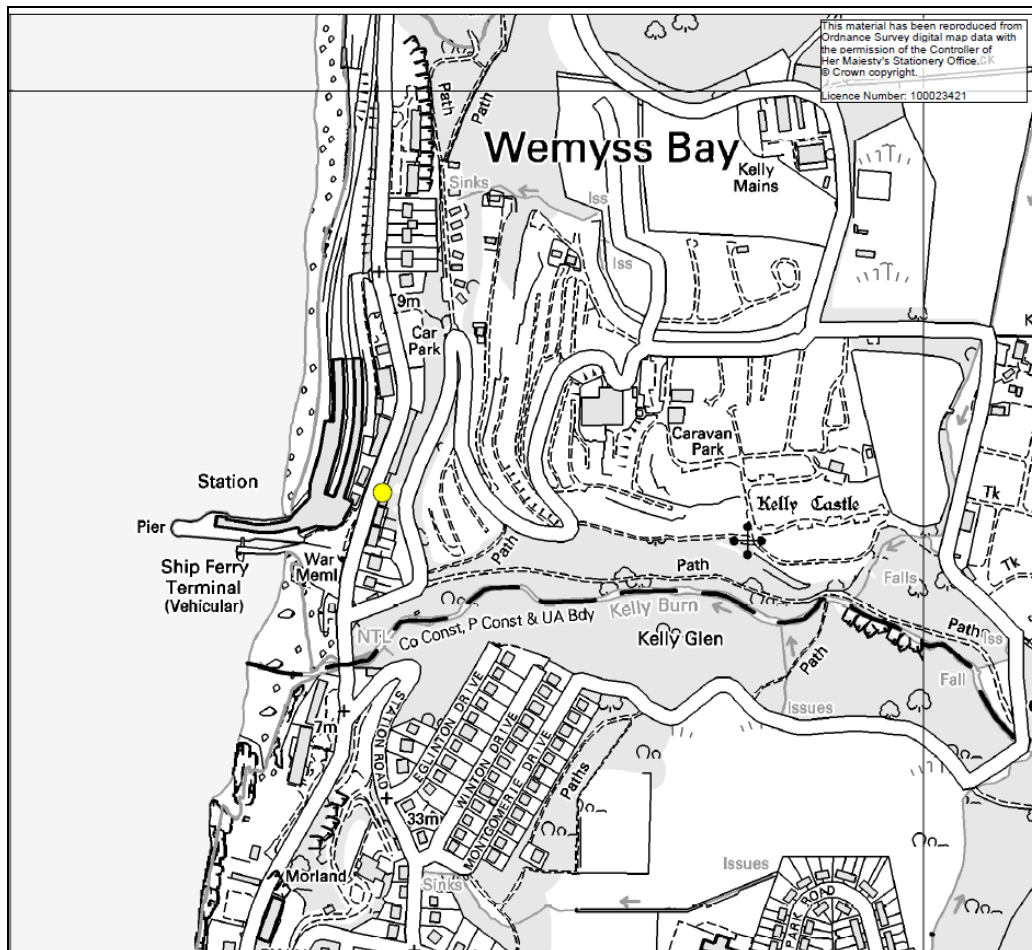
Map of NO₂ Diffusion Tube Monitoring Network: Port Glasgow



Map of NO₂ Diffusion Tube Monitoring Network: Kilmacolm



Map of NO₂ Diffusion Tube Monitoring Network: Wemyss Bay



Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

- 1 Inverclyde Council Air Quality
(www.inverclyde.gov.uk/environment/environmental-health/air-quality)
- 2 Scottish Air Quality Website (www.scottishairquality.scot/)
- 3 Inverclyde Council Local Development Plan 2014 (www.inverclyde.gov.uk/ldp)
- 4 Transport Outcomes Report for Inverclyde 2018, Strathclyde Partnership for Transport (www.spt.co.uk)
- 5 Inverclyde Council Climate Change Plan 2018
(www.inverclyde.gov.uk/planning-and-the-environment/climate-change/climate-change-plan)
- 6 GSS Diffusion Tubes for Ambient NO₂ Monitoring Practical Guidance
- 7 Scottish Air Quality National Bias Adjustment factor, Spreadsheet Version
Number 03/19, (www.scottishairquality.scot/laqm/tools)
- 8 Part IV of the Environment Act 1995 Local Air Quality Management Technical
Guidance LAQM.TG(16), DEFRA, April 2016
- 9 DEFRA Local Bias Adjustment factor Spreadsheet AEA_DifTPAB_v04(4)
<https://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html>