Carmarthenshire County Council 2023

Air Quality Progress Report

In fulfilment of Part IV of the Environment Act 1995, as amended by the Environment Act 2021

Local Air Quality Management

Date: (September, 2023)

Information	Carmarthenshire County Council Details
Local Authority Officer	Lisa Jones
Department	Homes and Safer Communities
Address	Ty Parc-yr-hyn, Ffordd Y Rhyd, Ammanford, Carmarthenshire SA18 3FB
Telephone	01269 598255
E-mail	lisajjones@carmarthenshire.gov.uk
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Executive Summary: Air Quality in Our Area

Air Quality in Carmarthenshire

The main air quality pollutant relevant to Carmarthenshire is Nitrogen Dioxide (NO_2) and the main source of NO_2 emissions in the County is road traffic. We have developed a monitoring network that follows some of our busiest roads and most congested streets to enable us observe trends in NO_2 concentrations and assess the effectiveness of any changes made in attempt to improve air quality in those areas.

The Nitrogen Dioxide trends observed during 2022 have continued to decrease in comparison to 2017, 2018 and 2019 however monitoring results have observed an increase compared to 2020 with similar results that was reported in 2021. No sites within the Carmarthenshire Air Quality Management Areas have exceeded the Air Quality Objective for 2022 for the third year running. Two sites; one based in Carmarthen and one based in Llanelli had however remained marginally compliant of exceeding the Air Quality Objective. This is a great improvement from 2019 where it was reported that one site had exceeded the AQO in the County and three further sites remained marginally compliant.

This trend is promising, however there are many factors that may be influencing these results year on year, including the weather and vehicles generally getting cleaner as older ones are replaced. The significant reduction of Nitrogen Dioxide during 2020, was not surprising given the COVID19 Pandemic resulted in many travel restrictions during the lockdowns, this limited non-essential travel for a period of time, and restricted distance and reasons to travel. There were also long periods where schools were closed and working from home arrangements continued to be encouraged where it was possible, even after other restrictions had eased.

2021 observed more normal travel behaviours compared to 2020, however it also experienced a ‘COVID lockdown’ during the first couple of months of the year, with a phased return of shops and schools opening between March and April 2021. It was not until August 2021 that all restrictions fully ended, so we certainly observed an overall reduction in traffic levels during the early part of 2021. Still despite traffic levels largely returning, many businesses along with this Council, continued to allow home working and hybrid working arrangements. This has continued through 2022 and helps to discourage unnecessary travel through the County, and is a positive contribution within our own

Authority, given that many of our offices are located within the Air Quality Management Areas (AQMA's).

Although we are observing an overall downward trend, year on year, with a significant improvement observed over the last three years. When excluding the impact of the COVID pandemic, it is difficult to suggest that there has been such a significant reduction identified over the last three years that it should warrant changes at this time, to the AQMA's. As mentioned, the influence of the weather can play a significant part. Wind and rain can help to disperse pollutants more readily, and increased sunshine can also reduce the levels of Nitrogen Dioxide in the air through chemical reactions.

2022 was the warmest year on record with all months except for December being the warmer than average, it was a generally sunnier year. Rainfall was also below average for the year with the months From January to August and December being drier than average, whilst the autumn months were wetter than average. This type of climate will have some influence over the results that we are observing, and therefore it is important to continue to compare future years in case weather patterns change significantly.

It was expected that we would see a much greater reduction during 2020 -2021 given the reduced travel at periods during those years. However, this will not reflect the typical travel behaviours pre-COVID-19 and so it is important we continue to monitor the AQMA's beyond the pandemic period. It was not predicted that as much decrease in levels of Nitrogen Dioxide will be observed during 2022 in comparison to the last two years, following a return of the more typical travel behaviours. This appears to be apparent with some marginal increases and decreases in Nitrogen Dioxide reported across different sites across the county.

It is not expected that there will be any exceedances for 2023, because 2023 has experienced another warm and wet year with sunny summer periods providing many lower monthly results of NO_2 compared to 2022. However, it is too early to confirm this and there may still be some sites that remain borderline compliant. However, hopefully the overall downward trend will continue compared to pre-pandemic years. The site with the greatest risk of reporting an exceedance for 2023 is near 85 Priory Street, Carmarthen. This area continues to provide the highest readings in the County.

Carmarthenshire currently has three Air Quality Management Areas (AQMA) in Llandeilo, Carmarthen and Llanelli. Further details can be found on our website:

https://www.carmarthenshire.gov.wales/home/council-services/environmental-health/air-quality/#.W46Mg-mQzIU

The Llandeilo AQMA was designated in 2011 and an action plan was later developed in 2014. The fourth-year review of the Llandeilo action plan was conducted in 2019 and included in the 2019 Air Quality Progress Report. The outstanding options of the Llandeilo Action plan are largely under consideration within the Llandeilo and Ffairfach Transport Study commissioned by Welsh Government, due to the function of the Strategic Trunk Road of the A483. Sadly, announcement of the recommended preferred outcome of this work continues to be postponed. This has unfortunately delayed progress on this work and the review the Llandeilo Action Plan, however outstanding actions have been incorporated into the Council's most recent AQ delivery plan. It was planned to conduct this review in 2021, however we will continue to work closely with partners involved in this study to monitor progress with those outstanding options and compliance in this area. 2022 is the fourth year running where all monitoring sites in Llandeilo complied with the Air Quality Objective.

The AQMA's for the towns of Carmarthen and Llanelli were designated and Orders issued in August 2016. Action Plans for both towns were subject to public consultation during 2017. Responses were reviewed and draft Action Plans were submitted to Welsh Government late 2017. Although work has already began to assess and deliver some of the proposed measures in these Action Plans, the final Action Plan for Carmarthen and Llanelli was submitted to Welsh Government late 2019.

No new major sources of uncontrolled pollution or fugitive emissions have been identified within the County during 2022 and although many developments are underway, some of which have required air quality impact assessments to be conducted, no significant impacts have been identified. The requirement to adhere to an approved dust/construction management plan can be quite effective in reducing the risk to a negligible impact. Nevertheless, collaboration work with planners and developers continues and wherever possible further measures are encouraged to mitigate any impact that development may pose on air quality.

Two locations incorporating a Biomass boilers have been identified one was screened to assess any impacts they may pose on the environment and local air quality and the second location relates to a cluster in an Industrial site in Llangennech, Llanelli to which an

air quality assessment was submitted in support of an environmental permit application. The sites are not within any of the AQMA's.

We continue to work closely with our partners to manage local air quality in Carmarthenshire, including Natural Resources Wales, the Planning Authority, the Highways Authority, SWTRA and local schools.

Actions to Improve Air Quality

Air quality screening exercises were performed during 2022 at various locations and monitoring did not identify any breach of the Objectives. Further monitoring at other locations is being performed through 2023 and the results will be reported in the 2024 Progress Report.

A number of improvements have been delivered to improve air quality during 2022:

- **Electric Vehicle charging infrastructure** installed, including Cross Hands Rapid Charging EV Hub.
- **Electric Vehicle Infrastructure Strategy** had been published. Can be found here
- **Green and Blue Infrastructure Strategy –** phase one was produced in 2022 and can be found here
- **Cycling improvements including**
    - **EBike Charging**
    - **E- Cargo Bikes** – for businesses undertake deliveries.
    - **Cycle parking** - Installed at 27 locations in Llanelli, Carmarthen Ammanford and Leisure centres.
    - **Cycle Repair Units** have been installed across main towns of the County.
    - **Cycle routes** are promoted on the internet and discovercarmarthenshire.com
- A **Carmarthen Masterplan** has been created to look at increasing the amount of active travel links throughout the town.
- **New wayfinding signage** being installed across towns with walking/cycling journey times to key trip attractors from public transport stops/stations.
- **Footpath improvements** – Completed active travel routes and shared footpaths
- **A school street** introduced at Elkington Park, Bury Port.

- **Traffic Orders** restricting stopping outside schools with enforcement.
- **Car sharing** is promoted through the Liftshare scheme.
- **20mph zones** around schools and key shopping areas have been completed.
- Comprehensive **modelling work and feasibility studies** have been undertaken to evaluate options to improve the A484 congestion, Llanelli. The outcome of the roads review is awaited, in the interim work has commenced to promote Active Travel with schools in the area.
- The **T1 Carmarthen / Aberystwyth bus** service to deliver T1 electric bus by February 2023.
- **Improvements to bin collections & road sweeping** - Three fully electric refuse collection vehicles were introduced within the Fleet in January 2023.
- Impacts from the **Carmarthen Western Link Road** assessed.

Local Priorities and Challenges

The Challenge for 2023 will be lowering further and maintaining compliance against our Air Quality Objectives beyond 2022 and support the travel behavioural changes to sustain those improvements.

Work will continue in partnership to improve air quality under our Air Quality Deliver Plan. We continue to work closely with our partners to manage local air quality in Carmarthenshire, including Natural Resources Wales, the Planning Authority, the Highways Authority, SWTRA and local schools. The economy is in the stage of recovery, but uncertainty prevails in terms of the length of the recovery period given recent geopolitical and other influences. The Bank of England has warned of a recession with increasing interest rates, and a shrinking economy until the end of 2023, so this may pose additional challenges.

We can see that much more work is needed promote a sustainable modal shift, as NO_2 levels can quickly return with increased traffic. The Welsh Government aspirations for Southwest Wales Metro and the need for investment to deliver modal shift to both Active Travel and Public Transport along with the development of the Regional Transport plans next year will also have a major influence on modal shift.

Whilst Local Authorities are not in control of the levers to effect modal shift, a substantial amount of work has been undertaken in developing Active Travel infrastructure and

behavioural change interventions in the County and every major town has an active Travel Master Plan.

Priorities for the coming year in Carmarthenshire will focus on progressing the with the proposed actions for the Carmarthen and Llanelli AQMA's and working with Welsh Government and South Wales Trunk Road Agency to follow the progress of the Llandeilo Transport Study that includes the outstanding measures of the Action Plan for Llandeilo. Some key measures will include additional 20mph zones on residential streets, additional wayfinding signs to help pedestrians navigate, further improvements to footpaths including shared use footpaths will be constructed. A review of the Carmarthen Park and Ride service will be completed along with general review of the Council fleet and completion of an electric T1 Carmarthen / Aberystwyth bus service.

Screening exercises will also be planned to monitor and assess impacts that should be brought by the Cross Hands Economic Link Road and increasing development in other parts of the County. Further monitoring of NO_2 will be carried out in Carmarthen and Llanelli to ensure that any action plan work carried out does not move the problem to another location.

Where possible, efforts will be made to engage with schools located within our AQMA's to raise awareness of local air pollution and encourage active travel. It is planned to monitor levels of Nitrogen Dioxide around the school gates for schools within the County that are located within our AQMA Towns.

Carmarthenshire County Council recognises what can be achieved to improve air quality and the COVID-19 Pandemic portrayed a best-case scenario in 2020, when non-essential travel is kept to a minimum. We also recognise that a number of Council' offices are based within our AQMA's and so efforts will be made to increase our own contribution towards improving air quality.

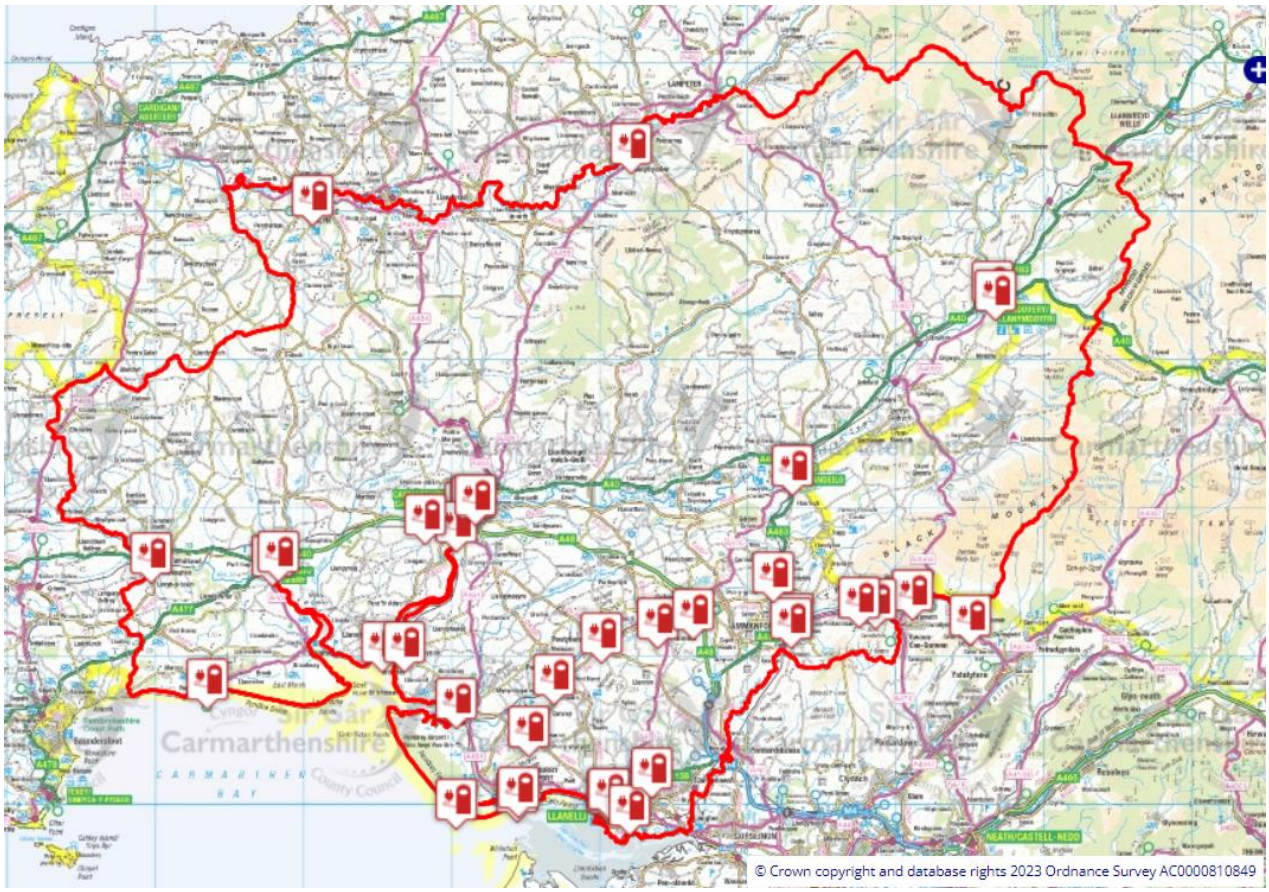
How to Get Involved

Air quality continues to be the largest environmental risk to public health, so there are many ways that you can help improve their local air quality in your area. Try reducing the use of cars for single person journeys, by car sharing, using other sustainable modes of transport such as electric vehicles and public transport, cycling or walking to work.

Rural residents can try Bwcabus – the Transportation Model for Rural Wales in Carmarthenshire providing access into neighbouring Powys and Ceredigion. The Bwcabus service enables people to travel between local towns and villages within the Bwcabus zone or connect to the main line bus services to travel further afield to places such as Aberaeron, Aberystwyth, Cardigan and Carmarthen.

Replacing your petrol or diesel vehicle with an electric car helps improve air quality and reduces emissions where you travel. There are also much more places available to charge an electric car in County and help plan your journey. Further information on electric vehicles, charging locations, and available grants can be found here.

Map of Electric Charging stations in Carmarthenshire car parks



77% of people in Carmarthenshire commute by car, 0.78% commute by bike and 9.5% commute by foot. Our aim is to see an increase in the number of commutes by bike and foot, so we encourage you to commute as much as possible through active travel.

If you would like to try out an electric bike or hire one for your commute you can hire an electric Brompton Bike from a Docking Station in Carmarthen Bus Station, Burry Port at the Seaview Terrace carpark or Llanelli Train Station. Further information on how to hire a bike can be found here:

https://www.bromptonbikehire.com/docks/3163-carmarthenbusstation
https://www.bromptonbikehire.com/docks/3164-carmarthenburryport
https://www.bromptonbikehire.com/docks/3165-llanelli

Travel more actively by getting involved in national walking and cycling weeks and make good use of the improved cycle routes across the Carmarthenshire. Improve pollution at the school gates by not idling car engines and improve walking and cycling routes for schools by signing up to schemes such as living streets to encourage children to travel actively.

More information on active travelling such as finding a cycle route/ footpath or public right of way is available in our active travel webpage.

Anyone can all get involved on National Clean Air Day, and participate in a global effort to make the air cleaner and healthier for everyone, Find out more on https://www.cleanairday.org.uk/wales

For further information on air quality within Carmarthenshire please visit:

https://www.carmarthenshire.gov.wales/home/council-services/environmental-health/air-quality/#.W46Mg-mQzIU

Or contact 01267 234567

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1 Actions to Improve Air Quality

Previous Work in Relation to Air Quality

Carmarthenshire County Council's first Air Quality Review and Assessment went to consultation in draft form during the summer of 2001. Assessment was made with reference to the Air Quality Regulations 2000. Only sulphur dioxide and nitrogen dioxide were identified in the Stage 1 assessment as requiring a Stage 2 assessment. The Draft Review concluded that a 3rd stage assessment was not necessary for any pollutant.

In response to consultation comments received from the National Assembly for Wales in respect of nitrogen dioxide levels from road traffic, Carmarthenshire County Council commissioned consultants to undertake a 3rd stage Review and Assessment in respect of nitrogen dioxide levels from road traffic along a particular route.

The final report of the 3rd stage review and assessment was produced in March 2002 and concluded that it was unlikely that nitrogen dioxide levels from road traffic sources would exceed objectives and that there was no need at that time to declare an Air Quality Management Area. It was considered, however, that for future assessments further investigation of street canyon effects would be advisable.

An Updating and Screening Assessment was started in 2003 and submitted to the Welsh Assembly Government in 2004. A number of conclusions were reached but progress on any of the recommendations was delayed until confirmation of guidance. Prioritisation of workloads within Carmarthenshire County Council meant that no further formal documentation was produced until the next Updating and Screening Assessment.

An Updating and Screening Assessment was undertaken in 2006, which included the Progress Report for 2005 (submitted to the Welsh Assembly Government in 2007) and concluded that there was no need to progress to a Detailed Assessment for carbon monoxide, benzene, 1,3 butadiene, lead, nitrogen dioxide, sulphur dioxide or PM_{10}. However, the report concluded that a nitrogen dioxide co-location study was needed to validate the results. Also, to reduce the potential for public exposure of sulphur dioxide at the Gwili Railway Station, the Public Protection Department of Carmarthenshire County Council needed to work with the management of the railway company. This has been on-

going with a work instruction relating to the idling time of steam engines to be less than 15 minutes when alongside the platform.

The original 2008 Progress Report that was submitted to the Welsh Assembly Government concluded that there had been an increase in the number of tube sites that had exceeded the annual objective. In total, eight sites had failed to meet the objective which was more than expected and had been predicted. It was noted that there was a significant change in the tube bias adjustment figure used compared to the previous couple of years. The figure was 0.90.

However, after submission of the report the authority received correspondence from the Welsh Assembly Government that detailed the latest bias adjustment figure had been reviewed and subsequently changed to 0.77. Also, that using the new "NO_2 with Distance from Roads" tool effectively reduced the number of tube sites that failed to meet the annual mean objective. The 2008 report was amended internally to reflect the changes and provide accurate historical information. The net result of this was that only one relevant tube location was identified as exceeding the air quality objective.

The Updating and Screening Assessment 2009 identified the need to proceed to a Detailed Assessment for NO_2 in Llandeilo, based on the annual mean objective of 40µg/m^3 being exceeded for the last two years and that work on the proposed relief road was not likely to begin for at least the next five years. The USA also recommended a full review of the diffusion tube network and assessments for the additional criteria detailed in Technical Guidance (09).

The Progress Report 2010 provided details of the Detailed Assessment that had been set up in Llandeilo, along with providing information on how the diffusion tube network had changed following the review in 2009. Further reviews of the tube network were recommended.

The Llandeilo Detailed Assessment Report 2010 was submitted and accepted by the Welsh Assembly Government in 2010. The report concluded that a public consultation should begin for the proposed designation of an Air Quality Management Area within the town and that a Further Assessment should follow on from the Detailed Assessment. The consultation took place and an Air Quality Management Area Order declared in November 2011.

The Progress Report 2011 provided further details for modifications to the diffusion tube network and proposals for the potential Detailed Assessments that may be required for the towns of Carmarthen and Llanelli.

The 2012 Updating & Screening Assessment Report reviewed the work in Llandeilo since the designation of the AQMA. It reported that an Action Plan was to be developed and this would be achieved by setting up a Steering Group and Action Planning Group. The Action Plan was due to be submitted later in 2013. Included in the USA were the proposal reports for the Detailed Assessments that were to be carried out for the towns of Carmarthen and Llanelli, along with details of further modifications that had taken place with respect to the diffusion tube network in the rest of the county.

The Llandeilo Further Assessment Report was submitted and concluded that the authority was justified in designating an AQMA for the town and that the boundary of the AQMA was appropriate. Source apportionment work was carried out and the necessary reduction in NO_2 identified. The results from the Further Assessment work were used to assist the development of the Action Plan.

Detailed Assessment Reports for the towns of Carmarthen and Llanelli were submitted and concluded that the monitoring results had not identified the area of exceedance and that more work was needed to identify potential boundaries. Modifications to the Detailed Assessment monitoring networks for both towns were proposed and implemented from January 2013.

The modified Detailed Assessments continued through 2013 for both towns and a review of results established that the areas of exceedance were very localised and likely to be attributable to the location characteristics. Reports for both extended Detailed Assessments were submitted in February 2014 and the conclusions and recommendations accepted by Welsh Government.

Work on the Llandeilo AQMA continued through 2013 with a draft Action Plan being developed encompassing feedback from various stakeholders and a Report of the work, along with the proposals in the draft Action Plan being put out to public consultation in September 2013. Drop-in centres were set up in two locations (Ffairfach and Llandeilo) over a two-week period and comments received during the consultation have been used to review the draft Action Plan. The Llandeilo AQMA Boundary map can be found in Appendix D: AQMA Boundary Maps. In 2014 the Action Plan was finalised and published

with work continuing the Phase 1 proposals. The designation process for the AQMA's in the towns of Carmarthen and Llanelli also begun with reports being submitted to the various council committees for approval. Whilst it had been hoped to have the Orders issued by the end of 2015, work commitments meant this was not possible.

The 2015 Updating and Screening Assessment was submitted and accepted.

Work on designating the AQMA's for Carmarthen and Llanelli continued in 2016 with the Orders being signed and issued on the 2nd August 2016. The Llanelli and Carmarthen AQMA Boundary maps can be found in Appendix D. Subsequent Action Plans for both Carmarthen and Llanelli were drafted in 2017 encompassing feedback from various stakeholders. A report of the work along with the proposals in the draft Action Plan were then put out to public consultation in July 2017 until September 2017, comments received during the consultation were used to review the draft Action Plan and a report was submitted to Welsh Government in December 2017.

Improvements were made to the Action Plans incorporating feedback from Welsh Government appraisal, the revised plan was then consulted with stakeholders from the action plan steering group in July 2018 and included in the 2018 Annual Progress Report. The final Action Plan for Llanelli and Carmarthen was submitted to Welsh Government for approval December 2019. Progress with the Action Plans has been reported in the annual progress reports.

The Action Plan for Llandeilo AQMA was planned for 2020, however delayed and postponed with the Covid19 pandemic. It was planned to conduct this review in 2022 following a decision from Welsh Government to recommend the final preferred option on the Llandeilo Bypass, under the Llandeilo Transport Study. The final decision, however, continues to be postponed and has subsequently paused this progress. Carmarthenshire County Council has continuously maintained that a Bypass is the only viable solution to address the issues associated with A483 traffic travelling through Llandeilo.

The 2020 APR no reported no exceedances of the annual Air Quality Objective in Llandeilo during 2019, for the first time since the AQMA was declared. Two sites were however borderline compliant.

In 2021 Carmarthenshire County Council developed an Air Quality delivery plan for the County which incorporated all outstanding measures from the current AQAPs, for Llandeilo, Carmarthen and Llanelli, and included additional countywide measures to help influence

improvements to air quality across the County. The 2021 APR reported no exceedances of the annual Air Quality Objective during 2020 in all three AQMAs in the County.

The 2022 APR reported no exceedances of the annual Air Quality Objective during 2021 for the third year running in Llandeilo and for the second year running in both Carmarthen and Llanelli AQMA's.

Table 1.1 – **Summary of LAQM Reporting**

Air Quality Report	**Submitted**
1st Air Quality Review (2001)	2002
Updating & Screening Assessment (2003)	2004
Progress Report (2005)	2007
Updating & Screening Assessment (2006)	2007
Progress Report (2008)	2008
Updating & Screening Assessment (2009)	2009
Progress Report (2010)	2010
Llandeilo Detailed Assessment (2010)	2010
Progress Report (2011)	2011
AQMA Declaration (Llandeilo) (11/11/11)	2011
Updating & Screening Assessment (2012)	2012
Llandeilo Further Assessment (2012)	2012
Carmarthen Detailed Assessment (December 2012) + appended Modified DA Network Report (for January 2013)	2013
Llanelli Detailed Assessment (December 2012) + appended Modified DA Network Report (for January 2013)	2013
Progress Report (2013)	2013
Draft Action Plan Report for Llandeilo (Public Consultation)	2013

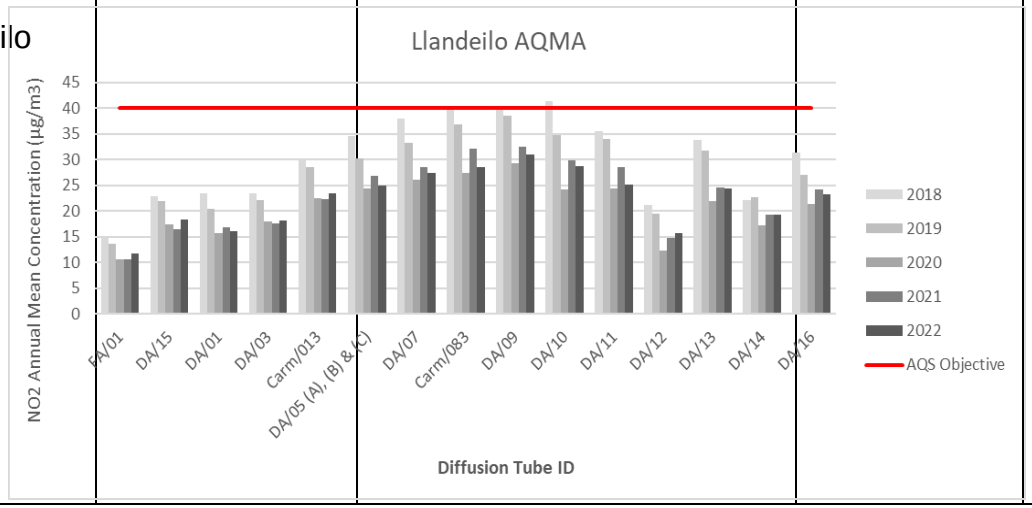
Extended Detailed Assessment Report for Carmarthen	2014
Extended Detailed Assessment Report for Llanelli	2014
Llandeilo Action Plan Report	2014
Llandeilo Action Plan	2014
Progress Report (2014)	2014
Updating & Screening Assessment (2015)	2015
Llandeilo Action Plan First Review (2016)	2016
Progress Report (2016)	2016
AQMA Declaration (Carmarthen and Llanelli) (02/08/16)	2016
Carmarthenshire AQ Screening Review Report (2016)	2017
Llandeilo Action Plan Second Year Review (2016)	2017
Carmarthen and Llanelli Draft Action Plan report	2017
Progress report (2017)	2018
Carmarthenshire AQ Screening Review Report (2017)	2018
Llandeilo Action Plan Third Review Feasibility of Phase 1 outstanding options (2017)	2018
Annual Progress report (2018)	2019
Carmarthenshire AQ Screening Review Report (2018)	2019
Llandeilo Action Plan fourth year review (2018)	2019
Final Action Plan for Carmarthen and Llanelli AQMA's	2019
Annual Progress report (2019)	2020
Annual Progress Report (2020)	2021
Annual Progress Report (2021)	2022
Annual Progress Report (2022)	2023

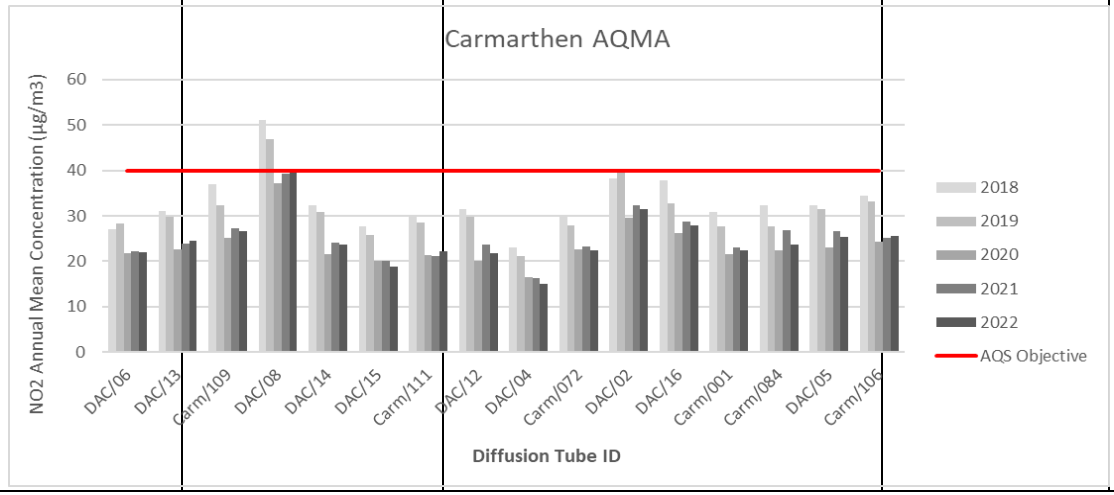
Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when air quality is close to or above an acceptable level of pollution (known as the air quality objective (Please see Appendix A)). After declaring an AQMA the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place to improve air quality to at least the air quality objectives, if not even better. AQMA(s) are seen by local authorities as the focal points to channel resources into the most pressing areas of pollution as a priority.

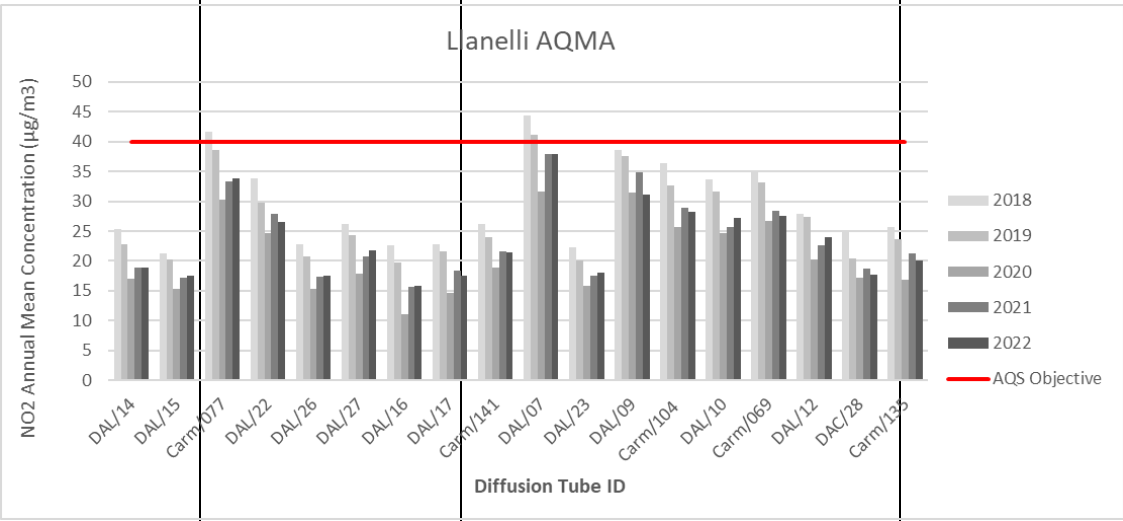
A summary of AQMAs declared by Carmarthenshire County Council can be found in Table 1.2. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=395 see full list at AQMA webpage.

Table 1.2 – Declared Air Quality Management Areas

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
AQMA Llandeilo 	NO_2 annual mean	This year's monitoring results indicates a significant improvement in air quality compared to previous pre-Covid years. Although there has been an increase in NO_2 compared to 2020. No exceedances are reported for the fourth year running.	Llandeilo	The length of the A483 from the roundabout junction of A483 with A476 Ffairfach north along Towy Terrace across Llandeilo Bridge into Bridge St then Rhosmaen St through the town centre until the roundabout junction of the A483 with the A40.	Llandeilo AQMA Action Plan

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
AQMA Carmarthen 	NO_2 annual mean	This year's monitoring results indicates a significant improvement in air quality compared to previous pre-Covid years. Although 2021 saw a marginal increase in NO_2 across most of the AQMA in comparison to 2020. 2022 has mostly seen a small further reduction. DAC/08 continues to observe the highest levels in Carmarthen, although no exceedances have been reported since 2019.	Carmarthen	The designated area incorporates the Jobs Well Road junction on the B4312 in Johnstown and travels in an easterly direction up Monument Hill and down Picton Terrace to meet the St Catherine's Street roundabout. It continues along St Catherine's Street, spurring north up Water Street to the junction with Glannant Road and Pentrefelin Street, on to Barn Road and Francis Terrace and continuing to Richmond Terrace before bearing right along Old Oak Lane and reaching Old Oak roundabout. The boundary spurs east along Priory Street, through Abbey Mead and as far as Tanerdy roundabout on the A484, being the eastern extent of the AQMA. At Old Oak roundabout the boundary also spurs right along Priory Street and through Church Street, Spilman Street and on to the junction on the A484 below County Hall. The boundary travels south over Towy Bridge as far as the Towy Bridge roundabout, which is the southern extent of the AQMA. From the junction below County Hall the boundary travels west along Coracle Way and on to Morfa roundabout before heading north up Morfa Lane to meet up with St Catherine's Street roundabout and then heads west back to the Jobs Well Road junction completing the AQMA boundary.	Carmarthen AQMA Action Plan

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Town	Description	Action Plan
AQMA Llanelli	NO_2 annual mean	This year's monitoring results indicates a significant improvement in air quality compared to the previous pre-Covid years, although 2022 has not reported a discernible improvement of NO_2 in the AQMA in comparison to 2021. No exceedances have been reported since 2019.	Llanelli	The designated area starts from the section of the A484 known as Bassett Terrace from the far west at the junction with Waun Eos Road travelling easterly through Sandy Road and incorporating Sandy Road roundabout, continues to follow an easterly direction along the A484 Pembrey Road before turning north up New Road as far as the mini round-about in Furnace, and then travels back south along Old Road as far as the junction with Thomas Street on the A476. The boundary then travels north east along the A476 through Felinfoel Road and Panteg, as far as the mini roundabout joining Farmers Row. The boundary travels back south west along the A476 right down to Thomas Street bearing left along the A484 continuing on to the roundabout and bearing right following the A4214 along Stepney Place. The boundary continues along the series of mini roundabouts going through Upper Robinson Street and Murray Street before turning right at the junction with Station Road. The boundary continues along the A4214 through Church Street, Hall Street, West End on to Pembrey Road, again incorporating Sandy Road roundabout before travelling back west along Sandy Road and on through Bassett Terrace before completing the boundary at the far west junction with Waun Eos Road.	Llanelli AQMA Action Plan



AQMA boundary maps within Carmarthenshire can be viewed at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=395 and are included in Appendix D.

Implementation of Action Plans

Carmarthenshire County Council has taken forward a number of measures during 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 1.3. More detail on these measures can be found in the Air Quality Action Plan relating to any designated AQMAs.

Air Quality Action Plans are continuously reviewed and updated whenever deemed necessary, but no less frequently than once every five years. Such updates are completed in close consultation with local communities.

Key measures completed in 2022 are:

- **The Electric Vehicle Infrastructure Strategy** was developed in 2021 and adopted and published 2022. Can be found here
- **EV charging infrastructure** has and continues to be developed across the County at strategic locations prioritised around strategic routes, trip attractor/destinations and regeneration;
    - 43 charging points have been located in towns, visitor locations, leisure centres and on the strategic highway network.
    - Charging infrastructure is currently being installed at key depots to support the transition to Ultra Low Emission Vehicles.
    - Cross Hands Rapid Charging EV Hub opened to the public at the end of March 2022.
- **Green and Blue Infrastructure Strategy –** phase one was produced in 2022 and can be found here
- **EBike Charging** – Physical works to 8 E-bike Charging Stations were installed across county. 4x sites are completed 2022 with 3x sites completed in 2023 with one installed at Pendine development when the project is completed in March 2023.
- **E- Cargo Bikes** – 12 Bikes have been purchased for load to support local businesses undertake deliveries. A Comms plan has been arranged to promote the scheme. A unit will be deployed through Llanelli BID. This will be an ongoing area of work to stimulate uptake and support businesses through recovery.
- **Cycle parking** - New cycle parking installed at 27 locations in Llanelli, Carmarthen Ammanford and Leisure centres. 20 cycle repair Units have been installed across main towns of the County. Sheltered Cycle Parking also installed at Carmarthen

Leisure Centre, Carmarthen Market and Ammanford Quay Street in November 2022.

- A **Carmarthen masterplan** has been created to look at increasing the amount of active travel links throughout the town and Feasibility studies are underway in 2023.
- **Cycle routes** are promoted on the internet and discovercarmarthenshire.com **New wayfinding signage** being installed across towns with walking/cycling journey times to key trip attractors from public transport stops/stations.
- **Car sharing** is promoted to staff through the Liftshare scheme.
- An additional electric taxi was licensed, bring a total of four electric taxi's in the county.
- **20mph** zones around schools and key shopping areas have been completed and further residential roads have also been identified to benefit from 20mph.
- **Improvements to bin collections & road sweeping** - The new routes have been routed in order to make them more efficient, moving to zonal working, reducing the need for vehicles to be traveling across the whole county on any given day. Three fully electric refuse collection vehicles were introduced within the Fleet in January 2023.
- Comprehensive **modelling work and feasibility studies** have been undertaken to evaluate options to improve the A484 congestion, Llanelli. The options have been subject to consultation with stakeholders. Overall, there was support for infrastructure improvements. The work formed part of a wider study for infrastructure in Llanelli which was subject to the Roads Review. The outcome of the roads review is awaited, in the interim work has commenced to promote Active Travel with schools in the area. The interventions will support improved reliability of public transport.
- **Footpath improvements** – Work continues to improve active travel routes and shared footpaths following the active travel consultation responses to improve active travel connectivity. Our Active Travel Strategy includes an Active Travel Master Plan for infrastructure development for each principal towns.
- A **school street** was implemented and promoted at Elkington Park, Bury Port, and enforcement being undertaken by camera car.
- The **T1 Carmarthen / Aberystwyth bus service** in process of transitioning to an electric fleet. In progress to deliver T1 electric bus by February 2023 in partnership with the Welsh Government and Transport for Wales.

- Impacts from the **Carmarthen Western Link Road** has been monitored and assessed. Diffusion tubes are located on the alternative route (old St Clears Road& Jobs Well Road) travelling through the Carmarthen AQMA, to identify whether there has been a reduction of traffic and subsequent NO_2 along these roads. College Street has been included so that we can identify whether the link road has resulted in any increase in traffic and pollution travelling through this area. It was not felt that 2020 and 2021 data provided a true representation of any impacts this link road has made and so monitoring has continued.

Carmarthenshire County Council expects the following measures to be completed over the course of the next reporting year:

- Impacts from the Cross Hands Economic Link Road will be assessed following completion during 2022. Diffusion tubes are located on the surrounding routes in Gorslas, Cross Hands to identify whether there has been a reduction of traffic and subsequent NO_2 along these roads.
- Welsh Government legislation is being introduced in September 2023 which will reduce the speed limit on residential streets from 30mph to 20mph. Preparations are currently underway for this change in legislation and implementation of a 20mph default speed limit by September 2023.
- A **school street** is being implemented at Morfa School, Olive Street Llanelli.
- **Carmarthen Park and Ride** - The Service is currently under review. Patronage is low, with many of the users having access to alternative bus services. Ongoing driver shortages resulting in some lost journeys, with operator considering future ability to provide the service.
- **Council Fleet -** EV charging facilities are also being introduced at Glanaman, Trostre and Cillefwr Depots to support electric fleet. We have purchased 3 full electric refuse collection vehicles, with a target of introducing 33 electric vehicles across WES services by Autumn 2024. A Fleet strategy is also under development for completion by April 2023.
- **Enhance Walking routes** - Infrastructure development for active travel will continue year on year subject to Welsh Government funding and where possible through planning development.

- Further **Wayfinding signage** is scheduled for installation across 13 towns providing direction to/from public transport stops and stations (completion March 2023).
- A **new active travel bridge** and connecting routes will be constructed in Llanelli over the A484 to enhance links between Halfway and Trostre as well as tying in with works completed in previous years leading to Coedcae and Stebonheath schools. The bridge will also form an important section of the Llanelli active travel spinal route that will eventually link Hendy with the Millennium Coastal Path via a number of key destinations such as Pentre Awel, Trostre Retail Park and Prince Phillip Hospital.
- An upgrade of a key Public Right of Way link to shared use status will also be delivered. This link connects the residents of Morfa (South Llanelli) with the Millennium Coastal path without having to travel around Machynys Golf Course.
- Work is in progress to research staff sustainable travel, parking provision and active Travel linkages at 11 key employment sites throughout the county. The aim is to see how travel behaviours can be improved and principles that embody good travel planning.
- **EV charging facilities to support waste collection vehicles** are also being introduced at Glanaman, Trostre and Cillefwr Depots. Grant funding opportunities for transitioning fleet vehicles to ULE continue to be monitored.
- Real -time Air Quality monitor to be installed in Priory Street Nov 22, to link with traffic counts to help determine source apportionment and next steps.
- It is planned to carry out a project with schools within our three AQMA's during 2023 using three real-time indicative air quality monitors to measure pollution outside the school gates and raise awareness to pupils about air quality.
- Further work will also be conducted to monitor progress of delivering the outstanding intervention proposals of the Llandeilo Action Plan in conjunction with the A483: Llandeilo and Ffairfach Transport Study, commissioned by Welsh Government. The remaining actions are under consideration within this study. Following the consultation, of WeITAG Stage Two, the Independent Review Panel will consider all of the feedback and will recommend a preferred option to Welsh Government for a Welsh Ministerial decision on a final recommendation which was postponed to the end of 2022.
- It was planned to review the Llandeilo action plan during 2020, however the COVID19 Pandemic has unfortunately delayed this progress. There is a significant

overlap in the options considered in the Welsh Government Llandeilo Transport Study with the measures proposed in the Action Plan, so it is prudent to review the action plan work in parallel. This was postponed to 2021, however as no further progress has been updated since the latest consultation, it is now planned to review this once further decisions will be announced on the preferred delivery options.

- The AQAP's for Carmarthen and Llanelli are due to be reviewed in 2024.

Table 1.3 – Progress on Measures to Improve Air Quality

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
	CARMARTHEN **High Priority**										
C1	Improve cycle routes in and around the town.	Provide alternative to car journey	County Council	2018	2018 – 2022	Usage of cycle routes by counter	0.1%	Safer routes in Communities (Johnstown) Cycle routes advertised on website. First section of Tywi Valley Cycle path opened New Shared Use path along Llansteffan Rd, Picton Hill and Picton Terrace constructed by end of 20/21 Masterplan being scoped for the town as well as active travel consultation currently live	Tywi Valley Path succcesful in receving leveling up funding £16.7 million for it's creation Works have now been completed along identified areas. A Carmarthen masterplan has been created to look at increasing the amount of active travel links throughout the town. Feasibility studies underway	SUP by 2021 2022 Action ongoing March 2024	Impossible to identify reduction in emissions

C3	Improve car parking issues at Glangwili Hospital.	Reduce congestion on and around the site	Local Health Board / County Council	2017	2018	Reduced congestion / traffic counts	1%	Cycle space compound, Additional parking spaces and promotes use of park and ride scheme. Car park Management contract started Sept 2018, APNR enforcement started August 2019. Carpark Capacity reduced 2019 (loss of 32 spaces). Increased demand from contractors on site. Looking to increase parking provision by 64. Agile working and Telemedicine helped to reduce appointments and demand for parking.	NHS have developed a partnership with Gwili railway which is on periphery of hospital site. There are 144 parking spaces made available to staff Mon to Fri. ANPR system will allow staff access to car park. 170 staff would be making use of the parking facility. Looking to develop pedestrianised routes to access to hospital from car park. Car park has availability for 300 + cars. Building works at Glangwili to be completed by June 2023 and this would also free up additional 50 parking spaces. Dual lane access to the hospital is being developed by using the nursing accommodation access route, stewards will be deployed in the carpark to redirect people looking to drop off or find a space to ease congestion in and around the hospital.	2023	Impossible to identify reduction in emissions
C6	Review the Park & Ride provision for the town.	Improve service and increase uptake	County Council / Partners	2019-2020	2020 - 2022	Usage data / monit	0.5%	Timings of P&R reviewed and improved to	Service is currently under review. Patronage is very low, with many of the users	2023	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
						oring data		support hospital staff Staff uptake of park and ride increased in 2019. P&R service increased its operational hours from 7am – 7pm to 6am – 9pm to support shift workers Jan 2020.	having access to alternative services. Ongoing driver shortages resulting in some lost journeys, with operator considering future ability to provide the service. Due for cyclic retender in 2024 Service continues to be promoted by Hywel Dda Board		
~~C7~~	Introduce a 20mph speed limit in the town (possibly part time)	Reduce emissions, improve road safety, less congestion, encourage walking, improve health	County Council	2018	2018 - 2019	Monit oring data	1%	20mph zones introduced around schools and shopping areas Additional 20mph areas Area wide in Carmarthen - complete	Welsh Government legislation is being introduced in September 2023 which will reduce street lit residential roads from 30mph to 20 mph. Preparations are currently underway for this change in legislation.	2023	Too early to identify reduction in emissions
	Medium -High Priority										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C2	Promote use of Carmarthen by-pass	Reduce number of vehicles travelling through town unnecessarily	County Council	2021	2022	Traffic counts	0.5%	Signage in place directing Hospital traffic to use bypass not Town Centre.	Carmarthen Town Feasibility Study being prepared for the Regeneration Forum which includes consideration of traffic signs.	TBC	
C4	Install AQMA signage (suggest alternative routes?).	Reduce number of vehicles travelling through AQMA unnecessarily	County Council / SWTRA / WG	2019	TBC	Traffic counts	1%	Explored options for AQMA signage	Alternative routes currently include Carmarthen Western Bypass and A40 Bypass which are signposted.		Improvements may be identified through monitoring results
~~C5~~	Assess positive / negative impacts of Western Link once opened.	Reduce congestion, improve traffic flow, reduce emissions	County Council	2018	2019	Traffic counts / monitoring data	3%	Western Link construction completed, opened March 2019	Assessment of impact on surrounding areas included in APR 2023	2023	
	Medium Priority										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~C8~~	Promote more car sharing / dedicated car parks (involve supermarkets?)	Reduced vehicles trips	County Council / Partners	2018	2019	Use of car sharing spaces?	0.1%	Promotion of car share website. Dedicated parking through planning . Travel Plans have been introduced in schools. A lift sharing app for parents was being developed. Car sharing promotion has been paused during COVID	Car share through Liftshare.com promoted to staff	Ongoing Await outcome of covid travel impacts	Impossible to identify reduction in emissions Difficult to monitor uptake
	Medium-Low Priority										
~~C~~ ~~10~~	Introduce electric/low emission buses, and introduce smaller buses at off-peak times.	Emissions reduction	County Council / Bus Operators	2019	TBC	Change in bus fleet	1%	Unsuccessful application for electric bus bid for the park and Ride scheme.	Work completed to introduce an electric T1 service From Aberystwyth to Carmarthen by end of 2022 in partnership with WG and transport for Wales.	Feb 2023	
	LLANELLI **High Priority**										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~L5~~	Introduce a 20mph speed limit in the town (possibly part time)	Reduce emissions, improve road safety, less congestion, encourage walking, improve health	County Council	2018 2020	2019 – 2020 2021	Monitoring data	1%	Safe routes in Communities Fund -20mph zones introduced around schools and some others areas completed 2021 Additional zones in place Part of 3 year project 2022 Further projects for Llanelli north and south areas will introduce 20mph planned 2022-26	Welsh Government legislation is being introduced in September 2023 which will reduce street lit residential roads from 30mph to 20 mph. Preparations are currently underway for this change in legislation.	Sept 2023	Too early to identify reduction in emissions

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
L9	Improve footpath / cycle route connectivity for the Sandy Road area.	Provide alternative to car journey	County Council	2018	2019 - 2021	Usage of cycle routes by counter	0.1%	Local Transport Fund/Active Travel Fund Plans designed, improvements made and ongoing	Footway widening across Sandy Bridge (Pembrey Rd) to be complete by Summer 2021. Carriageway narrowed to achieve this. Wider active travel network being developed Sandy Road and its junctions are currently under review. Adjoining active travel routes have been improved via Safe Routes in Communities funding e.g. ramped access to Sandpiper Road	2021	Impossible to identify reduction in emissions
~~L11~~	Determine opportunities from the Wellbeing Village development.	Sustainable travel, travel plan, EV charging etc.	County Council / Partners	2018	2019	Implementation of alternative travel options	?	Use of policy guidance to reduce pollution impact from development	Outline Planning consent granted, signage strategy and travel plan conditioned.	2023	
	Medium-HIgh Priority										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
L3	Install AQMA signage (suggest alternative routes?).	Reduce number of vehicles travelling through AQMA unnecessarily	County Council / SWTRA / WG	2018-19	2020	Traffic counts	1%	Explored signage options	Alternative routes are considered as part of the signage strategy for the town	2022	Improvements may be identified through monitoring results
L4	Promote use of Coast road through media resources.	Reduce number of vehicles travelling through town unnecessarily	County Council	2018 - 2019	2020 - 22	Traffic counts	0.5%	None	Signage Strategy planned as part of Traffic modelling study for the Town	2023	
Replaces L10, L20 and L21	Consider sustainable options to reduce congestion via A484, Llanelli West (Sandy Road Corridor) encouraging sustainable modal shifts	Strategi Highway Improvements UTC, congestion management, traffic reduction	County Council	2019		Traffic counts Changes in traffic flow, congestion monitoring data		Application to WG to fund improvements	Consultation on Sandy Road Corridor Improvements carried out 2021 following comprehensive feasibility and modelling studies on options to reduce congestion	Options subject to WG funding	
	GENERAL ACTIONS FOR CARMARTHEN & LLANELLI										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
A	Feasibility study for Low Emission Zones.	Reduce emissions	County Council / SWTRA	2022	?	Monitoring results	?	None	WG Clean Air Plan has proposal for all new cars and LGV's in public sector to be ULE by 2025	?	
B	Feasibility study for Congestion Zones.	Improve traffic flow, reduce emissions	County Council	2022	?	Monitoring results	?	None	None (For consideration if other measures do not reduce emissions enough)	?	
C	Introduce Taxi Idling Ban.	Reduce emissions	County Council	2021	?	?	?	No areas identified as a problem	None	?	
~~E~~	~~Introduce Supplementary Planning Guidance (e.g. provision of EV Charging points (– what criteria?).~~ Produce an electric Vehicle Strategy	Emissions reduction	County Council	2019	2020 - 2021	Number of EV charging points	?	26 additional charging points in 24 carparks installed across County. Electric vehicle Strategy under consideration, paused pending WG's release	Funding sought to commission studies on predicting future demand and additional locations along with a commission to complete and adopt a Carmarthenshire specific EV strategy in line with latest Welsh Government draft strategy 2020. Draft Strategy due to be published 2022	2022	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~1~~	Feasibility study for shared use footpaths. (with markings?)	Increase uptake of alternative travel	County Council	2018	2020	?	?	Sustainable Transport Fund (£1.7m) Funding secured for design. Bid submitted for funding the construction 2022	A number of shared use footpaths have been constructed across the county and including Carmarthen and Llanelli areas to improve connectivity. Details of completed schemes can be found here.	2023	
~~2~~	Advertise cycle paths.	Alternative transport	County Council	On going	Already being done	Cycle path counters	?	Cycle routes advertised on internet. Funding secured promote further. Cycle routes advertised on internet and discovercarmarthenshire.com Improvements to be made as additional new paths created	Wayfinding strategy has been completed. Installation of recommended signage has begun.	2022	Impossible to identify reduction in emissions.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
K	Advertise offices that have facilities for cyclists. (Increase number of offices/buildings providing cycle safe storage)	Encourage staff to use alternative transport	County Council	2019	2020	Use of facilities / Uptake of Cycle to work scheme	?	Pool bicycles available to Council staff in Carmarthen Cycle parking facilities at staff offices under review	Staff Travel review planned	2024	
L	Produce and distribute public messages (e.g. – turn engine off when parked/idling, slow down, consider air quality, stay back from car in front).	Public Information	County Council	2021	?	?	?	Social media messages as parts of National Clean Air Days	Social media messages as parts of National Clean Air Days	ongoing	
~~M~~	Check tourist route maps / websites for advised routes (avoid AQMA's where relevant)	Appropriate travel routes used	County Council / SWTRA	2022	?	?	?	Review indicates correct instructions on Discover Carmarthenshire, balance not to deter visitors from the town centres	None	2023	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
~~N~~	Review & improve timings of bin collections & road sweeping	Improve congestion	County Council	2022	?	?	?	WG Clean Air Plan has proposal for all HGV's in public sector to be ULE by 2030, so focus may be redirected here.	The new routes have been routed in order to make them more efficient, move to zonal working, reducing the need for vehicles to be traveling across the whole county on any given day.	2022	Council is also purchasing Electric Vehicles for waste collection
O	Feasibility study of making towns and villages vehicle free.	Reduce emissions	County Council	2022	?	Monitoring	?	Clean Air Zone Framework to be published by WG Spring 2021		?	
Q	Assess reward scheme for people who rarely use cars or for those that walk/cycle frequently.	Reduce emissions	County Council	2019	2019	Uptake	?	2019 cycle to work day competition	(Opportunities to reward staff for participating in active travel days/ Air Campaigns)	ongoing	
R	Facilitate retrofitting buses / coaches to gas fuel.	Reduce emissions	County Council / Partners	2021	?	Uptake	?	Clean Air plan target for all buses to have zero exhaust emissions by 2028	Local buses are predominantly owned by private transport operators. The development of the Southwest Wales Metro will review the bus networks across the region.	?	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
S	Diesel engine vehicle ban.	Reduce emissions	County Council / Partners	?	?	?	?	Government proposals to phase out sales of Diesel and Petrol cars and vans by 2040.	Considered unfeasible as technology is not yet available	?	
~~T~~	Enhance walking routes.	Alternative travel	County Council	2017	On-going	Path counters	?	Various routes introduced	Improvements to footpaths planned for Llanelli. Pedestrianised routes improved, introduced through planning development	March 2023	Wayfinding signage also introduced
V	Introduce green infrastructure or urban planting schemes. (possibly through Planning)	Emissions reduction	County Council / Partners	On going	?	Number of schemes	?	Included through planning developments. Consideration to developing a Green Infrastructure strategy. GI Infrastructure has been mapped. GI schemes Included BID for Jackson's Lane Carmarthen and Newcastle Emlyn	Consultation carried out on a Green and blue Infrastructure strategy 2021, phase one strategy developed 2022.	2023	Co-benefits of GI - reducing pollution levels and improving Health and Wellbeing

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
X	Liaise with 'Car Club' facilitators for opportunities to introduce across the County.	Emissions reduction	County Council / Partners	2018	2019	Uptake of Lift sharing	?	No car clubs currently operate in Carmarthenshire AQMAs Considering options. DolenTeifi community have 9 EV minibuses 4 EV's and 2 and MPV's available for the community to hire.	Dolen Teifi continue to increase provision of vehicles	?	
	LLANDEILO Phase 1										
3a	Assess and reduce parking provision along Bridge Street if possible. [Gerwyn's Fruit & Veg]	Improve congestion	WG / SWTRA	2015	2017	Monitoring data	2-4%	Assessed within first year review, no action possible at this time.	WG Transport Study considering option	2017	Link with 3d

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
3b	Assess and reduce parking provision along Rhosmaen Street if possible. [St Teilo's Church].	Improve congestion	WG / SWTRA	2015	2017	Monitoring data	2-4%	Traffic Orders issued in March 2017 Traffic Enforcement ongoing	WG Transport Study considering option	2017	
3c	Assess and reduce parking provision along Rhosmaen Street if possible. [Cawdor Hotel].	Improve congestion	WG / SWTRA	2015	2017	Monitoring data	6-10%	Assessed within first year review, removal of loading only bays would result in parking on the carriageway	None	2017	
3d	Assess and reduce parking provision along Rhosmaen Street if possible. [Opposite Principality Building Society].	Improve congestion	WG / SWTRA	2015	2017	Monitoring data	2-4%	Traffic Order issued March 2017	Traffic Enforcement ongoing		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C2	Review parking provision in town with respect to removing residents parking during the day to allow shared use thereby alleviating the need to park on Rhosmaen Street and supplementing Crescent Road car park.	Improve congestion	WG / SWTRA / CCC	2015	2017	Monitoring data	?	Traffic orders issued providing shared used of spaces, Coaches now drop off in Crescent Road carpark rather than Rhosmaen Street	Traffic Enforcement ongoing		
C3	Assess parking charges in the town to determine any benefits from reduction or removal of charges particularly to encourage more appropriate parking.	Improve congestion	CCC	2015	2017	Use of Carpark	?	Review of charges carried out.	Pilot of free parking Monday, Tuesdays and Wednesdays started Oct 2018		Insufficient evidence that it will identify improvement in AQ.
7	Look at possibility of service delivery to rear of business premises rather than along Rhosmaen Street.	Improve traffic flow, reduce emissions	CCC	2015	2016	Monitoring data	6-8%	Survey carried out, 10 out of 14 properties benefit and use rear access for deliveries	None	2016	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
8	Promote cycling and walking to school more. Provide incentives such as free cycle helmets if children cycle to school more than 75 times in a year.	Emissions reduction / alternative travel	CCC	2015	2017	Monitoring data	?	Links with Living Streets and walking to school campaigns promoted.	School Travel plans to encourage sustainable travel Council's Cycling Strategy 2018		
9	Promote car sharing to work/school. Website has been set up for the rural heartland north of Llandeilo for people commuting to Swansea / Llanelli / Carmarthen etc.	Emissions reduction / alternative travel	CCC	2015	2017	Uptake of car sharing	?	Share Cymru promoted on Council website	Increase in use of Llandeilo Train station		
11	Improve parking issues on the street with additional or more frequent enforcement.	Improve traffic flow, reduce emissions	CCC	2015	2017	Monitoring data	4-6%	Traffic orders issued March 2017	Enforcement ongoing		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
20	Identify if bus stops along the street can be improved to allow free flow of traffic.	Improve traffic flow, reduce emissions	CCC with WG / SWTRA	2015	2017	Monitoring data	?	Assessed in first year review, no other suitable locations for main bus route, however coaches now drop off in Crescent Road carpark	None	2017	
21	Publicise alternative routes (possibly through haulage associations) to destinations north of Llandeilo so that vehicles can avoid the town.	Reduce number of vehicles travelling through AQMA unnecessarily	CCC with WG / SWTRA	2015	Once other routes available	Monitoring data / Traffic Counts	3-6%	No alternative routes available	Proposals for alternative routes under consideration in Llandeilo and Ffairfach Transport Study		Link with actions C1 and C4
22	Identify peak use of the road e.g. school run, mart days and markets – then target improvements / restrictions / alternative routes during these times.	Improve traffic flow, reduce emissions	CCC with WG / SWTRA	2015	2017	Monitoring data	?	Assessed in second year review	None	2017	

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
C4	Assess feasibility of a six month trial of HGV diversion away from town (except for deliveries).	Reduce traffic congestion emissions	CCC with WG / SWTRA	2015	2017	Traffic Count monit oring data	3-6%	Discussions with Welsh Government and SWTRA	WG Transport Study considering option Under consideration require re-routing		Link with C1 and 3d
C1	Assess the feasibility of implementing a 15t weight limit on bridge below Bridge Street to ensure that larger vehicles were diverted away from the town.	Reduce traffic, congestion and emissions	WG / SWTRA	2015	2017	Traffic Count monit oring data	3-6%	Discussions with Welsh Government and SWTRA	Under consideration requires re-routing		Link with C4 and 3d
	Phase 2										
5	Improvements to street layout i.e. pedestrian crossing, pavement width improvements.	Reduce traffic Improve pedestrian safety	WG / SWTRA	2018 - 2020	TBC	Monit oring data	8-12%	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		Opportunity for Green Infrastructu re if delivered

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
6	School buses arriving / leaving at definitive staggered times and their routes using the Bethlehem / Llangadog, Llangathen option.	Reduce traffic Improve pedestrian safety	CCC	2018-2020	TBC	Alternative route used monitoring data	2-4%	Ysgol Bro Dinefwr has large catchment area and many coach movements	Under consideration as part of re-routing HGV's		
	Phase 3										
16	Encourage a park and ride scheme.	Reduce traffic and emissions	CCC	2018-2020	TBC	Introduction of a scheme	?	Train option from Ffairfach to Llandeilo,	Improvements to public transport infrastructure and integration between bus and rails services is under consideration as a wider opportunity to Llandeilo transport schemes		
	Phase 4										

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
1	Diversion of HGV's to other routes and/or their restriction to certain hours through the town e.g. to avoid commuting and school run.	Reduce number of vehicles travelling through AQMA unnecessarily	WG / SWTRA	2018-2020	TBC	Traffic Count monitoring data	8-12%	Included as option for the Llandeilo and Ffairfach Transport study	HGV restrictions have not been shortlisted due to the lack of viable alternative routes		
2	One-way system with vehicles diverted around King Street.	Improve traffic flow, reduce emissions	WG / SWTRA with CCC	2018-2020	TBC	Traffic Count monitoring data	10-17%	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		
4	Traffic light system at peak times to reduce the fumes problem at pinch points in the centre of town.	Reduce congestion and emissions	SWTRA	2018-2020	TBC	Monitoring data	?	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		
12	Implementation of traffic lights either end of Rhosmaen Street to regulate single stream of traffic thereby improving free flow.	Reduce congestion and emissions	WG / SWTRA	2018-2020	TBC	Monitoring data	?	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
17	Build a by-pass.	Reduce number of vehicles travelling through AQMA unnecessarily	WG	2018-2020	**TBC**	Traffic Count monitoring data	40%	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		
18	Close Rhosmaen Street to traffic (except deliveries).	Reduce number of vehicles travelling through AQMA unnecessarily	WG / SWTRA with CCC	2018-2020	TBC	Traffic Count monitoring data	50%	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		
19	Remove parking bays and loading bays	Improve traffic flow, reduce emissions	WG / SWTRA	2018-2020	TBC	Monitoring data	?	Under consideration	Included as option for the Llandeilo and Ffairfach Transport study		Link with action 5 under phase 2
23	Variable diversion within set NO_2 limits (using continuous monitoring equipment.	Reduce emissions	WG / SWTRA with CCC	2020	TBC	Monitoring data	?	Still to be considered	Sensor equipment explored		

Table 1.4 – Action Plan Measures Completed or Not Pursued and the Reasons for that Decision

The following measures have been removed from Table 1.3 – Progress on Measures to Improve Air Quality**Error! Reference source not found.** and the action plans after further consideration by the Action Plan Steering group.

Action category	Action description	Reason action is not being pursued further
Traffic Management	C5 - Assess positive / negative impacts of Western Link once opened.	Western Link construction completed, opened March 2019. Assessment of impact on surrounding areas included in APR 2023.
Promoting travel Alternatives	C8 - Promote more car sharing and Initiatives including School Travel Plans	Transitioning from car dominated journeys to alternative more sustainable forms of travel will require behavioural change. Interventions to support behavioural change have included the development of Travel Plans for new school development. Officers are working with schools and colleges in the Llanelli area to encourage young people to make use of improved infrastructure to encourage walking and cycling. This work will continue and schools will continue to be supported Car share through Liftshare is promoted
Traffic Management	L5 and C7 - Introduce a 20mph speed limit in the town	20mph zones introduced around schools and other areas within town centres Carmarthen and Llanelli completed, Blue St and Mansel St Carmarthen. Llanelli North Welsh Government legislation is being introduced in September 2023 which will reduce the speed limit on residential streets from 30mph to 20 mph. Preparations are currently underway for this change in legislation and implementation of a 20mph default speed limit by September 2023.
Policy Guidance and Developmental Control	L11 - Determine opportunities from the Wellbeing Village development	Policy guidance applied to reduce pollution impact from development. Planning consent granted, signage strategy and travel plan conditioned

	C10 - Introduce electric/low emission buses, and introduce smaller buses at off-peak times. R - Promote shift to Low emission buses / Consider Vehicle Retrofitting programmes	The T1 Carmarthen / Aberystwyth bus service transitioned to an electric fleet. T1 electric bus by February 2023 in partnership with the Welsh Government and Transport for Wales. Local buses are predominantly owned by private transport operators, the exception being the T1 service where electric buses will be leased to an operator. Providing a second fleet of smaller buses during off peak periods is not commercially viable for operators. Current purchase costs for electric buses and associated infrastructure are significant and are only feasible if external grant funding is available. The development of the Southwest Wales Metro will review the bus networks across the region.
Policy Guidance and Development Control	E - Produce an Electric Vehicle Infrastructure Strategy	The Electric Vehicle Infrastructure Strategy was developed in 2021 and adopted and published 2022. Can be found here
Increase uptake of alternative travel	I - Feasibility study for shared use footpaths. (with markings?)	A number of shared use footpaths have been constructed across the county and including Carmarthen and Llanelli areas to improve connectivity. Details of completed schemes can be found here.
Public Information	J - Advertise Cycle Paths	Cycle routes are promoted on the internet and discovercarmarthenshire.com New wayfinding signage being installed across towns with walking/cycling journey times to key trip attractors from public transport stops/stations.
Public Information	M- Check tourist route maps / websites for advised routes (avoid AQMA's where relevant)	Review indicates correct instructions on Discover Carmarthenshire, balance not to deter visitors from the town centres
Freight and Delivery Management	N - Review & improve timings of bin collections & road sweeping	The new routes have been routed in order to make them more efficient, move to zonal working, reducing the need for vehicles to be traveling across the whole county on any given day.

Promoting travel Alternatives	T - Enhance walking routes.	Our Active Travel Strategy includes an Active Travel Master Plan for infrastructure development for each principal towns. Infrastructure development will continue year on year subject to Welsh Government funding and where possible through planning development. Wayfinding signage is scheduled for installation across 13 towns providing direction to/from public transport stops and stations.

Delays in Progressing Llandeilo measures

Work towards constructing a Llandeilo relief road was initially timetabled to start at the end of 2019. However, at the start of 2020 this was then delayed until Autumn 2022 due to the consideration of objections received during the consultation process. It was then planned to hold a further stakeholder consultation around Nov-Dec 2019, but in light of the further work needed, this latest WeiTag Stage 2 consultation on this study was scheduled for April 2020 but unfortunately postponed again to September 2020, due to the COVID pandemic. A further update was announced indicating that for a long-term measure such as this, work would not begin until 2025. Although work on shorter- and medium-term measures will progress sooner. Carmarthenshire County Council are still awaiting the final recommended outcome following the WeiTag Stage 2 assessment from Welsh Government, which was postponed to be announced Winter 2022. Carmarthenshire County Council remains of the opinion that a Bypass is the only option that will deliver significant improvements to Air Quality and support other co-beneficial measures to improve pedestrian safety and encourage more active travel.

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

Summary of Monitoring Undertaken in 2022

2.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how results compare with the objectives.

Carmarthenshire County Council has no automatic (continuous) monitoring sites within its administrative area.

2.1.2 Non-Automating Monitoring Sites

Carmarthenshire County Council undertook non- automatic (passive) monitoring of NO_2 at 94 sites during 2022.Table 2.2 – Details of Non- Automatic Monitoring Sites presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 1 – Map(s) of Non-Automatic Monitoring Sites. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

2.1.3 Details of screening exercises

2.1.3.1 Screening in Laugharne

Monitoring of Nitrogen dioxide at Laugharne, was set up for 2022, following reports of increased travel particularly during the summer periods. The area observed an increase of visitors during the pandemic when ‘stay at home holidays’ were encouraged and there has also been development to increase the local campsites. The area does not experience high traffic counts, although a number of HGVs and tractors use the main route that travels through the town. The landscape of which is very narrow in parts with lengths of terraced buildings. It was considered that the town would benefit from monitoring of Nitrogen Dioxide during 2022, to assess the concerns raised. Four diffusion tube sites were set up referenced LAN/1, LAN/2, LAN/3 and LAN/4 as illustrated in Figure 13 - Map of Laugharne NO_2 Non-Automatic Monitoring Sites (Screening exercise), located in Clifton Street,

Wogan Street and Gosport Street. During 2022 LAN/1, LAN/3 and LAN/4 reported similar annual results of 8.6µg/m^3, 8.4µg/m^3 and 8.1µg/m^3 respectively. LAN/2 which is located outside a GP surgery and on a narrow brow of hill, however reported a slightly higher annual result of 10.1µg/m^3. Nonetheless, there was no breach of the AQS Objective at any of the screening locations assessed.

2.1.3.2 Screening in Llanelli

Screening continued in the Tyisa ward of Llanelli, South of the AQMA boundary since 2020. Four sites are located along Station Road, Llanelli including TYL2, TYL3, TYL4 and TYL5, all of which reported results between 13.6µg/m^3 and 15.7µg/m^3. Another diffusion tube further south of this road and south of Llanelli Railway Station is located in New Dock Street and labelled TYL1 reported a slightly higher result of 18.6µg/m^3. TYL5 was set up in replacement of the nearby TYL3, which had inaccessible toward the end of 2021, due to scaffolding works. Nevertheless, TYL5 is located on the façade of a residential property and provides a more representative exposure, whereas TYL3 was on a roadside lamppost, so it was decided to remove TYL3 during 2022. A map of the tube site locations can be found in Figure 5 - Map of Llanelli NO2 Development is planned in this area and so monitoring should help identify any impacts ahead.

A new tube site was also set up on a lamppost near 12 George Street, Llanelli and referenced TYL6. Further development is planned nearby Ysgol Penrhos and it had been reported that this narrow street of terraced houses experiences congestion during peak times. The location of this site can also be found in **Figure 5.** The 12-month screening study reported an annual result of 9.5µg/m^3 and therefore significantly below the air quality objective.

A new site was set up in 16 Trostre Road, Llanelli (Carm/146) toward the end of 2021, following concerns raised about the volume of traffic and air quality impacting on residents' health. Traffic counts conducted in 2017 indicated volumes approximately 16337 AADT, reducing to 13500 in 2020. Only four months valid data was captured between September to December of 2021 and the annualised result was 15.1µg/m^3 and below the air quality objective, however the site will continue to be screened into the end of 2022, given the volume of traffic and to indicate a better picture of the exposure as normal travel behaviours resumed. The 2022 annual result reported a slight improvement on the previous year with 13.8µg/m^3. Screening at this site was completed and the tube site was removed as it indicated compliance of the Air Quality Objective.

Two diffusion tube sites continued to monitor roadside NO_2 in Llangennech, Llanelli, a village that lies some distance away from the Llanelli AQMA boundary. Nonetheless, the main road travelling though the village is quite narrow in parts with several terraced properties, and the restricted space on the road creates difficulties for two-way traffic to pass at the same time which can result in congestion during peak times. Tubes were initially set up in 2019 for a 9-month study but has continued to monitor any changes that may arise from future developments. The two sites monitor roadside emissions on Bridge Street (LLG3) and Afon Road (LLG2), a map can be found in **Figure 10 - Map of Llangennech, Llanelli NO2 Non-Automatic Monitoring SitesFigure 10**. No exceedances of the Air Quality Objective were observed as both sites reported a concentration level below 16µg/m^3.

Two new additional sites were also set up in Llangennech in 2022 referenced LLG4 and LLG5. They are located in the vicinity of Stradey Business Park to review and assess current ambient levels of NO_2, following information of a number of biomass boilers operating in the industrial estate and concerns from residents of proposals for a permit to burn uncontaminated waste wood. The site location can also be found in **Figure 10**. 2022 annual results for LLG4 and LLG5 was 9.1µg/m^3 and 6.9µg/m^3 respectively. LLG5, will be removed for 2023, although another site new site in the vicinity and more representative of residents exposure will be identified to continue to monitor any changes from the change in fuel to waste wood.

2.1.3.3 Screening in Ffairfach, Llandeilo

In February 2021, diffusion tube sites were reinstalled in the Ffairfach area, south of the Llandeilo AQMA boundary. This area had been previously monitored and removed in 2018 due to reported low results. However, there were plans to remove the roundabout and introduce signalised traffic lights instead, in order to improve pedestrian safety as it's a route frequently used by children walking to the nearby schools. An air quality assessment determined that the change should not have significant impact on air quality however it may increase some congestion and queue lengths during peak times. The sites included FA/03(A), FA/04(A), FA/06(A) and FA/07(A). A map of the tube site location can be found in Figure 7 - Map of Ffairfach, Llandeilo NO2 Non-Automatic Monitoring Sites (Screening exercise). The annual results can be seen in the Table 2.1 below, with FA/03(A) providing the highest reading and located within the southern boundary of the Llandeilo AQMA.

Table 2.1 Screening results in Ffairfach

SITE ID	Site Name	2021	2022
FA/04(A)	Ffairfach Chapel	8.9	9.9
FA/06(A)	10 Heol Myrddin, Ffairfach	10.5	11.7
FA/03(A)	29 Towy Terrace	14.2	16.6
FA/07(A)	Heol Bethlehem (Opp School)	5.8	6.5

Works to the traffic lights finished in 2021, and monitoring results of 2022 have demonstrated a small increase in NO_2 levels, which may have resulted from increased congestion or maybe due to an overall increase in traffic compared to 2021, given that early 2021 also experienced temporary COVID lockdown restrictions. Complaints have been received about the level of congestion at peak times so monitoring will continue into 2023 to assess the full impact.

2.1.3.4 Screening in Cross Hands

Monitoring continued in the surrounding area of the proposed Economic Link Road in Cross Hands (Carm/ELR 9, 10,11, 12 ,21 and 22). Carm/ELR 16, 19 & 20) and three within the SSSI (Carm/ELR6, 7 & 8) located alongside the economic link road were removed for 2020 and 2021 due to construction moving to another phase, although these were reinstated during 2022. Carm/ELR 14, 15, and 18 were not able to be reinstated following removal in 2019 because they were located alongside the new link road and were in the way of its construction. This screening exercise will enable us to monitor the current levels of NO_2, monitor any impacts during construction and assess the impact the economic link will make following its completion and opening in August 2022. A map of the area and tube sites can be found in **Figure 12 - Map of Cross Hands Economic Link Road NO2 Non-Automatic Monitoring Sites**. To date there have not been any significant impacts during construction. A full assessment will be made in the 2024 annual progress report to include 2023 data following the opening of the new link road.

Maps showing the location of the monitoring sites are provided in **Figure 1 – Map(s) of Non-Automatic Monitoring Sites**. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in **Appendix C: Air Quality Monitoring Data QA/QC.**

Table 2.2 – Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/089	Ammanford - Tir Y Dail Lane (2)	Kerbside	N/A	262804	212204	2.6	No	0.5	1.5	1.0
Carm/064	Ammanford – Wind Street	Roadside	N/A	262936	212285	2.9	No	1.0	3.0	2.0
Carm/090	Ammanford - High St (2)	Roadside	N/A	263028	212324	2.8	No	0.0	3.0	3.0
DAL/14	10 Sandy Road	Roadside/Façade	Llanelli	249701	200598	2.8	No	0.0	4.9	4.9
DAL/15	33 Sandy Road	Roadside/Façade	Llanelli	249727	200608	2.5	No	0.0	4.7	4.7
Carm/077	Sandy Rd (2)	Roadside	Llanelli	249606	200638	2.8	No	4.0	5.7	1.7
DAL/22	44 Sandy Road (3)	Roadside/Façade	Llanelli	249610	200632	2.8	No	0.0	5.6	5.6
DAL/26	123 Sandy Road	Roadside/Façade	Llanelli	249483	200713	2.6	No	0.0	7.5	7.5
DAL/27	Sandy Road (4)	Roadside	Llanelli	249483	200709	2.9	No	4.2	7.5	3.3
DAL/16	96 Sandy Road	Roadside/Façade	Llanelli	249456	200706	2.7	No	0.0	5.1	5.1
DAL/17	131 Sandy Road	Roadside/Façade	Llanelli	249463	200724	2.8	No	0.0	5.3	5.3
Carm/141	Llanelli - 3 Old Road	Roadside/Façade	Llanelli	250649	200786	2.9	No	0.0	1.5	1.5
DAL/07	nr 13 Felinfoel Road	Kerbside	Llanelli	250717	200818	2.8	No	0.5	1.3	0.8
DAL/23	50 Felinfoel Road	Roadside/Façade	Llanelli	250754	200870	2.9	No	0.0	2.1	2.1
DAL/09	Thomas St (Barnados)	Roadside/Façade	Llanelli	250709	200673	2.8	No	0.0	2.7	2.7
Carm/104	Thomas St (2)	Roadside/Façade	Llanelli	250719	200689	3.0	No	0.0	1.7	1.7

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
DAL/10	Thomas St (Bridal Shop)	Roadside/Façade	Llanelli	250734	200603	2.7	No	0.0	1.6	1.6
Carm/069	West End	Kerbside	Llanelli	250458	200603	2.8	No	6.0	6.2	0.2
DAL/12	West End (Creative Cakes)	Kerbside	Llanelli	250411	200616	2.8	No	1.7	1.9	0.2
DAL/28	West End, Pentip School	Roadside	Llanelli	250344	200631	2.4	No	0.4	2.8	2.4
DAL/04	51 Panteg Road	Roadside	N/A	251623	201976	2.8	No	0.3	1.3	1.0
Carm/114	Panteg Road	Roadside	N/A	251665	202013	2.7	No	0.4	1.6	1.2
Carm/113	Swiss Valley	Roadside	N/A	251951	202411	2.9	No	0.4	1.5	1.1
Carm/135	23 Bassett Terrace	Roadside/Façade	Llanelli	248512	200892	2.5	No	0.0	1.7	1.7
TYL1	34 Station Road	Roadside	N/A	250567	199977	2.8	No	0.2	5.2	5.0
TYL2	132 Station Road	Roadside	N/A	250713	199530	2.5	No	0.3	5.1	4.8
TYL3	107 Station Road	Roadside	N/A	250740	199503	2.5	No	1.0	3.9	3.0
TYL4	47 New Dock Road	Roadside	N/A	250895	199157	2.5	No	0.4	1.7	1.4
TYL5	101 Station Road, Llanelli	Roadside	N/A	250735	199517	2.5	No	0.0	1.1	1.1
Carm/146	16 Lower Trostre Road, Llanelli	Roadside	N/A	251808	198929	2.3	No	0.0	2.1	2.1
DAC/06	Glenholme Nursery - Richmond Terrace	Kerbside	Carmarthen	241546	220536	2.7	No	2.2	3.0	0.8

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
DAC/13	Carmarthen - 72 Richmond Terrace (2)	Kerbside	Carmarthen	241559	220554	2.7	No	0.3	1.3	1.0
Carm/109	Carmarthen - Richmond Terrace	Kerbside	Carmarthen	241596	220563	2.7	No	0.2	0.8	0.6
DAC/08	Carmarthen - 85 Priory Street (E)	Roadside	Carmarthen	241876	220565	2.7	No	0.4	1.5	1.1
DAC/14	Carmarthen - 50 Priory Street	Roadside	Carmarthen	241932	220583	2.9	No	0.4	1.7	1.3
DAC/15	Carmarthen - Old Oak rdbt (E)	Roadside	Carmarthen	241816	220519	2.9	No	1.5	3.9	2.4
Carm/111	Carmarthen - Church Street	Roadside	Carmarthen	241539	220179	3.0	No	0.7	3.5	2.8
DAC/12	Carmarthen - 24 Spilman Street	Roadside/Façade	Carmarthen	241492	220171	2.8	No	0.0	3.0	3.0
DAC/04	Carmarthen - Water Street (Probation Office)	Kerbside/Façade	Carmarthen	240931	220144	2.8	No	0.0	0.9	0.9
Carm/072	Carmarthen - St. Catherine St rdbt	Roadside	Carmarthen	240688	220057	2.8	No	0.3	3.3	3.0
DAC/02	Carmarthen - 15 Park Terrace	Kerbside	Carmarthen	240618	220041	3.0	No	0.4	1.4	1.0
DAC/16	Carmarthen - 6 Park Terrace	Roadside/Façade	Carmarthen	240557	220026	2.7	No	0.0	1.4	1.4
Carm/001	Carmarthen - St. Catherine St	Roadside	Carmarthen	240798	220155	2.8	No	0.3	2.0	1.7
Carm/084	Carmarthen - Water Street	Kerbside	Carmarthen	240831	220272	2.8	No	0.3	1.2	0.9

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
DAC/05	Carmarthen - 44 Water Street	Roadside/Façade	Carmarthen	240797	220297	2.7	No	0.0	1.3	1.3
Carm/106	Carmarthen - St Catherine St (A)	Roadside/Façade	Carmarthen	240979	220244	2.9	No	0.0	1.4	1.4
Carm/134	Carmarthen - 2 College Road	Other/Façade	N/A	240377	220397	3.0	No	0.0	5.6	5.6
Carm/126	Johnstown - 2 Jobs Well Road	Roadside	N/A	239914	219829	2.8	No	0.8	2.9	2.1
Carm/132	Johnstown - 7 Old St Clears Road	Roadside/Façade	N/A	239865	219745	2.6	No	0.0	7.0	7.0
FA/01	North roundabout (No 8 Rhosmaen St)	Roadside	Llandeilo	263190	223000	2.6	No	1.5	3.1	1.6
DA/15	Rhosmaen Street (No 15) (north)	Roadside/Façade	Llandeilo	263150	222763	2.6	No	0.0	3.1	3.1
DA/01	Rhosmaen Street (No. 69)	Roadside	Llandeilo	263076	222596	2.7	No	3.0	4.3	1.3
DA/03	Rhosmaen Street (No. 87)	Roadside/Façade	Llandeilo	263021	222503	2.9	No	0.0	4.4	4.4
Carm/013	Llandeilo - Rhosmaen Street	Kerbside	Llandeilo	263006	222505	2.8	No	2.5	2.9	0.4
DA/05 (A), (B) & (C)	Rhosmaen Street (Evans Butchers)	Roadside/Façade	Llandeilo	262982	222445	3.0	No	0.0	1.5	1.5
DA/07	Rhosmaen Street (Castle Hotel)	Roadside/Façade	Llandeilo	262966	222412	2.9	No	0.0	1.7	1.7

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/083	Llandeilo - Rhosmaen Street (2)	Roadside	Llandeilo	262959	222396	2.8	No	1.0	2.5	1.5
DA/09	Rhosmaen Street (No. 123)	Roadside/Façade	Llandeilo	262951	222375	2.9	No	0.0	1.2	1.2
DA/10	Rhosmaen Street (No. 133) (Craft Shop)	Kerbside/Façade	Llandeilo	262933	222345	2.9	No	0.0	0.8	0.8
DA/11	Rhosmaen Street (No. 74) (Style Shop)	Roadside/Façade	Llandeilo	262924	222346	3.0	No	0.0	1.7	1.7
DA/12	Stryd Y Brenin (Travel House)	Roadside/Façade	Llandeilo	262908	222329	2.9	No	0.0	1.0	1.0
DA/13	Rhosmaen Street (Park Area)	Kerbside	Llandeilo	262906	222299	2.9	No	4.0	4.9	0.9
DA/14	Rhosmaen Street (Bin post by Bus stop)	Roadside	Llandeilo	262902	222250	2.8	No	3.0	4.2	1.2
DA/16	Bridge Street (N Trust) (south)	Roadside/Façade	Llandeilo	262848	222170	2.6	No	0.0	2.3	2.3
Carm/127	41 New Street, Burry Port	Kerbside	N/A	244999	200840	3.0	No	2.5	2.9	0.5
Carm/128	Lloyds Bank, New Street, Burry Port	Kerbside	N/A	244857	200828	2.9	No	0.5	1.4	0.9
LLG2	Llangennech – 28 Afon Road	Roadside	N/A	256144	201792	2.5	No	0.0	2.1	2.1
LLG3	Llangennech – 26 Bridge Street	Roadside	N/A	256050	201600	2.4	No	0.3	2.2	1.9
Carm/ELR1	Cross Hands (2) (N)	Roadside	N/A	256458	213067	2.7	No	6.1	7.7	1.5

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
Carm/ELR2	Cross Hands (House) (N)	Roadside/Façade	N/A	256465	213085	2.7	No	0.0	6.0	6.0
Carm/ELR3	Gorslas Sixways	Roadside	N/A	257027	213774	2.6	No	3.5	5.1	1.7
Carm/ELR4	Gorslas Sixways (2)	Roadside/Façade	N/A	257022	213777	2.7	No	0.0	6.9	6.9
Carm/ELR6	SSSI (B)(5m)	Other	N/A	257550	214505	2.3	No	-	-	-
Carm/ELR7	SSSI (C)(10m)	Other	N/A	257553	214503	2.4	No	-	-	-
Carm/ELR8	SSSI (D)(20m)	Other	N/A	257562	214497	2.3	No	-	-	-
Carm/ELR9	Gate Road (nr No. 81)	Roadside	N/A	257837	214594	2.7	No	3.5	5.3	1.8
Carm/ELR10	Norton Road (nr No. 43)	Roadside	N/A	258269	213646	2.8	No	4.5	6.8	2.3
Carm/ELR10(B)	35 Norton Road	Roadside	N/A	258288	213651	2.7	No	0.0	3.7	3.7
Carm/ELR11	Norton Road (nr ELR jnc DP 24)	Roadside	N/A	257752	213562	2.5	No	4.5	6.3	1.8
Carm/ELR12	Norton Road (nr No. 94)	Kerbside	N/A	257563	213717	2.7	No	1.2	1.3	0.1
Carm/ELR16	ELR (west) (D) (20m)	Other	N/A	257664	214087	2.6	N	-	-	20.0
Carm/ELR19	ELR (east) (C) (10m)	Other	N/A	257730	214100	2.61	N	-	-	10.0
Carm/ELR20	ELR (east) (D) (20m)	Other	N/A	257749	214104	2.68	N	-	-	20.0
Carm/ELR21	Black Lion Road (nr Helyg)	Roadside	N/A	257564	212950	2.6	No	15.1	16.7	1.6
Carm/ELR22	Black Lion Road (nr Gorse Villa)	Roadside	N/A	257666	212864	2.8	No	3.2	5.4	2.2
FA/04(A)	Ffairfach Chapel	Roadside	No	262869	221274	2.6	No	1.8	2.9	1.1

Site ID	Site Name	Site Type	Associated with Named AQMA?	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Collocated with a Continuous Analyser?	Distance from monitor to nearest relevant exposure (m) (1)	Distance from Kerb to Nearest Relevant Exposure (m)	Distance from Kerb to Monitor (m)
FA/06(A)	10 Heol Myrddin, Ffairfach	Roadside	No	262780	221469	2.5	No	5.0	6.1	1.1
FA/03(A)	29 Towy Terrace	Roadside	Llandeilo	262853	221512	2.7	No	0.0	3.4	3.4
FA/07(A)	Heol Bethlehem (Opp School)	Roadside	No	262980	221490	2.7	No	16.0	17.5	1.5
TYL6	12 George Street	Roadside	No	250529	199371	2.7	No	0.3	1.4	1.1
LLG4	Llangennech - Llandaff House, Mwrwg Rd	Roadside	No	255890	201898	2.6	No	4.5	5.7	1.7
LLG5	Llangennech - Nr The Paddocks, Mwrwg Rd	Other	No	255638	201847	2.6	No	24.1	29.3	5.2
Carm/147	Ammanford - 16 Florence Road	Other	No	262436	212935	2.5	No	0.0	7.4	7.4
LAN/1	Laugharne - Clifton House, Clifton Street	Roadside	No	230163	211120	2.5	No	0.0	1.8	1.8
LAN/2	Laugharne - Laugharne Surgery, Wogan Street	Kerbside	No	230161	210795	2.6	No	2.1	3.0	0.9
LAN/3	Laugharne - 9 Wogan Street	Roadside	No	230116	210766	2.5	No	1.3	2.6	1.3
LAN/4	Laugharne - Gosport Street	Roadside	No	230112	210591	2.6	No	1.7	3.2	1.5

Notes:

(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

Figure 1 – Map(s) of Non-Automatic Monitoring Sites

Figure 2 - Map of Llandeilo NO_2 Non-Automatic Monitoring Sites (AQMA)

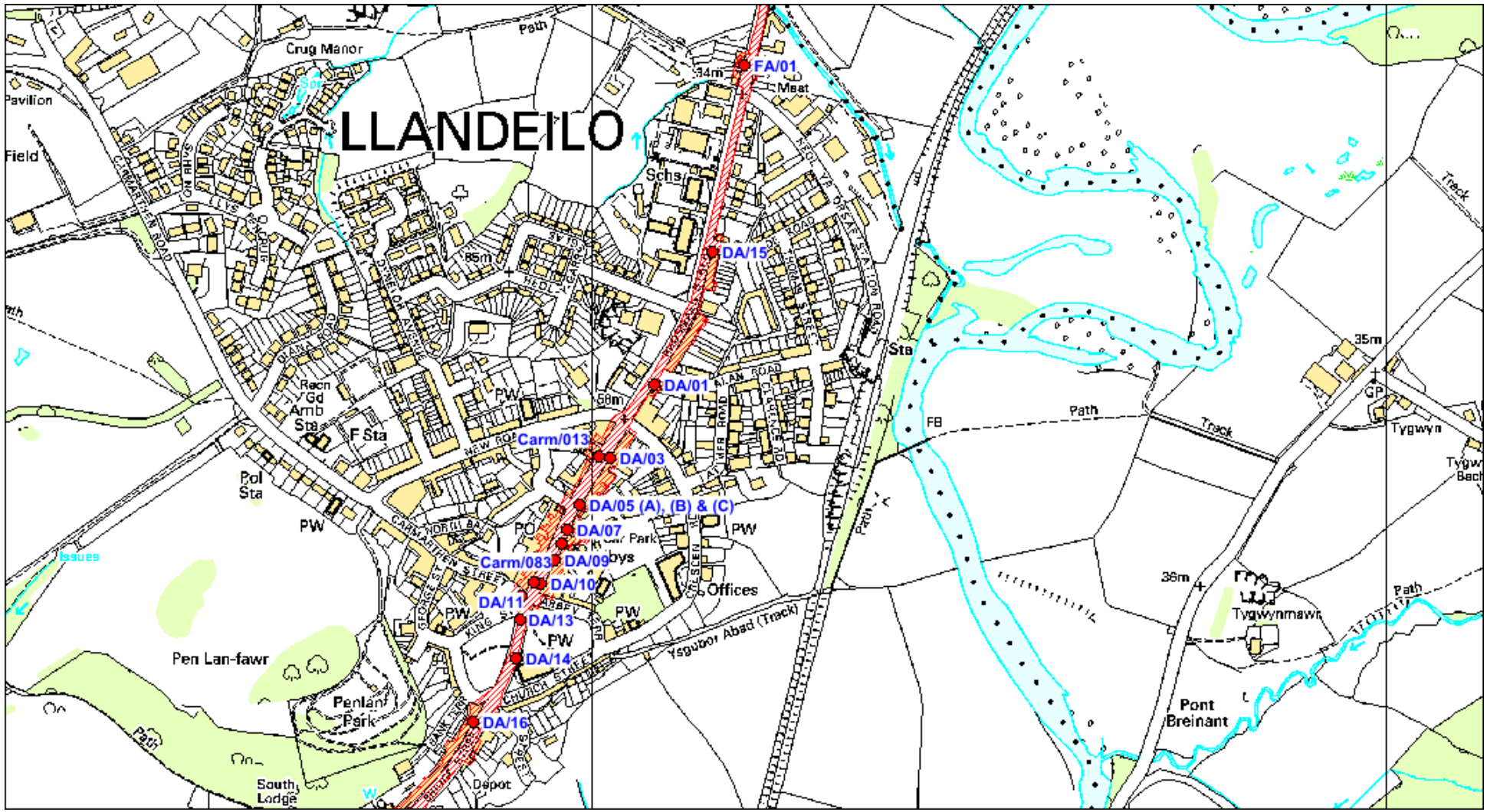


Figure 3 - Map of Carmarthen NO_2 Non-Automatic Monitoring Sites (AQMA)

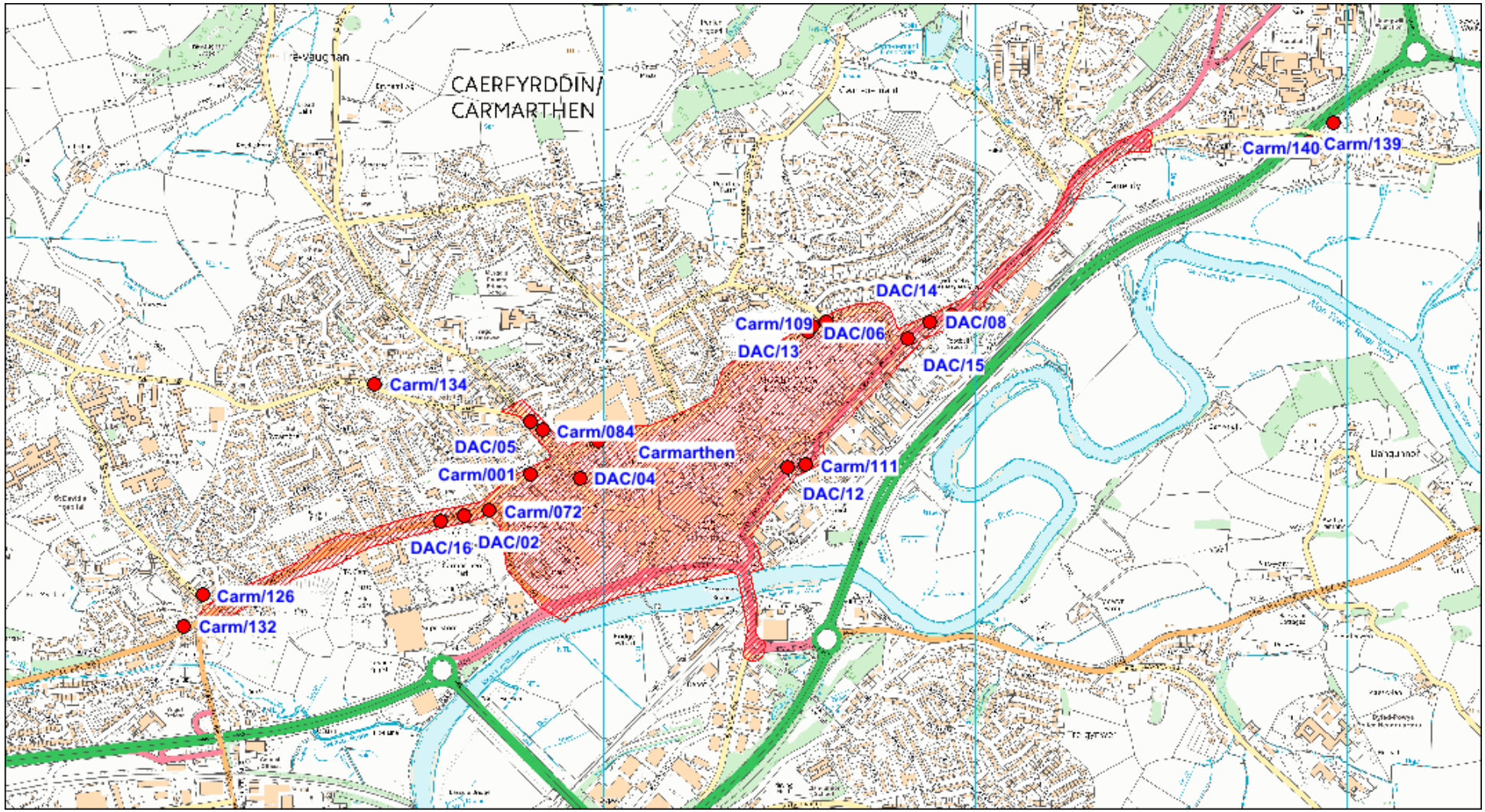


Figure 4 - Map of Llanelli NO_2 Non-Automatic Monitoring Sites (AQMA)

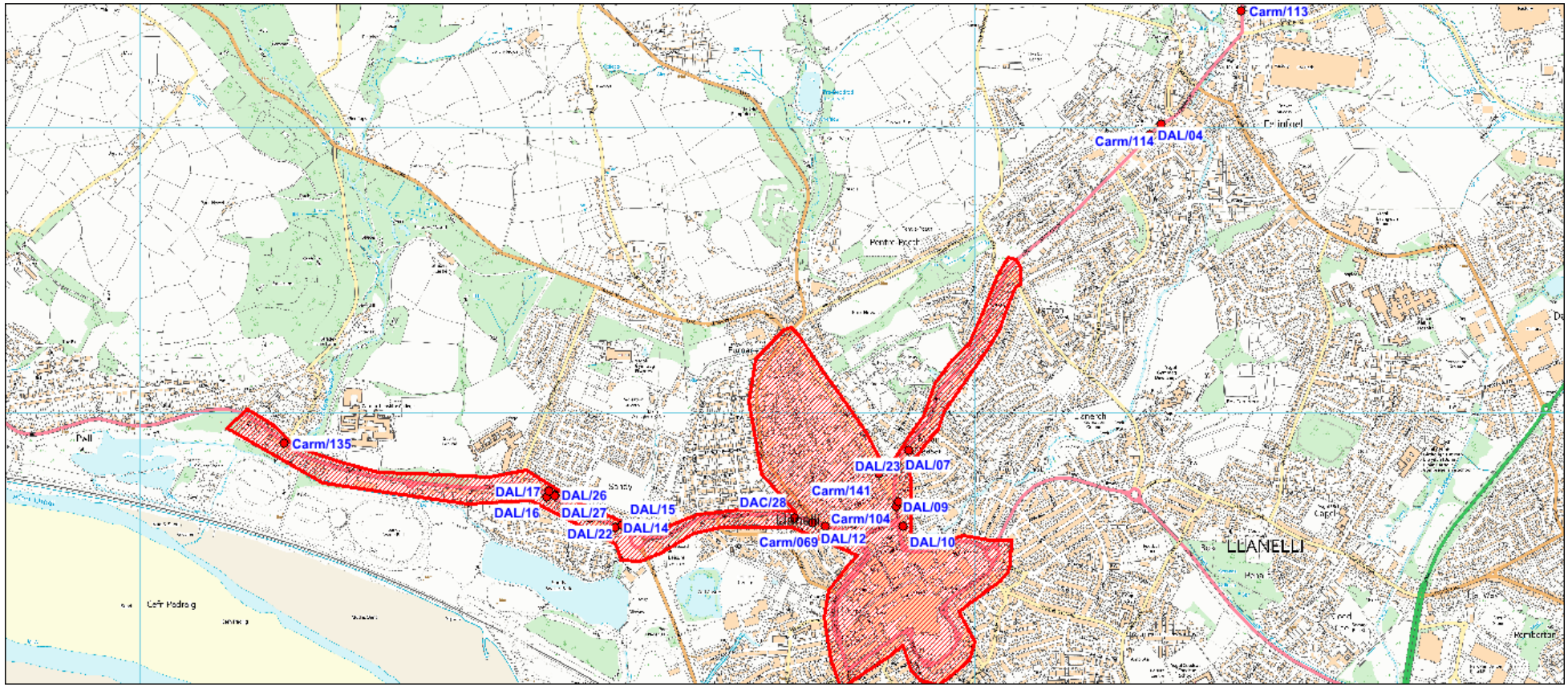


Figure 5 - Map of Llanelli NO_2 Non-Automatic Monitoring Sites (non-AQMA)

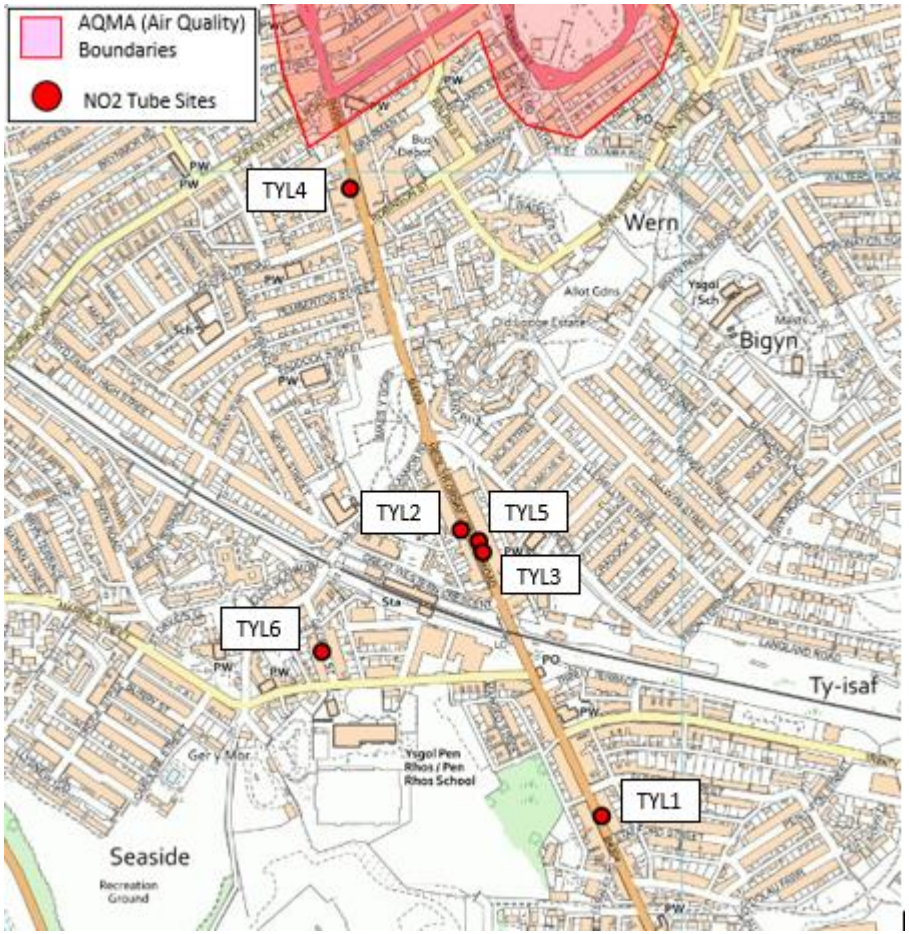


Figure 6 - Map of 16 Trostre Road, Llanelli NO_2 Non-Automatic Monitoring Site (Screening exercise)

Figure 7 - Map of Ffairfach, Llandeilo NO_2 Non-Automatic Monitoring Sites (Screening exercise)

Figure 8 - Map of Burry Port NO_2 Non-Automatic Monitoring Sites

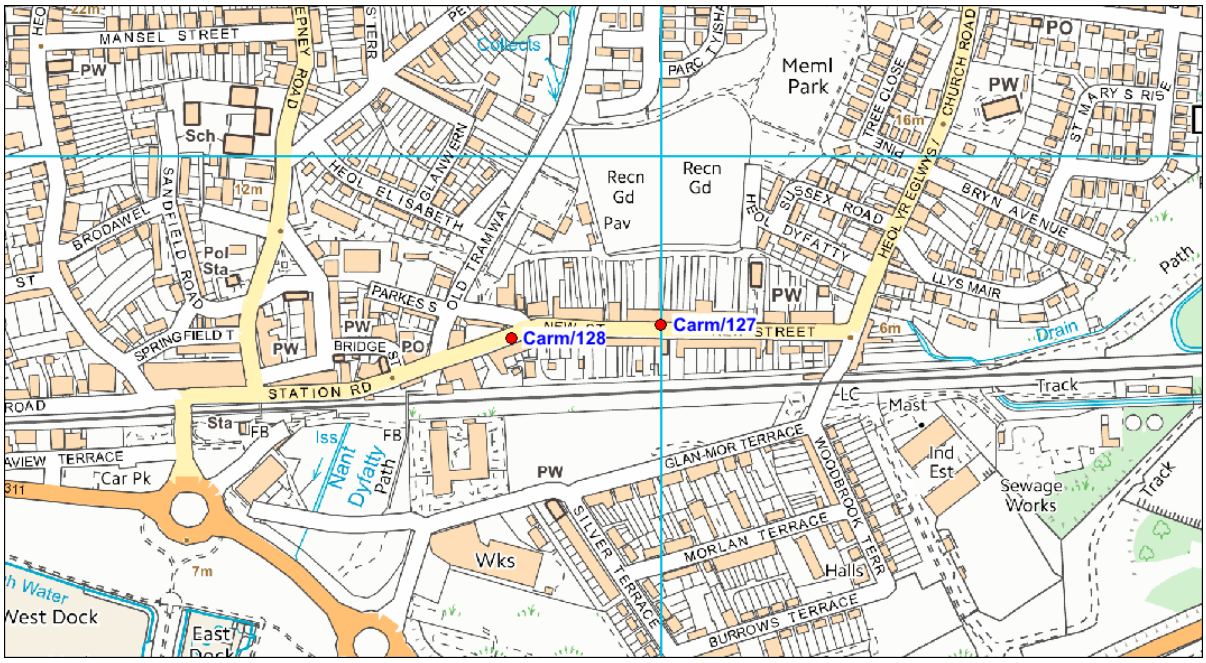


Figure 9 - Map of Ammanford NO_2 Non-Automatic Monitoring Sites

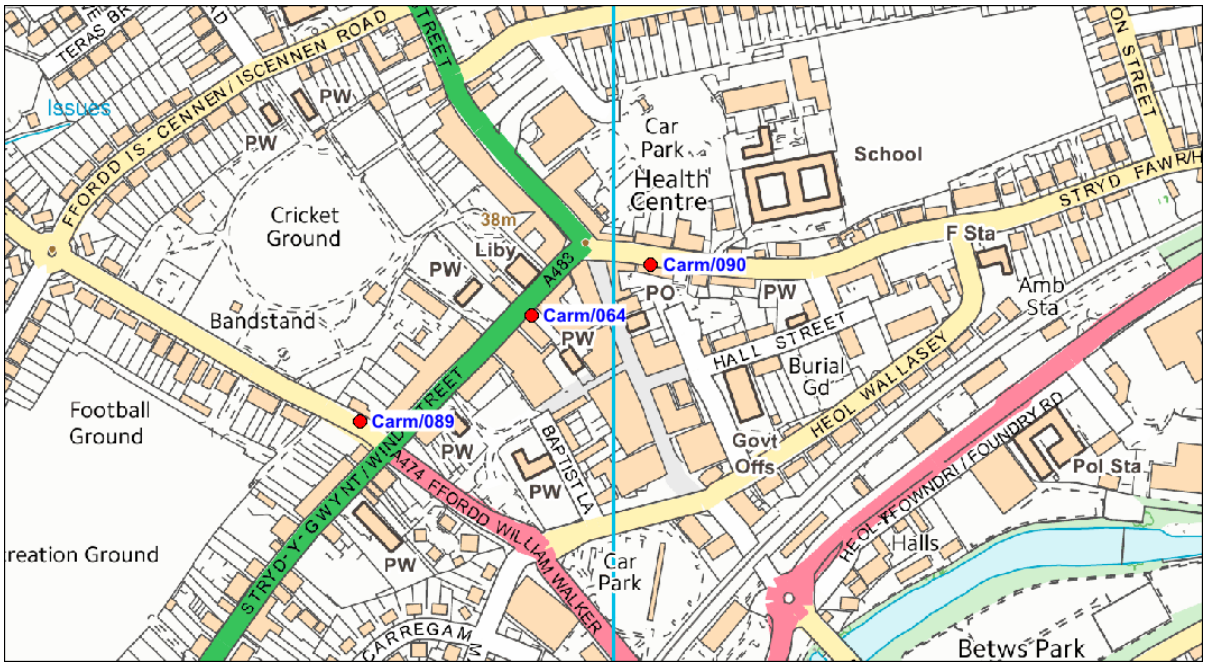


Figure 10 - Map of Llangennech, Llanelli NO_2 Non-Automatic Monitoring Sites

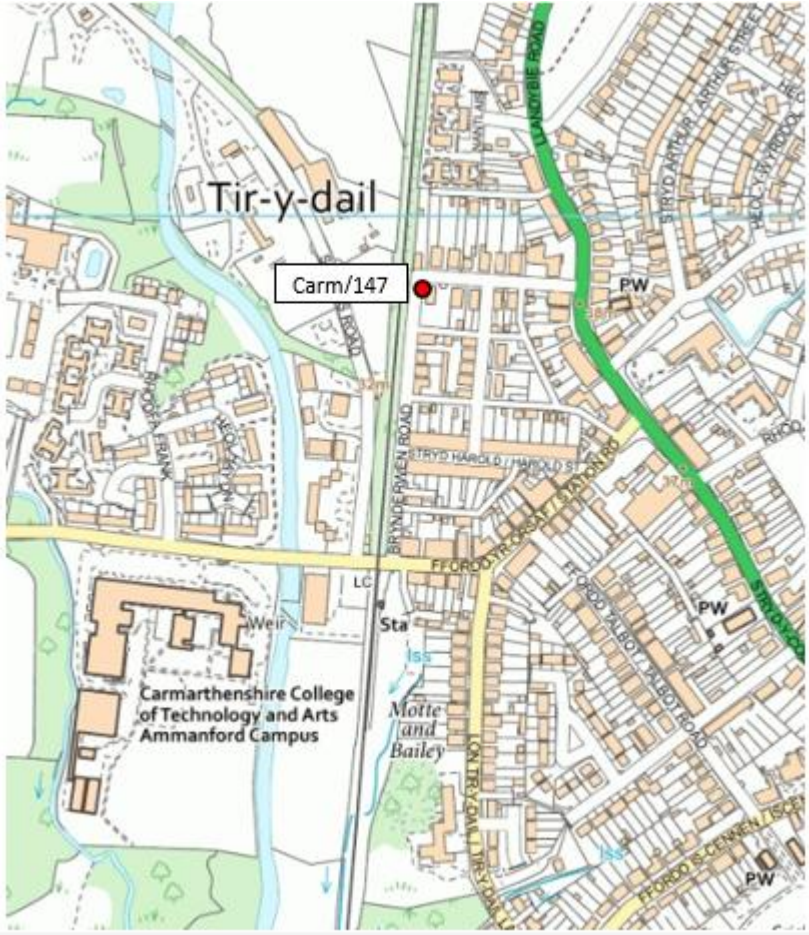


Figure 11 - Map of 16 Florence Street, Ammanford, NO_2 Non-Automatic Monitoring Site (Screening exercise)

Figure 12 - Map of Cross Hands Economic Link Road NO_2 Non-Automatic Monitoring Sites

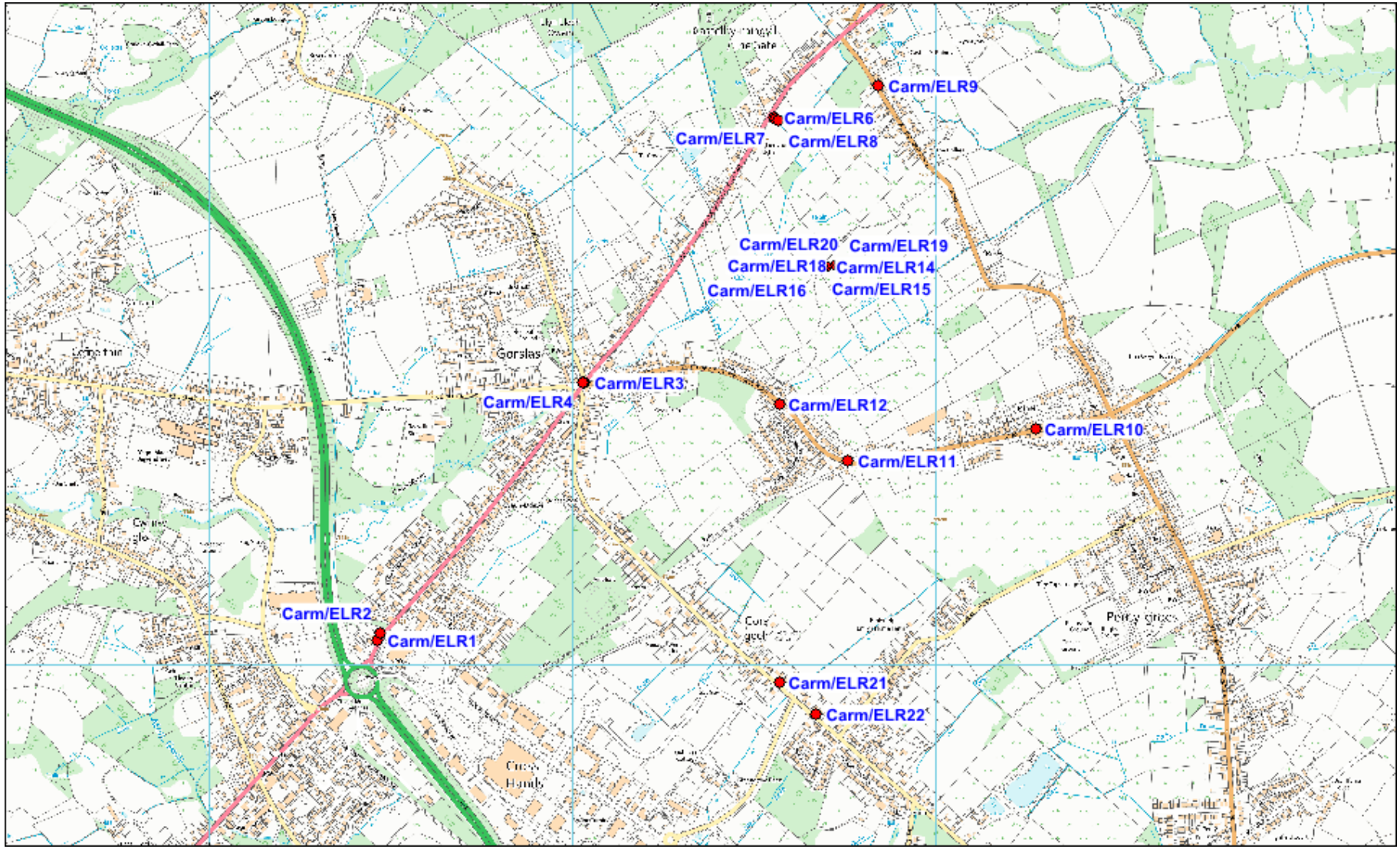
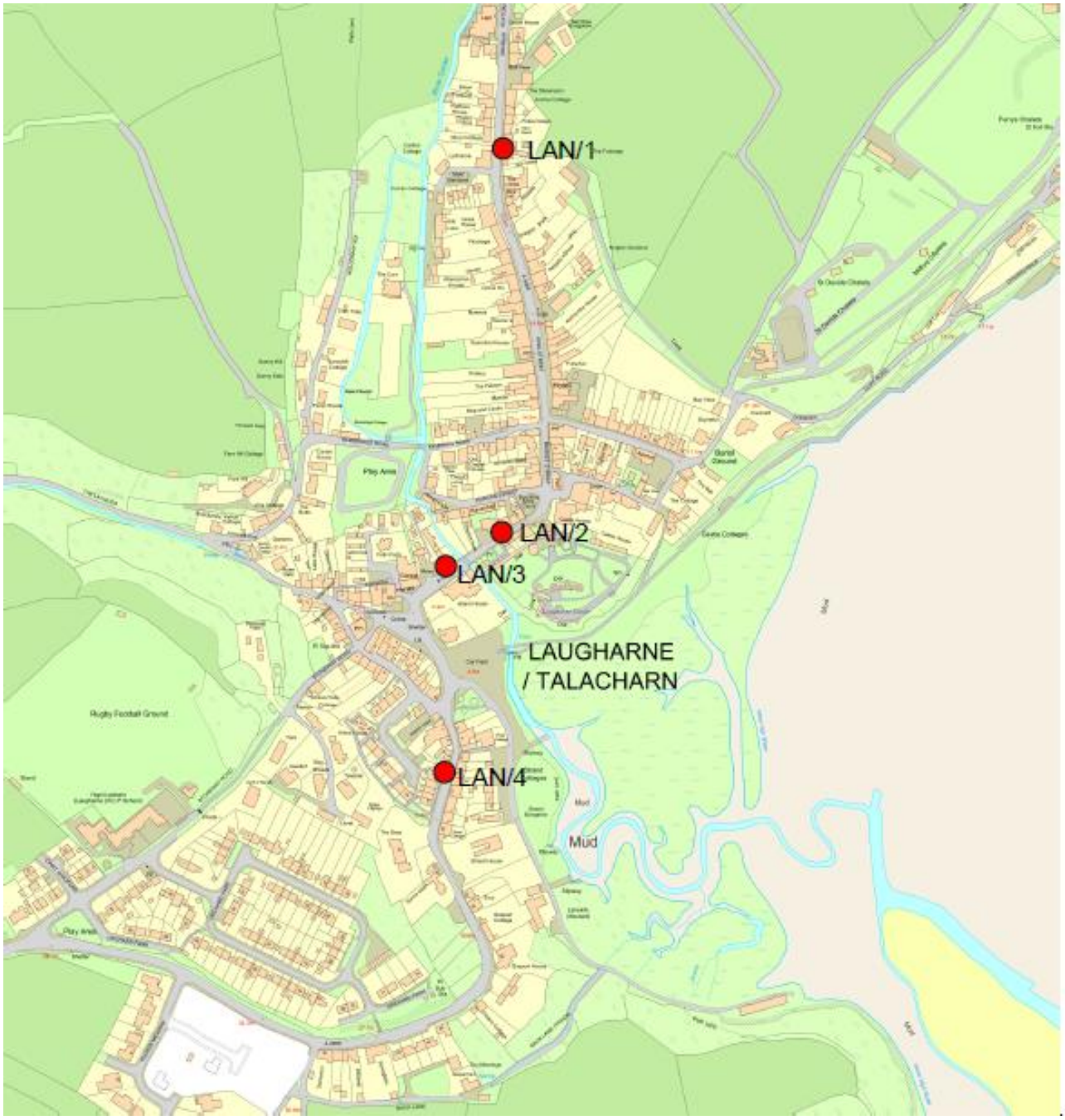


Figure 13 - Map of Laugharne NO_2 Non-Automatic Monitoring Sites (Screening exercise)



2022 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO_2 Diffusion Tube Monitoring Results (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2022 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
						2018	2019	2020	2021	2022
Carm/089	262804	212204	Kerbside	100	100.0	23.0	18.6	15.1	15.8	17.2
Carm/064	262936	212285	Roadside	100	100.0	23.2	21.3	18.6	20.0	19.9
Carm/090	263028	212324	Roadside	100	100.0	27.0	24.9	19.8	21.7	21.3
DAL/14	249701	200598	Roadside/Façade	100	100.0	25.3	22.8	17.0	18.6	19.0
DAL/15	249727	200608	Roadside/Façade	100	100.0	21.3	20.2	15.4	16.9	17.5
Carm/077	249606	200638	Roadside	100	100.0	**41.7**	38.6	30.2	32.9	33.8
DAL/22	249610	200632	Roadside/Façade	100	100.0	33.9	29.7	24.7	27.6	26.6
DAL/26	249483	200713	Roadside/Façade	100	100.0	22.8	20.7	15.3	17.2	17.5
DAL/27	249483	200709	Roadside	100	100.0	26.2	24.3	17.9	20.5	21.8
DAL/16	249456	200706	Roadside/Façade	100	100.0	22.6	19.8	11.1	15.4	15.9
DAL/17	249463	200724	Roadside/Façade	100	100.0	22.8	21.6	14.6	18.1	17.5
Carm/141	250649	200786	Roadside/Façade	83.3	82.7	26.1	24.0	18.9	21.4	21.5
DAL/07	250717	200818	Kerbside	83.3	84.6	**44.4**	**41.2**	31.6	37.4	37.9
DAL/23	250754	200870	Roadside/Façade	100	100.0	22.2	20.1	15.8	17.4	18.0
DAL/09	250709	200673	Roadside/Façade	91.7	92.3	38.5	37.6	31.5	34.4	31.1

Carm/104	250719	200689	Roadside/Façade	91.7	92.3	36.4	32.7	25.6	28.5	28.2
DAL/10	250734	200603	Roadside/Façade	91.7	92.3	33.7	31.6	24.7	25.4	27.2
Carm/069	250458	200603	Kerbside	100	100.0	35.0	33.2	26.6	28.0	27.6
DAL/12	250411	200616	Kerbside	100	100.0	27.9	27.4	20.2	22.3	24.0
DAL/28	250344	200631	Roadside	100	100.0	24.9	20.4	17.2	18.4	17.8
DAL/04	251623	201976	Roadside	91.7	92.3	30.4	26.6	21.2	21.2	22.2
Carm/114	251665	202013	Roadside	91.7	92.3	32.9	30.8	24.0	25.0	25.1
Carm/113	251951	202411	Roadside	100	100.0	33.9	31.5	22.6	24.3	25.1
Carm/135	248512	200892	Roadside/Façade	100	100.0	25.7	23.6	16.9	21.0	20.1
TYL1	250567	199977	Roadside	100	100.0	-	-	16.2	17.6	18.2
TYL2	250713	199530	Roadside	75	48.1	-	-	14.6	14.0	15.7
TYL3	250740	199503	Roadside	75	25.0	-	-	14.4	16.0	13.6
TYL4	250895	199157	Roadside	91.7	92.3	-	-	14.5	15.7	15.0
TYL5	250735	199517	Roadside	100	100.0	-	-	-	14.3	14.6
Carm/146	251808	198929	Roadside	75	75.0	-	-	-	15.1	13.8
DAC/06	241546	220536	Kerbside	91.7	92.3	27.0	28.3	21.8	21.9	21.9
DAC/13	241559	220554	Kerbside	91.7	92.3	31.1	29.9	22.5	23.7	24.5
Carm/109	241596	220563	Kerbside	100	100.0	36.9	32.4	25.2	27.0	26.7
DAC/08	241876	220565	Roadside	91.7	92.3	**51.2**	**46.9**	37.2	38.8	39.9
DAC/14	241932	220583	Roadside	100	100.0	32.4	30.8	21.6	23.8	23.7

DAC/15	241816	220519	Roadside	91.7	92.3	27.6	25.7	20.1	19.7	18.8
Carm/111	241539	220179	Roadside	100	100.0	30.3	28.6	21.4	20.8	22.2
DAC/12	241492	220171	Roadside/Façade	100	100.0	31.5	29.8	20.2	23.4	21.9
DAC/04	240931	220144	Kerbside/Façade	63.6	55.8	23.1	21.2	16.4	16.0	15.0
Carm/072	240688	220057	Roadside	100	100.0	30.0	28.0	22.6	23.0	22.5
DAC/02	240618	220041	Kerbside	100	100.0	38.3	**40.0**	29.6	31.9	31.4
DAC/16	240557	220026	Roadside/Façade	100	100.0	37.9	32.8	26.2	28.4	27.8
Carm/001	240798	220155	Roadside	100	100.0	30.9	27.7	21.6	22.8	22.4
Carm/084	240831	220272	Kerbside	83.3	82.7	32.3	27.6	22.4	26.4	23.8
DAC/05	240797	220297	Roadside/Façade	100	100.0	32.4	31.5	23.0	26.3	25.4
Carm/106	240979	220244	Roadside/Façade	91.7	92.3	34.4	33.1	24.2	24.8	25.5
Carm/134	240377	220397	Other/Façade	100	100.0	12.5	11.5	8.5	9.5	9.2
Carm/126	239914	219829	Roadside	91.7	92.3	22.2	19.6	15.9	17.2	16.2
Carm/132	239865	219745	Roadside/Façade	83.3	84.6	16.8	15.5	12.1	14.2	11.7
FA/01	263190	223000	Roadside	100	100.0	14.9	13.6	10.7	10.5	11.7
DA/15	263150	222763	Roadside/Façade	100	100.0	22.9	22.0	17.4	16.3	18.4
DA/01	263076	222596	Roadside	100	100.0	23.5	20.4	15.8	16.7	16.1
DA/03	263021	222503	Roadside/Façade	100	100.0	23.5	22.1	18.1	17.4	18.1
Carm/013	263006	222505	Kerbside	100	100.0	30.3	28.6	22.5	22.0	23.4
DA/05 (A), (B) & (C)	262982	222445	Roadside/Façade	50	50.0	34.6	30.3	24.4	26.6	25.0

DA/07	262966	222412	Roadside/Façade	100	100.0	37.9	33.3	26.2	28.2	27.4
Carm/083	262959	222396	Roadside	100	100.0	**40.1**	36.8	27.4	31.7	28.5
DA/09	262951	222375	Roadside/Façade	100	100.0	**40.1**	38.6	29.4	32.2	30.9
DA/10	262933	222345	Kerbside/Façade	100	100.0	**41.3**	34.8	24.3	29.5	28.8
DA/11	262924	222346	Roadside/Façade	100	76.9	35.6	34.1	24.4	28.2	25.2
DA/12	262908	222329	Roadside/Façade	91.7	90.4	21.2	19.5	12.3	14.6	15.6
DA/13	262906	222299	Kerbside	100	100.0	33.8	31.7	22.0	24.2	24.3
DA/14	262902	222250	Roadside	91.7	92.3	22.2	22.7	17.2	19.0	19.2
DA/16	262848	222170	Roadside/Façade	100	100.0	31.4	27.1	21.4	23.9	23.2
Carm/127	244999	200840	Kerbside	100	100.0	12.6	11.6	9.0	9.5	9.1
Carm/128	244857	200828	Kerbside	91.7	92.3	14.7	14.0	11.1	12.0	12.0
LLG2	256144	201792	Roadside	100	100.0	-	18.3	15.7	15.2	15.7
LLG3	256050	201600	Roadside	100	100.0	-	18.0	13.3	13.9	14.2
Carm/ELR1	256458	213067	Roadside	83.3	84.6	34.3	33.0	24.0	24.8	25.5
Carm/ELR2	256465	213085	Roadside/Façade	100	100.0	22.4	20.3	16.5	16.7	17.3
Carm/ELR3	257027	213774	Roadside	91.7	92.3	17.3	16.5	12.0	14.1	13.8
Carm/ELR4	257022	213777	Roadside/Façade	50	15.4	15.0	14.0	11.1	11.2	-
Carm/ELR6	257550	214505	Other	80	32.7	10.2	9.7	-	-	6.1
Carm/ELR7	257553	214503	Other	80	32.7	8.6	8.5	-	-	5.4
Carm/ELR8	257562	214497	Other	80	32.7	8.2	7.0	-	-	4.8

Carm/ELR9	257837	214594	Roadside	100	100.0	7.7	7.2	5.3	5.6	5.7
Carm/ELR10	258269	213646	Roadside			12.6	12.5	8.7	-	-
ELR/10(B)	258288	213651	Roadside	91.7	92.3	-	-	-	9.1	10.5
Carm/ELR11	257752	213562	Roadside	75	73.1	9.6	9.8	7.5	8.0	8.7
Carm/ELR12	257563	213717	Kerbside	100	100.0	12.2	12.2	9.4	9.9	9.2
Carm/ELR16	257664	214087	Other	50	17.3	6.9	5.6	-	-	-
Carm/ELR19	257730	214100	Other	100	92.3	6.5	5.9	-	-	4.1
Carm/ELR20	257749	214104	Other	100	92.3	6.2	5.9	-	-	4.2
Carm/ELR21	257564	212950	Roadside	83.3	84.6	10.2	9.7	7.6	8.6	7.2
Carm/ELR22	257666	212864	Roadside	91.7	92.3	15.8	15.2	11.8	12.7	12.7
FA/04(A)	262869	221274	Roadside	91.7	92.3	-	-	-	8.9	9.9
FA/06(A)	262780	221469	Roadside	75	73.1	-	-	-	10.5	11.7
FA/03(A)	262853	221512	Roadside	91.7	92.3	-	-	-	14.2	16.6
FA/07(A)	262980	221490	Roadside	66.7	65.4	-	-	-	5.8	6.5
ELR/10(B)	258288	213651	Roadside	91.7	92.3	-	-	-	9.1	10.5
TYL6	250529	199371	Roadside	91.7	92.3	-	-	-	-	9.5
LLG4	255890	201898	Roadside	100	100.0	-	-	-	-	9.1
LLG5	255638	201847	Other	100	100.0	-	-	-	-	6.9
Carm/147	262436	212935	Other	100	34.6	-	-	-	-	6.1
LAN/1	230163	211120	Roadside	100	100.0	-	-	-	-	8.6

LAN/2	230161	210795	Kerbside	91.7	92.3	-	-	-	-	10.1
LAN/3	230116	210766	Roadside	91.7	92.3	-	-	-	-	8.4
LAN/4	230112	210591	Roadside	100	76.9	-	-	-	-	8.1

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

Figure 14 – Trends in Annual Mean NO_2 Concentrations

Figure 15 – Carmarthen AQMA Trends in Annual Mean NO_2 Concentrations

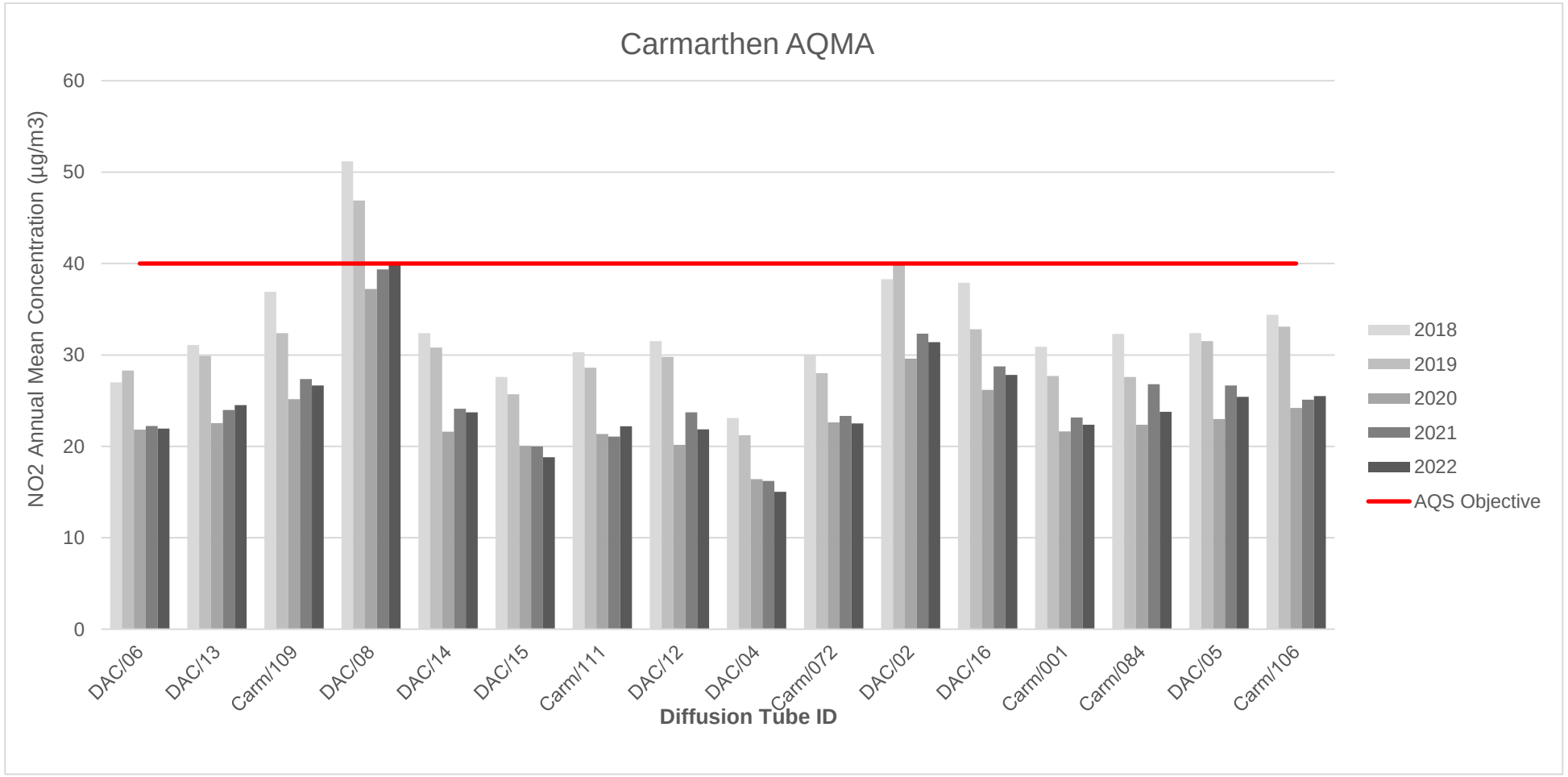


Figure 16– Llandeilo Trends in Annual Mean NO_2 Concentrations

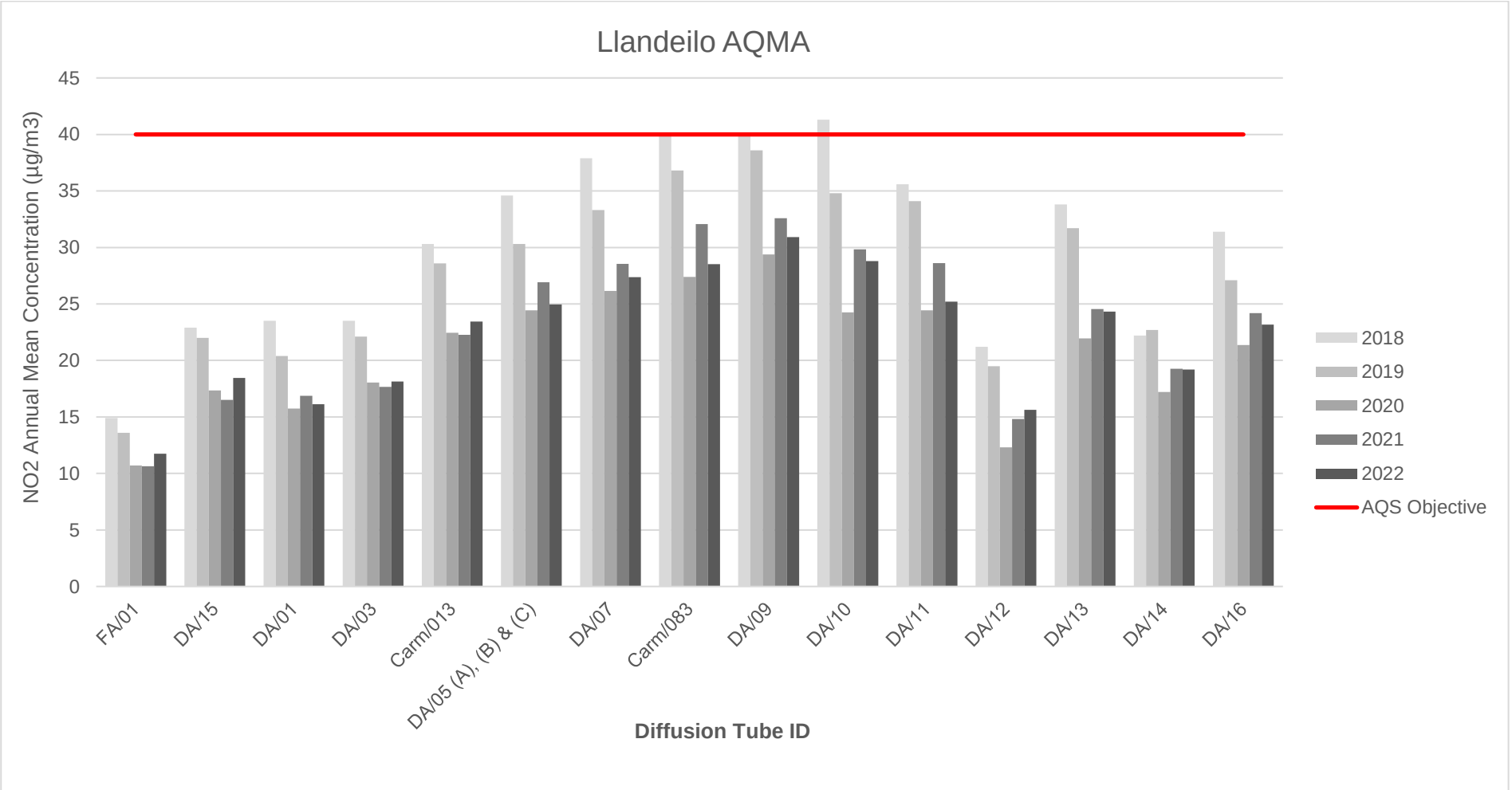
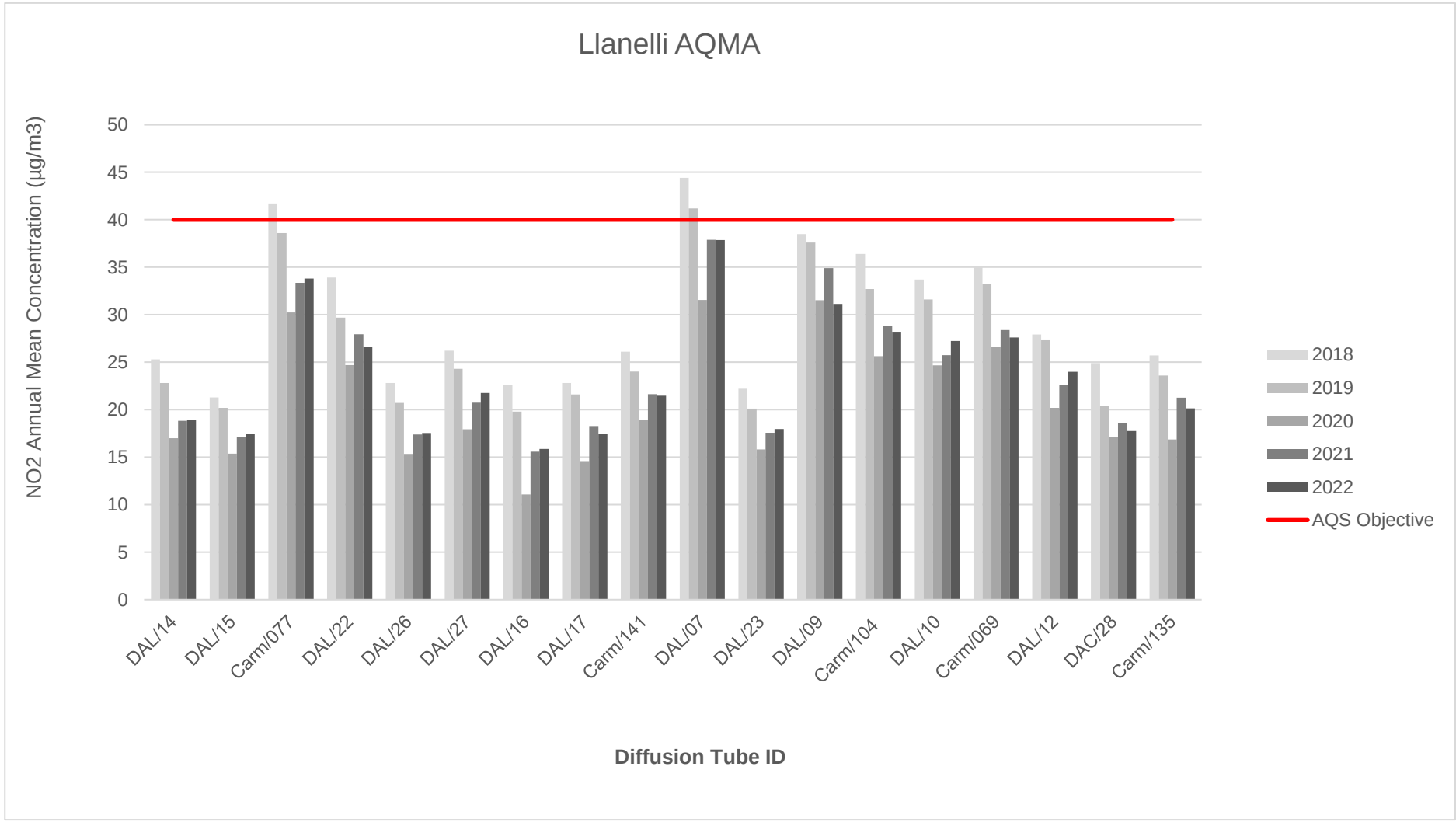
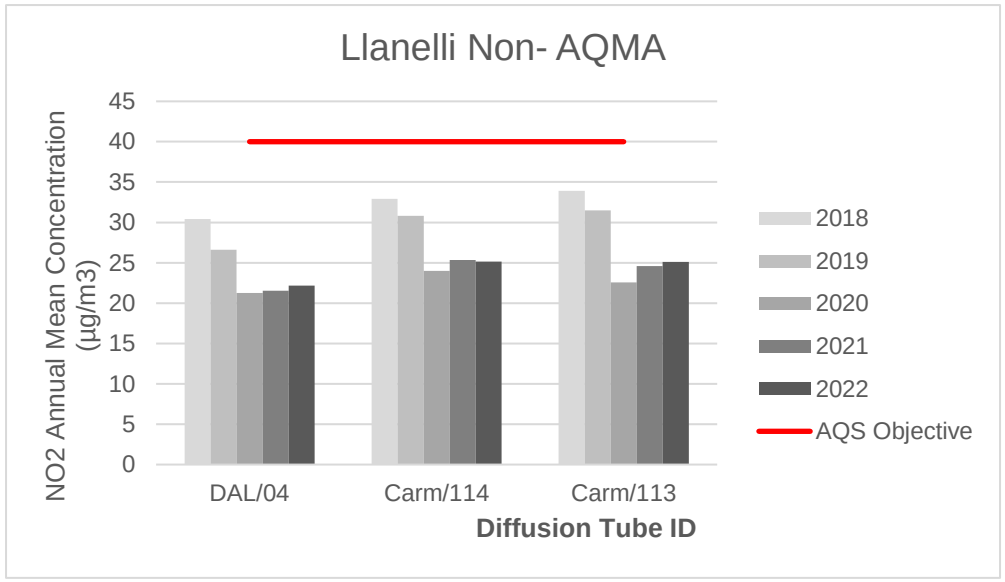
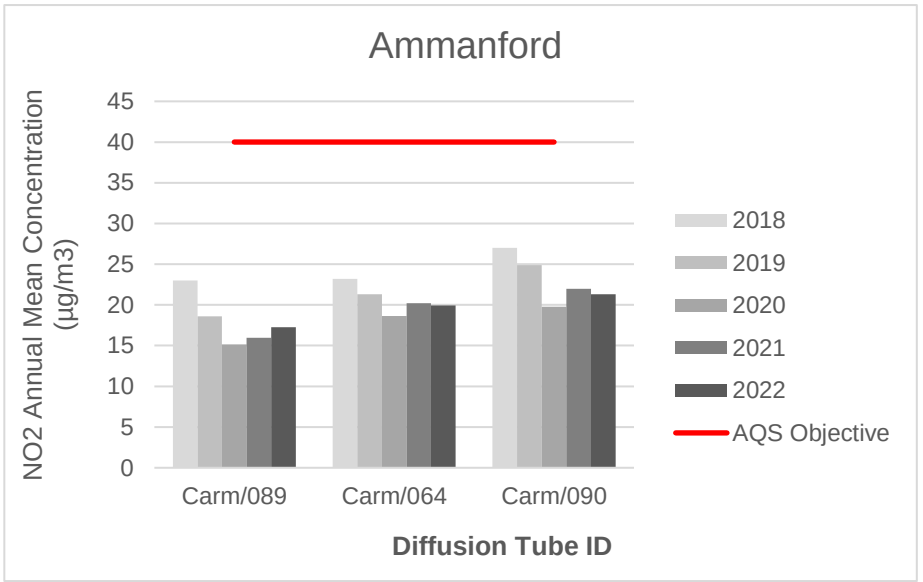


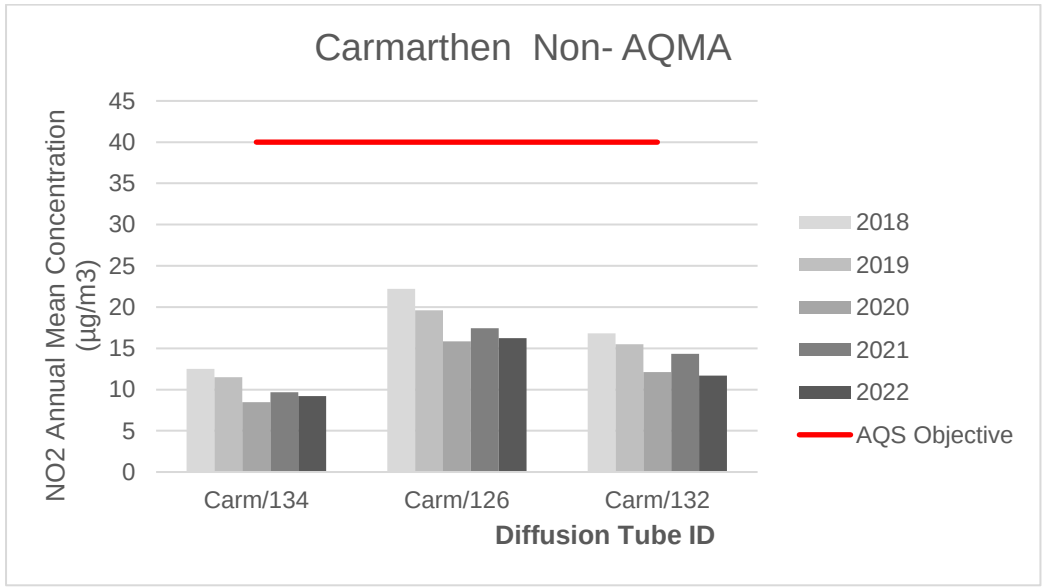
Figure 17– Llanelli Trends in Annual Mean NO_2 Concentrations

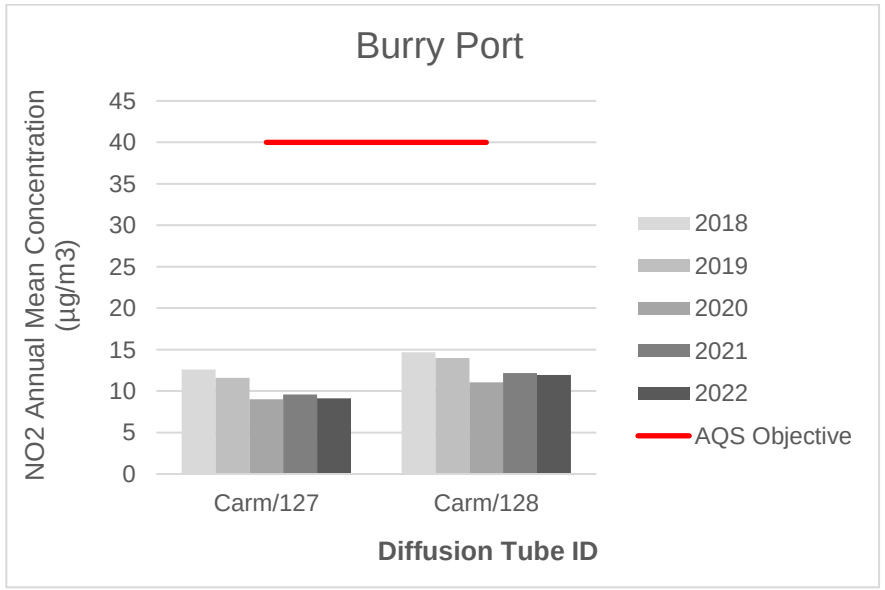


Figures 18 – Non- AQMA Trends in Annual Mean NO_2 Concentrations









Comparison of 2022 Monitoring Results with Previous Years and the Air Quality Objectives

Monitoring periods and valid data capture

A network of 88 NO_2 diffusion tube monitoring in Ammanford, Carmarthen, Llanelli, Llangennech, Burry Port, Llandeilo and Cross Hands was set up for the full calendar year, with tube changes coinciding with the recommended exposure periods suggested by the LAQM helpdesk. An additional 6 sites were also set up for 11 months or less, totalling 94 locations during 2022. Forty seven of these sites experienced missing or non-exposed tubes which lowered the percentage of valid data that was captured for the full calendar year. This is illustrated on **Table 2.3** – Annual Mean NO2 Diffusion Tube Monitoring Results (µg/m3). Despite this reduction in valid data capture, the bias adjusted annual mean did not require annualisation for thirty six of the sites because more than 75% of the full calendar year was captured.

Eleven of the ninety-four total monitoring sites had a shorter monitoring period than the full calendar year and captured less than 75% valid data. However, nine of these sites had captured more than 3 months valid data. This included two new tube sites within two new screening exercises.

Both Carm/ELR4 and Carm/ELR16 only captured 2 months valid data, and were therefore unable to be subject to annualisation. It was necessary to annualise the results for nine sites because data capture for these sites was less than 75%, this included TYL2, TYL3, DAC/04, DA/05 (A)(B)&(C), Carm/ELR6, Carm/ELR7, Carm/ELR8, FA/07(A) and Carm/147.

One existing site referenced TYL3 in Station Road Llanelli (outside of the AQMA), was replaced in 2021 by TYL5 and considered a more suitable location reflective of the nearest receptor exposure, so this site was removed in May but had captured 3 months valid data. Nearby, site TYL2 which had previously been inaccessible at the start of the year, was reinstated in May 2022 but only captured six months valid data and so the results were annualised.

DAC/04 in Water Street, (Probation Office) Carmarthen and FA/07(A) Heol Bethlehem, Ffairfach had a number of missing tubes during the calendar year and both sites only captured 7 months valid data requiring annualisation.

DA/05 (A)(B)&(C) a triplicate tube site outside Evans's Butchers, Llandeilo also experienced a number of missing tubes and only captured 6 months valid data. The results were subsequently annualised.

Five existing sites were removed early due to the site location becoming inaccessible due to vegetation during the calendar year, this included Carm/ELR4, Carm/ELR6, Carm/ELR7, Carm/ELR8, and Carm/ELR16 which surrounded the new Economic link Road in Gorslas.

A new site was set up in 16 Florence Street, Ammanford (Carm/147) following concerns raised about the air quality from smoke activities of a nearby scrap metal site impacting on residents' health. This area had very little traffic and as short screening exercise only four months valid data was captured between September to December although it was still possible to annualise the data.

Two further sites had a shorter monitoring period than a full calendar month including an existing site referenced DA/11 in Llandeilo, which missed out on the first 3 months of exposure as scaffolding was blocking access to the tube site. Secondly, site LAN/4 Gosport Street, Laugharne was only subject to a 9-month monitoring period. For both monitoring therefore started April 2022, but captured 9 months of data and therefore did not require any further annualisation to be carried out.

Further details on the approach taken on annualising this data can be found in Appendix C Diffusion Tube Annualisation and the annualised post data bias end result has been used in Table 2.3 – Annual Mean NO_2 Diffusion Tube Monitoring Results ($\mu g/m^3$) above.

Monitoring results exceeding / close to the Annual Air Quality Objective

There were no diffusion tube locations that exceeded the annual mean AQO in both 2020 2021 and 20222, although two sites reported a borderline result above 35$\mu g/m^3$ in both 2021 and 2022. Those sites that have previously exceeded the AQO are detailed below with the relevant data presented in Table 2.3 – Annual Mean NO2 Diffusion Tube Monitoring Results (µg/m3) above. The raw data for 2022 can be found Table A.1. Appendix A: Quality Assurance / Quality Control (QA/QC) Data.

Llanelli

It was reported that one site in Llanelli exceeded the AQO for 2019, this was 13 Felinfoel Road (DAL/07), which had exceeded the AQO in the previous seven years and although it

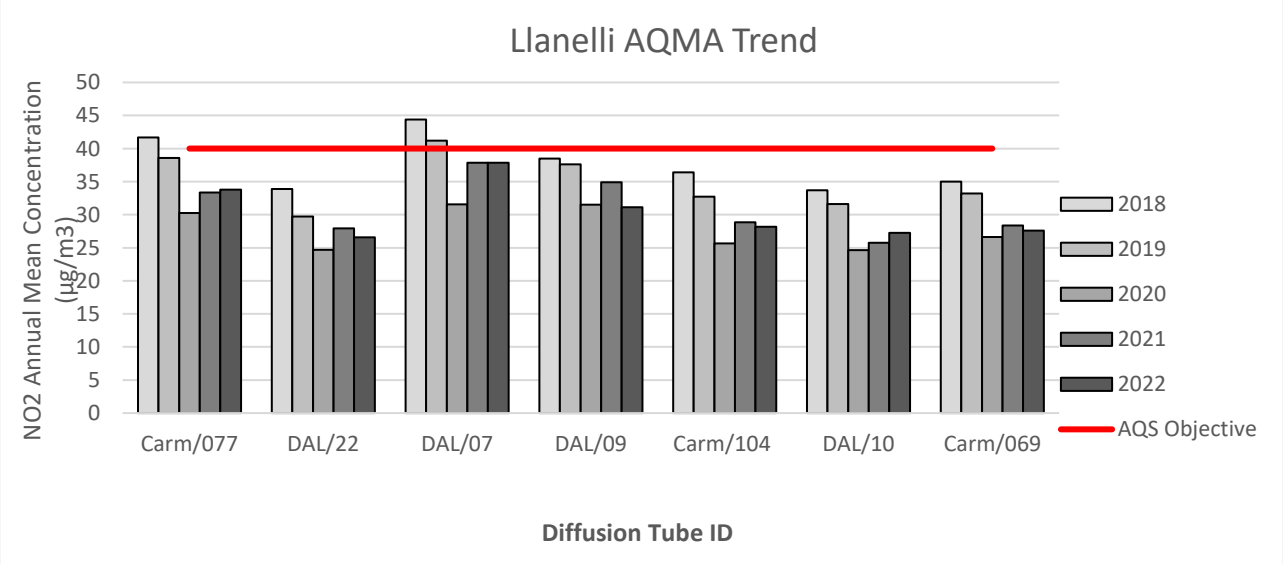
has experienced decreases over the last few years from 47.4µg/m^3 (2017) to 44.4µg/m^3 (2018) to 41.2µg/m^3 (2019), 2020 was the first time we were able to report compliance of the AQO, at 31.6µg/m^3. 2021 results at this site had increased to 37.4µg/m^3 and remains marginally compliant for 2022 with 37.9µg/m^3.

Thomas Street (Barnados) (DAL/09) is located approximately 140m downhill from 13 Felinfoel Rd, it last exceeded the AQO in 2017, and remained borderline in 2019 and 2018 after experiencing a decrease below the AQO for the first time in the previous five years. It had significantly reduced for 2020, reporting an annual average result similar to 13 Felinfoel Rd, with 31.5µg/m^3, yet in 2021 it increased to 34.4µg/m^3. 2022 has however reported a similar result to 2020 with 31.1µg/m^3. Improvements have been made to the junction near this site in 2021, moving the traffic further away from some of the receptors. The changes do not appear to have had an adverse effect on the NO_2 levels.

Carm/077 in Sandy Road (2) previously exceeded the AQO for the first time in 2018 after observing a gradual increase over three years, however during 2019 results remained borderline at 38.9µg/m^3. Notably, this site is located near the kerb and some meters away from the relevant receptor. In 2020, the annual average for this site reduced to 30.2µg/m^3 and only increased slightly to 32.9µg/m^3 in 2021 and 33.8µg/m^3 in 2022.

The three above mentioned sites are the only monitoring sites in Llanelli to report an annual average greater than 30µg/m^3 from 2020 to 2022.

Figure 19 : Five Year Trend in Llanelli AQMA (Highest NO_2 results)



The majority of sites in Llanelli observed similar levels of NO_2, in 2022 compared to 2021 with some marginal increases and others marginally decreasing, so noticeable improvement overall. Nonetheless, there is a definitive downward trend compared to pre-

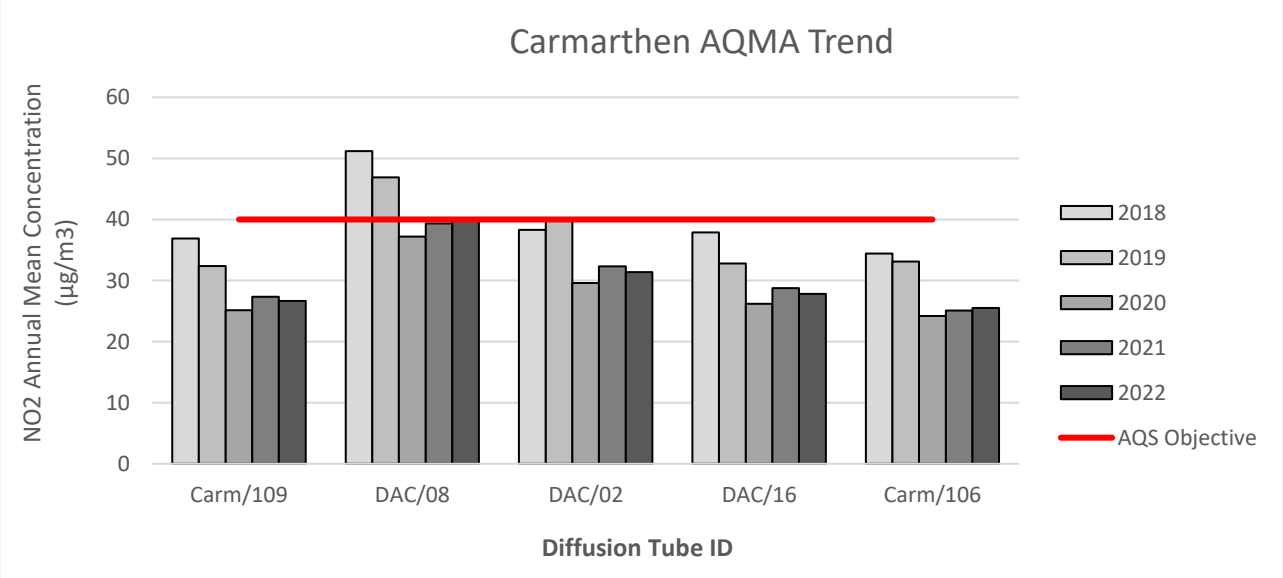
2020 years and this trend appears consistent across the whole monitoring network in Llanelli's AQMA.

Carmarthen

In Carmarthen there were no exceedances of the annual AQO in 2020, 2021 or 2022 whereas two locations exceeded the AQO in 2019. They were 85 Priory Street (E) (DAC/08), which had exceeded the AQO for the eight years prior to 2020 but reduced from 46.9µg/m^3 in 2019 to 37.2µg/m^3 in 2020, 38.8µg/m^3 in 2021 and this year has reported another borderline result of 39.9µg/m^3. Secondly, 15 Park Terrace (DAC/02), which reported 38.3µg/m^3 in 2018, increased to 40µg/m^3 in 2019 and then reduced to 29.6µg/m^3 in 2020, and has remained compliant in 2021 with 31.9µg/m^3 and 31.4µg/m^3 in 2022.

All the monitoring sites in Carmarthen have seen a reduction in concentration compared to 2019. The highest reading tube in the county was for the tenth-year running was 85 Priory Street (E)(DAC/08). The annual result was 39.9µg/m^3, and has remained borderline compliant for three years, reporting 38.8µg/m^3 (2021), 37.2µg/m^3 (2020), 46.9µg/m^3 (2019), 51.2µg/m^3 (2018) and 57µg/m^3 (2017). This was the only monitoring site in Carmarthen that reported an annual average result above 36µg/m^3. Similarly, to Llanelli, most sites within Carmarthen AQMA, experienced a reduction in NO_2 compared to previous years.

Figure 20 : Five Year Trend in Carmarthen AQMA (Highest NO_2 results)

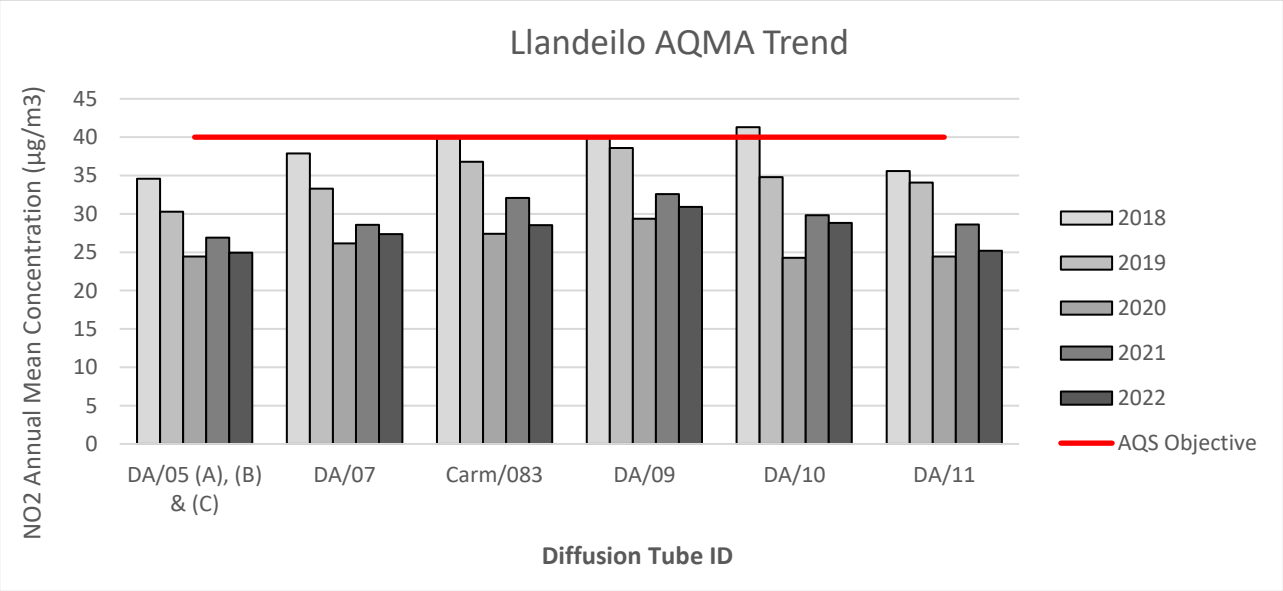


Llandeilo

From 2019 to 2022 Llandeilo has had no sites that exceeded the annual AQO, just two locations remained borderline during 2019, and all monitoring sites reported annual

average results below 30µg/m^3 in 2020, however this slightly increased in 2021 with three sites reporting an NO_2 reading above 30µg/m^3, but has again reduced in 2022 with only one site (DA/09) reporting an annual result above 30µg/m^3, still no sites in Llandeilo are borderline compliant. This is a great improvement compared to 2018 where it was reported that three sites breached the AQO before any NO_2 fall off with distance calculations were conducted. They included 123 Rhosmaen St (DA/09) and Rhosmaen Street (2) (Carm/083) both reporting 40.1µg/m^3 (2018), borderline between 36-38µg/m^3 in 2019 and 32-33µg/m^3 (2021). No 133 (DA/10) which reported 41.3µg/m^3 in 2018, decreased to 34.8µg/m^3 in 2019, 24.3µg/m^3 2020), 29.5µg/m^3 (2021) and has now reported 28.8µg/m^3 for (2021).

Figure 21 : Five Year Trend in Llandeilo AQMA (Highest NO_2 results)



2019 was the first year that has observed all monitoring locations in Llandeilo AQMA to fall below the Annual Air Quality Objective and has maintained this decrease furthermore into 2022.

The full trends over the last five years for Llanelli, Carmarthen and Llandeilo AQMA monitoring network are illustrated in Figure 14 – Trends in Annual Mean NO_2 Concentrations above. All of the diffusion monitoring sites are largely experiencing a downward trend, with the most significant improvement overwhelmingly observed in 2020, yet results of 2022 are closely similar for many sites, particularly Carmarthen and Llandeilo.

2.1.3 Nitrogen Dioxide (NO_2)

Diffusion Tube Monitoring Data

Two sites in the diffusion tube network were corrected for NO_2 fall-off with distance because the post bias (and annualised) annual mean fell within 10% of the AQO. This site was Carmarthen - 85 Priory Street (E) (DAC/08) and nr 13 Felinfoel Road (DAL/07).

The calculation was carried out in accordance with paragraph 7.212 of LAQM Technical Guidance (22), using LAQM Helpdesk 'Diffusion Tube Processing Tool', which amalgamates the on-line LAQM Helpdesk distance calculator tool (Version 4.2) to generate the NO_2 predicted results for the fall-off with distance.

After using the Diffusion Tube processing tool to calculate the fall-off with distance for DAC/08 (85 Priory Street, Carmarthen) the result reduced from 39.9ug/m^3 to a predicted concentration of 37.6ug/m^3. This is a significant improvement in comparison to the 2019 result which exceeded the Annual Air Quality Objective at 44.3ug/m^3 after the fall off with distance was calculated, yet a marginal increase from 2021 which calculated 36.8ug/m^3.

After using the Diffusion Tube processing tool to calculate the fall-off with distance for nr 13 Felinfoel Road (DAL/07) the result reduced from 37.9ug/m^3 to a predicted concentration of 34.9ug/m^3. This is a small improvement in comparison to the 2019 result which exceeded the Annual Air Quality Objective at 38.1ug/m^3 after the fall off with distance was calculated, yet very similar to 2021 results which predicted 34.6ug/m^3.

Further details relating to the distance calculations are contained in Appendix C NO2 Fall-off with Distance from the Road. Overall, the total number of sites exceeding the AQO compared to 2019 has reduced from one to none; 85 Priory Street, Carmarthen (E) continues to have the highest reading of all monitoring sites in the County. This site has always been recognised as a hotspot within the Carmarthen AQMA. No sites demonstrated an exceedance of 60ug/m^3 or more which indicates there is unlikely to be any risk of exceeding the 1-hour objective.

There is one triplicate tube site which is in Llandeilo (DA/05 – Rhosmaen Street (Evans Butchers)) and this will be maintained for the continued monitoring and assessment of Action Plan work.

The tube sites associated with Burry Port and Ammanford all had results well below the AQO, as was expected, but the monitoring sites will be maintained for use as developments around the towns continue.

The monthly raw data results for the 2022 data, including the distance calculated prediction is contained in Table A1 Appendix A: Quality Assurance / Quality Control (QA/QC) Data.

2.1.4 Particulate Matter (PM_{10})

Carmarthenshire County Council does not monitor PM_{10}.

In previous years PM_{10} monitoring exercises have been carried out in various locations across the county where it has been considered there may be a potential issue or in response to complaints about industrial activities. None of the previous surveys have identified any breaches of the PM_{10} objective levels. Due to the continuing financial constraints, it was deemed appropriate to discontinue the annual surveys, unless a specific requirement was identified, and to concentrate on those air quality issues that were known to exist, i.e. traffic related NO_2. There were no specific issues identified during 2022 that required a particulate monitoring survey to be performed.

2.1.5 Particulate Matter ($PM_{2.5}$)

Carmarthenshire County Council does not monitor $PM_{2.5}$, and there are currently no plans to do so in the future.

2.1.6 Other Pollutants Monitored

There has been no formal monitoring of sulphur dioxide by Carmarthenshire County Council. However, previous assessments and reports identified that there was the potential for exceedance of the 15-minute mean by way of idling steam locomotives at a station in Bronwydd, Carmarthen. The locomotives would regularly idle at the platform for periods of greater than 15 minutes where members of the public would be waiting, within 15 meters of the locomotives.

Discussions with the management of the railway company resulted in an agreed fixed work notice being issued that restricted the waiting time at the platform to less than 10 minutes. This agreement has been in place for many years and is still being monitored.

It has been agreed that Carmarthenshire County Council will carry out unannounced compliance visits to confirm that the requirements of the fixed work notice are being maintained. No issues were observed during 2022.

Carmarthenshire County Council does not carry out monitoring for benzene. There are no requirements for other pollutants to be monitored by Carmarthenshire County Council.

Summary of Compliance with AQS Objectives as of 2022

Carmarthenshire County Council has examined the results from monitoring in the County. Concentrations are all below the Objectives, therefore no further action is required. Some Concentrations in Carmarthen and Llanelli have been found to be close to the Objectives and therefore further investigation is required. Carmarthenshire County Council does not intend to revoke the Llandeilo, Llanelli or Carmarthen AQMA's for lack of exceedance of Nitrogen Dioxide as further investigation is required before deciding on whether action is necessary. Therefore, these AQMAs should remain.

3 New Local Developments

There have been a number of planning applications received in the last couple of years for projects that span a number of years and a few more recent applications. Air Quality Assessments have been requested for some of the proposals to determine whether the developments will result in a negative impact on local air quality. Table 3.1 below summarises these details.

Table 3.1 - Planning Applications

Reference	Location	Information Request	Response	Status
PL/04251 PL/04400	Pentre Awel, Llanelli Wellness Centre	Signage Strategy, Travel plan and construction management plan. Environmental Statement submitted including dust risk assessment and air quality assessment from increased traffic.	Negligible impact from construction with operational slight adverse impact on Sandy Rd concluded from AQA. Mitigation measures included.	Reserved matters Granted
PL/03651	Land at Garreglwyd, Pembrey	100 residential properties, travel plan submitted.	AQA during outline S/21597 concluded no significant impact	Refused 2019, appeal allowed 2022
PL/04746	Land South of Dol Y Dderwen,, Llangain, Carmarthen	Reserved matters for 36 homes	No AQA required	Granted
PL/04604 & PL/03748	Land adj Primary School, Laugharne	42 houses, site layout submitted	AQA screening indicates no significant impact.	Outline W/3545 appeal allowed, Reserved matters granted.

PL/04627	Land at Frondeg, Carmarthen West	93 residential units, 209 parking spaces, dust management plan submitted	450 vehicle trips below screening threshold for AQA	Full planning granted
PL/02576	Land to the north of Old St Clears Road (B4312 south of Pentremeurig Rd and west of Carmarthen	Phasing of 250 residential units for planning ref W/2776	AQA not required at outline	Granted
PL/00435	Plot C1 Burns Parc Pensarn, Carmarthen, SA31 2NF	New manufacturing/ warehousing facility with ancillary office accommodation and associated infrastructure works	AQA submitted no significant impact	Granted
PL/05187	Land at Cefncaeau, Pemberton, Llanelli,	Outline for 90 residential units. AQA screening submitted with dust risk assessment	No significant impact from AQA	In review
PL/04717	Former Cattle Breeding Centre, Travellers Rest Johnstown Carmarthen	21 houses, 97 trips falls below screening threshold	No AQA required	Granted
PL/04776 & PL/03790	Housing site at Ffos Las, Kidwelly	Dust management plan submitted for 141 dwellings w/20882		Reserved matters Granted
PL/04306	Vacant land off St Annes Lane, Cwmffrwd, Carmarthen, SA31 2LZ	23 residential units, 111 trips not in AQMA	No AQA required	Application refused, appeal allowed
PL/03864	Land off Caergar, Llwynhendy, Llanelli	18 plots, dust mitigation scheme submitted	Below screening threshold for AQA	Granted
PL/04495	Land south of Cwmgarw Rd, Brynaman	Outline for 60 dwellings,	Trip generation, below screening	Outline refused, appeal allowed

			threshold for AQA	
PL/04430	Land off Heol-Y-Parc, Hendy	7 residential dwellings	Trip generation, below screening threshold for AQA	In review
PL/04079	Land at Glanmor Terrace, Burry Port	32 Residential units, and site layout includes shared EV charging point	AQA not required at outline (below screening threshold)	Granted
PL/00668	Land off Clos Llwyn Ty Gwyn, Whitland	15 houses and construction of new estate road	AQA not required at outline (below screening threshold)	Granted
PL/04110	Land adjacent to Spring Gardens, Whitland, Carmarthen, SA34 0HW	Plan for 9 residential dwellings increase from 8 under original ref W/35037	AQA not required at outline (below screening threshold)	Granted
PL/03374	Land west of High Street, St Clears	64 Residential units	AQA not required at outline (below screening threshold)	Granted

Road Traffic Sources (and Other Transport)

During 2022, traffic related air pollution at different locations were considered in respect of an ongoing exercise in at Afon Road to Bridge Street in Llangennech and in New Dock Road to Station Road in Llanelli.

A new screening exercise was set up in Laugharne following complaints of the traffic and frequent congestion along the narrow routes through the Town. Four diffusion tube sites were set up referenced LAN/1, LAN/2, LAN/3 and LAN/4. It was considered that each of these sites would benefit from monitoring of Nitrogen Dioxide during 2022. There was no breach of the AQS Objective at any of the screening locations assessed.

In 2021 four diffusion tube sites were also reinstated in Ffairfach, Llandeilo one on each arm of the crossroads in light of plans to remove the roundabout and install traffic lights to aid pedestrian crossing and safety for children that regularly use the route to the nearby schools. An air quality assessment indicated that the change would likely increase congestion and queuing at peak times, but that it would not have a significant adverse impact on the local air quality. Results at each of the four sites have reported a marginal increase (1-2ug/m^3) of NO_2, however the highest result was 16.5ug/m^3. Further complaints have been received about the perceived increase in queuing traffic, and so monitoring is continuing for the time being. However

A further ongoing screening exercise, which started in May 2017 monitors NO_2 in existing routes surrounding the proposed Cross Hands Economic Link Road. Details of this first 2-year exercise was reported in the 2020 Annual Progress Report, assessing levels of NO_2 before and during construction however the final conclusions should be reported after the new link road has been built and opened, to observe the impact on levels of NO_2 on the surrounding routes (completion was originally planned for 2019 but has since been delayed until 2022). This ELR link road opened August 2022, a screening assessment was carried out before and during the construction, and the final year of monitoring NO_2 during 2023 will be reported in 2024 APR to assess the impact of the new road.

Monitoring of NO_2 has continued in Jobs Well Road, Old St Clears Road and College Street Carmarthen to monitor any impact since the construction and opening of the

Carmarthen Western Link Road. The road connects the A40 at Travellers Rest with College Road providing direct access to the trunk road network for key employment sites at St David's Park, Hywel Dda Health Board's Hafan Derwen and the University of Wales Trinity St David's Carmarthen campus. It also serves the new S4C headquarters Yr Egin, a major project for the Swansea Bay City Region.

It was hoped that the link road may reduce the volume of traffic using Old St Clears road and Jobs Well Road. To date we have not observed any significant impact above the overall downward trend that we are observing across other sites in Carmarthen. Although more importantly, since the road was completed and opened in March 2019 we have not observed any adverse impact on College Street and further towards Water Street Carmarthen, to which the new link road may encourage more traffic towards. The results of these sites are summarised in table 3.2 below.

Table 3.2 – Results of sites potentially impacted by the Carmarthen Western Link Road

Site Location	Diffusion Tube ID	NO_2 Annual Mean Concentration (µg/m^3)					
		2017	2018	2019*	2020	2021	2022
Carmarthen - 2 College Road	Carm/134	12.1	12.5	11.5	8.5	9.5	9.2
Johnstown - 2 Jobs Well Road	Carm/126	22.5	22.2	19.6	15.9	17.2	16.2
Johnstown - 7 Old St Clears Road	Carm/132	17.1	16.8	15.5	12.1	14.2	11.7
Carmarthen - 15 Park Terrace	DAC/02	**41.4**	38.3	**40.0**	29.6	31.9	31.4
Carmarthen - Water Street	Carm/084	33.1	32.3	27.6	22.4	26.4	23.8
Carmarthen - 44 Water Street	DAC/05	32.9	32.4	31.5	23.0	26.3	25.4

*Carmarthen Western Link Road opened March 2019

There are a number of large developments planned near the Carmarthen Western Link Road in the future. Carmarthen West has been identified as a strategic site within the council's Local Development Plan and is allocated for mixed use development including 1,100 new homes, a primary school, employment space, a small retail centre, open space and affordable housing. Therefore, monitoring will continue to observe any impacts this has on these sites as traffic is likely to increase once those developments are completed.

Road Safety Improvements were made to the Thomas Arms Junction from Thomas Street to Old Road in Llanelli to support safe pedestrian crossing in Lower Felinfoel Road and improvements to the bus stop at Thomas Street. This included widening of the footways, removing the northbound left-hand turn which would prevent parked/idling vehicles next to the receptors and therefore move traffic further away. Work was completed August 2021.

Table 3.3 – Results of sites potentially impacted improvements to the Thomas Arms junction, Llanelli

Site Location	Diffusion Tube ID	NO_2 Annual Mean Concentration (µg/m^3)				
		2018	2019	2020	2021*	2022
Llanelli - 3 Old Road	Carm/141	26.1	24.0	18.9	21.4	21.5
nr 13 Felinfoel Road	DAL/07	**44.4**	**41.2**	31.6	37.4	37.9
Thomas St (Barnados)	DAL/09	38.5	37.6	31.5	34.4	31.1
Thomas St (2)	Carm/104	36.4	32.7	25.6	28.5	28.2

*Works to junction completed August 2021

Across much of Carmarthenshire Nitrogen Dioxide levels were largely comparative or marginally higher than 2021 results and remain much lower than the pre-pandemic years. Notably, Thomas Street (Barnados) reported a decrease for 2022 compared to other sites in the nearby vicinity; this is the closest monitoring site to the junction improvement. It is possible that the changes have had a positive impact, given the difference in trend to the other nearby sites. There is no discernible impact on lower Felinfoel Road since the changes were made, however the site has not exceeded the Air Quality Objective of 40µg/m^3 for the third year running in 2022, so it does not appear to have had a negative impact in this area.

Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

3.2.1 Industrial Sources

3.2.1.1 New or Proposed Installations for which an Air Quality Assessment has been carried out

A new environmental permit application was received for Stradey Business Park, Llangennech Llanelli for the operation of four biomass boilers combusting uncontaminated waste wood. An air quality assessment was conducted to determine the individual and combined impact on sensitive receptors and conservation areas. The Assessment concluded that it would be unlikely to have a significant impact on local air quality in compliance with the permit conditions. A new Environmental Permit was granted.

Carmarthenshire County Council has not identified any other new developments with fugitive or uncontrolled sources since the last assessment relating to new or proposed installations for which an air quality assessment has been carried out.

3.2.1.2 Existing industrial Installations for where emissions have increased substantially, or new relevant exposure has been introduced

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to existing industrial installations where emissions have increased substantially, or new relevant exposure has been introduced.

3.2.1.3 New or significantly changed Industrial Installations with no previous air quality assessment

Torcoed Quarry are regulated under a Part B permit and have varied the fuel used on site for the Road stone coating plant under their Part B permit. The change involves using LPG gas as a main fuel with heating oil as a secondary fuel instead of only using processed fuel oil. The change includes using a cleaner fuel and should recue pollution emissions. Torcoed Quarry was requested to carry out an air quality assessment. The Air quality assessment illustrated that the change from heavy fuel oil towards LPG would significantly

improve emissions as they would be moving towards a much cleaner fuel source. The use of Gas oil as a back-up emergency fuel only is subjected to limited use conditions.

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to new or proposed installations for which an air quality assessment has been carried out.

3.2.1.4 Major Fuel Depots Storing Petrol

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to Major fuel storage depots storing petrol.

3.2.1.5 Petrol Stations

There have not been any new petrol stations with throughputs greater than 2000m^3 per annum near a busy road (>30,000 vehicle/day) where there is relevant exposure within 10m of the pumps.

Carmarthenshire County Council has granted planning permission for a new petrol station at Land at St Clear's Roundabout, Old Tenby Road, St Clear's, Carmarthenshire. SA33 4JW. Development is underway (2023) to construct the new petrol Station in Old Tenby Road, St Clears. An Air Quality Assessment was conducted as part of the planning process which concluded that there would not be any significant impact on local air quality from the increased volume of traffic it would generate. Once constructed, it would require a part B environmental permit for a Vapour Recovery Stage 1b and Stage II activities.

3.2.1.6 Poultry Farms

Carmarthenshire County Council has not identified any new developments with fugitive or uncontrolled sources since the last assessment relating to Poultry Farms.

3.2.2 Fugitive or Uncontrolled Sources

3.2.2.1 Landfill Sites

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include Landfill sites.

3.2.2.2 Quarries

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include Quarries.

3.2.2.3 Unmade Haulage Roads

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include unmade haulage roads on industrial sites.

3.2.2.4 Waste Transfer Stations

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include waste transfer sites.

3.2.2.5 Other potential sources of fugitive particulate emissions

Carmarthenshire County does not have any identified areas with a background PM_{10} >25µg/m^3. Potential receptors within the vicinity of dusty activities like construction or demolition are screened and where relevant, developers are requested to assess the impacts of dust from a construction or demolition proposal. Where an assessment is not required Developers are requested to follow good practice measures. In all cases a dust management plan or construction management plan is expected to support such applications, to ensure that any adverse impacts identified by the development are mitigated to a negligible risk.

Carmarthenshire County Council confirms that there are no new or newly identified potential sources of fugitive or uncontrolled particulate matter, which include other potential sources of fugitive particulate matter emissions.

3.2.3 Commercial or Domestic Sources

3.2.3.1 Biomass Combustion Plant - Individual installations

It has been identified that several Biomass Boilers have been installed across the county, much of which has not been consulted on through the Planning Consultation process. Many are associated with agricultural use or commercial settings where the RHI incentive schemes have been a primary reason for installation. Much of the plant is located within

the rural setting, although some do appear in the towns. It is not considered that many of these are likely to be having significant impact of local air quality, although relevant details of all the plant are not always obtained.

As part of LAQM TG(22) it is a requirement to list any installations with the potential to impede on air quality with relevant exposure nearby.

A biomass boiler assessment was carried out for an 80kw boiler at Pantypistyll, Llanwrda following submission of a planning application. Following LAQM TG(22) and using Defra's Screening Emissions Calculation tools for the calculation of actual and targeted emission rates, the need for further detailed assessments was evaluated. In this instance, the proposed facility indicated that actual emission rates were significantly below the targeted emission rates for PM_{10}, and NO2 and could be confidently screened out. The capacity of the boiler and use of BSL approved fuel subject to quality control end of waste test meant that it was below the threshold of requiring an environmental permit. The Froling T4e 80kW has been recommended for use in smoke control areas when burning wood chip and wood pellets only.

3.2.3.2 Biomass Combustion Plant - Combined impact

One location near Llanelli has been identified as a small 'concentration' of biomass boilers where there exists a potential for local impact. A new environmental permit application was received for Stradey Business Park, Llangennech Llanelli for the operation of four biomass boilers using uncontaminated waste wood as a fuel, the large industrial site also uses a further five biomass boilers on its site burning virgin wood chip. An air quality assessment was conducted to determine the individual and combined impact on sensitive receptors and conservation areas. The Assessment concluded that it would be unlikely to have a significant impact on local air quality in compliance with the permit conditions. A new Environmental Permit was granted.

Carmarthenshire County Council has not identified any other commercial or domestic sources in relation to areas where the combined impact of several biomass combustion sources may be relevant.

3.2.3.3 Other Sources

Carmarthenshire County Council has not identified any other commercial or domestic sources in relation:

- Areas where domestic solid fuel burning may be relevant.
- Combined Heat and Power (CHP) plant.

3.3 Other Sources

Carmarthenshire County Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Carmarthenshire County 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.

4 Policies and Strategies Affecting Airborne Pollution

Local / Regional Air Quality Strategy

Carmarthenshire County Council has not developed a specific Local Air Quality Strategy. The air quality work is based on the National Strategies for monitoring of air quality and this has been used as the county's Air Quality Plan. The air quality work is constantly being reviewed to ensure it remains relevant and appropriate. The designation of the AQMA's in Llandeilo, Llanelli and Carmarthen and the setting up of the Steering and Action Planning Groups has helped to forge the links with internal stakeholders.

Having more internal links has helped to raise the profile of the air quality work such that there is greater collaboration between departments leading to improved communications and working arrangements.

A regional document was developed between Carmarthenshire, Ceredigion, Powys and Pembrokeshire in 2011/12 which was aimed at developers and planners to provide guidance from the air quality perspective on new development. The document was very much based on the Environmental Protection UK guidance document "Development Control: Planning for Air Quality (2010 Update)". The collaborative guidance document was written and agreed between the four authorities and issued in September 2012. It was made available to the Planning Departments of each authority and was used to assist with planning consultations. The document is titled "Mid and West Wales, Air Quality: A Guide for Developers".

Since the review of the EPUK 2010 document (which was issued in May 2015 and more recently January 2017) it has been agreed between the four authorities that the 2017 document would form the basis of the Regional Strategy. As part of Action Planning work we are looking at developing local strategies that can be applied to development with the ultimate aim of minimising air quality impacts from development wherever possible.

In carrying out our functions under Part IV of the 1995 Act, due regard is given to the policy guidance issued by Welsh government 'Local Air Quality Management in Wales' and the five ways of working as set out by the Well-being and Future Generations (Wales) Act 2015 are adopted when conducting out our functions to manage local air quality.

Air Quality Planning Policies

Carmarthenshire County Council is in the process of finalising the Revised Local Development Plan (LDP) 2018 -2033 for its area (excluding that part contained within the Brecon Beacons National Park). Once finalised (adopted), the Revised LDP will supersede the current adopted LDP with decisions on planning permissions primarily based on its content. The current Carmarthenshire Local Development Plan (LDP) was adopted by the County Council on 10th December 2014. Until the Revised LDP is adopted, the existing 2006-2021 LDP will remain in place for all planning decisions, in line with advice issued by the Welsh Government.

Whilst development proposals should be considered against the policies and provisions of the Plan as a whole (along with other relevant considerations and policies), the most notable LDP policy in relation to Air Quality is EP2: Pollution and TR2: Location of Development – Transport Considerations which are set out below:

Policy EP2 Pollution

Proposals for development should wherever possible seek to minimise the impacts of pollution. New developments will be required to demonstrate that they:

a) *Do not conflict with National Air Quality Strategy objectives, or adversely affect to a significant extent, designated Air Quality Management Areas (permitted developments may be conditioned to abide by best practice);*
b) *Do not cause a deterioration in water quality;*
c) *Ensure that light and noise pollution are where appropriate minimised;*
d) *Ensure that risks arising from contaminated land are addressed through an appropriate land investigation and assessment of risk and land remediation to ensure its suitability for the proposed use.*

Strategic Objectives Supported: SO4, SO5, SO10 and SO11
This policy should be read in conjunction with other relevant policies and proposals of this LDP.

Policy TR2: Location of Development- Transport Considerations

Proposals which have a potential for significant trip generation will be permitted where:

a. *It is located in a manner consistent with the plans strategic objectives, its settlement framework and its policies and proposals;*
b. *It is accessible to non-car modes of transport including public transport, cycling and walking;*
c. *Provision is made for the non-car modes of transport and for those with mobility difficulties in the design of the proposal and the provision of on site facilities;*
d. *Travel Plans have been considered and where appropriate incorporated.*

Strategic Objectives Supported: SO1, SO2, SO3, SO4, SO5, SO6, SO8, SO9, SO10, SO11, SO12, SO13 and SO14
This policy should be read in conjunction with other relevant policies and proposals of this LDP.

The Air Quality Management Orders for Carmarthen and Llanelli have been signed and Action Plans have been developed. As part of the Action Plan work discussions are ongoing in respect of what opportunities there are to update the supporting text to Policy EP2 (paragraph 6.8.21) and embrace the latest Welsh Government Policy on Air Quality.

It should be noted that clear guidance in respect of a range of Environmental Protection matters are contained within Planning Policy Wales (PPW), notably in relation to the impact of development on Air Quality Management Areas; minimising pollution of air and water. These are not therefore repeated within the LDP. Additional national development management policy statements may be found in PPW.

Local Transport Plans and Strategies

The authority historically held a Local Transport Plan; however, this was incorporated into a Regional Transport Plan which had been established under the direction of the Welsh Government. The region covers the unitary authorities of Neath-Port Talbot, Swansea, Carmarthenshire and Pembrokeshire. The collective name of the authorities was known as the South West Wales Integrated Transport Consortium (SWWITCH).

The Regional Transport Plan, as issued by SWWITCH is now no longer being utilised in the same way since funding for the consortium was removed. It is now expected that local transport plans will be developed but that will still have to have due regard to the regional transport requirements.

However, the partnership arrangement with the other authorities remains in place and they have developed a combined Local Transport Plan for the Swansea Bay City Region covering the period 2015 – 2020.

The Local Air Quality Management work that fed into the Regional Transport Plan work has now transferred and is given due regard within the Local Transport Plan and the policy and infrastructure interventions being tailored to help improve air quality and minimise air pollution from transport sources.

Further information on the Local Transport Plan can be found using the link below: https://www.swansea.gov.uk/localtransportplan

Reference is also made to this in Carmarthenshire's Parking Strategy 2018, which can be found at: http://democratiaeth.sirgar.llyw.cymru/documents/s20624/Adroddiad.pdf?LLL=1

Active Travel Plans and Strategies

It is acknowledged that NO_2 from road traffic is the primary cause for concern for Carmarthenshire. Any measures that can encourage and facilitate alternative means of transport are therefore to be welcomed. The Active Travel (Wales) Act 2013 places a statutory requirement on Local Authorities to identify and improve routes for walking and cycling, which includes the publication of maps to identify suitable routes, and to provide links within key locations, such as places of work, education etc

Carmarthenshire County Council has published its integrated network maps, which can be found here: https://www.carmarthenshire.gov.wales/home/council-services/travel-roads-parking/active-travel/#.W832x-aot9B

This ties in with the Council's long term aim of becoming the Cycling Hub of Wales. Further information on Carmarthenshire's cycling strategy can be found here: https://www.carmarthenshire.gov.wales/home/business/tourism/tourism-priorities/cycling/#.W834XOaot9B

Local Authorities Well-being Objectives

Following work undertaken to formulate Carmarthenshire's Well-being Assessment, the Public Services Board produced Carmarthenshire's Well-being plan for 2018-2023. This is very much based on the 7 well-being goals and five ways of working (Wellbeing of Future Generations (Wales) Act 2015).

Carmarthenshire's Corporate Strategy 2022-2027 sets out its Well-being objectives which seeks to continuously improve economic, environmental, social and cultural well-being in the County. This was updated in 2022 following a consultation in summer of 2022.

Carmarthenshire's Corporate Strategy 2022-27 includes its Well-being Objectives for the period. Air Quality can impact on a three of the four well-being objectives that have been identified, Well-being Objective 1.(Start Well) -Enabling children and young people to have the best possible start in life, Well-being Objective 2 (Live and Age Well)- Enabling our residents to live and age well and Well-being Objective 3 – (Prosperous communities) Enabling our communities and environment to be healthy, safe and prosperous.

Green Infrastructure Plans and Strategies

A Green and Blue Infrastructure Strategy has been developed and can be found here in which all green infrastructure assets across the County have been mapped. This will help identify areas where tree planting schemes could be implemented and quantify in area (for monitoring and reporting purposes) green infrastructure across the County.
The Strategy builds on evidence on the cost-effectiveness and benefits of using nature-based solutions to tackle and solve a range of economic, social, environmental and well-being problems. Action plans have been developed to make improvements across eight key towns in the County.

The Council adopted a supplementary planning guidance in September 2016, 'Placemaking and Design' which encourages developers to adopt a green infrastructure approach to support policy GP1 of the Local Development Plan for 'Sustainability and High-Quality Design'.

The Council's Corporate Strategy 2018-23 also has a Well-being objective to '*Look after the Environment now and in the future*', which reflects the Resilience Goal in the Well-being Future Generations Act that requires public bodies to set objectives to achieve a 'biodiverse natural environment with healthy functioning ecosystems'.

A Forward Plan for Environment (Wales) Act 2016 to protect habitats and biodiversity was revised by Carmarthenshire County Council in February 2019 and its associated actions include action 7bTH: *'Highways and Transportation will work with Rural Conservation section to identify and highlight opportunities in the development and implementation of new infrastructure that positively contributes to ecological resilience.'*

A Pollinator Strategy for Carmarthenshire was recently published in August 2020 to inform positive action for pollinators throughout the council's work. Carmarthenshire Nature Partnership are working to produce a Local Nature Recovery Plan to address the address the issues that are driving the decline in biodiversity, and to support recovery.

These works support the strategic objectives set out in 'Wales Nature Recovery Action Plan' produced by Wales Biodiversity Partnership, the Carmarthenshire Public Service Board Well-being Plan and the Council's Well-being objectives and The Well-being of Future Generations (Wales) Act 2015.

Climate Change Strategies

There are measures contained within Carmarthenshire's Corporate Strategy 2022-2027 that relate to Climate Change, specifically around the implementation and promotion of the increased use of renewable energy and reducing carbon outputs. In February 2019 Carmarthenshire County Council adopted a zero-carbon motion to become carbon neutral by 2030 in support of well-being objective 12 'Improve the Environment for now and the future'. We have since been the first local authority in Wales to publish a net zero carbon action plan, which was endorsed by full Council in February 2020, which outlines our route towards becoming a Net Zero Carbon Local Authority by 2030.

5 Conclusion and Proposed Actions

Conclusions from New Monitoring Data

There have been no exceedances of the Annual Air Quality Objective (AQO) for NO_2 during 2022, 2021 or 2020, compared to one site identified in 2019 (after NO_2 distance to nearest exposure was calculated) and located within Carmarthen's AQMA.

For both 2021 and 2022 two sites reported a borderline compliant result, within 10% of the Air Quality Objective, they included nr 13 Felinfoel Road (DAL/07) and 85 Priory Street (DAC/08). 85 Priory Street was also the only site that reported borderline compliance of the AQO in 2020. This site continues to produce the highest readings in the County, yet this is the third year running that it has not exceeded the AQO.

Both nr 13 Felinfoel Road (DAL/07) and 85 Priory Street (DAC/08) was adjusted further because the monitoring site is not located on the façade of the nearest receptor. The predicted annual concentration was 34.9µg/m^3 for DAL/07, whereas DAC/08 remained borderline compliant with a predicted 37.6µg/m^3, after calculating the NO_2 fall-off with distance. This is similar to 2021(36.8µg/m^3) and 2020 (35.3µg/m^3) but much lower than the previous three years which reported predicted exposure at 44.3µg/m^3 (2019), 48.5µg/m3 (2018) and 53.6µg/m3 (2017).

No sites in the Llanelli AQMA exceeded the AQO for 2019 -2022, compared to one exceedance reported for 2018. This was at nr 13 Felinfoel Road (DAL/07), and although it initially appeared to exceed the AQO for 2019, after calculating the NO_2 fall off distance, the levels were reduced from 41.2µg/m^3 to 38.1µg/m^3. In 2020 no calculation was necessary as the annual average had fallen to 31.6µg/m^3. It is good to report that this site has fallen below the Annual AQO for the fourth time in nine years, as it tends to provide the highest readings in Llanelli AQMA.

Four further sites across the County reported an annual result above 30µg/m^3 two of which were located in Llanelli including; Carm/077 Sandy Road(2) and Thomas Street(Barnados) (DAL/09). One site was located within the Carmarthen AQMA 15 Park Terrace (DAC/02) and one site was located in Llandeilo AQMA, Rhosmaen Street (No.123)(DA/09).

Carm/077 Sandy Road(2) appeared to be borderline of AQO in 2019, however after calculating the NO_2 fall off distance the levels were reduced from 38.9µg/m^3 to 29.6µg/m^3, because the monitoring site is located some distance from the nearest receptor and near to the road. For 2022, 2021 and 2020 results, no distance calculation was necessary as it did not report a borderline result, however the predicted result would likely reflect 44 Sandy Road (DAL22) at 27.6µg/m^3 because this site reflects the nearest receptor.

Thomas Street (Barnados) (DAL/09) reported 31.1µg/m^3 for 2022, 34.4µg/m^3 for 2021, 31.5µg/m^3 for 2020, and was borderline compliant in 2019 with a concentration of 37.6µg/m^3, and so for the fifth-year running has not exceeded the AQO.

15 Park Terrace (DAC/02) appeared to exceed the AQO in 2019, however after calculating the NO_2 fall off distance the levels were reduced from 40.0µg/m^3 to 37.6µg/m^3 which was a small increase from 2018 which reported 36µg/m^3. Whilst levels at this site significantly improved for 2020 with 29.6µg/m^3, 2021 also observed a significant improvement from the previous years with 31.9µg/m^3 and 31.1µg/m^3 for 2022. It's important that we continue to investigate this to ensure the levels continue to fall.

Llandeilo AQMA also reported no exceedances of the annual AQO and for the fourth year running since the AQMA was declared. No sites in Llandeilo reported annual results greater than 30µg/m^3 within its AQMA for 2020, although there were two in 2021 and just one in 2022, still, these results were between 30-32µg/m^3.
The two sites in Llandeilo that last breached the AQO was during 2018, and included sites 123 Rhosmaen St (DA/09) which in 2019 reported 38.6µg/m^3 after exceeding the AQO for the previous six years, and 133 Rhosmaen St (DA/10) which also last exceeded the AQO in 2018 with 41.3µg/m^3, however observed a significant reduction for 2019 with 34.8µg/m^3, and an even greater drop to 24.3µg/m^3 for 2020. 2021 and 2022 reported similar results of 29.5µg/m^3 (2021) and 28.8µg/m^3 (2022).

In 2019 Rhosmaen Street (2) (Carm/083) appeared to be within 10% of compliance with 36.8 µg/m^3 (2019) but finally reported 33.1µg/m^3 after calculating the NO_2 fall-off with distance, however this reduced to 27.4µg/m^3 for 2020 and 31.7µg/m^3 for 2021, and more recently 28.5µg/m^3 for 2022 and so no further calculation is necessary for the last three years.

All other areas of the county where diffusion tube monitoring is performed have not identified any other areas of exceedance. However, any sites that remain marginally compliant will require further monitoring and work to ensure that levels of NO_2 do not exceed the AQO in the future, whist future development is planned, and in case weather conditions do not influence the results favourably.

Conclusions relating to New Local Developments

Work continues with a number of new development sites across the county that have been previously reported, but as yet no impacts on air quality have been identified.

The Carmarthen Western Link road was been completed and opened to the public in May 2019, congestion appears to have improved and NO_2 monitoring in the surrounding areas haves not identified any adverse impact on air quality. Future development is planned to the west of the bypass and so monitoring will continue to ensure the bypass does not move the problem to another part of Town.

Phase 2 of the Cross Hands Economic Link Road (ELR) development has been constructed and opened in 2022. Phase 2 links Black Lion Road to the A476 north of Gorslas (before the junction with the B4297 Gate Road). This includes the first link from A476 to Norton Road, the second link from Norton Road to the Black Lion Road along with a further link road from Norton Road to the ELR, which should help direct haulage vehicles onto the ELR away from some residential properties. The road opens access to the Cross Hands East Strategic employment site benefitting existing infrastructure whilst improving traffic flows and journey time. It is also aimed to relieve congestion and improve safety at the A48 Cross Hands Roundabout, A476 Llandeilo Road and A476 Gorslas ‘six-ways’ junctions supporting the ‘Safe Routes in Communities Programme and improve air quality on existing residential routes. A full assessment of the impact on NO2 in the surrounding routes will be carried out and reported in the annual progress report 2024.

Following the identification of a cluster of biomass boilers operating in the Llangennech area, ambient monitoring will be conducted to verify that the operation does not impact local air quality. Regulation of the boilers will also help ensure that emission limits are met to minimise potential impacts.

Other Conclusions

A significant amount of work has been carried out to create, improve and promote sustainable travel options for residents and visitors in the County, whether through grant funding or through the development process. However, it is difficult to determine that any single intervention alone has made a positive impact on reducing nitrogen dioxide levels within our County. The collaborative partnership approach taken by different services is key to delivering any impacts, and it's recognised that any small gains are collectively beneficial to improving local air quality.

The COVID19 Pandemic provided an overdue boost towards supporting people to undertake activities without needing to travel by car. From home and agile working opportunities, to accessing services digitally and meeting virtually, one no longer needs to consider using the car in the first instance. Carmarthenshire County Council has used this as an opportunity to engage better with residents and businesses to help develop the active travel network and infrastructure to support this change in travel behaviour further and help it continue beyond the pandemic.

Whilst no 'formal' Air Quality Strategy exists, the use of the Environmental Protection UK Guidance document has increased and has been an agreed update to the regional strategy that had been developed.

Although the Regional Transport Plan no longer exists, as such, many of the elements that were within the plan have been incorporated into the Joint Transport Plan for South West Wales which incorporates the Local Transport Plan (LTP). This has been developed in collaboration with the other local authorities across the region. The Plan recognises the potential impacts from transport sources and is reviewed as more data and information relating to air quality across the region becomes available.

Carmarthenshire's Cycling Strategy holds the vision of being the Cycling Hub of Wales. Work continues to progress with improvements to market more cycling in Carmarthenshire with the Carmarthen Velodrome and the Pembrey Closed Circuit track proving popular. Cycle routes have been mapped, more cycle parking has been installed along with a number of cycle repair stations installed. Further work continues to improve shared foot and cycle paths and the Tywi Valley cycle path also continues to progress.

The Local Development Plan (LDP) has been adopted and updated with specific reference to air quality and the need to consider air quality impacts from development. The LDP also

references national guidance and policy relating to air quality that has been incorporated into Welsh Planning Policies. Discussions are taking place to update the Plan to incorporate latest policy guidance and ensure air quality impacts are minimised.

Impacts from the Cross Hands Economic Link Road is currently under review due to the proximity to a SSSI site and the potential vehicle emission impact is being assessed. Although not strictly within the LAQM remit, in the interests of a holistic approach and taking in to account the WG Future Generations Act it is deemed prudent to report the findings of the work. Monitoring of NO_2 in the area is continuing into 2023 and will be reported in the 2024 Annual Progress Report.

Proposed Actions

There has been no requirement to undertake further assessment / investigation for any pollutant identified during the year, nor is there a need to declare any new AQMAs. There is also no need to change the boundaries of the AQMA's as we have observed a continued improvement in 2022 compared to pre-2020 years. No additional routes or areas have been identified as sites as a potential concern.

Although we observed a general increase in NO_2 levels for 2021 compared to 2020, 2022 results have largely decreased and it's a continued improvement compared to previous years and for the third year running we have not observed any exceedances of the AQO, Nevertheless, it is too premature to consider revoking the AQMA's at this stage. Llanelli and Carmarthen have reported no exceedances for the last three years, and Llandeilo has had no exceedances for the last four years, still there have been borderline results reported. It's important to ensure that the reduction trend continues and is not just reflective of an unprecedented year for travel behavioural change. Furthermore, the influence of the weather needs to be considered to ensure that the reductions continue despite a change in weather conditions.

The diffusion tube monitoring in Llandeilo will continue and further work will be carried out to progress the Llandeilo and Ffairfach transport study commissioned by Welsh Government, in consultation with the Public, to improve the highway network and air quality in the Llandeilo AQMA. The Llandeilo AQAP will also be reviewed during 2023 to include the progress of the options included within this study and identify any further work necessary to improve air quality in this area. This review has been postponed from 2020 resulting from delays caused by the COVID-19 Pandemic as we want to ensure that any

further reviews does not hinder but complements the work already in progress under the Llandeilo and Transport Study, especially as air quality is a key objective to this work.

The diffusion tube monitoring in the towns of Llanelli and Carmarthen will continue along with progress to address the Action Plans with relevant partners. Much has changed since we first consulted on our action plans and following the Pandemic. As such we will progress on work identified under our Air Quality Delivery Plan, of which the actions can be found here. which both encompasses the outstanding actions from our adopted AQAP's for Carmarthen, Llanelli and Llandeilo, alongside the additional measures in line with other key Council priorities to improve air quality across the County as a whole. Actions would normally be prioritised on improving the transport network to reduce congestion. However, actions to help encourage active travel and choose sustainable modes of transport have also been identified with particular importance during the post COVID-19 Pandemic, to encourage a behavioural modal shift. This is especially evident from the improvements in NO_2 levels observed from reduced travel during 2020.

The Authority, working in partnership with other Public Services has set up a Public Service Board and is working collaboratively with Pembrokeshire and Ceredigion to assess and develop Well-being Plans (WBP) which will work towards the seven Well-Being goals identified in the Well-being of Future Generations (Wales) Act 2015. The LAQM work will be reported and hopefully help raise the profile of health impacts from air quality.

The Authority will continue to check compliance with the steam engine idling times at Gwili Railway station in Bronwydd by way of unannounced visits. There are plans to relocate the main station for picking up passengers at Abergwili, Carmarthen. The platform is located south of Glangwli Hospital, and there is no relevant exposure within 15m. Idling times will continue to be restricted to 15mins.

Work will start towards completing aspects for the 2024 Progress Report and the Authority will engage with Welsh Government and the LAQM support helpdesk to deliver improvements to air quality.

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Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix D: AQMA Boundary Maps

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Table A.1 – Full Monthly Diffusion Tube Results for 2022 (µg/m^3)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
AMMANFORD															
Carm/089	36.6	20.8	30.7	21.4	16.2	15.2	17.8	19.4	22.9	18.2	25.4	27.7	22.7	17.2	
Carm/064	39.8	28.3	26.1	27.4	21.5	21.1	20.7	20.0	22.3	25.1	31.4	31.2	26.2	19.9	
Carm/090	38.1	33.7	26.8	27.9	25.4	24.9	22.4	20.7	23.2	29.1	32.6	31.7	28.0	21.3	
LLANELLI															
DAL/14	39.1	30.0	27.0	24.4	19.3	20.4	18.6	20.0	21.8	21.5	29.7	27.6	25.0	19.0	
DAL/15	38.0	24.6	28.0	23.2	14.4	15.3	17.6	20.4	24.9	15.9	27.3	26.0	23.0	17.5	
Carm/077	58.9	50.3	51.3	43.4	41.8	40.5	34.0	41.6	35.8	42.5	50.2	43.3	44.5	33.8	
DAL/22	44.9	38.6	39.6	36.4	33.0	33.3	28.2	31.2	26.3	34.3	38.5	35.3	35.0	26.6	
DAL/26	36.3	21.6	34.6	24.6	15.3	14.1	15.8	20.6	23.0	17.5	25.4	28.2	23.1	17.5	
DAL/27	44.1	27.4	40.9	30.1	18.3	17.1	21.4	27.6	27.8	21.3	33.1	34.4	28.6	21.8	
DAL/16	33.2	23.7	28.1	20.7	15.4	17.5	15.1	16.9	17.9	18.4	24.2	19.5	20.9	15.9	
DAL/17	37.4	21.8	32.5	24.4	14.4	14.2	16.4	22.1	21.5	17.0	25.9	28.0	23.0	17.5	
Carm/141	39.4	30.4	26.7	26.4	22.4	24.8		24.3	22.4		34.2	31.4	28.2	21.5	
DAL/07	70.2		50.4	45.0	41.1	41.7		49.0	47.3	43.9	57.5	52.2	49.8	37.9	34.9
DAL/23	35.7	19.3	34.0	21.8	15.3	16.5	16.8	20.5	21.1	22.1	29.0	31.6	23.6	18.0	
DAL/09	54.4		37.4	42.7	40.5	45.2	35.7	42.0	39.3	40.4	47.5	25.7	41.0	31.1	
Carm/104	51.2		45.7	38.8	27.2	25.7	31.0	37.7	34.9	33.6	38.4	43.8	37.1	28.2	
DAL/10	57.6	31.4		37.9	24.9	29.6	29.8	37.6	33.6	29.1	38.0	44.7	35.8	27.2	
Carm/069	50.6	37.9	29.9	37.3	31.5	34.9	29.6	35.4	30.9	34.0	45.0	38.9	36.3	27.6	
DAL/12	49.8	30.5	41.5	28.8	22.7	22.8	21.0	26.6	29.6	27.8	38.9	38.5	31.5	24.0	
DAL/28	38.4	25.3	29.3	22.3	17.0	15.9	14.8	17.7	17.6	20.6	30.6	31.0	23.4	17.8	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DAL/04	44.1		29.8	28.8	22.9	24.0	23.8	28.0	26.2	23.4	34.5	35.5	29.2	22.2	-
Carm/114	53.8		31.3	33.1	25.3	27.9	25.5	29.8	28.0	27.6	40.4	41.3	33.1	25.1	-
Carm/113	42.4	31.7	35.5	34.3	29.1	31.3	29.4	34.0	30.6	30.2	35.8	31.8	33.0	25.1	-
Carm/135	38.3	29.0	29.7	26.8	23.6	19.4	21.3	23.1	22.9	24.4	31.1	28.4	26.5	20.1	-
TYL1	35.6	23.5	25.3	22.2	18.3	19.7	21.9	21.8	22.3	20.0	29.7	27.4	24.0	18.2	-
TYL2						14.1	14.9	15.4	17.2		26.5	19.6	18.0	15.7	-
TYL3	30.6	17.5		21.1									23.1	13.6	-
TYL4	35.6	16.4	29.0	19.2	12.5	11.7	16.1	18.4	19.7	16.5		22.4	19.8	15.0	-
TYL5	33.8	18.8	27.3	17.7	9.2	10.0	14.0	15.4	18.2	16.0	25.3	24.7	19.2	14.6	
Carm/146	28.7		28.9		10.9	10.5	13.0	17.7		13.7	20.4	19.8	18.2	13.8	
CARMARTHEN															
DAC/06		31.9	34.2	29.9	20.9	23.5	21.9	26.3	25.6	29.9	36.4	37.0	28.9	21.9	-
DAC/13	46.9		31.9	30.0	28.0	28.6	25.1	28.3	27.4	30.5	39.1	39.1	32.3	24.5	-
Carm/109	47.5	36.1	37.8	34.7	26.9	28.7	25.2	31.1	29.4	32.7	44.7	46.2	35.1	26.7	-
DAC/08	66.7		50.5	52.5	41.1	45.2	48.7	55.1	50.5	48.3	59.1	59.4	52.5	39.9	37.6
DAC/14	41.1	39.0	23.7	28.4	27.1	26.6	22.8	23.7	21.8	34.0	41.3	44.9	31.2	23.7	-
DAC/15	31.7	31.8	25.6	24.7	23.4	24.0	20.5	20.3	21.7	19.1		29.4	24.7	18.8	-
Carm/111	37.8	30.8	29.9	28.1	24.2	23.6	22.1	25.2	25.7	30.7	35.4	36.9	29.2	22.2	-
DAC/12	43.3	34.5	15.6	28.2	25.4	25.1	24.4	26.4	25.9	27.8	40.8	27.6	28.8	21.9	-
DAC/04	31.6		24.3	19.8		15.1	17.1	17.0	19.9				20.7	15.0	-
Carm/072	38.1	36.4	28.8	27.6	23.6	25.7	23.5	23.9	24.6	33.1	39.3	30.9	29.6	22.5	-
DAC/02	54.8	43.8	50.9	40.5	32.9	32.8	32.4	39.2	37.1	43.0	42.0	46.5	41.3	31.4	-
DAC/16	49.0	39.0	42.3	35.9	26.6	29.0	26.7	32.9	32.0	37.9	44.4	43.3	36.6	27.8	-
Carm/001	45.2	31.7	32.2	28.7	20.3	21.3	21.5	27.2	24.1	26.7	37.2	36.9	29.4	22.4	-
Carm/084	46.2	29.4		30.2	22.4	22.8	23.9	29.0	32.1		39.7	37.1	31.3	23.8	-
DAC/05	46.0	36.3	39.4	30.8	27.2	29.4	25.0	25.3	30.9	34.3	39.5	37.2	33.4	25.4	

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Carm/106	49.5		30.7	31.2	27.1	27.7	25.9	29.6	27.8	31.6	44.6	43.4	33.6	25.5	
Carm/134	21.2	13.8	15.1	9.7	7.4	7.2	7.0	7.8	9.5	10.3	17.6	18.5	12.1	9.2	
Carm/126		23.5	25.1	21.3	16.3	17.0	17.9	20.1	19.1	20.1	27.2	27.5	21.4	16.2	
Carm/132			20.6	15.7	11.7	11.8	12.0	15.3	13.3	14.4	17.2	21.9	15.4	11.7	
LLANDEILO															
FA/01	22.3	13.2	16.6	13.6	11.5	13.1	13.5	14.6	13.7	14.5	19.7	19.1	15.5	11.7	
DA/15	33.6	24.3	29.2	22.7	18.6	19.1	19.1	20.2	21.8	23.6	30.2	28.9	24.3	18.4	
DA/01	30.6	23.9	25.0	20.7	15.8	16.7	16.4	18.7	18.8	18.6	23.1	26.3	21.2	16.1	
DA/03	31.6	23.6	28.2	22.6	19.0	19.6	17.9	19.5	20.1	24.8	30.7	28.8	23.9	18.1	
Carm/013	45.9	38.6	28.0	27.4	25.0	27.1	25.6	27.6	25.9	30.8	33.8	34.3	30.8	23.4	
DA/05 (A), (B) & (C)	43.3	31.7							31.9	33.0	41.2	35.4	36.1	25.0	
DA/07	45.3	35.1	39.1	36.5	29.8	30.3	30.1	36.4	34.1	34.7	43.2	37.5	36.0	27.4	
Carm/083	51.5	32.7	48.6	42.2	32.4	31.1	32.5	42.9	38.5	26.7	43.1	28.2	37.5	28.5	
DA/09	54.8	35.8	49.1	44.9	29.3	32.9	32.1	42.4	39.5	36.7	41.8	48.7	40.7	30.9	
DA/10	55.5	35.9	43.8	38.9	28.0	27.0	32.6	37.9	37.2	35.2	39.5	43.3	37.9	28.8	
DA/11				36.0	31.0	31.4	25.7	33.0	31.6	31.9	39.1	38.8	33.2	25.2	
DA/12	27.7	23.9	20.0	19.2	17.3	18.2	13.6	17.9	16.8	22.8	28.8		20.6	15.6	
DA/13	44.0	31.5	29.4	32.3	28.4	29.4	27.2	30.6	28.9	32.2	38.7	31.3	32.0	24.3	
DA/14	36.0	26.8		22.8	20.8	22.0	20.6	21.4	24.6	24.9	32.0	26.1	25.3	19.2	
DA/16	42.6	34.5	27.9	31.5	27.2	25.9	28.3	28.4	28.1	27.6	29.8	34.1	30.5	23.2	
BURRY PORT															
Carm/127	22.2	10.9	16.6	12.2	8.2	6.9	8.4	9.3	8.2	9.5	14.4	17.5	12.0	9.1	
Carm/128	25.2		18.5	16.6	12.4	12.3	11.6	14.6	10.7	11.9	19.4	19.8	15.7	12.0	
LLANGENNECH															
LLG2	31.9	24.8	25.7	19.3	13.3	14.8	15.5	16.5	17.4	17.9	24.4	26.6	20.7	15.7	
LLG3	30.1	18.7	27.5	18.1	11.1	12.4	13.3	15.2	16.2	15.2	20.5	26.5	18.7	14.2	
CROSS HANDS / ECONOMIC LINK ROAD															

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Carm/ELR1			37.2	32.3	29.6	32.8	30.4	33.3	32.9	33.3	41.3	32.7	33.6	25.5	
Carm/ELR2	34.5	18.7	26.6	21.6	18.3	19.3	20.1	21.8	20.8	21.7	27.1	23.3	22.8	17.3	
Carm/ELR3	31.6		20.4	16.6	13.2	12.5	14.0	14.8	15.5	17.0	21.5	22.6	18.2	13.8	
Carm/ELR4	26.6		18.7										-	-	
Carm/ELR6	14.9	10.8	9.6	8.3									10.9	6.1	
Carm/ELR7	12.6	10.4	8.3	7.4									9.7	5.4	
Carm/ELR8	10.4	9.0	8.4	6.4									8.6	4.8	
Carm/ELR9	14.9	8.4	8.8	6.4	5.0	4.6	6.2	4.8	5.2	6.2	11.1	9.1	7.6	5.7	
ELR/10(B)	24.3		15.7	12.1	9.7	8.4	8.9	11.7	12.1	11.1	19.6	18.8	13.9	10.5	
Carm/ELR11	21.3		13.7			8.0	6.8	6.1	8.3	10.1	15.1	14.0	11.5	8.7	
Carm/ELR12	21.1	15.7	13.6	10.0	9.5	8.1	10.0	7.3	8.0	10.2	18.1	14.0	12.1	9.2	
Carm/ELR16			7.4	4.2											
Carm/ELR19		8.0	6.8	4.1	3.8	3.1	3.4	2.6	3.9	4.2	9.6	9.4	5.4	4.1	
Carm/ELR20		7.6	7.7	4.0	3.9	3.3	3.9	2.6	3.3	5.2	10.7	8.4	5.5	4.2	
Carm/ELR21	18.3			7.9	6.9	6.5	7.1	6.6	7.1	8.4	13.3	12.2	9.4	7.2	
Carm/ELR22	27.8		18.0	14.3	12.9	13.2	12.8	12.9	13.8	12.9	24.9	19.7	16.7	12.7	
FFAIRFACH															
FA/04(A)	19.6		12.1	11.8	10.7	11.6	11.5	11.9	10.6	10.8	16.9	15.1	13.0	9.9	
FA/06(A)	22.7		18.1		11.6	10.7	13.5	13.8	13.3		17.2	18.0	15.4	11.7	
FA/03(A)	29.7		29.6	21.8	15.9	18.1	17.5	20.8	20.8	18.2	23.6	23.7	21.8	16.6	
FA/07(A)	13.8		9.8		6.2	6.5	7.3	7.1	6.6	6.4			8.0	6.5	
NEW SCREENING SITES															
TYL6	24.3		16.0	10.5	7.4	6.9	8.0	9.7	9.3	9.2	17.3	19.2	12.5	9.5	
LLG4	22.5	13.4	16.2	11.1	6.6	6.4	8.6	8.1	7.7	8.0	17.1	17.5	11.9	9.1	
LLG5	18.1	8.7	11.2	8.8	5.0	4.8	8.0	6.9	5.8	5.4	13.1	12.8	9.1	6.9	
Carm/147									5.1	4.9	10.5	10.8	7.8	6.1	
LAN/1	17.7	10.4	14.3	12.7	9.3	7.5	9.1	9.8	9.4	8.7	13.2	14.1	11.4	8.6	
LAN/2	19.6		16.3	14.0	11.2	9.6	11.8	16.0	11.2	8.5	15.8	11.6	13.2	10.1	
LAN/3	16.6		12.2	11.2	8.8	8.0	8.8	10.8	8.8	7.2	14.1	14.6	11.0	8.4	
LAN/4				12.3	9.3	8.4	9.7	10.4	8.6	9.2	13.3	14.8	10.7	8.1	

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to the nearest relevant public exposure

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995, as amended by the Environment Act 2021, 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 must then be reviewed and updated no later than every five years; or if a local authority considers there is a need for further or different measures to be taken in order to achieve air quality standards; or if significant changes to sources occur within your local area.

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.

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.

The table shows the objectives in units of microgrammes per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table B.1 – Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as	Date to be achieved by
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO_2)	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
Particulate Matter (PM_{10})	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
Sulphur dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	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
Benzene	5µg/m^3	Annual mean	31 12 2010
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

Appendix C: Air Quality Monitoring Data QA/QC

QA/QC of Diffusion Tube Monitoring

NO_2 Diffusion Tube monitoring

Monitoring has been completed in adherence with the 2022 Diffusion Tube Monitoring Calendar, provided on the LAQM website. Due to the number of diffusion tubes located across the County, it is not feasible to collect and replace the tubes on the same day, however they are collected and replaced within 1-2 days of the suggested calendar dates to ensure the exposure period can be reported. There were no divergences from this during 2022 for the reported results.

SOCOTEC Didcot prepares and analyses the diffusion tubes on behalf of Carmarthenshire County Council. The tubes are prepared by spiking acetone:triethanolamine (50:50) mixtures onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection.

The analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of their UKAS accreditation schedule. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a **Satisfactory** laboratory.

Tube Precision

SOCOTEC Didcot uses a preparation method of 50% TEA in Acetone and carried out 29 studies in 2022 for this method, all of which were rated ‘Good’ precision results for Nitrogen Dioxide diffusion tube colocation studies and none rated ‘bad’. Tube precision is rated as good where the coefficient of variation (CV) of eight or more diffusion tube replicate periods is less than 20% and the average CV of all monitoring periods is less than 10%. None of their studies was rated ‘poor’ precision. The distinction between "good" and "poor" precision is an indicator of how well the same measurement can be reproduced. This precision will reflect the laboratory’s performance/consistency in preparing and analysing the tubes, as well as the subsequent handling of the tubes in the field.

This information was obtained from the Defra LAQM Helpdesk website page on Air Quality Assessment Precision and Accuracy.

AIR PT Results

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR offers a number of test samples designed to test the proficiency of laboratories undertaking analysis of chemical pollutants in ambient indoor, stack and workplace air.

AIR PT started in April 2014, which combined two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme. AIR NO2 PT forms an integral part of the UK NO2 Network's QA/QC and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM).

The results below in Table C1 are for SOCOTEC, Didcot [1].

Table C.1– AIR PT Rounds

AIR PT Round	AIR PT AR045	AIR PT AR046	AIR PT AR049	AIR PT AR050	AIR PT AR052	AIR PT AR053	AIR PT AR055	AIR PT AR056
Round conducted in the period	July – August 2021	September – October 2021	January – February 2022	May – June 2022	July – August 2022	September – October 2022	January – February 2022	May - June 2022
SOCOTEC [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]	100 % [1]

[1] Participant subscribes to two sets of test samples (2 X 4 test samples) in each AIR PT round.

The above details were obtained from the document '2022 LAQM NO2 Performance data up to August 2023_v1 ' located on the Defra LAQM Helpdesk website.

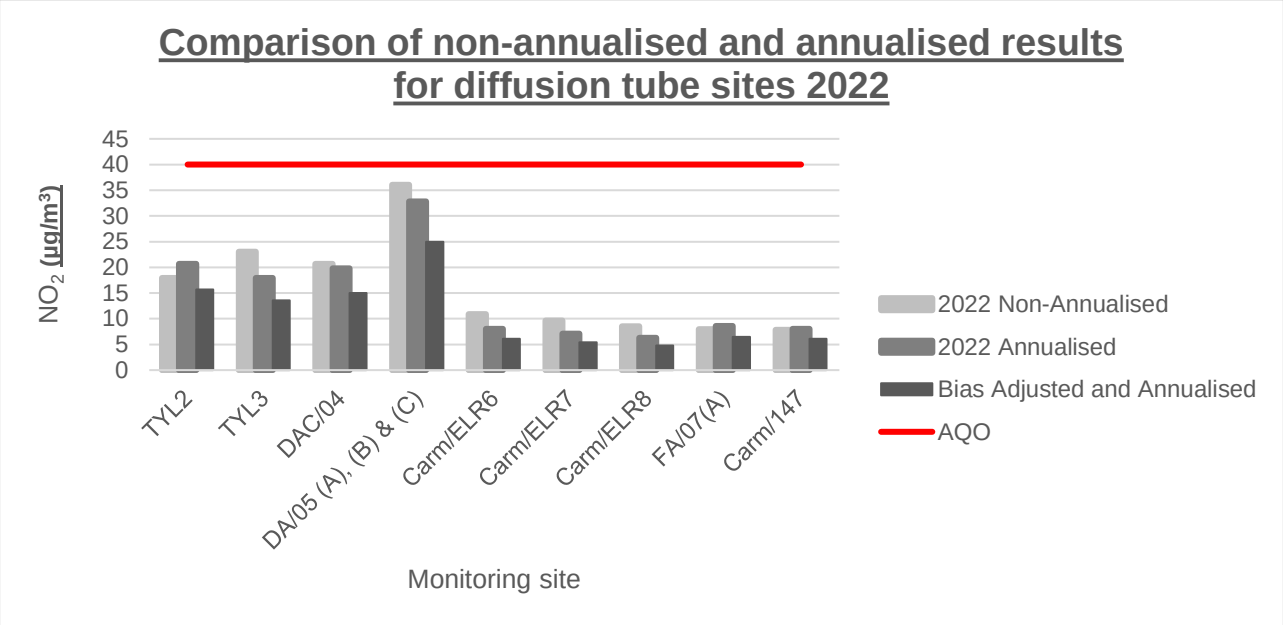
Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. Nine NO_2 Diffusion Tube sites captured less than 75% valid data during the 2022 calendar year, and therefore required an adjustment to calculate the short term into long term data, called annualisation. Using the method provided in Technical Guidance TG (22) it is possible to estimate what the annual mean concentration may have been had there been 12 months of data capture for the tube site. This was achieved using the LAQM Diffusion Tube processing tool which encompasses the methodology of the LAQM Diffusion Tube date processing Tool (v.2). 2022 data from two automatic monitoring sites at other locations within the Country was used, averaging the data and attaining a ratio

figure for use with the sites under review. The sites used for this exercise were Narberth, and Cwmbran. Further details of the calculation method undertaken is provided in Table C.3

All the sites subject to annualisation complied with the AQO and a comparison of the results can be seen in the graph below:

Figure 22 : Comparison of Non-Annualised and Annualised Results



The annualisation exercise revealed that minor amendments need to be applied to these final reported results to reflect a more representative annual mean, had there been 12 months valid data capture. None of the tube sites requiring annualisation exceeded the annual air quality objective of 40µg/m^3. There are some minor and insignificant differences between the annualised readings determined by the annualisation exercise using the background AURN automatic monitoring data, as all results were within 1-2µg/m^3 of the non-annualised raw data. The annualised and bias adjusted final results have been used for the purpose of reporting within this Annual Progress Report and noted in Table 2.3 – Annual Mean NO_2 Diffusion Tube Monitoring Results (µg/m^3)

Diffusion Tube Bias Adjustment Factors

Carmarthenshire County Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by Carmarthenshire County Council over the past five years is presented in Table C.2.

The national bias adjustment factor was used because a co-location study has not been carried out locally. The latest version of the tube bias adjustment spread sheet is 09/23 (final), as detailed on the Review and Assessment Helpdesk website. SOCOTEC have 29 studies listed for the year 2022 that gives an overall bias adjustment figure of 0.76 for 2022. This bias adjustment figure has been applied to all the diffusion tube monitoring results in Carmarthenshire.

Carmarthenshire County Council has not carried out a co-location study to derive a local factor.

Table C.2 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	09/23	0.76
2021	National	09/22	0.77
2020	National	09/21	0.76
2019	National	09/20	0.75
2018	National	09/19	0.77

NO_2 Fall-off with Distance from the Road

Two diffusion tubes NO_2 monitoring location within Carmarthenshire required distance correction during 2022, because the annual mean concentration was greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure. The Diffusion Tube Processing Tool was used to calculate the distance correction and the outcome is presented in Table C.4 below.

Table C.3 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Narberth	Annualisation Factor Cwmbran	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
TYL2	1.1922	1.1079	1.1501	18.0	20.6	
TYL3	0.7499	0.8037	0.7768	23.1	17.9	
DAC/04	0.9267	0.9862	0.9564	20.7	19.8	
DA/05 (A), (B) & (C)	0.9776	0.8431	0.9103	36.1	32.8	
Carm/ELR6	0.7104	0.7567	0.7336	10.9	8.0	
Carm/ELR7	0.7104	0.7567	0.7336	9.7	7.1	
Carm/ELR8	0.7104	0.7567	0.7336	8.6	6.3	
FA/07(A)	1.0732	1.0773	1.0753	8.0	8.6	
Carm/147	1.1286	0.9241	1.0263	7.8	8.0	

Table C.4 – NO_2 Fall off With Distance Calculations (concentrations presented in µg/m^3)

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
DAL/07	0.8	1.3	37.9	7.8	34.9	
DAC/08	1.1	1.5	39.9	7.6	*37.6*	*Predicted concentration at Receptor within 10% the AQS objective.*

Appendix D: AQMA Boundary Maps

Figure D.1 – Llandeilo AQMA Boundary Map

Figure D.2 – Carmarthen AQMA Boundary Map

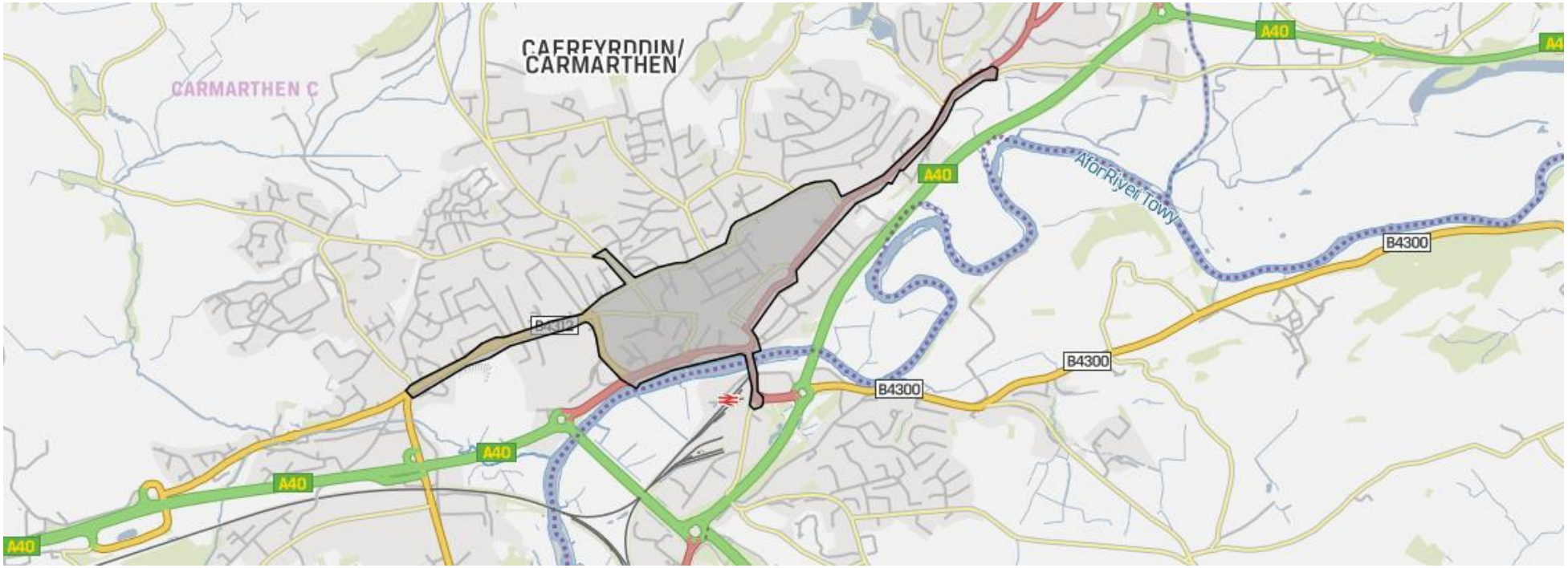
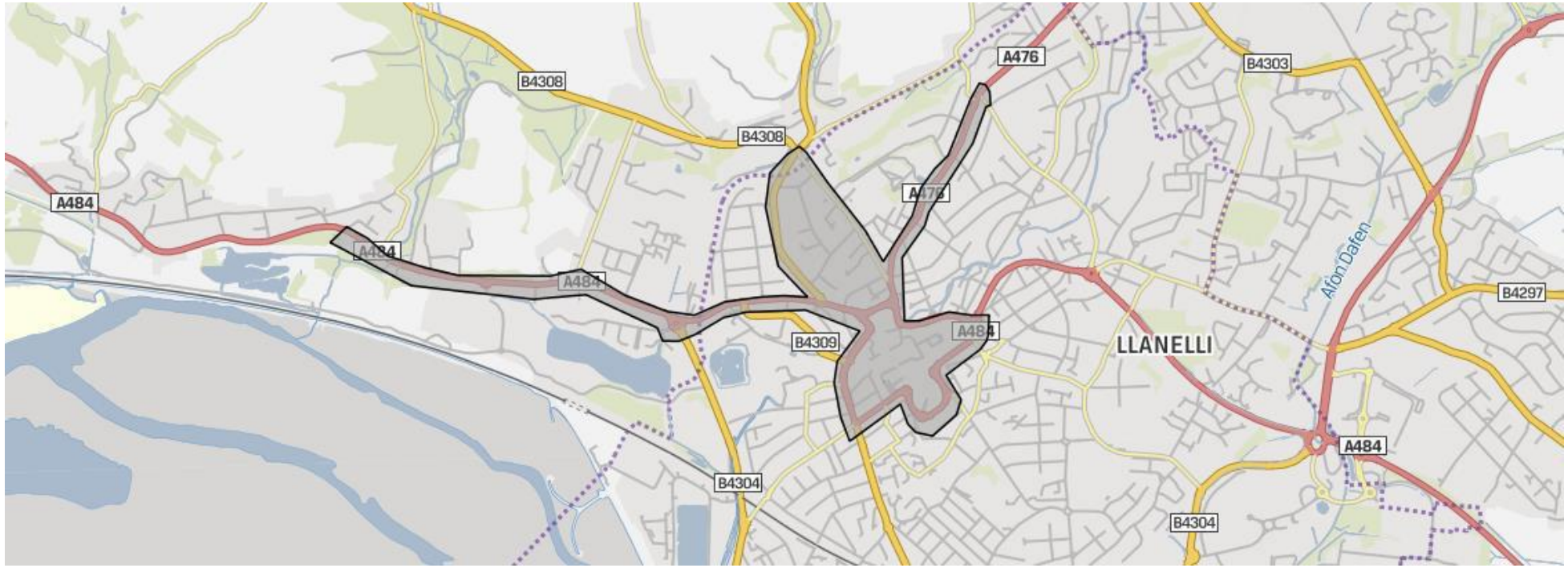


Figure D.3 – Carmarthen AQMA Boundary Map



Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQO	Air Quality Objective
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EV	Electric Vehicle
LAQM	Local Air Quality Management
LDP	Local Development Plan
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
PSB	Public Safety Board
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
ULEV	Ultra Low Emission Vehicle