

CYNGOR BWRDEISTREF SIROL RHONDDA CYNON TAF
RHONDDA CYNON TAF COUNTY BOROUGH

2023 Adroddiad Cynnydd o Ansawdd Aer

Medi 2023

2023 Air Quality Progress Report

September 2023



Wrth gyflawni Rhan IV o Ddeddf yr Amgylchedd 1995
Rheoli Ansawdd Aer Lleol

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

Mae'r Adroddiad ar Gynnydd 2023 wedi ei baratoi a'i gyhoeddi gan Gyngor Bwrdeistref Sirol Rhondda Cynon Taf yn unol â'i ddyletswyddau o dan Adran IV o Ddeddf yr Amgylchedd 1995. Oni nodir fel arall, barn a sylwadau Cyngor Bwrdeistref Sirol Rhondda Cynon Taf sy'n cael eu mynegi yn yr Adroddiad ar Gynnydd 2023.

Yn unol â Chynllun y Gymraeg 2023, ystyrir y ddogfen yma'n un dechnegol a fyddai o ddiddordeb i gynulleidfa fach o bobl yn unig, ac felly mae'i chyhoeddi yn y Saesneg. Fodd bynnag, bydd modd gofyn am fersiwn Gymraeg ohoni.

The 2023 Progress Report has been produced and issued by Rhondda Cynon Taff County Borough Council in fulfilment of its duties under Part IV of the Environment Act 1995. Unless otherwise stated all opinions and views contained within the 2023 Progress Report are that of Rhondda Cynon Taff County Borough Council only.

In accordance with Rhondda Cynon Taff's Welsh Language Scheme, the 2023 Progress Report is deemed to be a technical document of limited public interest and has therefore been produced in English. A Welsh version, however, can be made available on request.

Local Authority:	Rhondda Cynon Taf County Borough Council
Local Authority Officer:	Neil Pilliner Environmental Protection & Housing Standards Manager
Department:	Public Health and Protection
Address:	Ty Elai Dinas Isaf East Williamstown Tonypany CF40 1NY
Telephone:	01443 425001
E-mail:	EnvironmentalPollution@rhondda-cynon-taff.gov.uk
Report Ref. No.:	2023PR
Date:	28 September 2023

1. Crynodeb Gweithredol: Ansawdd Aer yn Ein Hardal

1.1 Ansawdd Aer yn Rhondda Cynon Taf

Mae Cyngor Bwrdeistref Sirol Rhondda Cynon Taf [yr Awdurdod Lleol] yn cydnabod bod modd i ansawdd aer gwael effeithio ar iechyd pobl a bod modd i ansawdd aer da fod yn bwysig o ran gwella hyd ac ansawdd bywyd, amwynder y gymuned leol a'r amgylchedd yn ehangach.

Yn ôl y gyfraith, mae angen i'r Awdurdod Lleol fesur ansawdd aer yn rheolaidd yn ei ardal mewn perthynas â'r Amcanion Ansawdd Aer. Wrth wneud hynny, mae'r Awdurdod Lleol wedi amlygu dau lygrydd aer – nitrogen deuocsid [NO₂] a deunydd gronynnol mân [PM₁₀] – y mae angen eu harchwilio'n fwy manwl. Mae Adroddiad Cynnydd Ansawdd Aer 2023 yn cynnwys asesiad o ddata monitro diweddar ar gyfer NO₂ a PM₁₀ a gasglwyd yn ystod 2022, yn ogystal ag adolygiad o ddatblygiadau wedi eu caniatáu yn ddiweddar, manau o ddi-ddordeb parhaus a newydd, a pholisïau perthnasol yr Awdurdod Lleol.

Mae'n wir bod gan y rhan fwyaf o sir Rhondda Cynon Taf ansawdd aer sy'n cydymffurfio ac mae hynny'n debygol o barhau yn y dyfodol, ac efallai y bydd yn parhau i wella. Dim ond rhai ardaloedd bach sy'n gysylltiedig â chyffyrdd ffyrdd trefol prysur, y rhwydwaith ffyrdd rhanbarthol neu ffynonellau lleol penodol sy'n debygol o gael ansawdd aer nad yw'n cydymffurfio. Credir bod yr ardaloedd sydd mewn perygl – ardaloedd sydd yn hanesyddol yn gysylltiedig â lefelau uwch o NO₂ – eisoes wedi cael eu henwi'n [Ardaloedd Rheoli Ansawdd Aer](#) [ARhAA] ac, yn wahanol i'r rhan fwyaf o'r lleoliadau, mae'n bosibl fydd ansawdd aer yn yr ardaloedd yma ddim yn gwella mor gyflym ag ardaloedd eraill yn y tymor canolig.

Mae gyda Rhondda Cynon Taf 16 ARhAA, fel sydd wedi'u rhestru yn Appendix D1: AQMA Boundary Maps, sydd i gyd yn ymwneud ag achosion o dorri Amcanion Ansawdd Aer ar gyfer NO₂. Mae'r ARhAA yma o faint penodol ac maen nhw wedi'u gwasgaru ar hyd a lled y Fwrdeistref. Mae gwaith monitro diweddar yn cefnogi'r ddealltwriaeth bod ARhAA Canol Tref Aberdâr, Broadway, Pentre'r Eglwys, Cilfynydd, Llanharan, Llwynypia, Mwyndy, Nantgarw, Trefforest a Thonyrefail i'w gweld yn debygol o gydymffurfio'n gynaliadwy â'r Amcanion Ansawdd Aer blynnyddol ar gyfer NO₂ yn y tymor byr. Y disgwyl yw ei bod hi'n bosibl y bydd adolygiadau manwl o'r ARhAA yma'n cael eu cynnal dros y blynnyddoedd nesaf, a hynny er mwyn penderfynu a yw'r ardaloedd daearyddol yn parhau i gydymffurfio ac a oes angen diwygio pob ARhAA neu hyd yn oed eu dirymu.

Mae ARhAA Cymer, Glynrhedynog, Canol Tref Aberpennar, Nightingales Bush, Canol Tref Pontypridd a Tylorstown i'w gweld yn debygol o barhau i beidio â chydymffurfio â'r Amcanion Ansawdd Aer blynnyddol ar gyfer NO₂ yn y tymor canolig, oni bai bod camau gwella wedi'u targedu yn cael effaith gadarnhaol yn y dyfodol.

Yn 2022 mae'n bosibl bod effaith Chwarel Craig yr Hesg ar lefelau PM₁₀ lleol wedi parhau i leihau. Gallai'r newid yma, sydd wedi dod i sylw ers 2015, fod o ganlyniad i welliannau parhaus i leihau allyriadau PM₁₀ o Chwarel Craig yr Hesg. Mae newidiadau naturiol i dywydd lleol a newidiadau posibl yn Chwarel Craig yr Hesg yn y dyfodol yn golygu ei bod yn anodd gwybod a fydd yr ardal yn dal i gydymffurfio yn y dyfodol. O ganlyniad i hynny, bydd yr Awdurdod Lleol yn parhau i fonitro lefelau PM₁₀ yng Nglyn-coch os bydd yr adnoddau a'r amgylchiadau yn caniatáu hynny.

1.2 Camau i Wella Ansawdd Aer

Yn ogystal ag adolygu dealltwriaeth gyfredol o ansawdd aer lleol, efallai bydd yr Awdurdod Lleol hefyd yn cymryd camau a fydd, gobeithio, yn gweithio tuag at wella ansawdd aer mewn Ardal Rheoli Ansawdd Aer, neu'n fwy eang ledled y Fwrdeistref Sirol. Os nad oes gweithredu, mae'n amlwg nad yw'r ansawdd aer lleol yn yr ardaloedd sy'n cael eu heffeithio fwyaf yn Rhondda Cynon Taf yn debygol o wella unrhyw bryd yn fuan. O ganlyniad i hyn, mae'r Awdurdod Lleol wedi adolygu ac ailfabwysiadu Cynlluniau Gweithredu Ansawdd Aer yn ddiweddar ar gyfer pob un o'i 16 ARhAA, sydd i'w gweld yn Appendix E2: Revised Air Quality Action Plans

Mae'r Awdurdod Lleol yn parhau, pan fo'n bosib, i weithredu neu i ddylanwadu ar weithredu camau yn ei ARhAA yn ogystal â chamau eraill a all wella ansawdd aer lleol yn gyffredinol. Serch hynny, oherwydd adnoddau cyfyngedig, ni fu'n bosib gweithredu'r holl gamau gwella ansawdd aer ar unwaith. Mae'r math o gamau gwella ansawdd aer sydd wedi'u cymryd yn ddiweddar yn cynnwys gwaith adeiladu parhaus ar Gynllun Deuoli'r A4119 Coed-elái a Seilwaith Metro De Cymru. Maen nhw hefyd yn cynnwys gosod dros 70 man gwefru pwrpasol ar gyfer cerbydau trydan mewn 31 maes parcio cyhoeddus, rhoi cyfle i bawb deithio am ddim ar fysiau yn Rhondda Cynon Taf yn ystod mis Mawrth a theithiau bws rhatach (uchafswm o £1) am gyfnod yn yr haf, 2023. Yn ogystal â hynny, caiff pobl ifainc sy'n derbyn addysg ôl-16 deithio ar fysiau penodol am ddim ac mae rhaglen waith fesul cam sydd gwerth miliynau o bunnoedd i wella nifer o lwybrau teithio llesol wedi'i chyflawni.

Yn y dyfodol bydd yr Awdurdod Lleol yn parhau i symud ymlaen ag ystod o gamau gweithredu a mentrau. Mae'r rhain yn cynnwys dylunio a gweithredu sawl gwelliant arfaethedig i wella priffyrdd er mwyn gwella 'pwyntiau pinsio', a phrosiectau i gynyddu defnyddioldeb ac ymwybyddiaeth o lwybrau teithio llesol ac opsiynau trafnidiaeth gynaliadwy leol. Wrth gydnabod effeithiau posibl newid yn yr hinsawdd, a'r manteision y byddai'n gallu deillio o roi dull cyfannol o ymdrin â materion amgylcheddol ar waith, mae'r Awdurdod Lleol yn parhau i ddatblygu strategaethau a rhaglenni newid hinsawdd lleol allweddol. Mae hyn wedi cynnwys datblygu Strategaeth Gwefru Cerbydau Trydan a rhaglen cynhyrchu ynni adnewyddadwy uchelgeisiol.

Gan fod amgylchiadau yn gallu newid, er enghraifft, fel y caiff camau gweithredu eu rhoi ar waith, mae'n angenrheidiol adolygu Cynlluniau Gweithredu Ansawdd Aer sydd wedi'u mabwysiadu yn rheolaidd er mwyn sicrhau eu bod yn parhau'n berthnasol. Yn 2022, roedd yr Awdurdod Lleol wedi adolygu, diwygio ac ailfabwysiadu pob un o'r Cynlluniau Gweithredu Ansawdd Aer cyfredol yn Rhondda Cynon Taf. Mae'r Cynlluniau Gweithredu Ansawdd Aer yma sydd wedi'u hailfabwysiadu yn cefnogi nifer o gamau gweithredu lleol a chamau gweithredu'r Fwrdeistref Sirol gyfan, a hynny er mwyn parhau â gwaith yr Awdurdod Lleol tuag at sicrhau cydymffurfiaeth barhaus ym mhob ARhAA cyn gynted â phosibl. Bydd yr Awdurdod Lleol yn parhau i gynnal y Cynlluniau Gweithredu Ansawdd Aer fel dogfennau byw ac yn anelu at eu hadolygu nhw eto yn 2028, gan ystyried y cynnydd sydd wedi'i wneud a natur gyfnewidiol ansawdd aer lleol.

Mae'r gallu i ddod o hyd i adnoddau digonol yn hanfodol i ddatblygiad tymor hir y camau i wella ansawdd aer lleol. Mae modd i hyn fod yn heriol, ac mae'n galw am ddulliau cyfannol creadigol i ddatblygu camau gweithredu gwella ansawdd aer lleol. O ganlyniad i hyn, er bod buddion amlasiantaeth yn aml yn cael eu gwireddu, mae modd i'r dull yma hefyd ddod ar draws ansicrwydd a phrosesau gwneud penderfyniadau hirach wrth geisio datblygu rhai camau gweithredu.

1.3 Blaenoriaethau a Heriau Lleol

Mae'r Awdurdod Lleol yn cydnabod bod ansawdd aer sy'n cydymffurfio yn bwysig iawn wrth gyflawni ei agenda cynhwysfawr. O ganlyniad i hyn, mae wedi ymgorffori'r gydnabyddiaeth yma yn y flaenoriaeth 'Lleoedd' sydd wedi'i chynnwys yn y fersiwn diweddaraf o'i Gynllun Corfforaethol [2]. Bydd yr Awdurdod Lleol yn parhau i geisio datblygu ei Gynlluniau Gweithredu Ansawdd Aer sydd wedi'u mabwysiadu, gweithredu camau gwella ansawdd aer cyfannol cyraeddadwy, anelu at gyflawni'r gofynion monitro ac adrodd disgwylidig a pharhau i adeiladu ar berthnasoedd gwaith agos gyda phartneriaid a rhanddeiliaid amrywiol.

Mae'r Awdurdod Lleol hefyd yn cydnabod nifer o heriau er mwyn darparu ansawdd aer lleol da. Y rhai mwyaf amlwg yw:-

- Dyfalbarhad tebygol yr amgylchedd lle mae'r adnoddau sydd wedi'u dyrannu ar hyn o bryd o dan bwysau sylweddol, ac yn wynebu cystadleuaeth barhaus o agendâu eraill â blaenoriaeth.
- Efallai bydd datblygiad Bil yr Amgylchedd (Ansawdd Aer a Seinweddau) (Cymru) [4] yn arwain at newidiadau statudol posibl i'r fframwaith cyfreithiol sy'n sail i'r agenda ansawdd aer lleol. Mae'n bosibl y bydd hyn yn gofyn am ailystyried sut mae'r Awdurdod Lleol yn cyflawni ac yn sicrhau adnoddau ar gyfer ei ddyletswyddau ansawdd aer lleol.
- Esblygu dealltwriaeth o'r tebygolrwydd o lefelau NO₂ yn codi'n uwch na'r Lefel Terfyn, o ganlyniad i rai cymunedau ger cefnffordd yr A470 a'r angen cryf am gamau gweithredu cenedlaethol, rhanbarthol a lleol gyda phartneriaeth gyfatebol yn gweithio i helpu i wella'r sefyllfa cyn gynted â phosibl, heb arwain at ganlyniadau niweidiol.
- Trefoli parhaus, a'r rhwystrau cenedlaethol a lleol posibl sy'n wynebu gweithredu datrysiadau cludiant glanach newydd yn gyflym.

1.4 Sut i Gymryd Rhan

Mae rhagor o wybodaeth ar ansawdd aer lleol yn Rhondda Cynon Taf, gan gynnwys y canlyniadau monitro diweddaraf, ar gael ar wefan [Ansawdd Aer Cymru](#) [1].

2. Executive Summary: Air Quality in Our Area

2.1 Air Quality in Rhondda Cynon Taf

Rhondda Cynon Taf County Borough Council [the Local Authority] recognises poor air quality can affect people's health and that good air quality can be important in improving the length and quality of people's lives, the amenity of their local community and the wider environment.

The law requires the Local Authority to regularly check air quality in its area against Air Quality Objectives [AQO]. In doing so, the Local Authority has identified two air pollutants, Nitrogen Dioxide [NO₂] and Fine Particulate Matter [PM₁₀], as requiring closer examination. The 2023 Air Quality Progress Report contains an assessment of recent monitoring data for NO₂ and PM₁₀ collected during 2022, as well as a review of newly consented developments, new and ongoing areas of interest and relevant Local Authority policies.

It is the case that the vast majority of Rhondda Cynon Taf experiences compliant air quality, which is likely to remain so into the future and potentially continue to improve. Only some small areas associated with busy urban road junctions, the regional road network or specific local sources are likely to be vulnerable to non-compliant air quality. It is believed these vulnerable areas, linked to historically high levels of NO₂, have already been declared [Air Quality Management Areas](#) [AQMAs] and, in contrast to most locations, the air quality in these vulnerable areas may not improve as rapidly as elsewhere over the medium-term.

Currently Rhondda Cynon Taf has sixteen AQMAs, listed in Appendix D1: AQMA Boundary Maps, all of which are in respect of breaches of AQOs for NO₂. These AQMAs are of limited size and are distributed throughout the Borough. Recent monitoring supports the understanding that the Aberdare Town Centre, Broadway, Church Village, Cilfynydd, Llanharan, Llwynypia, Mwyndy, Nantgarw, Treforest and Tonyrefail AQMAs appear to all be likely to become sustainably compliant to the annual AQO for NO₂ in the near-term. It is expected that detailed reviews of these AQMAs may occur over the next few years, to determine if compliance has been sustained within their geographical areas and whether each AQMA requires amendment or even revocation.

The Cymmer, Ferndale, Mt Ash Town Centre, Nightingales Bush, Pontypridd Town Centre and Tylorstown AQMAs appear likely to potentially remain non-compliant to the annual AQO for NO₂ into the medium-term, unless future targeted improvement actions have a desirable effect.

It is possible that during 2022 the impact of Craig Yr Hesg Quarry on local PM₁₀ levels may have continued to have been subdued. This change, which has been observed since 2015, may be as a result of ongoing improvements to reduce PM₁₀ emissions from Craig Yr Hesg Quarry. Natural changes to locally prevailing weather and possible future changes at Craig Yr Hesg Quarry, means it is difficult to know if future compliance will continue. As such the Local Authority will, continue to monitor PM₁₀ levels at Glyncoch, resources and circumstances permitting.

2.2 Actions to Improve Air Quality

In addition to reviewing current understanding of local air quality the Local Authority may also take actions that hopefully work towards improving air quality within an AQMA or more broadly throughout the County Borough. It is clear that, without action, local air quality within

the most vulnerable areas of Rhondda Cynon Taf is unlikely to improve as quickly as possible. As a result, the Local Authority has recently reviewed and re-adopted Air Quality Action Plans [AQAPs] for each of its sixteen AQMAs, published in Appendix E2: Revised Air Quality Action Plans.

The Local Authority continues, where possible, to implement or influence the implementation of actions within its AQAPs as well as other actions that may more generally improve local air quality. However, due to limited resources, it has not been possible to immediately implement all air quality improvement actions. The type of air quality improvement actions undertaken recently include the continued construction of the A4119 Coed Ely Dualling Scheme and South Wales Metro Infrastructure, installation of more than seventy dedicated electrical vehicle charging points at thirty-one public car parks, free-for-all bus travel within Rhondda Cynon Taf during March and subsidised (£1 max fare) travel during part of the summer of 2023 as well as defined free post-16 education travel and undertaken a multimillion pound phased works programme to upgrade and improve a number of active travel routes.

Looking to the future, the Local Authority is continuing to progress a range of actions and initiatives. These include the design and implementation of several proposed highway improvements to improve 'pinch-points' and projects to increase usability and awareness of active travel routes and local sustainable transport options. In recognising the potential effects of climate change and the 'win win' which may be realised by an holistic approach to environmental issues, the Local Authority continues to advance key local climate change strategies and programmes. This has included, progressing its Electric Vehicle Charging Strategy and an ambitious renewable energy generation programme.

As circumstances can change, for instance as actions are implemented, it is necessary to regularly review adopted AQAPs to maintain their pertinence. In 2022 the Local Authority reviewed, revised and readopted all current AQAPs within Rhondda Cynon Taf. These readopted AQAPs advocate a number of locally targeted and County Borough wide actions, so as to continue the Local Authority's work towards achieving sustained compliance within each AQMA as quickly as reasonably possible. The Local Authority will continue to maintain the AQAPs as living documents and will aim to review them again in 2028, to take account of progress made and the ever-changing nature of local air quality.

Fundamental to the longer-term progression of actions to improve local air quality is the ability to obtain sufficient resources. This can be challenging and invariably requires creative holistic approaches to the advancement of local air quality improvement actions. As a consequence, although multi-agenda benefits are often realised, this approach can also encounter greater uncertainty and longer decision-making processes when trying to advance certain actions.

2.3 Local Priorities and Challenges

The Local Authority recognises that compliant air quality has significant importance in the delivery of its comprehensive agenda, in doing so it has incorporated this recognition within the 'Places' priority included in its updated Corporate Plan [2]. The Local Authority will continue to seek to progress its adopted AQAPs, implement achievable holistic air quality improvement actions, aspire to fulfil expected monitoring and reporting requirements and build-upon close working relationships with various partners and stake-holders.

The Local Authority also recognises a number of challenges to the delivery of good local air quality, most notably: -

- The likely persistence of an environment where currently allocated resources are significantly under pressure and will face continued competition from other priority agendas.
- The progression of the Environment (Air Quality and Soundscapes) (Wales) Bill [3] may result in possible statutory changes to the legal framework underpinning the local air quality agenda, which could require reconsideration as to how the Local Authority undertakes and resources its local air quality duties.
- Evolving understanding of the likely exceedance of the Limit Level for NO₂ associated with some communities in proximity to the A470 trunk road and a strong need for both national, regional and local actions with corresponding partnership working to help improve the situation as quickly as reasonably possible and without resulting in the displacement of adverse consequences.
- Continued urbanisation and the potential national and local obstacles faced with the rapid adoption of emergent cleaner transport solutions.

2.4 How to Get Involved

Further information on local air quality within Rhondda Cynon Taf, including up-to-date monitoring results, can be obtained from the "[Air Quality In Wales](#)" website [1].

Contents

1. Crynodeb Gweithredol: Ansawdd Aer yn Ein Hardal.....	iii
1.1 Ansawdd Aer yn Rhondda Cynon Taf.....	iii
1.2 Camau i Wella Ansawdd Aer	iv
1.3 Blaenoriaethau a Heriau Lleol.....	v
1.4 Sut i Gymryd Rhan	v
2. Executive Summary: Air Quality in Our Area.....	vi
2.1 Air Quality in Rhondda Cynon Taf.....	vi
2.2 Actions to Improve Air Quality.....	vi
2.3 Local Priorities and Challenges.....	vii
2.4 How to Get Involved	viii
3. Actions to Improve Air Quality.....	15
3.1 Previous Work in Relation to Air Quality	15
3.2 Air Quality Management Areas	16
3.3 Implementation of Actions to Improve Air Quality.....	21
3.4 Review of Air Quality Action Plans.....	35
3.5 Prioritisation of Air Quality Action Plans	35
3.6 Monitoring of Air Quality Action Plans.....	35
4. Air Quality Monitoring Data and Comparisons	38
4.1 Summary of Monitoring Undertaken in 2022	38
4.1.1 Automatic Monitoring Sites	38
4.1.2 Non-Automatic Monitoring Sites	38
4.2 Air Quality Monitoring Results in 2022	48
4.3 Comparison of 2022 Monitoring Results with AQOs	54
4.3.1 Nitrogen Dioxide [NO ₂].....	54
4.3.2 Comparison with the 1-hour AQO for NO ₂	62
4.3.3 Comparison with the annual mean AQO for NO ₂	64

4.3.4	Particulate Matter [PM ₁₀]	76
4.3.5	Particulate Matter [PM _{2.5}]	88
4.4	Summary of Compliance with AQOs as of 2022	89
5.	New Local Developments	90
5.1	Road Traffic Sources (and Other Transport)	90
5.1.1	Trunk Road Traffic Sources	90
5.1.2	Non-Trunk Road Traffic Sources	91
5.1.3	Other Transport Sources	95
5.2	Industrial / Fugitive or Uncontrolled Sources / Commercial Sources	95
5.2.1	Environmental Permitting (England and Wales) Regulations 2016	95
5.2.2	Clean Air Act 1993	95
5.3	Planning Applications	95
5.4	Other Sources	97
5.5	Summary of Local Developments	98
6.	Policies and Strategies Affecting Airborne Pollution	99
6.1	Clean Air Plan for Wales	99
6.2	Local / Regional Air Quality Strategy	99
6.3	Development Control Policies	99
6.4	Local & Regional Transport Plans and Strategies	100
6.4.1	Regionally Collaborative Local Transport Plan	100
6.4.2	Cardiff Capital Region Transport Authority	104
6.4.3	Welsh Government Supplemental Plan	104
6.4.4	Electric Vehicle Charging Strategies	105
6.5	Active Travel Plans and Strategies	105
6.6	Local Authority's Corporate Plan & Well-being Objectives	106
6.6.1	Corporate Plan	106
6.6.2	Well-being Objectives	109

6.7	Green Infrastructure Plans and Strategies	110
6.8	Climate Change Strategies	110
7.	Conclusions and Proposed Actions	112
7.1	Conclusions from New Monitoring Data	112
7.2	Conclusions relating to New Local Developments.....	112
7.3	Other Conclusions	113
7.4	Proposed Actions.....	114
8.	References.....	116
9.	Appendix A1: Monthly Diffusion Tube Monitoring Results.....	122
10.	Appendix B: A Summary of Local Air Quality Management	126
10.1	Purpose of an Annual Air Quality Progress Report	126
10.2	Air Quality Objectives	126
11.	Appendix C1: Air Quality Monitoring Data QA/QC.....	128
11.1	QA/QC of Diffusion Tube Monitoring.....	128
11.1.1	Diffusion Tube Bias Adjustment Factors.....	128
11.1.2	Factor from Local Co-location Studies.....	129
11.1.3	Discussion of Choice of Factor to Use	130
11.2	Short-Term to Long-Term Data Adjustment	131
11.3	NO ₂ Fall-off with Distance from the Road.....	132
11.4	QA/QC of Automatic Monitoring.....	132
11.4.1	PM ₁₀ Monitoring Adjustment.....	133
12.	Appendix C2: Monitoring Location Maps	134
13.	Appendix D1: AQMA Boundary Maps.....	194
14.	Appendix D2: AQMA Trends	210
14.1	Cymmer AQMA	211
14.2	Ferndale AQMA.....	212
14.3	Llwynypia AQMA	213

14.4	Tonyrefail AQMA	214
14.5	Tylorstown AQMA.....	215
14.6	Aberdare Town Centre AQMA	216
14.7	Mt Ash Town Centre AQMA.....	217
14.8	Broadway AQMA	218
14.9	Church Village AQMA.....	219
14.10	Cilfynydd AQMA.....	220
14.11	Llanharan AQMA.....	221
14.12	Mwyndy AQMA.....	222
14.13	Nantgarw AQMA.....	223
14.14	Nightingales Bush AQMA	224
14.15	Pontypridd Town Centre AQMA.....	225
14.16	Pontypridd Town Centre AQMA.....	226
15.	Appendix E2: Revised Air Quality Action Plans	228
15.1	Rhondda.....	228
15.1.1	Cymmer AQAP	228
15.1.2	Ferndale AQAP.....	229
15.1.3	Llwynypia AQAP	230
15.1.4	Tonyrefail AQAP	230
15.1.5	Tylorstown AQAP	231
15.2	Cynon.....	231
15.2.1	Aberdare Town Centre AQAP.....	232
15.2.2	Mt Ash Town Centre AQAP	232
15.3	Taf.....	233
15.3.1	Broadway AQAP	233
15.3.2	Church Village AQAP	234
15.3.3	Cilfynydd AQAP	234

15.3.4	Llanharan AQAP	235
15.3.5	Mwyndy AQAP.....	236
15.3.6	Nantgarw AQAP	236
15.3.7	Nightingales Bush AQAP	237
15.3.8	Pontypridd Town Centre AQAP	238
15.3.9	Treforest AQAP	240
16.	Glossary of Terms.....	241

List of Tables

Table 3-1:	General Information on AQMAs within Rhondda Cynon Taf	18
Table 3-2:	Information on the Characteristics of each AQMA.....	20
Table 3-3:	Progress on Measures to Improve Air Quality	23
Table 3-4:	AQAP Prioritisation Order.....	35
Table 3-5:	AQAP Action Monitoring.....	36
Table 4-1:	Details of Automatic Monitoring Sites in 2022	40
Table 4-2:	Details of Non-Automatic Monitoring Sites in 2022.....	42
Table 4-3:	Annual Mean NO ₂ Monitoring Results	48
Table 4-4:	1-Hour Mean NO ₂ Monitoring Results	51
Table 4-5:	Annual Mean PM ₁₀ Monitoring Results.....	53
Table 4-6:	24-Hour Mean PM ₁₀ Monitoring Results.....	53
Table 4-7:	Estimation of the five year trend in NO ₂ at each RCT Environment.....	60
Table 4-8:	Monitoring sites with an annual mean for NO ₂ greater than 54µgm ⁻³ at least once between 2018 and 2022	62
Table 4-9:	Annual mean NO ₂ , in 2022, collated to region and each local community.....	66
Table 4-10:	Screening Assessment Review of current AQMAs.....	74
Table 4-11:	Assessment of CPF polar plots for Site No. 130 (Upper Garth Avenue TEOM FDMS) from 2020 to 2022.	84
Table 5-1:	Proposed road schemes which have the potential to impact local air quality. ..	92
Table 5-2:	New or Substantially Changed Environmental Permits granted by the Local Authority in 2022.....	95
Table 5-3:	New or modified relevant furnaces notified to the Local Authority in 2022.	95
Table 5-4:	Planning Applications under consideration or approved in 2022 where an AQA was desired.....	96
Table 6-1:	“Policy AW 10 Environmental Protection and Public Health”.....	99
Table 6-2:	Objectives relevant to local air quality management within the rc-LTP.....	101
Table 6-3:	Proposed actions contained within the rc-Local Transport Plan.....	101
Table 6-4:	Overview of other key policy related developments.....	102
Table 6-5:	Cardiff Capital Region Transport Authority Schemes in Rhondda Cynon Taf.	104
Table 6-6:	Proposed Transport for Wales Rail Schemes.....	104
Table 6-7:	The Local Authority’s Core Priorities and Local Air Quality Management.....	107
Table 6-8:	Local Authority’s Climate Commitments to be achieved by 2030.	111

Table 6-9: Climate Change Actions and Local Air Quality Management	111
Table A.9-1: Full Monthly Diffusion Tube Results for 2022.....	122

List of Figures

Figure 3-1: Timeline of Air Quality Management in Rhondda Cynon Taf.....	16
Figure 4-1: Map of Automatic Monitoring Sites in 2022	41
Figure 4-2: Map of Non-Automatic Monitoring Sites in 2022	47
Figure 4-3: Time Variation Plot of NO ₂ Automatic Monitoring Data in 2022.....	54
Figure 4-4: Normalised Time Variation Plot of NO ₂ at Site No. 70 (Broadway) from 2006	56
Figure 4-5: Normalised Time Variation Plot of NO ₂ at Site No. 70 (Broadway) between 2022 and 2020.....	56
Figure 4-6: Trend Level Plot for NO ₂ at Site No. 70 (Broadway)	57
Figure 4-7: Time Plot of the annual mean for NO ₂ at the local rural background (blue), local urban background (gold) and roadside (red) environments	59
Figure 4-8: Time Plots, with reference lines, of the annual mean for NO ₂ at identified monitoring sites, from 2008 to 2021.....	63
Figure 4-9: Map of Rhondda Cynon Taf displaying the annual mean for NO ₂ , in 2022, at each monitoring site.	65
Figure 4-10: Time Plots of the maximum annual mean NO ₂ , from 2006 to 2022, collated to each community not currently associated with an AQMA.	68
Figure 4-11: Time Plots of the annual mean NO ₂ , from 2006 to 2022, collated to each relevant AQMA.	70
Figure 4-12: Time Plots of the annual mean NO ₂ from 2006 to 2022, collated to each AQMA.	72
Figure 4-13: Calendar Plot of the 24-hour daily means of PM ₁₀ at Site No. 130 (Upper Garth Avenue TEOM FDMS) in 2022	77
Figure 4-14: Time Variation Plot of PM ₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) in 2014 to 2021 and 2022.	78
Figure 4-15: Trend Level Plot of PM ₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) from 2014 to 2022.....	79
Figure 4-16: Map of Glyncoch and a Polar Frequency Plot of wind speed and direction observed at Craig Yr Hesg Quarry Weather Station in 2022	81
Figure 4-17: Pollution Rose Plot, by season and normalised, of PM ₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) in 2022	82
Figure 4-18: 90.4 th Percentile Rose Plot of PM ₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) in each year from 2020 to 2022	82
Figure 4-19: CPF Polar Plot of PM ₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) from 2020 to 2022.	83
Figure 4-20: Time Plot of the annual mean PM ₁₀ at Site No. 130 (Upper Garth Avenue TEOM FDMS) from 2014 to 2022.	86
Figure 4-21: Time and Bar plots illustrating PM ₁₀ results at Site No. 130 (Upper Garth Avenue TEOM FDMS).....	87

3. Actions to Improve Air Quality

3.1 Previous Work in Relation to Air Quality

Since the late 90s the Local Authority has periodically reviewed local air quality management within Rhondda Cynon Taf and since 2003 has produced an annual report on its latest findings. These reviews often include consideration of the current air quality monitoring results, trends and developments that may influence local air quality.

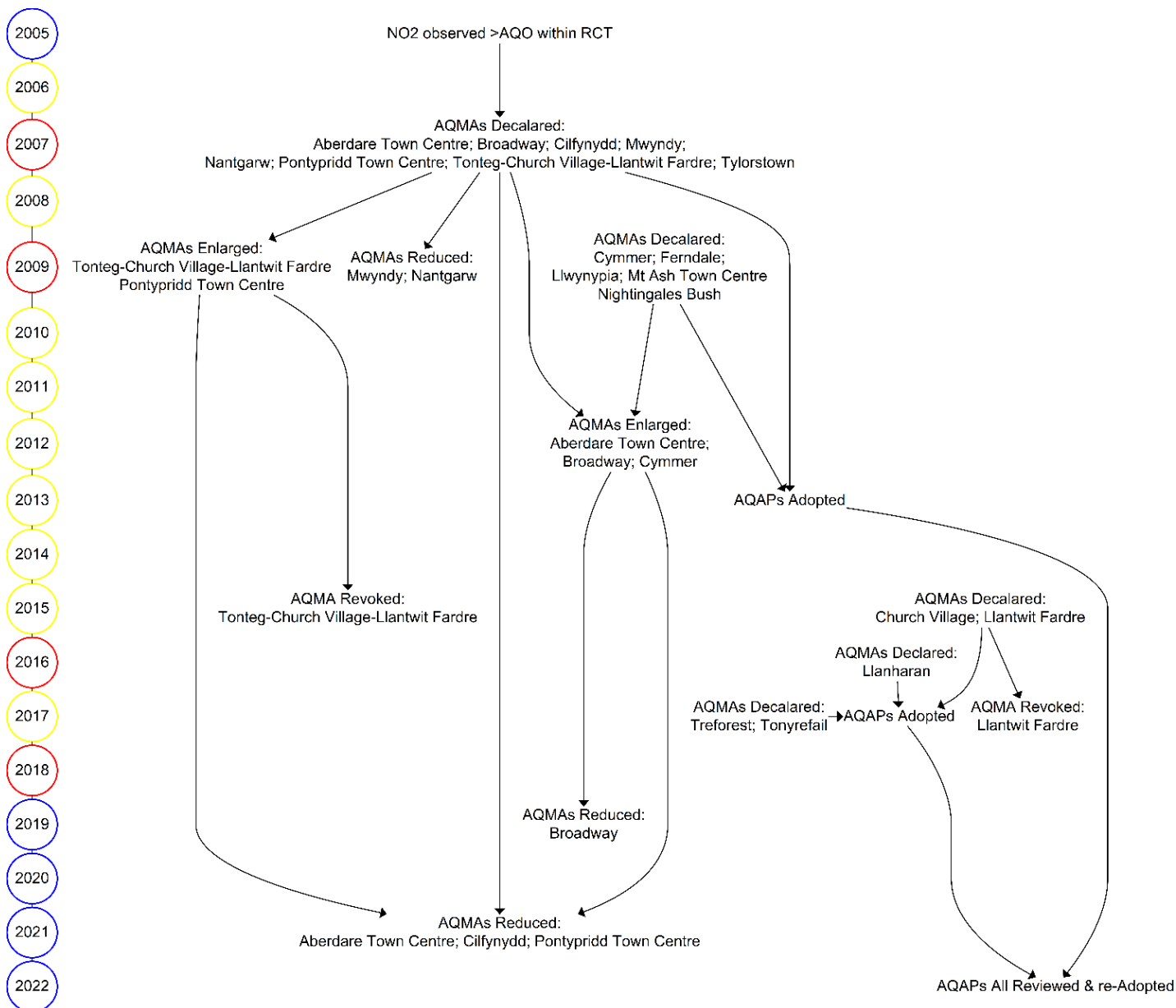
When necessary, annual local air quality progress reports have included the identification of relevant locations that may not comply with statutory Air Quality Objectives [AQOs], designated as Air Quality Management Areas [AQMAs], and the assessment of cost-effective actions, adopted within Air Quality Actions Plans [AQAPs], that may be necessary to bring about local air quality improvement.

To provide an illustration of local air quality management in Rhondda Cynon Taf,

Figure 3-1 below provides a timeline of recent important events. In addition, each year has been colour coded as to the observed local levels¹ of NO₂. The years circled in yellow indicate periods where locally observed elevated levels of NO₂ were, in general, rising and the years circled in red those occasions when the locally observed elevated levels peaked. The years circled in blue indicate a period where the overall trend in locally observed levels of NO₂ was reducing in comparison to the recent past.

¹ Having regard to the average roadside environment within Rhondda Cynon Taf, see Section 4.3.1.

Figure 3-1: Timeline of Air Quality Management in Rhondda Cynon Taf



3.2 Air Quality Management Areas

AQMAs are declared when air quality is close to or above a threshold of pollution known as the Air Quality Objective [AQO], see Appendix B10.2. After declaring an AQMA the Local Authority should prepare an AQAP within eighteen months, setting out measures it intends to put in place to improve air quality to at least the AQO, if not even better. AQMAs are seen by local authorities as the focal points to channel resources into the most pressing areas of air pollution as a priority.

Within Rhondda Cynon Taf there are currently sixteen AQMAs of varying sizes and characteristics. The following tables provide information with respect of each extant AQMA within Rhondda Cynon Taf. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at the relevant Defra webpage [4];

with maps of extant AQMAs having also been reproduced in Appendix D1: AQMA
Boundary Maps and information on their NO₂ trends in

Appendix D2: AQMA Trends.

Each AQMA designated within Rhondda Cynon Taf is associated with a breach of a relevant AQO for NO₂.

Table 3-1 below contains descriptive information on each AQMA, including if the community associated with the AQMA has also been identified by the 'Health and Air Prioritisation Risk Assessment Area Prioritisation' [HAP-RAP] tool [5]. The HAP-RAP tool has been designed by Public Health Wales, see Section 6.6.2, to identify communities where improvement actions may have the most overall benefit to public health. Having regard to the potential disproportionate impacts of air quality upon deprived communities and the burden reduction approach. In addition, Table 3-1 also indicates if the AQMA lies within a Noise Action Plan Priority Area [NAPPA] identified by Welsh Government [6]. NAPPAs are locations, identified via noise mapping undertaken by Welsh Government, which may experience adverse levels of environmental noise. There are often close relationships between the underlying causes of non-compliant air quality and adverse soundscapes, as a result the presence of NAPPAs may be relevant to local air quality management considerations.

Table 3-2 below, contains information on the importance of certain characteristics that are relevant to each AQMA and that may have a cause in or exacerbate the need for the AQMA. These characteristics can be relevant when considering actions that may be cost-effective in achieving future compliance to the relevant AQOs.

Table 3-1: General Information on AQMAs within Rhondda Cynon Taf

RCT Area	AQMA	Relevant AQO(s) for NO ₂	Description ⁽¹⁾	No. of Properties ⁽²⁾	HAP-RAP Priority ⁽³⁾	NAPPA ⁽⁴⁾
Rhondda	Cymmer	1-hour & annual mean	All properties from High St to Trebanog Rd	146	✓	✓
	Ferndale	annual mean	Certain properties from The Strand via High St to Dyffryn St	102	✓	✓
	Llwynypia	annual mean	All properties along Partridge Rd	28	✓	✓
	Tonyrefail	annual mean	Certain properties at Mill St	20	-	-
	Tylorstown	annual mean	Certain properties at East Rd	65	✓	✓
Cynon	Aberdare Town Centre	annual mean	All properties along Cardiff St from Victoria Sq to Cross St	40	-	-
	Mountain Ash Town Centre	annual mean	Certain properties from Oxford St to Ffrwyd Cres and Seymour St	57	✓	✓
Taf	Broadway	annual mean	All properties along Broadway	156	-	-
	Church Village ⁽⁵⁾	annual mean	Certain properties from Dyffryn Tce. to Main Rd	21	-	-
	Cilfynydd	annual mean	Certain properties from Pontshonnorton Rd to Merthyr Rd	36	-	✓
	Llanharan	annual mean	Certain properties from The Sq to Chapel Rd	7	-	-
	Mwyndy	annual mean	One property at Mwyndy	1	-	✓
	Nantgarw	annual mean	All properties at Graig View	8	-	✓
	Nightingales Bush	annual mean	All properties at Nightingales Bush to Pentrebach Rd	11	-	✓
	Pontypridd Town Centre	annual mean	Certain properties along Gelliwastad Rd and Morgan St	52	-	✓
Treforest	annual mean	Certain properties nearest the A470 at Cardiff St	8	-	✓	

Table Notes

- (1) AQMA boundary maps and corresponding AQAPs within Rhondda Cynon Taf CBC can be viewed on the relevant Defra webpage [4], with maps of extant AQMAs also reproduced in Appendix D1: AQMA Boundary Maps.
- (2) The No. of Properties is an estimate utilising relevant GIS information at the time of publication, this number may not reflect the nature of the property, its level of occupancy or changes as a consequence of continued development.
- (3) Health and Air Pollution Risk Assessment/Area Prioritisation [HAP-RAP] tool [5] outcome for each community associated with the AQMA. The HAP-RAP tool has been designed (see Section 6.6) to identify communities where improvement actions may have the most overall benefit to public health, with regards to the potential disproportionate impacts of air quality and the burden reduction approach.
- (4) AQMA lies within a Noise Action Plan Priority Area or Proximity Area [NAPPA] identified by Welsh Government.
- (5) A successor to the much larger and now revoked Tonteg – Church Village – Llantwit Fardre A473 Corridor AQMA.

Table 3-2: Information on the Characteristics of each AQMA

Area	AQMA	Traffic Volume	Buses	HGVs	Road Incline	Network Congestion	Road Narrowness	Controlled Traffic	Pedestrian Crossing	Parked Vehicles	Loading Vehicles	In-road Bus Stop	Traffic Calming	Street Canyon	Steep Sided Valley	Dwellings Near Road	Five-Year NO ₂ Trend
Rhondda	Cymmer	**	**		***		***	***	*	***	**			***	*	***	←
	Ferndale	**	**				**		*	***	***			***	**	**	←
	Llwynypia	**	**					***						**	*		←
	Tonyrefail	*	*		**		***	***		***		*		***	*	*	←
	Tylorstown	**	**		*		***		*	***		**		***	**	**	←
Cynon	Aberdare	**						***	*								←
	Mountain Ash	***	*	*	*			***	*					**	*	***	←←
Taf	Broadway	**						**	*			*	*				←
	Church Village	**						***				*		**			←←
	Cilfynydd	***		*		*				*					*		←←
	Llanharan	**					***							**		**	←
	Mwyndy	***		*		*		***									←←
	Nantgarw	***		**	***			***							*		←
	Nightingales Bush	***		*		***									*		←←
	Pontypridd	**	**			*		***	*						*		←
Treforest	***		*		**										*	←←	

Table Notes

* = slight importance, ** = moderate importance, *** = substantial importance ↓ = 0% to 5% reducing ↓↓ = 5% to 10% reducing

3.3 Implementation of Actions to Improve Air Quality

The Local Authority, its partners and other organisations have taken forward a number of actions in pursuit of improving local air quality. AQAP measures recently significantly progressed or completed are:

- The continued construction of the A4119 Coed Ely Dualling Scheme.
- The continued construction of Metro Infrastructure, to provide future support in the operation of the South Wales Metro.
- The adoption of an Electric Vehicle Charging Improvement Plan that details measures that can further facilitate EV take-up by local public transport, the Local Authority fleet and the general public.
- The ongoing installation, on behalf of the Cardiff Capital Region, of more than seventy dedicated electrical vehicle charging points at thirty-one public car parks across Rhondda Cynon Taf.
- Trialling free-for-all bus travel within Rhondda Cynon Taf during March 2023 and subsidised (£1 max fare) travel during part of the summer as well as defined free post-16 education travel.
- In regards to the Ferndale and Tylorstown AQMAs, an initial £1.9 million phased works programme to upgrade and improve Rhondda Fach active travel routes

Due to a challenging resource environment there may be some uncertainty as to the expected completion timeframes of various future improvement actions, however, the Local Authority considers the following measures may be potentially completed or progressed over the course of the next reporting year:

- In regards to the Broadway, Church Village, Cilfynydd, Mt Ash Town Centre, Nantgarw, Nightingales Bush, Pontypridd Town Centre and Treforest AQMAs, continued progress in delivery of the South Wales Metro.
- In regard to the Llanharan AQMA, a review of design and funding options to consider the prospect of delivery of the Llanharan Bypass in light of clarified Welsh transport policy or via alternative funding mechanism.
- Progress in the construction of the A4119 Coed Ely Dualling Scheme.
- A further twenty-six locations identified for dedicated electrical vehicle charging points.
- Review of 'Hackney Carriage and Private Hire Vehicle Licensing Policy' to consider the setting of minimum vehicle emission standards or proxy standards.
- Removal of the last remaining diesel locomotives from the South Wales Valleys Railway (passenger services) potentially resulting in directly reduced railway emissions as well as possible improvement in the attractiveness of this transport option.

- Reintroducing an additional up to four trains per hour between Cardiff to Bridgend with the potential to improve capacity and desirability of the railway route via Llanharan and Pontyclun.
- Introducing up to four trains per hour to Treherbert with the potential to improve capacity and desirability of the railway route through Rhondda Fawr.
- Consideration of the relocation of Treforest Industrial Estate train station, on the South Wales Valleys Railway, to a location that may increase its use.

Details of all actions planned, in progress or completed are set out in Table 3-3 below, with the actions listed in order of most likely impact.

Table 3-3: Progress on Measures to Improve Air Quality

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
1	Electric Vehicle Charging To advance local electric charging infrastructure so as to reduce the practical barriers to the adoption of ELVs	RCT	Promoting Low Emission Transport	Alternative Refuelling Infrastructure to Promote Electric Vehicle Recharging	RCT	2021	Ongoing	TBC	Delivery of EV strategy. Emphasis on establishing a charging network at community destinations.
2	A473/B4595 Corridor Church Village Bypass To relieve traffic from existing local roads	B4595 (inc. Church Village AQMA)	Traffic Management	Strategic Highway Improvements	RCT (RCT+WG)	2008	2010	20% to 36% reduction in NO ₂	Construction and operation of new 7km A473, providing relief to B4595. Changes to traffic flow from relief road fully manifested

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
3	A4233 Porth-Lower Rhondda Fach Relief Road To relieve traffic from existing local roads	Porth & Lower Rhondda Fach	Traffic Management	Strategic Highway Improvements	RCT (RCT+WG)	2005	2007	NA	Construction and operation of new 8km A4233, providing relief to local roads. Changes to traffic flow from relief road fully manifested
4	South Wales Metro The construction and operation of an integrated metro to relieve traffic congestion from the existing local and regional roads	RCT	Alternatives to private vehicle use	Other	TfW (WG)	Ongoing	Ongoing	TBC	Phase 2 Implementation including modernisation of core Valley Lines with the aim to attract higher patronage and a reduction in car commuting.

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
5	A470 Speed Reduction Preservation of existing green barriers and reduction in speed limit to 50mph along designated length of the A470	Taf Valley	Traffic Management	Reduction of Speed Limits	WG (WG)	2018	2018 (further expansion under review)	Overall ~2.8µgm ⁻³ NO ₂ reduction in nearby areas	Permanent speed reduction in combination with fixed enforcement and in-site information dissemination. Possible further expansion of intervention to the south.
6	Llanharan Bypass To relieve traffic from the existing local roads	Llanharan	Traffic Management	Strategic Highway Improvements	RCT (RCT+WG)	TBC	TBC	TBC	Preferred route (Route No.2) determined, planning and design phase [7]. Under review to consider funding mechanisms

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
7	Fee-Charging Public Bus Support To consider vehicle emission standards	RCT	Promoting Low Emission Transport	Company Vehicle Procurement	RCT	2020	TBC	March trial 35% increase in journey uptake leading to 7% increase post trial	Trial of free-for-all public bus travel during March 2023 followed by subsidised (max £1 fare) travel during part of the summer and defined free post 16 school transport to encourage sustained uptake.
8	RCT Staff Homeworking Initiative ICT systems to enable wide scale homeworking	RCT	Promoting Travel Alternatives	Encourage / Facilitate Homeworking	RCT (RCT)	2019	2020	Significant uptake in home working	Mass role-out of ICT systems and support to enable as wide as possible uptake by RCT staff, minimising the need for commuting.

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
9	Hackney Carriage and Private Hire Vehicle Licensing Policy To consider regional vehicle emission standards	RCT	Promoting Low Emission Transport	Taxi Licensing Incentives and Conditions	RCT (CCR)	2020	2022	TBC	Collaborative review supported by evidence provided by CCR commissioned 'cenex' report [8]. Work ongoing to determine viability of regional approach as well as to consider any potential WG intervention Expectation of alignment to WG policy of mostly ZEV fleet by 2028 or earlier
10	Urban 20mph Speed Limit Introduction of WG 30mph to 20mph general urban speed limit	RCT	Traffic Management	20mph Zones	RCT	2020	2023	TBC	Implementation of national policy.

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
11	Local Authority Vehicle Procurement To consider Local Authority vehicle emission standards	RCT	Promoting Low Emission Transport	Public Vehicle Procurement	RCT (RCT)	2020	2022	TBC	Initial review concluded that a move to hire, as opposed to owned, fleet will provide greater flexibility as modernisation of the Local Authority takes place. In action trials of LEV (Light Electric Vehicle) and ZEVs progressing. Expectation of alignment to WG policy of mostly ZEV fleet by 2028 or earlier

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
12	Pontypridd Town Centre Junction (Morgan St & Berw Rd) Improvement Increasing the junction capacity and maximising efficiency	Pontypridd	Traffic Management	Strategic Highway Improvements	RCT	-	2014	-	Works undertaken, with resultant re-programming of traffic light controlled junction to accommodate greater vehicle capacity and junction efficiency Reduction in congestion from traffic queuing within and near Pontypridd Town Centre AQMA
13	Aberdare Town Centre Junction (Cardiff Rd & Cross St) Improvement Phase 1 & 2 modification of existing traffic light controlled junction within the AQMA	Aberdare	Traffic Management	Congestion Management	RCT (WG)	2013 & 2015	2014 & 2016	Reduction at Cardiff St (North) of ~1.6% NO ₂ ; increase at Cardiff St (South) of ~0.2% NO ₂	Reprogramming to favour traffic flow within the Aberdare AQMA above traffic queuing to enter or cross the AQMA and to enable wait detection and pedestrian use to improve traffic light sequence efficiency.

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
14	Broadway Junction (A4058) Improvement Increasing the number of carriageways turning right from Broadway onto the A4058	Broadway	Traffic Management	Strategic Highway Improvements	RCT (RCT)	2016	2017	-	Works undertaken, with resultant re-programming of traffic light controlled junction to accommodate the greater vehicle capacity. Significant reduction in congestion from traffic queuing within Broadway AQMA.
15	Mt Ash Town Centre Junctions (New Rd, Oxford St, Bridge St Complex) Improvement Modification of existing traffic light controlled junction within the AQMA	Mt Ash	Traffic Management	Congestion Management	RCT (RCT)	2013	2014	Insignificant change at New Rd and Oxford St	Reprogramming of traffic light controlled junctions to favour traffic flow within the Mt Ash AQMA above traffic queuing to enter or cross the AQMA.

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
16	Mountain Ash Cross Valley Link (south) To relieve traffic from the existing local roads	Mt Ash	Traffic Management	Strategic Highway Improvements	RCT (RCT+WG)	2018 - 2020	2020	Est. 10.4% reduction in NO ₂ south of AQMA	Improvement of existing A4059 Jct and southern bridge completed.
17	Abercynon and Abercynon Park & Ride to support existing public mass transit relieve traffic congestion from the existing local road infrastructure	Taf Valley	Alternatives to Private Vehicle Use	Rail Based Park & Ride	RCT (RCT+WG)	2018	2019	-	Construction of additional 310 vehicle parking spaces associated with core valley-lines railway station. Expectation of minor reduction to NO ₂ within Taf Valley
18	Aberdare Relief Rd Extension To relieve traffic from the existing local roads	Aberdare	Traffic Management	Strategic Highway Improvements	RCT	2020	TBC	TBC	Preliminary investigation of feasibility and potential options supported by undertaking WelTag Stage 1 assessment.

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
19	Gelli/Treorchy Bypass To relieve traffic from the existing local roads	Rhondda Fawr	Traffic Management	Strategic Highway Improvements	RCT	2019	TBC	TBC	Preliminary investigation of feasibility and potential options supported by undertaking WeTag Stage 1 assessment.
20	Travel Information Leaflets for Ferndale, Pontypridd and Porth Public and active travel advice leaflets relevant to the area.	RCT	Public Information	Via Leaflets	RCT (RCT)	2015	2018	Leaflet uptake by partners and service user gateways strong with positive feedback	Hard and electronic travel and active travel information leaflets reproduced and distributed to service user gateways and other relevant stakeholders [9].
21	Support of National 'Clean Air Day' 2020	RCT	Promoting Travel Alternatives	Other	RCT (RCT)	2020	Ongoing	Limited engagement	Poster displays at some service user gateways.

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
22	Tax Incentivised Bicycle Purchase Scheme Government approved salary sacrifice scheme to offer bicycles to RCTCBC employees via "Cycle 2 Work" scheme	RCT	Promoting Travel Alternatives	Promotion of cycling	RCT (indirect)	2015	Ongoing	-	Cycle 2 Work scheme active with employee uptake facilitated via payroll. Advertisement of the scheme via pay slips and RCTCBC intranet. Scheme delivered as part of ongoing staff welfare package
23	Highway Improvement Ely Valley Road Dualing to relieve traffic congestion from the existing local road infrastructure	Tonyrefail	Traffic Management	Strategic Highway Improvements	RCT (RCT+WG)	2019 - 2024	TBC	TBC	Construction works commenced. Expectation of minor effect on NO ₂ within the entirety of Tonyrefail AQM

No.	Measure & Focus	Area of Potential Effect	EU Measure		Lead Authority (Primary Funding Source(s))	Planning & Implementation Phase	Completion	Annual Emission Reduction in the AQMAs & Indicators	Progress & Comment
			Category	Classification					
24	On-street Parking Provision Review to consider proposed Pavement Parking Restrictions WG	RCT	Traffic Management	Parking Enforcement on Highway	RCT	2020	TBC	TBC	Initial review of current local provisions, adaptation and enforcement with respect to possible national policy implications Potential to reduce general emissions where current on pavement parking is impeding traffic

3.4 Review of Air Quality Action Plans

AQAPs are ‘living’ plans that are required to be regularly reviewed and updated whenever deemed necessary, normally at least once every five years, to ensure they remain relevant to ever changing local, regional and national circumstances. As part of this schedule the Local Authority formally reviewed and re-adopted revised AQAPs for all sixteen AQMAs in 2022; these revised and re-adopted AQAPs are reproduced within Appendix E2: Revised Air Quality Action Plans. The next scheduled review of all the Local Authority’s AQAPs is expected in 2028.

3.5 Prioritisation of Air Quality Action Plans

It is recognised that in the current financial climate for Local Government, it may not be possible to implement all actions within all the proposed revised AQAPs immediately. Therefore, it is believed appropriate to target resources where they achieve the maximum benefit. In this regard, it is possible to prioritise the proposed and existing AQAPs into a hierarchy which allows focused direction from the Local Authority and its partners. In accordance with the Local Authority’s use of the HAP-RAP tool (described in Section 6.6.2) Table 3-4 provides the prioritisation of the revised AQAPs. This will ensure that the location with the greatest need will receive the highest priority.

Table 3-4: AQAP Prioritisation Order

AQAP	Priority
Cymmer	1
Ferndale	
Tylorstown	
Mt Ash Town Centre	
Nightingales Bush	2
Pontypridd Town Centre	3
Llwynypia	
Tonyrefail	
Aberdare Town Centre	
Broadway	
Church Village	
Cilfynydd	
Llanharan	
Mwyndy	
Nantgarw	
Treforest	

3.6 Monitoring of Air Quality Action Plans

It is important that the revised AQAPs contain monitoring indicators to demonstrate any progress in their delivery. Where appropriate, these indicators can involve the direct or proxy measurement of an expected effect. Table 3-5 below, provides a description of the monitoring associated with each revised AQAP action and an update on progress.

Table 3-5: AQAP Action Monitoring

AQAP Action		Monitoring	Update
Ref	Description		2023
AT1	Active travel routes	The total of length of new or improved relevant Active Travel Routes	New: 0.71 km of shared routes Improved: 15.8 km of footways; 9.6 km of shared routes
		The amount of investment in new or improved Active Travel Routes	~ £8,881,000
AT3	Behavioural influences	Delivery of schemes to increase travel information	Nil
		Favourable perspective of current public transport operators	NA
		Delivery of schemes to increase modal shift	Trial of free (Mach 2023) and reduced fare (Summer 2023) public bus journeys. Trial of free bus journeys undertaken for defined post 16 education.
		Opportunities undertaken to encourage active travel route usage	Continuation of cycle proficiency courses
LP1	Dedicated SPG	Production of an SPG	Current review of LDP progressing
MT1	Light-rail (Metro) system	Achievement of phased development scheme in accordance with published schedule	Phase 1 completed with Phase 2 being progressed
MT2	Improvement of public bus frequency	No. of additional or enhanced relevant bus routes	Nil
MT4.NB	Park and Ride Scheme	No. of additional park and ride spaces in the Cynon, Merthyr and Rhondda areas, based on a 2022 baseline	£730,000 to improve Park and Ride provision
OP1.Cy	Green Infrastructure	Total length of green barrier at Cymmer	Nil
OP1.NB	Green Infrastructure	Total length green barrier at Nightingales Bush	Nil
OP2	Green Synchronism	Delivery of green infrastructure and biodiversity policies	Progression of urban tree planting as green barriers at select education locations

RF4	Alternative Vehicle Fuel Provision	Delivery of the RCTCBC EV strategy in accordance with published schedule	Strategy being progressed
RF6	LA fleet improvement	Delivery of the RCTCBC EV strategy in accordance with published schedule	Strategy being progressed
RF7	Contracted fleet improvement	Delivery of the RCTCBC EV strategy in accordance with published schedule	Strategy being progressed
RF8	Public transport fleet improvement	Delivery of the RCTCBC EV strategy in accordance with published schedule	Strategy being progressed
RI7.Cy	Local off-street parking	No. of additional local off-street parking spaces provided in Cymmer	Nil
RM2.Cy	Traffic management: increase traffic flow	% relevant bias adjustment made	NA
		% change in average speed within Cymmer AQMA	NA
RM2.Po	Traffic management: increase traffic flow	% relevant bias adjustment made	NA
		% change in average speed within Pontypridd AQMA	NA
RM5	Increased parking enforcement	No. of additional hours spent patrolling relevant areas	Nil

4. Air Quality Monitoring Data and Comparisons

4.1 Summary of Monitoring Undertaken in 2022

This section sets out the automatic and non-automatic monitoring of air quality undertaken by the Local Authority in respect of its local air quality management duties. It provides details of monitoring locations, both those that were actively monitored in 2022 and other locations where monitoring may have previously taken place but has been suspended or that has recently commenced but results are not available yet.

In accordance with best practice the Local Authority annually reviews, in December, the scope and extent of the Local Authority's local air quality monitoring network. Where changes have been made to the local air quality monitoring network, the reasoning is also provided in this subsection.

4.1.1 Automatic Monitoring Sites

The Local Authority undertook automatic monitoring at four sites during 2022, with three automatic monitoring locations examining NO₂ and one automatic monitoring location examining PM₁₀. Table 4-1 presents the details of the sites with further information available via the [Air Quality in Wales](#) website [1].

Towards the end of 2022 the automatic monitoring of PM₁₀ at Site No. 130 was temporarily suspended, as the instrumentation at the air quality station had come to the end of its functionality without significant overhaul. The Local Authority is currently committed to maintaining, and if possible enhancing, its capability with respect to the monitoring of fine particulate matter at Glyncoch. To this aim, the Local Authority has allocated resources and advanced the procurement process to upgrade the Glyncoch air quality station with new instrumentation, capable of monitoring both PM_{2.5} and PM₁₀ concurrently whilst continuing to utilise an approved equivalence method. It is envisioned that the new instrumentation will be in place by the end of 2023 and monitoring recommenced at that time.

No other new automatic monitoring sites were commenced or existing automatic monitoring sites discontinued in 2022.

A map showing the location of the monitoring sites is provided in Figure 4-1, with higher resolution area maps of extant automatic monitoring sites in Appendix C2: Monitoring Location Maps. Further details on how the monitors are calibrated and how the data has been adjusted, validated and ratified are included in Appendix C1: Air Quality Monitoring Data QA/QC.

4.1.2 Non-Automatic Monitoring Sites

Rhondda Cynon Taf CBC undertook non-automatic (passive) monitoring of NO₂ at fifty-four sites (utilising fifty-six NO₂ passive diffusion tubes) during 2022.

No existing non-automatic monitoring sites were discontinued in 2022.

At the beginning of 2022, the following non-automatic monitoring sites for NO₂ were commenced at: -

- Site No. 139 (Llwydcoed Rd, Llwydcoed) was established to support community understanding of local air quality trends.
- Site No. 140 (Penrhys Rd, Tylorstown) was established to further understand the influence of local urban layout and topography.
- Site No. 141 (Gelligaled Rd, Ystrad) was established to periodically re-consider the incremental change in the local urban environment.

Table 4-2 presents the details of these sites, with higher resolution area maps of extant non-automatic monitoring sites in Appendix C2: Monitoring Location Maps. Further details on how the NO₂ passive diffusion tubes are bias adjusted, annualisation and distance corrected, are included in Appendix C1: Air Quality Monitoring Data QA/QC.

Table 4-1: Details of Automatic Monitoring Sites in 2022

Site ID	Site Name	Activity		Site Type	Associated AQMA	OS Grid Reference		Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Monitor to Nearest Relevant Exposure ⁽¹⁾ (m)	Kerb to Nearest Relevant Exposure (m)	Kerb to Monitor (m)
		Start	End			X	Y						
70	Broadway	2006	Active	Roadside	Broadway	307839	189619	Nitrogen Dioxide	Chemi	2.5	-2.1	3.1	5.2
120	Pontypridd	2011	Active	Roadside	Pontypridd	307286	190433	Nitrogen Dioxide	Chemi	1.5	-5.9	2.1	8
130	Upper Garth Avenue FDMS	2014	Active	Industrial	N/A	307861	192046	Particulate Matter PM ₁₀	TEOM FDMS	3.5	NA	NA	NA
131	Mt Ash	2014	Active	Roadside	Mt Ash	304772	199307	Nitrogen Dioxide	Chemi	1.5	-0.5	0.5	1

Table Notes:

- (1) Where the difference is <1m, indicates that the sited monitor represents exposure and as such no subsequent distance calculation is required.

Figure 4-1: Map of Automatic Monitoring Sites in 2022

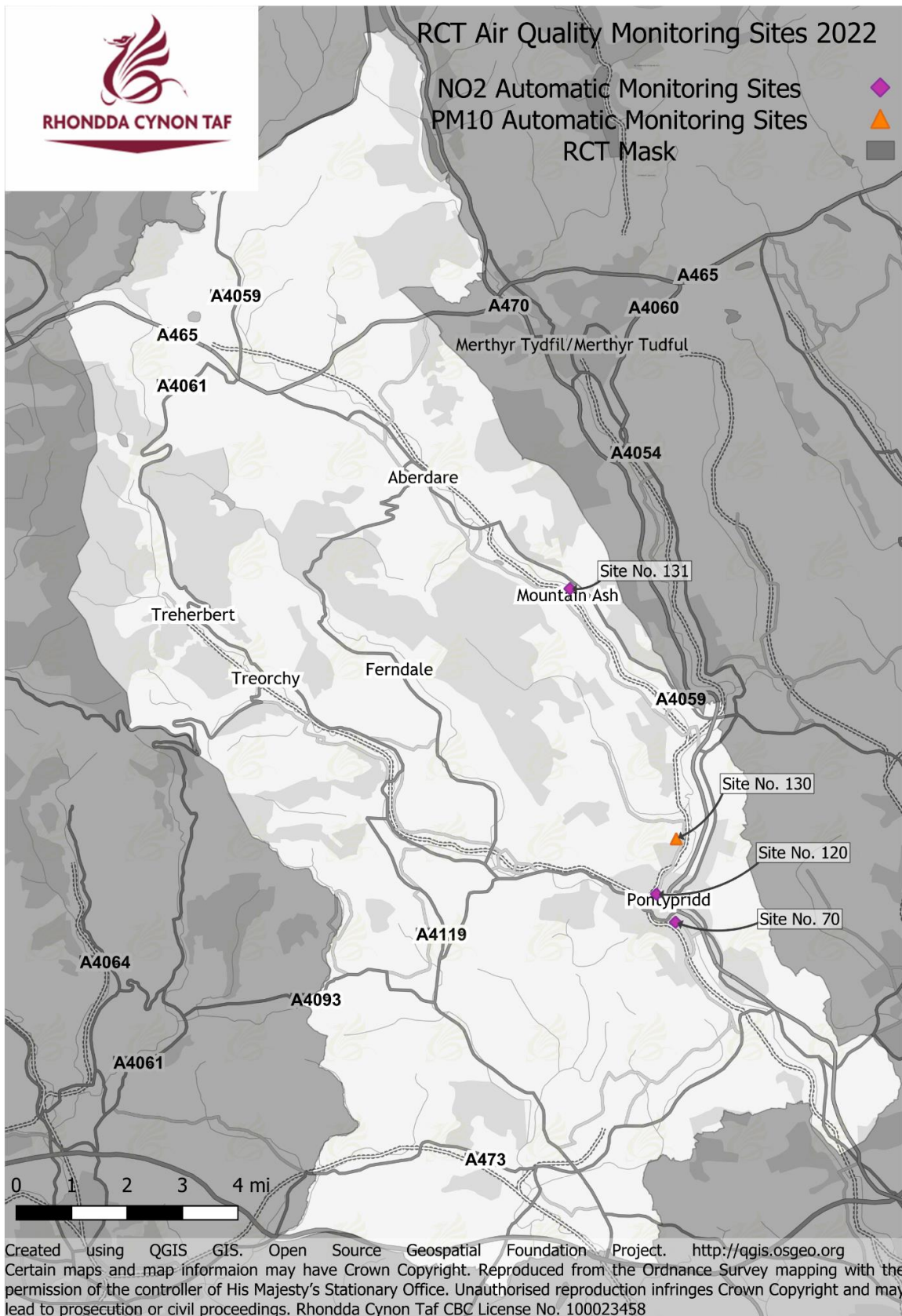


Table 4-2: Details of Non-Automatic Monitoring Sites in 2022

Site ID	Site Name	Activity		Site Type	Associated AQMA	OS Grid Reference		Site Height (m)	Co-located	Monitor to Nearest Relevant Exposure ⁽¹⁾ (m)	Kerb to Nearest Relevant Exposure (m)	Kerb to Monitor (m)
		Start	End			X	Y					
4	Lanelay Terrace, Maesycod	2001	Active	Urban Background	N/A	306587	189833	3.5	No	<0.1	2.3	2.3
8	Parc y Nant, Nantgarw	2001	Active	Roadside	Nantgarw	312629	185612	3.5	No	0.8	7.4	6.6
21	Woodland Park, Penderyn	2001	Active	Urban Background	N/A	294867	207733	3.5	No	10.5	11.8	1.3
37	Lakeside Court, A4119	2003	Active	Roadside	Mwyndy	305442	181579	3.5	No	1.9	4.1	2.2
41	East Rd, Tylorstown	2003	Active	Roadside	Tylorstown	300953	195129	3.5	No	1.2	1.8	0.6
44	Coronation Terrace, Pontypridd	2003	Active	Roadside	Cilfynydd	308205	191053	3.5	No	-5.4	3.8	9.2
47	Broadway Co-Sampling	2004	Active	Roadside	Broadway	307839	189619	3.5	Yes	-2.1	3.1	5.2
48	Broadway Co-Sampling	2004	Active	Roadside	Broadway	307839	189619	3.5	Yes	-2.1	3.1	5.2
50	Broadway Co-Sampling	2004	Active	Roadside	Broadway	307839	189619	3.5	Yes	-2.1	3.1	5.2
51	Broadway, Treforest	2005	Active	Roadside	Broadway	307762	189680	3.5	No	5	5.5	0.5
52	Oxford St, Mountain Ash	2005	Active	Roadside	Mt Ash	304721	199179	3.5	No	<0.1	1.6	1.6
53	Cardiff St, Aberdare	2005	Active	Roadside	Aberdare	300359	202539	3.5	No	1.1	1.8	0.7
55	Cilfynydd Rd, Cilfynydd	2005	Active	Roadside	Cilfynydd	308457	191595	3.5	No	1.8	4	2.2

Site ID	Site Name	Activity		Site Type	Associated AQMA	OS Grid Reference		Site Height (m)	Co-located	Monitor to Nearest Relevant Exposure ⁽¹⁾ (m)	Kerb to Nearest Relevant Exposure (m)	Kerb to Monitor (m)
		Start	End			X	Y					
56	Broadway, Treforest	2005	Active	Roadside	Broadway	308236	189344	3.5	No	1.2	2	0.8
66	Broadway, Treforest	2006	Active	Roadside	Broadway	307990	189538	3.5	No	1.8	2.5	0.7
68	Canon Street, Aberdare	2006	Active	Roadside	Aberdare	300159	202644	3.5	No	<0.1	2.2	2.2
69	Cardiff St, Aberdare.	2006	Active	Roadside	Aberdare	300485	202437	3.5	No	0.4	2.9	2.5
76	Heol-y-Gors, Nantgarw	2006	Active	Roadside	Nantgarw	312620	185619	3.5	No	<0.1	2.4	2.4
79	High St, Pontypridd	2007	Active	Roadside	Pontypridd	307201	189887	3.5	No	<0.1	3.7	3.7
80	Morgan St, Pontypridd	2007	Active	Roadside	Pontypridd	307345	190531	3.5	No	2.7	3.2	0.5
81	Sardis Bridge Pontypridd	2007	Active	Roadside	Pontypridd	307123	190022	3.5	No	<0.1	2	2
82	Main Rd, Llantwit Fardre	2007	Active	Roadside	N/A	307281	184886	3.5	No	1.6	3.2	1.6
83	Ceridwen Terrace	2007	Active	Roadside	Pontypridd	307481	190369	3.5	No	<0.1	2.4	2.4
84	Gelliwastad Rd	2007	Active	Roadside	Pontypridd	307264	190403	3.5	No	<0.1	1.5	1.5
85	Efail Isaf Junction	2007	Active	Roadside	Church Village	308579	185863	3.5	No	0.7	2.4	1.7
88	Victoria Square, Aberdare	2007	Active	Roadside	Aberdare	300320	202564	3.5	No	<0.1	2.2	2.2
90	Cymmer Rd, Dinas	2007	Active	Roadside	N/A	302169	191535	3.5	No	0.3	1.5	1.2
91	High St, Cymmer	2007	Active	Roadside	Cymmer	302494	190868	3.5	No	<0.1	1.5	1.5

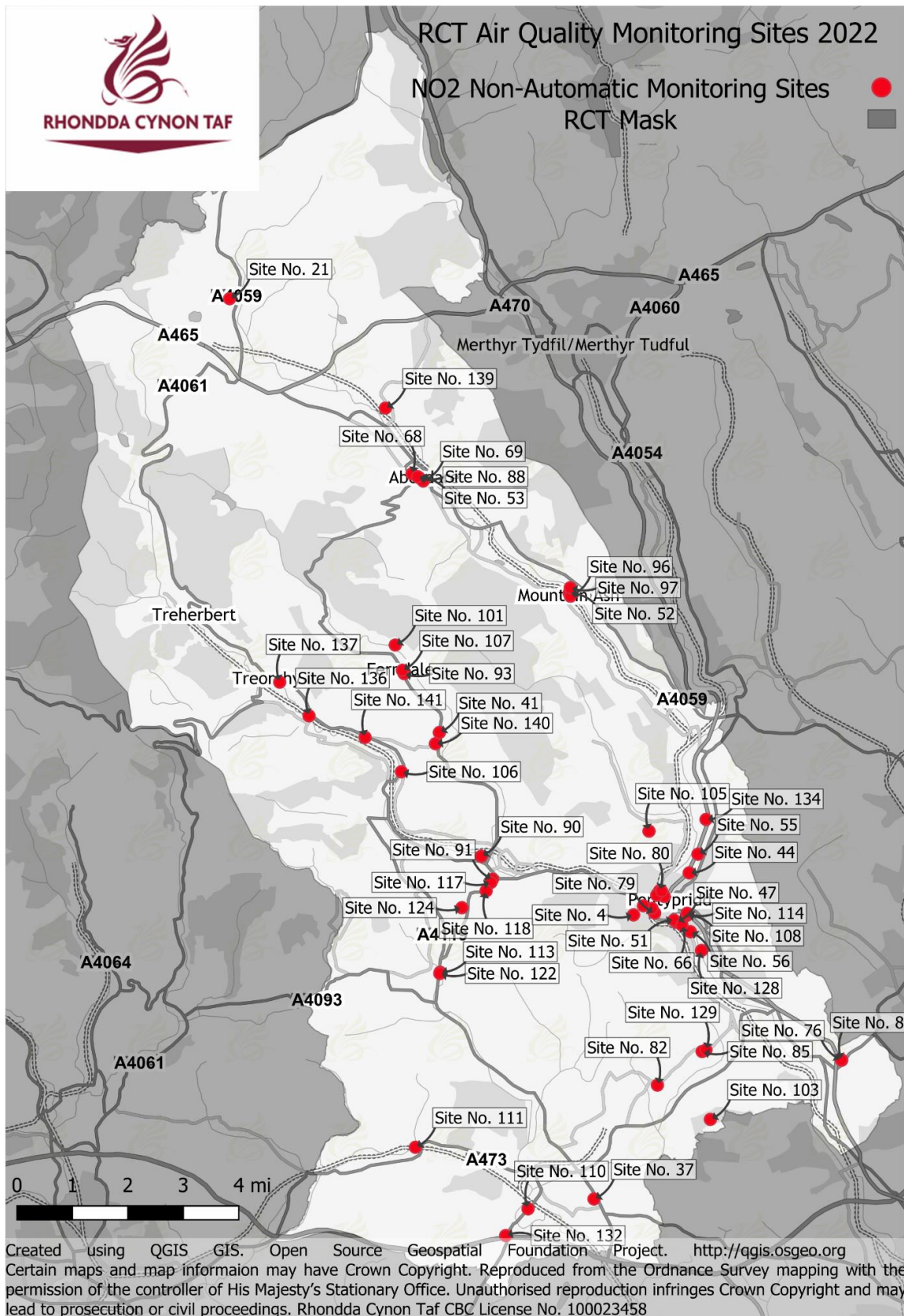
Site ID	Site Name	Activity		Site Type	Associated AQMA	OS Grid Reference		Site Height (m)	Co-located	Monitor to Nearest Relevant Exposure ⁽¹⁾ (m)	Kerb to Nearest Relevant Exposure (m)	Kerb to Monitor (m)
		Start	End			X	Y					
93	High Street, Ferndale	2007	Active	Roadside	Ferndale	299931	196843	3.5	No	<0.1	2.1	2.1
96	Oxford St, Mountain Ash	2008	Active	Roadside	Mt Ash	304757	199091	3.5	No	<0.1	1.5	1.5
97	New Rd, Mountain Ash	2008	Active	Roadside	Mt Ash	304751	199336	3.5	No	0.4	2.9	2.5
101	Long Row, Blaenllechau	2008	Active	Rural Background	N/A	299674	197673	3.5	No	NA	N/A	N/A
103	Ty Mawr Farm, Efail Isaf	2008	Active	Rural Background	N/A	308817	183891	3.5	No	NA	N/A	N/A
105	Greenfield Ave, Glyncoch	2008	Active	Rural Background	N/A	307038	192263	3.5	No	NA	N/A	N/A
106	Partridge Rd, Llwynypia	2008	Active	Roadside	Llwynypia	299851	193991	3.5	No	<0.1	1.7	1.7
107	High Street, Ferndale	2008	Active	Roadside	Ferndale	299880	196937	3.5	No	<0.1	1.8	1.8
108	Nightingales Bush, Pontypridd	2008	Active	Roadside	Pontypridd	308101	189853	3.5	No	6.3	9.6	3.3
110	Cowbridge Rd	2009	Active	Roadside	Pontyclun	303533	181287	3.5	No	0.4	2	1.6
111	Bridgend Rd, Llanharan	2009	Active	Roadside	Llanharan	300259	183082	3.5	No	<0.1	0.5	0.5
113	Mill St, Tonyrefail	2009	Active	Roadside	Tonyrefail	300976	188165	3.5	No	0.4	1	0.6
114	Pentrebach Rd	2009	Active	Roadside	Nightingales Bush	308146	189882	3.5	No	3.4	5.1	1.7
117	High St, Cymmer	2009	Active	Roadside	Cymmer	302452	190778	3.5	No	0.9	1.5	0.6
118	High St, Cymmer	2009	Active	Roadside	Cymmer	302312	190531	3.5	No	1.7	3	1.3

Site ID	Site Name	Activity		Site Type	Associated AQMA	OS Grid Reference		Site Height (m)	Co-located	Monitor to Nearest Relevant Exposure ⁽¹⁾ (m)	Kerb to Nearest Relevant Exposure (m)	Kerb to Monitor (m)
		Start	End			X	Y					
122	Mill St, Tonyrefail	2011	Active	Roadside	Tonyrefail	300966	188131	3.5	No	0.6	2.6	2
124	Trebanog Rd, Trebanog	2011	Active	Roadside	Cymmer	301606	190042	3.5	No	<0.1	1.6	1.6
128	Cardiff Rd, Treforest	2013	Active	Roadside	Treforest	308561	188796	3.5	No	0.4	1.9	1.5
129	Main Rd, Church Village	2014	Active	Roadside	Church Village	308687	185905	3.5	No	1.1	3.2	2.1
132	Cowbridge Rd, Talygarn	2016	Active	Roadside	N/A	302880	180517	3.5	No	0.7	23.2	22.5
134	Pontypridd High School, Pontypridd	2019	Active	Other	N/A	308690	192589	3.5	No	13.9	33.7	19.8
135	Ysgol Evan James, Pontypridd	2020	Active	Roadside	N/A	306875	190098	3.5	No	4.4	6.5	2.1
136	Ystrad Rd, Pentre	2020	Active	Roadside	N/A	297171	195616	3.5	No	<0.1	1.8	1.8
137	High St, Treorchy	2020	Active	Roadside	N/A	296321	196594	3.5	No	1.3	1.9	0.6
138	Berw Rd, Pontypridd	2021	Active	Roadside	Pontypridd	307401	190525	3.5	No	<0.1	2.1	2.1
139	Llwydcoed Rd, Llwydcoed	2022	Active	Roadside	N/A	299388	204555	3.0	No	2.3	4.2	1.9
140	Penrhys Rd, Tylorstown	2022	Active	Roadside	N/A	300840	194805	3.0	No	1.5	1.8	0.3
141	Gelligaled Rd, Ystrad	2022	Active	Roadside	N/A	298799	194989	3.0	No	0.3	1.6	1.3

Table Notes

- (1) Where the difference is <1m, indicates that the sited monitor represents exposure and as such no subsequent distance calculation is required.
- (2) Where a row has been 'greyed' monitoring has commenced at the end of the calendar year and results are not yet available.

Figure 4-2: Map of Non-Automatic Monitoring Sites in 2022



4.2 Air Quality Monitoring Results in 2022

This subsection presents the results of air quality monitoring undertaken in 2022 by the Council with respect to its local air quality management duties. Table 4-3 provides the results for the annual mean NO₂ at all relevant monitoring sites, both automatic and non-automatic, whilst Table 4-4 provides the results of the 1-hour mean NO₂, and associated statistics, at relevant automatic monitoring sites. Table 4-5 provides the results of the annual mean PM₁₀ and Table 4-6 the results of the 24-hour Mean PM₁₀, and associated statistics, at relevant automatic monitoring sites.

Unless specifically stated all non-automatic Nitrogen Dioxide results have been corrected using the local bias factor [Bias A] for the respective year, see Appendix C1: Air Quality Monitoring Data QA/QC. Users of this data should not re-correct the data.

Table 4-3: Annual Mean NO₂ Monitoring Results

Site ID	Site Name	Site Type	Monitoring Type	NO ₂ Fall-Off ⁽¹⁾	Valid Data Capture Period (%) ⁽²⁾	Valid Data Capture 2022 (%) ⁽³⁾	NO ₂ Annual Mean Concentration (µg ^m - ³) ⁽⁴⁾				
							2018	2019	2020	2021	2022
4	Lanelay Terrace, Maesycoed	Suburban	Non-Automatic	-	100	100	15.2	14.1	10.3	11.5	11.9
8	Parc y Nant, Nantgarw	Roadside	Non-Automatic	NA	100	100	37.1	35.8	24.7	31.8	35.4
21	Woodland Park, Penderyn	Urban Background	Non-Automatic	NA	100	100	6.6	5.4	3.9	5.3	5.1
37	Lakeside Court, A4119	Roadside	Non-Automatic	Y	100	100	37.1 {33.7}	32.3 {29.5}	22.7 {21.2}	27.8 {25.5}	28.0 {25.3}
41	East Rd, Tylorstown	Roadside	Non-Automatic	NA	100	100	42.5	42.2	31.0	40.6	39.8
44	Coronation Tr, Pontypridd	Roadside	Non-Automatic	Y	100	100	33.2 {40.1}	29.2 {34.9}	21.7 {25.2}	24.7 {29.3}	24.7 {29.6}
47	Broadway Co-Sampling	Roadside	Non-Automatic	NA	91.7	91.7	25.8	25.5	20.3	21.4	22.9
48	Broadway Co-Sampling	Roadside	Non-Automatic	NA	100	100	25.4	25.7	19.4	21.2	22.9
50	Broadway Co-Sampling	Roadside	Non-Automatic	NA	83.3	83.3	25.4	25.1	18.9	22.1	24.5
51	Broadway, Treforest	Roadside	Non-Automatic	NA	91.7	91.7	34.4	34.5	24.7	31.0	31.2

Site ID	Site Name	Site Type	Monitoring Type	NO ₂ Fall-Off ⁽¹⁾	Valid Data Capture Period (%) ⁽²⁾	Valid Data Capture 2022 (%) ⁽³⁾	NO ₂ Annual Mean Concentration (µg ^m - ³) ⁽⁴⁾				
							2018	2019	2020	2021	2022
52	Oxford St, Mt Ash	Roadside	Non-Automatic	-	100	100	48.1	42.2	32.1	31.7	33.2
53	Cardiff St, Aberdare	Roadside	Non-Automatic	NA	100	100	36.0	33.6	24.4	29.5	29.3
55	Cilfynydd Rd, Cilfynydd	Roadside	Non-Automatic	NA	100	100	36.4 [‡]	28.1	21.9	26.6	26.4
56	Broadway, Treforest	Roadside	Non-Automatic	NA	91.7	91.7	35.9	31.5	26.8	33.3	33.1
66	Broadway, Treforest	Roadside	Non-Automatic	NA	91.7	91.7	32.1	33.5	23.2	29.4	30.5
68	Canon Street, Aberdare	Roadside	Non-Automatic	-	100	100	33.1	29.6	21.5	27.1	25.3
69	Cardiff St, Aberdare.	Roadside	Non-Automatic	NA	91.7	91.7	30.6	27.7	21.3	25.5	27.0
70	Broadway	Roadside	Automatic	Y	95.5	95.5	25.3 {27.5}	25.4 {27.7}	20.4 {22.1}	21.7 {24.1}	22.8 {25.0}
76	Heol-y-Gors, Nantgarw	Roadside	Non-Automatic	-	100	100	28.0	28.0	20.8	25.2	26.1
79	High St, Pontypridd	Roadside	Non-Automatic	-	100	100	32.3	30.0	22.8	25.3	26.6
80	Morgan St, Pontypridd	Roadside	Non-Automatic	NA	100	100	30.7	28.8	20.1	23.2	24.4
81	Sardis Bridge Pontypridd	Roadside	Non-Automatic	-	100	100	31.1	32.7 [‡]	21.4	25.7	27.1
82	Main Rd, Llantwit Fardre	Roadside	Non-Automatic	Y	100	100	28.4 {25.7}	24.9 {22.7}	19.4 {18.0}	22.9 {20.3}	23.4 {21.2}
83	Ceridwen Terrace	Roadside	Non-Automatic	-	91.7	91.7	32.6	31.5	26.4 [‡]	26.6	27.0
84	Gelliwastad Rd	Roadside	Non-Automatic	-	91.7	91.7	45.0	41.2	31.4	39.1	38.5
85	Efail Isaf Junction (West)	Roadside	Non-Automatic	NA	100	100	34.5	30.3	22.7	29.4	27.6
88	Victoria Sq, Aberdare	Roadside	Non-Automatic	-	100	100	32.0	29.1 [‡]	21.0	26.5	27.0
90	Cymmer Rd, Dinas	Roadside	Non-Automatic	NA	100	100	32.7	31.7	24.3	33.5	30.4
91	High St, Cymmer	Roadside	Non-Automatic	-	91.7	91.7	48.4	45.6	37.8	43.8	43.6
93	High Street, Ferndale	Roadside	Non-Automatic	-	100	100	43.8	43.3	29.0	40.3	37.6
96	Oxford St, Mt Ash	Roadside	Non-Automatic	-	100	100	39.2	37.1	27.4 [‡]	26.0	28.2
97	New Rd, Mt Ash	Roadside	Non-Automatic	NA	100	100	47.8 [‡]	45.6	45.7	38.2	39.5

Site ID	Site Name	Site Type	Monitoring Type	NO ₂ Fall-Off ⁽¹⁾	Valid Data Capture Period (%) ⁽²⁾	Valid Data Capture 2022 (%) ⁽³⁾	NO ₂ Annual Mean Concentration (µg m ⁻³) ⁽⁴⁾				
							2018	2019	2020	2021	2022
101	Long Row, Blaenllechau	Urban Background	Non-Automatic	NA	100	100	6.9	5.7	5.0 [‡]	5.9	5.1
103	Ty Mawr Farm, Efail Isaf	Urban Background	Non-Automatic	NA	100	100	8.9	7.9	5.6	7.4	6.3
105	Greenfield Ave, Glyncoch	Urban Background	Non-Automatic	NA	91.7	91.7	9.1	7.5	5.9	7.6	7.3
106	Partridge Road, Llwynypia	Roadside	Non-Automatic	-	100	100	36.0	36.0	26.8	34.3	31.4
107	High St, Ferndale	Roadside	Non-Automatic	-	100	100	31.5	32.0	22.9	28.5	27.7
108	Nightingales Bush ⁽⁶⁾	Roadside	Non-Automatic	NA	100	100	56.6	51.4	33.7 [‡]	38.1	39.0
110	Cowbridge Rd	Roadside	Non-Automatic	NA	100	100	29.0	30.5	18.6	23.2	23.2
111	Bridgend Rd, Llanharan	Roadside	Non-Automatic	-	91.7	91.7	36.5	33.1	26.9	32.4	27.3
113	Mill St, Tonyrefail	Roadside	Non-Automatic	NA	58.3	58.3	33.9 [‡]	31.4	25.1 [‡]	28.3	27.8 [‡]
114	Pentrebach Rd	Roadside	Non-Automatic	NA	91.7	91.7	28.3	25.1	18.4	23.5	22.2
117	High St, Cymmer	Roadside	Non-Automatic	NA	83.3	83.3	50.2	49.7	35.6	44.0	43.9
118	High St, Cymmer	Roadside	Non-Automatic	NA	100	100	56.7	63.8	45.1	52.9	52.2
120	Pontypridd	Roadside	Automatic	NA	99.8	99.8	31.7	30.2	25.1	28.3	28.4
122	Mill St, Tonyrefail	Roadside	Non-Automatic	NA	91.7	91.7	29.2	28.7	22.5	29.0	28.0
124	Trebanog Rd, Trebanog	Roadside	Non-Automatic	-	100	100	26.7	24.1	17.4	23.1	20.9
128	Cardiff Rd, Treforest	Roadside	Non-Automatic	NA	91.7	91.7	33.7	29.1	20.8	25.5	27.4
129	Main Rd, Church Village	Roadside	Non-Automatic	Y	100	100	23.9 {22.6}	23.1 {21.9}	18.1 [‡] {17.3}	20.9 {19.8}	20.4 {19.2}
131	Mt Ash	Roadside	Automatic	NA	99.5	99.5	45.0	46.6	34.2	33.2	31.6
132	Cowbridge Rd, Talygarn	Roadside	Non-Automatic	NA	100	100	29.5	31.0	19.6 [‡]	24.4	22.8
134	Pontypridd High School	Other	Non-Automatic	Y	91.7	91.7	-	15.4 {13.4}	13.1 [‡] {11.6}	15.1 {13.0}	16.4 {14.5}

Site ID	Site Name	Site Type	Monitoring Type	NO ₂ Fall-Off ⁽¹⁾	Valid Data Capture Period (%) ⁽²⁾	Valid Data Capture 2022 (%) ⁽³⁾	NO ₂ Annual Mean Concentration (µg ^m ⁻³) ⁽⁴⁾				
							2018	2019	2020	2021	2022
135	Ysgol Evan James	Roadside	Non-Automatic	Y	91.7	91.7	-	-	16.7 {13.8}	22.9 {18.3}	23.5 {19.6}
136	Ystrad Rd, Pentre	Roadside	Non-Automatic	-	91.7	91.7	-	-	28.1	33.7	36.2
137	High St, Treorchy	Roadside	Non-Automatic	NA	91.7	91.7	-	-	22.2	27.0	25.7
138	Berw Rd, Pontypridd	Roadside	Non-Automatic	-	100	100	-	-	-	31.7	31.1
139	Llwydcoed Rd, Llwydcoed	Roadside	Non-Automatic	Y	100	100	-	-	-	-	15.8 {14.0}
140	Penrhys Rd, Tylorstown	Roadside	Non-Automatic	NA	100	100	-	-	-	-	30.0
141	Gelligaled Rd, Ystrad	Roadside	Non-Automatic	Y	100	100	-	-	-	-	25.2 {24.4}

Table 4-4: 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Name	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽²⁾	Valid Data Capture 2021 (%) ⁽³⁾	NO ₂ 1-Hour Means > 200µg ^m ⁻³ ⁽⁵⁾				
						2018	2019	2020	2021	2022
70	Broadway	Roadside	Continuous	95.5	95.5	0 (81.5)	0 (88.9)	0 (72.0)	0 (64)	0 (76)
120	Pontypridd	Roadside	Continuous	99.8	99.8	0 (109.4)	0 (115.0)	0 (102.0)	0 (100)	0 (118)
131	Mt Ash	Roadside	Continuous	99.5	99.5	0 (131)	0 (141.3)	0 (124.0)	0 (108.5)	0 (106)

Table Notes

Exceedances of the NO₂ annual mean objective of 40 µg^m⁻³ are shown in bold.

Exceedances of the NO₂ 1-hour mean objective (200 µg^m-³ not to be exceeded more than 18 times per year) or otherwise NO₂ annual means exceeding 60 µg^m-³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in bold and underlined.

- (1) Monitoring locations indicated with 'Y' have met the NO₂ 'fall-off' correction criteria and the corrected predicted mean at the receptor is provided in curly brackets '{ }', monitoring locations indicated with 'NA' experience location specific reasons which would suggest it is not appropriate to undertake NO₂ 'fall-off' correction, monitoring locations indicated with '-' are located at the relevant population and do not require correction.
- (2) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
- (3) 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%).
- (4) Means for diffusion tubes have been corrected for bias with means labelled with a ‡ having been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG22, as their valid data capture for the full calendar year is less than 75%. See Appendix C1: Air Quality Monitoring Data QA/QC for details.
- (5) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in parenthesis.

Table 4-5: Annual Mean PM₁₀ Monitoring Results

Site ID	Site Name	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µgm ⁻³) ⁽³⁾				
					2018	2019	2020	2021	2022
130	Garth Ave. TEOM FDMS	Industrial	73.0	73.0	25.1	14.4	14.4	11.5	16.4

Table 4-6: 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Name	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50 µgm ⁻³ ⁽³⁾⁽⁴⁾				
					2018	2019	2020	2021	2022
130	Garth Ave. TEOM FDMS	Industrial	73.0	73.0	13 (48.2)	2 (22.7)	4 (28.7)	2 (19.9)	3 (28.7)

Table Notes:

Exceedances of the PM₁₀ annual mean objective of 40 µgm⁻³ are shown in bold.

Exceedances of the PM₁₀ 24-hour mean objective (50 µgm⁻³ not to be exceeded more than 35 times per year) 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) Due to local specific influences means have not been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16
- (4) If the period of valid data is less than 85%, the 90.4th percentile of daily means is provided in brackets.

4.3 Comparison of 2022 Monitoring Results with AQOs

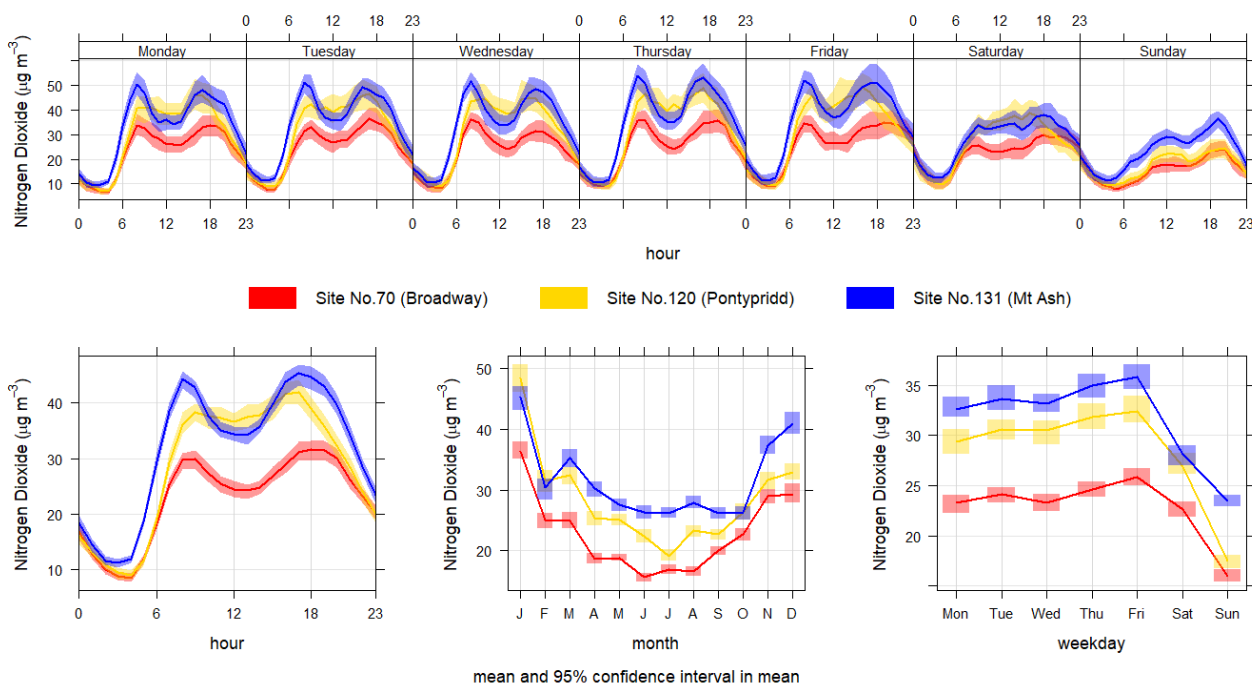
This section details the Local Authority’s consideration of air quality monitoring data collected in 2022, its context in relation to previous years and its relation to relevant Air Quality Objectives.

4.3.1 Nitrogen Dioxide [NO₂]

It has been reported [10] that, based on a measured assessment in 2021 and being the most recently available, the South Wales Non-agglomeration Zone, which includes Rhondda Cynon Taf, was compliant with the 1-hour EU Limit Value for NO₂ but was not compliant with the annual mean EU Limit Value for NO₂ and is likely to remain so. Published UK wide statistics [11] note that “NO₂ decreased by 1% at urban background sites and 5% at roadside sites from 2021 levels”. It has also been reported [12] that Rhondda Cynon Taf, in comparison with other Welsh Local Authorities, has been ranked² (lower the better) 4th out of 7 for NO₂.

To help consider the relevance and context of the latest NO₂ monitoring data, from 2022, it is possible to examine it in a number of ways. Figure 4-3 below contains time variation plots of the 2022 absolute hourly mean NO₂ measurements collected and assessed against time of the day, day of the week and month of the year, for each NO₂ automatic monitoring location in 2022.

Figure 4-3: Time Variation Plot of NO₂ Automatic Monitoring Data in 2022



The time variation plots clearly illustrate, at all three NO₂ automatic monitoring sites, several relationships that are widely observed within Wales. These observed relationships often

² Although there are currently twenty-two Local Authorities in Wales, some may be ranked equally

underline the anthropogenic nature of NO₂ within a local air quality context and yet also its synergy with naturally occurring cyclical events:

- Diurnal Relationship

This day/night relationship can be observed with the steep relative increases in NO₂ at ~6am and then a more gradual decline at ~6pm. This relationship is closely associated to human activity, notably commuter linked transportation, giving rise to NO₂ and its precursors, and also the natural influence of sunlight on the prevalence of NO₂, with respect to its interaction with day-light dependant associative pollutants.

- Hebdomadad Relationship

This through-the-week relationship can be strongly correlated to human activity and is often observed as a pronounced reduction in levels of NO₂ on the weekend, particularly Sunday, when transportation and industrial activity may be subdued.

- Biannual Relationship

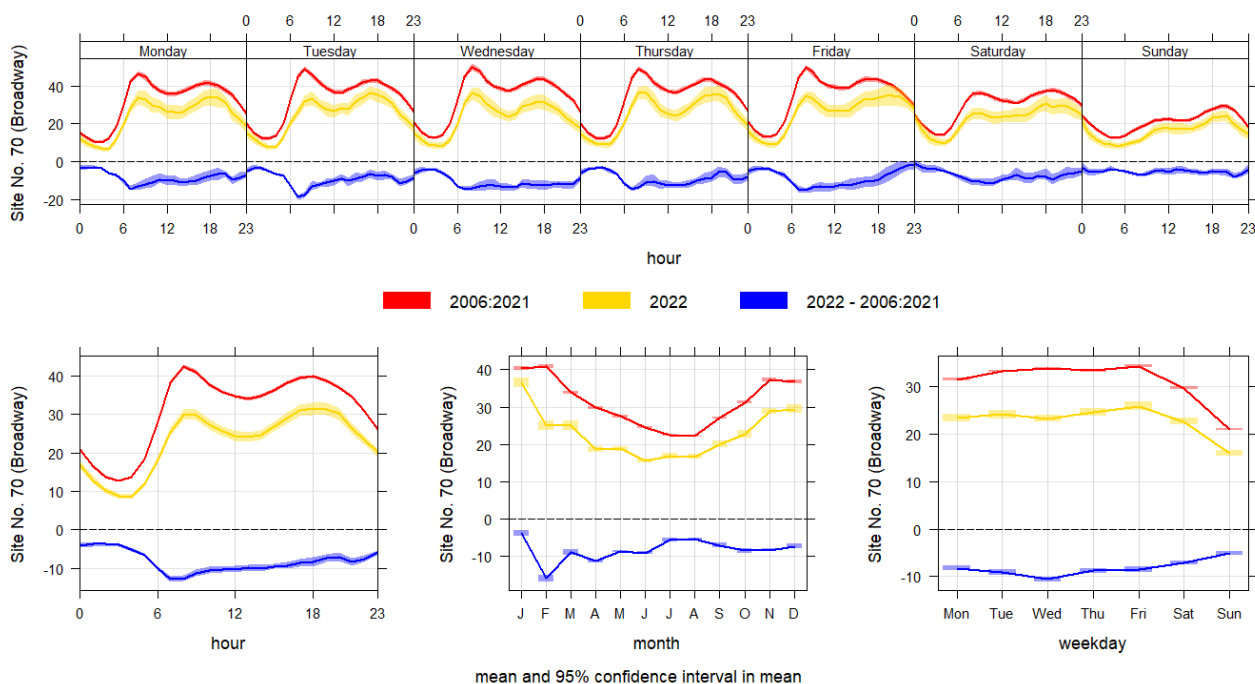
This summer/winter relationship can be influenced by human activity, for instance the greater use of domestic heating and vehicle transportation during the winter, resulting in greater emissions of NO₂ and its precursors. Natural phenomena can also be influential, such as winter weather patterns that are more likely to give rise to conditions that reduce the local dispersion of air pollutants, allowing them to build-up more readily. Whereas, in the summer conditions may, at certain times, result in greater levels of tropospheric Ozone [O₃] that can result in reduced NO₂ stability.

Although very similar patterns in the occurrence of NO₂ are observed at all three automatic sites, it is also the case that specific circumstances at each location are likely reflected in the observations. For instance, the comparatively reduced levels of NO₂ at Site No. 70 (Broadway) is likely reflective of the locations suburban characteristics. Whereas the greater emphasis of peak levels of NO₂ at 8 am and 6 pm at Site No. 131 (Mt Ash) may reflect the large degree of regionally related commuting traffic traversing the local road network at this location. Although also observed to an extent at Site No. 120 (Pontypridd), this location also seems to experience comparatively less of a reduction in NO₂ on Saturdays, which may reflect road traffic related to the location being part of a local commercial hub.

Both human factors and natural phenomena can be heavily influenced by changeable weather conditions, which themselves maybe cyclical. These weather conditions can result in significant variability in observed air quality from year to year. For instance, a protracted dry and cold winter may increase the emission of NO₂, and its precursors, from heating activities or increase the likelihood of weather phenomena that may reduce the dispersion of local pollution. Significant unusual events as well as a globally changing environment can also influence local air quality either in the short-term or have more longer term implications.

At Site No. 70 (Broadway) where monitoring data has been consistently collected since 2006 it is possible to compare the hourly mean monitoring data from 2022 with the historic average, between 2006 and 2021. Figure 4-4 provides normalised time variation plots of this comparison and the calculated difference between the current and historic measurements.

Figure 4-4: Normalised Time Variation Plot of NO₂ at Site No. 70 (Broadway) from 2006

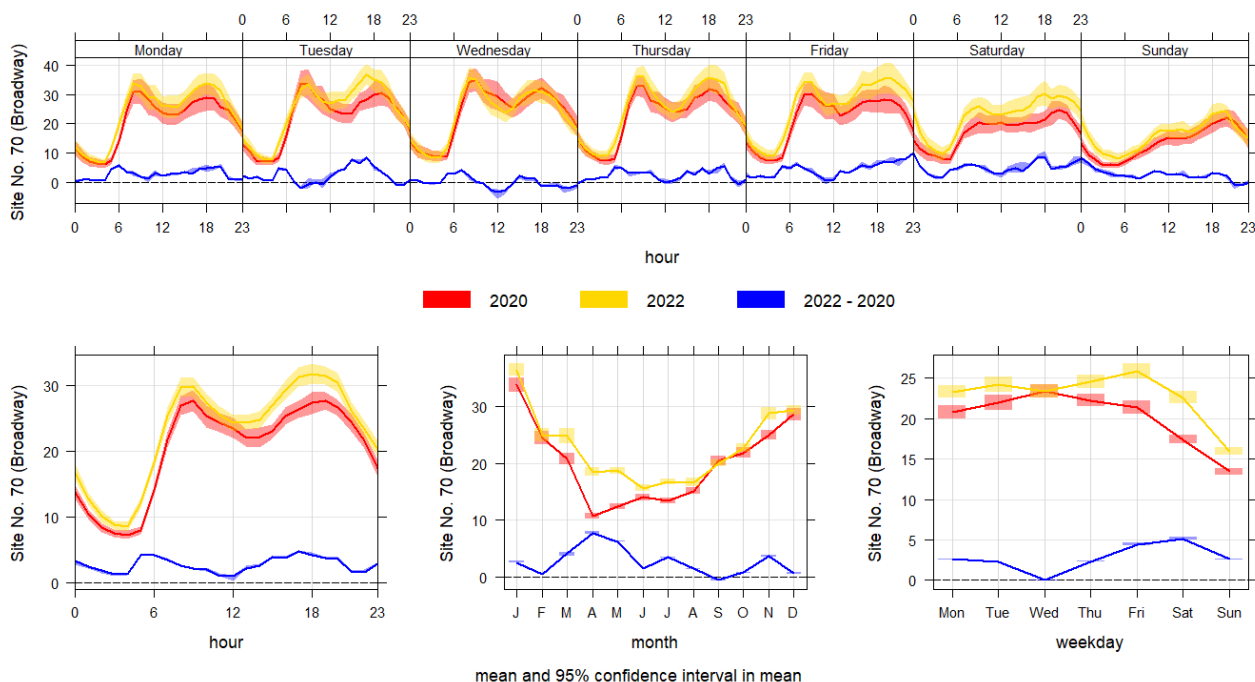


The above normalised time variation plots of current and historic NO₂ measurements shows that the pattern associated with the occurrence of NO₂ at Broadway has historically (results from 2006 to 2021) been consistent (the narrowness of the plotted red line). Both the latest 2022 results (the plotted gold line) and the historic results (the plotted red line) show very similar patterns albeit with levels of NO₂ in 2022 generally 8 µgm⁻³ to 10 µgm⁻³ lower, and 18 µgm⁻³ lower in respect to February, than the longer-term average.

The lower than longer-term average levels of NO₂ apparent in 2022 appear to be relatively stable throughout 2022, suggesting the possibility of an ongoing improving trend in NO₂ that has continued into and throughout 2022. The noticeable reduction in levels of NO₂ in February 2022, in comparison to the historic average, may be attributable to a “sequence of particularly stormy weather” [13] at that time causing ‘fresh’ Atlantic air to move across the UK.

It is expected that the dramatic changes associated with COVID-19 related disruption during parts of 2020 and 2021 have now settled back to becoming part of an underlying longer term trend. To further understand this impact and the potential continued changes, Table 4-5 provides normalised time variation plots of the comparison of hourly mean monitoring data from 2020, during which the greatest disruption may have been observed, with 2022 at Site No. 70 (Broadway) and the calculated difference between these measurements.

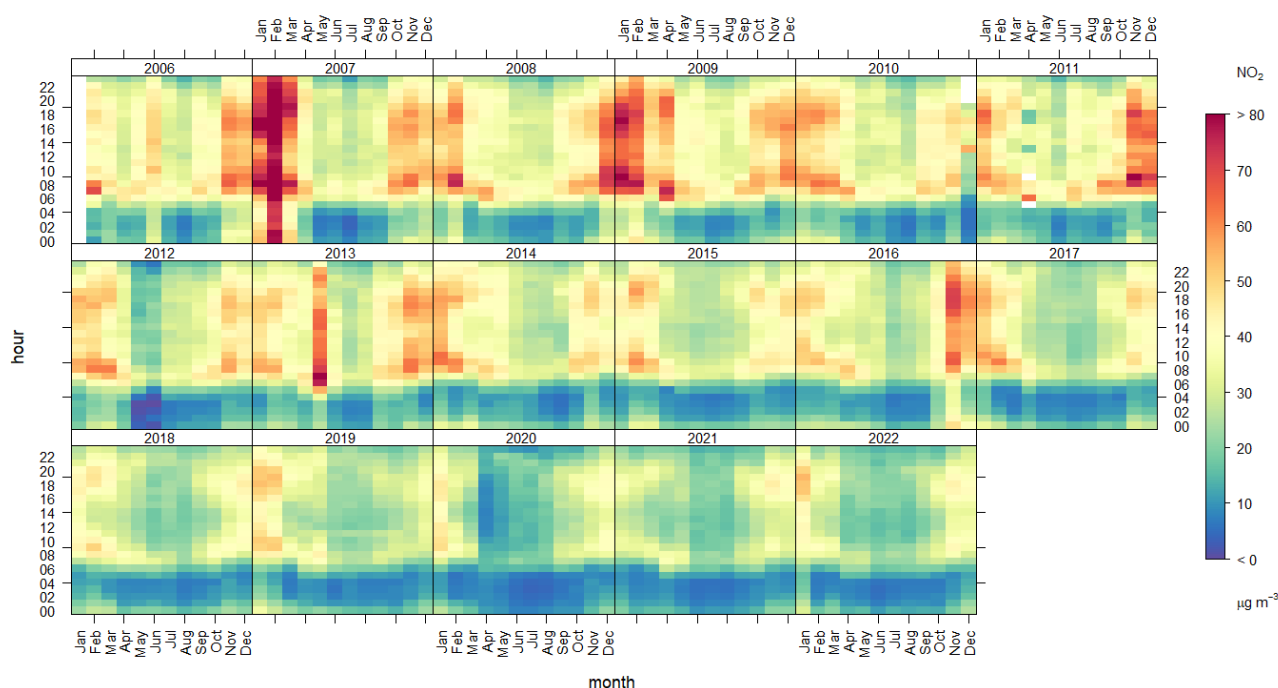
Figure 4-5: Normalised Time Variation Plot of NO₂ at Site No. 70 (Broadway) between 2022 and 2020



The above normalised time variation plots show distinctive patterns that share some similarities but also some notable difference, for instance the dramatic reduction in NO₂ observed between March and May 2020 and to a lesser extent in November 2020. In comparison to 2020, 2022 shows a 2 µgm⁻³ to 8 µgm⁻³ increase in levels of NO₂ throughout most of 2022, with the rise most notably observed Friday to Saturday. This could indicate the re-establishment, in 2022, of both a more traditional five-day a week 9 am to 5 pm commuter working pattern as well as greater social travel at weekends. In contrast by examining the 2017 to 2019 NO₂ average, the levels of NO₂ throughout 2022 were 1 µgm⁻³ to 3 µgm⁻³ lower, with the decrease most notable at the beginning of the year and on a Wednesday. This may suggest that some practices adopted during COVID-19 related disruption, such as agile workers working from home mid-week, may, at least for now, have been retained to some extent.

The trend level plot of hourly mean NO₂ at Site No. 70 (Broadway) produced in Figure 4-6 below, is another useful way of examining the relationship of NO₂ over each year between 2006 and 2022. The trend level plot demonstrates that most years have comparable distributions in the occurrence of NO₂, although certain years (2007, 2009, 2011 & 2013) potentially show emphasised winter periods of elevated levels of NO₂, albeit within the same consistent pattern. Beyond 2016 the occurrence of the highest elevated levels of NO₂ appear reduced, in comparison to the preceding period, potentially indicating a change in the trend in locally observed levels of NO₂. Given the known disruption attributed to COVID-19, with a substantial decrease in local travel and some industrial activity during parts of 2020 and 2021, it is unsurprising that these years appear distinctly more muted than the historic record, with NO₂ levels most noticeably depressed (prevalence of blue shades throughout the day in the 2020 plot) during the spring of 2020. Whereas 2022 appears more comparable to the recent past between 2017 and 2019.

Figure 4-6: Trend Level Plot for NO₂ at Site No. 70 (Broadway)



Years showing particularly elevated or depressed levels of NO₂ may, in part, be the result of regular cyclic variation in weather (with some summers hotter and winters colder than the average), albeit climatic change may make these changes more or less common. For instance, it has been reported [11] that the lower levels of NO₂ observed in early 2021 “may be partially explained by strong westerly winds throughout December 2021, blowing clean air into the UK from the Atlantic”.

This observed cyclic pattern in air quality can also often be influenced by local human derived events, for instance Bonfire Night, resulting in emissions not normally experienced at any other time of year. In addition, routinely observed transient transboundary events in which air pollution can be transported great distances from its source, such as Saharan sand winds, can have an important influence on locally observed levels of air pollution. Occasionally, certain ad hoc events, for instance the Eyafjallajökull [14], Grímsvötn [15] and Bárðarbunga [16] volcanic eruptions can have a similar influence.

As any individual monitoring site can be influenced by very local circumstances, it can be of benefit to consider a collection of similar monitoring locations when assessing general influences upon local air quality. It has been possible to collate monitoring data from locations where monitoring has been maintained for some time and influences from new developments or abnormal events are expected to have been minimal. These locations have been categorised with regards to their representation of the ‘local rural background’³ environment (isolated and peri-urban residential areas), the ‘local urban background’⁴ environment (residential areas of most townships and the suburbs of strategic towns) and the ‘roadside’⁵

³ rural or sub-urban locations where there is an absence of local busy roads or industry and it most closely reflects the regional background.

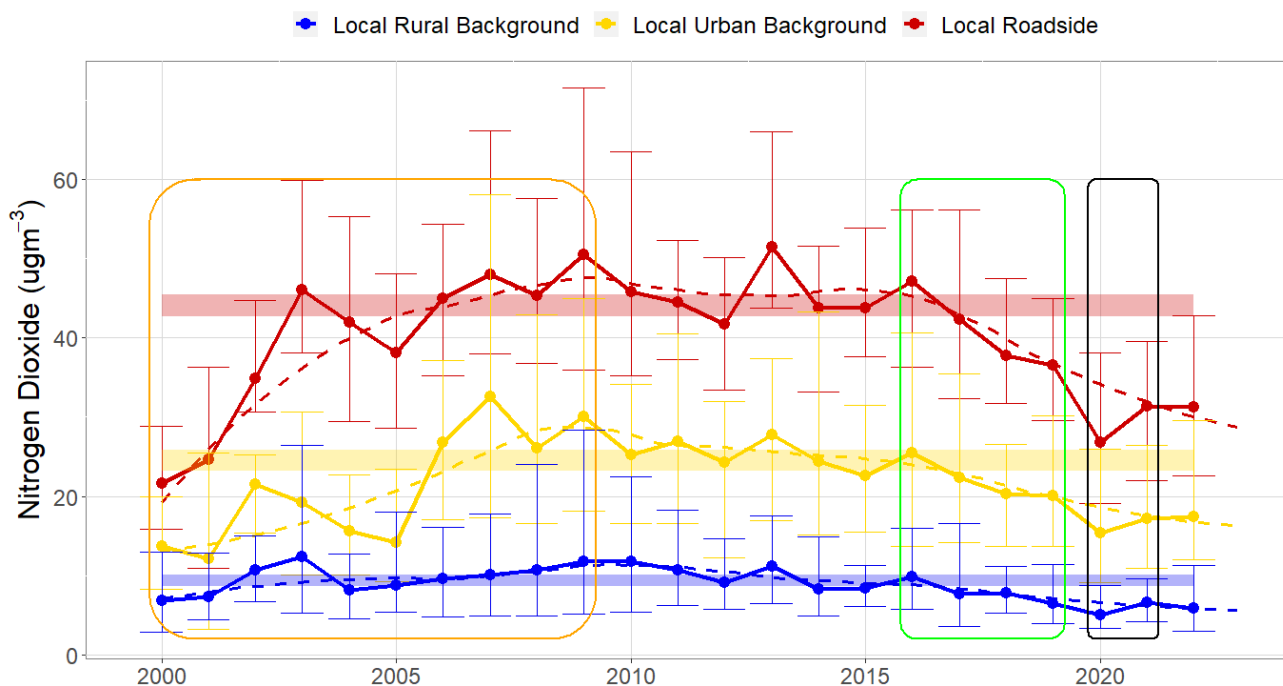
⁴ urbanised residential areas at a distance from the kerb of major roads and an absence of local industry.

⁵ roadside urban locations within Air Quality Management Areas, often associated with commercial centres or strategic roads, where it is believed that the sources of NO₂ have not markedly changed.

environment (residential areas in close proximity to busy urban roads) within Rhondda Cynon Taf. The local rural background may help to illustrate wide-scale regional influences. The local urban background environment likely represents the vast majority of areas within Rhondda Cynon Taf where people live. The local roadside environment tends to be reflective of small parts of various communities that may be more at risk of experiencing elevated levels of NO₂, often due to the close proximity of major or strategic roads.

Figure 4-7 produces a time plot of the local rural background (blue), local urban background (gold) and local roadside (red) environments, with the respective NO₂ annual mean (solid line with solid dots), the associated trend line⁶ (dashed line), the 10-year mean Confidence Interval (shaded zone) and the intra-year monthly mean spread (whiskers). Due to the exceptional events of both 2020 and 2021, the 10-year mean Confidence Interval (shaded zone) has been determined with respect to a 10-year period excluding 2020 to 2021.

Figure 4-7: Time Plot of the annual mean for NO₂ at the local rural background (blue), local urban background (gold) and roadside (red) environments



When compared to nationally produced datasets, the local rural background (solid blue line) shows strong historic consistency with published background levels (2020 onwards published background levels may not take account of likely COVID-19 related disruption and its legacy) and, as with the local urban background (solid gold line), demonstrate current and historic levels of NO₂ within most of Rhondda Cynon Taf that are well below the 40ugm⁻³ annual mean AQO for NO₂. This understanding is in keeping with Rhondda Cynon Taf's layout of linear settlements, which observe a generally suburban character, interposed with large rural spaces, which would be conducive to reducing general exposure to elevated levels of NO₂. Given that the rural and local urban backgrounds are likely to represent, by area and population, most of Rhondda Cynon Taf, it is very likely that the vast majority will experience

⁶ produced by Local Polynomial Regression Fitting with α of 0.5

levels of NO₂ well below the current annual mean AQO for NO₂. However, the local roadside (solid red line) environment does historically illustrate that where certain circumstances manifest, which are often limited to relatively small specific areas, a risk of elevated levels of NO₂ may become apparent.

Air quality can generally fluctuate over time as the significance of various sources and interactions change. For instance, 2007, 2009 and 2013 appear to demonstrate all three environments having respective annual means clearly above the ten-year mean confidence interval (shaded areas), potentially indicating unusually 'poor' air quality years. Over-time the degree of fluctuation may change as underlying trends evolve, examination of the intra-year monthly mean spread (whiskers) indicates a relatively consistent spread of results in years not considered as observing unusually 'poor' air quality and with the spread potentially reducing in range from 2018 onwards. The monthly mean spread also suggests that, since 2009, those years experiencing comparatively elevated levels of NO₂ may be as a result of specific limited periods of time within the year when the levels of NO₂ were particularly elevated as opposed to a general uplift in NO₂ throughout the year. This could suggest, post 2009, specific influences upon (for instance weather conditions) rather than the underlying trend in the sources of NO₂ may be more significant, in increasing the likelihood of any one year experiencing comparatively elevated levels of NO₂.

After a period of rising NO₂ levels between 2000 to 2009 (orange boxed area) followed by a period of fluctuation between 2010 and 2015, the trend (dotted lines), from 2016 to 2019 (green boxed area), was of significantly reducing levels of NO₂ in all three environments. A similar evolution of the prevailing trend in NO₂ has also been reported [11] with respect to the UK as a whole. It is borne in mind that COVID-19 related disruption (black boxed area) appears associated with levels of NO₂, during 2020, being generally at their lowest since 2003. This exceptional impact has appeared to have ebbed to some extent, as society re-establishes prevailing practices, resulting in a somewhat expected year-on-year uplift in NO₂ subsequently. This uplift is significantly less noticeable in 2022, which may suggest that a more stable trend has begun to reassert.

To further understand the recently observed trend, examination can be made of the five year trend, which is considered⁷ the minimum time period to examine a trend in NO₂. However, it is acknowledged that the five year trend can be influenced by data outliers or cyclical effects that have a similar or longer timeframe, potentially distorting the trends interpretation if considered in isolation. For instance, it can capture the recent impact of COVID-19 related disruption considered at its nadir in 2020. Table 4-7 provides quantification of the respective trends, with and without inclusion of monitoring results from 2020, for each environment.

Table 4-7: Estimation of the five year trend in NO₂ at each RCT Environment

Environment	Trend (% yr ⁻¹ five-year trend)	
	Including 2020	Excluding 2020
Local Background	-5.47	-3.98

⁷ Paragraph 4.14 of LAQM.TG(16)

Local Urban	-4.11	-3.94
Local Roadside	-4.76	-4.84

Given the uniformity of the improvement in the five-year trend in NO₂, its cause may be associated with factors widely experienced throughout Rhondda Cynon Taf over an extended period of time. Although prolonged conducive weather conditions may play a part, given the length of consistent improvement within the local background and local urban environments and a similar experience reported [17] to some extent throughout Wales, human factors are likely to be strongly relevant.

The current and likely future trend in NO₂ may be influenced by a range of factors. At the national level it has been suggested that the increase and subsequent stability in the occurrence of NO₂ observed from the early 2000s to mid 2010s may “likely [be] as a result of the increased ownership of diesel-fuelled vehicles which historically emitted far more Nitrogen Oxides compared to equivalent petrol-fuelled vehicles” potentially “offsetting the impact of reduced emissions from other sources” [11]. At the local level, renewed urbanisation in the south of Rhondda Cynon Taf, during the 2000s and 2010s, may have also contributed to significant local traffic growth and subsequently an increase in local emission of NO₂.

Since that period, continued overall reductions in national emission inventories of certain air pollutants as well as the adoption of “newer vehicles subject to stricter emissions standards” and certain local transport network improvements may of, in part, helped to sustain a reducing trend in NO₂ [11]. It is also understood that the winter periods of 2017 to 2019 experienced prevailing metrological conditions that may have been benign to minimising the local occurrence of NO₂.

It is the case that the dramatic reductions in NO₂ in 2020 have been reversed to some extent, which has been attributed to being “likely as a result of the reduction in COVID-19 related disruption” but across the UK 2022 levels of NO₂ still remain 24% lower in comparison to 2019 [11]. The relatively small uplift observed in 2022 combined with the significant improvements observed prior to 2020 could indicate either a continuation of the recent improving trend, conciliated by recent COVID-19 disruption, or the possibility that the recent improving trend has begun to tail and instead stabilise to a more static position. As such, it remains difficult to determine if the current improving trend will be further sustained at its recent rate by continued cultural and economic changes, such as the continuation of home-working and non-traditional commuting times by some. Alternatively, there is a risk that the trend may ebb, with potential future economic conditions challenging the adoption of new transport technology or if the prevailing weather conditions observed through 2016 to 2019 were to alter so as to become less conducive.

Notwithstanding recent events, it is believed that improvements to the local background and local urban environments are likely being sustained by various national and broader local policies and actions which are having a wide geographical effect, possibly in combination with underlying longer-term cyclic climatic changes. These measures would also be expected to have an impact upon the local roadside environment but due to local circumstances their effects may have historically been more muted and slower to fully manifest. Nonetheless, a combination of broader measures in association with locally targeted intervention at several

AQMAs may have helped to support improvement within the local roadside environment, albeit this may remain uncertain in the near term at some locations.

4.3.2 Comparison with the 1-hour AQO for NO₂

The automatic monitoring data from 2022, which can be directly compared to the 1-hour AQO for NO₂, demonstrates that Broadway (Site No. 70), Pontypridd (Site No. 120) and Mt Ash (Site No. 131) did not exceed the 1-hour mean AQO for NO₂. Due to the complexity of automatic monitoring, it has not been possible to locate these monitoring instruments at all relevant locations. Fortunately, inference can also be drawn from the annual mean, which can be monitored more readily using non-automatic methods, with locations showing an annual mean greater than 60 µgm⁻³ potentially likely to be in breach of the 1-hour AQO for NO₂.

As the annual mean for NO₂ can fluctuate from one year to the next, without there necessarily being an underlying change in circumstances, it can be appropriate to examine monitoring sites that have shown an NO₂ annual mean greater than 54 µgm⁻³ during the recent past. As these locations may require further consideration to assess if they are at risk of experiencing an annual mean for NO₂ greater than 60 µgm⁻³, in the near future. Table 4-8 below identifies the locations of relevant population where the annual mean for NO₂ was above 54 µgm⁻³ at least once between 2018 and 2022.

Table 4-8: Monitoring sites with an annual mean for NO₂ greater than 54µgm⁻³ at least once between 2018 and 2022

Site ID ⁽¹⁾	AQMA	Area	1-hour AQO for NO ₂	NO ₂ Annual Mean Concentration (µgm ⁻³) ⁽²⁾				
				2018	2019	2020	2021	2022
117◇	Cymmer	Rhondda	✓	50.2	49.7	35.6	44.0	43.9
118◇	Cymmer	Rhondda	✓	56.7	63.8	45.1	52.9	52.2
108*	Nightingales Bush	Taf	-	56.6	51.4	33.7‡	38.1	39.0

Table Notes

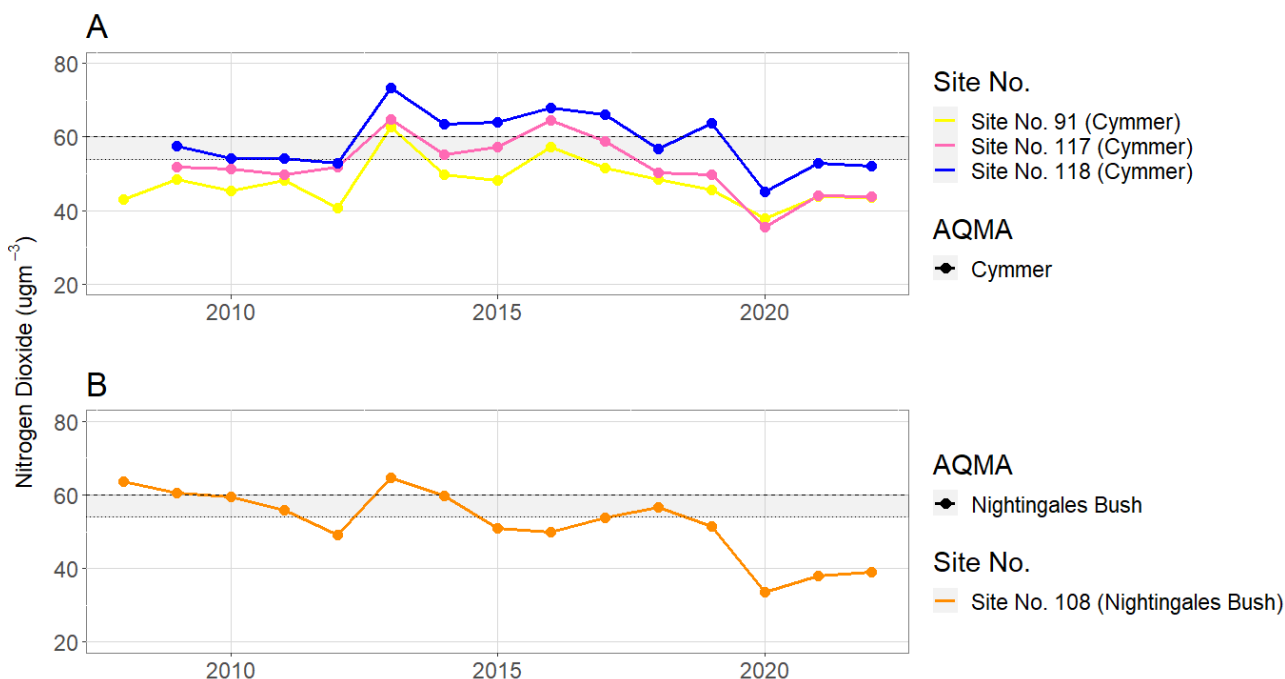
Exceedances of the NO₂ annual mean objective of 40 µgm⁻³ are shown in bold. Exceedances of the NO₂ 1-hour mean objective (200 µgm⁻³ not to be exceeded more than 18 times per year) or otherwise NO₂ annual means exceeding 60 µgm⁻³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in bold and underlined.

- (1) Means for diffusion tubes indicated with ◇ have met the initial NO₂ ‘fall-off’ correction criteria but have not been corrected as monitoring location is within a street canyon and correction may not be valid. Means for diffusion tubes indicated with * have met the NO₂ ‘fall-off’ correction criteria but have not been corrected as monitoring location is associated with a complex interaction of multiple road sources (however, considered worse case as some degree of drop-off is expected).
- (2) Means for diffusion tubes have been corrected for bias with means labelled with a ‡ having been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, as their valid

data capture for the full calendar year is less than 75%. See Appendix C1: Air Quality Monitoring Data QA/QC for details.

To consider the context of the identified monitoring sites, Figure 4-8 below displays two time plots of the recent annual means at these locations, as well as the area between 54 $\mu\text{g}\text{m}^{-3}$ and 60 $\mu\text{g}\text{m}^{-3}$ shaded in grey. All the identified monitoring sites are within extant AQMAs, with the monitoring sites in Plot A being within an AQMA already declared for a breach of the annual mean and 1-hour mean AQOs for NO_2 and those in Plot B being within an AQMA currently declared for a breach of the annual mean AQO for NO_2 only.

Figure 4-8: Time Plots, with reference lines, of the annual mean for NO_2 at identified monitoring sites, from 2008 to 2021.



Within Rhondda Cynon Taf, it is apparent that in 2022, no locations experienced sufficiently elevated levels of NO_2 , above 60 $\mu\text{g}\text{m}^{-3}$, that would likely have resulted in a breach of the 1-hour mean AQO for NO_2 .

Plot A illustrates that only Site No. 118 (Cymmer) has shown a relatively stable elevated annual mean for NO_2 that has been above 54 $\mu\text{g}\text{m}^{-3}$ during the recent past but, since 2019, the annual mean for NO_2 has been proximal to or below 54 $\mu\text{g}\text{m}^{-3}$. Other locations within the Cymmer AQMA have also experienced elevated levels of NO_2 but, since 2017, the annual mean for NO_2 at these locations has been consistently below 54 $\mu\text{g}\text{m}^{-3}$. This may indicate that the area within the Cymmer AQMA, likely at risk of breaching of the 1-hour mean AQOs for NO_2 , is relatively confined, with most or even possibly all of the Cymmer AQMA now likely compliant with the 1-hour mean AQOs for NO_2 .

At present it is uncertain if the reductions in NO_2 observed, since 2019, will be sufficiently sustained into the future. As such, even though levels of NO_2 within the Cymmer AQMA have been below 54 $\mu\text{g}\text{m}^{-3}$ since 2020, it is too early to determine if circumstances have sustainably

changed to warrant reconsideration of the Cymmer AQMA and its reference to the 1-hour mean AQO for NO₂.

As observed in Plot B, all remaining monitoring sites that are within an AQMA declared for a breach of the annual mean AQO for NO₂ only, but that may have experienced an annual mean in NO₂ in proximity to 60 µgm⁻³ in the recent past, have an annual mean for NO₂ significantly below 54 µgm⁻³ since at least 2018. In addition, none of these monitoring sites seem to indicate a likelihood of being at risk of breaching the 1-hour AQO for NO₂ into the near future. As such, these AQMAs are considered likely to continue to experience compliance with the 1-hour AQO for NO₂.

4.3.3 Comparison with the annual mean AQO for NO₂

Figure 4-9 displays a map of Rhondda Cynon Taf and the annual mean NO₂ at each active monitoring site in 2022; the smaller size and blueness in hue of each circle indicates a lower annual mean and conversely the larger size and orange to redness in hue of each circle indicates a higher annual mean for NO₂. As expected, the map clearly shows that the varying communities within Rhondda Cynon Taf have experienced differing levels of NO₂ in 2022. This will be for a wide range of reasons both local and regional. For instance, Figure 4-9 highlights the importance of the local and regional arterial road network, the pattern of local urbanisation and regional valley topography as important factors in the likelihood of a location experiencing elevated levels of NO₂

Figure 4-9: Map of Rhondda Cynon Taf displaying the annual mean for NO₂, in 2022, at each monitoring site.

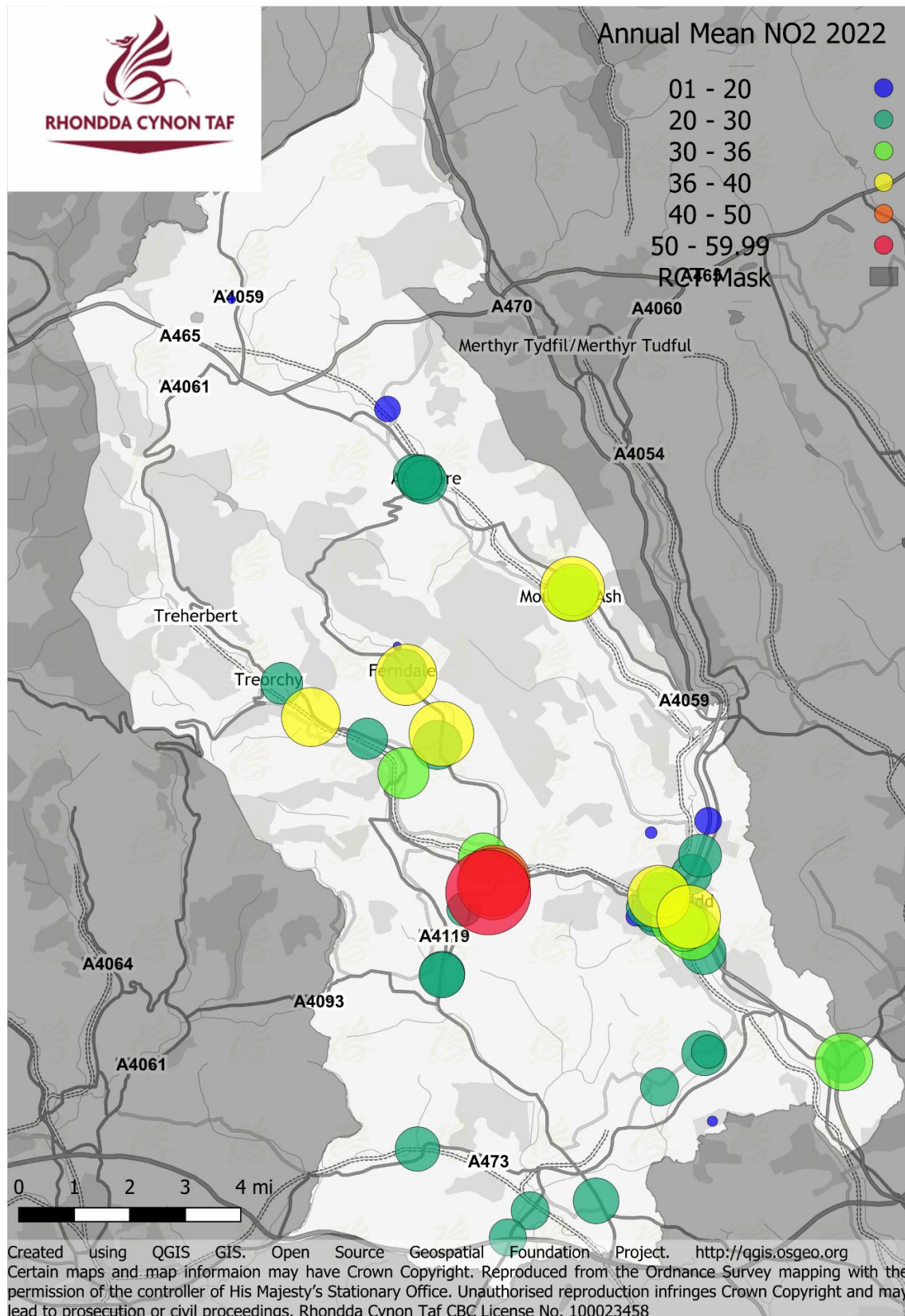


Table 4-9 collates each monitoring site to its region and associated local community. Where the community is in bold, the community is also associated with an AQMA that has been declared for a breach of the annual mean AQO for NO₂, and where underlined the AQMA has in addition been declared for a breach of the 1-hour AQO for NO₂.

Table 4-9: Annual mean NO₂, in 2022, collated to region and each local community.

Region	Community ⁽¹⁾⁽²⁾	Site No.	2022 NO ₂ Annual Mean ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾
Background	Rhondda	101	5.1
	Cynon	21	5.1
	Taf	4	11.9
		103	6.3
		105	7.3
Rhondda	Cymmer	91	43.6
		117	43.9
		118	52.2
	Dinas	90	30.4
	Ferndale	93	37.6
		107	27.7
	Llwynypia	106	31.4
	Pentre	136	36.2
	Tonyrefail	113	27.8 [†]
		122	28
	Trebanog	124	20.9
	Treorchy	137	25.7
	Tylorstown	41	39.8
		140	30.0
	Ystrad	141	25.2 {24.4}
	Cynon	Aberdare	53
68			25.3
69			27.0
88			27.0
Llwydcoed		139	15.8 {14.0}
Mountain Ash		52	33.2
		96	28.2
		97	39.5
		131	31.6
Taf	Broadway	51	31.2
		56	33.1
		66	30.5
		70	22.8 {25.0}
	Church Village	85	27.6

Region	Community ⁽¹⁾⁽²⁾	Site No.	2022 NO ₂ Annual Mean ⁽³⁾⁽⁴⁾⁽⁵⁾⁽⁶⁾
		129	20.4 {19.2}
	Cilfynydd	44	24.7 {29.6}
		55	26.4
		134	16.4 {14.5}
	Llanharan	111	27.3
	Llantwit Fardre	82	23.4 {21.2}
	Mwyndy	37	28 {25.3}
	Nantgarw	8	35.4
		76	26.1
	Nightingales Bush	108	39.0
		114	22.2
	Pontyclun	110	23.2
	Pontypridd	79	26.6
		80	24.4
		81	27.1
		83	27.0
		84	38.5
		120	28.4
		135	23.5 {19.6}
		138	31.1
	Talgarn	132	22.8
	Treforest	128	27.4

Table Notes

- (1) Communities highlighted in bold have within them an Air Quality Management Area declared in respect of an exceedances of the NO₂ annual mean objective
- (2) Communities that are underlined and highlighted in bold have within them an Air Quality Management Area declared in respect of an exceedances of the annual mean 1-hour mean objectives for NO₂.
- (3) Exceedances of the NO₂ annual mean objective of 40 µg^m-³ are shown in bold.
- (4) Exceedances of the NO₂ 1-hour mean objective (200 µg^m-³ not to be exceeded more than 18 times per year) or otherwise NO₂ annual means exceeding 60 µg^m-³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in bold and underlined.
- (5) Annual means have been corrected for bias with means labelled with a ‡ having been “annualised” as per Boxes 7-9 and 7-10 in LAQM.TG22, as their valid data capture for

the full calendar year is less than 75%. See Appendix C1: Air Quality Monitoring Data QA/QC for details.

- (6) Where the NO₂ 'fall-off' corrected predicted mean has been determined it is has been reported in curly brackets '{ }'

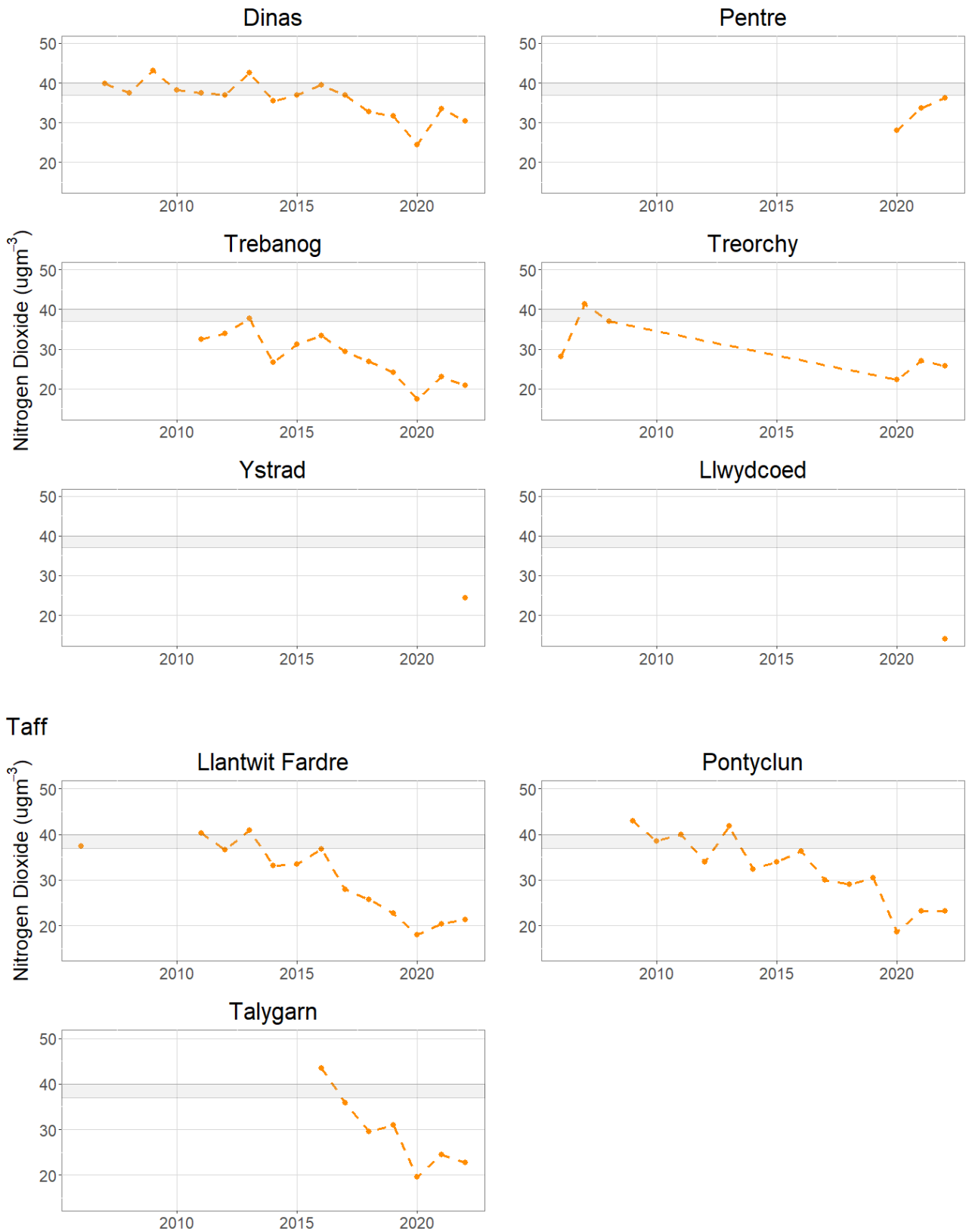
4.3.3.1 Review of areas not associated with an AQMA

It has not been possible to monitor, at all times, every community within Rhondda Cynon Taf. However, it is believed, as discussed in Section 4.3.1 that most communities have experienced relatively low NO₂ annual means, consistently over the recent past, and are likely to continue to do so. To remain vigilante to potential change, facilitate better geographical understanding of the local levels of NO₂ and provide community reassurance, the Local Authority has monitored locations that are not currently associated with an AQMA.

The annual mean for NO₂ can fluctuate from one year to the next, without there necessarily being an underlying change in circumstances. As such it may be appropriate to further examine monitoring sites that have shown an NO₂ annual mean greater than 36 µgm⁻³ during the recent past. As these locations may require consideration to assess if they are at risk of experiencing an annual mean for NO₂ greater than 40 µgm⁻³. Figure 4-10 below provides time plots of the maximum levels of NO₂ monitored within each relevant community. As can be seen, mostly relatively low NO₂ annual means have been experienced over the recent past. In addition, none of the communities monitored are considered currently to be at risk of experiencing an annual mean for NO₂ greater than 36 µgm⁻³ and will be expected, unless circumstances were to dramatically change, to remain compliant with the annual mean AQO for NO₂ of 40 µgm⁻³, into the near future.

Figure 4-10: Time Plots of the maximum annual mean NO₂, from 2006 to 2022, collated to each community not currently associated with an AQMA.

Rhondda & Cynon



Monitoring has only recently become available in Llwydcoed, Pentre, Treorchy and Ystrad but the levels of NO₂ observed are comparable to other areas of the County Borough that

were compliant to the annual mean AQO for NO₂ prior to 2020. Nonetheless, further monitoring of these locations may be necessary to better understand likely future trends.

4.3.3.2 Review of AQMAs

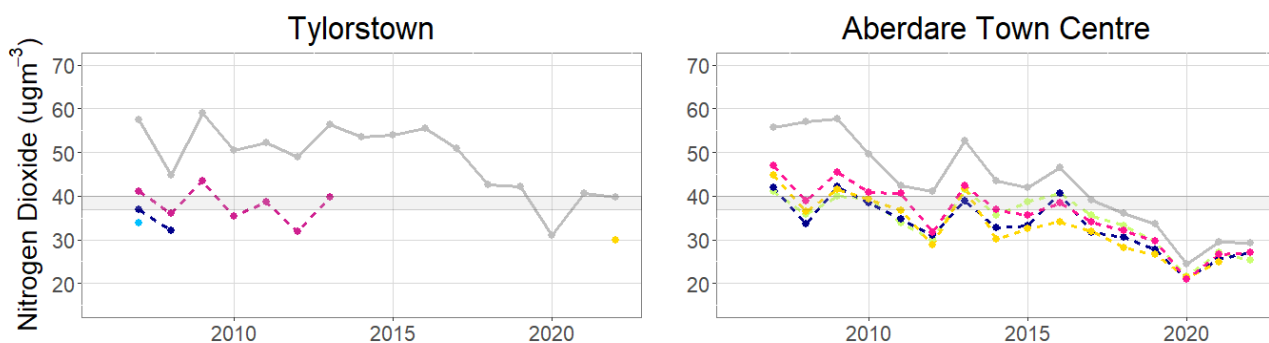
Currently there are sixteen AQMAs within Rhondda Cynon Taf, all of which are in respect of breaches of AQOs for NO₂. These AQMAs are of limited size, are distributed throughout the County Borough and all are significantly associated with road transport emissions, Section 3.2 provides further information on each AQMA and Appendix D1: AQMA Boundary Maps provides detailed maps of the AQMAs and associated monitoring locations.

As local air quality can change over time due to national, regional and local changes as well as due to the progression of targeted actions that may improve local air quality. It can be appropriate to review existing AQMAs to ensure they remain pertinent and continue to reflect any area of non-compliance to an AQO. Where local air quality near an AQMA has or is likely to deteriorate it can be appropriate to consider amending an AQMA to increase its geographical coverage. Conversely, where sustained compliance to an AQO has been achieved within the AQMA or part thereof, it may be appropriate to reduce or even revoke the AQMA.

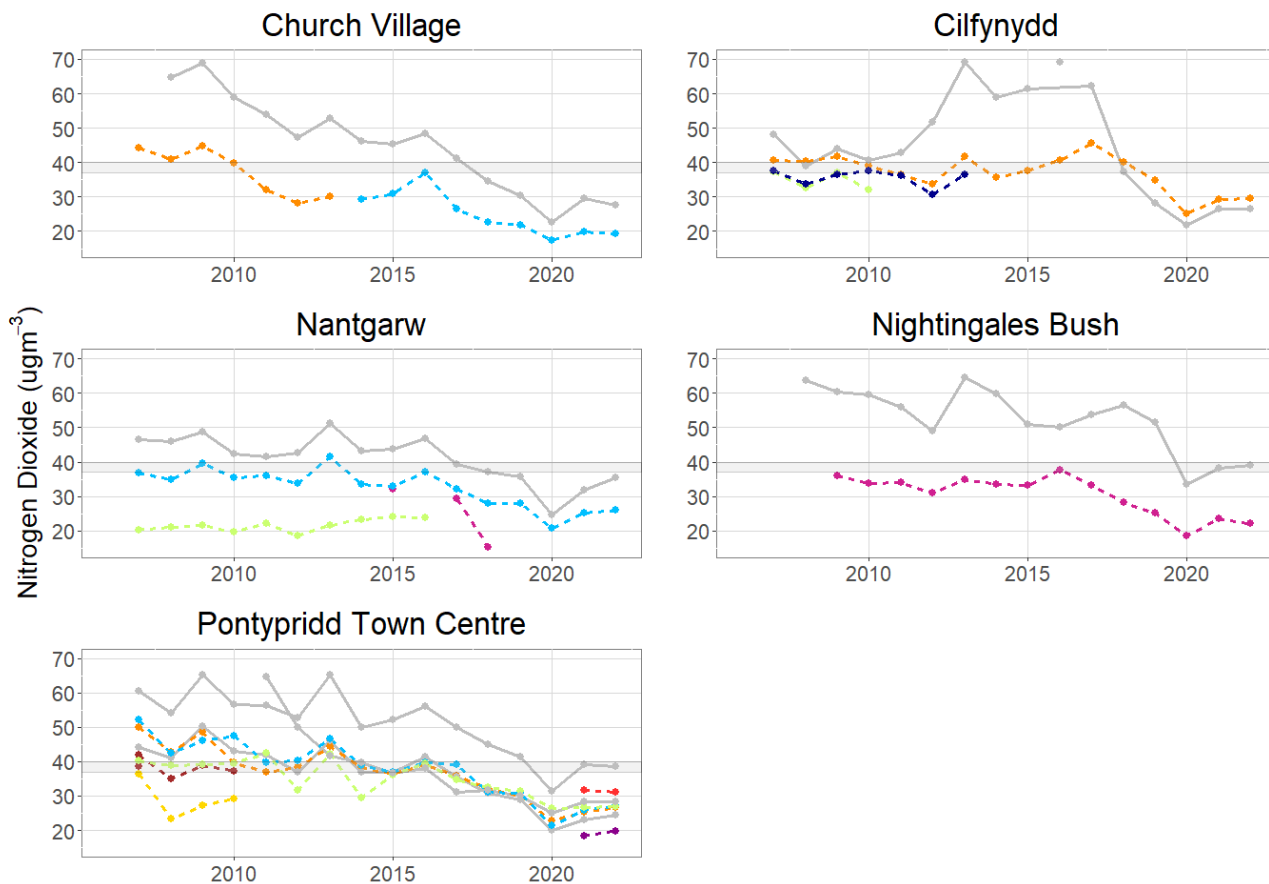
It is acknowledged that certain areas in proximity to some extant AQMAs may be vulnerable to elevated levels of NO₂. Not all areas adjacent to every AQMA will have a relevant population present or, even if present, they may observe markedly different characteristics which would mean elevated levels of NO₂ would be unlikely. The Aberdare Town Centre, Church Village, Cilfynydd, Nantgarw, Nightingales Bush, Pontypridd Town Centre and Tylorstown AQMAs have potentially relevant areas proximate to them which may require continued monitoring to confirm the associated AQMA boundary includes all areas that may be non-compliant to the annual mean AQO for NO₂. Figure 4-11 provides time plots of the monitored annual means for NO₂ at each relevant monitoring location and collated to each AQMA; NO₂ monitoring locations denoted in grey solid lines are located within the respective AQMA, whereby monitoring locations in colour dashed lines are located in relevant areas adjacent to the respective AQMA.

Figure 4-11: Time Plots of the annual mean NO₂, from 2006 to 2022, collated to each relevant AQMA.

Rhonnda & Cynon



Taf



As can be seen, none of the monitored locations within adjacent areas to an AQMA have observed levels of NO₂ that are above 36 μgm⁻³ during the recent past. As such these adjacent areas are expected, unless circumstances were to dramatically change, to remain compliant with the annual mean AQO for NO₂, into the near future.

In addition to areas adjacent to an existing AQMA, it is also important to examine if sustained compliance to an AQO has been achieved within an AQMA or part thereof, as it may be appropriate to amend or even revoke the AQMA. Although an AQMA, or part thereof, may show compliance to the annual mean AQO for NO₂ in any particular year, it may not mean that this would always be sufficient justification to review the AQMA's designation. Instead, consideration must first be made to the likely future sustainability of the compliance, as well as any other factors which could support maintaining the AQMA as it currently is.

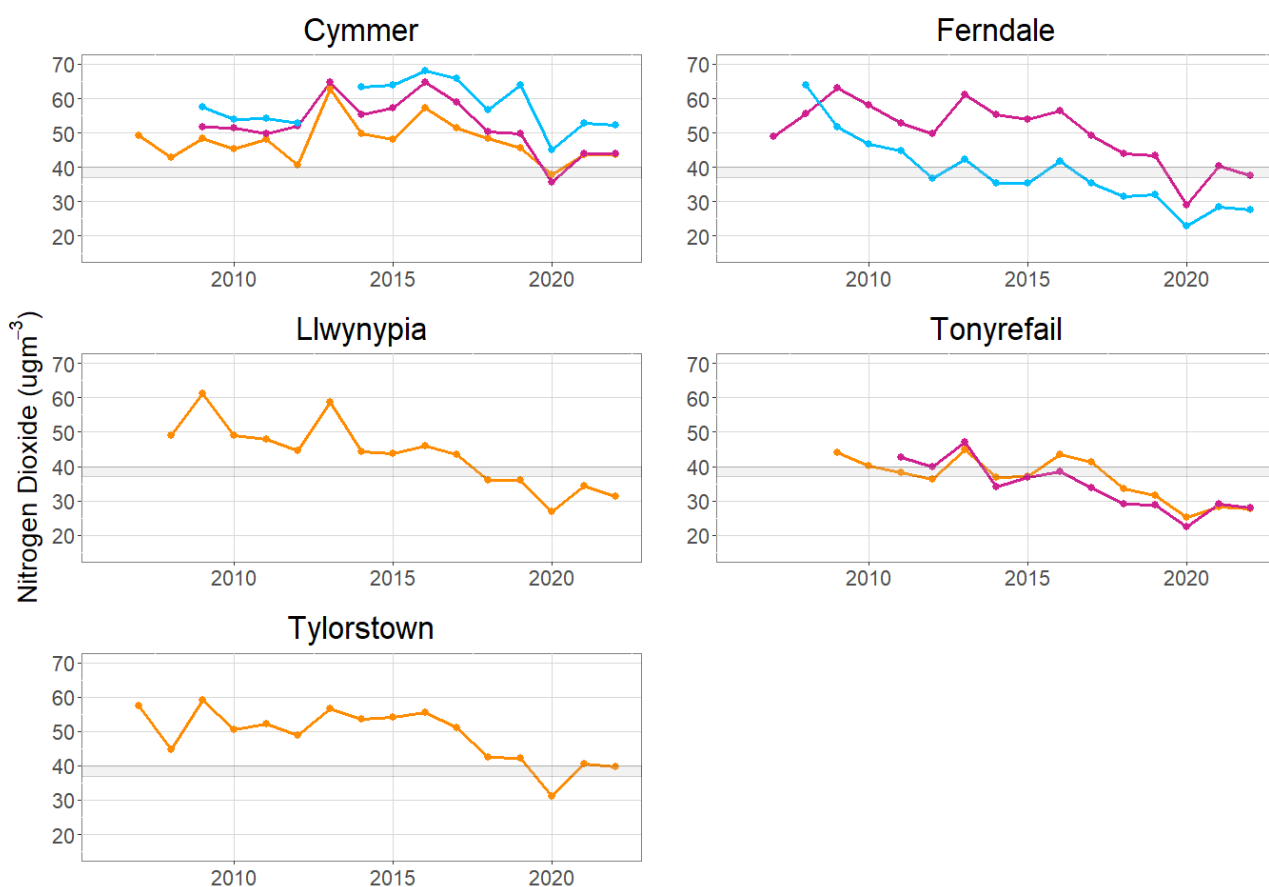
To maintain an efficient approach to its local air quality management duties initial consideration can be undertaken with available monitoring data and the examination of local trends and understanding, referred to as a 'screening assessment review'. Where the screening assessment review identifies a need for further detailed assessment, prior to determining any necessary changes to an AQMA, this can then be carried out accordingly.

In undertaking the screening assessment review, it can be helpful to consider the previous year's monitoring results to examine the past consistency of any current improvement. However, this approach can still be influenced by recent major events, for instance COVID-19 related disruption has meant that the representative nature of some recent years of

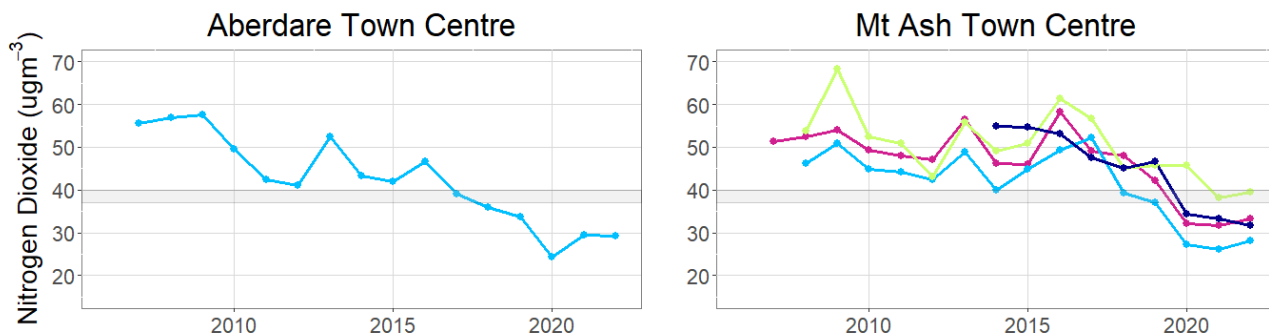
monitoring data may be difficult to determine. This may be most relevant to 2020 when socio-economic restrictions were at their height, however 2021 is also expected to have experienced a degree of impact. Figure 4-12 below produces time plots of the most recent annual mean NO₂ monitoring results collated to each AQMA, and a dot dash horizontal grey reference bar indicating the NO₂ level between 36 µg_m⁻³ and the annual mean AQO for NO₂ level at 40 µg_m⁻³.

Figure 4-12: Time Plots of the annual mean NO₂ from 2006 to 2022, collated to each AQMA.

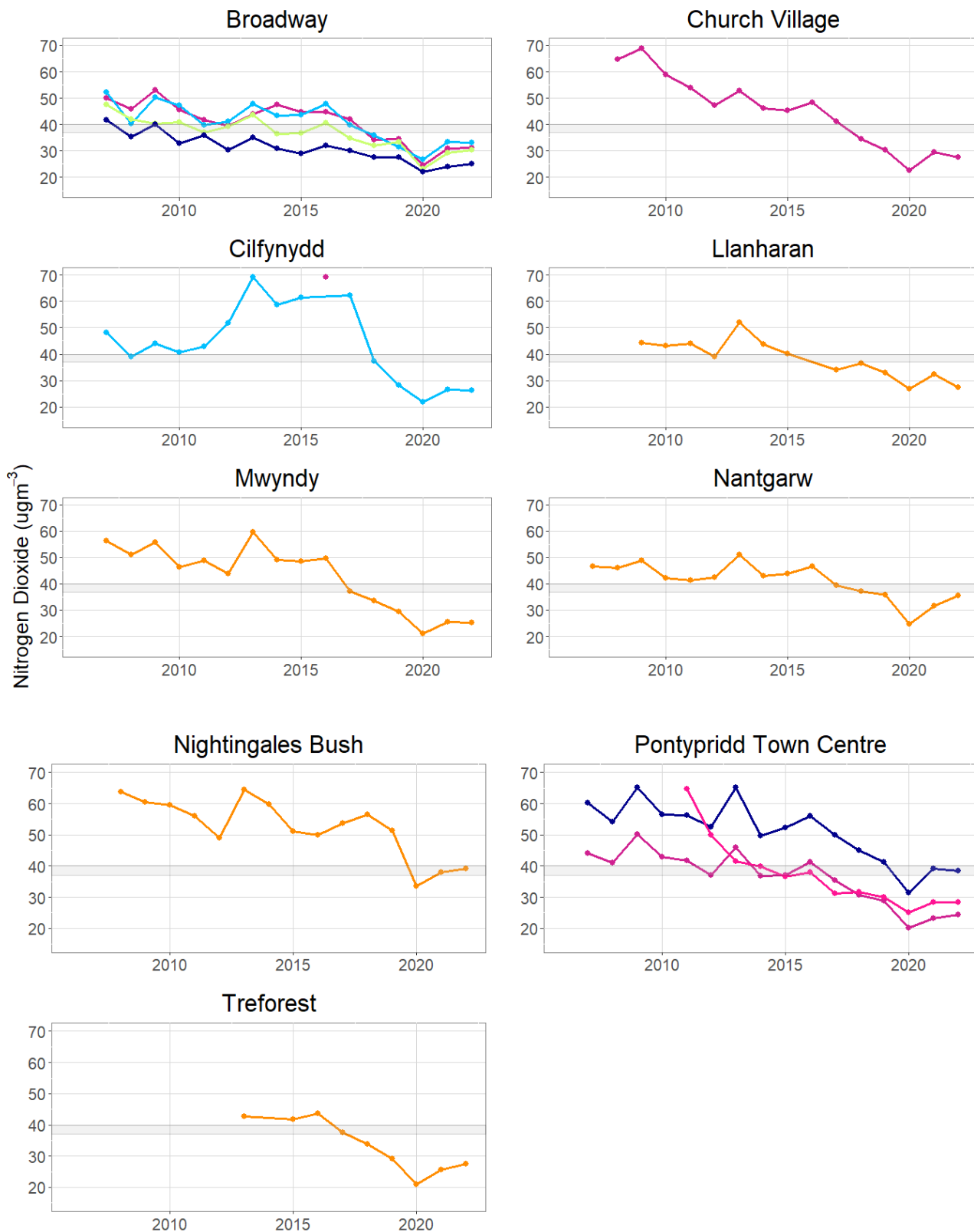
Rhondda



Cynon



Taf



Consideration of the available monitoring data, within each AQMA, has been undertaken to examine the likelihood of current compliance or non-compliance within each AQMA, or part thereof, and has been summarised in Table 4-10 below.

Table 4-10: Screening Assessment Review of current AQMAs

Region	AQMA	Initial Assessment				Further Review
		Non-Compliant ⁽¹⁾	Possibly Non-Compliant ⁽²⁾	Probably Compliant ⁽³⁾	Compliant ⁽⁴⁾	
Rhondda	Cymmer	In Full	-	-	-	No
	Ferndale	-	In Part	In Part	-	No
	Llwynypia	-	-	In Full	-	No
	Tonyrefail	-	-	In Part	In Part	No (see narrative)
	Tylorstown	-	In Full	-	-	No
Cynon	Aberdare Town Centre	-	-	In Full	-	No
	Mountain Ash Town Centre	-	In Full	-	-	No
Taf	Broadway	-	-	In Part	In Part	No (see narrative)
	Church Village	-	-	In Full	-	No
	Cilfynydd	-	In Full	-	-	No
	Llanharan	-	-	In Full	-	No
	Mwyndy	-	-	In Full	-	No
	Nantgarw	-	-	In Part	-	No
	Nightingales Bush	-	In Full	-	-	No
	Pontypridd Town Centre	-	In Part	In Part	In Part	No (see narrative)
Treforest	-	-	In Full	-	No	

Table Notes

- (1) “Compliant” means the monitoring locations annual mean for NO₂ was less than 36 µgm⁻³ in the most recent three years, excluding 2020 and 2021, and less than 40 µgm⁻³ in the most recent five years, excluding 2020 and 2021, and since 2021 the monitored level of NO₂ is not significantly increasing;
- (2) “Probably Compliant” means the monitoring locations annual mean was less than 36 µgm⁻³ in the most recent three years, excluding 2020 and 2021,
- (3) “Possibly Non-Compliant” means the monitoring locations annual mean greater than 36 µgm⁻³ in the most recent three years, excluding 2020 and 2021;
- (4) “Non-Compliant” means the monitoring locations annual mean was 40 µgm⁻³ or greater in 2022.

As illustrated in Figure 4-12 above and further discussed in

Appendix D2: AQMA Trends, all the current AQMAs in Rhondda Cynon Taf observe, to varying degrees, a medium-term reducing trend in the monitored levels of NO₂. Although COVID-19 related disruption may have disproportionately emphasised this in the near-term, it is apparent that a locally downward trend in NO₂ was established before 2020. Given understanding of the recent past as well as current national policy interventions, it is expected that, in the near-term, the trend in NO₂ will either continue to reduce or otherwise stabilise to some extent. Notwithstanding some 'bounce back' from the very low levels of NO₂ that were observed in 2020.

When considering if there is a need to review an AQMA, it is not only necessary to consider available monitoring data, which can inherently reflect the past, but also to consider likely future national, regional and local circumstances. As discussed in Section 4.3.1, at the national and regional scale, the levels of NO₂ are expected, in the medium to longer-term, to decrease as wide-scale policy interventions, regional public transport improvements and road vehicle fleet modernisation takes effect. In respect of new local developments, most of the AQMAs are not expected to experience a substantive change in local circumstance that would be expected to significantly influence current understanding of them. With the exception that levels of NO₂ within the Llanharan AQMA may substantively reduce should the Llanharan Bypass be completed within the medium-term.

Table 4-10 above indicates that Broadway, Pontypridd Town Centre and Tonyrefail AQMAs may contain relevant areas within them⁸ that may now be compliant with the annual mean AQO for NO₂.

In respect of the Broadway AQMA the monitoring data associated with the compliance is in respect of the automatic monitoring location Site No. 70 (Broadway) which, for logistical reasons, has not been located at the immediate worse-case scenario. Although the monitoring location has observed compliance with the annual AQO for NO₂ for a number of years, the inclusion of the area enables the current AQMA to remain contiguous and acknowledges the close interrelationship of the local environment along the length of Broadway. As such it is not considered appropriate at this time to further review the geographical extent of the Broadway AQMA. Given current circumstances and ongoing trends it is likely the whole the AQMA may, in the near-term, be considered compliant and a full review of the AQMA can take place then.

In respect of the Tonyrefail AQMAs, the AQMA is limited in geographical area and the respective monitoring location, Site No.122 (Tonyrefail), has been located at the current boundary of the respective AQMA. Due to challenges in delineating the likely area of compliance and any potential non-compliance, and the marginal geographical area encompassed that are likely to be newly compliant. It is not considered appropriate at this time to further review the extent of the Tonyrefail AQMA. Given current circumstances and ongoing trends it is likely the whole of the AQMA may, in the near-term, be considered compliant and a full review of the AQMA can take place then.

In respect of the Pontypridd Town Centre AQMA, monitoring data associated with the probable compliance is in respect of the automatic monitoring location Site No. 120

⁸ that were not otherwise included for administrative purposes

(Pontypridd) which, for logistical reasons, has not been located at the immediate worse-case scenario. Although the monitoring location has observed compliance with the annual AQO for NO₂ for a number of years, the inclusion of the area enables the current AQMA to remain contiguous and acknowledges the close interrelationship of the local environment along the length of the AQMA. As such it is not considered appropriate at this time to further review the geographical extent of the Pontypridd Town Centre AQMA.

In summary, at this time it is not considered necessary to undertake a detailed review of any existing AQMA within Rhondda Cynon Taf. However, the Aberdare Town Centre, Broadway, Church Village, Cilfynydd, Llanharan, Llwynypia, Mwyndy, Nantgarw, Treforest and Tonyrefail AQMAs appear to all be likely to become compliant to the annual AQO for NO₂ in the near-term. It is expected that detailed reviews of these AQMAs may occur over the next few years, to determine if compliance has been sustained within their geographical areas and, if such, whether each AQMA requires amendment or revocation.

The Cymmer, Ferndale, Mt Ash Town Centre, Nightingales Bush and Pontypridd Town Centre and Tylorstown AQMAs appear likely to potentially remain non-compliant to the annual AQO for NO₂ into the medium-term and in respect of the Cymmer AQMA the longer-term, unless future targeted improvement actions have a desired effect.

4.3.4 Particulate Matter [PM₁₀]

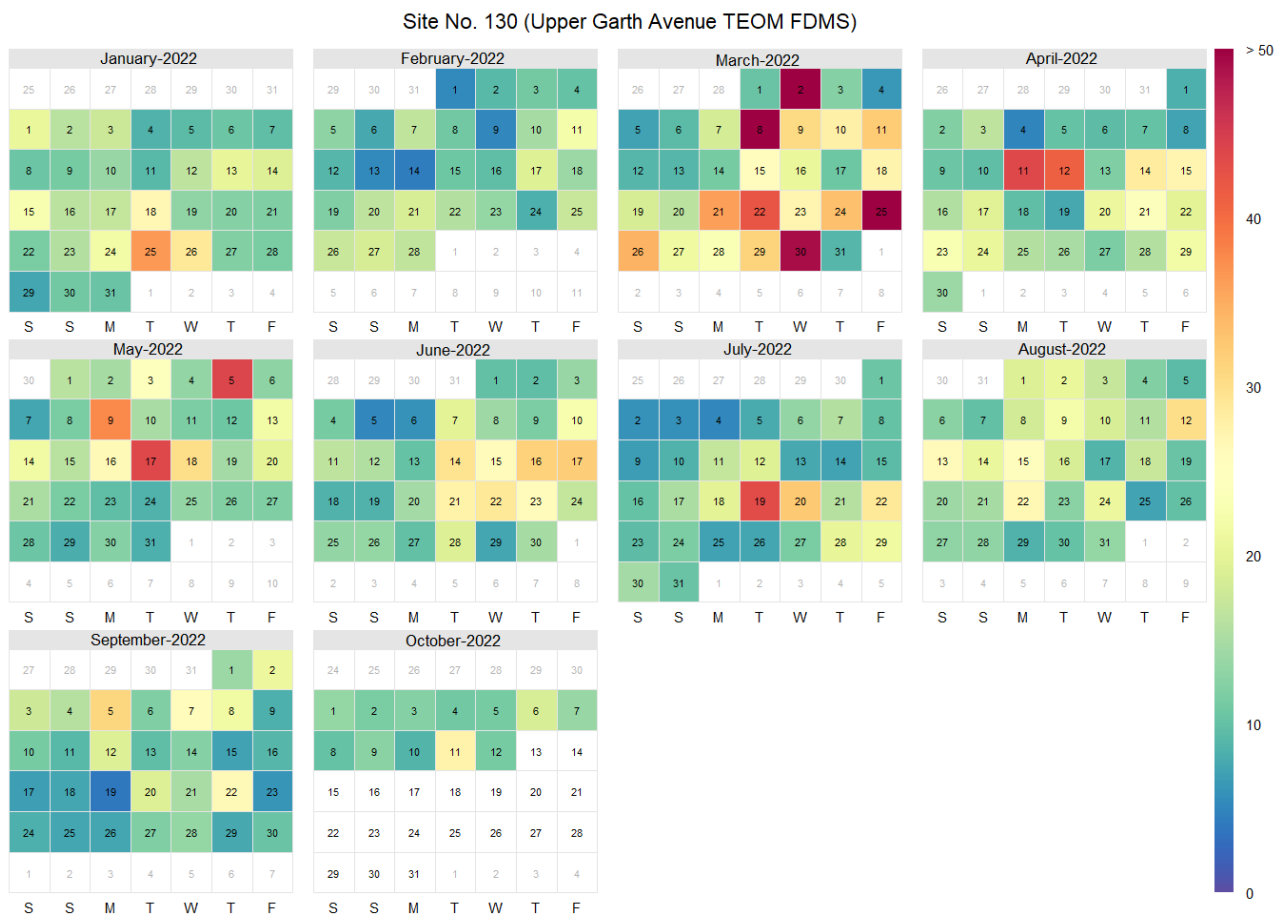
It has been reported [10] that, based upon modelled assessment, the South Wales Non-agglomeration Zone, which includes Rhondda Cynon Taf, is compliant with both the annual mean EU Limit Value for PM₁₀ and the 24-hour daily mean EU Limit Value for PM₁₀. It has also been reported [12] that Rhondda Cynon Taf, in comparison with other Welsh Local Authorities, has been ranked⁹ (lower the better) 4th out of 5 for PM₁₀.

The Local Authority did not monitor PM₁₀ within the Rhondda Cynon Taf general urban environment in 2022. However, the Local Authority has undertaken PM₁₀ monitoring within Glyncoch, at Site No. 130 (Upper Garth Avenue TEOM FDMS), a suburban community within the Taf Valley and in close proximity to the active Craig Yr Hesg Quarry. It is believed that during 2022 Glyncoch was not subject to any unexpected influences derived from a significant change in local circumstance or a locally transient event. Towards the end of 2022 the automatic monitoring of PM₁₀ at Site No. 130 was temporarily suspended, as the instrumentation at the air quality station had come to the end of its functionality without significant overhaul. The Local Authority is currently committed to maintaining, and if possible enhancing, its capability with respect to the monitoring of fine particulate matter at Glyncoch.

To consider the relevance and context of the 2022 PM₁₀ monitoring data, it is possible to examine it in a number of ways. Figure 4-13 provides a calendar plot identifying when the 24-hour daily means of PM₁₀ in 2022 was at its highest at Site No. 130 (Upper Garth Avenue TEOM FDMS).

⁹ Although there are currently twenty-two Local Authorities in Wales, some may be ranked equally

Figure 4-13: Calendar Plot of the 24-hour daily means of PM₁₀ at Site No. 130 (Upper Garth Avenue TEOM FDMS) in 2022

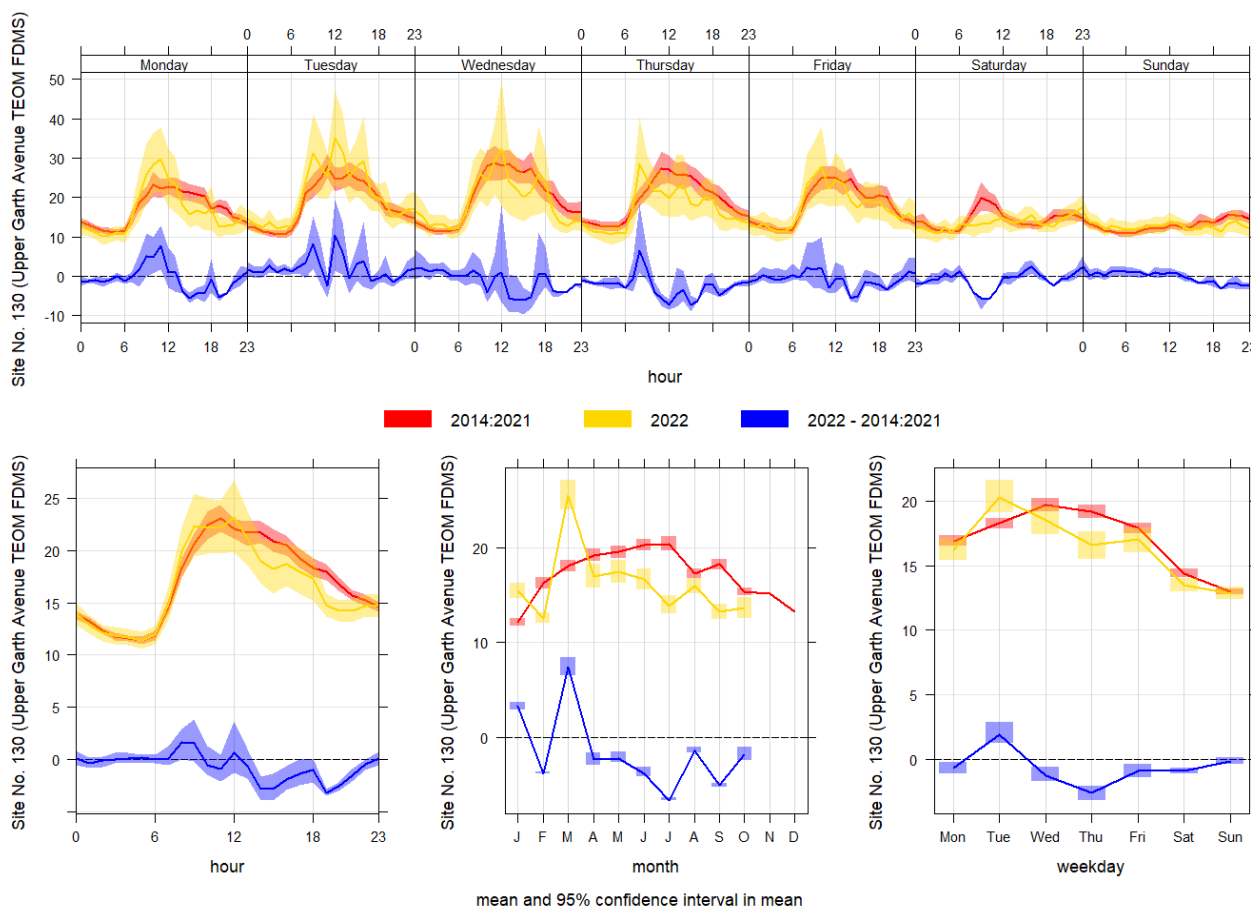


The calendar plot illustrates that, in general, occasions of elevated PM₁₀ levels at Glyncoch were relatively infrequent but when they did occur, this was more often observed during the spring months, March to May, of 2022. Nonetheless, it also suggests that occasional elevated levels of PM₁₀ can be experienced at any time of year. The calendar plot doesn't indicate wildly varying results but rather that the highest levels of PM₁₀ often appear to be clustered to several consecutive days at a time, for instance there are several consecutive elevated days in March and April 2022.

To further appreciate the context of 2022, it is possible to compare the PM₁₀ monitoring data with the historic average.

Figure 4-14 provides time variation plots of the 2022 PM₁₀ monitoring results (gold), the historic aggregated results from 2014 to 2021 (red) and the difference in comparison (blue).

Figure 4-14: Time Variation Plot of PM₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) in 2014 to 2021 and 2022.



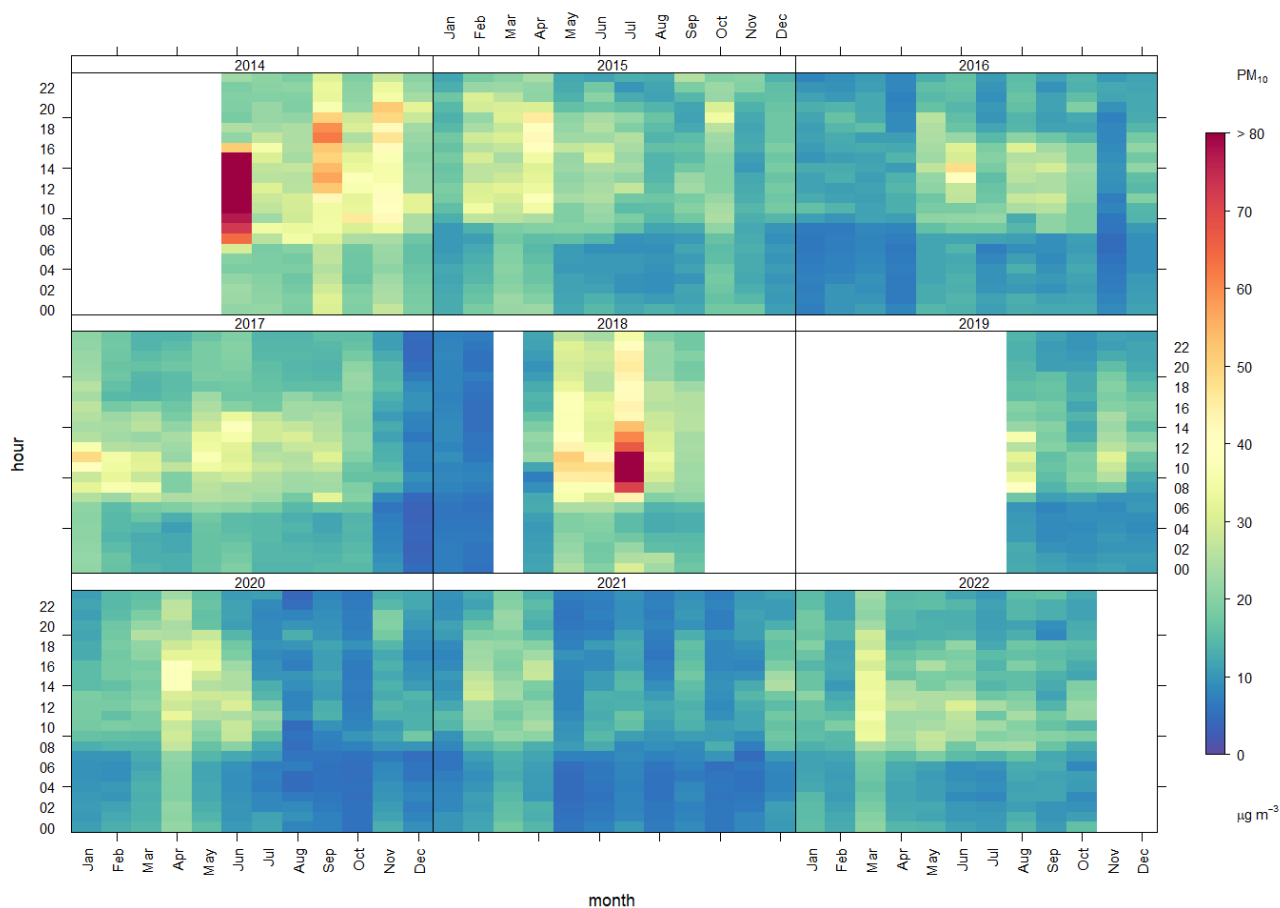
Site No. 130 (Upper Garth Avenue TEOM FDMS) demonstrates consistently elevated levels of PM₁₀ during Monday to Friday with noticeable reductions in the levels of PM₁₀ at the weekend (red and gold lines). PM₁₀ levels are most elevated between 7 am to 5 pm with elevated levels of PM₁₀ also showing a consistently strong diurnal and hebdomadal relationship. Although PM₁₀ data from 2022 (gold line) appears to show only a small biannual relationship, the historic PM₁₀ data (red line) suggests a more obvious biannual relationship, with greater levels of PM₁₀ more often experienced during the summer. The general pattern observed in 2022 has some similarity with the historic data, albeit some fluctuations within the time series can be observed, for instance lower levels of PM₁₀ observed on a Thursday and higher levels of PM₁₀ observed during March. It is also apparent that the levels of PM₁₀ appeared to have reduced slightly in 2022 when compared to previous years.

Nationally levels of PM₁₀ have been persistently declining in the long-term, despite a period of stability between 2015 and 2022, with “the average roadside PM₁₀ concentration [falling] to the lowest value in the [nationally monitored] time series [in 2021]” [18]. It is also recognised that weather conditions, both locally and more widely, can be highly influential in the levels of PM₁₀ observed. The weather during 2022 was reported as being “the warmest year on record” with “rainfall mostly below average for the year” and with the first half of the year being drier than normal, albeit this was countered to some extent by the autumn being wetter than normal [19]. The reported rainfall pattern during 2022, may correlate to a degree with

the slightly more elevated levels of PM₁₀ observed at Glyncoch during the Spring when compared to the remainder of the year.

The trend level plot for PM₁₀ at Site No. 130 (Upper Garth Avenue TEOM FDMS) produced in Figure 4-15 below, is a useful way of examining the temporal relationship of the trend in PM₁₀ over each year between 2014 and 2022. The trend level plot indicates 2022 may have experienced similar levels of PM₁₀ as that experienced during the recent past. The trend level plot does show some variation, possibly as a result of cyclical climatic affects, for instance the sustained dry summer in 2018 or the wetter than normal winter of 2019. These cyclical climatic effects can often result in some years being more or less prone to elevated levels of PM₁₀ when compared to the average, even where the underlying sources of PM₁₀ may remain consistent or are only changing incrementally.

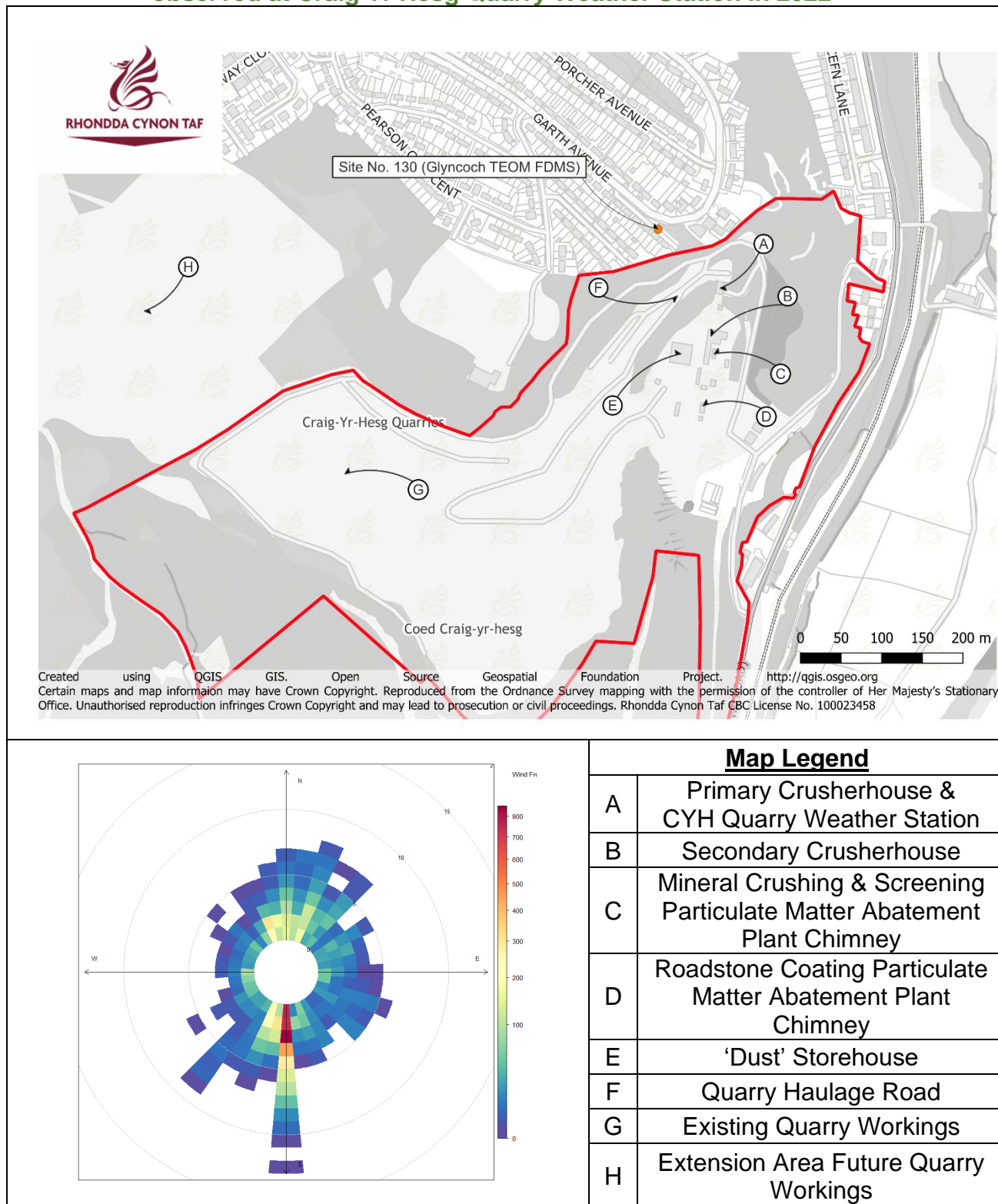
Figure 4-15: Trend Level Plot of PM₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) from 2014 to 2022.



It is expected that local influences, including potential sources of PM₁₀ from various activities at Craig Yr Hesg Quarry, may have particular relevance to the levels of PM₁₀ experienced at Site No. 130 (Upper Garth Avenue TEOM FDMS). To further assist with the consideration of the PM₁₀ monitoring data, it has been possible to obtain local weather monitoring data, gathered during 2022. The Craig Yr Hesg Quarry Weather Station is located at the primary crusher production building at Craig Yr Hesg Quarry, Glyncoch and is considered likely to be reflective of local weather conditions. Figure 4-16 below provides an annotated map of the

local environment and a polar frequency plot of ten-minute average wind speed and direction measurements in 2022.

Figure 4-16: Map of Glyncoch and a Polar Frequency Plot of wind speed and direction observed at Craig Yr Hesg Quarry Weather Station in 2022



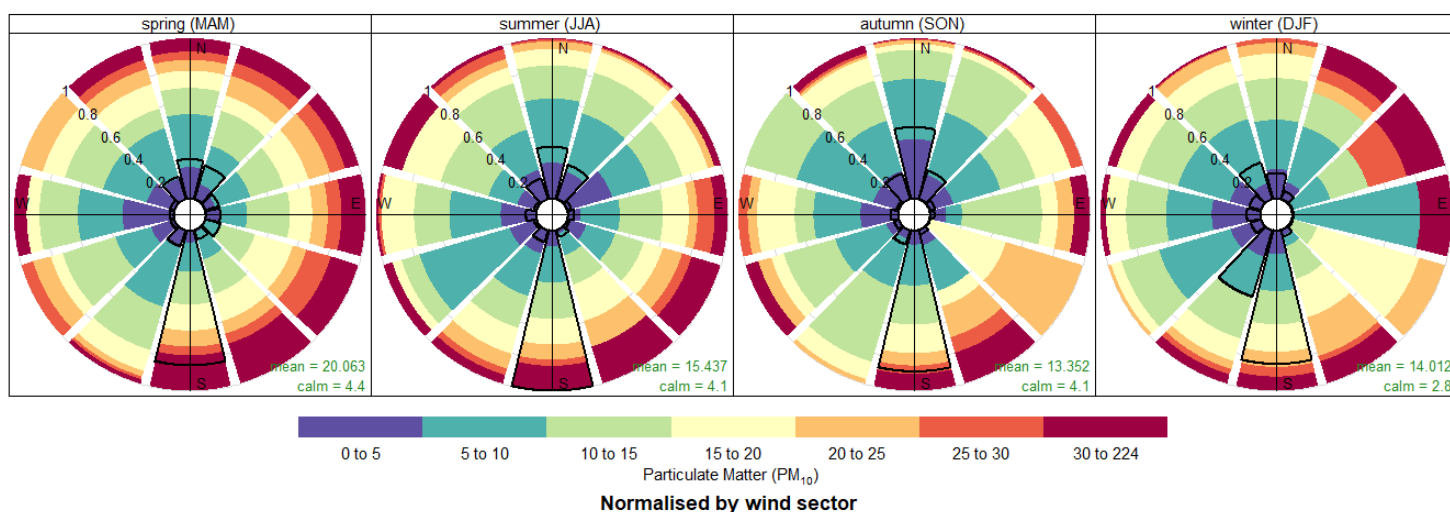
It would seem that, in 2022, relatively slow to moderate strength winds (more intense yellow-red colour squares that are towards the centre of the polar frequency plot) from the south to south-southwest predominate. In addition, there is a discernible influence of slow strength winds from the north. To a lesser extent, occasional slow to moderate winds from the east

and very occasional slow winds from the west are also observed. This is consistent with often-observed regionally predominant southwest winds adjusting to the locally defining north-south Taf Valley topography and with Glyncoch being on the western side of the valley.

To consider the potential influence of local weather conditions upon PM₁₀ levels monitored at Site No. 130 (Upper Garth Avenue TEOM FDMS). It is possible to consider the relationship between the observed levels of PM₁₀ and local wind direction.

Figure 4-17 provides a normalised pollution rose plot, split by season, of the PM₁₀ monitoring results at Glyncoch in 2022.

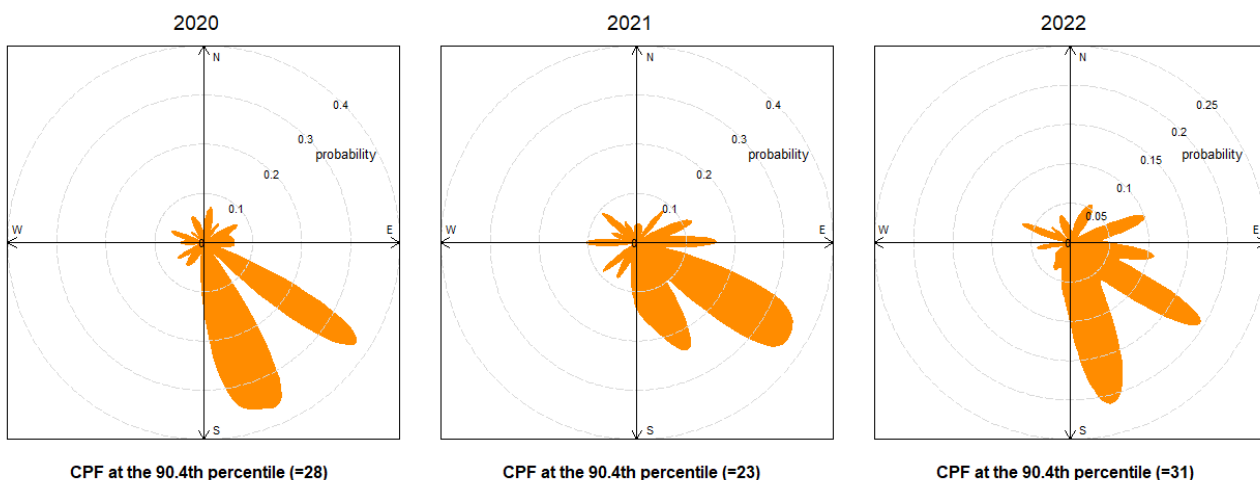
Figure 4-17: Pollution Rose Plot, by season and normalised, of PM₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) in 2022



As mentioned the wind direction at Glyncoch in 2022 was dominated by south and to a lesser extent conversely north winds during all seasons (black outlined segments). However, the normalised plot helps to illustrate that the wind directions with the most consistently likely influence on the highest levels of PM₁₀, observed at the monitoring location, were potentially from the southeast (the depth and intensity of red of each segment). Even though winds from the southeast were less prevalent when compared to the dominant wind direction in 2022. In contrast, persistently lower levels of PM₁₀ may have been more loosely associated with winds from the east and north. It is also apparent that these observed patterns were most noticeable in the spring, summer and autumn but being less obvious in winter, when comparatively elevated PM₁₀ levels were also observed from the northeast.

To emphasise the association between wind direction and occasions when PM₁₀ levels are observed at their highest at Glyncoch, Figure 4-18 provides a 90.4th percentile conditional probability function rose plot of PM₁₀ levels measured in each year from 2020 to 2022 at Site No. 130 (Upper Garth Avenue TEOM FDMS).

Figure 4-18: 90.4th Percentile Rose Plot of PM₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) in each year from 2020 to 2022

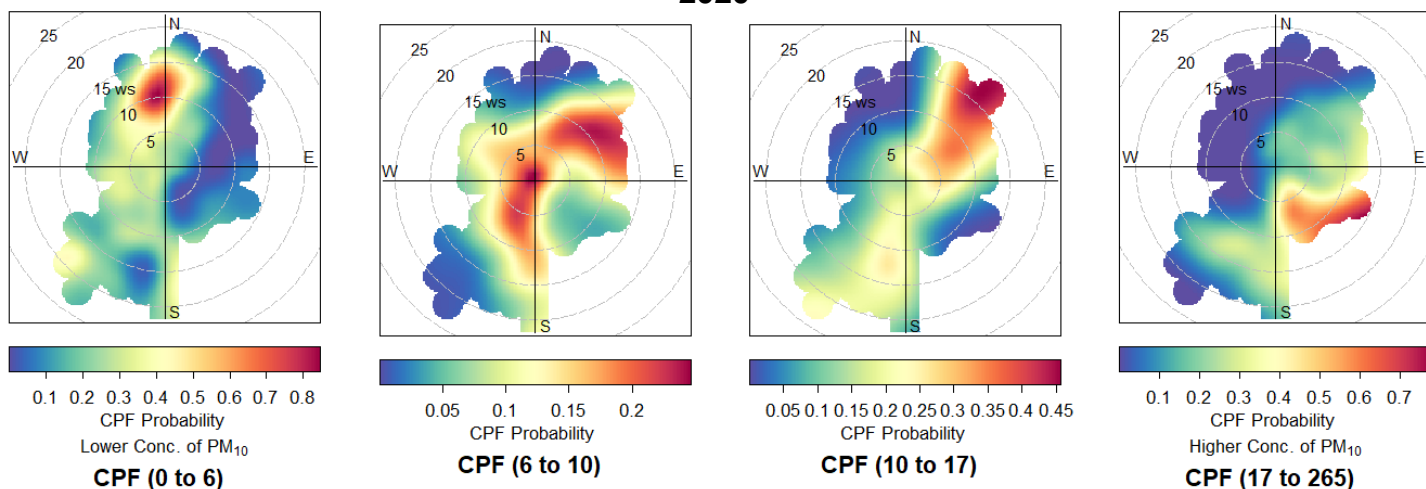


The 90.4th percentile rose Plot confirms that, in 2022, the very highest levels of PM₁₀ were most likely to be associated with wind from the south-southeast and southeast. The 2022 data appears very similar to that experienced since 2020, indicating that the sources of PM₁₀ from this direction maybe both persistent, consistent and of importance when considering circumstances that may support continued compliance with the 24-hour mean for PM₁₀.

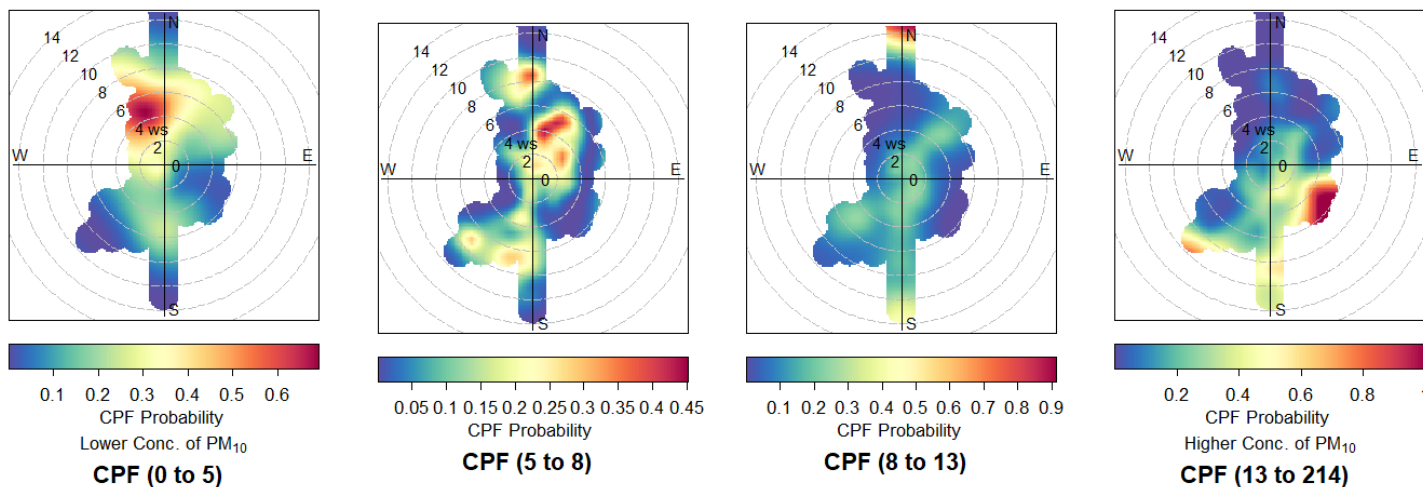
Although wind direction is likely to be the primary factor in influencing local levels of PM₁₀ at Site No. 130 (Upper Garth Avenue TEOM FDMS), wind speed in combination with wind direction may also be important in understanding various influences. To help further illustrate the possible connections between the observed levels of PM₁₀ and local wind direction and measured ten-minute average wind speed, Figure 4-19 provides conditional probability function polar plots of PM₁₀ levels measured in 2020, 2021 and 2022 at Site No. 130 (Upper Garth Avenue TEOM FDMS).

Figure 4-19: CPF Polar Plot of PM₁₀ measured at Site No. 130 (Upper Garth Avenue TEOM FDMS) from 2020 to 2022.

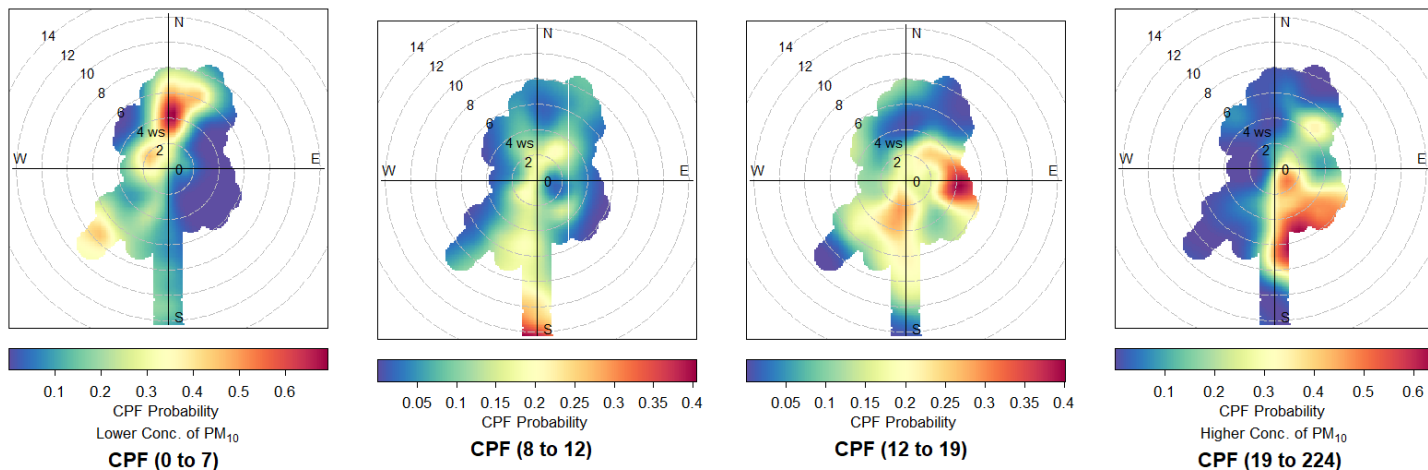
2020



2021



2022



The above CPF polar plots help to demonstrate if specific wind directions and associated ten-minute average wind speeds are associated with differing observed levels of PM₁₀, for each calendar year over the last three years. The plots to the left are associated with the lowest observed levels of PM₁₀ (< 5-7 µg_m⁻³) whilst the plots to the right are associated with the highest observed levels of PM₁₀ (> 13-19 µg_m⁻³). The above CPF polar plots illustrate a number of possible associations which are further described in Table 4-11 below.

Table 4-11: Assessment of CPF polar plots for Site No. 130 (Upper Garth Avenue TEOM FDMS) from 2020 to 2022.

PM ₁₀ Level	Wind Direction	Wind Strength	Importance	Association(s)
------------------------	----------------	---------------	------------	----------------

Lower	north	moderate	primary	Possible emissions from local residential PM ₁₀ point sources, such as boiler exhausts or chimneys along Garth Ave., in combination with aggregated residential PM ₁₀ emissions from the wider Glyncoch residential estate
	west	slower	secondary	Possibly associated with fugitive or resuspended residential household PM ₁₀ emissions from very nearby residential premises along upper Garth Avenue (< 10 meters)
	southwest	stronger	secondary	May be associated with fugitive or resuspended residential household PM ₁₀ emissions from very nearby residential premises along upper Garth Avenue (< 10 meters) as well as potentially emissions from the wider area, that at lower speeds may become impeded or deflected by the very local urban environment
	Consistent pattern from 2020 to 2022			
Moderate	east	moderate	primary	Persistent influence, associated with moderate to higher wind speeds that may be suggestive of regional PM ₁₀ sources such as the A470 (< 700 meters to east and northeast)
	southwest	moderate	secondary	May be associated with fugitive or resuspended residential household PM ₁₀ emissions from very nearby residential premises along upper Garth Avenue (< 10 meters) and/or fugitive or resuspended emissions within the wider area, that at lower speeds may become impeded or deflected by the very local urban environment
	south	stronger	secondary	May be associated with persistent PM ₁₀ emissions within the local area and certain parts of Craig Yr Hesg Quarry but possibly at an intermediate distance from the monitoring location.
	A similar pattern is observed for the results 2021, albeit there may be a greater association with moderate winds from the northeast (which is also associated to the A470) rather than the east and to a lesser extent stronger winds from the north. The 2020 results also consistently show a noticeable influence of moderate to stronger winds from the northeast but in a departure from subsequent years there was a clear influence associated with slower winds from the west			

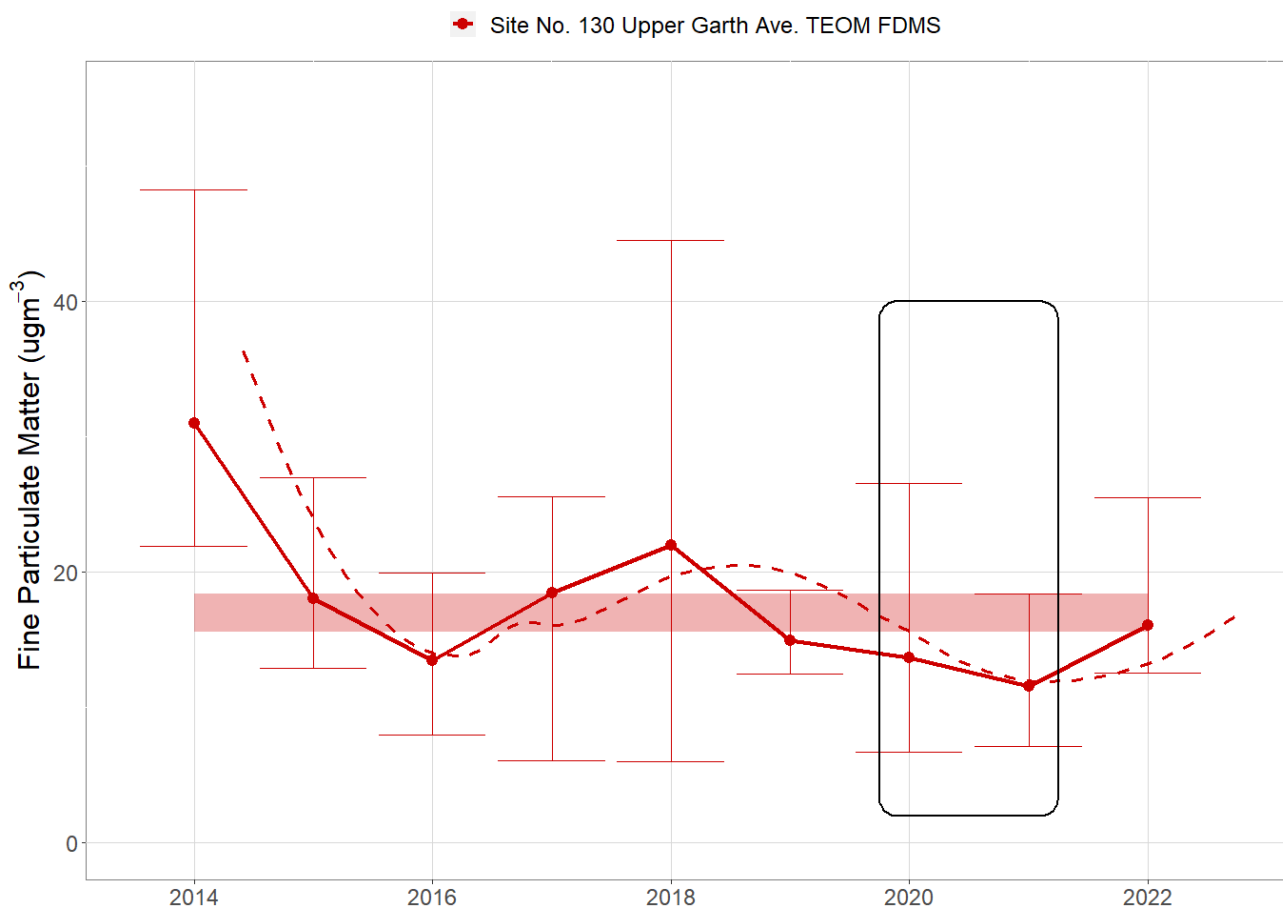
Higher	south to southeast	moderate	primary	May be associated with PM ₁₀ emissions from the local area, notably certain parts of Craig Yr Hesg Quarry, either becoming entrained in medium strength winds or grounding due to point source plumb instability.
	Consistent pattern across 2020 to 2022			

The above analysis reinforces the longstanding awareness of the likely significant influences that a range of sources of PM₁₀ have at Site No. 130 (Upper Garth Avenue TEOM FDMS) being very local, intermediate and at distance from the monitoring location. In addition, environmental influences may affect the transport of PM₁₀ to and its dispersion within the locality, influencing the locally experienced levels of PM₁₀. It is known that sources of PM₁₀ can be extremely variable, however, the patterns identified at Site No. 130 (Upper Garth Avenue TEOM FDMS) would likely be associated, in the main, to anthropogenic sources. The above analysis, supported by understanding reported in previous reviews, would suggest that the sources of PM₁₀ experienced at Garth Avenue are likely to be specific to the locality, repetitive and predominated by an activity largely undertaken during ‘working hours’. Furthermore, the influence of the activity’s emissions is variable, possibly in part due to the importance of cyclical climatic conditions and specific prevailing weather affecting its emission and subsequent transportation. This analysis continues to support the conclusion that Craig Yr Hesg Quarry remains a significant source of locally observed PM₁₀.

In considering the recent levels of PM₁₀ at Glyncoch it can be useful to have regard to the local PM₁₀ trend, however, it should be noted that the assessment of local PM₁₀ trends can be fickle, due to the multitude of influences that can impact upon observed PM₁₀, and ideally require long duration data sets. Figure 4-20 produces a time plot of Site No. 130 (Upper Garth Avenue TEOM FDMS) with the PM₁₀ annual mean (solid line with solid dots), the associated trend line¹⁰ (dashed red line), the 10-year mean Confidence Interval (shaded red zone) and the intra-year 24-hour daily mean spread (vertical bars and whiskers).

Figure 4-20: Time Plot of the annual mean PM₁₀ at Site No. 130 (Upper Garth Avenue TEOM FDMS) from 2014 to 2022.

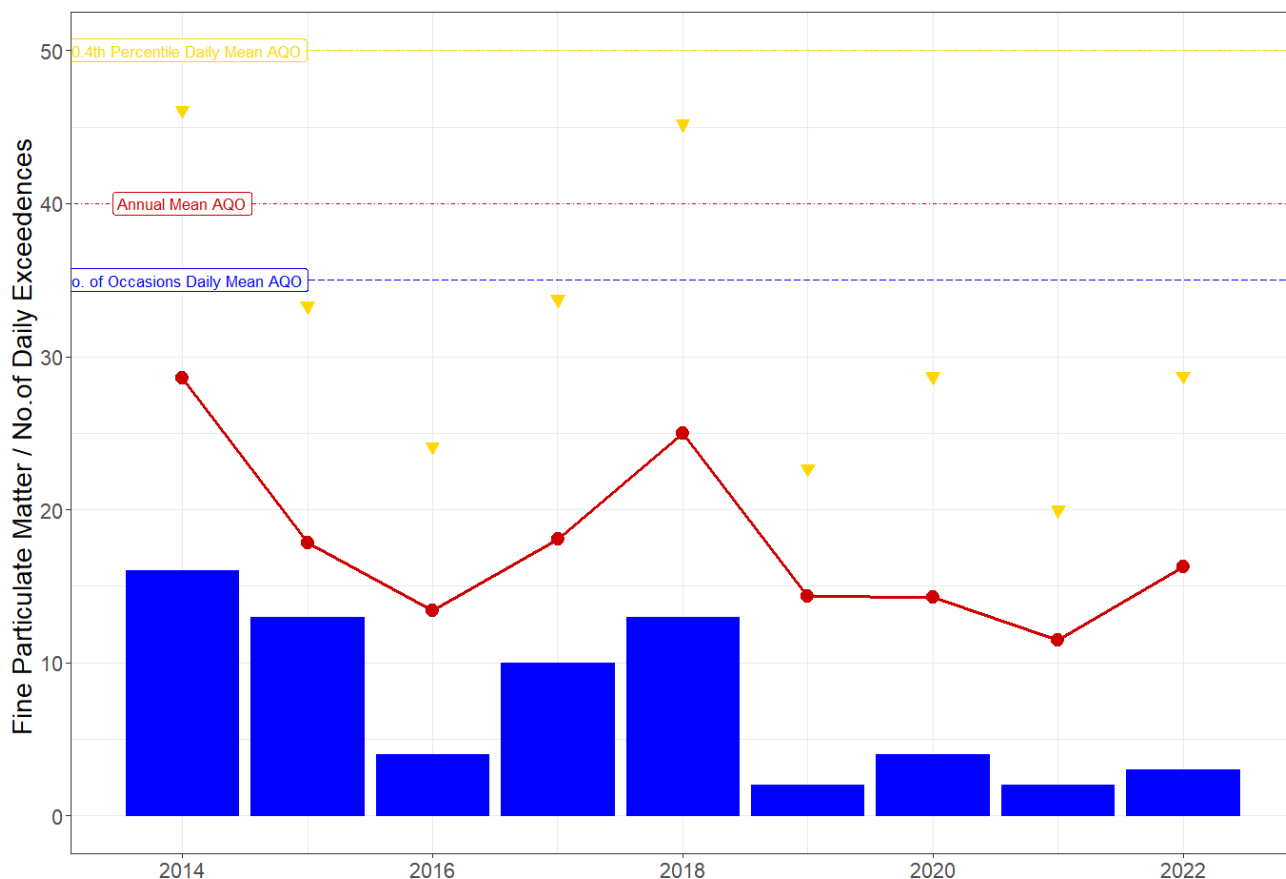
¹⁰ produced by Local Polynomial Regression Fitting with α of 0.5



Site No. 130 (Upper Garth Avenue TEOM FDMS) appears to continue to experience an undulating annual mean (solid line), subject to a degree of oscillation (ranging between 25.1 μgm^{-3} and 11.5 μgm^{-3} over the recent past) around a relatively consistent long-term average (shaded red area). It may be the case that 2022 observed an ‘up-tick’ in the annual mean compared to the very recent past. Although this proceeding period may have been slightly affected, by general COVID-19 related disruption (black box area). It is also apparent that the 24-hour daily mean spreads (the whiskers) can be subject to some year to year change, most notably in 2018, which could be linked to climatic variation. However, in 2022, the 24-hour daily mean spread, along with the 2022 annual mean, appears comparable to previous years.

It is possible to examine the relationship between the annual mean, the number of occasions the 24-hour daily mean for PM_{10} has exceeded $50\mu\text{gm}^{-3}$ and the 90.4th percentile. Figure 4-21, provides integrated time and bar plots illustrating the annual mean (the red solid line), the number of occasions the daily mean was greater than $50\mu\text{gm}^{-3}$ (the blue edged white bars) and the 90.4th Percentile of 24-hour daily means (gold triangles), with the correspondingly colour dotted reference lines.

Figure 4-21: Time and Bar plots illustrating PM_{10} results at Site No. 130 (Upper Garth Avenue TEOM FDMS).



Monitored PM₁₀ levels at Site No. 130 (Upper Garth Avenue TEOM FDMS) are consistent with the understanding that, at least since 2014, Glyncoch experiences a broadly stable situation, albeit with some inherent fluctuation. As a result, the community of Glyncoch is likely to be compliant to both the annual mean and the 24-hour daily mean AQOs for PM₁₀, often with a clear margin between the measured results and the associated AQOs.

Although it remains difficult to predict a future trend at Glyncoch it appears that, at present the location remains compliant to the annual mean and the 24-hour daily mean AQOs for PM₁₀. Furthermore, the available evidence may suggest that the levels of PM₁₀ have improved since 2014, potentially corresponding to known improvements to the control of Particulate Matter emissions from Craig Yr Hesg Quarry. Nonetheless, sustained climatic events, for instance a protracted dry summer period, may threaten continued improvement, as indicated by the 2018 results. Therefore, continued monitoring may be necessary to ensure any future changes which have the potential to impact on the local prevalence of PM₁₀ can be fully considered, most notably the implementation of the extension of Craig Yr Hesg Quarry.

4.3.5 Particulate Matter [PM_{2.5}]

The Local Authority did not undertake the monitoring of PM_{2.5} in 2022, however, in looking to support understanding and further inform the local community, the Local Authority has determined to implement the monitoring of PM_{2.5} at Glyncoch. It is expected that this monitoring will commence during the latter half of 2023.

4.4 Summary of Compliance with AQOs as of 2022

Rhondda Cynon Taf County Borough Council has examined the results from monitoring within its area. In maintaining a precautionary approach, as recent changes in local NO₂ trends are further understood overtime, it is considered appropriate to **retain, as they currently are, all sixteen extant AQMAs for NO₂.**

The level of NO₂ outside of the current sixteen AQMAs and levels of PM₁₀ throughout Rhondda Cynon Taf are likely to be below their relevant AQOs, therefore **no additional action is required at this time.**

5. New Local Developments

The Local Authority is the Highway Authority for all of its area other than for those roads which are the responsibility of Welsh Government, as managed by its South Wales Trunk Road Agent.

The Local Authority is the Regulator of certain provisions of the Environmental Permitting (England and Wales) Regulations 2016 and the Clean Air Act 1993.

The Local Authority is the Local Planning Authority for all of its area other than that which forms part of the Bannau Brycheiniog National Park Authority, where that Authority is the Local Planning Authority.

5.1 Road Traffic Sources (and Other Transport)

It is believed that there have been no newly built local roads or related transport developments, in 2022, that would likely significantly elevate levels of air pollution within a relevant population.

5.1.1 Trunk Road Traffic Sources

Certain parts of Rhondda Cynon Taf's strategic road network (M4 and A470) is separately managed by the South Wales Trunk Road Agent [SWTRA] on behalf of Welsh Government, so as to facilitate national interconnectivity.

In response to an understanding that parts of the A470 may observe elevated levels of NO₂, that may be non-compliant to the respective EU Limit Values. The Welsh Government determined that parts of the A470 should be subject to a reduction in the speed limit from 70mph to 50mph, this action being assessed as the most cost effective option to improve local air quality [20].

The intervention was primarily pursued by Welsh Government with the stated aim of working towards achieving compliance to Limit Values for NO₂ within the South Wales Non-Agglomeration Zone. However, it is acknowledged that this action, which has affected communities between the Upper Boat & Pontypridd Junctions, could have significant consequences for the closely related Cilfynydd, Nightingales Bush, Pontypridd Town Centre and Treforest AQMAs, as well as more widely in the region. Further details of the area affected and actions taken are available on the Welsh Government [website](#).

The impact of this action so far has been reviewed [21] on behalf of Welsh Government and its specific implications, with respect to the Cilfynydd, Nightingales Bush and Treforest AQMAs have also been examined, by the Local Authority, within its 2020 Annual Air Quality Progress Report. Prior to 2020 and associated coronavirus related disruption, it was estimated that the benefit of the current vehicle speed reductions may equate to a 2.8µgm⁻³ lowering in the level of NO₂ along the intervention area, with the greatest impact likely to be experienced where the original maximum speed limit was being achieved or where chronic congestion manifested. However, along parts of the A470, often associated with its junctions, where slower speeds predominated and at times significant congestion can still be encountered, the measure may have been less impactful.

In addition to the maximum speed reduction action, certain “precautionary retained measures” have also been outlined, with Welsh Government reserving the right to implement them if deemed necessary to do so. In respect to the A470 these measures currently include additional air quality barriers at certain points, improved park & ride provision and a Clean Air Zone. It is understood that preliminary work to enable, if necessary, these precautionary retained measures have also been progressed. With specific regard to the implementation of a Clean Air Zone it has been acknowledged that the measure could be “detrimental to Pontypridd based on current modelling information and routes available for traffic to use” [21]. As such the Local Authority retains reservations about the implementation of a Clean Air Zone and awaits the outcome of further work that may help to explore its likely full impact.

Subsequent to the implementation of the maximum speed reduction action, the Welsh Government has acknowledged [22] the possibility that additional areas, between the Tongwynlais & Upper Boat Junctions of the A470, may be at risk of becoming non-compliant with the EU Limit Values for NO₂. It is understood that further investigation may be ongoing to consider the appropriateness of targeted measures, such as extension of the 50 mph speed restriction, that may be considered necessary to reduce, as quickly as reasonable, locally observed NO₂.

5.1.2 Non-Trunk Road Traffic Sources

With regard to non-trunk roads, Rhondda Cynon Taf CBC as the local Highways Authority continues to make significant investment in local transport provision and has published [23] updates on a number of major highways projects which may have an effect on local air quality. Table 5-1 provides some brief details on these schemes and a provisional qualitative assessment of their impact.

Table 5-1: Proposed road schemes which have the potential to impact local air quality.

Project	Description	Status	Affected AQMA	Qualitative Impact
Llanharan Bypass	New through road network associated with multi-phase housing development, which is planned to relieve traffic from the existing A473 as it runs through Llanharan centre.	Given the Welsh Government 'programme of future road investment', this scheme is under review as to whether a revised scheme could be considered that could conform to possible future delivery requirements that may be supported by Welsh Government or if alternative funding mechanisms can be applied.	Llanharan	Potential major improvement within AQMA
Ely Valley Road Dualling	Providing additional carriageways along A4119 north of Royal Glamorgan Hospital, to improve capacity and reduce the likelihood of peak traffic congestion.	£8.12M allocated to advance ongoing works, with construction phase commenced. This scheme has not been subject to review by the 'programme of future road investment' as it is being delivered via alternative funding mechanisms.	Tonyrefail	Potential minor improvement within AQMA
Core-Valleylines Railway Park & Ride	Providing additional and improved park & ride capacity at strategic railways stations to increase public transport use. Several Park & ride schemes have already been advanced.	£0.73M allocated to advance continuous improvement programme of works having regard to Metro delivery	Cilfynydd Llanharan Mt Ash Mwyndy Nightingales Bush Treforest	Potential minor improvement within AQMAs due to reduction in longer-distance road journeys.

Project	Description	Status	Affected AQMA	Qualitative Impact
Gelli/Treorchy Relief Rd	New road network to relieve traffic from Stagg Jct, Treorchy and associated road network within the Rhondda Fawr	£0.36M allocated to advance further study and consideration	Llwynypia	Uncertain impact dependent upon desired scheme
North West Cardiff Corridor	Improvements to bus infrastructure, junction capacity and traffic management to reduce existing congestion points	£0.959M allocated to Cardiff CC as lead authority to advance improvement works	Mwyndy	Effects on AQMA unclear but potential moderate improvement within area from Talbot Green to Mwyndy
A465 Cynon Valley Gateway	Extension of Aberdare bypass to the dualled A465 Heads of the Valley road and potential other local road network modifications combined with possible mass transit improvements	Given the Welsh Government 'programme of future road investment', this scheme is under review as to whether a revised scheme could be considered that could conform to possible future delivery requirements that may be supported by Welsh Government or if alternative funding mechanisms can be applied.	Aberdare	Potential moderate improvement within AQMA and surrounding suburban area.
Porth Town Centre Transport Hub	Providing a transportation hub for local bus and train transport with additional park & ride facilities, including electric vehicle charging points and possible infrastructure to encourage electric bus and taxi uptake.	£3.5M allocated to advance ongoing works, with construction phase commenced in 2022.	-	Potential moderate improvement within Porth and minor improvement within wider Rhondda Valleys area.

Project	Description	Status	Affected AQMA	Qualitative Impact
Local Road Network Traffic Management Programme	small-scale traffic management schemes and the provision of residents parking.	£0.11M allocated to progress ongoing works and small projects	-	Potential minor improvement within area due to improved traffic management and reducing road traffic congestion causing factors.
Default 20mph Programme	Implementation of the default 20mph programme	£1.07M allocated to progress ongoing works which are acknowledged as being “challenging”	-	Uncertain impact dependent upon implementation and local circumstances.
Making Better Use Programme	Identify low cost, high value improvements for congested sections of the local highway network.	£0.544M allocated to progress ongoing works	Aberdare Mt Ash	Potential improvement within areas targeted due to improved traffic management and reducing road traffic congestion causing factors.

5.1.3 Other Transport Sources

The Local Authority continues to work closely with the Welsh Government Transport Company and other partner organisations in the development and delivery of the South Wales Metro. It is likely that the gradual operation of the South Wales Metro will have a significant impact upon air quality throughout a large area of Rhondda Cynon Taf and specifically those communities in the Taf Valley that are associated with the A470.

5.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

Although the degree of industrialisation of Rhondda Cynon Taf has significantly reduced compared to historic levels, there are still a number of industrial premises present which could impact upon local air quality.

5.2.1 Environmental Permitting (England and Wales) Regulations 2016

Under Regulation 13(1) of the Environmental Permitting (England and Wales) Regulations 2016, the Local Authority can grant Environmental Permits to operate various permitted activities, further details about this regime are available on the Local Authority's website [24]. Further details of the Regulated Facilities within Rhondda Cynon Taf are available on the Environmental Permitting Public Register held by the Local Authority, the index of which is also available on its webpage [24]. Table 5-2 identifies that there were no new or substantially changed stationary Regulated Facilities, within Rhondda Cynon Taf, in 2022.

Table 5-2: New or Substantially Changed Environmental Permits granted by the Local Authority in 2022.

Permit Ref.	Operator	Activity	Relevant Pollutants	Area	Affecting LAQM
Nil	Nil	Nil	Nil	Nil	Nil

5.2.2 Clean Air Act 1993

The Clean Air Act 1993 requires that the occupiers of premises utilising certain 'furnaces', to notify the Local Authority of their installation or modification, further details about this regime is available on the Local Authority's website [25]. Table 5-3 identifies no new or significantly changed relevant furnaces and their chimneys, within Rhondda Cynon Taf, which have been granted consent under the Clean Air Act in 2022.

Table 5-3: New or modified relevant furnaces notified to the Local Authority in 2022.

Ref.	Operator	Rating	Fuel	Chimney Height	Relevant Pollutants	Area	Affecting LAQM
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

5.3 Planning Applications

In accordance with Planning Policy Wales [26] and the Local Development Plan [27], the Local Authority considers air quality a material planning consideration. The Local Authority will, when necessary, take account of the implications of any development upon local air quality during the planning consent decision making process. The Local Authority will attempt to ensure that, if necessary, future developments will negate or mitigate any impacts on local

air quality whilst continuing to treat each application for planning consent on its individual merits.

The Local Authority has produced informal guidance criteria [28] used by it to identify, in a consistent and proportional way, applications for proposed developments which could either have the potential to adversely impact upon local air quality or introduce a relevant population to an existing area of potentially poor local air quality. Should a development meet the criteria and it is proportionate to do so, the Local Authority will seek to require an Air Quality Assessment [AQA]. An AQA will look to objectively examine the air quality implications of the proposed development and provide sufficient information to allow the Local Planning Authority to evaluate the material planning consideration.

During 2018-2019¹¹ the Local Planning Authority [29] approved 514 new dwellings across a range of consented developments. In addition, 96% of new dwellings and 100% of new employment and retail developments constructed, in 2018-2019, were within 400m of a transport node. Table 5-4 details the planning applications in 2022 considered as having the potential to impact local air quality management and, where appropriate, an Air Quality Assessment was desired or was otherwise assessed for its air quality impact.

Table 5-4: Planning Applications under consideration or approved in 2022 where an AQA was desired.

Application Number	Location	Description	Affecting LAQM or AQMA
15/0666/10	Craig Yr Hesg Quarry, Glyncoch	Western extension to existing quarry to enable the phased extraction of 10 million tonnes of sandstone	Application Refused Granted on Appeal
21/0720/15	Craig Yr Hesg Quarry, Glyncoch	Continuation of quarrying and related operations for an extended period of six years	Application Refused Granted on Appeal

Subsequent to appeal, planning consent was granted by the Relevant Authority in respect to both the western extension (App. no. 15/0666/10) and continuation of existing quarrying (App. no. 21/0720/15) at Craig Yr Hesg Quarry, Glyncoch. It is expected that the proposed development will likely continue an existing impact upon the community of Glyncoch. The Local Authority continues to engage with the operators of Craig Yr Hesg Quarry to attempt to mitigate any potential impact of the site activities on the surrounding community. It is also acknowledged that the Operator has, over a number of years, undertaken improvement works to on-site particulate matter abatement. In addition the Local Authority, in its position as the Local Mineral Planning Authority, has undertaken a Review of Old Mineral Permissions [ROMP] for Craig Yr Hesg Quarry. The ROMP, accompanied by an Environmental Impact Assessment, has allowed the Local Authority to ensure the most appropriate conditions, at that time, are in place to prevent and mitigate emissions of PM₁₀ from the site.

¹¹ At the time of publication the most recently issued monitoring report was for 2019

No other relevant proposed developments have been identified which would be expected to materially affect or be affected by local air quality management considerations.

5.4 Other Sources

The Local Authority appreciates that certain pollution incidents as well as wide scale bonfire activity, large firework displays, wildfires and domestic solid-fuel burning can have the potential to impact upon local air quality.

Rhondda Cynon Taff routinely experiences a large number of intentional wildfires; over the last 20 years there have been 76,000 reported wildfires, of which 96% were intentionally set, in the South Wales Valleys area with 297 wildfires reported within Rhondda Cynon Taf in 2020/21 alone” [30]. In the past, the incidence of intentional wildfires has varied, being dependent upon dry weather aligning with school term breaks, which has resulted in occasions of wide-scale wildfires affecting large areas of the Rhondda and Cynon valleys. Although these wildfires are usually associated with rural open mountainside locations they can still, on occasion, arise in close proximity to some residential areas. These wildfires normally involve the burning of large areas of bracken and other vegetation, in an uncontrolled manner, with significant amounts of black smoke being produced, occasionally for extended periods of time.

Although these wildfires are unlikely, in themselves, to pose a risk of compliance to a relevant AQO, the Local Authority considers that the prevalence of intentional wildfires can, dependent upon circumstances, have a significant short-term effect on local air quality by potentially elevating local levels of Particulate Matter and Black Carbon. Anecdotal reports suggest these incidents could have a direct effect on public health as well as causing anxiety and concern within the communities affected.

Although, the Local Authority has not got the resources to directly quantify the air quality impact of wildfires within or in proximity to its area, in recognising the potential impact of such wildfires the Local Authority will continue to work with its partners to deter their occurrence. This work involves playing an important role in the delivery of the Healthy Hillside Initiative, which includes a goal of “providing opportunities and education in land management so that together, [Rhondda Cynon Taf] can become a wildfire-wise county borough”. It is hoped that targeted holistic interventions, involving a range of stakeholders and the communities effected, will result in a reduction in the occurrence of intentional wildfires, whilst acknowledging that climatic change may otherwise increase their prevalence and extent. In addition, the Local Authority will also continue to monitor emerging understanding upon the public health impact of wildfires and, where necessary, will react accordingly.

The Local Authority is not aware of any other pollution incidence that could have significantly affected air quality within its area during 2022.

The Local Authority recognises the impact of bonfires, firework displays and domestic solid-fuel burning within its area could have on local air quality. As such it continues to enforce a range of statutory provisions, including building regulations and the statutory nuisance regime, to deter or otherwise minimise these activities where they are shown to cause a significant negative impact.

In recognising that, in certain circumstances, there can be a potential association between the domestic use of solid fuels and fuel poverty. It is also acknowledged that the potential for future economic challenges may result in an increased use of solid fuels in the near term. The Local Authority is working to tackle this in a number of ways including raising awareness, signposting eligible households to available grants, encouraging the installation of energy efficiency measures in domestic settings while also encouraging more energy efficient behaviour, maximising the income of low-income households and providing support for vulnerable people.

The Local Authority does not maintain sufficient information to evaluate the likely prevalence or combined impact of the above activities, however, it is believed that at present it is unlikely that they would significantly threaten compliance to a relevant AQO within Rhondda Cynon Taf.

5.5 Summary of Local Developments

Rhondda Cynon Taf County Borough Council confirms that there are **no new or newly identified local transport or other developments which may have a single significant impact on air quality** within the Local Authority area.

Rhondda Cynon Taff County Borough Council confirms that all the following have been considered:

- Road traffic sources
- Other transport sources
- Industrial sources
- Commercial and domestic sources
- New developments with fugitive or uncontrolled sources.

6. Policies and Strategies Affecting Airborne Pollution

A diverse range of activities and interests can have a material effect on local air quality management, including a number of policy areas where the Local Authority may have adopted formal strategies, policies or positions or otherwise has an interest.

6.1 Clean Air Plan for Wales

The Local Authority welcomes the publication, by Welsh Government, of the Clean Air Plan for Wales [22]. This overarching Plan highlights a number of possible future changes to not only Local Air Quality Management but also more widely as to how air pollution can be locally and nationally improved. The Local Authority also acknowledges the importance of the Environment (Air Quality and Soundscapes)(Wales) Bill [3] that has recently been introduced to Senedd Cymru. Having regard to the draft legislation, it is envisaged it will likely include a range of new or enhanced measures to help realise the policy objectives outlined within the Clean Air Plan for Wales.

The Local Authority anticipates that, as it currently stands, the proposed legislation could result in significant operational implications to how it resources and performs its Local Air Quality Management duties and related tasks. As such the Local Authority will continue to engage with Welsh Government throughout the legislative process and beyond. As further clarity as to any statutory implications become apparent, the Local Authority may undertake a review of how it delivers its local air quality management duties into the future. Any likely significant resource constraints, competing priorities and the potential desire to minimise duplication of work with any future centralised monitoring or management of air quality, will need to be taken in to account.

6.2 Local / Regional Air Quality Strategy

At present the Local Authority has not determined to produce a local air quality strategy and is not a member of any local government produced regional air quality strategy. However, it is expected that the sixteen revised AQAPs re-adopted by the Local Authority, will have a co-ordinating role with regards to the delivery of air quality improvement.

6.3 Development Control Policies

The Local Authority is the Local Planning Authority for that part of its area not within the Bannau Brycheiniog National Park. In accordance with guidance the Local Authority has adopted a Local Development Plan [27] for the period 2006-2021. The Local Planning Authority has also commenced the process for formulating a future Local Development Plan for the period after 2021. It is currently expected that a revised Local Development Plan 2022-2037 will be adopted by May 2026. During the interim period, the existing Local Development Plan 2006-2021 will continue to be the mechanism for determining planning applications until it is formally replaced.

The Local Development Plan references several policies which are designed to protect the environment and human health. A key policy is “Policy AW10 – Environmental Protection and Public Health”, reproduced in Table 6-1, which provides a clear indication on how proposed developments which adversely affect air quality will be catered for.

Table 6-1: “Policy AW 10 Environmental Protection and Public Health”.

Development proposals will not be permitted where they would cause or result in an unacceptable risk of harm to health and/or local amenity because of: -

1. Air Pollution
2. Noise Pollution
3. Light Pollution
4. Contamination
5. Landfill Gas
6. Land Instability
7. Water Pollution
8. Flooding
9. Or any other identified risk to public health

Unless it can be demonstrated that measures can be taken to overcome any significant adverse risk to public health and / or impact upon local amenity.

The Local Planning Authority has not yet proposed to adopt any Special Planning Guidance with regard to air quality but will continue to strive to harmonise treatment of planning applications and ensure transparency where air quality is a material consideration.

As part of the sustainability monitoring framework put in place to assess the application of the Local Development Plan, a number of air quality indicators have been adopted and were reported upon within the Local Development Plan Annual Monitoring Report [29].

6.4 Local & Regional Transport Plans and Strategies

As a result of a Regulatory Order¹² the Local Authority is no longer required to maintain an individual Local Transport Plan, instead a number of plans and regional transport related strategies may apply to the Local Authority's area.

6.4.1 Regionally Collaborative Local Transport Plan

The Local Authority has adopted a regionally collaborative Local Transport Plan [rc-LTP] [31], which is based upon a number of objectives, several of which are relevant to local air quality management; as shown in Table 6-2.

¹² In accordance with The Transport Wales Act 2006

Table 6-2: Objectives relevant to local air quality management within the rc-LTP.

No.	Objectives of the rc- Local Transport Plan
1	To improve connectivity by sustainable transport between the SE Wales Valleys and the rest of Wales, the UK and Europe.
2	To improve interchange within and between modes of transport
3	To improve the quality, efficiency and reliability of the transport system.
4	To reduce traffic growth, traffic congestion and to make better use of the existing road system
5	To achieve a modal shift towards more sustainable forms of transport for moving people and freight.
6	To reduce significantly carbon emissions from transport.
7	To reduce the impact of the transport system on the local street scene and the natural, built and historic environment.
8	To promote sustainable travel and to make the public more aware of the consequences of their travel choices on climate, the environment and health.

The rc-LTP, which initially covered the period 2015 to 2020, acknowledges the need for sustainable transport solutions and proposes a number of actions to encourage the use of public transport and modal shift, whilst limiting new major road building. Table 6-3 notes the relevant actions proposed by the rc-LTP which, if delivered within existing funding constraints, could have a potential effect on local air quality management in Rhondda Cynon Taf. In line with guidance, the rc-LTP only has regard to schemes which are deliverable within the Local Authority's remit.

Table 6-3: Proposed actions contained within the rc-Local Transport Plan.

rc-Local Transport Plan Schemes		Relevant AQMA or area of interest
1	Active Travel Schemes, to improve walking and cycling links to key services and facilities and improve accessibility within and between communities.	All
2	Safe Routes in Communities Scheme, to improve accessibility within communities with a specific focus on providing safe, sustainable routes to schools and school travel plans to encourage a greater use of active modes of travel	All
3	A4059 Aberdare Bypass Extension Scheme to develop an existing road, in parallel with the ongoing dualling of the A465, to maintain access between communities	Hirwaun
4	Bus Priority Schemes to include measures to relieve congestion pinch points along strategic bus corridors, raise kerbs, new information displays and, where feasible, new seating and shelters for public bus users within Rhondda Cynon Taf	All
5	Bus Rapid Transit Schemes to develop, where feasible, improved cross-valley links between key settlements outside Cardiff and Newport, by construction of segregated sections of bus priority road space.	Broadway Cilfynydd Nantgarw Pontypridd

rc-Local Transport Plan Schemes		Relevant AQMA or area of interest
6	Treforest Estate Station Park and Ride Provision Scheme, to provide a new Park and Ride Facility which could serve a wide catchment area including Tonteg and Church Village.	Broadway Church Village Llantwit Fardre
7	Park and Ride Improvement Schemes to improve current provision of park and ride facilities at railway stations	All
8	Aberdare Bus Station Upgrade Schemes to include new electronic information displays and other changes to improve the desirability of the stations to users	Aberdare
9	Tonypany Bus Station Upgrade Schemes to include new electronic information displays and other changes to improve the desirability of the stations to users	Ferndale Llwynypia Tylorstown
10	Strategic Transport Corridor Management System A4119 / A473, to include modifying the junction layout and the installation of a new urban traffic control system.	Mwyndy Church Village Llantwit Fardre
11	Mountain Ash Cross Valley Link Road, to provide a bridge forming a cross valley link to divert traffic from the B4275 to the A4059	Mountain Ash

In addition to the specific schemes and interventions outlined above it is recognised that certain transport related policy interventions, associated with the Local Authority, can also have an important role in Local Air Quality Management. Table 6-4 provides an overview of other key policy related developments and potential implications to local air quality management.

Table 6-4: Overview of other key policy related developments.

Policy	Description
Hackney Carriage (Taxi) & Private Hire Vehicle Fleet	The Local Authority currently stipulates vehicle technical standards, including proscriptions on the maximum age of a vehicle, for licensed vehicles. It has also been working collaboratively with its partners, both local and regional, in the regulatory delivery of Taxi & Private Hire vehicle emission improvements through best practice, industry support and possible licensing conditions. As an example, SWARCO has been awarded a contract by the Cardiff Capital Region to deliver 34 chargers at 31 sites throughout the Region and funding has also been awarded by the Cardiff Capital Region to implement a 'try before you buy' scheme for low emission wheel chair accessible vehicles.
Local Authority Low or Zero Emission Vehicle Fleet	Local Authority early adoption of Zero or Low Emission Vehicles, where practical, as ongoing replacement of existing petrol or diesel powered vehicles. Historically, the Council's fleet is predominantly diesel based. However, the Council have been trialling Hybrid and EV vehicle options, as well as alternative fuel options, with the intention of moving towards the use of more sustainable forms of fuel for many of its vehicles by 2025 and for certain HDVs by 2030 where

Policy	Description
	practical. The Council are in the process of formally evaluating its fleet composition with the aim of identifying the necessary measures required to transition to a low emission vehicle fleet. In time this may bring forward vehicle emissions improvements, especially with respect to NO _x emissions, emitted by the Local Authority.
Fare-Charging Low or Zero Emission Bus Fleet	Proposed requirement for Operators' early adoption of Zero or Low Emission Vehicles, where practical, as ongoing replacement of existing petrol or diesel powered vehicles. In time this may bring forward vehicle emissions improvements, especially with respect to NO _x emissions, produced by Operators. Depending upon support mechanisms this could also have the potential to impact, in the short term, on the viability of some currently marginal bus routes.
School Bus Transport	Requirement for Operators to ensure full accessibility of vehicles providing the service. This may result in the early phase out of older, potentially more polluting, vehicles which may also not be compatible with modern access standards. Depending upon support mechanisms this could also have the potential to impact, in the short term, on the viability of some school transport provision.
General Urban Road 20mph Speed Limit	Requirement for substantial parts of the urban road network to be reclassified from 30mph to 20mph vehicle speed limit by September 2023. Although challenging to predict, this may not universally have a significant ¹³ direct impact on NO _x emissions [32] [33], albeit each location will experience its own specific circumstances. However, careful consideration [34] of any engineered street speed reduction measures, especially along streets that may otherwise be vulnerable to elevated levels of NO ₂ , will be necessary to avoid potential adverse side-effects.
Prohibition on Informal Pavement Parking	Proposed requirement to prohibit the informal parking of road vehicles on pavement associated with the Highway. Pavement parking can be particularly prevalent in many communities within Rhondda Cynon Taf due to the legacy of limited off-street parking options and narrow carriageways. Pavement parking can, in certain circumstances, result in localised traffic congestion and an associated increase in NO _x emissions, as identified in several AQMAs. Its prohibition may enable smoother traffic flow and subsequently less polluting journeys. Contrastingly should parked cars further encroach the carriageway, as a consequence of not being able to use available pavement,

¹³ Significance, in relation to NO_x emissions, may depend on the composition of Petrol to Diesel vehicles within the local vehicle fleet.

Policy	Description
	then the likelihood of additional traffic congestion may increase.

6.4.2 Cardiff Capital Region Transport Authority

Complimentary to the regionally collaborative Local Transport Plan, the Local Authority is also a member of the Cardiff Capital Region Transport Authority, which has been formed to support the Cardiff Capital Region’s ambition for a ‘more connected, competitive and resilient region’. The Regional Transport Authority is advancing a number of Capital Region transport improvement schemes [35] and provides regular updates on the progress made delivering them, via the Cardiff Capital Region ‘Project Hub’ webpage [36]. Some of these schemes are specific to Rhondda Cynon Taf and have been outlined below in Table 6-5.

Table 6-5: Cardiff Capital Region Transport Authority Schemes in Rhondda Cynon Taf.

Cardiff Capital Region Transport Authority Schemes		Relevant AQMA or area of interest
1	South Wales Metro (hybrid rail/tram/road) to include potential new North West Tram Corridor from Cardiff to Pontyclun, with the possibility of establishing connections to additional communities along the route, as well as the separate development of a new station at Nantgarw.	All
2	South Wales Main Line Railway Upgrade to improve journey times, capacity and user experience.	Llanharan
3	Mid Valley Train Tram Connectivity to possibly include a cross valley connection from the Rhondda Valleys to Pontypool and to include possible integration with Pontypridd Bus Station.	All
4	Reinstatement of passenger services between Aberdare and Hirwaun	Aberdare

In addition to the above, the Welsh Government are investing £750M to progress a range of rail improvement schemes [37] associated with the Core Valley Railway Lines, which could have an effect on local air quality management within Rhondda Cynon Taf; as detailed in Table 6-6.

Table 6-6: Proposed Transport for Wales Rail Schemes.

Transport for Wales Rail Schemes		Relevant AQMA or area of interest
1	Core-Valley Lines electrification	Broadway Pontypridd Aberdare
2	Upgrading of all stations and signalling	All
3.	Constructing at least two new railway stations	All

The Local Authority will monitor the impact of the above schemes on local air quality and where necessary react accordingly.

6.4.3 Welsh Government Supplemental Plan

Parts of Rhondda Cynon Taf's strategic road network (M4 and A470) are separately managed by the South Wales Trunk Road Agent [SWTRA] on behalf of Welsh Government, so as to facilitate national interconnectivity. The Welsh Government, has acknowledged that certain parts of this national transport network may require additional intervention to bring about improvements in air quality as quickly as reasonable. In doing so Welsh Government has adopted a supplemental plan [20] for tackling roadside NO₂.

Currently this supplemental plan specifically addresses targeted action to reduce the levels of NO₂ along a part of the A470 that runs between the Upper Boat and Pontypridd Junctions. A key supplemental plan intervention has been the implementation of enforced speed limit reduction, along relevant parts of the A470, and associated information dissemination. The impact of this supplemental plan intervention is discussed in Section 5.1.

Although the supplemental plan intervention has likely had an effect in reducing observed NO₂ levels, it is possible that the Welsh Government may also consider further interventions, potentially both within the current targeted area and other neighbouring parts of the A470, to further expedite improvement in the locally observed levels of NO₂. Whilst the Local Authority welcomes the Welsh Government action so far, it continues to stress the importance of a close working relationship to ensure any future proposed actions do not have unacceptable adverse consequences on local air quality management elsewhere.

6.4.4 Electric Vehicle Charging Strategies

Both the Welsh Government and the Local Authority have adopted their own strategies in respect of Electric Vehicle (EV) Charging. With the Welsh Governments overarching Electric Vehicle Charging Strategy [38] acknowledging the need for a significant increase in both private and public charging infrastructure incorporating a mix of provision to support all road users as they transition to Low Emission Vehicles. With this aim in mind, the strategy advocates measures to require certain new homes to have electric vehicle charging capabilities whilst also supporting households without off-street parking provision. In addition, the availability of appropriate charging capacity to hackney carriage and bus operators is recognised as a priority.

The Local Authority has adopted its own complimentary 'Electric Vehicle (EV) Charging Strategy 2021 - 2030' [39]. The number one aim of the strategy is to "develop an Implementation Plan to roll out an electric vehicle charging infrastructure aligned to future demand". The strategy aims to further understand needs, capabilities and likely resourcing of future electric vehicle charging infrastructure across a range of likely users. It also highlights the current lack of public electric vehicle charging infrastructure in Rhondda Cynon Taf and advocates, at least initially, the targeting of 'destination charging' whilst continuing to evaluate best practice with respect to residential charging.

In further advancing the EV agenda, the Local Authority has produced the 'Electric Vehicle (EV) Charging Implementation Plan' [40], under the auspices of the Cardiff Capital Region Transport Authority. The Implementation Plan consider a number of infrastructure related actions that could help support EV uptake, and in particular has identified the provision of EV charging infrastructure at Local Authority owned locations, particularly public car parks.

6.5 Active Travel Plans and Strategies

The Local Authority has recently updated a number of maps [41] showing the Active Travel routes within its area. In doing so the Local Authority has designated eleven 'Walking Routes' and nineteen 'Shared Routes' as reportable active travel routes. The Local Authority has also produced a proposed prioritisation of improvement works [42] relevant to maintaining and improving the local active travel network. It is expected that these works will have a generally geographically broad effect in helping to improve local air quality by continuing to facilitate active travel as an alternative to or otherwise complimentary of many road vehicle journeys. As part of the active travel remit, the Local Authority has also produced an Active Travel Annual Report [43], which provides details on identified goals and progress made in promoting the active travel agenda.

In line with national policy expectations, it is expected that the Local Authority will continue to build upon and improve local infrastructure for walking and cycling. In addition, the Local Authority will aim to consider the needs of walkers and cyclists during its decision processes and, where appropriate to do so, make better provision for them. It will also look to promote, where practical, walking and cycling as a mode of transport.

It is envisaged that the potential for collaborative working to further this mutually conducive agenda could deliver local air quality improvement in a "win win" scenario. An example of this approach was the progression of AQAPs actions to improve the provision of information about active and sustainable travel routes associated with [Ferndale](#), [Pontypridd](#) and [Porth](#) [9].

6.6 Local Authority's Corporate Plan & Well-being Objectives

Having regard to statutory requirements and the overarching themes presented by the Well-being of Future Generations (Wales) Act 2015 the Local Authority has adopted a Corporate Plan, to shape its intent on further improving Rhondda Cynon Taf. The Local Authority, in partnership with various partners and stakeholders, is also a member of the Cwm Taf Public Service Board and shares its well-being objectives.

6.6.1 Corporate Plan

The Rhondda Cynon Taf CBC Corporate Plan [2] provides a framework in which the Local Authority has set out its core priorities as being 'People, Places and Prosperity'. It is expected that all actions taken by the Local Authority will at least have regard to these priorities and should, where it is reasonable to do so, aim to advance them. Table 6-7 provides a description of the Local Authority's core priorities, some of the aspects of their delivery and a brief indication on how local air quality management can act synergistically with them.

In agreeing its Corporate Plan, the Local Authority determined that the Priorities it contained would also serve as the Council's Well-being objectives.

Table 6-7: The Local Authority's Core Priorities and Local Air Quality Management

<p>People</p> <p>Ensuring people are independent, healthy and successful</p>	1.	Delivery	Supporting residents who are older, vulnerable or who have disabilities, to remain independent and have a good quality of life
		Connection	The young, old and vulnerable often are more likely to experience poorer air quality than the rest of the public and yet can also be disproportionately disadvantaged by experiencing poor air quality which can directly reduce their lifespan and quality of life.
		Outcomes	Analysis can be used to prioritise targeted actions at communities which may experience higher levels of ill health but would also experience the greatest gains from improvements in local air quality
	2.	Delivery	Encouraging all residents to lead active and healthy lifestyles
		Connection	Improving air quality and protecting good quality air can directly bring about healthier lives for all those who experience it. It can also enable them to participate more freely in a healthy lifestyle by supporting underlying health. Where people are able to lead healthy lifestyles, they may be less impacted on inevitable occasions when air quality is less satisfactory.
		Outcomes	Advancing broader County Brough wide actions that may improve air quality, even if only marginally, can help to incrementally reduce the burden of air quality across a large population.
<p>Places</p> <p>Creating places where people are proud to live, work and play</p>	3.	Delivery	Keeping the County Borough moving, including improvements to roads and pavements and public transport, whilst also improving air quality
		Connection	Acknowledging the key linkage between transport and its potential impact on air quality and supporting sustainable transport solutions to help break the linkage.
		Outcomes	Maintaining air quality consideration during the design and decision making process for relevant transport projects, ensuring air quality benefits can be maximised.
	4.	Delivery	Getting the best out of parks by looking after and investing in our greenspaces
		Connection	Highlighting the importance of green infrastructure in both tackling the experience of air quality and Climate Change.
		Outcomes	Examining latest understanding on the multiple benefits well placed green infrastructure can have and considering local projects that can demonstrate likely positive outcomes
<p>Prosperity</p>	5.	Delivery	Investing in town centres, bringing jobs and homes into town centres to create vibrant, thriving places people wish to live, work and socialise

Enabling prosperity by creating the opportunity for people and businesses to be: innovative, entrepreneurial and fulfil their potential and prosper		Connection	Communities that experience good air quality are likely to be more conducive for people to visit, work and stay. Likewise sustainable investment in our communities may enable the types of holistic solutions that can permanently improve local air quality.
		Outcomes	AQAP actions that advocate improvement of local sustainable transport provision and more generally an efficient transport network are likely to also bring about local economic benefit.
	6.	Delivery	Delivering major regeneration and transportation schemes, maximising the impact of the new South Wales Metro, to create better places to live and work, whilst protecting and enhancing the County Borough
		Connection	Significant active travel and public transport improvements likely represent an important part to improving local air quality, especially where, for historical reasons, improvement may be challenging.
		Outcomes	Due to a limited resource environment, projects that maximise a range of benefits, including improvements to local air quality, may be prioritised for delivery in comparison to those delivering narrower benefits.
	7.	Delivery	Increase the number of quality homes available and affordable to provide greater housing choice for residents
		Connection	Sensible development that provides good housing stock in combination with measures to improve and protect good air quality may be more desirable to a range of residents
		Outcomes	Correlation between good air quality and affluent communities has been demonstrate. For instance, anecdotal evidence in London from 'equivalent' areas that experience poorer rather than better air quality may have seen residential property prices depressed by up to 15% .

6.6.2 Well-being Objectives

In addition to the Priorities within its Corporate serving as the Local Authority's Well-being objectives. The Cwm Taff Well-Being Plan [44] has the following Well-being Objectives:

- Thriving Communities, to promote safe, confident, strong and thriving communities improving the well-being of residents and visitors and building on our community assets
- Healthy People, to help people live long and healthy lives and overcome any challenges
- Strong Economy, to grow a strong local economy with sustainable transport that attracts people to live, work and play in Cwm Taf

As part of the delivery of these well-being objectives, [National Indicators and Milestones](#) have been produced, including one for air quality [45]. It is expected that this will also require consideration of air quality in the form of a broader 'pollution burden reduction approach'. This currently differs to that of the compliance approach enacted by the current local air quality management regime, which targets levels of air pollution which has exceeded a defined level regardless of the number of people likely to be affected. Instead, the burden reduction approach considers that it can be beneficial to reduce pollution affecting a large number of people regardless of its absolute level. Even if the reduction is a small amount the overall benefit can be great if a large number of people are affected. Nonetheless, it is anticipated that both routes to air quality improvement will act in collaboration where possible.

To enable the evaluation of a burden reduction approach, the Welsh Government has made available rankings [12] of each Local Authority based upon the modelled background concentration for NO₂, PM₁₀ and PM_{2.5} for each 1km², referenced to the number of dwelling associated within each km². The most recently published data ranks (the lower the ranking the better) Rhondda Cynon Taf as 4 out of 7 for NO₂, 4 out of 5 for PM₁₀ and 3 out of 5 for PM_{2.5}. Although there are currently twenty-two Local Authorities in Wales, some may be ranked equally.

It is acknowledged, that in a resource limited system it can be beneficial to focus actions to maximise the public health benefits of intervention. In considering the pollution burden reduction approach, it is often the case that disadvantaged communities are more likely to observe adverse health inequalities which could benefit from improvements in local air quality. Therefore, given similar population sizes, targeting action at communities which experience elevated levels of air pollution as well as deprivation would likely deliver greater public health benefit if compared to targeting action only at a more affluent community.

Collaborative work with Public Health Wales and Cwm Taf Health Board has enabled the consideration of various statistics which best highlight the communities which are most likely to be detrimentally affected by air quality in combination with known air quality data. This has resulted in the Health and Air Pollution Risk Assessment/Area Prioritisation (HAP-RAP) tool, which can help to identify locations where actions to improve air quality may have the greatest benefit to local communities. Provisional use of the HAP-RAP tool has potentially identified two clusters, one based around Mt Ash and Penrhiwceiber and the other based around Cymmer, Ferndale, Llwynypia and Tylorstown, where air quality improvements may well have

the greatest benefit to the community. Each current AQMA has been assessed against HAP-RAP prioritisation and where the AQMA and the MSOA (the zones used by HAP-RAP) match this has been highlighted (see Section 3.2).

It may become incumbent upon the members of Cwm Taf Public Service Board to consider their service delivery and the potential for positive action to be taken to holistically improve overall air quality. It may also be a requirement for partners to provide annual updates and reviews of progress in furthering achievement of the well-being objectives.

It is uncertain as to the practical extent of interaction between this regime and the current local air quality management regime. As a result the Local Authority will, for the foreseeable future, continue to produce AQAPs as standalone statutory plans as well as separate local air quality management progress reports. This position will be reviewed should future statutory guidance require a harmonised approach to actions and reporting.

6.7 Green Infrastructure Plans and Strategies

The Local Authority recognises the importance of green infrastructure to public health and the environment, as well as it being an important potential resource in the improvement of local air quality or protecting communities from elevated levels of air pollutants. The Local Authority has adopted a Biodiversity Duty Document and Plan [46] which outlines its goals, and how it will go about trying to achieve them, with respect to local Biodiversity within its area other than that which is also within the Bannau Brycheiniog National Park. It has also issued its 'Action for Nature - Local Nature Recovery Action Plan for Rhondda Cynon Taf', available here [webpage](#), which provides an assessment of the many habitats and ecologies within Rhondda Cynon Taf and the importance they may have in tackling a range of environmental concerns as well as the actions we can all take to help local nature recover and contribute to tackling the declared 'nature emergency' in Wales [47].

The Local Authority continues to assess ways in which recovery, protection and enhancement of green assets can bring real benefits to a diverse range of policy areas including flood prevention, active travel and climate change. As an example, the Local Authority engaged with the Queen's Green Canopy Project with the aim to protect existing woodland areas whilst providing an enhanced role for urban tree planting. This may provide distinct opportunities in protecting or bringing forward green infrastructure that may have a role in assisting local air quality management.

The Local Authority also continues to consider the benefits of actions which could improve green infrastructure as part of its other activities. In doing so, the Local Authority will continue to build upon internal mechanisms to enable knowledge sharing and coordination between ecological & countryside management and local air quality management.

6.8 Climate Change Strategies

With the declaration of a 'Climate Emergency' by Welsh Government, the Local Authority is clear that it must play its part in taking urgent action. The Local Authority has regard to climate change both by actions it may undertake to reduce its contribution to climate change and also the actions that maybe required to mitigate the impact of climate change upon service delivery. The Local Authority also recognises its dual role in leading and supporting

people, business and the wider community in better understanding and contributing to efforts to tackle climate change.

To emphasise its part in taking action to tackle Climate Change, the Local Authority has adopted four ongoing 'Climate Commitments', reproduced in Table 6-8 below, that are to be achieved by 2030.

Table 6-8: Local Authority's Climate Commitments to be achieved by 2030.

Commitments	
1.	The Local Authority will have become carbon neutral.
2.	Enable the whole County Borough to be as close as possible to carbon neutral.
3.	Working with partners to enable all public and private organisations that operate in the County Borough to become carbon neutral.
4.	Contribute to the Welsh Government's ambition of a Net Zero public sector by 2030.

The Local Authority recognises that it is making progress to tackle Climate Change, but we all need to do more, and faster, if we are to reduce carbon emissions, help to reverse the damage to the planet and adapt to the changes already happening within the County Borough. To help realise its Climate Commitments and encourage others to also commit to real change, the Local Authority has, subsequent to community and stakeholder engagement, adopted a Climate Change Strategy [48]. This strategy incorporates a number of specific goals, aligned to its Climate Commitments, to be achieved between now and 2030 as well as a range of actions that work towards achieving these goals.

The strategy recognises the potential synergistic effects actions to tackle climate change can have on other agendas, including local air quality management, and vice versa. Several of the climate change actions included within the strategy, as highlighted in Table 6-9 below, also have specific regard to improving local air quality, whilst many of the other climate change actions within the strategy are also likely to be indirectly complimentary to local air quality management.

Table 6-9: Climate Change Actions and Local Air Quality Management

Complimentary Climate Change Actions	
1.	Contributing to safer roads and improvements in air quality by introducing default 20 mph speed as required by Welsh Government's commitment to support Active Travel as well as provisions that emerge from the proposed Clean Air legislation in Wales.
2.	Encouraging people to support improvements in air quality by promoting good driving behaviours including implementing no idling zones and reduced speed limits
3.	Using natural planting in public areas of our town centres to improve air quality and well-being, reduce flood risk, provide cooling during heatwaves and other climate benefits for residents
4.	Commitment to support active travel and sustainable public transport within and connecting to Rhondda Cynon Taf

The Local Authority will continue to provide strong community leadership and create a cleaner, greener environment for people and businesses to be independent, healthy and prosperous and for natural ecosystems to thrive. It will play its part in tackling climate change and protecting the planet and also adapting our services and operations so that it is able to meet the climate challenges ahead.

7. Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

For more than a decade, a consistent improving trend in NO₂ throughout most parts of the County Borough reinforces the understanding that the vast majority of Rhondda Cynon Taf is expected to continue to show levels of NO₂ that are well within compliance to the relevant AQOs for NO₂. Although in 2022 levels of NO₂ may have stabilised and even uplifted slightly from the height of COVID-19 related disruption, monitored NO₂ levels continue to remain significantly lower than the pre COVID-19 related disruption period.

In the recent past some localised areas within Rhondda Cynon Taf observed elevated levels of NO₂, that were on occasion above or at risk of being above the relevant AQOs for NO₂, and as such have been included within an AQMA. Recent monitoring supports the understanding that the Aberdare Town Centre, Broadway, Church Village, Cilfynydd, Llanharan, Llwynypia, Mwyndy, Nantgarw, Treforest and Tonyrefail AQMAs are all likely to become compliant to the annual AQO for NO₂ in the near-term. It is expected that detailed reviews of these AQMAs may occur over the next few years, to determine if compliance has been sustained within their geographical areas and, if such, whether each AQMA requires amendment or revocation. However, the Cymmer, Ferndale, Mt Ash Town Centre, Nightingales Bush, Pontypridd Town Centre and Tylorstown AQMAs are likely to potentially remain non-compliant to the annual AQO for NO₂ into at least the medium-term, unless future targeted improvement actions have a desired effect.

Other pollutants of concern such as SO₂ and PM₁₀, which tend to be associated with emissions from heavy industry or large conurbations, are, in general, not considered to be prominent any longer within Rhondda Cynon Taf. However, monitoring has previously identified the area of Glyncoch as experiencing levels of PM₁₀ potentially incongruous to other areas of Rhondda Cynon Taf. Glyncoch appears to observe a fluctuating trend in PM₁₀ which may indicate the influence of particular local factors. Although this can pose difficulties in the prediction of the future PM₁₀ trend at Glyncoch it appears that, at present, the levels of PM₁₀ observed at Glyncoch have improved in recent years and the location remains compliant to the annual mean and the 24-hour daily mean AQOs for PM₁₀. The current situation potentially corresponds to known improvements to the control of Particulate Matter emissions from Craig Yr Hesg Quarry. However, cyclic climatic events, such as protracted dry summers, may threaten continued improvement. As such it is recognised that maintaining vigilance is necessary to enable continued understanding and to enable assessment of any potential future changes.

In its consideration of local air quality, it has been necessary for the 2022 Air Quality Progress Report to rely upon extensive local air quality monitoring and analysis. The Local Authority will aim to continue as far as is reasonable to preserve its monitoring network and comply with the required reporting regime. However, the impact of continued financial uncertainty as well as the changing regulatory landscape will need to be considered and will influence the amount of funding available to carry out future local air quality management duties.

7.2 Conclusions relating to New Local Developments

The Local Authority considers air quality can be a material planning consideration. As such, the Local Authority will, when necessary, take account of the implications of any development

upon local air quality during the planning consent decision making process. Consequently, the Local Authority will attempt to ensure that, if necessary, future developments will negate or mitigate any impacts on local air quality whilst continuing to treat each application for planning consent on its individual merits.

Subsequent to appeal, planning consent was granted by the Relevant Authority in respect to both the western extension (App. no. 15/0666/10) and continuation of existing quarrying (App. no. 21/0720/15) at Craig Yr Hesg Quarry, Glyncoch. It is expected that the proposed development will likely continue an existing impact upon the community of Glyncoch. The Local Authority continues to engage with the operators of Craig Yr Hesg Quarry to attempt to mitigate any potential impact of the site activities on the surrounding community.

To help tackle the non-compliance of the NO₂ EU Limit Value associated with the A470, Welsh Government and its South Wales Trunk Road Agent implemented a major programme of air quality improvement measures. As part of this programme, the designated speed limit of parts of the A470 were reduced from 70mph to 50mph to help reduce vehicle traffic emissions. This intervention continues to have substantial impact, likely the most regionally significant since the completion of the Church Village Bypass, upon reducing local levels of NO₂ and helping to achieve AQO compliance within parts of several associated AQMAs. It may also be the case that, given reported circumstances within and along nearby sections of the A470, further measures may be adopted by Welsh Government to continue progress in reducing local levels of NO₂. In this respect, although the Local Authority would welcome engagement with Welsh Government and its agents, the Local Authority retains reservations about the implementation of a Clean Air Zone, which additional assessment work may help to further explore.

It is also the case, as can be seen from road infrastructure improvement measures over the last few years at Llantwit Fadre and Church Village, Broadway and Pontypridd Town Centre, that highly localised measures can bring about smaller but still important reductions in local levels of NO₂, helping to achieve compliance to relevant AQOs within these AQMAs. Previous interventions help demonstrate how concerted action at all levels of society and the inclusion, as far as possible, of all parts of the community is vital in bringing about sustained improvement in local air quality.

7.3 Other Conclusions

The Local Authority acknowledges that, especially in this time, many different policies and actions undertaken by it may have a direct or indirect effect on local air quality. The Local Authority will continue to take account, where necessary, of local air quality during any relevant decision making process. It will also aim, wherever possible, to promote policies and actions which will maintain or be conducive to good air quality and any synergistic effects such actions may have on other service deliveries.

Of particular note are that many issues underlining non-compliant air quality, are also significant in the broader Active Travel, Climate Change, Environmental Noise and Biodiversity Agendas. Effective solutions to improve air quality can supplement efforts in tackling climate change and environmental noise. Close integration with the Active Travel Agenda, Climate Change Agenda and Noise Action Plan Priority Areas will continue to be aspired to in future local air quality management. It is also clear that, without intervention,

local air quality within the most vulnerable areas of Rhondda Cynon Taf may struggle to improve as quickly as possible.

To ensure their pertinence, in 2022 the Local Authority reviewed and readopted its revised AQAPs, see Appendix E2: Revised Air Quality Action Plans for each of its extant AQMAs. These AQAPs contain a range of recommended actions, both those that are locally targeted and those with a more boarder effect. Due to the availability of limited resources and competing agendas, it may not be possible to immediately implement all AQAP actions. However, the Local Authority continues, where possible, to implement or influence the implementation of actions within its AQAPs. This has included Welsh Government directed speed reductions along a part of the A470, progress in planning potential highway improvement projects and advancing a local strategy to support Electric Vehicle infrastructure. In addition, the Local Authority is progressing further actions to improve usability and awareness of active travel routes, plus encouraging the use of local sustainable transport options.

The Local Authority will continue to maintain the AQAPs as living documents and will aim to review them again in 2028, to take account of progress made and the ever-changing nature of local air quality.

The Local Authority is fully committed to openness and transparency in regard to its air quality duties. It will widely disseminate and consult upon the 2023 Air Quality Progress Report, with both interested parties and the public. The Local Authority will, resources and circumstances permitting, aim to ensure continuity of local air quality reporting by producing, in accordance with statutory requirements, an Air Quality Progress Report in 2024.

7.4 Proposed Actions

- The Local Authority will conduct an encompassing and transparent consultation into the findings of this report and all other key steps, in the local air quality management process being undertaken; with all relevant parties and to respond where necessary to feedback given.
- The Local Authority recognises the enhanced benefits which can be brought about by collaboratively working, both within the Local Authority as well as with other interested parties, to deliver a multi-benefit agenda which can directly improve local air quality. The Local Authority will look to build upon existing and new partnerships to deliver coordinated action in the delivery of local air quality management and that of other related agendas.
- Whilst delivering local air quality management duties, the Local Authority will have regard to any noise action planning priority areas as well as other relevant agendas, such as Climate Change, Active Travel and Green Infrastructure. It will continue to work with relevant stakeholders to ensure close integration with other environmental agenda and aspire to “win win” solutions.
- The Local Authority will continue to utilise existing resources as effectively and efficiently as possible to provide a greater understanding of the causes of non-compliant air quality and its possible solution. To facilitate this, the Local Authority will periodically review its monitoring programmes in light of available resources and new

information and changes in understanding, to aspire to ensure targeted comprehensive assessment of the most at risk locations. Where necessary, and resources permitting, it will consider repurposing or establishing new monitoring sites to provide enhanced understanding of any potentially affected area.

- Dependent upon the availability of resources, circumstances and future statutory guidance, in September 2024 the Local Authority will produce an Air Quality Progress Report which will aim to maintain a level of continuity of air quality review and assessment, based on the latest available data.

8. References

- [1] Welsh Government, "Air Quality in Wales Website," August 2021.
- [2] Rhondda Cynon Taf CBC, "Making A Difference The Council's Corporate Plan 2020-2024," October 2019.
- [3] Senedd Cymru, "The Environment (Air Quality and Soundscapes) (Wales) Bill," March 2023.
- [4] Defra, "UK Air: Air Information Service Website, Air Quality Management Areas (AQMAs) Webpage," August 2023.
- [5] H. Brunt and S. J. Jones, "Public health-driven air pollution risk assessment: A pragmatic approach to complement Local Air Quality Management implementation in Wales," Public Health Wales, 2019.
- [6] Exterium on behalf of, "Wales Noise and Air Quality Viewer," Welsh Government, August 2023.
- [7] Rhondda Cynon Taf CBC, "Minutes of the meeting of the Cabinet," September 2019.
- [8] Cenex on behalf of, "Taxi Strategy for South East Wales," The Office of the Cardiff Capital Region (CCR) City Deal, October 2019.
- [9] Rhondda Cynon Taf CBC, "Ferndale, Pontypridd and Porth Sustainable Travel Guides," 2020.
- [10] Defra and the Devolved Administrations, "Air Quality in the UK 2021," September 2022.
- [11] Department for the Environment, Food & Rural Affairs, "National statistics: Concentrations of Nitrogen Dioxide," Department for the Environment, Food & Rural Affairs, 27 April 2023. [Online]. Available: <https://www.gov.uk/government/statistics/air-quality-statistics/nitrogen-dioxide>.
- [12] StatsWales, "Air Quality Indicators by Local Authority," July 2022. [Online]. Available: <https://statswales.gov.wales/Catalogue/Environment-and-Countryside/Air-Quality/airqualityindicators-by-localauthority>. [Accessed August 2023].
- [13] Met Office, "UK annual climate summary 2022," 2023. [Online]. Available: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/summaries/uk_monthly_climate_summary_annual_2022.pdf.

- [1
4] Netcen on behalf of, "Air Pollution in the UK 2019," Defra and the Devolved Administrations, September 2011.
- [1
5] AEA on behalf of, "Air Pollution in the UK 2011," Defra and the Devolved Administrations, September 2012.
- [1
6] Ricardo Energy & Environment on behalf of, "Air Pollution in the UK 2014," Defra and the Devolved Administrations, September 2015.
- [1
7] Ricardo Energy & Environment on behalf of, "Air Pollution in Wales 2021," Welsh Government.
- [1
8] Department for Environment, Food & Rural Affairs, "National Statistics: Concentrations of Particulate Matter (PM10 and PM2.5)," Updated 27 April 2023. [Online]. Available: <https://www.gov.uk/government/statistics/air-quality-statistics/concentrations-of-particulate-matter-pm10-and-pm25>.
- [1
9] Met Office, "provisional assessment of the weather experienced across the UK," Met Office, 2023.
- [2
0] Welsh Government, "Welsh Government supplemental plan to the UK plan for tackling roadside nitrogen dioxide concentrations," November 2018.
- [2
1] Welsh Government, "Welsh Government supplemental plan to the UK plan for tackling roadside nitrogen dioxide concentrations 2017 – Annual Data for NO2 Concentrations for the Motorway and Trunk Road for 2020 and 2021," September 2022.
- [2
2] Welsh Government, "Clean Air Plan for Wales," August 2020. [Online]. Available: <https://gov.wales/sites/default/files/publications/2020-08/clean-air-plan-for-wales-healthy-air-healthy-wales.pdf>.
- [2
3] Rhondda Cynon Taf CBC, "Highways, Transportation & Strategic Projects Supplementary Capital Programme," October 2022.
- [2
4] Rhondda Cynon Taf CBC, "Environmental Permitting Webpage," August 2023. [Online]. Available: <https://www.rctcbc.gov.uk/EN/Business/LicencesandPermits/Pollutionrelatedlicences/EnvironmentalPermitting.aspx>.
- [2
5] Rhondda Cynon Taf CBC, "Clean Air Act Approval Webpage," August 2023. [Online]. Available: <https://www.rctcbc.gov.uk/EN/Business/LicencesandPermits/Pollutionrelatedlicences/Cleanairactapproval.aspx>.
- [2
6] Rhondda Cynon Taf CBC, "Planning Policy Wales Edition 11," February 2021.

- [2
7] Rhondda Cynon Taf CBC, "Rhondda Cynon Taf Local Development Plan up to 2021," March 2011.
- [2
8] Rhondda Cynon Taf CBC, "Planning Assessment Criteria V1.02," November 2017.
- [2
9] Rhondda Cynon Taf CBC, "Rhondda Cynon Taf Local Development Plan Annual Monitoring Report 2018-2019," March 2019.
- [3
0] S. W. F. a. R. Service, "Healthy Hillsides," August 2023. [Online]. Available: <https://www.southwales-fire.gov.uk/your-safety-wellbeing/your-community/healthy-hillsides/>.
- [3
1] The Five South East Wales Local Authorities, "South East Wales Valleys Local Transport Plan," January 2015.
- [3
2] Transport for London, "Emissions & Health - The impact of vehicle speed on emissions & health: an evidence summary," June 2018.
- [3
3] Adrian Davies Associates on behalf of, "The state of the evidence on 20mph speed limits with regards to road safety, active travel and air pollution impacts," Welsh Government, August 2018.
- [3
4] NICE, "Air pollution: outdoor air quality and health NICE guideline [NG70]," June 2017.
- [3
5] Cardiff Capital Region Cabinet, "Regional Transport Authority - Preparing for a New Future," December 2020.
- [3
6] Cardiff Capital Region, "Cardiff Capital Region 'Project Hub'," [Online]. Available: <https://www.cardiffcapitalregion.wales/project-hub/>. [Accessed August 2023].
- [3
7] Transport for Wales, "South Wales Metro Core Valley Lines Transformation," [Online]. Available: <https://tfw.wales/projects/metro/south-wales-metro/work-progress>. [Accessed August 2023].
- [3
8] Welsh Government, "Electric Vehicle Charging Strategy for Wales," March 2021.
- [3
9] Rhondda Cynon Taf CBC, "Electric Vehicle Charging Strategy 2021 - 2030," 2021.
- [4
0] Rhondda Cynon Taf County Borough Council, "Electric Vehicle (EV) Charging Implementation Plan," 2023.
- [4
1] Rhondda Cynon Taf CBC, "Active Travel Existing Route Maps," 2021. [Online]. Available: <https://datamap.gov.wales/maps/active-travel-network-maps/view?center=-3.4936103196589574,51.59394627224147&zoom=5#/>. [Accessed August 2023].

- [4
2] Rhondda Cynon Taf CBC, "PRIORITISATION OF PROPOSED ACTIVE TRAVEL SCHEMES SHOWN IN RHONDDA CYNON TAF ACTIVE TRAVEL NETWORK MAP," June 2022.
- [4
3] Rhondda Cynon Taf CBC, "Active Travel Annual Report," 28th September 2022.
- [4
4] Cwm Taff Public Service Board, "Cwm Taf Well-Being Plan 2018-2023," March 2018.
- [4
5] Welsh Government, "National Indicators for Wales - National Indicator 4," September 2022.
- [4
6] Rhondda Cynon Taf CBC, "Biodiversity Duty in Rhondda Cynon Taf," 2017.
- [4
7] Senedd Cymru, "Plenary Session: Motion to declare a Nature Emergency inter alia," June 2021.
- [4
8] Rhondda Cynon Taf CBC, "Think Climate RCT: Making Rhondda Cynon Taf Carbon Neutral by 2030," June 2022.
- [4
9] D. a. K. R. Carslaw, "Openair — an R package for air quality data analysis, Environmental Modelling & Software, Volume 27-28, 52-61," 2012.
- [5
0] RStudio Inc., "windows NT 6.1 version 1.0.136," 2016.
- [5
1] R Core Team, "R: A language and environment for statistical computing," R Foundation for Statistical Computing, 2013.
- [5
2] D. Carslaw, "The Openair manual — open-source tools for analysing air pollution data, Manual for version 1.4-4," Kings College London.
- [5
3] QGIS Development Team, "QGIS Documentation User Guide/Manual," August 2021.
- [5
4] QGIS Development Team, "QGIS GIS," 2021.
- [5
5] LAQM Helpdesk, "Summary of Laboratory Performance in AIR NO2 Proficiency Testing Scheme (May 2020 – June 2022)," Defra and the Devolved Administrations, June 2012.
- [5
6] National Physics Laboratory, "National Bias Adjustment Factors Spreadsheet version no. 06/23," Defra and the Devolved Administrations, June 2023.
- [5
7] AEA Energy & Environment, "Checking Precision and Accuracy of Triplicate Tubes Version 4," February 2011.

[5 B. V. U. o. b. o. T. L. S. Helpdesk, "NO2 Fall-Off with Distance Calculator (Version 4.2),"
8] The LAQM Support Helpdesk, April 2016.

[5 UK Air on behalf of Defra, "UK Approval of Particulate Matter Monitoring Instruments,"
9] Defra and the Devolved Administrations, [Online]. Available: <https://uk-air.defra.gov.uk/networks/monitoring-methods?view=mcerts-scheme>. [Accessed August 2023].

[6 Rhondda Cynon Taf CBC, "CLIMATE CHANGE CABINET STEERING GROUP Minutes
0] of the meeting of the Climate Change Cabinet Steering Group," 28th January 2020.

[6 Met Office, "A Year in Review 2019," December 2019.
1]

[6 Rhondda Cynon Taf CBC, "Air Quality Action Plan Document," August 2013.
2]

[6 Office of Rail and Road, "TOC Key Statistics for Transport for Wales," July 2020.
3]

[6 Rhondda Cynon Taf CBC, "2017 Progress Report," September 2017.
4]

[6 Welsh Government, "Welsh Government supplemental plan to the UK plan for tackling
5] roadside nitrogen dioxide concentrations,," November 2018.

[6 Welsh Government, "Tackling roadside nitrogen dioxide concentrations in Wales,"
6] September 2019.

[6 Rhondda Cynon Taf CBC, "Active Travel Monitoring Report," 2019.
7]

[6 Rhondda Cynon Taf CBC, "Active Travel and Cycling Webpage," August 2020.
8]

[6 Rhondda Cynon Taf CBC, "Our Living Space' Environmental Improvement Strategy,"
9] April 2005.

[7 Rhondda Cynon Taf CBC, "Energy Management Webpage," August 2020.
0]

[7 Rhondda Cynon Taf, "A4119 ELY VALLEY ROAD DUALLING – LLANTRISANT
1] BUSINESS Cabinet Report," July 2019.

[7 Ricardo Energy and Environment on behalf of, "Provisional Analysis of Welsh Air Quality
2] Monitoring Data – Impacts of Covid-19," Welsh Government, July 2020.

[7 Rhondda Cynon Taf CBC, "What action can be taken in the Air Quality Management
3] Areas, to ensure air quality improves across the County Borough," January 2020.

- [7
4] C. Trust, "RCTCBC Carbon Footprint Project 2019/20," Rhondda Cynon Taf CBC, March 2021.
- [7
5] Transport for Wales, "South Wales Metro Core Valley Lines Transformation," September 2021. [Online]. Available: <https://tfw.wales/projects/metro/south-wales-metro/work-progress>.
- [7
6] Welsh Government, "White Paper on a Clean Air (Wales) Bill," January 2021.
- [7
7] Department for Communities and Local Government, "Multi-criteria analysis: a manual," January 2009.
- [7
8] Department for Transport, "Road Traffic Statistics," 2021. [Online]. Available: <https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints>. [Accessed 2022].

9. Appendix A1: Monthly Diffusion Tube Monitoring Results

Table A.9-1: Full Monthly Diffusion Tube Results for 2022

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.89 Factor) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
4	19.4	16.1	12.6	14.4	10.9	8.9	9.5	7.2	12.3	10.4	20.3	-	12.9	11.5	11.5
8	44.8	34.7	33.2	37.7	34.9	26.8	18.6	-	43.6	-	46.9	-	35.7	31.8	31.8
21	7.4	8.5	4.7	6.0	6.2	3.1	3.1	-	7.6	4.5	5.7	8.6	5.9	5.3	5.3
37	33.4	31.8	23.8	34.4	29.4	24.3	31.1	23.2	32.0	33.1	42.7	35.2	31.2	27.8	25.5
41	49.6	40.6	45.1	45.2	45.9	35.4	41.1	37.0	50.0	49.7	49.7	57.5	45.6	40.6	40.6
44	35.0	29.8	25.4	22.8	30.4	21.9	23.0	25.3	29.2	24.7	34.2	30.7	27.7	24.7	29.3
47	26.4	25.8	21.7	27.1	22.3	17.4	20.5	17.3	28.8	24.3	31.4	25.6	24.1	21.4	21.4
48	25.2	23.8	23.5	26.7	23.9	18.6	18.8	16.3	25.6	23.3	30.5	29.0	23.8	21.2	21.2
50	25.5	23.5	18.5	25.6	29.8	21.4	19.5	16.4	26.2	25.1	36.6	30.2	24.9	22.1	22.1
51	35.9	35.7	31.0	37.5	40.0	26.6	33.0	25.2	39.1	33.6	46.2	34.5	34.9	31.0	31.0
52	42.7	38.7	34.5	-	32.9	21.6	-	28.1	33.4	40.4	48.5	-	35.6	31.7	31.7
53	42.0	33.6	27.3	36.4	33.5	23.3	28.4	26.6	30.3	-	40.3	42.4	33.1	29.5	29.5
55	35.1	34.1	26.0	32.1	30.9	22.9	24.3	26.8	33.4	29.0	33.8	30.5	29.9	26.6	26.6
56	46.6	39.8	33.0	37.0	34.3	25.1	27.2	28.3	40.9	38.5	51.0	47.1	37.4	33.3	33.3
66	41.9	32.4	31.5	37.6	33.9	21.9	25.1	23.8	35.9	33.3	37.7	41.2	33.0	29.4	29.4
68	33.9	28.1	28.3	36.1	23.0	26.6	28.6	24.5	33.2	28.8	36.2	38.1	30.5	27.1	27.1
69	33.4	29.6	24.4	35.4	25.2	19.4	23.7	20.0	24.5	28.5	43.4	35.9	28.6	25.5	25.5

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.89 Factor) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
75	35.3	29.2	24.3	29.2	31.7	16.7	19.8	20.3	28.4	27.8	40.5	31.4	27.9	24.8	24.8
76	36.5	29.2	19.4	29.4	26.6	20.1	26.5	17.7	37.5	27.2	37.4	32.5	28.3	25.2	25.2
79	28.7	30.1	24.5	30.3	30.2	21.4	26.7	17.2	33.0	28.3	36.0	34.3	28.4	25.3	25.3
80	34.4	24.6	22.4	25.5	27.1	18.8	20.2	13.7	29.0	28.7	36.8	31.2	26.0	23.2	23.2
81	37.0	30.6	24.5	31.3	26.5	20.8	22.5	22.7	24.7	30.3	40.1	35.5	28.9	25.7	25.7
82	30.0	26.1	25.3	27.4	22.7	19.6	22.6	16.3	28.3	25.7	32.8	32.0	25.7	22.9	20.3
83	37.6	34.2	24.7	35.0	31.5	23.5	20.6	25.8	31.2	29.4	-	35.2	29.9	26.6	26.6
84	49.6	39.1	37.5	44.3	43.7	-	38.0	35.6	45.8	45.7	54.4	49.5	43.9	39.1	39.1
85	36.3	29.6	29.5	29.7	37.2	-	28.0	24.8	35.5	34.6	40.4	38.0	33.1	29.4	29.4
88	34.3	34.3	22.3	36.9	31.4	19.4	25.0	21.1	34.1	31.0	31.9	36.1	29.8	26.5	26.5
90	40.4	38.1	37.5	36.2	33.8	45.7	52.2	20.5	35.2	34.9	37.4	39.8	37.6	33.5	33.5
91	45.8	58.4	48.3	64.4	60.1	25.8	32.4	30.7	60.0	51.0	56.3	57.2	49.2	43.8	43.8
93	48.2	41.7	38.7	47.7	43.0	-	42.8	31.3	51.7	45.0	56.7	51.9	45.3	40.3	40.3
96	43.8	29.9	28.0	-	28.2	20.8	23.1	18.8	13.5	32.6	43.8	39.1	29.2	26.0	26.0
97	49.8	41.8	36.1	46.3	41.8	35.5	44.9	26.2	-	47.7	55.3	46.7	42.9	38.2	38.2
101	10.3	8.1	7.4	7.9	4.8	4.9	4.1	4.4	5.2	5.2	7.2	10.2	6.6	5.9	5.9
103	10.9	8.2	7.8	6.8	6.5	6.9	6.4	4.8	7.6	5.5	19.4	9.3	8.3	7.4	7.4
105	12.1	11.3	7.2	7.6	6.7	5.3	5.2	7.4	8.4	9.0	11.0	10.6	8.5	7.6	7.6
106	40.9	30.0	43.8	39.1	37.9	31.7	35.6	32.4	38.7	39.1	45.4	48.3	38.6	34.3	34.3
107	31.0	34.9	25.1	34.7	35.7	26.2	-	21.9	39.5	32.3	33.7	37.1	32.0	28.5	28.5

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.89 Factor) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
108	36.2	50.1	40.7	44.4	45.5	32.7	36.7	27.9	50.1	44.1	54.7	50.5	42.8	38.1	38.1
110	28.2	28.3	25.3	31.0	25.4	20.8	23.5	20.5	24.3	25.8	29.3	30.4	26.1	23.2	23.2
111	42.6	32.8	38.1	37.0	42.9	28.8	33.7	24.4	38.6	28.8	47.1	41.4	36.4	32.4	32.4
113	30.1	15.6	34.2	33.7	39.5	-	29.9	20.3	32.2	34.7	43.9	35.6	31.8	28.3	28.3
114	34.1	29.9	23.6	26.4	26.4	19.0	18.6	17.1	28.7	26.1	37.3	29.3	26.4	23.5	23.5
117	53.4	47.6	53.6	40.6	44.1	41.1	41.3	-	-	54.7	60.9	57.4	49.5	44.0	44.0
118	58.2	58.0	62.9	66.8	67.5	40.6	63.4	32.5	64.4	64.0	67.5	67.7	59.5	52.9	52.9
122	-	--	33.0	35.1	27.1	-	29.8	21.8	30.6	33.5	44.8	38.0	32.6	29.0	29.0
124	30.6	-	25.2	28.5	--	19.6	22.0	18.9	26.6	25.0	35.0	27.8	25.9	23.1	23.1
128	40.5	39.0	24.4	29.0		16.5	18.4	15.2	27.3	28.3	41.9	34.6	28.6	25.5	25.5
129	30.8	23.8	23.8	-	22.2	16.3	15.6	15.5	22.3	26.5	31.0	30.1	23.4	20.9	19.8
132	33.6	24.4	32.4	28.0	-	22.3	22.1	18.2	-	22.2	40.0	31.3	27.5	24.4	24.4
134	17.1	21.5	12.6	17.8	19.1	16.6	12.6	14.3	14.4	13.7	23.7	20.7	17.0	15.1	13.0
135	32.5	25.8	22.2	26.0	21.7	17.2	32.5	18.5	25.2	23.0	31.2	32.8	25.7	22.9	18.3
136	41.6	45.7	32.2	43.9	36.5	30.3	35.5	23.7	44.3	36.4	45.1	39.0	37.9	33.7	33.7
137	39.5	31.8	25.0	38.2	24.5	24.0	26.0	17.4	31.8	28.9	39.8	37.5	30.4	27.0	27.0
138	45.2	36.9	36.7	36.2	35.6	28.1	30.5	25.8	-	33.0	44.1	39.5	35.6	31.7	31.7

Table Notes

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in bold.

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times per year) or otherwise NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in bold and underlined.

- (1) See Appendix C for detail on bias adjustment and annualisation
- (2) Means for diffusion tubes have been corrected for bias with means labelled with a ‡ having been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, as their valid data capture for the full calendar year is less than 75%. See Appendix C for details.

10. Appendix B: A Summary of Local Air Quality Management

10.1 Purpose of an Annual Air Quality Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995 and associated government guidance. 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 being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans should then be reviewed and updated where necessary at least every 5 years.

For Local Authorities in Wales, an Annual Progress Report replaces all other formal reporting requirements and have a very clear purpose of updating the general public on air quality, including what ongoing actions are being taken locally to improve it if necessary.

10.2 Air Quality Objectives

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298), and are shown in Table B.1.

Table B.1: AQOs Included in Regulations for the purpose of LAQM in Wales

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
	40µg/m ³	Annual mean	31.12.2010
Sulphur dioxide (SO ₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25µg/m ³	Running annual mean	31.12.2003
	5µg/m ³	Annual mean	31 12 2010

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
1,3 Butadiene	2.25µg/m ³	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m ³	Maximum Daily Running 8-Hour mean	31.12.2003
Lead	0.25µg/m ³	Annual Mean	31.12.2008

The table shows the objectives in units of microgrammes per cubic metre µg/m³ (milligrammes per cubic metre, mg/m³ for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

11. Appendix C1: Air Quality Monitoring Data QA/QC

Air quality monitoring often produces a large amount of data which, due to its quantity, can be difficult to interpret. Therefore, it is essential to utilise accepted statistical techniques to process and interpret it. In line with current practice the Local Authority has made use of the 'Openair Package' [49], in combination with other packages, within RStudio [50], version 2023.06.1-524, as operated within the open-source R-Programme [51] computational language for environmental statistical computing and graphics, version 4.3.1. This utility, with the aid of published literature [52], has enabled the Local Authority to undertake verification and validation of the monitoring data as well as various types of descriptive and inferential statistical analysis.

In addition to the statistical analysis and graphical representation mentioned above, the Local Authority has also made use, with the aid of published literature [53], of the GIS package QGIS version 3.32.1 "Lima" [54]. This has enabled the Local Authority to spatially assess and depict air quality monitoring data as well as associated geometries.

11.1 QA/QC of Diffusion Tube Monitoring

In 2022 the Local Authority made use of fifty-six Nitrogen Dioxide 'Palmer type' passive diffusion tubes which were exposed for a period of one month at a time, in accordance with the published 2022 NO₂ Diffusion Tube Monitoring Calendar, at fifty-four monitoring locations (one location was a triplicate collocation site).

Collected Nitrogen Dioxide passive diffusion tubes were analysed by SOCOTEC Ltd's Didcot Laboratory using in-house laboratory method HS/WI/1015 issue 15, 20% TEA in water method. The analysis was in accordance with their United Kingdom Accreditation Service [UKAS] schedule, with laboratory performance evaluated via the AIR Proficiency Testing Scheme¹⁴; achieving the highest rank of "satisfactory" [55].

11.1.1 Diffusion Tube Bias Adjustment Factors

It has been shown that passive diffusion tubes require bias correction in accordance with guidance to maximise their accuracy. The quoted desired accuracy for the measurement of NO₂ is 15%; the use of a bias factor from a suitable co-location study ensures that passive diffusion tube measurements attempt to meet this requirement.

Table C.1 below provides the collated local bias adjustment factors derived and provided by other users of the Nitrogen Dioxide diffusion tube monitoring method and laboratory, used by the Local Authority, as well as a statistically derived overall national bias adjustment factor [56].

¹⁴ Formerly the Workplace Analysis Scheme for Proficiency [WASP]

Table C.1: National Diffusion Tube Bias Adjustment Spreadsheet for 2022

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 06/23				
Follow the steps below in the correct order to show the results of relevant co-location studies										This spreadsheet will be updated at the end of September 2023 LAQM Helpdesk Website	
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods											
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet											
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.											
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.							Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.				
Step 1:		Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ³ shown in blue at the foot of the final column.							
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data.	If you have your own co-location study then see footnote ² . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953							
Analysed By ¹	Method <small>To make your selection, please click [All] from the pop-up list</small>	Year ² <small>To make your selection, please click [All]</small>	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁴	Bias Adjustment Factor (A) (Cm/Dm)	
SQCOTEC Didcot	20% TEA in water	2022	KS	Marglebone Road Intercomparison	12	59	42	38.9%	G	0.72	
SQCOTEC Didcot	20% TEA in water	2022	R	New Forest District Council	9	27	20	33.8%	G	0.75	
SQCOTEC Didcot	20% TEA in water	2022	KS	NFDC	12	37	25	46.5%	G	0.68	
SQCOTEC Didcot	20% TEA in water	2022	R	South Oxfordshire District Council	12	25	18	33.8%	G	0.75	
SQCOTEC Didcot	20% TEA in water	2022	R	South Oxfordshire District Council	12	36	32	10.0%	G	0.91	
Socotec Didcot	20% TEA in water	2022	KS	Fife Council	12	24	17	40.1%	G	0.71	
Socotec Didcot	20% TEA in water	2022	R	Fife Council	12	21	15	42.6%	G	0.70	
Socotec Didcot	20% TEA in water	2022	R	Fife Council	12	20	12	61.0%	G	0.62	
Socotec Didcot	20% TEA in water	2022	R	Fife Council	11	21	18	14.4%	G	0.87	
Socotec Didcot	20% TEA in water	2022	R	Mid And East Antrim Borough Council	11	21	16	29.7%	G	0.77	
Socotec Didcot	20% TEA in water	2022	R	Rhondda Cynon Taf Cbc	11	26	23	14.6%	G	0.87	
SQCOTEC Didcot	20% TEA in water	2022	Overall Factor³ (11 studies)						Use	0.76	

11.1.2 Factor from Local Co-location Studies

A Local Co-location Bias factor has also been produced by co-locating three passive diffusion tubes at the automatic NO₂ monitoring site located at Site No. 70 (Broadway), for the length of the study period. It is believed that Site No. 70 (Broadway) reflects conditions commonly encountered across Rhondda Cynon Taf. The monitoring site is also maintained to standards observed within the AURN network and annually independently audited by consultants acting on behalf of the WAQF. The data set produced by the local co-location study, in 2022, has been described by the AEA_DifTPAB_vo4.xls spreadsheet [57] as good, with the completed spreadsheet reproduced in Table C.2 below.

Table C.2 – Spreadsheet checking precisions and accuracy of 2022 colocation study

Checking Precision and Accuracy of Triplicate Tubes

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	05/01/2022	02/02/2022	41.5	37.7	41.0	40	2.1	5	5.1
2	02/02/2022	02/03/2022	25.7	25.2	27.7	26	1.3	5	3.3
3	02/03/2022	30/03/2022	33.2	33.0	32.6	33	0.3	1	0.8
4	30/03/2022	04/05/2022	22.7	24.1	23.6	23	0.7	3	1.8
5	04/05/2022	08/06/2022	19.8	20.5	19.8	20	0.4	2	1.0
6	08/06/2022	06/07/2022	25.0	20.3	22.9	23	2.4	10	5.8
7	06/07/2022	03/08/2022	26.3	29.1	26.6	27	1.5	6	3.8
8	03/08/2022	31/08/2022	23.9	23.0	23.7	24	0.5	2	1.2
9	31/08/2022	28/09/2022	16.5	17.9		17	1.0	6	8.9
10	28/09/2022	02/11/2022	25.5	25.8		26	0.2	1	1.9
11	02/11/2022	30/11/2022	24.3	31.5		28	5.1	18	45.7
12	30/11/2022	04/01/2023	29.2	34.5	32.7	32	2.7	8	6.7
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

AEA Energy & Environment
From the AEA group

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
38.74213	99.25595238	Good	Good
24.6209	99.70238095	Good	Good
25.60124	72.02380952	Good	or Data Capture
18.86626	78.33333333	Good	Good
18	99.64285714	Good	Good
15	99.85119048	Good	Good
17	99.85119048	Good	Good
17	99.25595238	Good	Good
19	99.85119048	Good	Good
23	99.76190476	Good	Good
29.17288	99.85119048	Good	Good
28.88439	99.88095238	Good	Good

Overall survey -->

Good precision	Good Overall DC
----------------	-----------------

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision **12 out of 12 periods have a CV smaller than 20%**

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 11 periods of data
Bias factor A **0.87 (0.77 - 1)**
Bias B **15% (0% - 29%)**
Diffusion Tubes Mean: **26 μgm^{-3}**
Mean CV (Precision): **6**
Automatic Mean: **23 μgm^{-3}**
Data Capture for periods used: **98%**
Adjusted Tubes Mean: **23 (20 - 26) μgm^{-3}**

Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

11.1.3 Discussion of Choice of Factor to Use

Table C.3 lists the local bias factors [Bias A + B] derived from the local co-location study since 2004, as well as the nationally aggregated mean bias factors [56] and their range for comparison, with the factor used for each corresponding year in bold blue font.

Table C.3– Bias Correction Factors for NO₂ Passive Diffusion Tubes

Year	Local Bias Factor [Bias A]	Local Precision Bias [Bias B]	“Good” Data Description	National Bias	
				Factor	Range
2004	1.04	-	✓	0.91	(0.68 – 1.18)
2005	0.98	-	✓	0.97	(0.79 – 1.27)
2006	1.08	-	✓	0.98	(0.87 – 1.07)
2007	1.10	-9	✓	0.89	(0.74 – 1.00)
2008	1.00	0	✓	0.91	(0.79 – 1.00)
2009	1.11	-10	✓	0.90	(0.62 – 1.28)
2010	1.00	0	✓	0.92	(0.61 – 1.20)
2011	1.06	-6	✓	0.89	(0.62 – 1.12)
2012	0.96	4	✓	0.97	(0.58 – 1.32)
2013	1.07	-6	✓	0.85 ^λ	(0.75 – 1.07)
2014	0.90	11	✓	0.79 ^λ	(0.77 – 0.90)
2015	0.96	4	✓	0.81 ^λ	(0.73 – 0.96)
2016	1.0	0	✓	0.83 ^λ	(0.74 – 1.00)

Year	Local Bias Factor [Bias A]	Local Precision Bias [Bias B]	“Good” Data Description	National Bias	
				Factor	Range
2017	0.91	10	✓	0.74 ^λ	(0.65 – 0.91)
2018	0.95	18	✓	0.74 ^λ	(0.59 – 0.95)
2019	0.83	20	✓	0.77	(0.66 – 0.86)
2020	0.81	23	✓	0.74	(0.61 – 0.88)
2021	0.89	12	✓	0.77	(0.66 – 0.89)
2022	0.87	15	✓	0.76	(0.62 – 0.91)

^λ it is noted that only two comparative results are available, this very limited number would be expected to increase the uncertainty of the National Bias Factor.

In general terms, it may be considered that a national bias factor may be less influenced by certain types of non-fixed systematic error or otherwise may moderate aberrational errors that could highly influence one-off monitoring studies. However, a local bias factor may be more likely to reflect particular local climatic and regional influences, potentially improving the accuracy of the bias factor. In addition, the Local Authority has a number of years of local bias factors to draw upon, providing context to any particular year and helping to identify unusual results.

Historically only a very few studies made up the national bias factor, weakening its main advantage and leading to the routine use of the local bias factor. Given the importance of maintaining continuity with previous years and the fact the local bias factor for 2022 is comparable with and in the range of the national bias factor it has been determined that the local bias factor will be used to enable correction, ensuring the greatest accuracy and interpretability.

Unless specifically stated all passive diffusion tube results have been corrected using the local bias factor [Bias A] for the respective year. Users of this data should not re-correct the data.

11.2 Short-Term to Long-Term Data Adjustment

Data Capture is an important element in the interpretation of results. Guidance recommends that 90% data capture over a calendar year is required to facilitate the greatest accuracy in assessment of the concentration of the pollutant. In some instances it has not been possible to reach this threshold; nonetheless, where data capture is still proximal to 90% accurate inference can still be made. Where data capture is significantly less than 90% interpretation may still be possible with the use of mathematical techniques to extrapolate a more robust result. In circumstances where data capture is less than a specified percentage for the technique, the Extrapolated Annual Mean has been derived by interpolation in accordance with the methods detailed within LAQM.TG(16); where undertaken this data manipulation has been recorded in Table C.4 below.

Table C.4 – Short-Term to Long-Term Monitoring Data Adjustment in 2022

Site	Average Annualization Factor	Raw Data Annual Mean (µg/m ³)	Data Capture in 2020 (%)	Annualised Annual Mean (µg/m ³)
113	0.897464885	30.96	58.3	27.8

11.3 NO₂ Fall-off with Distance from the Road

It may not always be possible to measure NO₂ levels at the worst-case relevant population for a range of practical reasons. Wherever possible, the Local Authority has utilised monitoring locations that are representative of exposure, with 80% of the monitoring locations being <2.5m away. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure can sometimes be estimated, using the NO₂ fall-off with distance calculator [58], Table C.5 below provides the output of the calculator for 2022 NO₂ monitoring data.

Table C.5 – NO₂ Fall-off with Distance from the Road Adjustment in 2022

Site Name/ID	Distance (m)		NO ₂ Annual Mean Concentration (µg/m ³)			Comment
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor	
RCTCBC/37	2.2	4.1	9.9	28.0	25.3	
RCTCBC/44	9.2	3.8	9.7	24.7	29.6	
RCTCBC/70/NO _x	5.2	3.1	8.9	22.8	25.0	
RCTCBC/82	1.6	3.2	8.5	23.4	21.1	
RCTCBC/129	2.1	3.2	8.8	20.4	19.2	
RCTCBC/134	19.8	33.7	9.3	16.4	14.5	Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution. Warning: your monitor is more than 10m further from the kerb than your receptor - treat result with caution.
RCTCBC/135	2.1	6.5	8.9	23.5	19.6	
RCTCBC/139	1.9	4.2	5.7	15.8	14.0	
RCTCBC/141	1.3	1.6	6.2	25.2	24.4	

11.4 QA/QC of Automatic Monitoring

During 2022, the Local Authority undertook automatic monitoring at four sites, with three automatic monitoring locations examining NO₂ and one automatic monitoring location examining PM₁₀.

The three automatic monitoring sites for NO₂ each made use of a Model 200E Teledyne Chemiluminescence's Nitrogen Oxides Analysers. The instruments are directly owned and controlled by the Local Authority (Site No. 70 (Broadway), Site No. 120 (Pontypridd) & Site No. 131 (Mt Ash)). Each instrument was inspected by a trained officer on a fortnightly basis with the necessary calibration checks conducted. The fortnightly calibrations were conducted using UKAS accredited Nitric Oxide [NO] calibration gas mixtures at a nominal concentration of 500ppb. The calibration method used for the AURN network and validated by external consultants contracted by the Welsh Air Quality Forum [WAQF] was used as far as possible. These fortnightly calibrations were complemented with twice yearly services by the Local Authority's service contract engineers, Enviro Technology. Additionally the station at Site No. 70 (Broadway) was audited on an annual basis by consultants working on behalf of the Welsh Air Quality Forum. All data has been processed, validated and ratified by Officers of the Local Authority in accordance to procedures set out in Guidance.

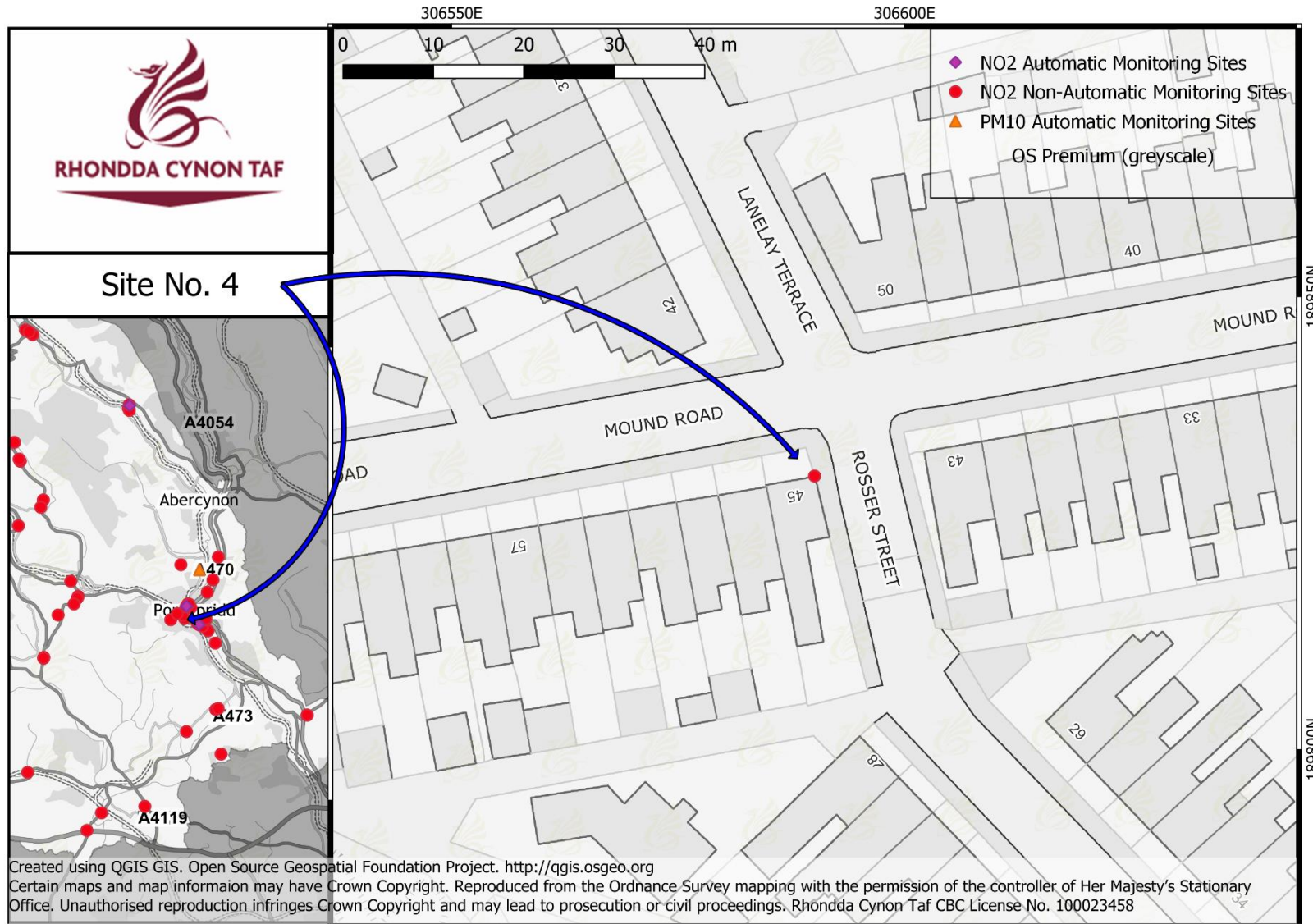
The Local Authority has also made use of an automatic monitoring analyser for PM₁₀. The Local Authority operated a Thermo Scientific 1405-F Tapered Element Oscillating Mass

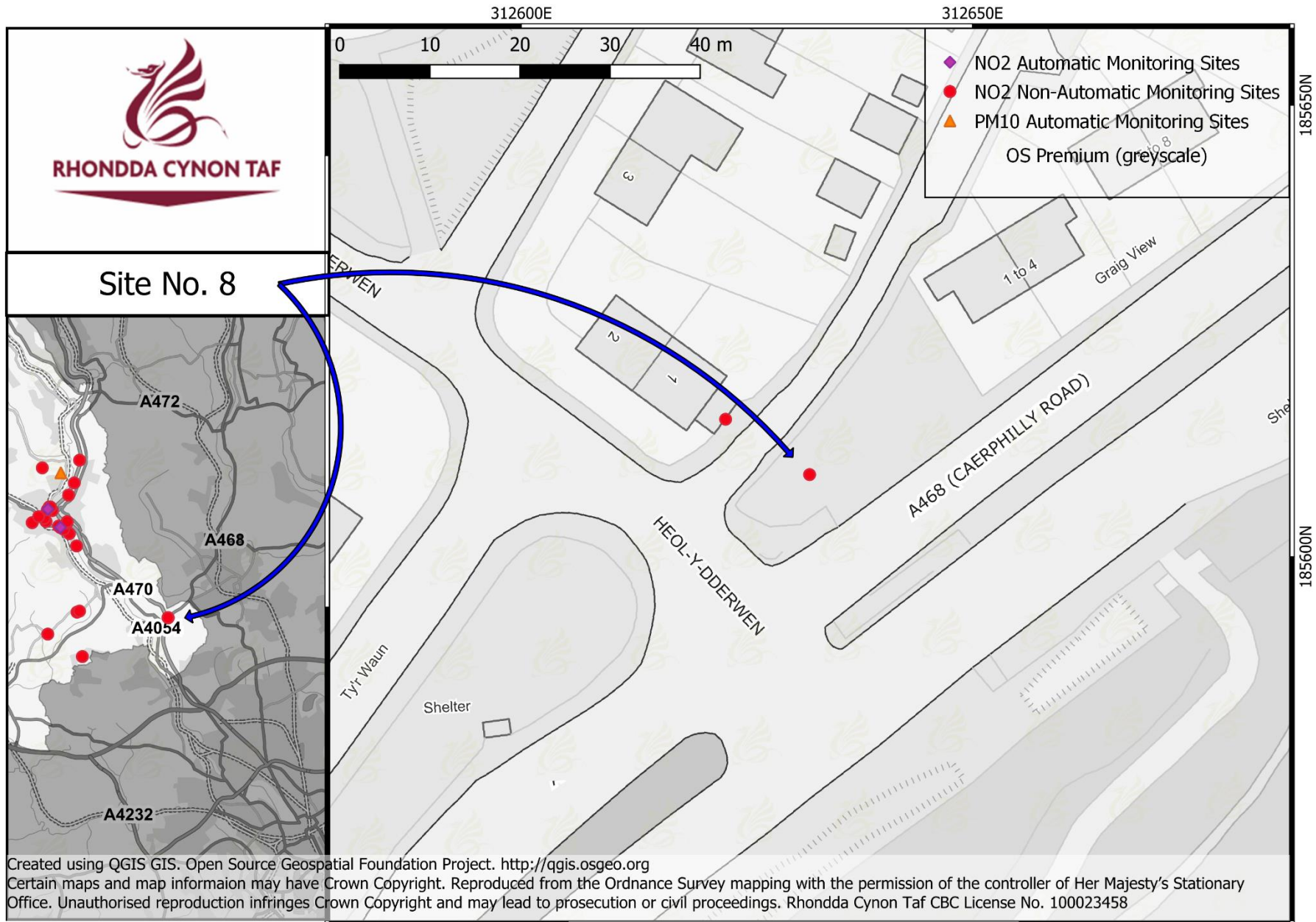
Balance with Filter Dynamics Measurement System [Site No. 130 (Upper Garth Avenue TEOM FDMS)]. It is directly owned and controlled by the Local Authority and is regularly inspected by a trained officer, with filter changes occurring six-weekly. These six-weekly inspections were complemented by twice yearly services by the Local Authority's service contract engineers, Air Monitors. All data gathered by Site No. 130 (Upper Garth Avenue TEOM FDMS) has been processed, validated and ratified in accordance to procedures, set out in guidance, by Officers of the Local Authority.

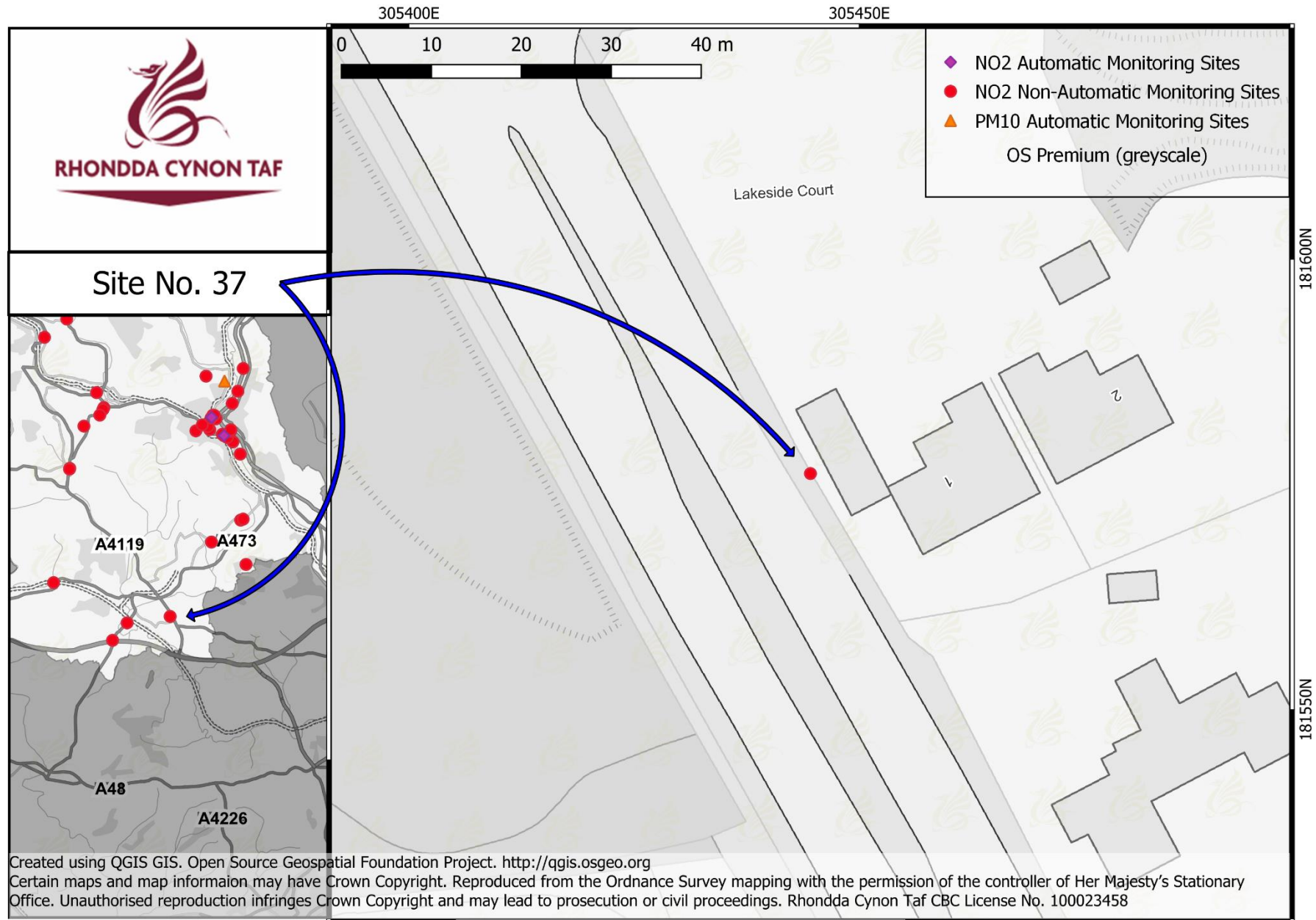
11.4.1 PM₁₀ Monitoring Adjustment

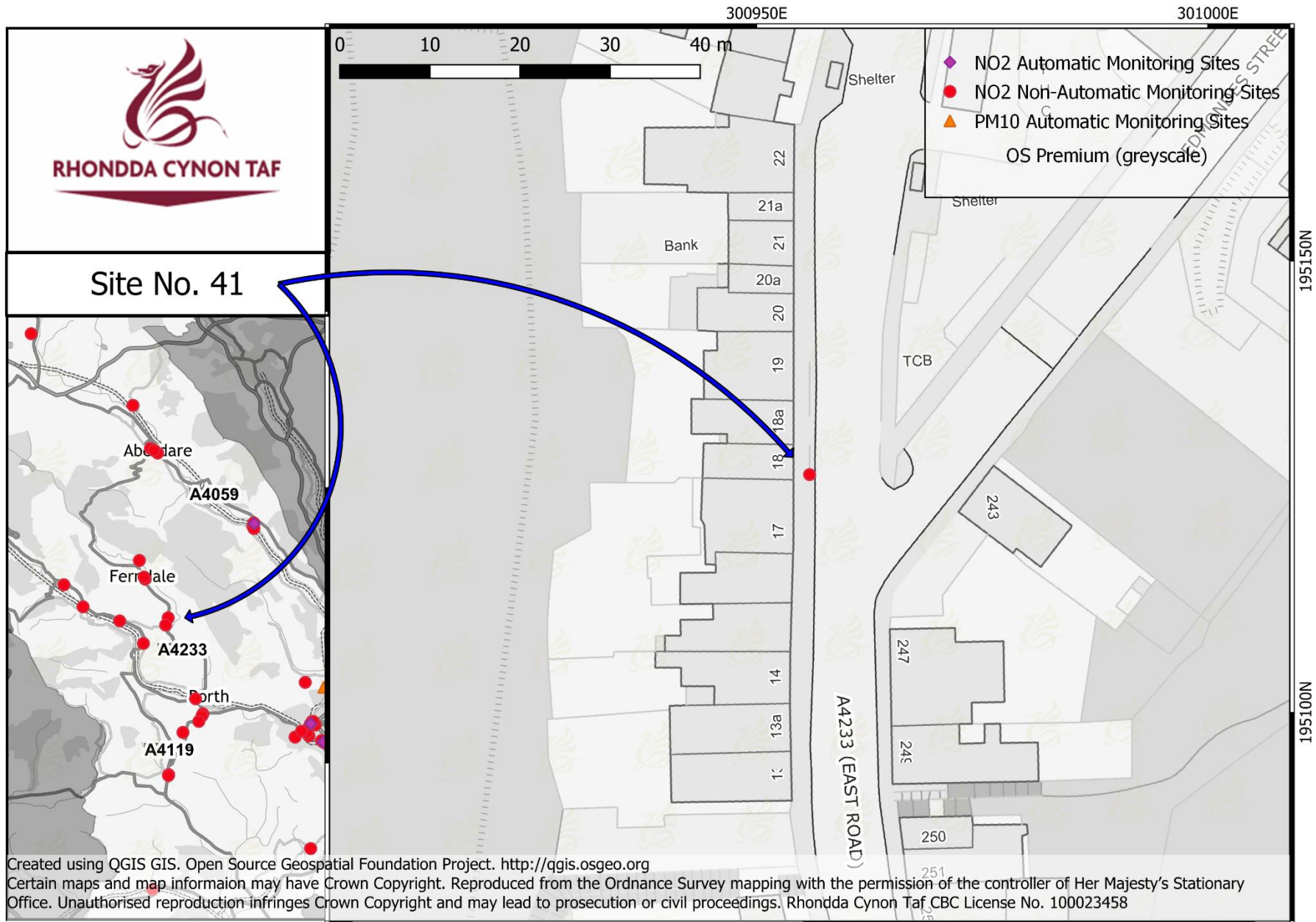
The Local Authority operates a Thermo Scientific 1405-F Tapered Element Oscillating Mass Balance with Filter Dynamics Measurement System [Site No. 130 (Upper Garth Avenue TEOM FDMS)]. The method used involves sampling at ambient conditions, without the need for mathematical adjustment post data collection, and has been formally considered [59] as an EU equivalent method without correction.

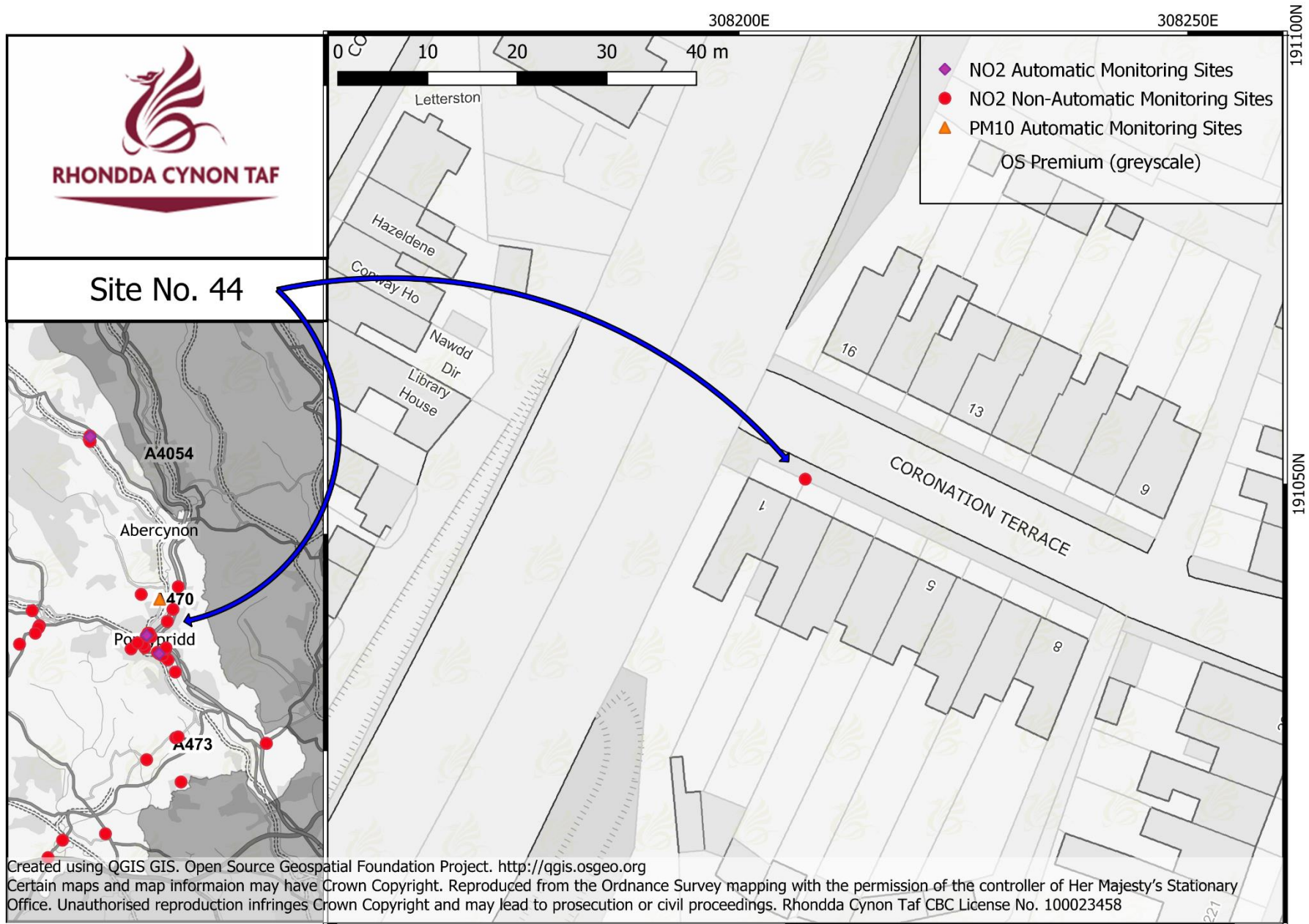
12. Appendix C2: Monitoring Location Maps

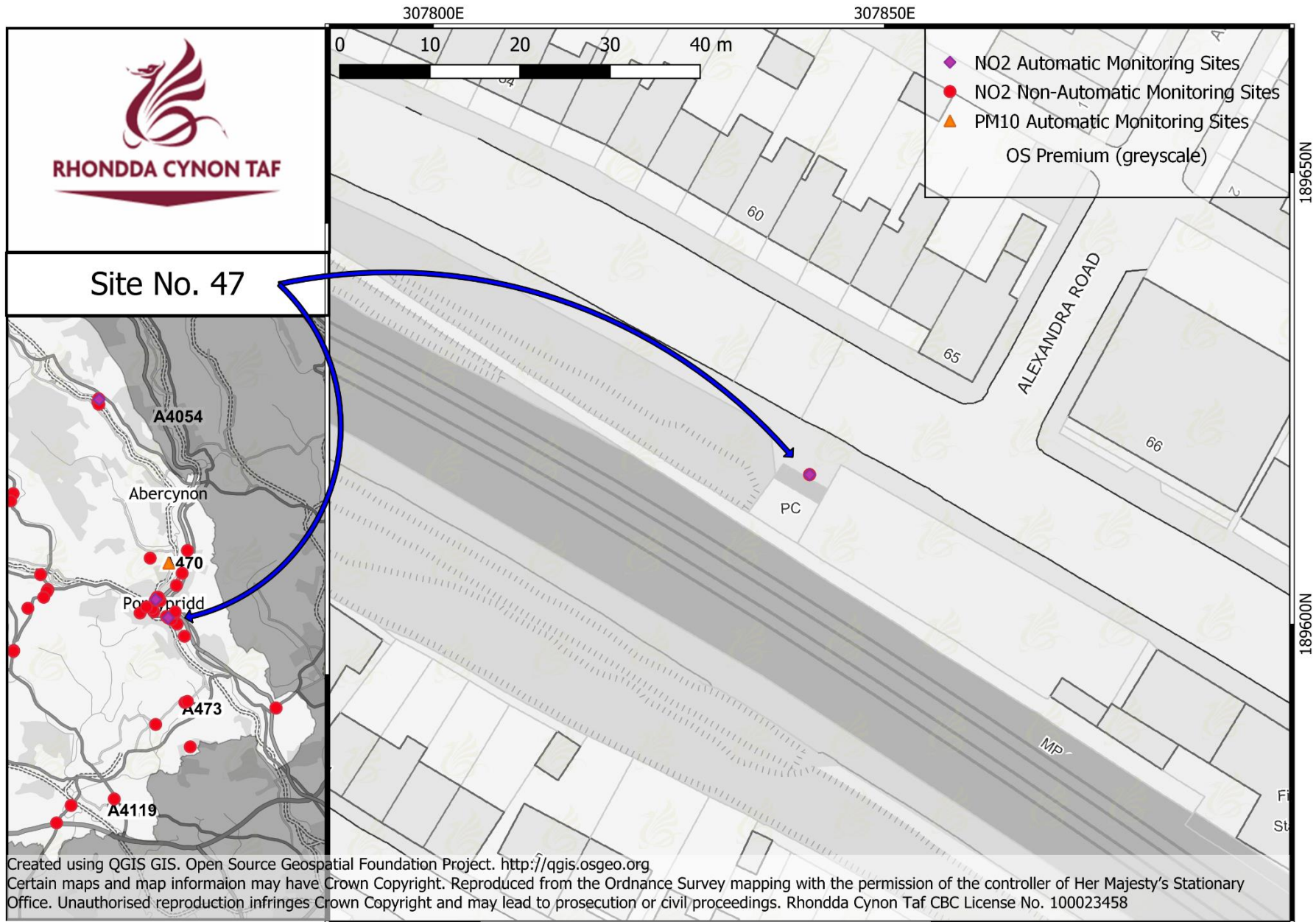


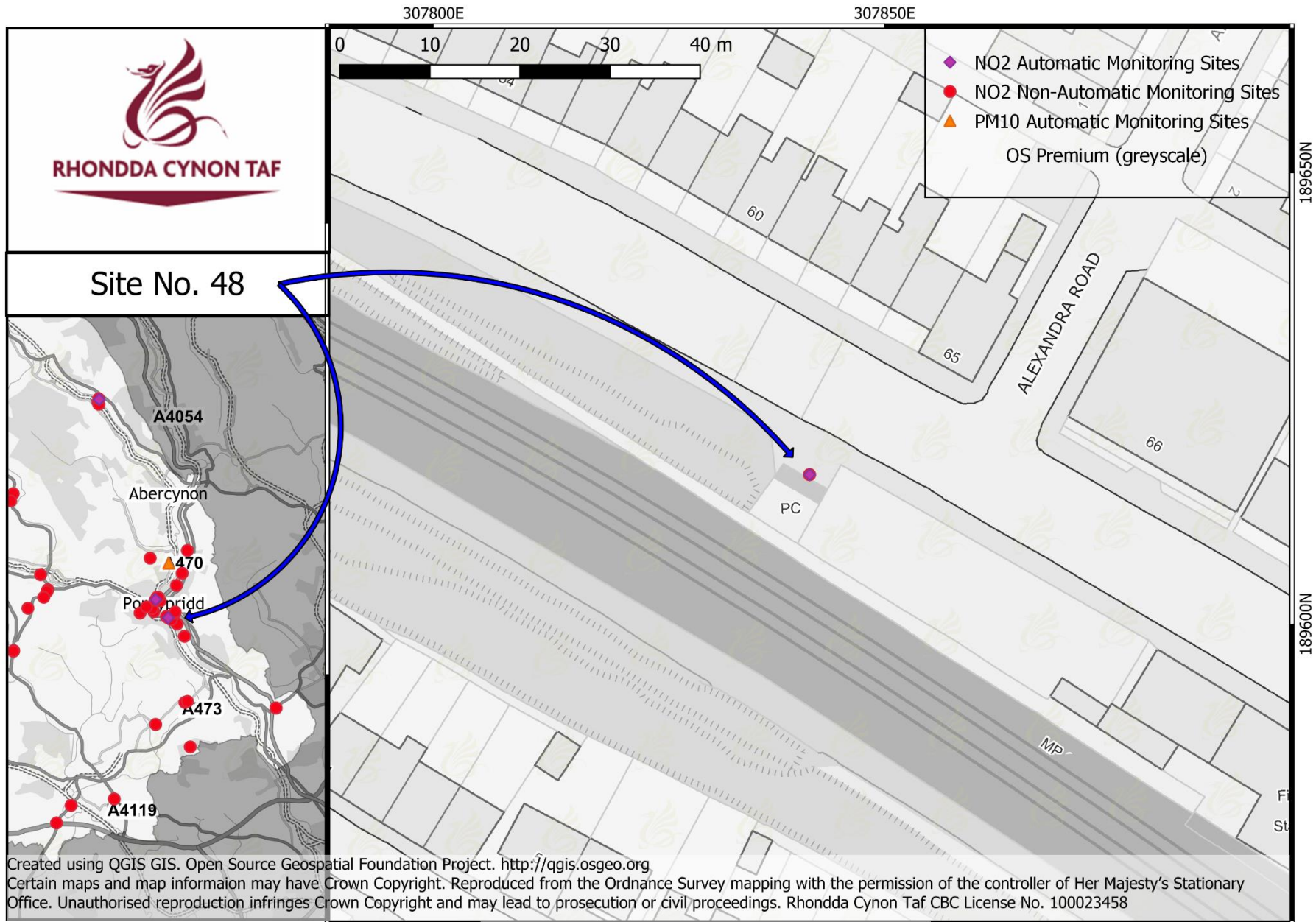


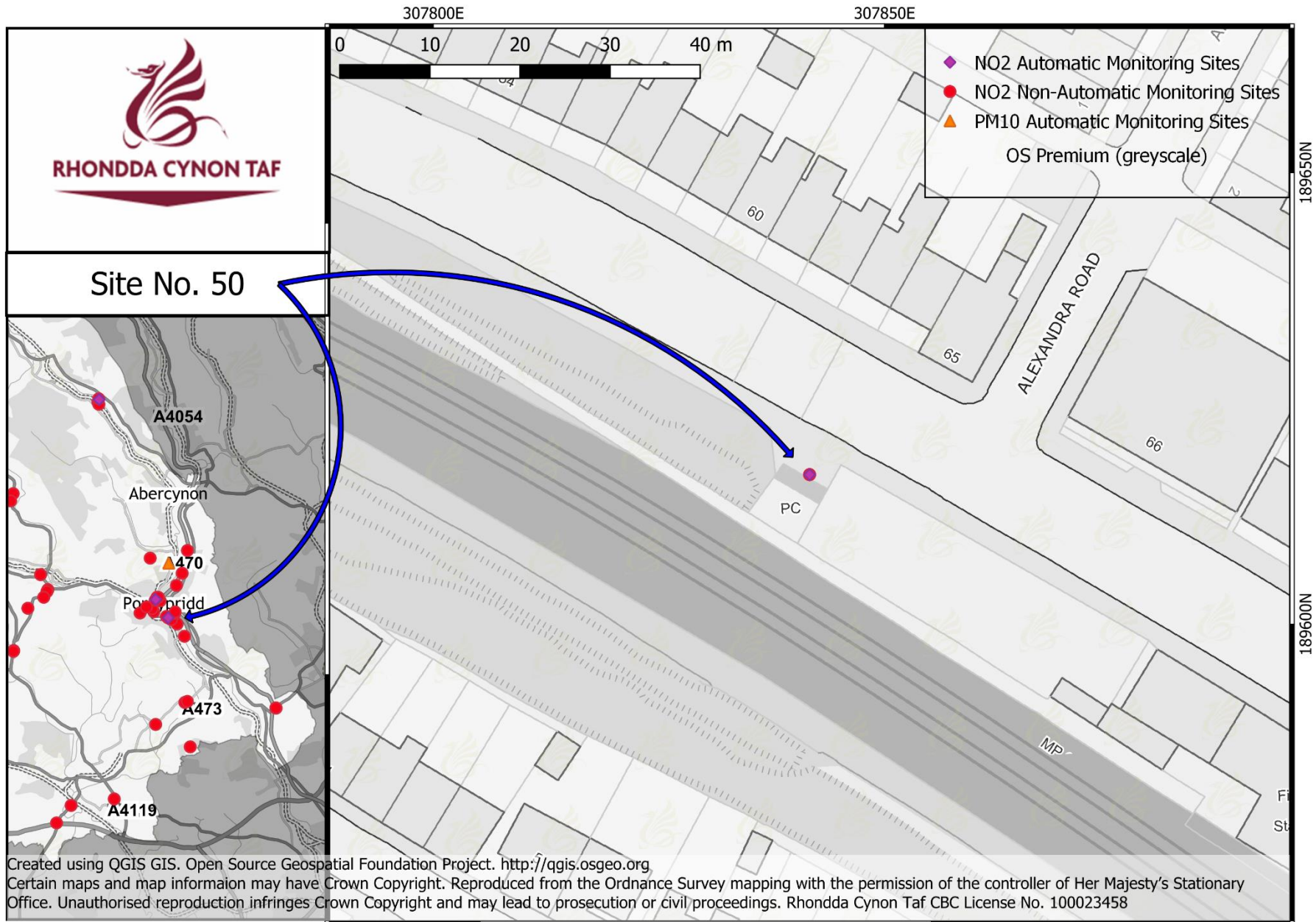




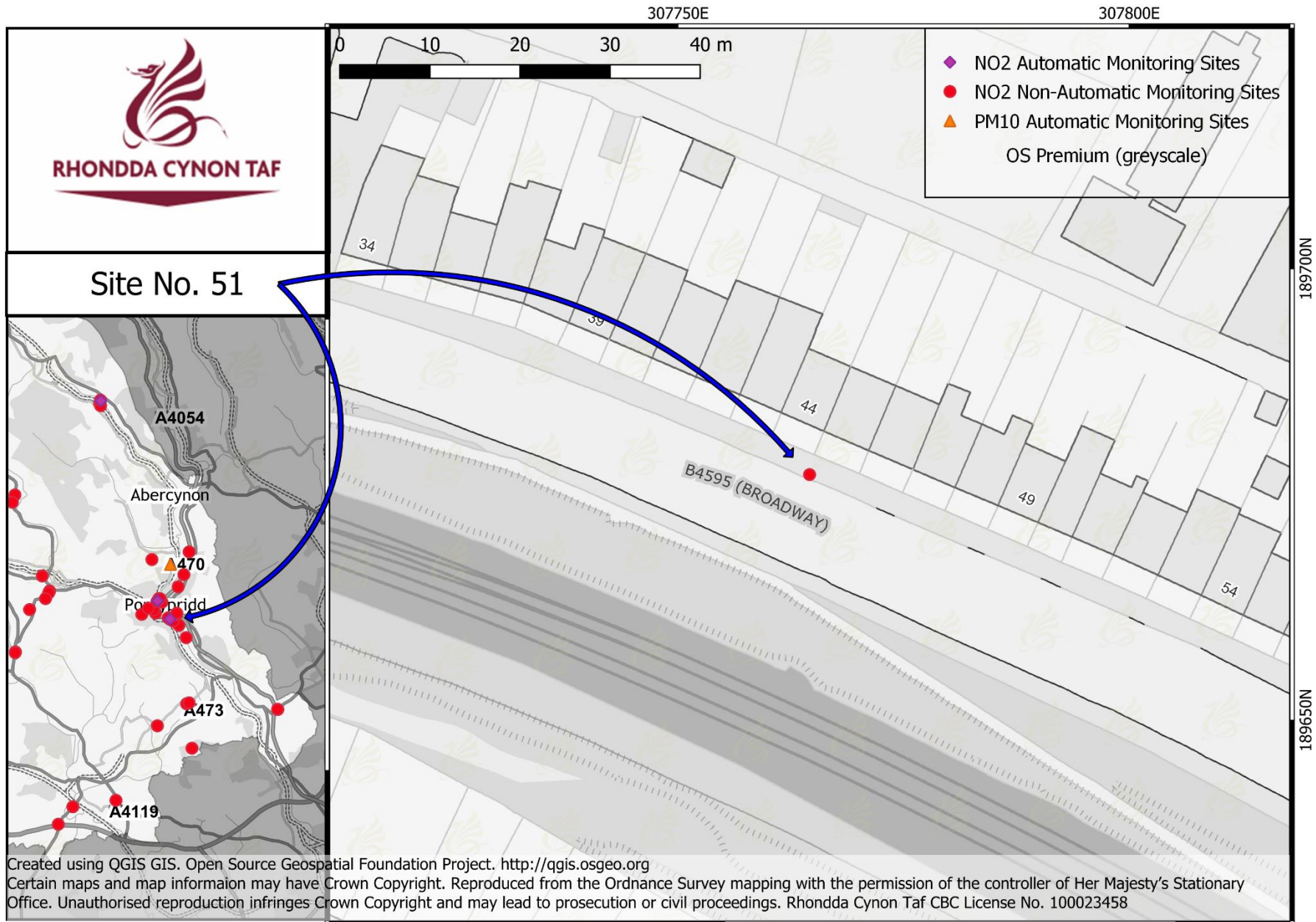


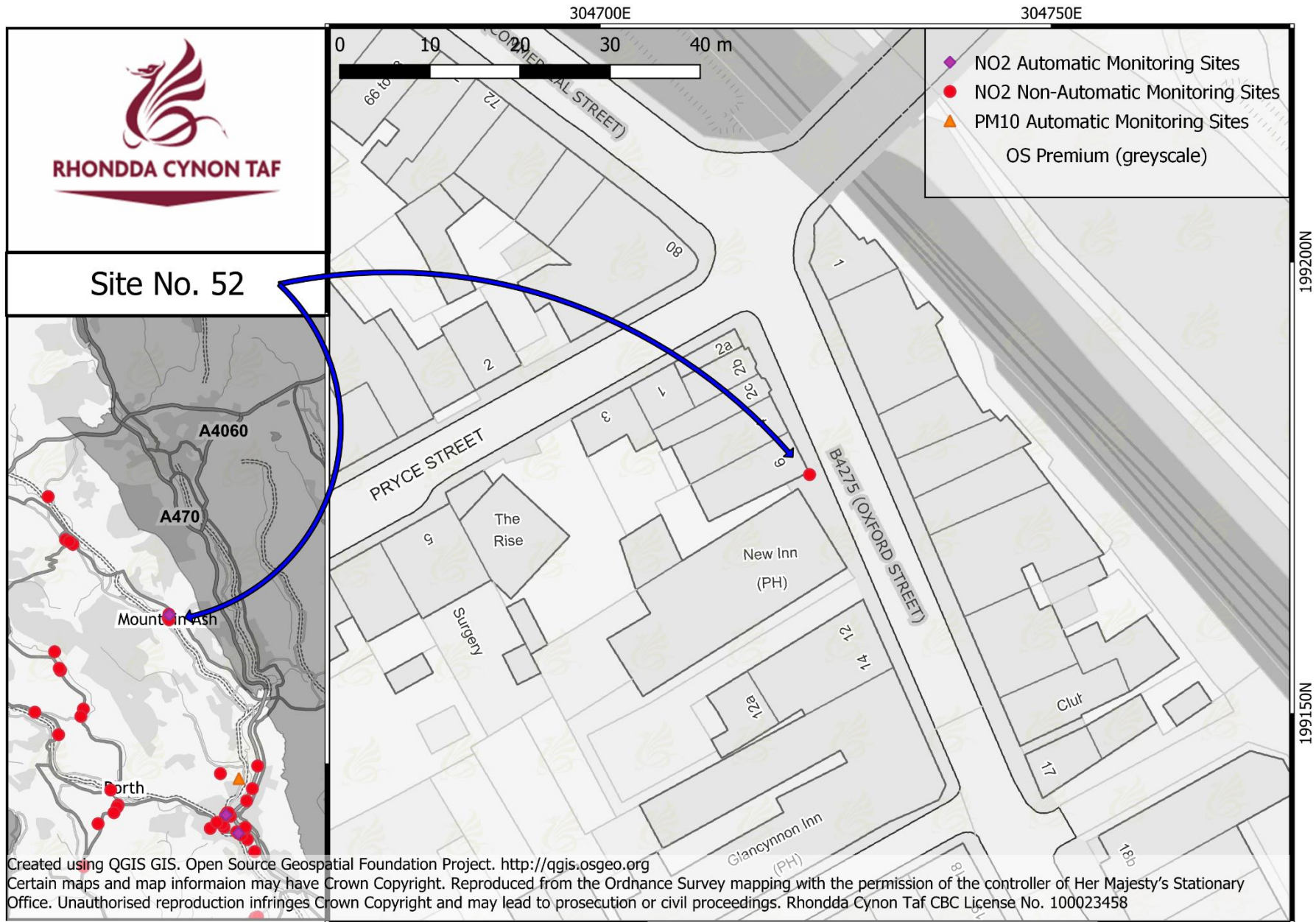


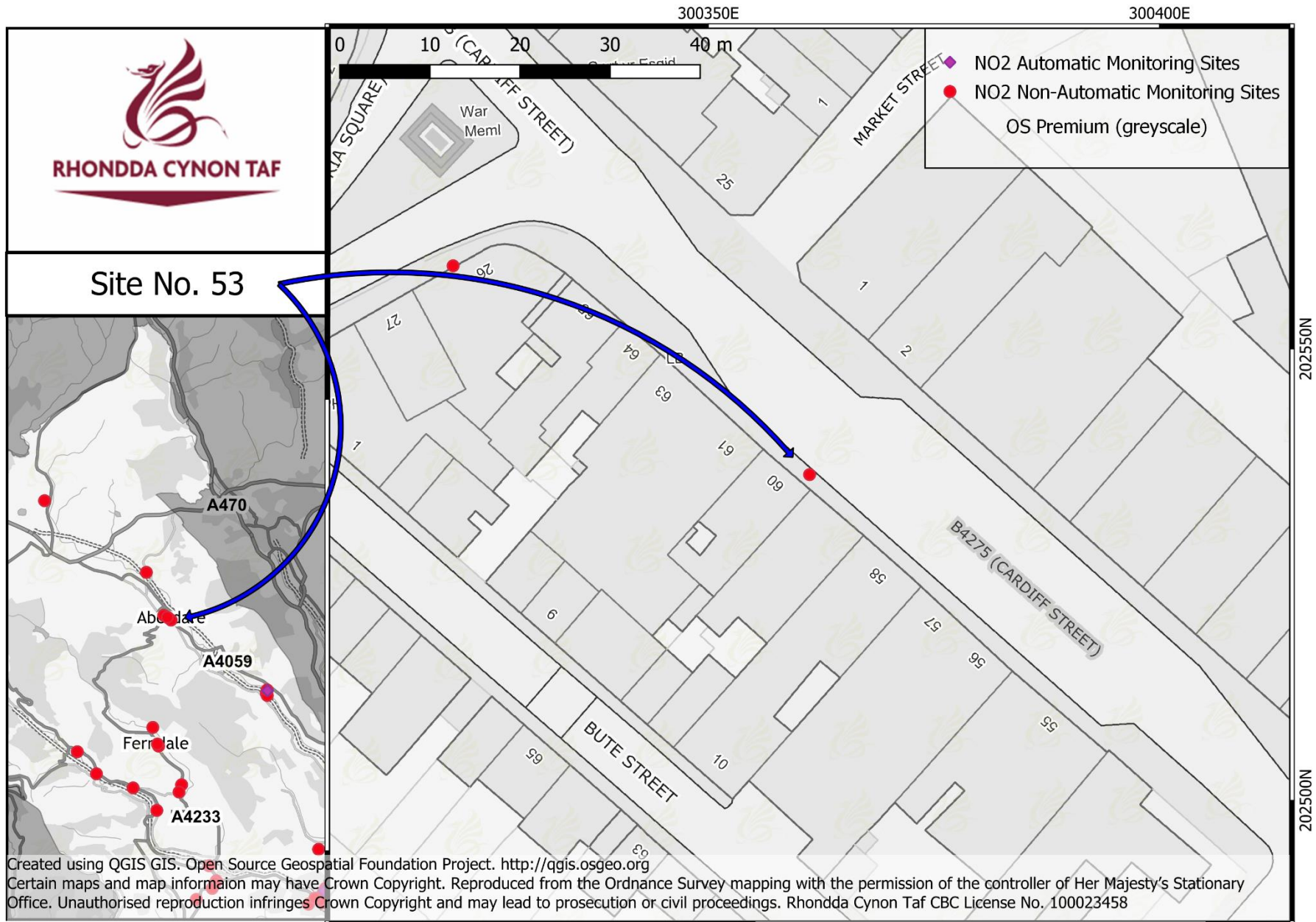


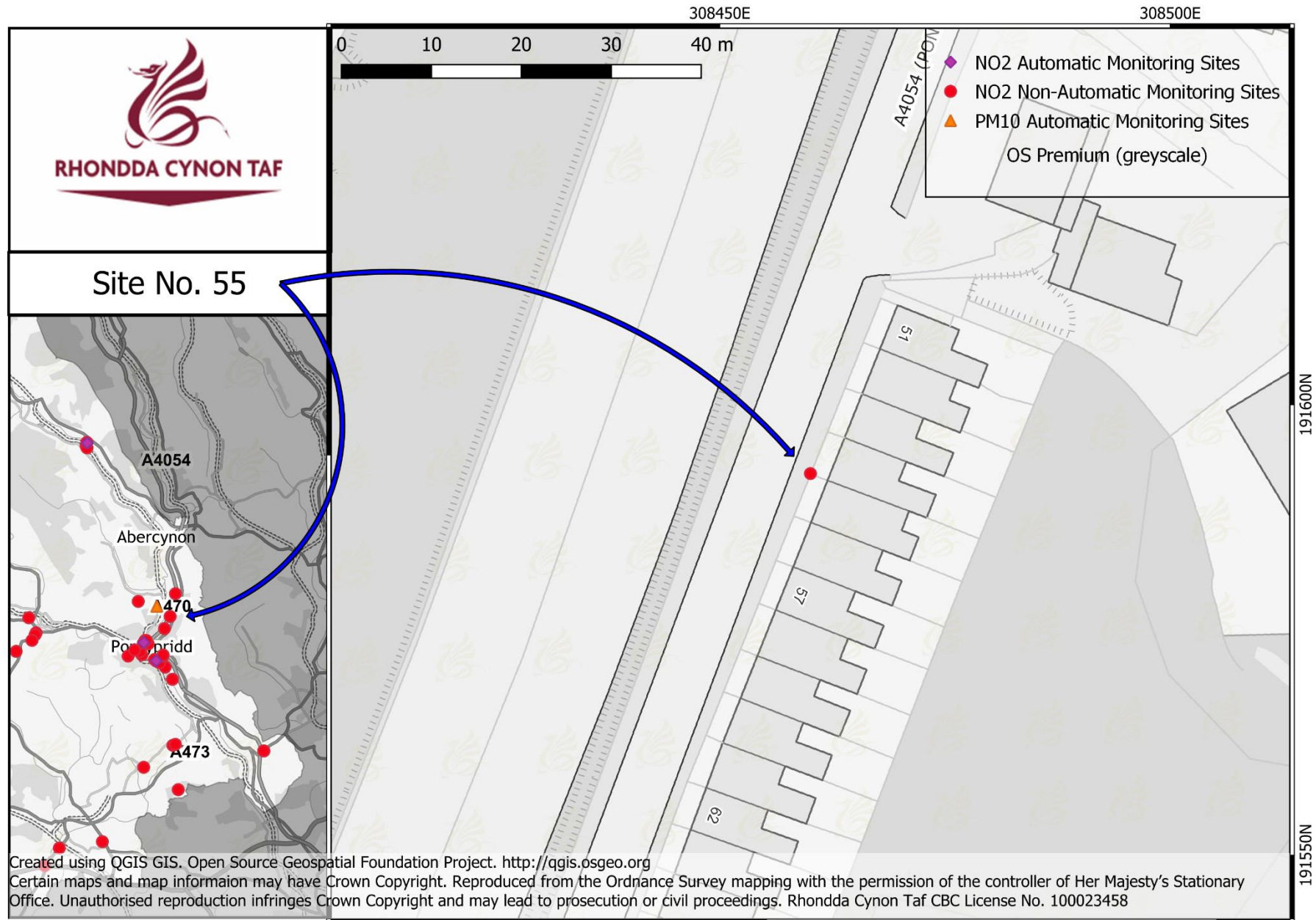


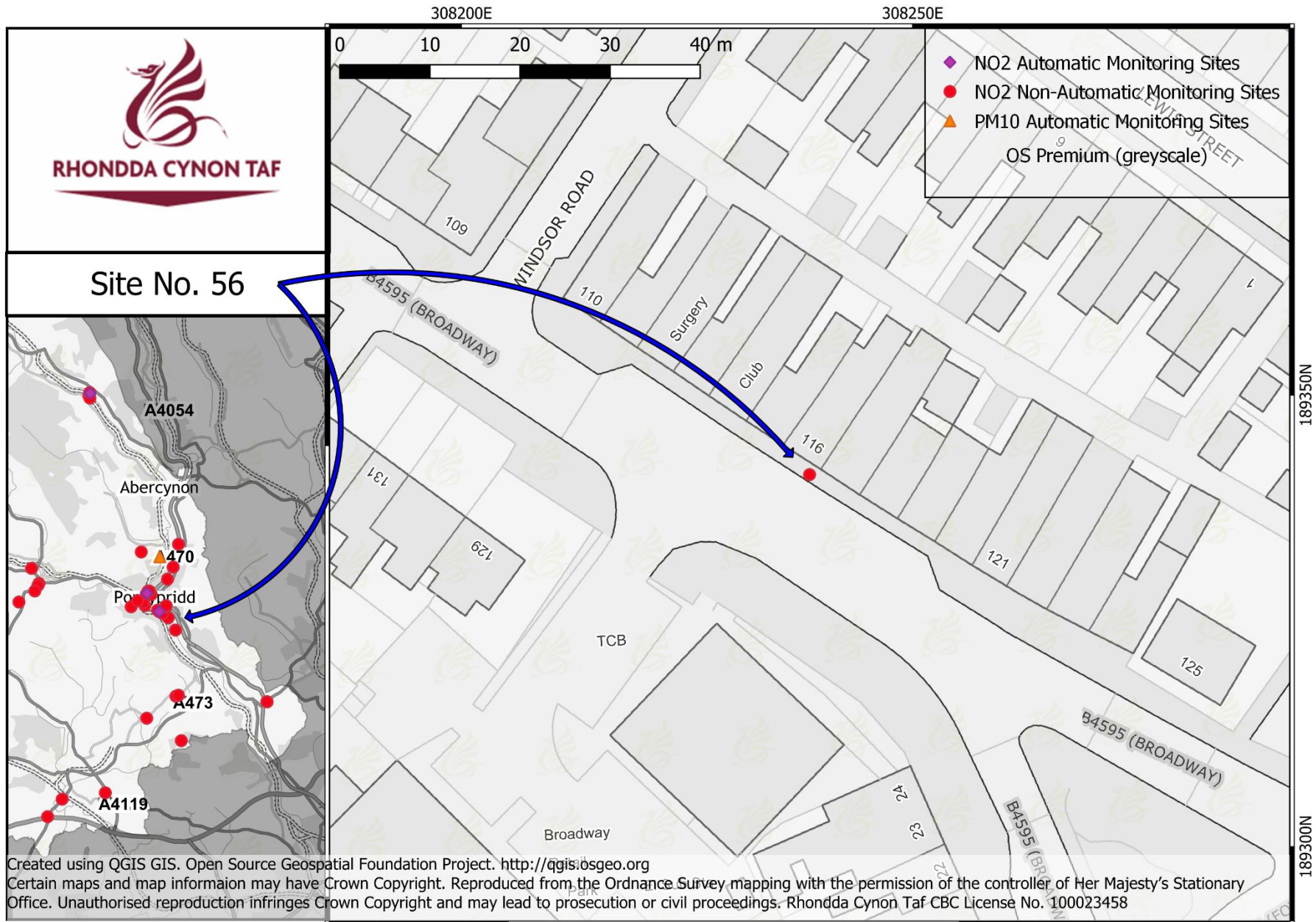
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

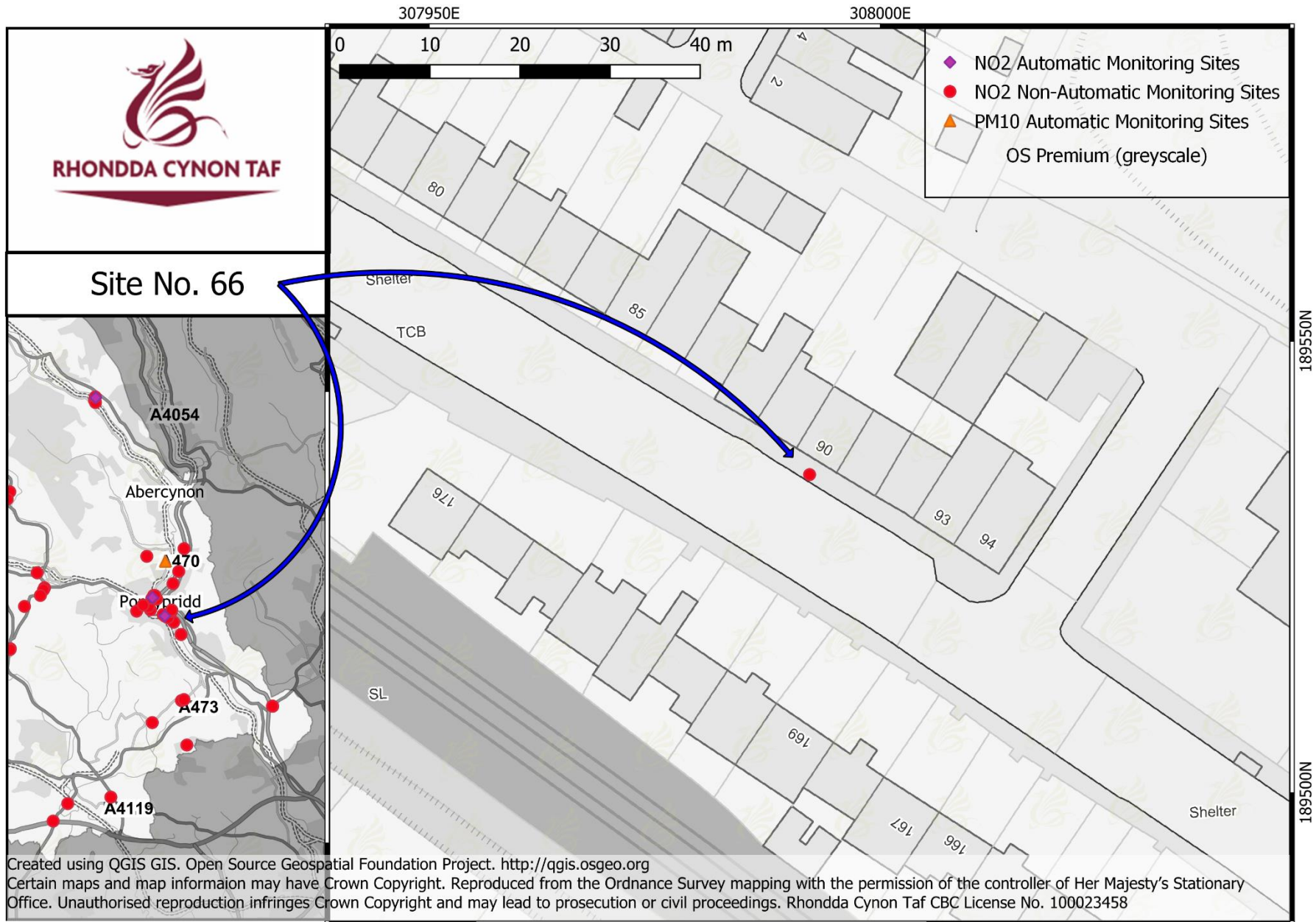


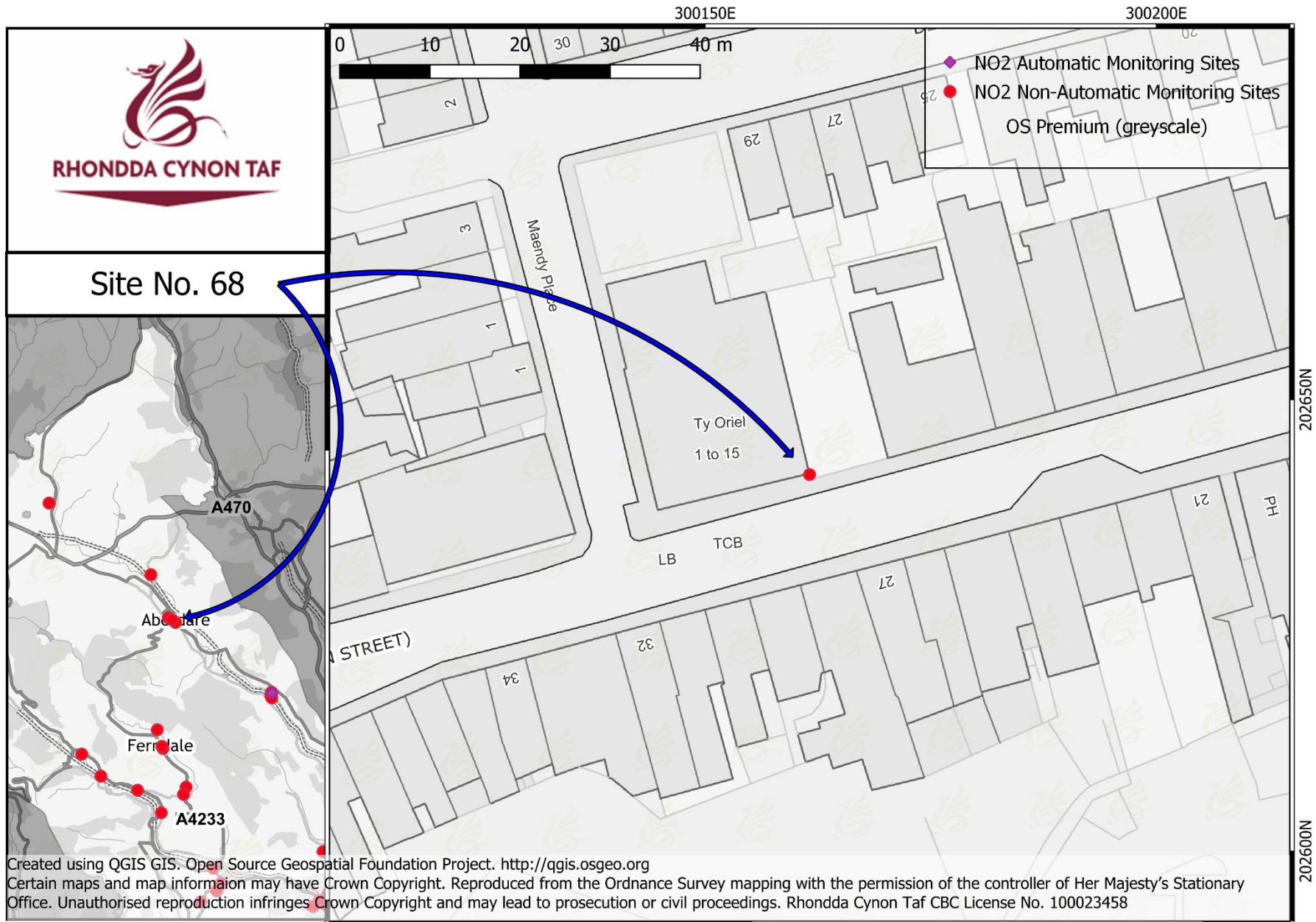


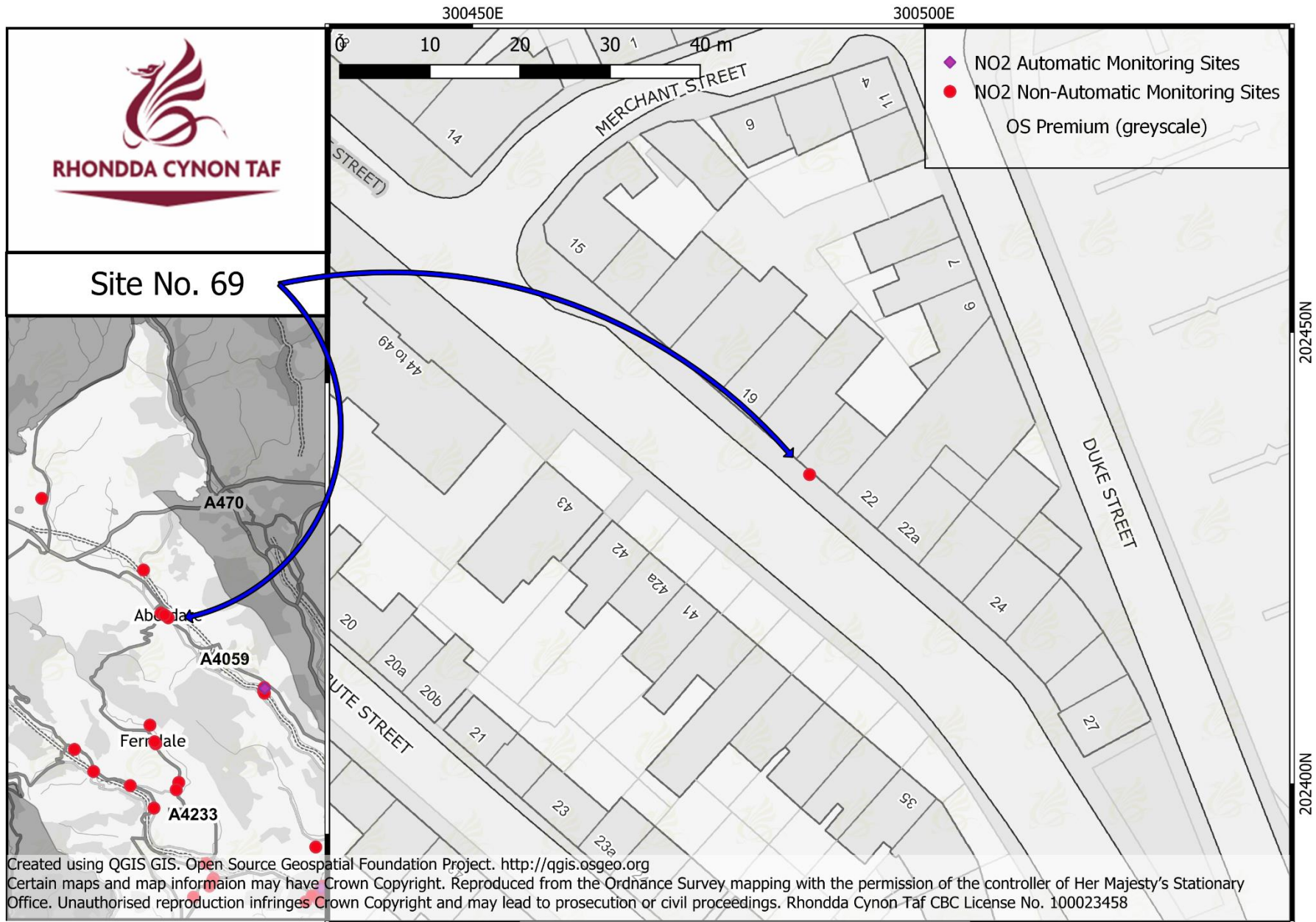


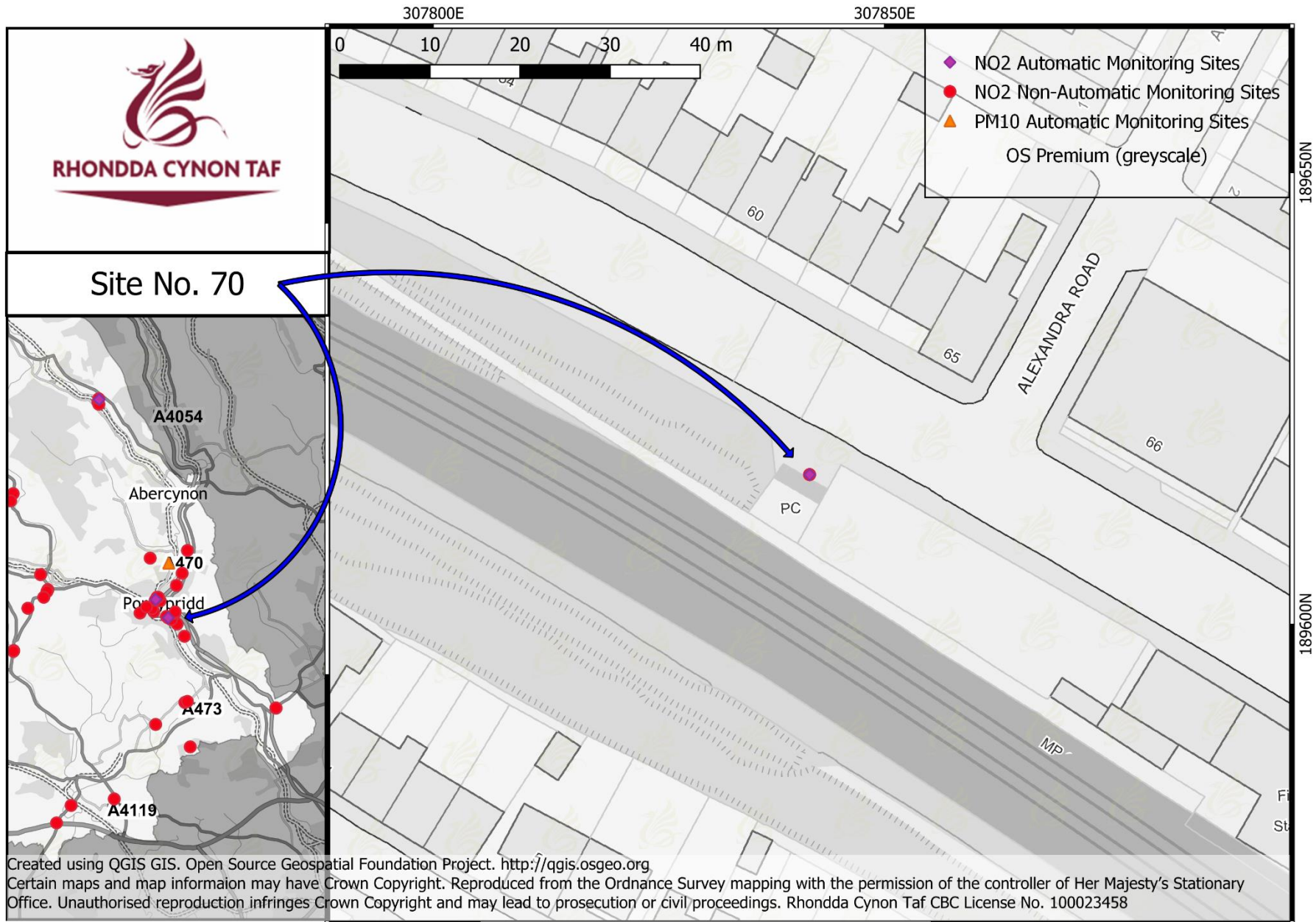




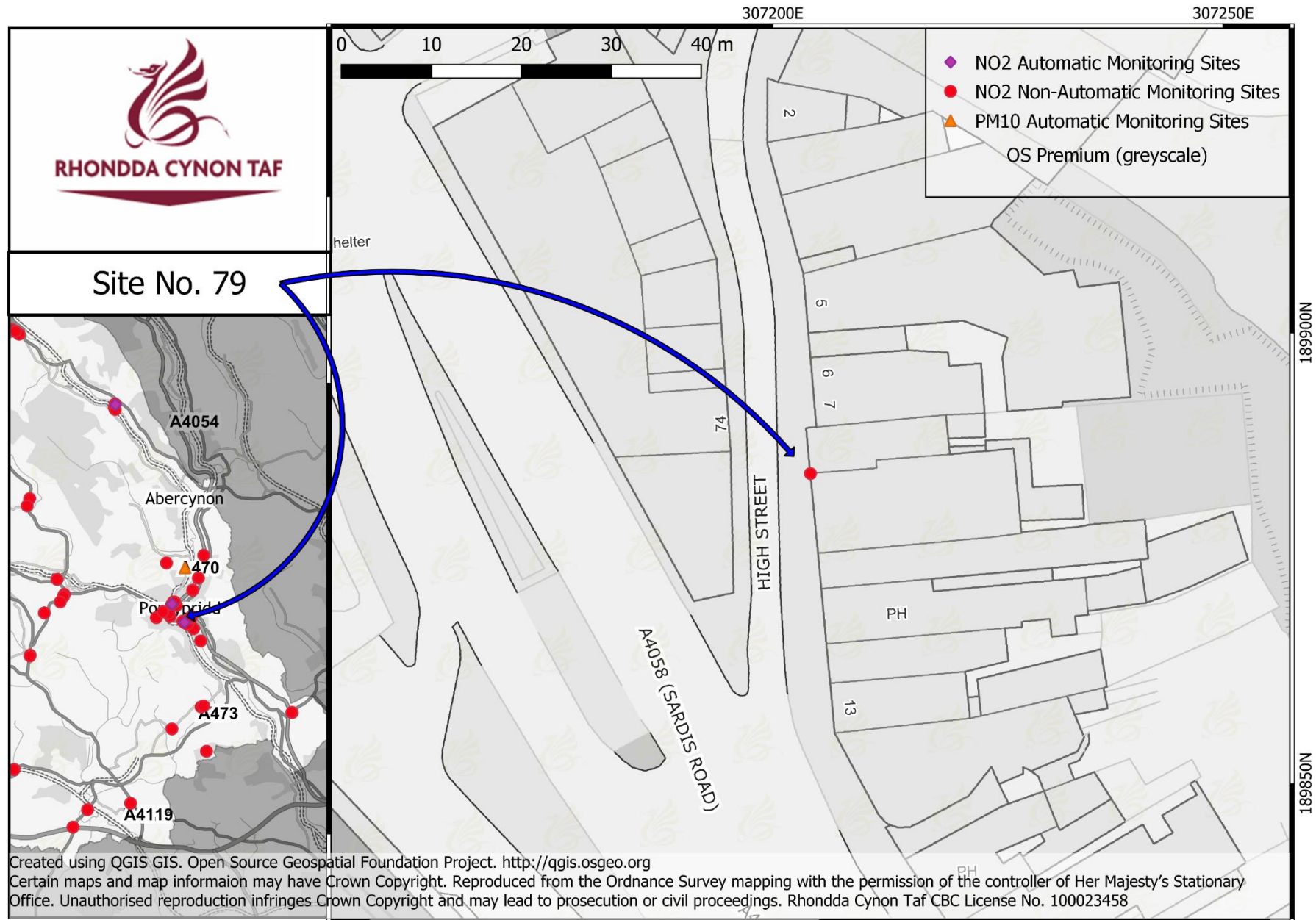


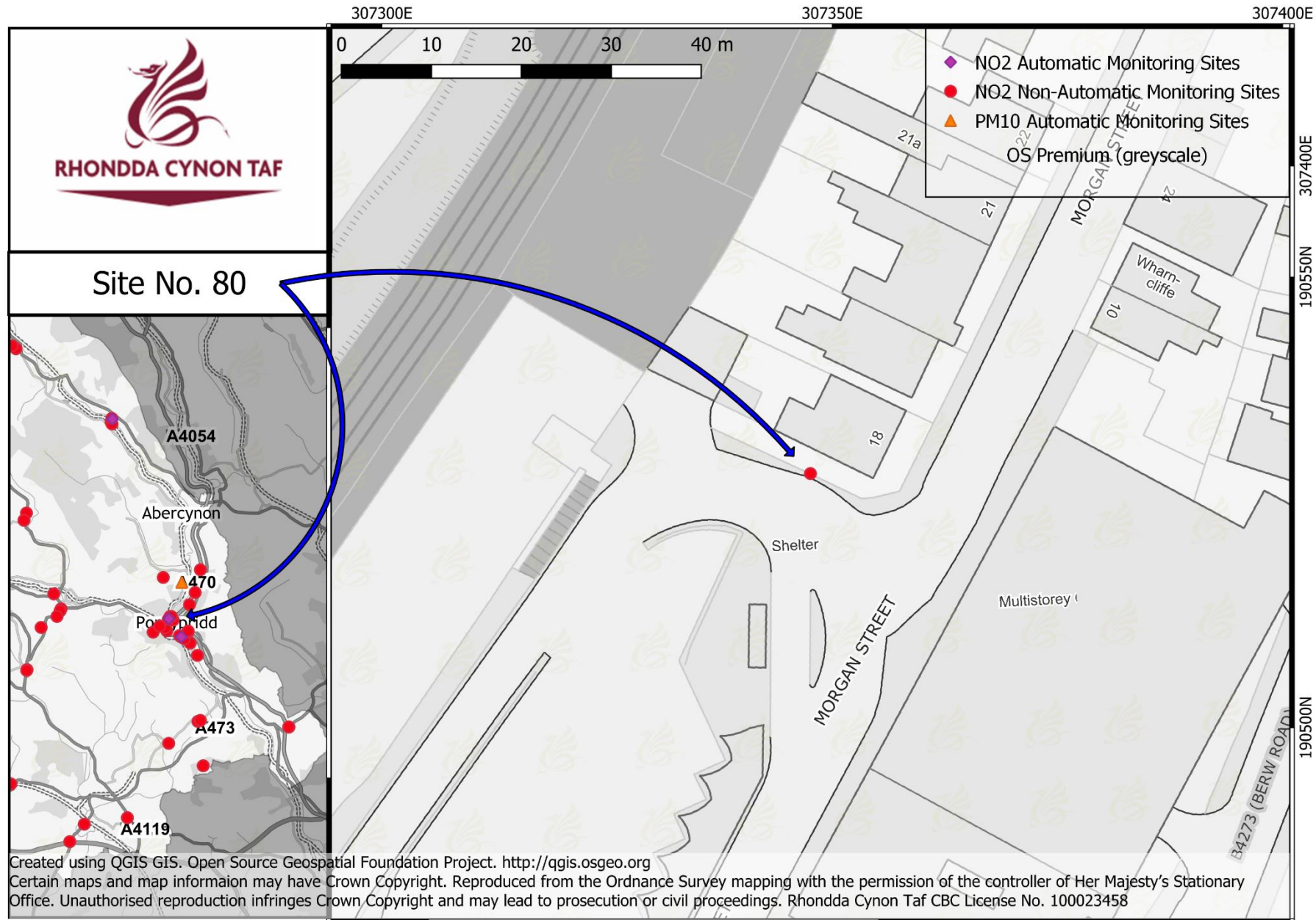


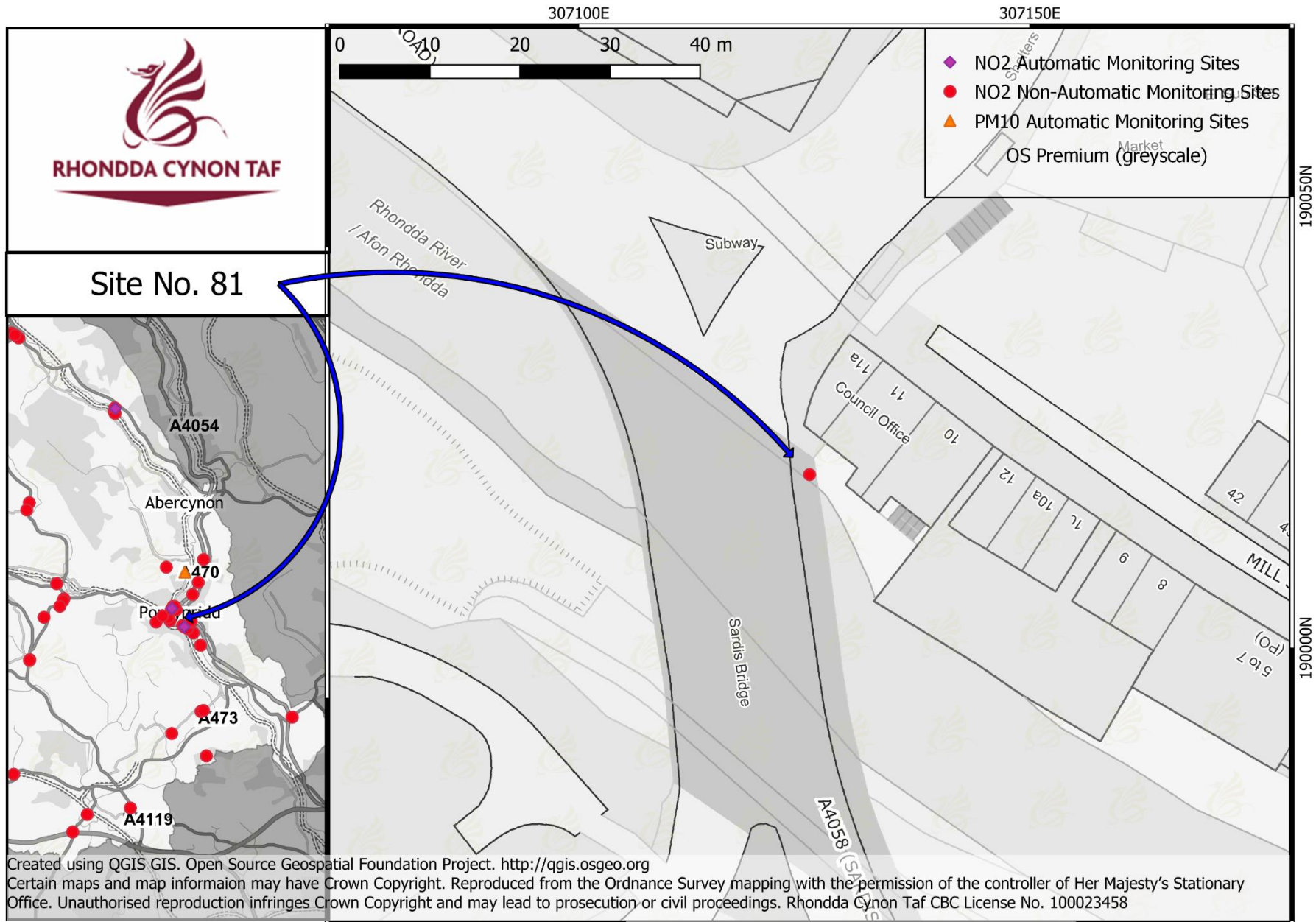


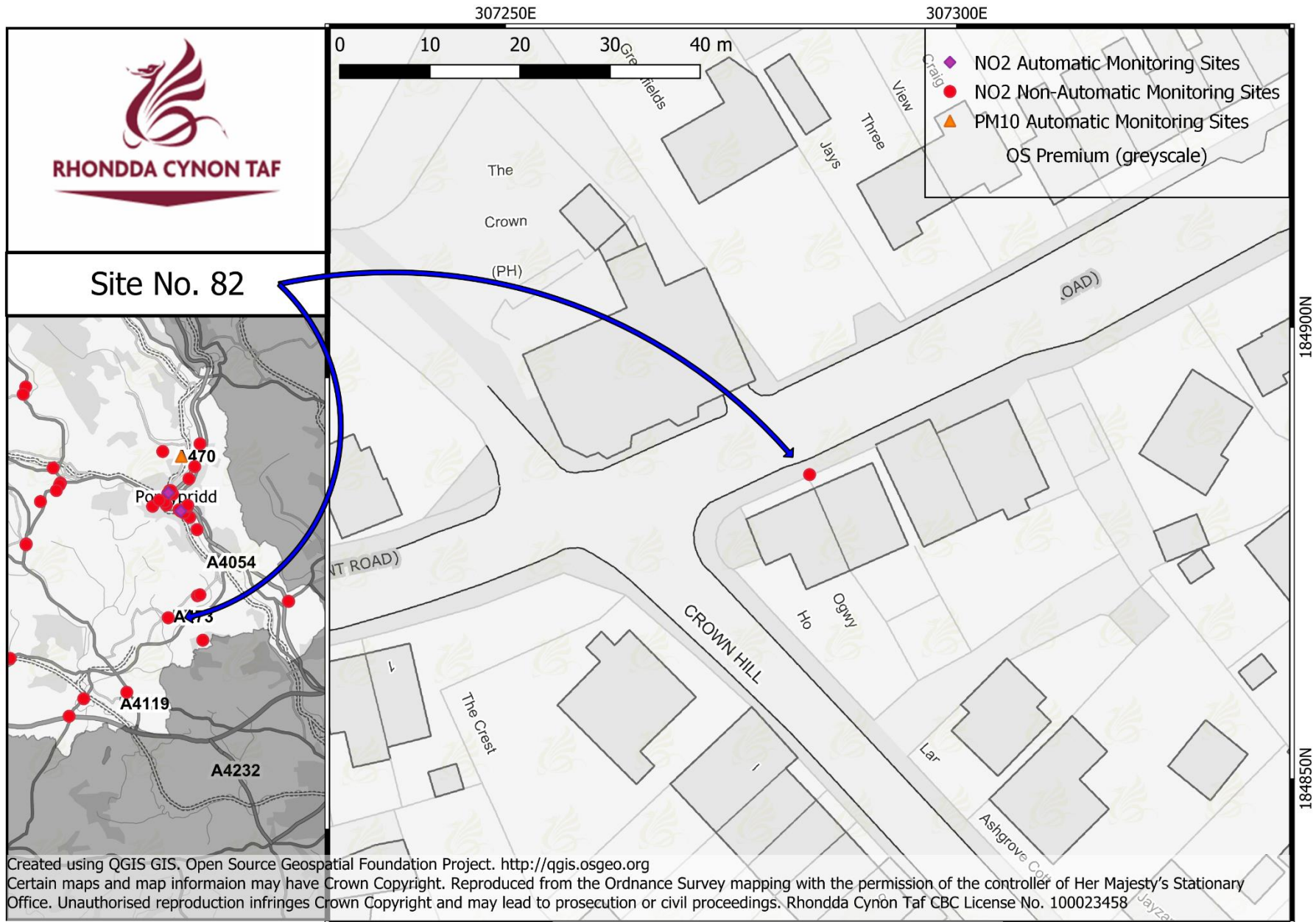


Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

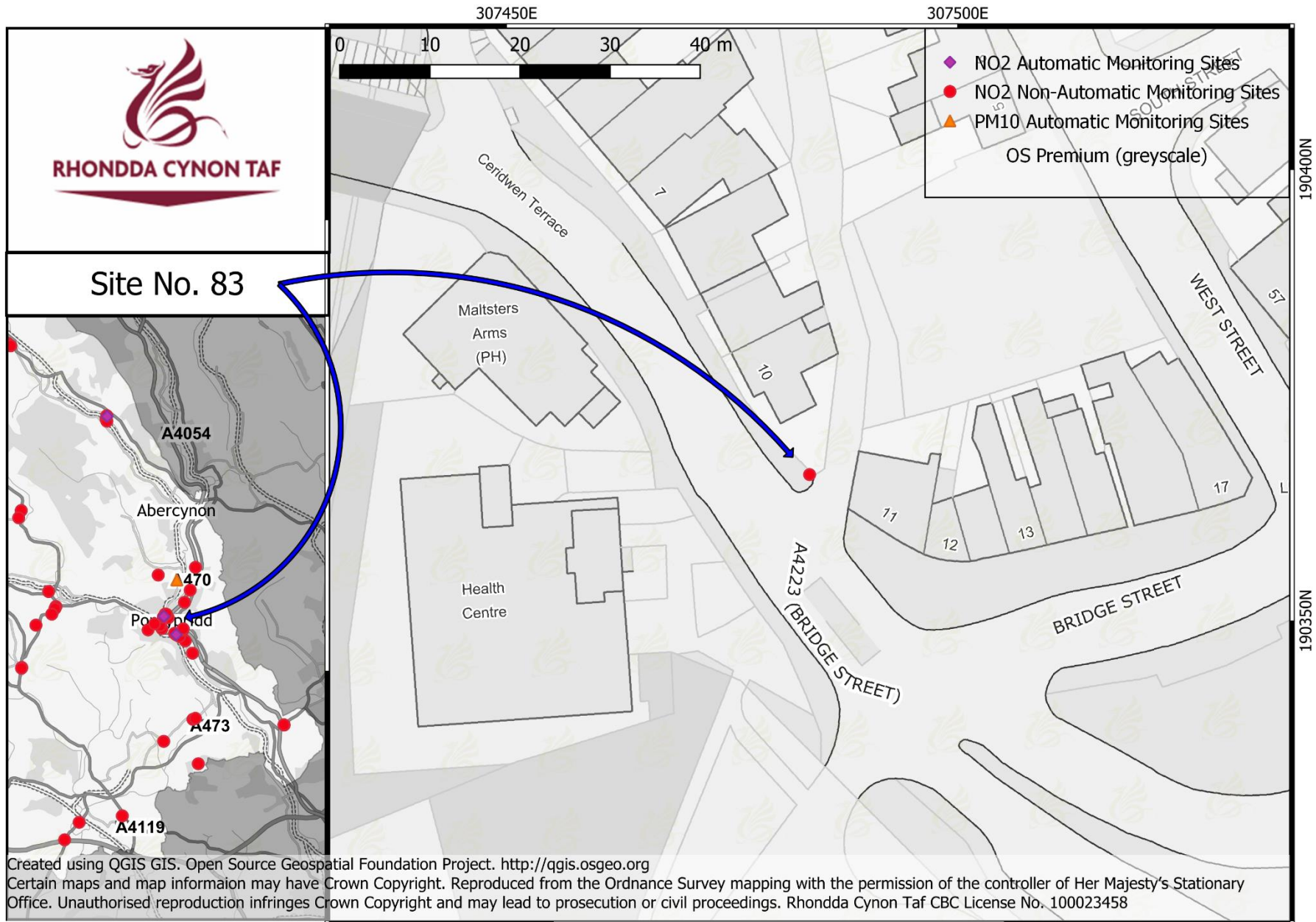


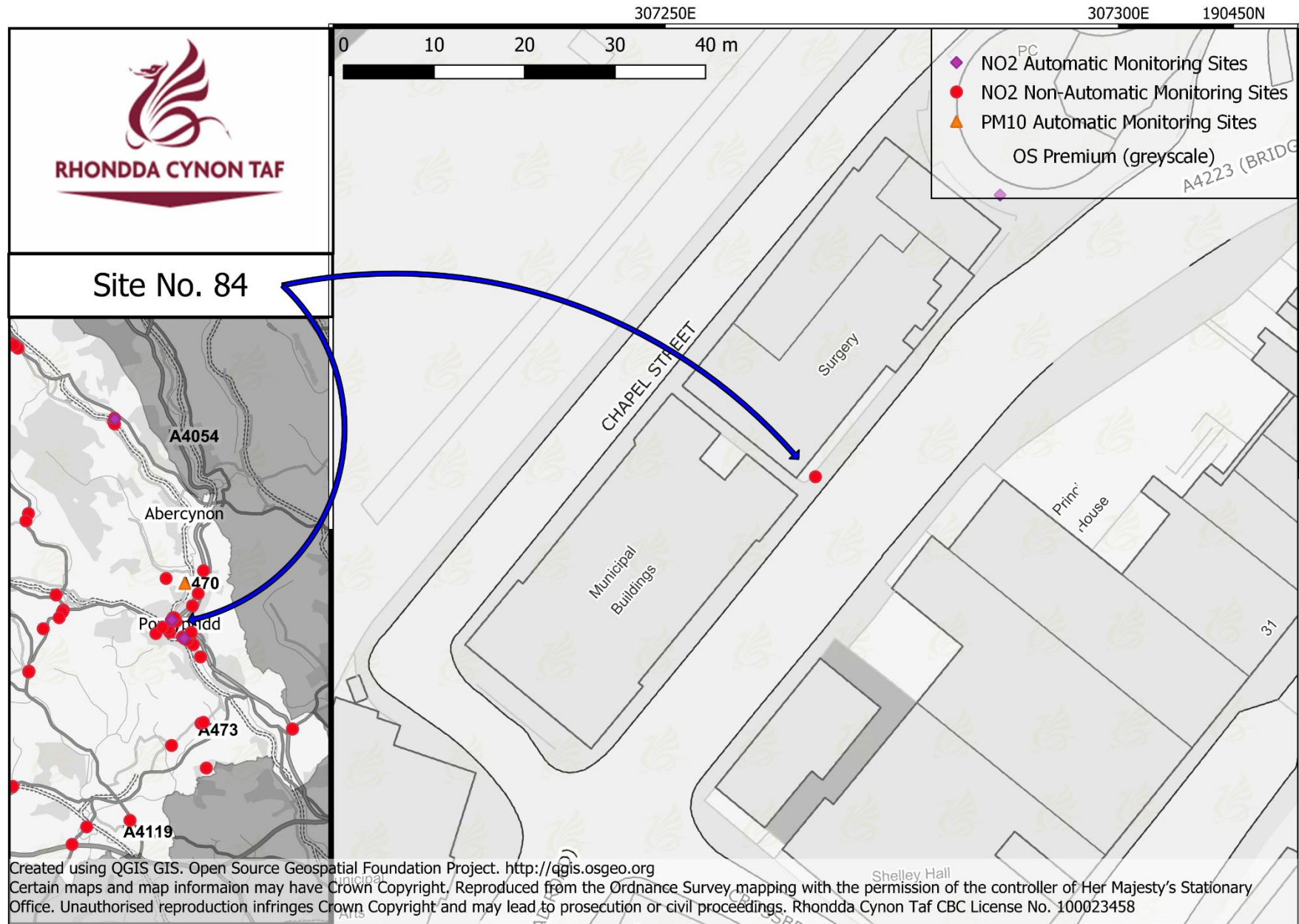


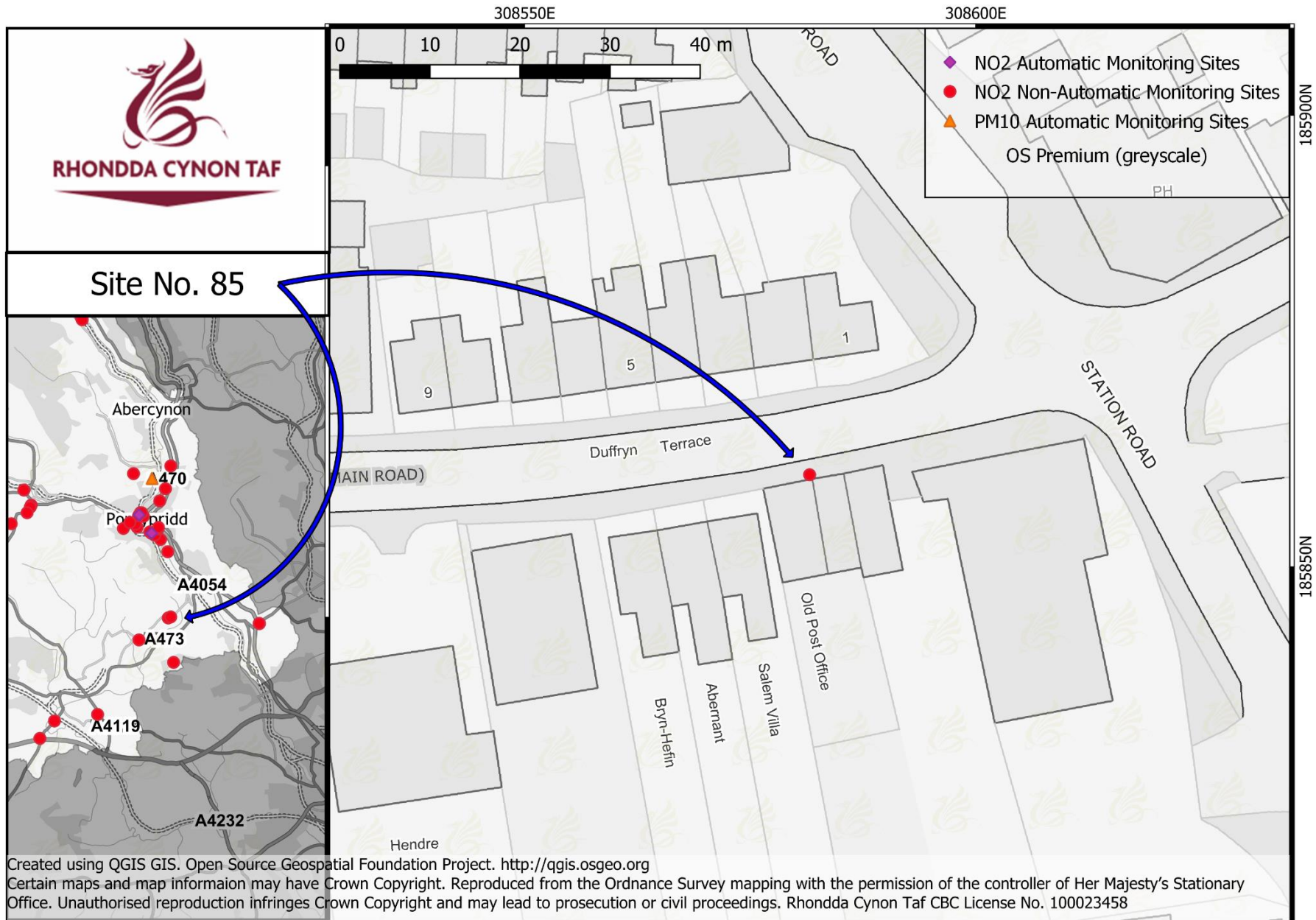


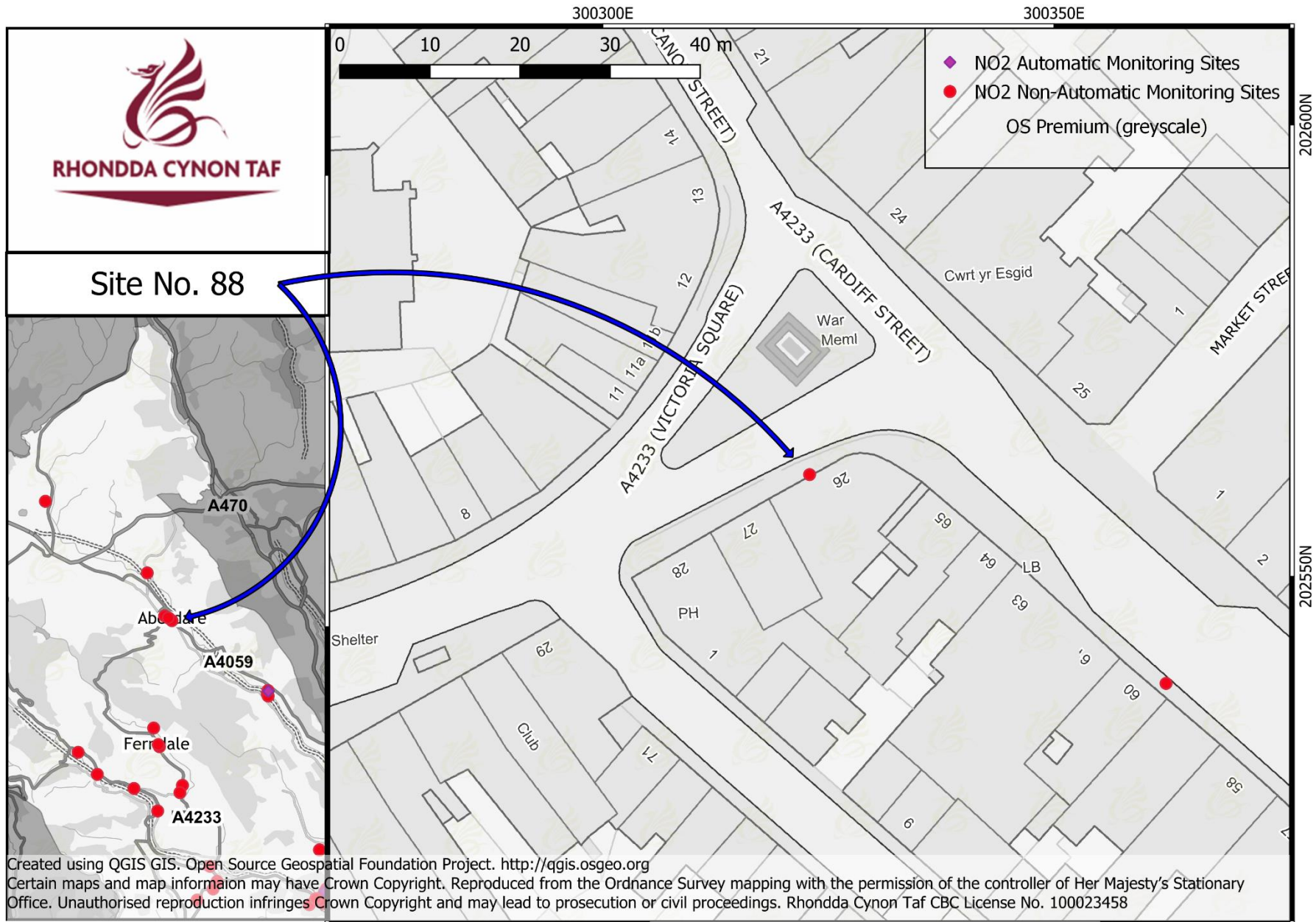


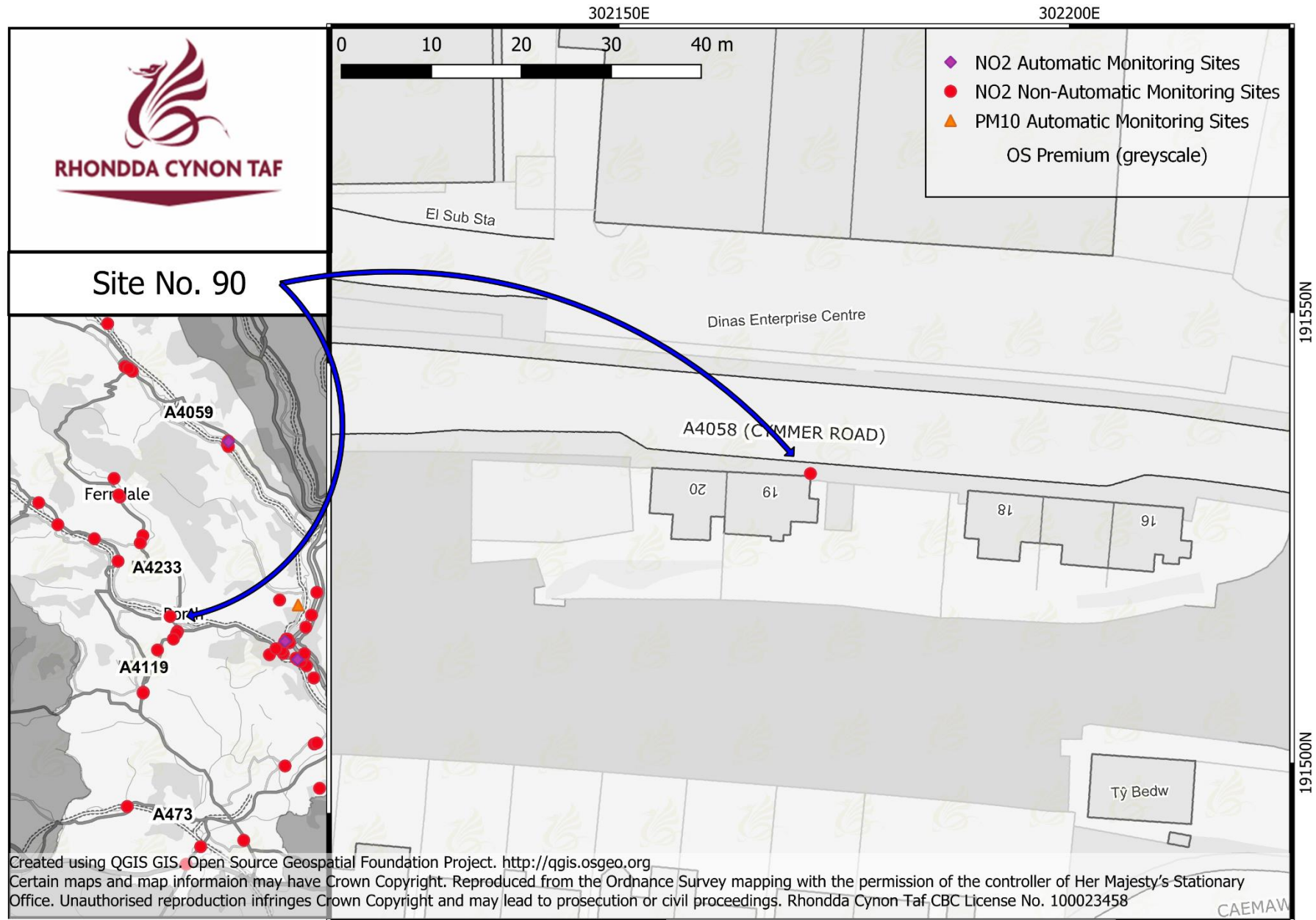
Created using QGIS GIS, Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

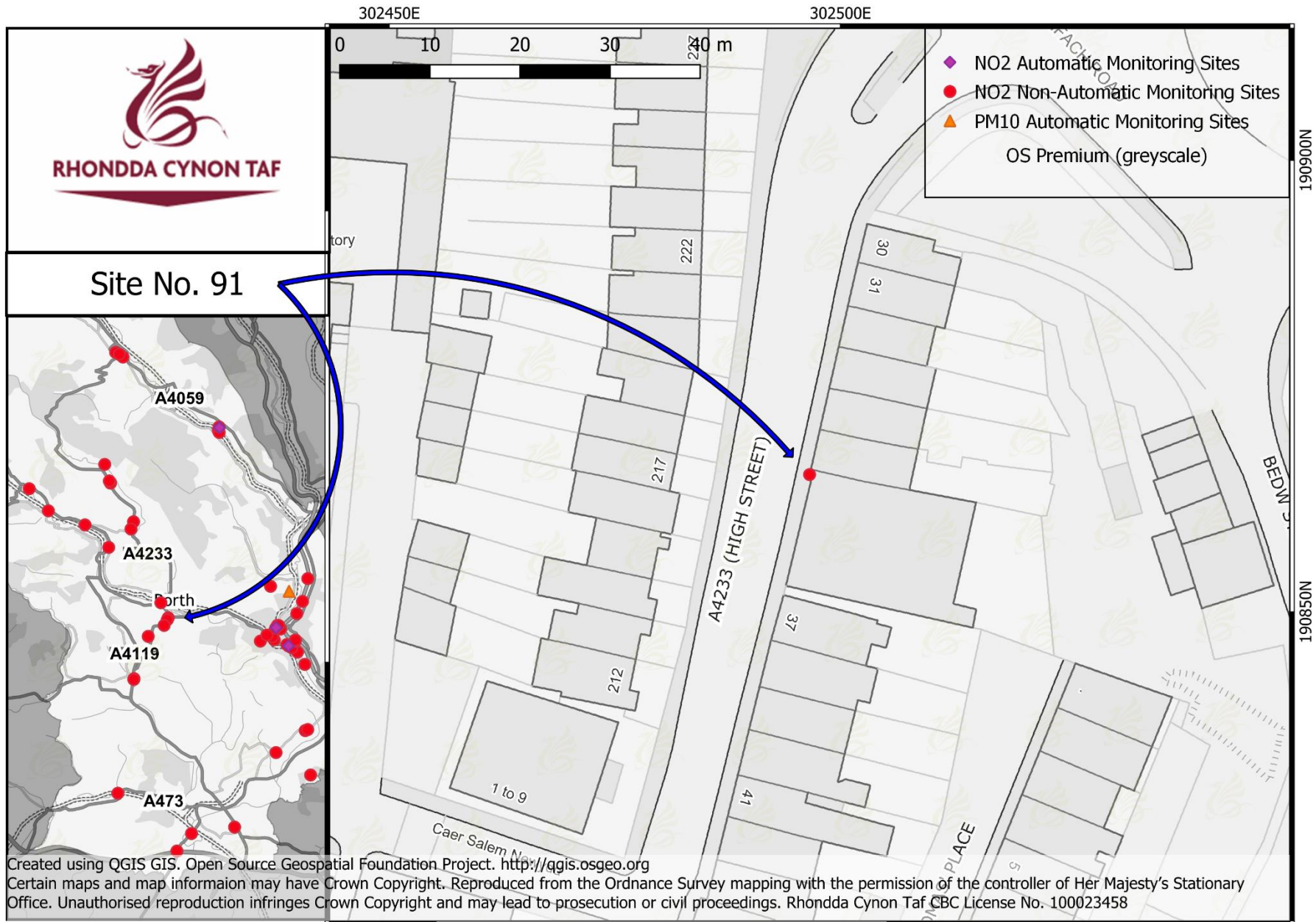


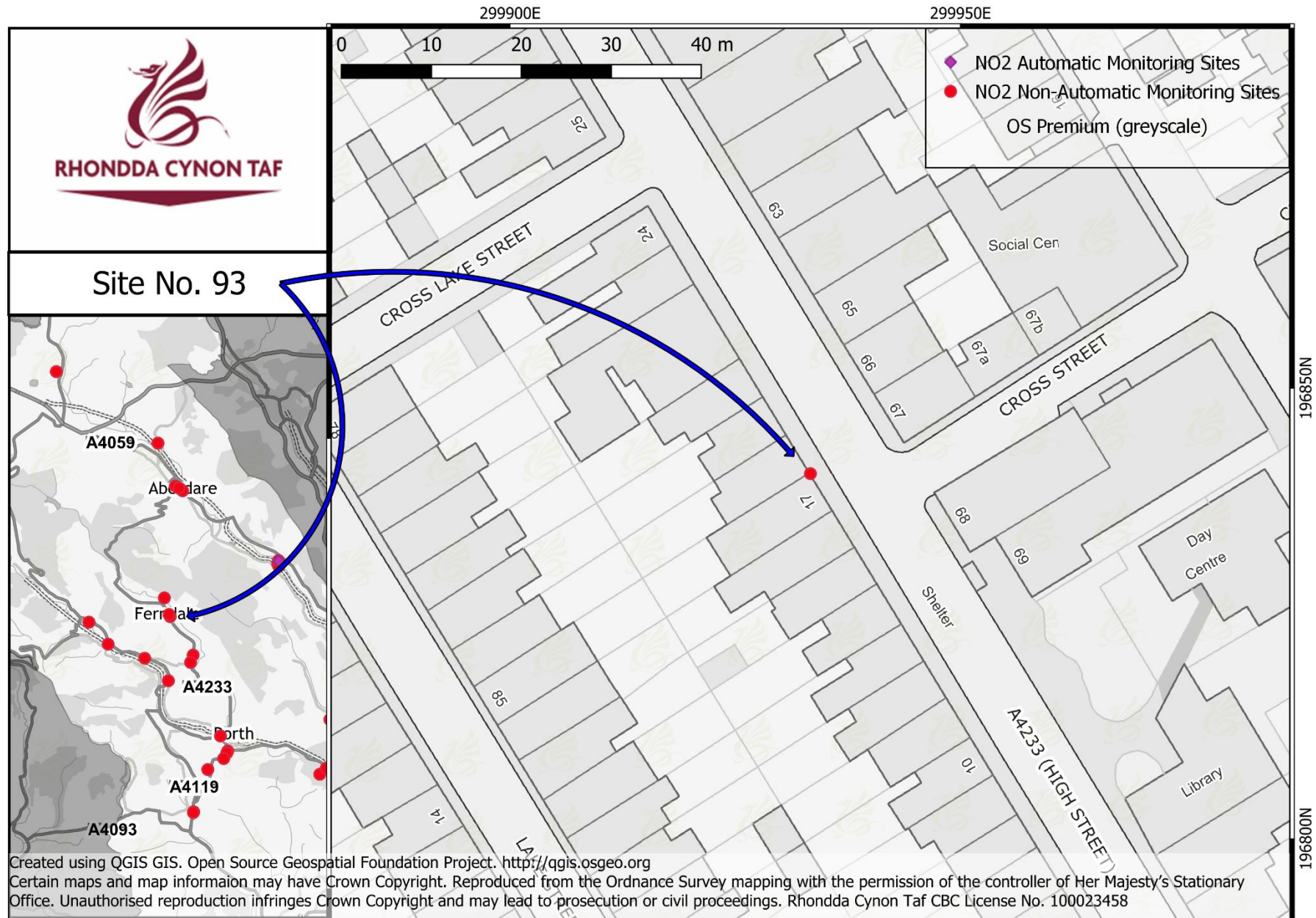


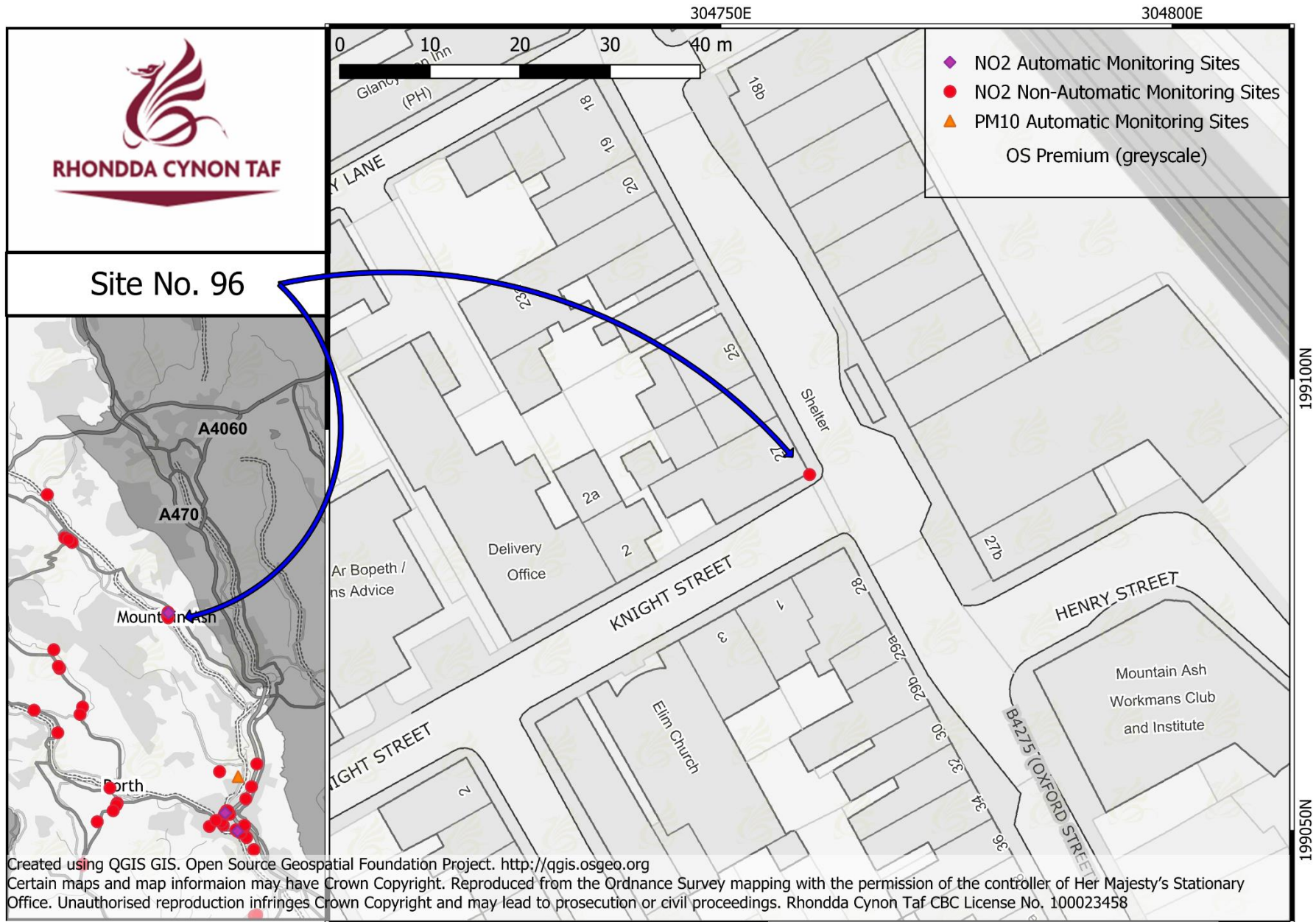


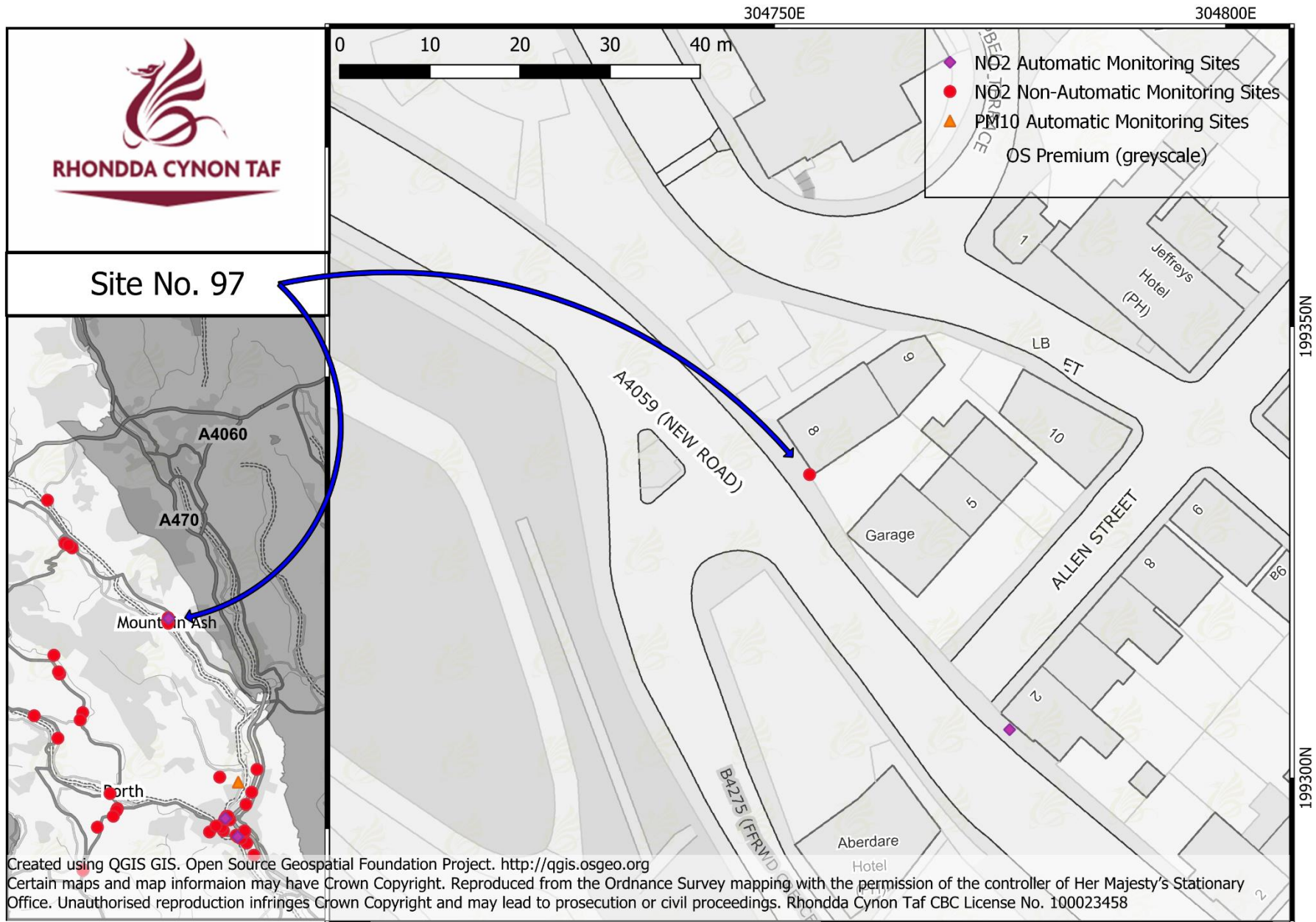


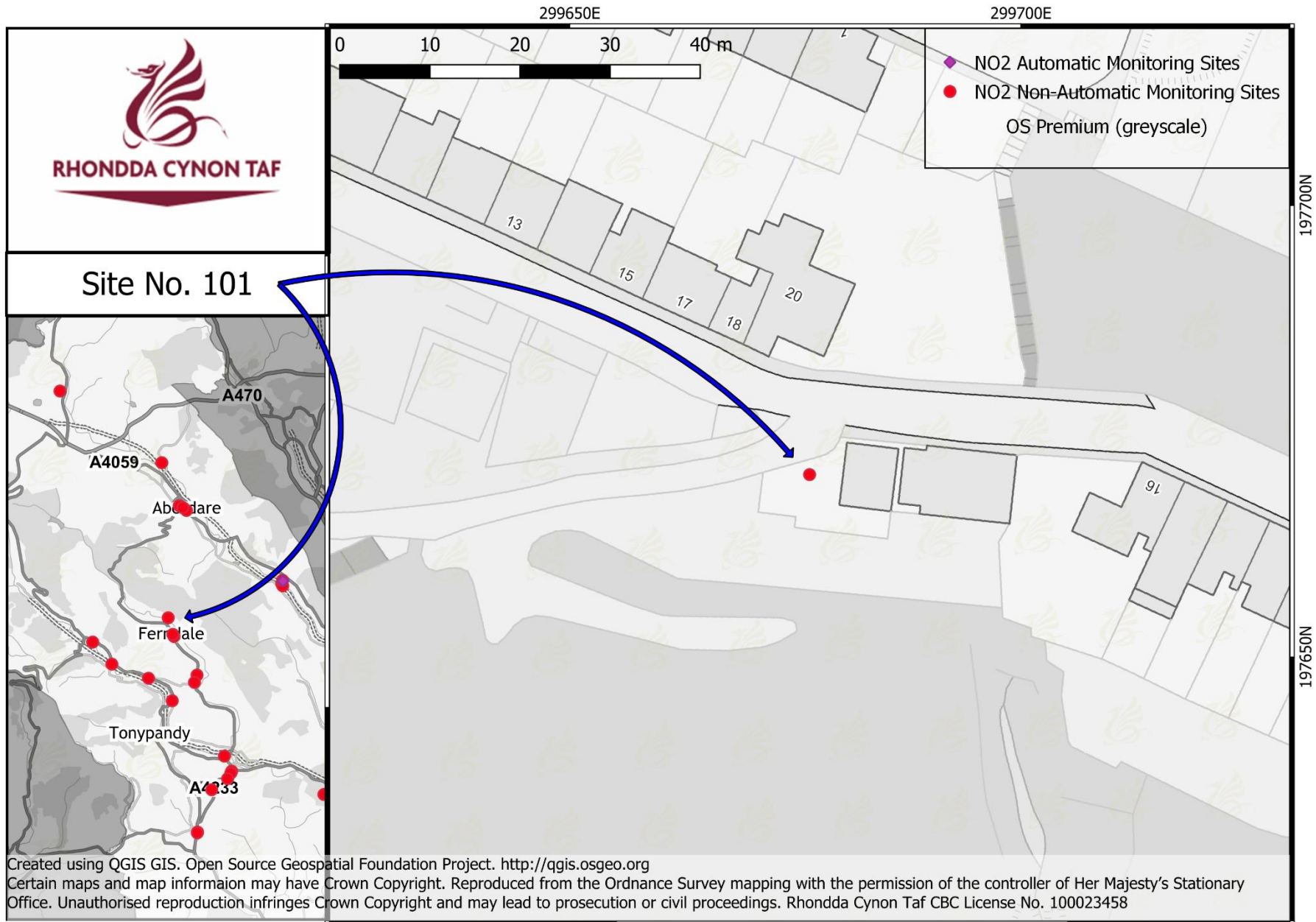


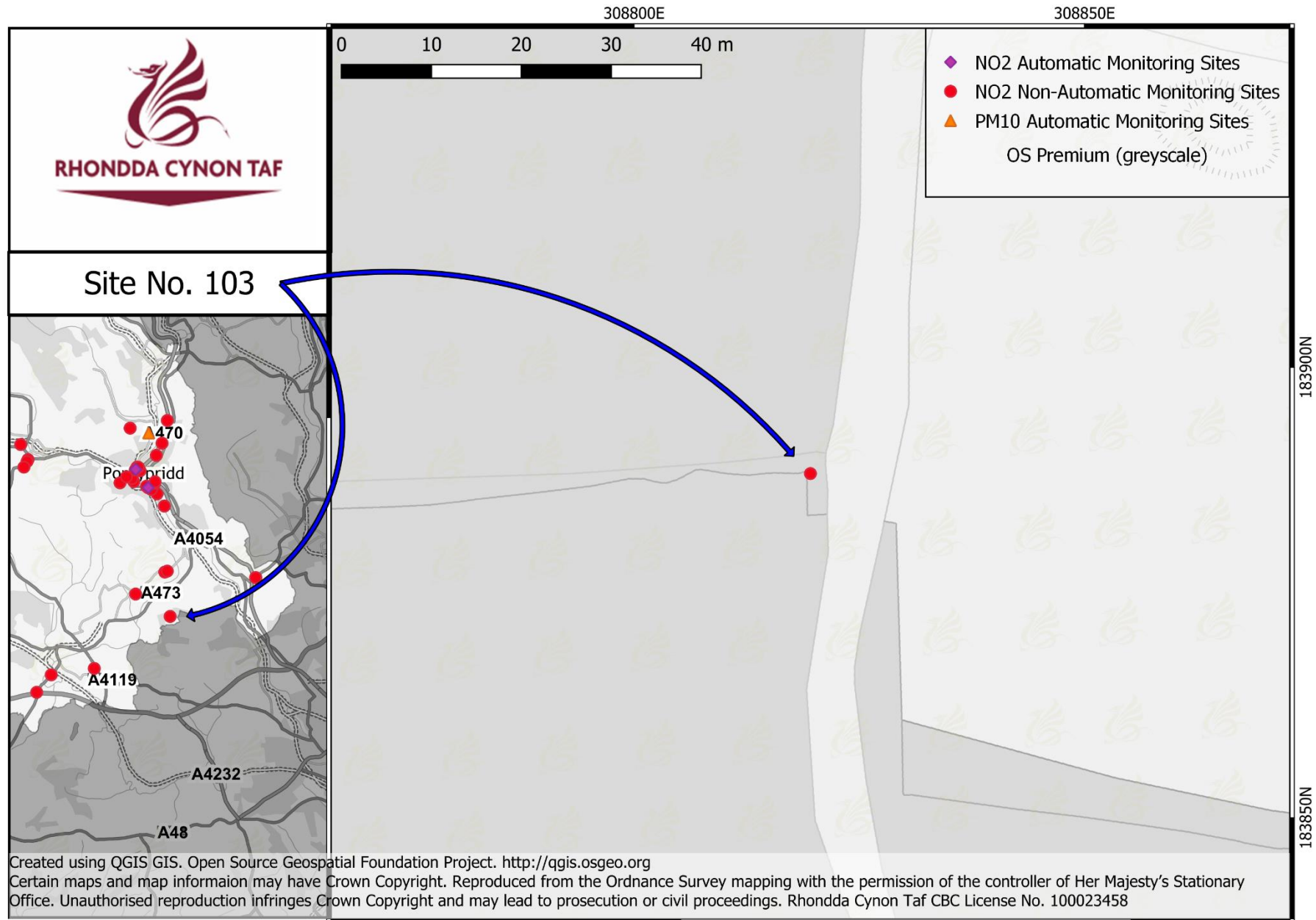


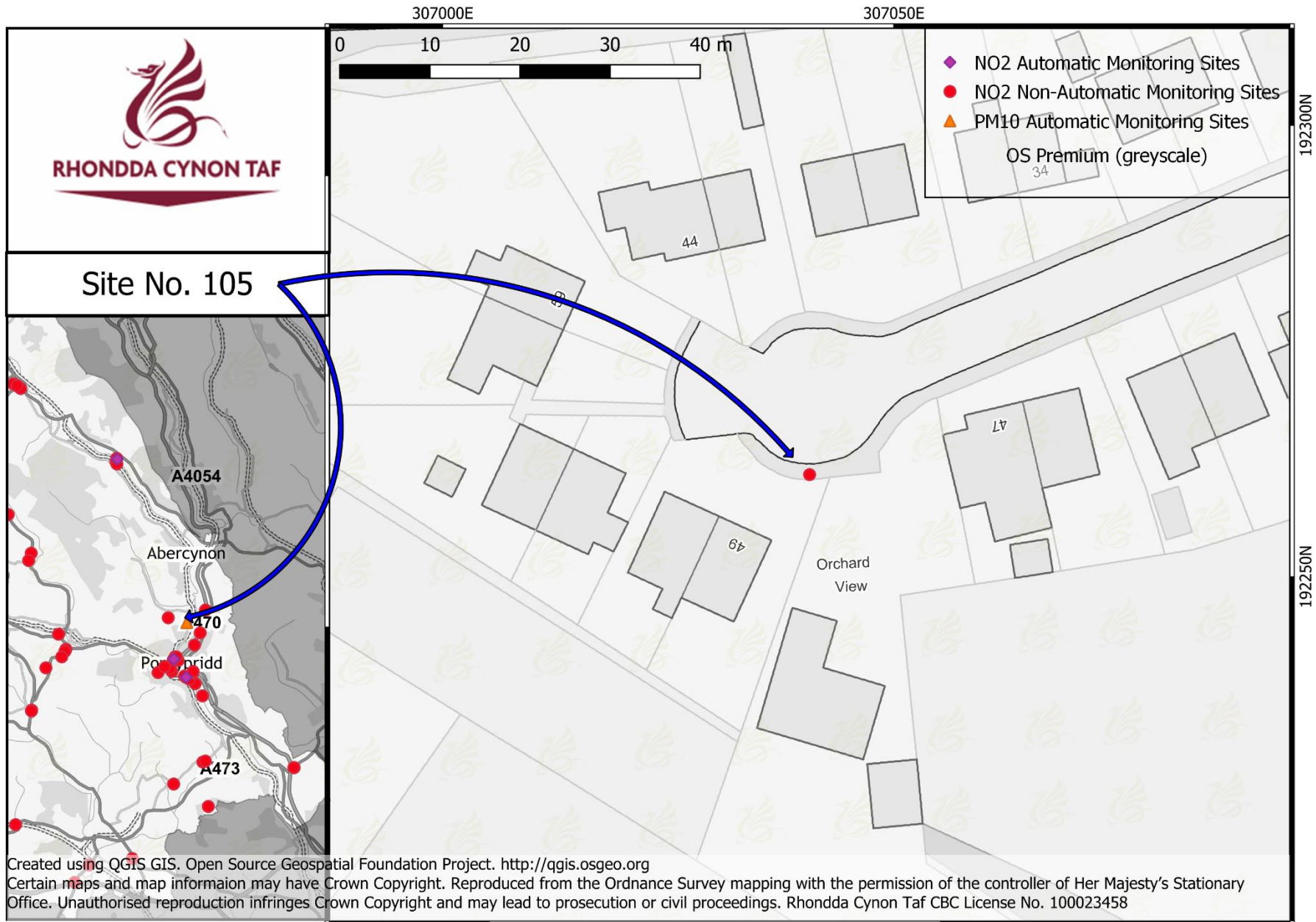


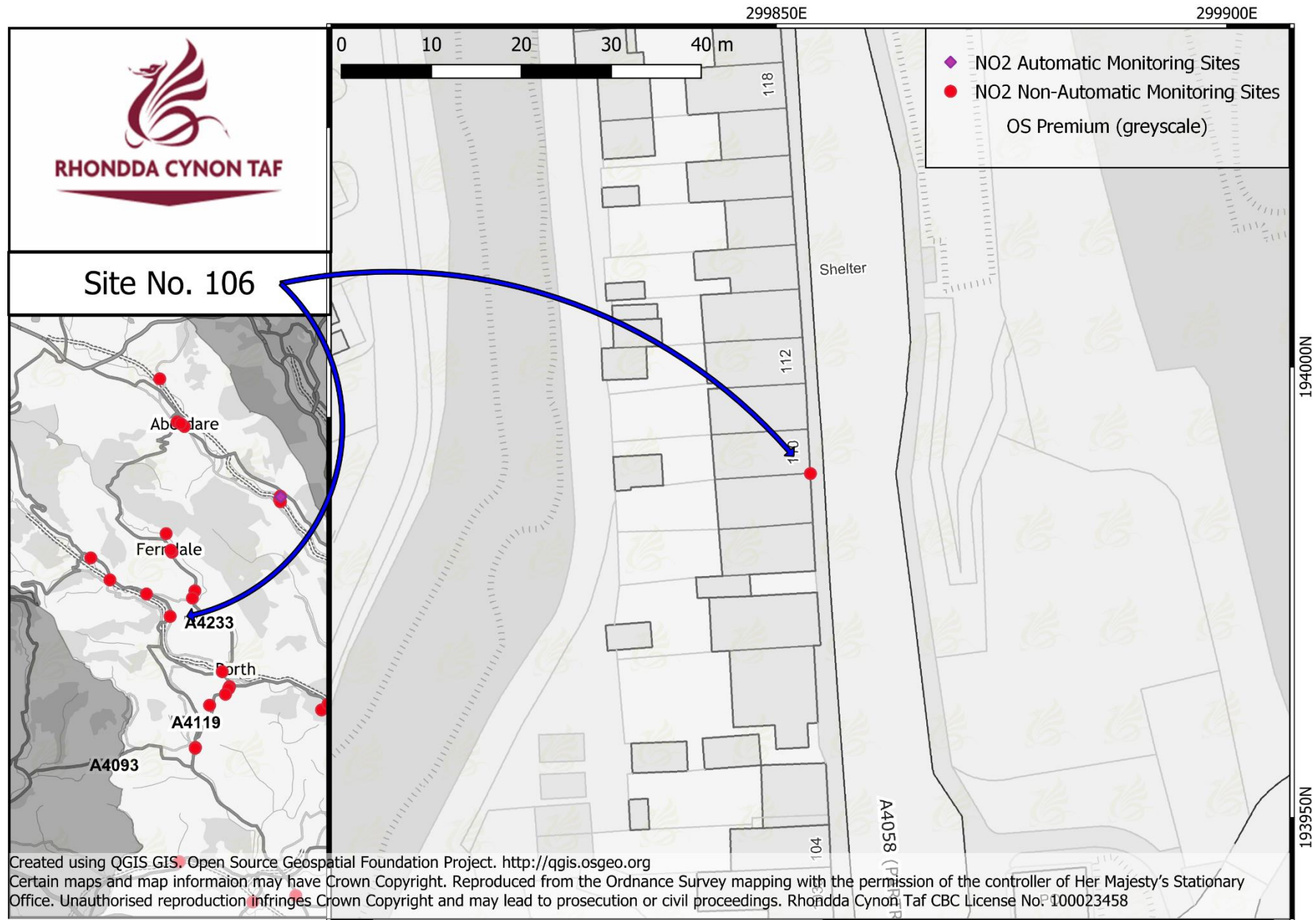


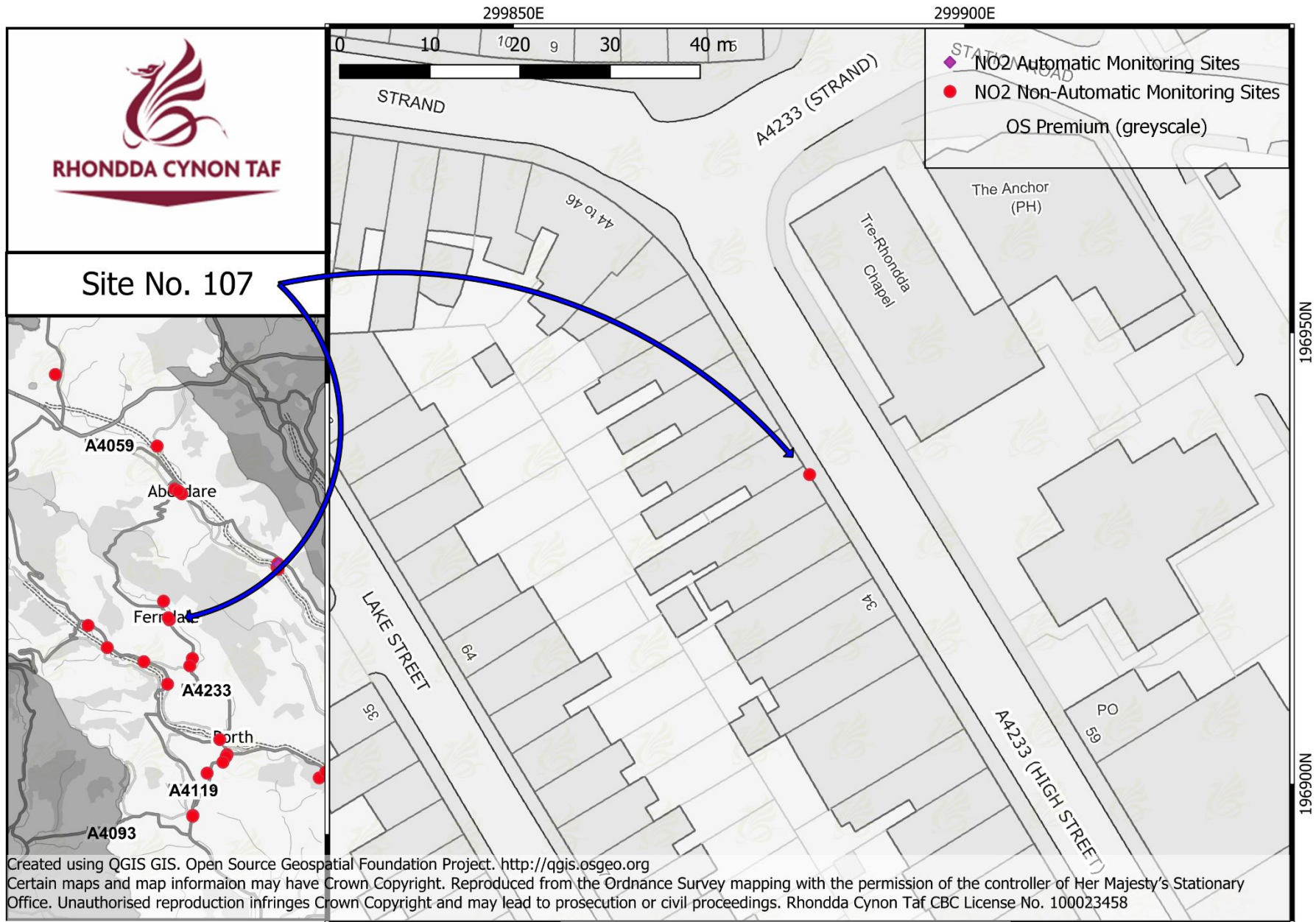


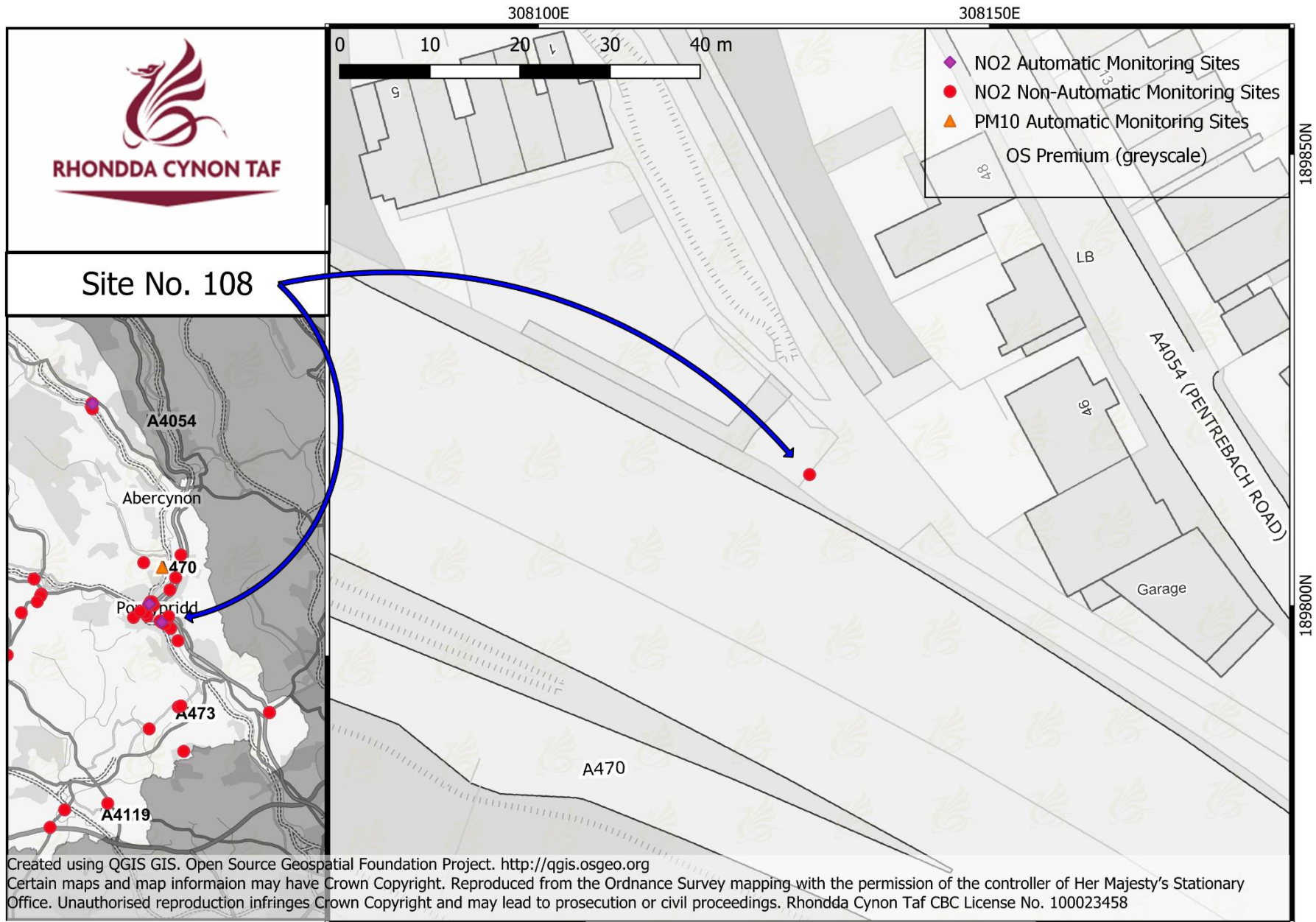




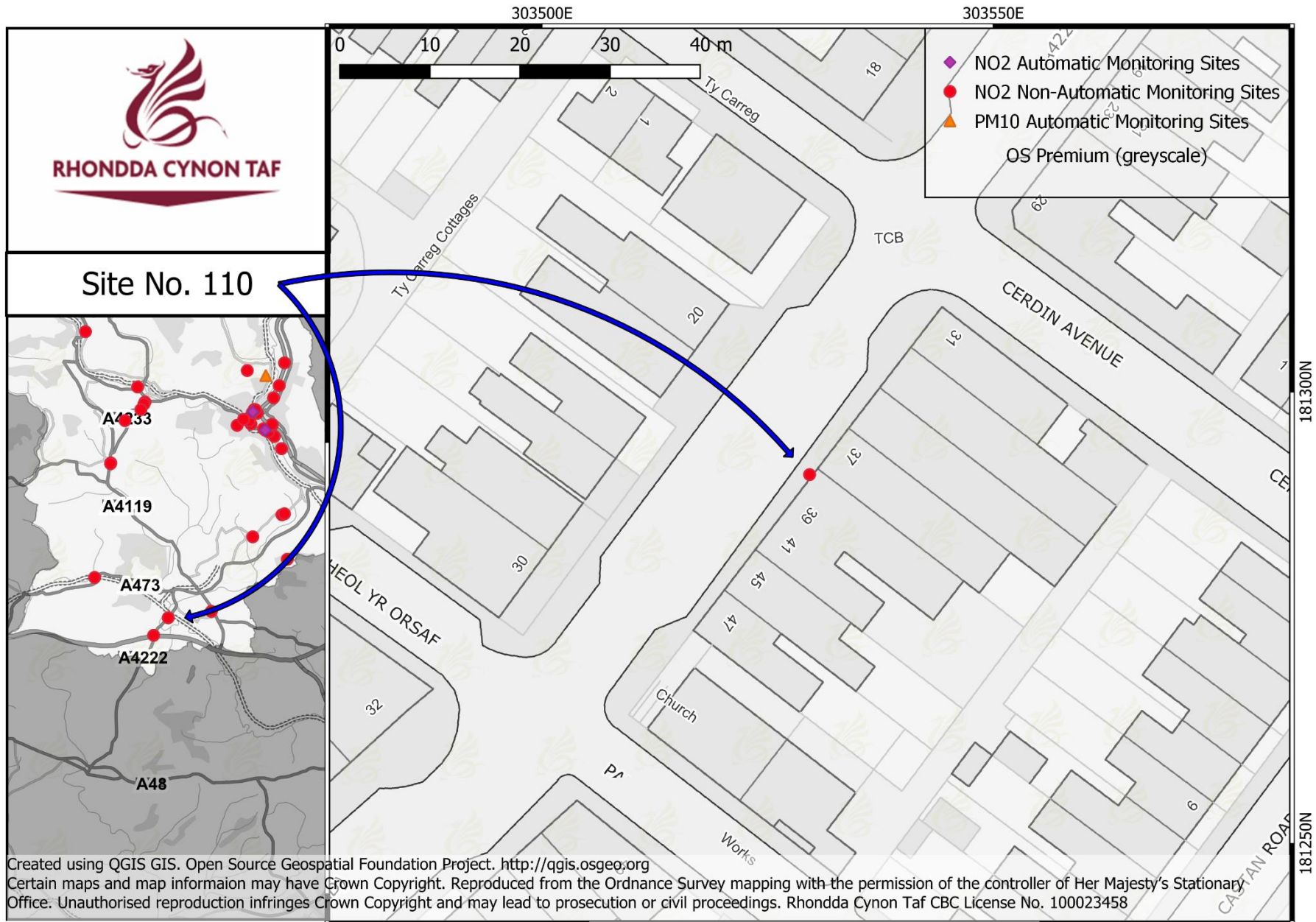


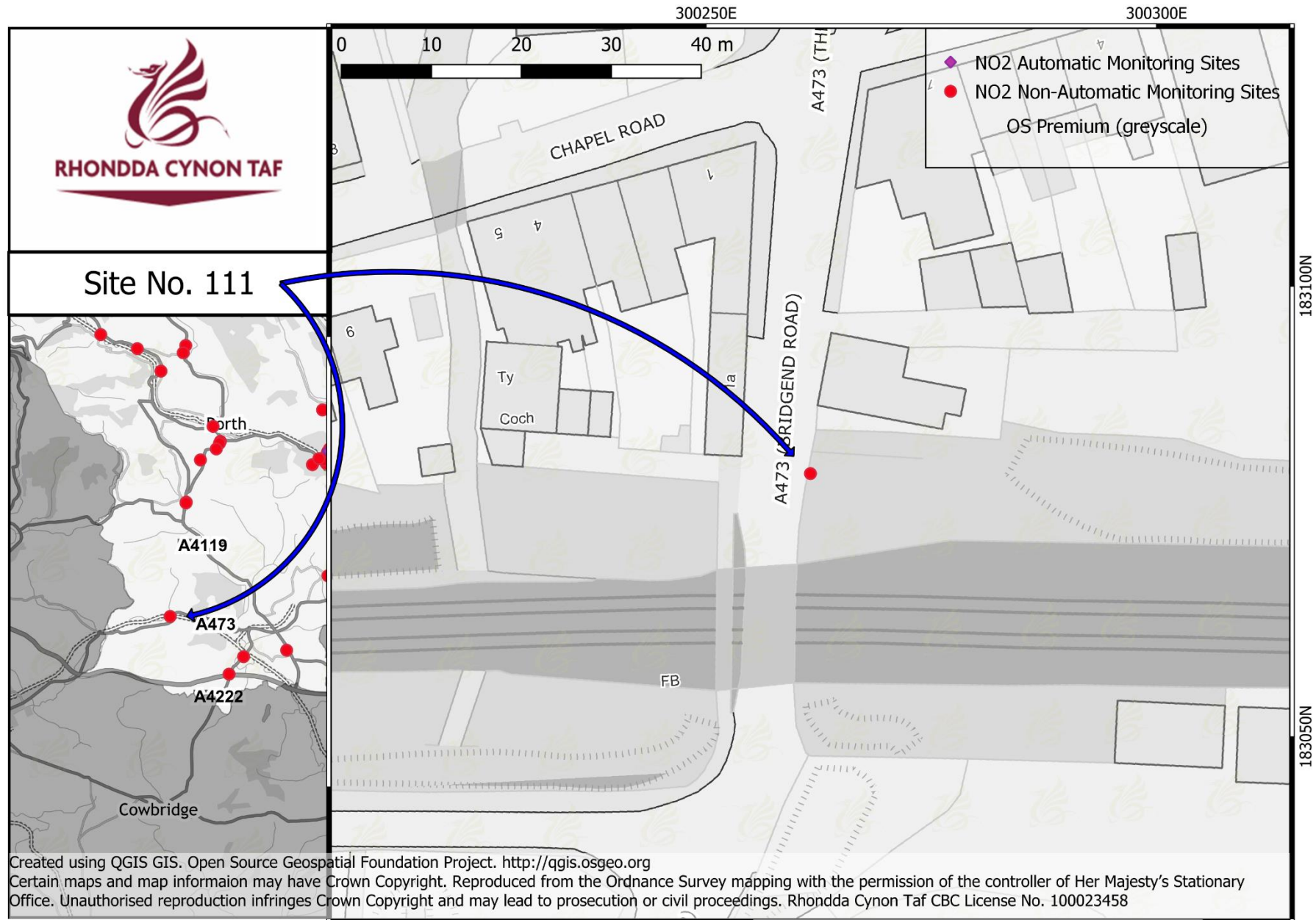


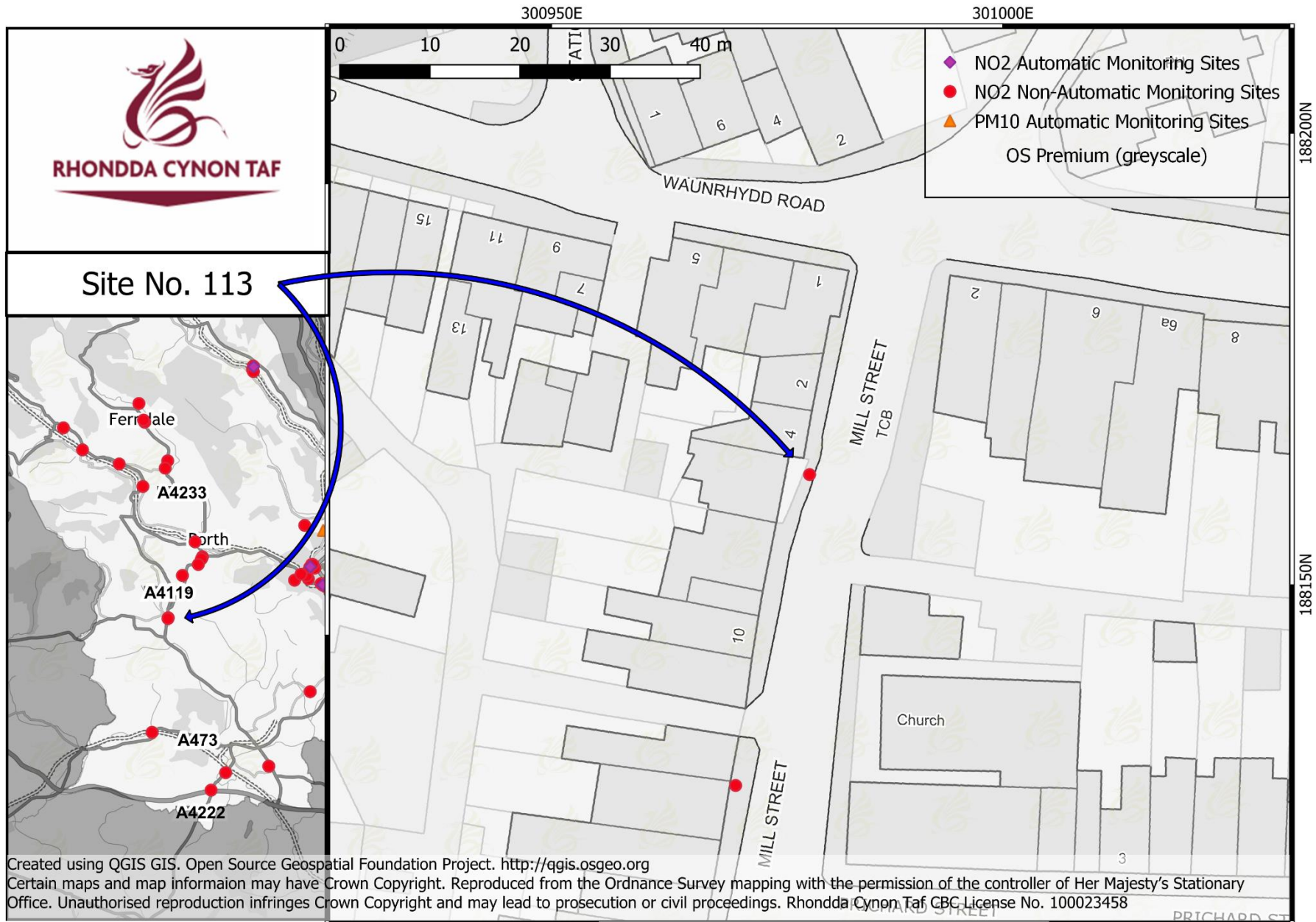


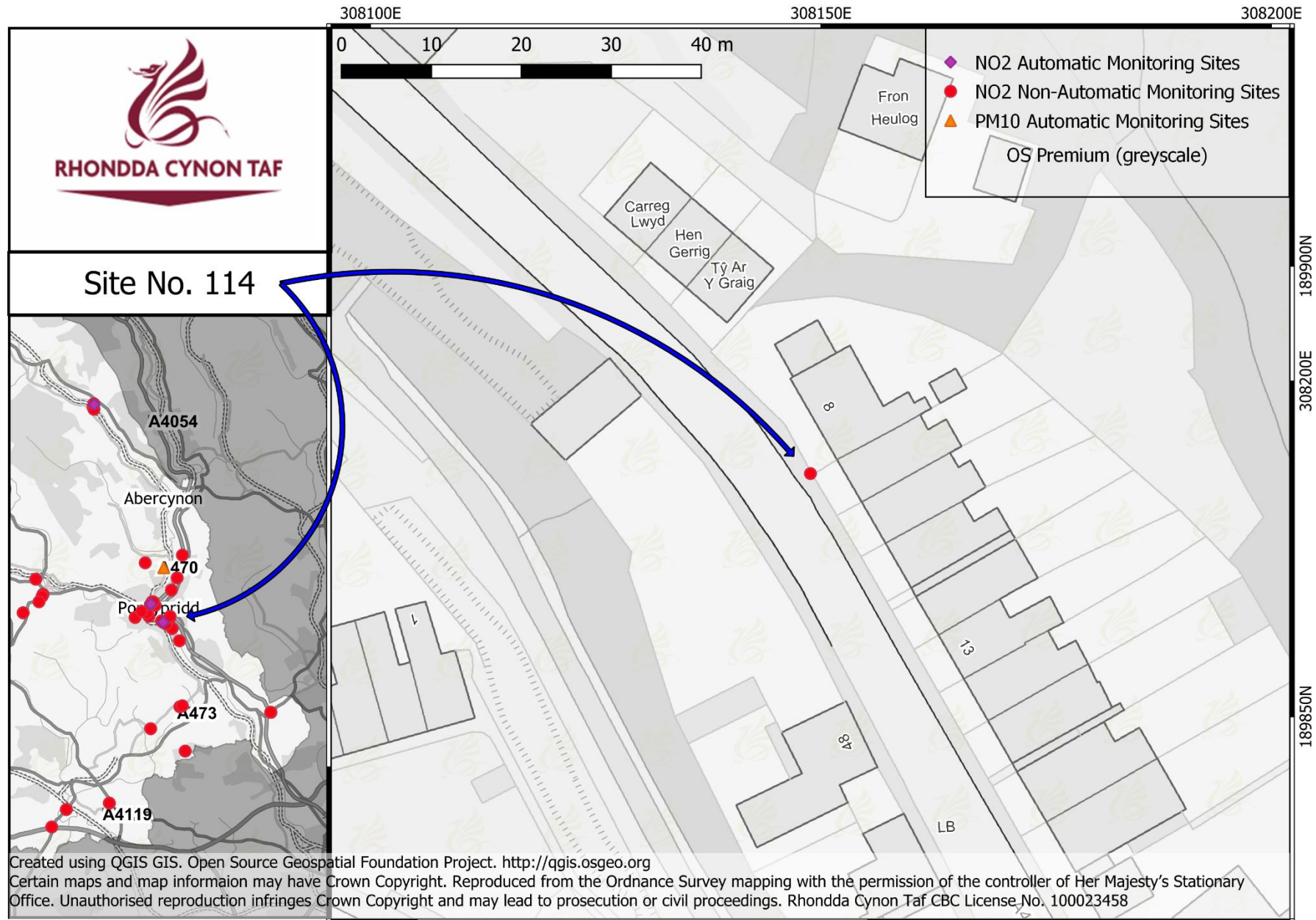


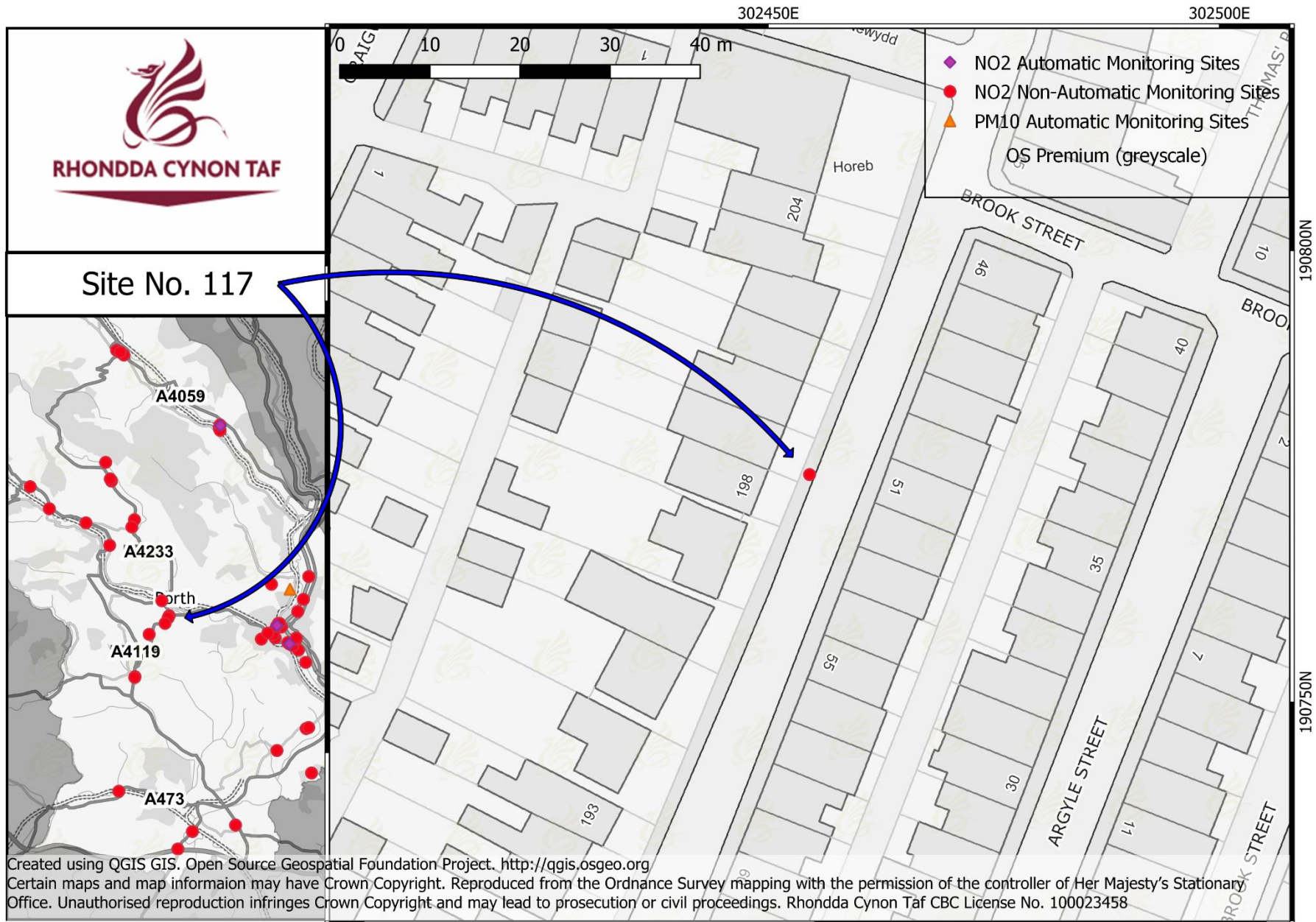
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

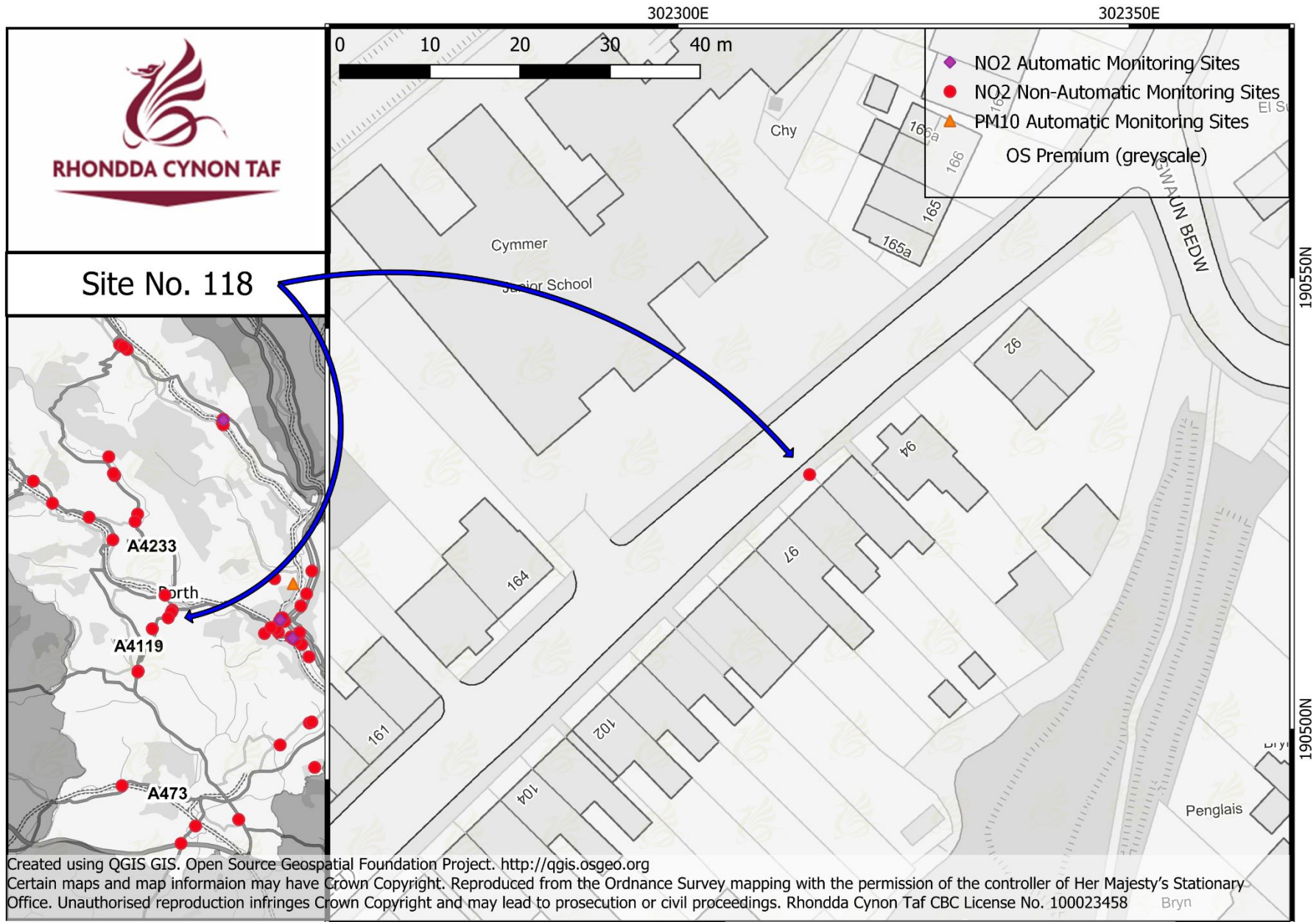


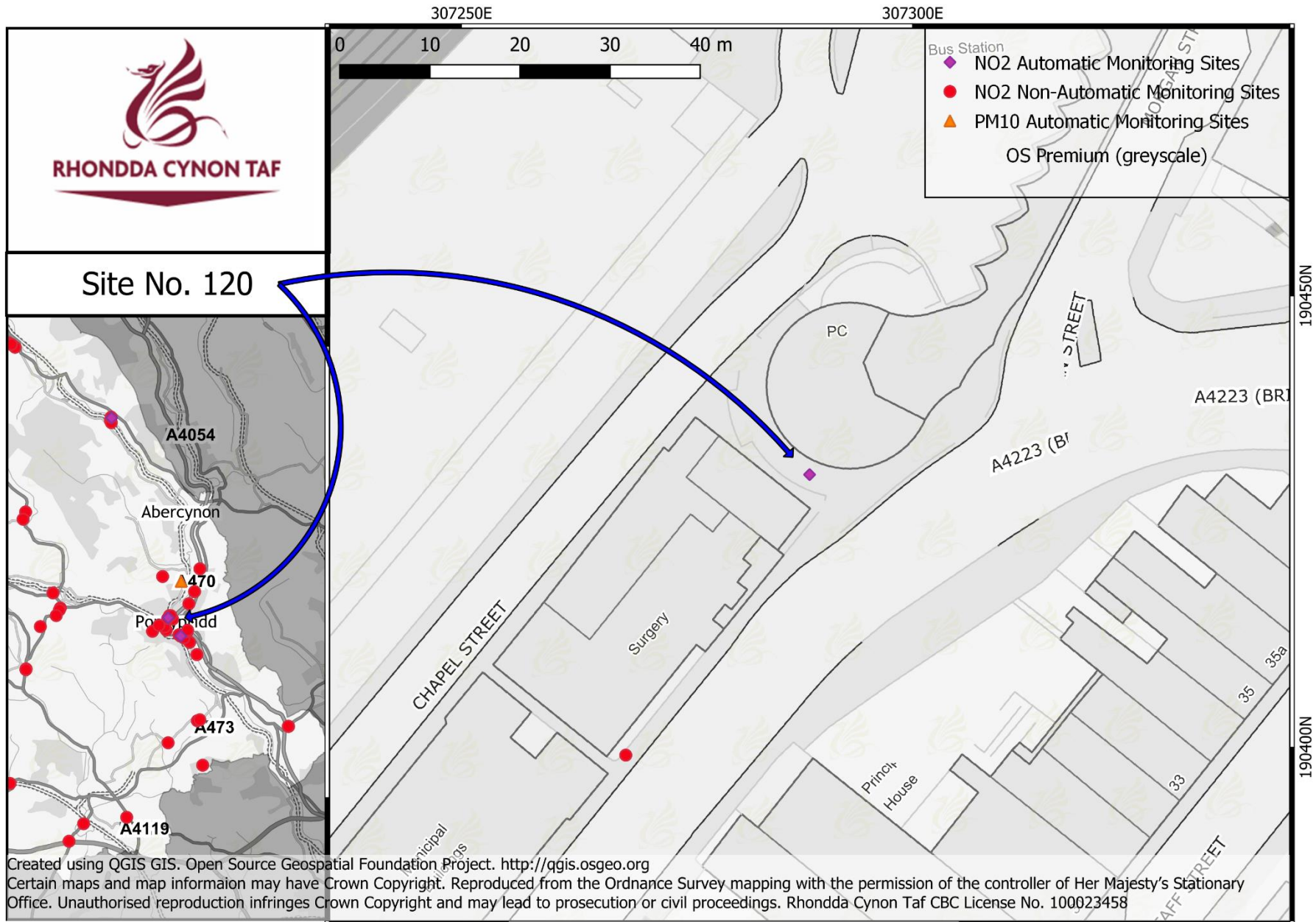


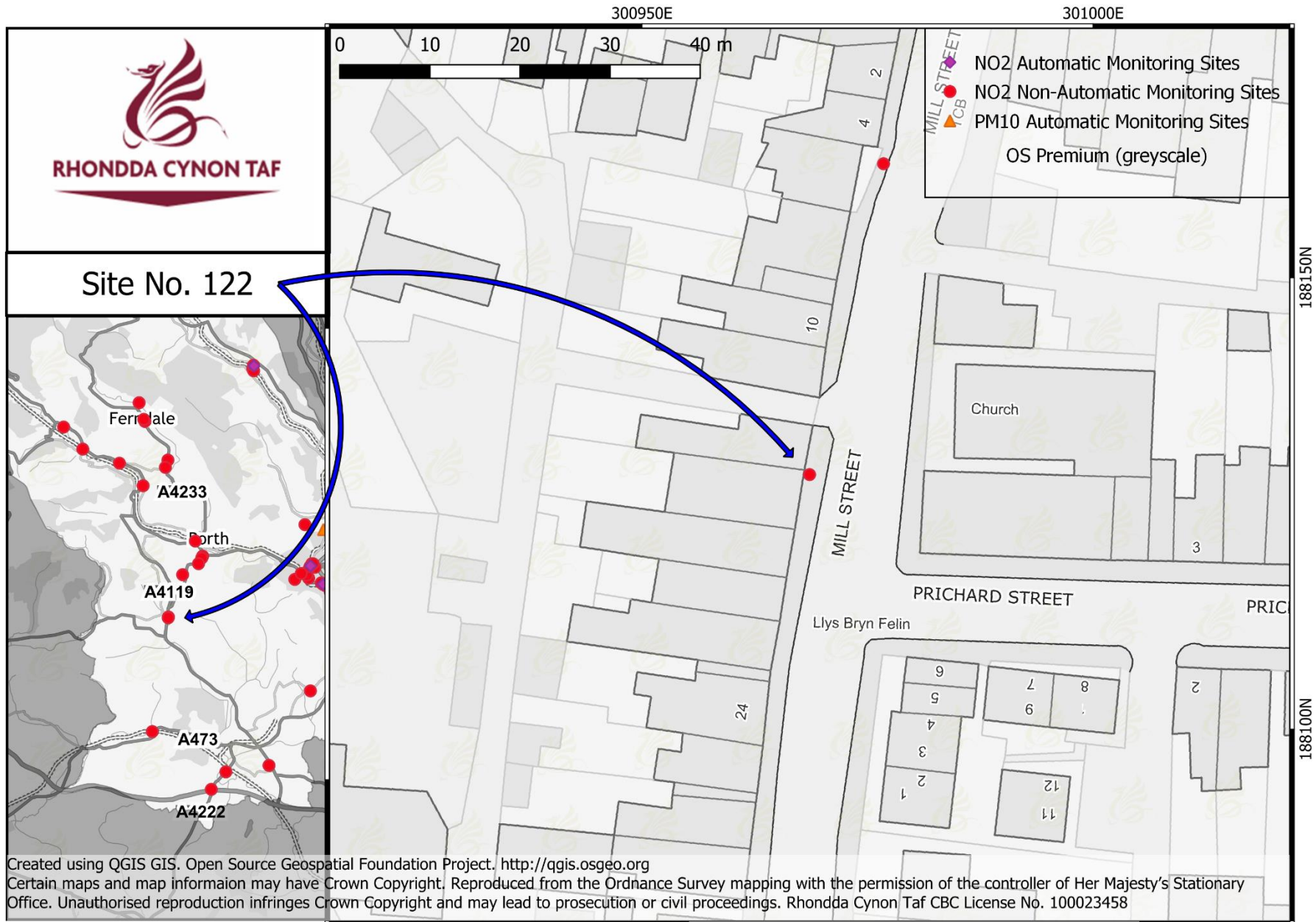


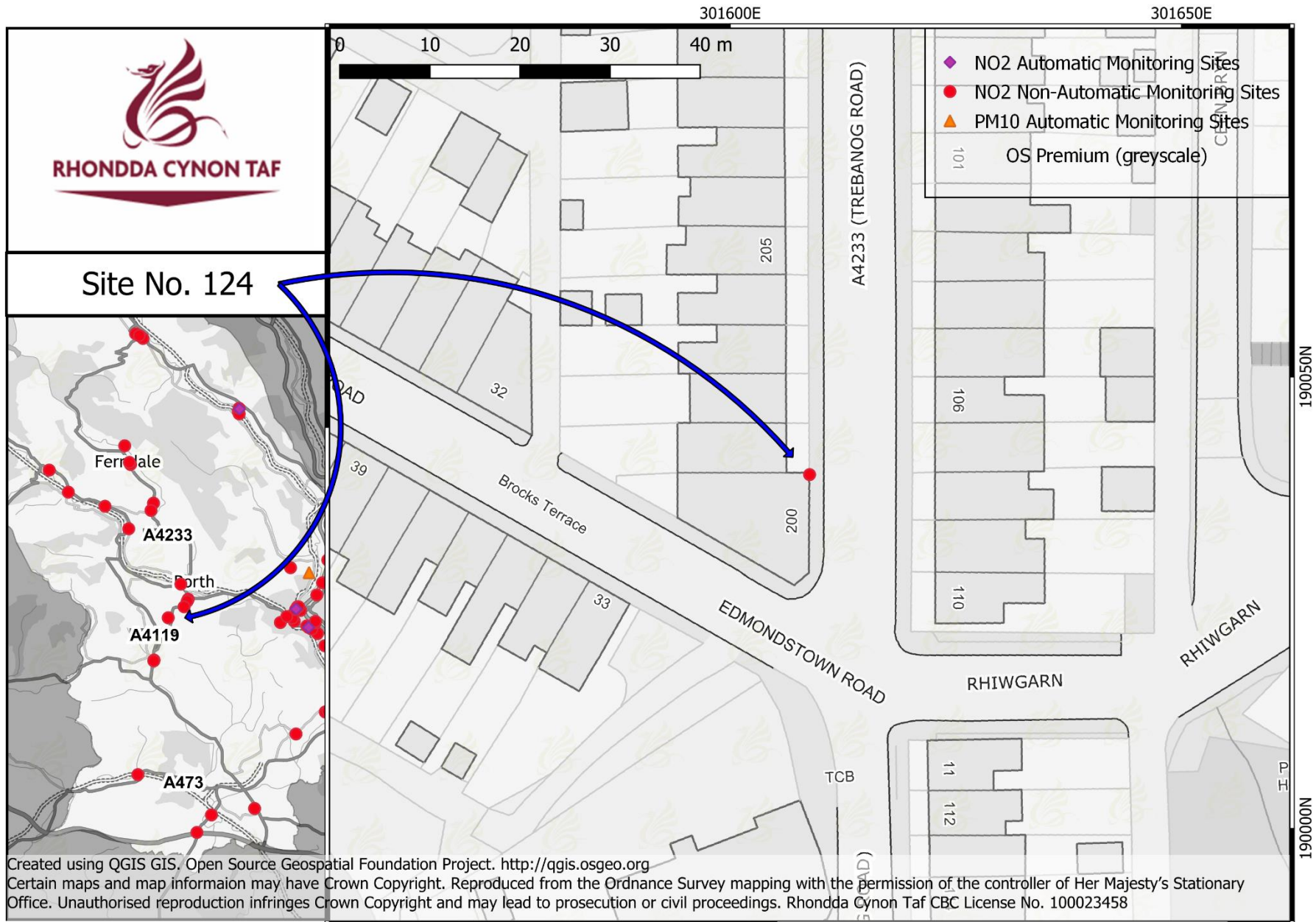


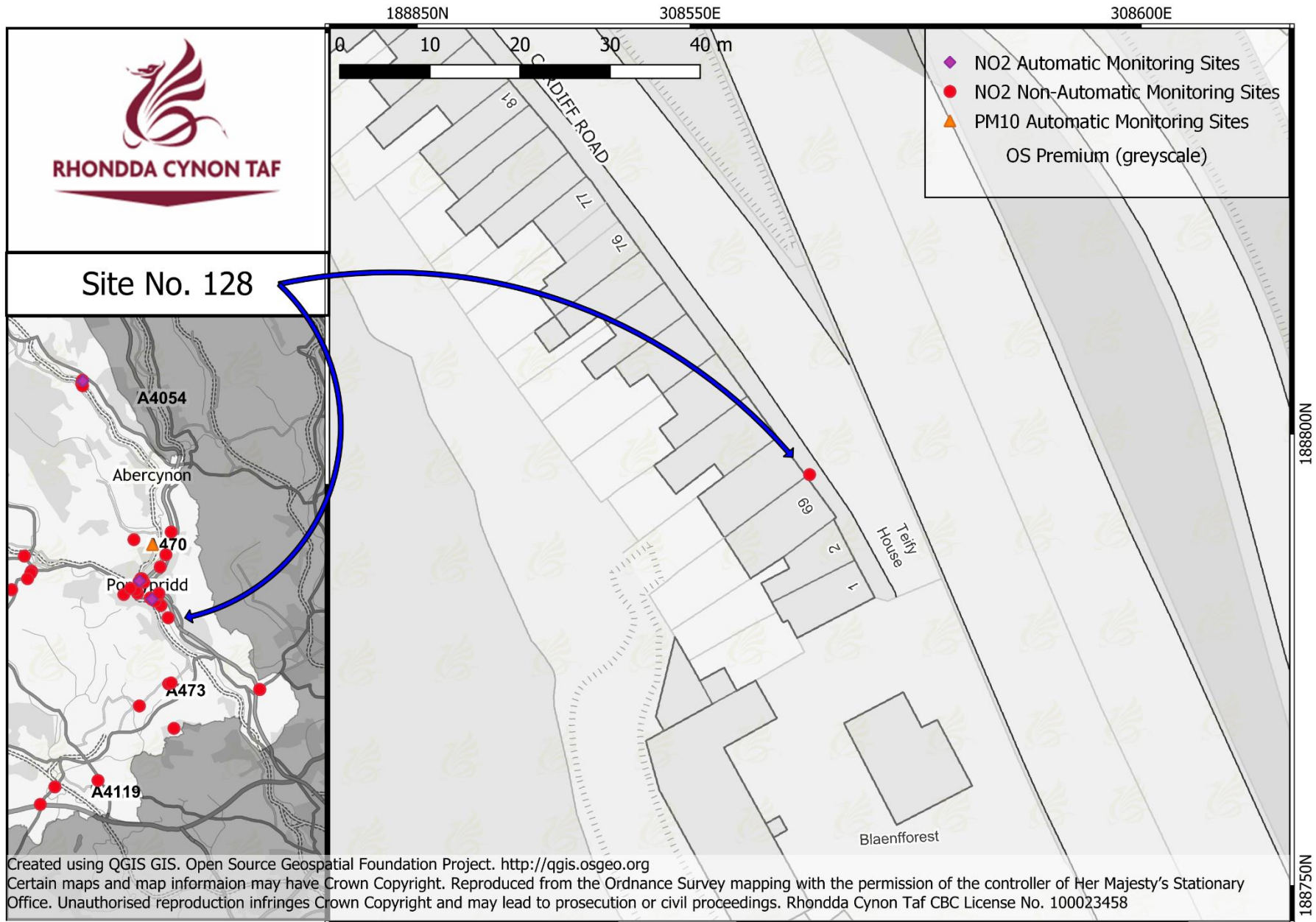


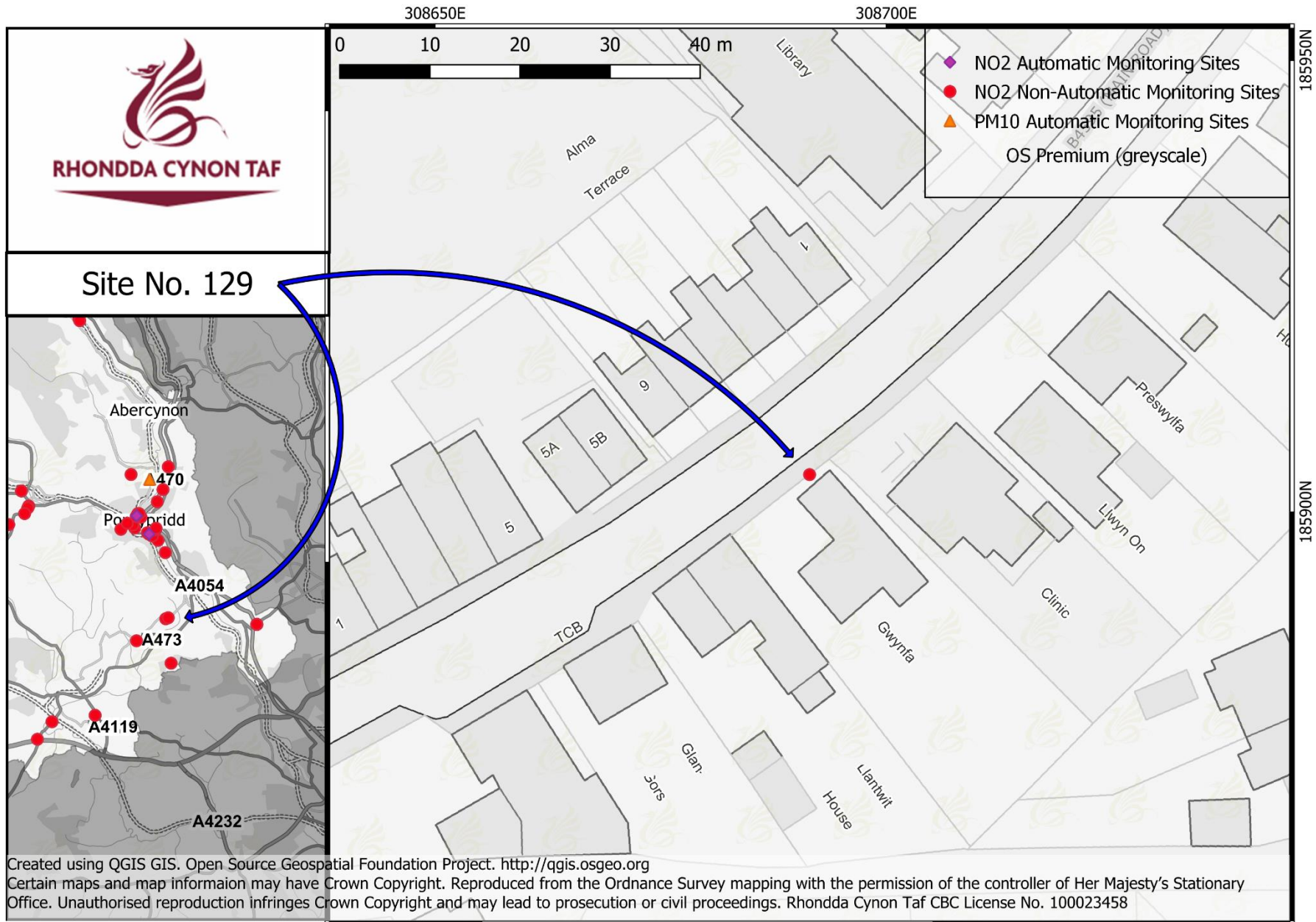


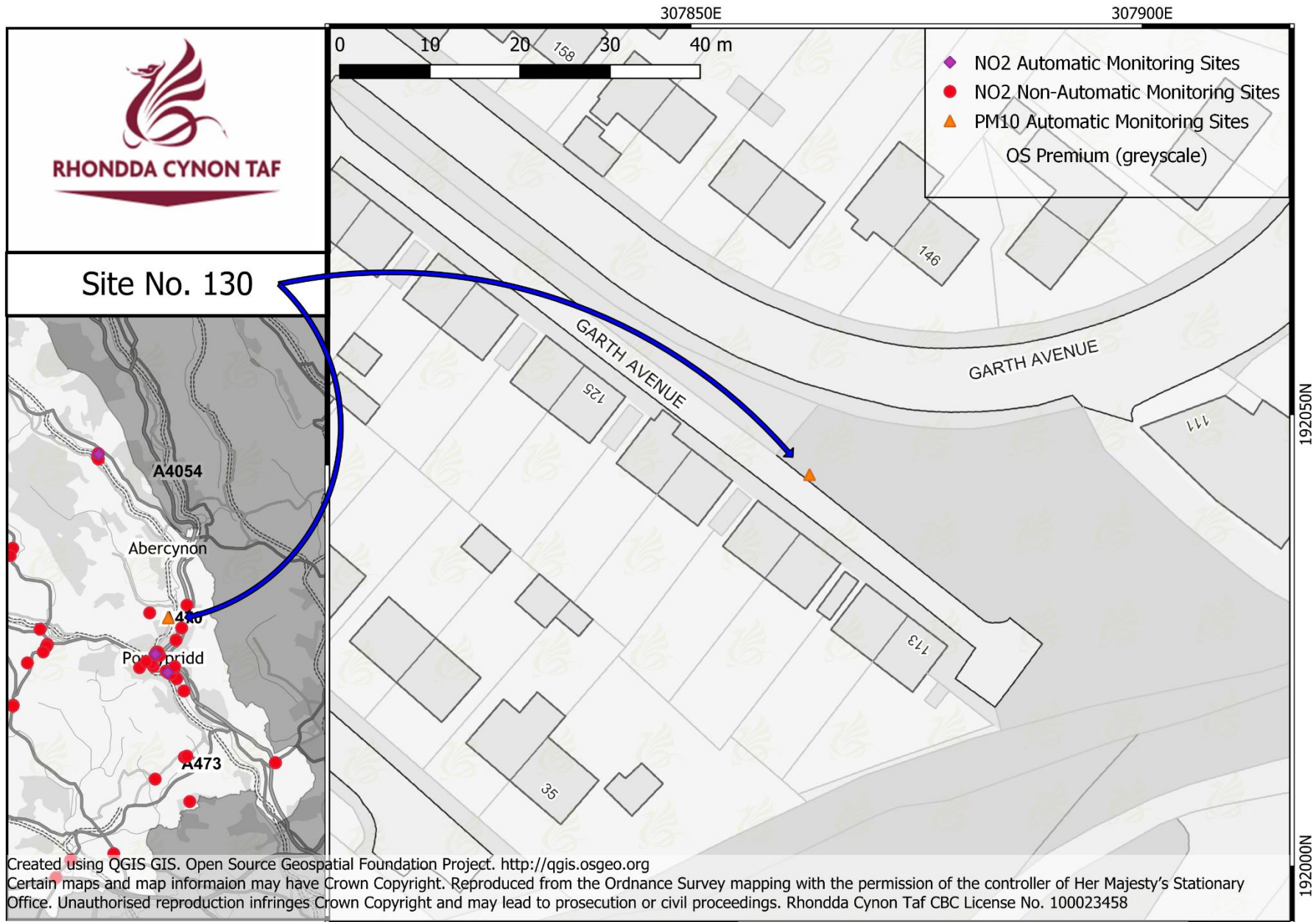


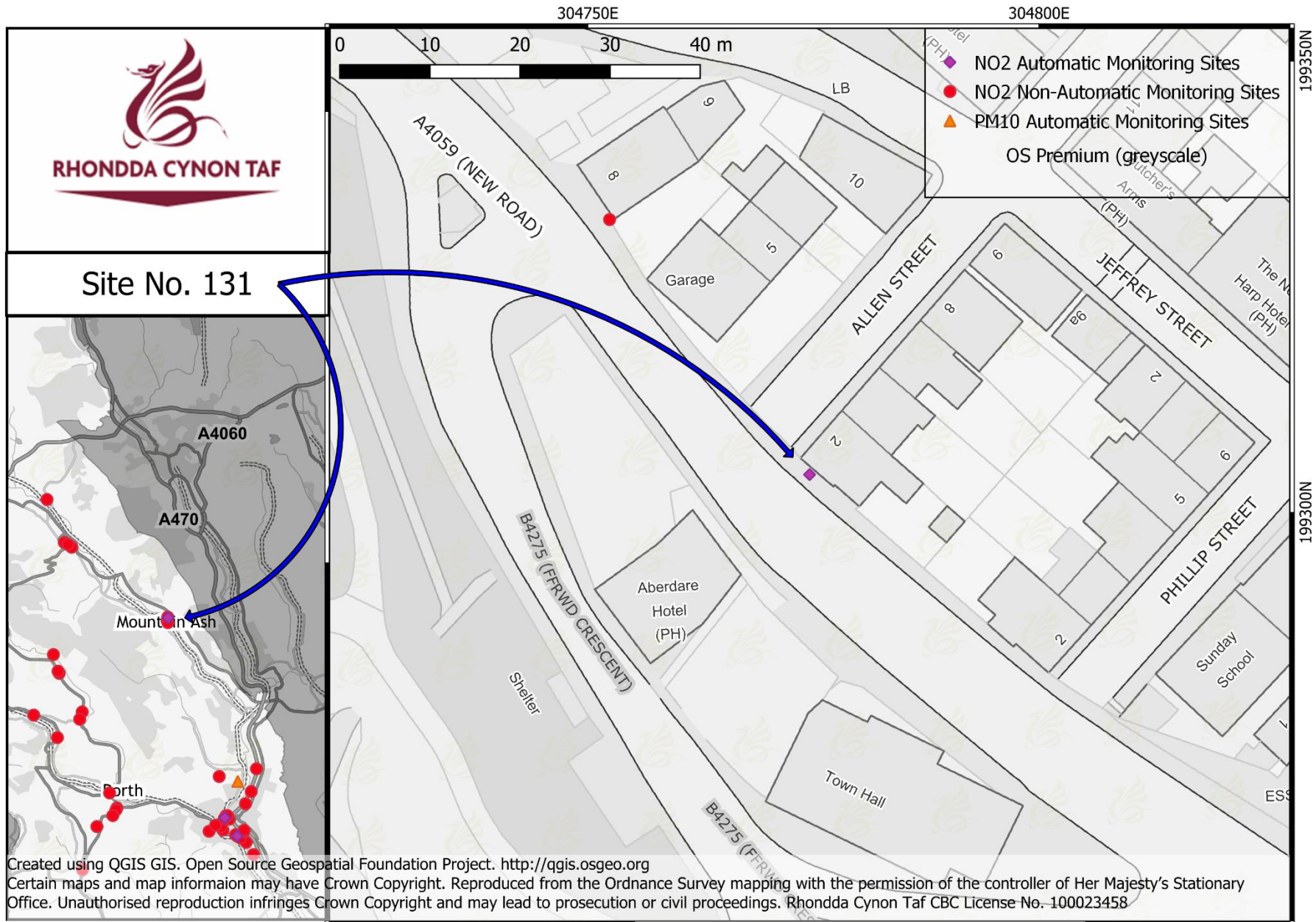


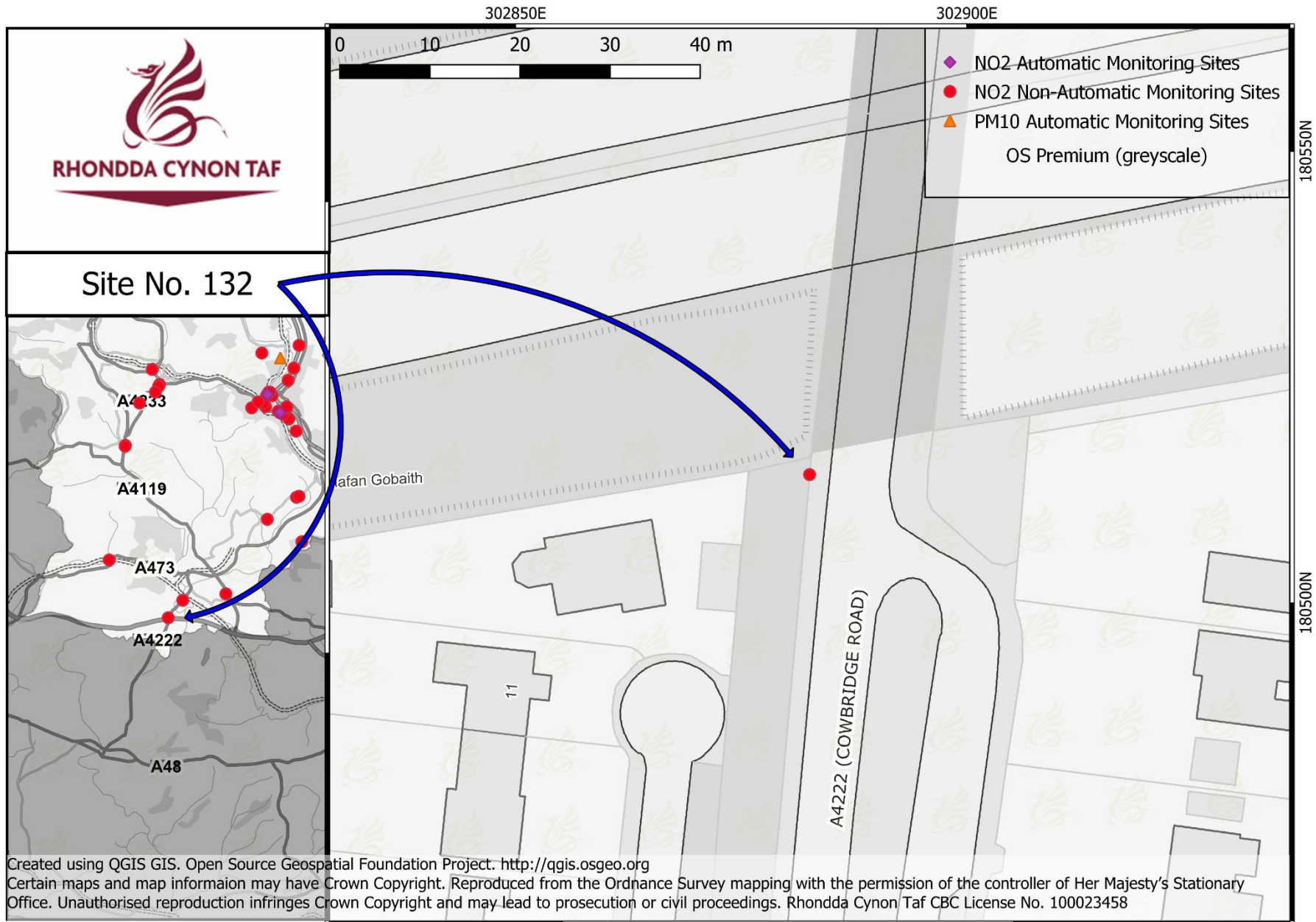


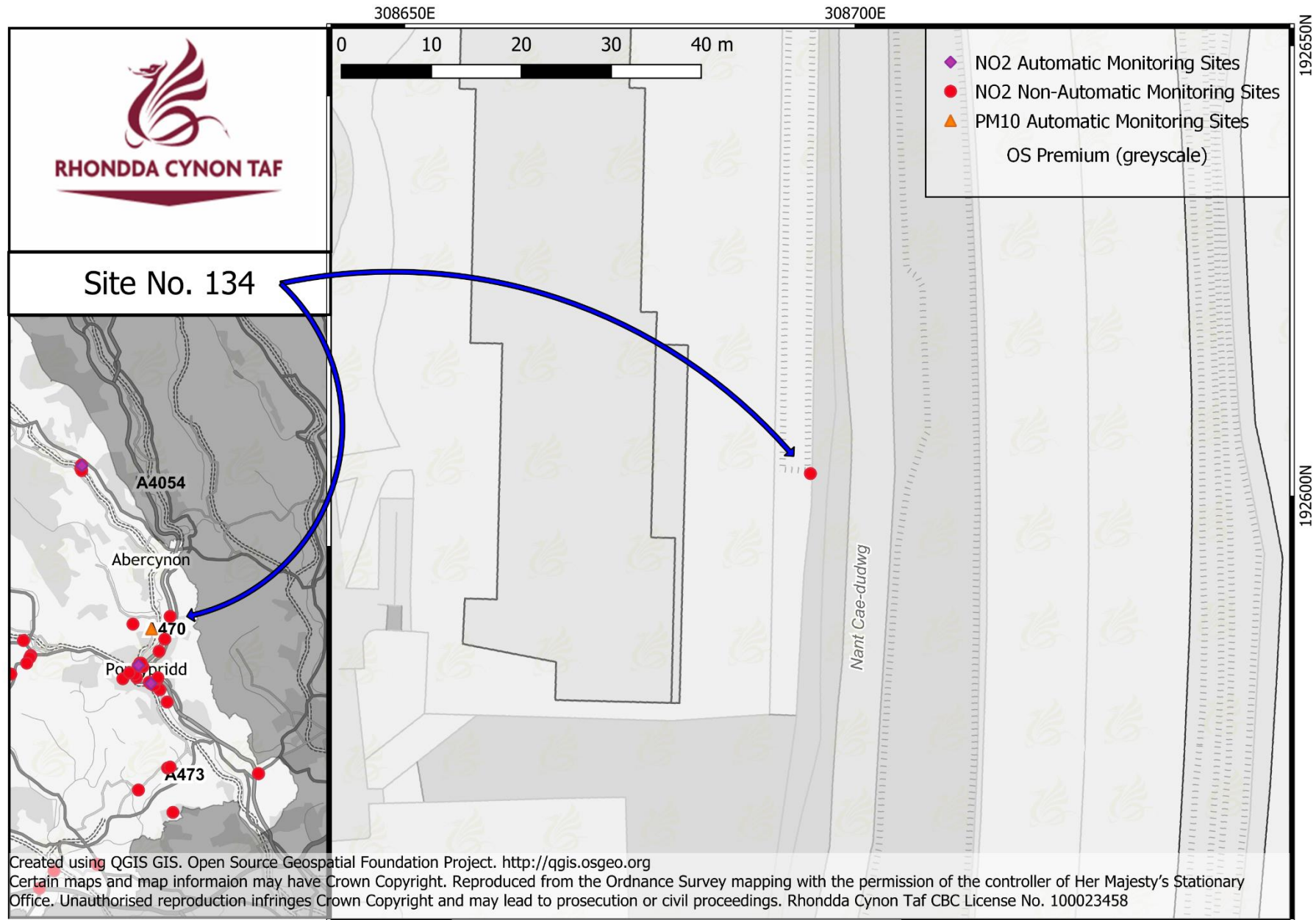


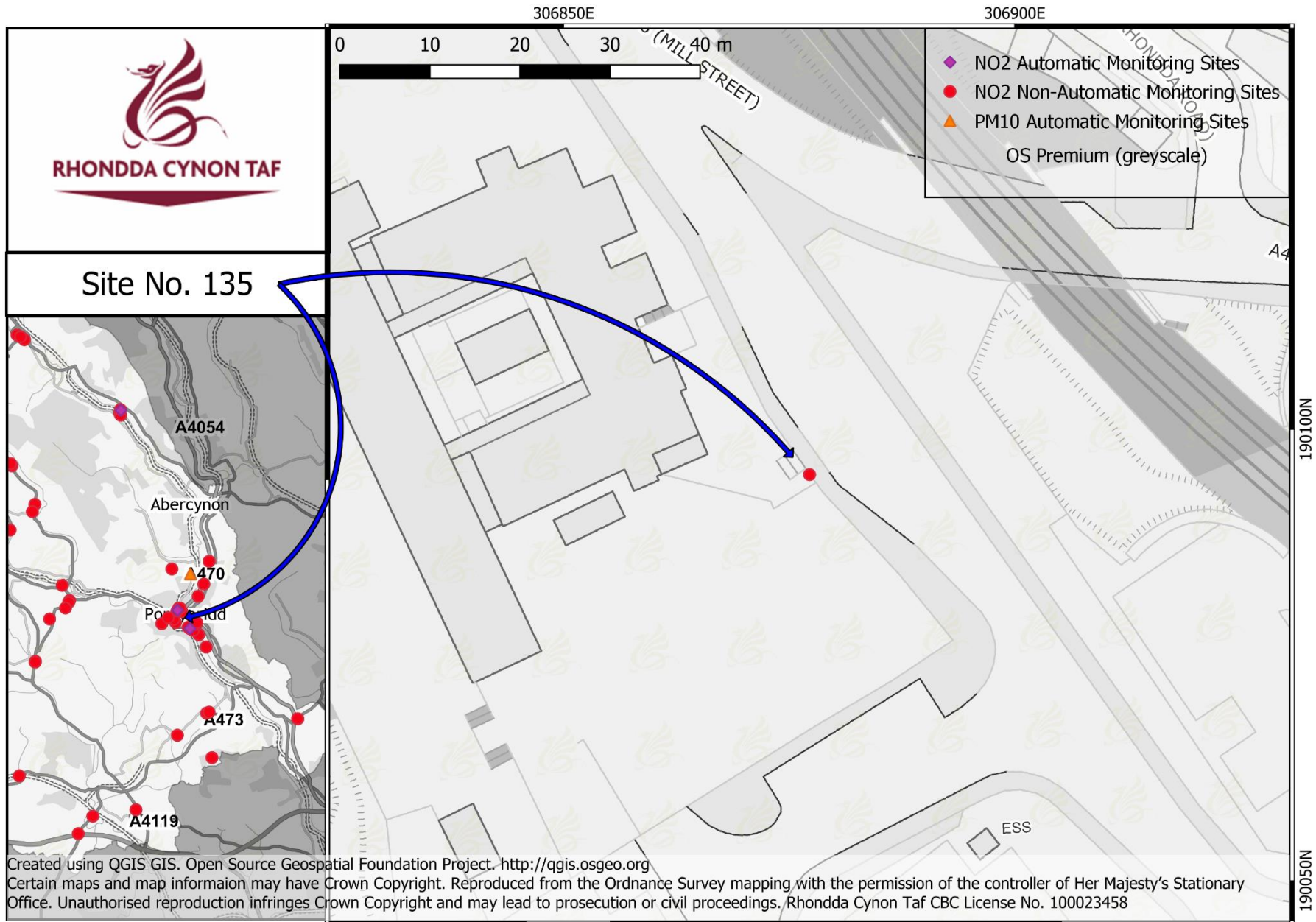


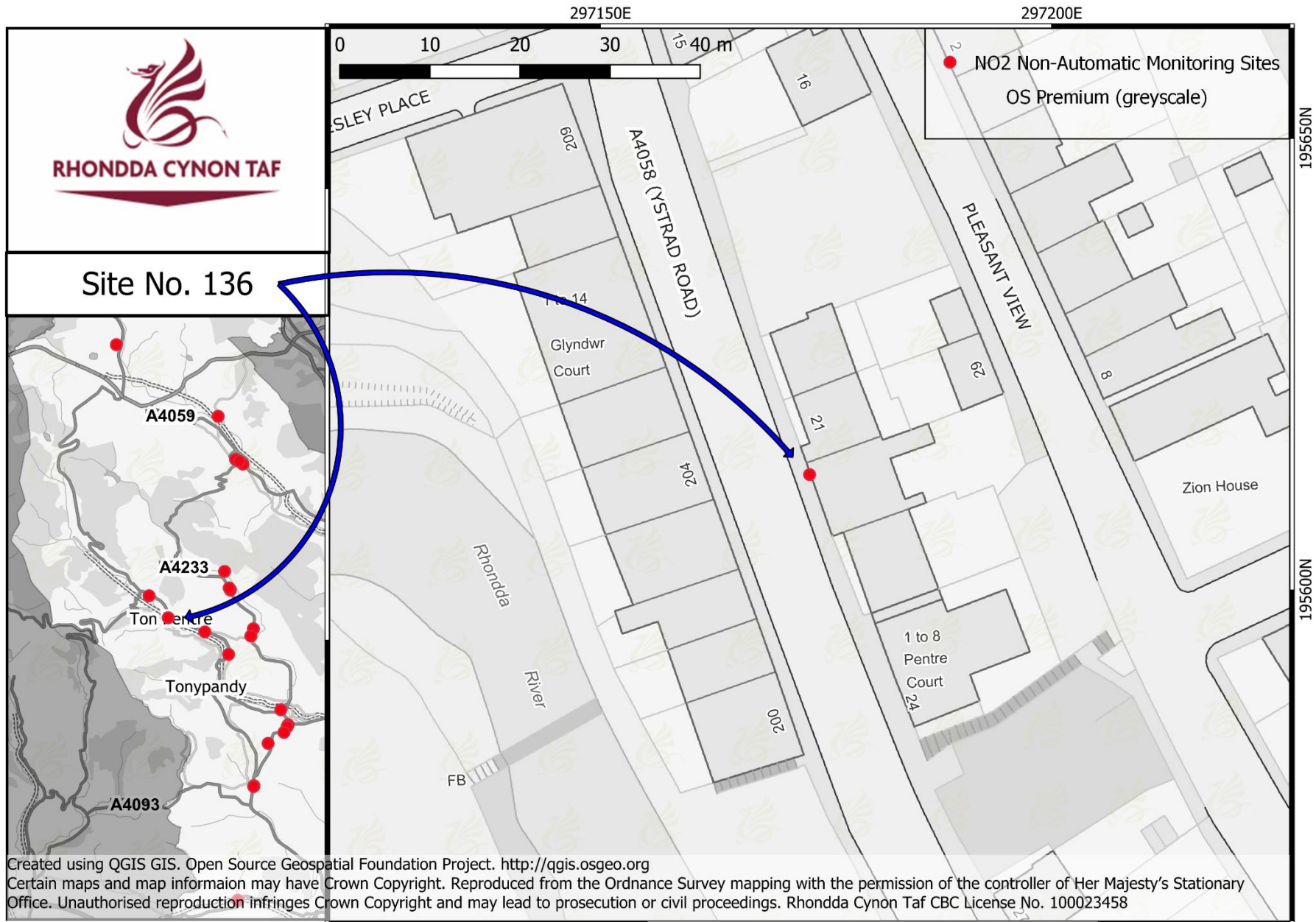


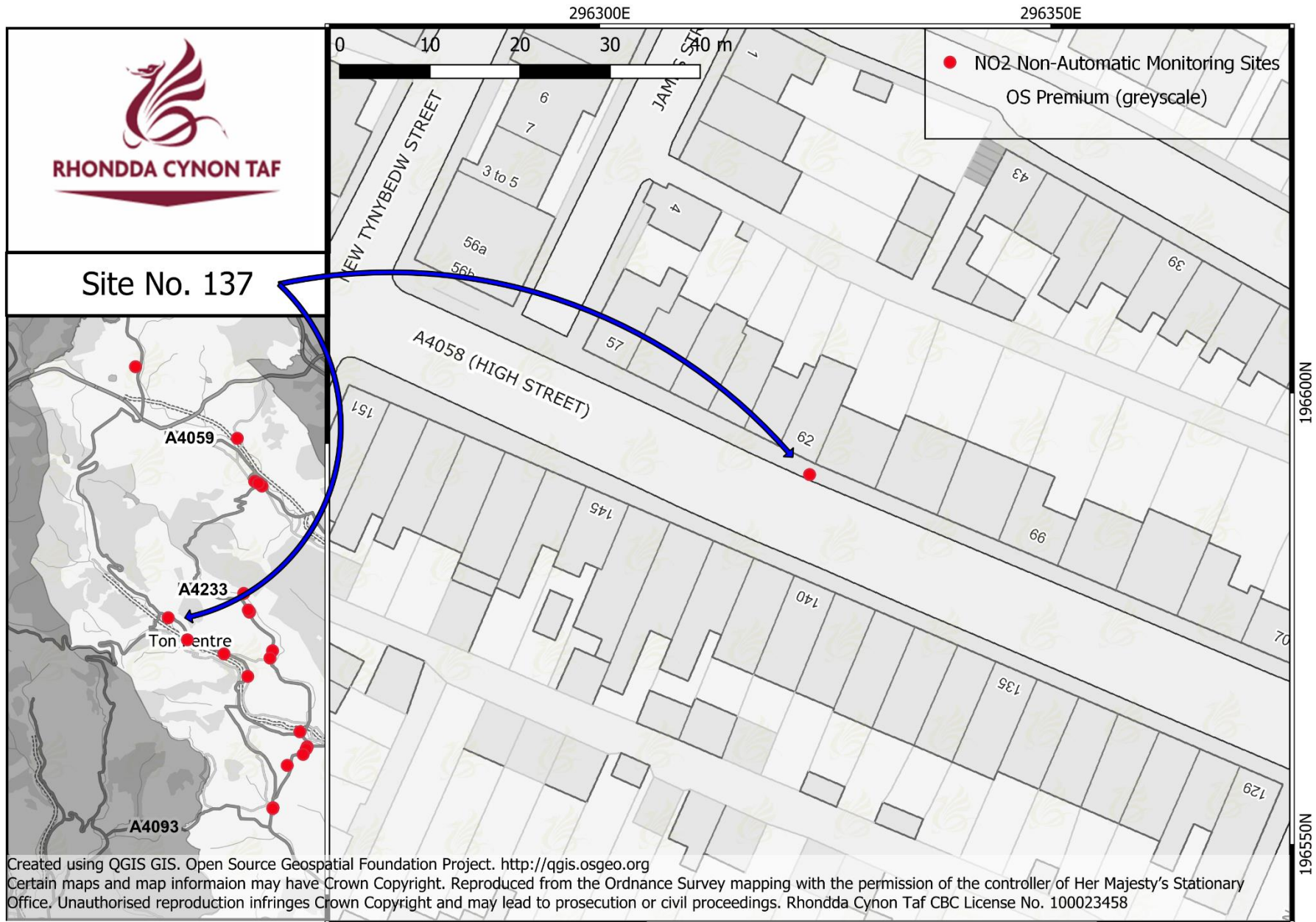


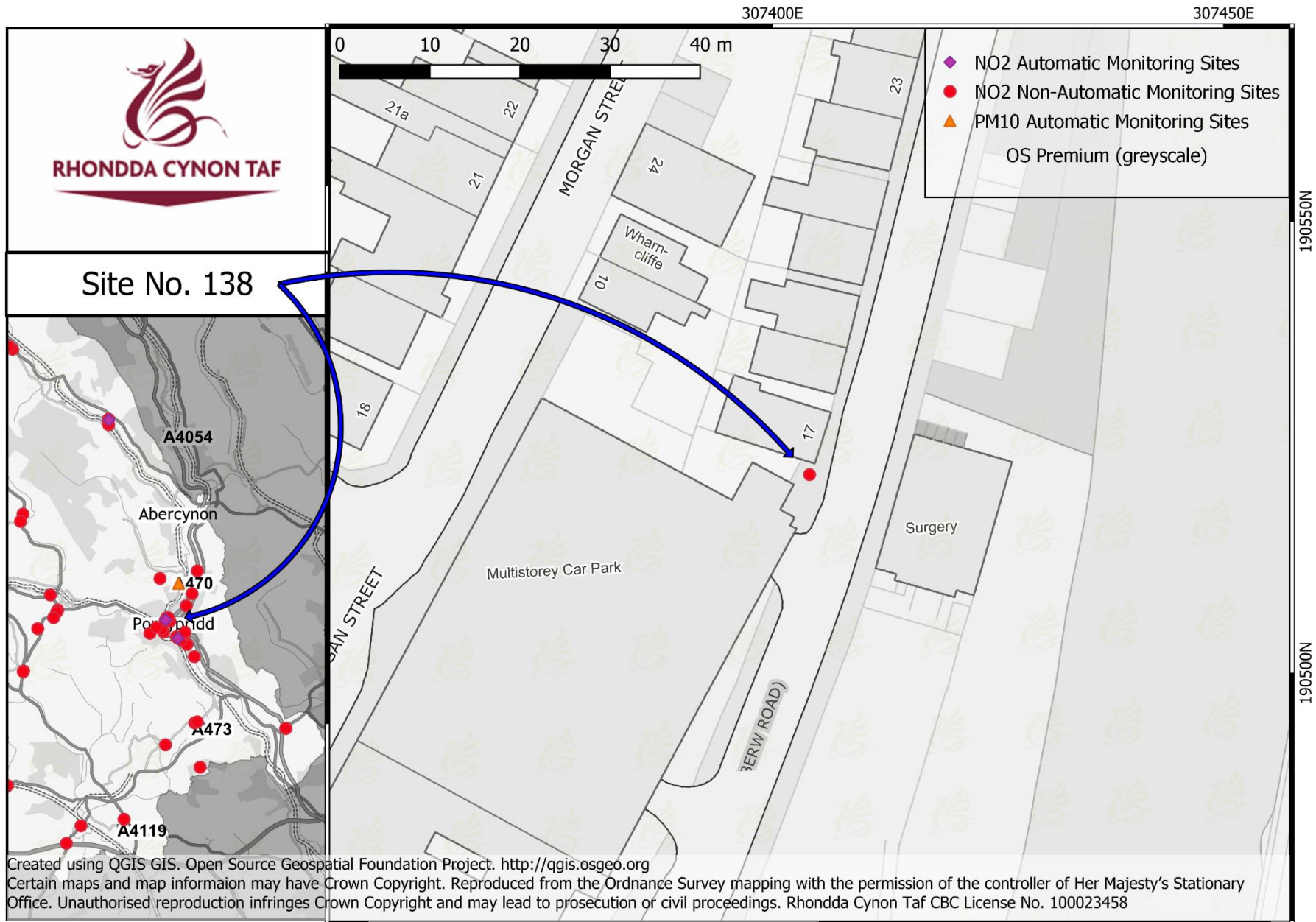


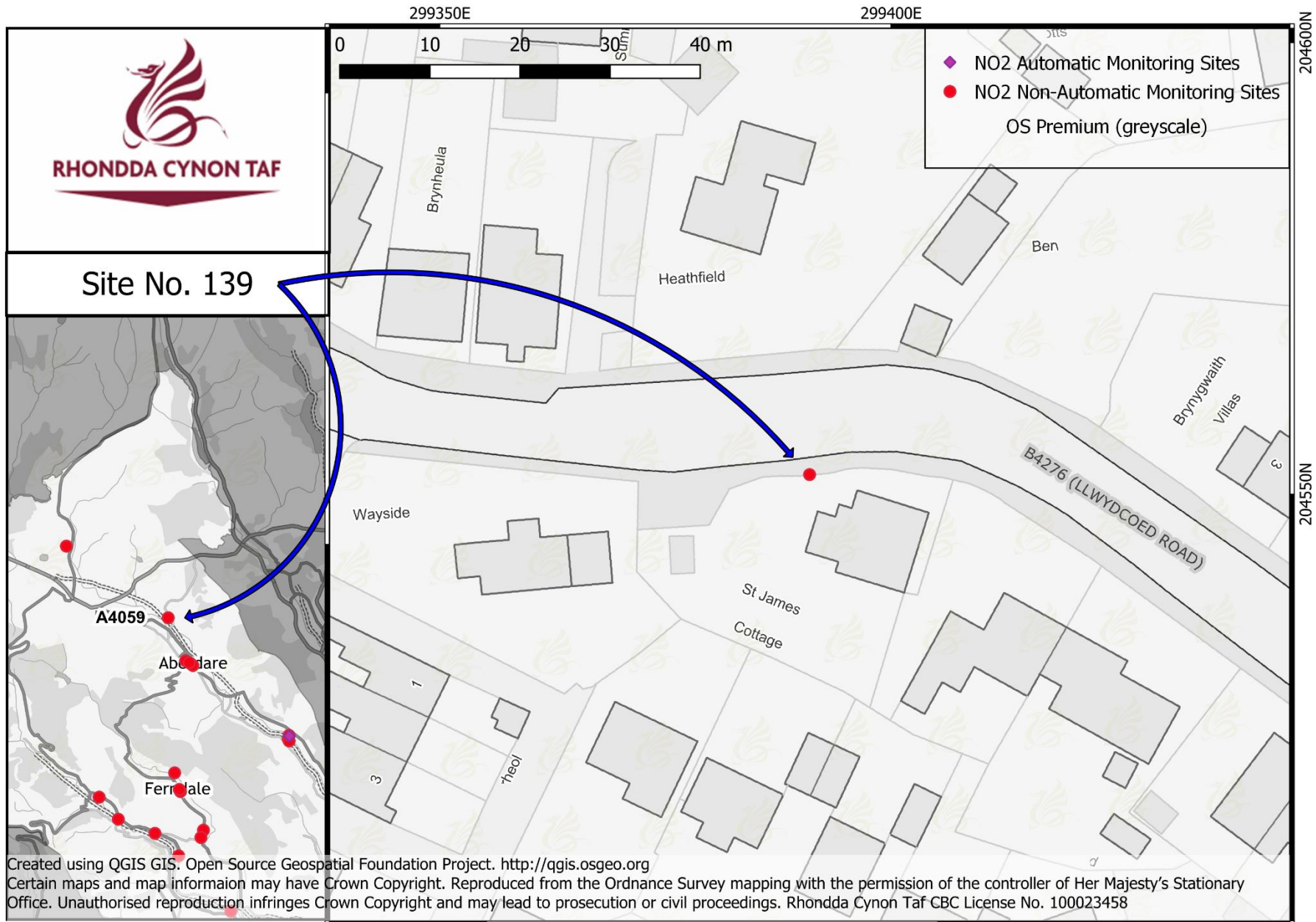


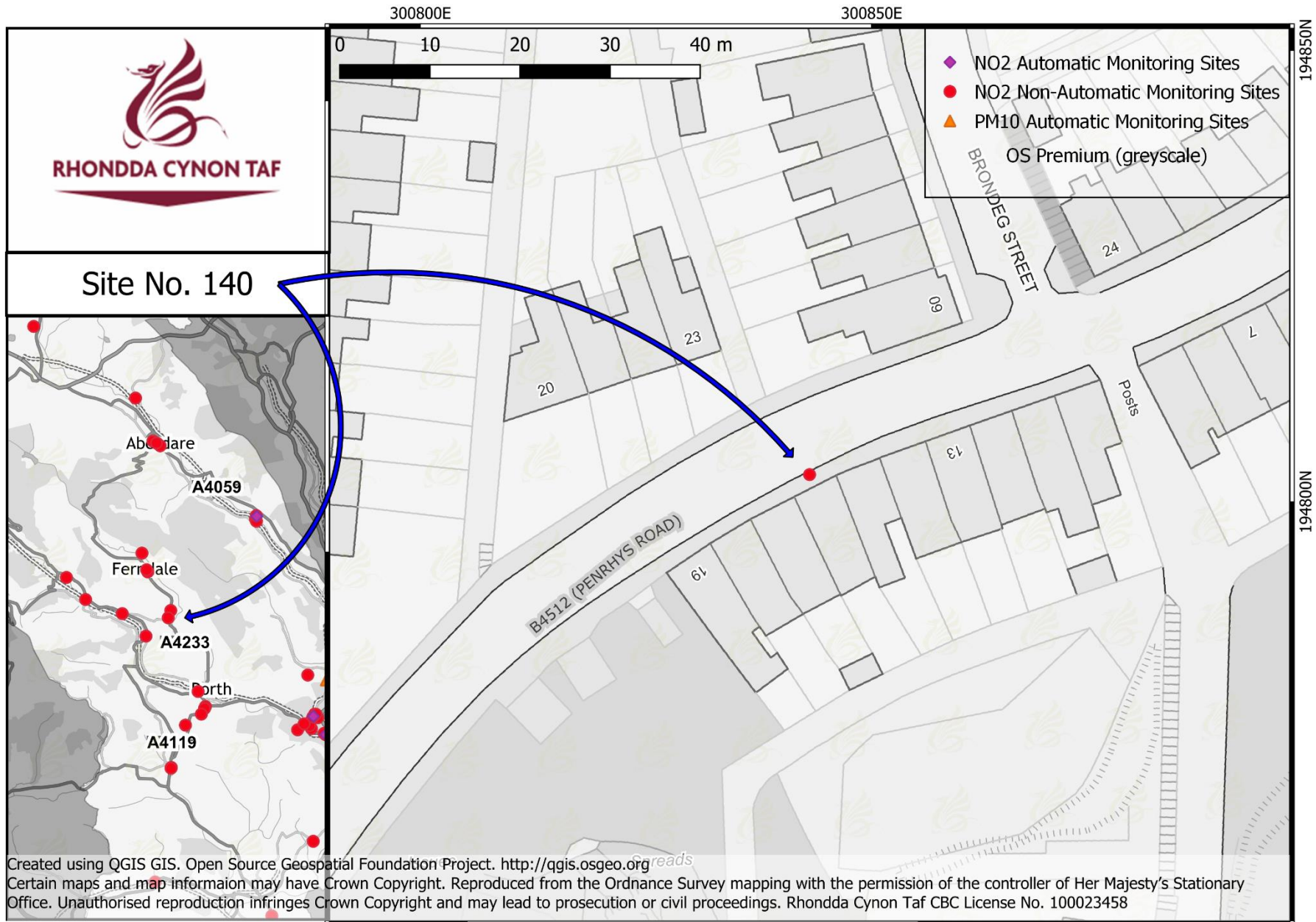


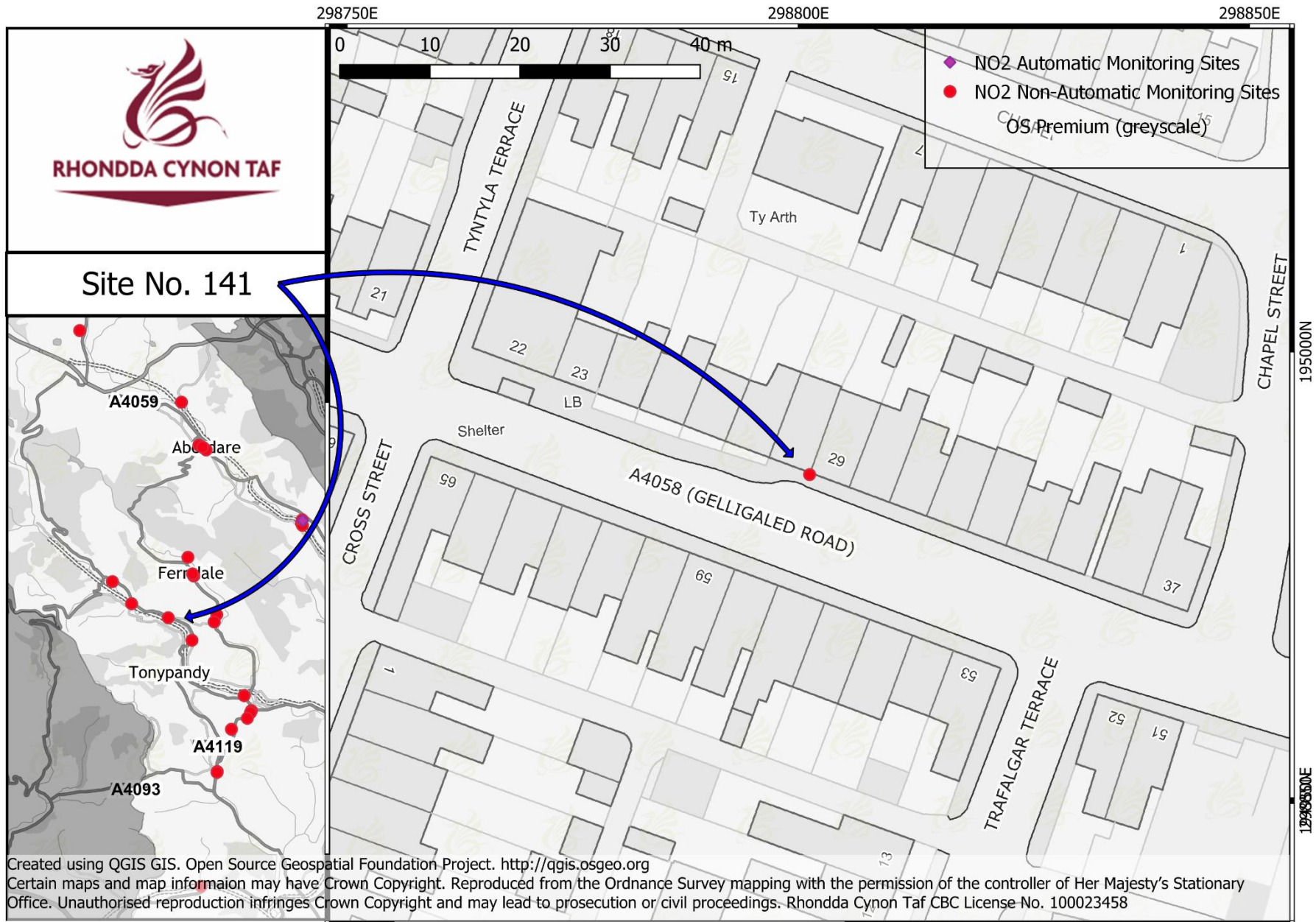






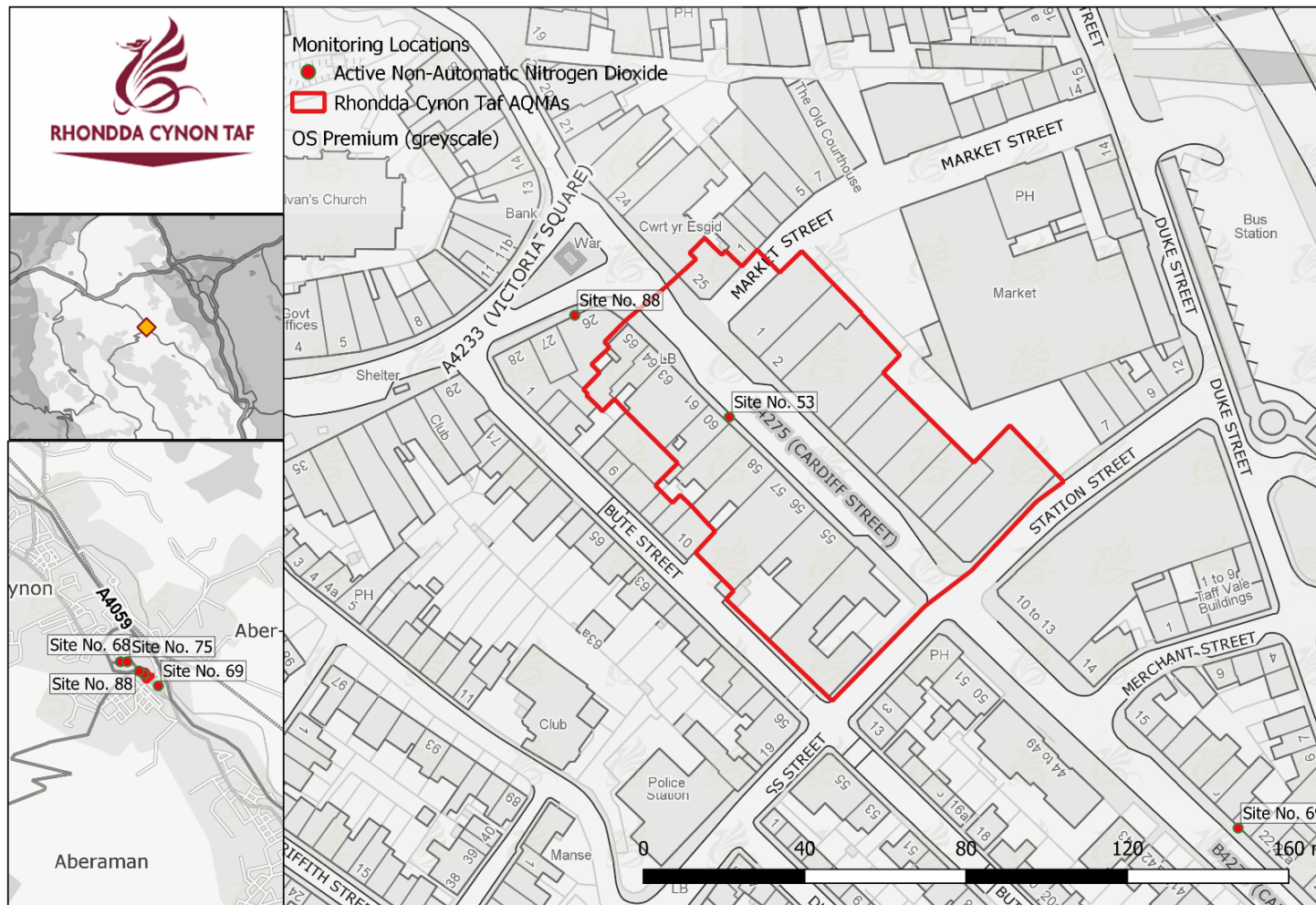






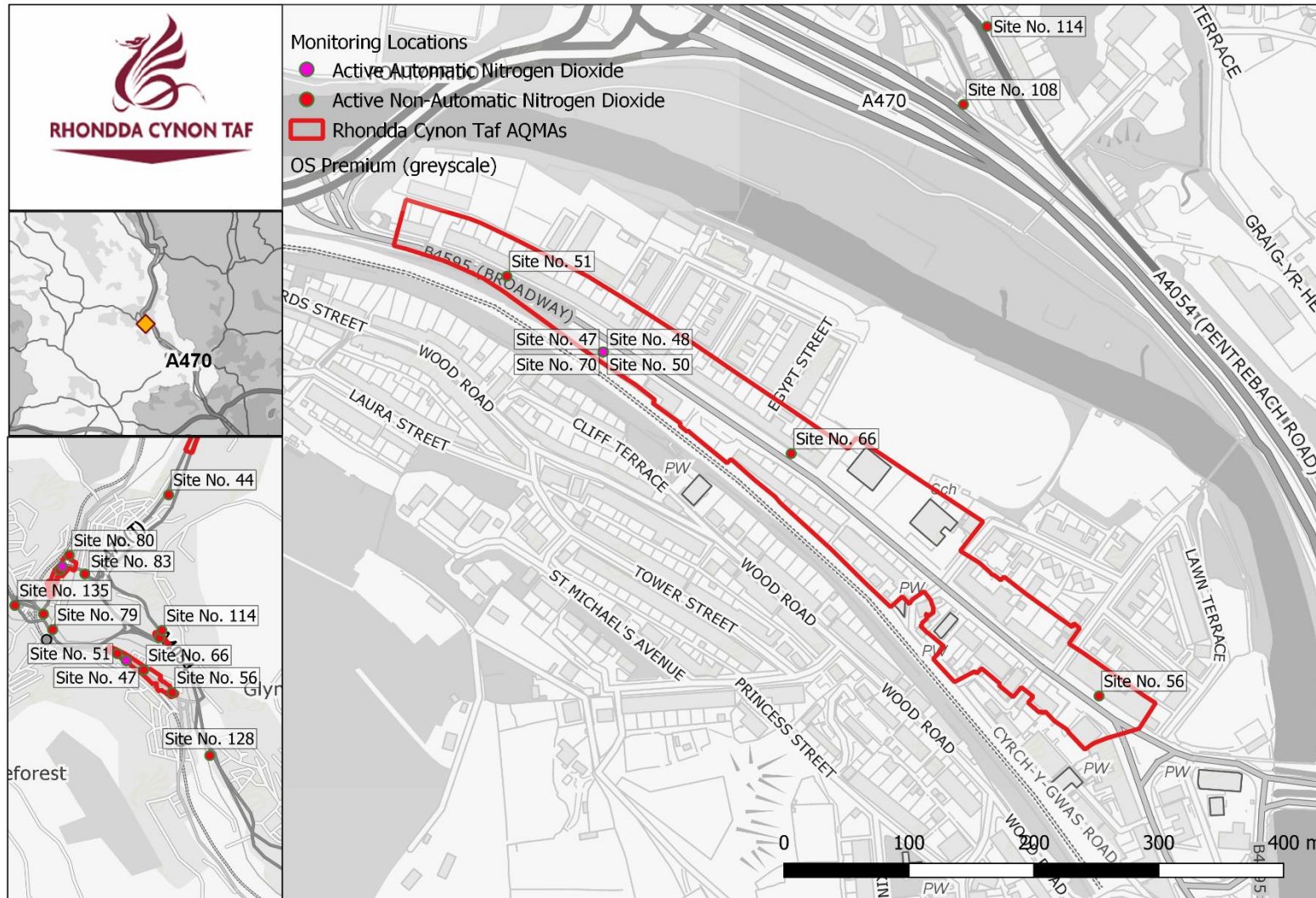
13. Appendix D1: AQMA Boundary Maps

Figure D.1: Aberdare Town Centre Air Quality Management Area



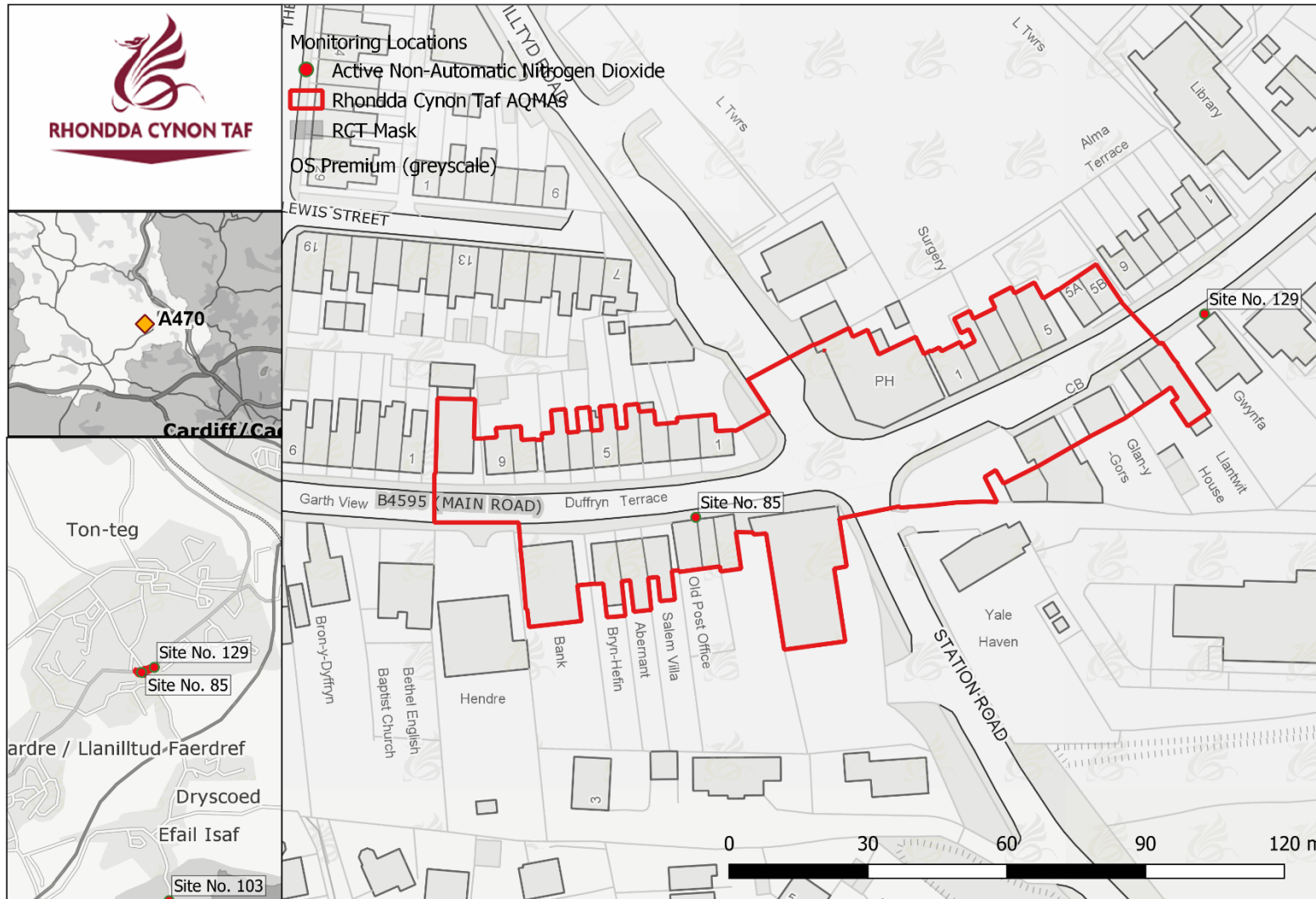
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.2: Broadway Air Quality Management Area



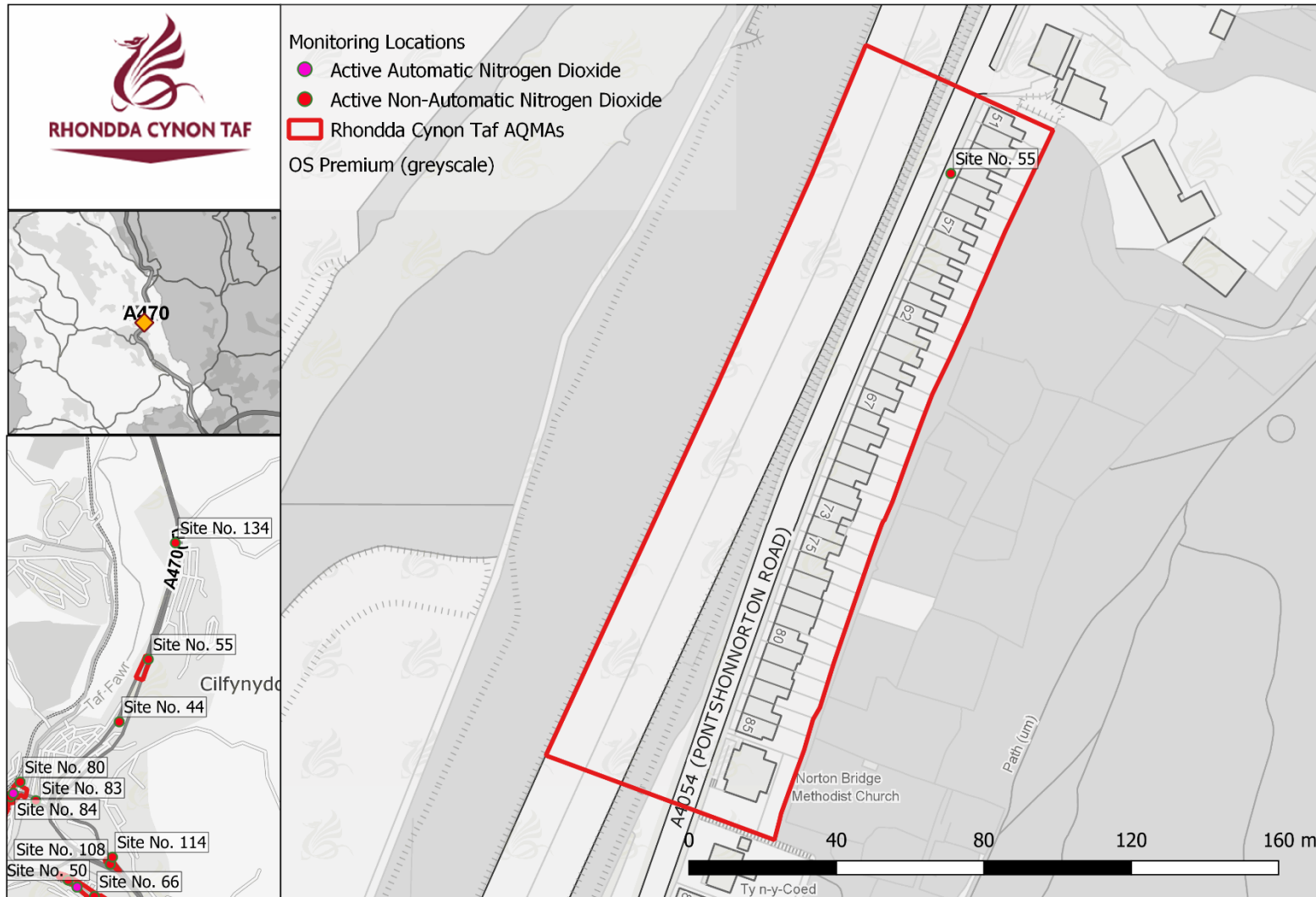
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
 Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
 Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.3: Church Village Air Quality Management Area



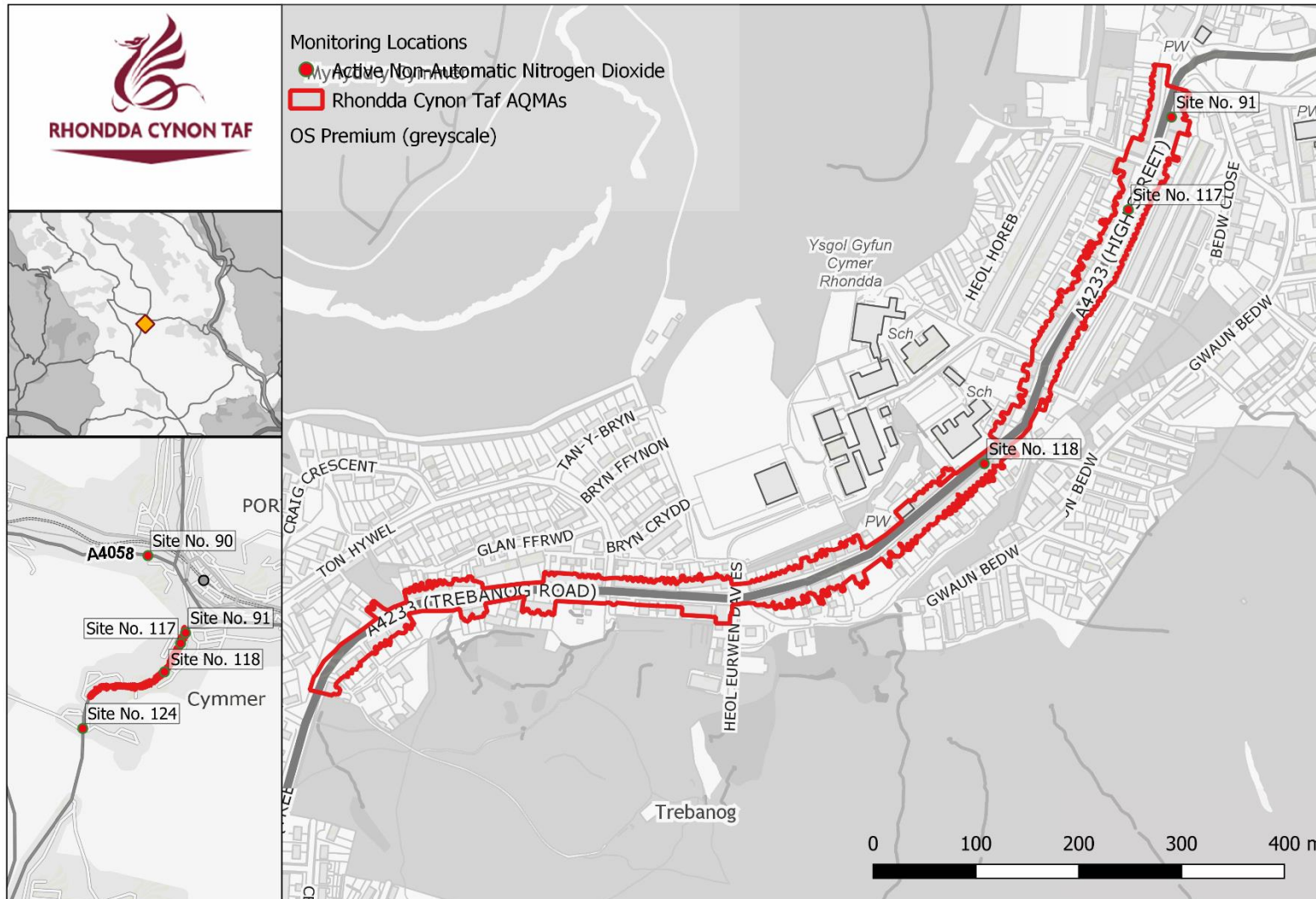
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
 Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
 Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.4: Cilfynydd Air Quality Management Area



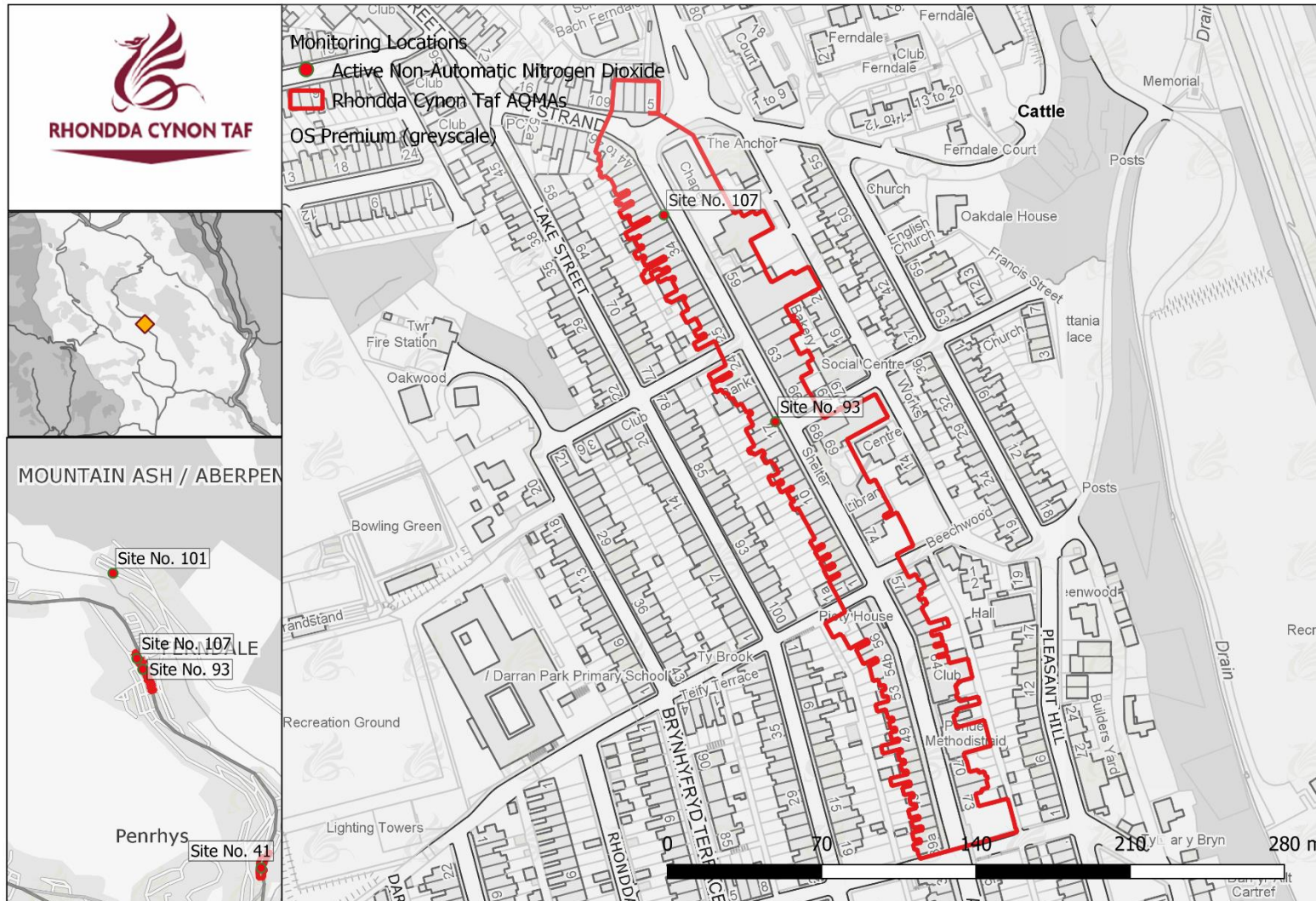
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.5: Cymmer Air Quality Management Area



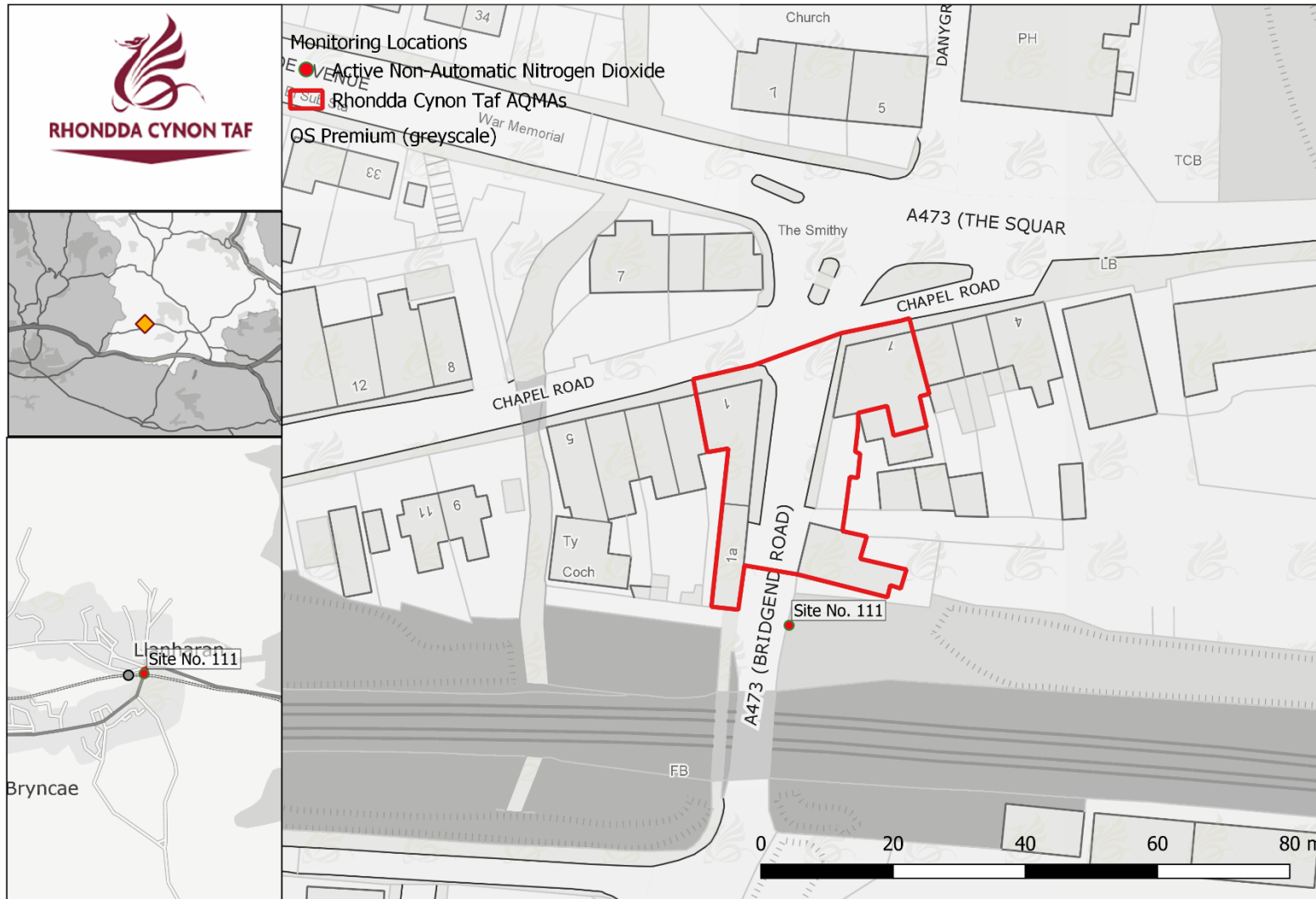
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.6: Ferndale Air Quality Management Area



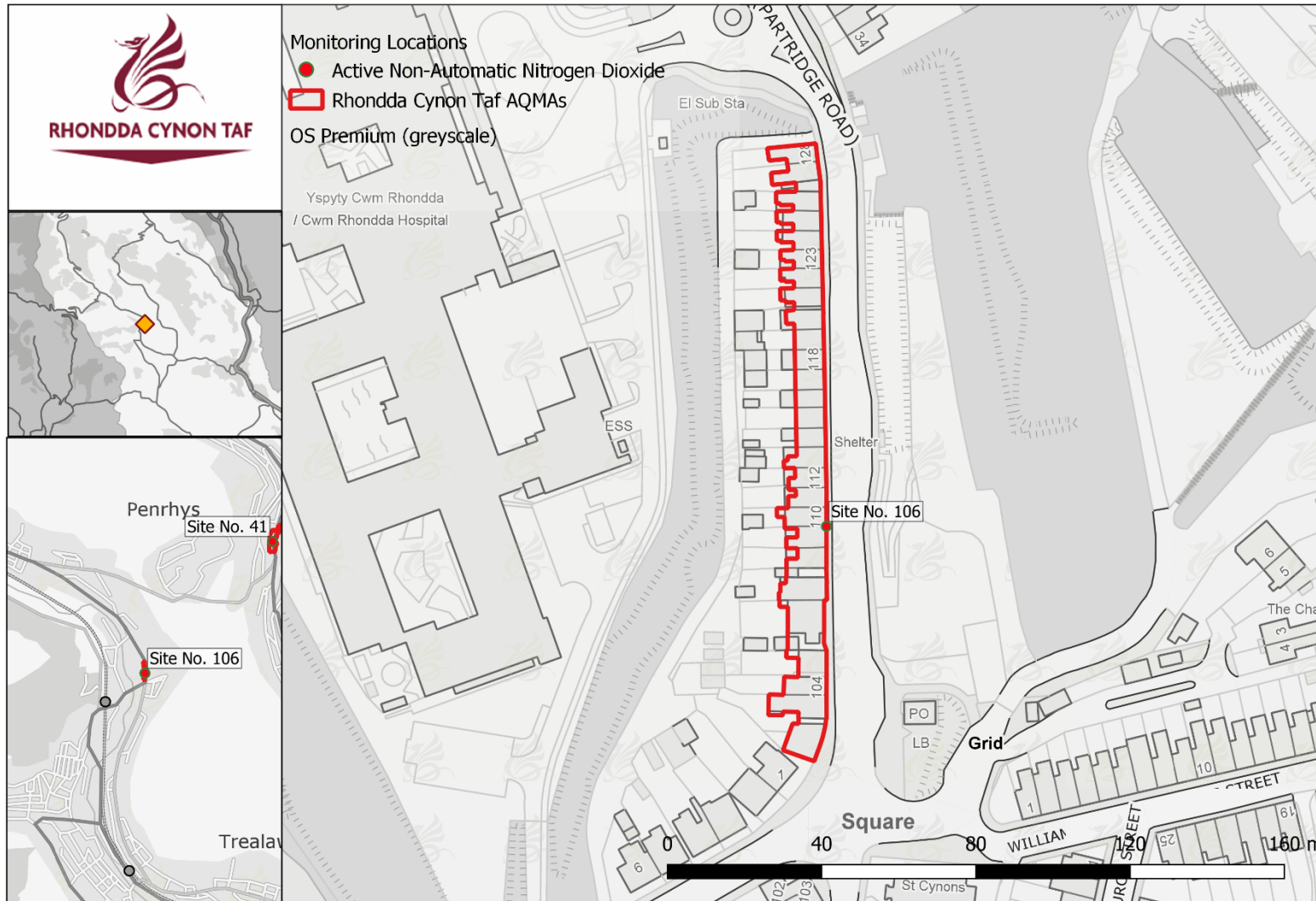
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.7: Llanharan Air Quality Management Area



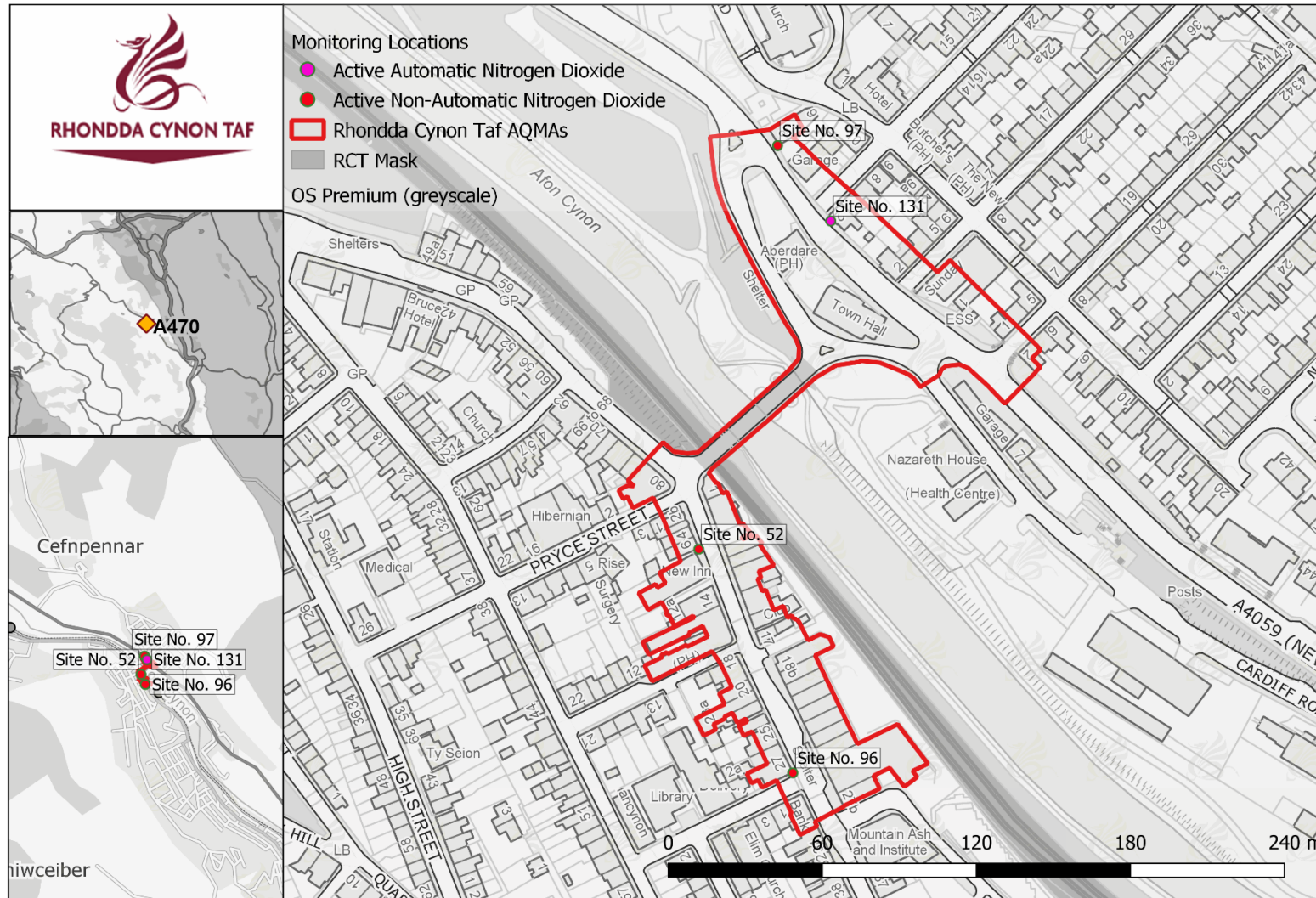
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.8: Llwynypia Air Quality Management Area



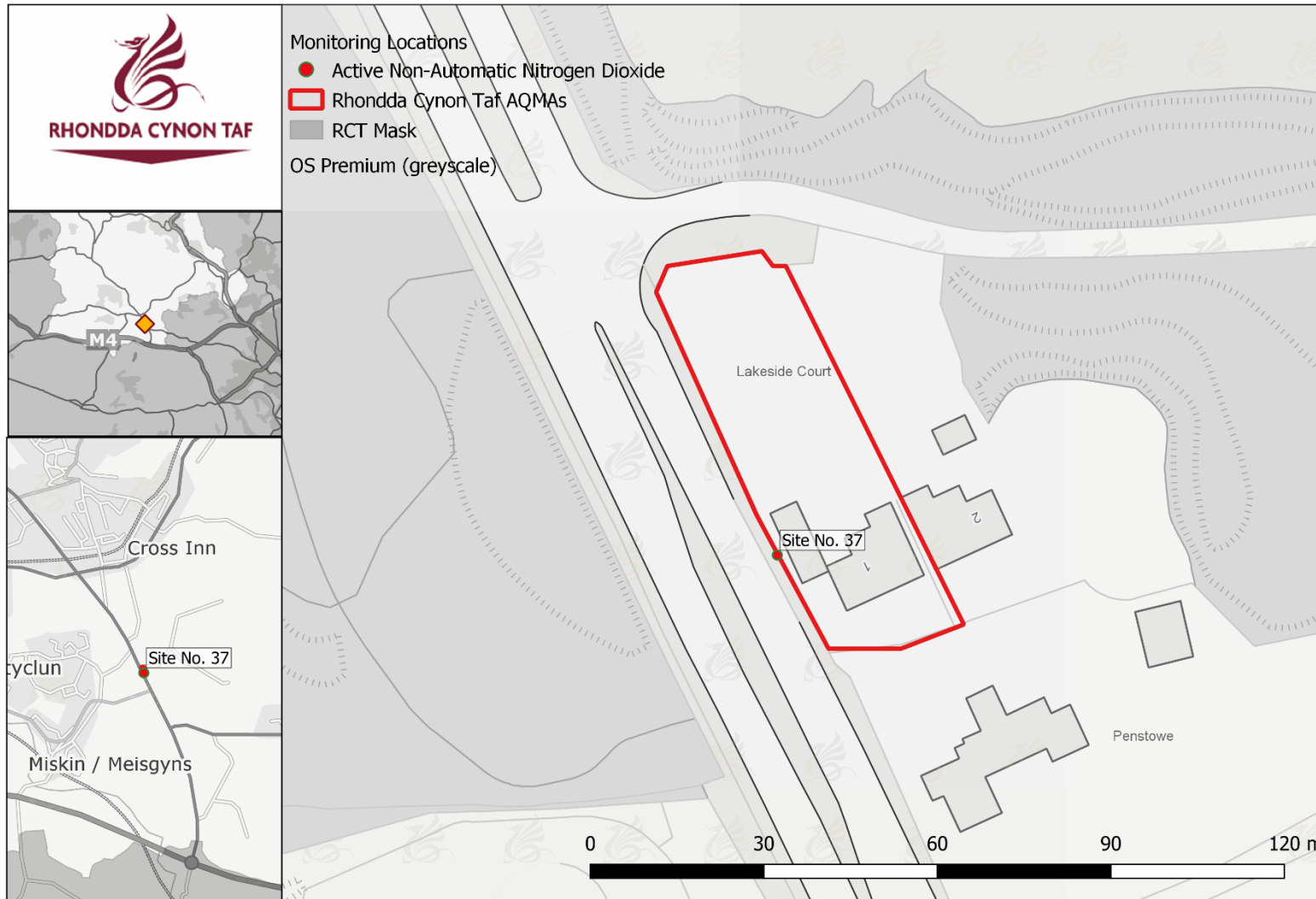
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.9: Mt Ash Town Centre Air Quality Management Area



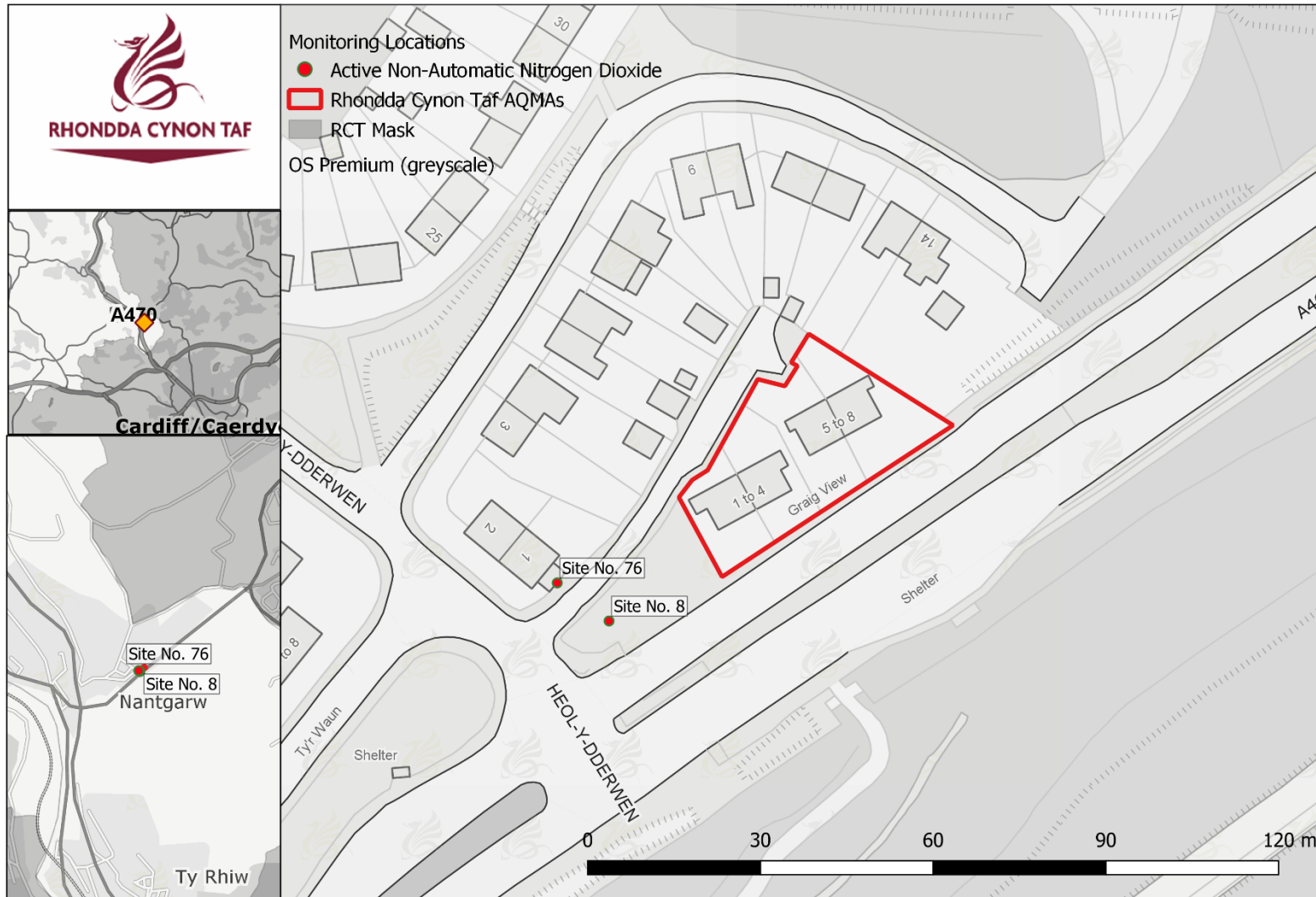
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
 Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
 Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.10: Mwyndy Air Quality Management Area



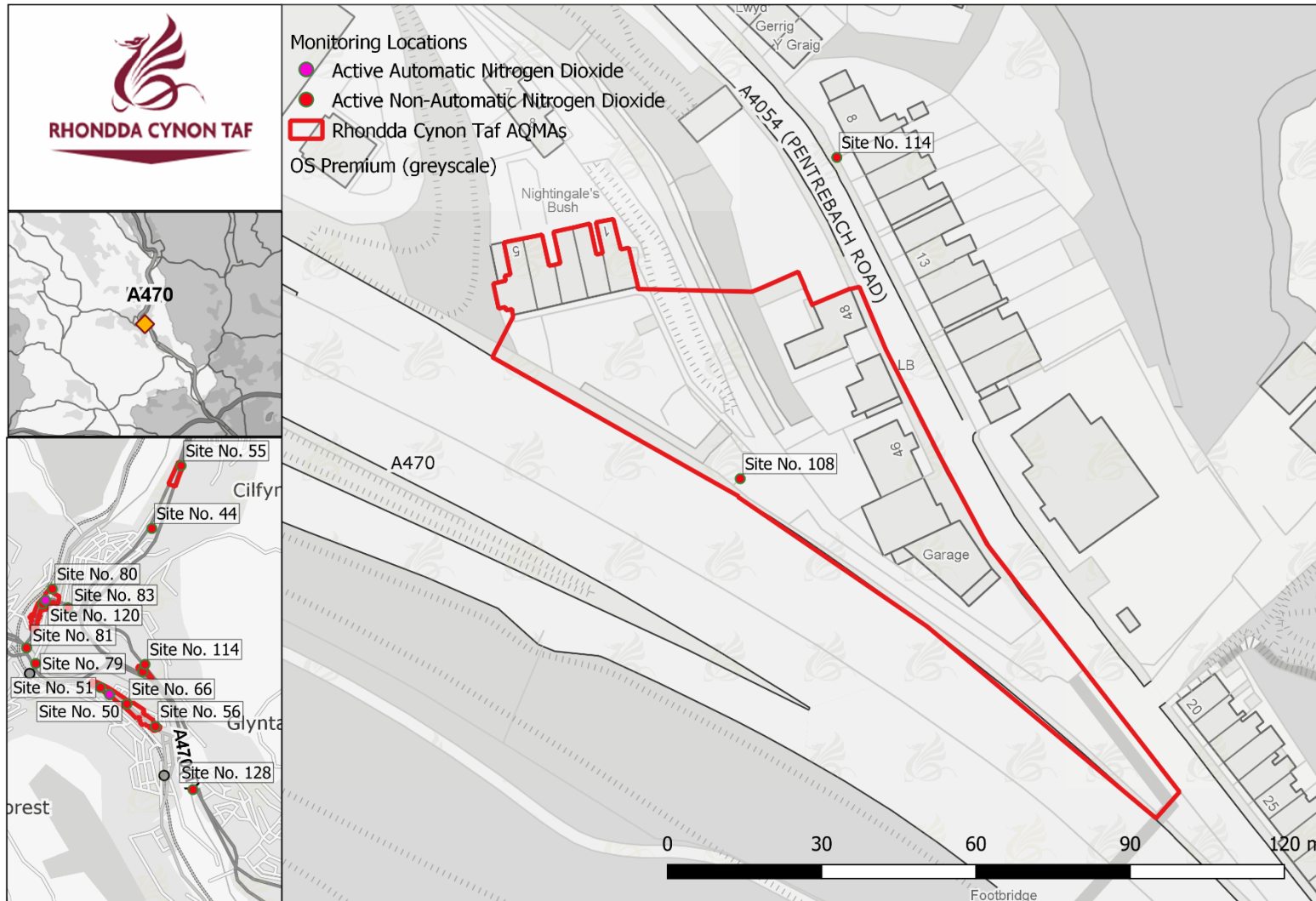
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.11: Nantgarw Air Quality Management Area



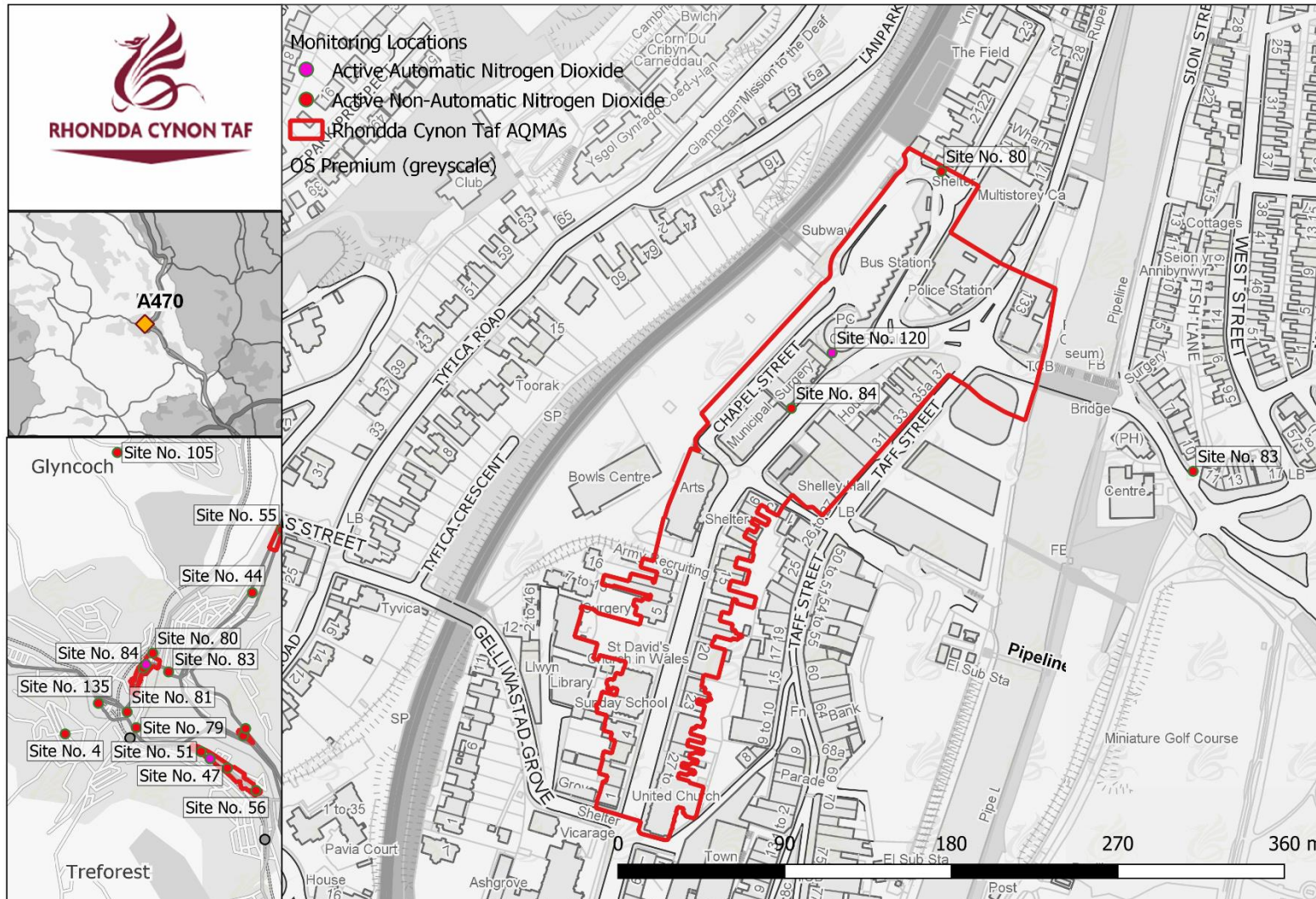
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.12: Nightingales Bush Air Quality Management Area



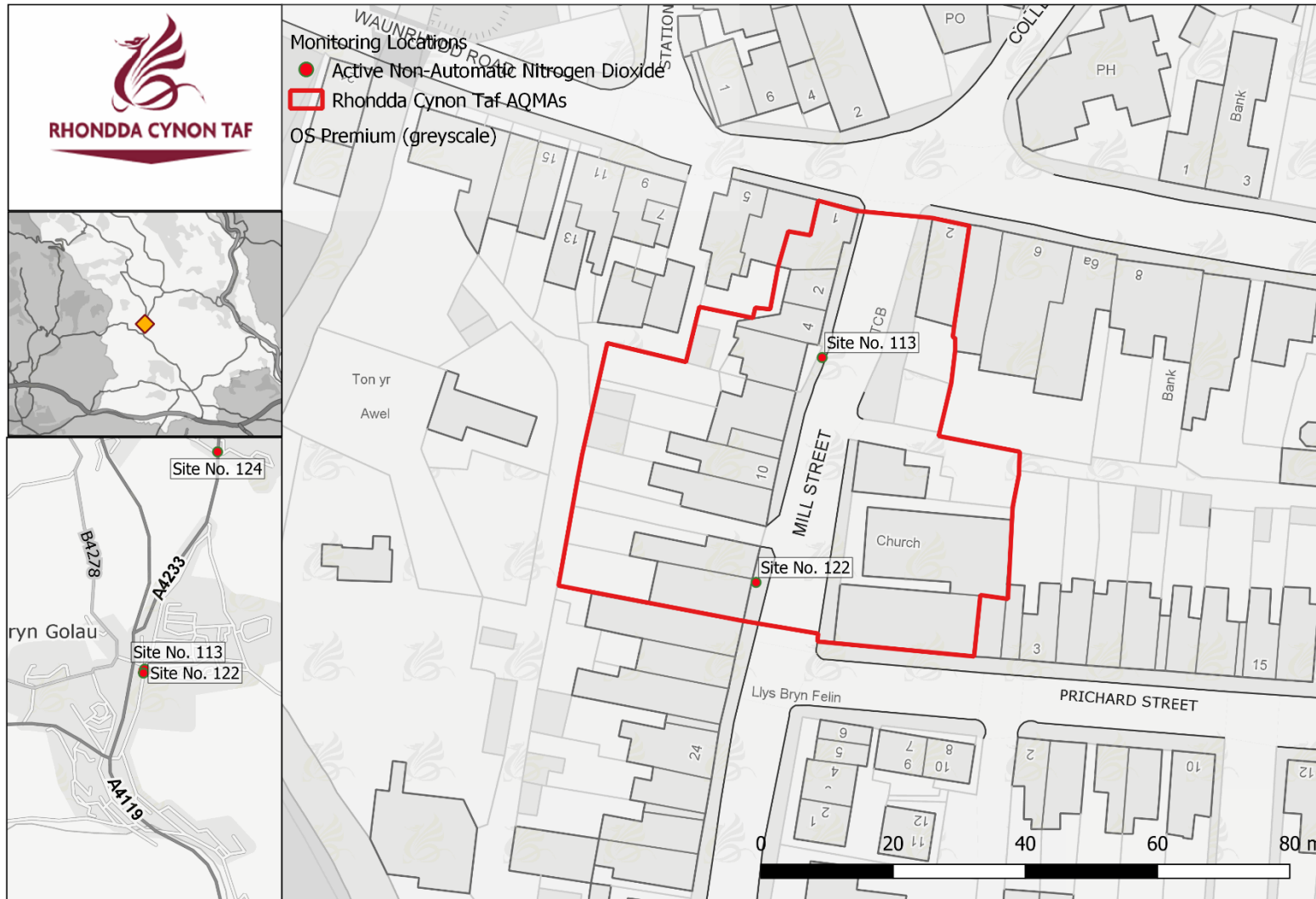
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.13: Pontypridd Town Centre Air Quality Management Area



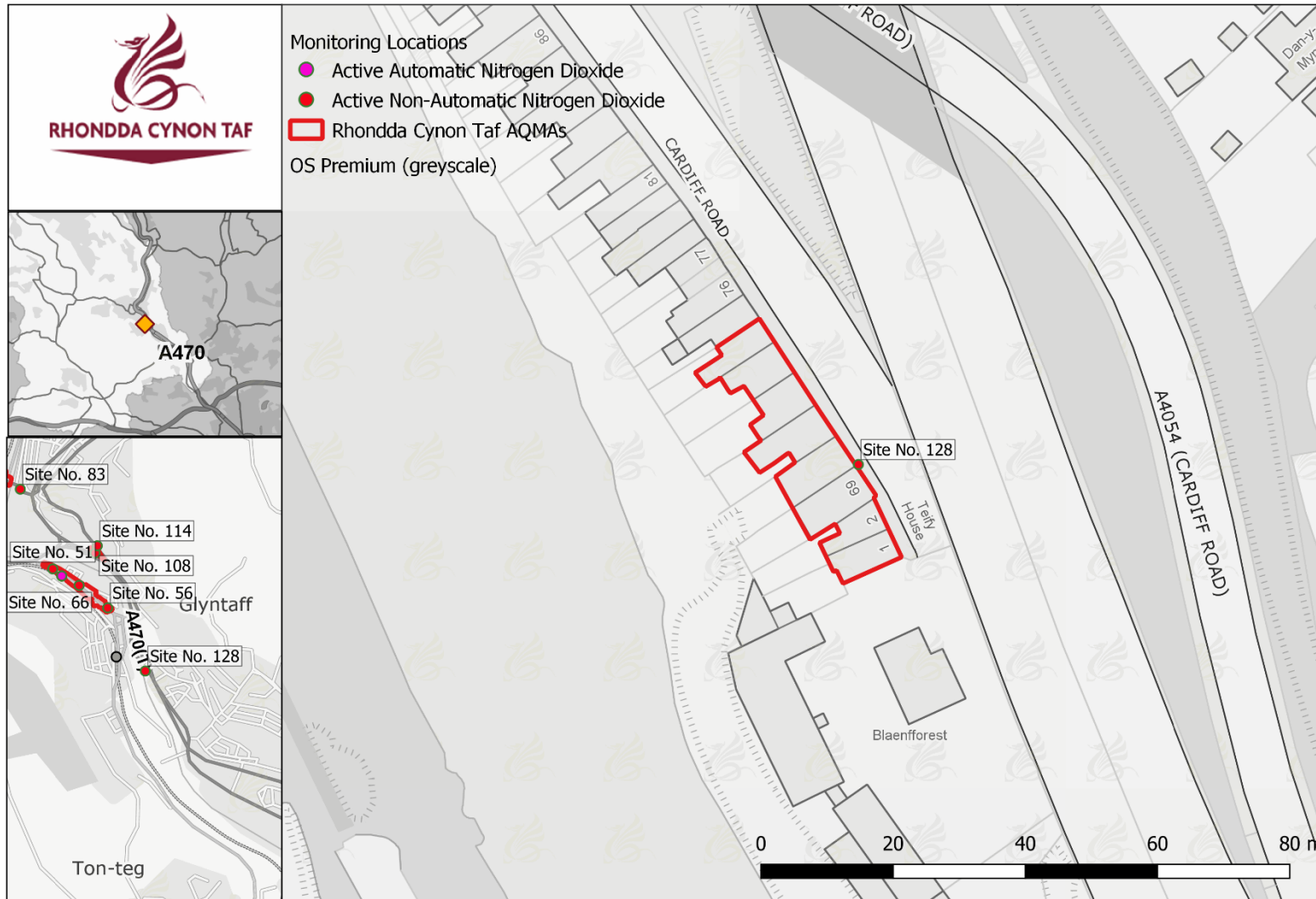
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.14: Tonyrefail Air Quality Management Area



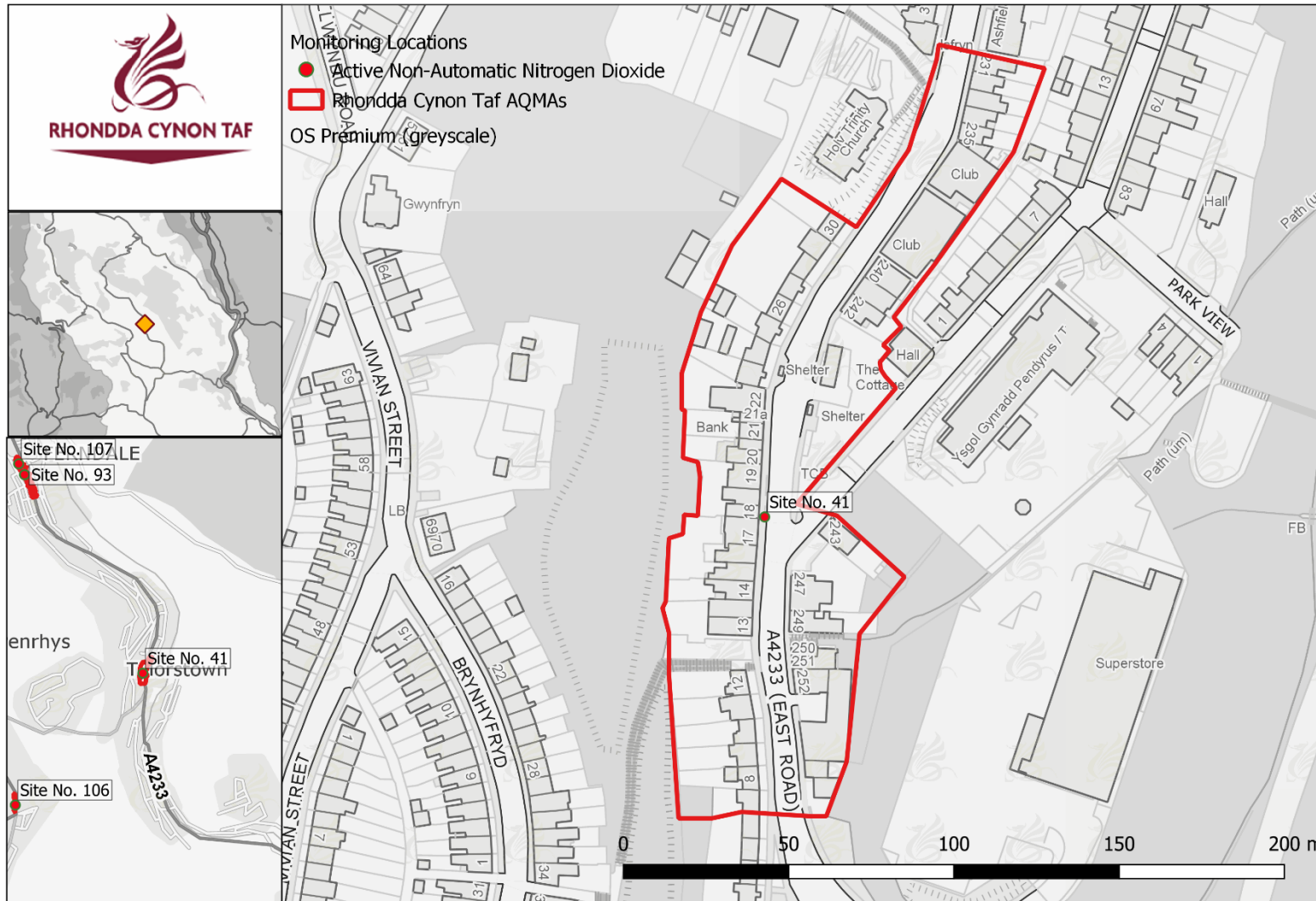
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.15: Treforest Air Quality Management Area



Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

Figure D.16: Tylorstown Air Quality Management Area



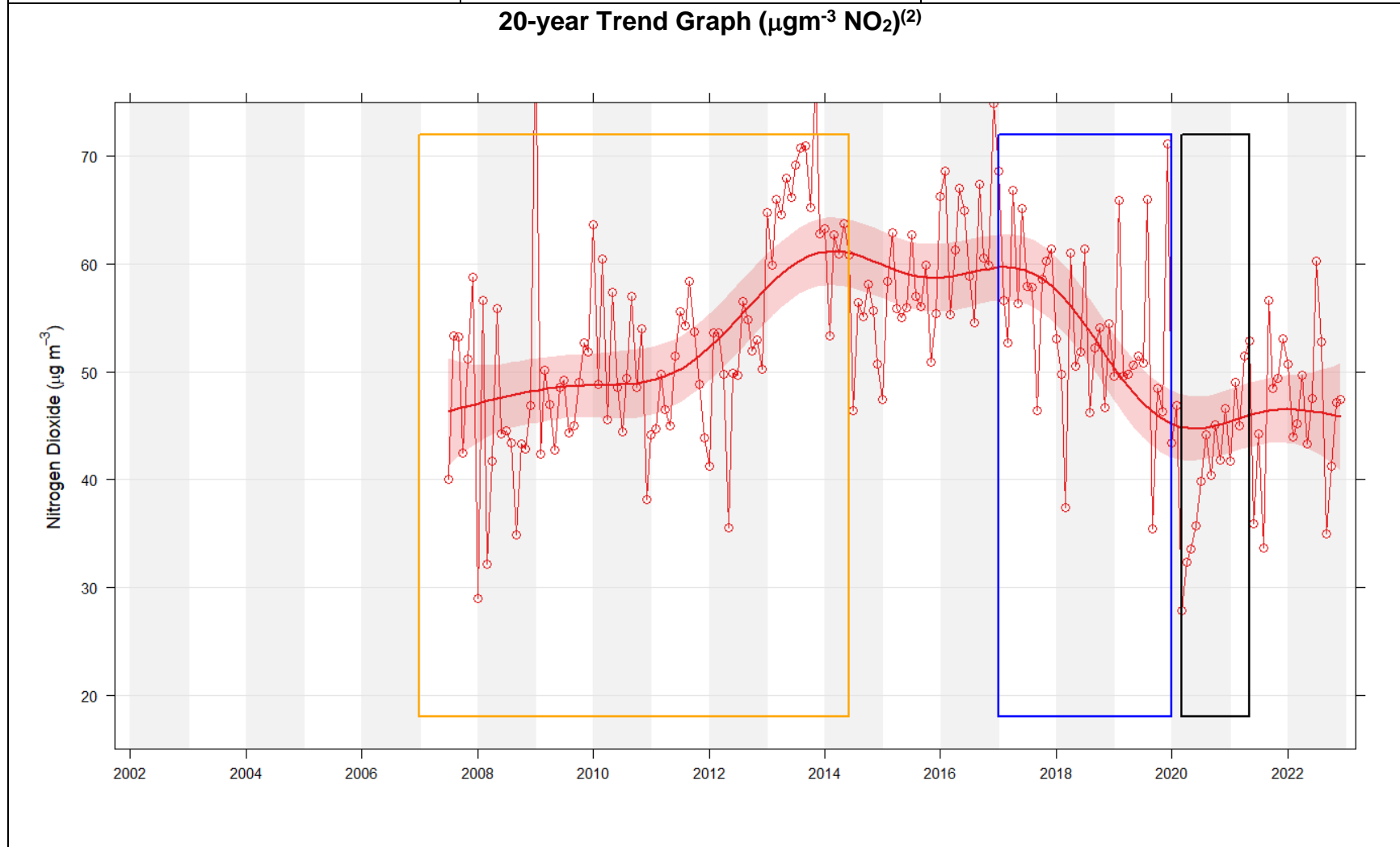
Created using QGIS GIS. Open Source Geospatial Foundation Project. <http://qgis.osgeo.org>
Certain maps and map information may have Crown Copyright. Reproduced from the Ordnance Survey mapping with the permission of the controller of Her Majesty's Stationary Office.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Rhondda Cynon Taf CBC License No. 100023458

14. Appendix D2: AQMA Trends

Error! Reference source not found. below contains information on the current trends in NO₂ within each AQMA, including consideration of both the longer-term up to 20-year trend and a quantification of the nearer-term 5-year trend. As the longer-term trend can change over time, the smooth trend plots provided have been annotated with colour coded boxes showing the likely distinct trend periods (orange for an increasing trend, blue for a reducing trend and black for the period of COVID-19 related disruption). The nearer-term 5-year trend often gives more bearing to recent events which may be more relevant when considering the immediate future. Also provided is an assessment of the likely improvement in levels of NO₂ that may be necessary to achieve compliance to the relevant AQOs for NO₂ as well as, should current trends persist, a projection of when compliance may be achieved.

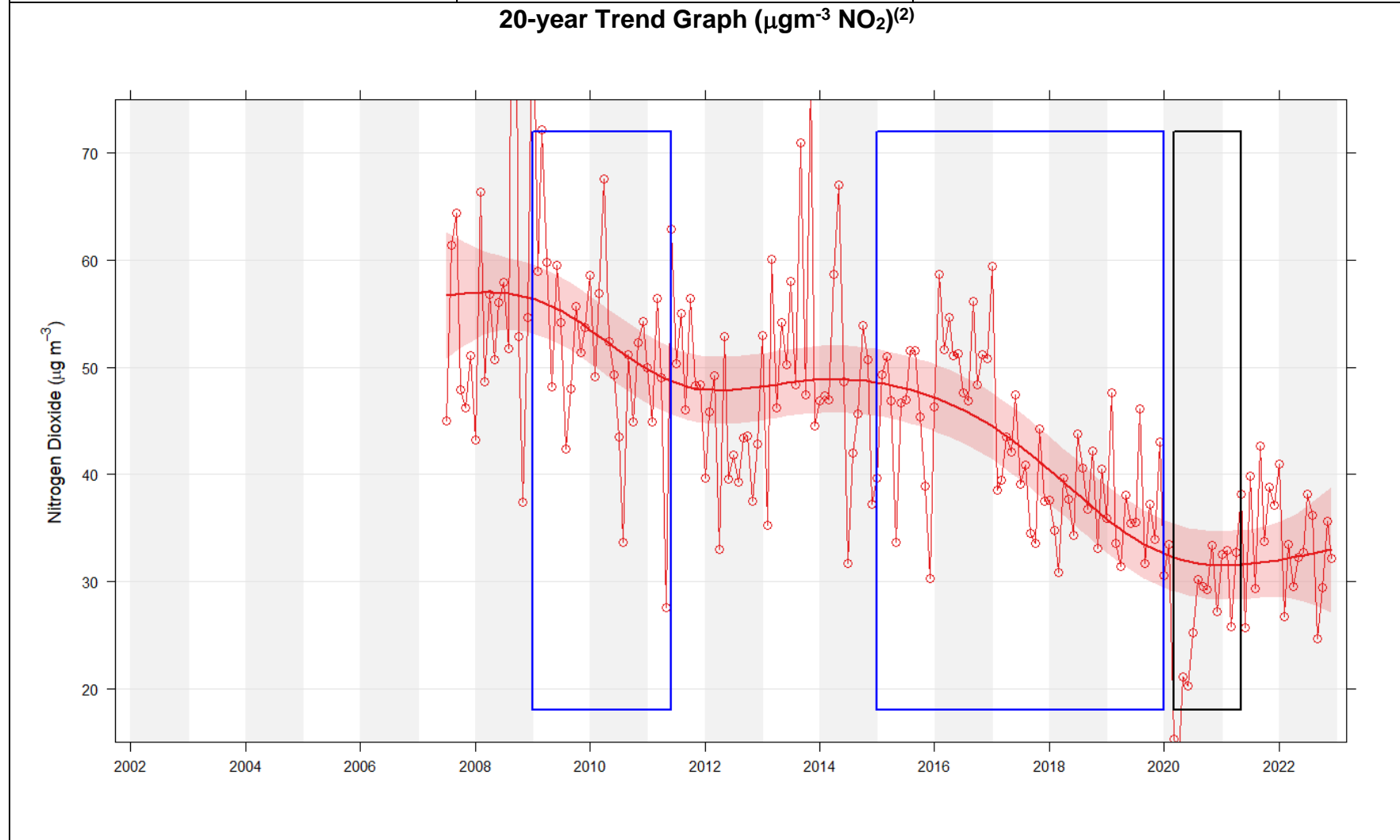
14.1 Cymmer AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
29.0	-3.9	7+



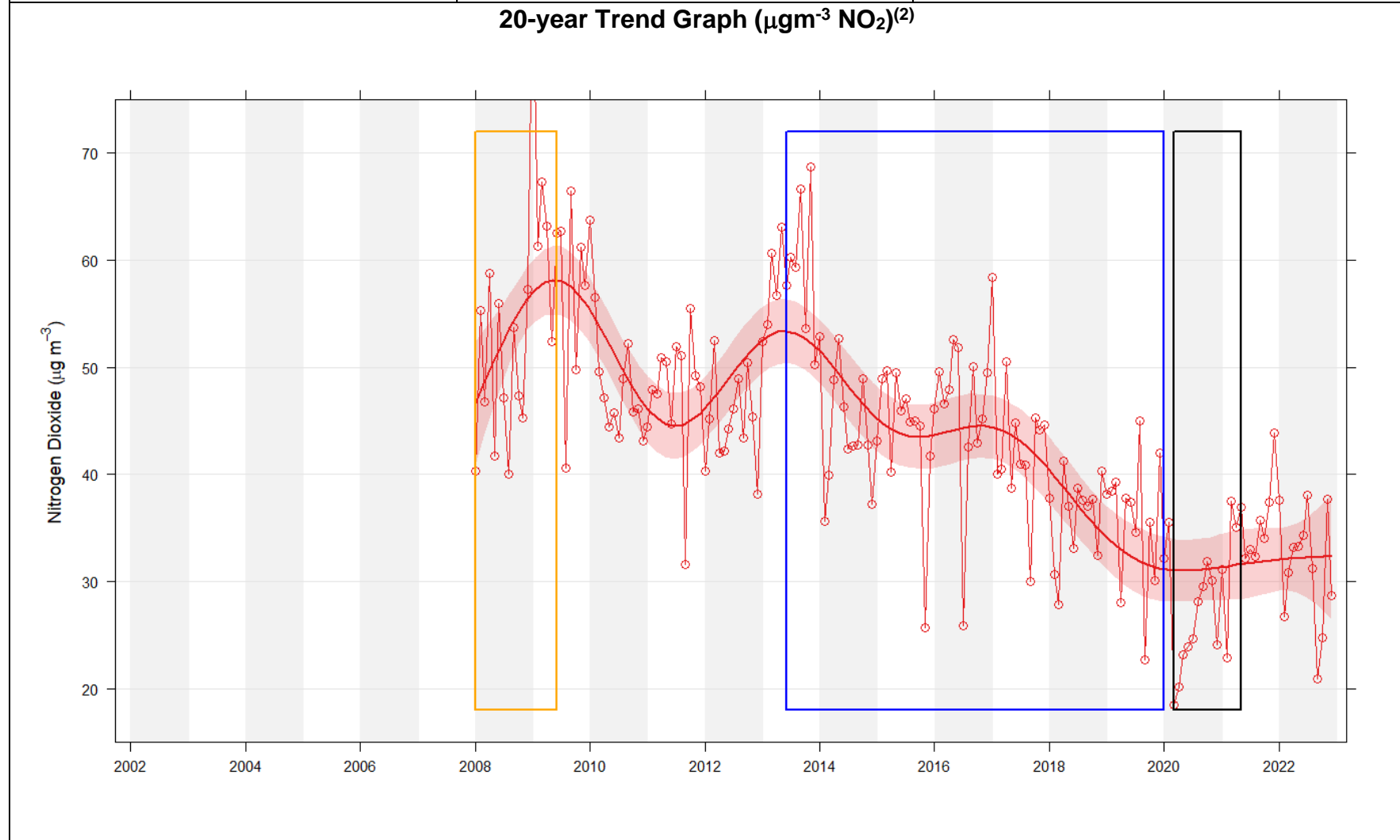
14.2 Ferndale AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
1.1	-3.7	1+



14.3 Llwynypia AQMA

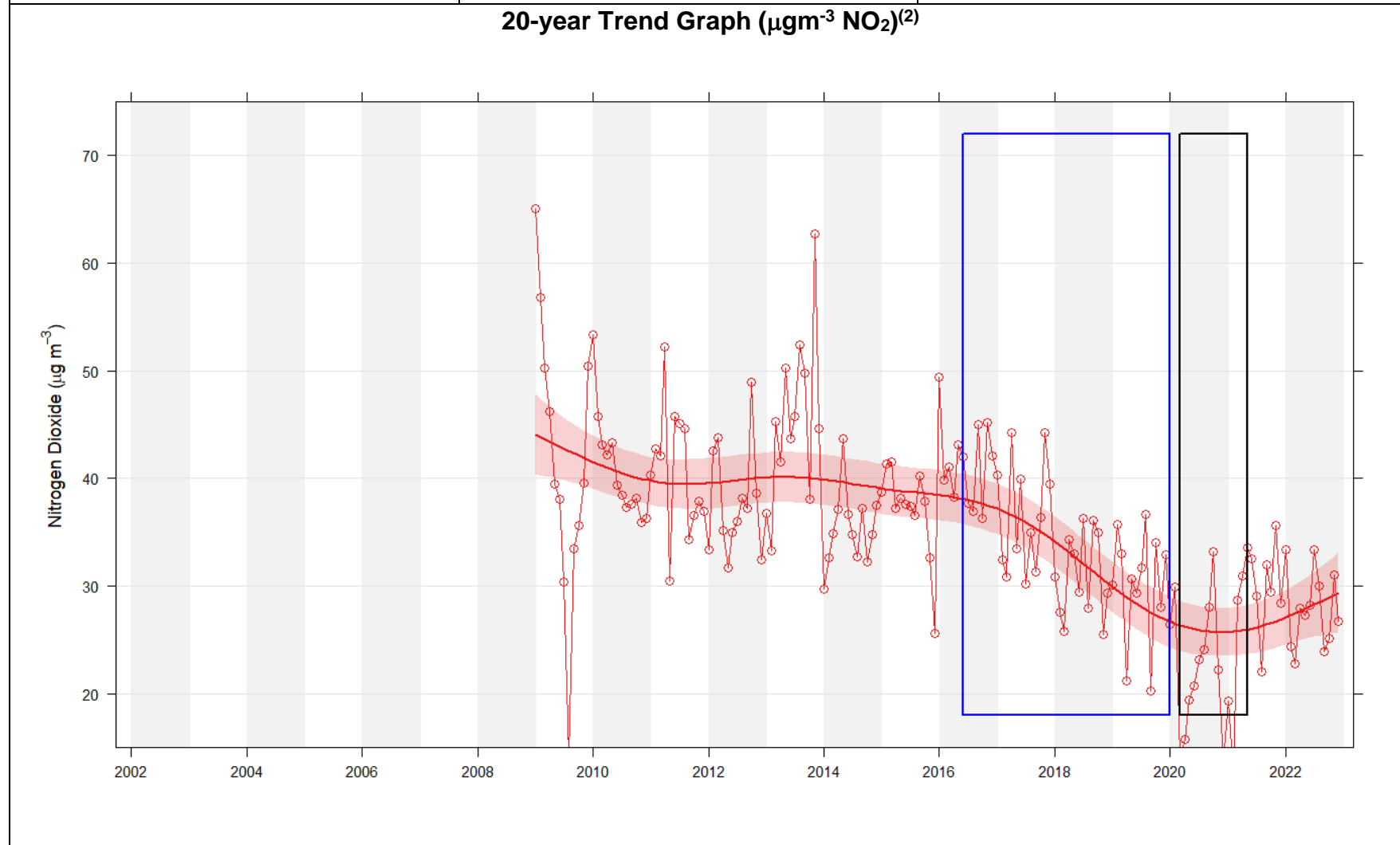
Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-4.3	Near Term



14.4 Tonyrefail AQMA

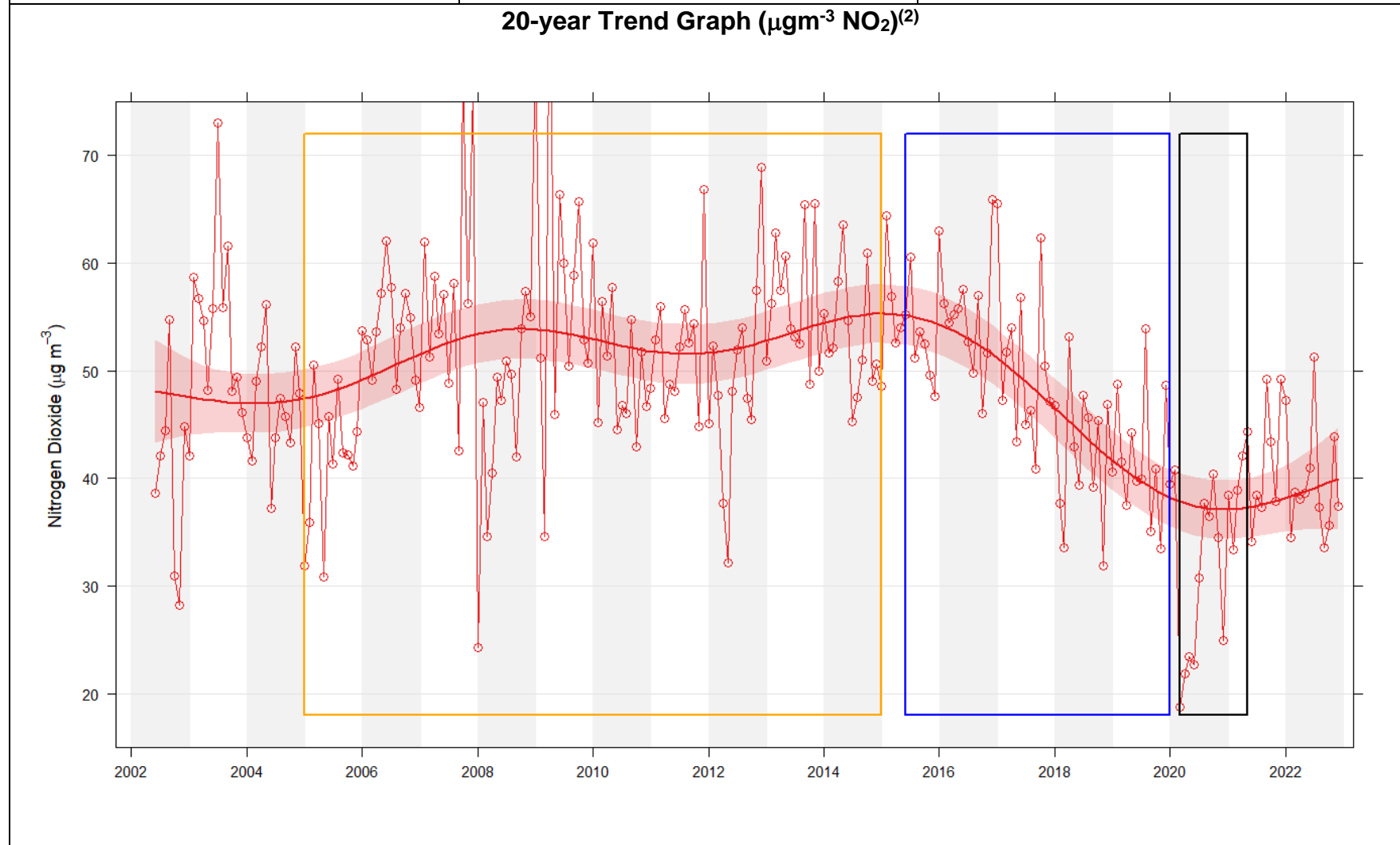
Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-4.2	Near Term

20-year Trend Graph ($\mu\text{g m}^{-3}$ NO₂)⁽²⁾



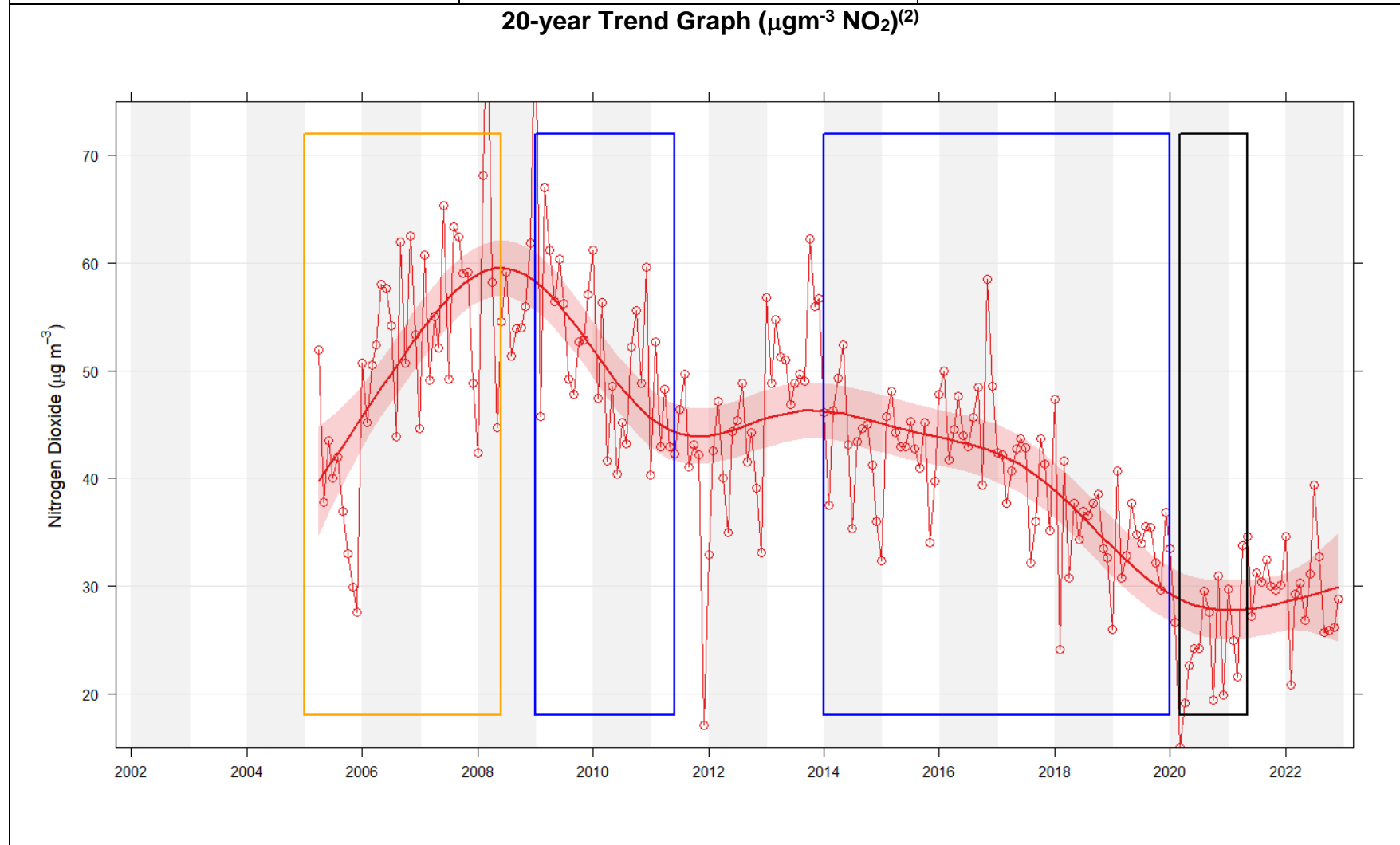
14.5 Tylorstown AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
2.1	-3.3	2+



14.6 Aberdare Town Centre AQMA

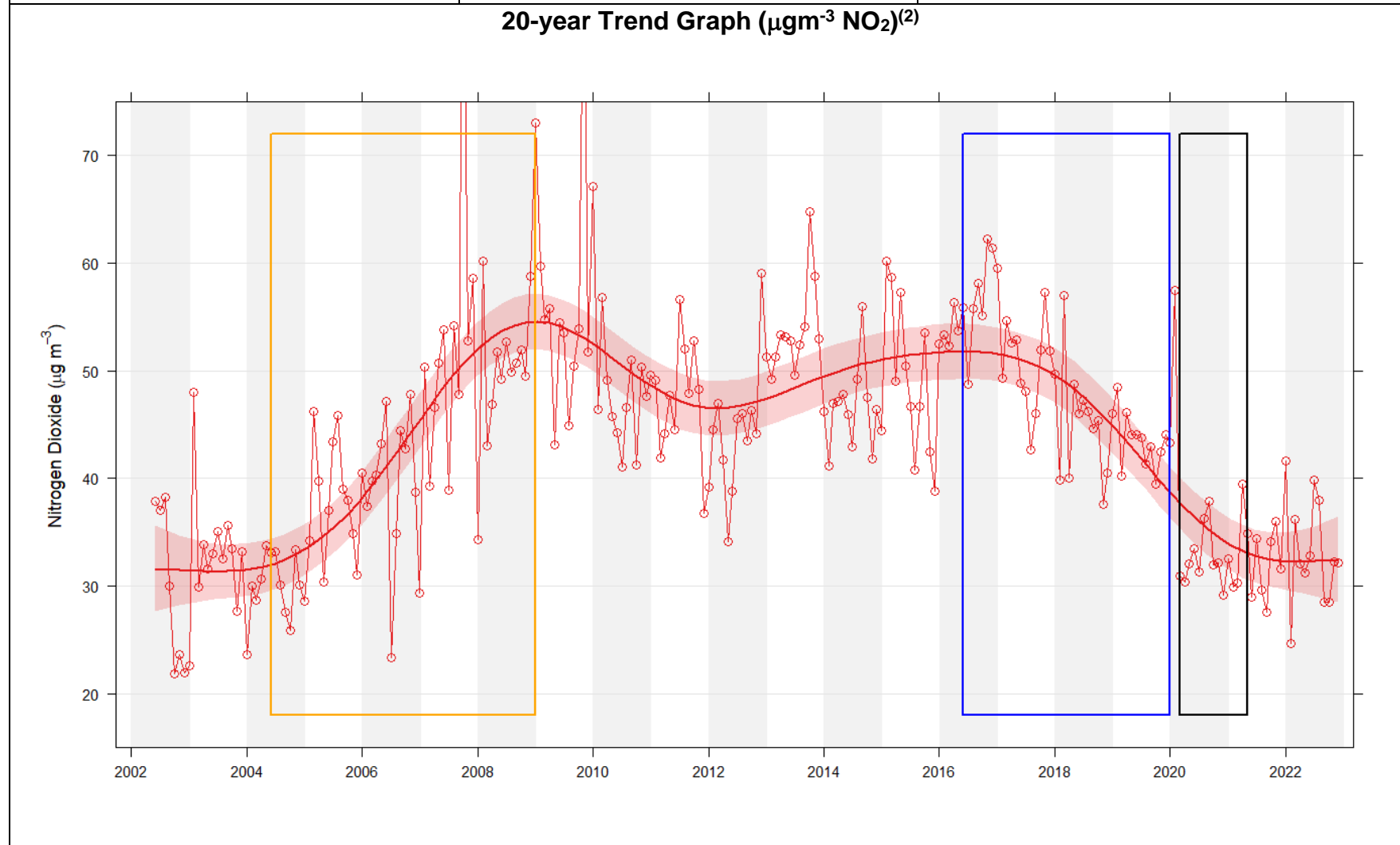
Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-4.9	Near Term



14.7 Mt Ash Town Centre AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
3.5	-6.8	1+

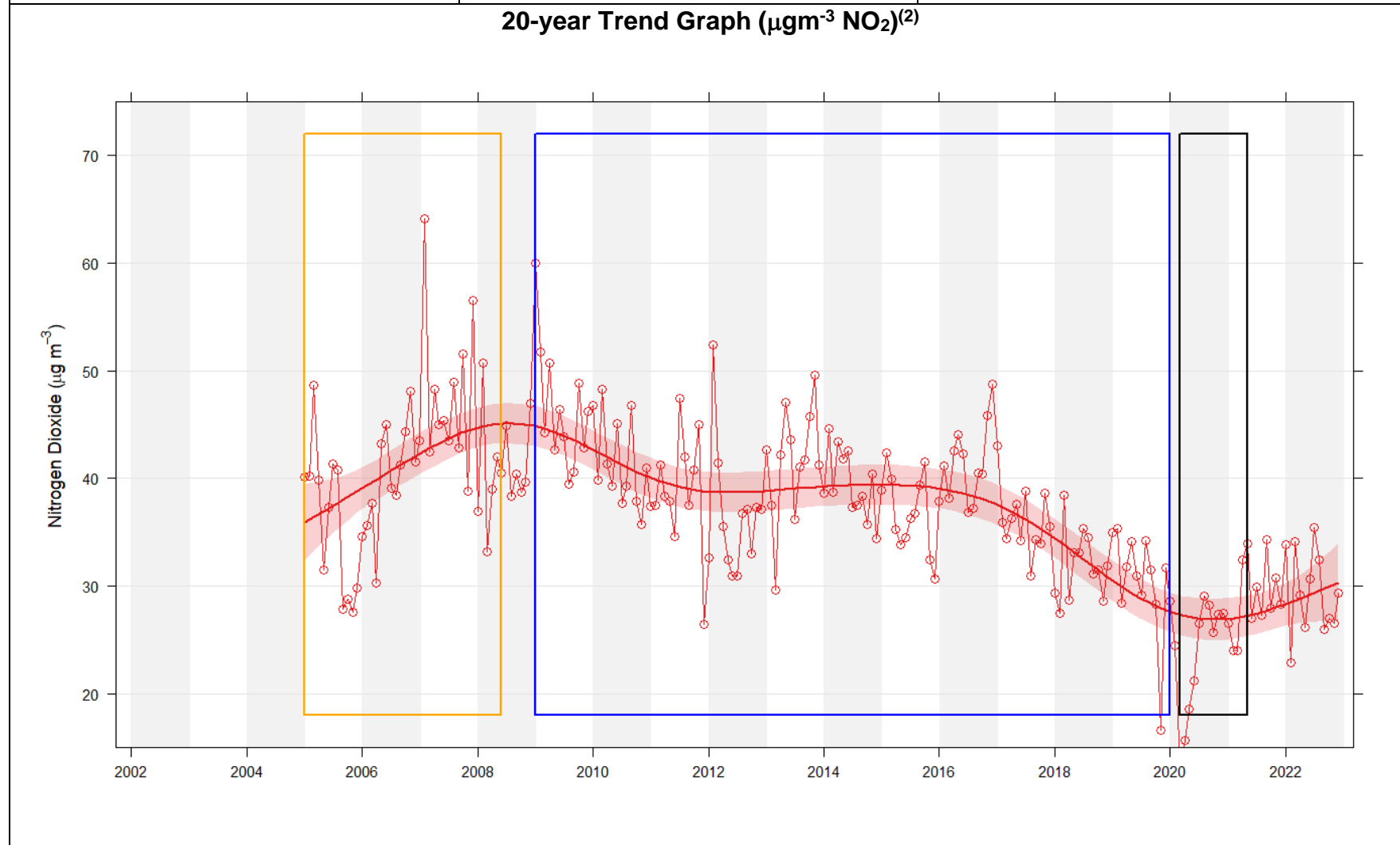
20-year Trend Graph ($\mu\text{g m}^{-3}$ NO₂)⁽²⁾



14.8 Broadway AQMA

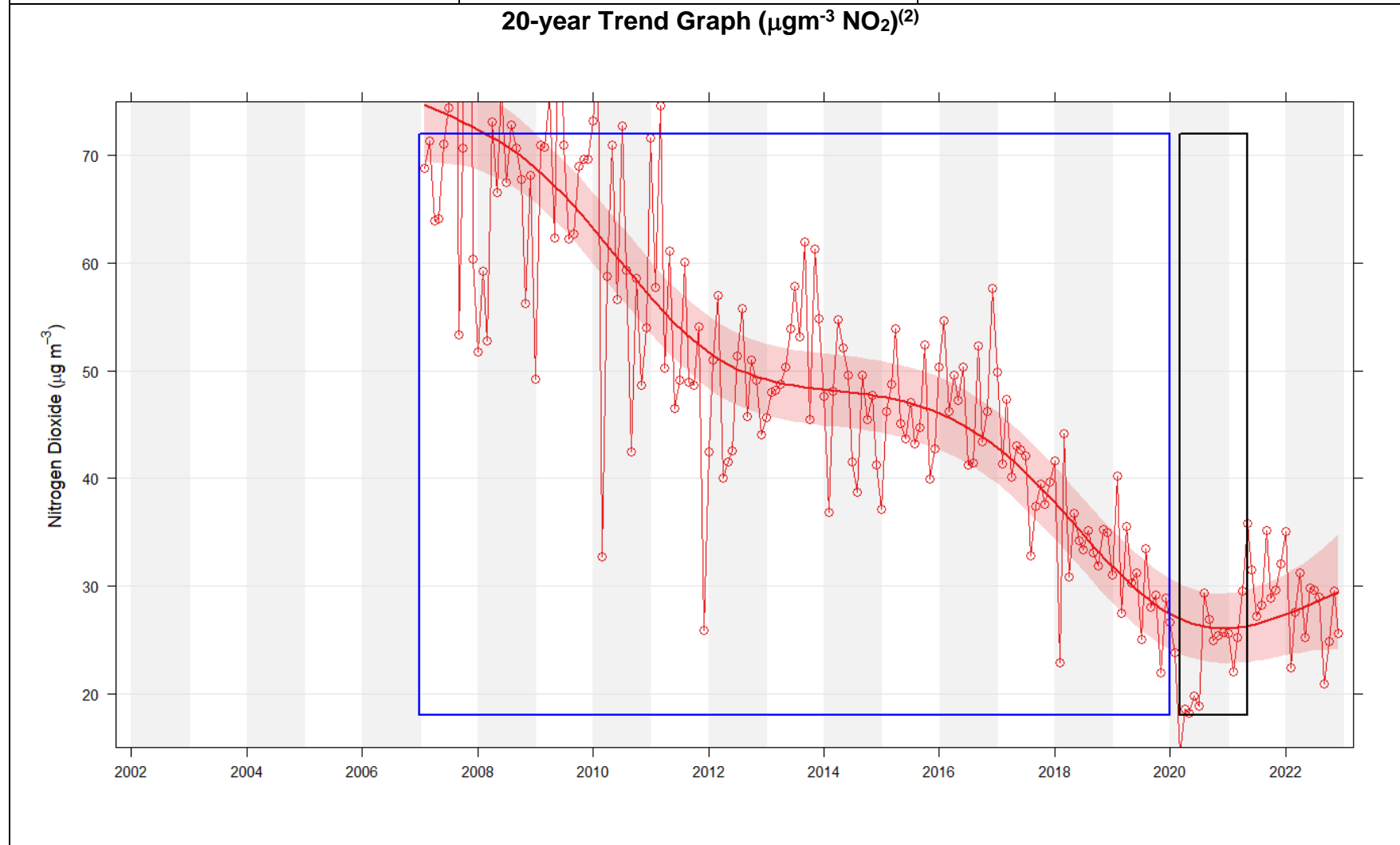
Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-3.3	Near Term

20-year Trend Graph ($\mu\text{g m}^{-3}$ NO₂)⁽²⁾



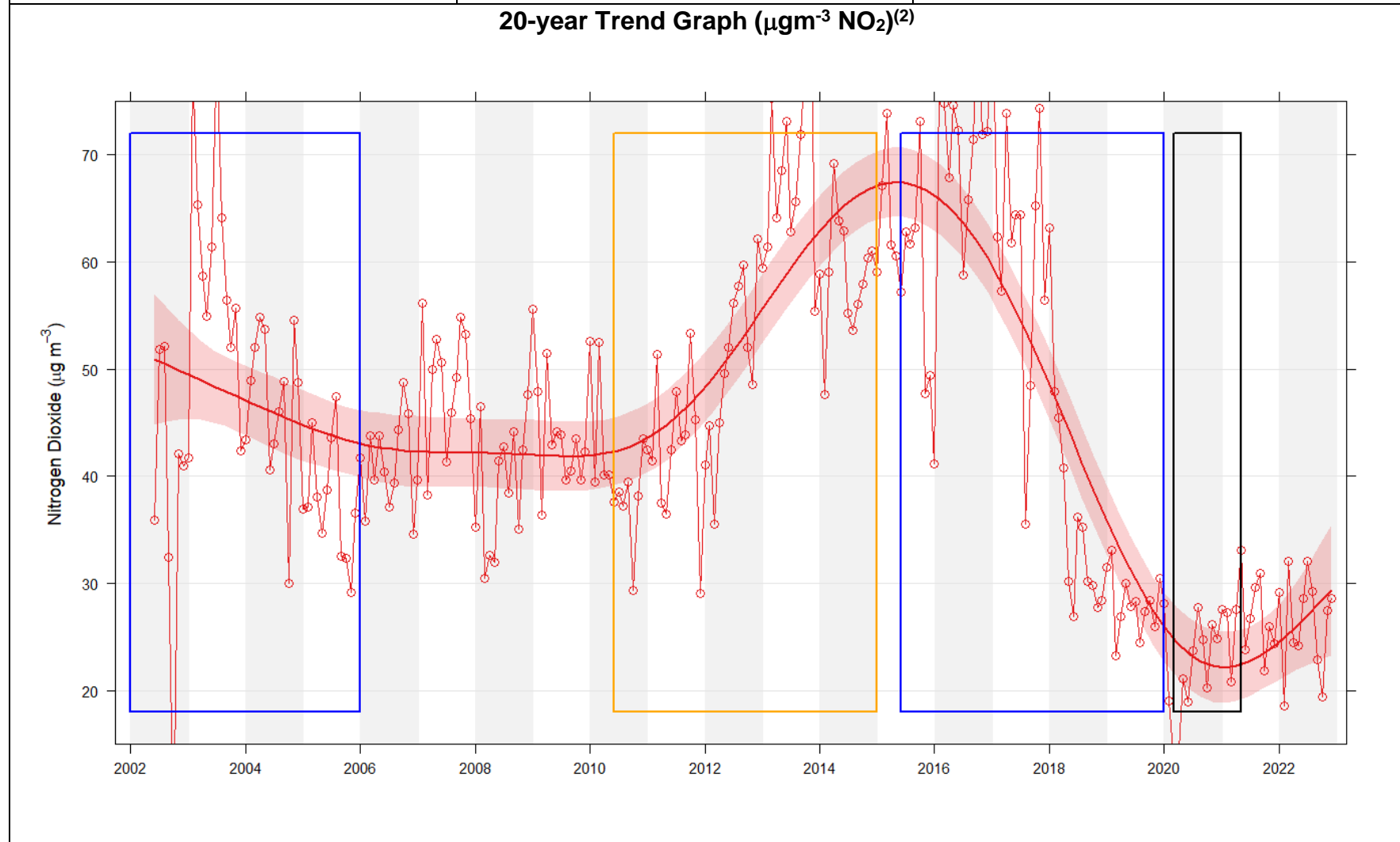
14.9 Church Village AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-6.2	Near Term



14.10 Cilfynydd AQMA

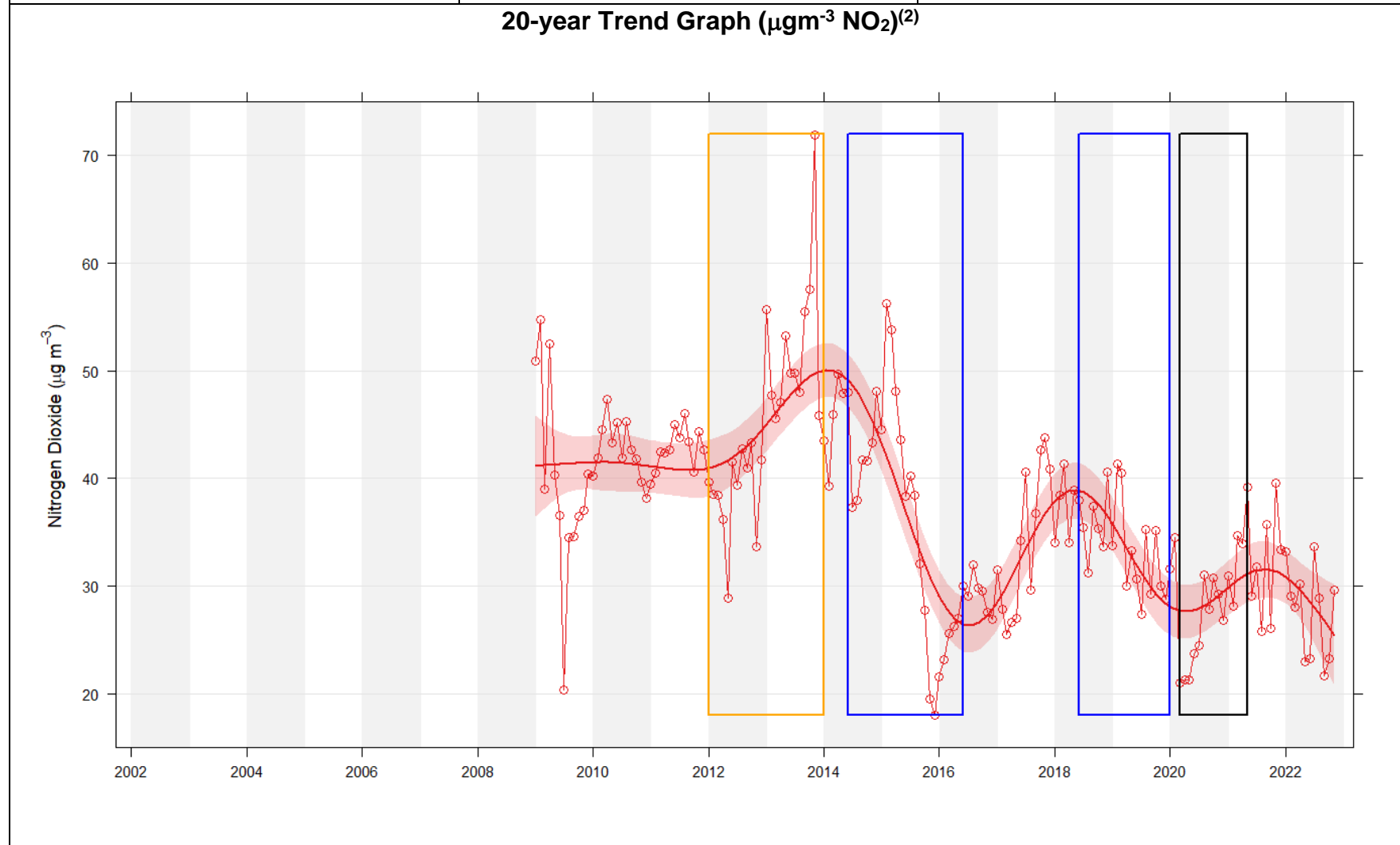
Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-8.3	Near Term



14.11 Llanharan AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-3.9	Near Term

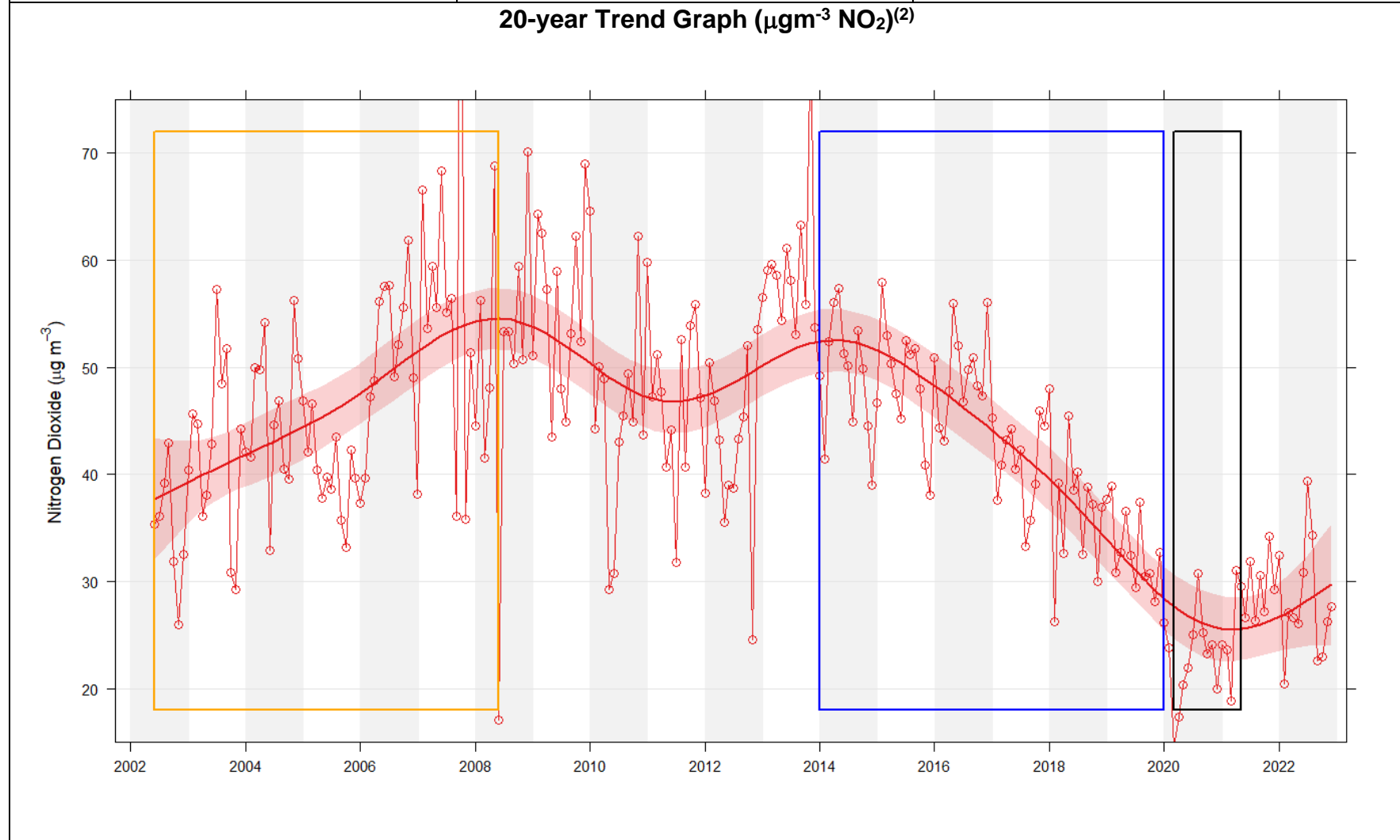
20-year Trend Graph (µgm⁻³ NO₂)⁽²⁾



14.12 Mwyndy AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-7.2	Near Term

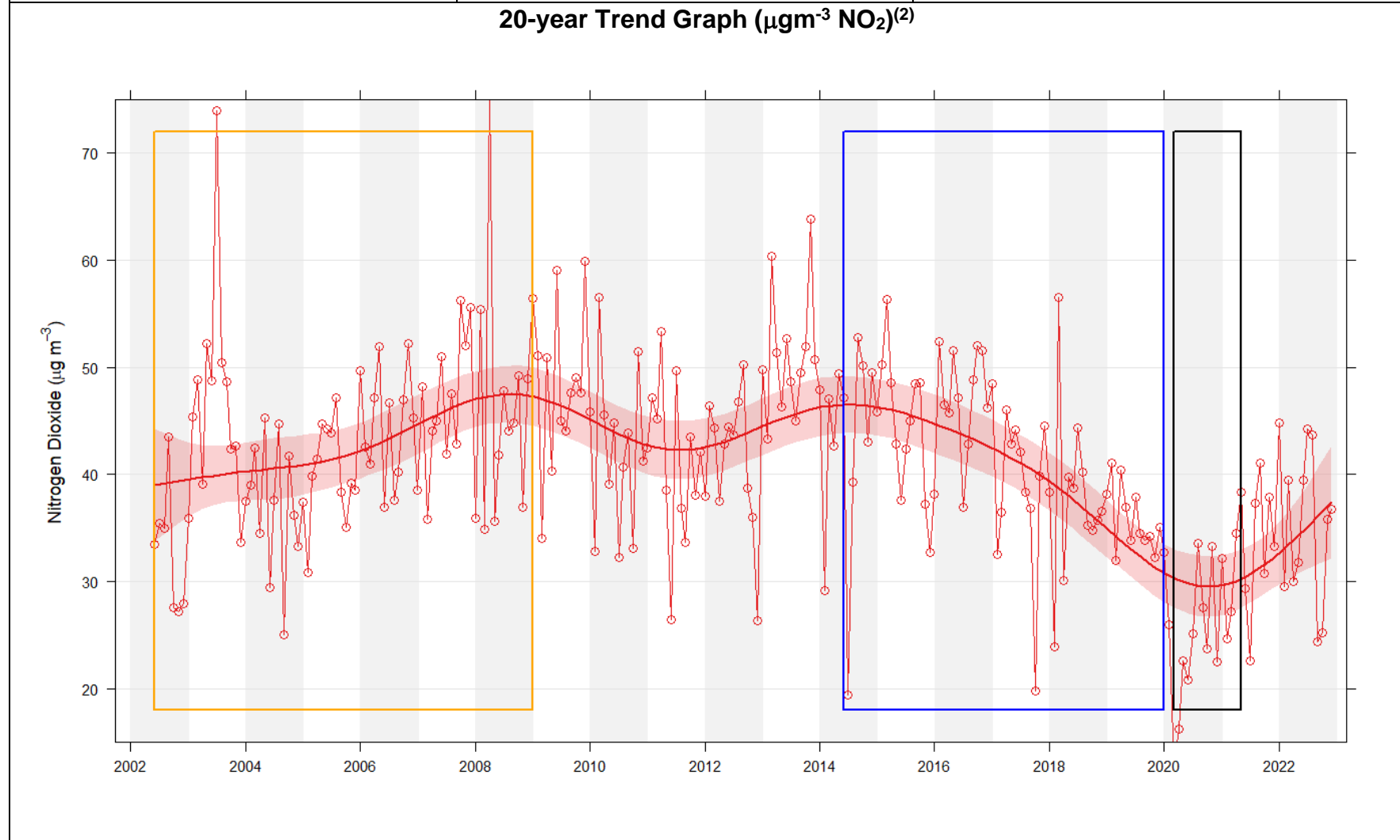
20-year Trend Graph ($\mu\text{g m}^{-3}$ NO₂)⁽²⁾



14.13 Nantgarw AQMA

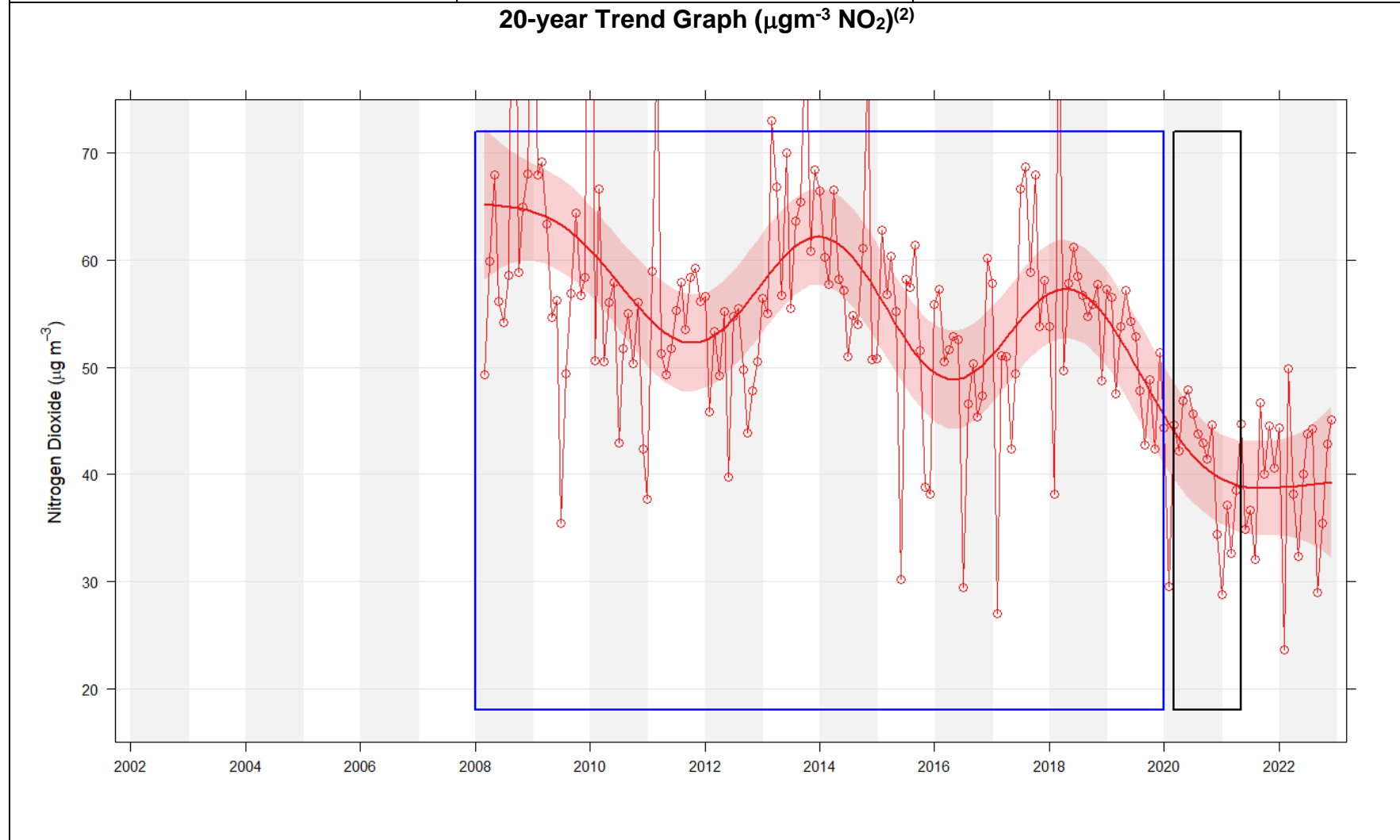
Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-3.0	Near Term

20-year Trend Graph ($\mu\text{g m}^{-3}$ NO₂)⁽²⁾



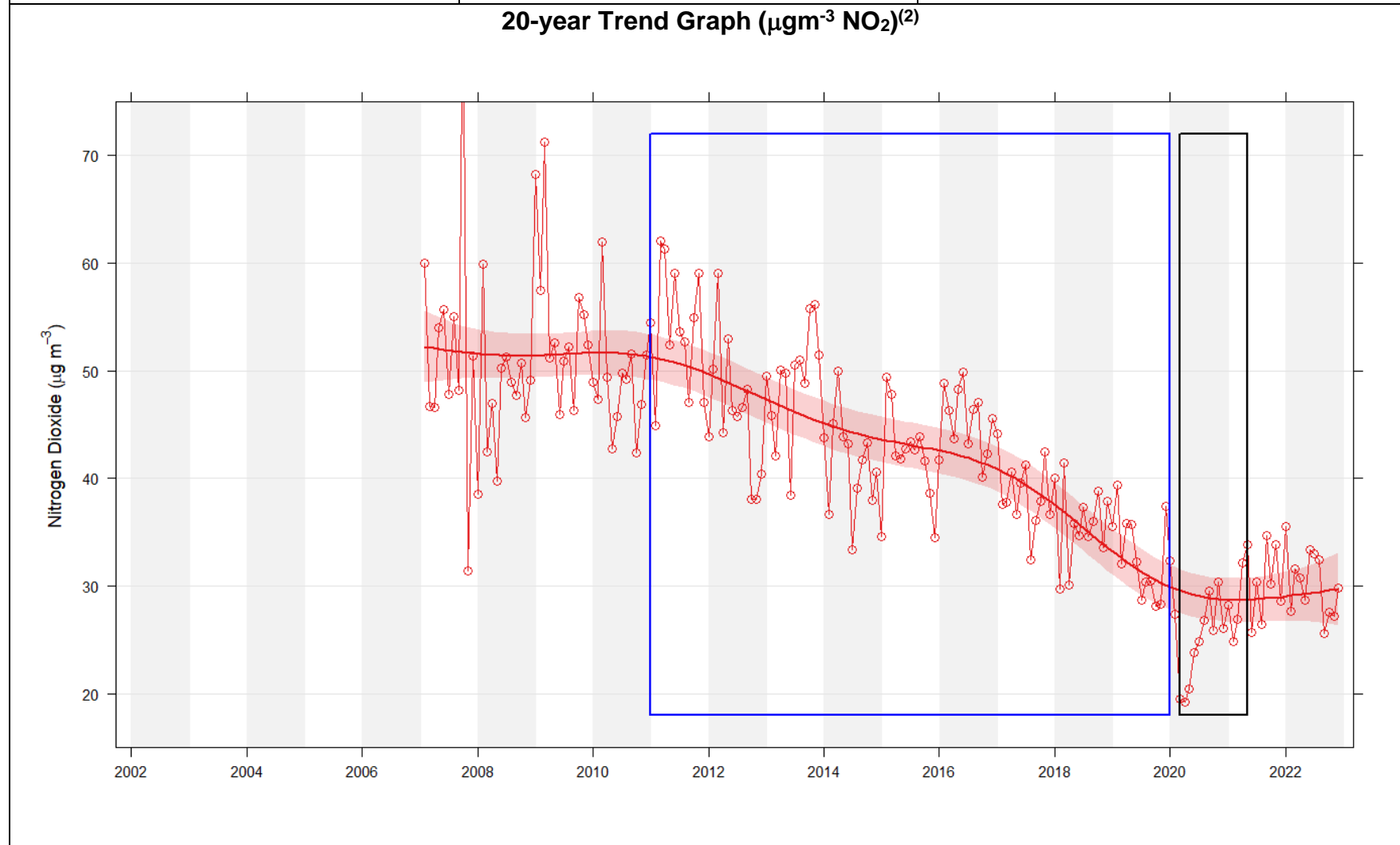
14.14 Nightingales Bush AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
6.7	-6.8	2+



14.15 Pontypridd Town Centre AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-4.3	Near Term



14.16 Pontypridd Town Centre AQMA

Needed Reduction in NO ₂ (%) ⁽¹⁾	Calculated 5-year Trend ⁽³⁾ (%)	Predicted Compliance (years) ⁽⁴⁾
Nil	-6.1	Near Term

20-year Trend Graph ($\mu\text{g m}^{-3}$ NO₂)⁽²⁾

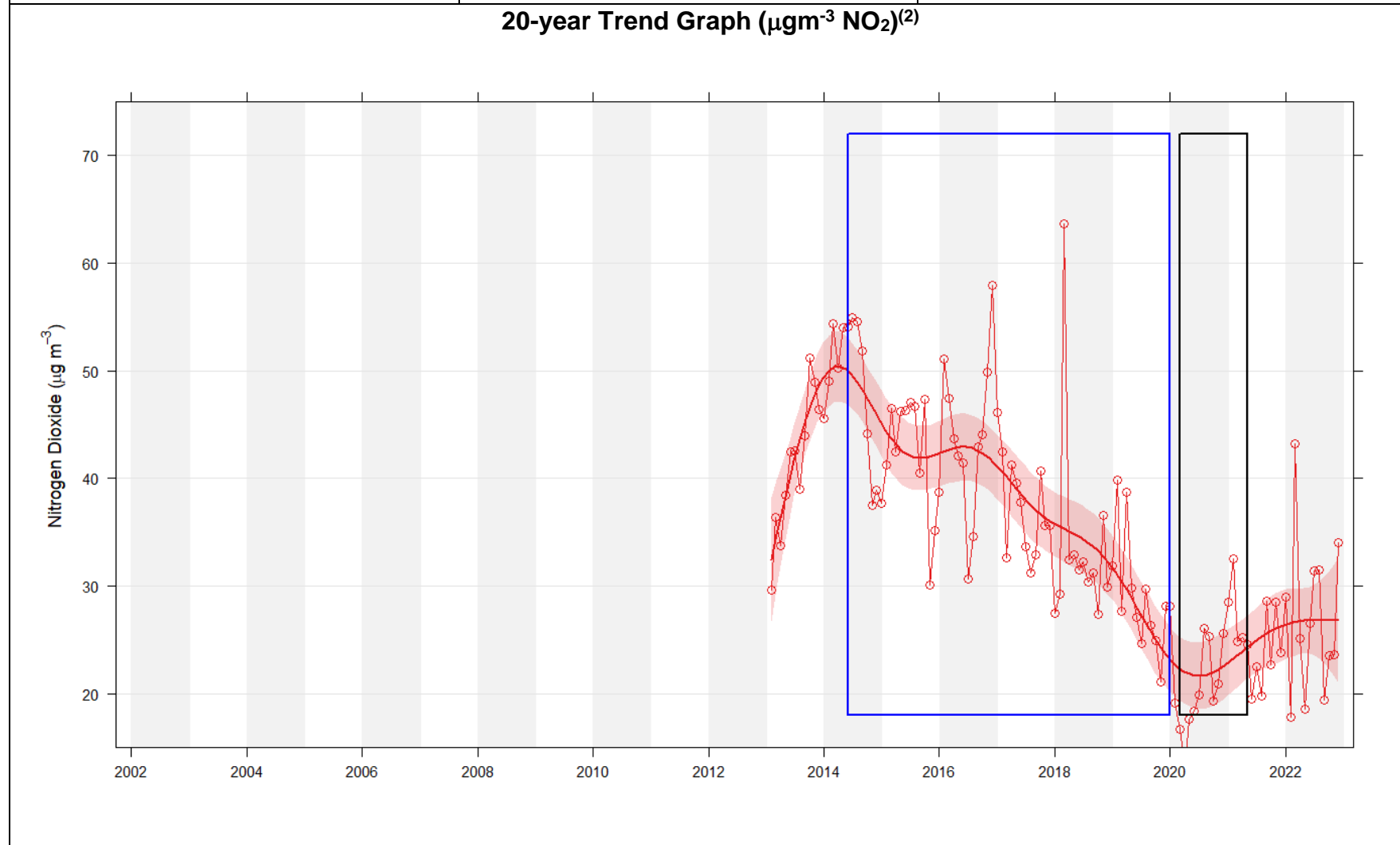


Table Notes

- (1) The required reduction in NO₂ determined on the three-year average at the worst case location within the AQMA. Due to the complex relationship between NO₂ and its precursors and sources, this is not a measure of the level of intervention required but rather a comparative indicator between AQMAs.
- (2) Trend analysis is indicative for comparison only and as an average may not be reflective of all areas within the respective AQMA.
- (3) Projected compliance periods are indicative only and do not necessarily take account of inherent uncertainties and future variables which may result in different real compliance periods.

15. Appendix E2: Revised Air Quality Action Plans

15.1 Rhondda

15.1.1 Cymmer AQAP

Cymmer AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Implement	AT1	New or improved active travel routes and supporting infrastructure within or serving Cymmer and neighbouring communities	2024	The total of length of new or improved relevant active travel routes
				The amount of investment in new or improved active travel routes
	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
	LP1	A dedicated Special Planning Guidance policy that provides instruction to development control applicants on how to account for and address air quality considerations, including mitigation measures, associated with relevant proposed developments	2023	Adoption of an SPG
	MT2	Improvement of public bus frequency for services serving Cymmer and neighbouring communities	2024	No. of additional or enhanced relevant bus routes
OP1.Cy	Green Infrastructure, including hybrid barriers, within Cymmer	2024	Total length of green barrier at Cymmer	
OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Cymmer and the wider region, that help to support existing or new green infrastructure which may support air quality improvements or	2024	Delivery of green infrastructure and biodiversity policies	

		protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.		
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RF6	Actions that support the adoption of alternative vehicle fuel by the Local Authority within its core fleet	2025	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RF7	Actions that support the adoption of alternative vehicle fuel by service providers contracted by the Local Authority within their core fleet associated with services affecting Cymmer	2025	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RI7.Cy	The provision of new off-street parking within Cymmer	2024	No. of additional local off-street parking spaces provided in Cymmer
	RM2.Cy	The assessment and potential realignment of traffic flow bias at the traffic light controlled junction of High St and Glynfach Rd so as to favour greater traffic flow along High St.	2023	% relevant bias adjustment made
				% change in average speed within Cymmer AQMA
	RM5	Increased civil parking enforcement by the Local Authority along High St within the Cymmer AQMA	2023	No. of additional hours spent patrolling relevant areas
Reserve	RF8	Actions that support the adoption of alternative vehicle fuel by public bus operators along routes that serve Cymmer	2028	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.1.2 Ferndale AQAP

Ferndale AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Ⓡ Ⓟ	AT3		2023	Delivery of schemes to increase travel information

		Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.		Favourable perspective of current public transport operators Delivery of schemes to increase modal shift Opportunities undertaken to encourage active travel route usage
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.1.3 Llwynypia AQAP

Llwynypia AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift Opportunities undertaken to encourage active travel route usage
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.1.4 Tonyrefail AQAP

Tonyrefail AQAP Actions	Action Monitoring Method
-------------------------	--------------------------

Type	Ref	Description	Implementation Year	
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
		Opportunities undertaken to encourage active travel route usage		
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.1.5 Tylorstown AQAP

Tylorstown AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
		Opportunities undertaken to encourage active travel route usage		
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.2 Cynon

15.2.1 Aberdare Town Centre AQAP

Aberdare Town Centre AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
		Opportunities undertaken to encourage active travel route usage		
Reserve	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.2.2 Mt Ash Town Centre AQAP

Mt Ash Town Centre AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Reserve	AT1	New or improved active travel routes and supporting infrastructure within or serving Cymmer and neighbouring communities	2024	The total of length of new or improved relevant active travel routes
				The amount of investment in new or improved active travel routes
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift

		information on practices that can reduce the impact of all travel options.		Opportunities undertaken to encourage active travel route usage
	MT2	Improvement of public bus frequency for services serving Mt Ash and neighbouring communities	2024	No. of additional or enhanced relevant bus routes
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RF6	Actions that support the adoption of alternative vehicle fuel by the Local Authority within its core fleet	2025	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RF7	Actions that support the adoption of alternative vehicle fuel by service providers contracted by the Local Authority within their core fleet associated with services affecting Mt Ash	2025	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RF8	Actions that support the adoption of alternative vehicle fuel by public bus operators along routes that serve Mt Ash	2028	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RM5	Increased civil parking enforcement by the Local Authority along New Rd within the Mt Ash AQMA	2023	No. of additional hours spent patrolling relevant areas

15.3 Taf

15.3.1 Broadway AQAP

Broadway AQAP Actions				
Type	Ref	Description	Implementation Year	Action Monitoring Method
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
		Opportunities undertaken to encourage active travel route usage		
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity,	2024	Delivery of green infrastructure and biodiversity policies

		within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.		
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.3.2 Church Village AQAP

Church Village AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
		Opportunities undertaken to encourage active travel route usage		
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.3.3 Cilfynydd AQAP

Cilfynydd AQAP Actions			Action Monitoring Method
------------------------	--	--	--------------------------

Type	Ref	Description	Implementation Year	
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
				Opportunities undertaken to encourage active travel route usage
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.3.4 Llanharan AQAP

Llanharan AQAP Actions				
Type	Ref	Description	Implementation Year	Action Monitoring Method
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
				Opportunities undertaken to encourage active travel route usage
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections	2024	Delivery of green infrastructure and biodiversity policies

		and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.		
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.3.5 Mwyndy AQAP

Mwyndy AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.3.6 Nantgarw AQAP

Nantgarw AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Ⓡ Ⓟ	AT3		2023	Delivery of schemes to increase travel information

		Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.		Favourable perspective of current public transport operators Delivery of schemes to increase modal shift
				Opportunities undertaken to encourage active travel route usage
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.3.7 Nightingales Bush AQAP

Nightingales Bush AQAP Actions				
Type	Ref	Description	Implementation Year	Action Monitoring Method
Implement	T1	Continued implementation of the A470 speed restriction of 50mph between Upper Boat and Pontypridd by the Highways Authority	-	To continue to be delivered and monitored by the relevant Highways Authority for the A470 at this location
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

Reserve	LP1	A dedicated Special Planning Guidance policy that provides instruction to development control applicants on how to account for and address air quality considerations, including mitigation measures, associated with relevant proposed developments	2023	Adoption of an SPG
	MT1	Delivery of the South Wales Metro by Transport for Wales	2024	Achievement of phased development scheme in accordance with published schedule
	MT4.NB	Provision of additional park and ride spaces at existing or new facilities within the Rhondda, Cynon or Merthyr areas		No. of additional park and ride spaces in the Cynon, Merthyr and Rhondda areas, based on a 2022 baseline
	OP1.NB	Green Infrastructure, including hybrid barriers, within Nightingales Bush	2024	Total length of green barrier at Nightingales Bush
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Nightingales Bush and the wider region, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

15.3.8 Pontypridd Town Centre AQAP

Pontypridd Town Centre AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Reserve	AT1	New or improved active travel routes and supporting infrastructure within or serving Pontypridd and neighbouring communities	2024	The total of length of new or improved relevant active travel routes
				The amount of investment in new or improved active travel routes
	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
				Opportunities undertaken to encourage active travel route usage
	MT2	Improvement of public bus frequency for services serving Pontypridd and neighbouring communities	2024	No. of additional or enhanced relevant bus routes
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RF6	Actions that support the adoption of alternative vehicle fuel by the Local Authority within its core fleet	2025	Delivery of the RCTCBC EV strategy in accordance with published schedule
	RF8	Actions that support the adoption of alternative vehicle fuel by public bus operators along routes that serve Pontypridd	2028	Delivery of the RCTCBC EV strategy in accordance with published schedule
RM2.Po	The assessment and potential realignment of traffic flow bias at the traffic light controlled junction of Gelliwastad Rd and Crossbrook St so as to favour greater traffic flow along Gelliwastad Rd.	2023	% relevant bias adjustment made	
			% change in average speed within Pontypridd AQMA	
RM5	Increased civil parking enforcement by the Local Authority along High St within the Cymmer AQMA	2023	No. of additional hours spent patrolling relevant areas	

15.3.9 Treforest AQAP

Treforest AQAP Actions				Action Monitoring Method
Type	Ref	Description	Implementation Year	
Implement	T1	Continued implementation of the A470 speed restriction of 50mph between Upper Boat and Pontypridd by the Highways Authority	-	To continue to be delivered and monitored by the relevant Highways Authority for the A470 at this location
Reserve	AT3	Behavioural measures to influence travellers, to include the dissemination of information to support active travel and public transport as well as information on practices that can reduce the impact of all travel options.	2023	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Delivery of schemes to increase modal shift
		Opportunities undertaken to encourage active travel route usage		
	OP2	Green Synchronism, to include policy's and actions that support ecology and biodiversity, within Rhondda Cynon Taf, that help to support existing or new green infrastructure which may support air quality improvements or protections and may include awareness and educational activities to further improve the sustainability of relevant local green infrastructure.	2024	Delivery of green infrastructure and biodiversity policies
	RF4	Actions that support the adoption of alternative vehicle fuel by the public and which are likely to reduce the dependency upon fossil fuels.	2024	Delivery of the RCTCBC EV strategy in accordance with published schedule

16. Glossary of Terms

Abbreviation	Description
4 th Stage Further Assessment	A review of all evidence and reasoning for an AQMA to be completed 12 months after the declaration is made. The assessment also requires identification of the sources of the pollutant which has triggered the AQMA and the reductions required for compliance.
Accuracy	A measure of how well a set of data fits the “true” value.
Air Quality Action Plan [AQAP]	A cost effective plan devised by a Local Authority to improve air quality.
Air Quality Management Areas [AQMA]	An area which a Local Authority has designated for action, based upon predicted or measured breach of an Air Quality Objective.
Air Quality Objective [AQO]	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups.
Annual mean	The average of the concentrations measured for the pollutant in one year. In the case of an AQO this is for a calendar year.
National Background Concentrations	The level of the pollutant predicted to be present using advanced modelling at a national level. Background concentrations added to local contribution (dependent upon unique local factors) is the total concentration
Benzene [C ₆ H ₆]	A liquid compound of Carbon and Hydrogen forming a stable aromatic “ring” structure. Mainly occurs due to the evaporation of petroleum.
1,3–Butadiene [C ₄ H ₆]	A gaseous compound of Carbon and Hydrogen forming a simple conjugated diene. Produced for specific industrial processes and as a by-product in the combustion of petroleum.
Carbon Monoxide [CO]	A gaseous compound of Carbon and Oxygen normally formed by the incomplete combustion of Carbon with Oxygen in an atmosphere with a deficiency of Oxygen.
Climate Change	Is the effect on the statistical distribution of weather over a period of time and caused by the increase in the mean temperature of the Earth’s near surface and oceans, triggered by the anthropogenic emission of greenhouse gasses.
Concentration	The amount of a (polluting) substance in a volume (of air), typically expressed as a mass of pollutant per unit volume of air (for example, microgrammes per cubic metre, µg/m ³) or a volume of gaseous pollutant per unit volume of air (parts per billion, ppb).
Confidence level	The degree of certainty at which the true value will be in a predicted range.
Coronavirus	SARS-CoV-2 virus and its variants
COVID-19	An infectious disease caused by the SARS-CoV-2 virus

Data capture	The percentage of all the possible measurements for a given period that were validly measured.
Defra	Department of the Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
Exceedence	A period of time where the concentration of the pollutant is greater than the appropriate Air Quality Objective.
Fine Particulate Matter [PM ₁₀]	An atmosphere of regular and/or irregular particles with a significant probability of having a diameter of 10µm and less. They are produced from a large variety of natural and anthropogenic sources.
Kurtosis	An index of the sharpness of the peaks in a data set
Lead [Pb]	A solid elemental metal. Lead is second only to Iron among the most widely used metals, having a broad range of manufacturing and construction uses. Historically also used as an anti-knocking agent in petroleum, however, its use has now been phased out in the United Kingdom.
Metrological effects	Effects of seasonal variations on the atmosphere. These effects can include temperature, atmospheric turbulence, prevalence of sunlight, etc and is often referred to as Winter or Summer Smog.
Modeling	The use of advanced stochastic simulations to predict a future variable, for instance the concentration of a pollutant in ambient air.
Monitoring Data	Data gained from monitoring using various scientific apparatus
Nitrogen Dioxide [NO ₂]	A gaseous compound of Nitrogen and Oxygen normally formed by the oxidation of Nitric Oxide with Oxygen in the air
Nitrogen Oxides [NO _x]	A generic term for all gaseous compounds of Nitrogen and Oxygen and normally comprising of Nitric Oxide and Nitrogen Dioxide
Nitric Oxide [NO]	An unstable gaseous compound of Nitrogen and Oxygen normally formed by the incomplete oxidation of Nitrogen with Oxygen in the air.
n th Percentile	A value that is the rank at a particular point in a collection of data. For example, the 99.8 th percentile of values for a year is the value that 99.8% of all the data in the year fall below, or equal.
Precision	A statistical definition of how closely readings within a range are to one another.
Annual Progress Report	An annual report providing the latest monitoring data and assessment of local development and policies for all pollutants of concern as well as progress in the implementation of AQAPs.
µgm ⁻³	Microgrammes per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1 µgm ⁻³ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Ratification (Monitoring)	A critical review of all information relating to a data set, in order to amend or reject the data. When the data have been ratified they represent the final data to be used (see also validation).
Running Mean	A mean composed of overlapping time periods. For instance, an 8-hour running mean is calculated every hour, and averages the values for eight hours. The period of averaging is stepped forward by one hour for each value.
Skewness	The bias to asymmetry of a data set
Sulphur Dioxide [SO ₂]	A gaseous compound of Sulphur and Oxygen normally formed by the oxidation of Sulphur with Oxygen in combustion processes.
TEA	Triethanolamine. Used as an absorbant for NO ₂ in Palmes type passive diffusion tubes.
Transboundary effects	The effects caused by the long distance transportation of air pollutants, typically across national borders. Examples are the Saharan dust episodes and the Central Europe particle episodes.
Validation (Monitoring)	Screening monitoring data by visual examination for spurious and unusual measurements (see also ratification).
Validation (Modeling)	The general comparison of modeled results against monitoring data carried out by the model developer to ensure the model is "fit for purpose".
Verification (Modeling)	A comparison of modeled results versus monitoring results at relevant local locations.
WG	Welsh Government