



Llywodraeth Cymru  
Welsh Government

# Wastewater Monitoring in Wales

**Report Date: 4 May 2023**

Using samples collected up to (unless indicated otherwise): 1 May 2023



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales



Dŵr Cymru  
Welsh Water

# Contents

|  |    |
|--|----|
| Background .....   | 2  |
| Introduction .....                                       | 2  |
| Methods.....   | 2  |
| SARS-CoV-2 Quantification .....                          | 2  |
| Data Processing and Modelling .....                      | 3  |
| Using this Report.....                                   | 4  |
| Alerting Indicators.....                                 | 4  |
| Wales Situation Report .....                             | 7  |
| Region 1: Carmarthen Bay and the Gower .....             | 9  |
| Region 2: Cleddau and Pembrokeshire Coastal Rivers ..... | 11 |
| Region 3: Clwyd .....                                    | 13 |
| Region 4: Conwy .....                                    | 15 |
| Region 5: Dee.....                                       | 17 |
| Region 6: Llŷn and Eryri .....                           | 19 |
| Region 7: Meirionnydd .....                              | 21 |
| Region 8: South East Valleys.....                        | 23 |
| Region 9: Tawe to Cadoxton.....                          | 25 |
| Region 10: Teifi and North Ceredigion.....               | 27 |
| Region 11: Usk .....                                     | 29 |
| Region 12: Wye.....                                      | 31 |
| Region 13: Ynys Môn .....                                | 33 |
| Region 14: Hafren Dyfrdwy.....                           | 35 |
| Appendix A – Data and Indicators .....                   | 37 |
| Site Level Indicators .....                              | 37 |
| Appendix B – Sewer Catchment Maps.....                   | 40 |
| Acknowledgements .....                                   | 49 |
| Data Usage .....   | 50 |

# Background

## Introduction

In September 2020 Welsh Government began sampling wastewater from 19 Wastewater Treatment Works (WwTW) from across Wales in order to detect the levels of SARS-CoV-2. Since then the programme has undertaken work not only to expand the coverage of the wastewater monitoring but also to improve the testing methodology to make it more representative of the catchments served.

Welsh Government intends to monitor up to 50 WwTW catchments across Wales in order to assist in the early detection of changing viral levels and the potential scale of outbreaks to help inform any public health action taken in the management of the pandemic and beyond.

## Methods

Wastewater-Based Epidemiology (WBE) provides comprehensive public health information at a community level. To achieve this, wastewater samples are collected at the inflow of sewage treatment plants across Wales. The samples are then analysed to determine the levels of specific pathogens, as well as summarising their physico-chemical characteristics. This data is then mapped against known infection rates and other public health indicators at the regional level.

Individuals with COVID-19 shed SARS-CoV-2 genetic material in their faeces in the form of ribonucleic acid (RNA), regardless of whether they have symptoms or not. Measurements quantify the amount of viral RNA present in wastewater alongside the presence of different mutations associated with SARS-CoV-2. This information therefore provides a representative and unbiased snapshot of the level of COVID-19 infection within a community at any point in time. In summary, WBE has the potential to act as key capability to aid in the surveillance and control of COVID-19.

Currently, a mixture of 'composite' and 'spot' samples (each comprising 1 litre of wastewater) are collected from each WwTW 5 times a week, Monday to Friday. Spot samples are taken at the same time each day to capture peak flow, while composite samples are collected over a 24-hour period at 15-minute intervals using automatic sampling machines. Welsh Government currently investigates levels of COVID-19 in wastewater at 47 sites across Wales within the Dŵr Cymru Welsh Water (DCWW) and Hafren Dyfrdwy networks.

## SARS-CoV-2 Quantification

The reported SARS-CoV-2 wastewater data is the concentration of viral gene copies (gc) detected in the wastewater sample. The viral copy number is obtained using an average of measurements from a single N1 nucleocapsid gene.

Samples are collected from the WwTW and transported at 4°C to laboratories on the day of collection. Samples are clarified to remove solid faecal matter and are subject to a PEG (polyethylene glycol) precipitation process. The quantity of a SARS-CoV-2 RNA present in the wastewater sample is then determined using a RT-qPCR (reverse transcriptase quantitative polymerase chain reaction) laboratory method.

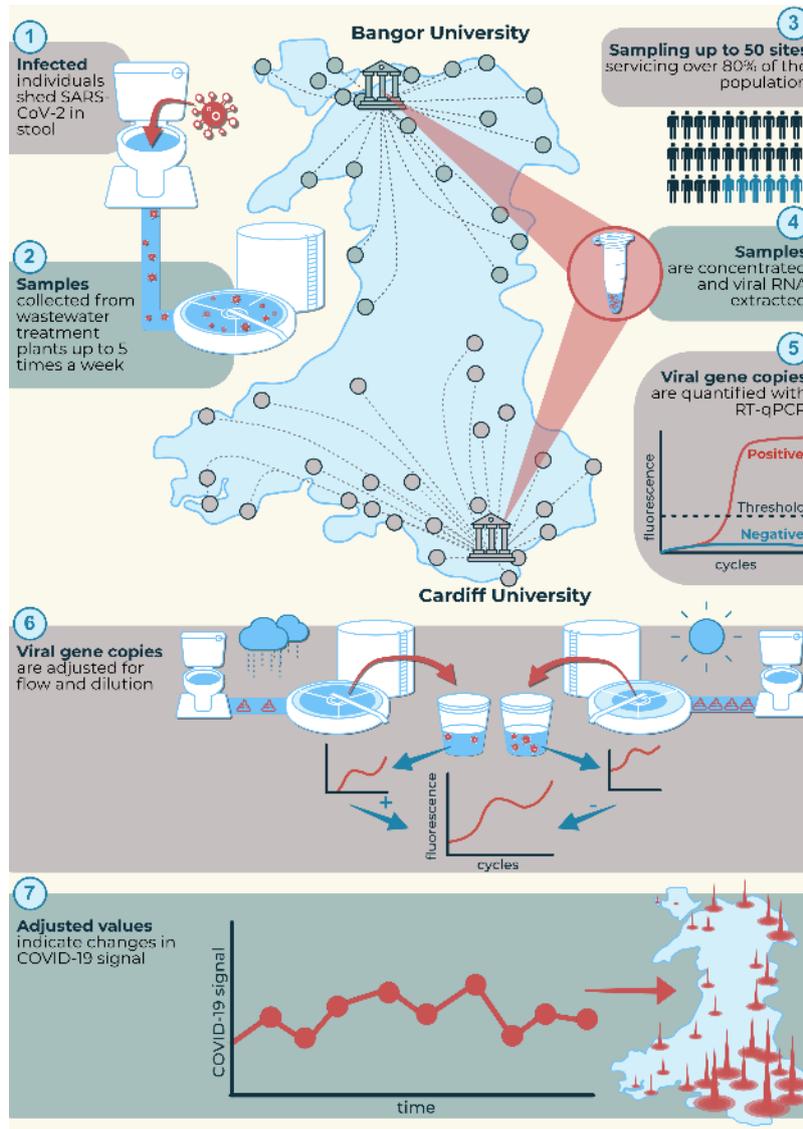


Figure 1 - Process diagram

## Data Processing and Modelling

The total amount of SARS-CoV-2 RNA in the sample is corrected for various factors as a result of the RT-qPCR analysis, giving a raw copy number for each target gene. The data is reported as SARS-CoV-2 gene copies per litre (gc/L).

Most sewers in Wales are combined systems that collect waste waters (domestic, industrial, etc.) and stormwater from flooding and rainfall. As such, the collected wastewater samples vary through time and across WwTW. In particular, a sample's dilution can depend on the amount of rain that day. Each WwTW in Wales services a sewage network of different size and population.

The data is 'normalised' to account for variations in dilution and population. To adjust specifically for dilution, we have developed a method for recovering daily flow that is based on daily measures of flow indicators (Ammonium, Electrical conductivity, Orthophosphate concentrations) and dry weather flow. The serviced population at each wastewater site is estimated using the latest ONS population data for its drainage area. With these measures of daily flow dilution and population, we can then report the SARS-CoV-2 signal as a daily rate of gene copies per 100,000 people (gc/day per 100k). This value is then comparable across all the Welsh catchments. Day-to-day variability is smoothed using weekly averaging of the data.

In addition to normalising the data, the data are also studied for samples that could be deemed as 'outliers' on account of being significantly outside of the range of other recent samples. True outliers are then removed from datasets as they could have a negative impact on the trends observed in the figures produced for this report.

# Using this Report

Wastewater monitoring is a type of environmental monitoring, so it is difficult to model data around local authorities or health boards. Sewer catchments can receive rainfall or environmental sources of water from anywhere within their relevant geography, which follows the topography of the land. Sewer networks are managed around regions that mostly correspond with river drainage basins and it is these management areas that have been chosen for wastewater regional reporting.

For both National and regional rolling averages the population of all catchments is taken into consideration when reporting the signal per 100,000 people. For example, in Region 4 there are two catchments: one with a population of approximately 400 and the other with a population of approximately 67,100. Individual catchment populations are detailed in Appendix A.

All data relating to wastewater signal (SARS-CoV-2 gc/day per 100k) is represented as an exponential figure ( $\times 10^{12}$ ) where  $1 \times 10^{12} = 1,000,000,000,000$  unless otherwise stated. The report uses a mixture of line graphs and spark charts; both are based on 10 day rolling averages.

Maps of individual sewer catchments are located in the appendix of this report. Each section of the report contains a map that represents the area that is covered by the region.

Each regional summary is given in the format:

- The trend within the region for the previous four weeks
- The trend within the region compared to the previous week
- Any indicators triggered for the region
- Any inconsistencies or issues in the region

To allow for noise in wastewater signal we only record changes greater than 10% to be decreases or increases.

Samples below the limit of detection (LOD) are treated as half the LOD to enable full analysis to be recorded. Therefore, the LOD samples will not be identified on a case-by-case basis on the regional situation reports.

Please note that the data collection from the COVID-19 Infection Survey (CIS) has now finished and Appendix B - ONS COVID-19 Infection Survey vs Wastewater National Mean removed. UK Health Security Agency is working with ONS and the devolved nations, including Wales, to develop a new health monitoring survey which will include community surveillance of flu and other viruses as well as SARS-CoV-2.

Any questions on the report, or the Welsh Government Wastewater Programme, can be sent to [wastewater@gov.wales](mailto:wastewater@gov.wales).

## Alerting Indicators

To highlight potentially concerning changes in wastewater signal, the three following types of alerting indicators are assessed once a week, based on the viral load (gc/day per 100k) measured. The indicator table in the National situation report indicates the number of sites within those regions that have triggered the indicators:

1. The **High Signal Level** indicator highlights the catchment areas where the viral load is high. It corresponds to a situation where the viral loads exceed half of the highest weekly average recorded in the previous 6 months.
2. The **Rapid Increase** indicator highlights the catchment areas where the viral loads have rapidly increased for the last week compared to the previous week. It corresponds to a situation where the weekly average of the viral load has increased by at least 100% since the previous week.
3. The **Increasing Signal Level** indicator highlights the catchment areas where the viral loads are showing signs of continuous increase. It corresponds to a situation where the weekly average of the viral load has increased since the previous week for at least 3 weeks in a row.

'0' corresponds to no alerts present for the region or site, whilst '-' represents no data being available.

To assist in locating which region is relevant for a particular Health Board or Local Authority they are broken down in the tables below.

|   |  |
|---|--|
| <b>Betsi Cadwaladr University Health Board</b>    | Region 3: Clwyd<br>Region 4: Conwy<br>Region 5: Dee<br>Region 6: Llŷn and Eryri<br>Region 7: Meirionnydd<br>Region 13: Ynys Môn                                |
| <b>Hywel Dda University Health Board</b>          | Region 1: Carmarthen Bay and the Gower<br>Region 2: Cleddau and Pembrokeshire Coastal Rivers<br>Region 7: Meirionnydd<br>Region 10: Teifi and North Ceredigion |
| <b>Powys Teaching Health Board</b>                | Region 7: Meirionnydd<br>Region 12: Wye<br>Region 14: Hafren Dyfrdwy   |
| <b>Swansea Bay University Health Board</b>        | Region 1: Carmarthen Bay and the Gower<br>Region 9: Tawe to Cadoxton   |
| <b>Cwm Taf University Health Board</b>            | Region 8: South East Valleys<br>Region 9: Tawe to Cadoxton<br>Region 11: Usk   |
| <b>Cardiff &amp; Vale University Health Board</b> | Region 8: South East Valleys<br>Region 9: Tawe to Cadoxton   |
| <b>Aneurin Bevan University Health Board</b>      | Region 12: Wye<br>Region 8: South East Valleys<br>Region 11: Usk   |

|   |  |
|---|--|
| <b>Blaenau Gwent County Borough Council</b>     | Region 8: South East Valleys   |
| <b>Bridgend County Borough Council</b>          | Region 9: Tawe to Cadoxton   |
| <b>Caerphilly County Borough Council</b>        | Region 8: South East Valleys   |
| <b>Carmarthenshire County Council</b>           | Region 1: Carmarthen Bay and the Gower<br>Region 10: Teifi and North Ceredigion                                      |
| <b>Ceredigion County Council</b>                | Region 7: Meirionnydd<br>Region 10: Teifi and North Ceredigion   |
| <b>City and County of Swansea</b>               | Region 1: Carmarthen Bay and the Gower<br>Region 9: Tawe to Cadoxton   |
| <b>City of Cardiff Council</b>                  | Region 8: South East Valleys   |
| <b>Conwy County Borough Council</b>             | Region 3: Clwyd<br>Region 4: Conwy<br>Region 5: Dee  |
| <b>Denbighshire County Council</b>              | Region 3: Clwyd<br>Region 5: Dee   |
| <b>Flintshire County Council</b>                | Region 5: Dee  |
| <b>Gwynedd Council</b>                          | Region 5: Dee<br>Region 6: Llŷn and Eryri<br>Region 7: Meirionnydd   |
| <b>Isle of Anglesey County Council</b>          | Region 13: Ynys Môn  |
| <b>Merthyr Tydfil County Borough Council</b>    | Region 8: South East Valleys   |
| <b>Monmouthshire County Council</b>             | Region 11: Usk<br>Region 12: Wye   |
| <b>Neath Port Talbot Council</b>                | Region 9: Tawe to Cadoxton   |
| <b>Newport City Council</b>                     | Region 8: South East Valleys<br>Region 11: Usk   |
| <b>Pembrokeshire County Council</b>             | Region 2: Cleddau and Pembrokeshire Coastal Rivers<br>Region 10: Teifi and North Ceredigion                          |
| <b>Powys County Council</b>                     | Region 7: Meirionnydd<br>Region 9: Tawe to Cadoxton<br>Region 11: Usk<br>Region 12: Wye<br>Region 14: Hafren Dyfrdwy |
| <b>Rhondda Cynon Taf County Borough Council</b> | Region 8: South East Valleys   |
| <b>Torfaen County Borough Council</b>           | Region 11: Usk   |
| <b>Vale of Glamorgan Council</b>                | Region 9: Tawe to Cadoxton   |
| <b>Wrexham County Borough Council</b>           | Region 5: Dee  |

# Wales Situation Report

**Since the last report, SARS-CoV-2 viral load has increased across the country. The signal increased in 9 regions, decreased in 1 region, and remained level in 4 regions.**

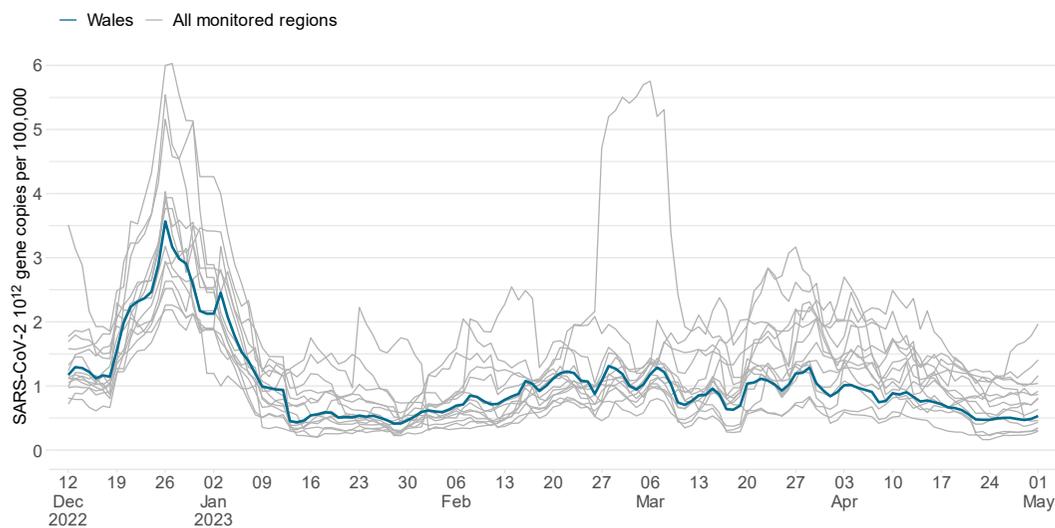


Figure 2 - National (blue lines) and Regions (grey lines) Rolling Mean SARS-CoV-2 gc/day per 100k

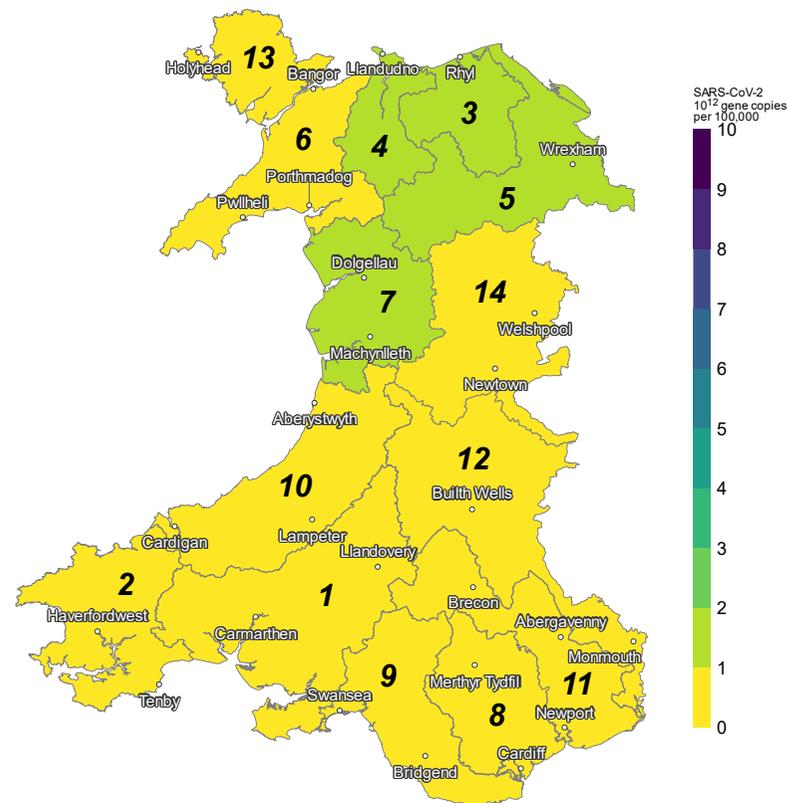


Figure 3 - National Heat Map showing Regional Mean SARS-CoV-2 gc/day per 100k

## Wastewater Monitoring in Wales – Weekly Report

### Wales Situation report:

- The trend in the national mean wastewater signal has been unstable, with both increases and decreases over the last four weeks.
- Since the last report, SARS-CoV-2 viral load has increased across the country. However, the signal decreased at Cleddau and Pembrokeshire Coastal Rivers, and remained level at Clwyd, Conwy, Tawe to Cadoxton and Hafren Dyfrdwy.

| Region name   | Number of sites monitored | % regional population covered | No. sites with High Signal Level | No. sites with Rapid Increase | No. sites with Increasing Signal Level |
|---|---------------------------|-------------------------------|----------------------------------|-------------------------------|--|
| <b>Region 1: Carmarthen Bay and the Gower</b>             | 4                         | 57                            | 0                                | 1                             | 0                                      |
| <b>Region 2: Cleddau and Pembrokeshire Coastal Rivers</b> | 4                         | 39                            | 0                                | 1                             | 0                                      |
| <b>Region 3: Clwyd</b>                                    | 2                         | 54                            | 0                                | 0                             | 0                                      |
| <b>Region 4: Conwy</b>                                    | 2                         | 82                            | 0                                | 0                             | 0                                      |
| <b>Region 5: Dee</b>                                      | 4                         | 46                            | 0                                | 0                             | 0                                      |
| <b>Region 6: Llŷn and Eryri</b>                           | 4                         | 34                            | 0                                | 0                             | 0                                      |
| <b>Region 7: Meirionnydd</b>                              | 3                         | 28                            | 0                                | 2                             | 0                                      |
| <b>Region 8: South East Valleys</b>                       | 2                         | 82                            | 0                                | 0                             | 0                                      |
| <b>Region 9: Tawe to Cadoxton</b>                         | 5                         | 73                            | 0                                | 0                             | 0                                      |
| <b>Region 10: Teifi and North Ceredigion</b>              | 3                         | 30                            | 0                                | 1                             | 0                                      |
| <b>Region 11: Usk</b>                                     | 4                         | 86                            | 0                                | 0                             | 0                                      |
| <b>Region 12: Wye</b>                                     | 4                         | 36                            | 0                                | 2                             | 0                                      |
| <b>Region 13: Ynys Môn</b>                                | 3                         | 37                            | 0                                | 0                             | 0                                      |
| <b>Region 14: Hafren Dyfrdwy</b>                          | 3                         | 26                            | 0                                | 1                             | 0                                      |

Table 1 - Regional Alert Indicators Watchlist. Indicates how many sites in the region have hit trigger points since last report.

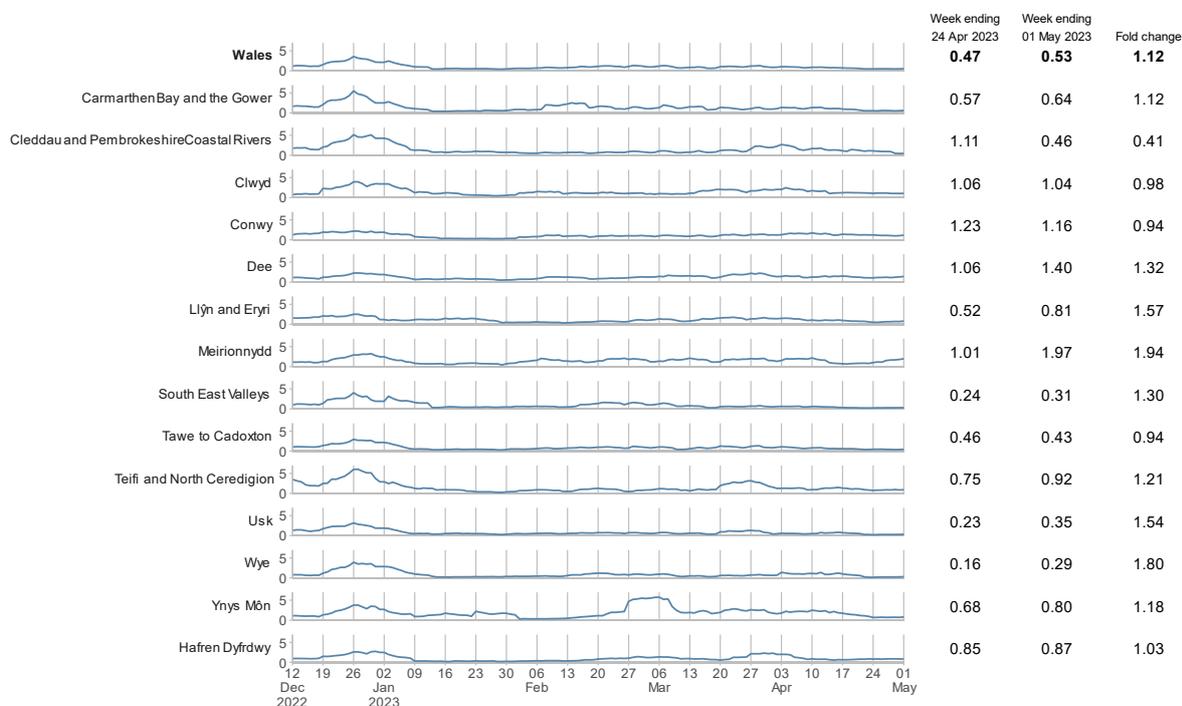


Figure 4 - National & Regional trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 1: Carmarthen Bay and the Gower

This section is relevant for:

Hywel Dda University Health Board  
Swansea Bay University Health Board

Carmarthen County Council  
Swansea Council

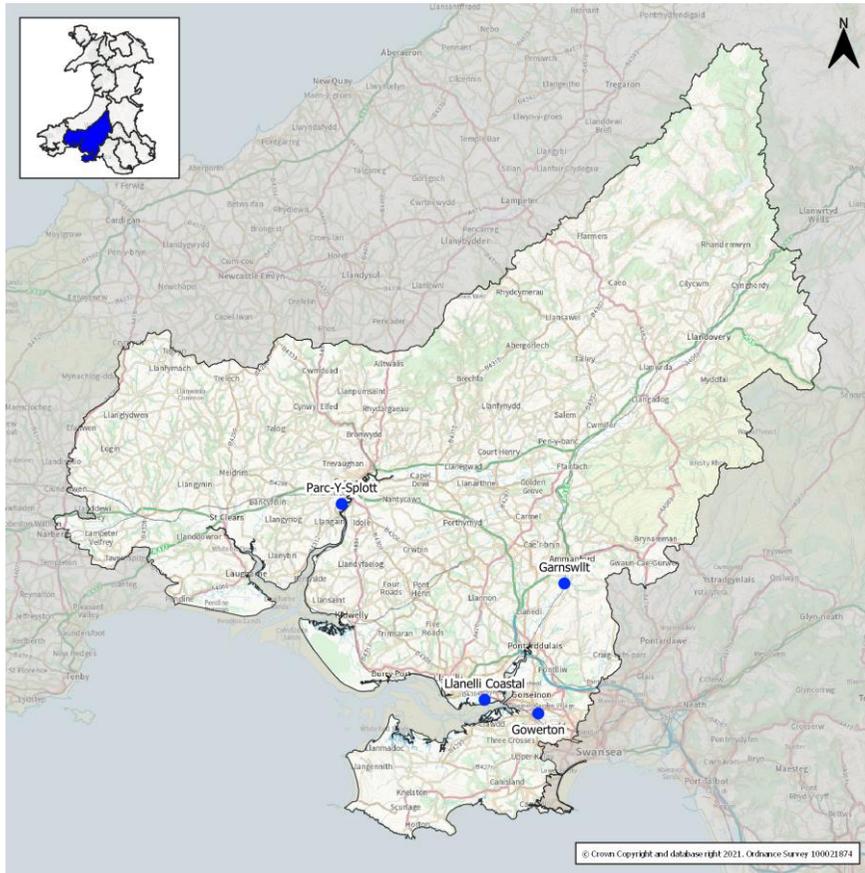


Figure 5 - Region 1 Map

### Region 1 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has increased across the region. However, the signal remained level at Llanelli Coastal and decreased at Parc-Y-Splott.
- The Rapid Increase indicator was triggered at Gowerton during the last reporting period.
- There was one sample missing from each of the sites in the region.

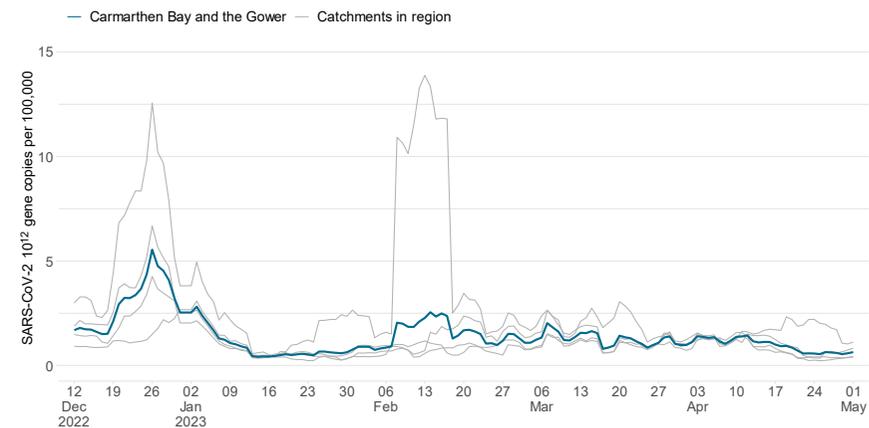


Figure 6 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

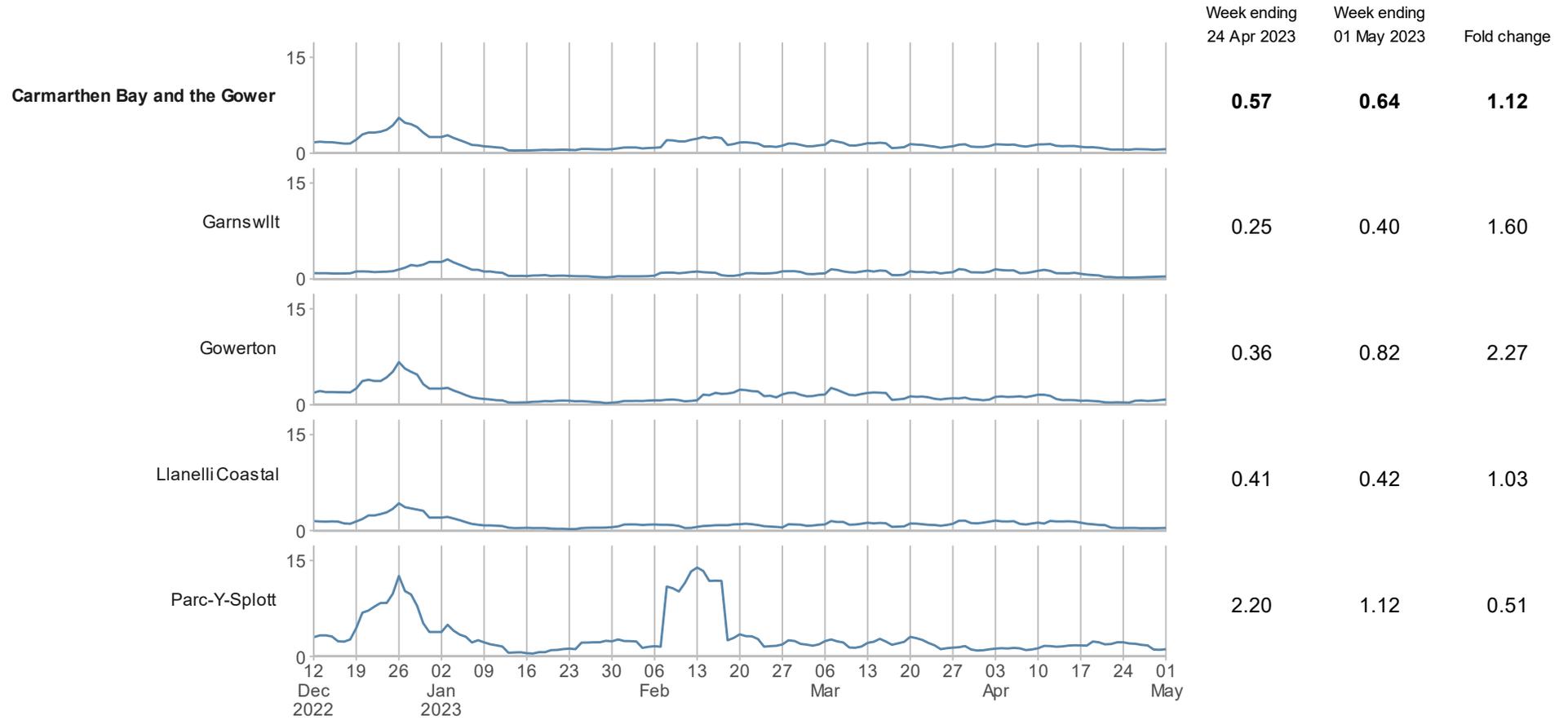


Figure 7 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 2: Cleddau and Pembrokeshire Coastal Rivers

This section is relevant for:

Hywel Dda University Health Board

Pembrokeshire County Council

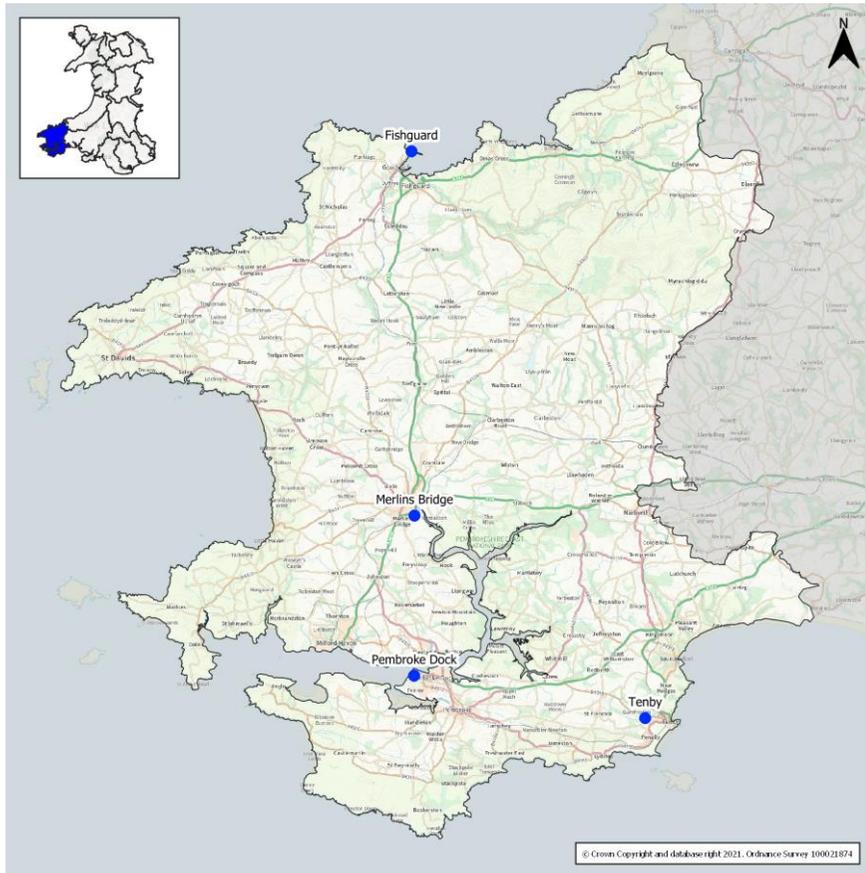


Figure 8 - Region 2 Map

### Region 2 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has decreased across the region. However, the signal increased at Fishguard and Merlins Bridge.
- The Rapid Increase indicator was triggered at Fishguard during the last reporting period.
- There was one sample missing from each of the sites in the region.

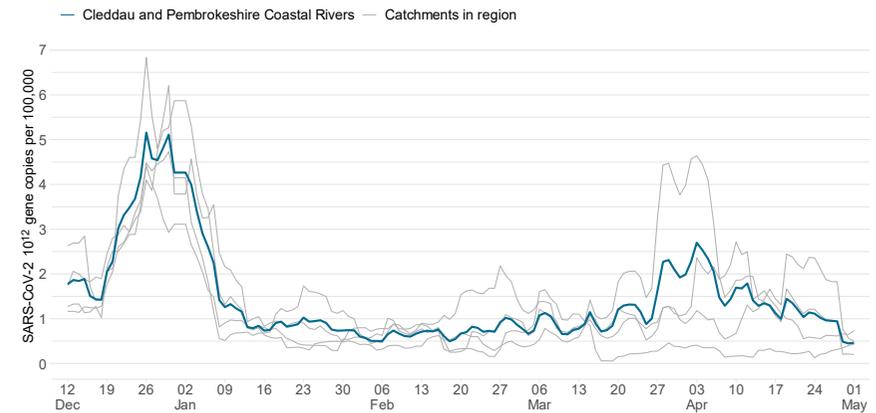


Figure 9 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

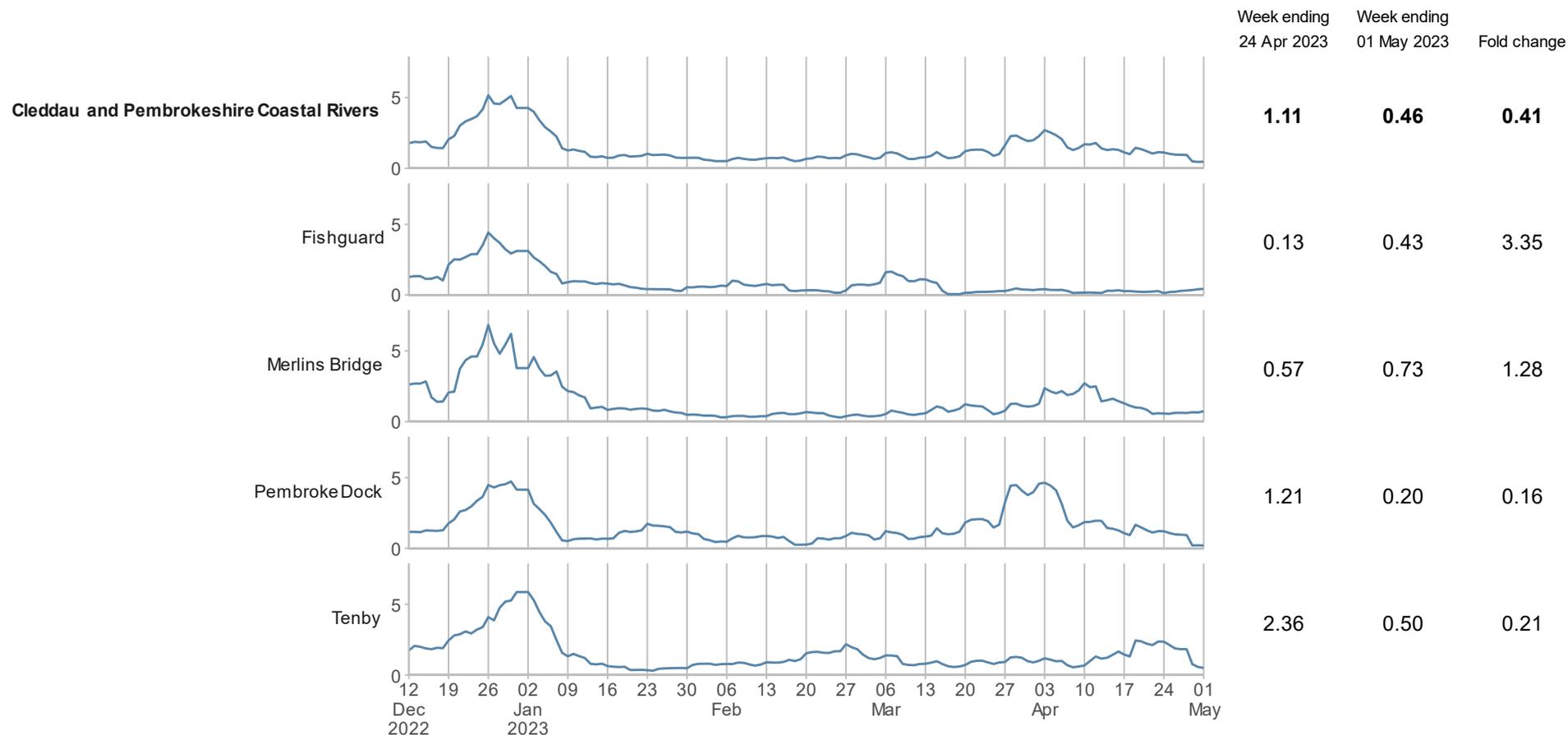


Figure 10 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 3: Clwyd

This section is relevant for:

Betsi Cadwaladr University Health Board

Denbighshire County Council  
Conwy County Council

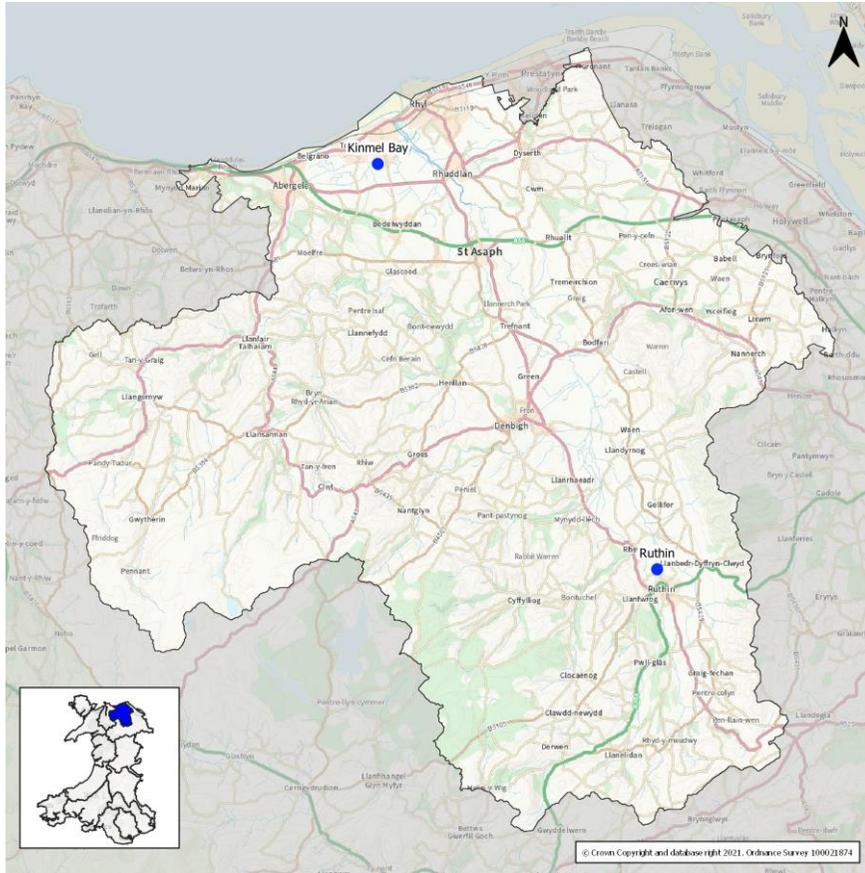


Figure 11 - Region 3 Map

### Region 3 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has remained level across the region. However, the signal decreased at Ruthin.
- No indicators were triggered during the last reporting period.
- There was one sample missing from each of the sites in the region.

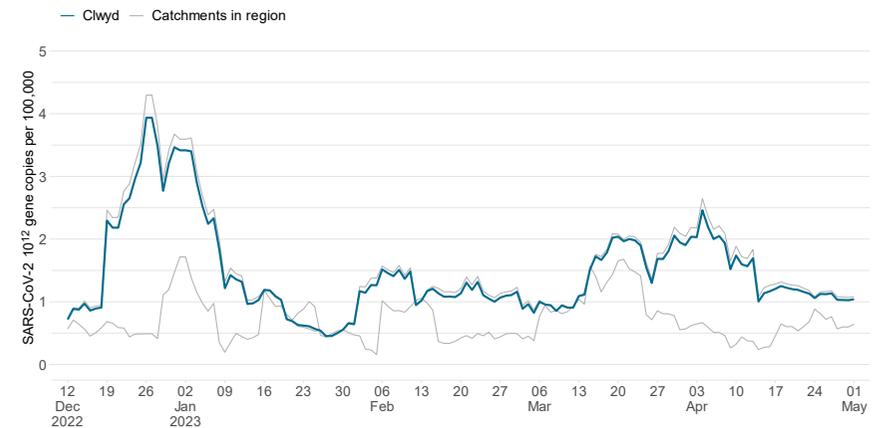


Figure 12 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

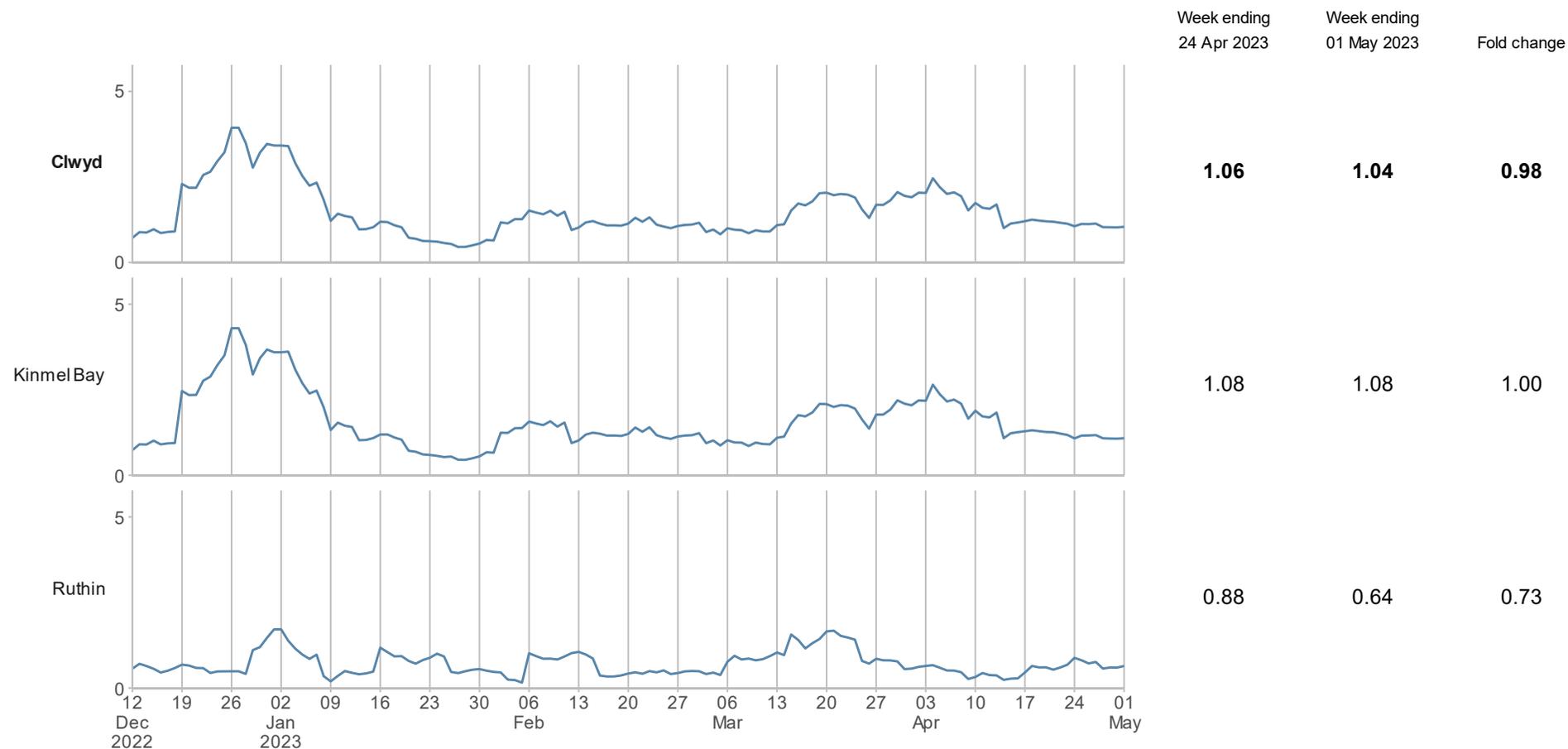


Figure 13 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 4: Conwy

This section is relevant for:

Betsi Cadwaladr University Health Board

Conwy County Council

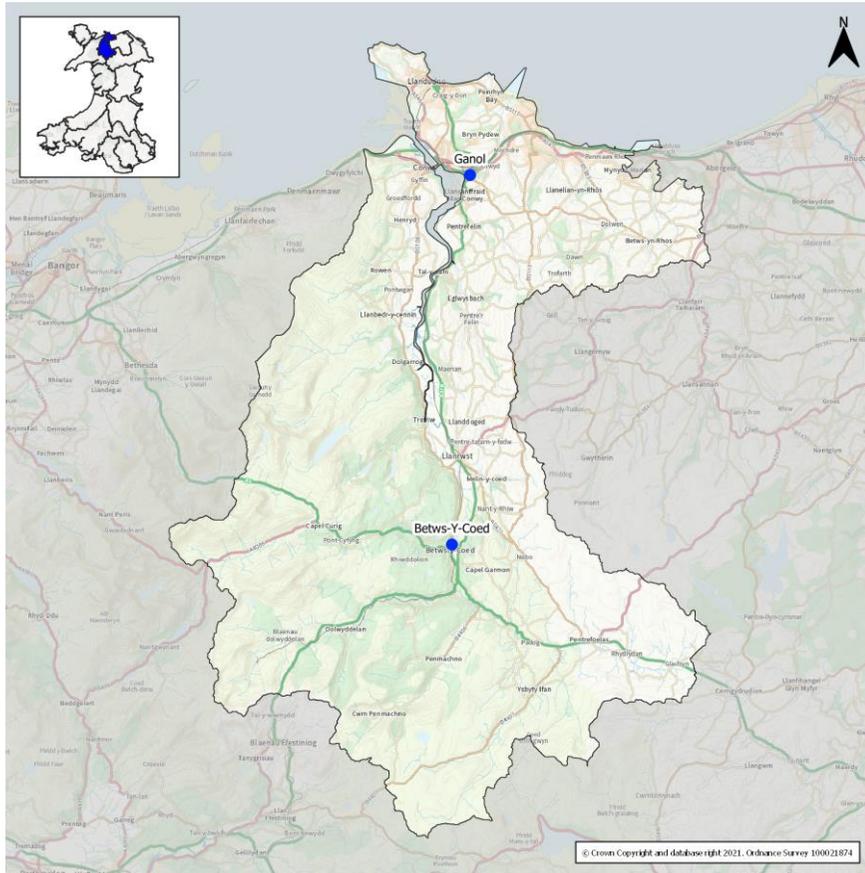


Figure 14 - Region 4 Map

### Region 4 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal in that period has remained level.
- Compared with last week, the signal has remained level across the region. However, the signal increased at Betws-Y-Coed.
- No indicators were triggered during the last reporting period.
- There was one sample missing from each of the sites in the region.

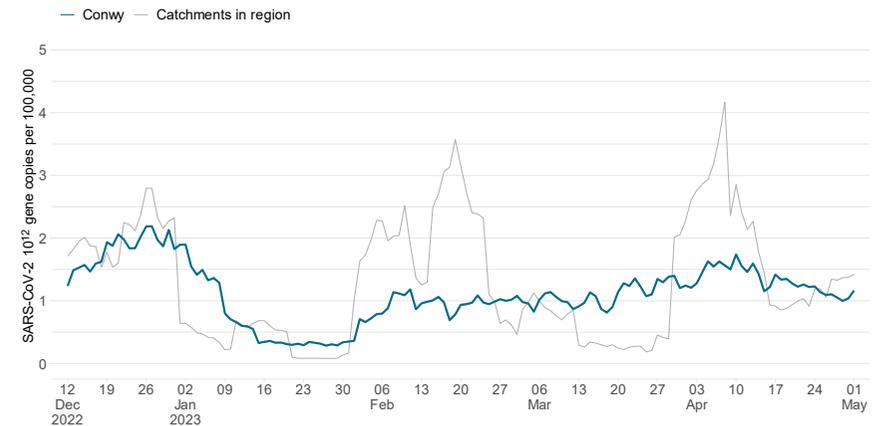


Figure 15 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

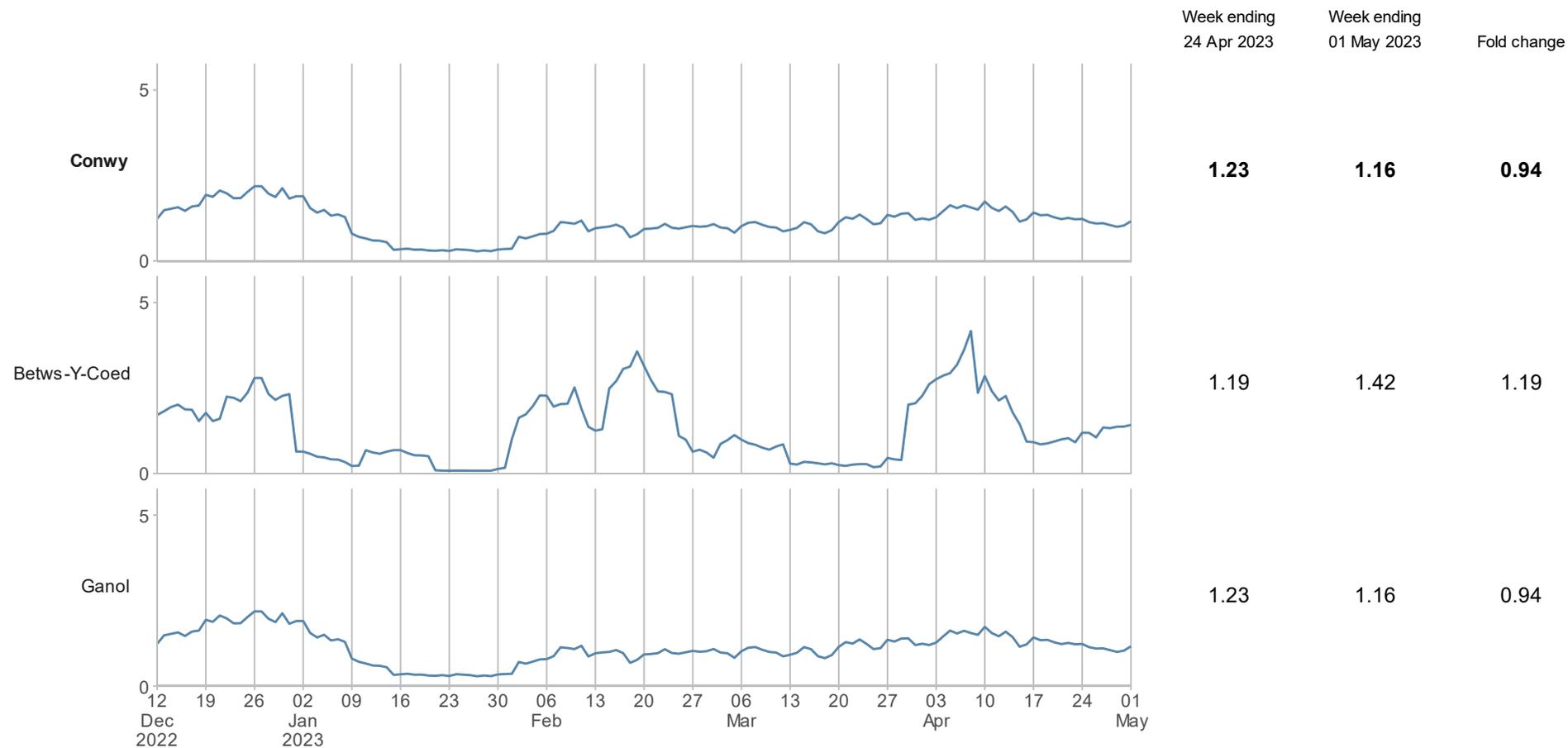


Figure 16 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 5: Dee

This section is relevant for: Betsi Cadwaladr University Health Board

Flintshire County Council  
Denbighshire County Council  
Wrexham Council

Conwy County Council  
Gwynedd County Council

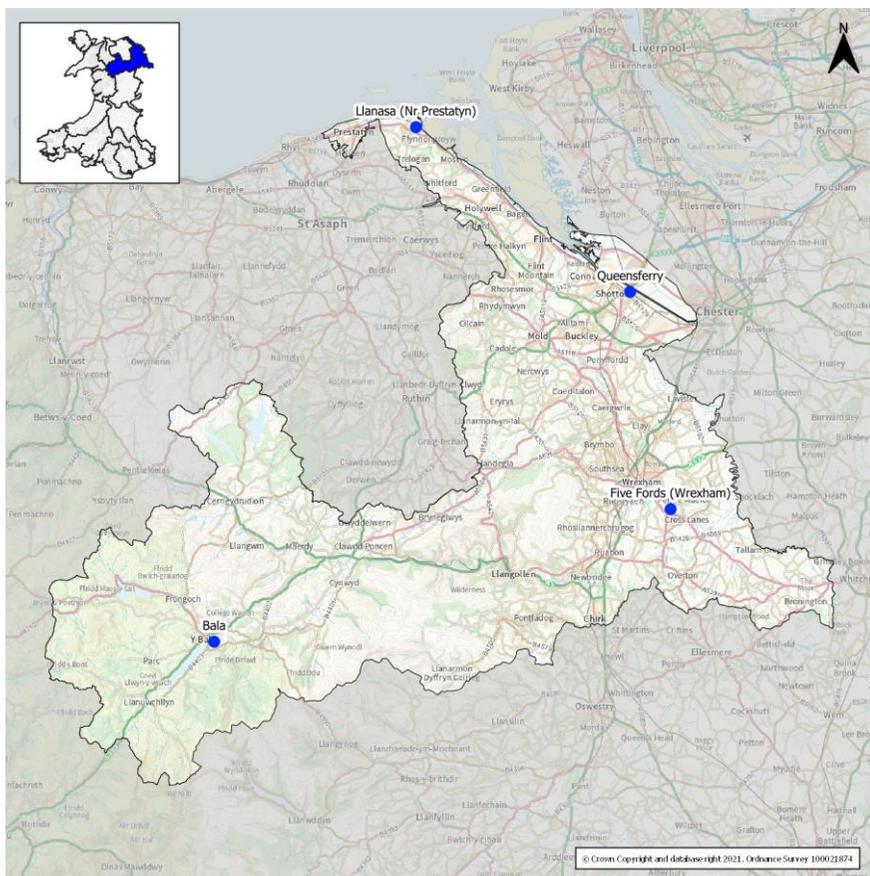


Figure 17 - Region 5 Map

### Region 5 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal in that period has remained level.
- Compared with last week, the signal has increased across the region. However, the signal remained level at Bala.
- No indicators were triggered during the last reporting period.
- There was one sample missing from each of the sites in the region.

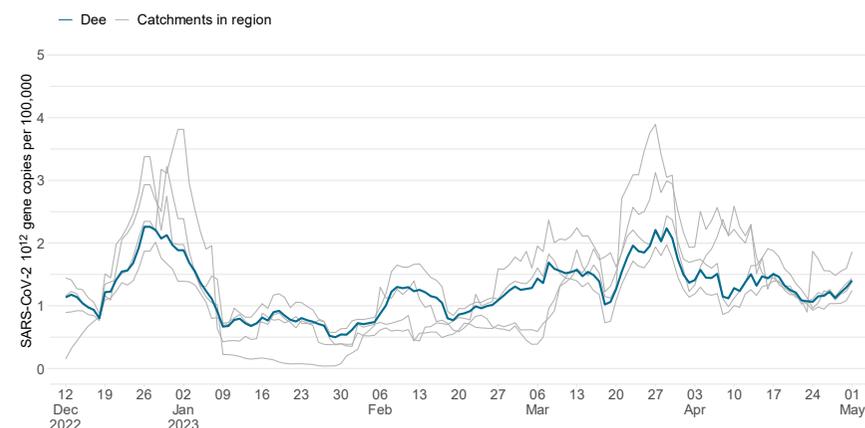


Figure 18 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

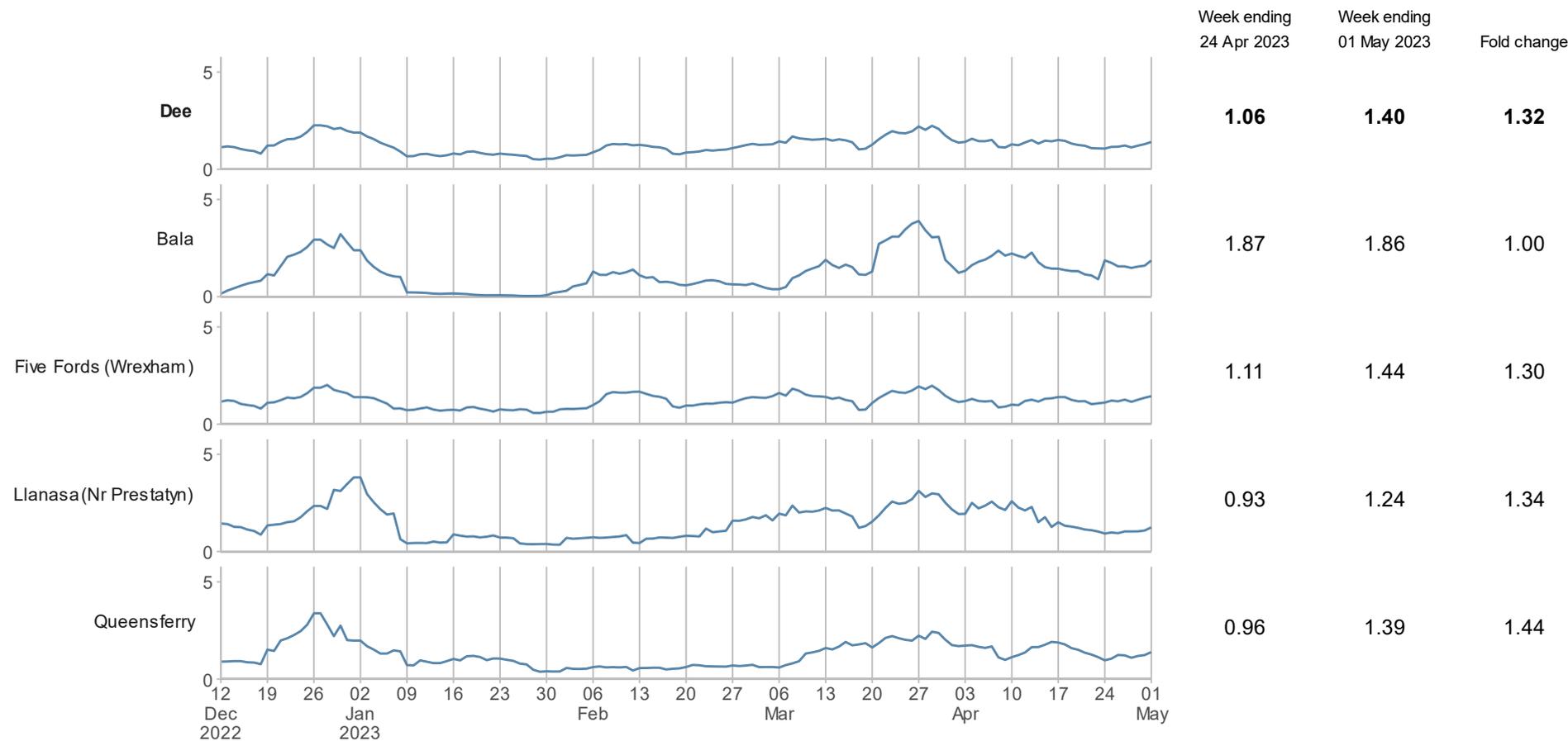


Figure 19 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 6: Llŷn and Eryri

This section is relevant for:

Betsi Cadwaladr University Health Board

Gwynedd County Council

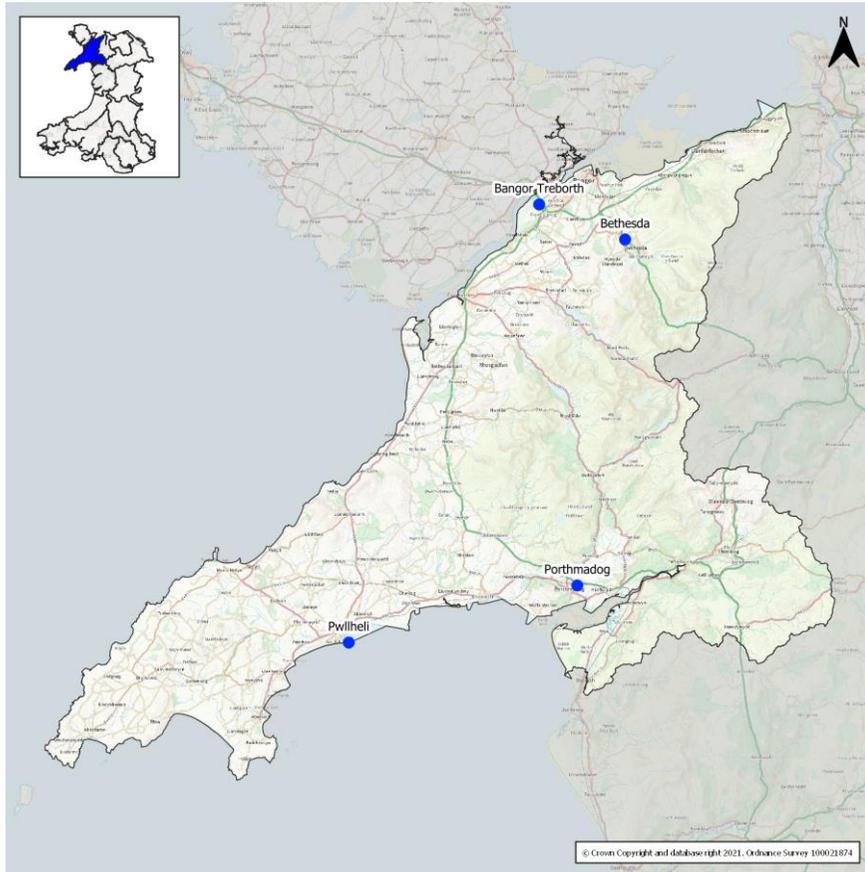


Figure 20 - Region 6 Map

### Region 6 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has increased across the region. However, the signal decreased at Porthmadog.
- No indicators were triggered during the last reporting period.
- There was one sample missing from each of the sites in the region. Staffing issues at Pwllheli between 28 – 30 December resulted in some missing samples causing a break in the series for that site.

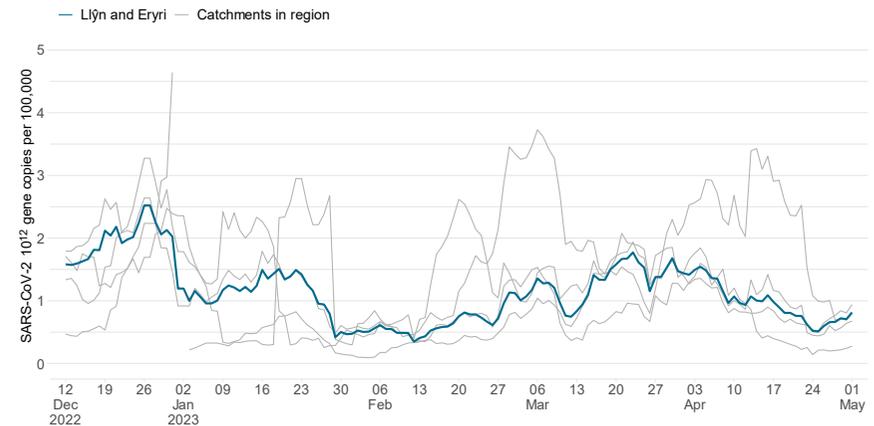


Figure 21 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

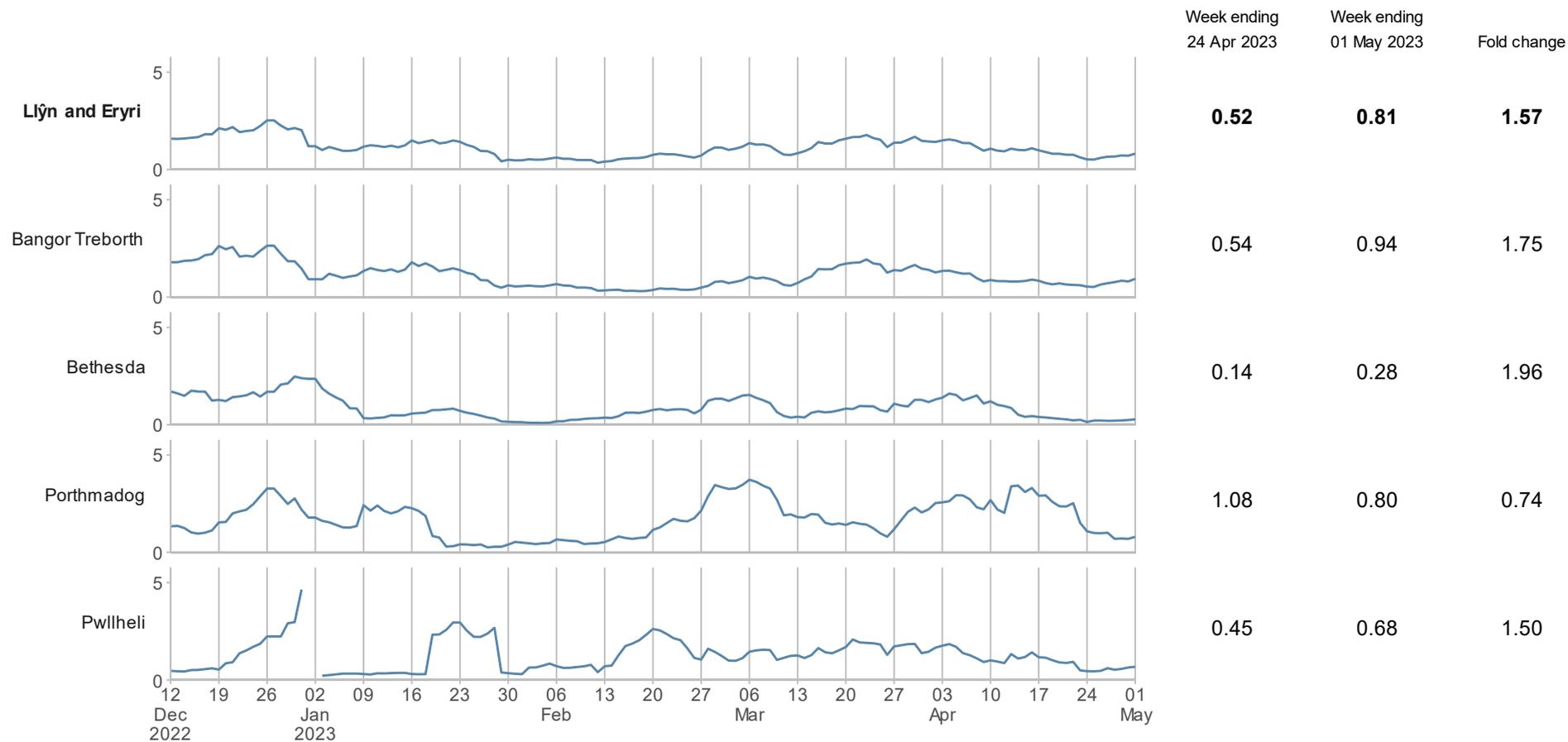


Figure 22 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 7: Meirionnydd

This section is relevant for:

Betsi Cadwaladr University Health Board  
Powys Teaching Health Board  
Hywel Dda University Health Board

Gwynedd County Council  
Powys County Council  
Ceredigion County Council

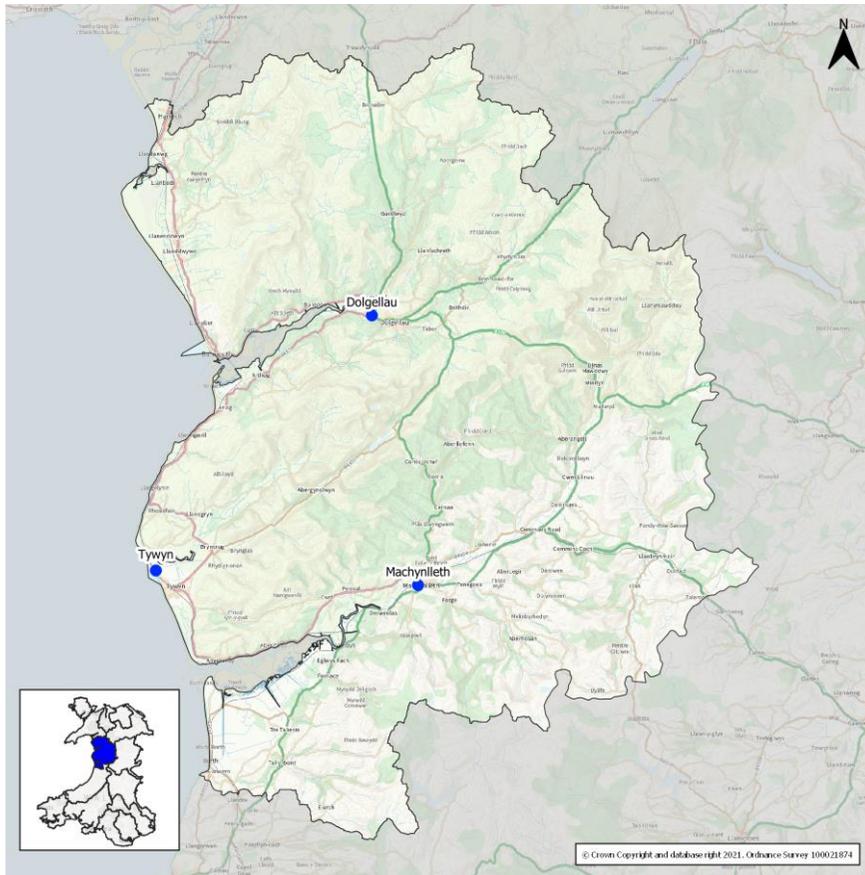


Figure 23 - Region 7 Map

### Region 7 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is an increase.
- Compared with last week, the signal has increased across the region. However, the signal remained level at Dolgellau.
- The Rapid Increase indicator was triggered at Machynlleth and Tywyn during the last reporting period.
- There was one sample missing from each of the sites in the region.

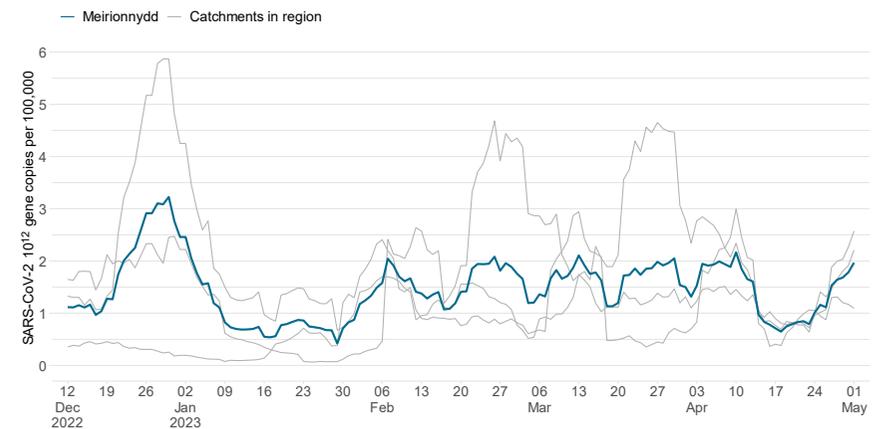


Figure 24 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

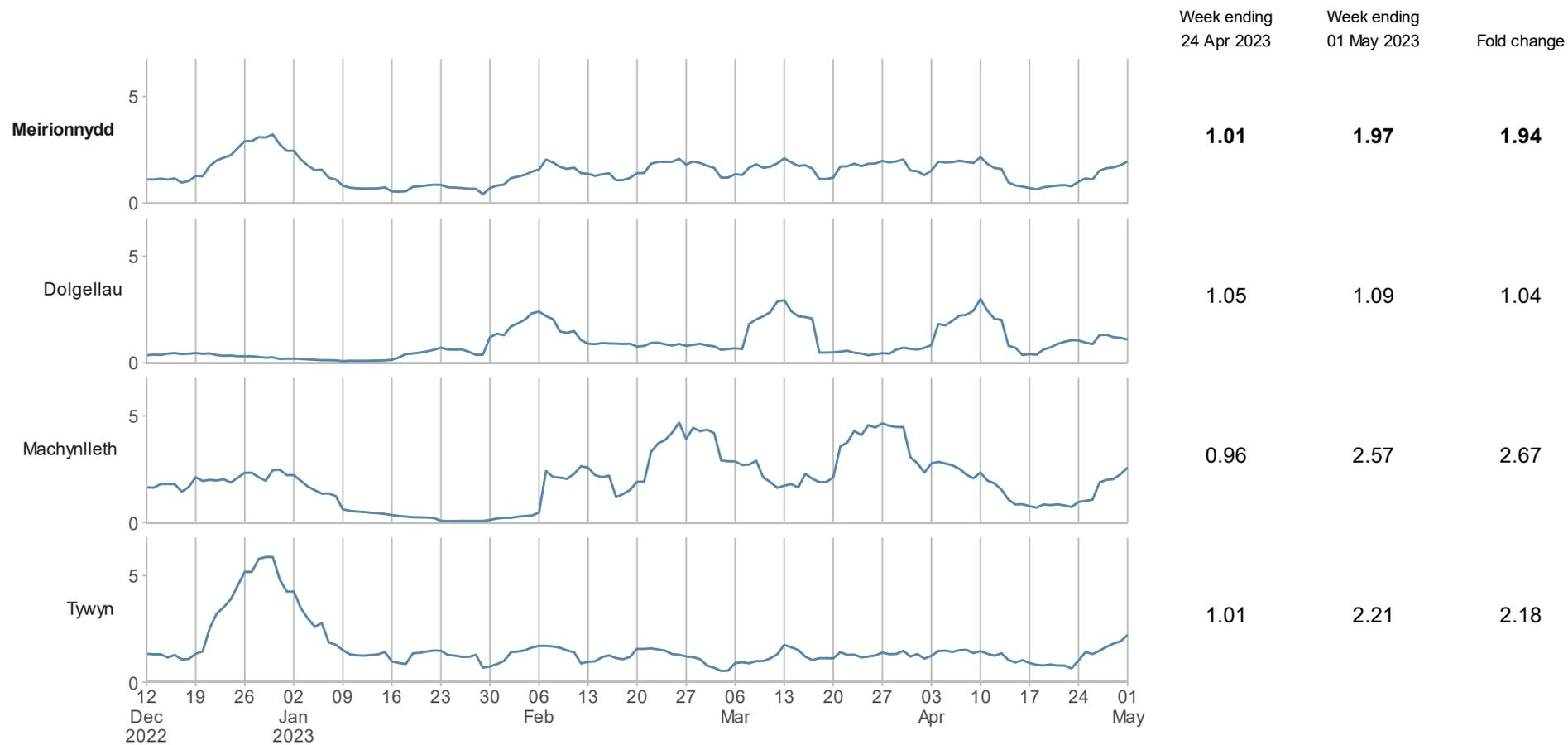


Figure 25 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 8: South East Valleys

This section is relevant for:

Aneurin Bevan University Health Board  
Cardiff & Vale University Health Board  
Cwm Taf University Health Board

Cardiff Council  
Rhondda Cynon Taf Council  
Merthyr Tydfil Council

Caerphilly Council  
Blaenau Gwent Council  
Newport Council

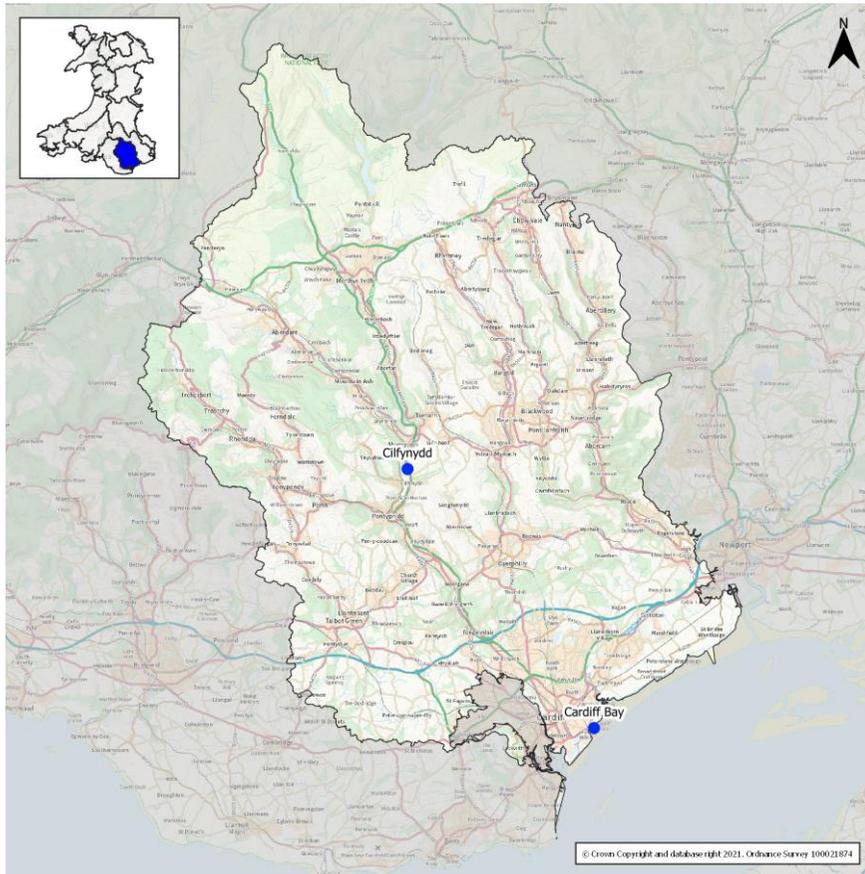


Figure 26 - Region 8 Map

### Region 8 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has increased across the region.
- No indicators were triggered during the last reporting period.
- There was one sample missing from each of the sites in the region.

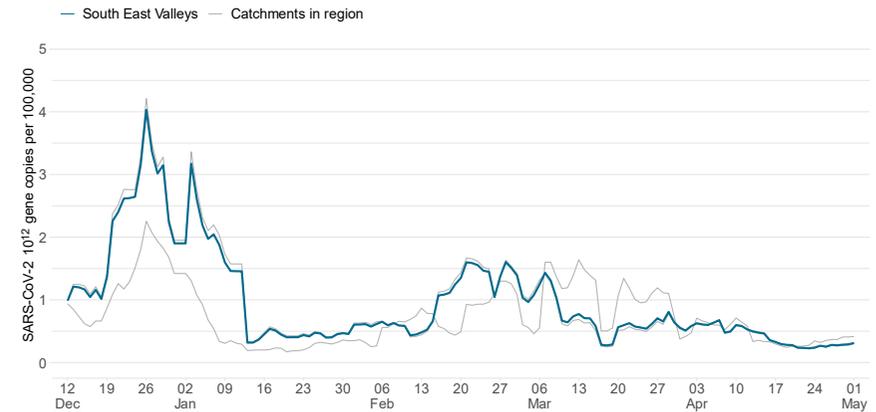


Figure 27 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

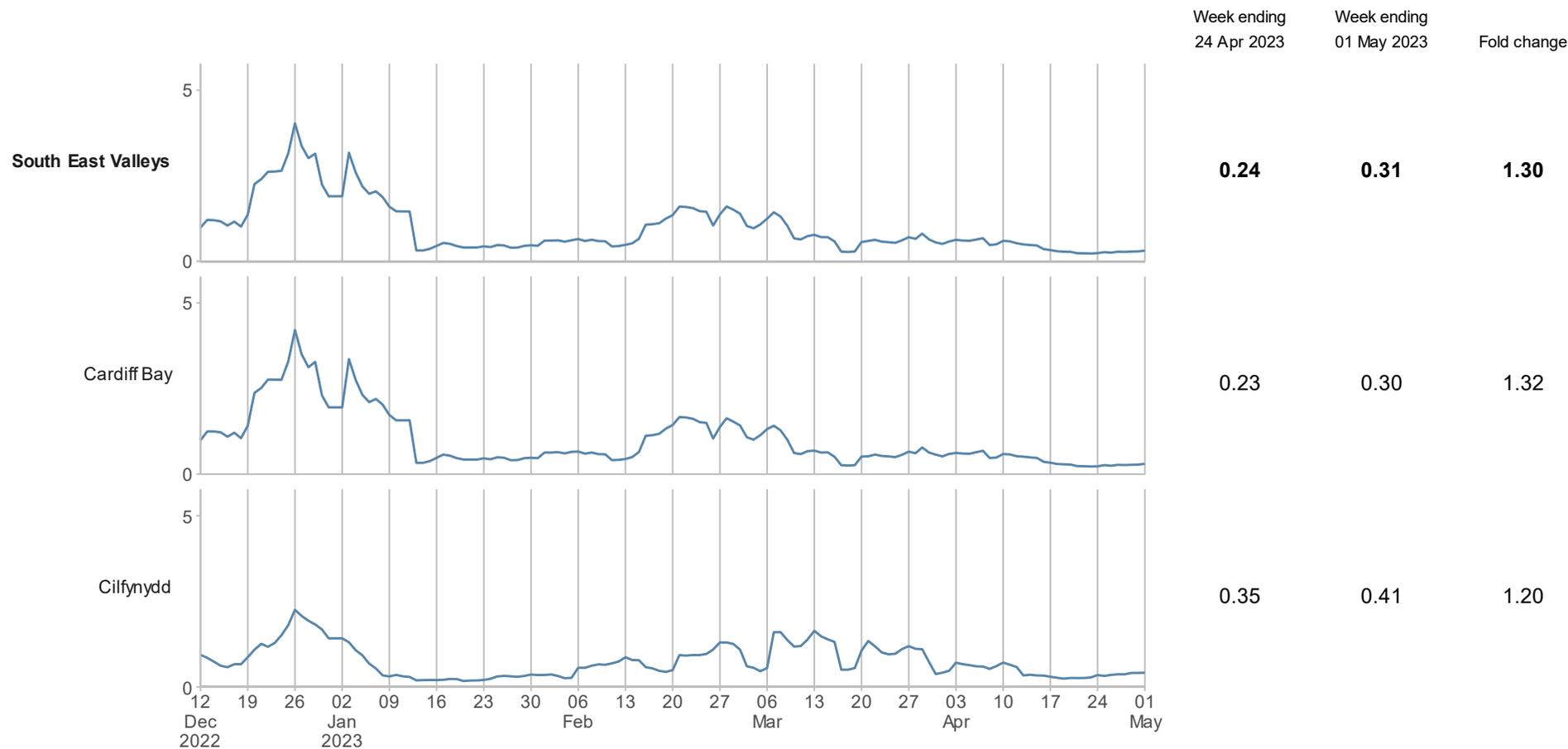


Figure 28 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 9: Tawe to Cadoxton

|                                      |  |                   |         |
|--------------------------------------|--|-------------------|---------|
| <b>This section is relevant for:</b> | Cardiff & Vale University Health Board | Vale of Glamorgan | Swansea |
|                                      | Cwm Taf University Health Board        | Bridgend          | Powys   |
|                                      | Swansea Bay University Health Board    | Neath Port Talbot |         |

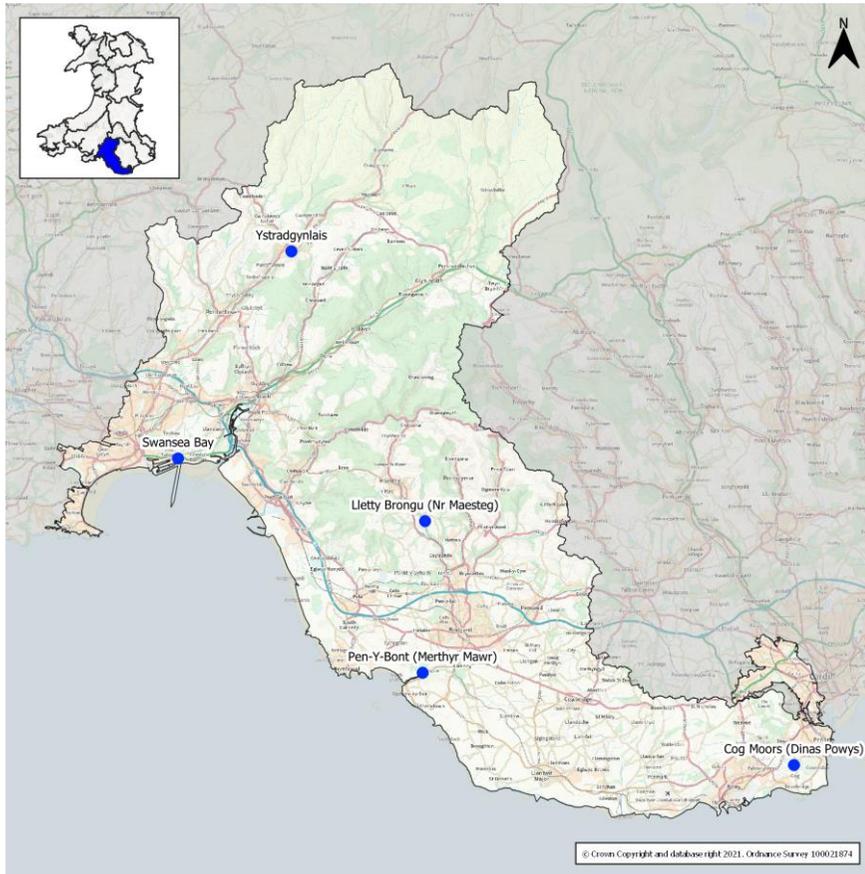


Figure 29 - Region 9 Map

### Region 9 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has remained level across the region. However, the signal increased at Cog Moors (Dinas Powys) and Pen-Y-Bont (Merthyr Mawr), and decreased at Swansea Bay and Ystradgynlais.
- No indicators were triggered during the last reporting period.
- There was one sample missing from each of the sites in the region.

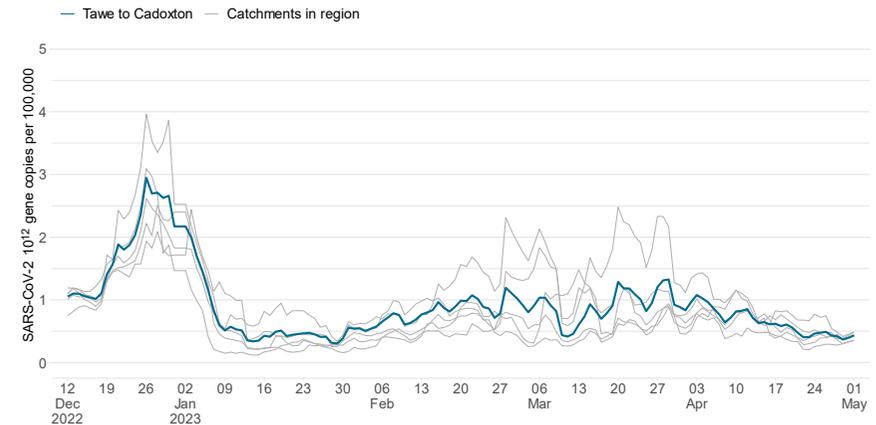


Figure 30 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

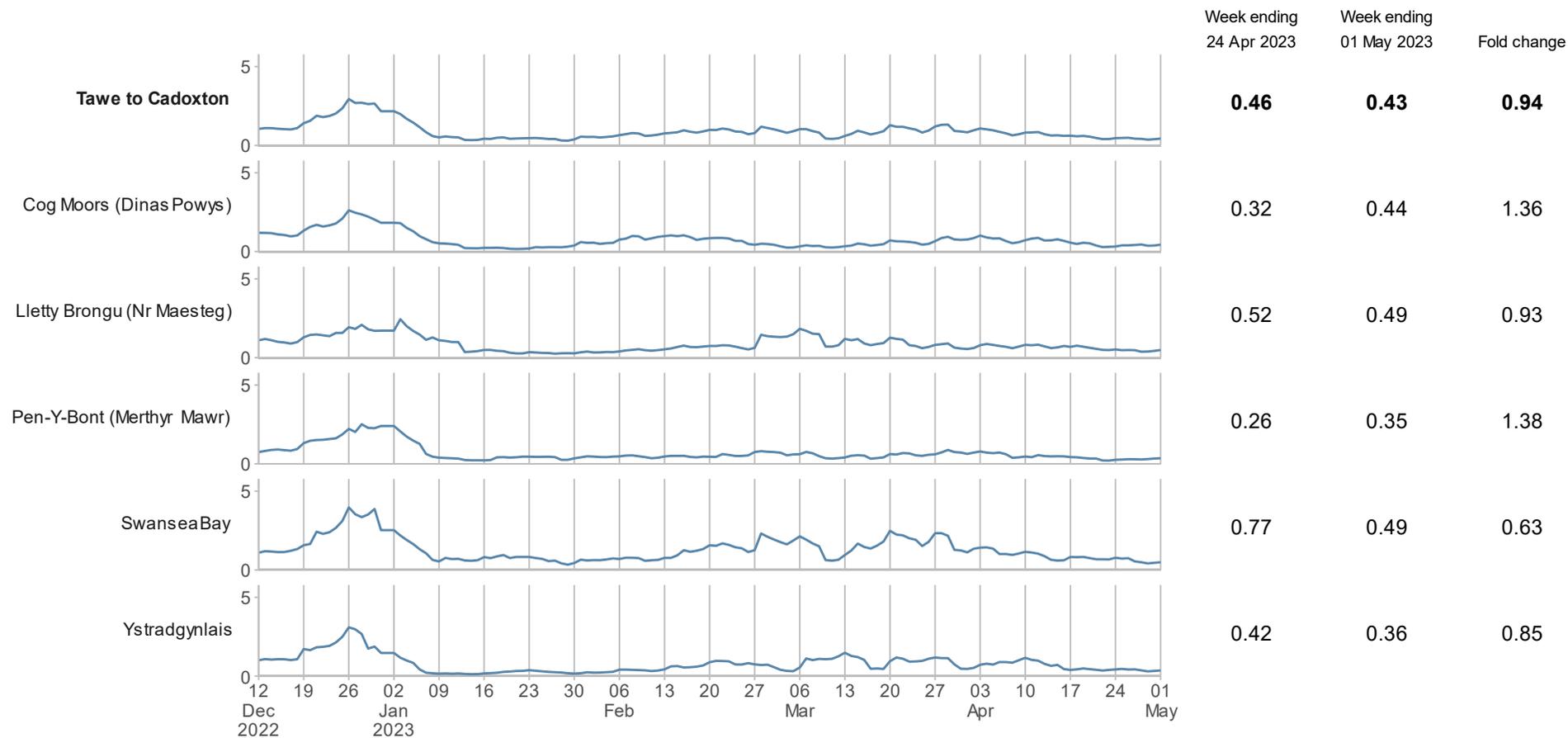


Figure 31 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 10: Teifi and North Ceredigion

This section is relevant for: Hywel Dda University Health Board

Ceredigion County Council  
 Pembrokeshire County Council  
 Carmarthen County Council

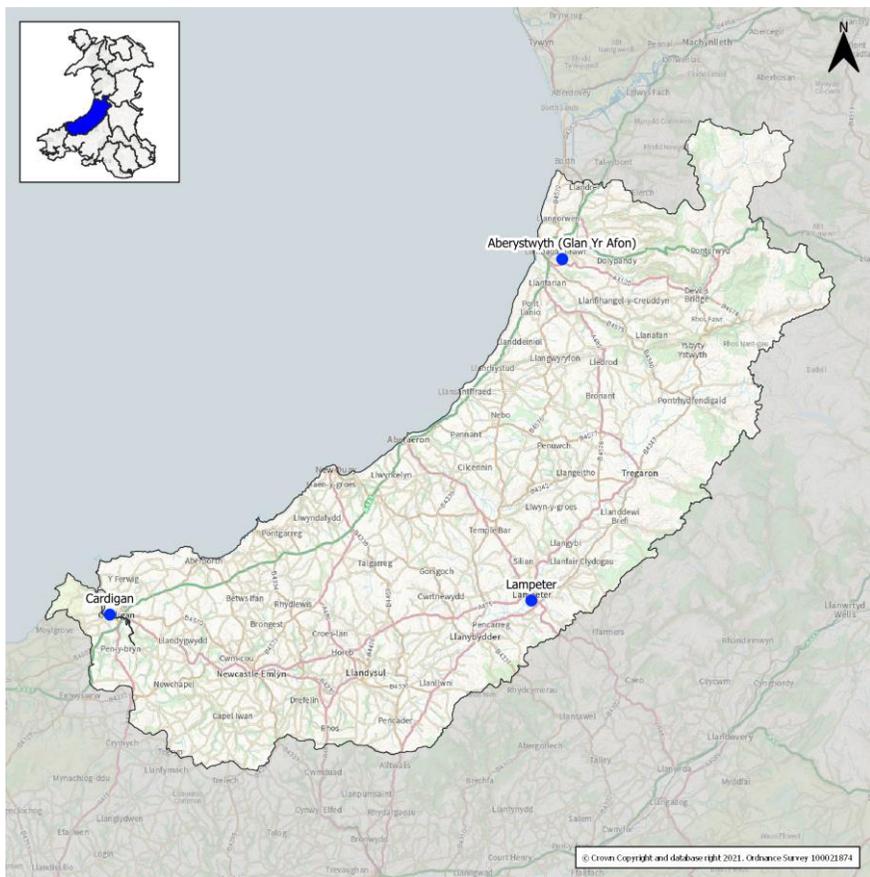


Figure 32 - Region 10 Map

### Region 10 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has increased across the region. However, the signal decreased at Cardigan.
- The Rapid Increase indicator was triggered at Lampeter during the last reporting period.
- There was one sample missing from each of the sites in the region.

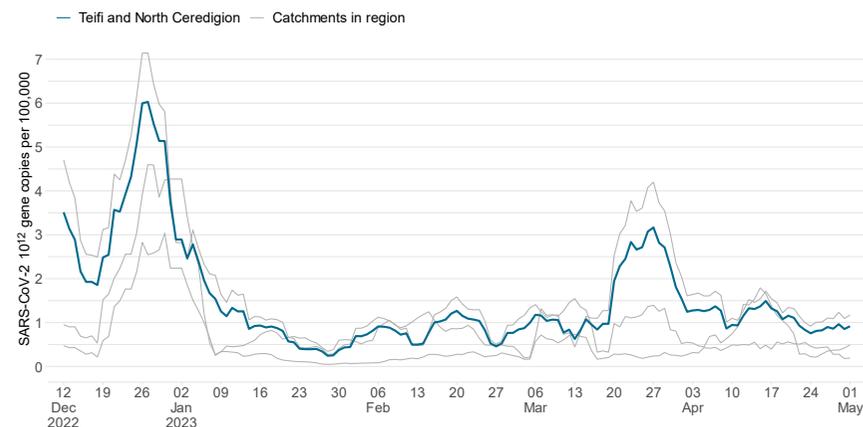


Figure 33 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

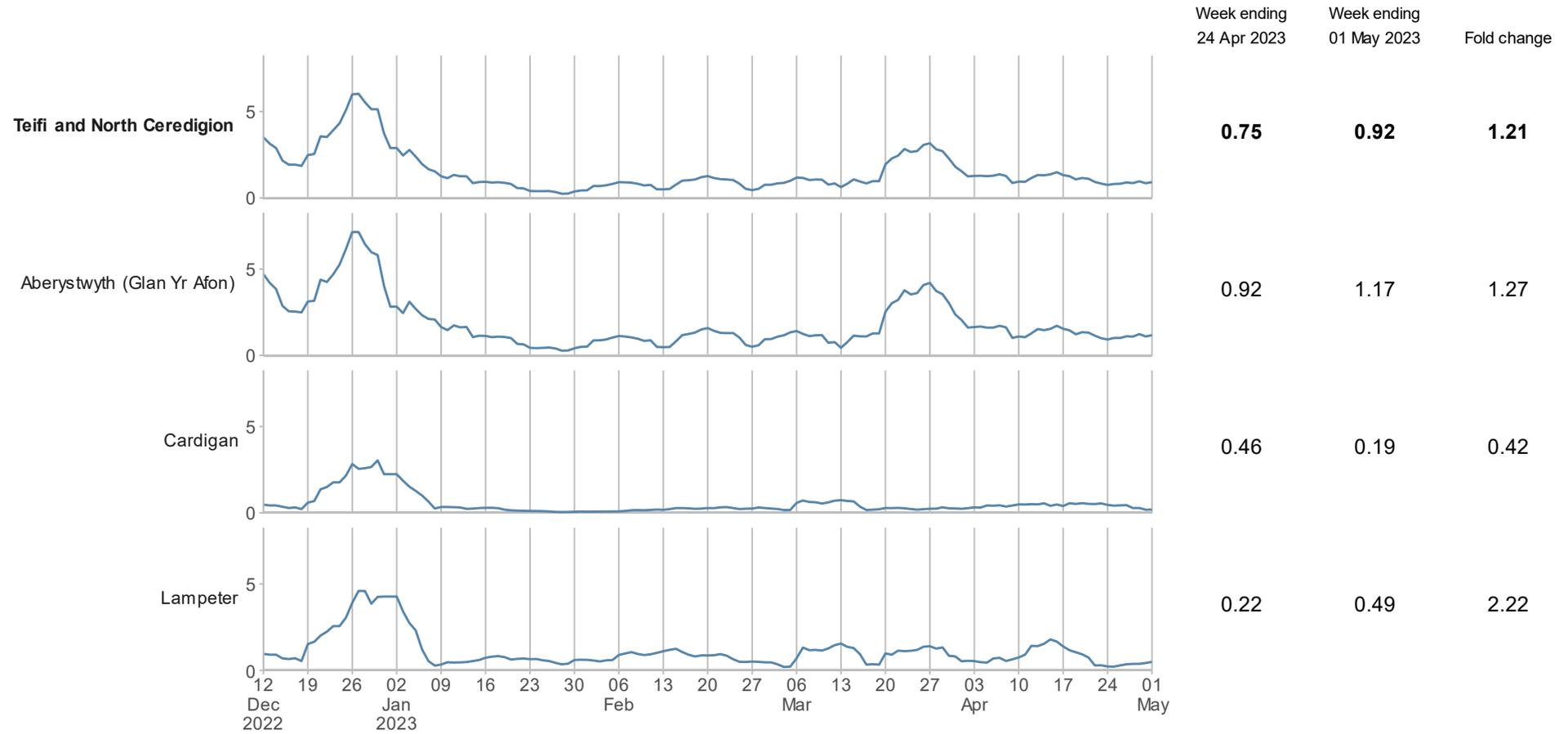


Figure 34 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 11: Usk

This section is relevant for:

Aneurin Bevan University Health Board  
Cwm Taf University Health Board

Newport  
Monmouthshire

Torfaen  
Powys County Council

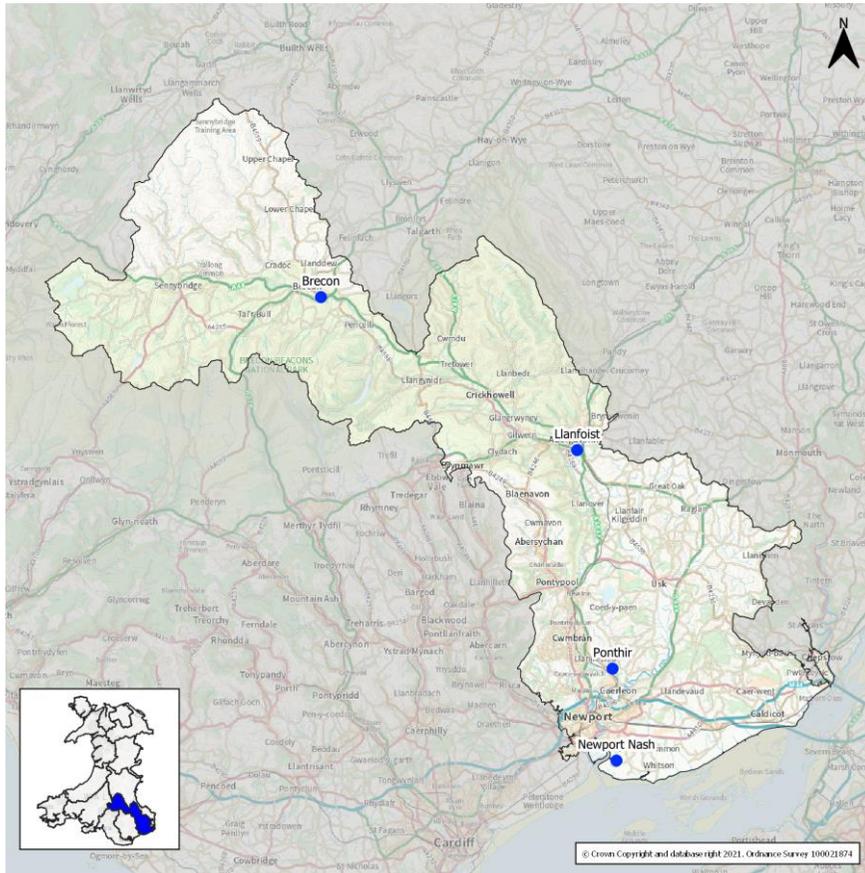


Figure 35 - Region 11 Map

### Region 11 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has increased across the region. However, the signal remained level at Llanfoist.
- No indicators were triggered during the last reporting period.
- There was one sample missing from Brecon, Llanfoist and Ponthir, and two samples missing from Newport Nash.

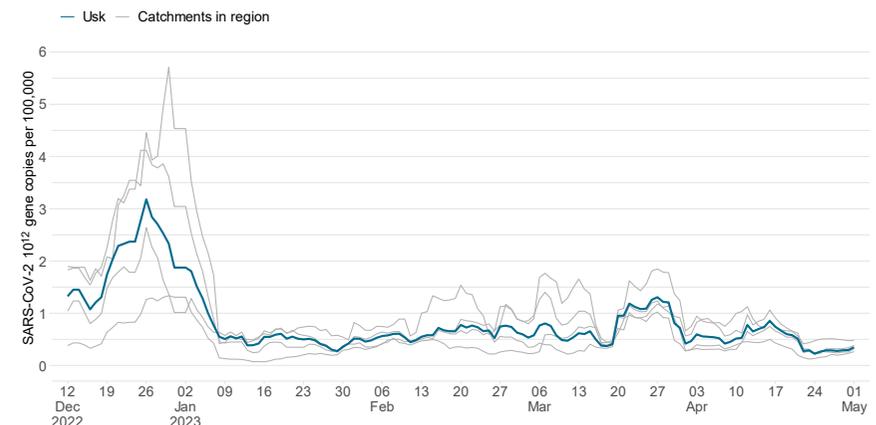


Figure 36 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

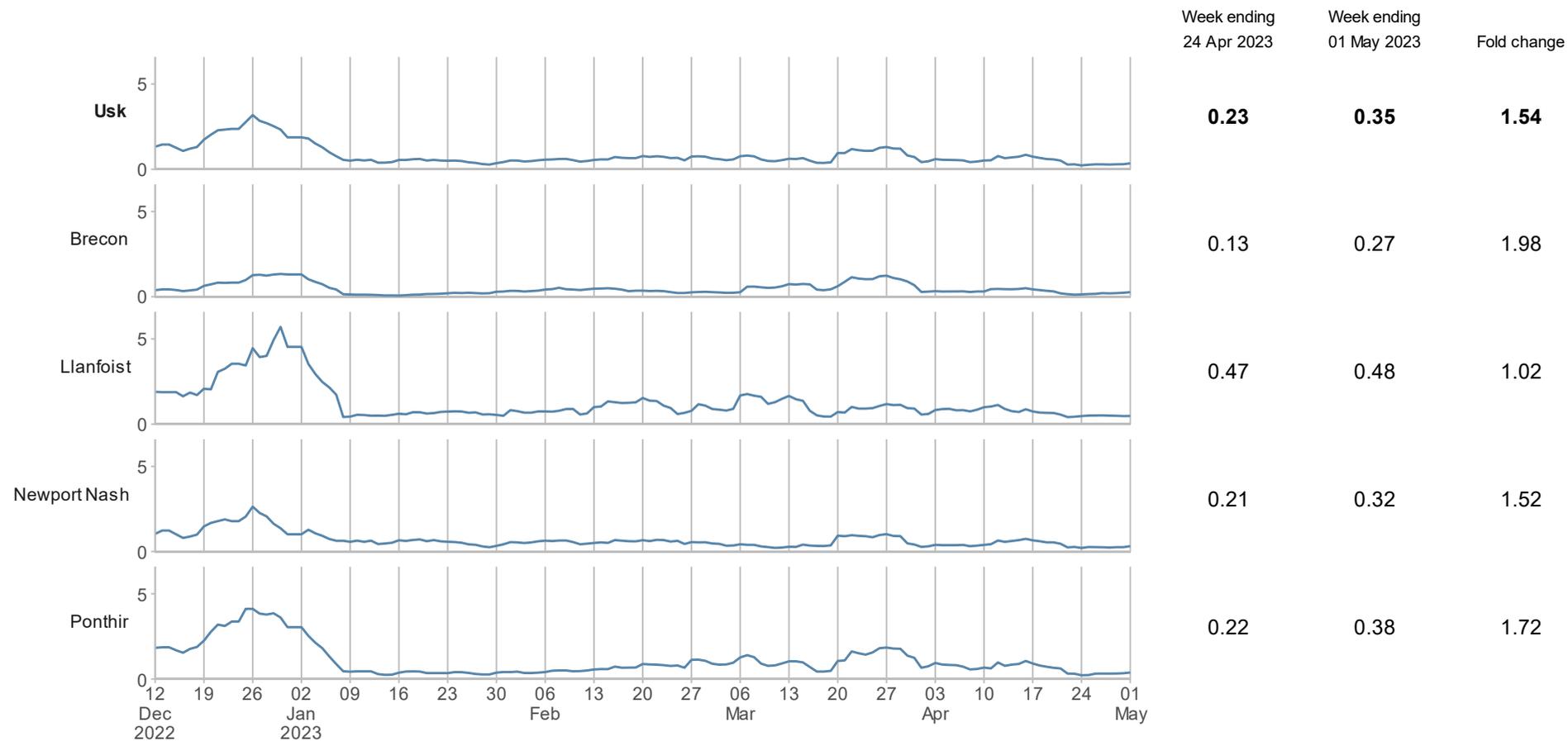


Figure 37 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 12: Wye

This section is relevant for:

Powys Teaching Health Board  
Aneurin Bevan University Health Board

Monmouthshire  
Powys

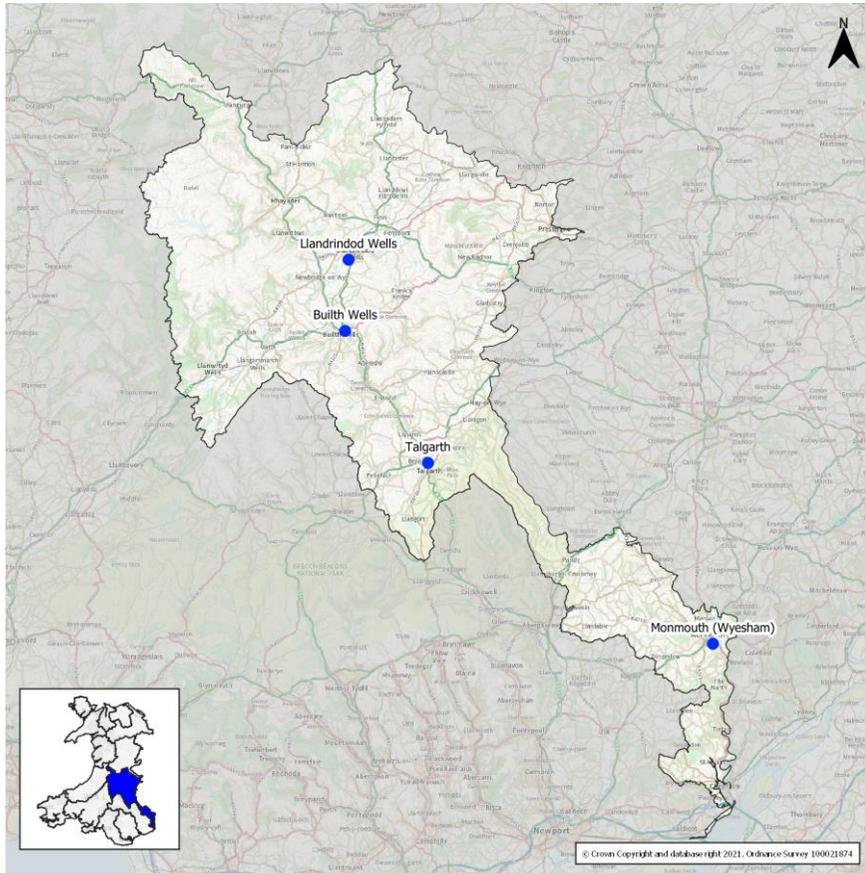


Figure 38 - Region 12 Map

### Region 12 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has increased across the region.
- The Rapid Increase indicator was triggered at Builth Wells and Llandrindod Wells during the last reporting period.
- There was one sample missing from each of the sites in the region.

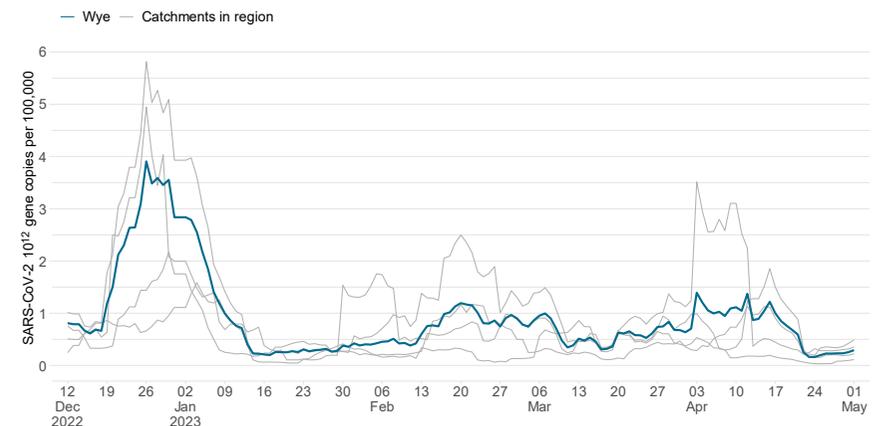


Figure 39 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

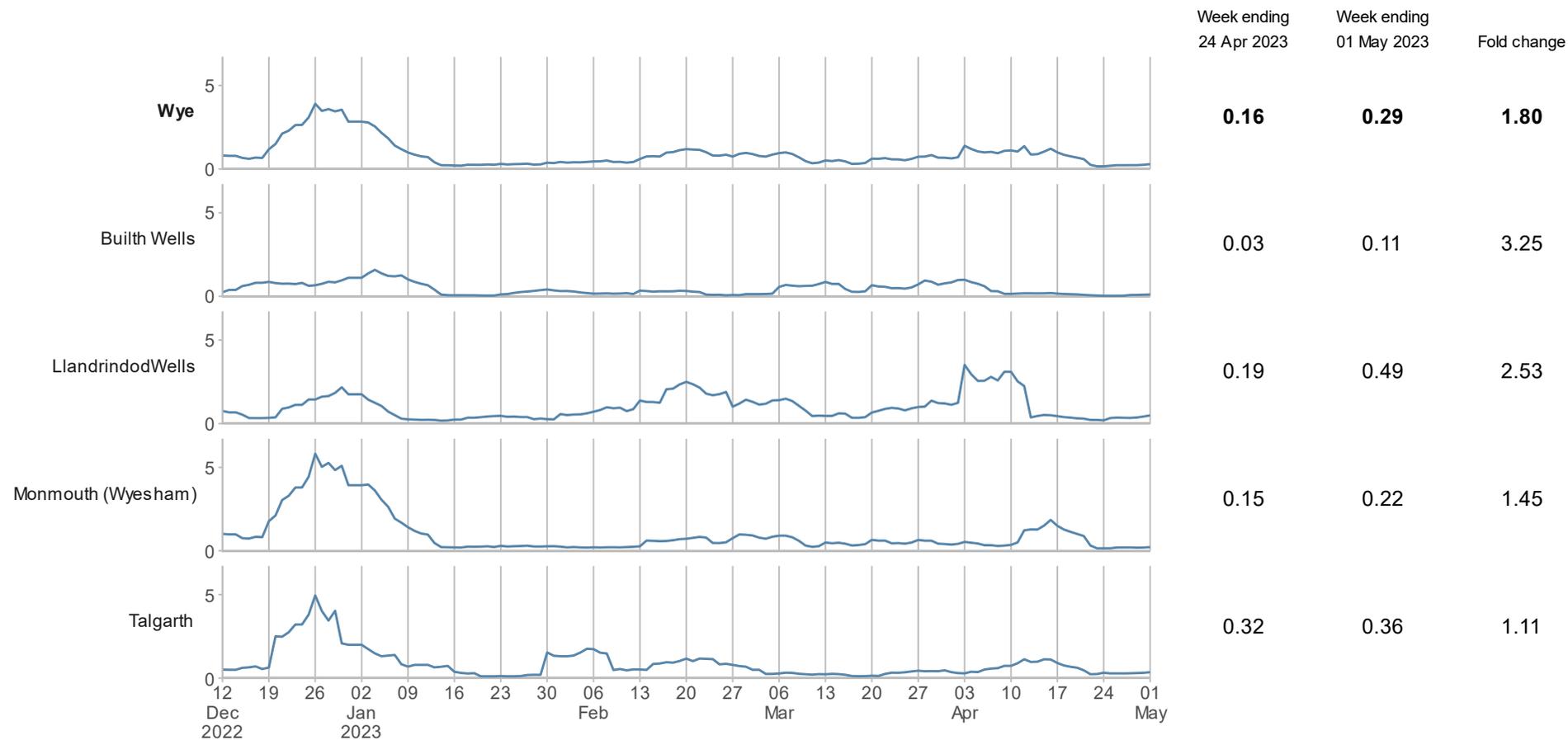


Figure 40 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 13: Ynys Môn

This section is relevant for:

Betsi Cadwaladr University Health Board

Isle of Anglesey Council

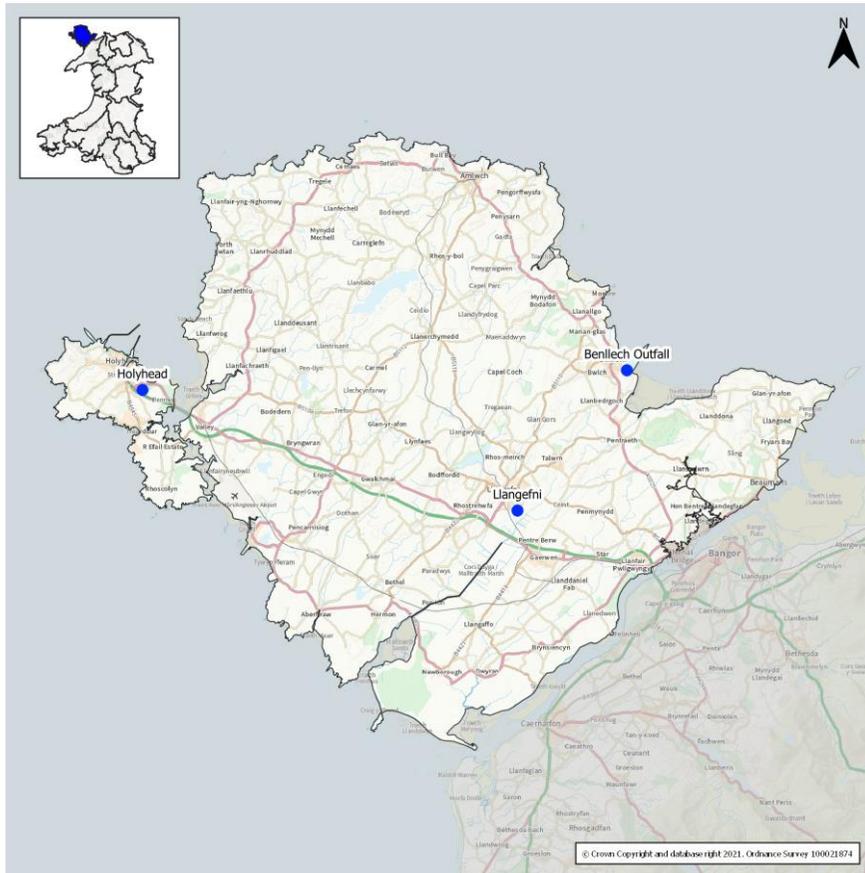


Figure 41 - Region 13 Map

### Region 13 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has increased across the region. However, the signal remained level at Holyhead.
- No indicators were triggered during the last reporting period.
- There was one sample missing from each of the sites in the region.

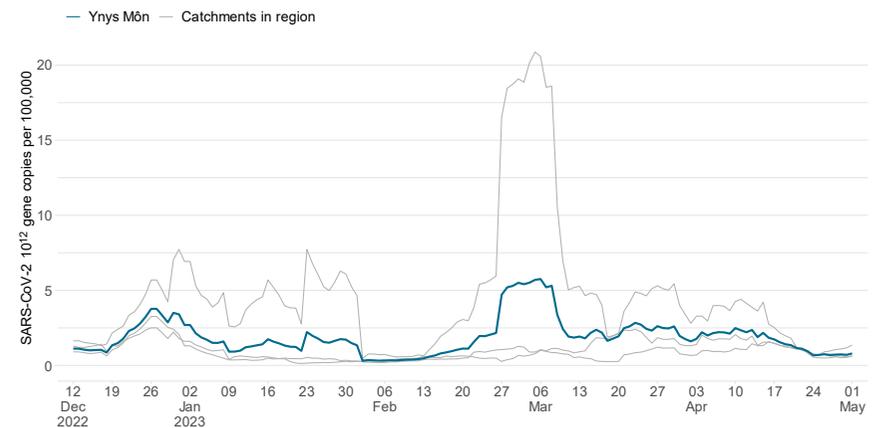


Figure 42 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

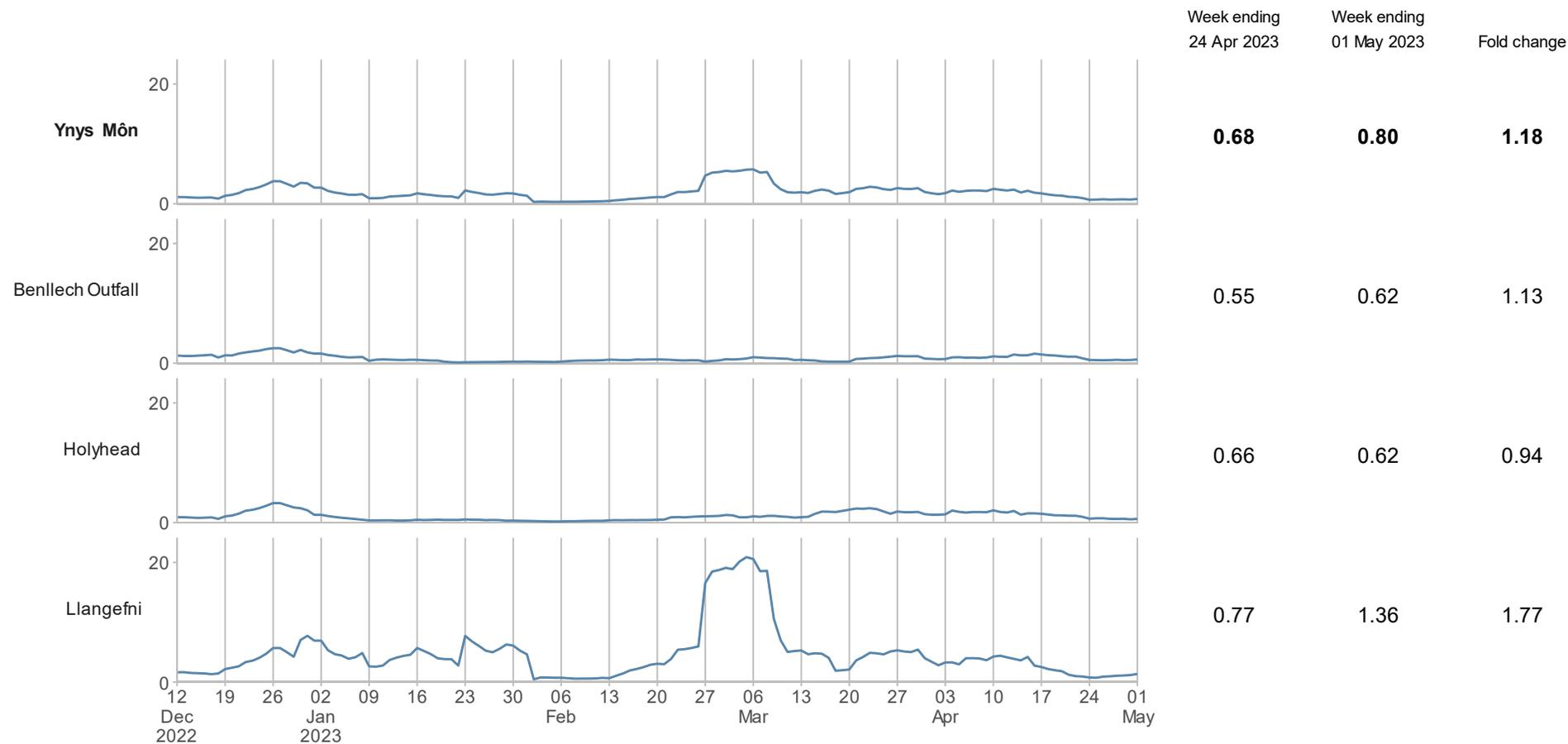


Figure 43 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Region 14: Hafren Dyfrdwy

This section is relevant for:

Powys Teaching Health Board

Powys County Council

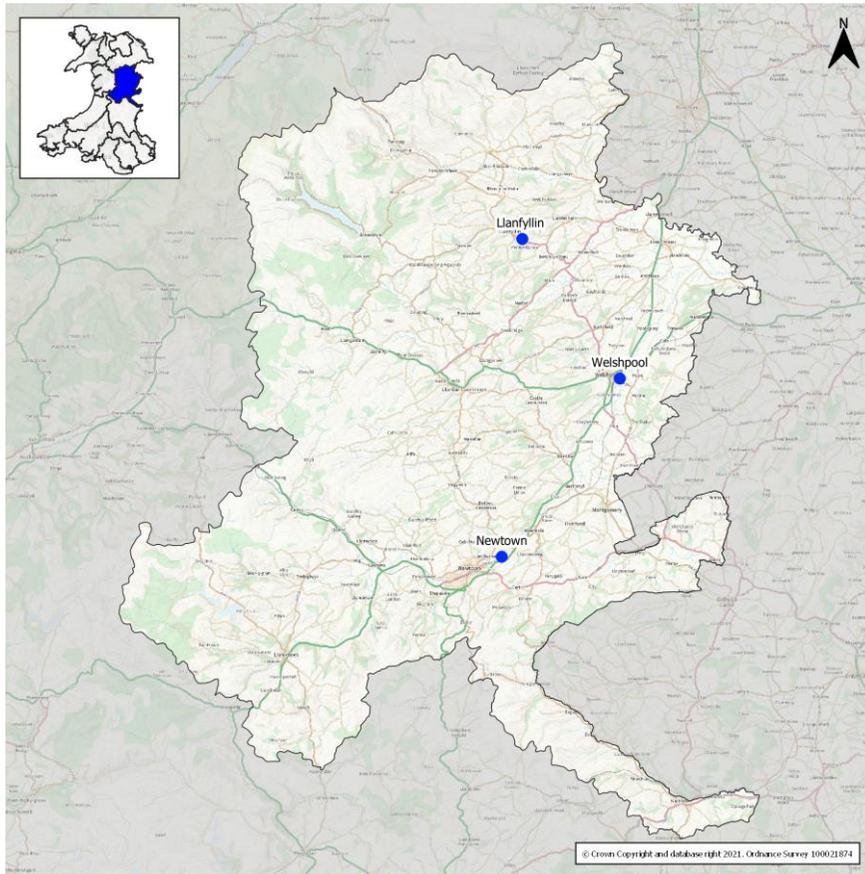


Figure 44 - Region 14 Map

### Region 14 situation report:

- Wastewater signal in the region has been unstable, with both increases and decreases over the last four weeks. However, the overall signal change in that period is a decrease.
- Compared with last week, the signal has remained level across the region. However, the signal increased at Llanfyllin and Newtown, and decreased at Welshpool.
- The Rapid Increase indicator was triggered at Llanfyllin during the last reporting period.
- There was one sample missing from each of the sites in the region.

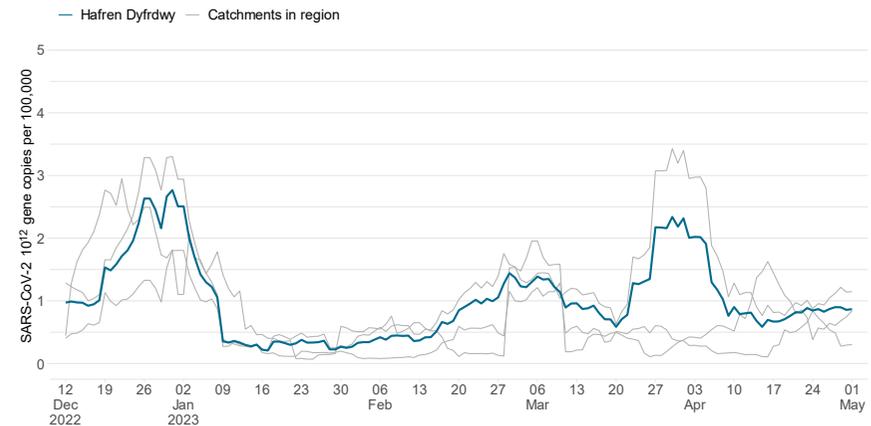


Figure 45 - Regional mean (blue lines) Site mean (grey lines) SARS-CoV-2 gc/day per 100k

### Wastewater Monitoring in Wales – Weekly Report

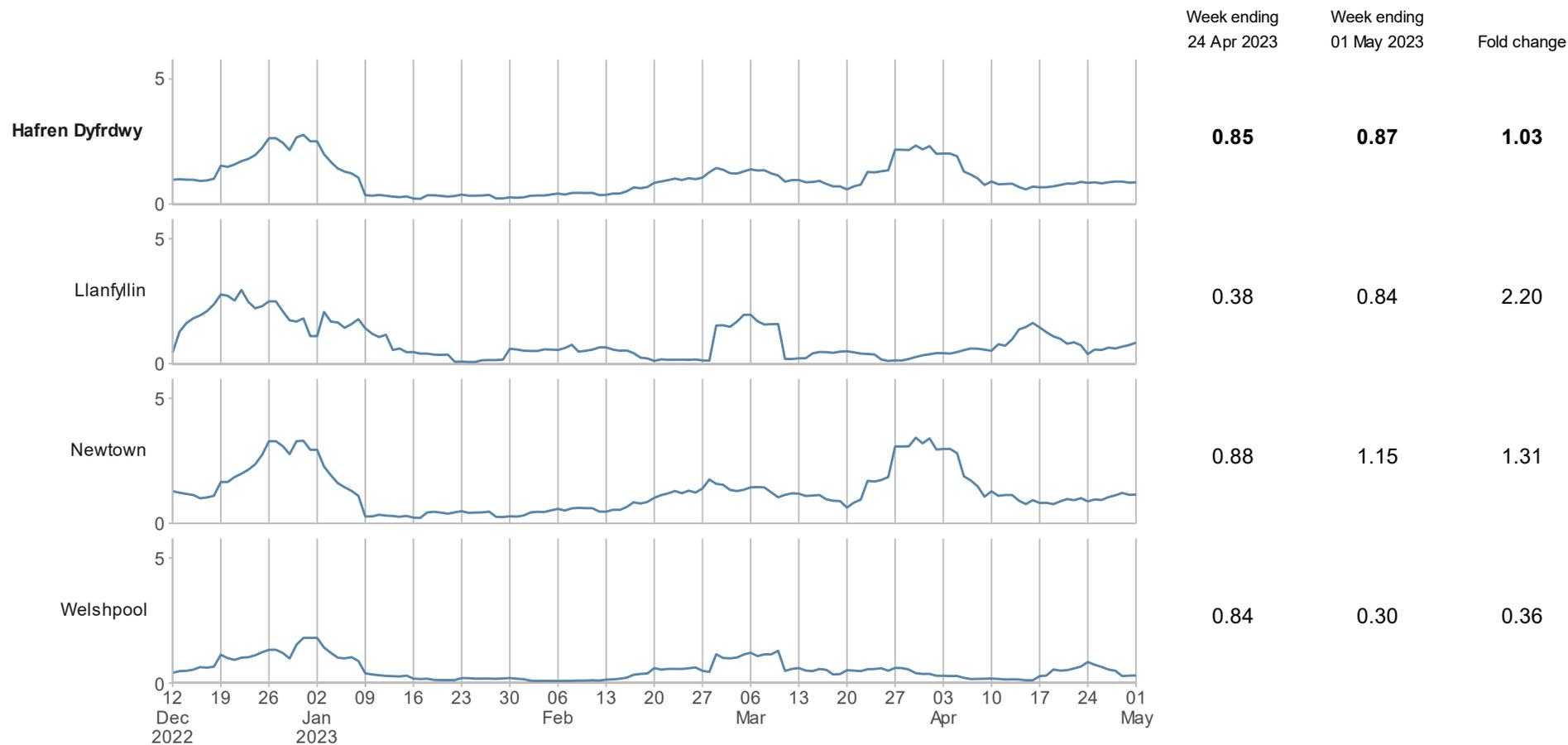


Figure 46 - Regional & Catchment trends and fold change. SARS-CoV-2 gc/day per 100k

## Appendix A – Data and Indicators

### Site Level Indicators

The following table provides site level detail on the catchment populations, indicators, normalised signal mean for the week relevant for this report and the type of sampling being undertaken (Composite, Spot or Mixed). Sites not currently monitored will have no data.

Table 2 - Site Level Indicators

| Site Name              | Region                                   | Catchment Population | High Signal Level | Rapid Increase | Increasing Signal Level | SARS-CoV-2 weekly mean, gc/day per 100k | Sampling Type | Successful Samples (Number / Total Samples) |
|------------------------|--|----------------------|-------------------|----------------|-------------------------|---|---------------|---|
| Garnswllt              | Carmarthen Bay and the Gower             | 28,151               | 0                 | 0              | 0                       | 0.40                                    | Composite     | 4/5   |
| Gowerton               | Carmarthen Bay and the Gower             | 52,162               | 0                 | 1              | 0                       | 0.82                                    | Composite     | 4/5   |
| Llanelli Coastal       | Carmarthen Bay and the Gower             | 52,059               | 0                 | 0              | 0                       | 0.42                                    | Composite     | 4/5   |
| Parc-Y-Splott          | Carmarthen Bay and the Gower             | 17,308               | 0                 | 0              | 0                       | 1.12                                    | Composite     | 4/5   |
| Fishguard              | Cleddau and Pembrokeshire Coastal Rivers | 5,499                | 0                 | 1              | 0                       | 0.43                                    | Composite     | 4/5   |
| Merlins Bridge         | Cleddau and Pembrokeshire Coastal Rivers | 15,366               | 0                 | 0              | 0                       | 0.73                                    | Composite     | 4/5   |
| Pembroke Dock          | Cleddau and Pembrokeshire Coastal Rivers | 16,726               | 0                 | 0              | 0                       | 0.20                                    | Mixed         | 4/5   |
| Tenby                  | Cleddau and Pembrokeshire Coastal Rivers | 9,727                | 0                 | 0              | 0                       | 0.50                                    | Mixed         | 4/5   |
| Kinmel Bay             | Clwyd                                    | 48,234               | 0                 | 0              | 0                       | 1.08                                    | Composite     | 4/5   |
| Ruthin                 | Clwyd                                    | 5,041                | 0                 | 0              | 0                       | 0.64                                    | Composite     | 4/5   |
| Betws-Y-Coed           | Conwy                                    | 419                  | 0                 | 0              | 0                       | 1.42                                    | Composite     | 4/5   |
| Ganol                  | Conwy                                    | 67,101               | 0                 | 0              | 0                       | 1.16                                    | Composite     | 4/5   |
| Bala                   | Dee                                      | 2,054                | 0                 | 0              | 0                       | 1.86                                    | Composite     | 4/5   |
| Five Fords (Wrexham)   | Dee                                      | 93,434               | 0                 | 0              | 0                       | 1.44                                    | Composite     | 4/5   |
| Llanasa (Nr Prestatyn) | Dee                                      | 22,066               | 0                 | 0              | 0                       | 1.24                                    | Composite     | 4/5   |

| Site Name                  | Region                     | Catchment Population | High Signal Level | Rapid Increase | Increasing Signal Level | SARS-CoV-2 weekly mean, gc/day per 100k | Sampling Type | Successful Samples (Number / Total Samples) |
|----------------------------|----------------------------|----------------------|-------------------|----------------|-------------------------|---|---------------|---|
| Queensferry                | Dee                        | 29,503               | 0                 | 0              | 0                       | 1.39                                    | Composite     | 4/5   |
| Bangor Treborth            | Llŷn and Eryri             | 25,945               | 0                 | 0              | 0                       | 0.94                                    | Composite     | 4/5   |
| Bethesda                   | Llŷn and Eryri             | 4,721                | 0                 | 0              | 0                       | 0.28                                    | Composite     | 4/5   |
| Porthmadog                 | Llŷn and Eryri             | 2,908                | 0                 | 0              | 0                       | 0.80                                    | Composite     | 4/5   |
| Pwllheli                   | Llŷn and Eryri             | 4,714                | 0                 | 0              | 0                       | 0.68                                    | Composite     | 4/5   |
| Dolgellau                  | Meirionnydd                | 2,431                | 0                 | 0              | 0                       | 1.09                                    | Composite     | 4/5   |
| Machynlleth                | Meirionnydd                | 2,158                | 0                 | 1              | 0                       | 2.57                                    | Composite     | 4/5   |
| Tywyn                      | Meirionnydd                | 3,363                | 0                 | 1              | 0                       | 2.21                                    | Composite     | 4/5   |
| Cardiff Bay                | South East Valleys         | 612,002              | 0                 | 0              | 0                       | 0.30                                    | Composite     | 4/5   |
| Cilfynydd                  | South East Valleys         | 61,721               | 0                 | 0              | 0                       | 0.41                                    | Composite     | 4/5   |
| Cog Moors (Dinas Powys)    | Tawe to Cadoxton           | 204,292              | 0                 | 0              | 0                       | 0.44                                    | Composite     | 4/5   |
| Lletty Brongu (Nr Maesteg) | Tawe to Cadoxton           | 19,375               | 0                 | 0              | 0                       | 0.49                                    | Composite     | 4/5   |
| Pen-Y-Bont (Merthyr Mawr)  | Tawe to Cadoxton           | 118,106              | 0                 | 0              | 0                       | 0.35                                    | Composite     | 4/5   |
| Swansea Bay                | Tawe to Cadoxton           | 168,225              | 0                 | 0              | 0                       | 0.49                                    | Composite     | 4/5   |
| Ystradgynlais              | Tawe to Cadoxton           | 10,532               | 0                 | 0              | 0                       | 0.36                                    | Composite     | 4/5   |
| Aberystwyth (Glan Yr Afon) | Teifi and North Ceredigion | 18,026               | 0                 | 0              | 0                       | 1.17                                    | Composite     | 4/5   |
| Cardigan                   | Teifi and North Ceredigion | 4,509                | 0                 | 0              | 0                       | 0.19                                    | Composite     | 4/5   |
| Lampeter                   | Teifi and North Ceredigion | 3,046                | 0                 | 1              | 0                       | 0.49                                    | Composite     | 4/5   |
| Brecon                     | Usk                        | 8,172                | 0                 | 0              | 0                       | 0.27                                    | Composite     | 4/5   |
| Llanfoist                  | Usk                        | 14,830               | 0                 | 0              | 0                       | 0.48                                    | Composite     | 4/5   |

| Site Name          | Region         | Catchment Population | High Signal Level | Rapid Increase | Increasing Signal Level | SARS-CoV-2 weekly mean, gc/day per 100k | Sampling Type | Successful Samples (Number / Total Samples) |
|--------------------|----------------|----------------------|-------------------|----------------|-------------------------|---|---------------|---|
| Newport Nash       | Usk            | 164,985              | 0                 | 0              | 0                       | 0.32                                    | Mixed         | 3/5   |
| Ponthir            | Usk            | 91,460               | 0                 | 0              | 0                       | 0.38                                    | Composite     | 4/5   |
| Builth Wells       | Wye            | 2,554                | 0                 | 1              | 0                       | 0.11                                    | Mixed         | 4/5   |
| Llandrindod Wells  | Wye            | 5,650                | 0                 | 1              | 0                       | 0.49                                    | Composite     | 4/5   |
| Monmouth (Wyesham) | Wye            | 10,817               | 0                 | 0              | 0                       | 0.22                                    | Composite     | 4/5   |
| Talgarth           | Wye            | 1,508                | 0                 | 0              | 0                       | 0.36                                    | Composite     | 4/5   |
| Benllech Outfall   | Ynys Môn       | 2,605                | 0                 | 0              | 0                       | 0.62                                    | Composite     | 4/5   |
| Holyhead           | Ynys Môn       | 15,719               | 0                 | 0              | 0                       | 0.62                                    | Composite     | 4/5   |
| Llangefni          | Ynys Môn       | 5,824                | 0                 | 0              | 0                       | 1.36                                    | Composite     | 4/5   |
| Llanfyllin         | Hafren Dyfrdwy | 629                  | 0                 | 1              | 0                       | 0.84                                    | Composite     | 4/5   |
| Newtown            | Hafren Dyfrdwy | 10,184               | 0                 | 0              | 0                       | 1.15                                    | Composite     | 4/5   |
| Welshpool          | Hafren Dyfrdwy | 5,022                | 0                 | 0              | 0                       | 0.30                                    | Composite     | 4/5   |

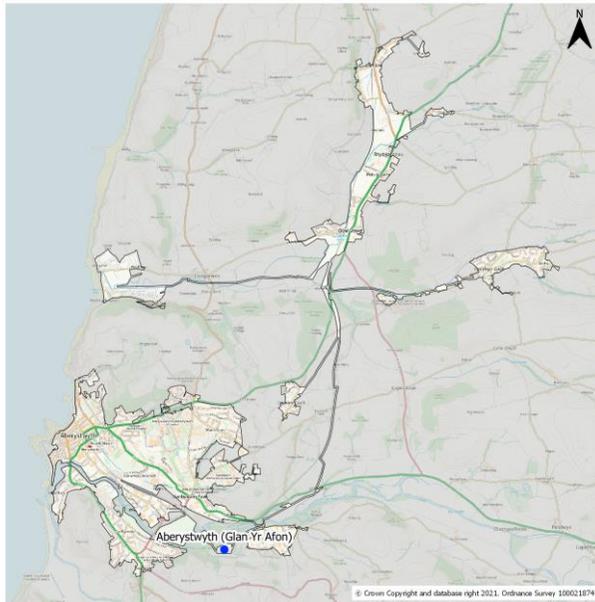
“-“ Indicates where no data is available. This could be as a result of no samples being taken or missing metadata.

“Mixed” is used to indicate the weekly mean is made up of both spot and composite samples.

# Appendix B – Sewer Catchment Maps

The maps featured in this report may not be used or reproduced without permission from our relevant partners, Dŵr Cymru and Hafren Dyfrdwy.

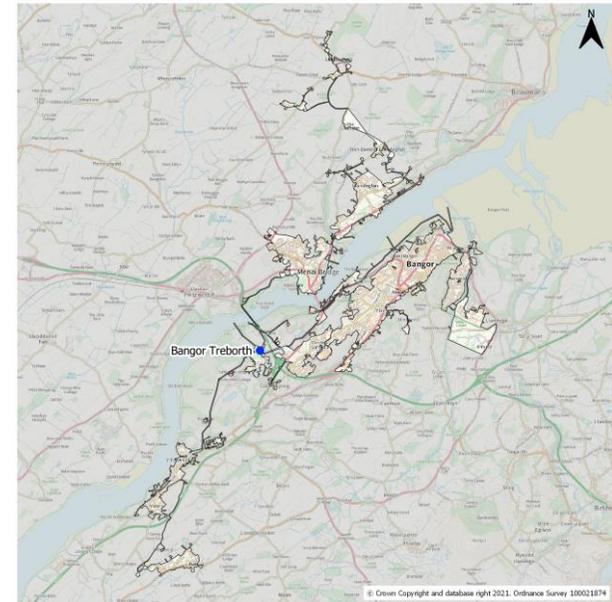
Maps are reproduced in alphabetical order and have been provided to give context to the physical sewer areas of the monitored wastewater catchments used in this report.



Aberystwyth (Glan Yr Afon)



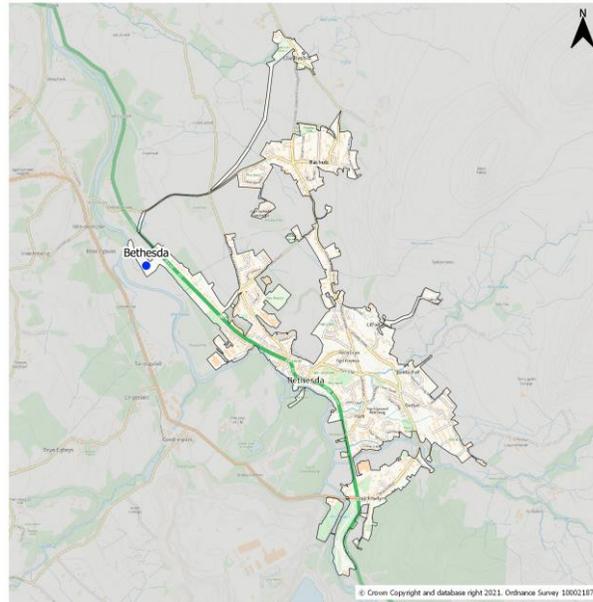
Bala



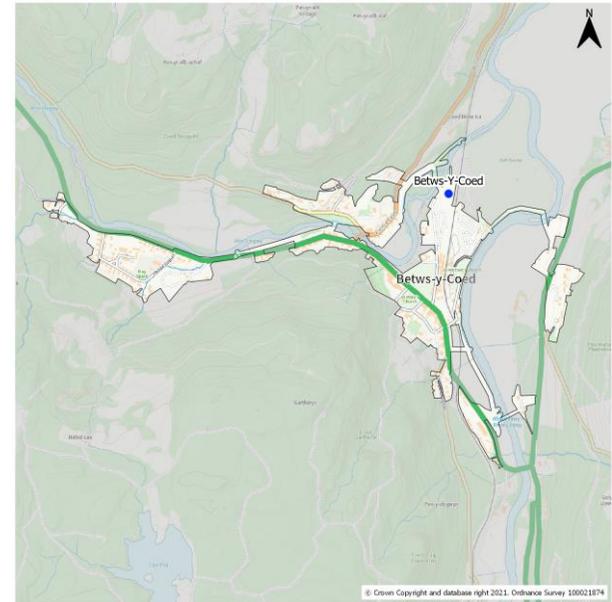
Bangor Treborth



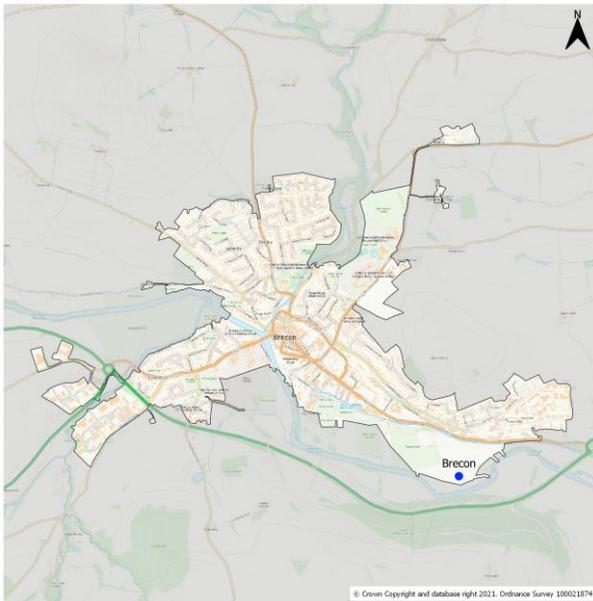
**Benllech Outfall**



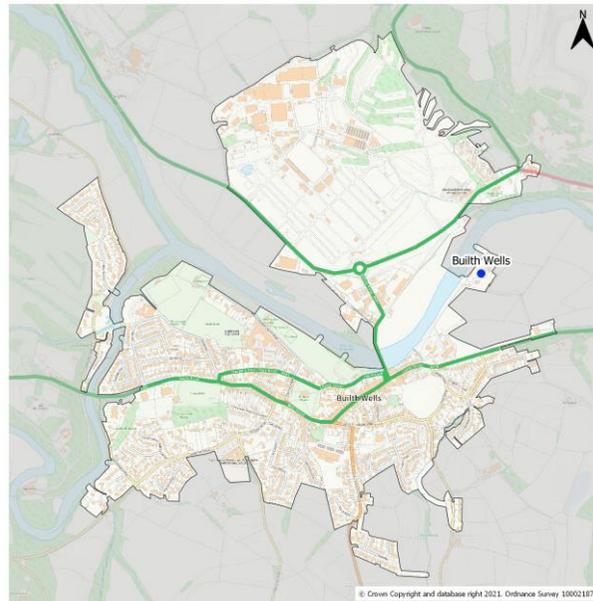
**Bethesda**



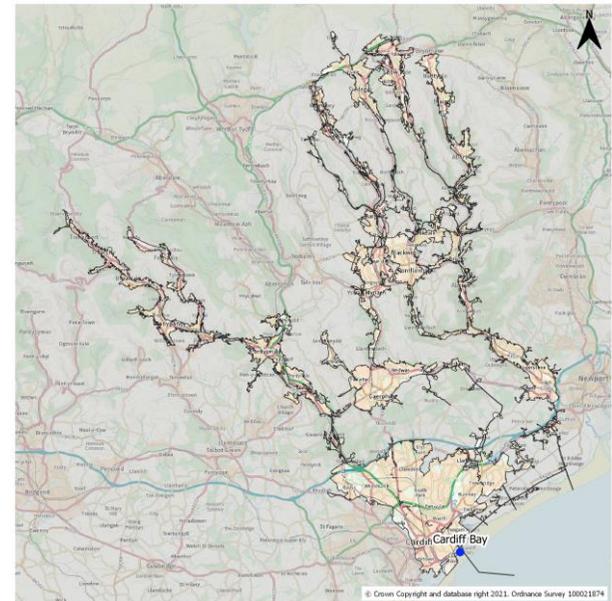
**Betws-Y-Coed**



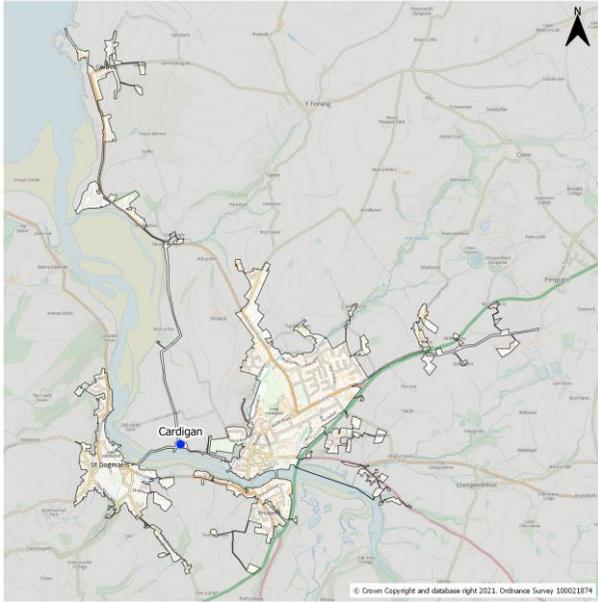
**Brecon**



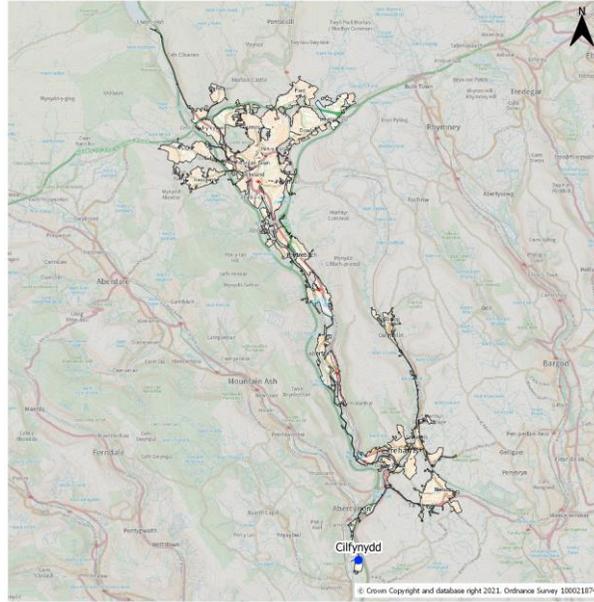
**Builth Wells**



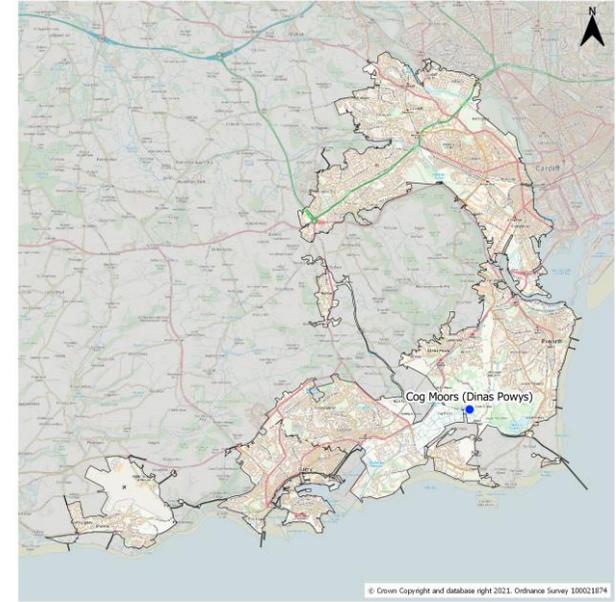
**Cardiff Bay**



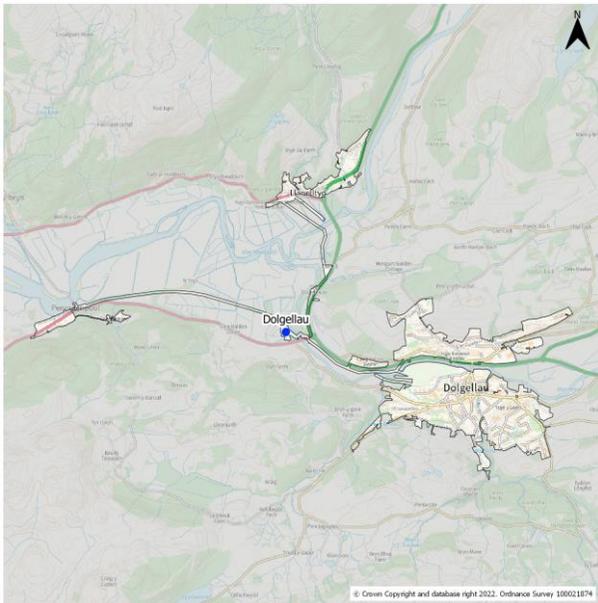
Cardigan



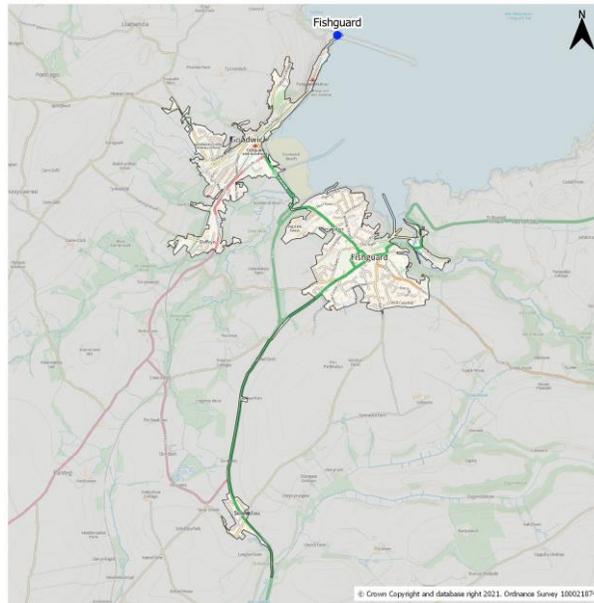
Cilfynydd



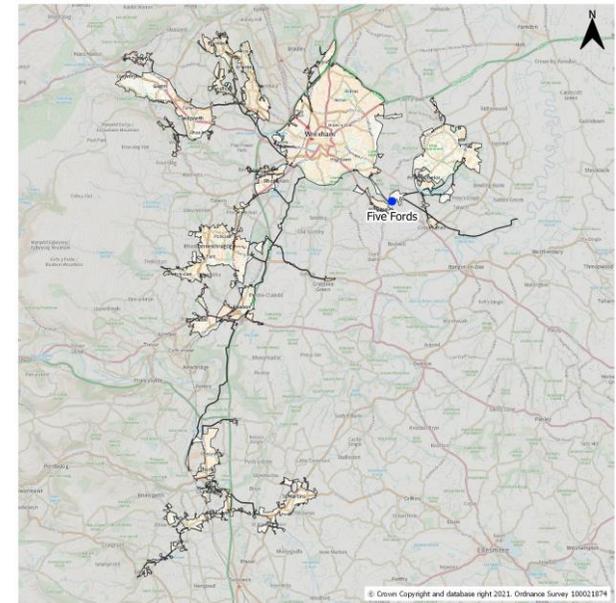
Cog Moors (Dinas Powys)



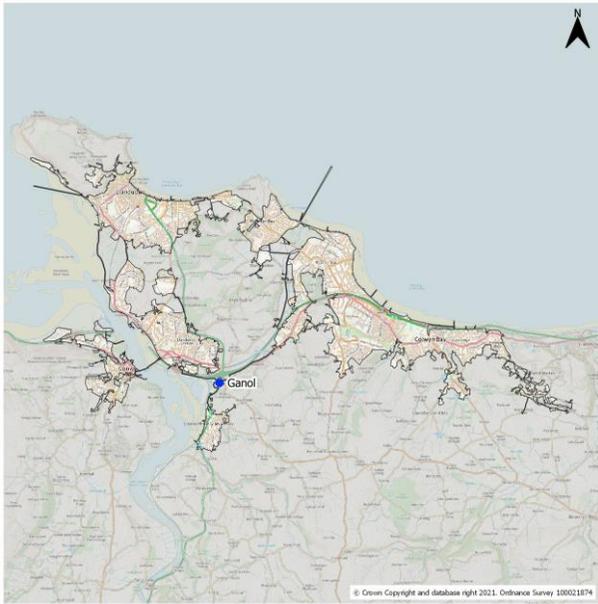
Dolgellau



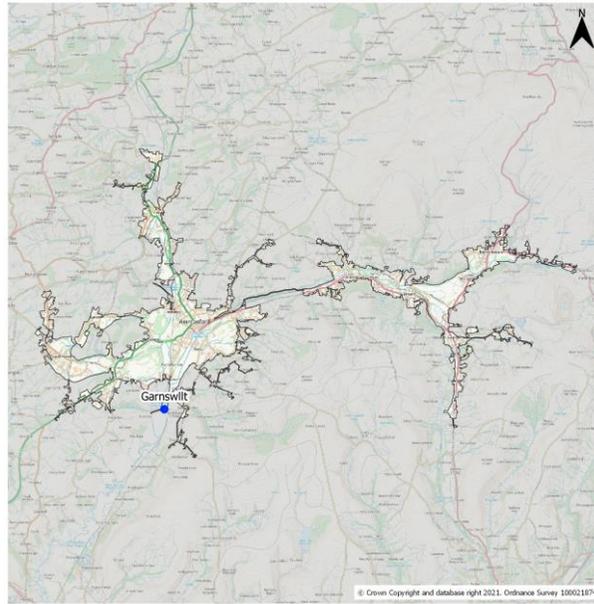
Fishguard



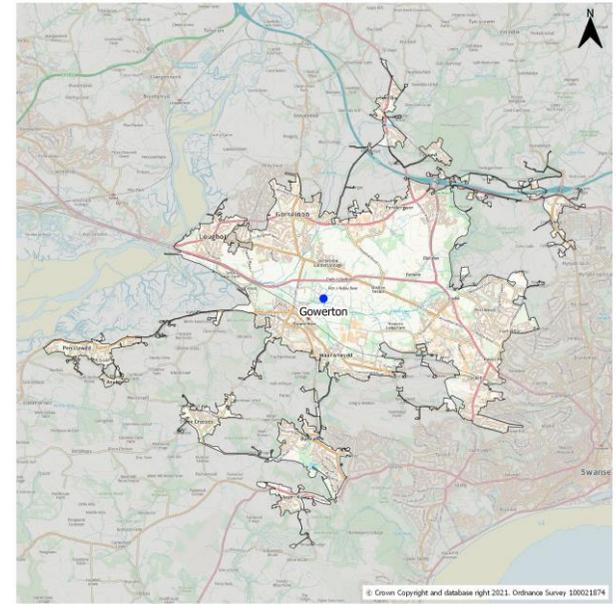
Five Fords (Wrexham)



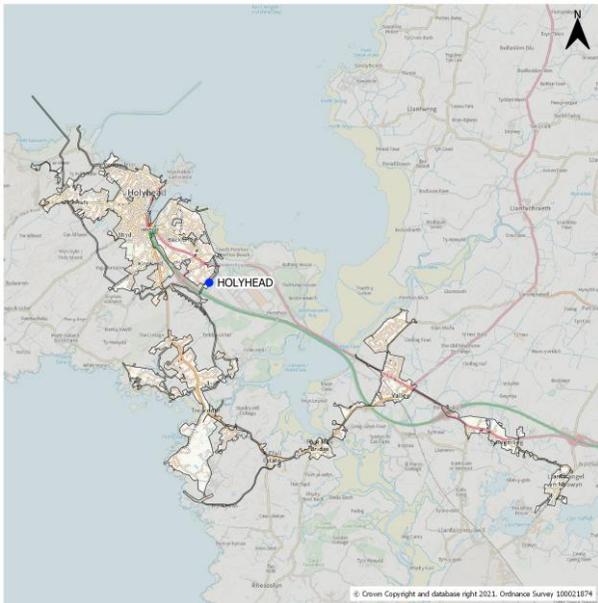
Ganol



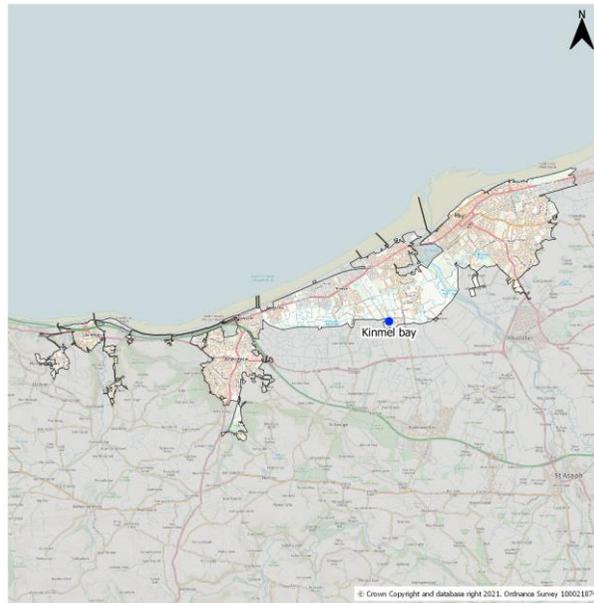
Garnswilt



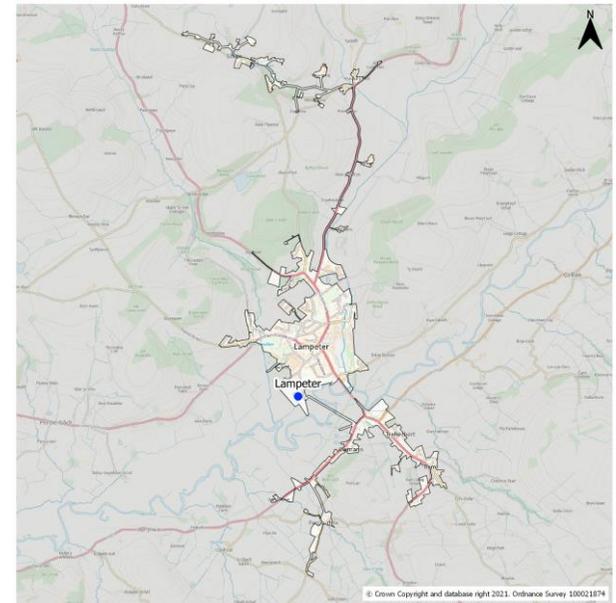
Gowerton



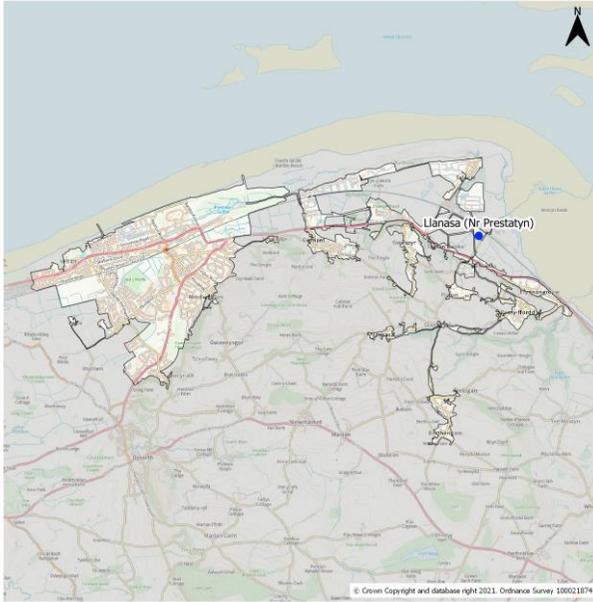
Holyhead



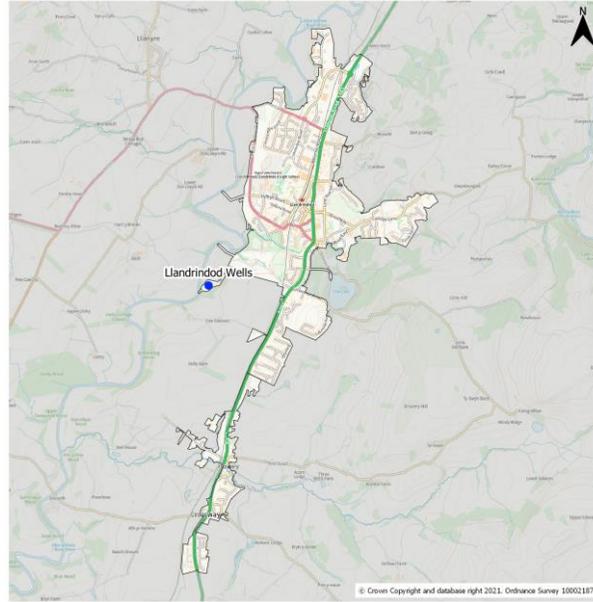
Kinmel Bay



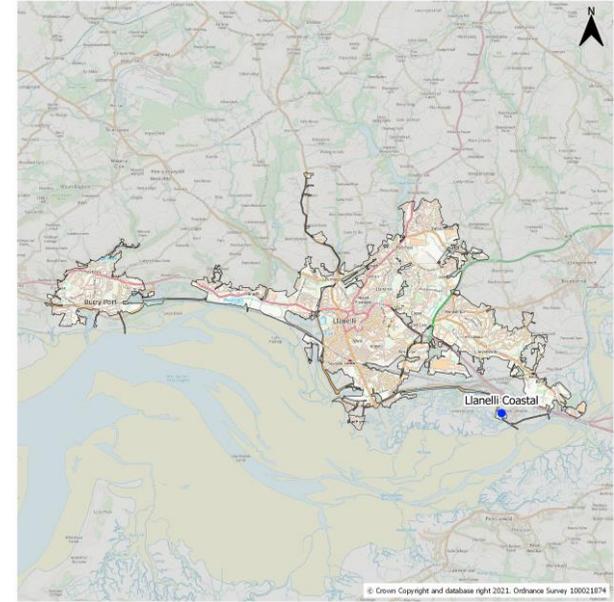
Lampeter



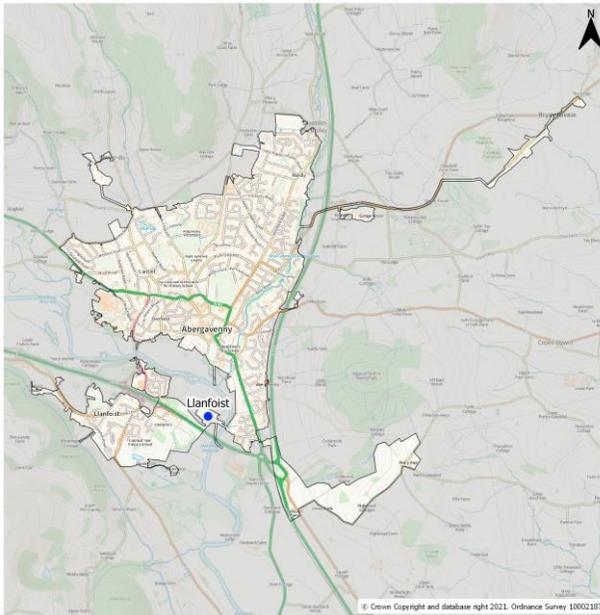
Llanasa (Nr Prestatyn)



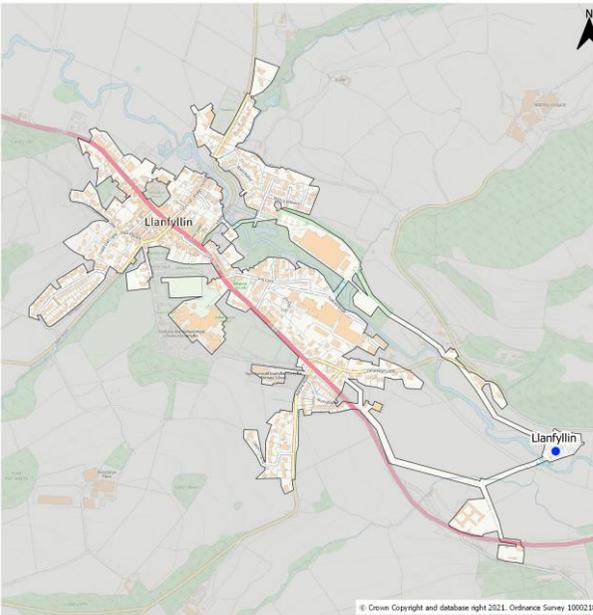
Llandrindod Wells



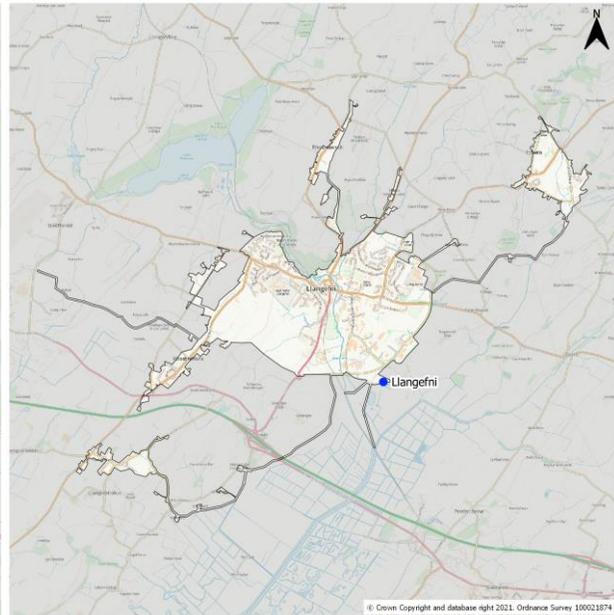
Llanelli Coastal



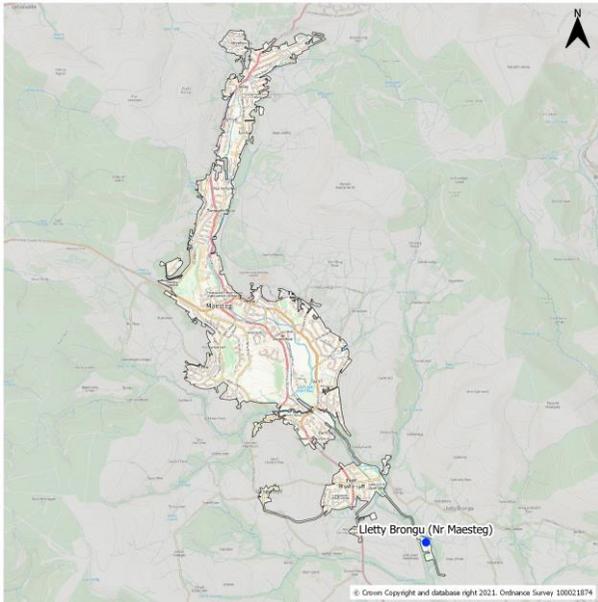
Llanfoist



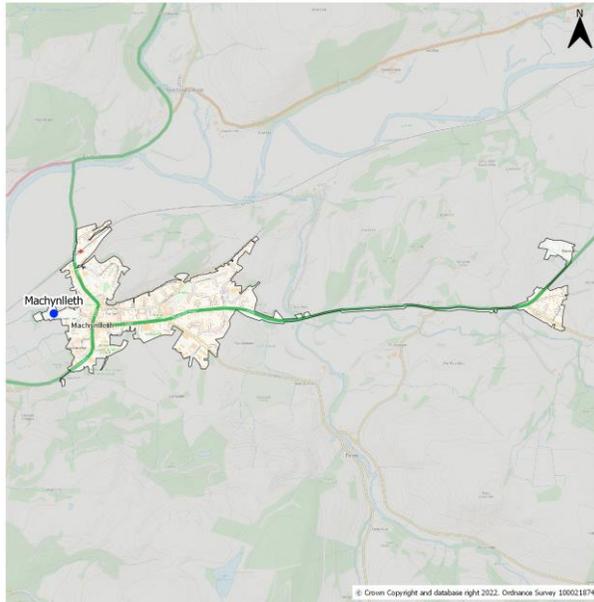
Llanfyllin



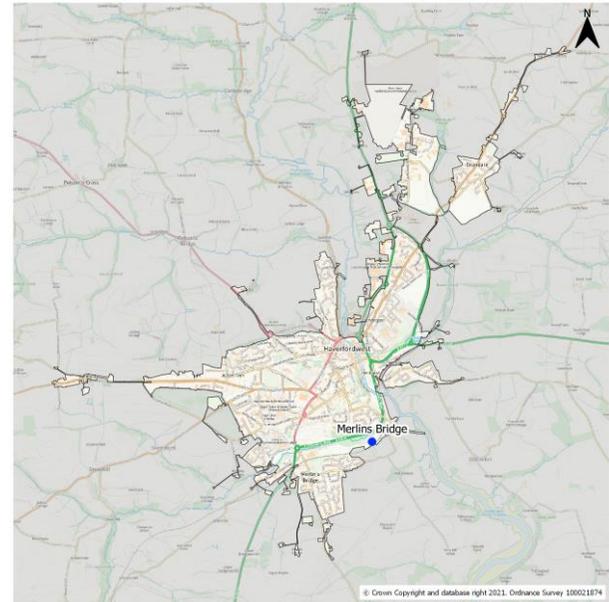
Llangefni



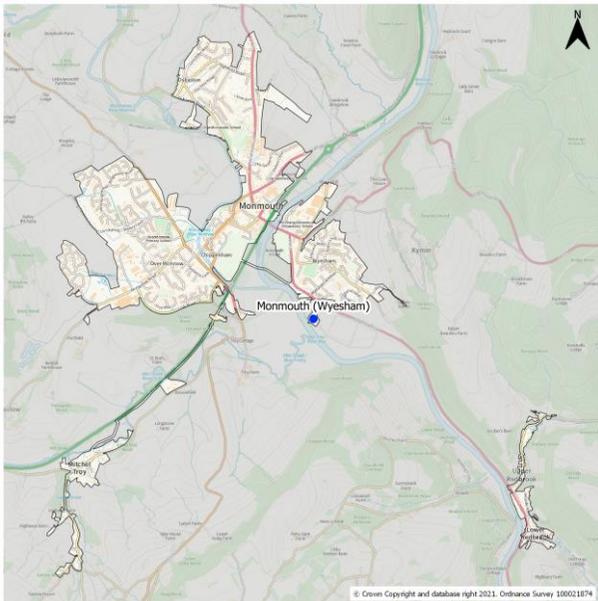
**Letty Brongu (Nr Maesteg)**



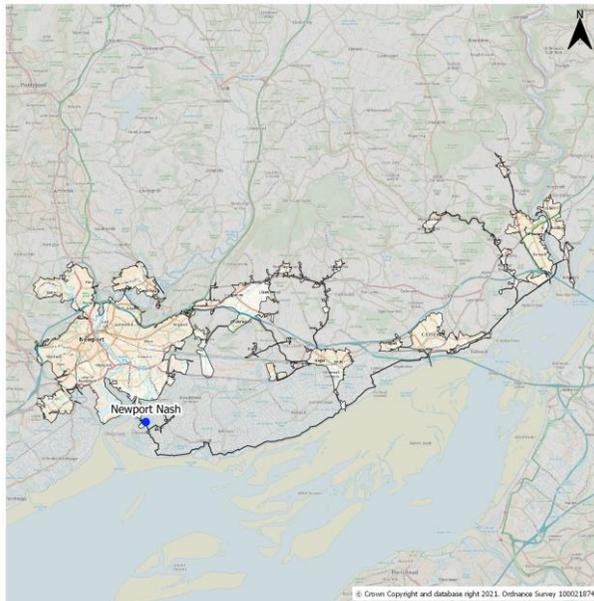
**Machynlleth**



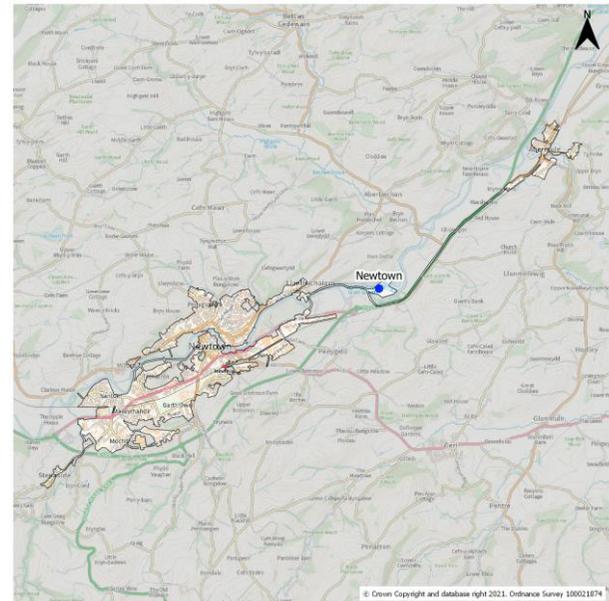
**Merlins Bridge**



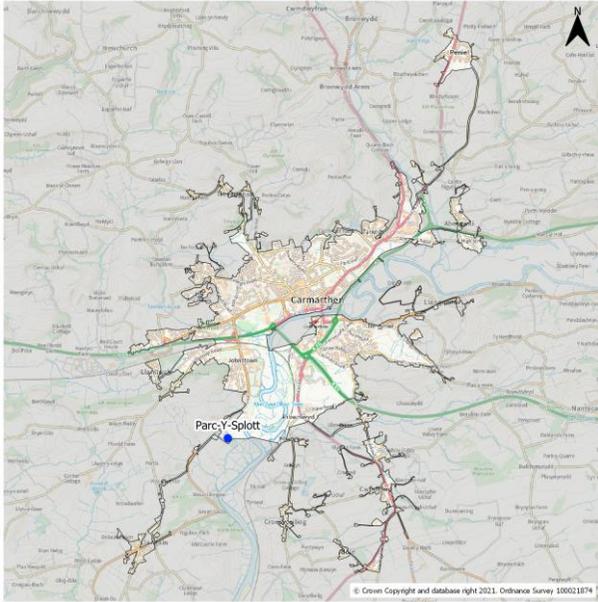
**Monmouth (Wyesham)**



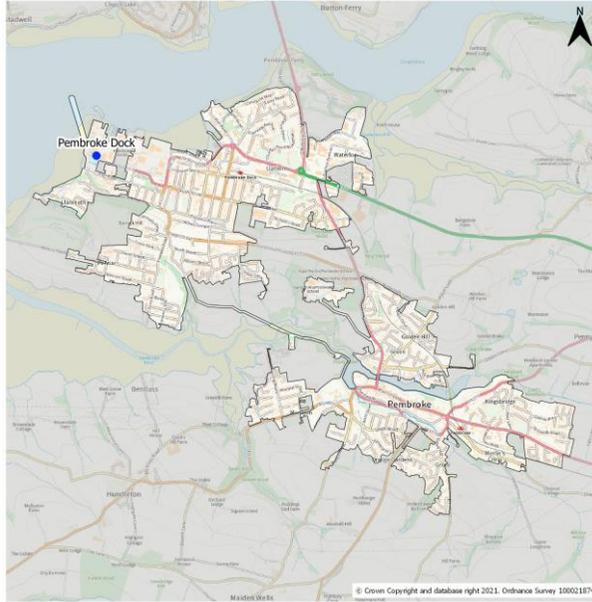
**Newport Nash**



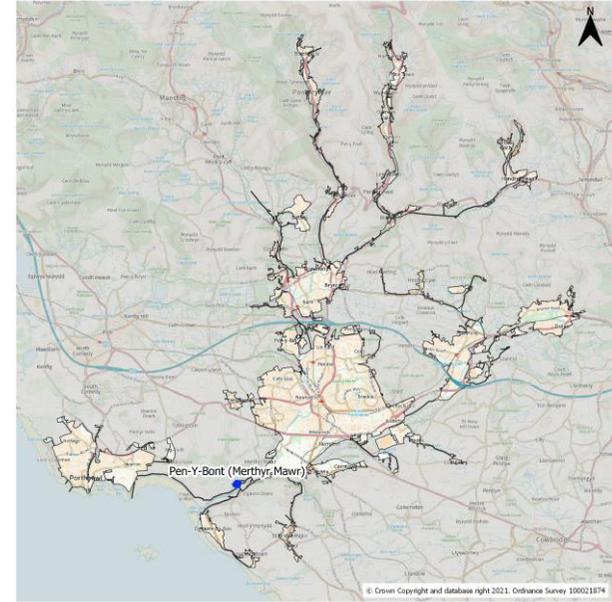
**Newtown**



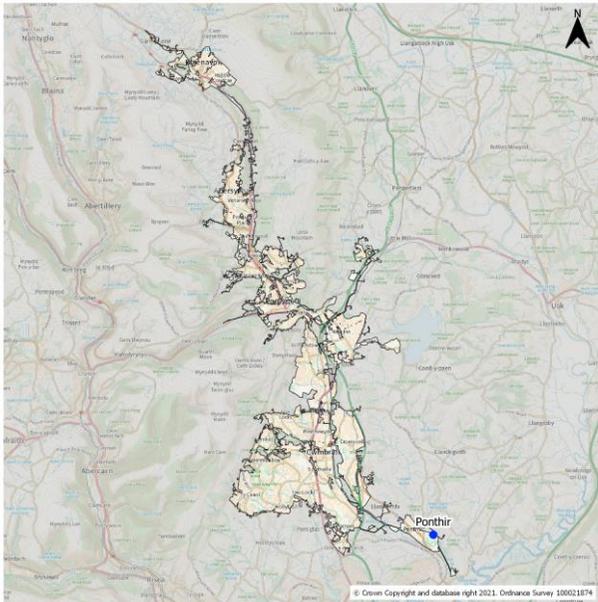
Parc-Y-Splott



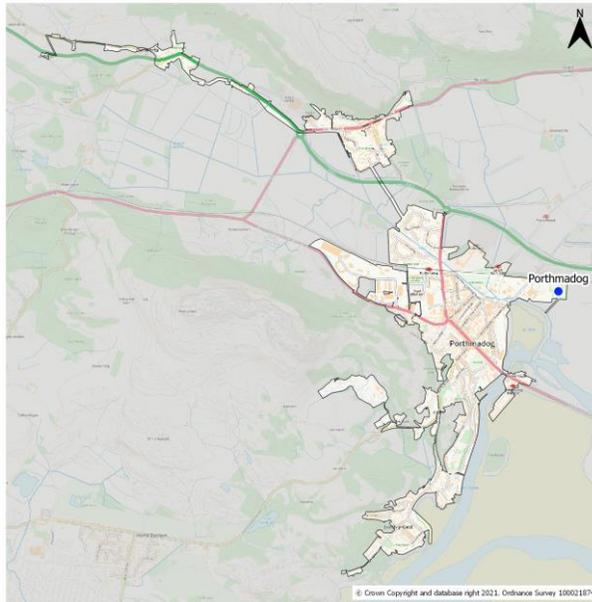
Pembroke Dock



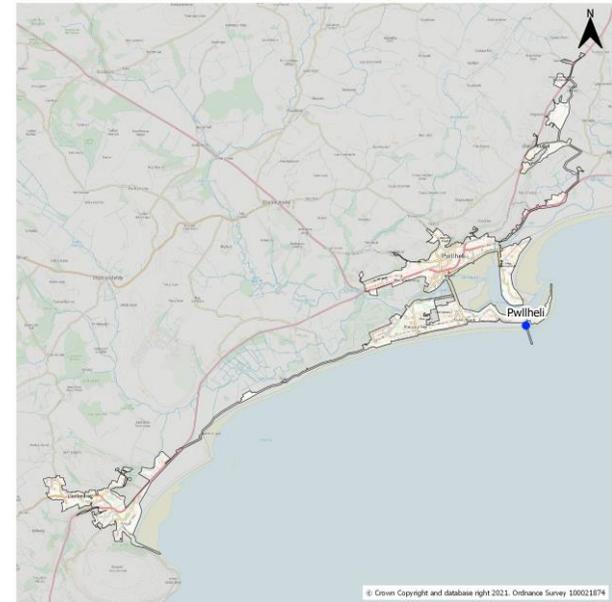
Pen-Y-Bont (Merthyr Mawr)



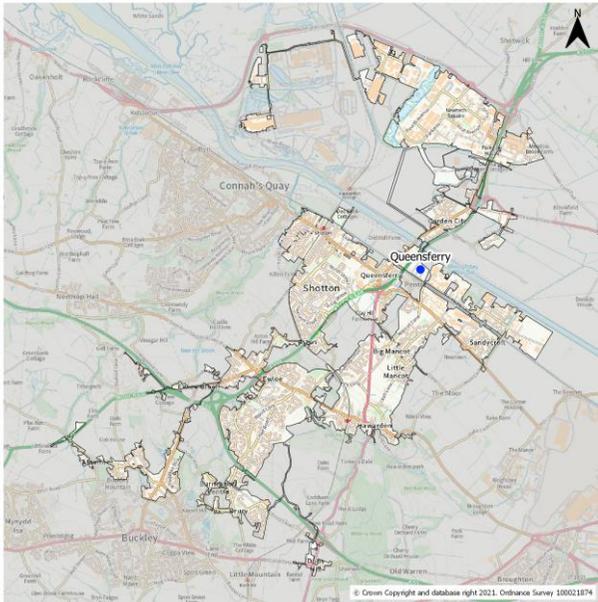
Ponthir



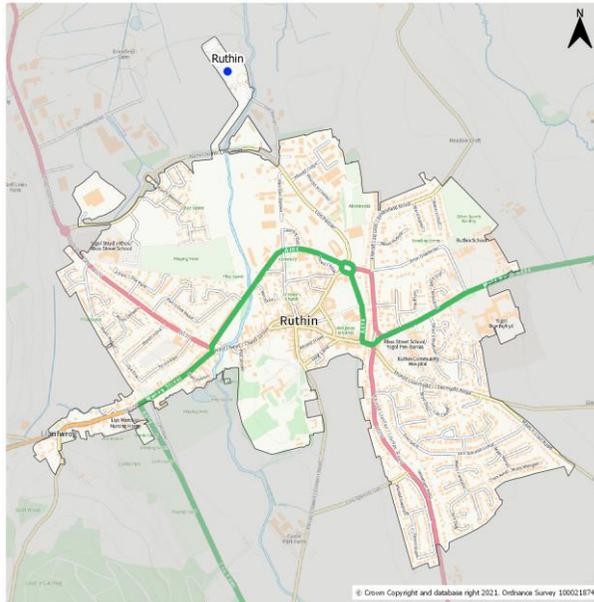
Porthmadog



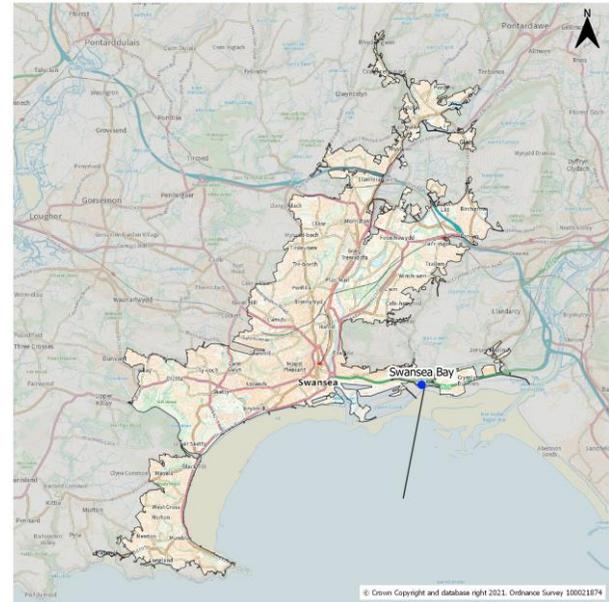
Pwllheli



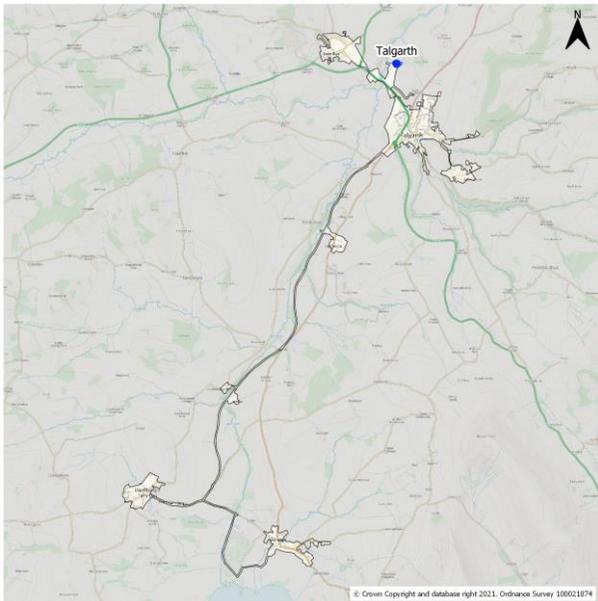
Queensferry



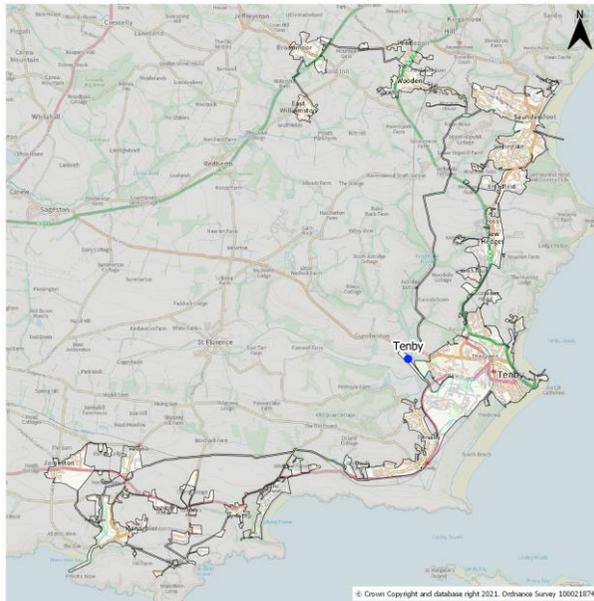
Ruthin



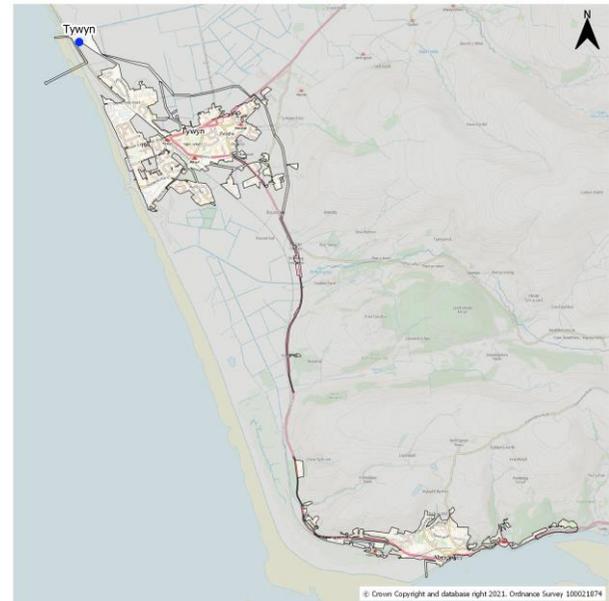
Swansea Bay



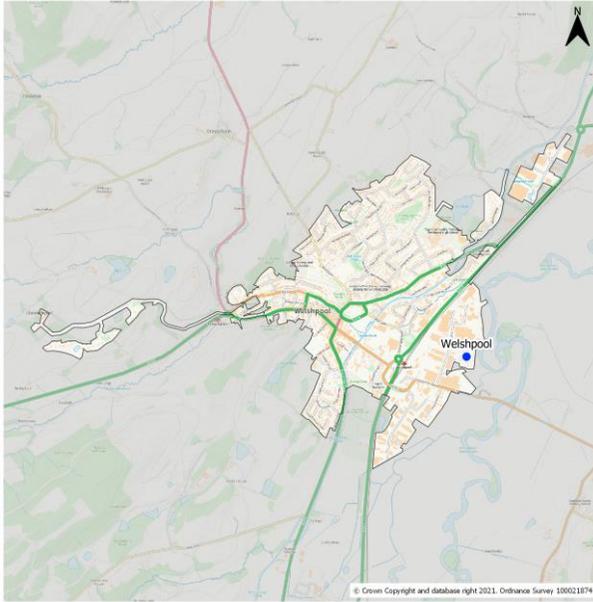
Talgarth



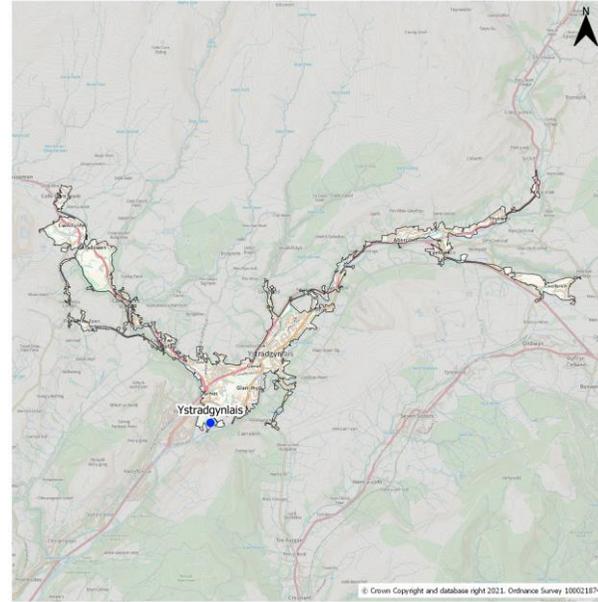
Tenby



Tywyn



Welshpool



Ystradgynlais

# Acknowledgements

We acknowledge and thank the following organisations for their valuable contributions toward the programme and in the production of this report (alphabetical order):

**Bangor University**

*Centre for Environmental Biotechnology*

**Cardiff University**

*School of Biosciences*

*School of Mathematics*

*Water Research Institute*

**Dŵr Cymru Welsh Water**

**Hafren Dyfrdwy**

**Iechyd Cyhoeddus Cymru / Public Health Wales**

# Data Usage

You may use and re-use the information featured in this report (not including logos or mapping products) free of charge in any format or medium, under the terms of the Open Government Licence on the National Archive.

<https://www.nationalarchives.gov.uk/doc/open-government-licence/>

## **Welsh Government logo**

The use of our logo is restricted and may not be used by other individuals or organisations without formal permission from us.

## **Other logos or brand identities**

The use of logos or brand identities from other organisations or entities contained within this report must not be used by other individuals or organisations without formal permission from us.

## **Mapping products and images**

The maps featured in this report may not be used or reproduced without permission from our relevant partners, Dŵr Cymru Welsh Water and Hafren Dyfrdwy.

Mapping products are produced under licence from the Ordnance Survey unless otherwise stated.  
© Crown Copyright and database right 2022. Ordnance Survey 100021874.

