

4.2 2020–2025 monitoring period

4.2.1 Site-wide surface water and ground monitoring

An ongoing monitoring program of site-wide monitoring has been developed for the Sanjiv Ridge Project following the 2019 monitoring period. Surface pools and bores have been monitored by Atlas according to the monitoring program shown in Table 4.1.

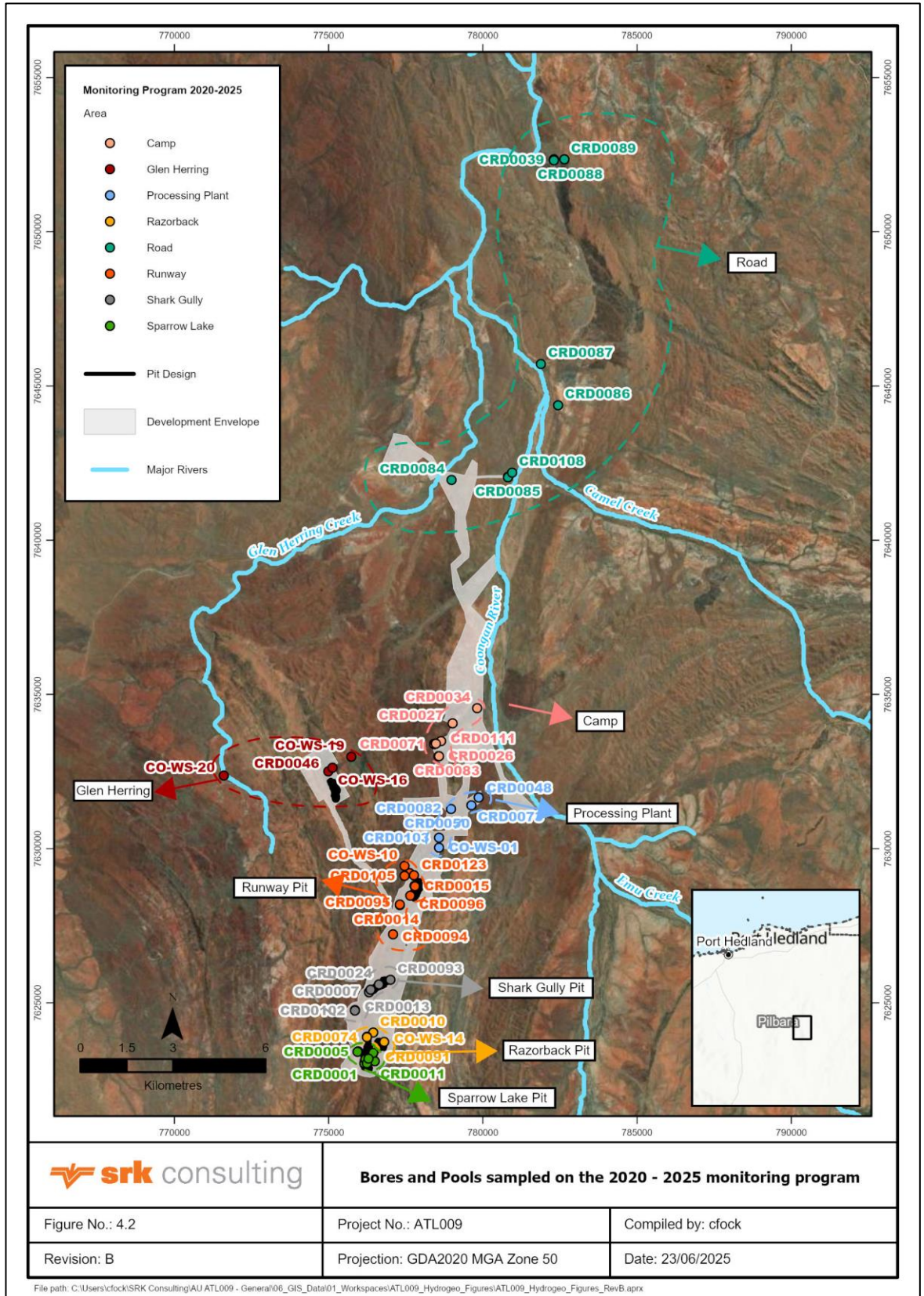
Table 4.1: Sanjiv Ridge monitoring program

Location	Frequency	Type of monitoring	Parameters
Bores	Monthly	Field measurement	Water levels
	Quarterly	Field measurement	pH, EC and temperature
	May/November	Laboratory testing	Major ions, metals, total dissolved solids, total petroleum hydrocarbons (November only)
		Dataloggers	Download dataloggers (water levels)
Surface pools	Quarterly	Field measurements	Presence of in-flow from nearby discharge points; pH, EC and temperature
		Laboratory testing	Major ions, metals, total dissolved solids, total petroleum hydrocarbons (May and November)
		Datalogger	Download datalogger (water levels)

This section summarises the monitoring data results collected from 2020 to April 2025, divided into the eight locations listed above.

During this period, 49 bores and 6 pools were monitored in 8 different locations, as is shown in Figure 4.2. Construction details and location are presented in Appendix A.

Figure 4.2: Bore areas for the 2020–2025 groundwater monitoring period



4.2.2 2024 groundwater investigation drilling program

Additional water quality sampling locations were added to the 2020–2025 monitoring program following the completion of the Stage 5 hydrogeological investigation completed in 2024.

The 2024 drill program included 5 production bores and 13 monitoring bores in the following areas:

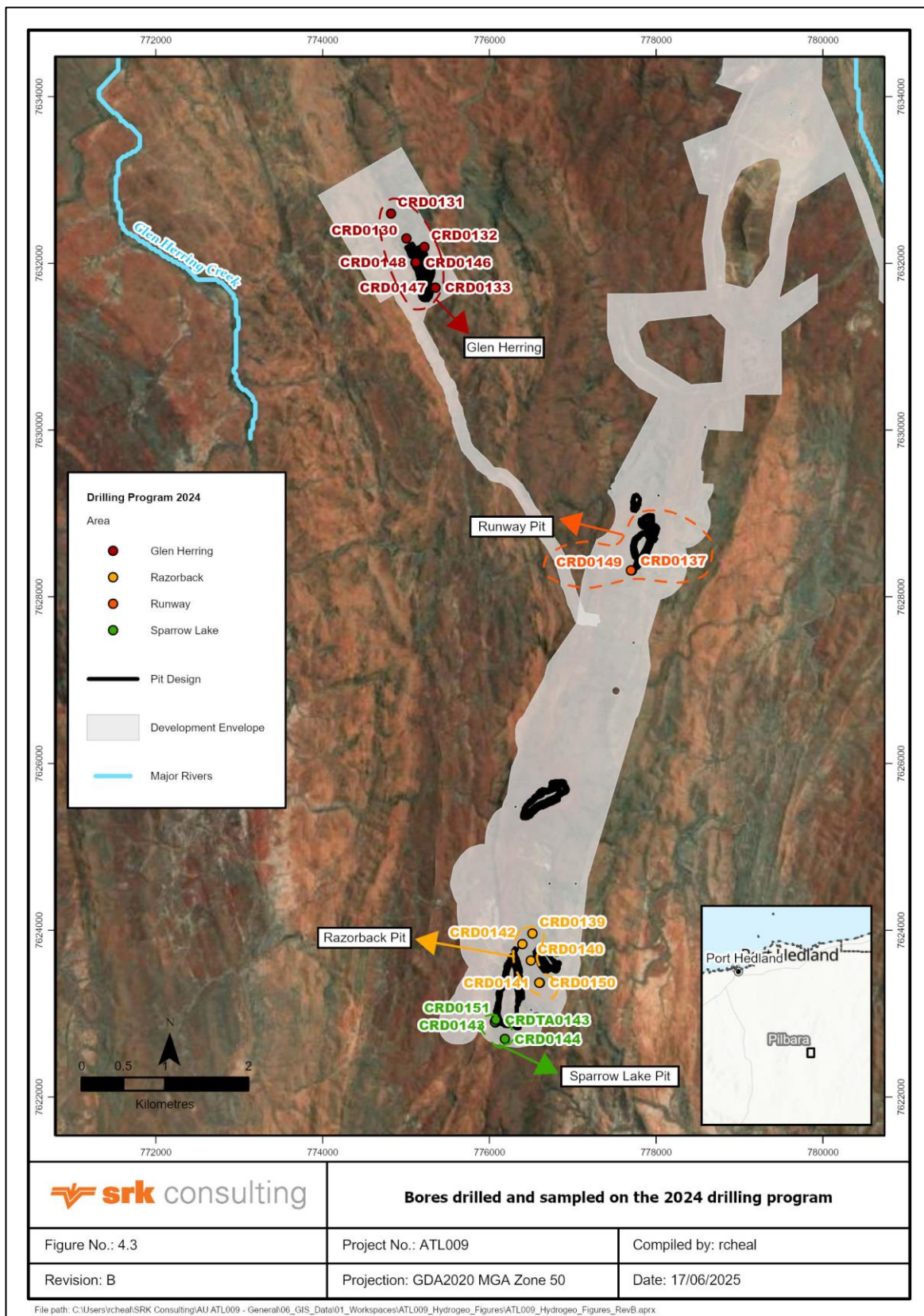
- Sparrow Lake/Razorback pits
- Runway pit
- Glen Herring.

The bore locations are presented in Figure 4.3 and a summary of the construction details is presented in Appendix A.

Water quality samples were collected during the drilling campaign and the pumping test, both conducted between January and November 2024.

Samples were taken during the development phase of the drilling campaign, immediately after bore installation, and before completing the development. During the pumping test, one water sample was collected 10 minutes after starting the constant rate test, and another was taken just before completing it.

Figure 4.3: Location of the bores of the 2024 drilling campaign



4.3 Radiocarbon isotope analysis

Eleven water samples were collected in October and November 2023 by Atlas hydrogeologists and submitted to GNS Science in New Zealand for radioisotope analysis. The interpretation of the results was conducted by the University of Western Australia (UWA) at SRK’s request on behalf of Atlas. The resulting report provided insights related to groundwater age determination and the characterisation of groundwater-surface water interactions in the Sanjiv Ridge area.

Isotope analysis was completed on five previously identified sensitive receptors and six groundwater locations, most of them adjacent to the sampled sensitive receptors, from five different areas at Sanjiv Ridge (Figure 4.4).

Sensitive receptors, as is the case at Pool 14 (CO-WS-14), tend to be fed by groundwater discharge from upstream of the pool.

The premise of the report was to assess the age of the groundwater from bores to determine groundwater flow patterns and to characterise the surface pools for relative proportions of surface water and groundwater. The main conclusions of the report and summary tables (Table 4.2 and Table 4.3) are given below.

The report conclusions of groundwater age:

- Groundwater samples exhibit signatures dominated by carbonate dissolution, creating uncertainty in the dating for groundwater age.
- The spatial and depth relationships of these results are inconclusive in terms of delineating groundwater flow patterns using age.
- No clear distinctions in the ages seen between these groups to indicate a north-south trend in proximity to recharge.
- Spatially close bores demonstrate very different groundwater ages.

Table 4.2: Minimum and maximum groundwater ages calculated for the groundwater samples

Borehole ID	Area	Lithology	Screen interval (m)	Minimum age	Maximum age
CRD0006	Runway	Cleaverville Formation	6–84	modern	modern
CRD0101	Runway	Cleaverville Formation	48–102	3000	5221
CRD0010	Razorback	Cleaverville Formation	72–114	modern	700
CRD0091	Razorback	Cleaverville Formation	6–90	modern	1250
CRD0099	Sparrow Lake	Cleaverville Formation	5–102	6600	8800
CRD0103	Processing area	Unknown	5.45–29.45	modern	250

Source: UWA

The report conclusions of surface pool proportions:

- The ¹⁴C signatures in the pools reflect a mix of groundwater inputs and re-equilibration with the atmosphere.
 - Pools with more depleted δ¹³C and higher ¹⁴C are closer to atmospheric equilibrium, indicating minimal groundwater input and likely proximity to recharge areas.
 - Conversely, pools with less depleted δ¹³C and lower ¹⁴C align with groundwater signatures, suggesting stronger groundwater influence.

Table 4.3: Surface water pools in the Sanjiv Ridge area

Surface water pools	Area	Contact lithology ¹	Likely GW contributions ²
CO-WS-01	Processing Plant	Mount Roe Basalt/Cleaverville	Likely GW input
CO-WS-10	Runway	Cleaverville Formation	Minimal GW input
CO-WS-14	Razorback	Cleaverville Formation	Dominated by GW input
CO-WS-16	Glen Herring	Cleaverville Formation	Dominated by GW input
CO-WS-19	Glen Herring	Lalla Rookh Sandstone	Minimal GW input

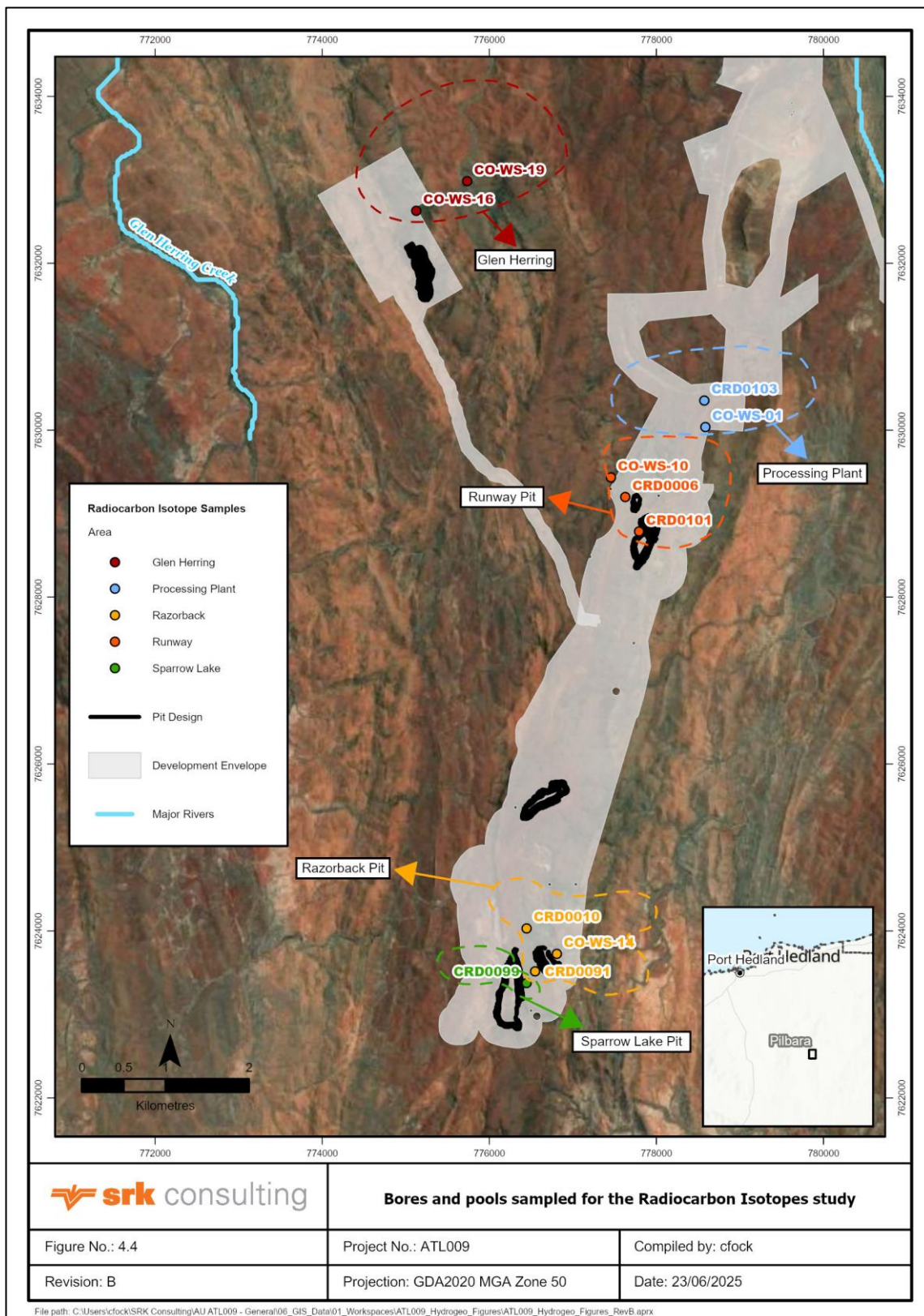
Source: UWA

Notes: GW – Groundwater.

¹ As per DMIRS

² Compared to the carbon signatures within the Clearville Formation.

Figure 4.4: Locations used for radiocarbon isotope analysis



Sources: SRK, adapted from UWA

5 Water quality assessment by area

5.1 Road

A total of 24 different locations have been sampled at different occasions since 2016 in the road area, under the monitoring program undertaken by Atlas in the Sanjiv Ridge Project. A total of 22 bores and pools have laboratory analysis completed. The frequency and dates of sampling are presented in Table 5.1 and locations are presented in Figure 5.1. A further two locations of samples that received field analysis only are included in Appendix A.

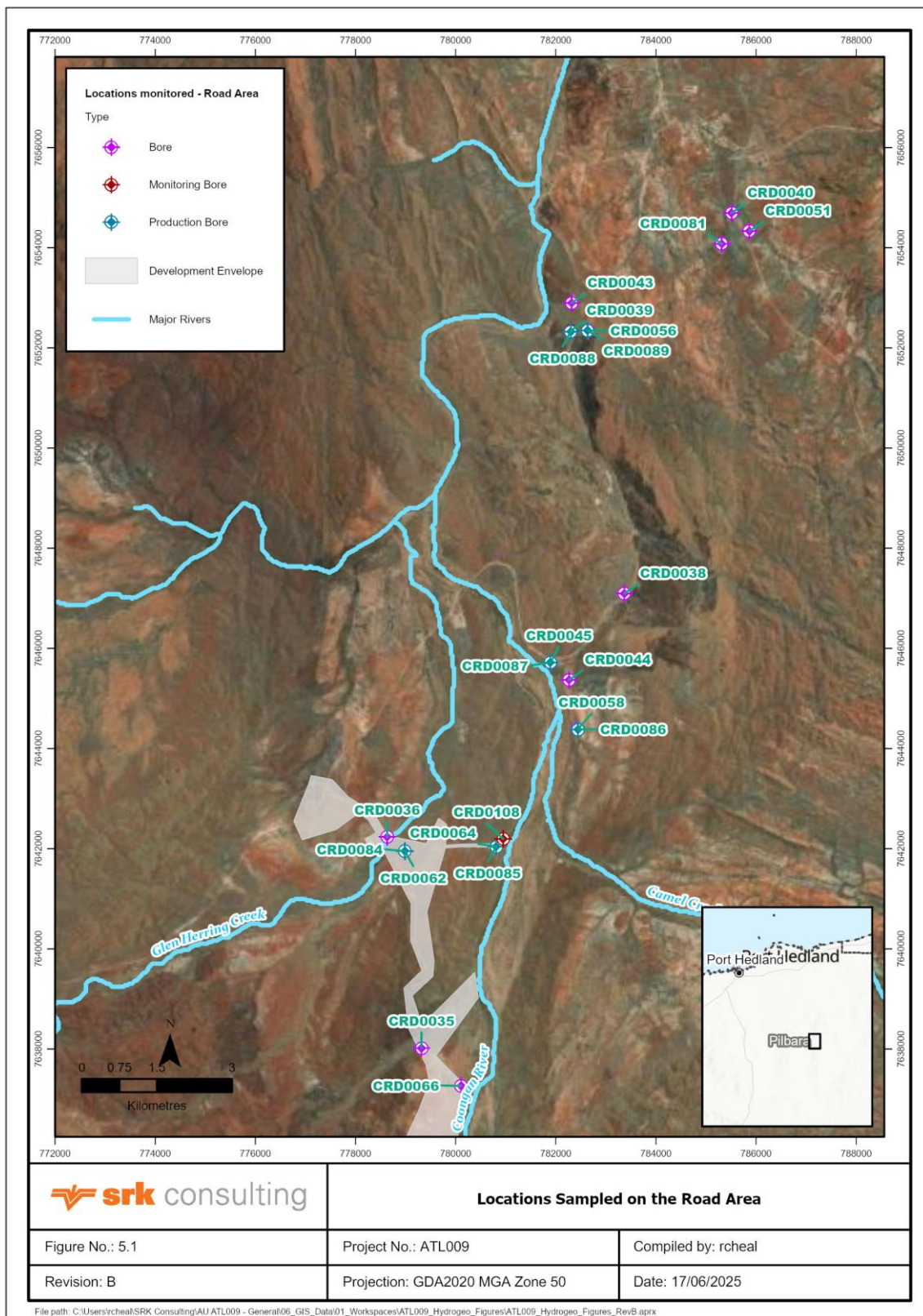
Table 5.1: Road area – sample summary

Location ID	Times sampled	Date range
CRD0035	1	Nov 2016
CRD0036	1	Nov 2016
CRD0038	1	Apr 2017
CRD0039	2	Nov 2017 to Apr 2024
CRD0040	1	Nov 2017
CRD0043	1	Nov 2017
CRD0044	1	Apr 2017
CRD0045	1	Apr 2017
CRD0051	1	Nov 2017
CRD0056	1	Nov 2017
CRD0058	1	Apr 2017
CRD0062	4	Nov 2017 to Nov 2024
CRD0064	6	Nov 2016 to Nov 2022
CRD0066	1	Nov 2016
CRD0081	1	Nov 2017
CRD0084	8	Apr 2017 to Apr 2024
CRD0085	9	Apr 2017 to Apr 2024
CRD0086	7	May 2017 to Apr 2024
CRD0087	9	Apr 2017 to Apr 2024
CRD0088	6	Nov 2017 to May 2023
CRD0089	7	Nov 2017 to May 2023
CRD0108	4	Nov 2021 to Nov 2024

Source: SRK

More information on the bore locations, design and sampling frequency is presented in Appendix A. Water quality figures for these locations are presented in Appendix B (time series plots) and in Appendix C (box-and-whisker plots). Each appendix groups data by project area. The descriptions of water quality are grouped into three main subsections: physico-chemical, major ions, and metals. If other analytes display notable trends, these are discussed in an additional subsection of 'Other relevant analytes'.

Figure 5.1: Road area – monitoring network



Note: Classification of 'Bore' denotes any borehole without a specific designation of monitoring bore or production bore within the Atlas database.

5.1.1 Physico-chemical analysis

Field measurements for EC and pH, along with laboratory data, were plotted and compared against the 2000 ANZECC guidelines for livestock water quality and the 2015 Australian Drinking Water Guidelines (ADWG). The key findings are as follows:

- **EC:** EC values across all samples remained consistently well below the ANZECC threshold of 7,000 $\mu\text{S}/\text{cm}$, showing stable trends over time. Bore CRD0086 was the only exception, with its EC values increasing from 1,800 $\mu\text{S}/\text{cm}$ in 2017 to 3,030 $\mu\text{S}/\text{cm}$ in 2024 – still below the guideline limit.
- **pH:** Laboratory-measured pH values ranged between neutral and basic levels, adhering to ANZECC guidelines for most samples. However, bore CRD0086 showed a notable increase in pH from 7.5 in 2017 to 9.03 in 2024. All other bores remained stable, with pH readings between 7.0 and 8.1.
- **Total dissolved solids (TDS):** TDS levels were generally consistent and below 1,000 mg/L, except for bore CRD0086, where values ranged from 1,100 mg/L to 1,820 mg/L. TDS concentrations showed minimal variation across all bores over time.
- **Water hardness:** Most samples were categorised as Very Hard Water, with exceptions classified as Soft, Moderately Hard, or Hard Water. Key observations include:
 - a decrease in water hardness over time in one bore (CRD0086), transitioning from Very Hard Water to Soft Water
 - stability in water hardness classifications across other bores, despite minor fluctuations in CaCO_3 concentrations over time.
- **Alkalinity:** Total alkalinity levels remained constant across all samples throughout the study period.

This data reflects stable water quality trends with localised variations, notably in bore CRD0086.

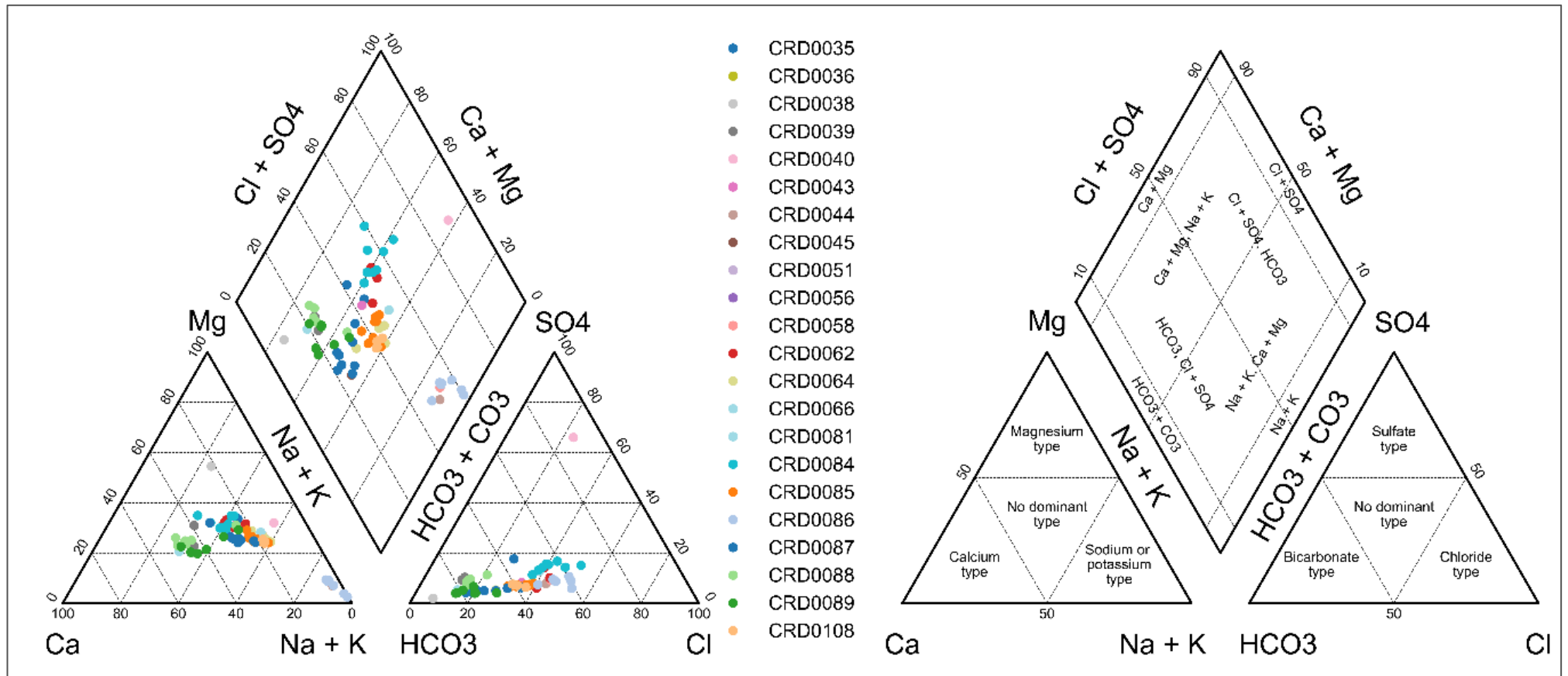
5.1.2 Major ions

Major ions were analysed using trilinear diagrams (Piper plots) to illustrate their relative abundance and identify groundwater facies, as shown in Figure 5.2. The classification results are summarised as follows:

- **Groundwater facies:** Most bores are classified between Mixed Type and Magnesium Bicarbonate Type, which aligns with the circum-neutral/basic pH observed in the samples. This water type is typically associated with recharge areas.
- **Exceptions:** Bore CRD0086 and its monitoring bore, CRD0058, exhibit a Sodium Chloride Type water classification, indicative of more mature water. This result is consistent with laboratory findings for bore CRD0086, where chloride and sodium concentrations exceed the aesthetic thresholds outlined in the ADWG. This is further supported by the recorded increase in alkalinity since 2019 from approximately 10 mg/L to a maximum of almost 120 mg/L in 2023.
- **Ion stability:** Across all other bores, ion concentrations – including calcium, magnesium, sodium, potassium, carbonate, bicarbonate, chloride and sulfate – have remained stable over time, showing no notable exceedances or irregularities.

All samples exhibited an ionic balance of less than 10%, which is considered acceptable and reflects reliable analytical results. However, two sample collected from bore CRD0086 in mid-2017 and mid-2024 displayed an ionic balance of 11.0% and 12.4% respectively. Values below 10% are considered acceptable and indicates a reliable analysis. Samples data from CRD0086 have been included within the analysis as all results are within trend of previous results

Figure 5.2: Road area – Piper plot



5.1.3 Metals

The analysis included metals such as aluminium, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, and zinc.

For the road samples, metal concentrations were generally below the laboratory limit of detection for elements such as aluminium, antimony, cadmium, chromium, copper, iron, lead, mercury, nickel, silver, and tin. In instances where concentrations exceeded the detection limit, the levels remained consistently low and well below the thresholds outlined in the 2000 ANZECC guidelines and 2015 ADWG.

This indicates no concern regarding metal concentrations in the sampled area.

5.1.4 Other relevant analytes

The analysis included boron, fluoride, nitrate, silicon, total petroleum and recoverable hydrocarbons (by fraction), a specific set of volatile organic compounds (VOCs) termed the BTEXN group comprising benzene, toluene, ethylbenzene, xylenes, and naphthalene.

No data above limit of detection are recorded for hydrocarbon or BTEXN analytes. Key findings are summarised below:

- **Exceedances:**
 - a single sample from bore CRD0088, collected in 2023, slightly exceeded the ADWG aesthetic limit for nitrite+nitrate as N (limit: 3 mg/L), reporting a value of 3.08 mg/L
 - fluoride concentrations from bore CRD0086 reached the ANZECC threshold (2 mg/L) on two occasions and remained consistently near this limit during other sampling periods.
- Levels of silicon for the road, camp and processing area are notably higher than other areas of the Project (Appendix C). This is likely due to silica dissolution of transported silica-rich sediment within the alluvial aquifers close to these areas.
- **Ion stability:** Concentrations of boron, fluoride, nitrate, and silicon have remained stable over time, with no notable exceedances or irregularities observed.

These findings indicate largely stable water quality across the study area.

5.2 Camp

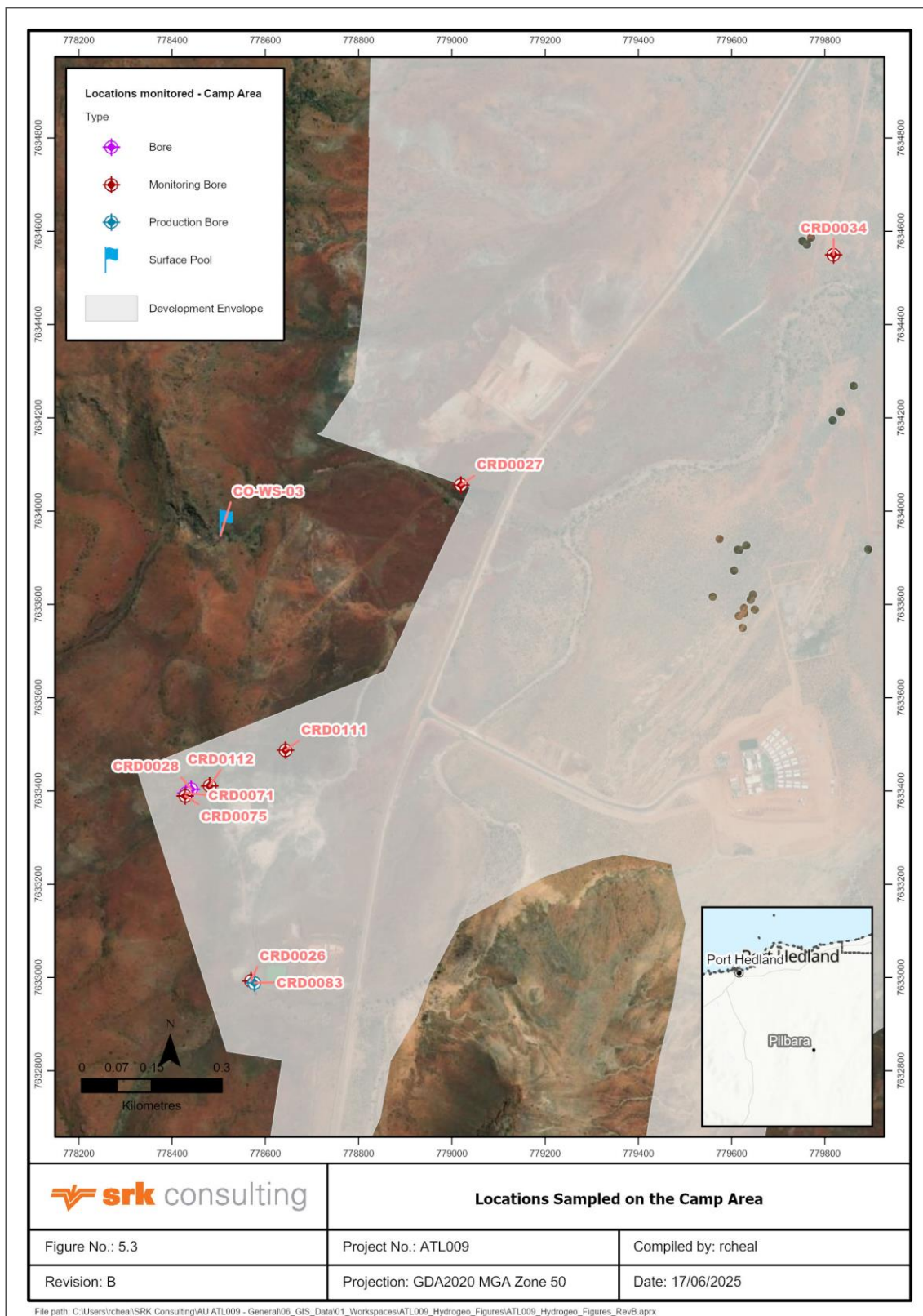
A total of 11 different locations have been sampled at different occasions since 2015 in the areas close to the camp. A total of 10 bores and pools have laboratory analysis completed. The frequency and dates of sampling are presented in Table 5.2 and locations are presented in Figure 5.3. Included in Appendix A is one further location of samples that received field analysis only.

Table 5.2: Camp area – sample summary

Location ID	Times sampled	Date range
CO-WS-03	1	Jul 2017
CRD0026	7	Dec 2015 to Nov 2024
CRD0027	12	Nov 2015 to Nov 2024
CRD0028	2	Dec 2015 to Aug 2016
CRD0034	5	Nov 2016 to Nov 2024
CRD0071	6	Aug 2016 to Nov 2020
CRD0075	6	Aug 2016 to Nov 2024
CRD0083	13	Apr 2017 to Nov 2024
CRD0111	3	Nov 2021 to Nov 2024
CRD0112	3	Nov 2021 to Nov 2024

More information on the bore locations, design and sampling frequency is presented in Appendix A. Water quality figures for these locations are presented in Appendix B (time series plots) and in Appendix C (box-and-whisker plots). Each appendix groups data by project area. The descriptions of water quality are grouped into three main subsections: physico-chemical, major ions, and metals. If other analytes display notable trends, these are discussed in an additional subsection of 'Other relevant analytes'.

Figure 5.3: Camp area – sample location



Note: Classification of 'Bore' denotes any borehole without a specific designation of monitoring bore or production bore within the Atlas database.

5.2.1 Physico-chemical analysis

Field measurements of EC and pH, along with laboratory data, were compared to the 2000 ANZECC guidelines for livestock water quality and the 2015 ADWG. Key findings are as follows:

- **EC:** EC values in all samples consistently remained well below the ANZECC threshold of 7,000 µS/cm, demonstrating stable trends over time.
- **pH:** Laboratory measured pH values ranged from neutral to basic (6.4 to 8.2), which adhere to ANZECC guidelines. Results have been stable over time, with one exception: bore CRD0027, which showed notable fluctuations. The pH in this bore decreased from 8.2 in 2015 to values around 6.6 between 2019 and 2021. From late 2021 onwards, the pH stabilised, averaging 7.2. Field pH data display the opposite trend, recording acidic conditions between 2020 and 2021 reaching a maximum of 8.9. The reason for this discrepancy is unknown.
- **TDS:** TDS levels generally remained consistent and below 850 mg/L across all samples, following a stable trend. An exception was observed in bore CRD0027, where TDS concentrations decreased significantly from 550 mg/L in 2015 to less than 100 mg/L between 2019 and 2023. Since 2023, results have stabilised around 200 mg/L.
- **Water hardness:** Most samples were categorised as Very Hard Water, with exceptions classified as Soft, Moderately Hard, or Hard Water. Key observations include:
 - bore CRD0034 showed an increase in water hardness over time, transitioning from Soft Water in 2016 to Very Hard Water from 2021 onward
 - bore CRD0027 has been consistently classified as Soft Water, with two samples classified as Moderately Hard Water in late 2023 and late 2024
 - other bores displayed stable hardness classifications over time, despite minor fluctuations in CaCO₃ concentrations.
- **Alkalinity:** Total alkalinity levels were constant for most samples throughout the study period. However, bore CRD0027 exhibited distinct variations: alkalinity decreased from 2015 to 2019, remained stable between 2019 and early 2023, and then increased after that period.

These findings indicate stable water quality trends across most bores, with notable temporal variations in bore CRD0027.

5.2.2 Major ions

Major ions were analysed to illustrate their relative abundance and identify groundwater facies, as shown in Figure 5.4. The key findings are as follows:

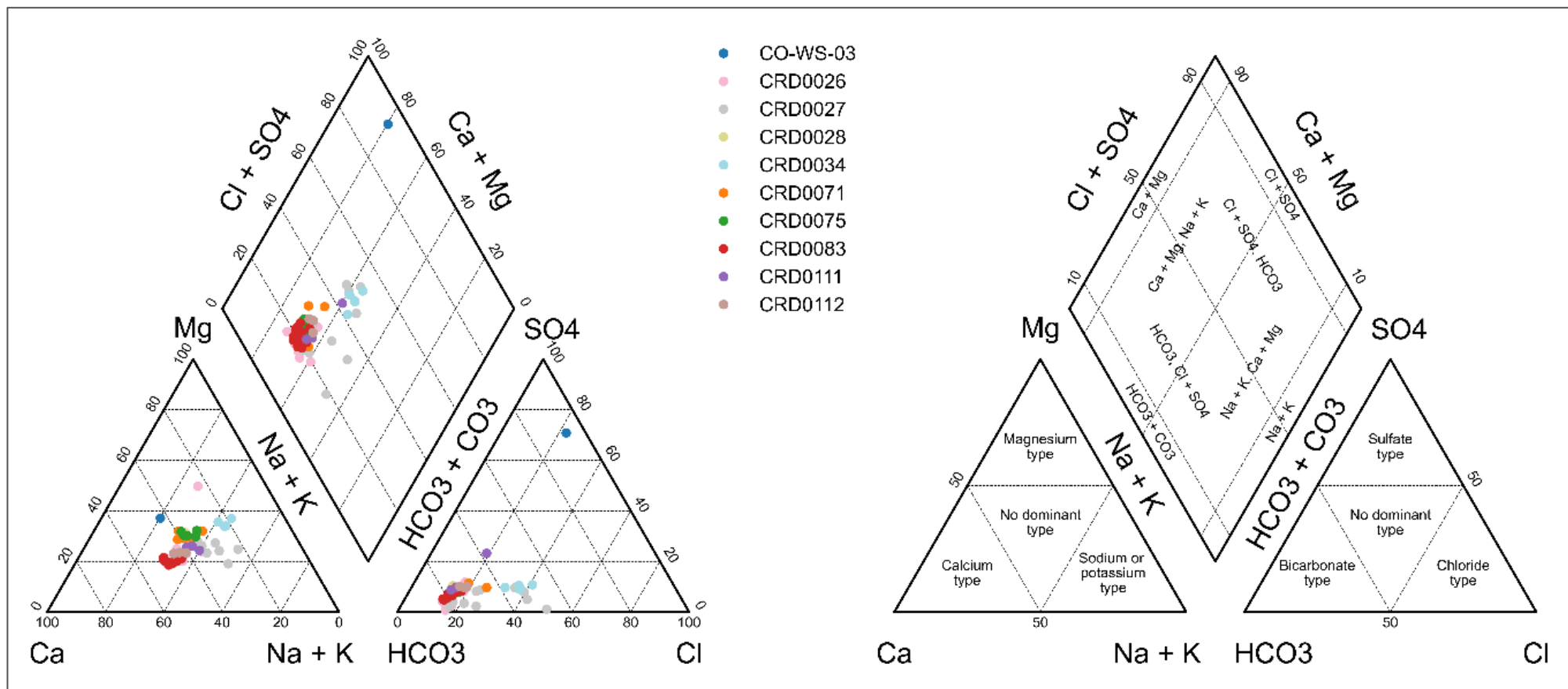
- **Groundwater facies:** Most locations are classified as Magnesium Bicarbonate Type, with some samples categorised as Mixed Type but situated near the magnesium carbonate region. A notable exception is the ephemeral pool CO-WS-03, sampled only once in 2017, which was classified as Calcium Sulfate Type. The unique chemistry of this sample is likely a function of surface runoff over the Cleaverville Formation which is known to be rich in sulfur.
- None of the sampled locations exceeded the thresholds established by the ANZECC guidelines or the ADWG.

- **Ion stability:** Ion concentrations across locations remained stable for elements such as calcium and sulfate, with some temporal variations observed for magnesium, sodium, potassium, carbonate, bicarbonate, and chloride:
 - bore CRD0026: showed increased concentrations of bicarbonate and magnesium between 2016 and 2017, followed by a decrease and stabilisation thereafter
 - bore CRD0027: displayed a downward trend in magnesium, potassium, sodium, and bicarbonate from 2015 to 2019, after which concentrations stabilised
 - bore CRD0034: remained stable for most elements, except chloride and sodium, which showed minor increases between 2016 and 2021 before stabilising
 - bore CRD0111: observed decreases in potassium and sodium between 2021 and 2022, followed by stabilisation. The remaining elements remained consistent.

These findings indicate stable groundwater chemistry for most locations, with localised variations in ion concentrations.

All samples exhibited an ionic balance of less than 10%, which is considered acceptable and reflects reliable analytical results. However, one sample collected from bore CRD0027 in mid-2023 displayed an ionic balance of 17.2%. Values below 10% are considered acceptable and indicates a reliable analysis. Samples data from CRD0027 have been included within the analysis as all results are within trend of previous results.

Figure 5.4: Camp area – Piper plot



5.2.3 Metals

The analysis included metals such as aluminium, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, and zinc.

For the Camp samples, metal concentrations were generally below the laboratory limit of detection for elements such as aluminium, antimony, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, and tin. When metal concentrations exceeded the detection limits, they were consistently low and well within the thresholds established by the ANZECC guidelines and ADWG.

Samples collected from bores CRD0027 and CRD0075 showed iron concentrations exceeding the aesthetic threshold of the ADWG. This result is consistent with the Project's context as an iron mine.

Overall, metal concentrations remain largely within acceptable limits, with the elevated iron levels in specific bores reflecting the geological characteristics of the Project area.

5.2.4 Other relevant analytes

The analysis included boron, fluoride, nitrate, silicon, total petroleum and recoverable hydrocarbons (by fraction), a specific set of VOCs termed the BTEXN group comprising benzene, toluene, ethylbenzene, xylenes, and naphthalene.

No data above limit of detection are recorded for hydrocarbon or BTEXN analytes. Key findings are summarised below:

- Levels of silicon for the road, camp and processing area are notably higher than other areas of the Project (Appendix C). This is likely due to silica dissolution of transported silica-rich sediment within the alluvial aquifers close to these areas.
- **Ion stability:** In all locations, concentrations for these elements have remained stable over time, with no notable exceedances or irregularities observed.

5.3 Processing plant

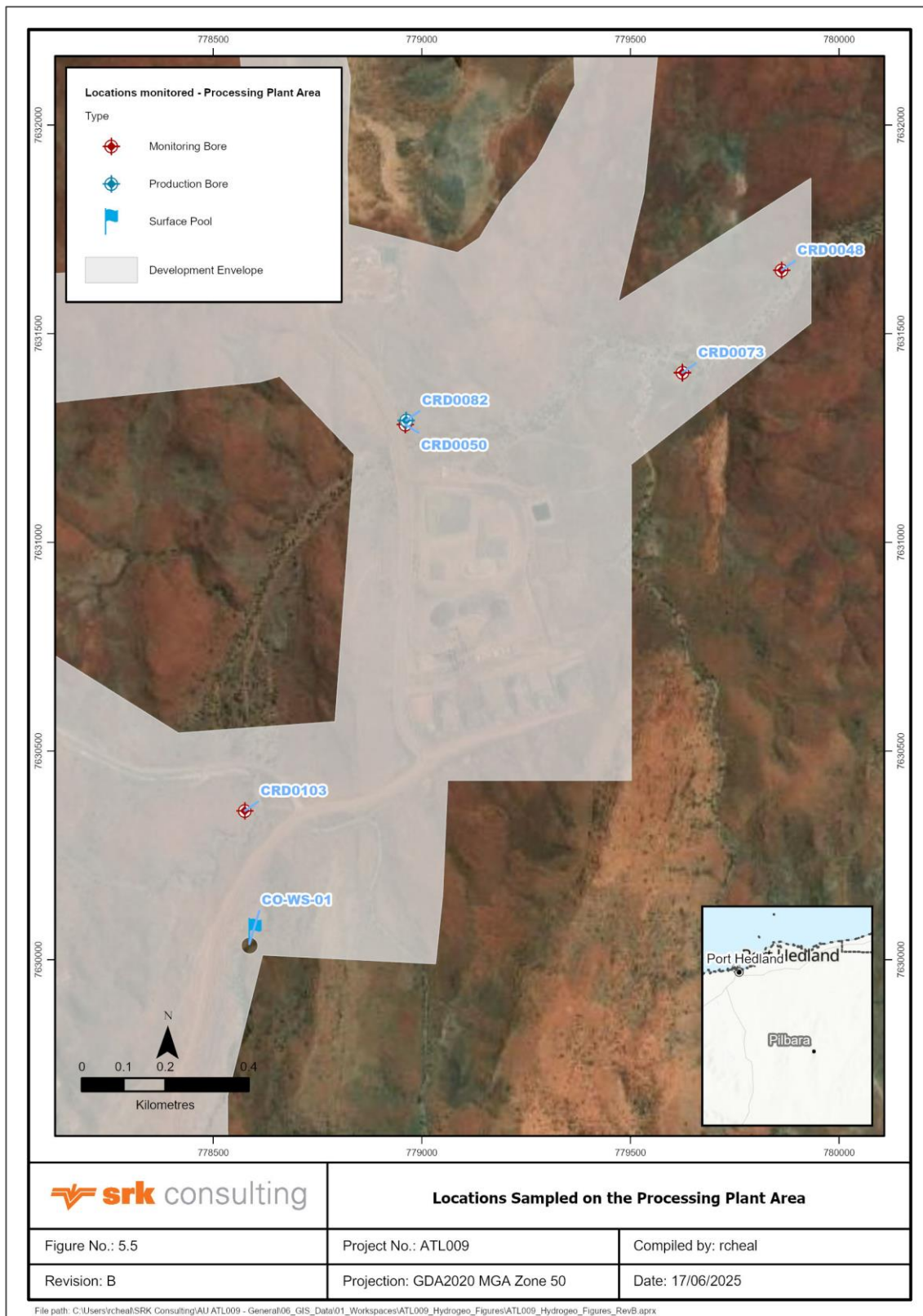
A total of nine different locations have been sampled at different occasions since late 2016 in the areas close to the processing plant, under the monitoring program undertaken by Atlas in the Sanjiv Ridge Project. A total of six bores and pools have laboratory analysis completed. The frequency and dates of sampling are presented in Table 5.3 and locations are presented in Figure 5.5. Included in Appendix A are a further three locations of samples that received field analysis only.

Table 5.3: Processing plant area – sample summary

Location ID	Times sampled	Date range
CO-WS-01	19	Jul 2017 to Nov 2024
CRD0048	10	Dec 2016 to Nov 2024
CRD0050	6	Dec 2016 to Nov 2024
CRD0073	10	Dec 2016 to Nov 2024
CRD0082	13	Apr 2017 to Nov 2024
CRD0103	6	Nov 2021 to Nov 2024

More information on the bore locations, design and sampling frequency is presented in Appendix A. Water quality figures for these locations are presented in Appendix B (time series plots) and in Appendix C (box-and-whisker plots). Each appendix groups data by project area. The descriptions of water quality are grouped into three main subsections: physico-chemical, major ions, and metals. If other analytes display notable trends, these are discussed in an additional subsection of 'Other relevant analytes'.

Figure 5.5: Processing plant area – sample location



5.3.1 Physico-chemical analysis

Field measurements of EC and pH, along with laboratory data, were compared to the 2000 ANZECC guidelines for livestock water quality and the 2015 ADWG. Key findings are as follows:

- **EC:** EC values across all samples consistently remained well below the ANZECC threshold of 7,000 $\mu\text{S}/\text{cm}$, demonstrating stable trends over time.
- **pH:** Laboratory-measured pH values ranged from neutral to basic (6.85 to 9.2). All samples remained within guidelines, except for one sample from bore CRD0048, which exceeded the ANZECC threshold once in 2021. The rest of the samples ranged between 7 and 8, showing stability over time. Field pH values show more variability, with more exceedances recorded, but in general compare well to laboratory pH values.
- **TDS:** TDS levels were generally consistent and remained below 950 mg/L across all samples. The surface pool CO-WS-01 showed a steady increase in TDS concentrations, rising from 210 mg/L in mid-2017 to 540 mg/L in late 2024, but remained within acceptable limits.
- **Water hardness:** Most samples were categorised as Very Hard Water, with exceptions classified as Soft, Moderately Hard, or Hard Water. Key observations include:
 - pool CO-WS-01 displayed increasing hardness values over time, transitioning from Hard Water to Very Hard Water
 - bore CRD0103 consistently classified as Moderately Hard Water, with one exception in late 2024, when it was classified as Soft Water
 - all other bores exhibited stable classifications, consistently categorised as Very Hard Water.
- **Alkalinity:** Total alkalinity levels were stable for most samples throughout the study period. Bore CRD0048, however, displayed variations, with alkalinity steadily decreasing from 2016 to 2021, subsequently increasing and stabilising from 2022 onward.

5.3.2 Major ions

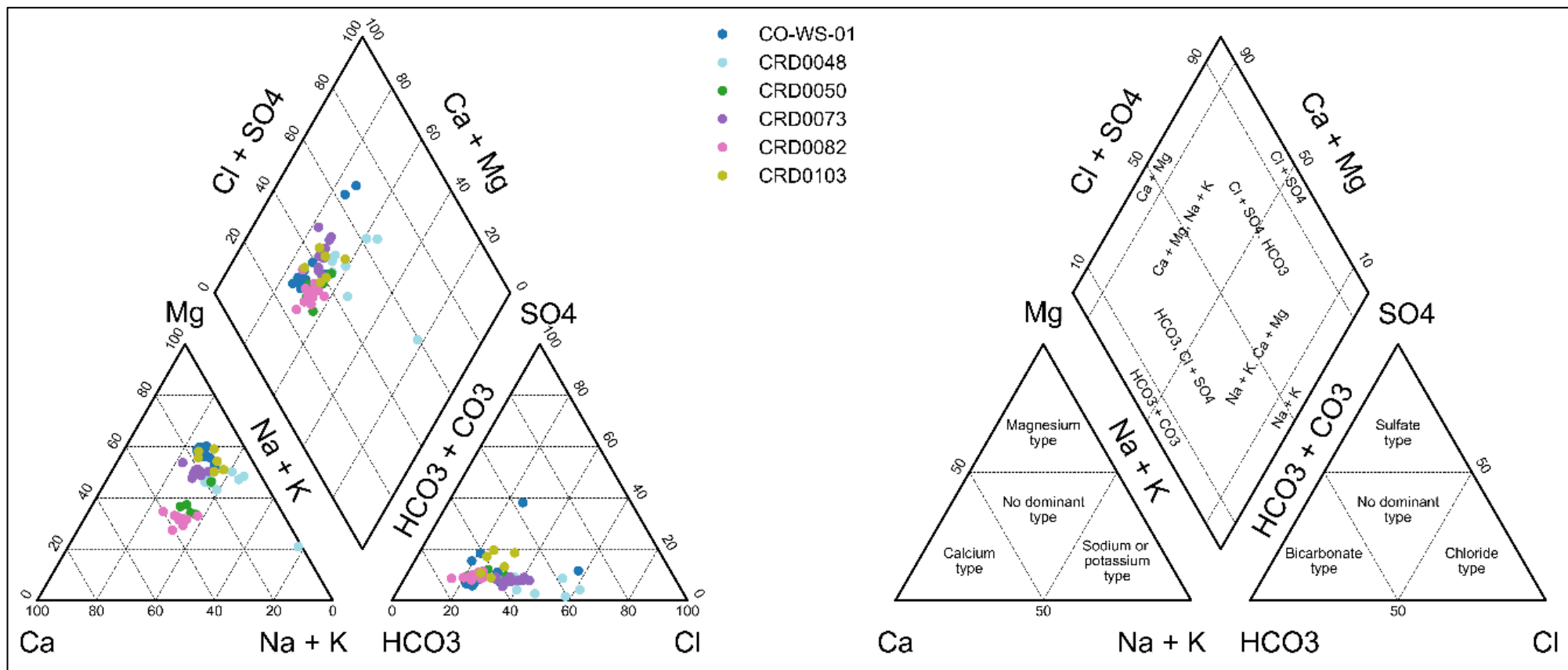
Major ions were analysed to illustrate their relative abundance and identify groundwater facies, as shown in Figure 5.6. The key findings are as follows:

- **Groundwater facies:** Most locations were classified as Magnesium Bicarbonate Type, with some samples from pool CO-WS-01 and bore CRD0048 categorised as Mixed Type but located near the magnesium carbonate region. A notable exception is one sample from bore CRD0048, which was classified as Sodium Chloride Type.
- Three samples from bore CRD0048 and two samples from bore CRD0073 exceeded the ADWG aesthetic threshold for chloride. All other sampled locations remained within the thresholds established by the ANZECC guidelines and ADWG.
- **Ion stability:** While ion concentrations were stable for elements such as calcium and sulfate in most of the cases, temporal variations were observed for magnesium, sodium, potassium, carbonate, bicarbonate, and chloride in certain locations:
 - Pool CO-WS-01: increasing trends were noted for sulfate, sodium, and magnesium, with the latest sulfate result (November 2024) recording elevated levels. Chloride showed one higher value in 2017 but stabilised thereafter. Other ion concentrations remained stable.

- Bore CRD0050: chloride, magnesium, potassium, and sodium displayed one elevated value in 2017 before decreasing and stabilising.
- Bore CRD0048:
 - chloride varied mostly between 200 mg/L and 300 mg/L, with one low value (~110 mg/L) recorded in 2021
 - magnesium decreased between 2016 and 2021, then increased and stabilised after 2022
 - potassium fluctuated between 5 mg/L and 10 mg/L over time, stabilising at ~6 mg/L from 2022 onward
 - bicarbonate decreased from 2016 to 2021, then increased and stabilised after 2022.
- Bore CRD0073: chloride varied from 150 mg/L to 300 mg/L over time, while potassium ranged between 5.5 mg/L and 8 mg/L.

These findings indicate largely stable water chemistry across most locations, with isolated variations linked to specific bores or surface pools.

Figure 5.6: Processing plant area – Piper plots (by location)



5.3.3 Metals

The analysis examined metals such as aluminium, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, and zinc in samples from the processing plant area. Key findings are summarised below.

Metal concentrations were generally below laboratory detection limits for aluminium, antimony, cadmium, chromium, cobalt, copper, lead, mercury, nickel, silver, and tin. When concentrations exceeded detection limits, they remained consistently low and well within the thresholds outlined in the ANZECC guidelines and ADWG.

Iron exceedances:

- One sample from pool CO-WS-01 recorded iron concentrations exceeding the ADWG aesthetic threshold.
- Two samples from bore CRD0048 (collected in late 2021 and mid-2024) also exceeded the ADWG aesthetic threshold for iron. These exceedances align with the Project's setting as an iron mine.

Selenium concentrations in bore CRD0073 increased between May 2023 and April 2024, temporarily exceeding the ANZECC threshold for this element. Levels subsequently decreased in the November 2024 sample, falling back within acceptable limits.

Concentrations of the remaining metals varied within acceptable limits, with no notable exceedances or significant trends observed.

5.3.4 Other relevant analytes

The analysis focused on boron, fluoride, nitrate, silicon, total petroleum and recoverable hydrocarbons (by fraction), a specific set of VOCs termed the BTEXN group comprising benzene, toluene, ethylbenzene, xylenes, and naphthalene.

No data above limit of detection are recorded for hydrocarbon or BTEXN analytes. Key findings are as follows:

- Levels of silicon for the road, camp and processing area are notably higher than other areas of the Project (Appendix C). This is likely due to the influence of transported silica-rich material alluvial sediment within the alluvial aquifers close to these areas. Strontium levels also follow this trend and are likely to be influenced by the same mechanism.
- **Ion stability:** Concentrations of these elements have generally remained stable across sampling locations, with no exceedances or irregularities observed.
- **Exception:** Bore CRD0103 showed a notable increasing trend in nitrite+nitrate as N concentrations since 2022, rising from 0.2 mg/L to 2.45 mg/L in November 2024.

5.4 Runway pit

A total of 21 different locations have been sampled at different occasions since early 2014 in the areas close to Runway pit, under the monitoring program undertaken by Atlas in the Sanjiv Ridge Project. A total of 15 bores and pools have laboratory analysis completed. The frequency and dates of sampling are presented in Table 5.5 and locations are presented in Figure 5.7. Included in Appendix A are a further six locations of samples that received field analysis only.

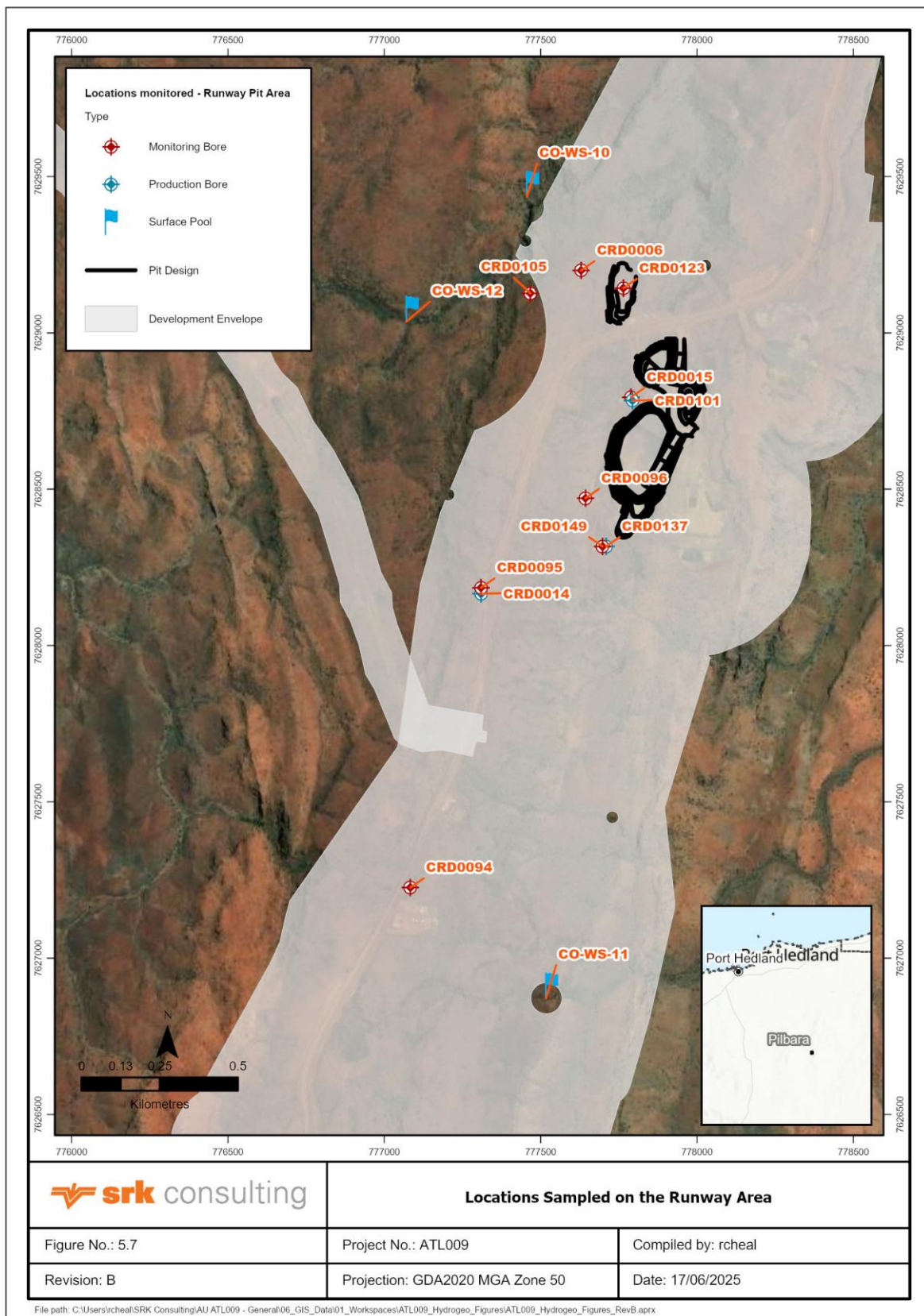
Table 5.4: Runway pit area – sample summary

Location ID	Times sampled	Date range
CDRC0334*	2	Apr 2014 to Apr 2015
CO-WS-10	16	Oct 2017 to May 2023
CO-WS-11	9	Jul 2017 to Feb 2019
CO-WS-12	11	Aug 2017 to Feb 2019
CRD0006	6	Jun 2019 to Nov 2024
CRD0014	9	May 2019 to May 2023
CRD0015	8	Feb 2019 to Nov 2024
CRD0094	6	May 2019 to Nov 2024
CRD0095	6	May 2019 to Nov 2024
CRD0096	4	Nov 2020 to Nov 2024
CRD0101	10	Jun 2019 to Apr 2024
CRD0105	2	Nov 2022 to Nov 2024
CRD0123	1	May 2023
CRD0137	3	May 2024 to April 2025
CRD0149	1	May 2024 to April 2025

Notes: * Location not available

More information on the bore locations, design and sampling frequency is presented in Appendix A. Water quality figures for these locations are presented in Appendix B (time series plots) and in Appendix C (box-and-whisker plots). Each appendix groups data by project area. The descriptions of water quality are grouped into three main subsections: physico-chemical, major ions, and metals. If other analytes display notable trends, these are discussed in an additional subsection of 'Other relevant analytes'.

Figure 5.7: Runway pit area – sample location



5.4.1 Physico-chemical analysis

Field measurements of EC and pH, along with laboratory data, were compared to the 2000 ANZECC guidelines for livestock water quality and the 2015 ADWG. Key findings are as follows:

- **EC:** EC values consistently remained well below the ANZECC threshold of 7,000 $\mu\text{S}/\text{cm}$ (Appendix B). Some variations were observed in the surface pools during 2018 and 2019, though all values remained within acceptable limits. Since then, EC trends have stabilised, showing consistent behaviour over time.
- **pH:** Laboratory-measured pH values ranged from slightly acidic to slightly basic (5.7 to 8.34), with all samples remaining within guideline limits. While some variability was noted over time, locations classified as slightly acidic or slightly basic maintained their respective categories.
- **TDS:** TDS levels were typically consistent and generally below 750 mg/L for most samples. An exception was noted in pool CO-WS-10, where two samples (late 2017 and late 2018) exceeded 750 mg/L. TDS concentrations at pool CO-WS-10 displayed irregular trends during 2017–2018 but have since stabilised, staying below 500 mg/L.
- **Water hardness:** Most samples were categorised as Moderately Hard Water, with exceptions classified as Soft, Hard Water, or Very Hard Water. Key trends include:
 - Pool CO-WS-10 showed decreasing hardness levels over time, fluctuating between Soft Water and Very Hard Water from 2017 to 2019, before steadily decreasing to Moderately Hard Water after 2020
 - Pools CO-WS-11 and CO-WS-12 demonstrated variability between Soft Water and Very Hard Water from 2017 to 2019, though no data were collected for these locations after 2019
 - All other bores maintained consistent classifications within a single category, despite minor variations in results.
- **Alkalinity:** Total alkalinity levels were stable for most bore samples. However, surface pools exhibited some variability during the 2017–2019 period, aligning with trends in water quality during that time. After 2019, alkalinity stabilised across these locations.

5.4.2 Major ions

Major ions were analysed to determine their relative abundance and identify groundwater facies, as shown in Figure 5.8. Key findings are detailed below:

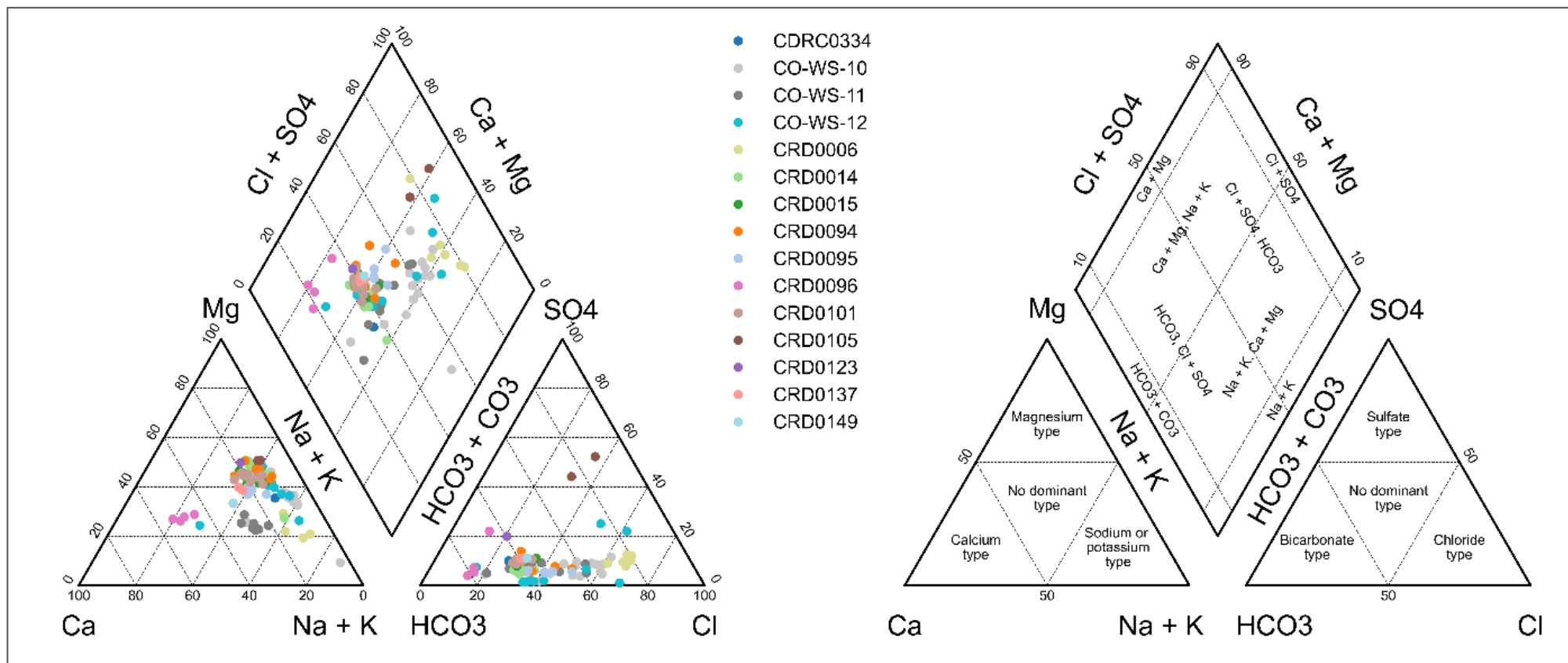
- **Groundwater facies:** Locations were categorised between Magnesium Bicarbonate Type and Sodium Chloride Type water, with some samples transitioning to Mixed Type. Bore samples generally maintained consistent groundwater facies, while surface pool samples exhibited greater variability – occasionally shifting from Magnesium Bicarbonate Type to Sodium Chloride Type and vice versa.
- Two samples from pool CO-WS-10 exceeded the ADWG aesthetic threshold for chloride, one of which also exceeded the threshold for sodium. These samples were collected in late 2017 and early 2019. All other sampling locations remained within the thresholds established by ANZECC guidelines and ADWG.

- **Ion stability:** Ion concentrations in bore samples were stable for all major ions. However, surface pools displayed variability during the 2017–2019 period, particularly pools CO-WS-10, CO-WS-11, and CO-WS-12. After this period, pool CO-WS-10 showed stabilisation, while no additional data were available for pools CO-WS-11 and CO-WS-12 beyond 2019. Key variations included:
 - Pool CO-WS-10 exhibited a peak in sodium concentration in late 2017, followed by a steady decrease and stabilisation in subsequent years
 - Pool CO-WS-11 displayed a pronounced peak in ion concentrations in early 2018, indicating variability during that period.

These findings suggest primarily stable groundwater chemistry across most locations, with isolated variations in certain surface pools during 2017–2019.

All samples exhibited an ionic balance of less than 10%, which is considered acceptable and reflects reliable analytical results, with the exception of certain samples from pools CO-WS-10, CO-WS-11, and CO-WS-12. Two notable outliers include a sample from pool CO-WS-10 collected in May 2018 and a sample from pool CO-WS-12 collected in April 2018, which recorded ionic balance values of -22% and -61%, respectively. These values fall outside the acceptable range and indicate significant uncertainty in the analysis.

Figure 5.8: Runway pit area – Piper plots (by location)



5.4.3 Metals

The analysis focused on metals such as aluminium, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, and zinc in samples from the Runway pit area.

Most metals concentrations were below the laboratory detection limits.

Metals including barium, lead, manganese, selenium, strontium and zinc recorded detectable concentrations but remained low and within the thresholds established by ANZECC guidelines and the ADWG.

Iron exceedances

Elevated iron levels within this area are expected due to the presence of the Cleaverville Formation BIF. Most sampled locations recorded at least one instance of exceedances in the ADWG aesthetic threshold for iron (0.3 mg/L). While iron concentrations largely appeared stable over time, some notable trends were observed:

- Surface pools exhibited variability between 2017 and 2019.
- Bore CRD0101 displayed an increasing trend in iron concentrations starting in 2021.
- Bore CRD0105 showed a decreasing trend in iron levels between samples collected in 2022 and 2024.

A single sample collected in 2015 from exploration reverse circulation (RC) bore CDRC0334 recorded exceedances for lead and selenium. No further exceedances have been recorded since then.

In summary, metal concentrations across the Runway pit area were generally within acceptable limits, apart from isolated exceedances for iron, selenium, and lead. These exceedances are notable but are consistent with localised conditions.

5.4.4 Other relevant analytes

The analysis focused on total petroleum and recoverable hydrocarbons (by fraction), a specific set of VOCs termed the BTEXN group comprising benzene, toluene, ethylbenzene, xylenes, and naphthalene.

No data above limit of detection are recorded for hydrocarbon or BTEXN analytes. Key findings are as follows:

- Nitrite and nitrate concentrations show some variability at bore CRD0095 between 2019 and 2022 but are all low and stable.

5.4.5 Comparison of pumping test data with sensitive receptors

In the area, water quality data collected from a pumping test at one bore (CRD0137) were compared with data from three surface pools (CO-WS-10, CO-WS-11, and CO-WS-12). The comparison used the most recent data from the surface pools alongside data from the pumping test. The data collection periods do not overlap which introduces some uncertainty; the surface

pool data has remained stable over time. The key findings from this comparison, based on the time series presented in Appendix B, are summarised below:

- Physical parameters
 - EC
 - EC values in pools CO-WS-11 and CO-WS-12 were consistent with those recorded during the pumping test for bore CRD0137. Pool CO-WS-10, however, showed a decreasing trend since 2021, gradually aligning with the EC values observed in bore CRD0137.
 - pH
 - Pools CO-WS-11 and CO-WS-12 exhibited slightly acidic to neutral pH values (6.3–7), while pool CO-WS-10 showed pH values like those of the pumped bore, ranging from slightly neutral to slightly basic (7.2–8.34). The pumped bore recorded neutral to slightly basic pH values between 7.12 and 7.95.
- Major Ions
 - Water Facies
 - According to the Piper plots in Figure 5.8, surface pools did not exhibit distinct water facies and ranged between magnesium bicarbonate and sodium chloride types. In contrast, all samples collected during the pumping test fell within the magnesium bicarbonate facies category.
- Metals
 - Most metals were below the laboratory detection limit in both surface pools and bore samples.
 - Iron was a notable exception, consistently detected in all samples and exceeding the ADWG aesthetic threshold in some samples from all pools and bore CRD0137.

5.5 Glen Herring pit

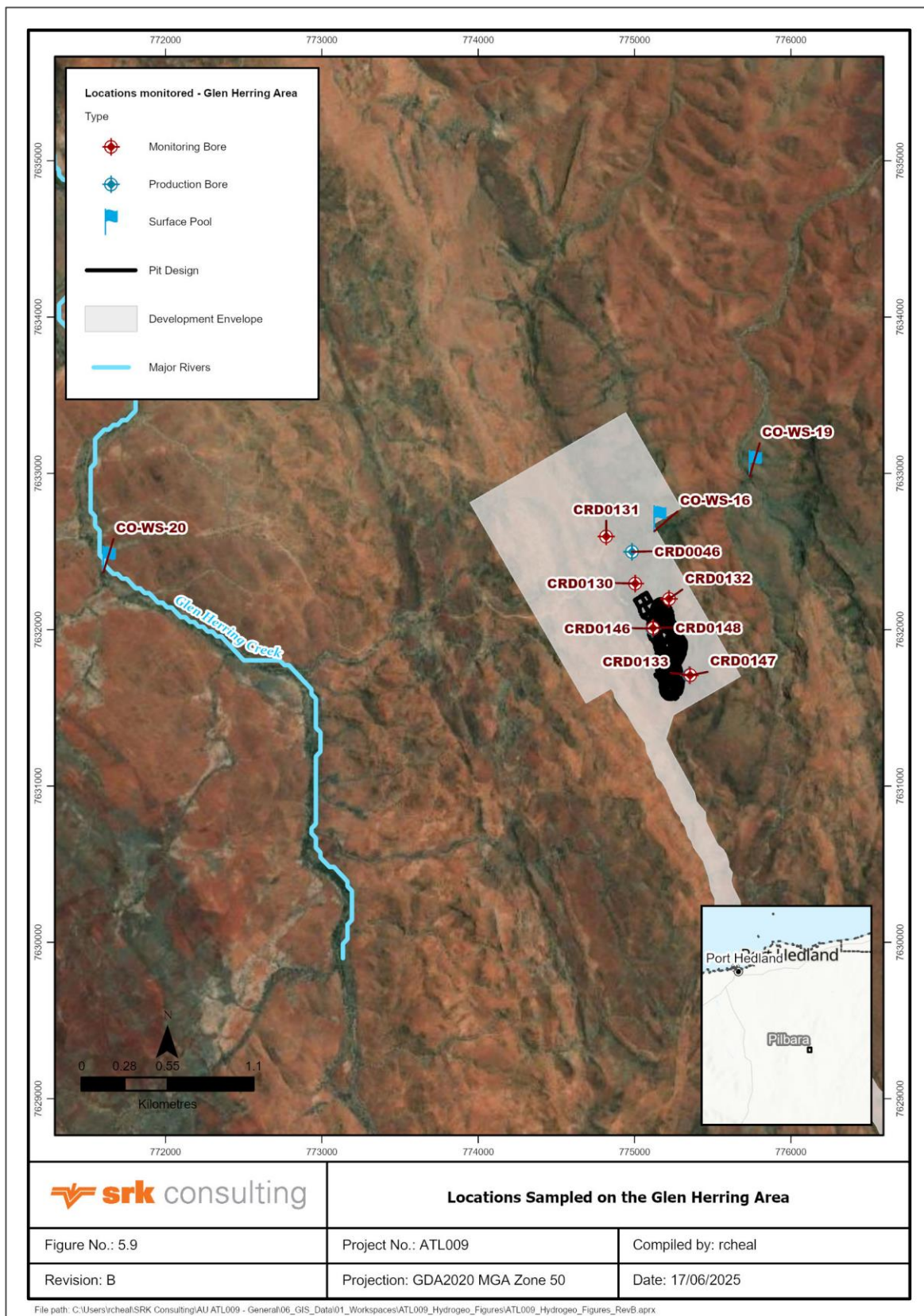
A total of 16 different locations have been sampled at different occasions since early 2014 in the areas close to Glen Herring pit, under the monitoring program undertaken by Atlas in the Sanjiv Ridge Project. A total of 11 bores and pools have laboratory analysis completed. The frequency and dates of sampling are presented in Table 5.5 and locations are presented in Figure 5.9. Included in Appendix A are a further five locations of samples that received field analysis only.

Table 5.5: Glen Herring pit area - sample summary

Location ID	Times sampled	Date range
CO-WS-16	2	Nov 2022 to Nov 2023
CO-WS-19	2	Nov 2022 to Nov 2023
CO-WS-20	2	Nov 2022 to Nov 2023
CRD0046	4	Nov 2015 to Oct 2024
CRD0130	2	May 2024 to Jul 2024
CRD0131	2	May 2024 to Jun 2024
CRD0132	2	May 2024 to Jun 2024
CRD0133	3	Jun 2024 to Oct 2024
CRD0146	4	May 2024 to Sep 2024
CRD0147	2	Jun 2024
CRD0148	1	Jul 2024

More information on the bore locations, design and sampling frequency is presented in Appendix A. Water quality figures for these locations are presented in Appendix B (time series plots) and in Appendix C (box-and-whisker plots). Each appendix groups data by project area. The descriptions of water quality are grouped into three main subsections: physico-chemical, major ions, and metals. If other analytes display notable trends, these are discussed in an additional subsection of 'Other relevant analytes'.

Figure 5.9: Glen Herring pit area – monitoring network



5.5.1 Physico-chemical analysis

Field measurements for EC and pH, along with laboratory data, were plotted and compared against the 2000 ANZECC guidelines for livestock water quality and the 2015 ADWG. The key findings are as follows:

- **EC:** EC values across all samples remained consistently well below the ANZECC threshold of 7,000 $\mu\text{S}/\text{cm}$, showing stable trends over time (Appendix B). Surface water pools have higher EC values compared with bores.
- **pH:** Field pH and laboratory-measured pH values compare well to each other (Appendix C). Time series data (Appendix B) show pH values from pool CO-WS-20 rise above the ANZECC guideline value of 8.5 in March 2023. This location has recorded field pH values between 8.5 and 9.9 consistently since between March 2023 and January 2025 which compare well to lab results with values of 8.55 and 9.1 during the same period. Bores CRD0132 and CRD0133, located on the eastern edge of the pit, each have a single data point (June 2024) which also show field pH values close to 8.5.
- **TDS:** TDS levels were generally consistent and below 500 mg/L, except for pools CO-WS-19 and CO-WS-20, where values ranged from 900 mg/L to 2,160 mg/L. TDS concentrations showed minimal variation across all bores over time.
- **Water hardness:** Most samples were categorised as Moderately Hard Water (below 180 mg/L as CaCO_3), with exceptions for pools CO-WS-16, CO-WS-19, and CO-WS-20 classified as Very Hard water with range between 187 mg/L and 740 mg/L as CaCO_3 .

This data reflects stable water quality trends with localised variations, notably in pool CO-WS-20.

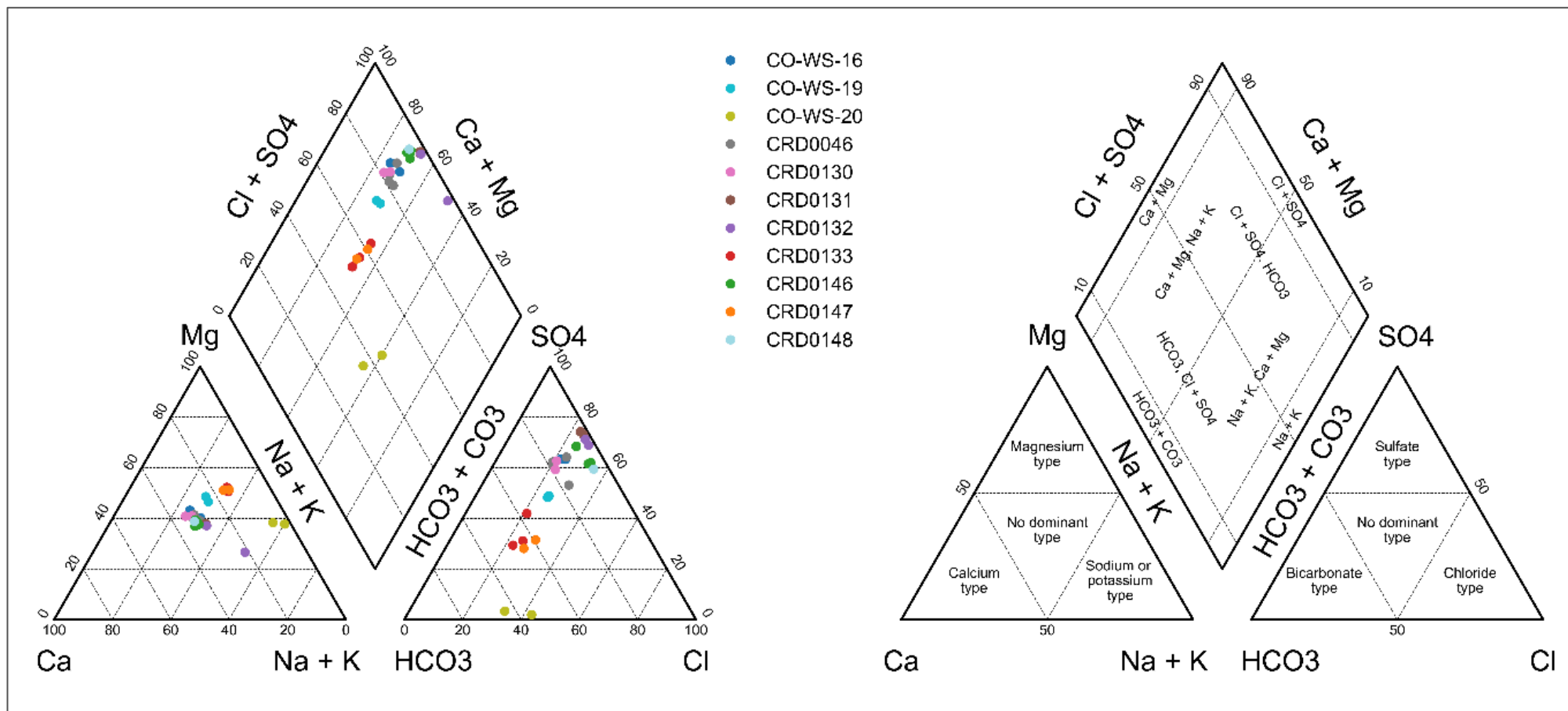
5.5.2 Major ions

Major ions were analysed using time series data (Appendix B) and trilinear diagrams (Piper plots) to illustrate their relative abundance and identify groundwater facies, as shown in Figure 5.10. The classification results are summarised as follows:

- **Groundwater facies:**
 - The area is dominated by magnesium sulfate water facies.
 - Pool CO-WS-20 resides on the boundary between magnesium sulfate water facies and sodium bicarbonate facies, suggesting a distinct facies.
- **Exceptions:**
 - CRD0133 and CRD0147 show relatively low ion concentrations compared to other bores.
 - CRD0131 and CRD0132 show very low bicarbonate alkalinity and calcium levels.
- Surface pools show significant temporal changes in sodium, chloride, and sulfate concentrations, likely influenced by evaporation or seasonal inputs.
- Production and monitoring bores exhibit relatively stable water chemistry over time, with minor fluctuations in major ion concentrations.

All samples have an ionic balance of less than 10% with the exception of the October 2024 sample at CRD0133 (15.3%). Values below 10% are considered acceptable and indicate a reliable analysis. October 2024 sample data from CRD0133 have been included within the analysis as all results are within trend of previous results.

Figure 5.10: Glen Herring pit area – Piper plots (by location)



5.5.3 Metals

The analysis included the following dissolved metals: aluminium, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, and zinc.

The majority of metal concentrations are consistently below laboratory detection limits with the exception of iron. Barium, boron and strontium tend to show higher concentrations in surface pools but are below ANZECC guideline values.

Elevated iron levels within this area are expected due to the presence of the Cleaverville Formation BIF. Iron shows variable concentrations ranging from very low (0.002 mg/L) to extremely high (e.g. 8.83 mg/L in CRD0046 on 2024-09-29) reflecting the iron-rich nature of local geology. Manganese shows some variability within bores (CRD0133 and CRD0147) but are below ANZECC guideline values.

5.5.4 Other relevant analytes

The analysis included the following analytes: nitrate and nitrite, total petroleum and recoverable hydrocarbons (by fraction), a specific set of VOCs termed the BTEXN group comprising benzene, toluene, ethylbenzene, xylenes, and naphthalene.

Two samples have been taken at Pool CO-WS-20 between November 2022 and November 2023. Both samples have recorded elevated values for the hydrocarbons in the C16–C34 fraction.

No data above limit of detection are recorded for BTEXN and nitrate/nitrite values.

5.5.5 Comparison of pumping test data with sensitive receptors

Water quality data collected from pumping tests at three bores (CRD0046, CRD0133, and CRD0146) were compared to data from three surface pools (CO-WS-16, CO-WS-19, and CO-WS-20). The comparison used the most recent data from the surface pools alongside data collected from the bores during the pumping tests. As the data collection periods do not overlap, this introduces some uncertainty; however, the surface pool data has remained stable over time. The key findings from this comparison, based on the time series presented in Appendix B, are summarised below:

- Physical parameters
 - EC
 - EC values observed in bores during the pumping tests ranged from 246 to 446 $\mu\text{S}/\text{cm}$, while surface pools showed higher concentrations, ranging from 486 to 3,080 $\mu\text{S}/\text{cm}$. The elevated EC levels in surface pools, particularly in CO-WS-19 and CO-WS-20 (both exceeding 1,390 $\mu\text{S}/\text{cm}$), are likely due to exposure to atmospheric conditions.
 - pH and alkalinity
 - Pools CO-WS-19 and CO-WS-20 exhibited higher pH values (above 8.13) and elevated alkalinity levels (>220 mg/L of CaCO_3), whereas pool CO-WS-16 had pH values closer to those of the pumped bores, ranging from slightly acidic to neutral (6.36–7.05).

- Major Ions
 - Water Facies
 - Based on the Piper plots presented in Figure 5.10, pool CO-WS-20 exhibited a distinct chemistry compared to the bores, positioned near the boundary between magnesium sulfate and sodium bicarbonate water facies. This pool also displayed higher concentrations of chloride and sodium.
 - Pools CO-WS-16 and CO-WS-19 tended to fall within the same water facies category as the pumped groundwater.
- Metals
 - Most metals were below the laboratory detection limit in both surface pools and bore samples.
 - An exception was Iron, which was consistently detected in all samples and exceeded the ADWG aesthetic threshold in pool CO-WS-16, as well as in bores CRD0046 and CRD0133.

5.6 Shark Gully pit

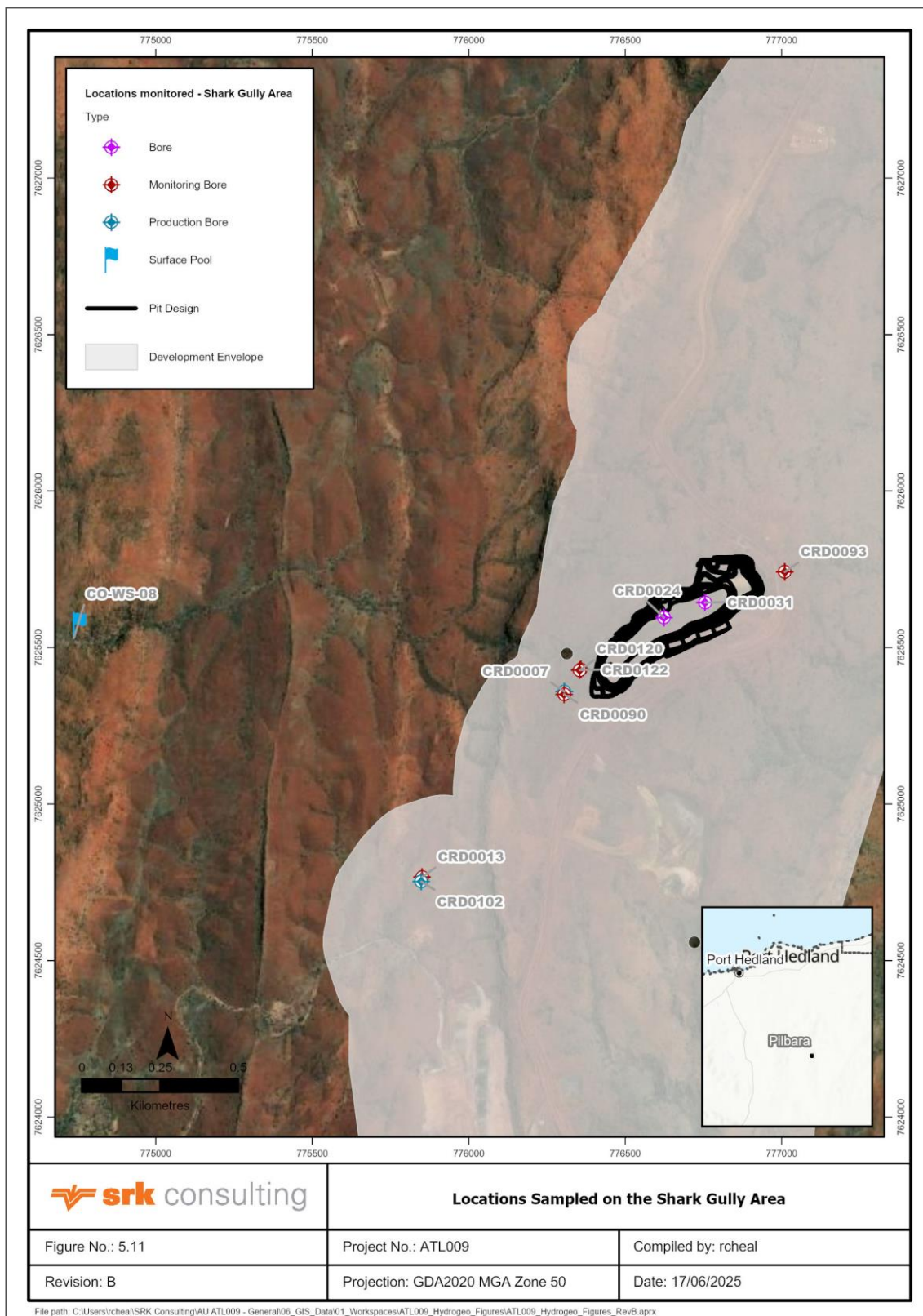
A total of 25 different locations have been sampled at different occasions since early 2014 in the areas close to Shark Gully pit, under the monitoring program undertaken by Atlas in the Sanjiv Ridge Project. A total of 10 bores and pools have laboratory analysis completed. The frequency and dates of sampling are presented in Table 5.6 and locations are presented in Figure 5.11. Included in Appendix A are a further 15 locations of samples that received field analysis only.

Table 5.6: Shark Gully pit area – sample summary

Location ID	Times sampled	Date range
CO-WS-08	8	Aug 2017 to Feb 2019
CRD0007	8	May 2019 to Nov 2022
CRD0013	4	May 2019 to Nov 2024
CRD0024	5	Oct 2017 to Nov 2020
CRD0031	2	Nov 2015 to Feb 2019
CRD0090	6	Apr 2019 to Nov 2024
CRD0093	6	Apr 2019 to Nov 2024
CRD0102	6	Jun 2019 to Nov 2021
CRD0120	2	Nov 2023 to Nov 2024
CRD0122	5	Apr 202 to Nov 2024

More information on the bore locations, design and sampling frequency is presented in Appendix A. Water quality figures for these locations are presented in Appendix B (time series plots) and in Appendix C (box-and-whisker plots). Each appendix groups data by project area. The descriptions of water quality are grouped into three main subsections: physico-chemical, major ions, and metals. If other analytes display notable trends, these are discussed in an additional subsection of 'Other relevant analytes'.

Figure 5.11: Shark Gully pit area – sample locations



Note: Classification of 'Bore' denotes any borehole without a specific designation of monitoring bore or production bore within the Atlas database.

5.6.1 Physico-chemical analysis

Field measurements for EC and pH, along with laboratory data, were plotted and compared against the 2000 ANZECC guidelines for livestock water quality and the 2015 ADWG. The key findings are as follows:

- **EC:** EC values across all samples remained consistently well below the ANZECC threshold of 7,000 $\mu\text{S}/\text{cm}$, showing stable trends over time. Surface water pools and bores show similar EC values with the majority of data recording values below 1000 $\mu\text{S}/\text{cm}$.
- **pH:** Field pH and laboratory-measured pH values compare well to each other. Data are variable over time (in both pools and bores), with a wide range of pH values from 5.5 to 9.2. All locations are recording values below ANZECC guidelines value (pH 8.5) since January 2022. Locations recording data above ANZECC guidelines are CO-WS-08 in 2018, and CRD0102, CRD0007 and CRD0013 between August 2020 and January 2022.
- **TDS:** TDS levels have been consistently below 500 mg/L since 2020.
- **Water hardness:** Most samples were categorised as Moderately Hard Water (below 180 mg/L as CaCO_3). Since 2020, only CRD0102 and CRD0013 are classified as Very Hard water with range between 200 mg/L and 290 mg/L as CaCO_3 .

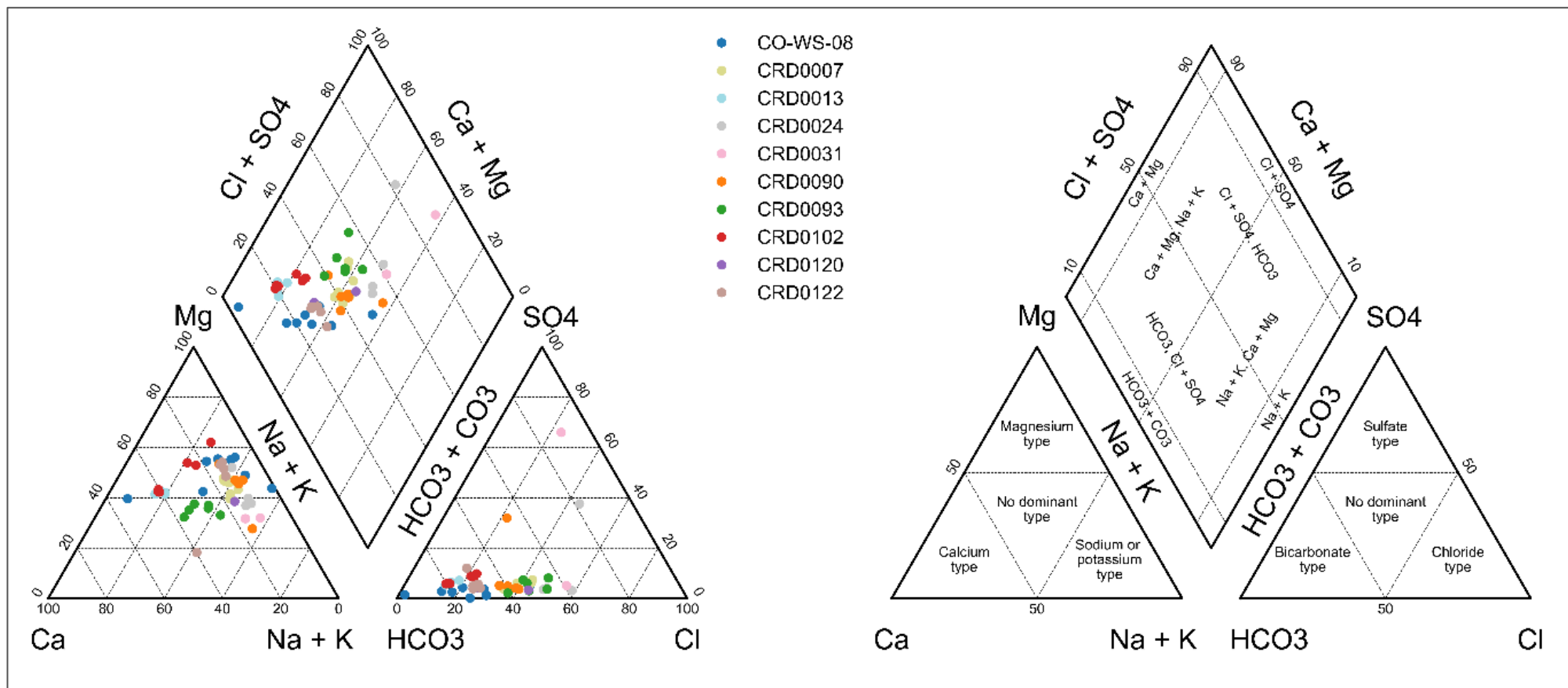
5.6.2 Major ions

Major ions were analysed using time series data (Appendix B) and trilinear diagrams (Piper plots) to illustrate their relative abundance and identify groundwater facies, as shown in Figure 5.12. The classification results are summarised as follows:

- **Groundwater facies:**
 - The area is dominated by magnesium bicarbonate waters facies, which are typical of shallow fresh groundwater.
 - Surface pools and bores show similar compositions with pools being tending to be more dominant in bicarbonate.
- **Exceptions:**
 - CRD0024 and CRD0031 have distinct groundwater facies and record higher sulfate values compared to other locations in the group.

All samples after 2019 have an ionic balance of less than 10% which is considered acceptable and indicates a reliable analysis.

Figure 5.12: Shark Gully pit area – Piper plots (by location)



5.6.3 Metals

The analysis included the following dissolved metals: aluminium, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, and zinc.

The majority of metal concentrations are consistently below laboratory detection limits with the exception of iron. Bores CRD0093 and CRD0120, and pool CO-WS-08 show elevated reading for barium, strontium and iron.

5.6.4 Other relevant analytes

The analysis included the following analytes: nitrate and nitrite, total petroleum and recoverable hydrocarbons (by fraction), a specific set of VOCs termed the BTEXN group comprising benzene, toluene, ethylbenzene, xylenes, and naphthalene.

No data above limit of detection are recorded for hydrocarbon or BTEXN analytes. All nitrate/nitrite values are well below ANZECC guideline values.

5.7 Razorback pit

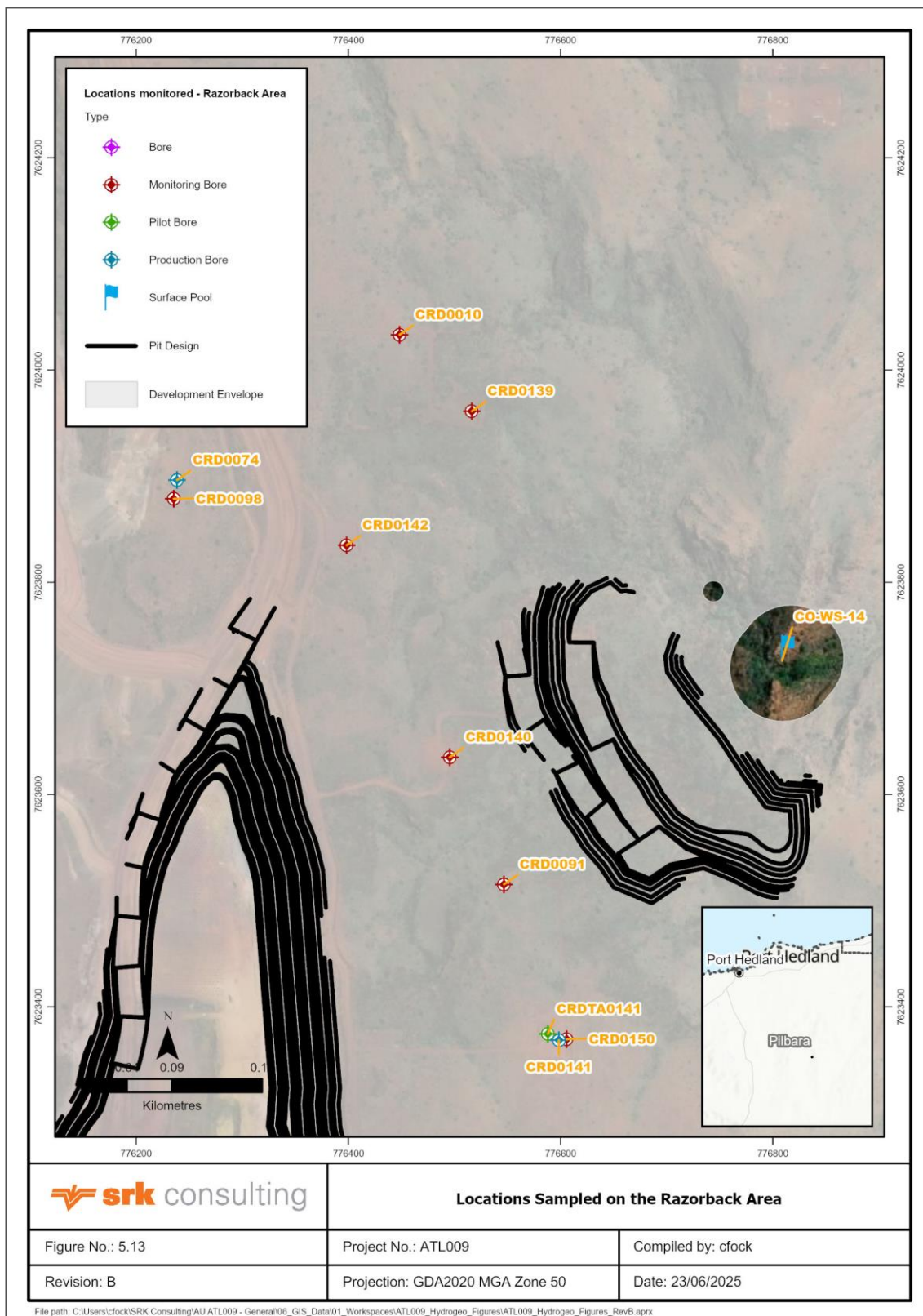
A total of 19 different locations have been sampled at different occasions since early 2014 in the areas close to Razorback pit, under the monitoring program undertaken by Atlas in the Sanjiv Ridge Project. A total of 10 bores and pools have laboratory analysis completed. The frequency and dates of sampling are presented in Table 5.7 and locations are presented in Figure 5.13. Included in Appendix A are a further nine locations of samples that received field analysis only.

Table 5.7: Razorback pit area – sample summary

Location ID	Times sampled	Date range
CO-WS-14	22	Aug 2017 to Nov 2024
CRD0010	5	May 2019 to Nov 2024
CRD0074	6	May 2019 to Nov 2022
CRD0091	9	Nov 2020 to Nov 2024
CRD0098	5	Nov 2020 to Nov 2024
CRD0139	1	Nov 2024
CRD0140	1	Mar 2024
CRD0141	3	Apr 2024 to Nov 2024
CRD0142	1	Mar 2024
CRD0150	1	Apr 2024

More information on the bore locations, design and sampling frequency is presented in Appendix A. Water quality figures for these locations are presented in Appendix B (time series plots) and in Appendix C (box-and-whisker plots). Each appendix groups data by project area. The descriptions of water quality are grouped into three main subsections: physico-chemical, major ions, and metals. If other analytes display notable trends, these are discussed in an additional subsection of 'Other relevant analytes'.

Figure 5.13: Razorback pit area – sample locations



Note: Classification of 'Bore' denotes any borehole without a specific designation of monitoring bore, pilot bore or production bore within the Atlas database.

5.7.1 Physico-chemical analysis

Field measurements for EC and pH, along with laboratory data, were plotted and compared against the 2000 ANZECC guidelines for livestock water quality and the 2015 ADWG. The key findings are as follows:

- **EC:** EC values across all samples remained consistently well below the ANZECC threshold of 7,000 $\mu\text{S}/\text{cm}$, showing stable trends over time. Surface water pools and bores show similar EC, values with the majority of data recording values below 1000 $\mu\text{S}/\text{cm}$.
- **pH:** Field pH and laboratory-measured pH values compare well to each other. Data is variable over time (in both pools and bores) with a wide range of pH values from 5.9 to 8.35. All locations are recording values below ANZECC guideline value (pH 8.5). While some variability was noted over time, locations classified as slightly acidic or slightly basic maintained their respective categories.
- **TDS:** TDS levels have been consistently below 500 mg/L since 2021, with some stable trend variations.
- **Water hardness:** Most samples were categorised as Moderately Hard Water (below 120 mg/L as CaCO_3). Since 2018, only CRD0091, CRD0141 and CRD00150 are classified as Very Hard water with range between 185 mg/L and 370 mg/L as CaCO_3 .

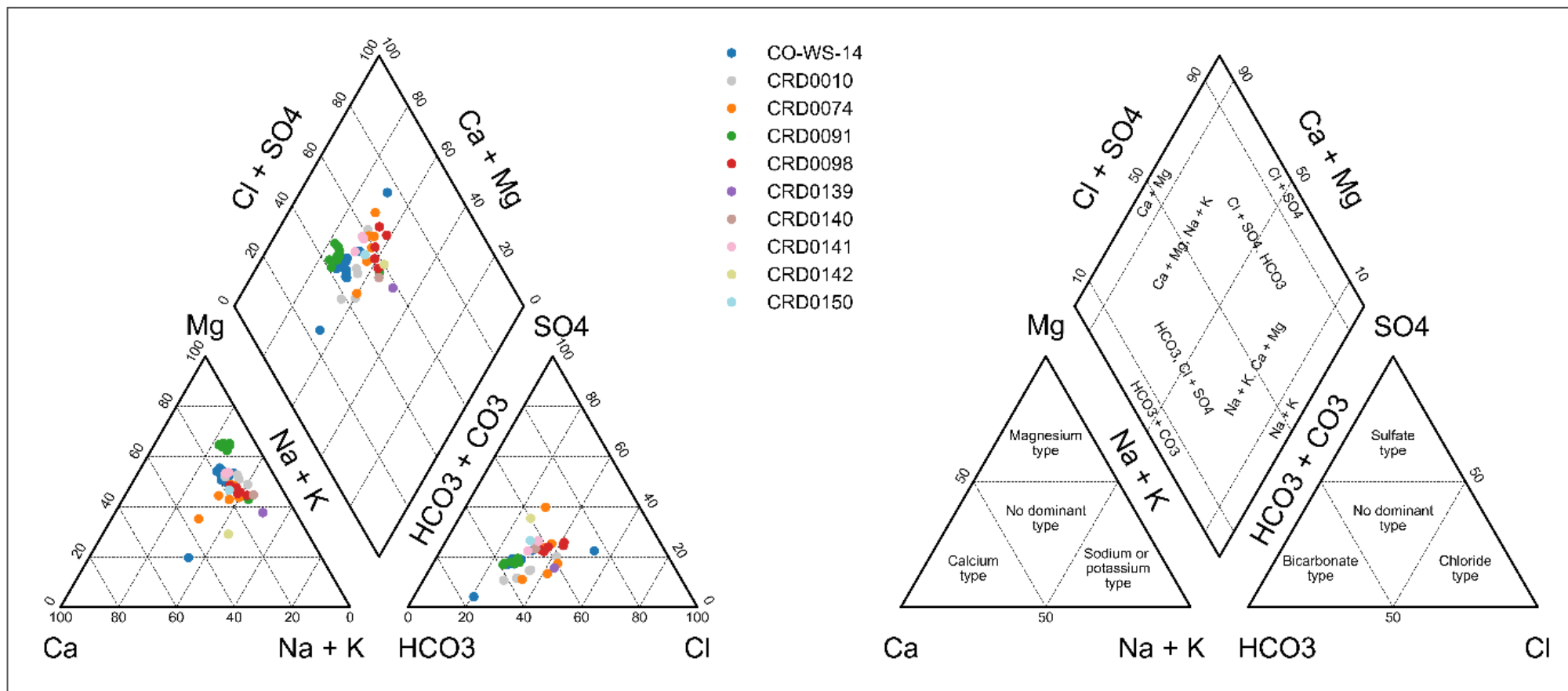
5.7.2 Major ions

Major ions were analysed using time series data (Appendix B) and trilinear diagrams (Piper plots) to illustrate their relative abundance and identify groundwater facies, as shown in Figure 5.14. The classification results are summarised as follows:

- **Groundwater facies:**
 - The area is dominated by Magnesium Bicarbonate to Mixed Type waters facies, which are typical of shallow fresh groundwater.
 - Surface pools and bores show similar compositions with pools being tending to be more dominant in bicarbonate.

All samples collected after 2019 exhibited an ionic balance of less than 10%, which is considered acceptable and reflects reliable analytical results. However, one sample collected from pool CO-WS-14 in early 2018 displayed an ionic balance of -42%, falling outside the acceptable range and indicating significant uncertainty in the analysis.

Figure 5.14: Razorback pit area – Piper plots (by location)



5.7.3 Metals

The analysis included the following dissolved metals: aluminium, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, and zinc.

Most metal concentrations consistently remained below laboratory detection limits, with the notable exception of iron. Iron concentrations exceeded the ADWG aesthetic limit across all bores, highlighting a recurring exceedance specific to this parameter.

Elevated iron levels within this area are expected due to the presence of the Cleaverville Formation BIF. Razorback shows the greatest range of Iron concentrations (Appendix C) across the Project area.

5.7.4 Other relevant analytes

The analysis included the following analytes: nitrate and nitrite, total petroleum and recoverable hydrocarbons (by fraction), a specific set of VOCs termed the BTEXN group comprising benzene, toluene, ethylbenzene, xylenes, and naphthalene.

No data above limit of detection are recorded for hydrocarbon or BTEXN analytes. All nitrate/nitrite values are well below ANZECC guideline values.

5.7.5 Comparison of pumping test data with sensitive receptors

Water quality data collected from a pumping test at one bore (CRD0141) was compared to data from one surface pool (CO-WS-14). The comparison used the most recent data from the surface pool alongside data from the pumping test. The data collection periods overlap providing confidence in the comparison. The key findings from this analysis, based on the time series presented in Appendix B, are summarised below:

- Physical parameters
 - EC
 - EC values in pool CO-WS-14 were consistent with those recorded during the pumping test for bore CRD0141.
 - pH
 - Pool CO-WS-14 exhibited neutral to slightly basic pH values (7.79–8.1), aligning with the neutral pH values observed in bore CRD0141 (7.15–7.21).
- Major Ions
 - Water Facies
 - According to the Piper plots in Figure 5.14, pool CO-WS-14 samples were predominantly classified as magnesium bicarbonate, with occasional mixed-type classifications. Bore CRD0141 was also classified as magnesium bicarbonate, closely aligning with the results from the pool.

- Metals
 - Most metals were below laboratory detection limits in both the surface pool and bore samples.
 - Iron was an exception, consistently detected in all samples. Iron concentrations tended to be lower in the pool, with two samples from bore CRD0141 exceeding the ADWG aesthetic threshold.

5.8 Sparrow Lake pit

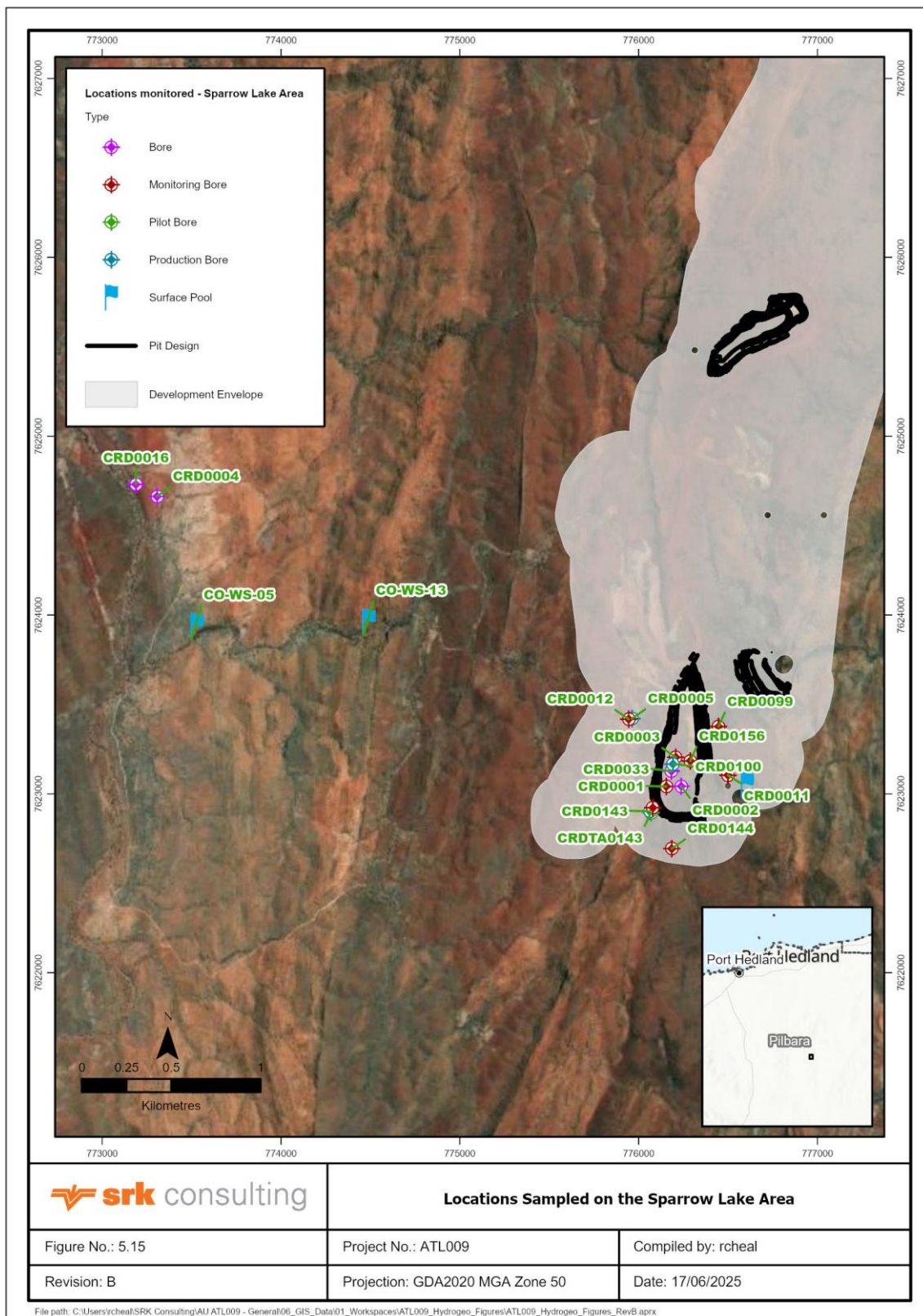
A total of 36 different locations have been sampled at different occasions since early 2014 in the areas close to Sparrow Lake pit, under the monitoring program undertaken by Atlas in the Sanjiv Ridge Project. A total of 19 bores and pools have laboratory analysis completed. The frequency and dates of sampling are presented in Table 5.8 and locations are presented in Figure 5.15. Included in Appendix A are a further 17 locations of samples that received field analysis only.

Table 5.8: Sparrow Lake pit area - sample summary

Location ID	Times sampled	Date range
CO-WS-05	9	Jul 2017 to Feb 2019
CO-WS-09	1	Jul 2017
CO-WS-13	7	Jul 2017 to Feb 2019
CRD0001	2	Nov 2020 to Nov 2021
CRD0002	1	Nov 2020
CRD0003	5	Apr 2014 to Nov 2021
CRD0004	1	Oct 2017
CRD0005	9	Apr 2014 to Nov 2024
CRD0011	5	Nov 2020 to Nov 2024
CRD0012	4	Apr 2019 to Nov 2023
CRD0016	2	Apr 2014 to Apr 2015
CRD0033	2	Oct 2015 to Nov 2020
CRD0099	10	May 2019 to Nov 2024
CRD0100	6	May 2019 to Nov 2021
CRD0143	4	Mar 2024 to Oct 2024
CRD0144	1	Jan 2024
CRD0151	1	Mar 2024
CRD0156	1	Nov 2024
CRDTA0143	1	Mar 2024

More information on the bore locations, design and sampling frequency is presented in Appendix A. Water quality figures for these locations are presented in Appendix B (time series plots) and in Appendix C (box-and-whisker plots). Each appendix groups data by project area. The descriptions of water quality are grouped into three main subsections: physico-chemical, major ions, and metals. If other analytes display notable trends, these are discussed in an additional subsection of 'Other relevant analytes.'

Figure 5.15: Sparrow Lake pit area – sample locations



Note: Classification of 'Bore' denotes any borehole without a specific designation of monitoring bore, pilot bore or production bore within the Atlas database.

5.8.1 Physico-chemical analysis

Field measurements for EC and pH, along with laboratory data, were plotted and compared against the 2000 ANZECC guidelines for livestock water quality and the 2015 ADWG. The key findings are as follows:

- **EC:** EC values across all samples remained consistently well below the ANZECC threshold of 7,000 $\mu\text{S}/\text{cm}$, showing stable trends over time. Surface water pools and bores show similar EC values with the majority of data recording values below 2000 $\mu\text{S}/\text{cm}$.
- **pH:** Field pH and laboratory-measured pH values compare well to each other. Data is variable over time (in both pools and bores) with a wide range of pH values from 6.3 to 9.0. Locations recording data above ANZECC guidelines (pH 8.5) are CO-WS-13 in 2018, and CRD0003 and CRD0005 between May 2020 and February 2022.
- **TDS:** TDS levels tend to be higher in the surface water pools. Pools tend to have recorded values below 1,200 mg/L whereas bore readings are consistently below 750 mg/L. The highest TDS values come from a single sample recorded at CO-WS-09 in July 2017 with a value of 2,800 mg/L.
- **Water hardness:** Data from all sample locations are categorised as Very Hard Water (above 180 mg/L as CaCO_3) with the exception of occasional sample events that drop below this threshold.

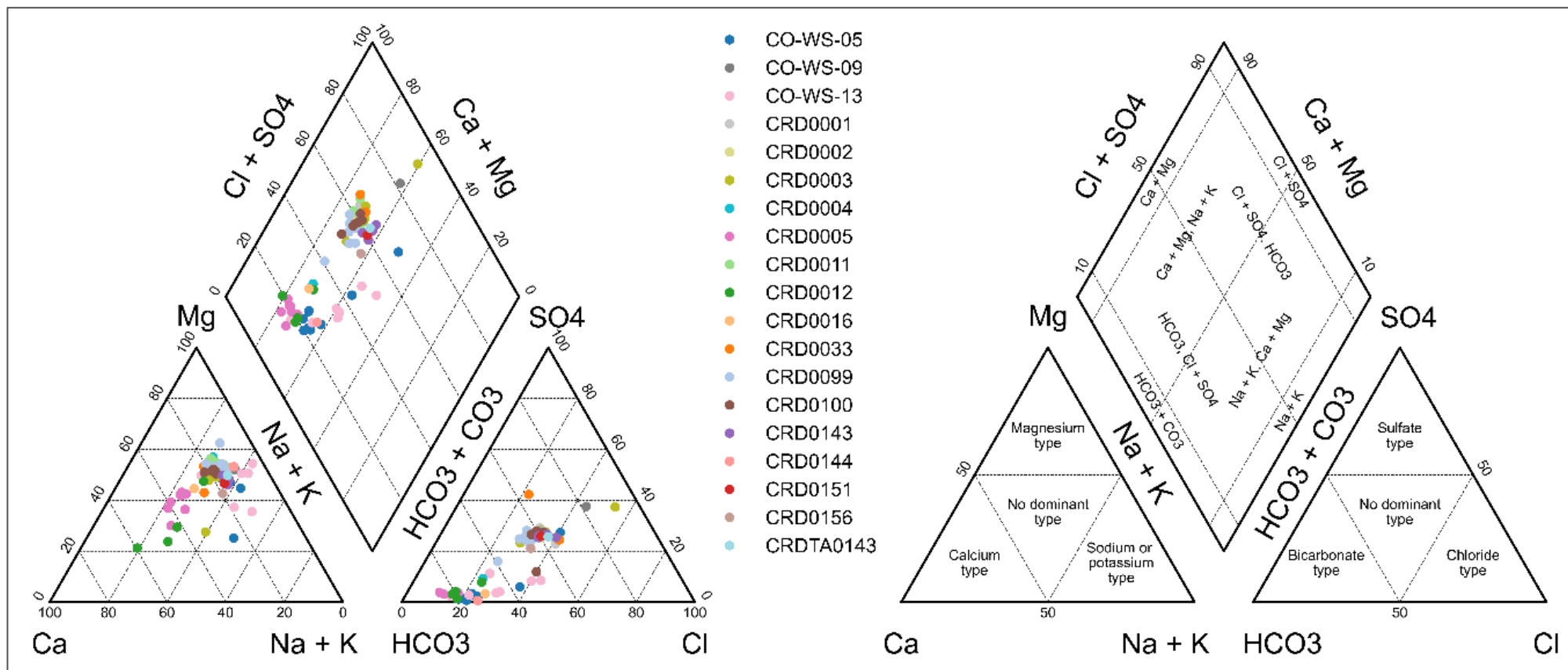
5.8.2 Major ions

Major ions were analysed using time series data (Appendix B) and trilinear diagrams (Piper plots) to illustrate their relative abundance and identify groundwater facies, as shown in Figure 5.16. The classification results are summarised as follows:

- **Groundwater facies:**
 - There are two dominant water facies in this area: Magnesium Bicarbonate Type and Mixed Type waters facies.
 - Surface pools (CO-WS-05 and CO-WS-13) tend to be dominantly Magnesium Bicarbonate Type.
- **Exceptions:**
 - The surface pool CO-WS-09 and bore CRD0003 have a distinct Calcium Sulfate Type groundwater facies and record higher sulfate values compared to other locations in the group.

All samples have an ionic balance of less than 10% which is considered acceptable and indicates a reliable analysis.

Figure 5.16: Sparrow Lake pit area – Piper plots (by location)



5.8.3 Metals

The analysis included the following dissolved metals: aluminium, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, and zinc.

The majority of metal concentrations are consistently below laboratory detection limits.

Iron levels range between 0 and 5 mg/L with most bores recording values less than 1 mg/L.

Selenium levels recorded between 2014 and 2015 are above ANZECC guideline values (0.02 mg/L) in bore CRD0003, CRD0005 and CRD0016. Since 2015, all bores record values well below the guideline value.

Bore CRD0003 also has a single datapoint from 2014 with recorded levels of strontium (0.63 mg/L) more than twice that of all subsequent readings.

5.8.4 Other relevant analytes

The analysis included the following analytes: nitrate and nitrite, total petroleum and recoverable hydrocarbons (by fraction), a specific set of VOCs termed the BTEXN group comprising benzene, toluene, ethylbenzene, xylenes, and naphthalene.

The C10-C40 Fraction (sum) data recorded data above detection limit in 2021. The 2022, 2023 and 2024 annual sampling events have all recorded values below limit of detection.

No data above limit of detection are recorded for BTEXN analytes.

All nitrate/nitrite values are well below ANZECC guideline values.

5.8.5 Comparison of pumping test data with sensitive receptors

Water quality data collected from a pumping test at one bore (CRD0143) were compared to data from the nearest surface pool (CO-WS-14) located in Razorback. The comparison used the most recent data from the surface pool alongside data from the pumping test. The data collection periods overlap providing confidence in the comparison. The key findings, based on the time series presented in Appendix B, are summarised below:

- Physical parameters
 - EC
 - EC values in pool CO-WS-14 were consistent with those recorded during the pumping test for bore CRD0143.
 - pH
 - Pool CO-WS-14 exhibited neutral to slightly basic pH values (7.79–8.1), closely aligning with the neutral to slightly basic pH values observed in bore CRD0143 (7.2–7.99).

- Major Ions
 - Water Facies
 - According to the Piper plots in Figure 5.14 and Figure 5.16, pool CO-WS-14 samples were predominantly classified as magnesium bicarbonate, with occasional mixed-type classifications. Bore CRD0143 was also classified as magnesium bicarbonate, closely aligning with results from the pool.
- Metals
 - Most metals were below laboratory detection limits in both the surface pool and bore samples.
 - Iron was a notable exception, consistently detected in almost all samples except for two from bore CRD0143. Iron concentrations were generally lower in the pool, while one sample from bore CRD0143 exceeded the ADWG aesthetic threshold.

6 Conclusions

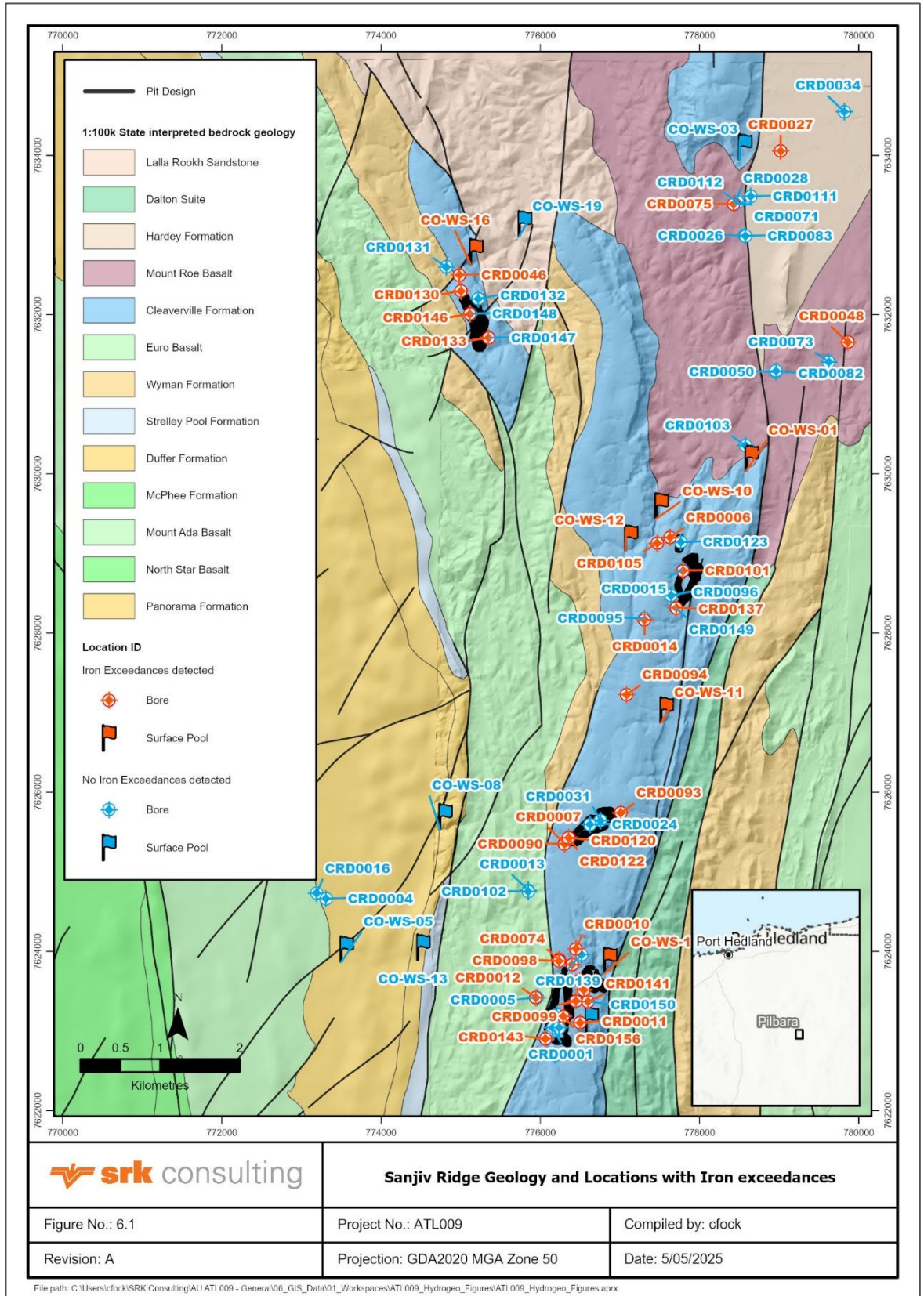
Groundwater quality data, collected from 165 locations between 2014 and 2025, have been assessed to support a hydrogeological H3 report to support approval for Stage 5 mining operations at Sanjiv Ridge.

This assessment has grouped all monitoring locations into eight different locations and aims to identify major trends and changes over time, particularly between the 2014–2019 monitoring period (covered by the Stage 4 hydrogeological H3 report) and the more recent 2020–2025 monitoring period.

The main conclusions regarding water quality changes are outlined as follows:

- **General stability in water quality across the Project area:**
 - In most monitored locations, physico-chemical parameters such as pH, EC, TDS, and water hardness, as well as element concentrations, remained stable over time with no significant changes in trends between the two monitoring periods. All results were within the limits established by ANZECC guidelines and ADWG.
 - Laboratory pH values across the Project area generally range between pH 6.5 and pH 8.0 and are consistent across the monitoring period. Field pH values compare well against the majority of laboratory data. However, the trends of field pH values for specific bores tend to display more variability over time and result in more exceedances to the ANZECC threshold.
 - Most locations were classified as Very Hard Water, with some areas, such as the Runway pit, exhibiting softer water characteristics.
 - Ionic balance values were predominantly below 10%. This supports the reliability of the data and analyses. However, a few isolated locations exhibited higher ionic balance values, introducing some uncertainty in those specific cases.
- **Localised exceptions:**
 - The bores CRD0086 (located near the road) and CRD0048 (at the processing area), and surface pools CO-WS-10 and CO-WS-20, displayed larger variations in physico-chemical parameters, including water hardness, TDS, and concentrations of chloride, sodium, and sulfate.
 - Surface pools exhibited greater variability compared to groundwater locations, likely influenced by surficial processes such as evaporation and seasonal changes.
- **Metals concentration:**
 - Most dissolved metals were below laboratory detection limits. When detectable concentrations were observed, levels were typically low and within the thresholds established by ANZECC guidelines and ADWG. No noticeable differences were observed between the two monitoring periods.
 - Iron was a notable exception, consistently reported at concentrations above laboratory detection limits. In some locations, iron levels exceeded the ADWG aesthetic threshold but are consistent with the site's geological context, with most iron exceedances located in the BIF within the Cleaverville Formation (Figure 6.1).

Figure 6.1: Locations with iron exceedances



- Certain locations recorded elevated concentrations which are exceeding the ANZECC threshold for metals. For example, selenium at bores CRD0003, CRD0005, and CRD0016 exceeds the threshold values while fluoride at bore CRD9986 records consistently close to the ANZECC threshold.
- Elevated manganese values in all pit areas have been recorded compared with other areas. Manganese is often associated with BIF composition and is therefore expected to be present in the groundwater system.
- Elevated silica values in the camp, processing and road areas have been recorded compared with other areas. Increased levels may be associated with silica dissolution of transported silica-rich material. The alkaline groundwater conditions can enhance silica dissolution and contribute to elevated silica concentrations in local water systems. The lower silica levels in the pit areas suggest that the weathering state and transportation of the silica-rich bedrock (such as the Cleaverville Formation BIF) is an important factor in silica release.
- **Hydrocarbons and VOCs:**
 - Hydrocarbon and VOC concentrations were typically below laboratory detection limits across most locations. A notable exception was one sample from pool CO-WS-20 (Glen Herring area), which has two samples taken between November 2022 and November 2023, which recorded elevated hydrocarbons readings for the C16-C34 fraction. Hydrocarbons within the fraction tend to be associated with diesel and oil range organics which may suggest the origin of these results. However, the reason for this is uncertain but requires continued monitoring.
- **Radiocarbon isotope analysis:**
 - The radiocarbon isotope results proved inconclusive for delineating groundwater flow patterns based on water age.
 - At all assessed locations, there is evidence suggesting that water entering the pools is influenced by varying contributions of both groundwater and surface water sources.
 - The analysis has suggested that pools CO-WS-14 (Razorback pit area) and CO-WS-16 (Glen Herring pit area) are dominated by groundwater inflows.
 - Groundwater modelling completed as part of this H3 report has also demonstrated that drawdown associated with dewatering activities of the planned Stage 5 operations is likely to extend to Pool CO-WS-14.
 - An updated water management plan for Sanjiv Ridge is expected to be developed later in 2025 to address these potential impacts.
- **Comparison between pumping test results with sensitive receptors**
 - Pools CO-WS-14 and CO-WS-16 are likely to be dominantly groundwater-fed, as their water quality closely aligns with the pumped bores, indicating strong connectivity. In contrast, pool CO-WS-20 showed the greatest differences, likely due to its distance, while limited data prevent direct conclusions for pools CO-WS-11 and CO-WS-12.

- **Variability between monitoring periods:**
 - Across all sampling locations of the Project area, no significant continuous changes were observed to physico-chemical parameters, major ion groupings, or metal concentrations trends between the two monitoring periods.
 - Surface pools exhibited greater variability over time compared to bore water that is likely influenced by surficial processes. While these variations are not currently of significant concern, they warrant ongoing monitoring and assessment.

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- SRK, 2019b. ATL004_H3_Appendix B Corunna Downs - Numerical Model Report.

Appendix A Locations sampled in the 2014–2025 period

Monitoring Network Details

Location ID	Sample Type	Bore type	Area	Easting	Northing	Elevation	Cased Depth	Screened Section	Date Range	Labs counts 2014-2019	Field counts 2014-2019	Labs counts 2020-2025	Field counts 2020-2025
CRD0017	Only field sample	Bore	Runway	777,112.0	7,627,250.0	461.67			Apr-2013 - Dec-2020		3		2
CRD0018	Only field sample	Bore	Runway	777,281.0	7,627,892.0	465.96			Apr-2013 - Mar-2021		4		7
CRD0022	Only field sample	Bore	Shark Gully	776,595.0	7,626,357.0	460.15			Apr-2013 - Dec-2020		4		2
CRD0023	Only field sample	Bore	Shark Gully	777,215.0	7,626,305.0	466.45			Apr-2013 - Dec-2020		3		2
CDRC0123	Only field sample	Bore	Razorback	776,746.0	7,623,597.0				Sep-2013 - Oct-2018		3		
CDRC0125	Only field sample	Bore	Razorback	776,681.0	7,623,599.0				Sep-2013 - Oct-2018		3		
CDRC0127	Only field sample	Bore	Razorback	776,769.0	7,623,528.0				Sep-2013 - Oct-2019		2		
CDRC0171	Only field sample	Bore	Razorback	776,799.0	7,623,560.0				Oct-2013 - Nov-2017		1		
CDRC0173	Only field sample	Bore	Razorback	776,780.0	7,623,595.0				Oct-2013 - Oct-2019		4		
CDRC0178	Only field sample	Bore	Razorback	776,701.0	7,623,669.0				Oct-2013 - Oct-2018		3		
CRD0003	Field and Laboratory Sample	Monitoring Bore	Sparrow Lake	776,206.2	7,623,203.2	408.75			Apr-2014 - Nov-2021	3	15	2	18
CRD0005	Field and Laboratory Sample	Production Bore	Sparrow Lake	775,961.9	7,623,419.7	383.68	65	6 - 65	Apr-2014 - Nov-2024	4	13	5	31
CRD0016	Field and Laboratory Sample	Bore	Sparrow Lake	773,188.0	7,624,729.0				Apr-2014 - Apr-2015	2	11		10
CDRC0334	Only Laboratory sample	Bore	Runway						Apr-2014 - Apr-2015	2			
CRD0033	Field and Laboratory Sample	Bore	Sparrow Lake	776,182.0	7,623,126.0				Oct-2015 - Nov-2020	1	11	1	13
CRD0027	Field and Laboratory Sample	Monitoring Bore	Camp	779,018.4	7,634,054.4	221.377			Nov-2015 - Nov-2024	3	21	9	50
CRD0046	Field and Laboratory Sample	Production Bore	Glen Herring	774,982.9	7,632,496.8	361.255			Nov-2015 - Oct-2024	1		3	14
CRD0031	Field and Laboratory Sample	Bore	Shark Gully	776,754.0	7,625,642.0				Nov-2015 - Feb-2019	2	11		5
CRD0028	Field and Laboratory Sample	Bore	Camp	778,440.0	7,633,402.0	231.34			Dec-2015 - Aug-2016	2	2		
CRD0071	Field and Laboratory Sample	Bore	Camp	778,429.0	7,633,394.0				Aug-2016 - Nov-2020	5	19	1	163
CRD0075	Field and Laboratory Sample	Monitoring Bore	Camp	778,427.1	7,633,387.9	232.858			Aug-2016 - Nov-2024	1	10	5	122
CRD0034	Field and Laboratory Sample	Monitoring Bore	Camp	779,817.7	7,634,548.3	215.527			Nov-2016 - Nov-2024	1	3	4	42
CRD0035	Field and Laboratory Sample	Bore	Road	779,316.0	7,638,017.0				Nov-2016	1	1		
CRD0062	Field and Laboratory Sample	Monitoring Bore	Road	778,987.3	7,641,946.1	203.072			Nov-2016 - Nov-2024	1	50	3	79
CRD0064	Field and Laboratory Sample	Monitoring Bore	Road	780,812.6	7,642,047.9	205.092			Nov-2016 - Nov-2022	1	28	5	83
CRD0036	Only Laboratory sample	Bore	Road	778,631.0	7,642,234.0				Nov-2016	1			
CRD0066	Only Laboratory sample	Bore	Road	780,108.5	7,637,261.1				Nov-2016	1			
CRD0021	Only field sample	Bore	Shark Gully	776,698.0	7,625,384.0	473.12			Dec-2016 - Dec-2020		2		2
CRD0048	Field and Laboratory Sample	Monitoring Bore	Processing Plant	779,861.5	7,631,650.6	225.229			Dec-2016 - Nov-2024	1	5	9	43
CRD0073	Field and Laboratory Sample	Monitoring Bore	Processing Plant	779,623.6	7,631,405.2	228.723			Dec-2016 - Nov-2024	1	5	9	44

Location ID	Sample Type	Bore type	Area	Easting	Northing	Elevation	Cased Depth	Screened Section	Date Range	Labs counts 2014-2019	Field counts 2014-2019	Labs counts 2020-2025	Field counts 2020-2025
CRD0050	Field and Laboratory Sample	Monitoring Bore	Processing Plant	778,959.5	7,631,280.9	234.114			Dec-2016 - Nov-2024	2	16	4	42
CRD0026	Field and Laboratory Sample	Monitoring Bore	Camp	778,568.3	7,632,991.1	231.695			Dec-2016 - Nov-2024	2	47	5	42
CRD0038	Field and Laboratory Sample	Bore	Road	783,368.0	7,647,094.0				Apr-2017	1	1		
CRD0044	Field and Laboratory Sample	Bore	Road	782,264.0	7,645,369.0	196.15			Apr-2017	1	20		44
CRD0058	Field and Laboratory Sample	Bore	Road	782,437.0	7,644,384.0	197.76			Apr-2017	1	14		65
CRD0087	Field and Laboratory Sample	Production Bore	Road	781,888.6	7,645,716.8	198.066		4 - 64	Apr-2017 - Apr-2024	5	4	4	68
CRD0045	Only Laboratory sample	Bore	Road	781,895.0	7,645,717.0				Apr-2017	1			
CRD0082	Field and Laboratory Sample	Production Bore	Processing Plant	778,961.4	7,631,290.6	234.438		10 - 88	Apr-2017 - Nov-2024	4	41	9	162
CRD0083	Field and Laboratory Sample	Production Bore	Camp	778,575.6	7,632,987.1	230.808		6 - 78	Apr-2017 - Nov-2024	4	41	9	166
CRD0084	Field and Laboratory Sample	Production Bore	Road	778,983.5	7,641,951.7	203.135		6 - 60	Apr-2017 - Apr-2024	4	30	4	92
CRD0085	Field and Laboratory Sample	Production Bore	Road	780,808.0	7,642,040.0	204.917		6 - 64	Apr-2017 - Apr-2024	4	24	5	78
CRD0086	Field and Laboratory Sample	Production Bore	Road	782,441.8	7,644,378.2	198.458		4 - 70	May-2017 - Apr-2024	4	12	3	67
CO-WS-01	Field and Laboratory Sample	Surface Pool	Processing Plant	778,585.5	7,630,036.1	245.781			Jul-2017 - Nov-2024	10		9	44
CO-WS-03	Only Laboratory sample	Surface Pool	Camp	778,502.8	7,633,945.9				Jul-2017	1			
CO-WS-05	Only Laboratory sample	Surface Pool	Sparrow Lake	773,497.2	7,623,864.3				Jul-2017 - Feb-2019	9			
CO-WS-09	Only Laboratory sample	Surface Pool	Sparrow Lake	776,575.5	7,622,976.9				Jul-2017	1			
CO-WS-11	Only Laboratory sample	Surface Pool	Runway	777,516.0	7,626,869.5				Jul-2017 - Feb-2019	9			
CO-WS-13	Only Laboratory sample	Surface Pool	Sparrow Lake	774,459.5	7,623,889.6				Jul-2017 - Feb-2019	7			
CO-WS-14	Field and Laboratory Sample	Surface Pool	Razorback	776,807.7	7,623,724.5	320.99			Aug-2017 - Nov-2024	13		9	50
CO-WS-12	Field and Laboratory Sample	Surface Pool	Runway	777,069.5	7,629,034.2				Aug-2017 - Feb-2019	11			2
CO-WS-08	Only Laboratory sample	Surface Pool	Shark Gully	774,737.3	7,625,528.5				Aug-2017 - Feb-2019	8			
CO-WS-10	Field and Laboratory Sample	Surface Pool	Runway	777,454.7	7,629,433.6	297.225			Oct-2017 - May-2023	11		5	19
CRD0004	Field and Laboratory Sample	Bore	Sparrow Lake	773,306.0	7,624,662.0				Oct-2017	1	13		12
CRD0024	Field and Laboratory Sample	Bore	Shark Gully	776,623.0	7,625,594.0			Nov-2020	Oct-2017 - Jan-1900	4	11	1	16
CRD0043	Field and Laboratory Sample	Bore	Road	782,315.0	7,652,896.0	175.86			Nov-2017	1	7		63
CRD0039	Field and Laboratory Sample	Monitoring Bore	Road	782,300.0	7,652,343.0	180	102		Nov-2017 - Apr-2024	1	2	1	71
CRD0056	Field and Laboratory Sample	Bore	Road	782,645.0	7,652,340.0				Nov-2017	1	2		6
CRD0040	Field and Laboratory Sample	Bore	Road	785,510.0	7,654,694.0				Nov-2017	1	2		
CDRC0122	Only field sample	Bore	Razorback	776,640.0	7,623,518.0				Nov-2017 - Oct-2019		3		

Location ID	Sample Type	Bore type	Area	Easting	Northing	Elevation	Cased Depth	Screened Section	Date Range	Labs counts 2014-2019	Field counts 2014-2019	Labs counts 2020-2025	Field counts 2020-2025
CRD0051	Field and Laboratory Sample	Bore	Road	785,866.0	7,654,331.0				Nov-2017	1	2		
CRD0081	Field and Laboratory Sample	Bore	Road	785,314.0	7,654,076.0				Nov-2017	1	2		
CRD0088	Field and Laboratory Sample	Production Bore	Road	782,298.1	7,652,322.4	177.532		9 - 99	Nov-2017 - May-2023	3	6	3	98
CRD0089	Field and Laboratory Sample	Production Bore	Road	782,634.3	7,652,346.5	182.262		12 - 66	Nov-2017 - May-2023	3	7	4	183
CRD0078	Only field sample	Bore	Road	782,649.0	7,652,930.0				Sep-2018		1		
CRD0020	Only field sample	Bore	Shark Gully	776,864.0	7,625,898.0	489.69			Oct-2018 - Nov-2023		2		12
CRD0015	Field and Laboratory Sample	Monitoring Bore	Runway	777,787.2	7,628,792.4	387.077	75	30-75	Feb-2019 - Nov-2024	3	9	5	30
CRD0047	Only field sample	Bore	Glen Herring	773,359.0	7,631,871.0	273.44			Apr-2019 - Sep-2020		1		2
CRD0012	Field and Laboratory Sample	Monitoring Bore	Sparrow Lake	775,943.5	7,623,416.2	383.019	54	30-54	Apr-2019 - Nov-2023	1	1	3	14
CRD0090	Field and Laboratory Sample	Monitoring Bore	Shark Gully	776,303.6	7,625,348.8	453.752	100	9 - 87	Apr-2019 - Nov-2024	1	2	5	27
CRD0093	Field and Laboratory Sample	Monitoring Bore	Shark Gully	777,009.3	7,625,740.1	487.749	102	6 - 102	Apr-2019 - Nov-2024	1	1	5	29
CRD0007	Field and Laboratory Sample	Production Bore	Shark Gully	776,304.5	7,625,357.6	453.05	84	42-84	May-2019 - Nov-2022	4	1	4	37
CRD0094	Field and Laboratory Sample	Monitoring Bore	Runway	777,082.2	7,627,224.1	462.007	120	53 - 119	May-2019 - Nov-2024	1	1	5	26
CRD0014	Field and Laboratory Sample	Production Bore	Runway	777,308.4	7,628,164.1	448.252	162	60-162	May-2019 - May-2023	3	1	6	131
CRD0095	Field and Laboratory Sample	Monitoring Bore	Runway	777,308.0	7,628,183.4	446.753	108	6 - 108	May-2019 - Nov-2024	1	1	5	32
CRD0013	Field and Laboratory Sample	Monitoring Bore	Shark Gully	775,850.0	7,624,765.5	366.492	84	6 - 64	May-2019 - Nov-2024	1	1	3	15
CRD0099	Field and Laboratory Sample	Monitoring Bore	Sparrow Lake	776,446.1	7,623,374.9	428.06	120	5 - 102	May-2019 - Nov-2024	1	1	9	44
CRD0010	Field and Laboratory Sample	Monitoring Bore	Razorback	776,447.2	7,624,031.7	433.767	114	72-114	May-2019 - Nov-2024	1	1	4	17
CRD0074	Field and Laboratory Sample	Production Bore	Razorback	776,237.5	7,623,894.8	441.423	172	72-132	May-2019 - Nov-2022	3	1	3	36
CRD0100	Field and Laboratory Sample	Production Bore	Sparrow Lake	776,190.9	7,623,164.9	408.651	138	60 - 114	May-2019 - Nov-2021	3	1	3	26
CRD0102	Field and Laboratory Sample	Production Bore	Shark Gully	775,847.3	7,624,750.9	365.689	72	36 - 72	Jun-2019 - Nov-2021	3	1	3	25
CRD0006	Field and Laboratory Sample	Monitoring Bore	Runway	777,628.1	7,629,198.2	400.288	84	6 - 84	Jun-2019 - Nov-2024	1	1	5	19
CRD0092	Only field sample	Bore	Runway	777,371.0	7,628,867.0				Jun-2019 - Feb-2024		2		18
CRD0101	Field and Laboratory Sample	Production Bore	Runway	777,792.4	7,628,781.8	386.957	132	48 - 104	Jun-2019 - Apr-2024	2	2	8	127
CRD0097	Only field sample	Bore	Processing Plant	778,886.0	7,630,420.0				Jul-2019 - Jun-2023		1		18
CDRC0019	Only field sample	Bore	Sparrow Lake	776,335.0	7,623,282.0				Oct-2019		1		
CDRC0041	Only field sample	Bore	Sparrow Lake	776,157.0	7,623,360.0				Oct-2019		1		
CDRC0061	Only field sample	Bore	Sparrow Lake	776,246.0	7,623,442.0				Oct-2019		1		
CDRC0070	Only field sample	Bore	Sparrow Lake	776,273.0	7,623,596.0				Oct-2019		1		

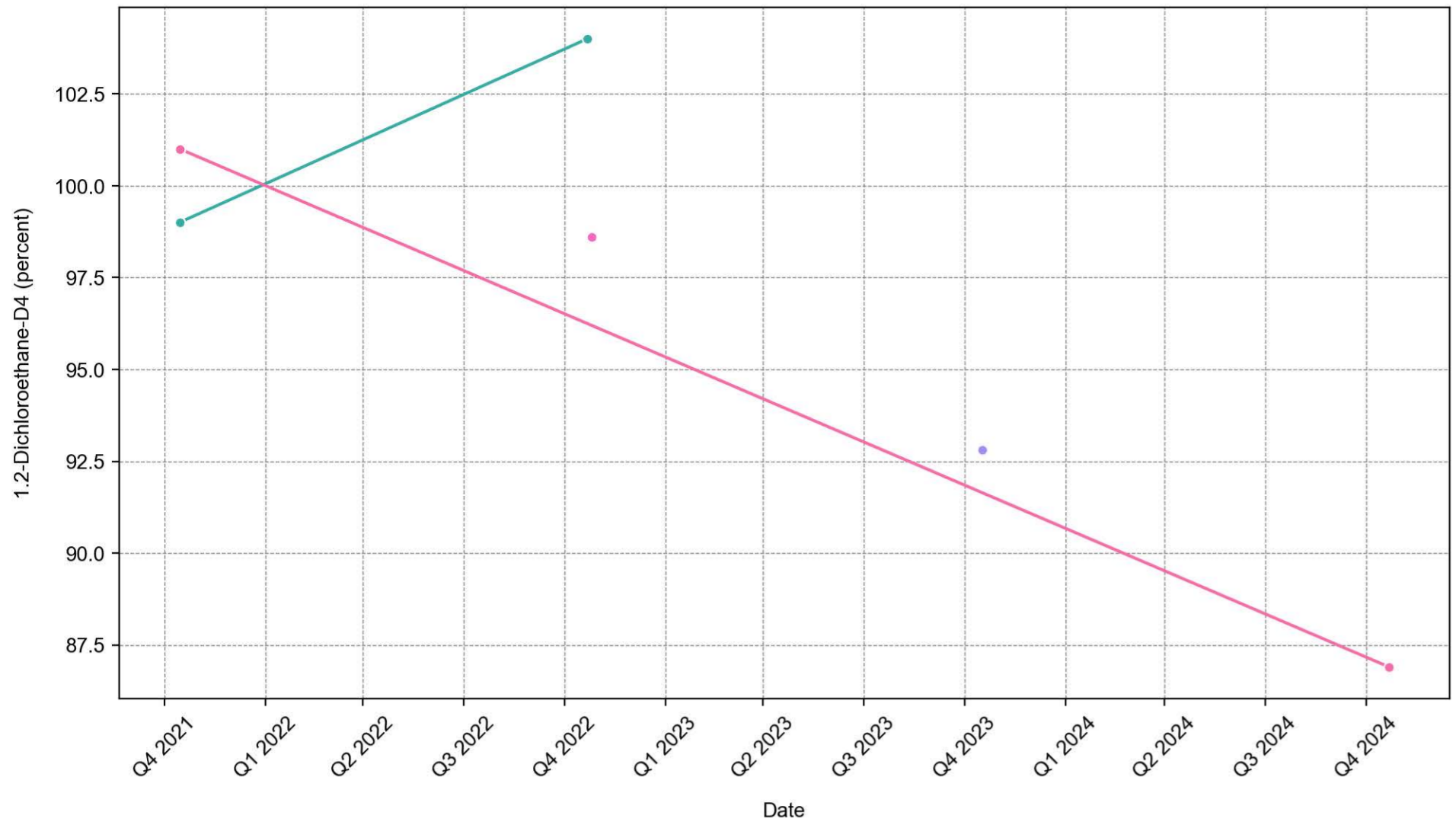
Location ID	Sample Type	Bore type	Area	Easting	Northing	Elevation	Cased Depth	Screened Section	Date Range	Labs counts 2014-2019	Field counts 2014-2019	Labs counts 2020-2025	Field counts 2020-2025
CDRC0071	Only field sample	Bore	Sparrow Lake	776,279.0	7,623,559.0				Oct-2019		1		
CDRC0073	Only field sample	Bore	Sparrow Lake	776,241.0	7,623,479.0				Oct-2019		1		
CDRC0075	Only field sample	Bore	Sparrow Lake	776,241.0	7,623,479.0				Oct-2019		1		
CDRC0079	Only field sample	Bore	Sparrow Lake	776,269.0	7,623,636.0				Oct-2019		1		
CDRC0081	Only field sample	Bore	Sparrow Lake	776,269.0	7,623,678.0				Oct-2019		1		
CDRC0099	Only field sample	Bore	Sparrow Lake	776,647.0	7,622,638.0				Oct-2019		1		
CDRC0100	Only field sample	Bore	Sparrow Lake	776,277.0	7,623,010.0				Oct-2019		1		
CDRC0124	Only field sample	Bore	Razorback	776,683.0	7,623,597.0				Oct-2019		1		
CDRC0150	Only field sample	Bore	Sparrow Lake	776,225.0	7,623,401.0				Oct-2019		1		
CDRC0166	Only field sample	Bore	Sparrow Lake	776,304.0	7,623,719.0				Oct-2019		1		
CDRC0078	Only field sample	Bore	Sparrow Lake	776,200.0	7,623,316.0				Oct-2019		1		
CDRC0093	Only field sample	Bore	Sparrow Lake	776,114.0	7,623,160.0				Oct-2019		1		
CDRC0204	Only field sample	Bore	Shark Gully	776,920.0	7,625,679.0				Oct-2019		1		
CDRC0205	Only field sample	Bore	Shark Gully	776,881.0	7,625,679.0				Oct-2019		1		
CDRC0207	Only field sample	Bore	Shark Gully	776,762.0	7,625,683.0				Oct-2019		1		
CDRC0208	Only field sample	Bore	Shark Gully	776,724.0	7,625,679.0				Oct-2019		1		
CDRC0209	Only field sample	Bore	Shark Gully	776,685.0	7,625,679.0				Oct-2019		1		
CDRC0212	Only field sample	Bore	Shark Gully	776,799.0	7,625,599.0				Oct-2019		1		
CDRC0213	Only field sample	Bore	Shark Gully	776,757.0	7,625,599.0				Oct-2019		1		
CDRC0215	Only field sample	Bore	Shark Gully	776,681.0	7,625,599.0				Oct-2019		1		
CRD0072	Only field sample	Bore	Road	782,253.0	7,642,419.0	202.76			Jun-2020 - May-2023				8
CDRC0397	Only field sample	Bore	Glen Herring	774,830.0	7,632,925.0				Jul-2020				1
CRD0029	Only field sample	Bore	Glen Herring	775,223.0	7,631,721.0				Jul-2020 - Oct-2023				8
CRD0019	Only field sample	Bore	Shark Gully	776,813.0	7,625,981.0	484.07			Aug-2020 - Dec-2020				2
CRD0110	Only field sample	Bore	Glen Herring	773,851.0	7,632,069.0	290.75			Sep-2020 - Sep-2022				5
CRD0001	Field and Laboratory Sample	Monitoring Bore	Sparrow Lake	776,154.1	7,623,040.0	404.837			Nov-2020 - Nov-2021		13	2	12
CRD0002	Field and Laboratory Sample	Bore	Sparrow Lake	776,237.0	7,623,041.0	407.13			Nov-2020		13	1	12
CRD0011	Field and Laboratory Sample	Monitoring Bore	Sparrow Lake	776,498.7	7,623,102.6	430.087	100	12 - 84	Nov-2020 - Nov-2024		2	5	23
CRD0091	Field and Laboratory Sample	Monitoring Bore	Razorback	776,545.5	7,623,513.8	422.348	90	6 - 90	Nov-2020 - Nov-2024		2	9	45
CRD0096	Field and Laboratory Sample	Monitoring Bore	Runway	777,642.5	7,628,469.7	414.21	90		Nov-2020 - Nov-2024		1	4	14
CRD0098	Field and Laboratory Sample	Monitoring Bore	Razorback	776,234.4	7,623,877.2	441.727	138	6 - 108	Nov-2020 - Nov-2024		1	5	25
Camp Meter	Only field sample	Bore	Camp	779,587.7	7,633,436.2	222.7			Apr-2021 - Jan-2024				23
CRD0116	Only field sample	Bore	Shark Gully	776,792.0	7,625,724.0	460.01			Jul-2021 - Jul-2021				2
CRD0117	Only field sample	Bore	Shark Gully	776,871.0	7,625,699.0	460.06			Jul-2021				1
CRD0108	Field and Laboratory Sample	Monitoring Bore	Road	780,948.3	7,642,193.4	203.447			Nov-2021 - Nov-2024			4	93
CRD0111	Field and Laboratory Sample	Monitoring Bore	Camp	778,642.0	7,633,485.9	227.894			Nov-2021 - Nov-2024			3	31

Location ID	Sample Type	Bore type	Area	Easting	Northing	Elevation	Cased Depth	Screened Section	Date Range	Labs counts 2014-2019	Field counts 2014-2019	Labs counts 2020-2025	Field counts 2020-2025
CRD0112	Field and Laboratory Sample	Monitoring Bore	Camp	778,479.5	7,633,409.3	230.845			Nov-2021 - Nov-2024			3	31
CRD0103	Field and Laboratory Sample	Monitoring Bore	Processing Plant	778,574.9	7,630,355.1	240.596			Nov-2021 - Nov-2024			6	29
CO-WS-17	Only field sample	#N/A	#N/A						Apr-2022				1
CRD0122	Field and Laboratory Sample	Monitoring Bore	Shark Gully	776,353.8	7,625,426.3	451.185			Apr-2022 - Nov-2024			5	47
CRD0121	Only field sample	Bore	Processing Plant	779,616.0	7,631,403.0	228.78			Apr-2022 - Jan-2024				13
CRD0123	Field and Laboratory Sample	Monitoring Bore	Runway	777,763.5	7,629,141.6	376.427			May-2022			1	2
CRD0127	Only field sample	Bore	Runway	777,773.0	7,629,146.0	375.37			Jul-2022				1
CDRC1169	Only field sample	#N/A	#N/A						Sep-2022				1
CDRC1615	Only field sample	#N/A	#N/A						Sep-2022				1
CRD0105	Field and Laboratory Sample	Monitoring Bore	Runway	777,466.0	7,629,125.0				Nov-2022 - Nov-2024			2	2
CO-WS-16	Field and Laboratory Sample	Surface Pool	Glen Herring	775,125.0	7,632,628.0				Nov-2022 - Nov-2023			2	14
CO-WS-19	Field and Laboratory Sample	Surface Pool	Glen Herring	775,735.0	7,632,980.0				Nov-2022 - Nov-2023			2	14
CO-WS-20	Field and Laboratory Sample	Surface Pool	Glen Herring	771,602.0	7,632,367.0				Nov-2022 - Nov-2023			2	15
CRD0104	Only field sample	Bore	Processing Plant	778,565.0	7,630,109.0				Nov-2022				1
CRD0124	Only field sample	Bore	Runway	777,735.0	7,628,942.0	397.69			Jun-2023 - Oct-2023				2
CRD0125	Only field sample	Bore	Runway	777,873.0	7,628,416.0	403.06			Oct-2023				1
CRD0153	Only field sample	Bore	Sparrow Lake	776,054.0	7,623,172.0				Oct-2023				1
CRD0152	Only field sample	#N/A	#N/A						Oct-2023				1
CRD0120	Field and Laboratory Sample	Monitoring Bore	Shark Gully	776,357.7	7,625,429.0	450.116			Nov-2023 - Nov-2024			2	20
CRDTA0143	Field and Laboratory Sample	Pilot Bore	Sparrow Lake	776,068.0	7,622,893.0				Jan-2024			1	1
CRD0144	Field and Laboratory Sample	Monitoring Bore	Sparrow Lake	776,183.8	7,622,692.4	439.324			Jan-2024			1	1
CRD0145	Only field sample	Pilot Bore	Sparrow Lake	776,372.5	7,622,713.3	434.571			Jan-2024				1
CRD0143	Field and Laboratory Sample	Production Bore	Sparrow Lake	776,061.9	7,622,901.2	404.496			Mar-2024 - Oct-2024			4	1
CRD0151	Field and Laboratory Sample	Monitoring Bore	Sparrow Lake	776,078.6	7,622,920.9	403.988			Mar-2024			1	1
CRD0140	Field and Laboratory Sample	Monitoring Bore	Razorback	776,494.5	7,623,633.6	423.289			Mar-2024			1	1
CRD0142	Field and Laboratory Sample	Monitoring Bore	Razorback	776,397.4	7,623,833.4	429.632			Mar-2024			1	1
CRDTA0141	Only field sample	Pilot Bore	Razorback	776,587.0	7,623,373.0				Apr-2024				1
CRD0150	Field and Laboratory Sample	Monitoring Bore	Razorback	776,604.7	7,623,368.1	429.376			Apr-2024			1	1
CRD0141	Field and Laboratory Sample	Production Bore	Razorback	776,597.4	7,623,367.1	429.592			Apr-2024 - Nov-2024			3	1

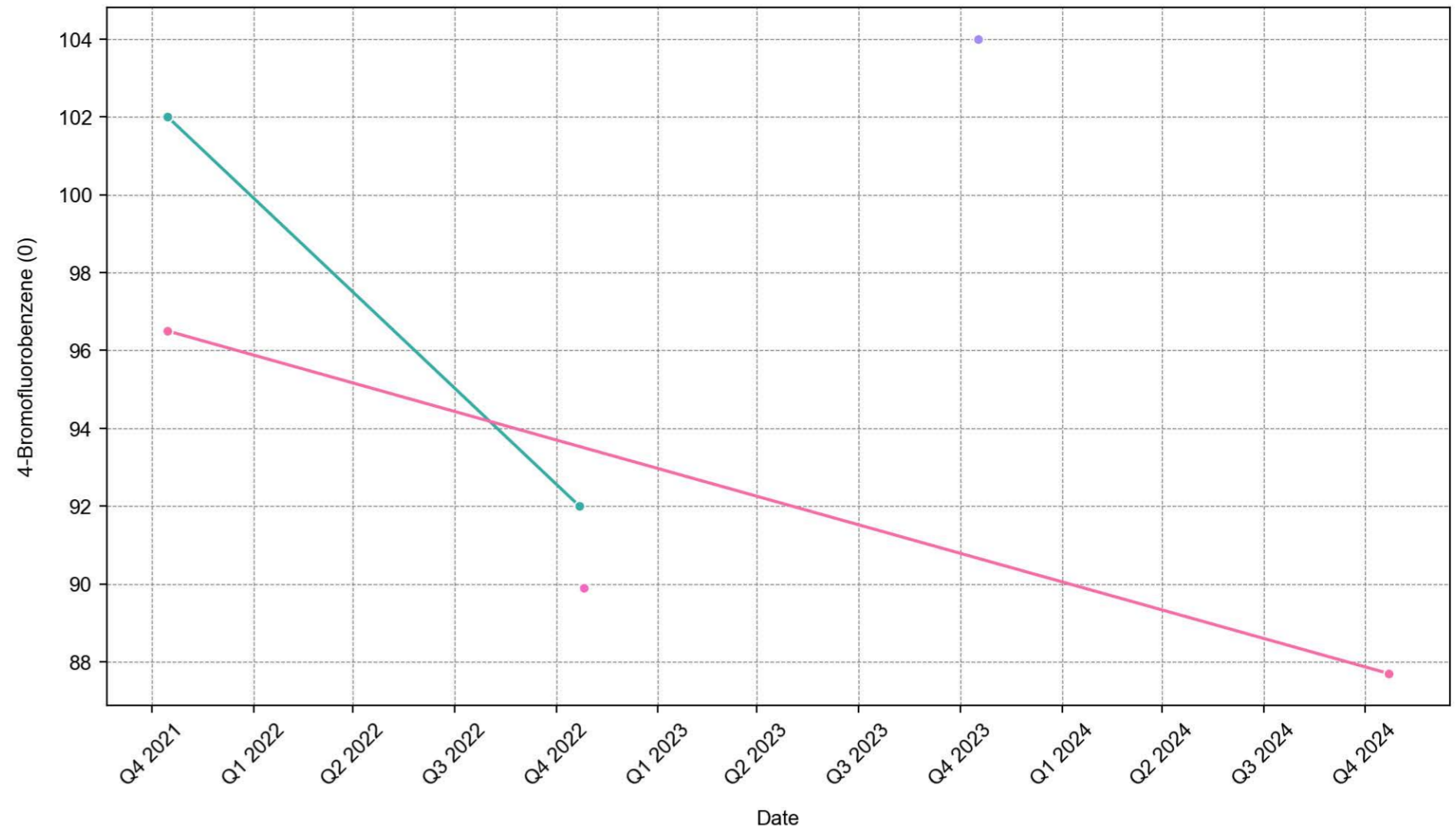
Location ID	Sample Type	Bore type	Area	Easting	Northing	Elevation	Cased Depth	Screened Section	Date Range	Labs counts 2014-2019	Field counts 2014-2019	Labs counts 2020-2025	Field counts 2020-2025
CRD0137	Field and Laboratory Sample	Production Bore	Runway	777,708.5	7,628,315.5	398.81			May-2024 - Nov-2024			3	1
CRD0131	Field and Laboratory Sample	Monitoring Bore	Glen Herring	774,818.0	7,632,595.5	356.413			May-2024 - Jun-2024			2	1
CRD0149	Field and Laboratory Sample	Monitoring Bore	Runway	777,697.0	7,628,315.4	399.071			May-2024			1	1
CRD0132	Field and Laboratory Sample	Monitoring Bore	Glen Herring	775,219.2	7,632,196.1	401.69			May-2024 - Jun-2024			2	1
CRD0130	Field and Laboratory Sample	Monitoring Bore	Glen Herring	775,003.8	7,632,293.9	395.483			May-2024 - Jul-2024			2	1
CRD0146	Field and Laboratory Sample	Production Bore	Glen Herring	775,113.0	7,632,005.2	405.065			May-2024 - Sep-2024			4	1
CRD0154	Only field sample	Monitoring Bore	Glen Herring	774,810.2	7,632,594.4	356.77			Jun-2024				1
CRD0133	Field and Laboratory Sample	Production Bore	Glen Herring	775,347.0	7,631,708.7	420.766			Jun-2024 - Oct-2024			3	1
CRD0147	Field and Laboratory Sample	Monitoring Bore	Glen Herring	775,353.9	7,631,706.6	420.642			Jun-2024 - Jun-2024			2	1
CRD0148	Field and Laboratory Sample	Monitoring Bore	Glen Herring	775,117.4	7,632,009.5	405.101			Jul-2024			1	1
CRD0139	Field and Laboratory Sample	Monitoring Bore	Razorback	776,515.3	7,623,959.6	424.801			Nov-2024			1	1
CRD0156	Only Laboratory sample	Monitoring Bore	Sparrow Lake	776,288.0	7,623,182.4				Nov-2024			1	

**Appendix B Chemical time series across the Sanjiv
Ridge Project**

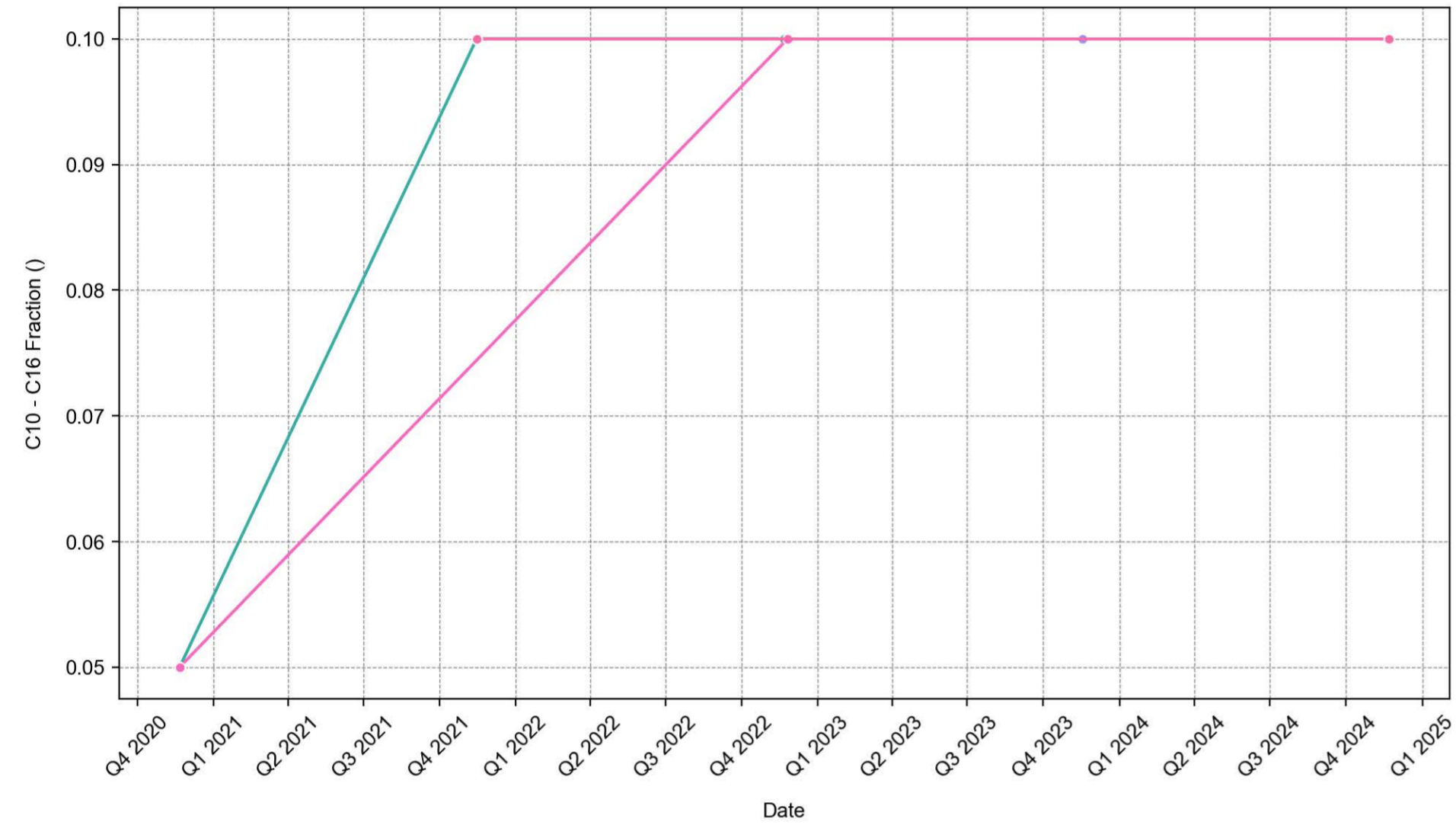
1,2-Dichloroethane-D4



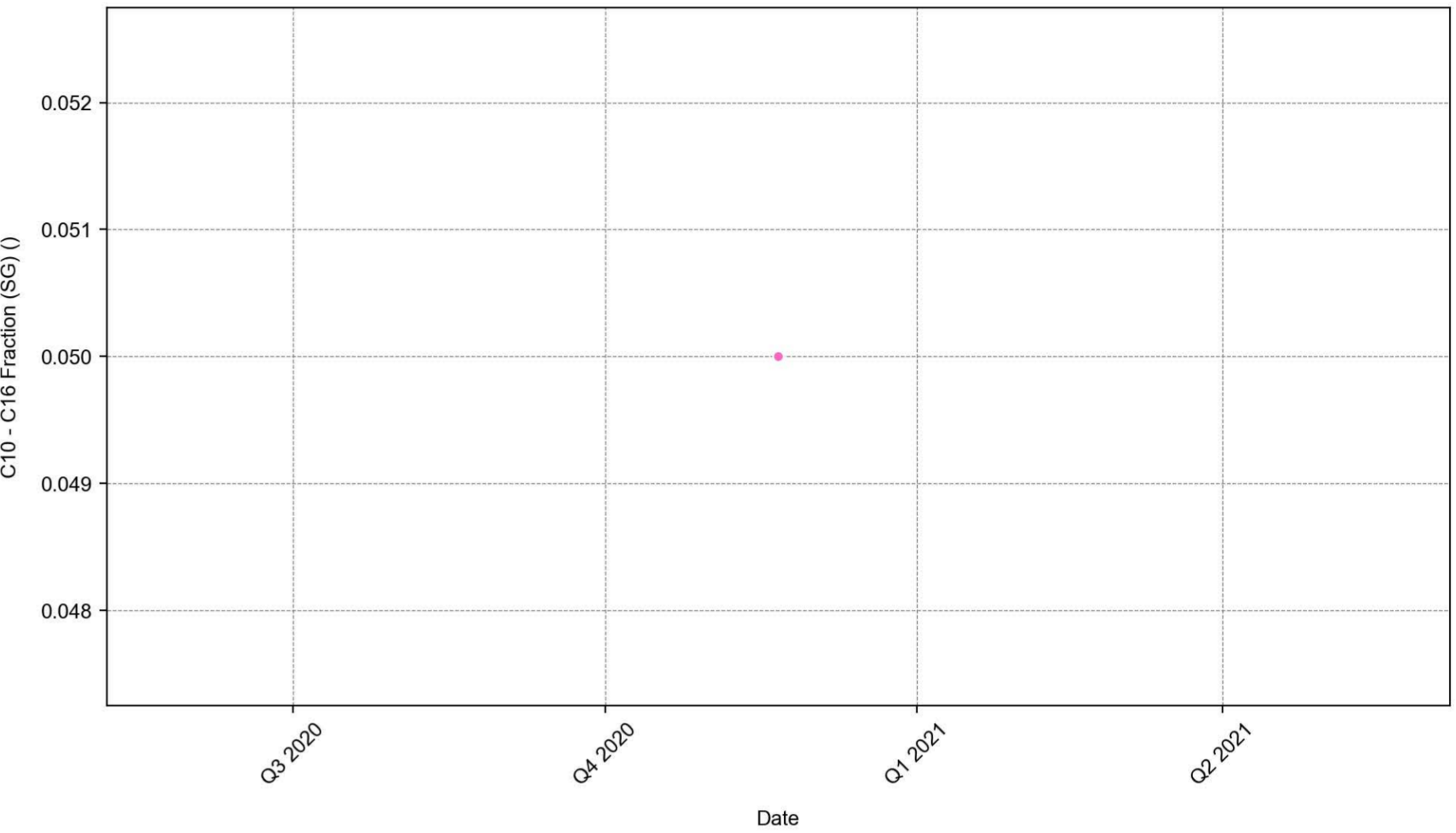
4-Bromofluorobenzene



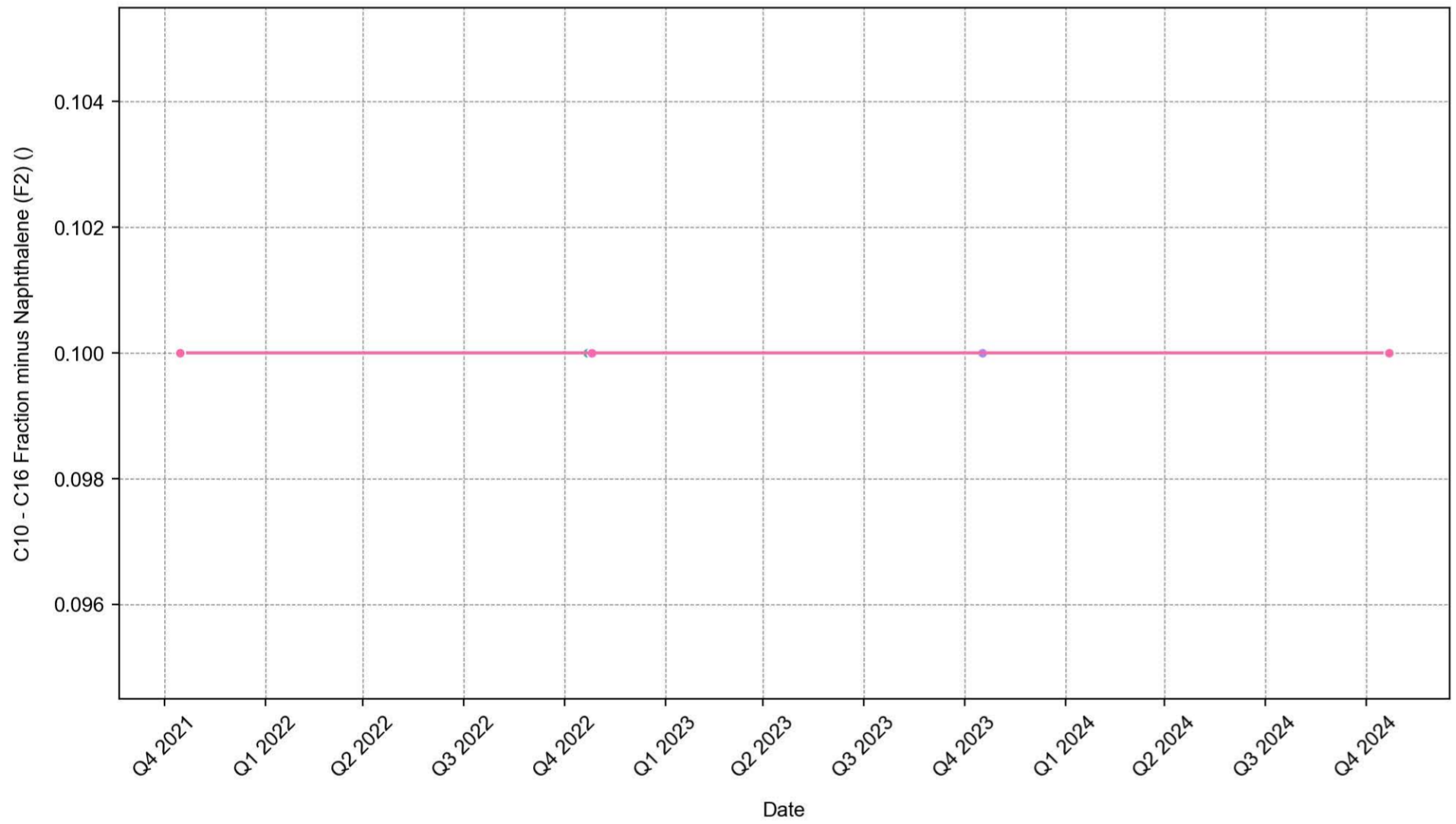
C10 - C16 Fraction



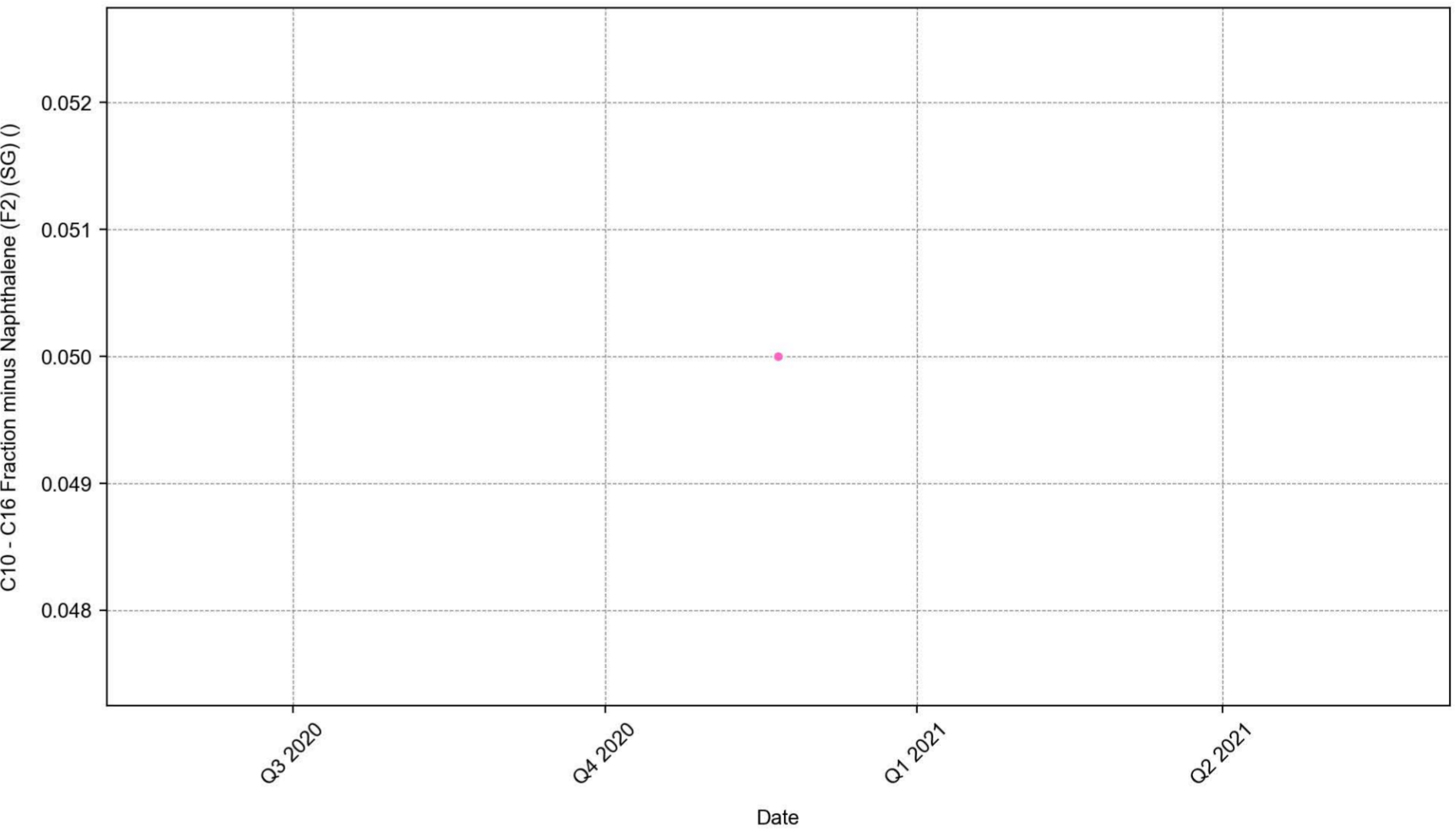
C10 - C16 Fraction (SG)



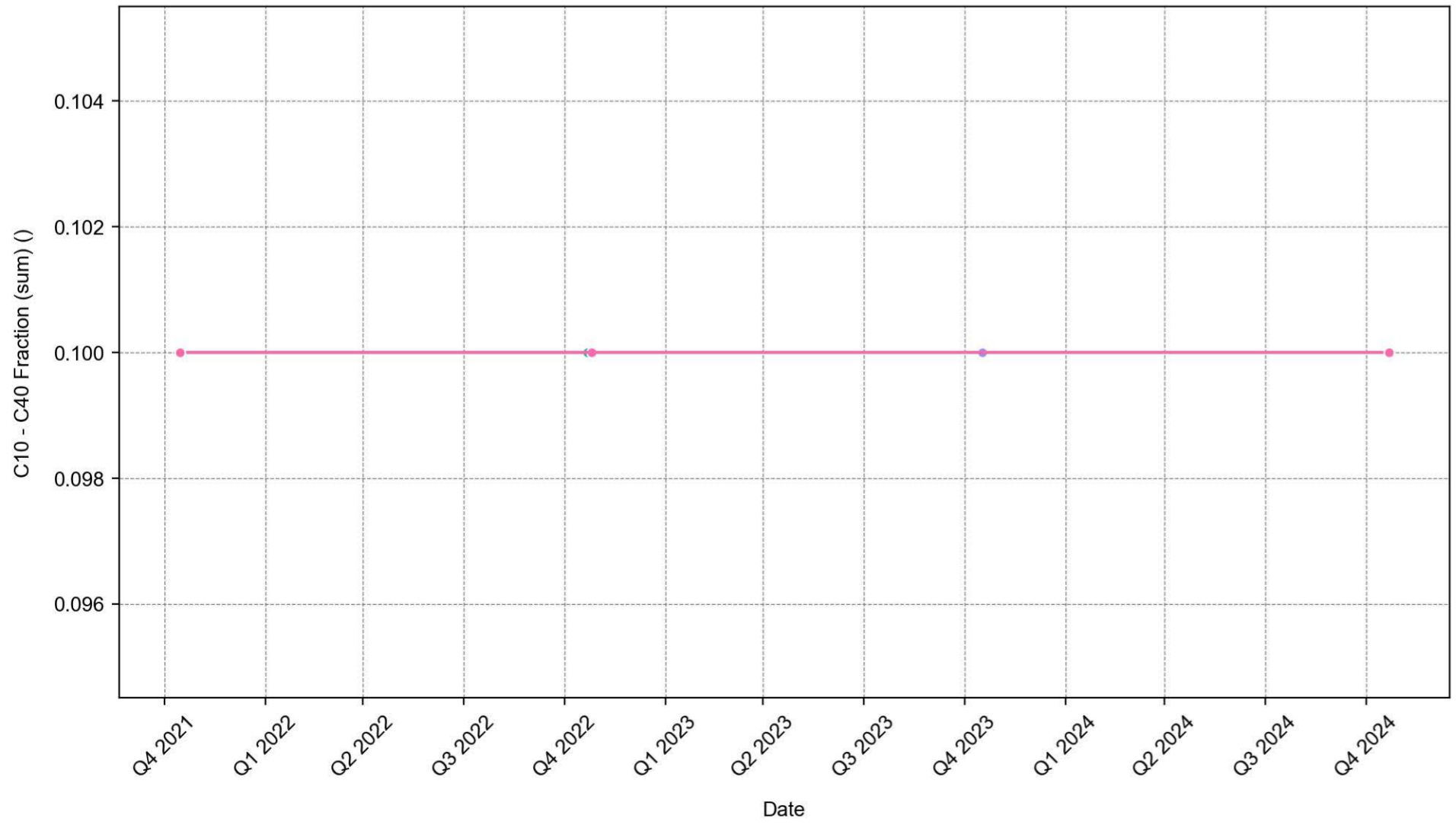
C10 - C16 Fraction minus Naphthalene (F2)



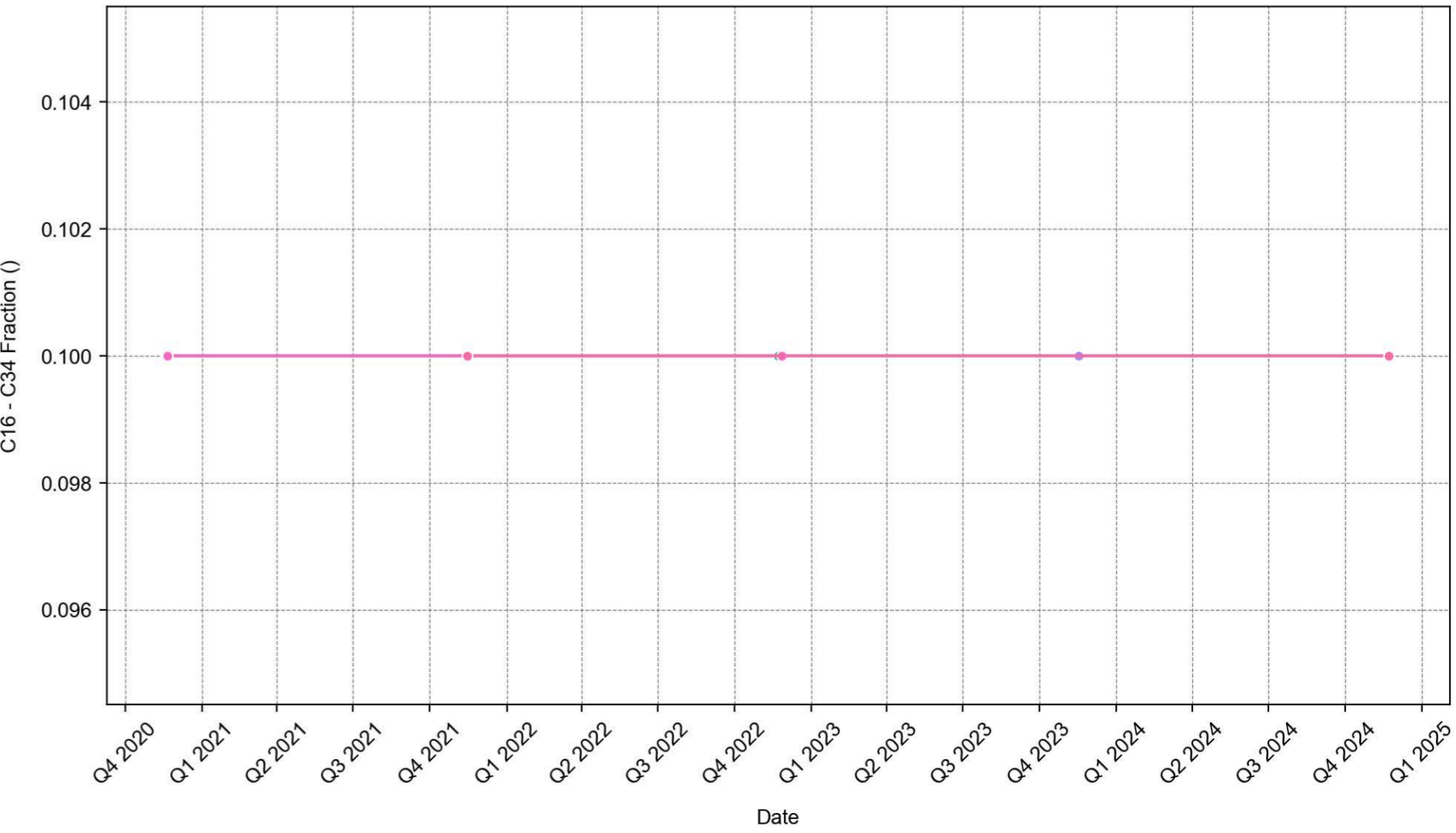
C10 - C16 Fraction minus Naphthalene (F2) (SG)



C10 - C40 Fraction (sum)

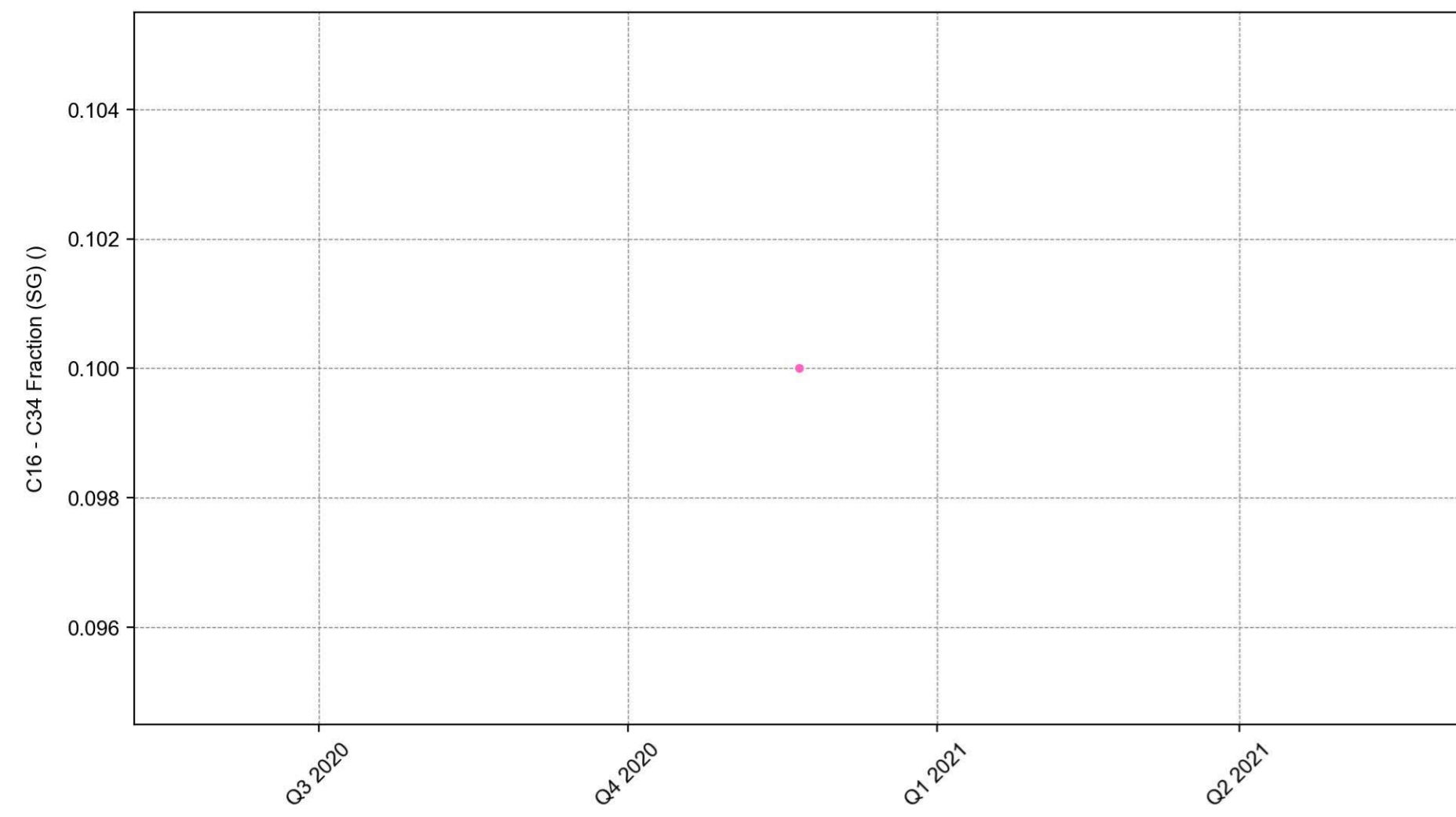


C16 - C34 Fraction

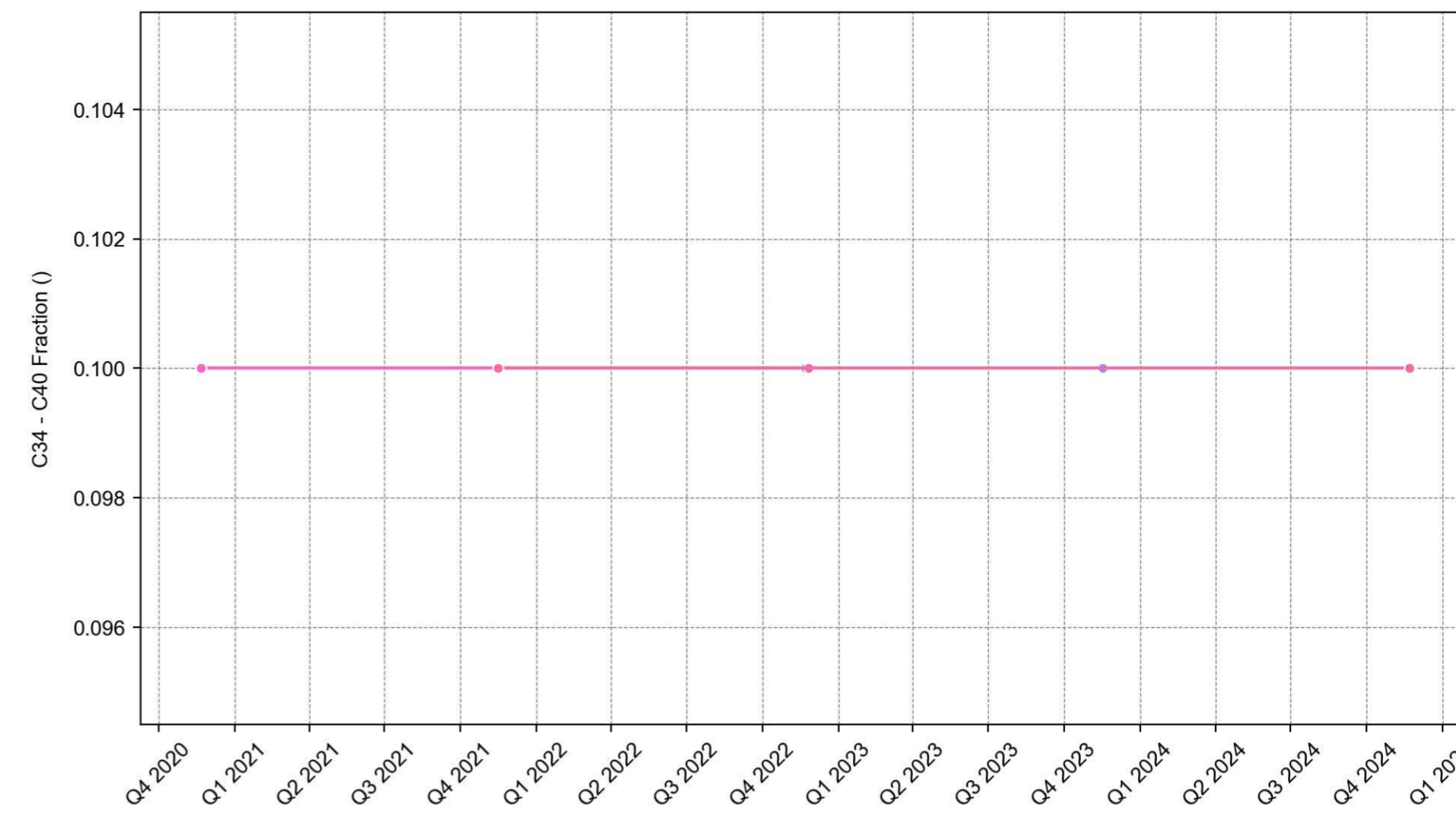


- CRD00035
- CRD00040
- CRD00051
- CRD00064
- CRD00081
- CRD00087
- CRD00036
- CRD00043
- CRD00056
- CRD00066
- CRD00084
- CRD00088
- CRD00038
- CRD00044
- CRD00058
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- CRD00045
- CRD00062
- CRD00078
- CRD00086
- CRD0108

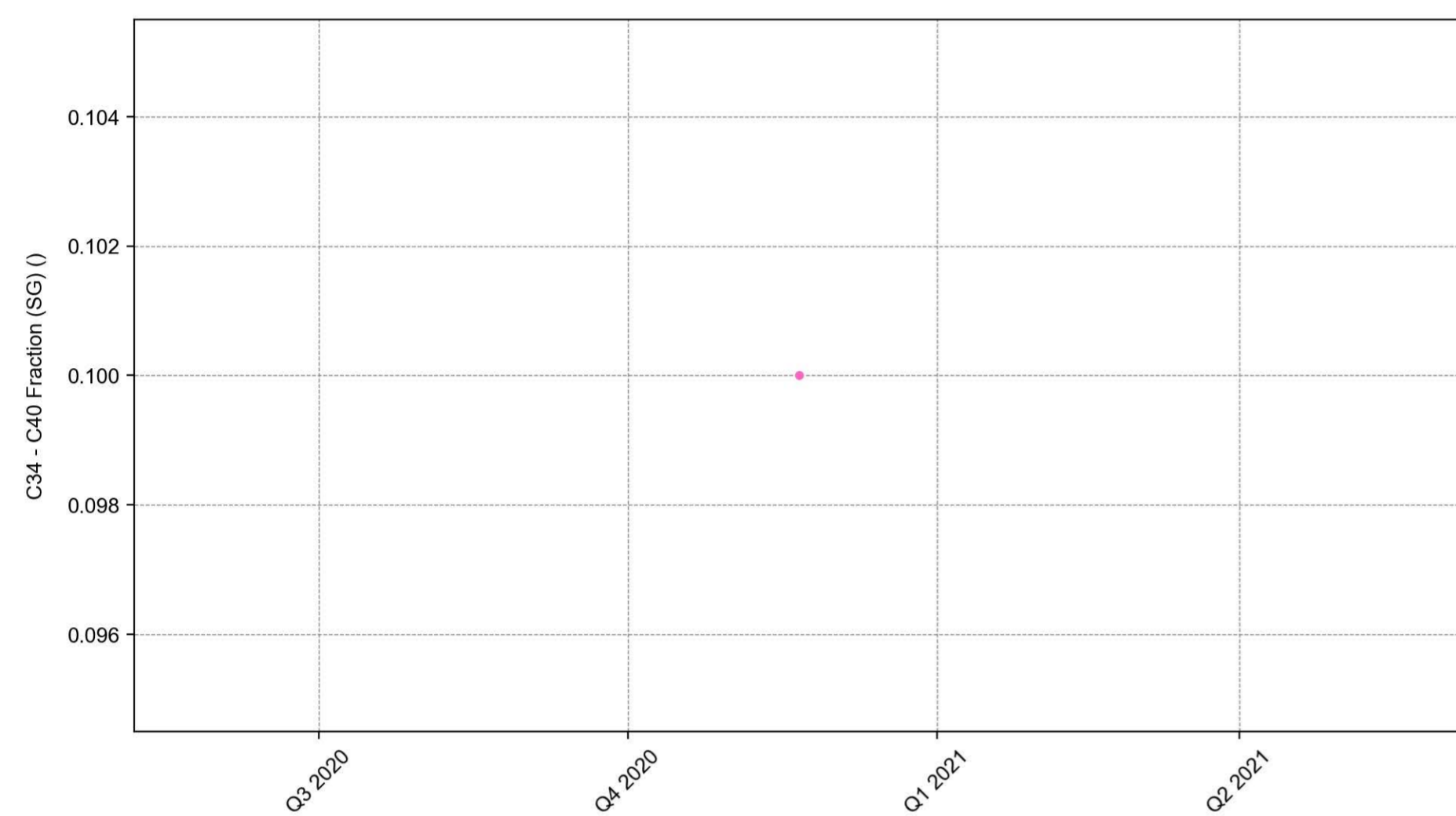
C16 - C34 Fraction (SG)



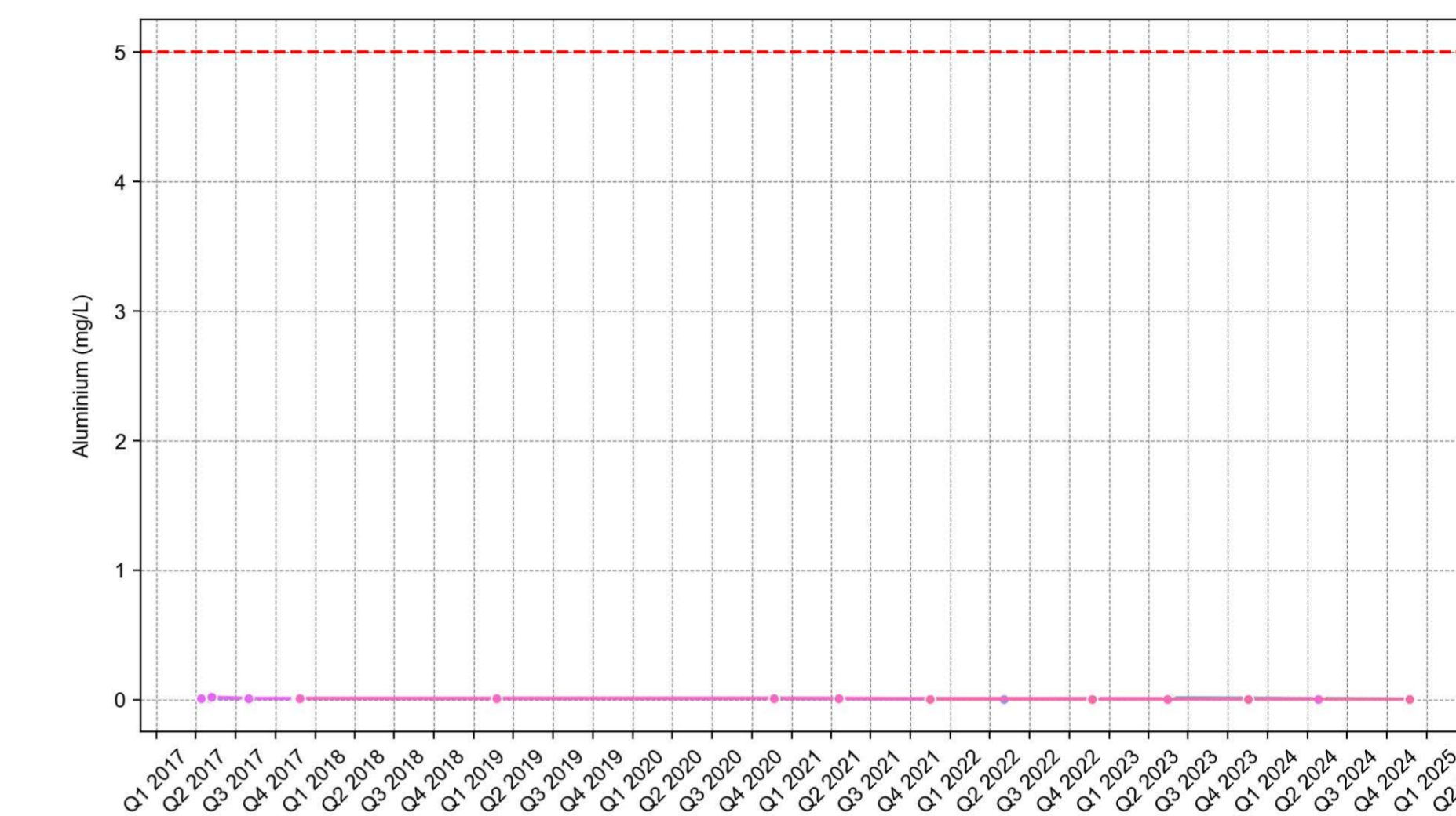
C34 - C40 Fraction



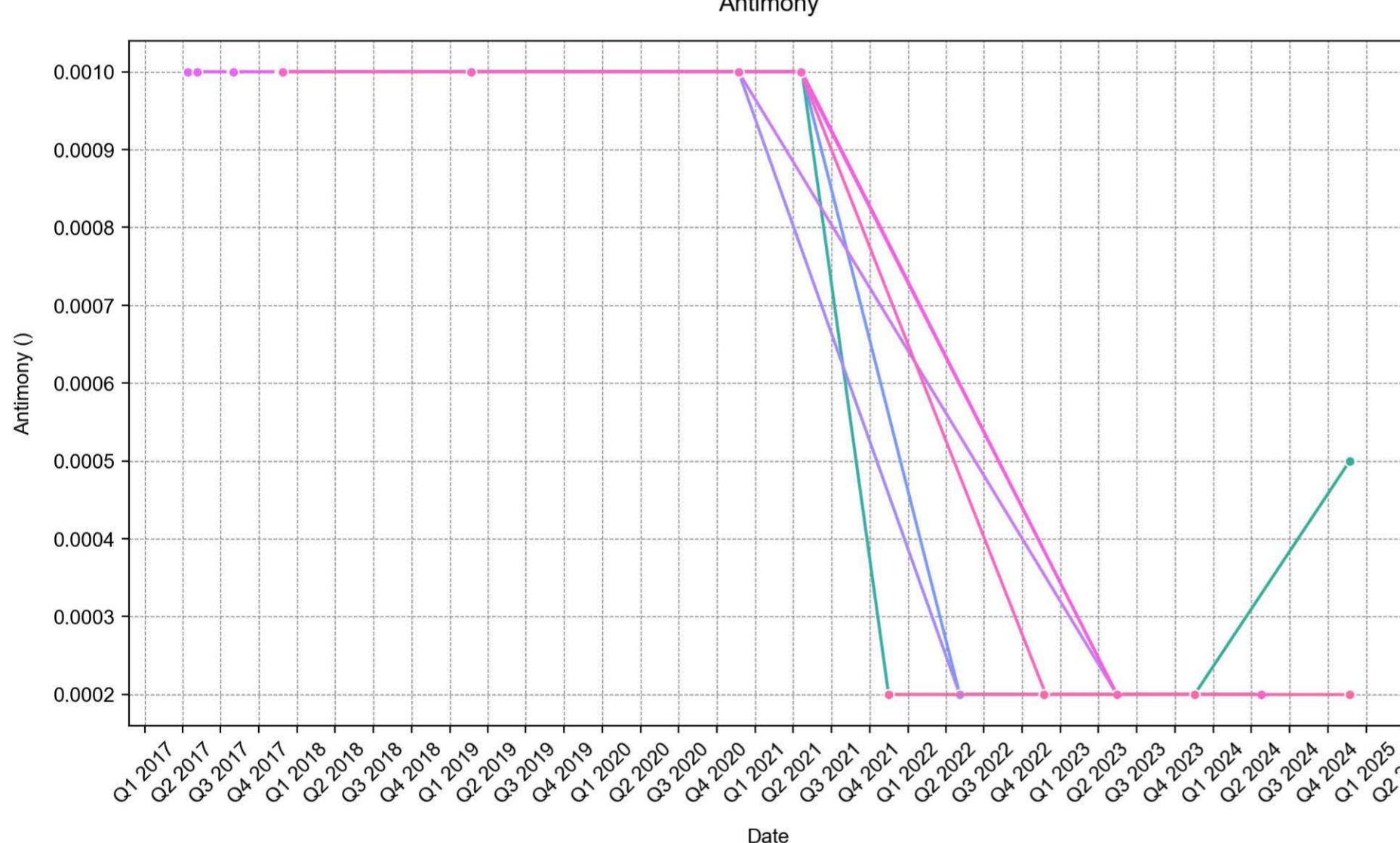
C34 - C40 Fraction (SG)



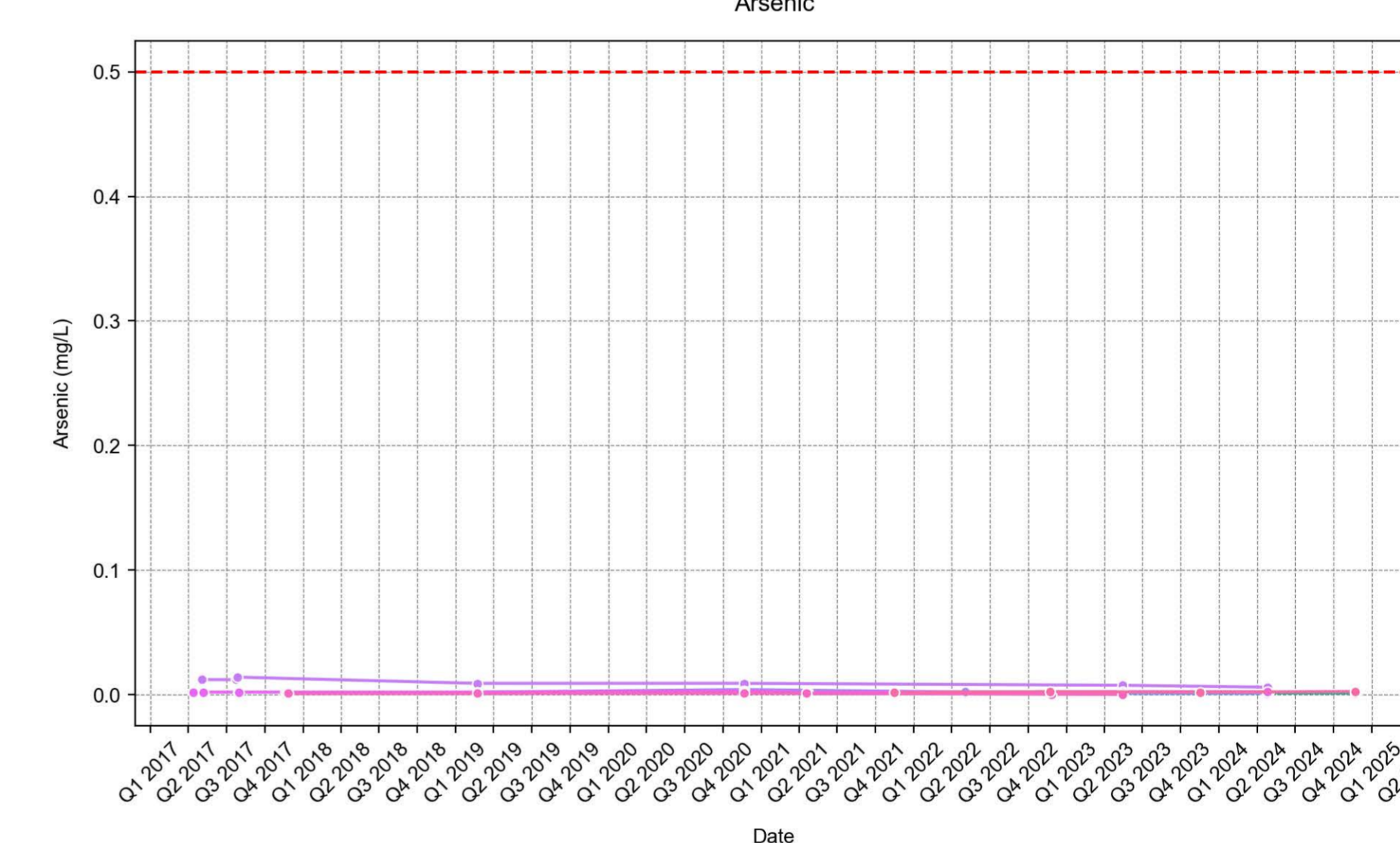
Aluminium



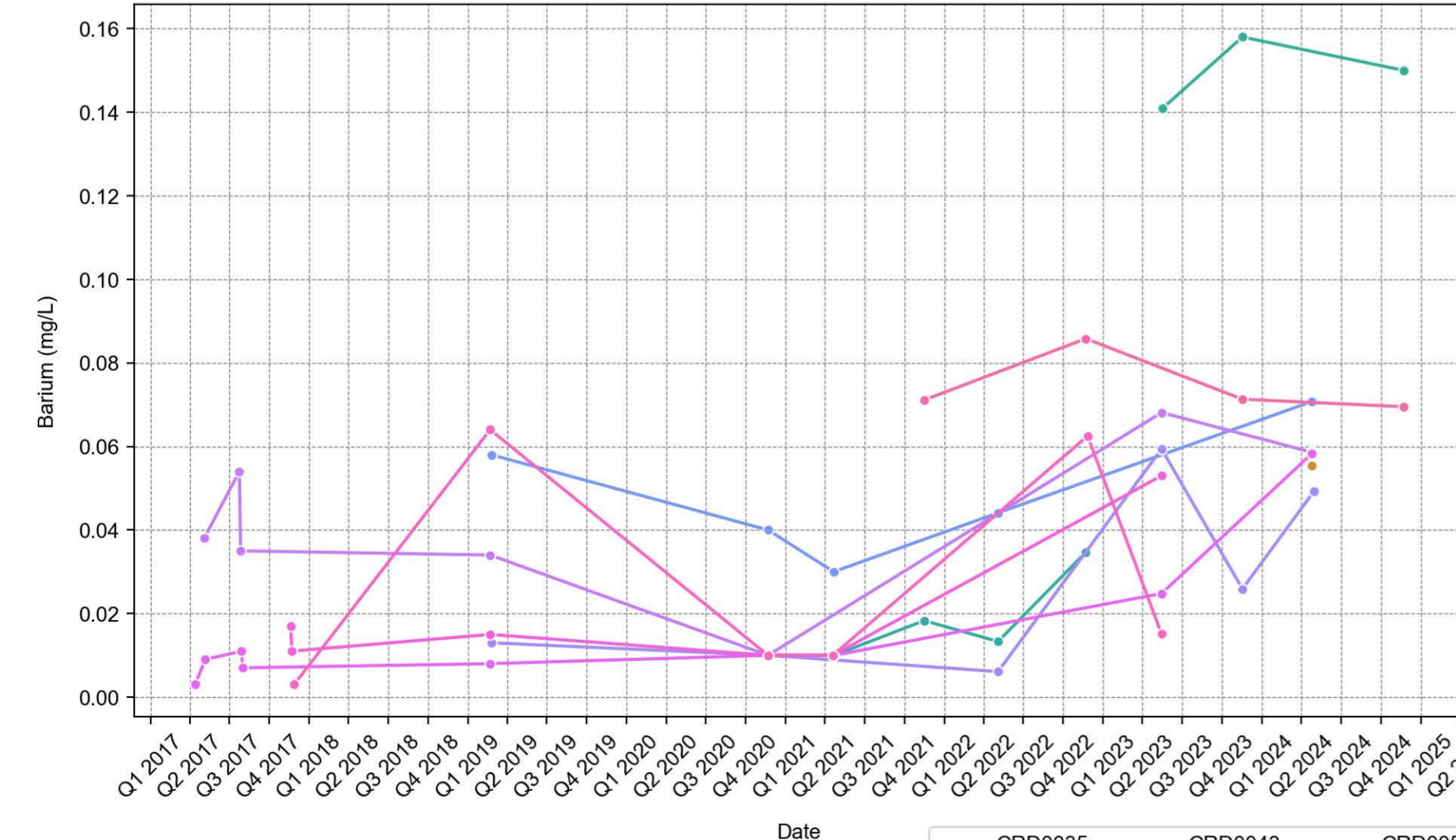
Antimony



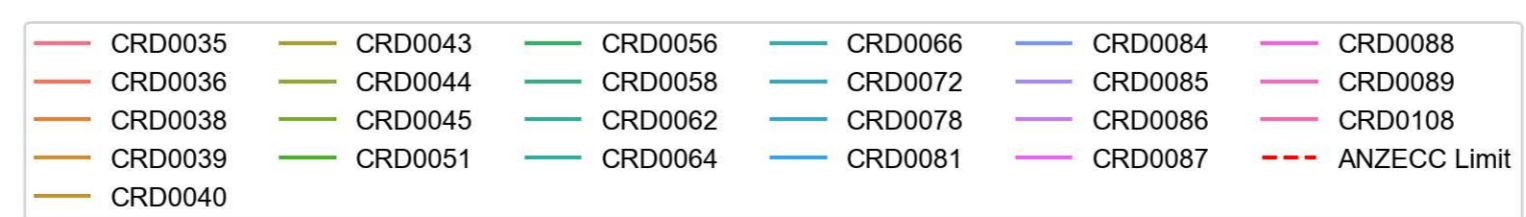
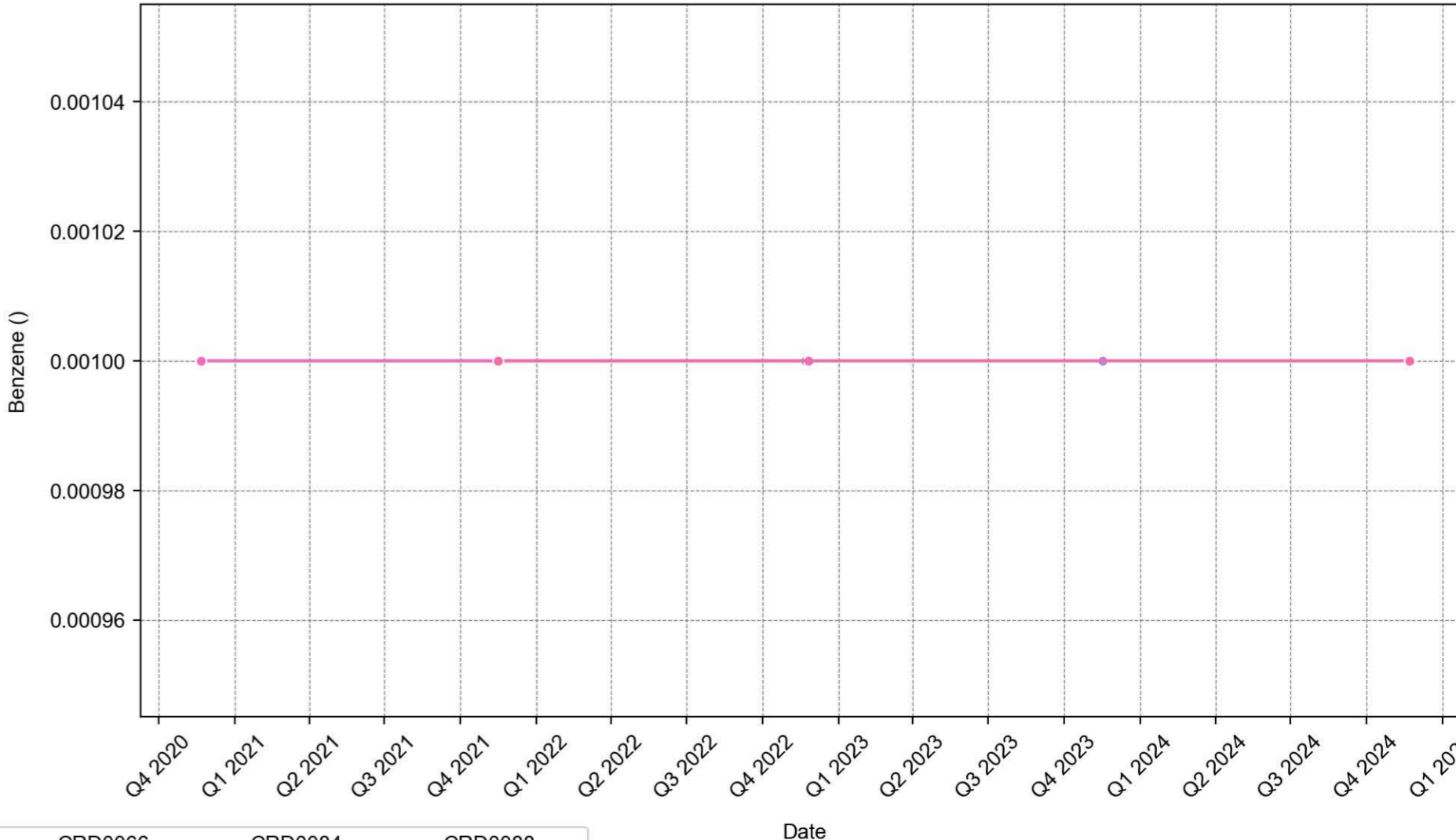
Arsenic



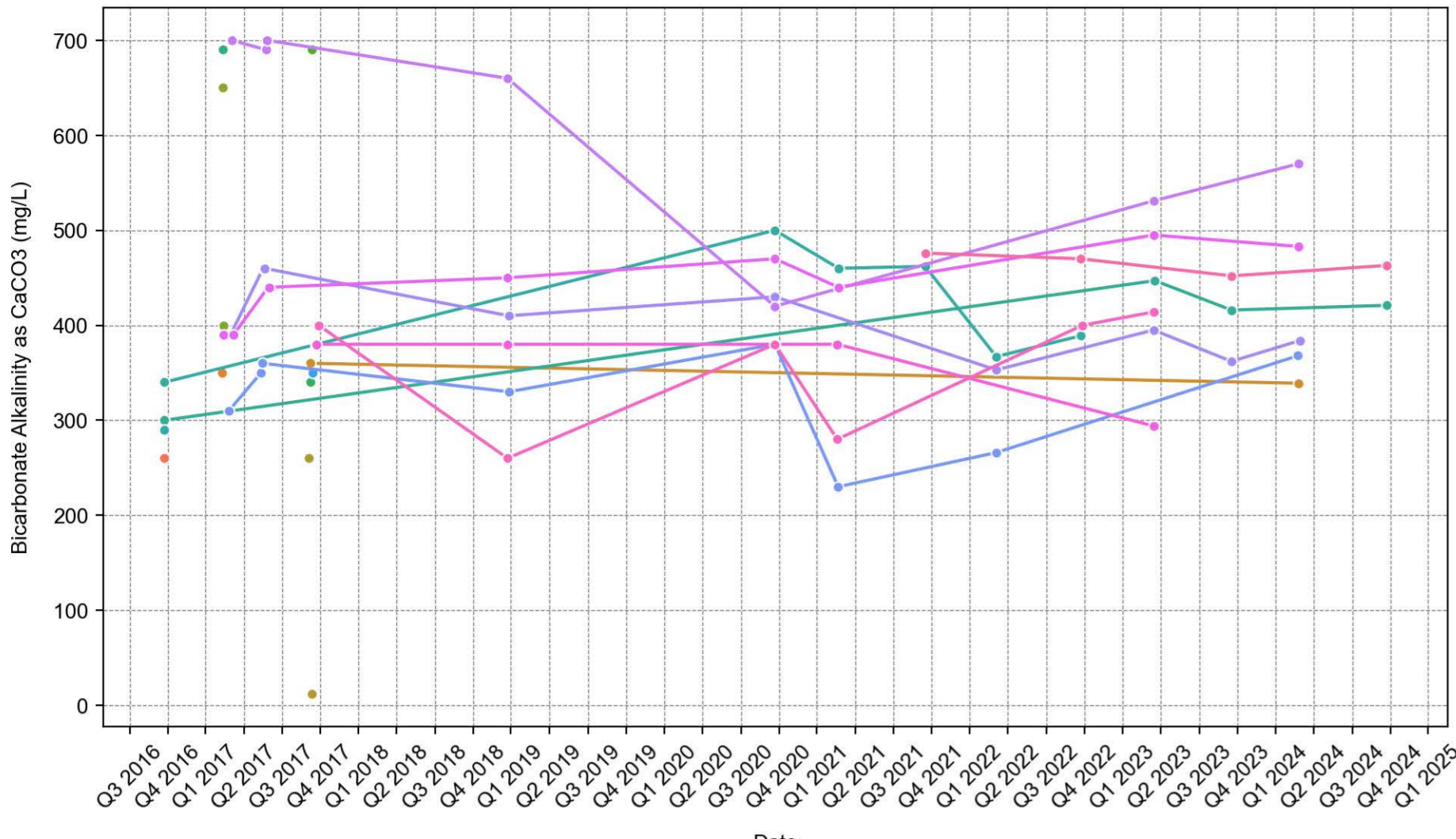
Barium



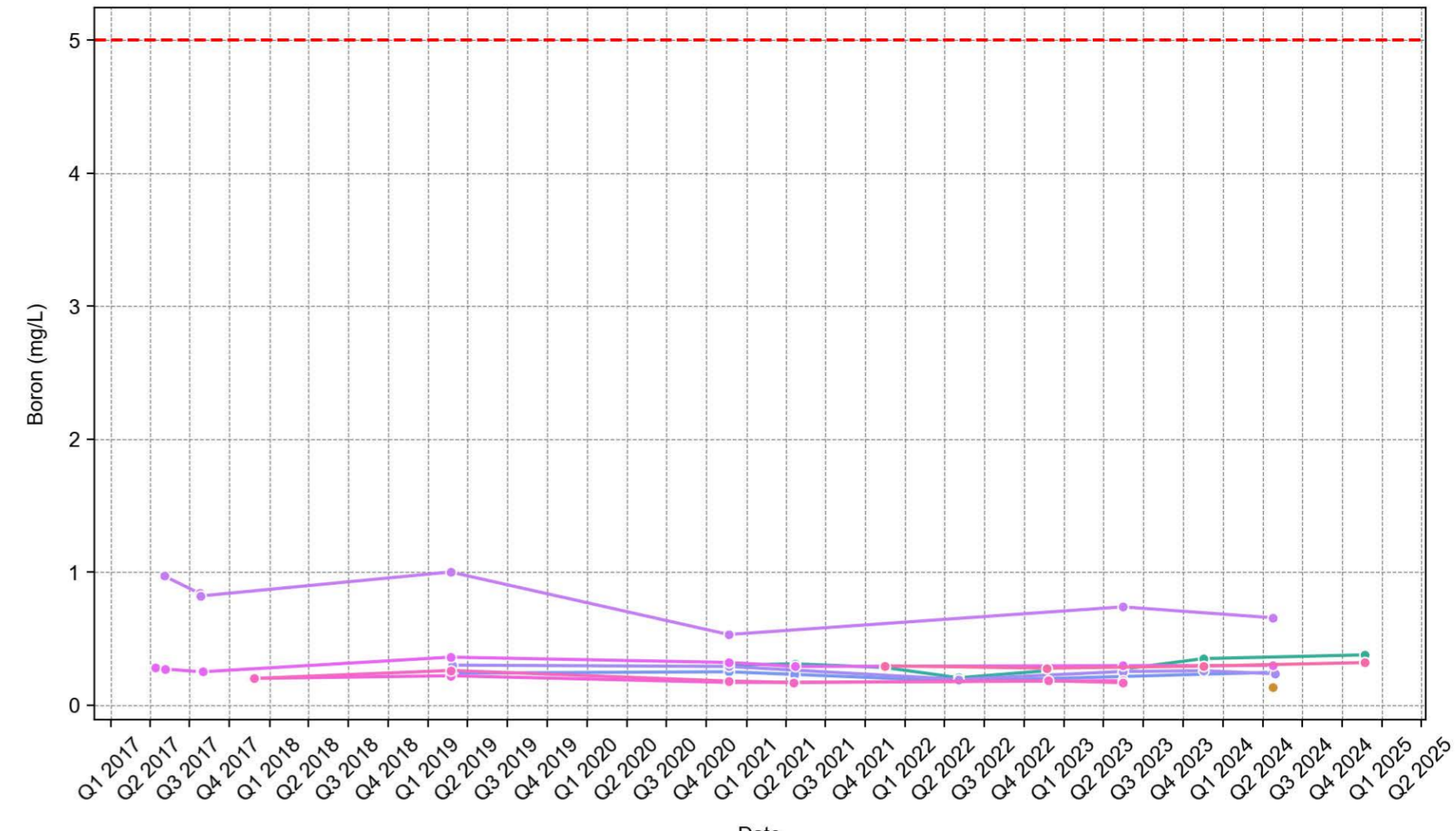
Benzene



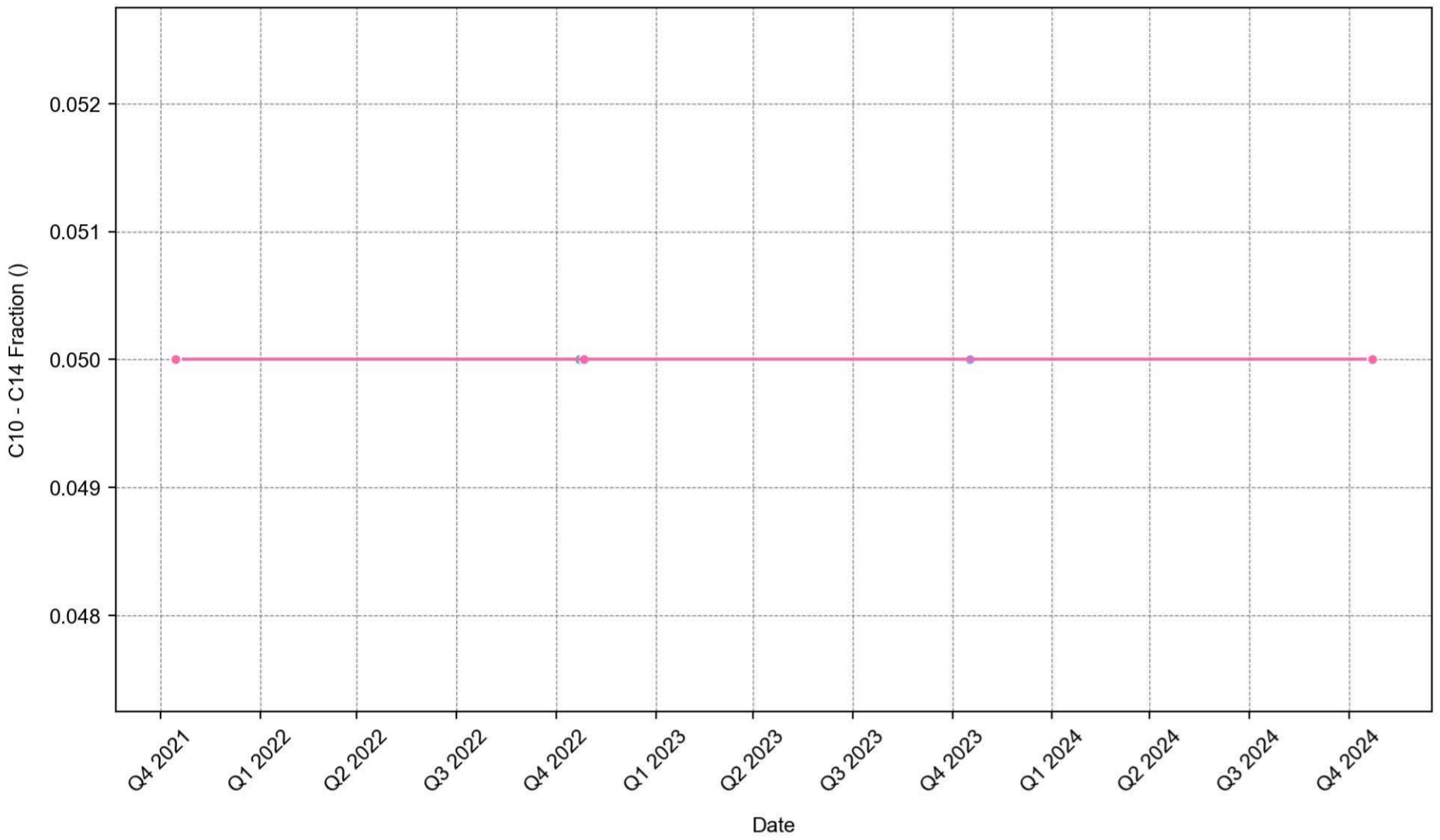
Bicarbonate Alkalinity as CaCO3



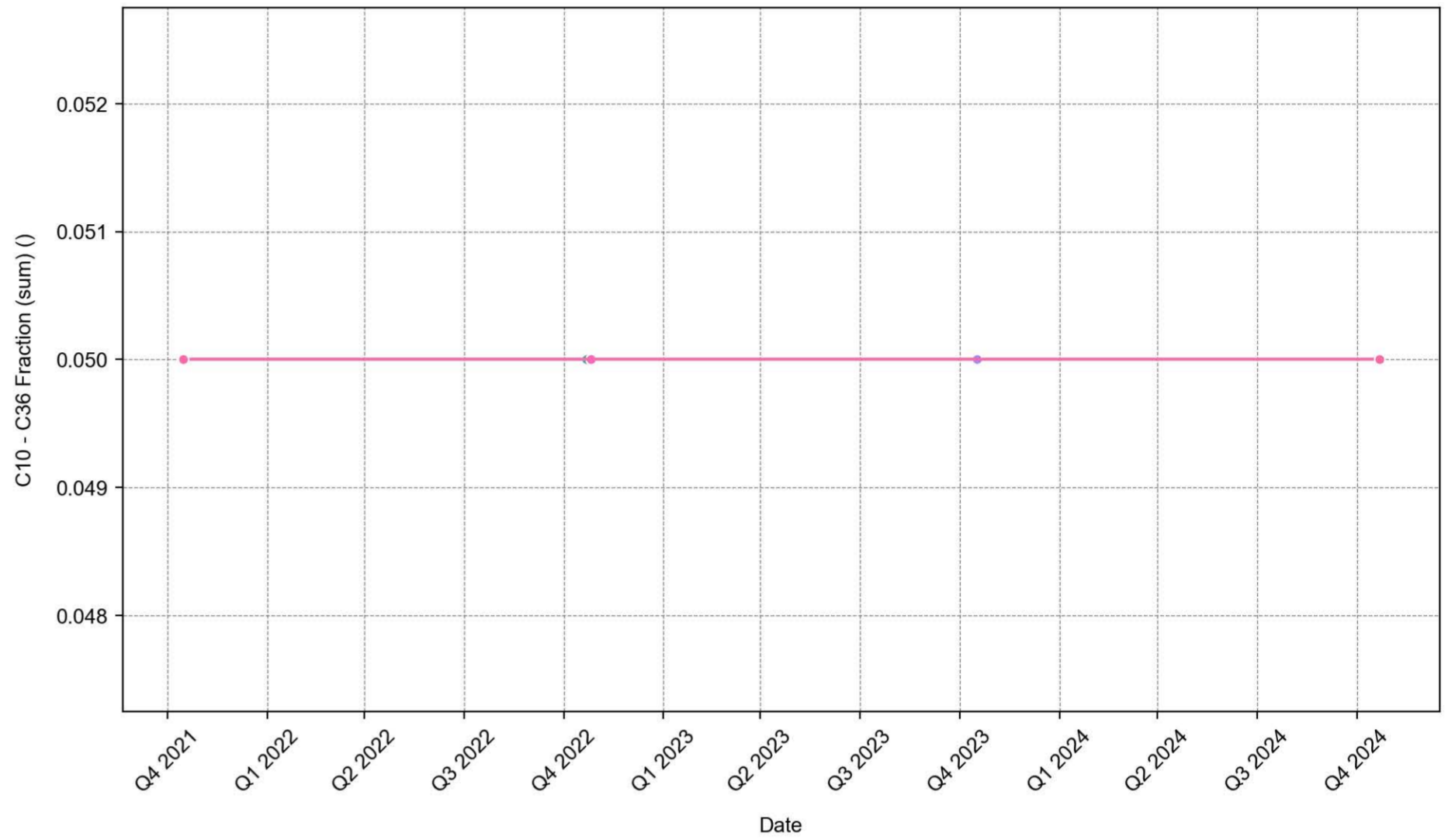
Boron



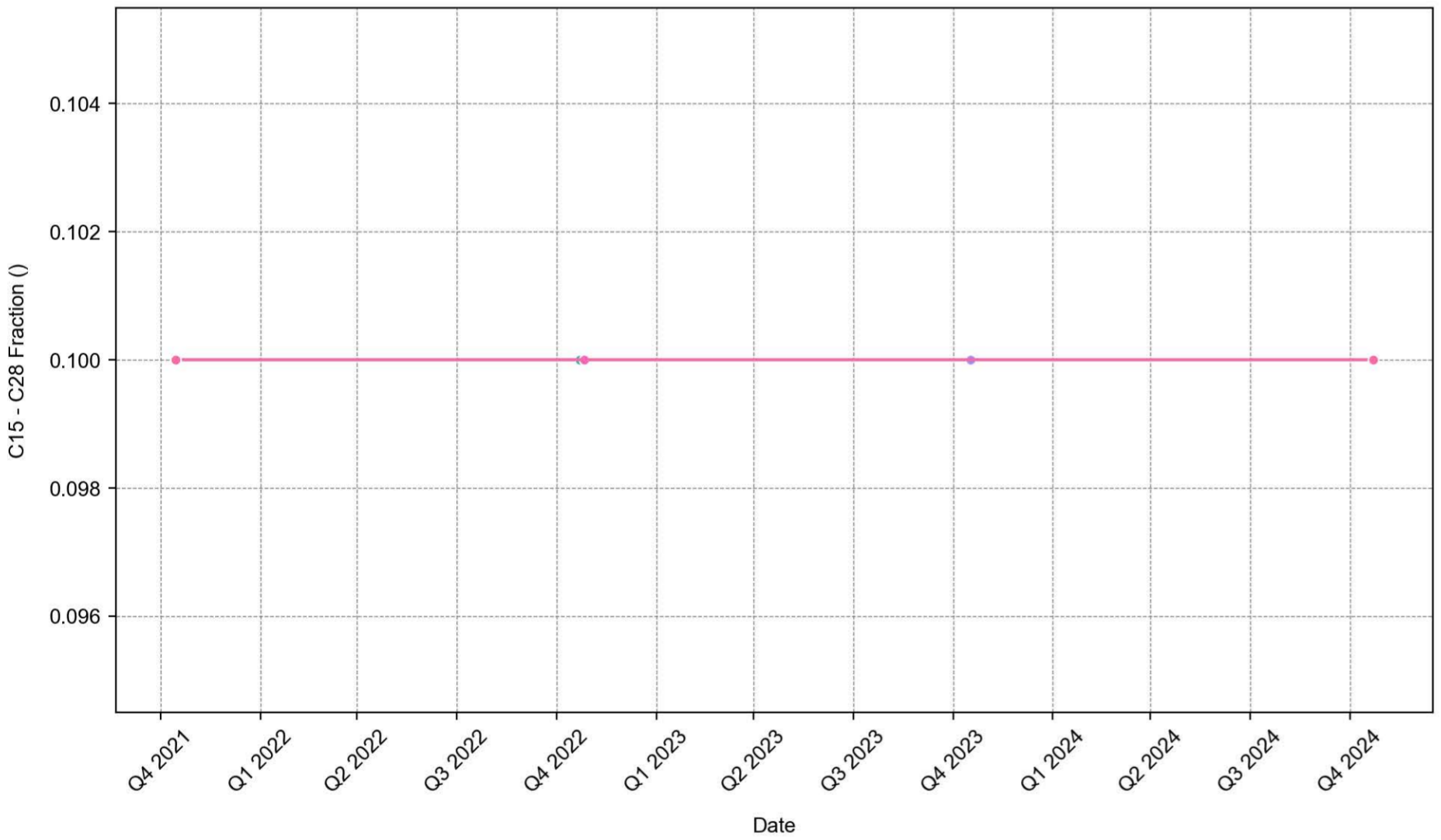
C10 - C14 Fraction



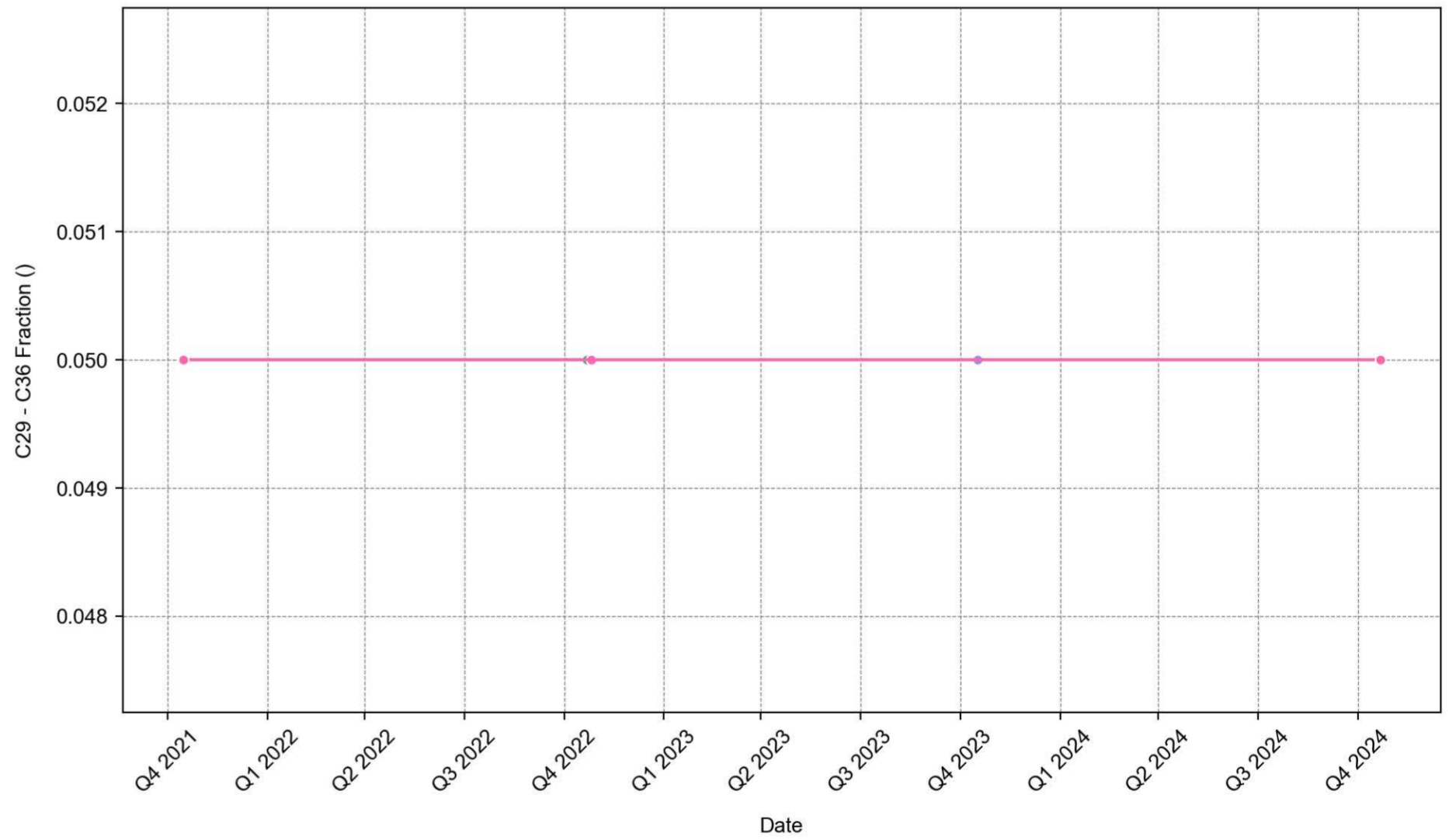
C10 - C36 Fraction (sum)



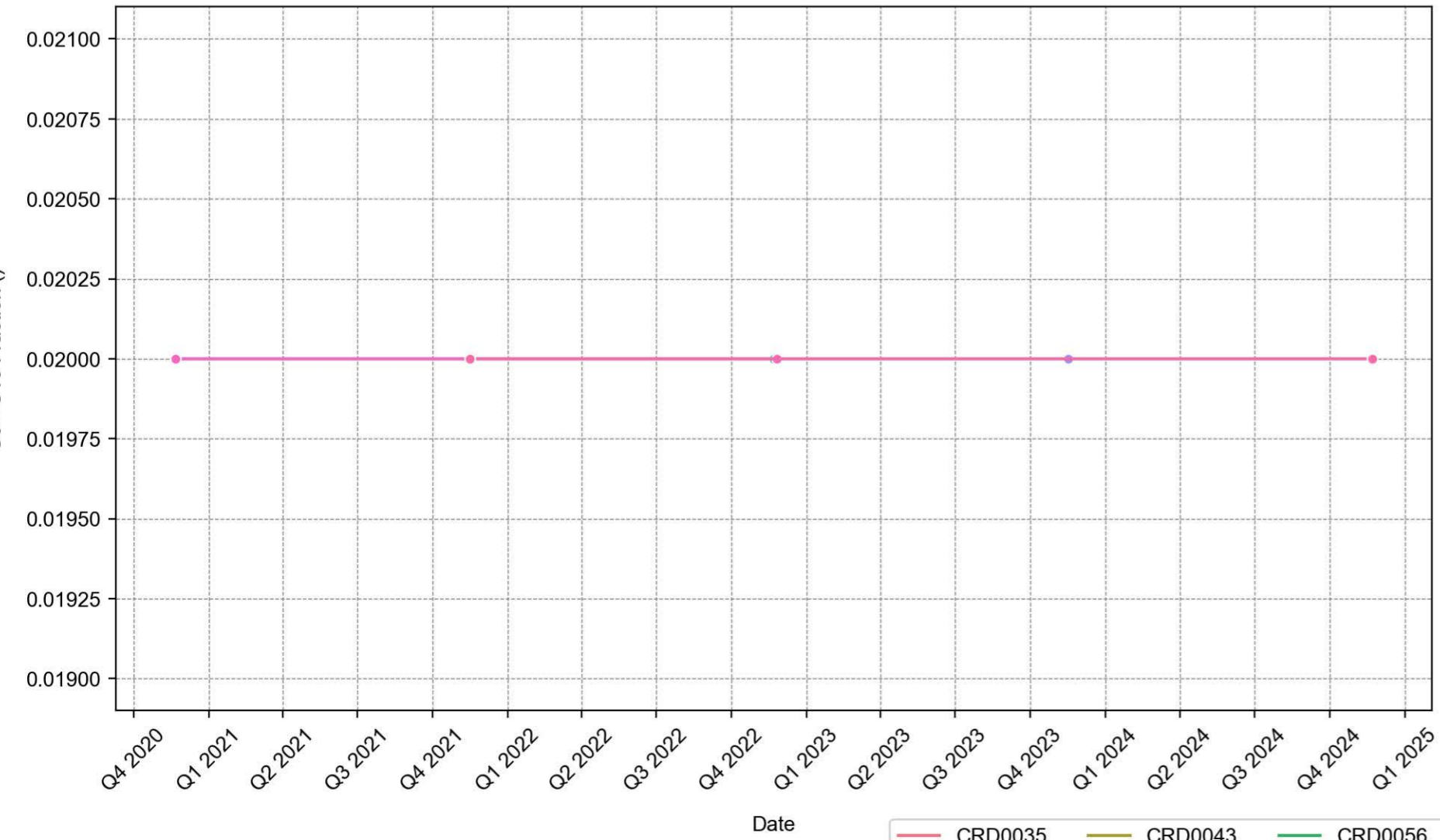
C15 - C28 Fraction



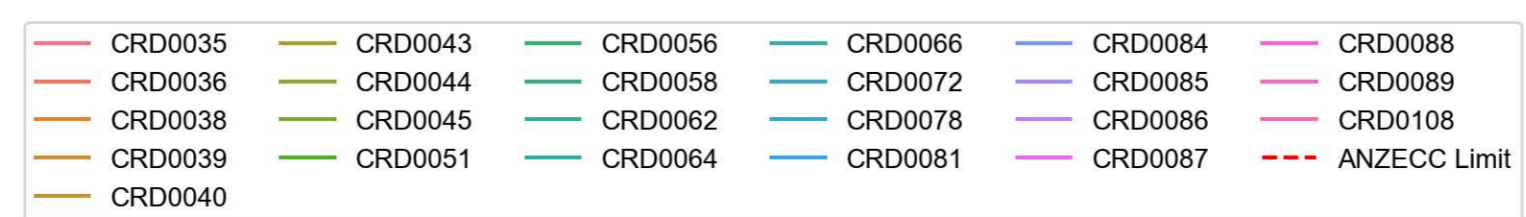
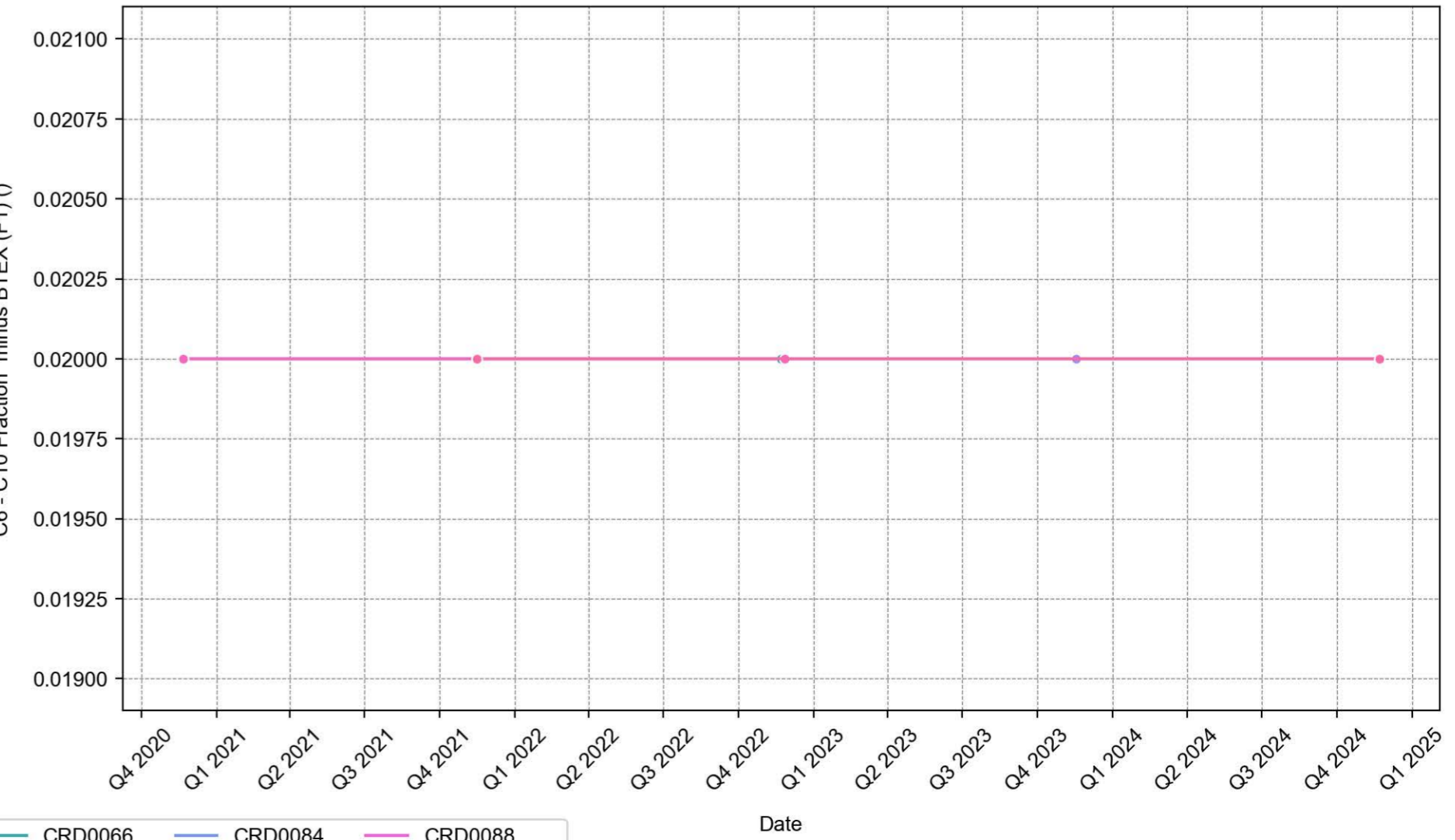
C29 - C36 Fraction



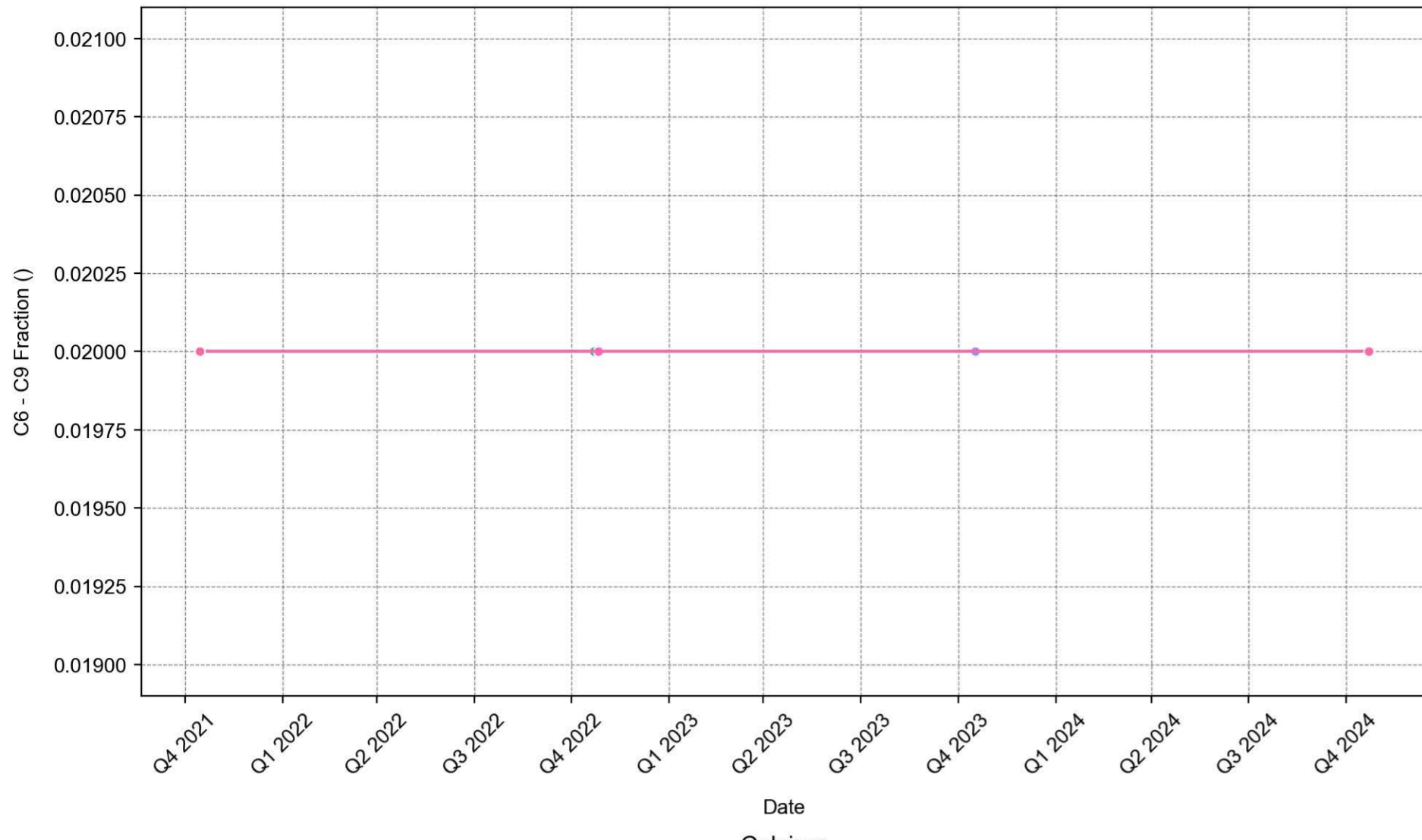
C6 - C10 Fraction



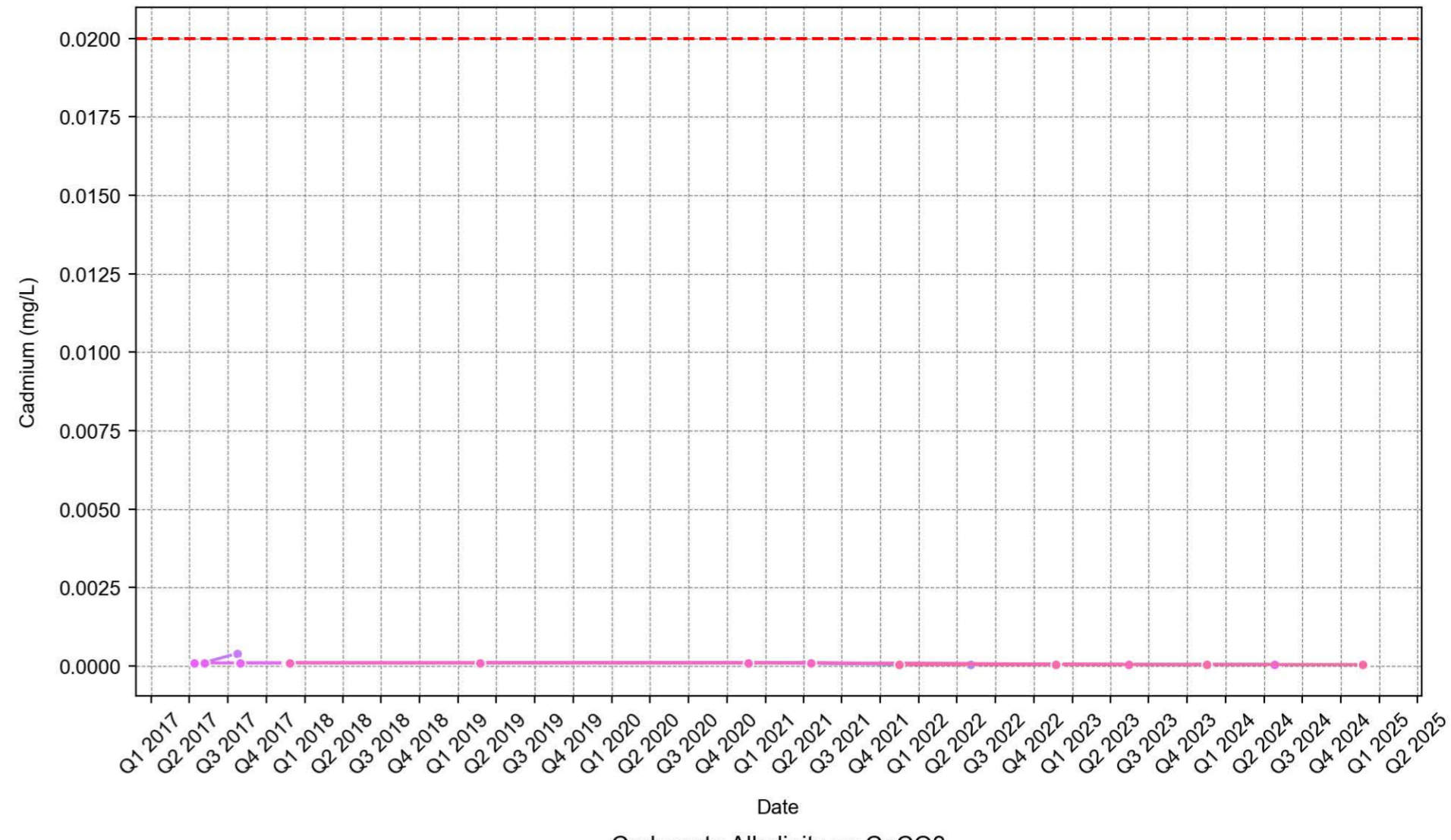
C6 - C10 Fraction minus BTEX (F1)



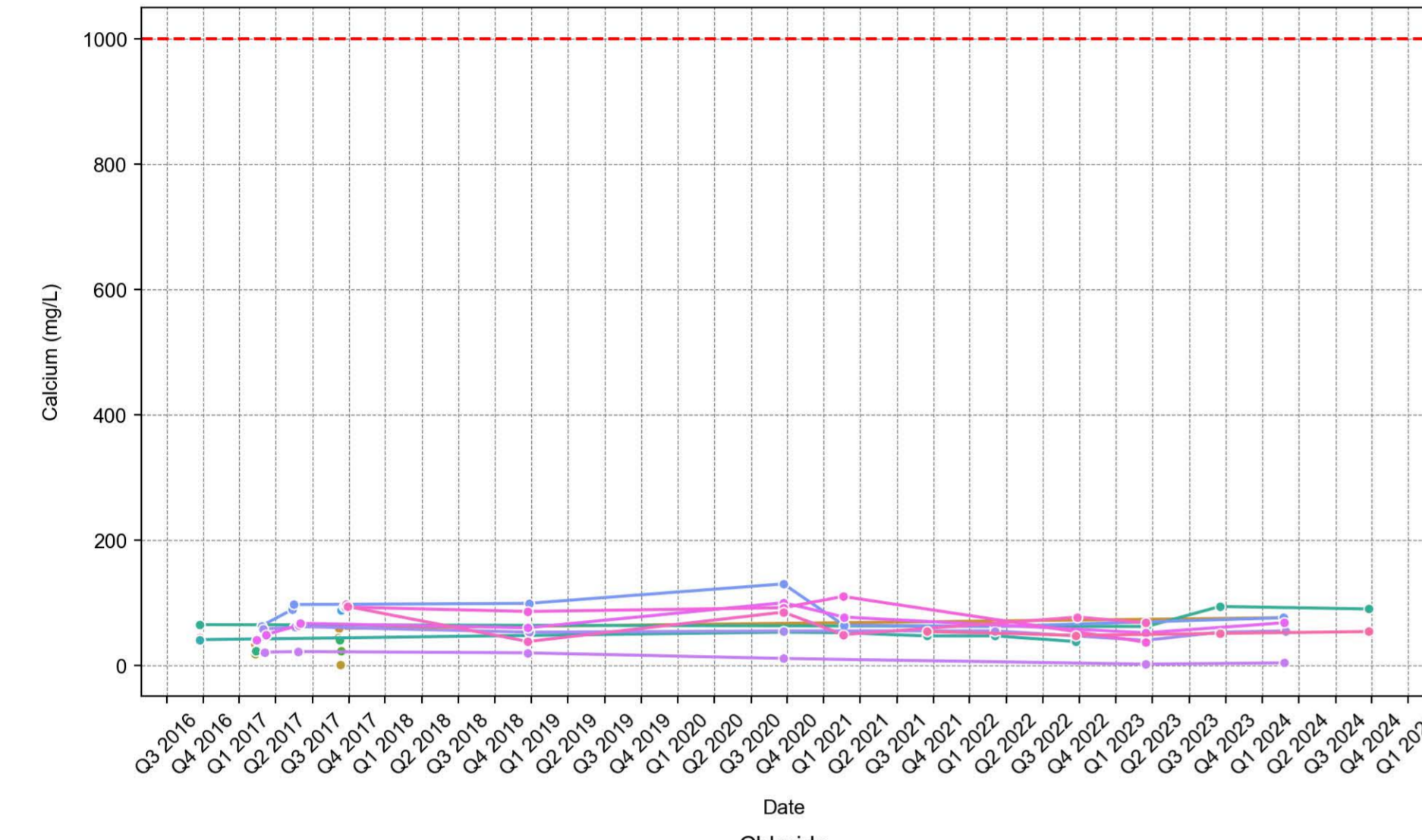
C6 - C9 Fraction



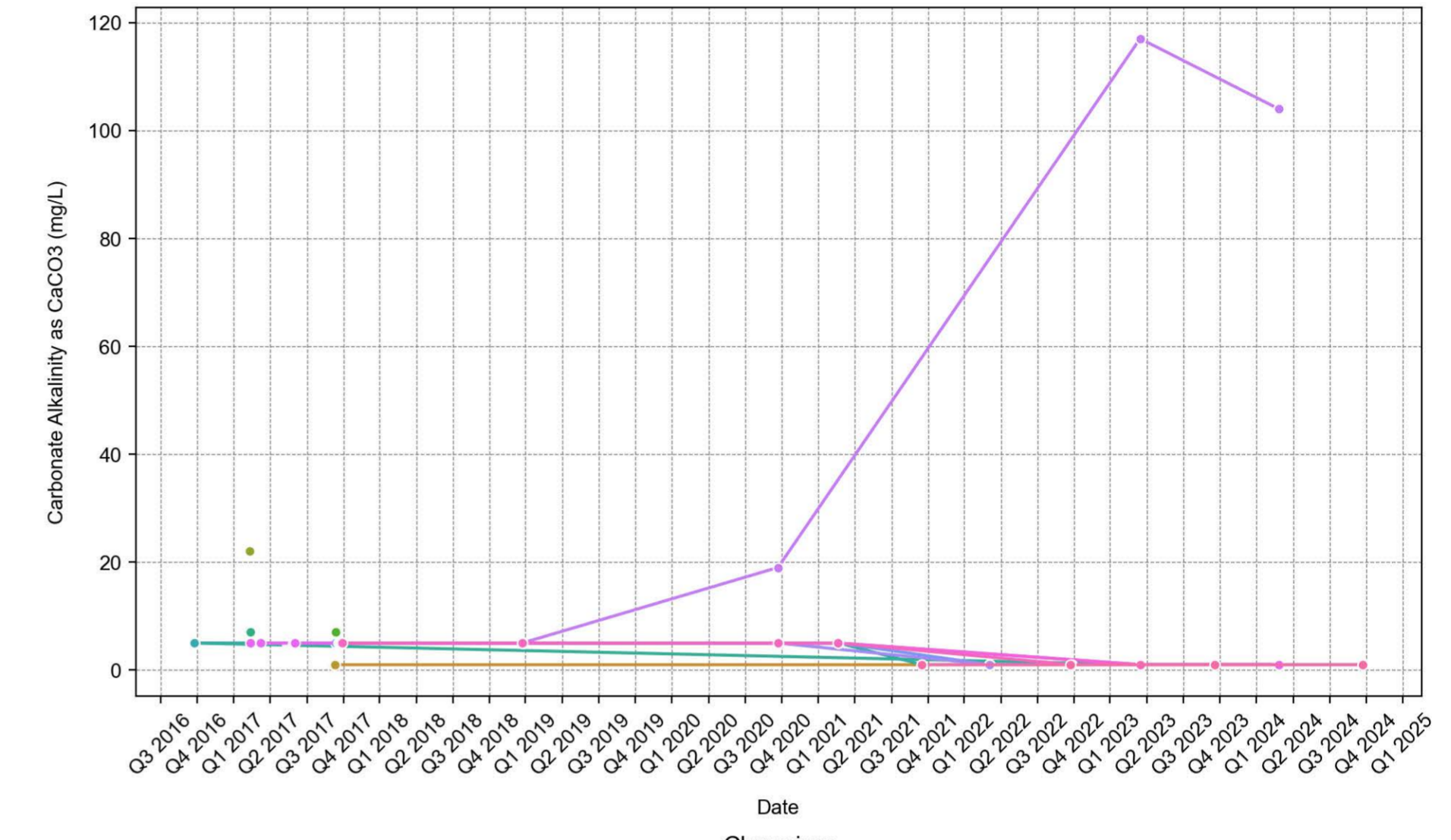
Cadmium



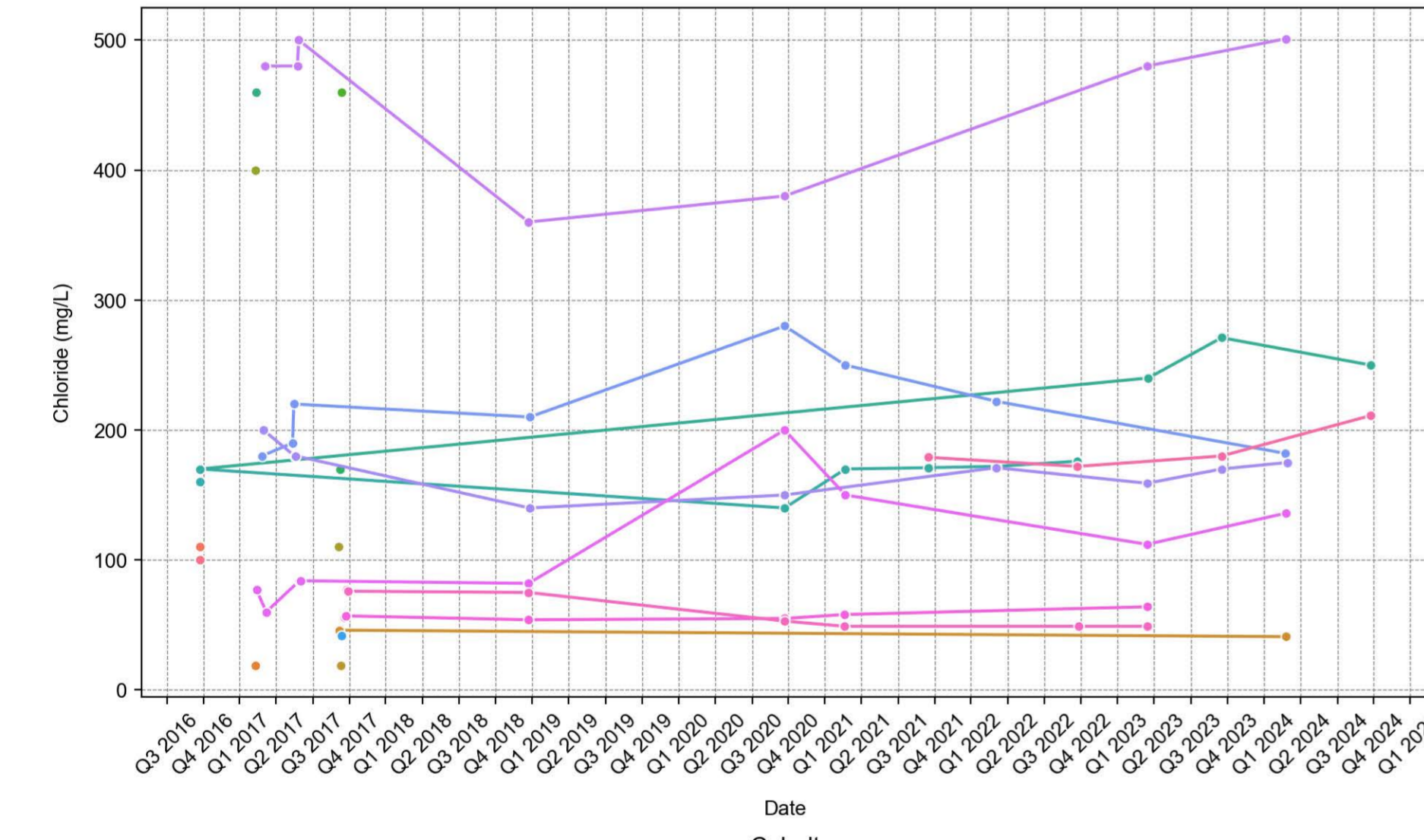
Calcium



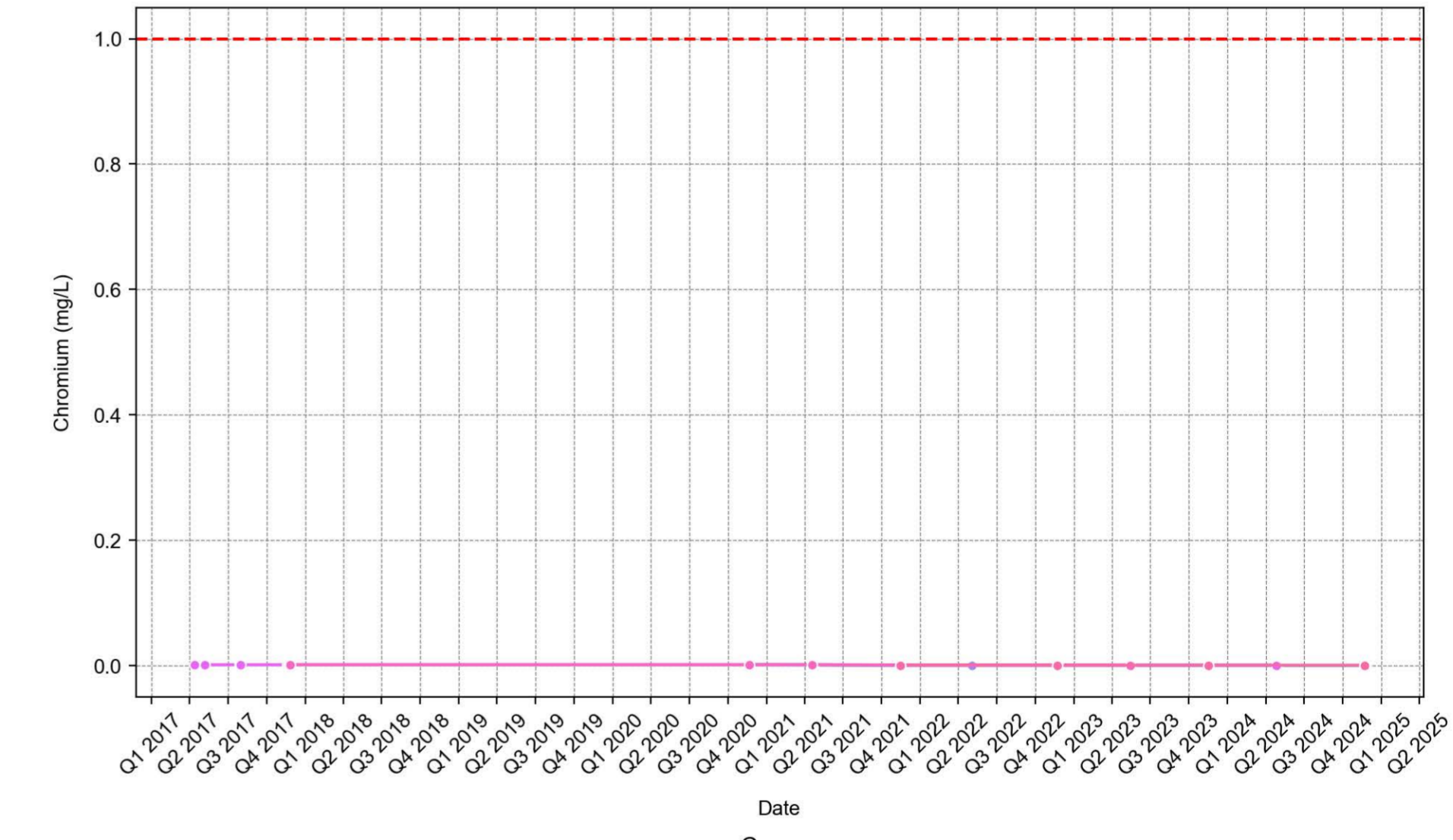
Carbonate Alkalinity as CaCO3



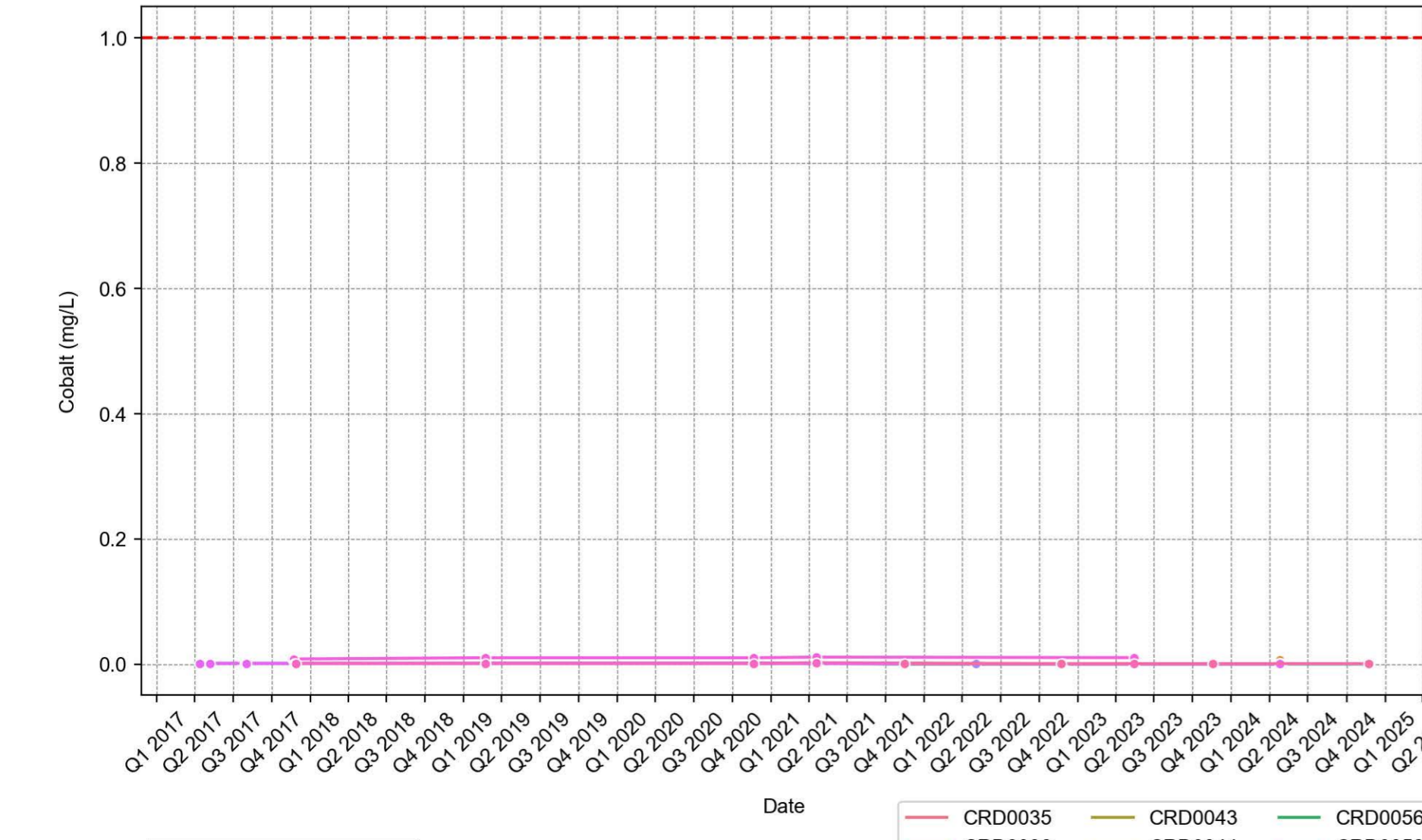
Chloride



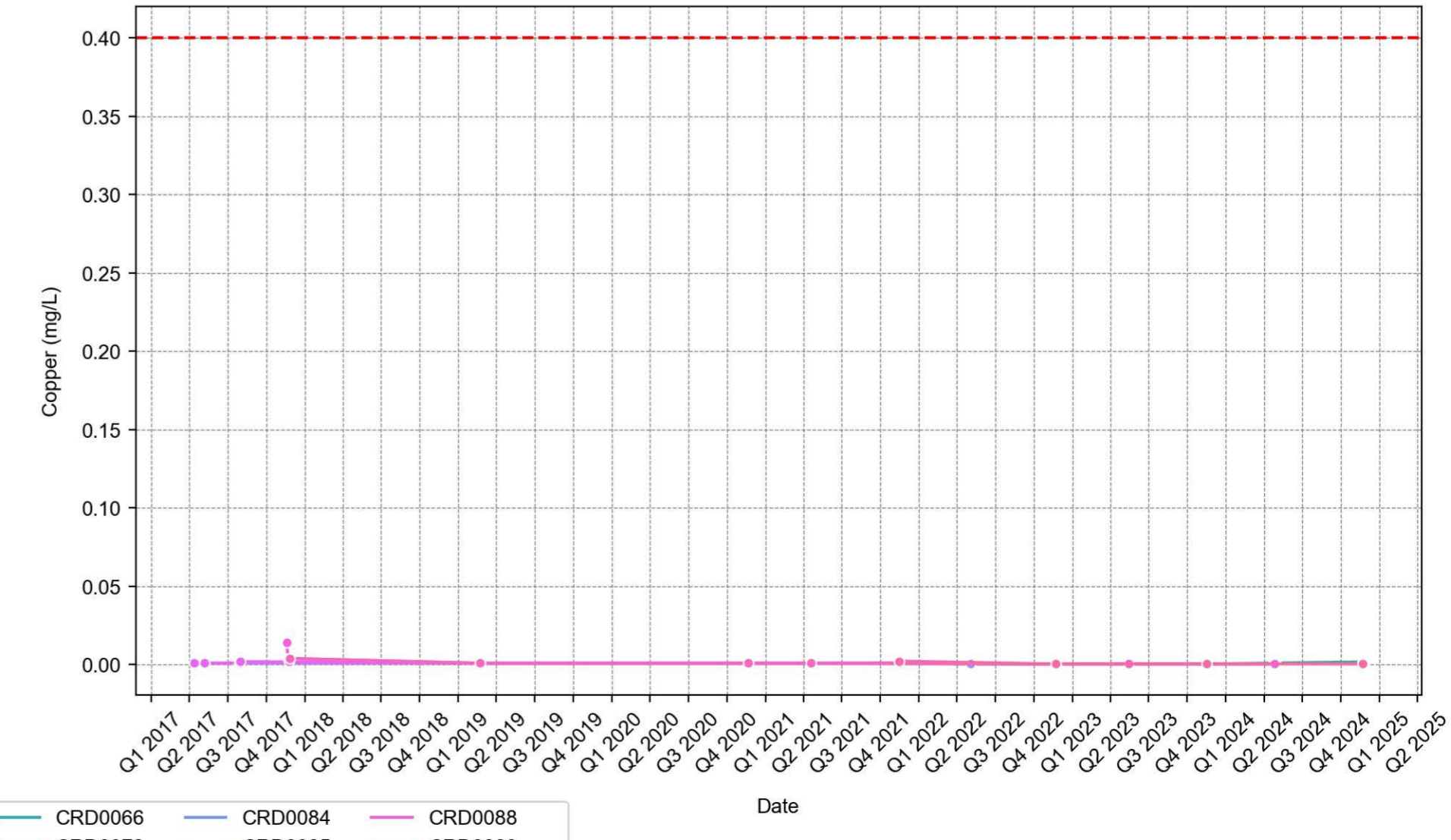
Chromium



Cobalt

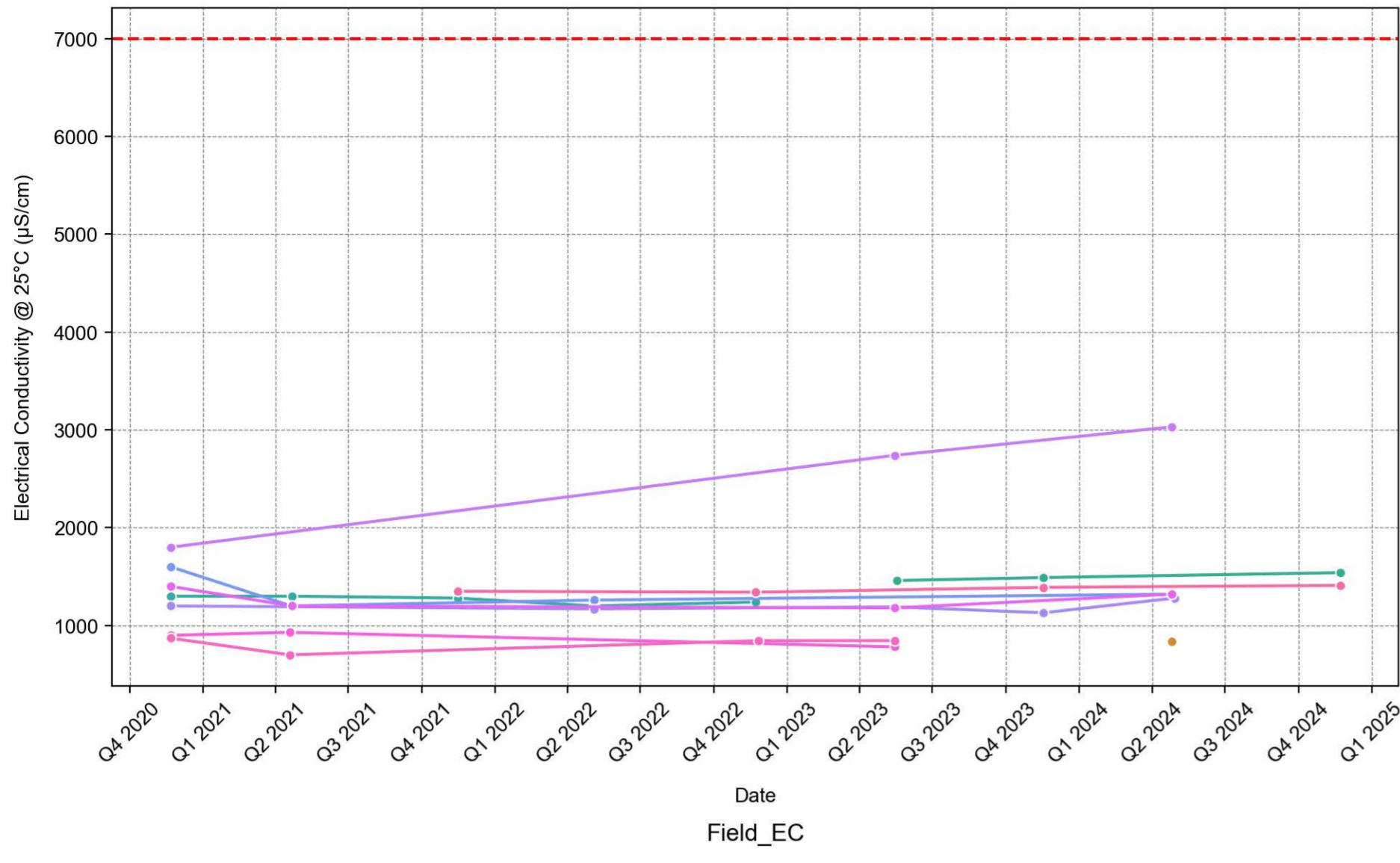


Copper

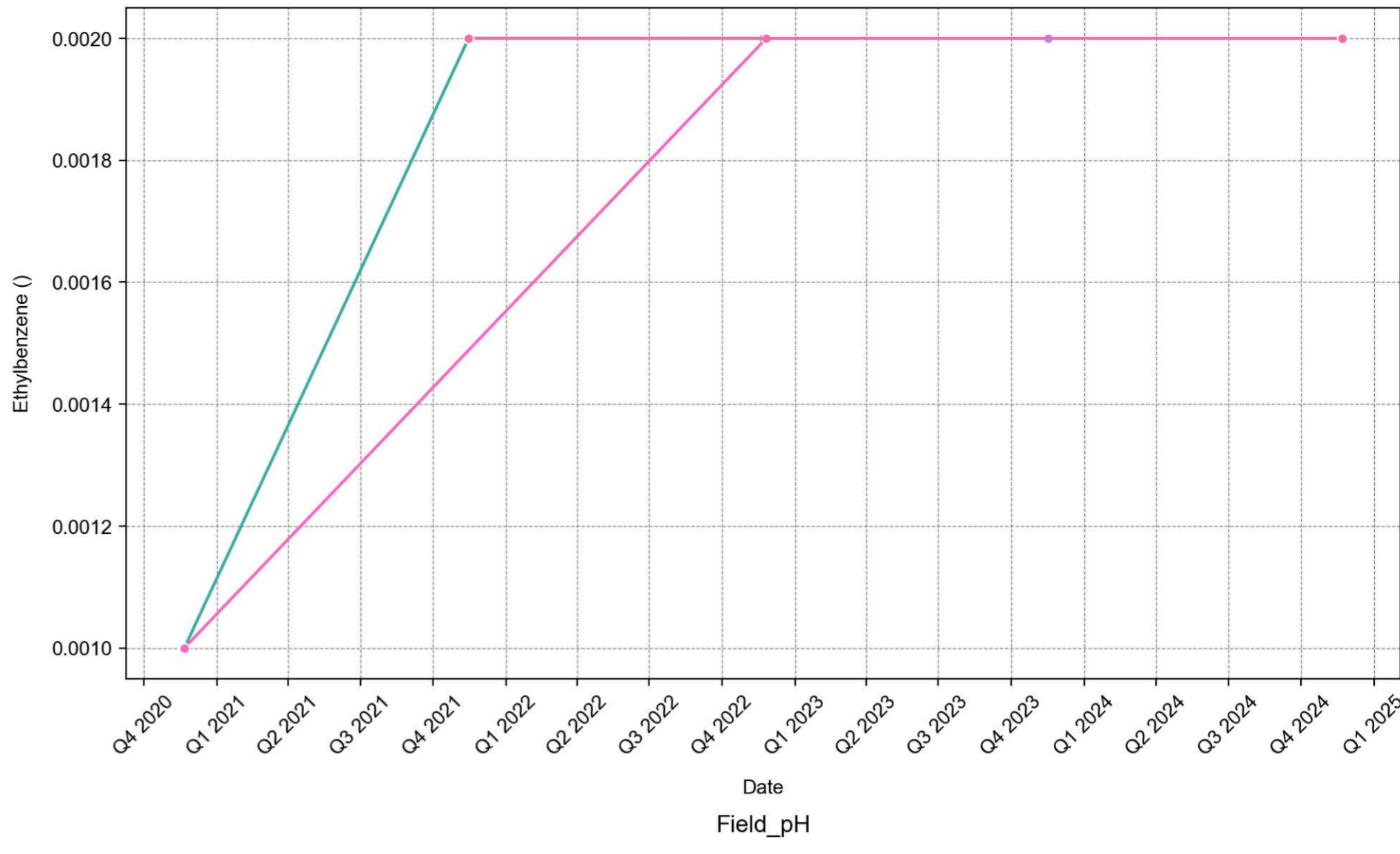


- CRD0035
- CRD0043
- CRD0056
- CRD0066
- CRD0084
- CRD0088
- - - ANZECC Limit
- CRD0036
- CRD0044
- CRD0058
- CRD0085
- CRD0089
- CRD0038
- CRD0045
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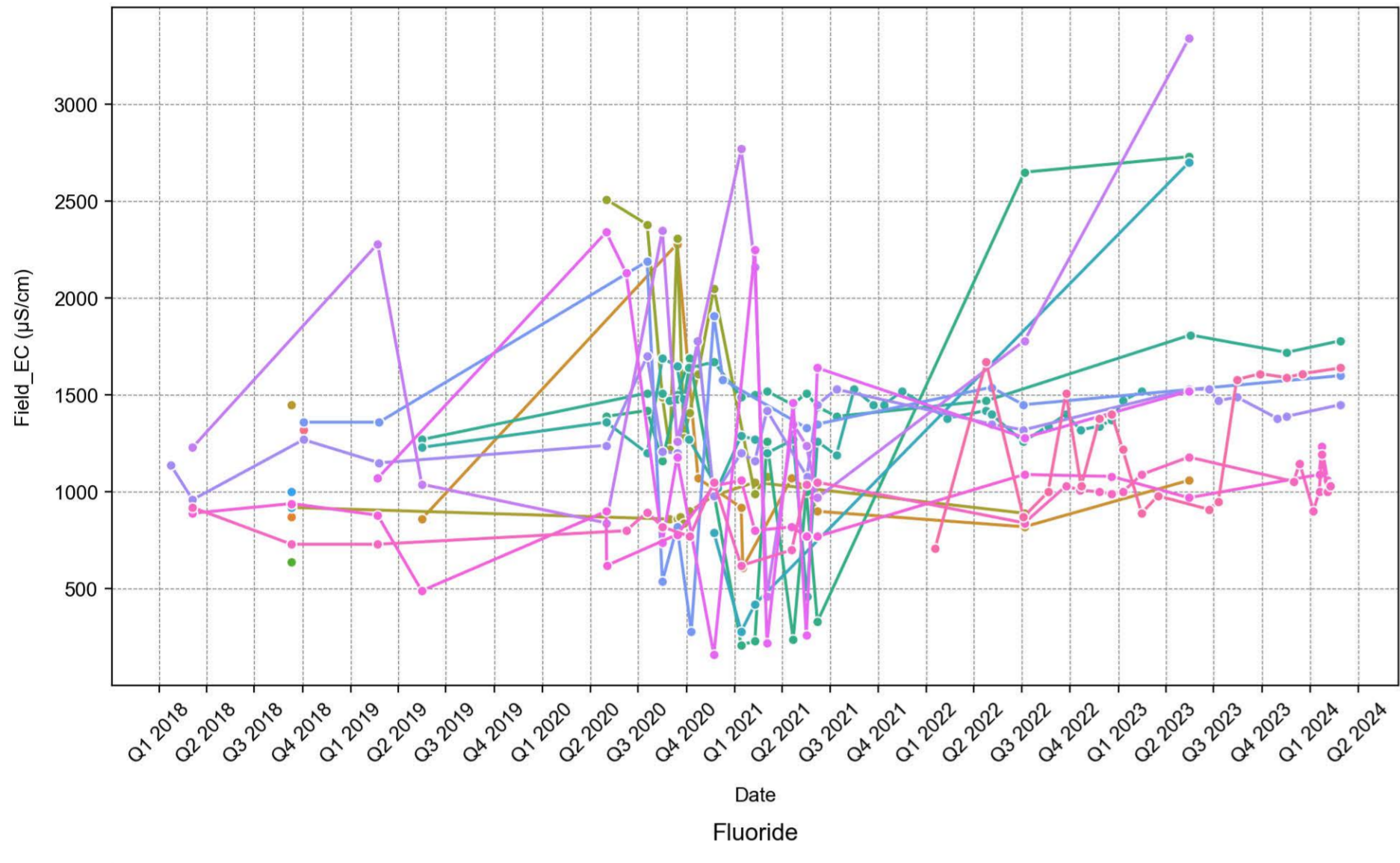
Electrical Conductivity @ 25°C



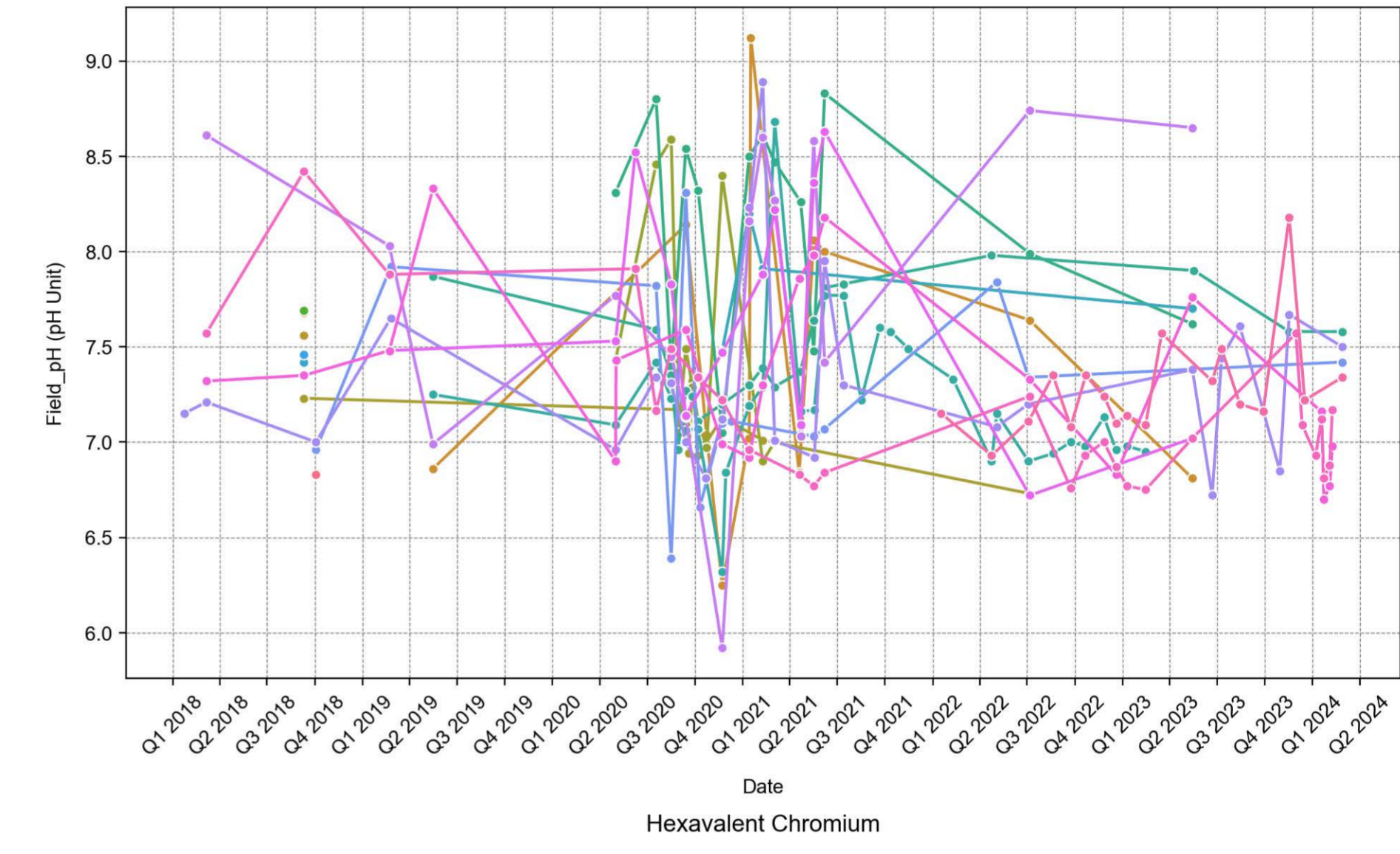
Ethylbenzene



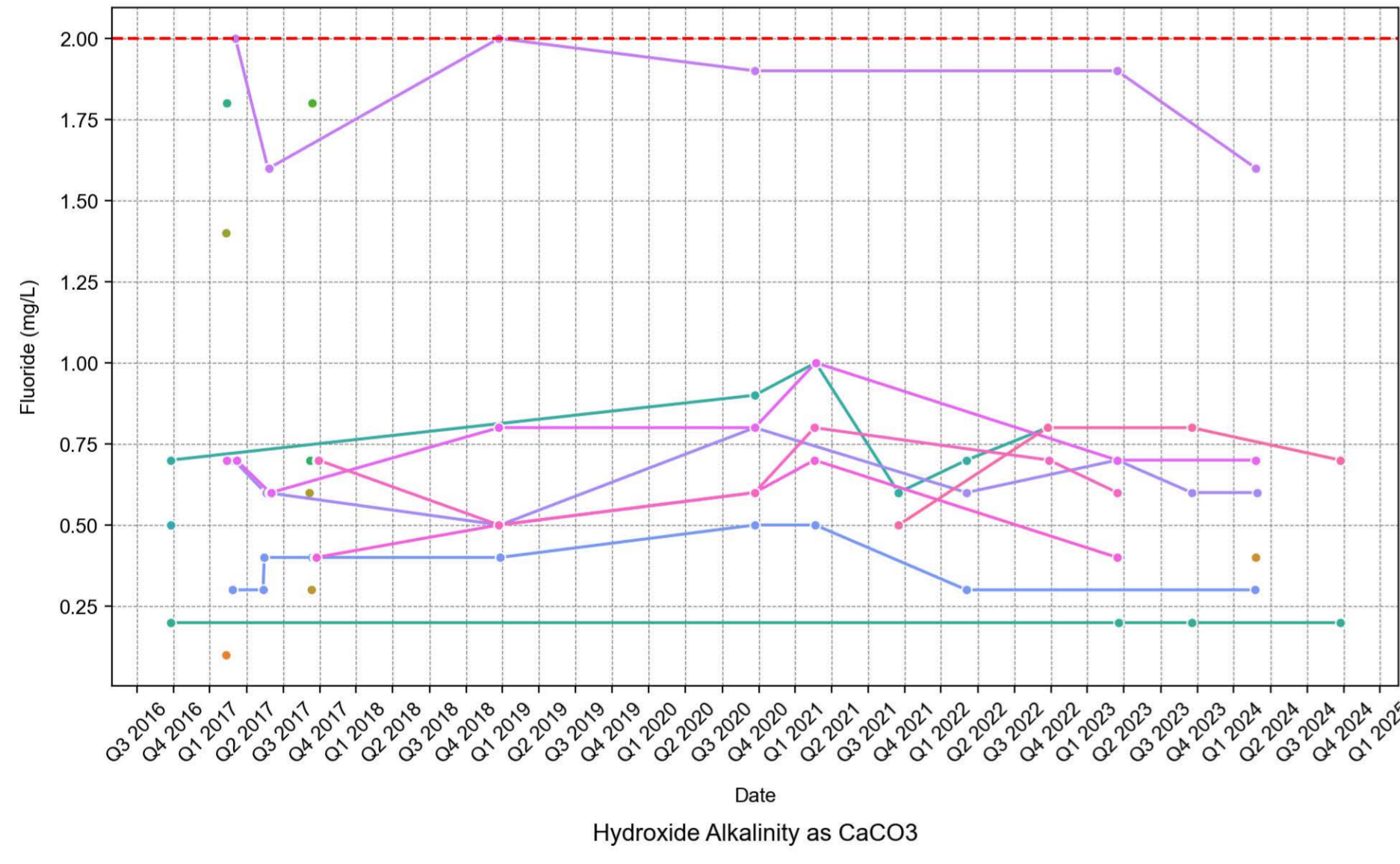
Field_EC



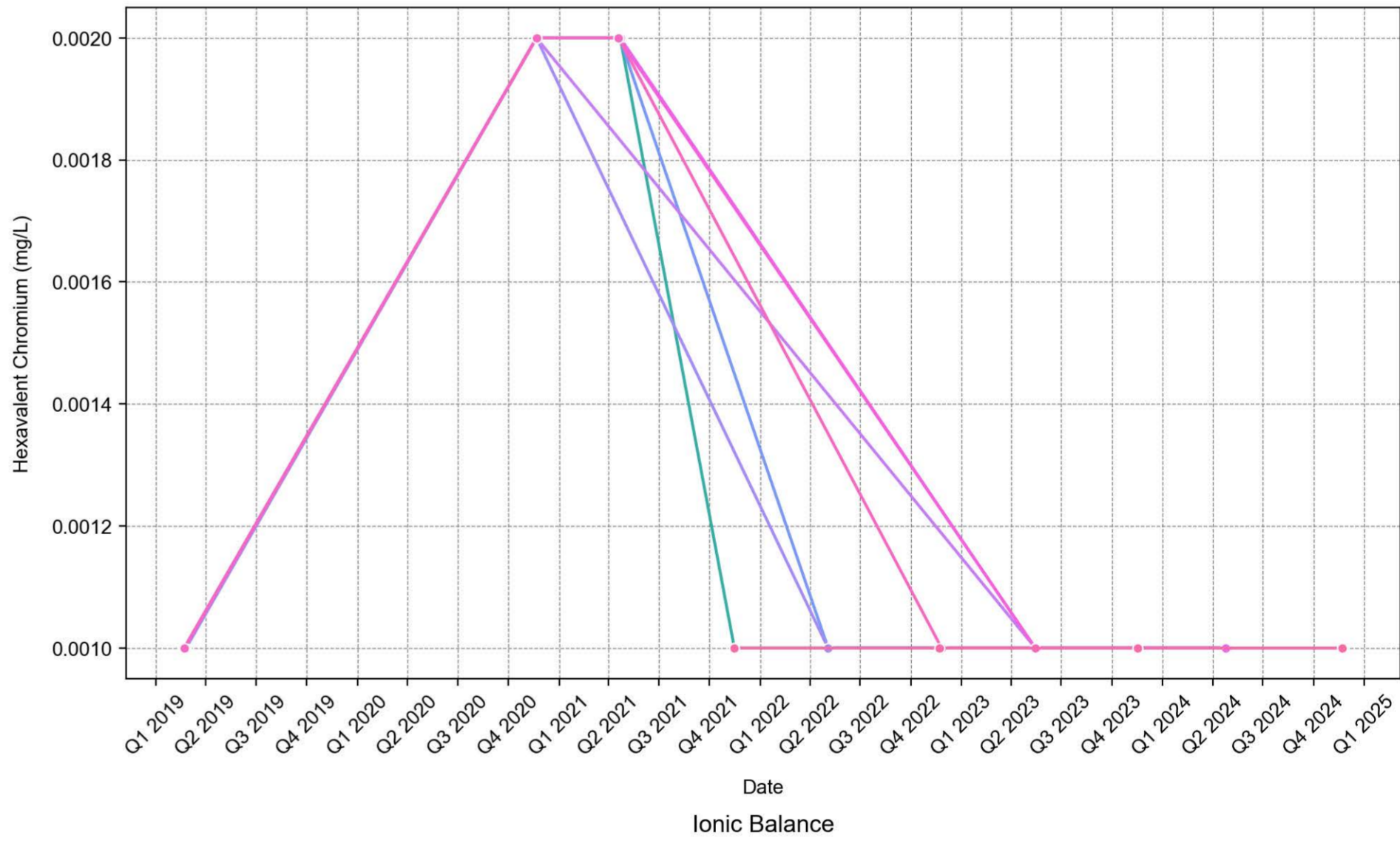
Field_pH



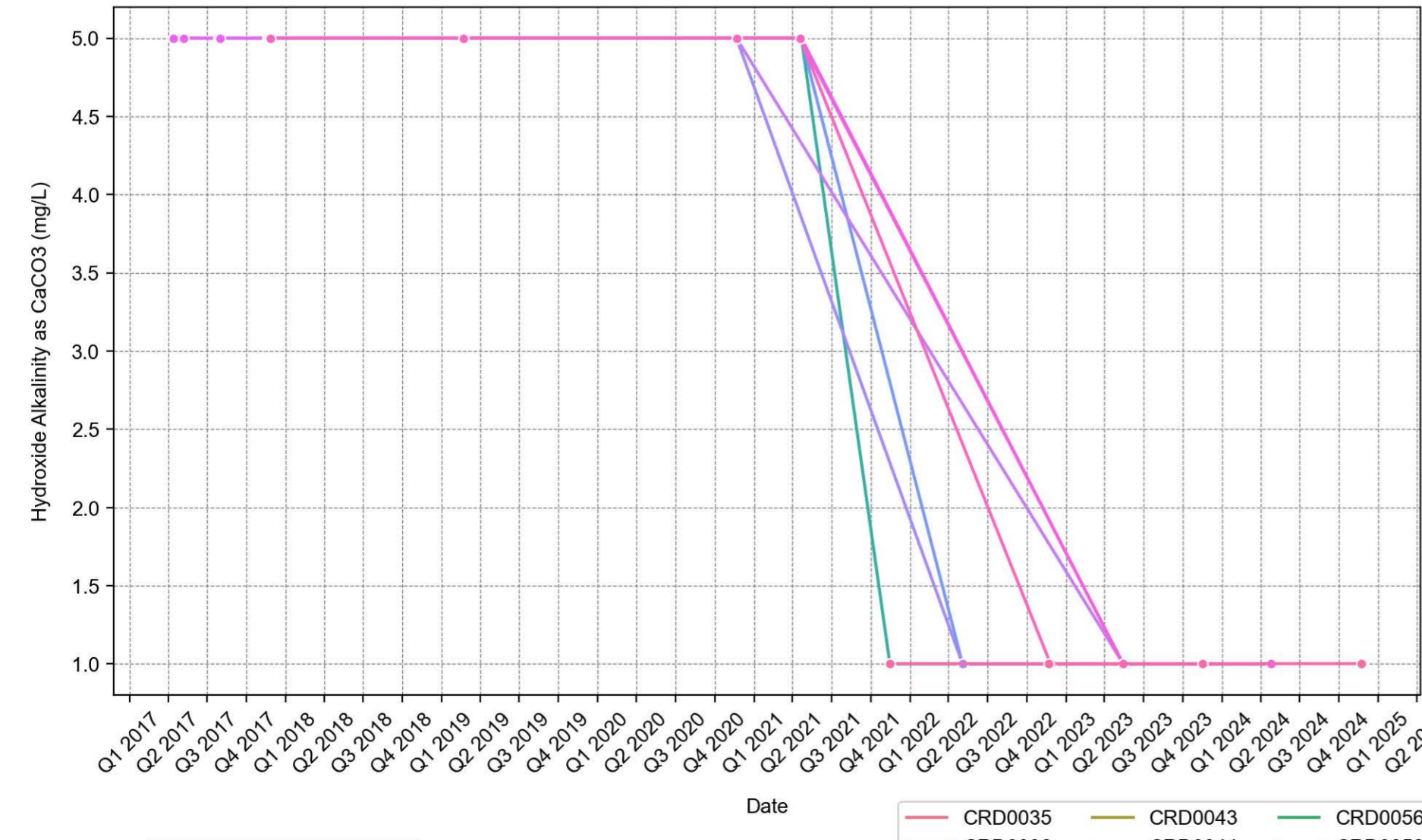
Fluoride



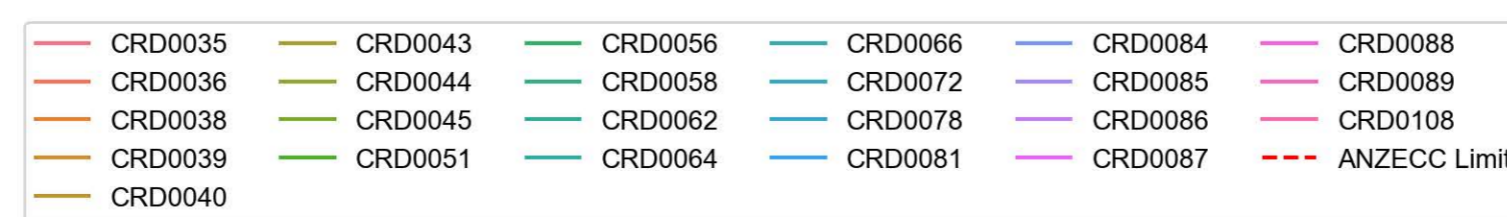
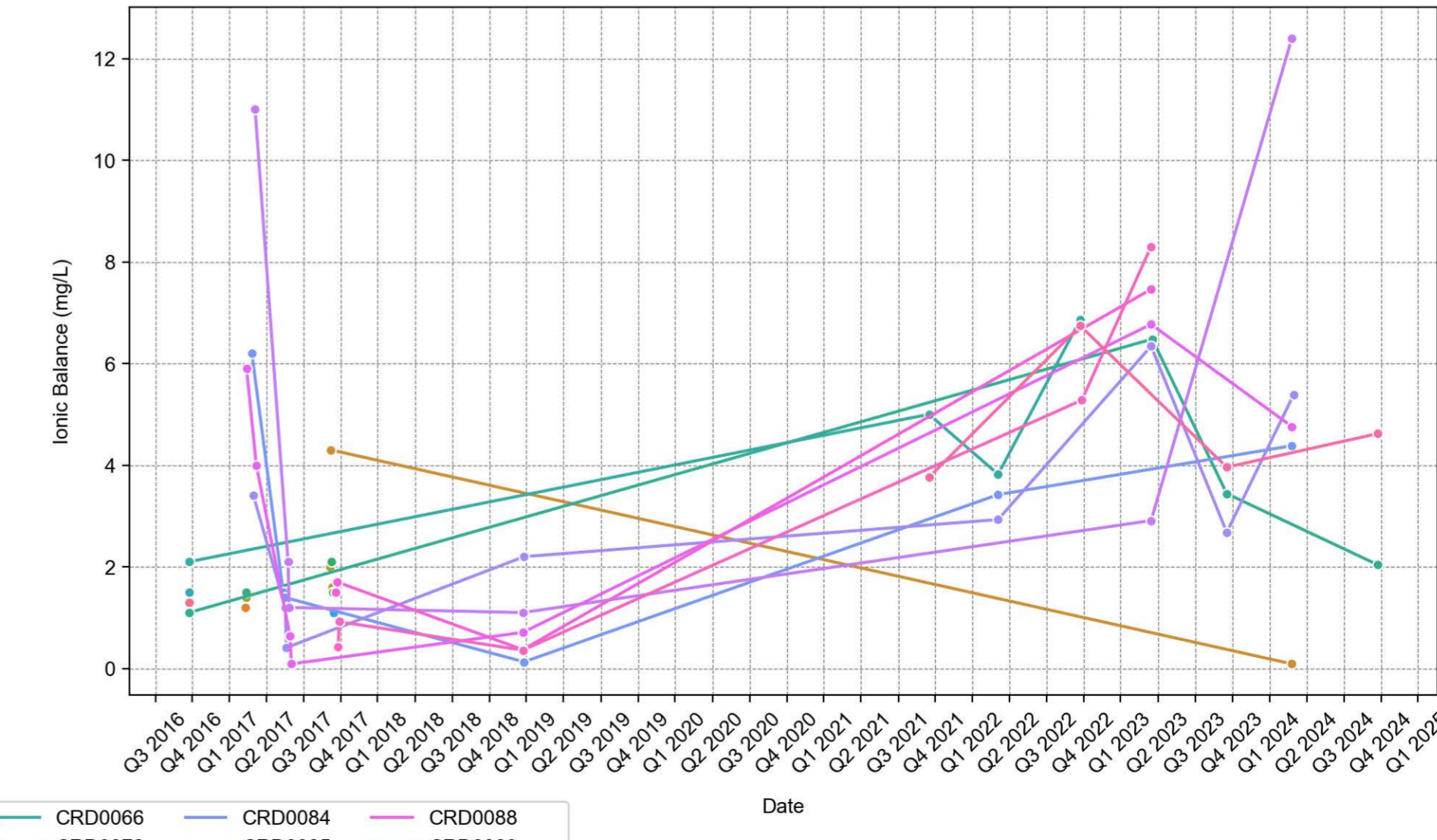
Hexavalent Chromium



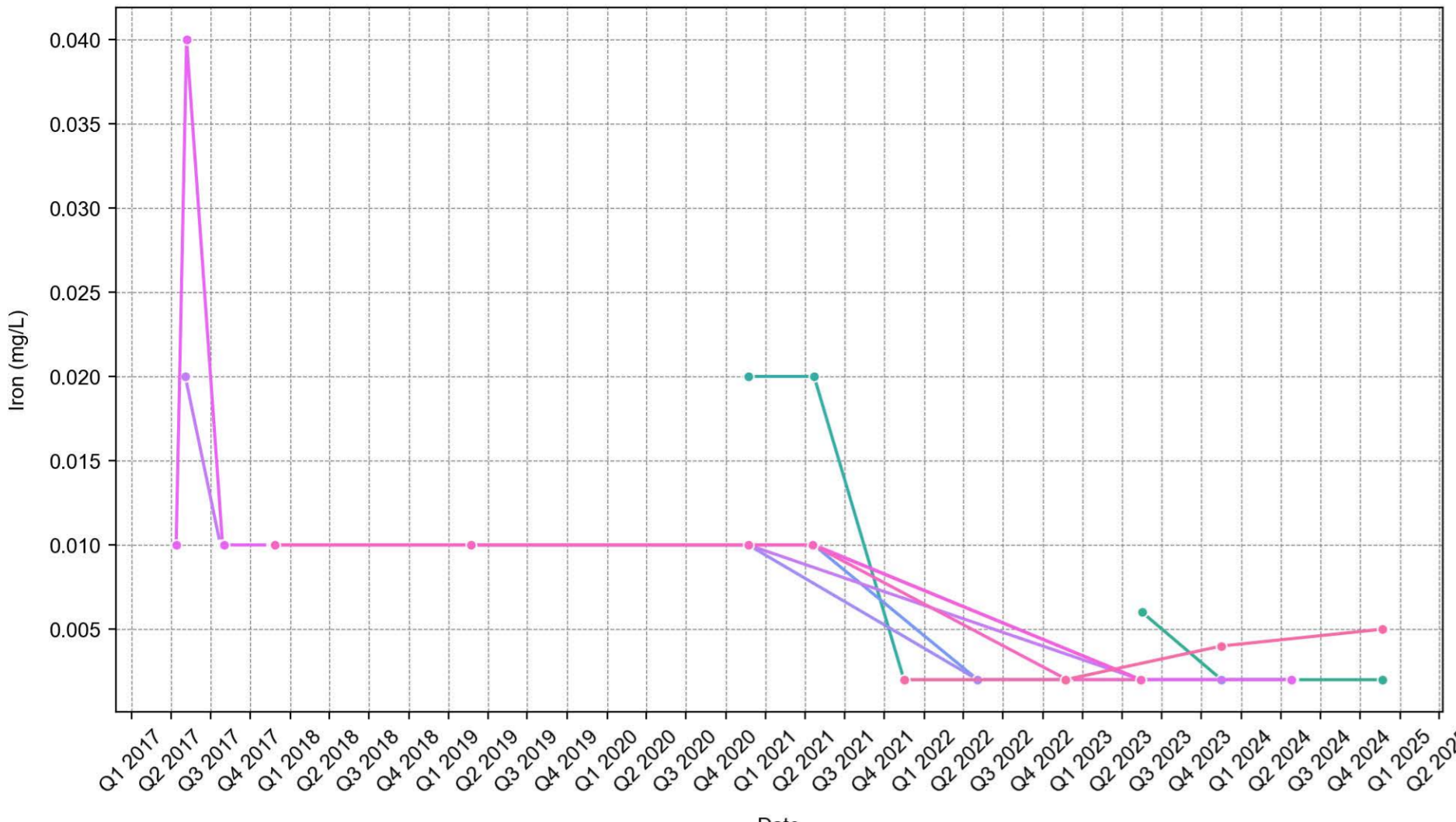
Hydroxide Alkalinity as CaCO3



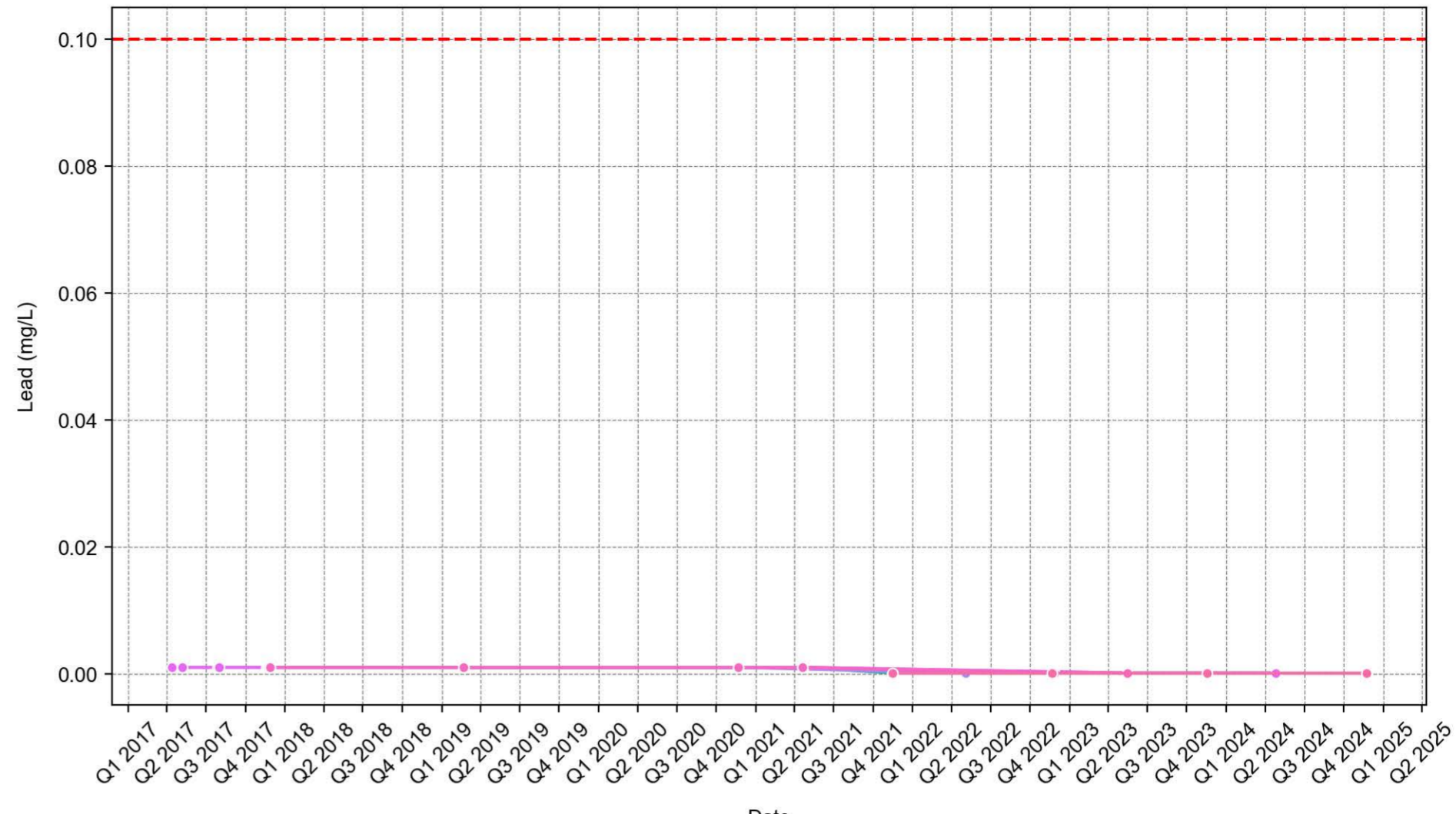
Ionic Balance



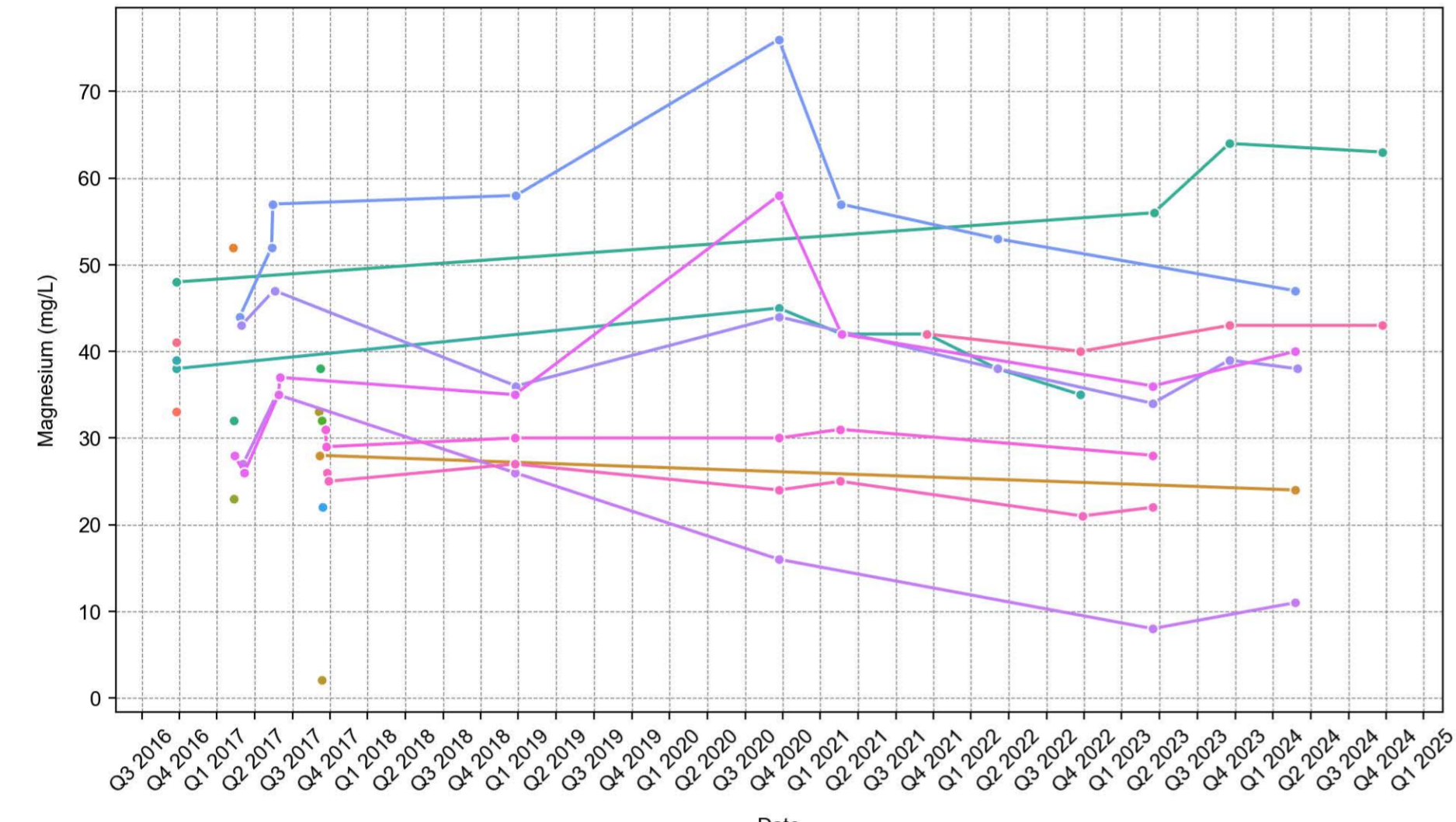
Iron



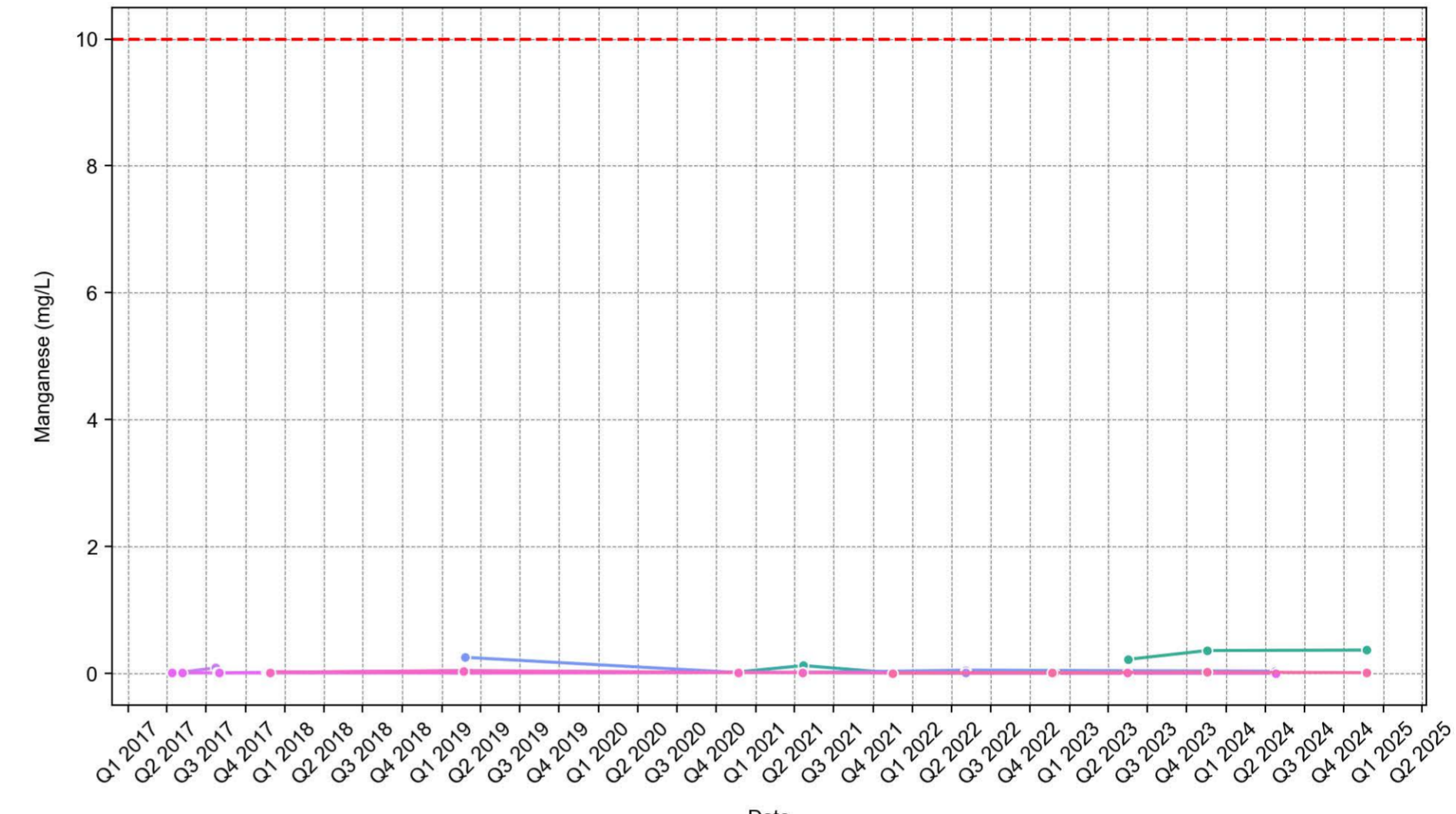
Lead



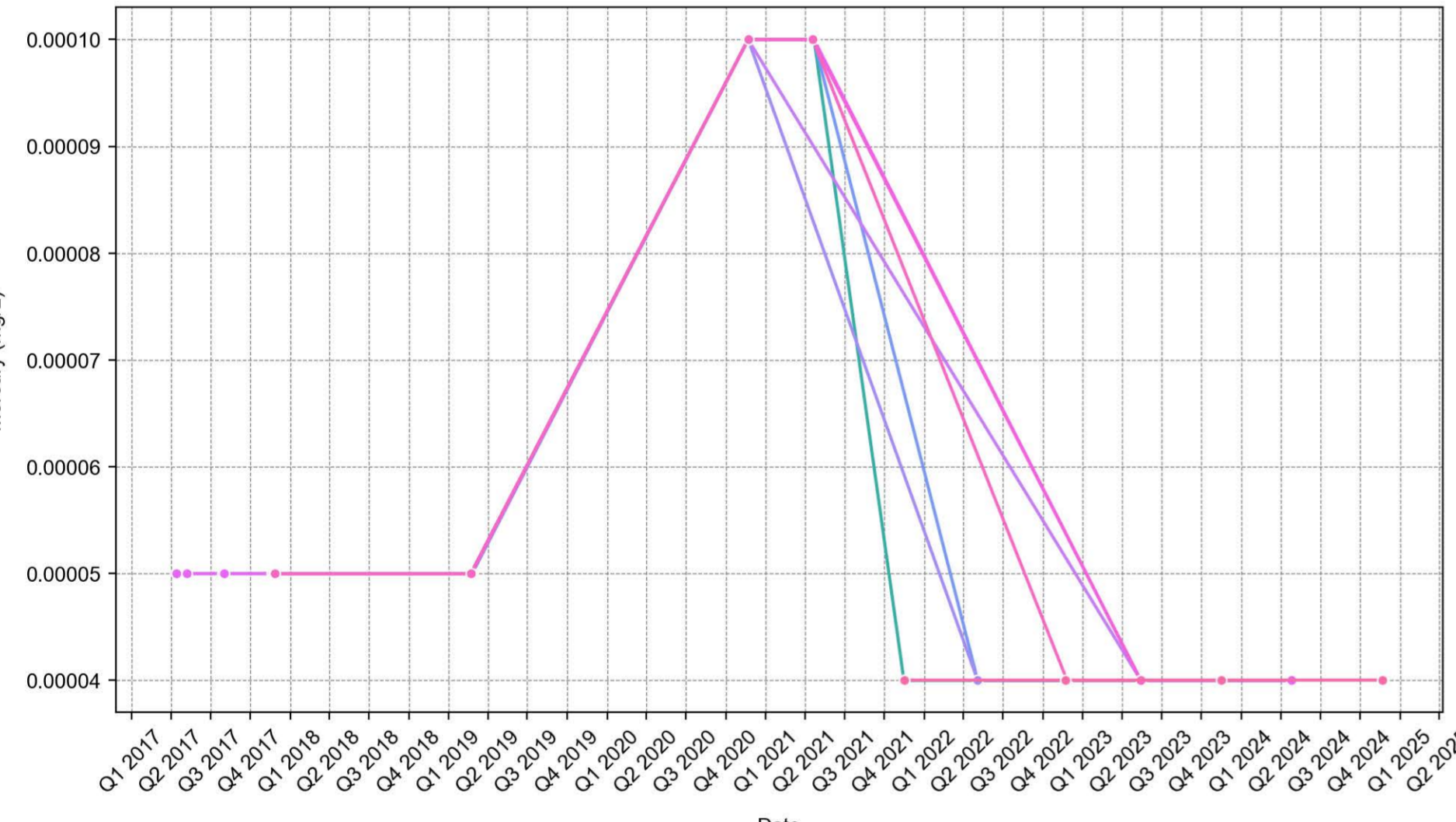
Magnesium



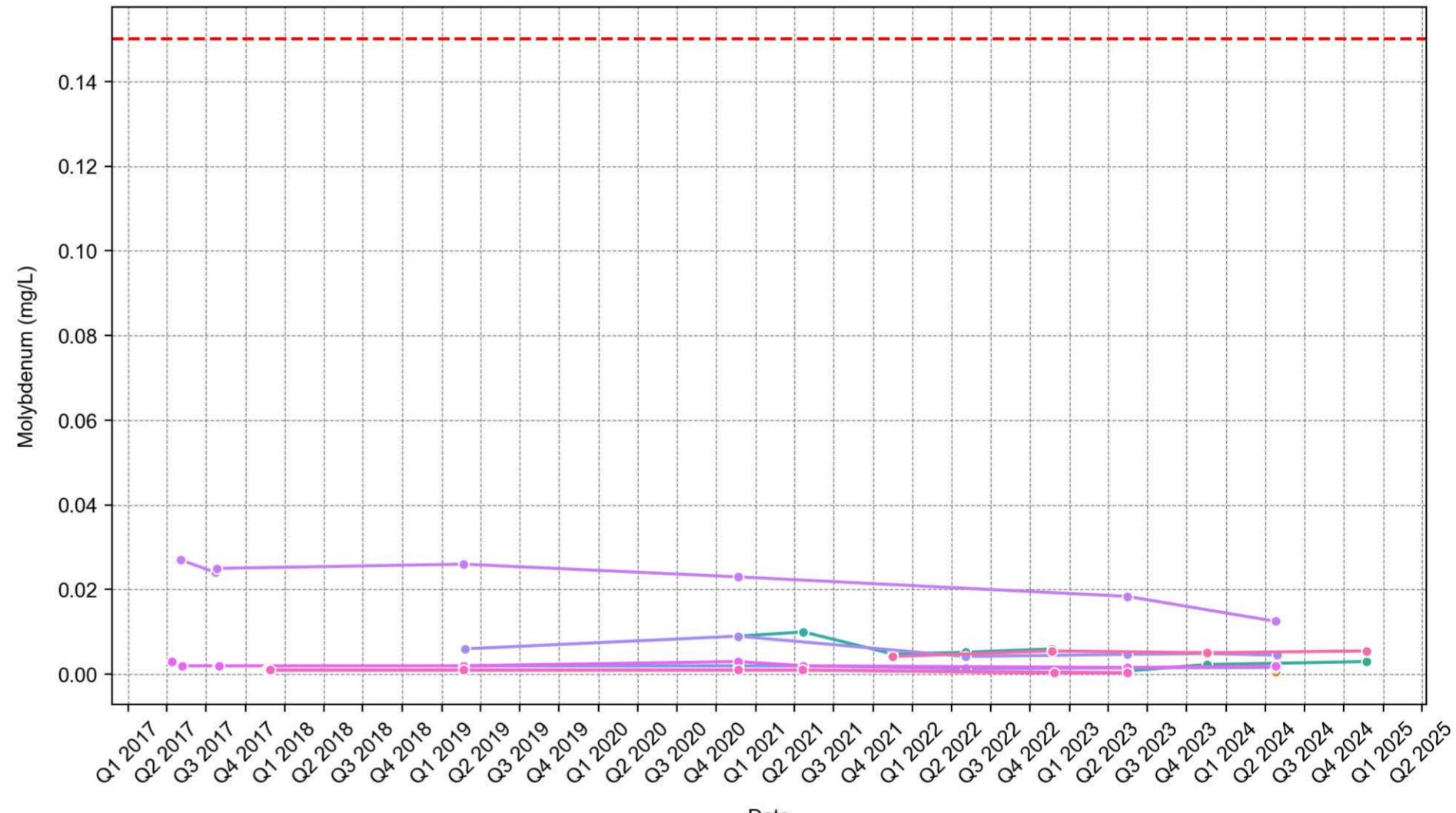
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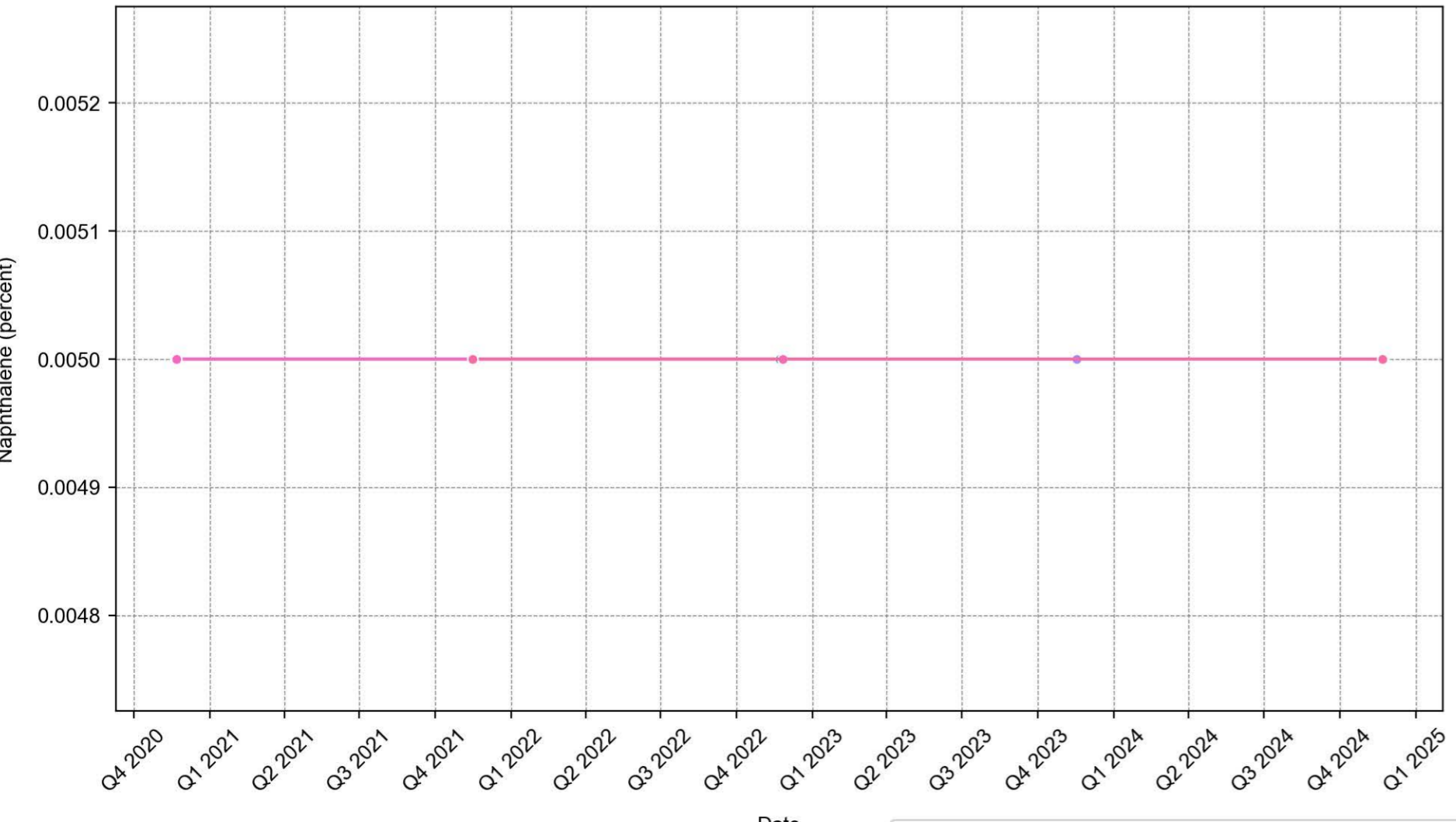
Mercury



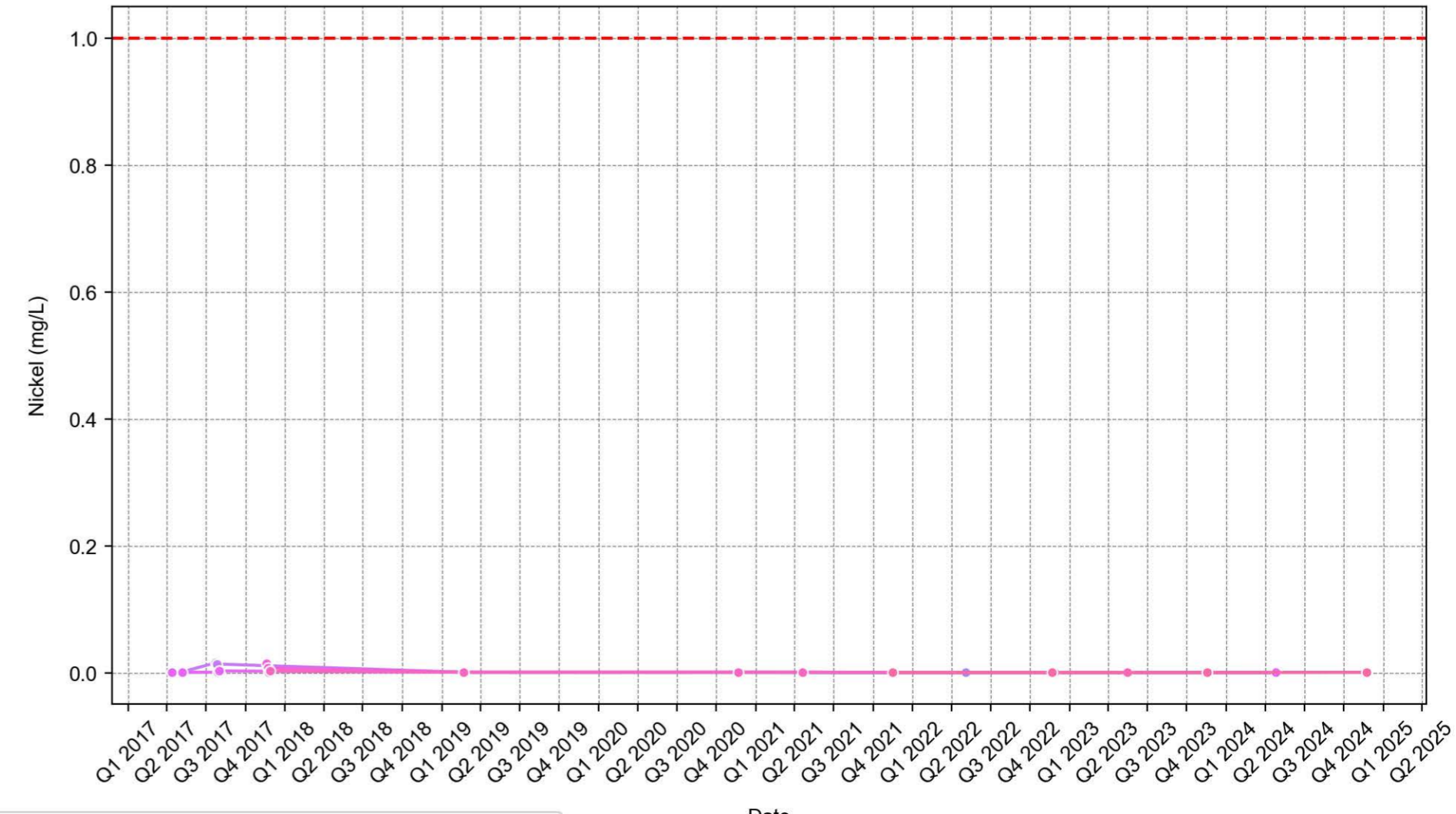
Molybdenum



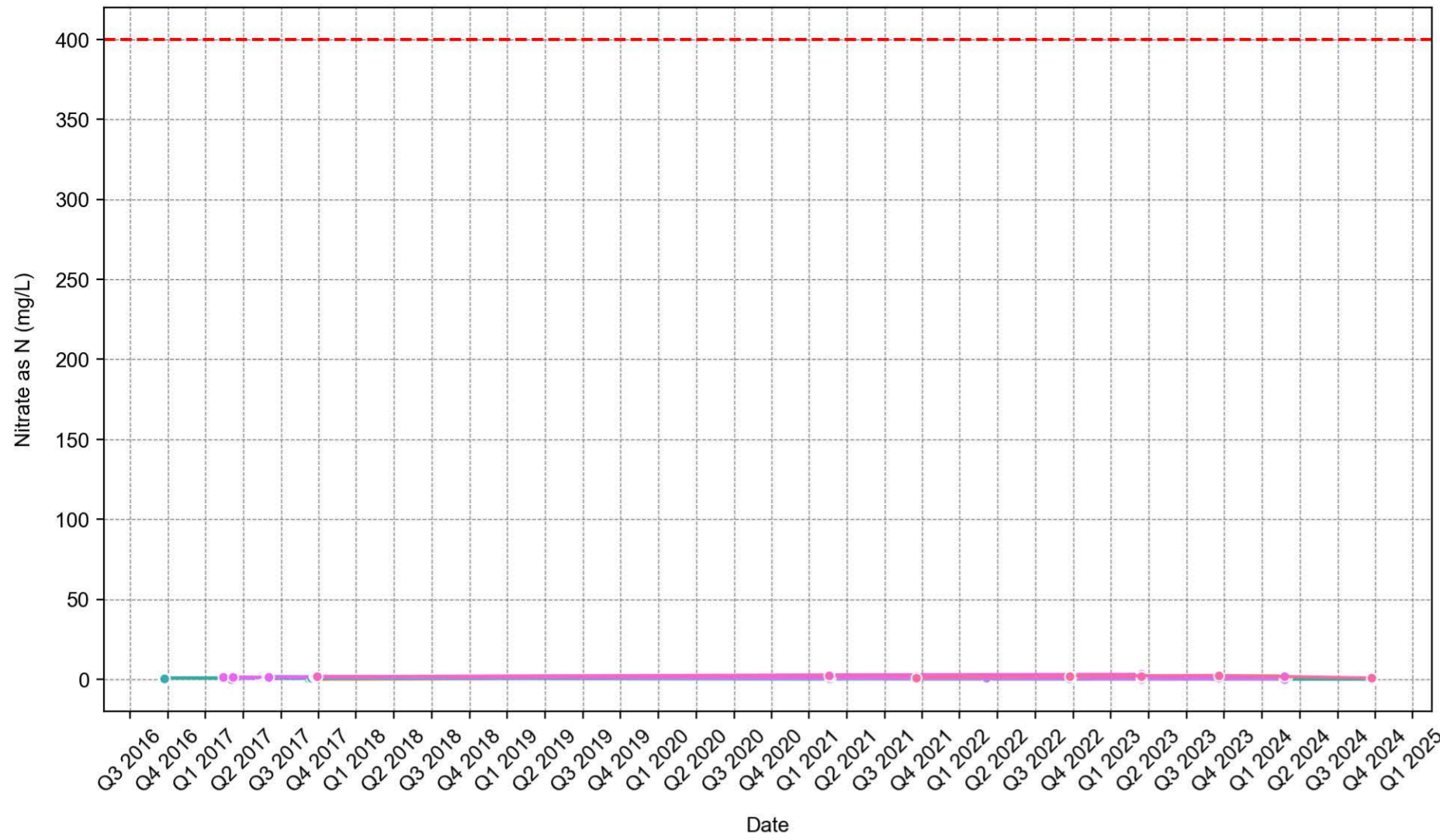
Naphthalene



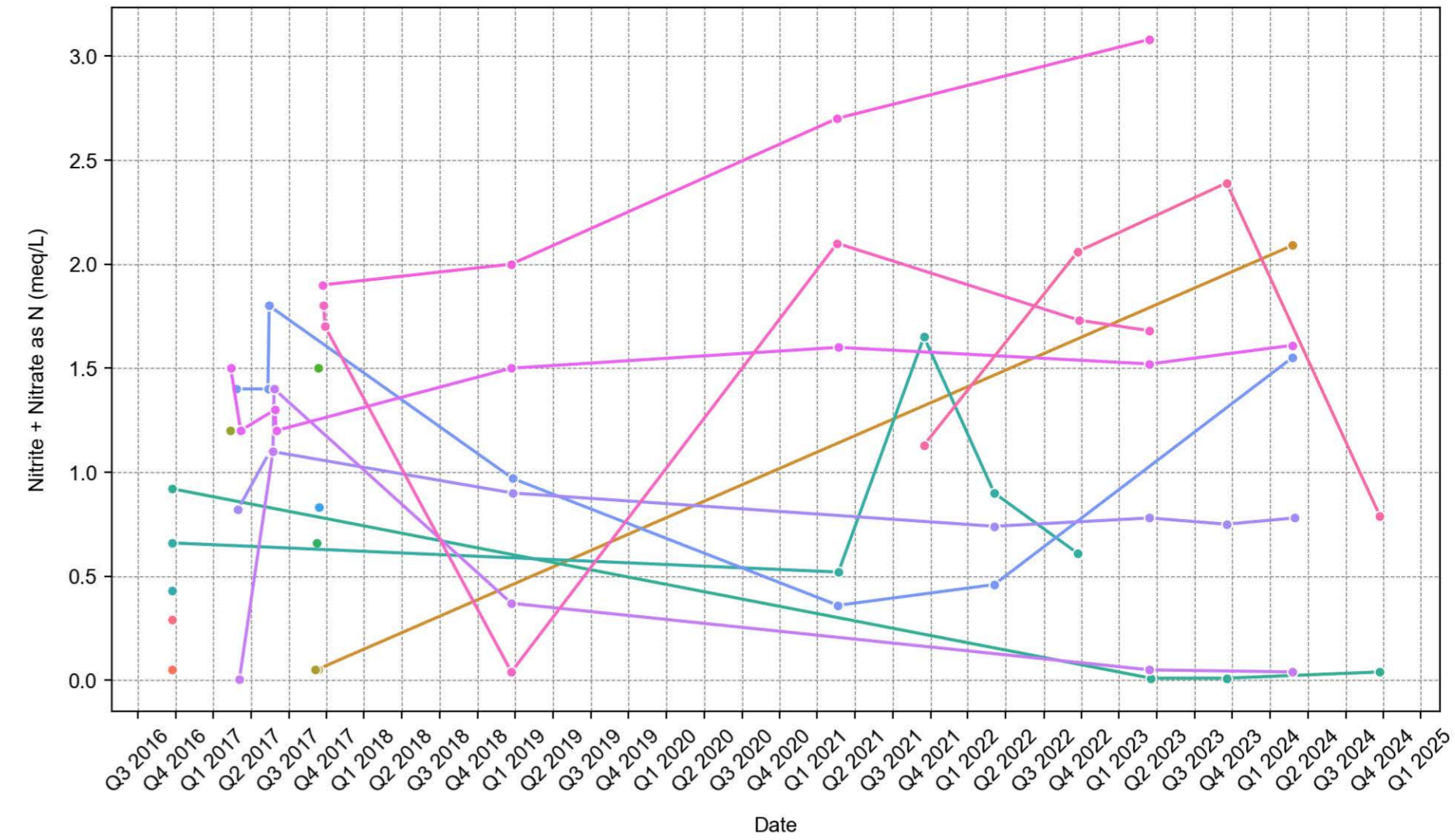
Nickel



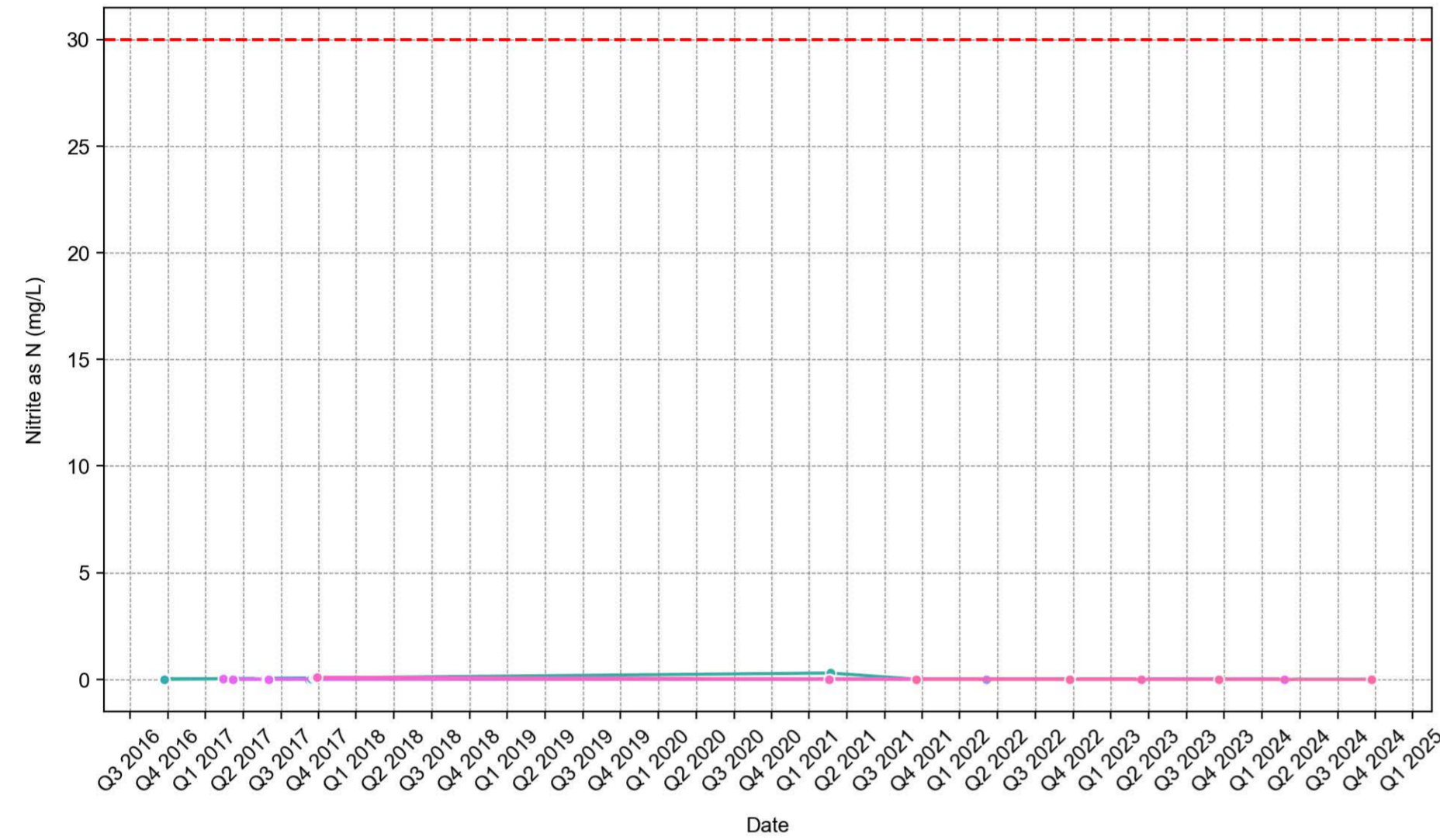
Nitrate as N



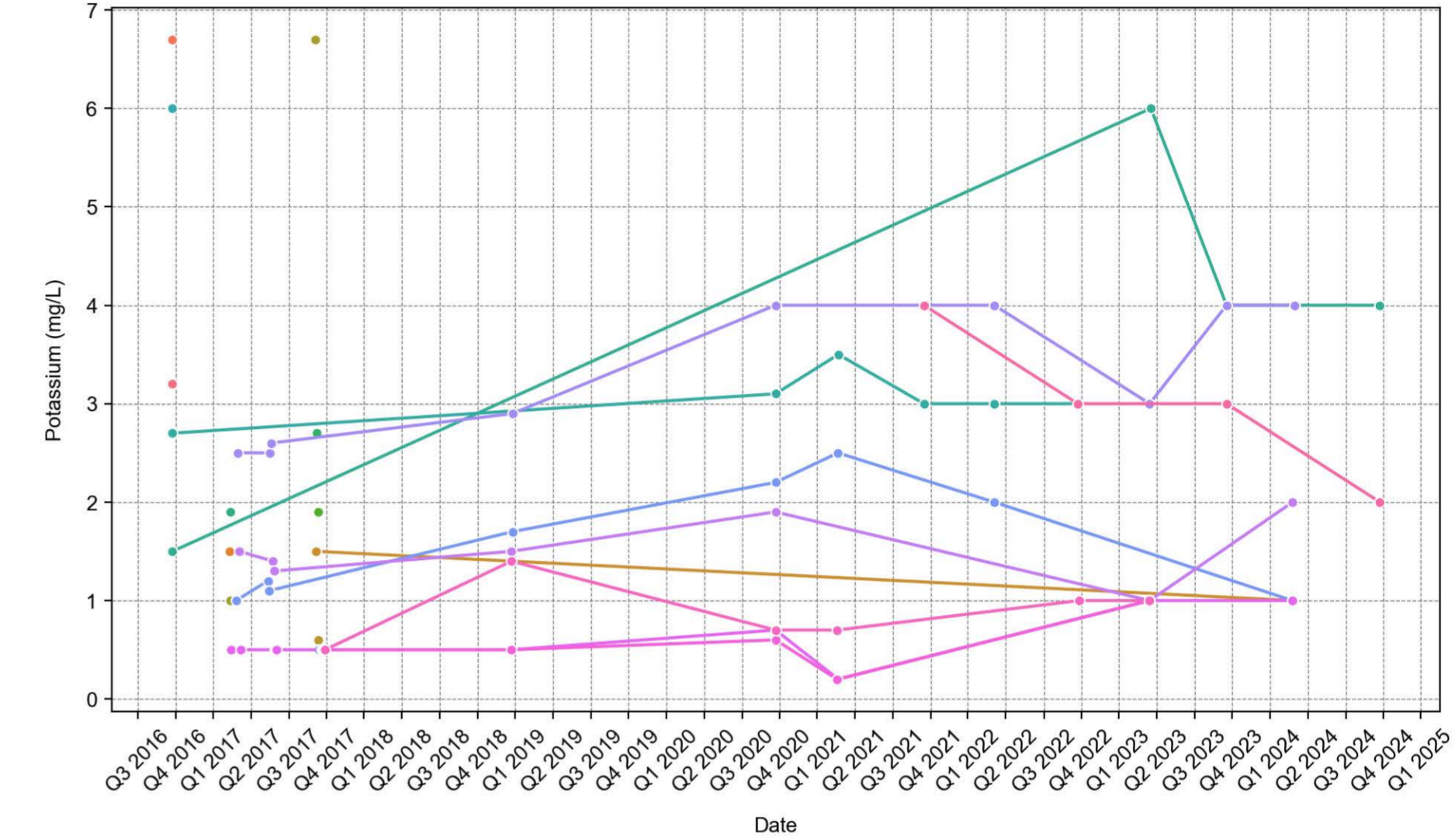
Nitrite + Nitrate as N



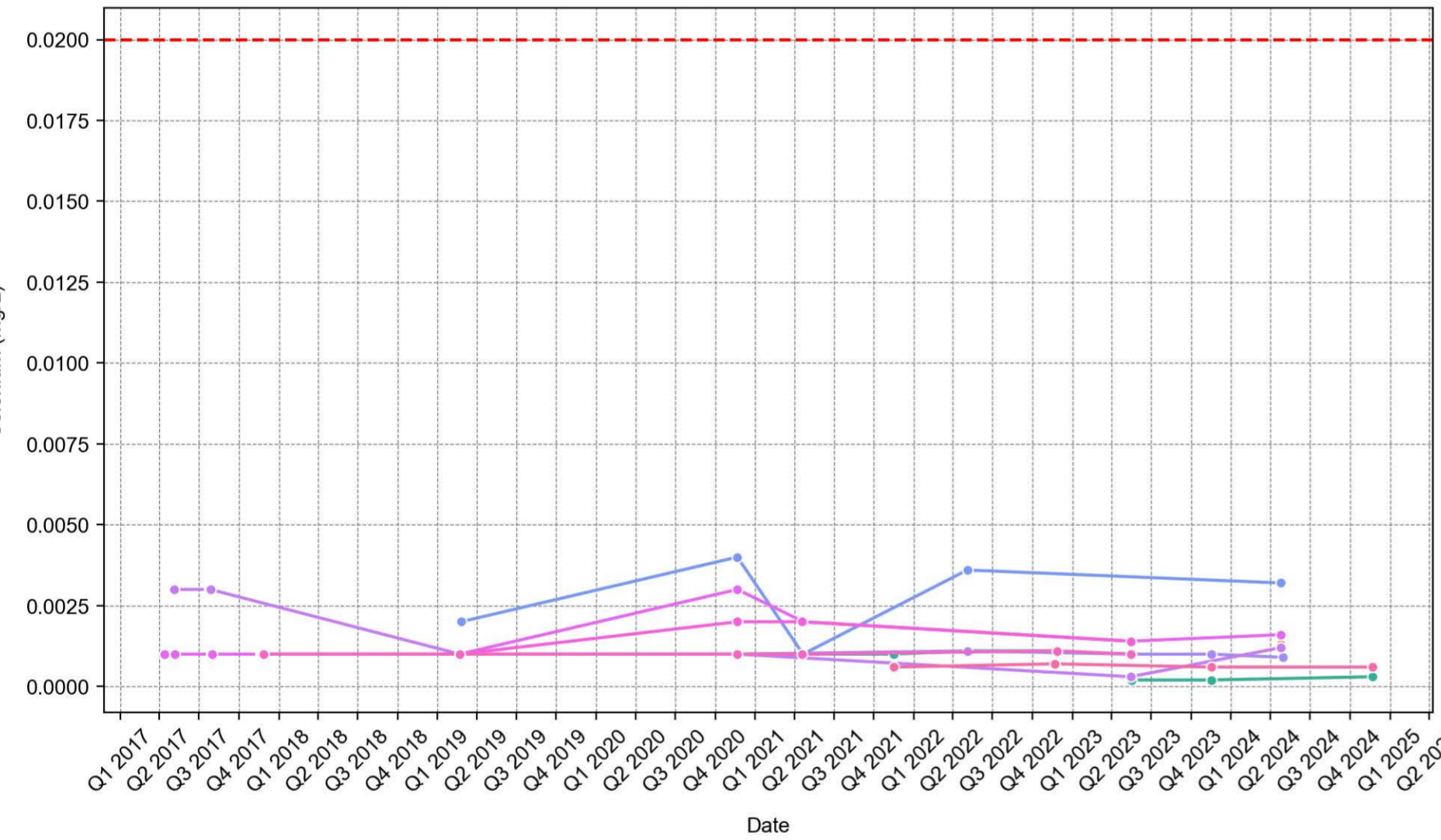
Nitrite as N



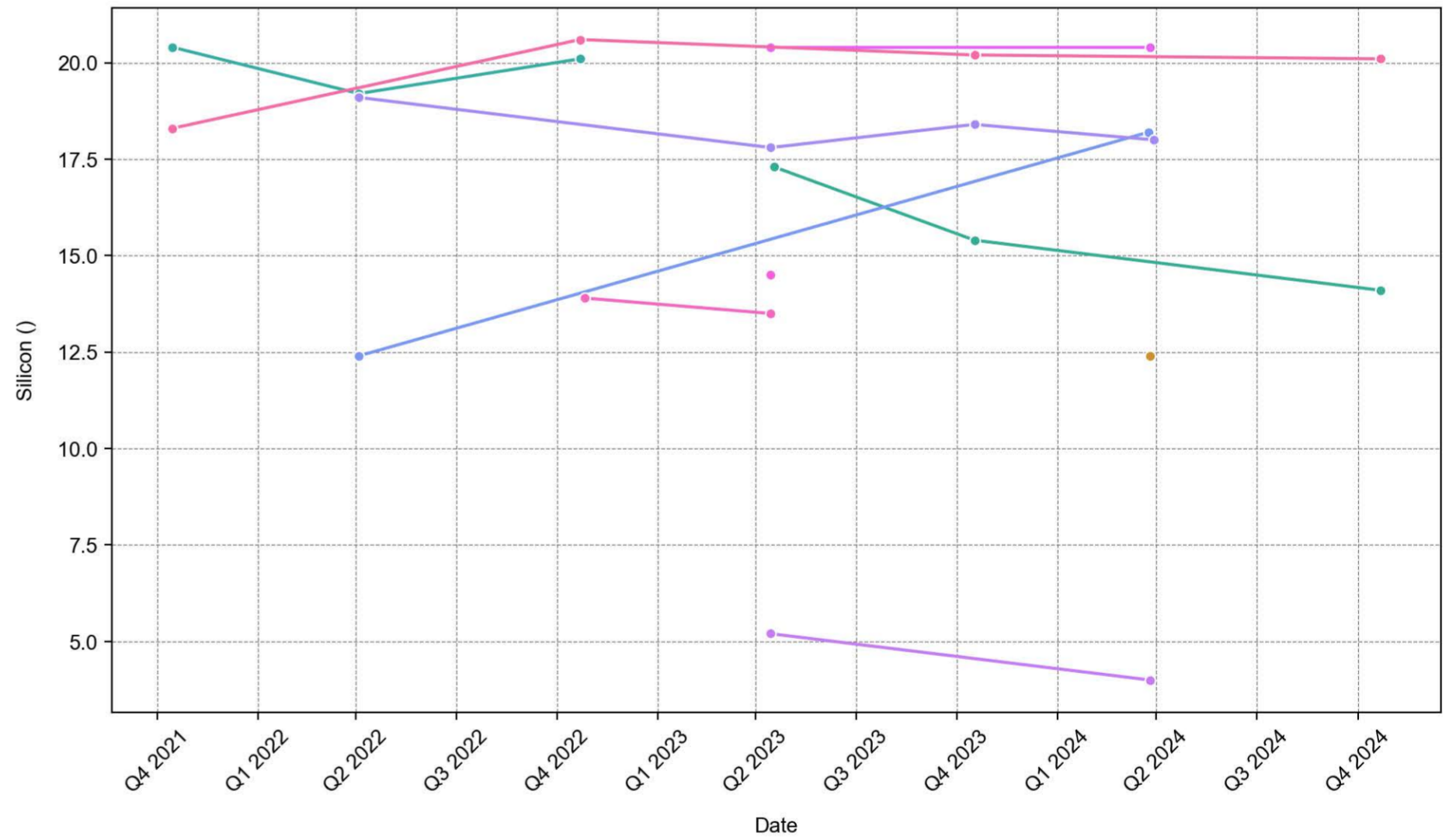
Potassium



Selenium



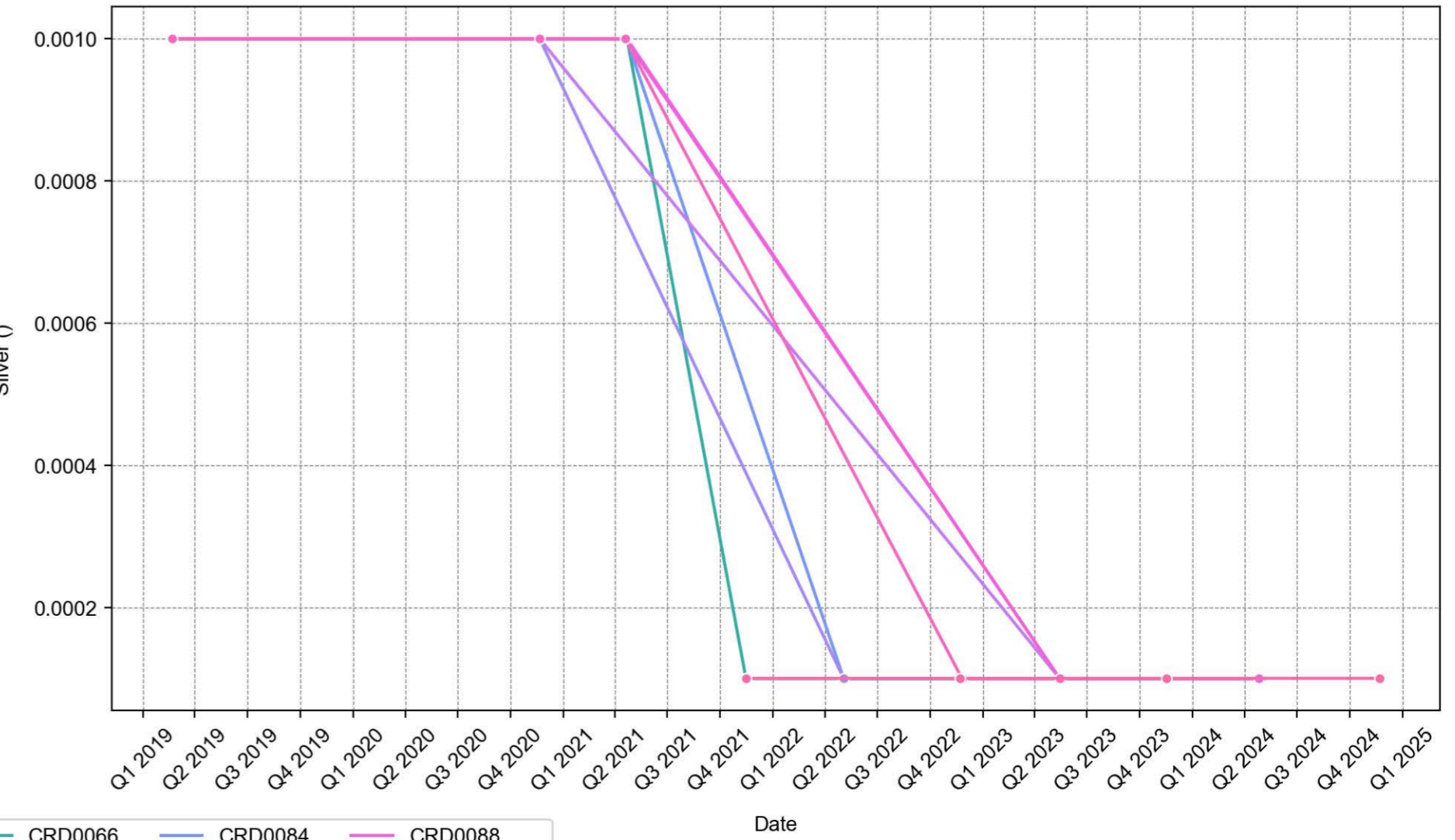
Silicon



Silicon as SiO2

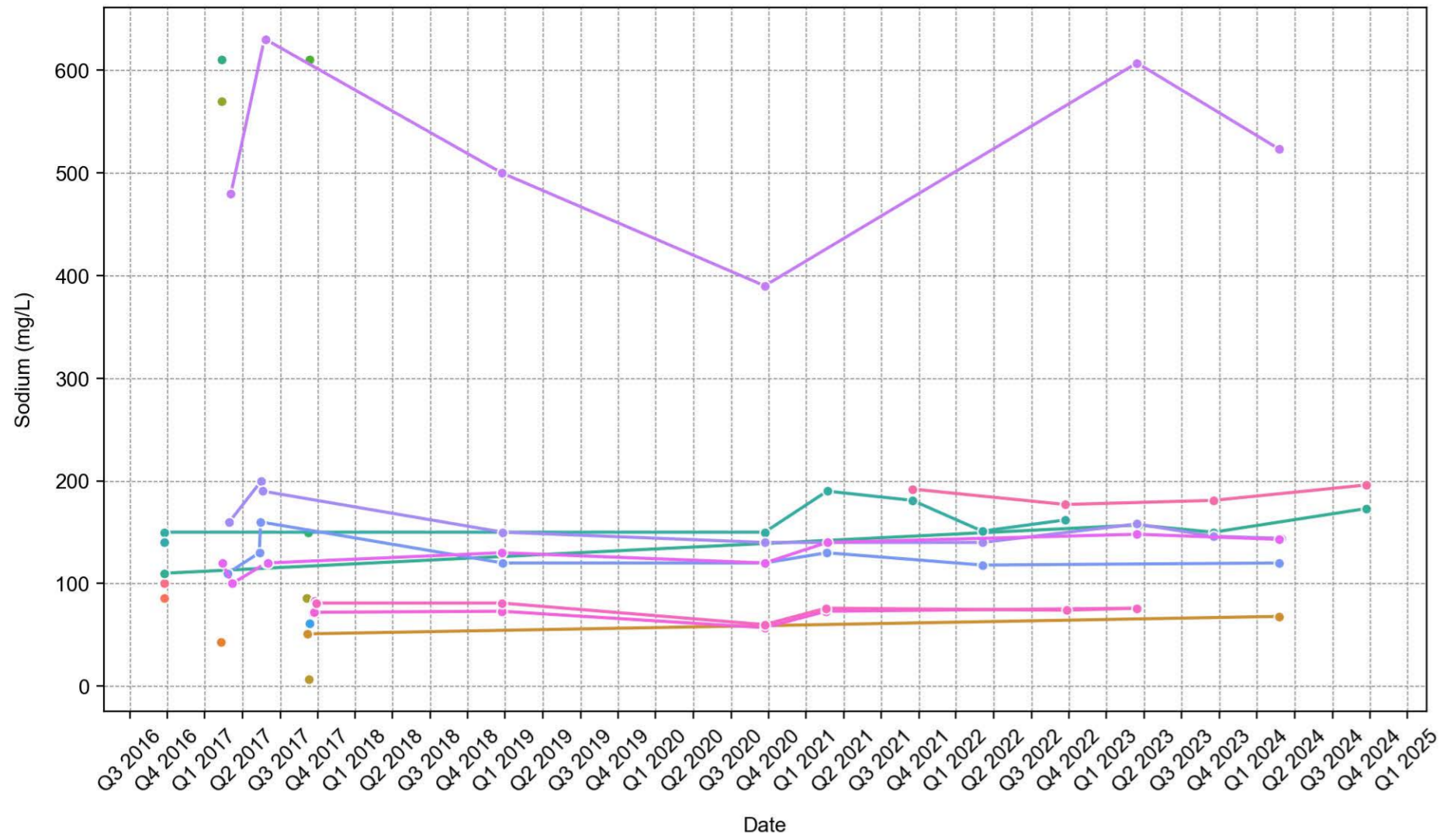


Silver

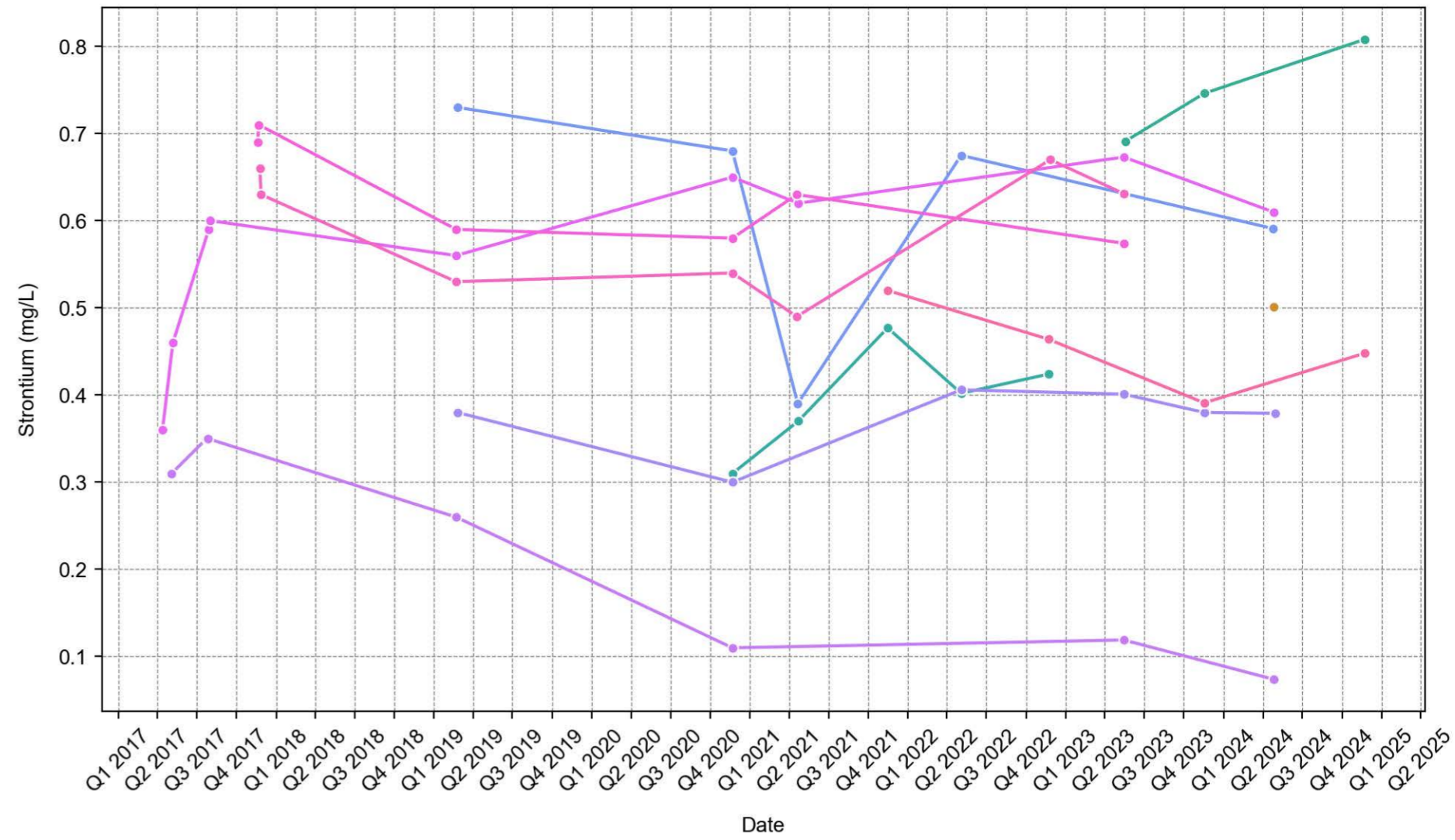


- CRD0035
- CRD0043
- CRD0056
- CRD0066
- CRD0084
- CRD0088
- - - ANZECC Limit
- CRD0036
- CRD0044
- CRD0058
- CRD0072
- CRD0085
- CRD0089
- CRD0038
- CRD0045
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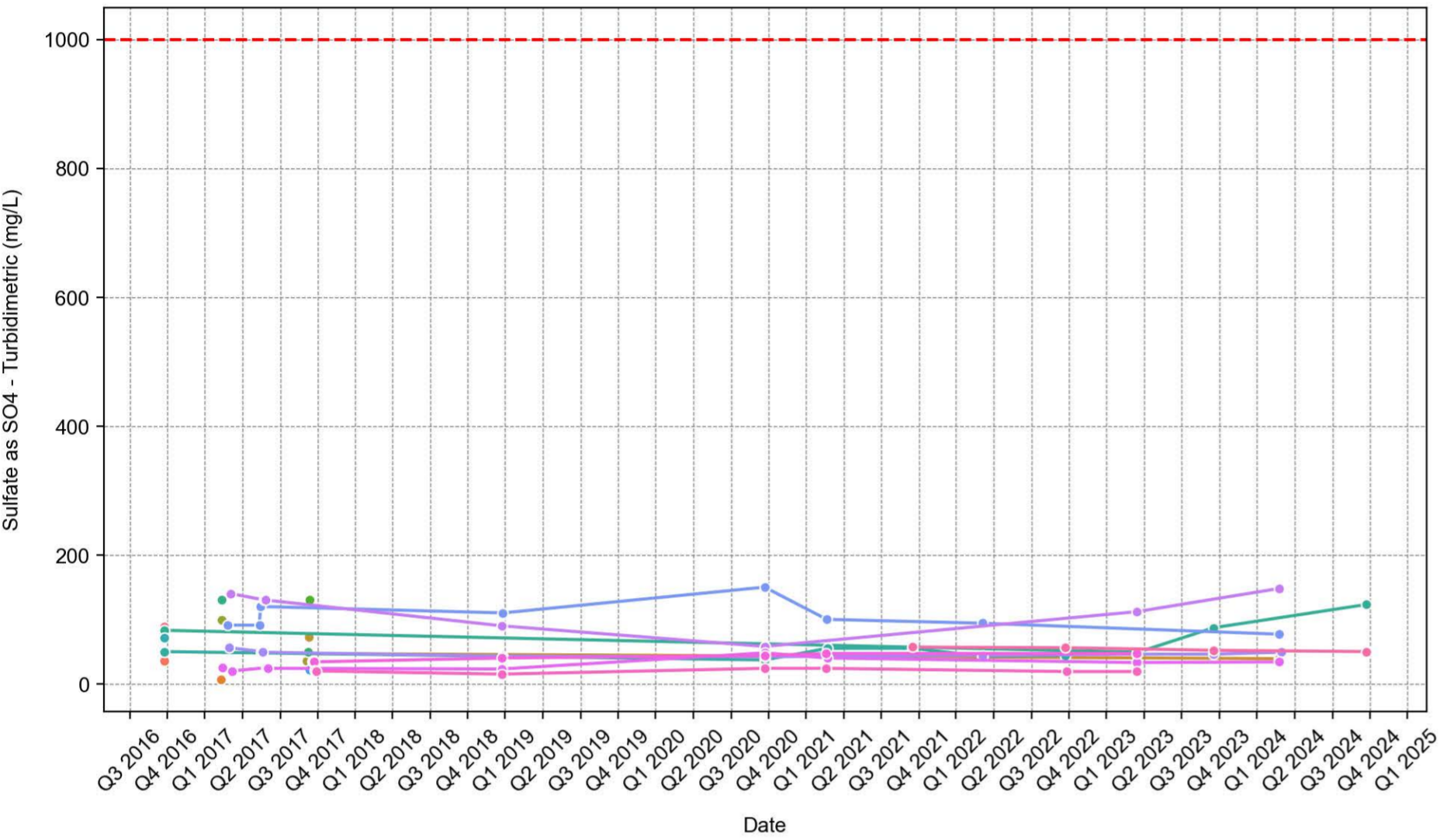
Sodium



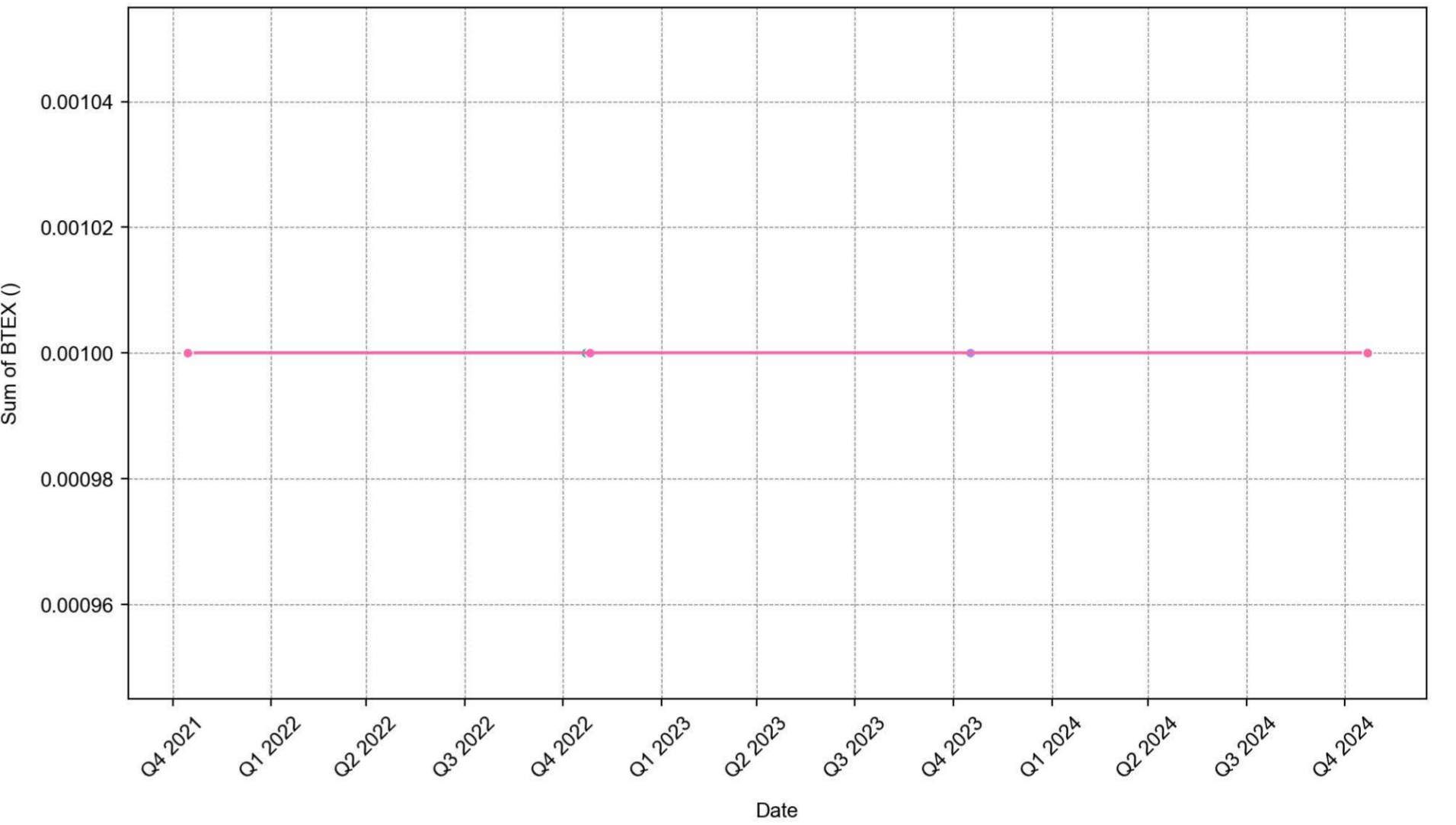
Strontium



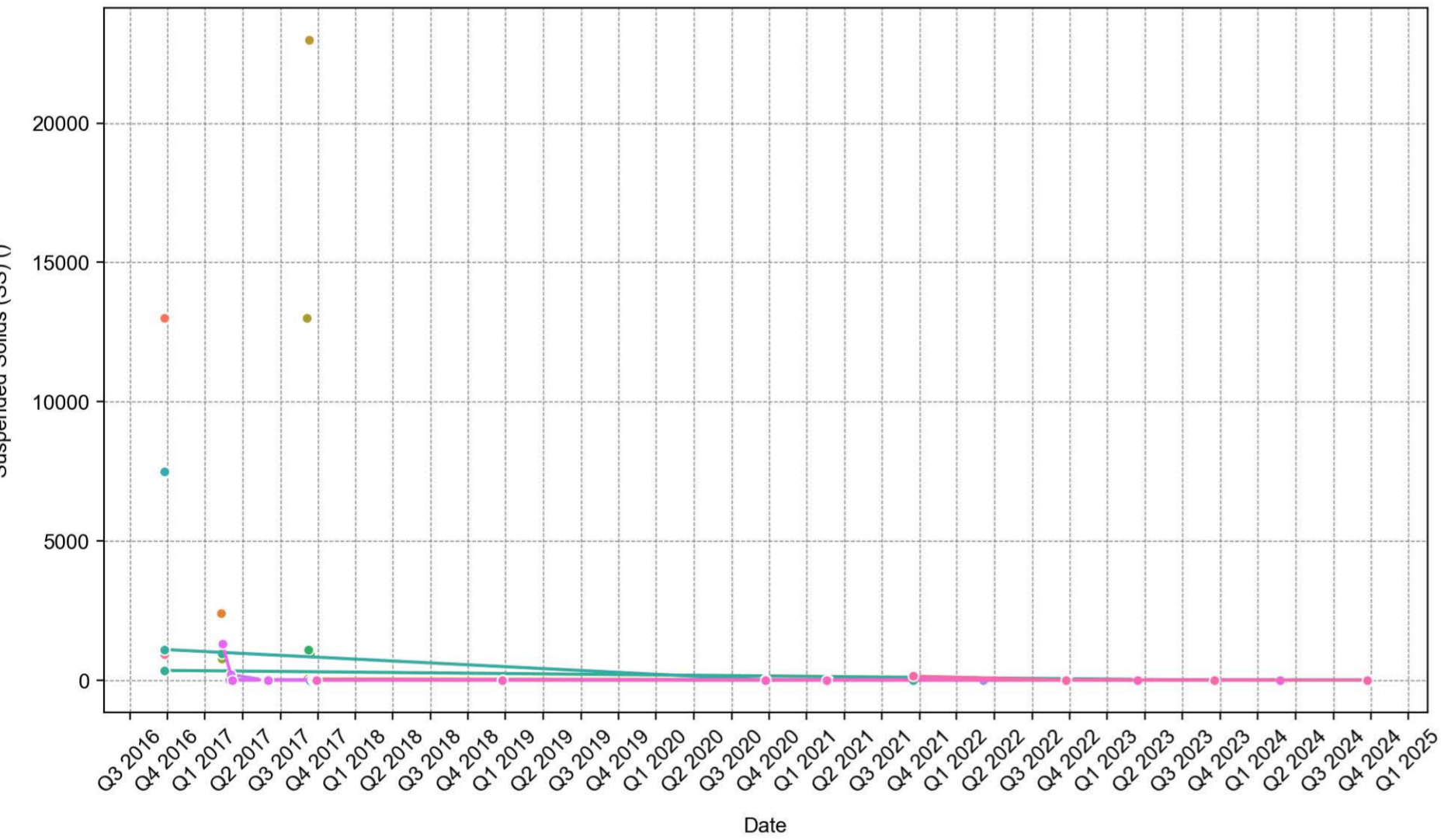
Sulfate as SO4 - Turbidimetric



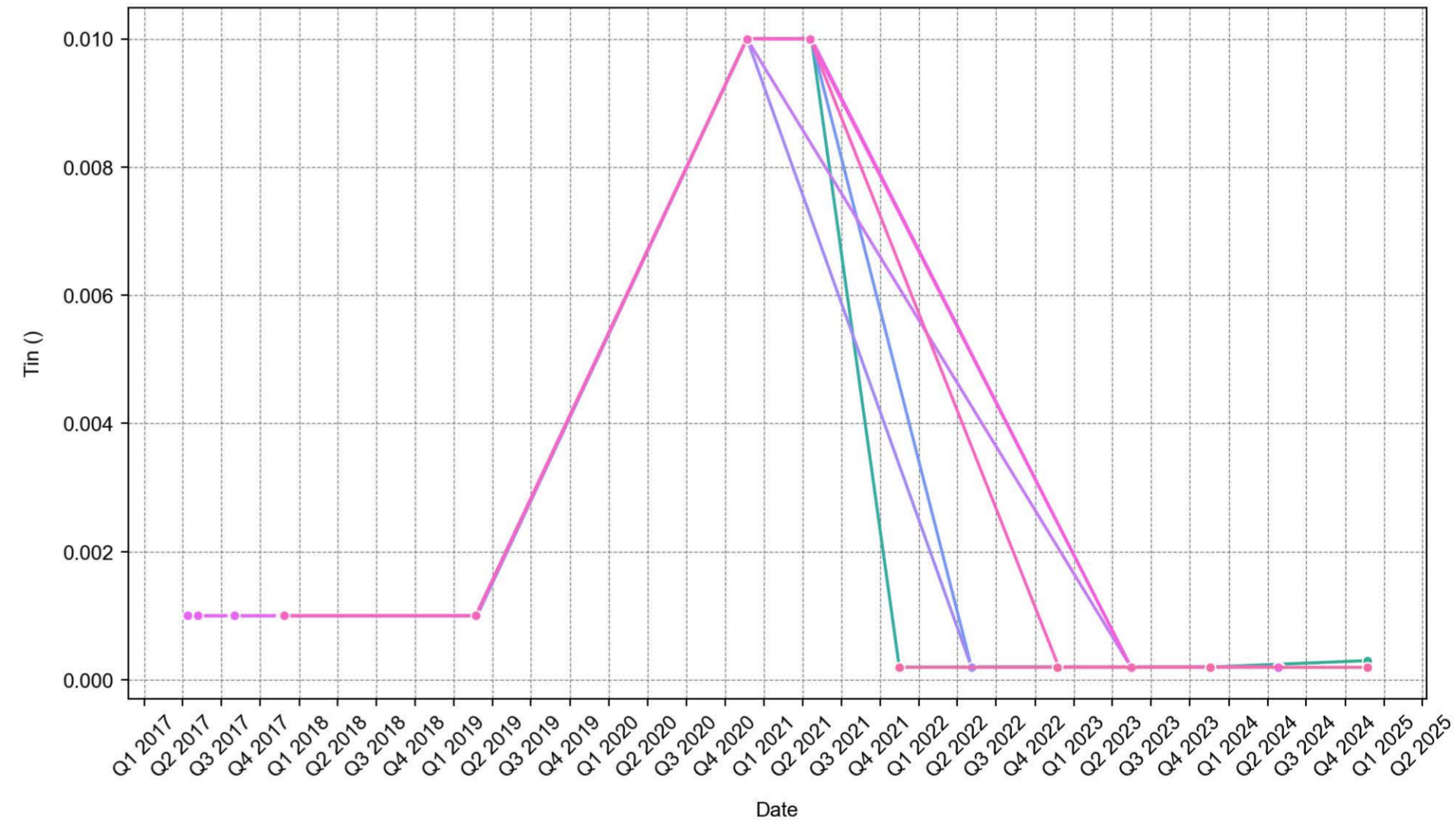
Sum of BTEX



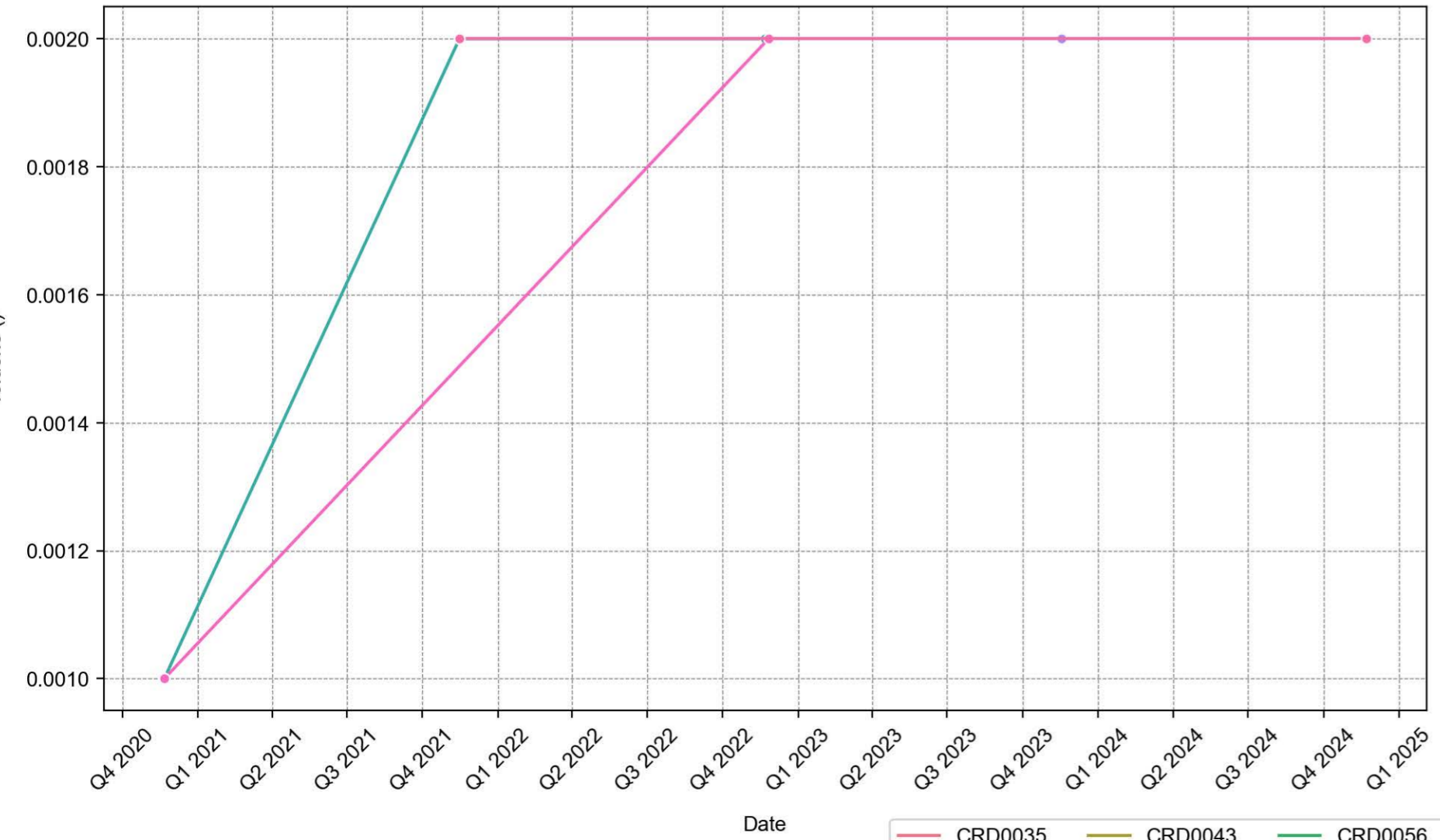
Suspended Solids (SS)



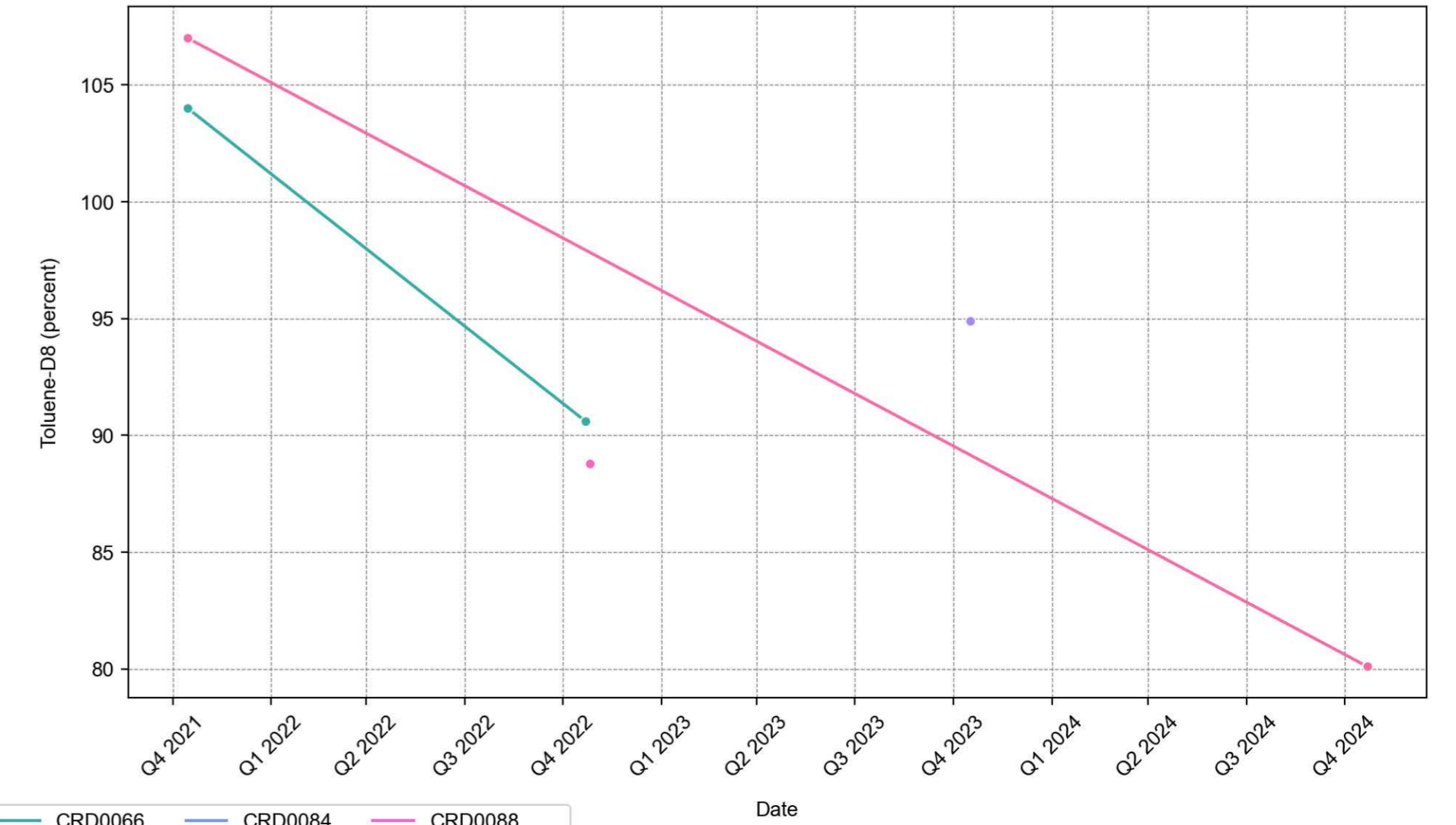
Tin



Toluene

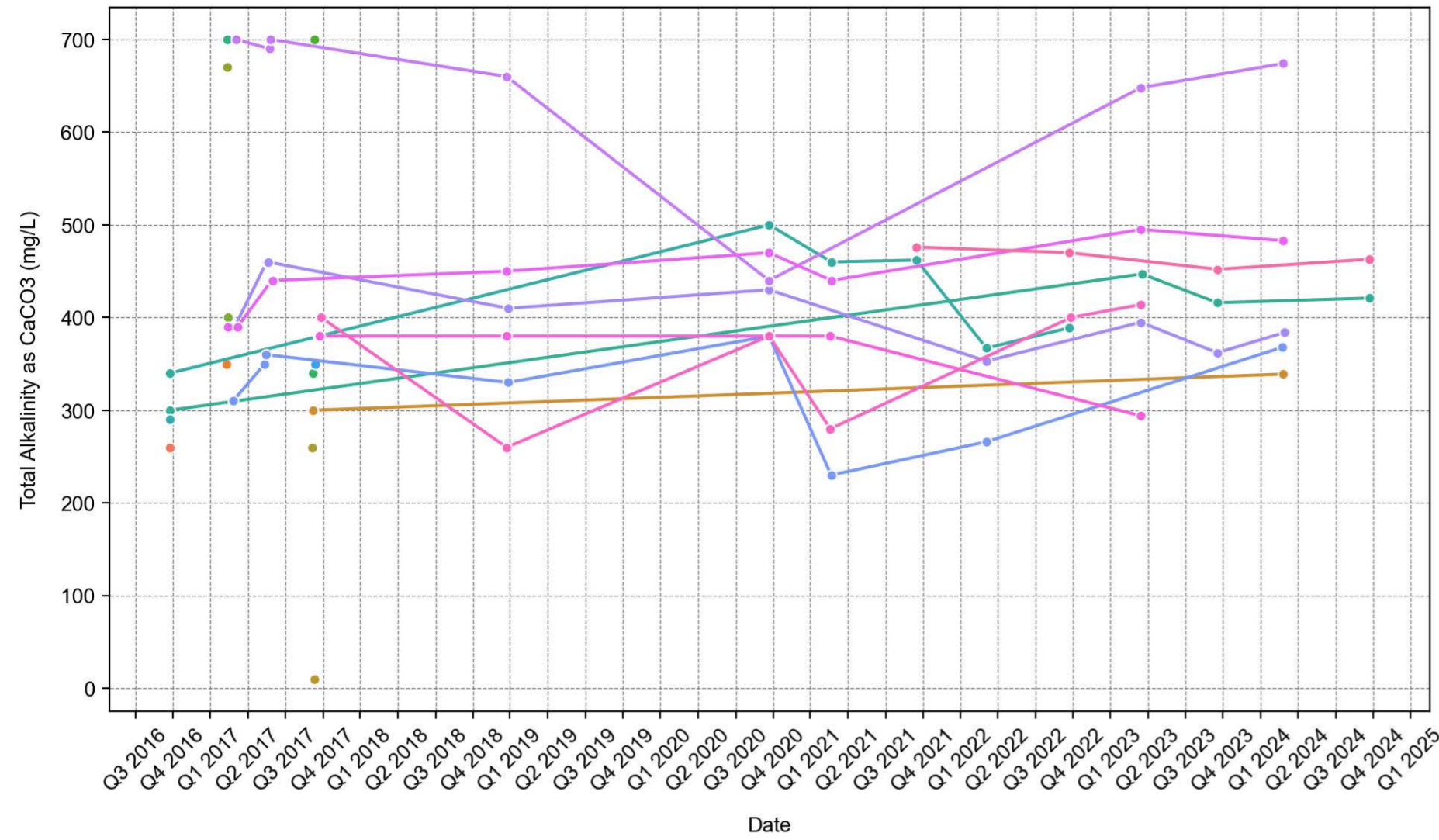


Toluene-D8

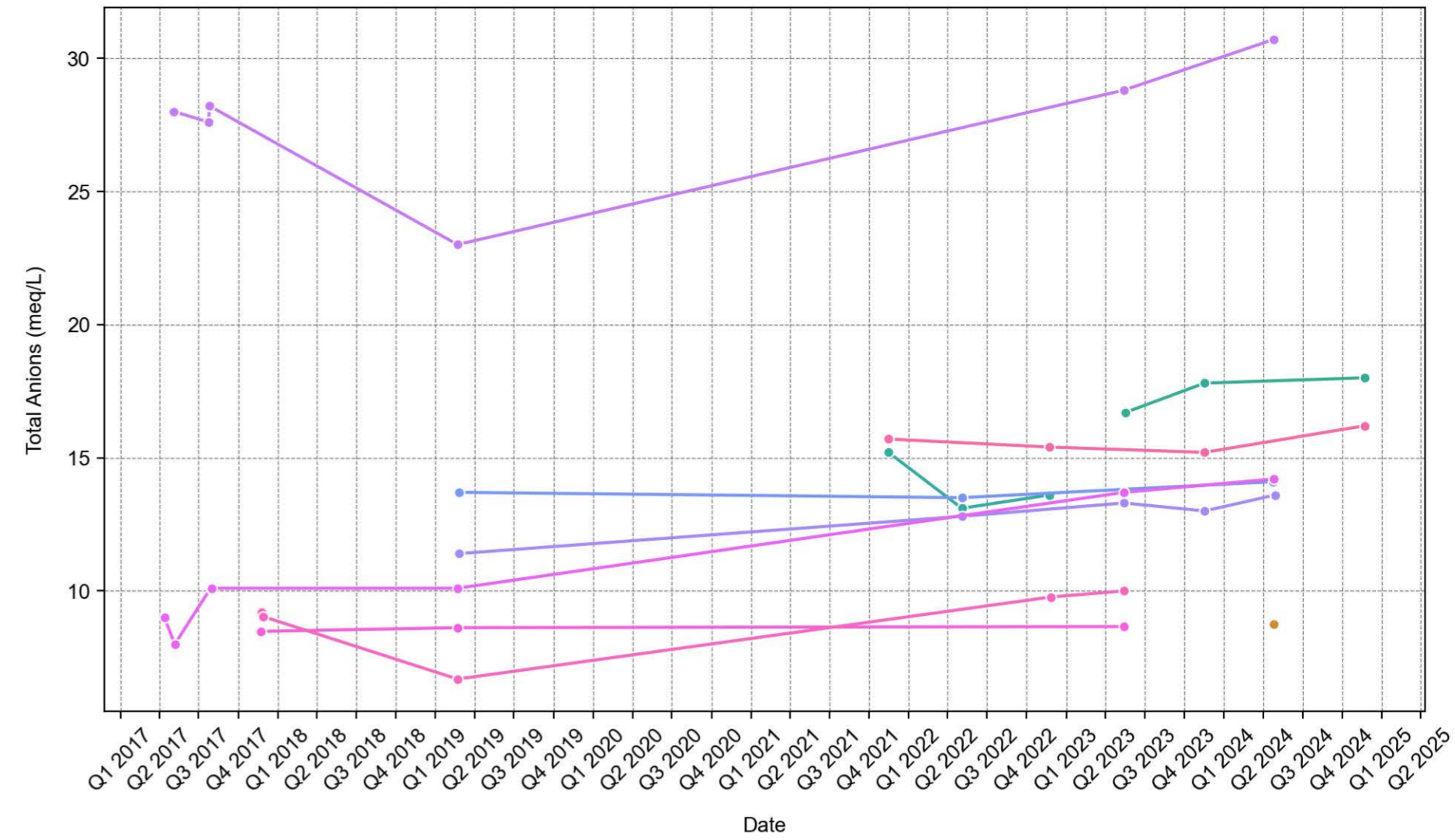


- | | | | | | |
|---------|---------|---------|---------|---------|--------------|
| CRD0035 | CRD0043 | CRD0056 | CRD0066 | CRD0084 | CRD0088 |
| CRD0036 | CRD0044 | CRD0058 | CRD0072 | CRD0085 | CRD0089 |
| CRD0038 | CRD0045 | CRD0062 | CRD0078 | CRD0086 | CRD0108 |
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| CRD0040 | | | | | |

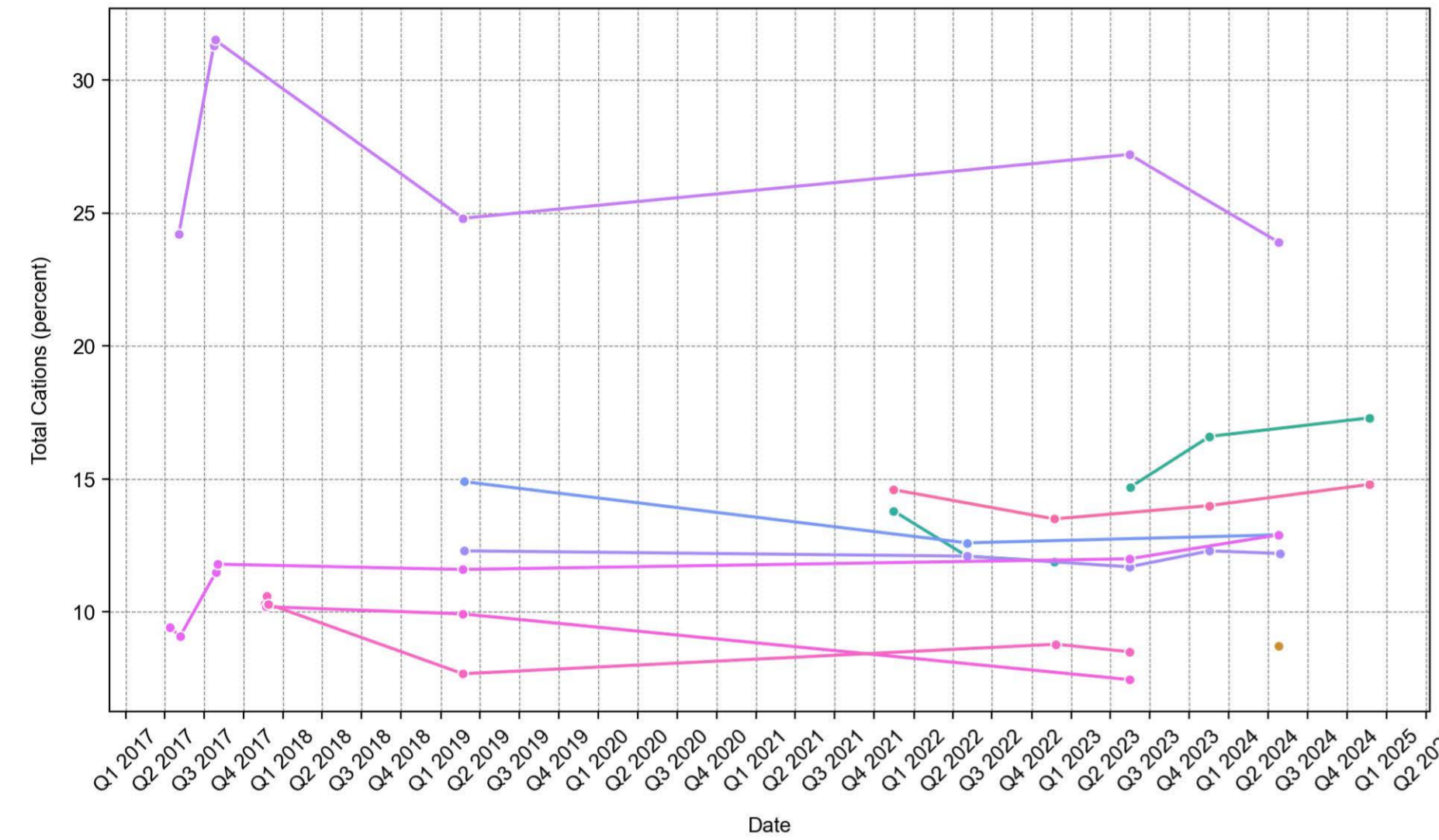
Total Alkalinity as CaCO3



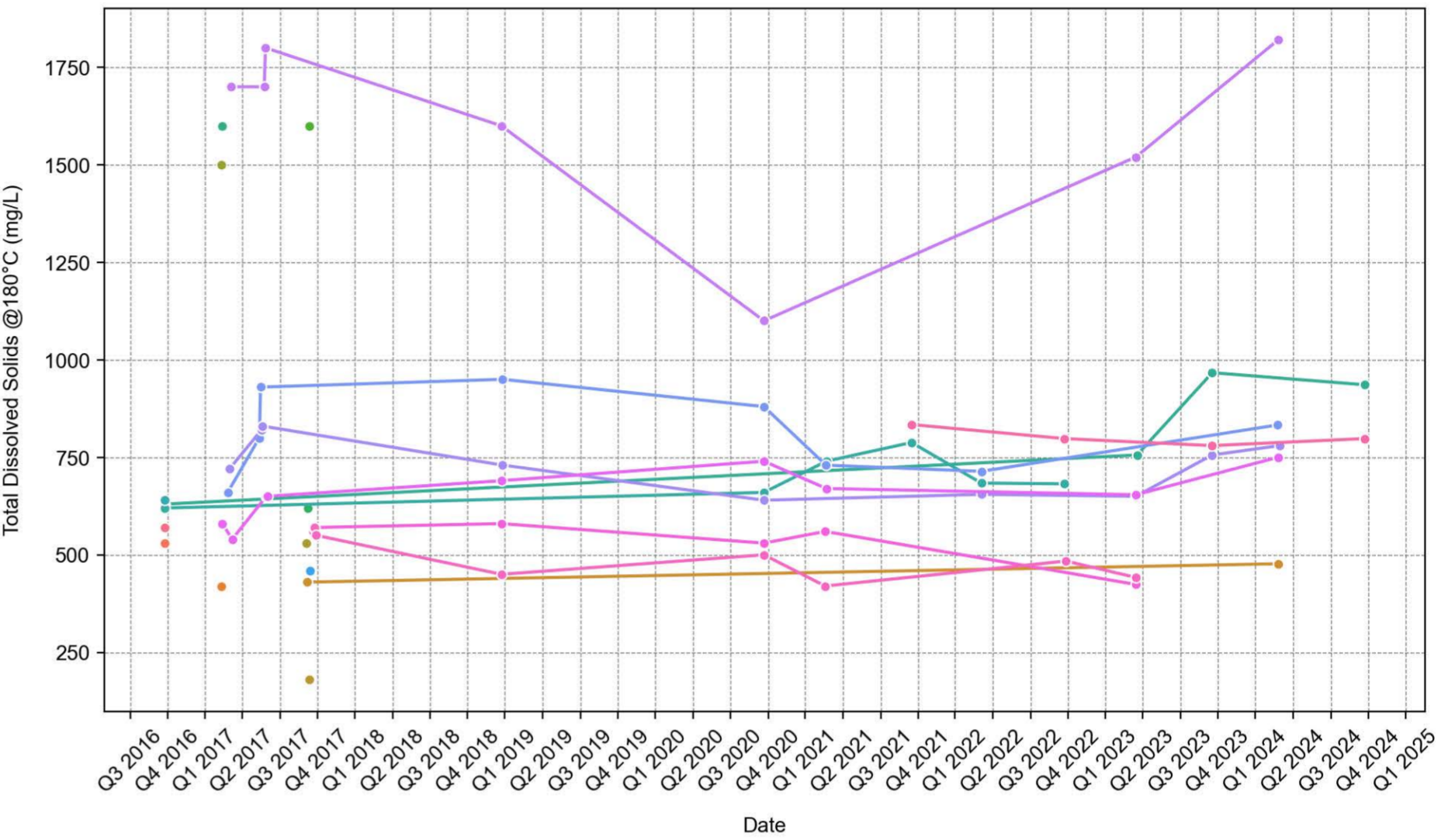
Total Anions



Total Cations



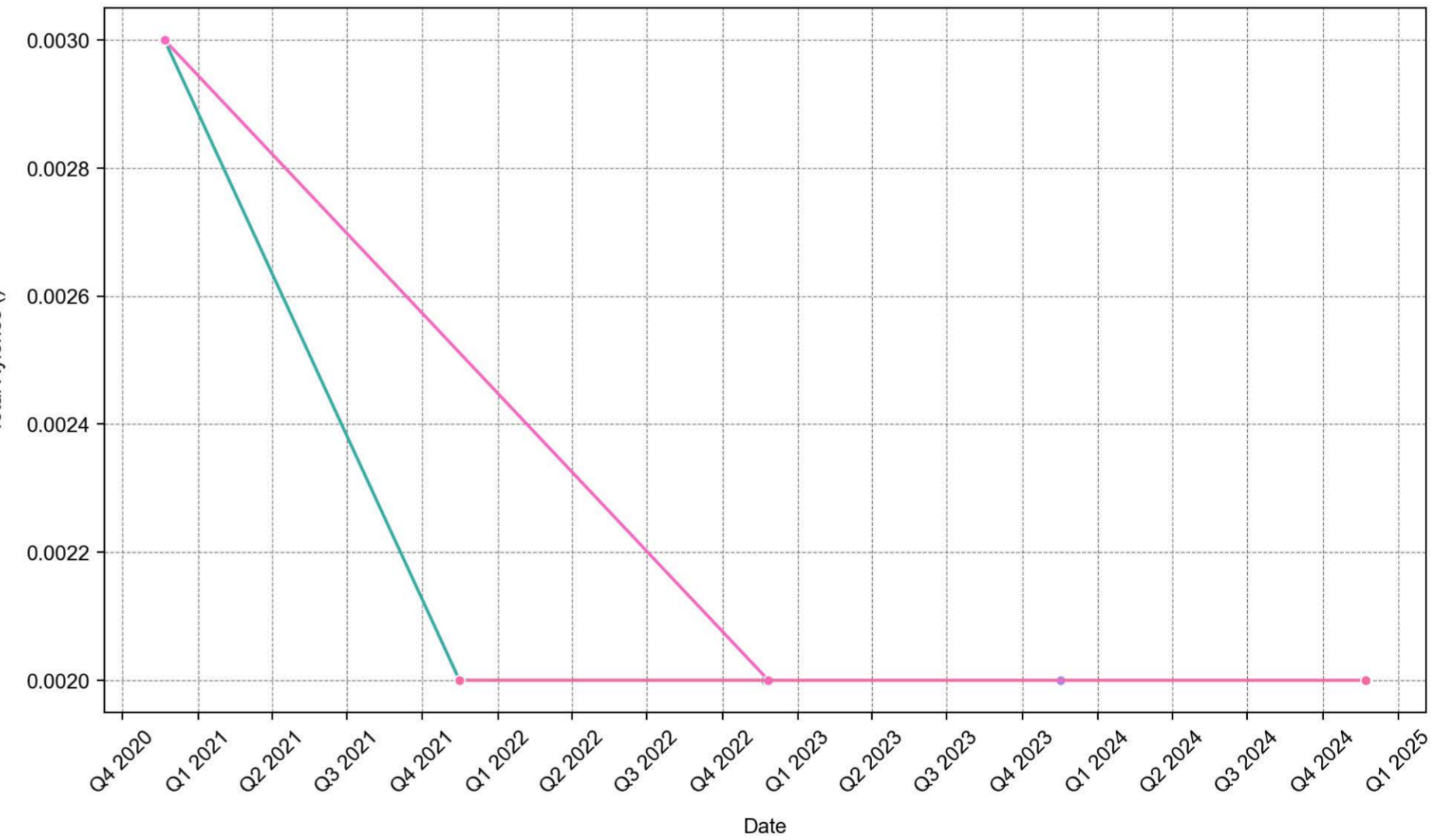
Total Dissolved Solids @180°C



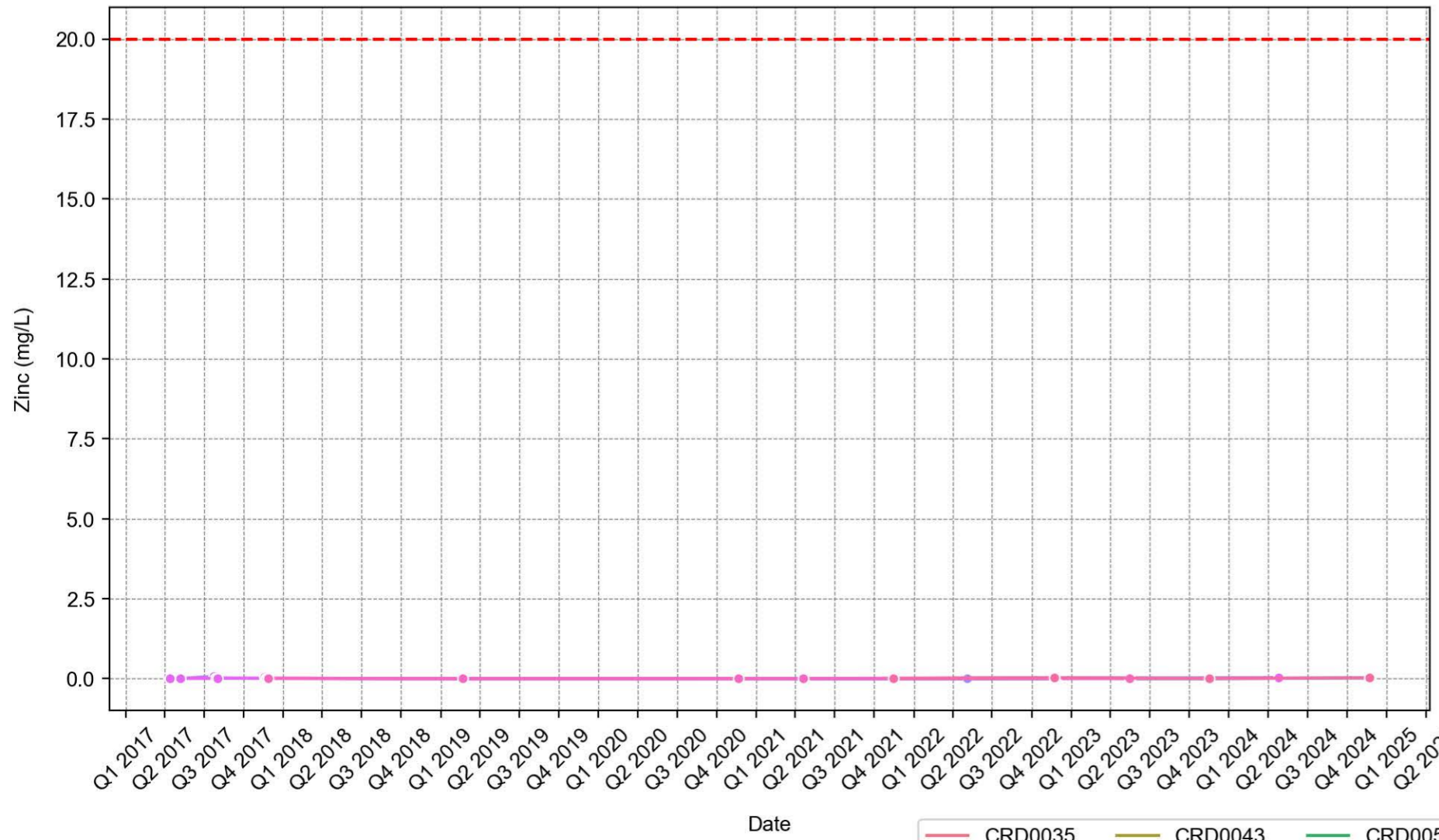
Total Hardness as CaCO3



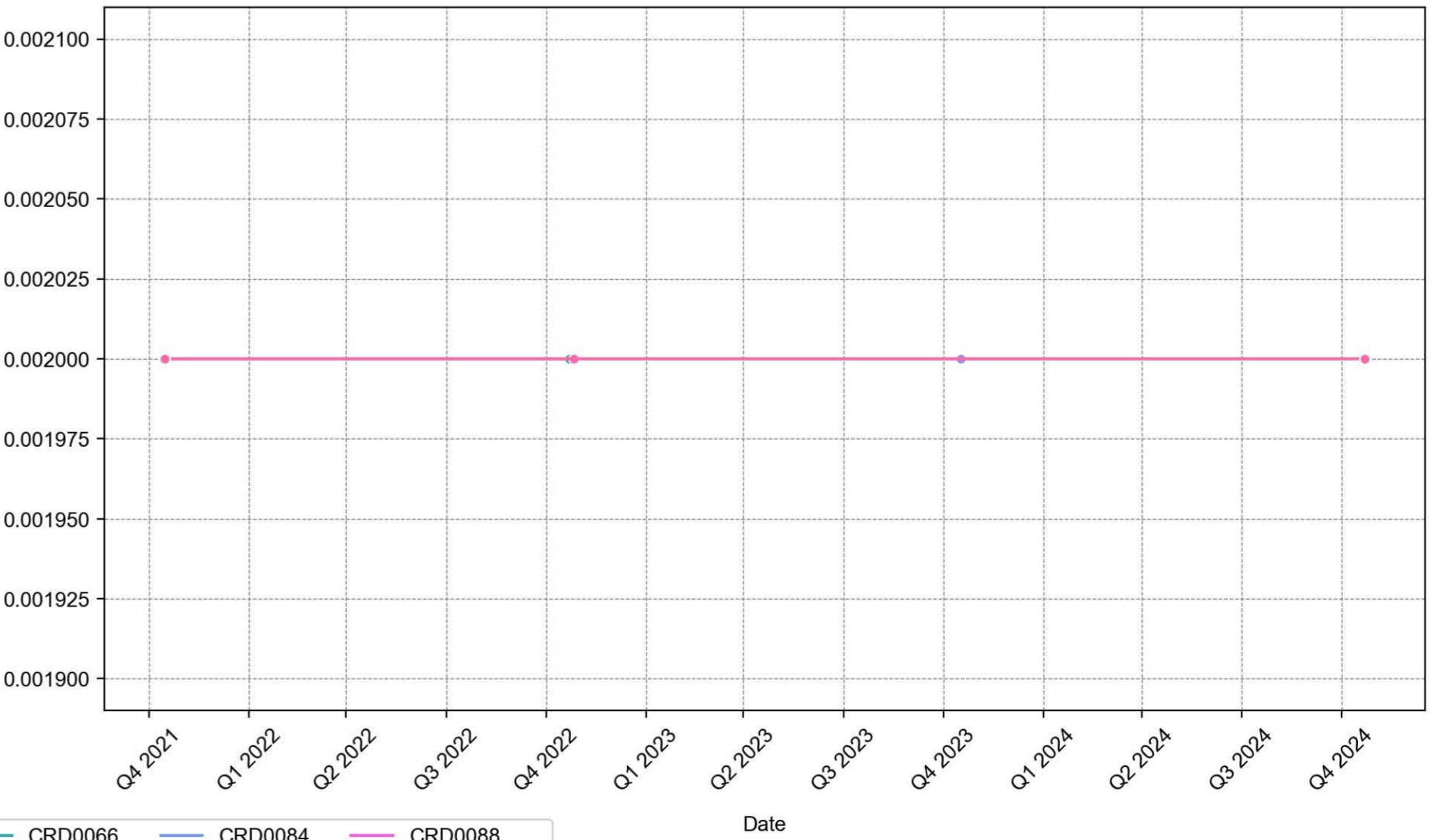
Total Xylenes



Zinc

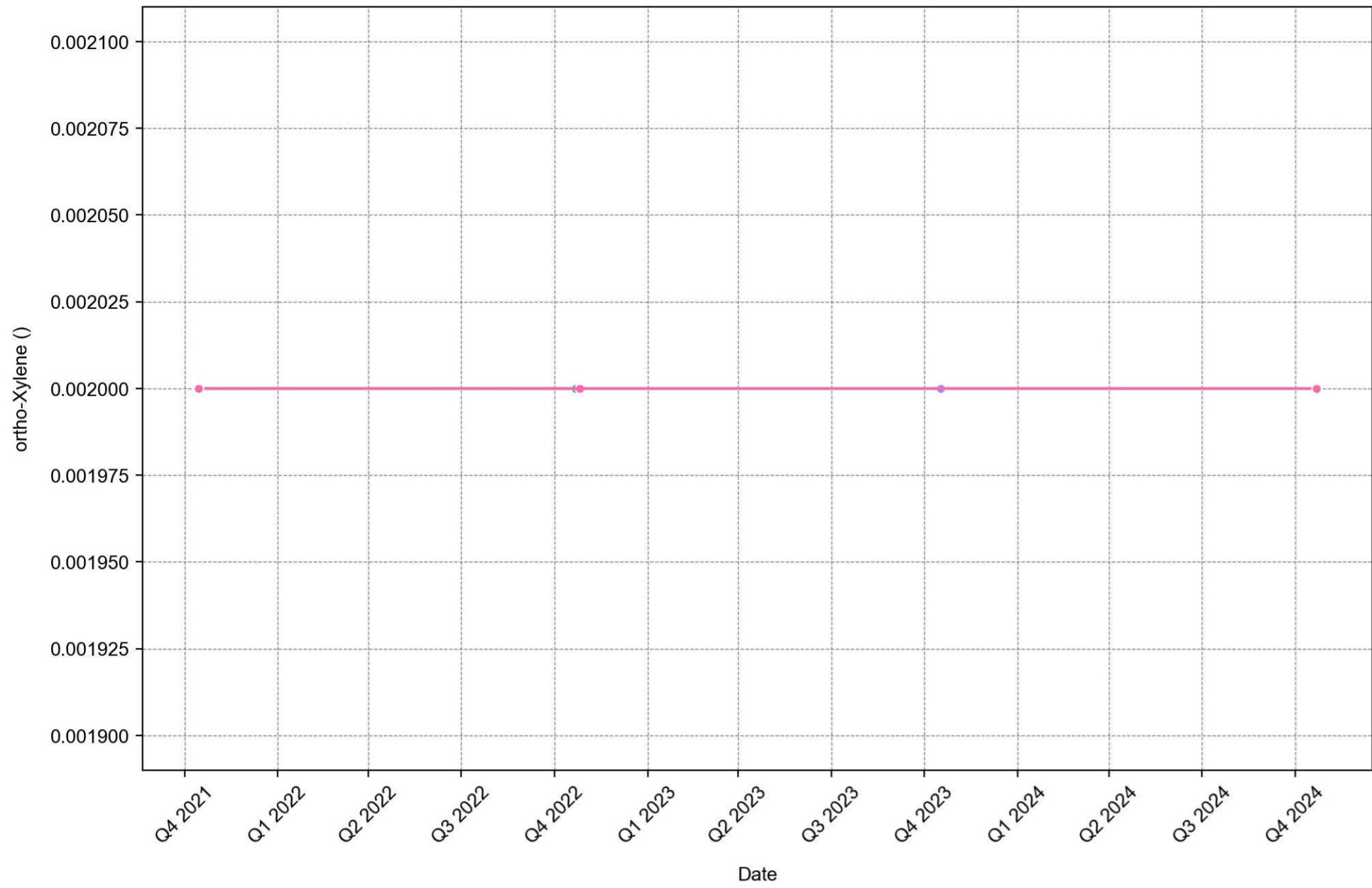


meta- & para-Xylene

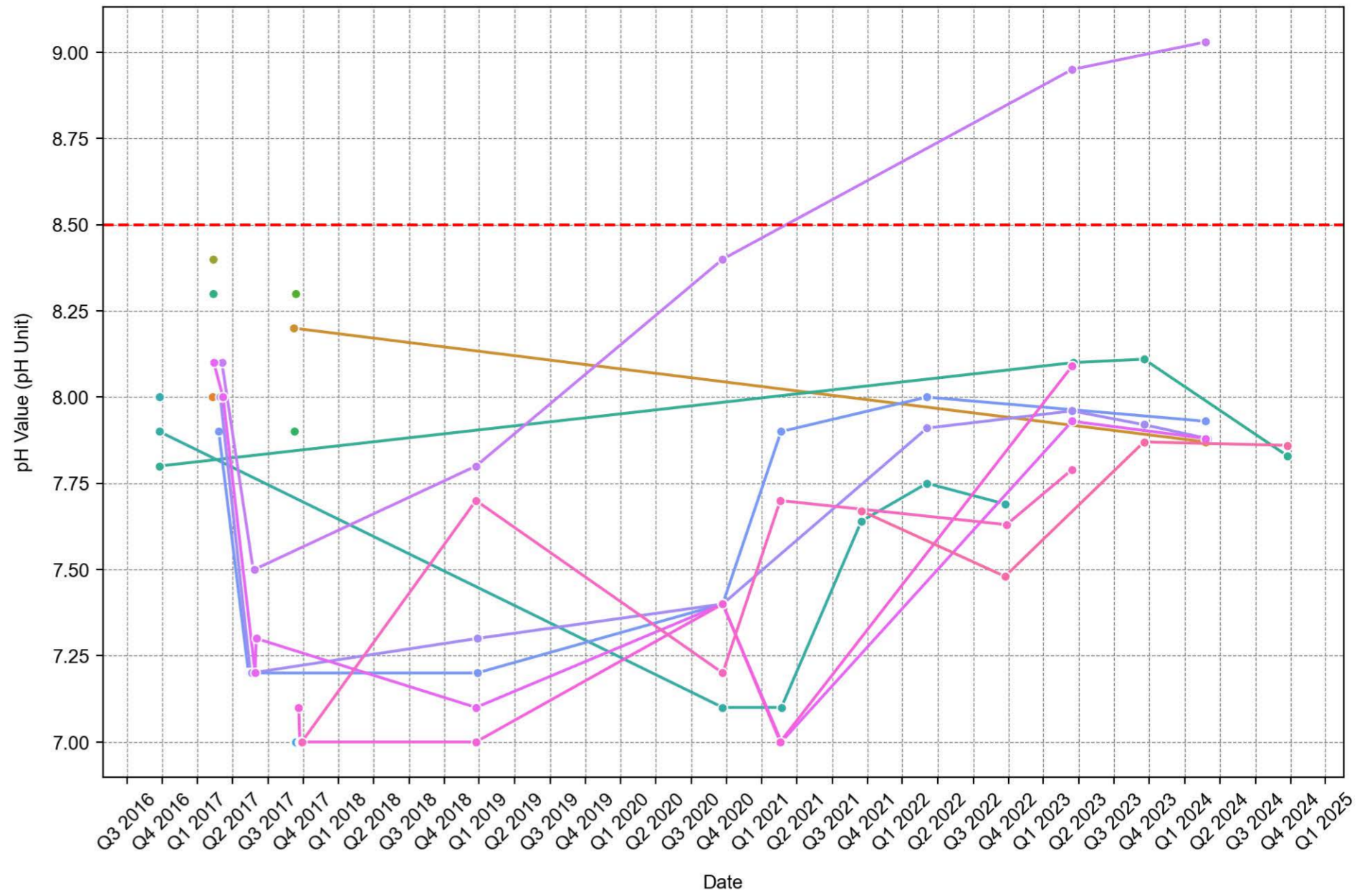


- CRD0035
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- ANZECC Limit

ortho-Xylene

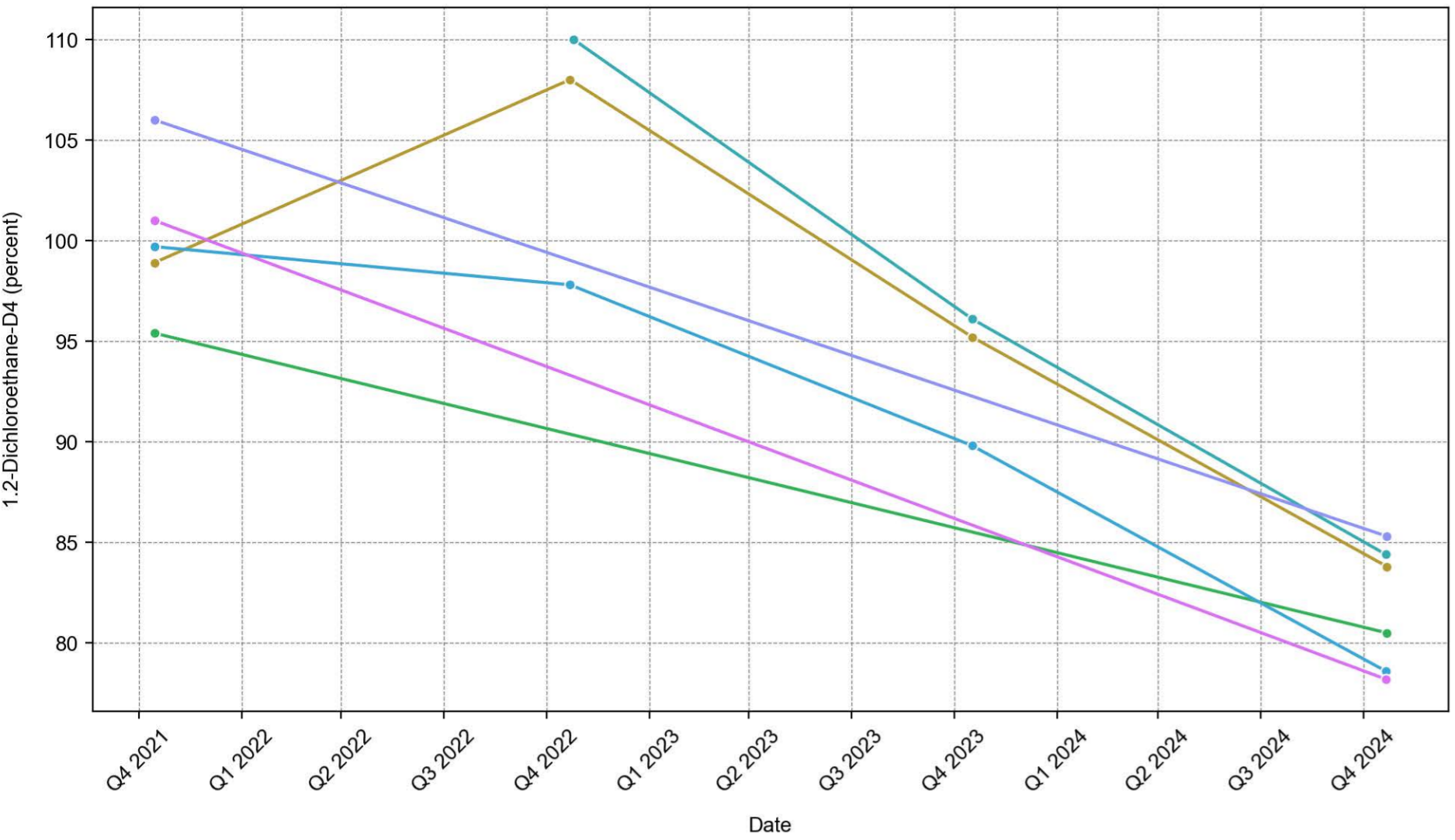


pH Value

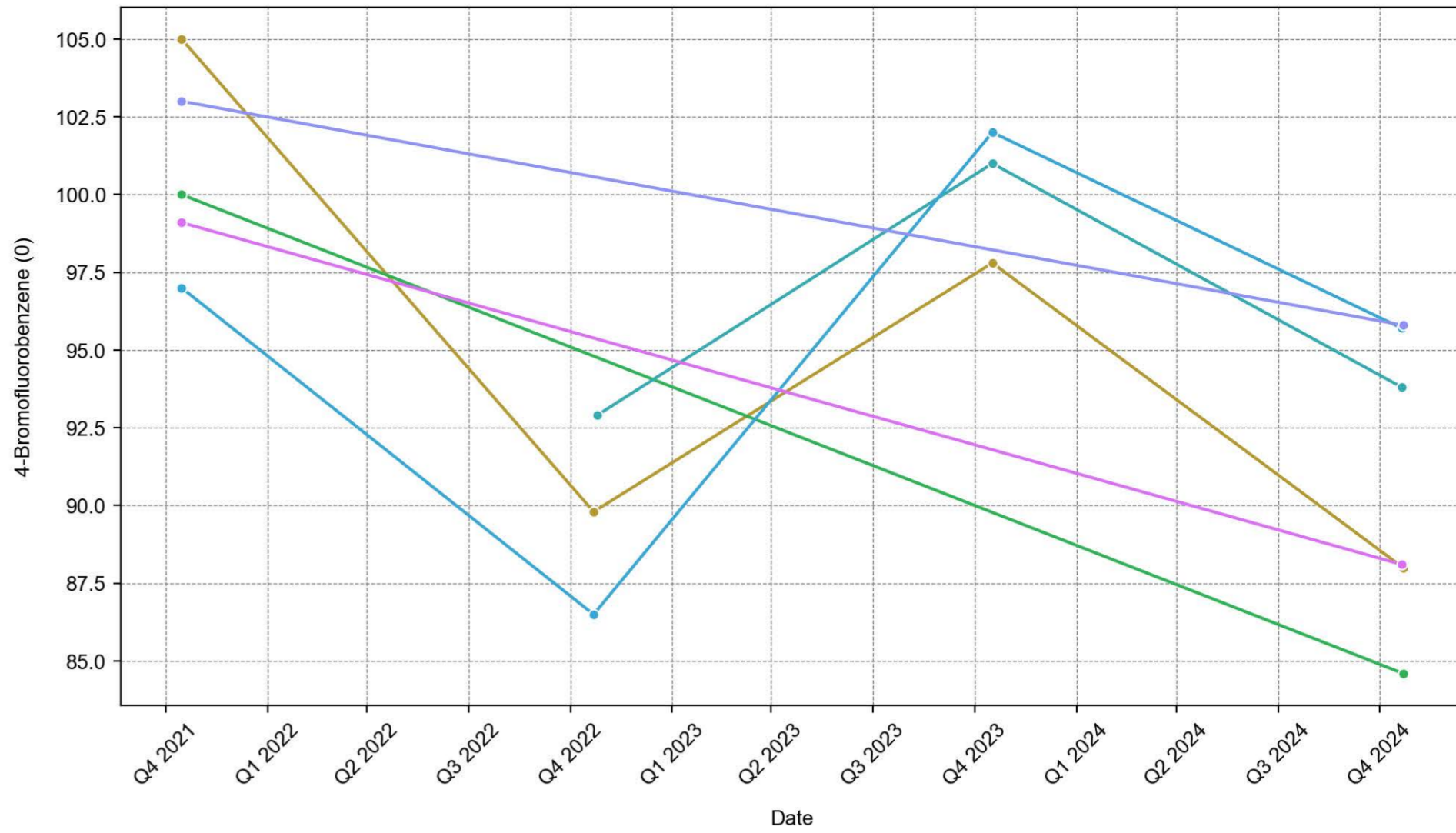


- CRD0035
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- ANZECC Limit
- CRD0040

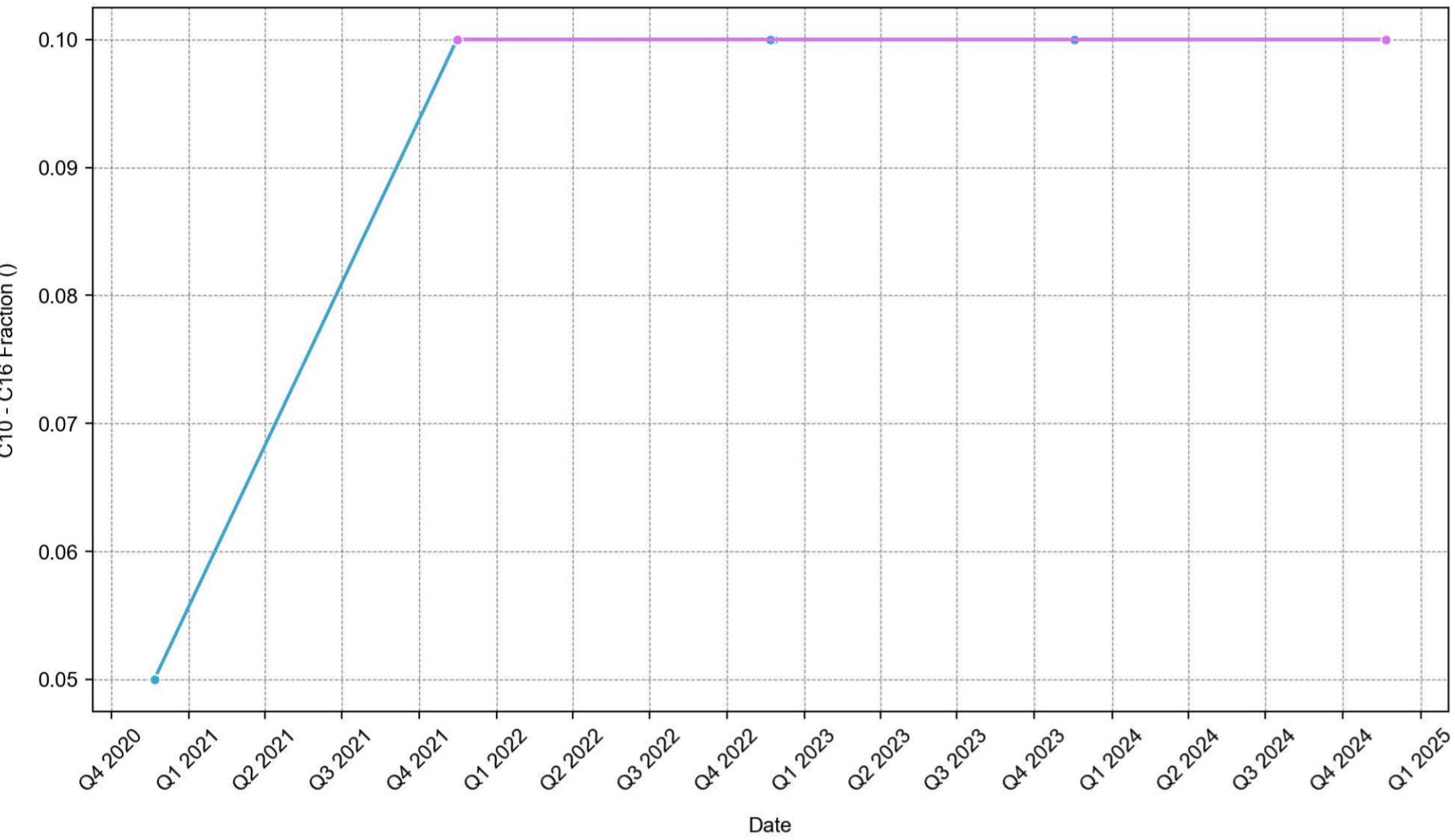
1,2-Dichloroethane-D4



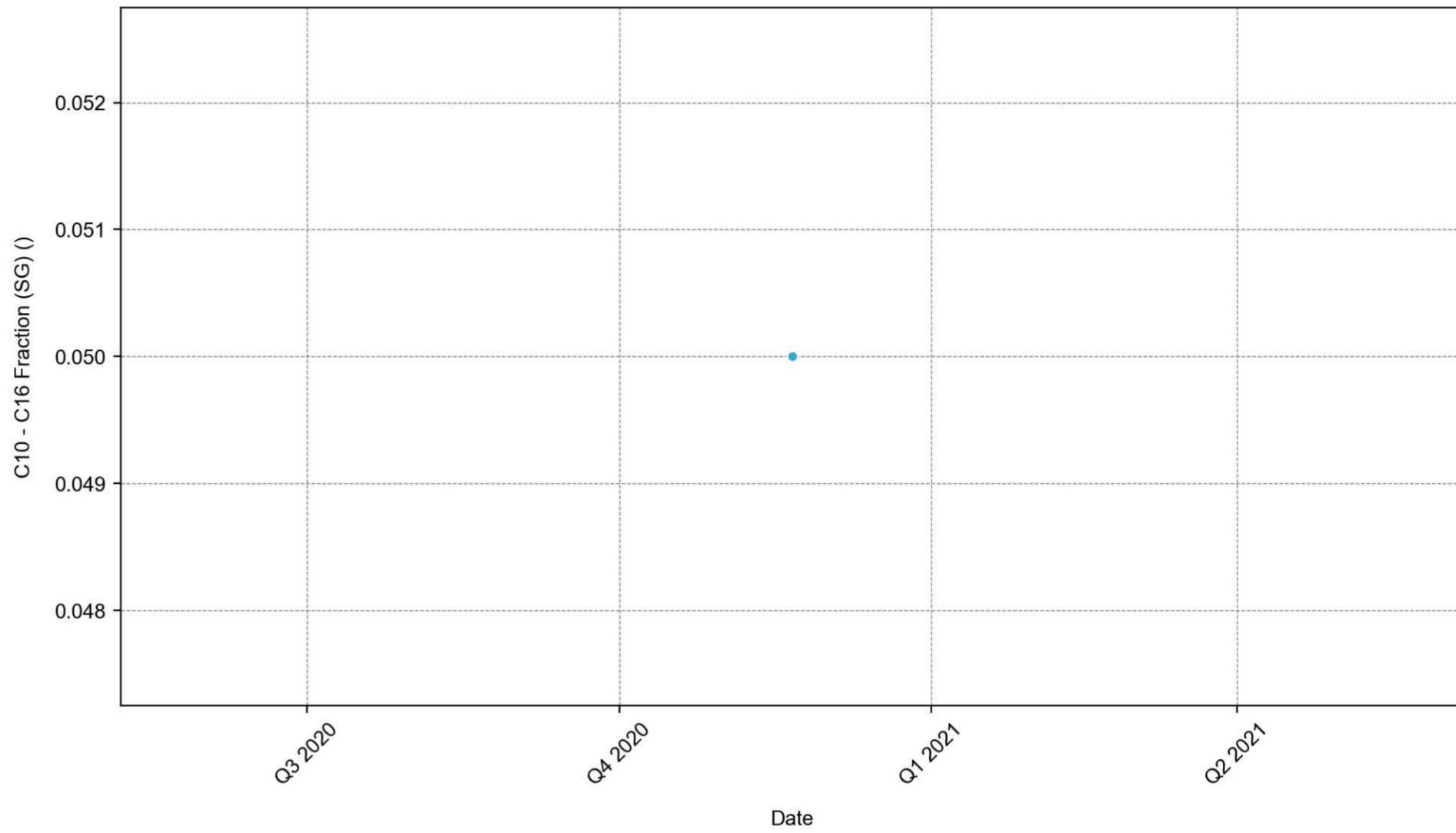
4-Bromofluorobenzene



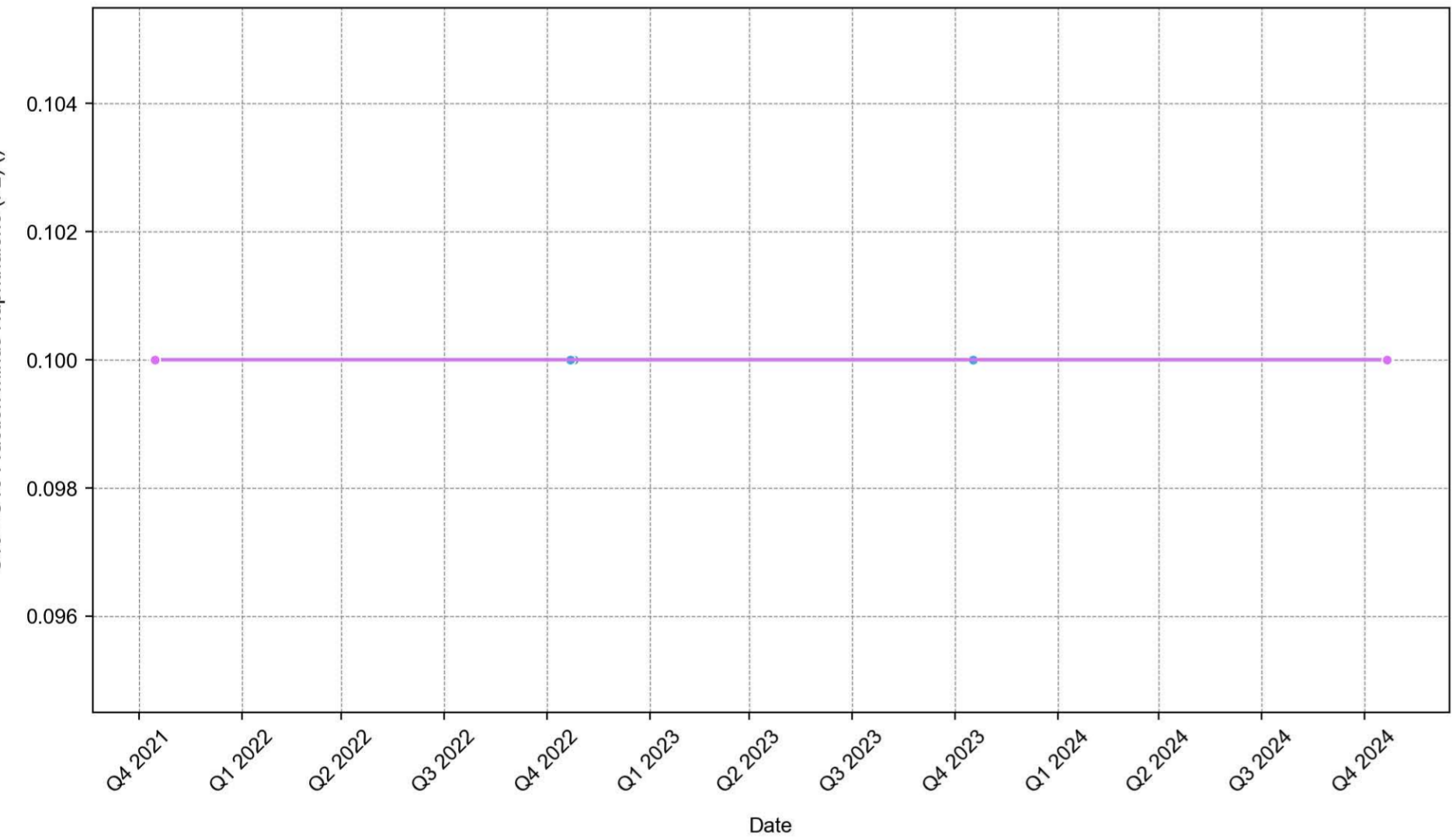
C10 - C16 Fraction



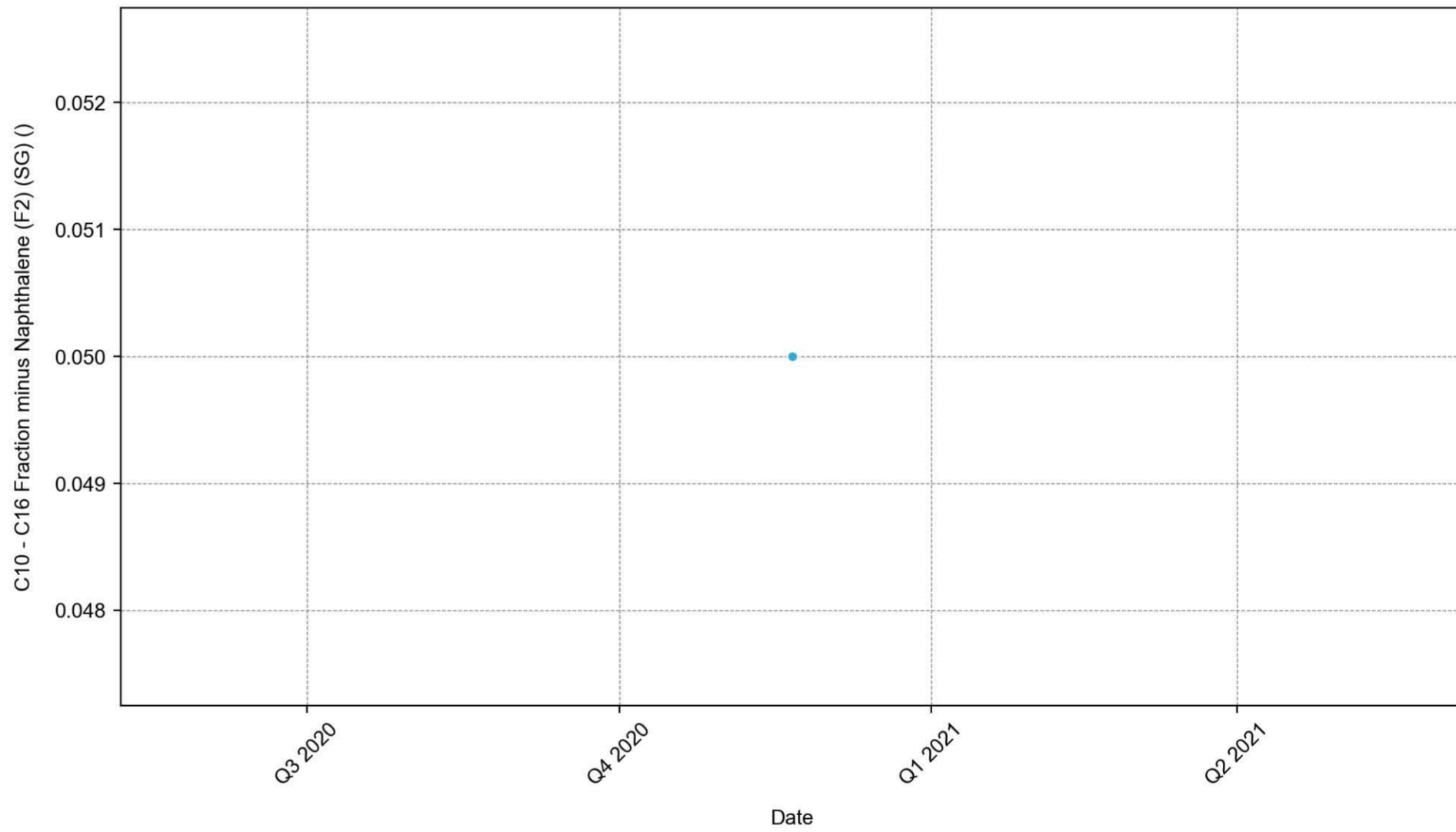
C10 - C16 Fraction (SG)



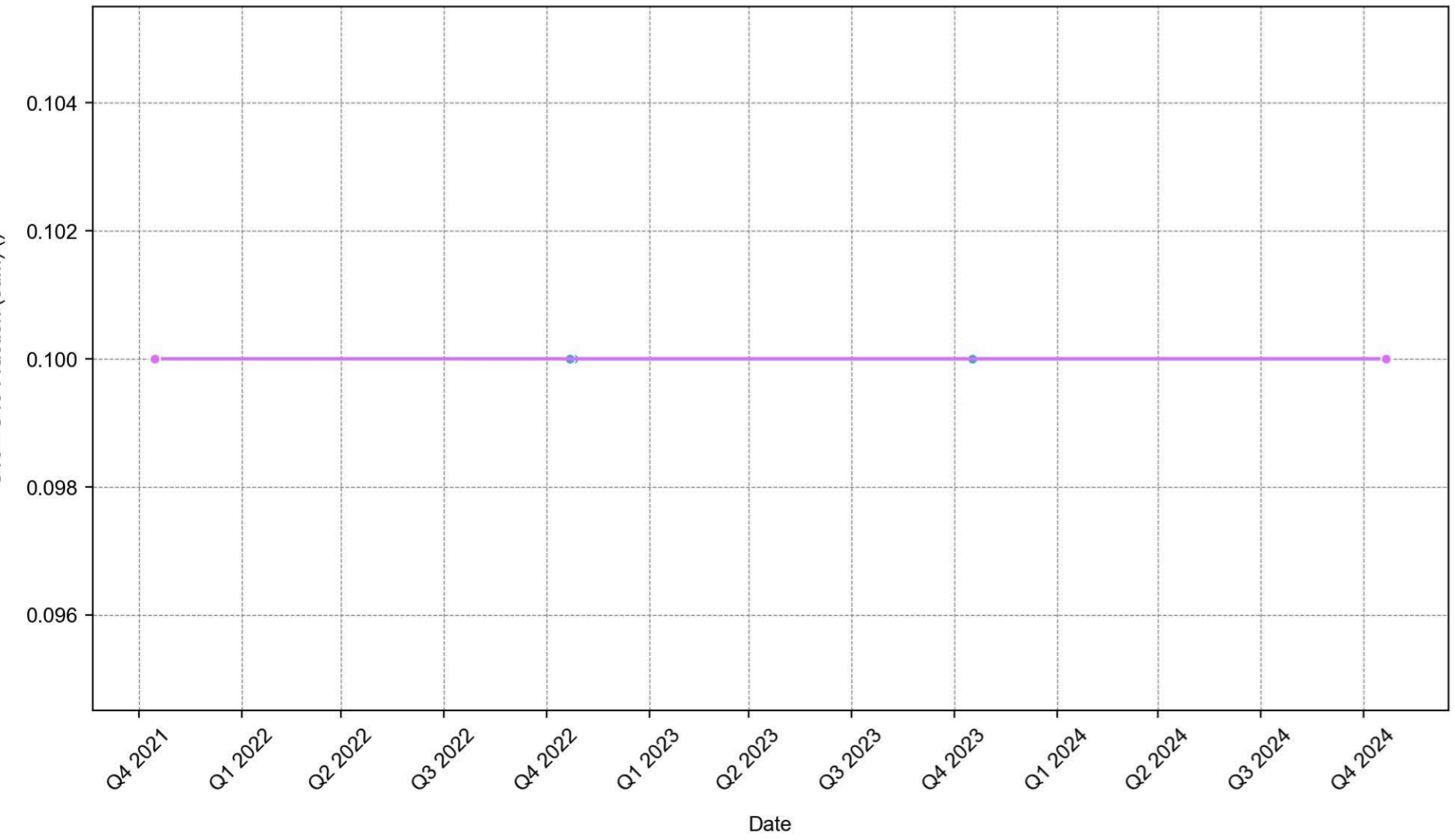
C10 - C16 Fraction minus Naphthalene (F2)



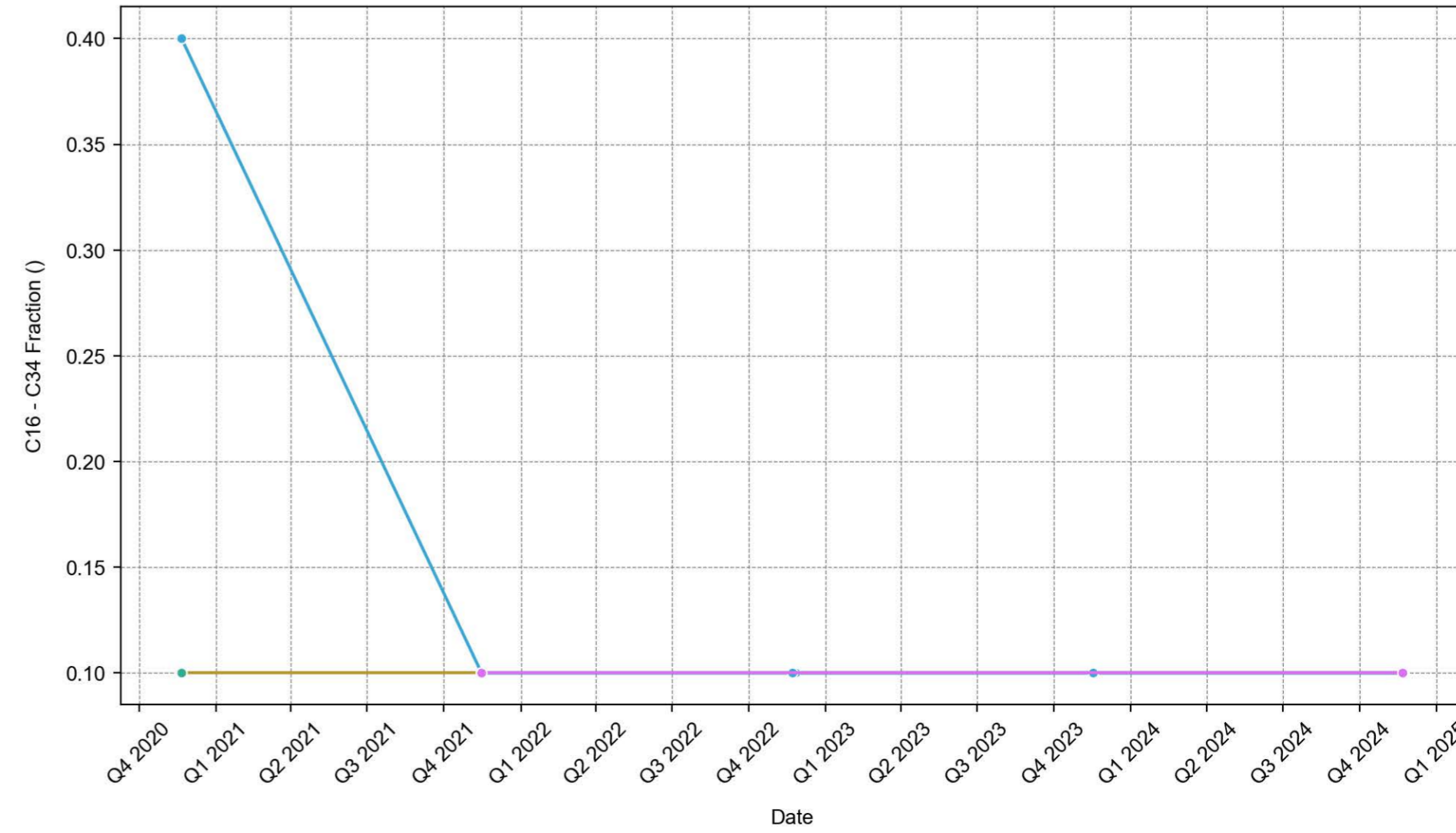
C10 - C16 Fraction minus Naphthalene (F2) (SG)



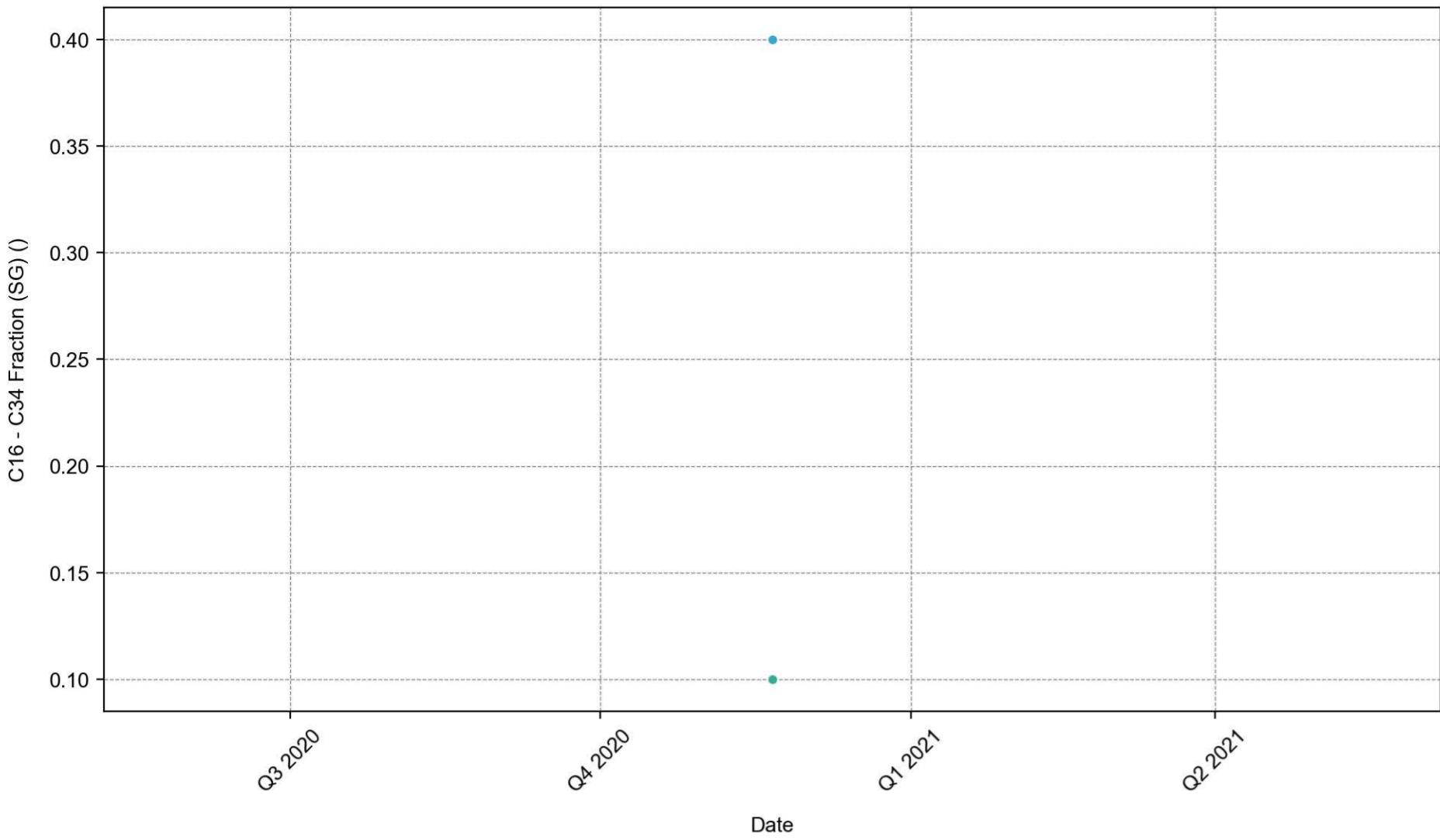
C10 - C40 Fraction (sum)



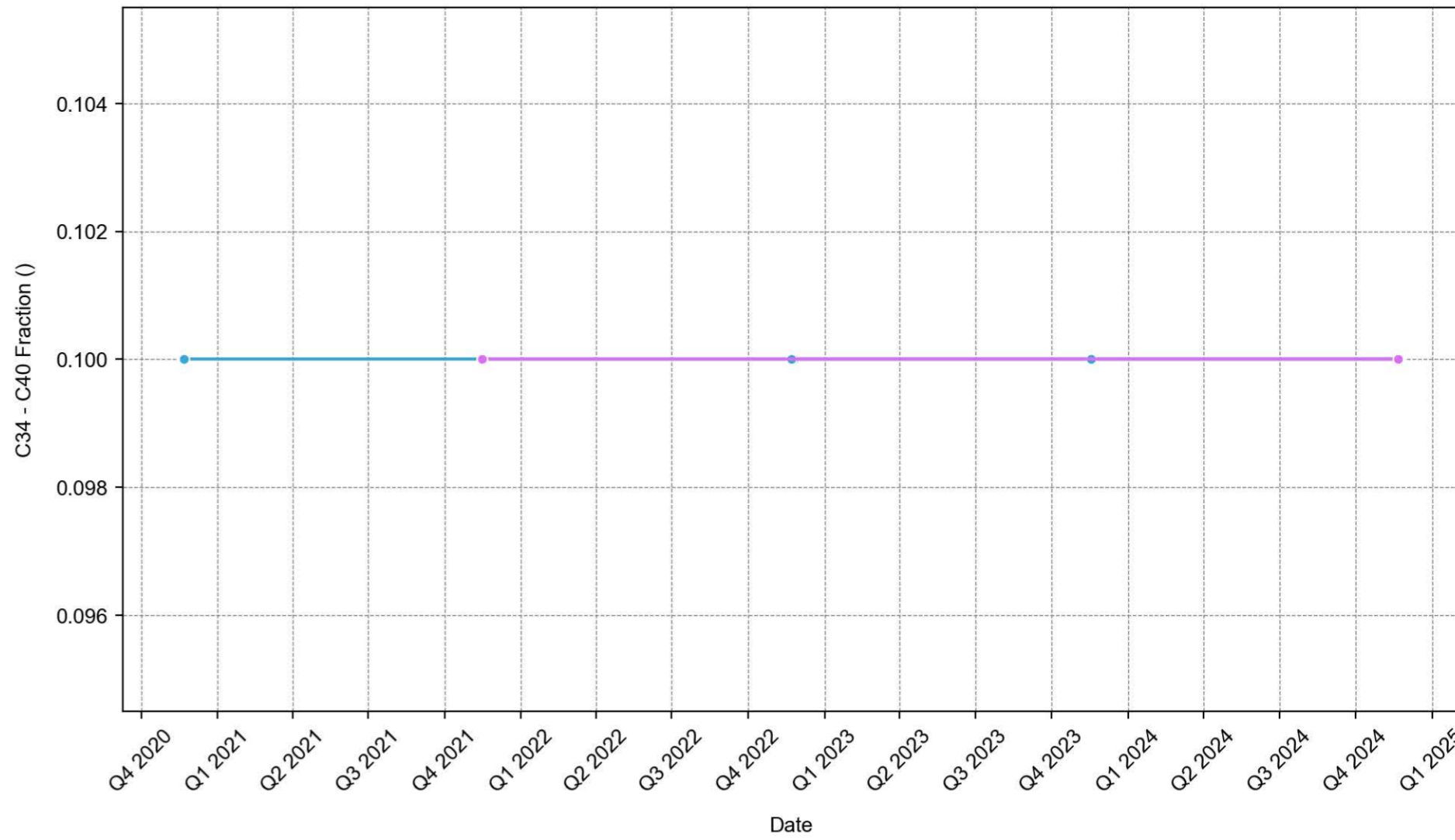
C16 - C34 Fraction



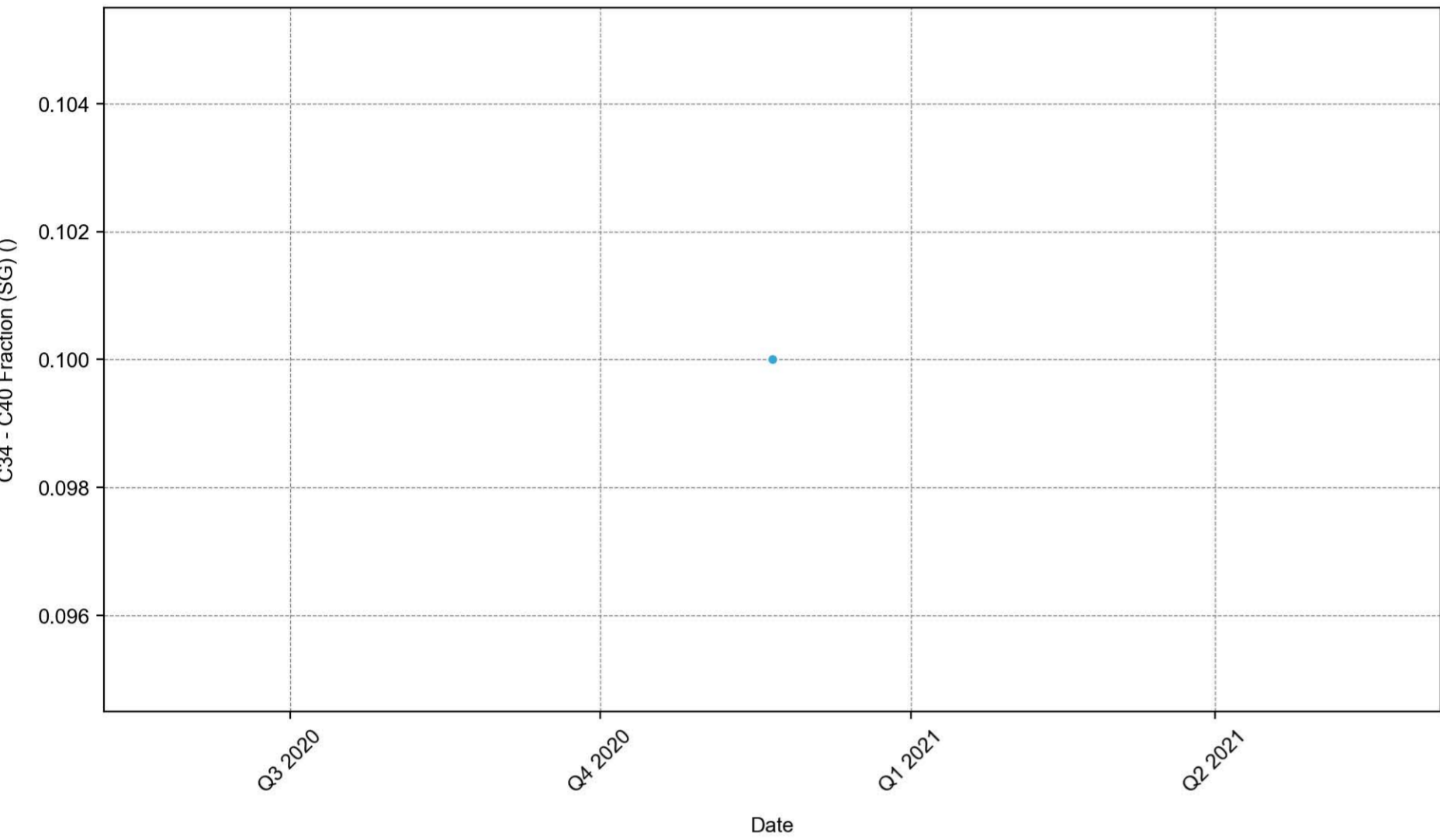
C16 - C34 Fraction (SG)



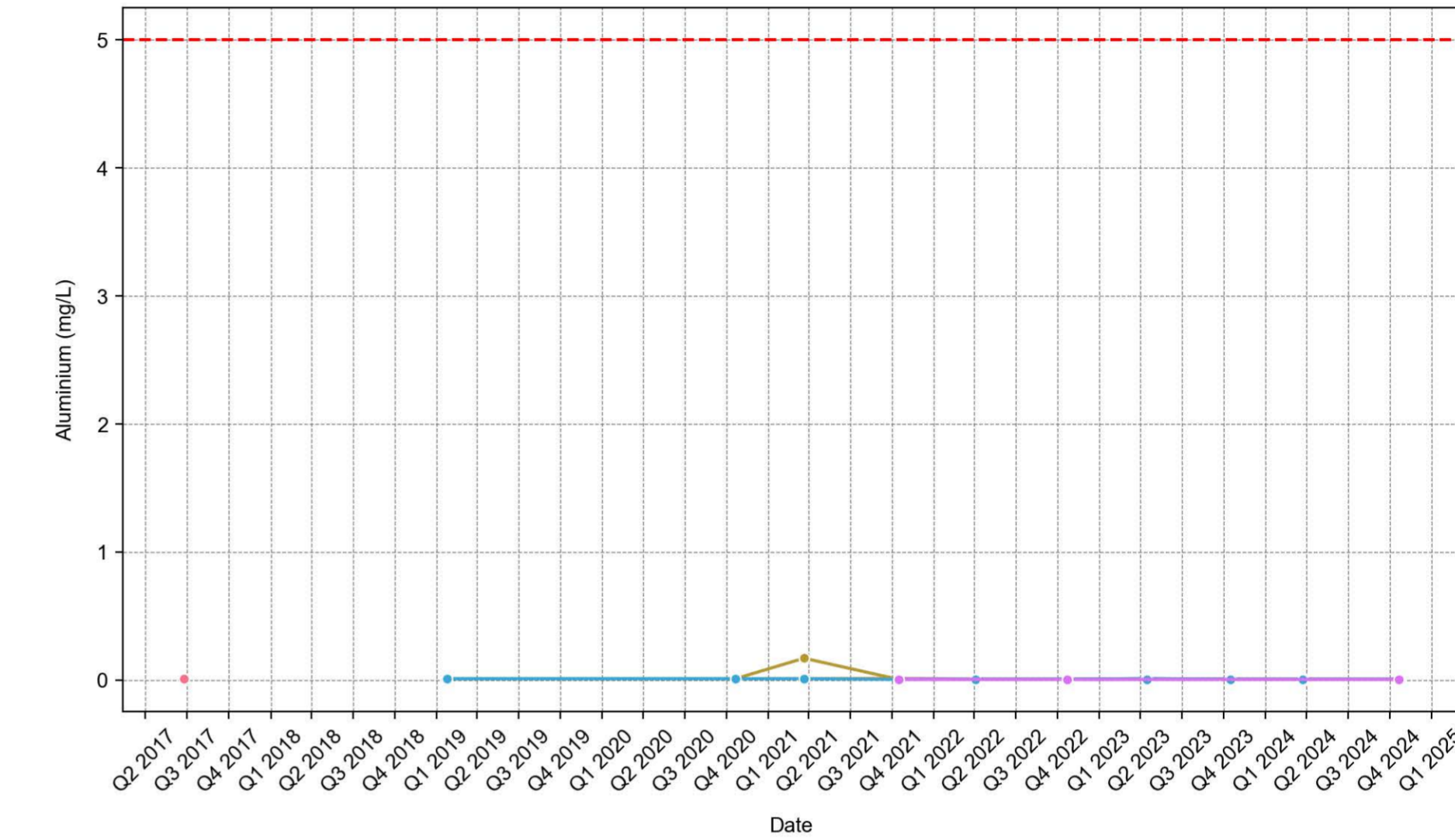
C34 - C40 Fraction



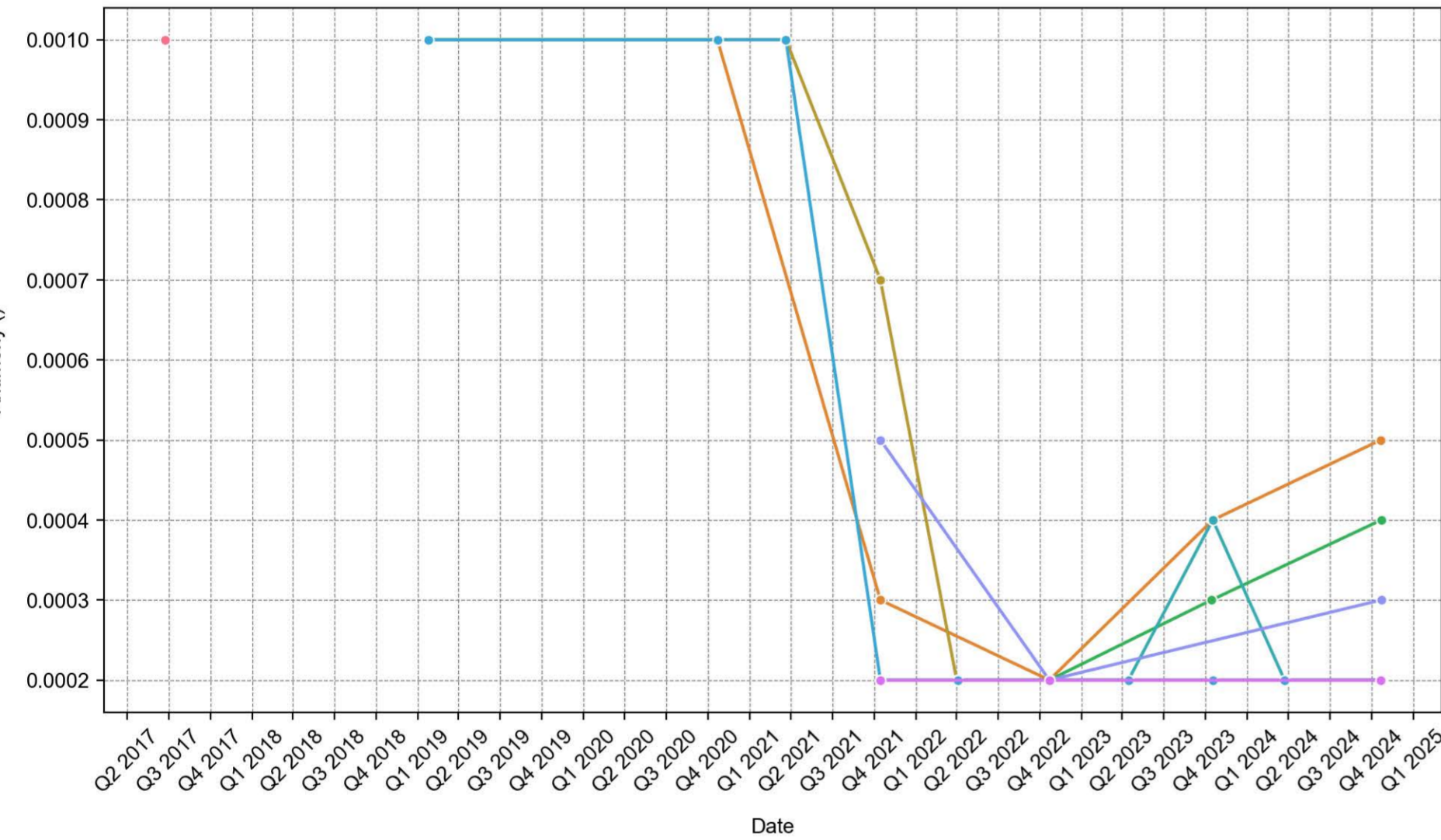
C34 - C40 Fraction (SG)



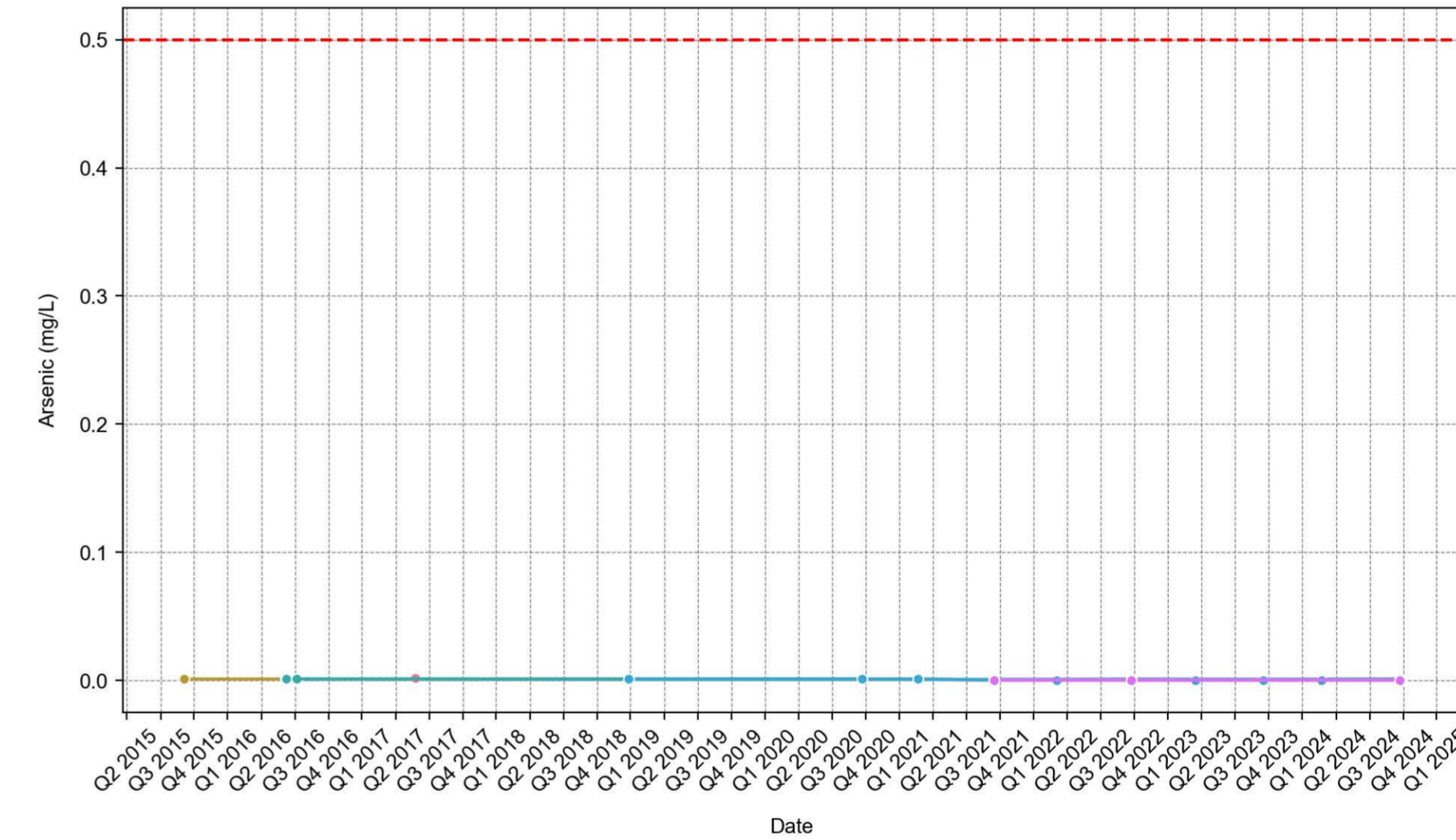
Aluminium



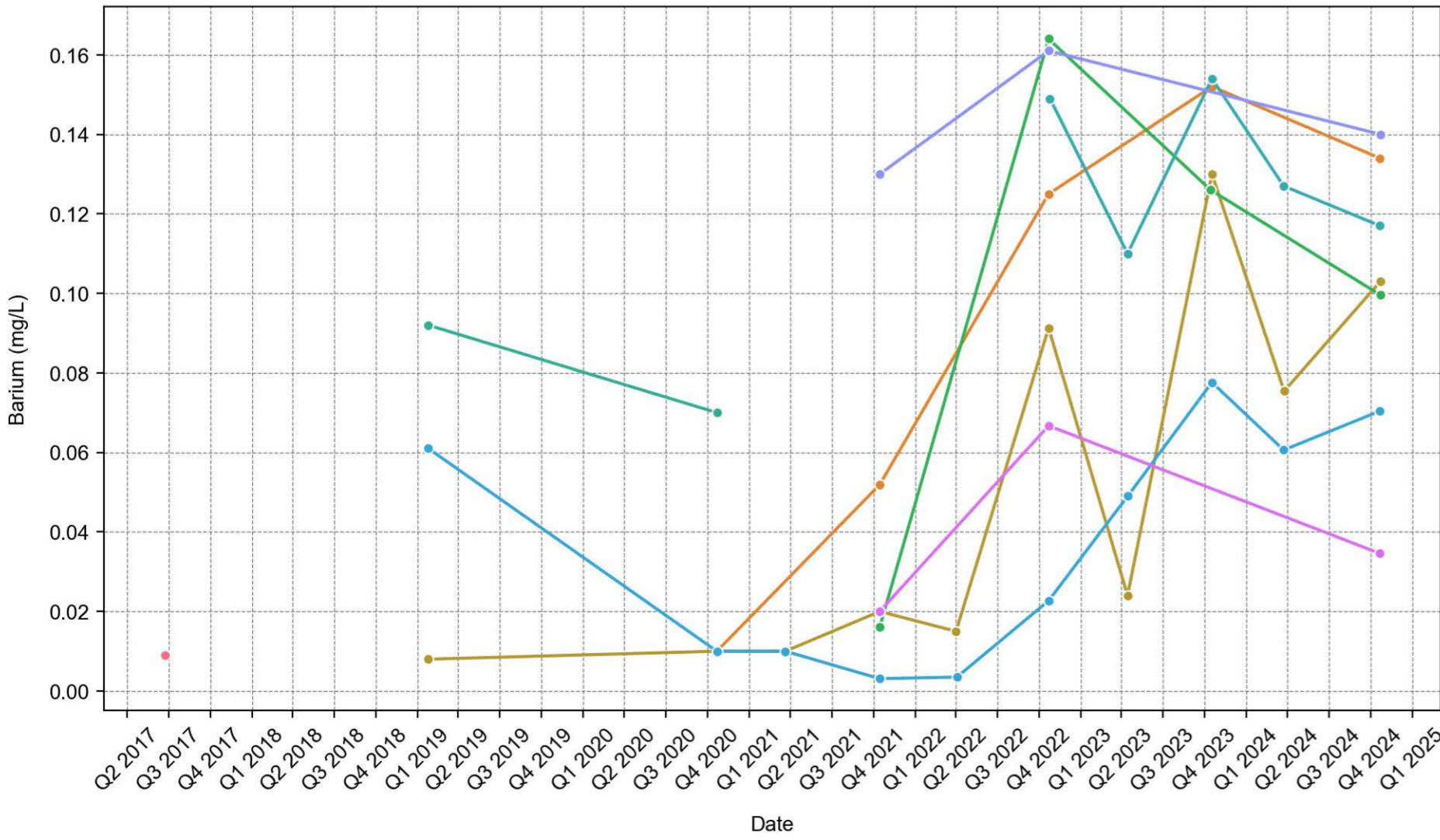
Antimony



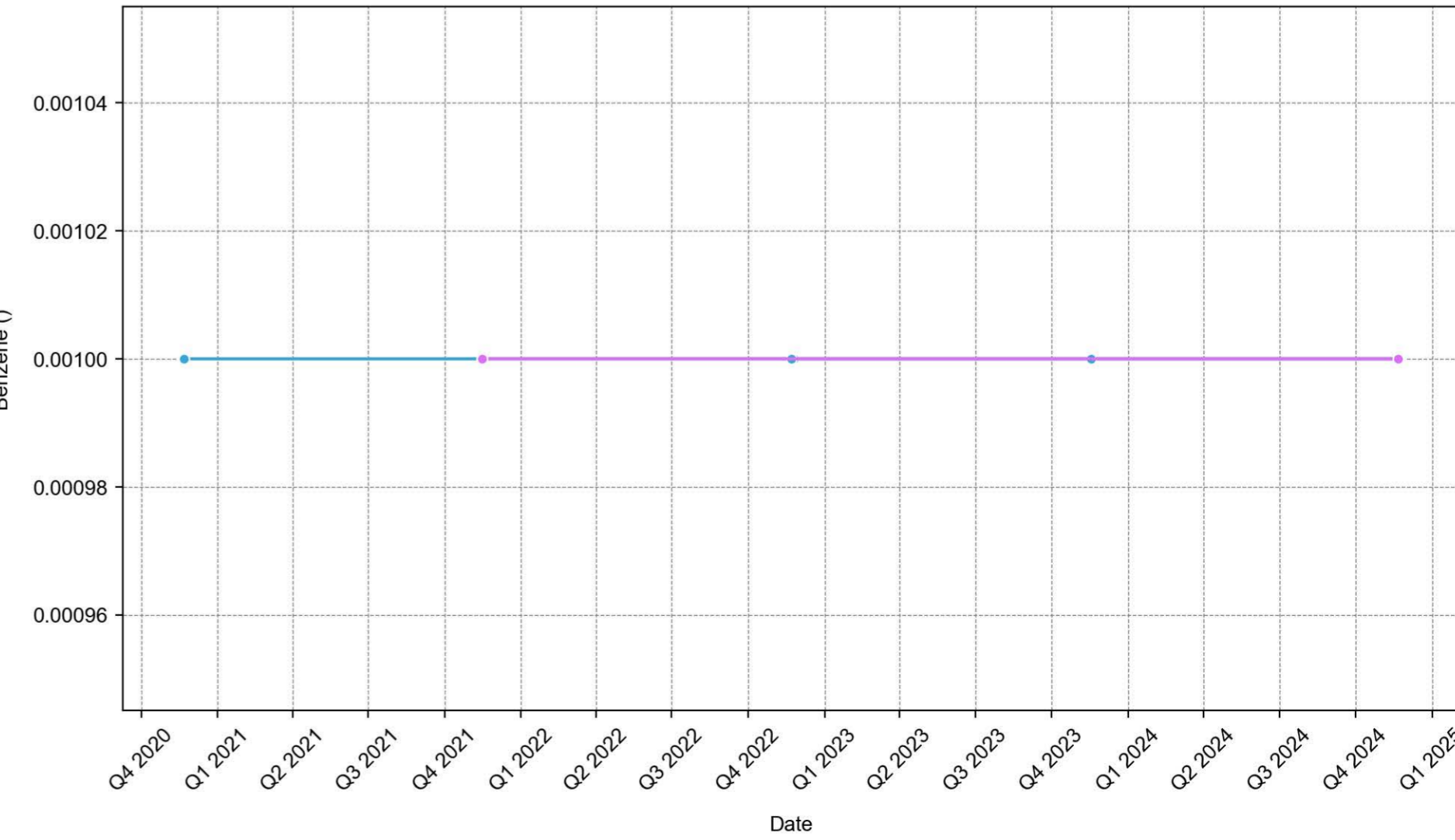
Arsenic



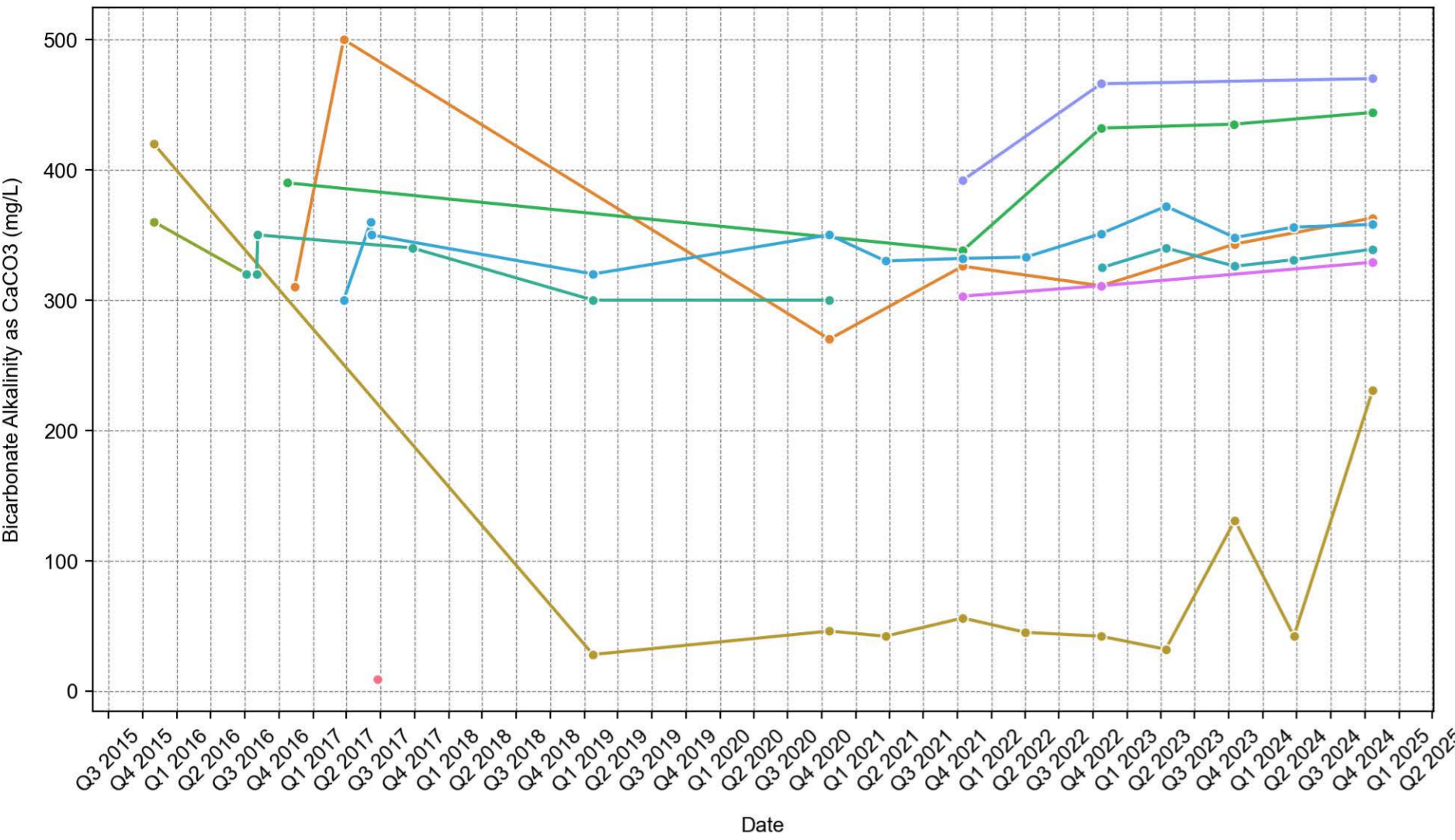
Barium



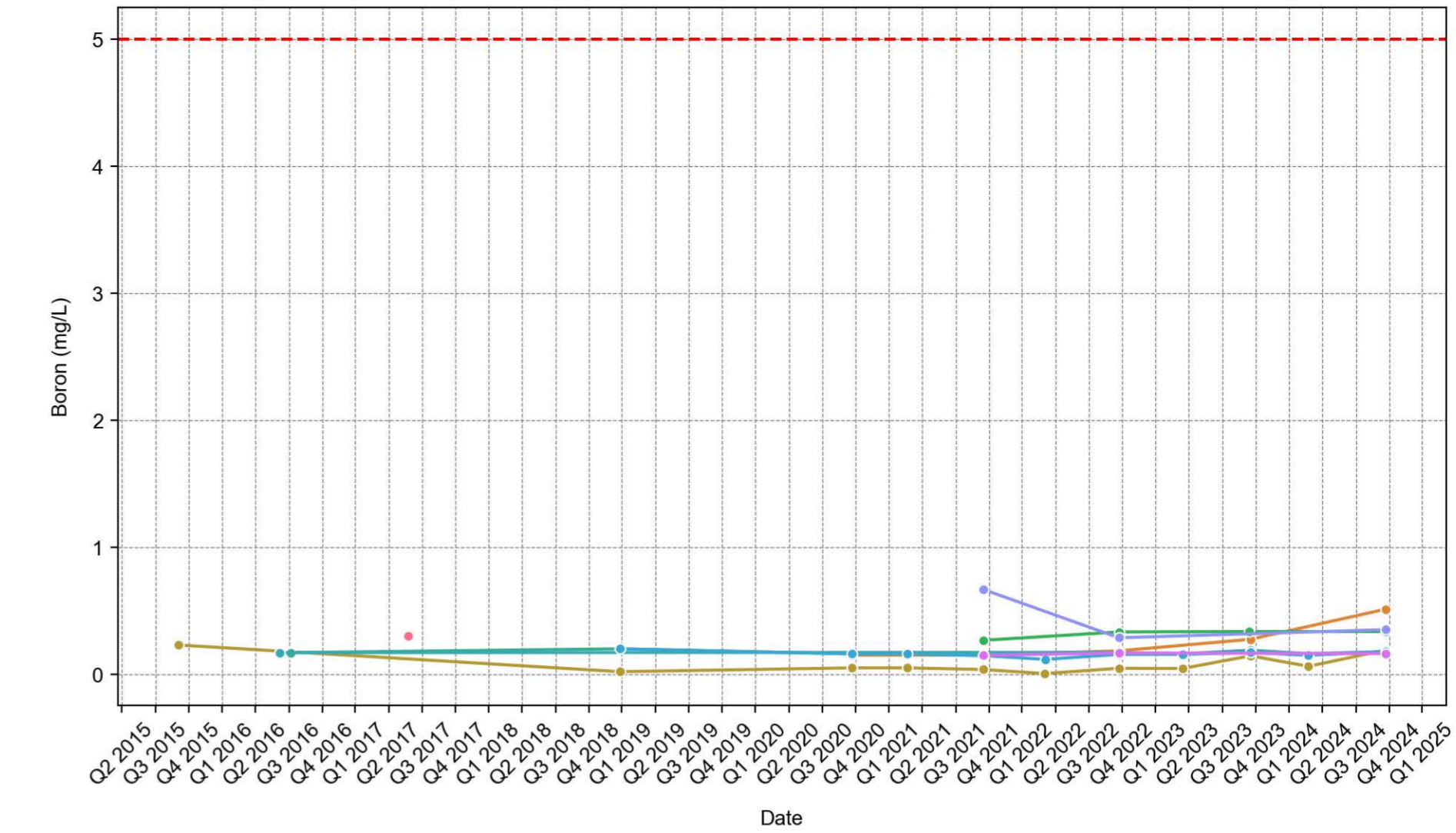
Benzene



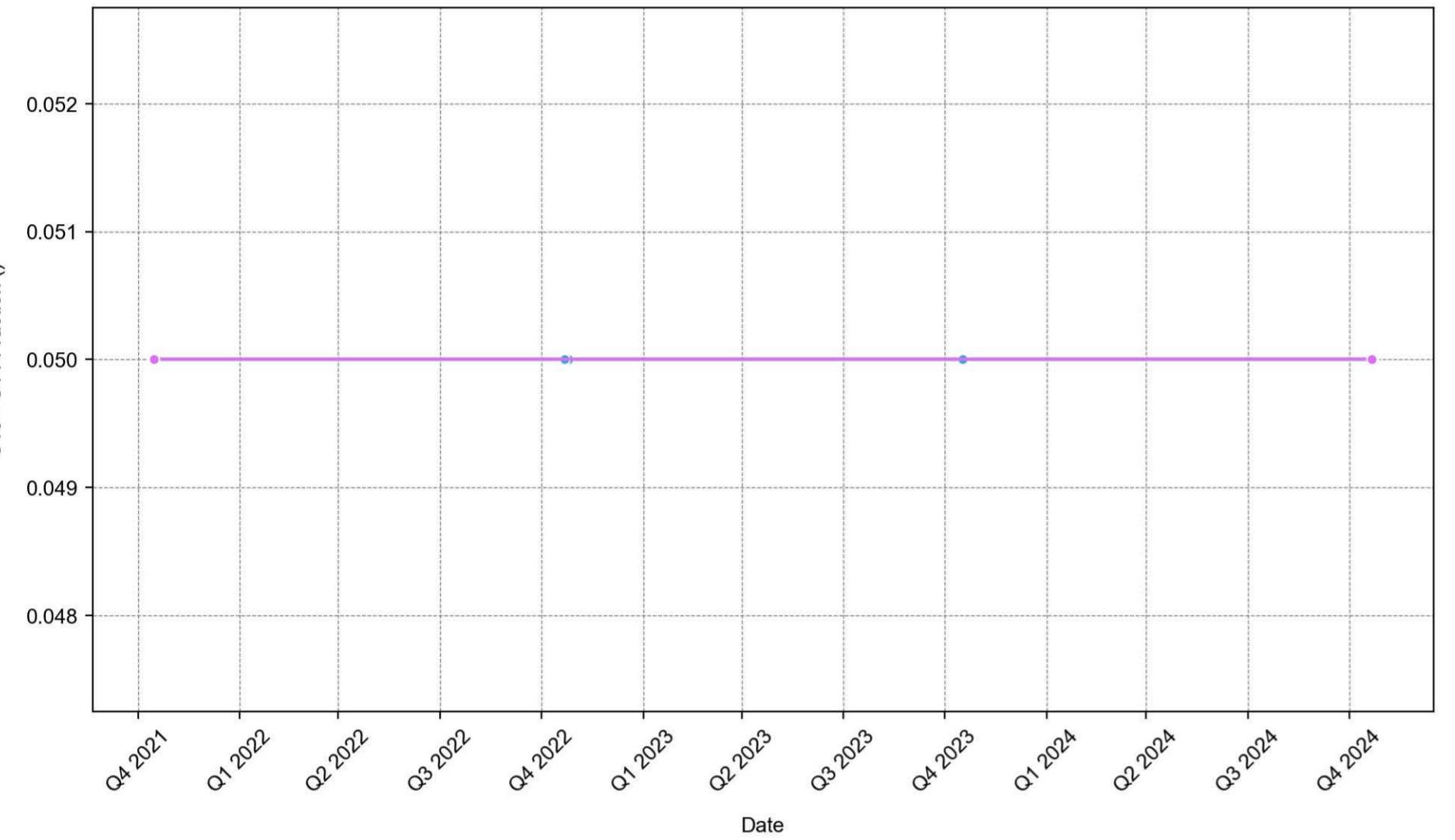
Bicarbonate Alkalinity as CaCO3



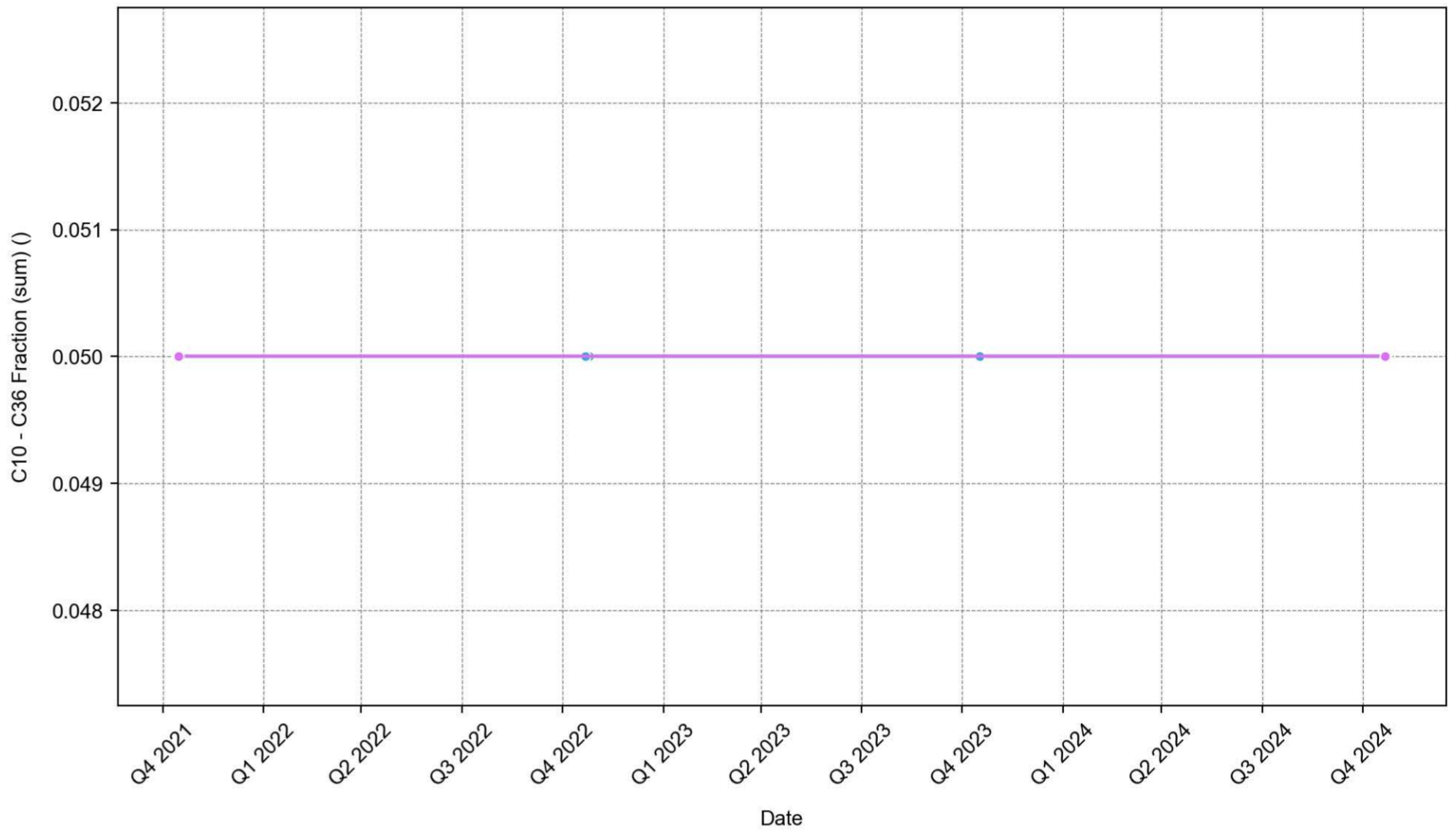
Boron



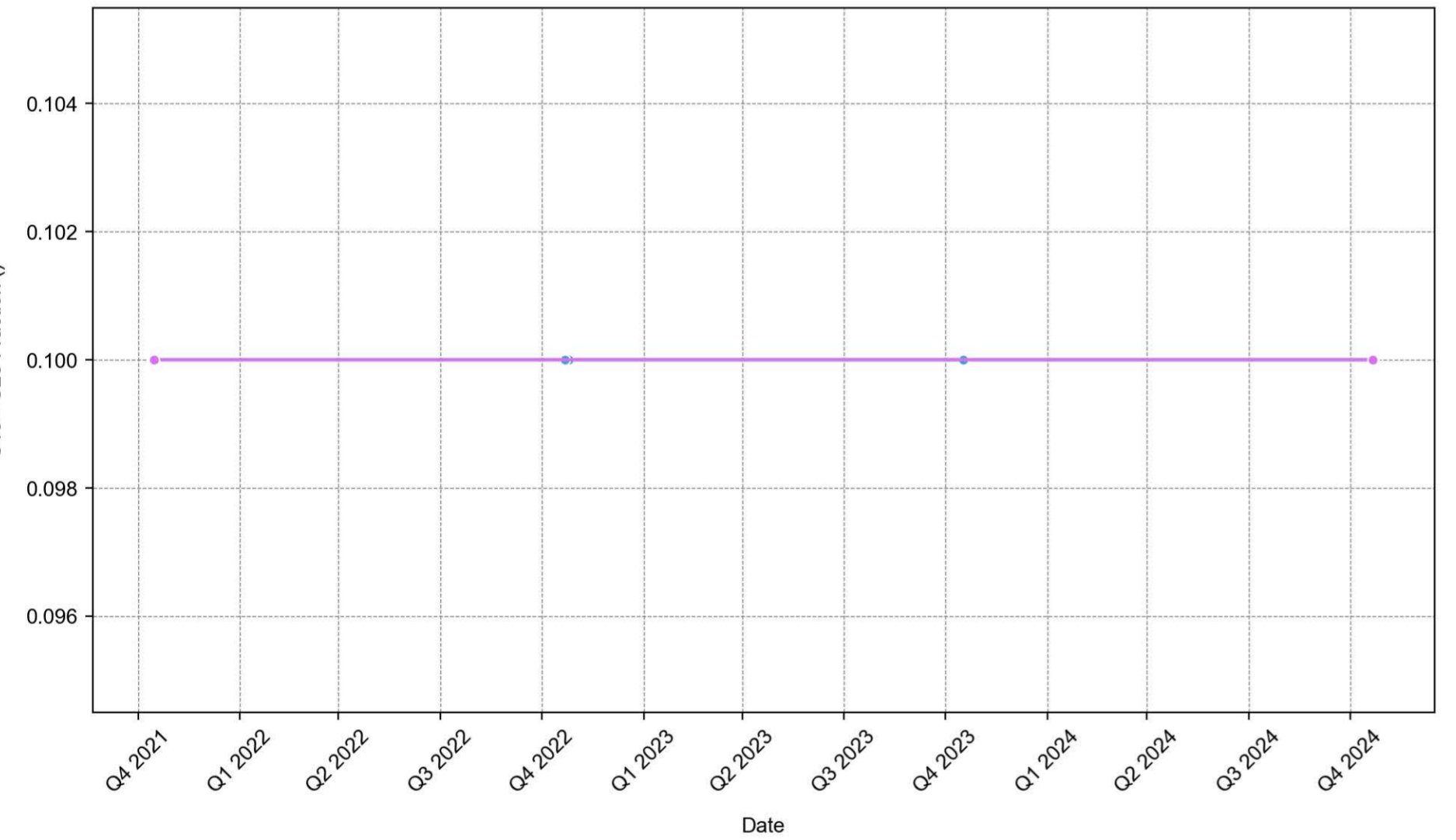
C10 - C14 Fraction



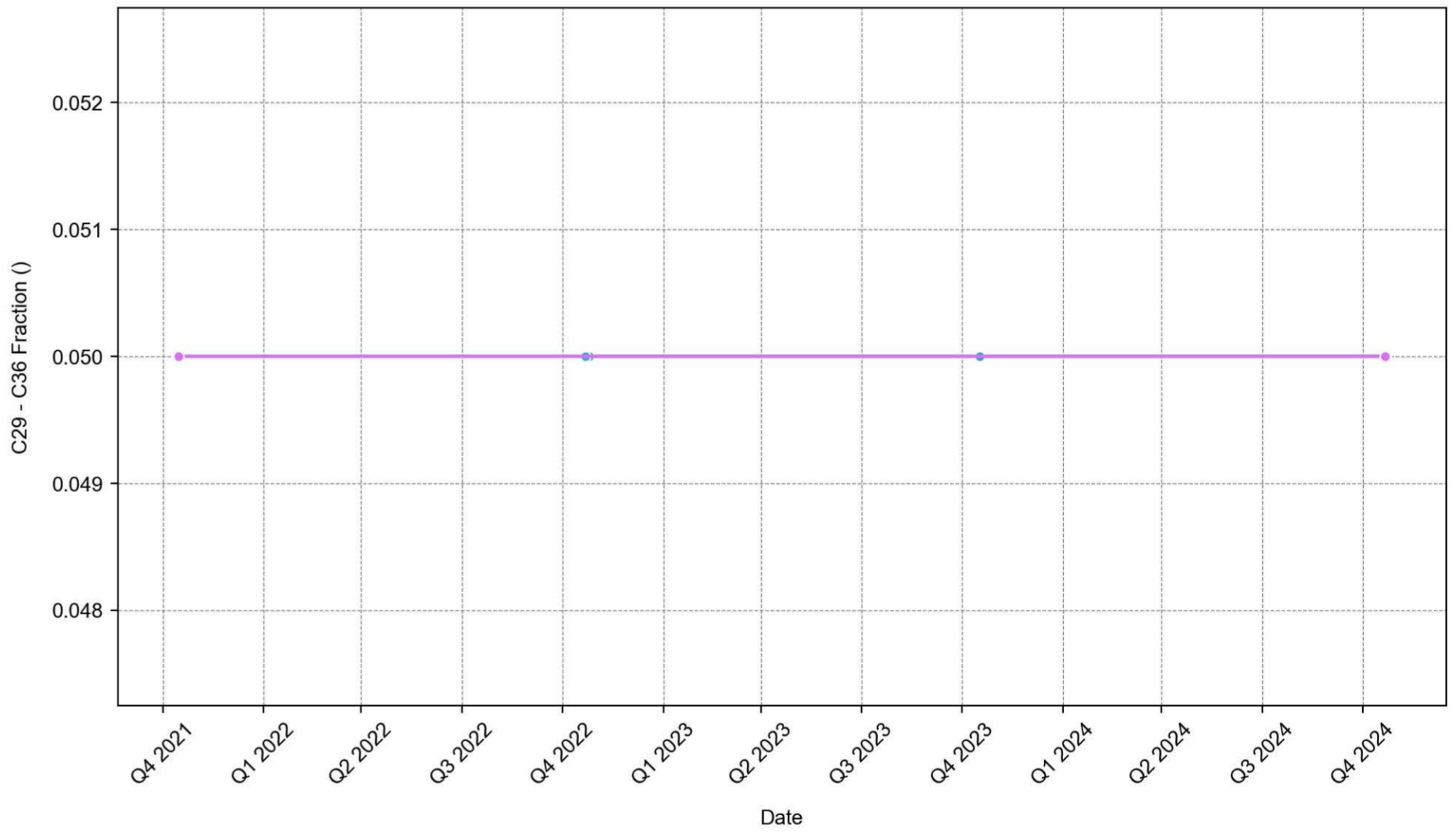
C10 - C36 Fraction (sum)



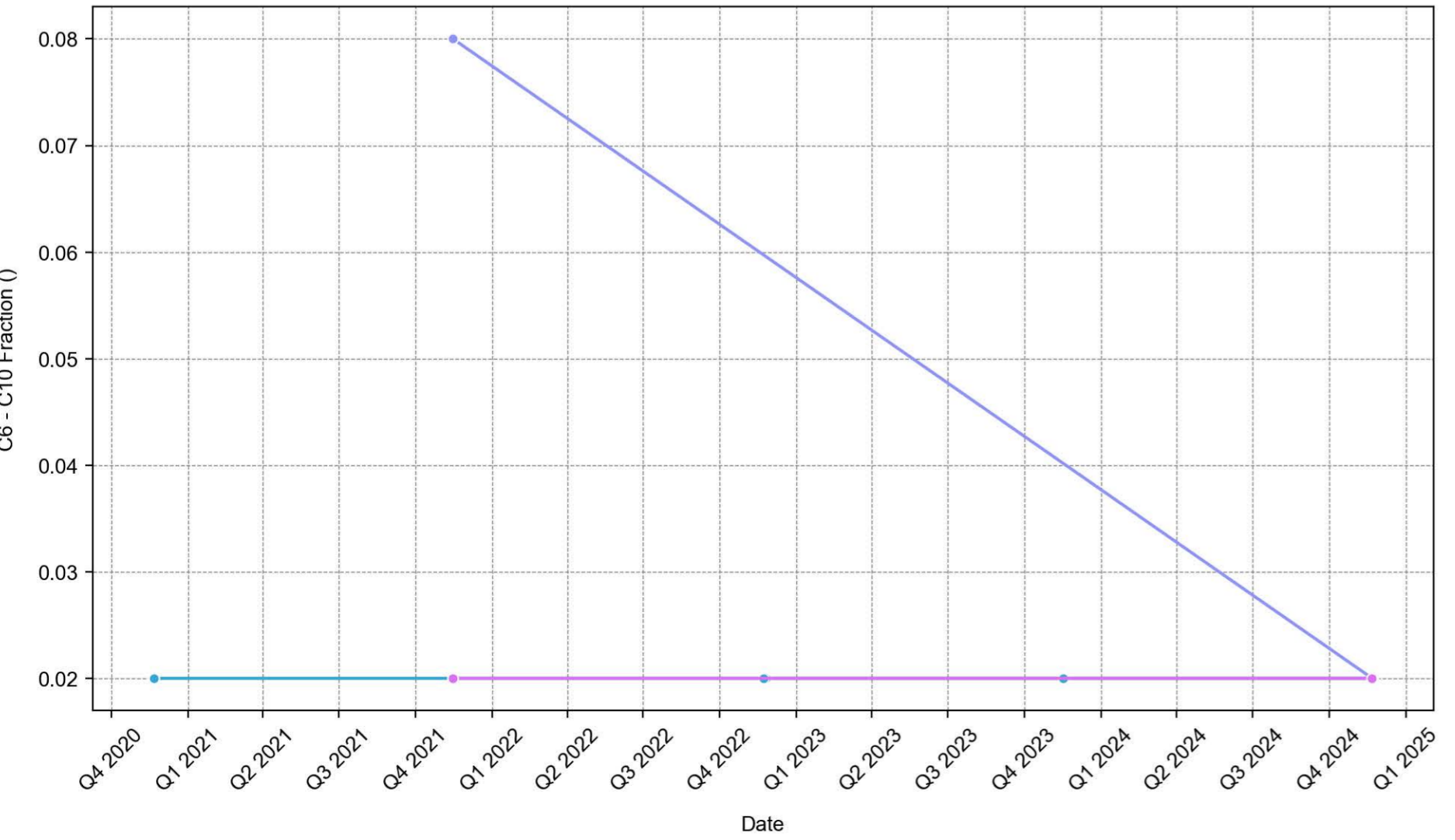
C15 - C28 Fraction



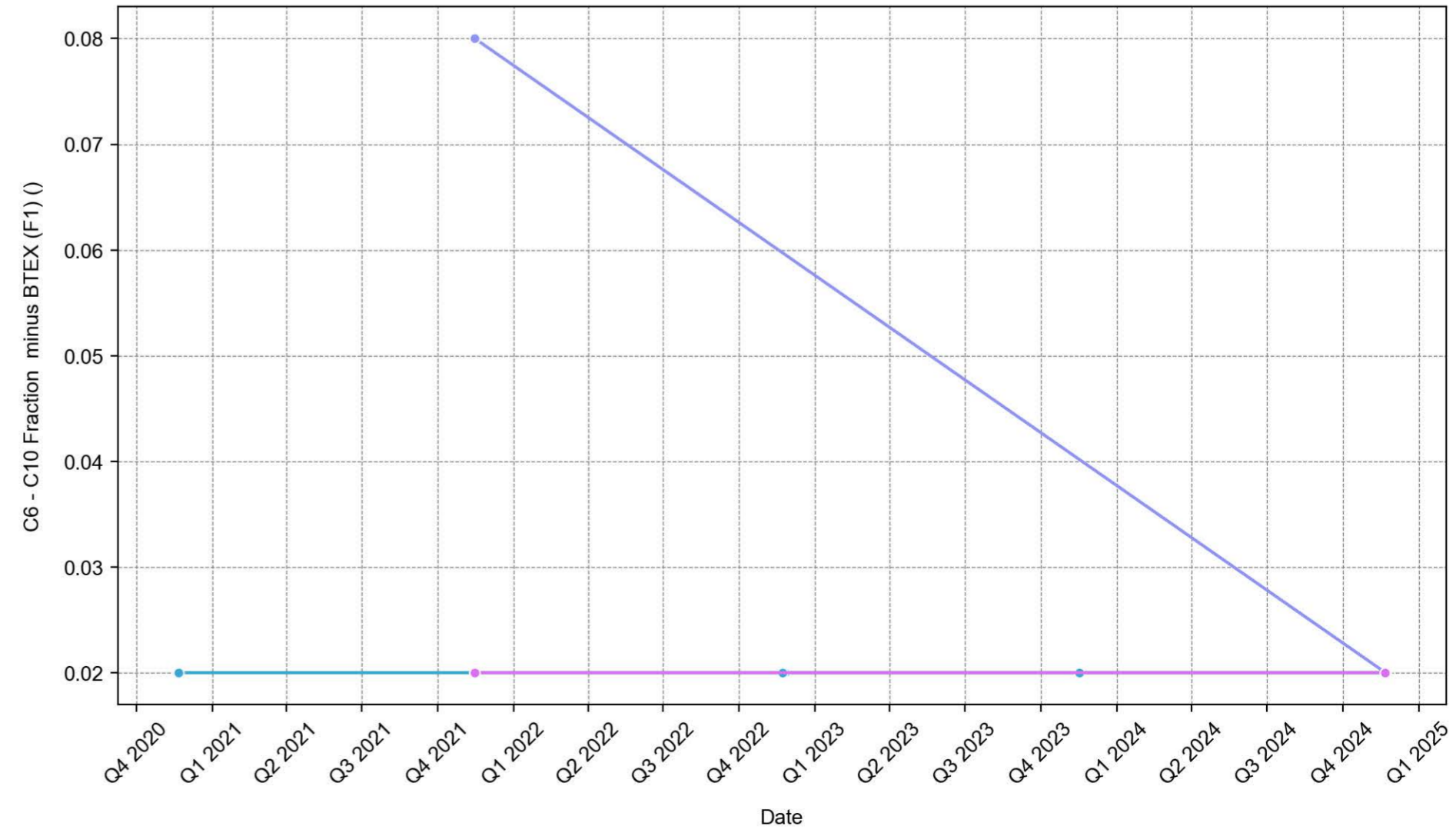
C29 - C36 Fraction



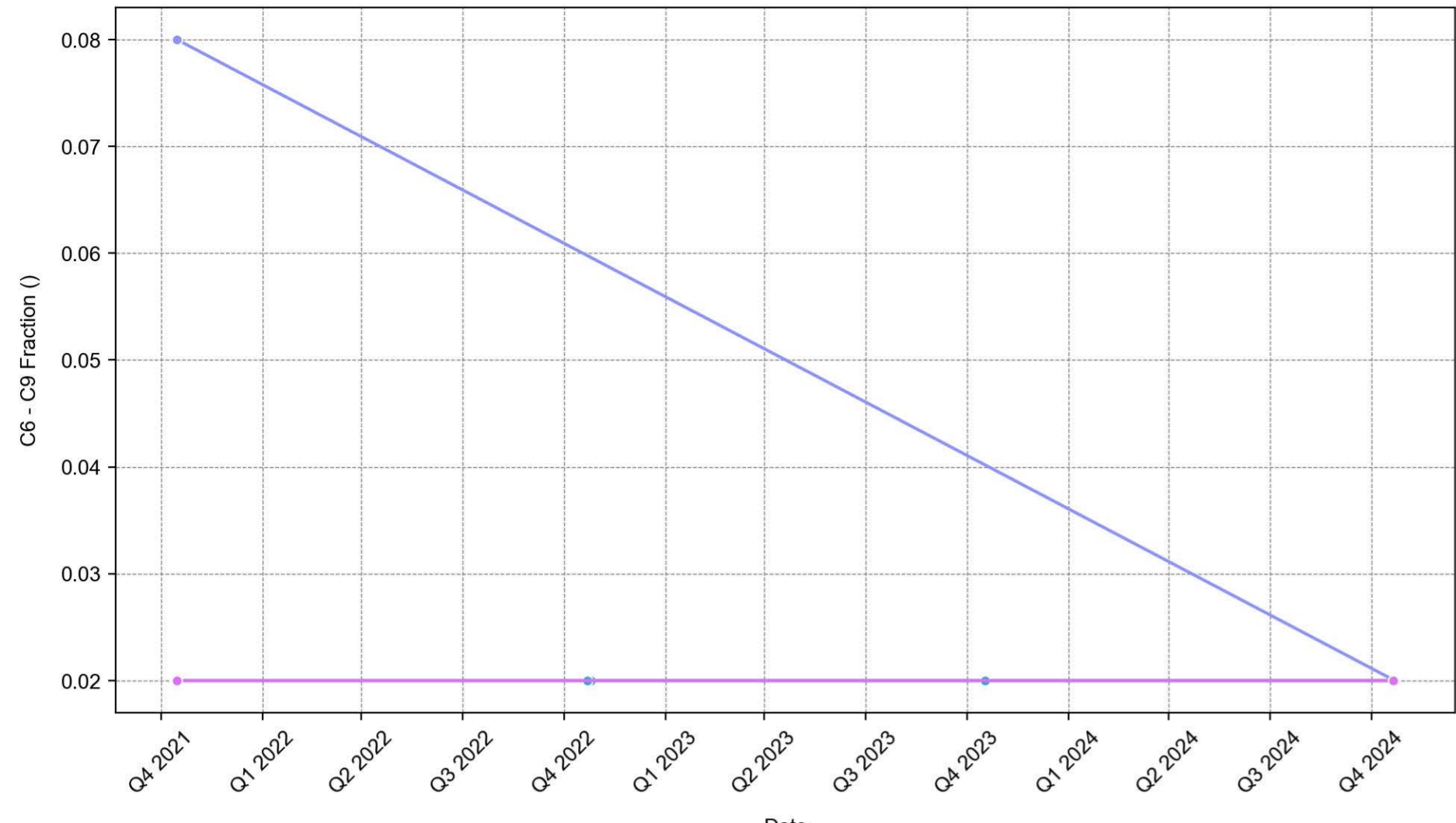
C6 - C10 Fraction



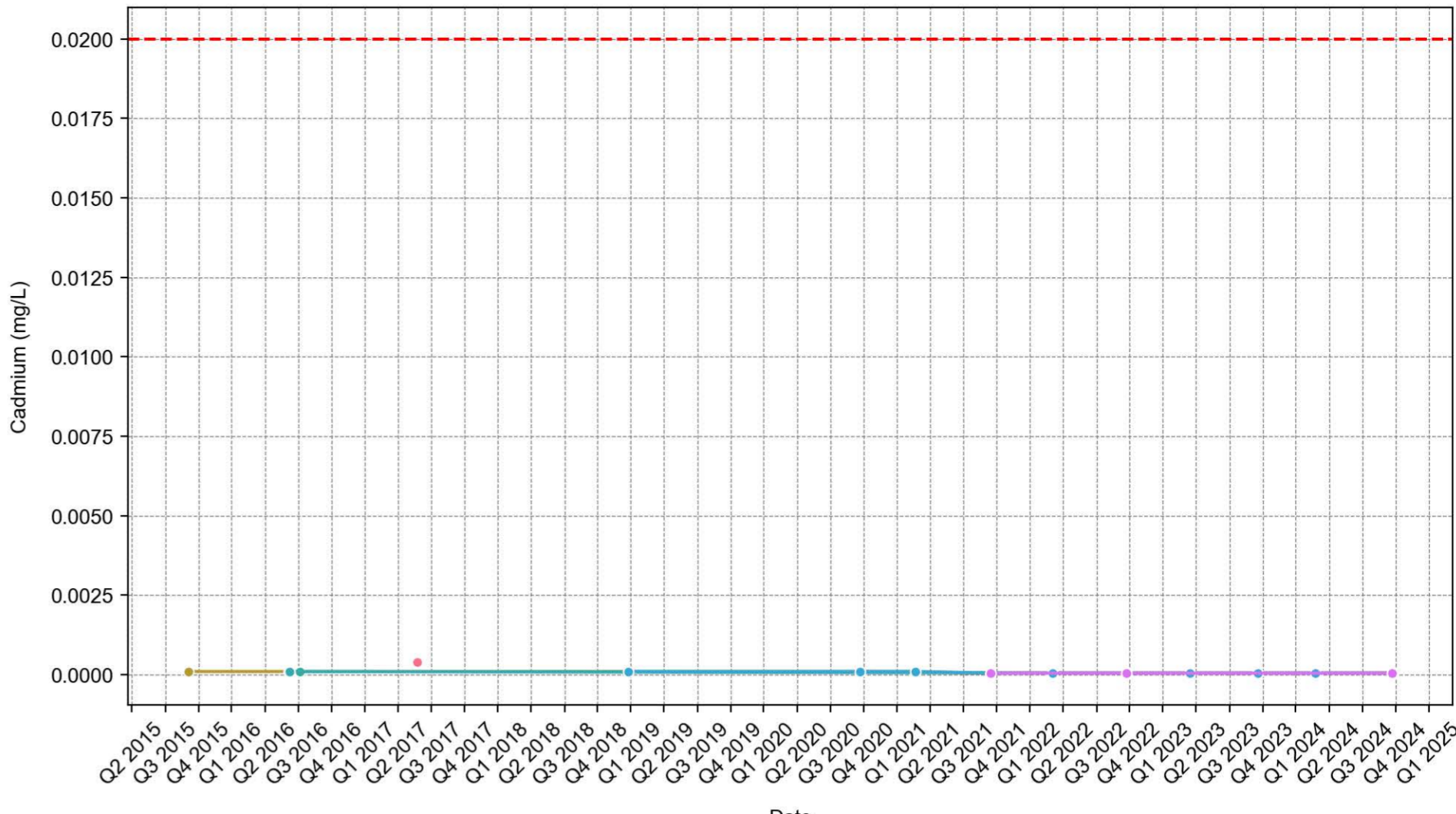
C6 - C10 Fraction minus BTEX (F1)



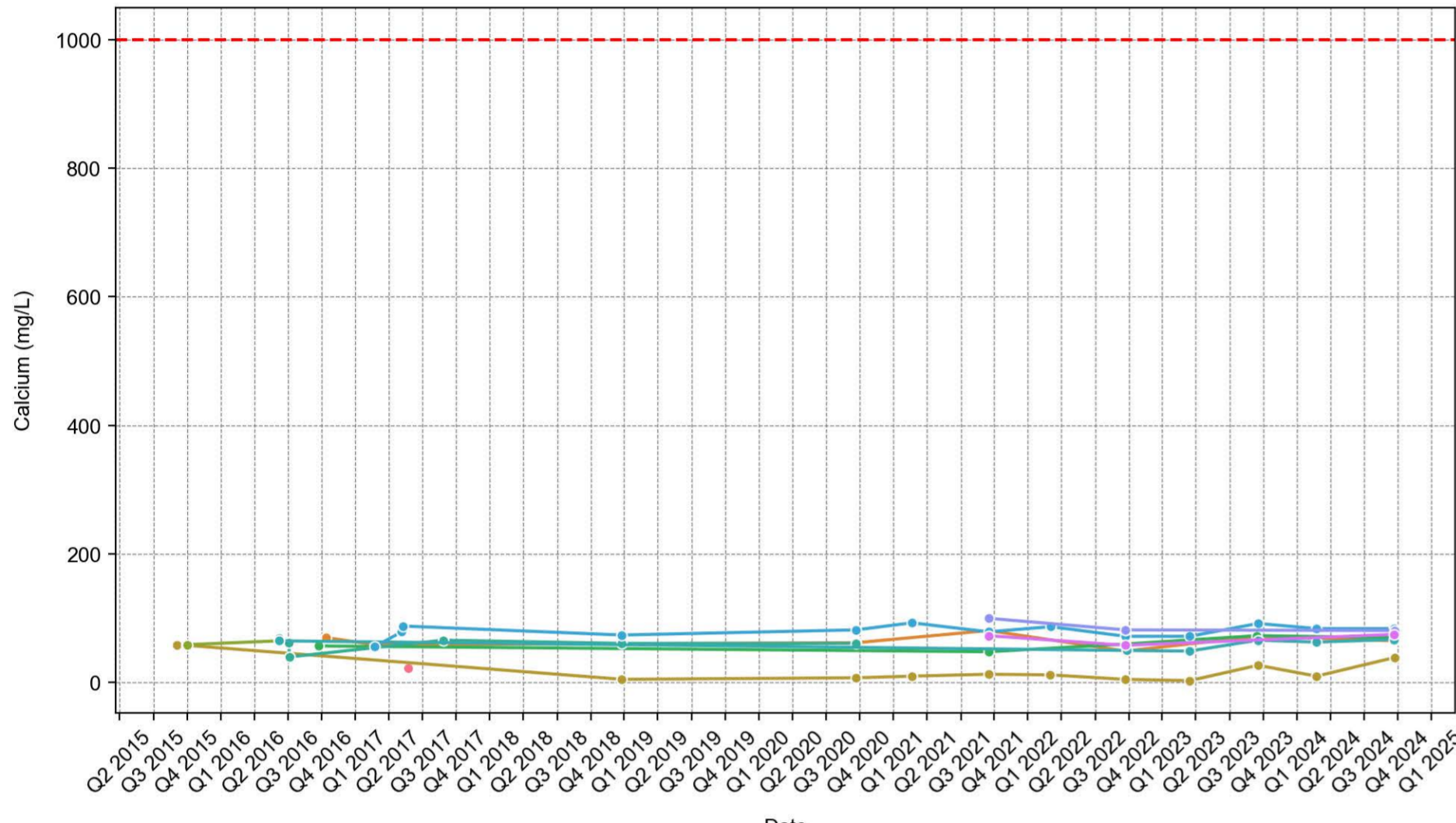
C6 - C9 Fraction



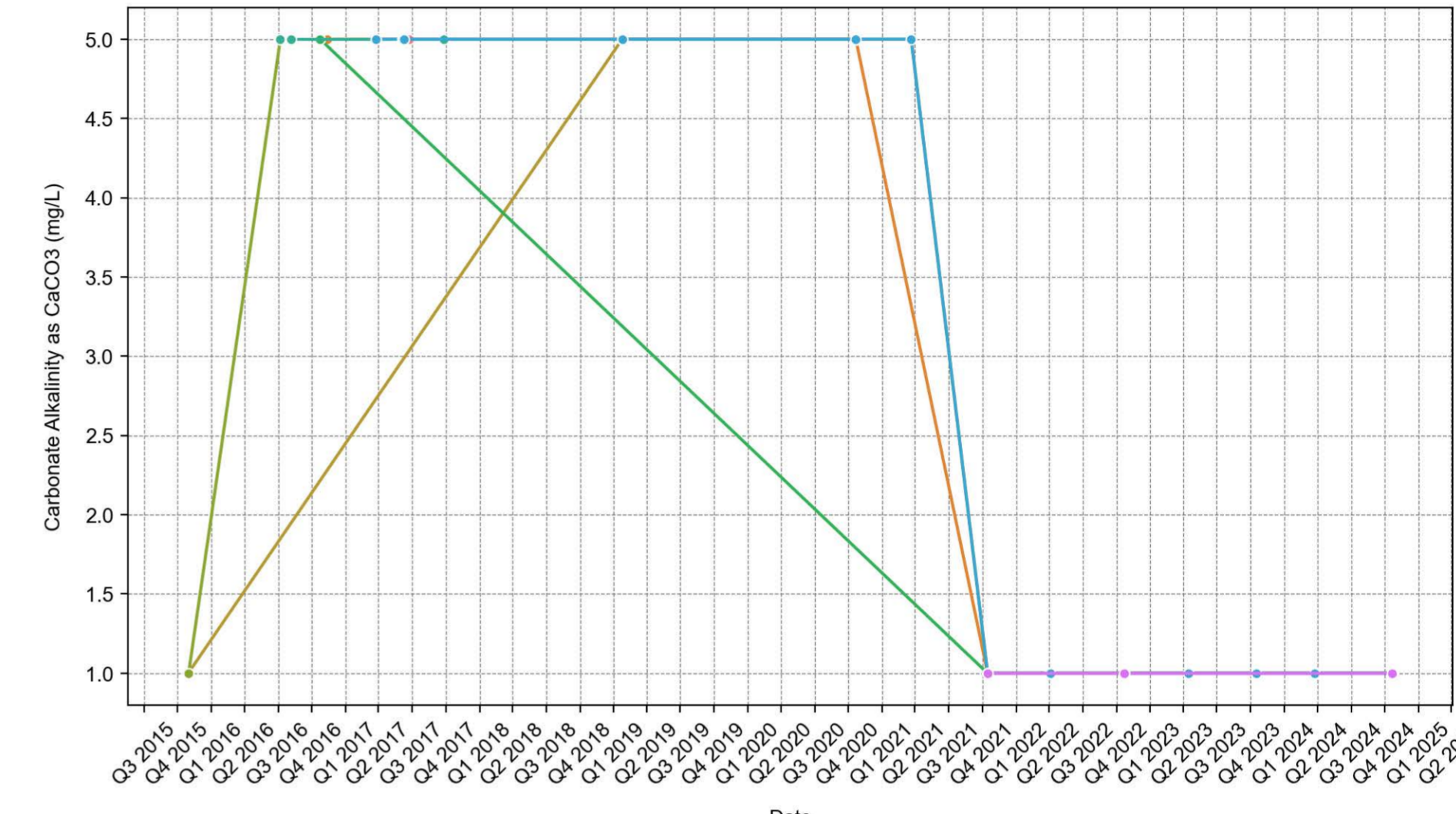
Cadmium



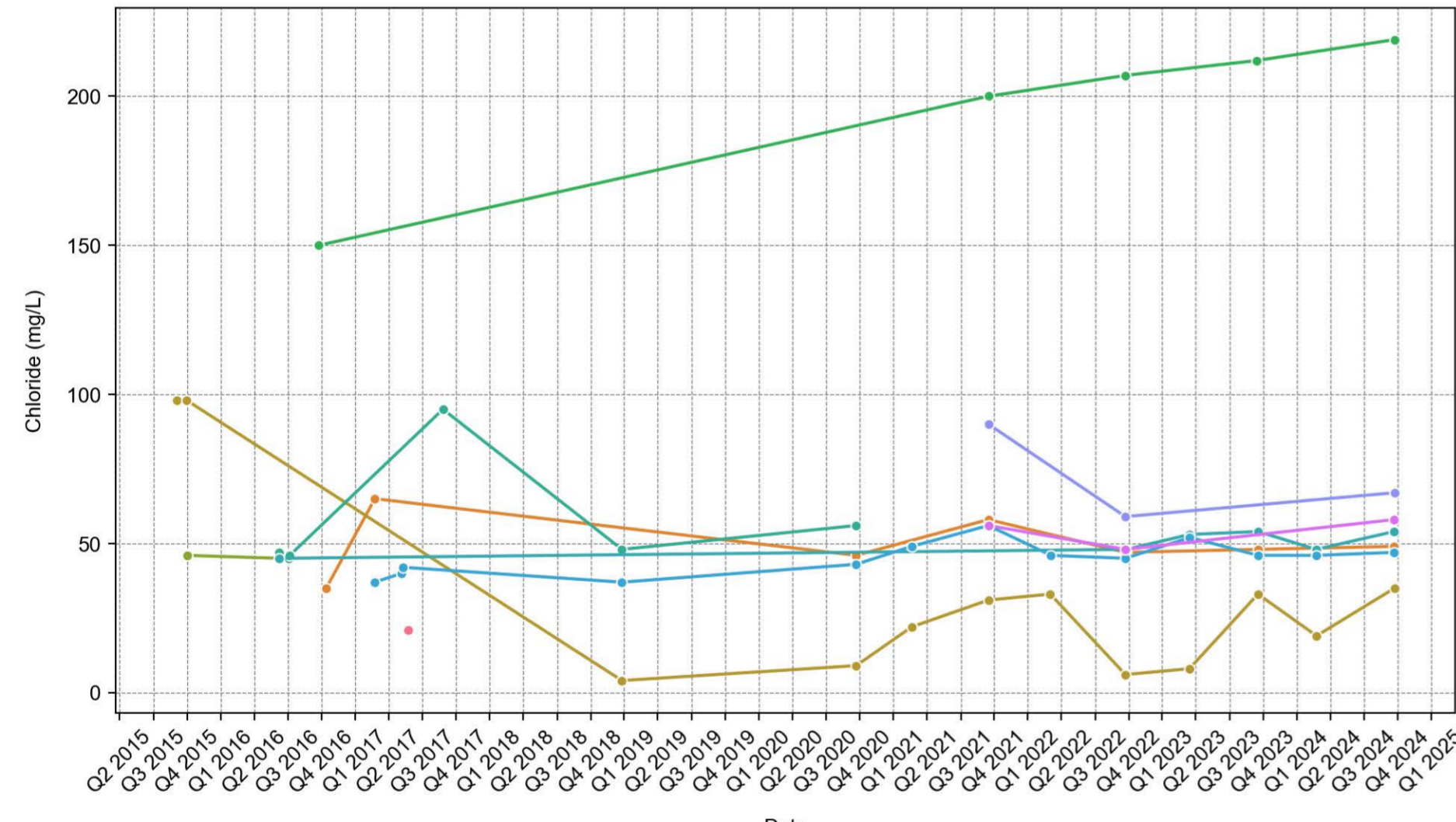
Calcium



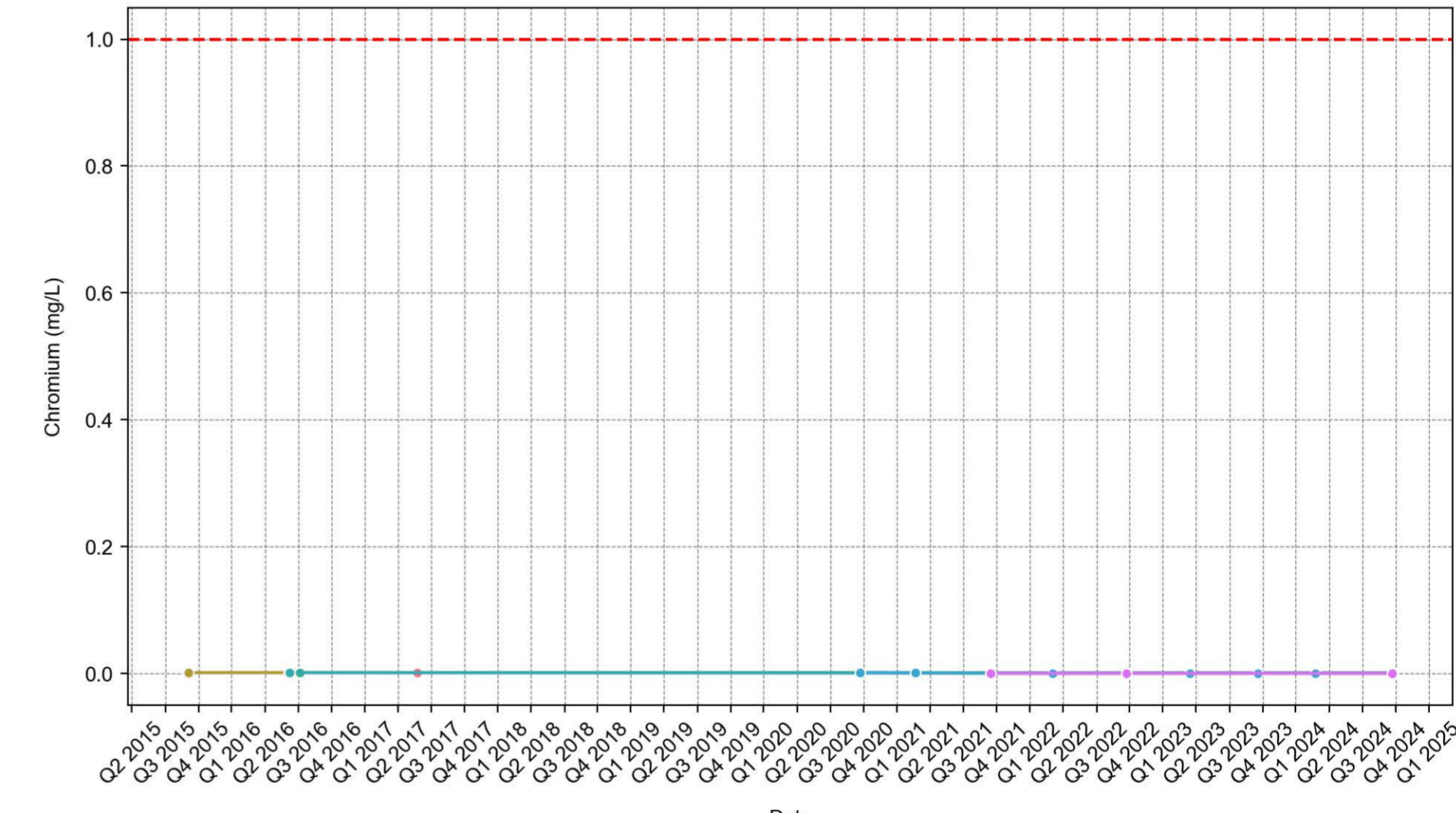
Carbonate Alkalinity as CaCO3



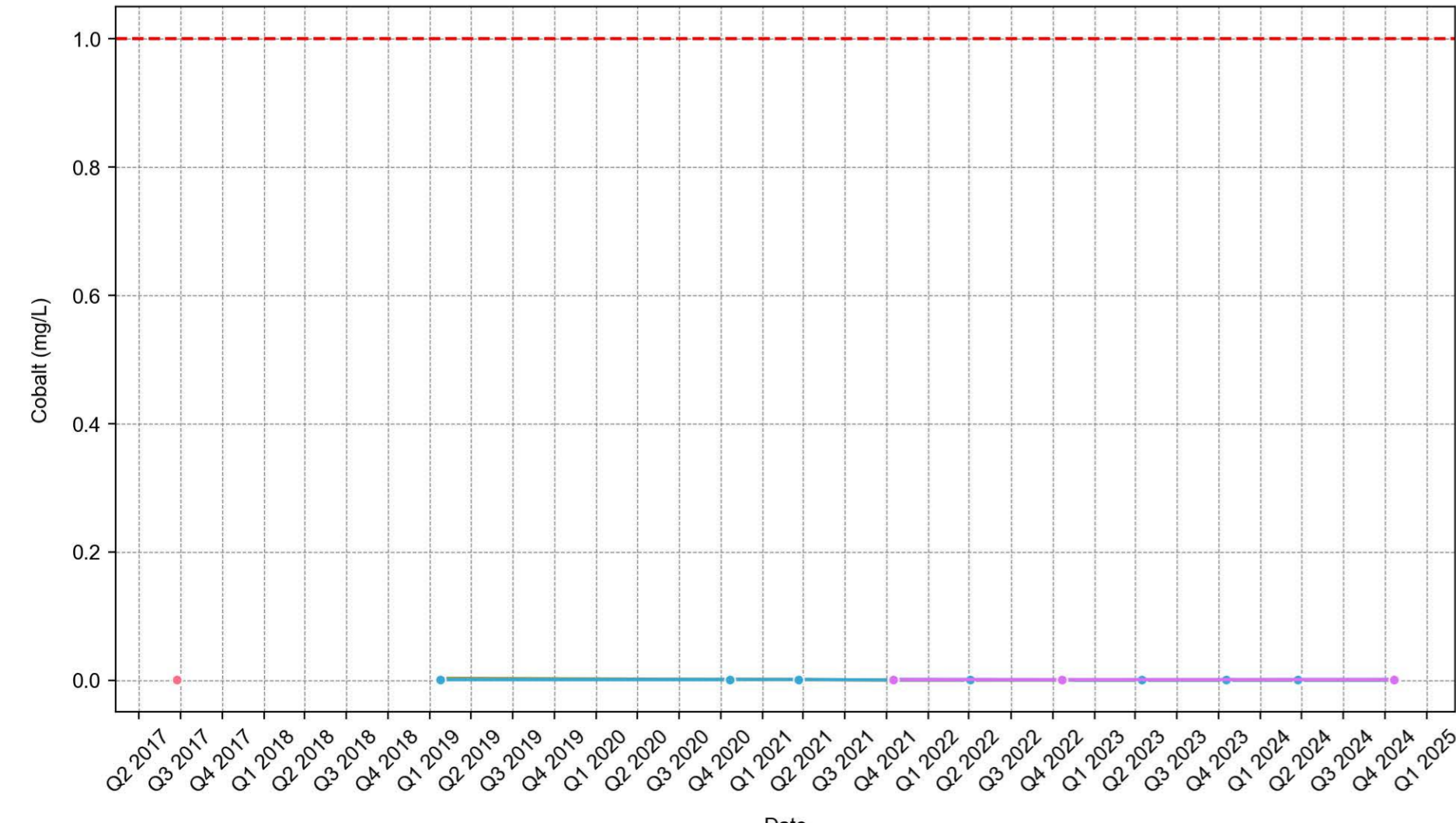
Chloride



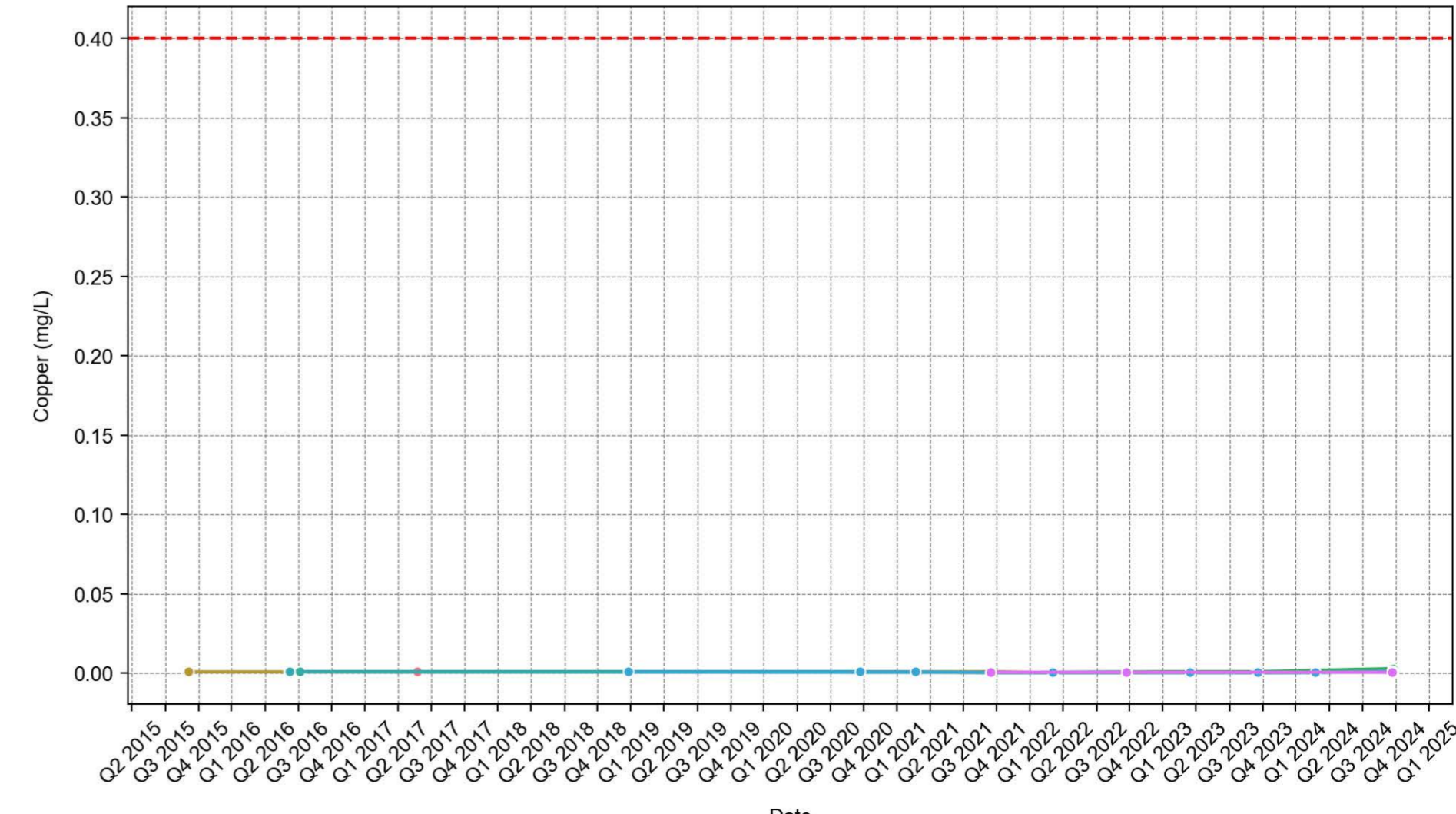
Chromium



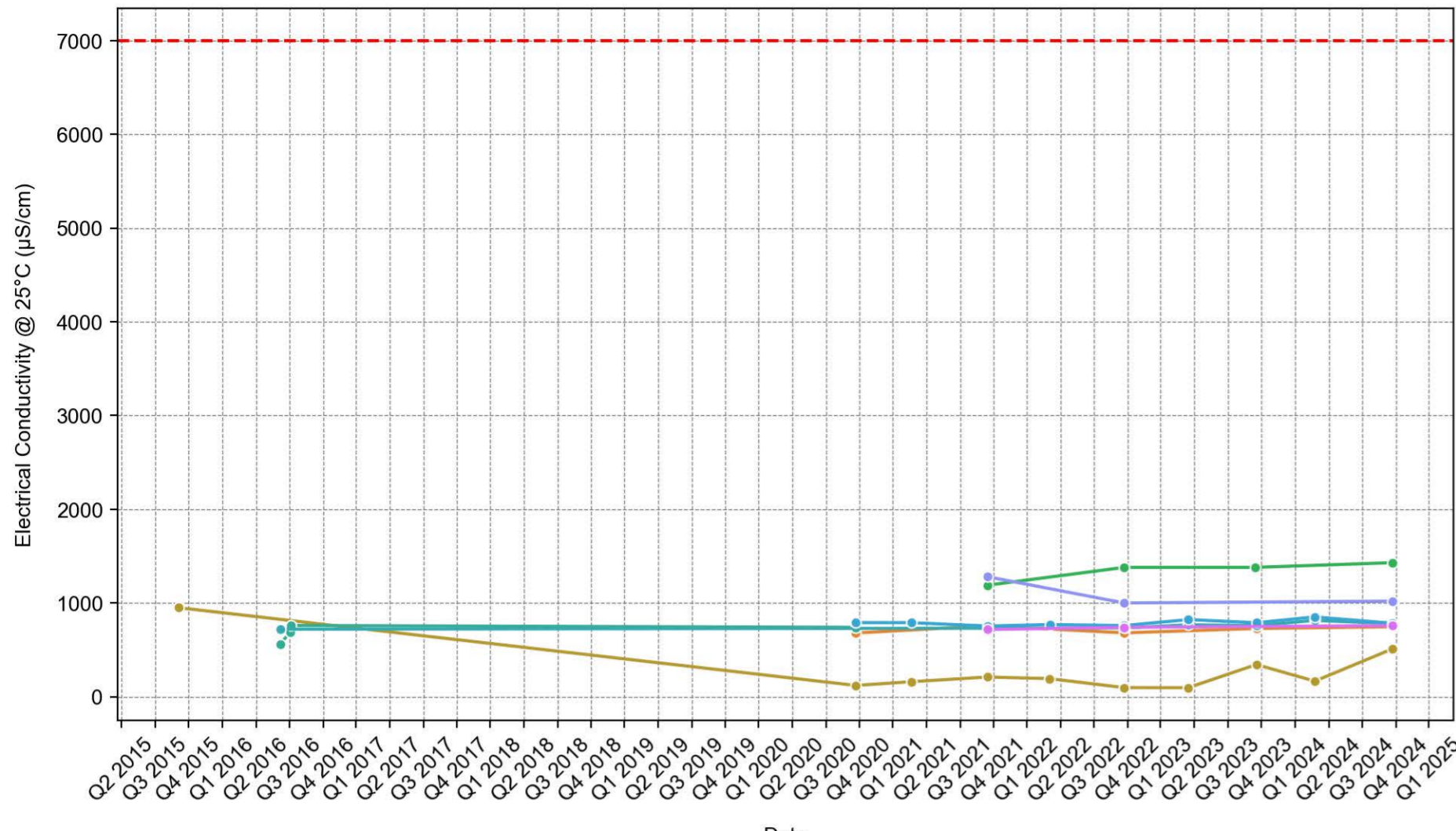
Cobalt



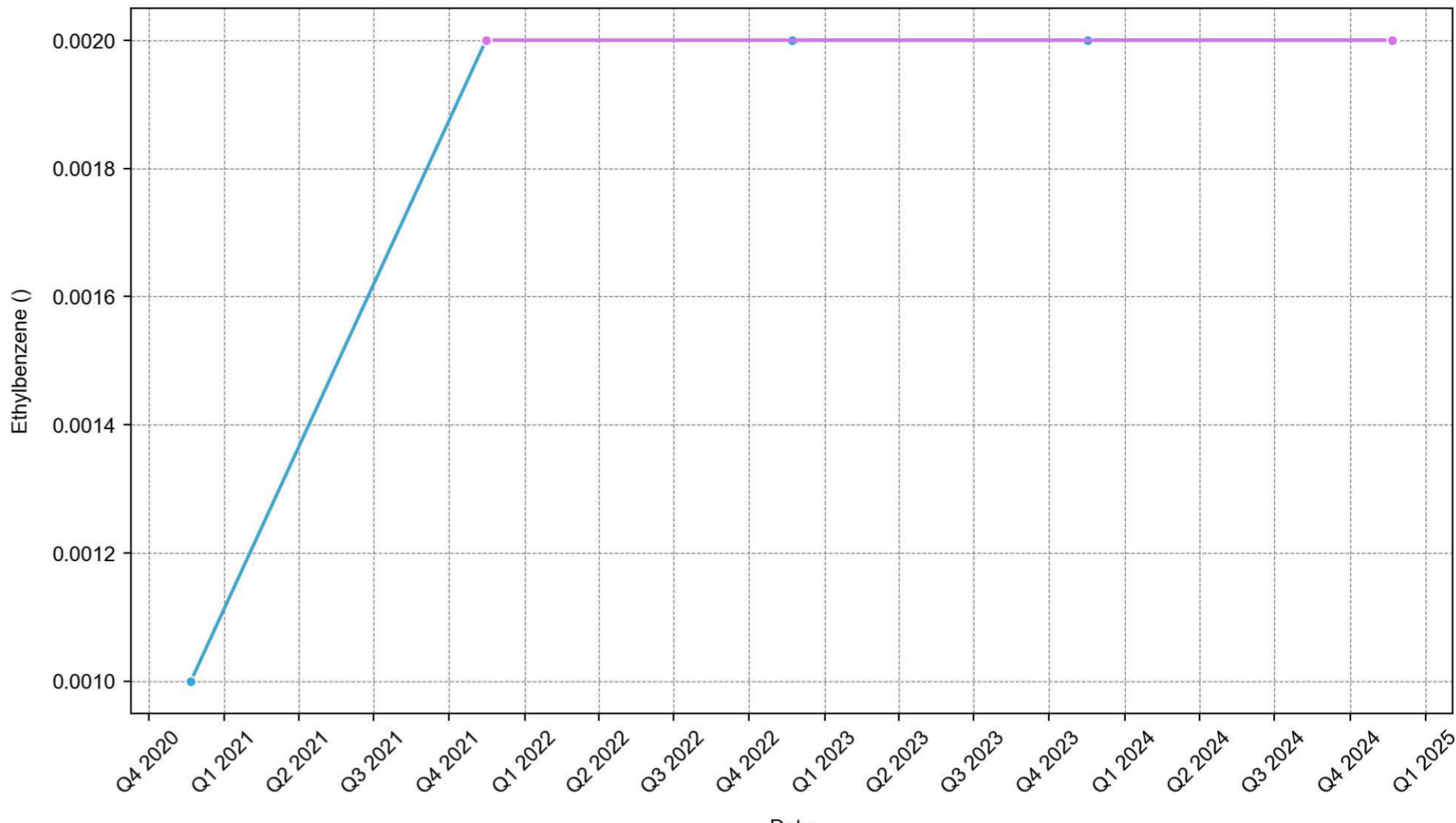
Copper



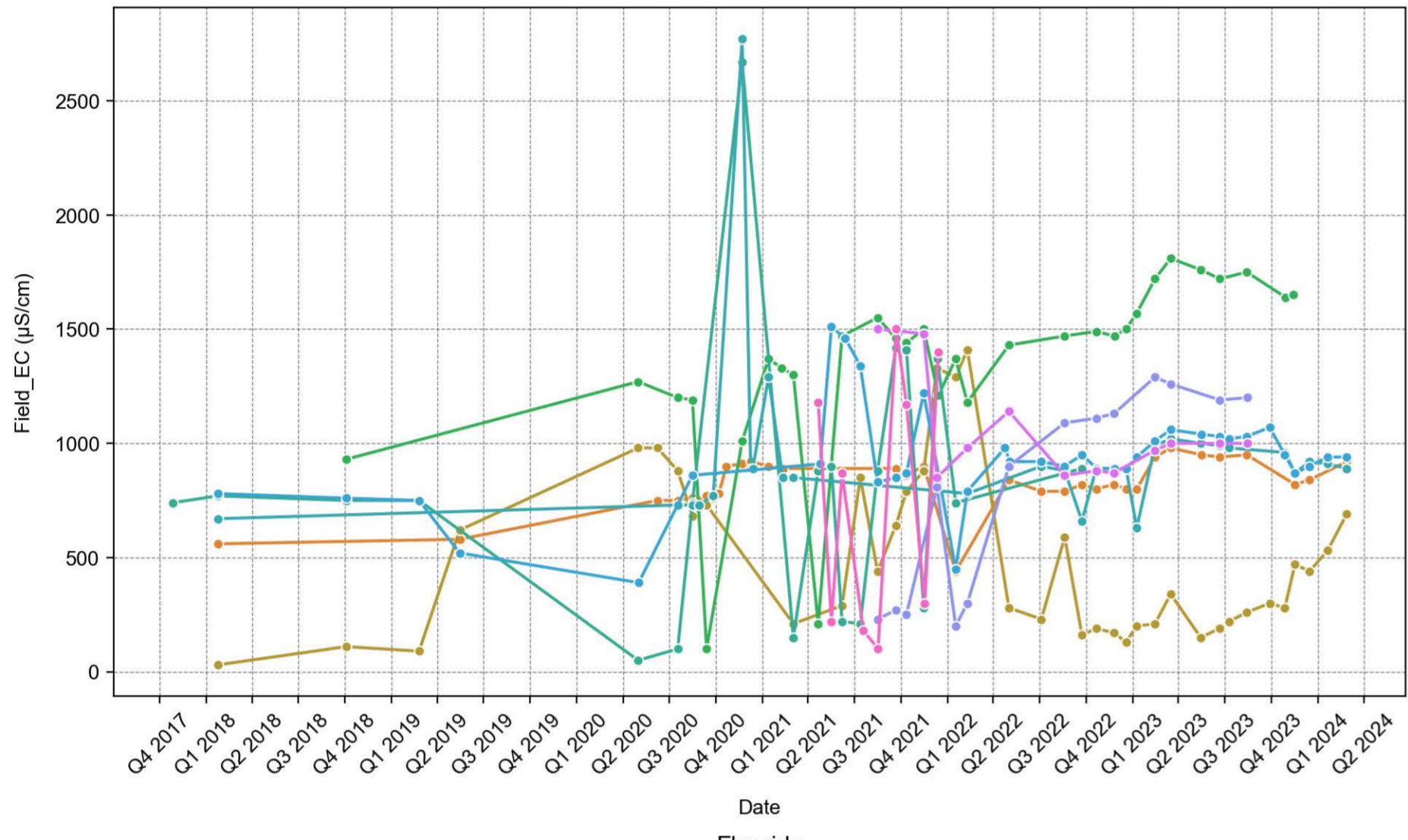
Electrical Conductivity @ 25°C



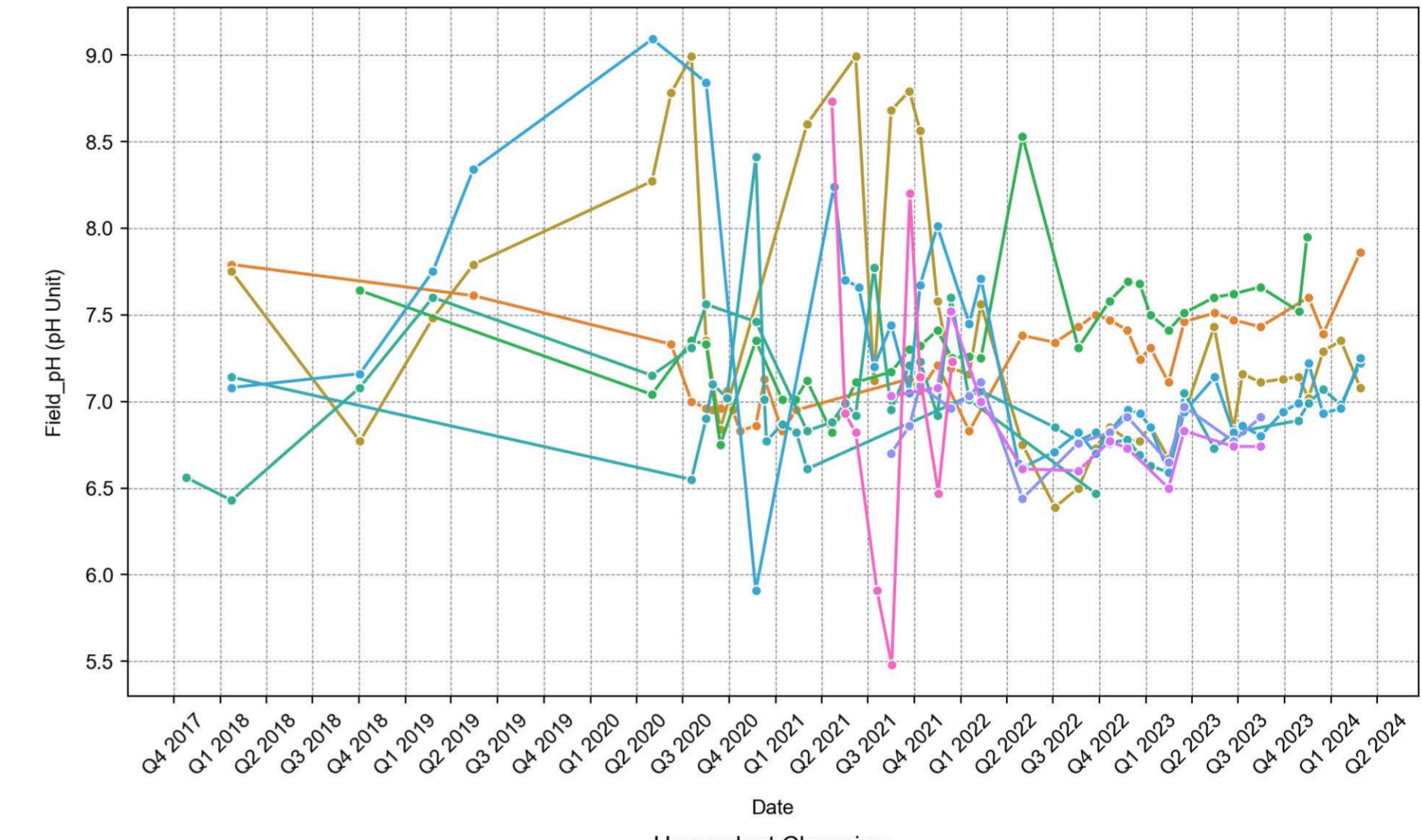
Ethylbenzene



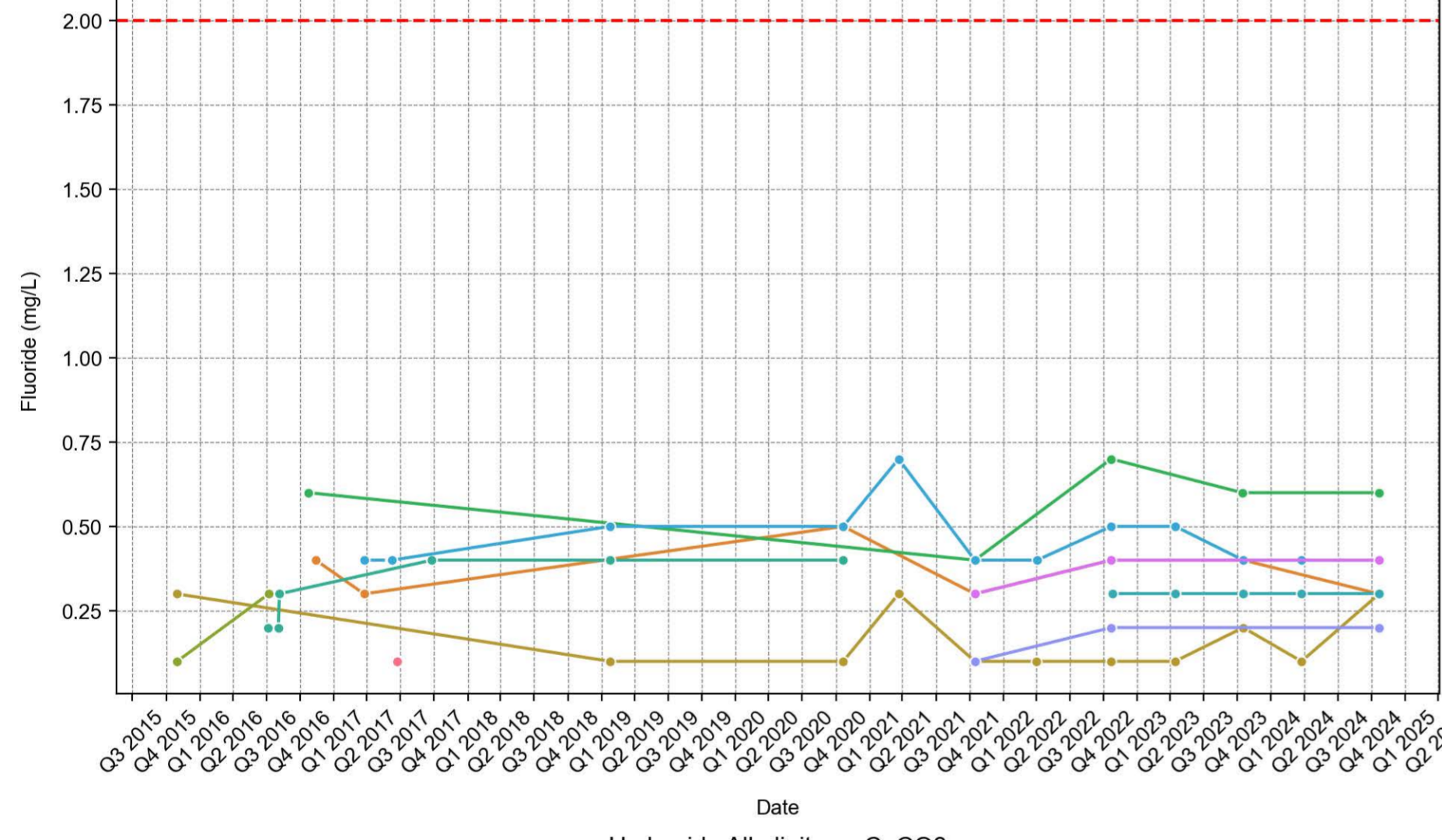
Field_EC



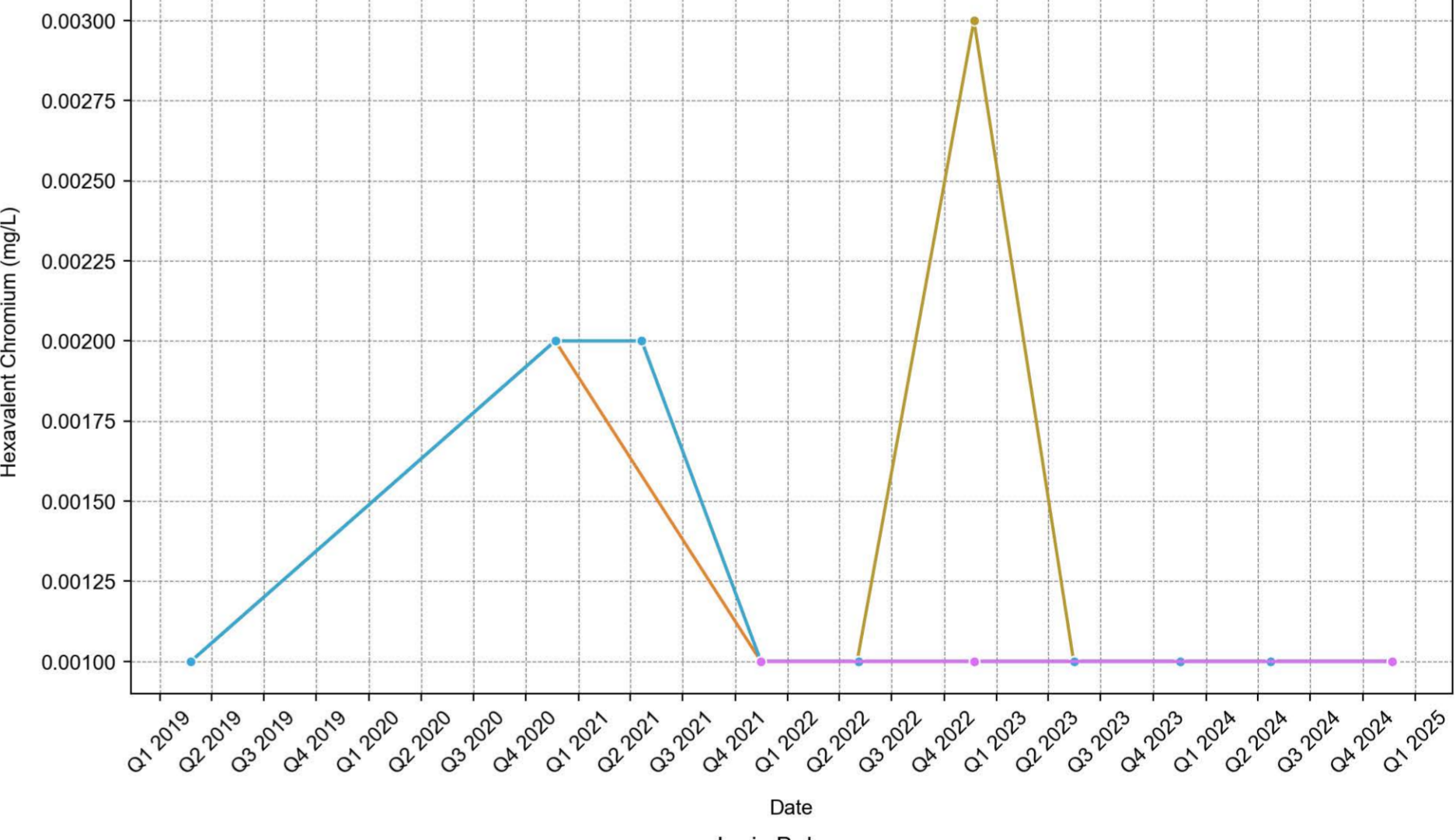
Field_pH



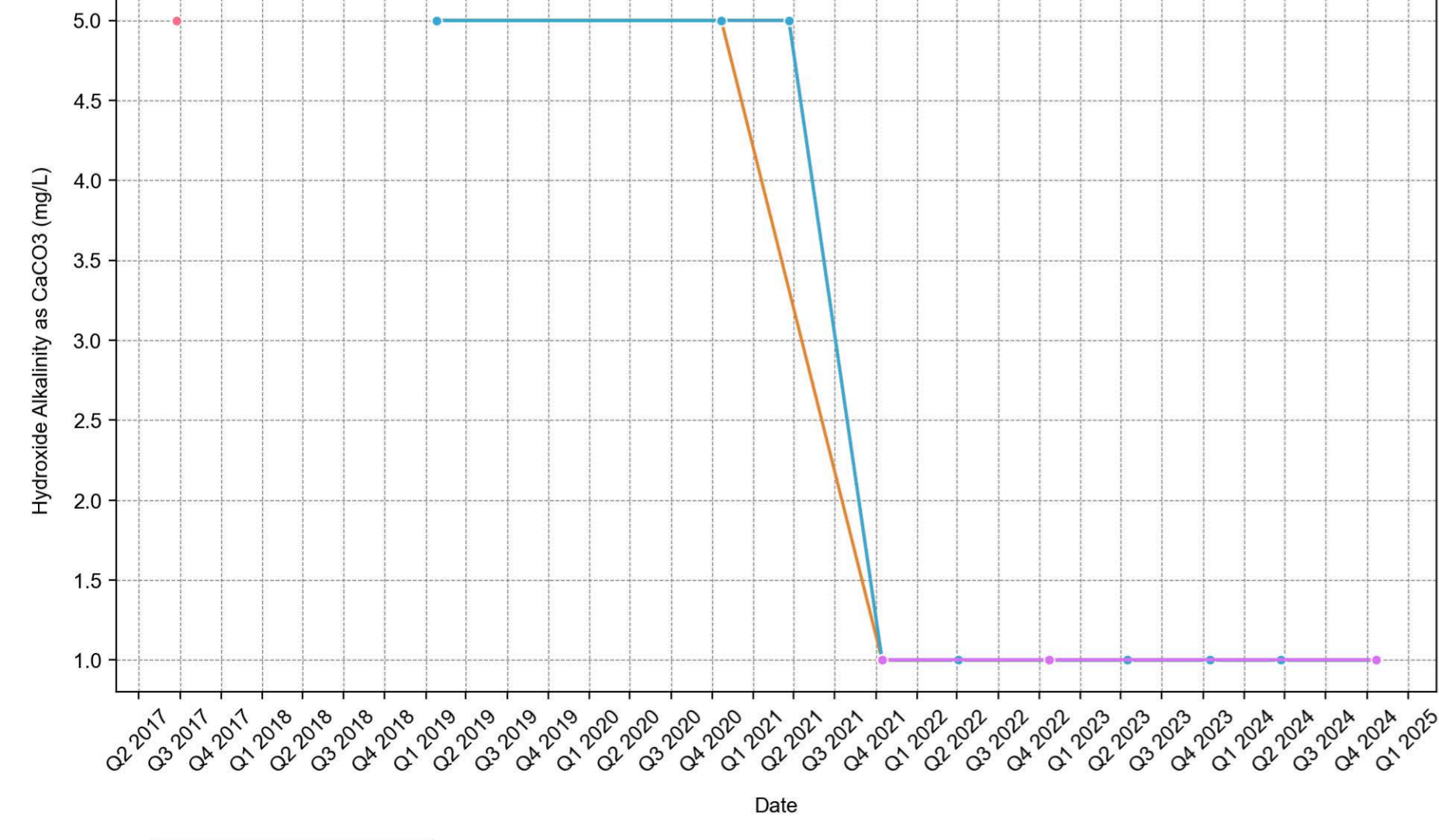
Fluoride



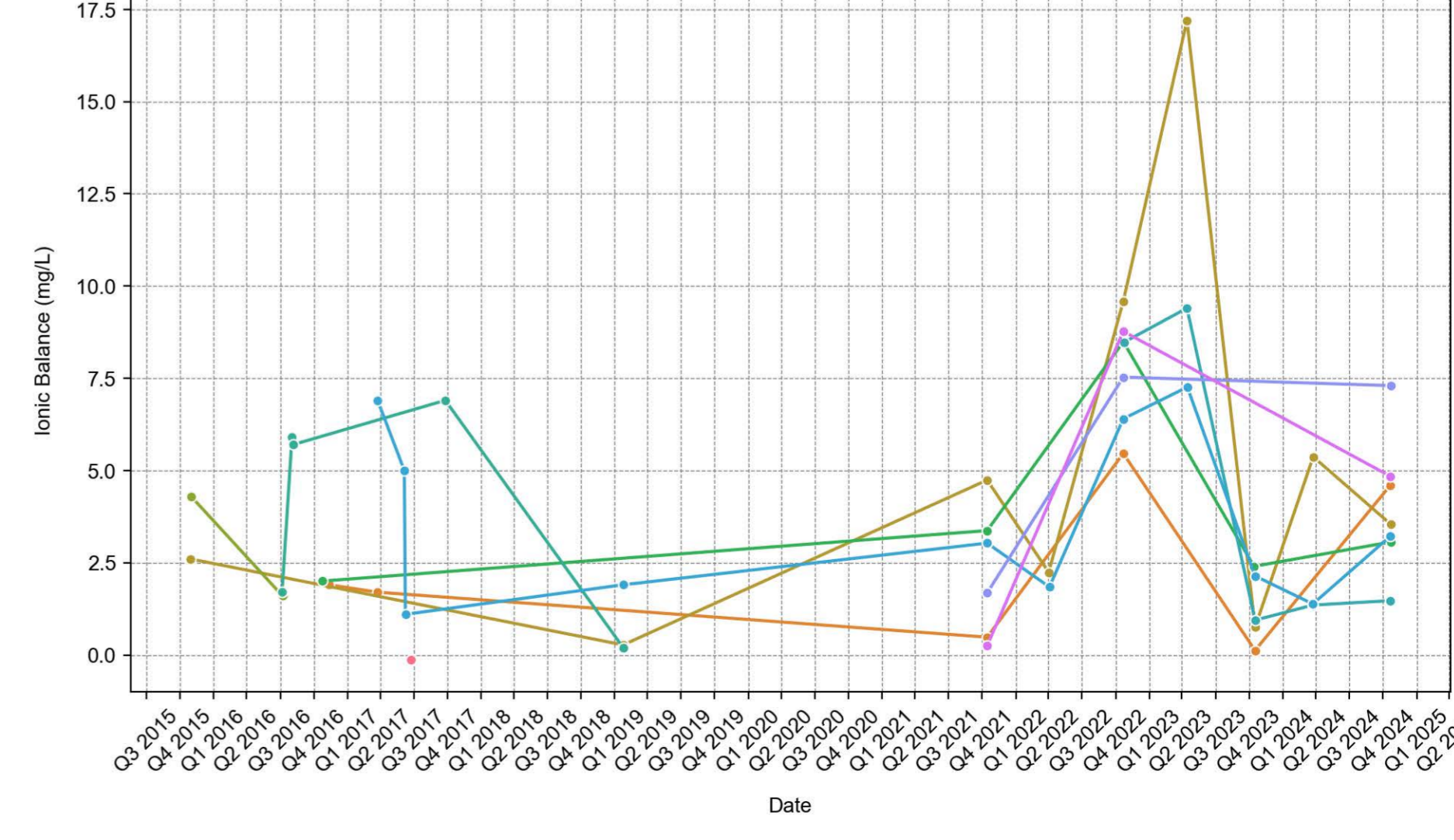
Hexavalent Chromium



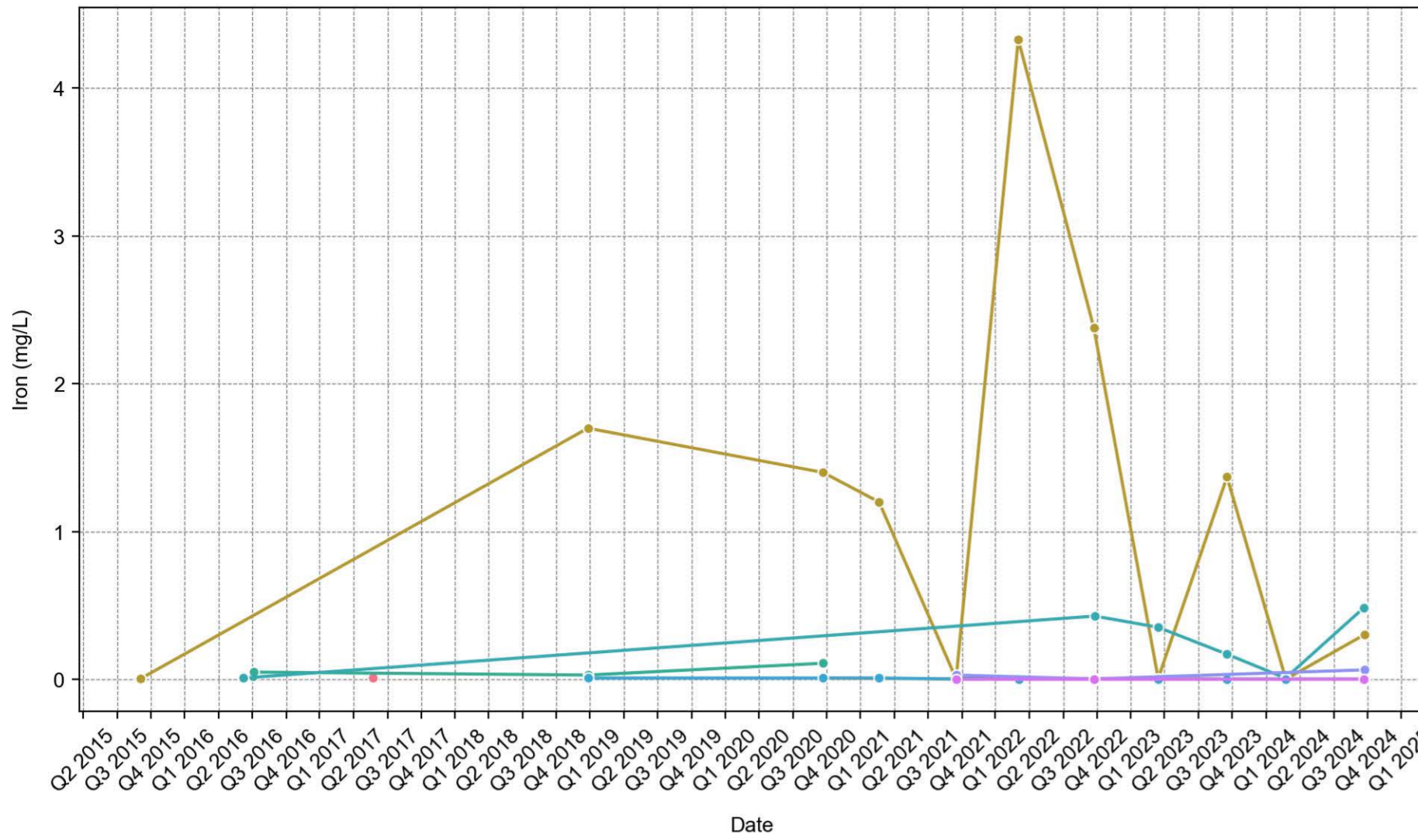
Hydroxide Alkalinity as CaCO3



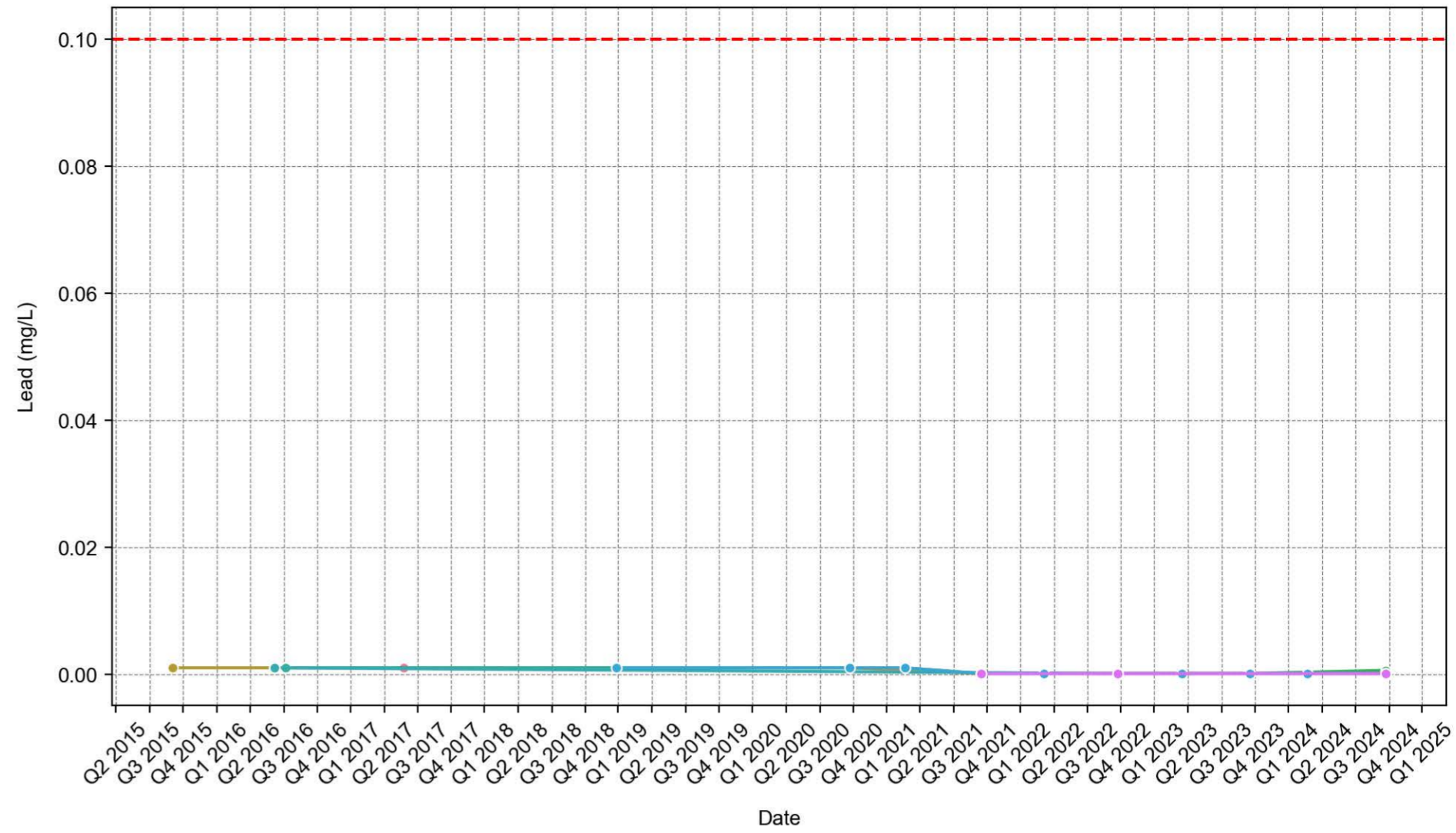
Ionic Balance



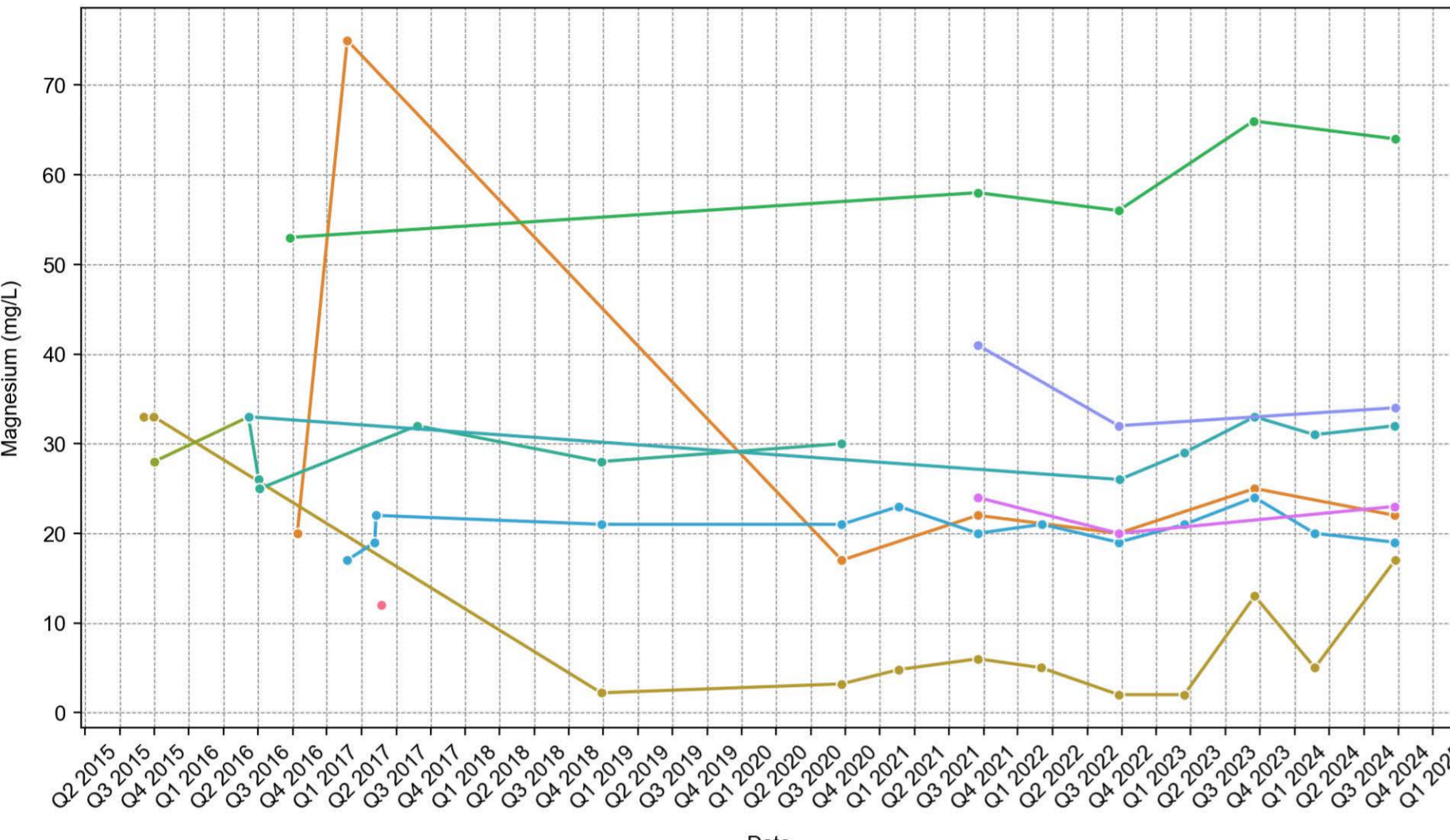
Iron



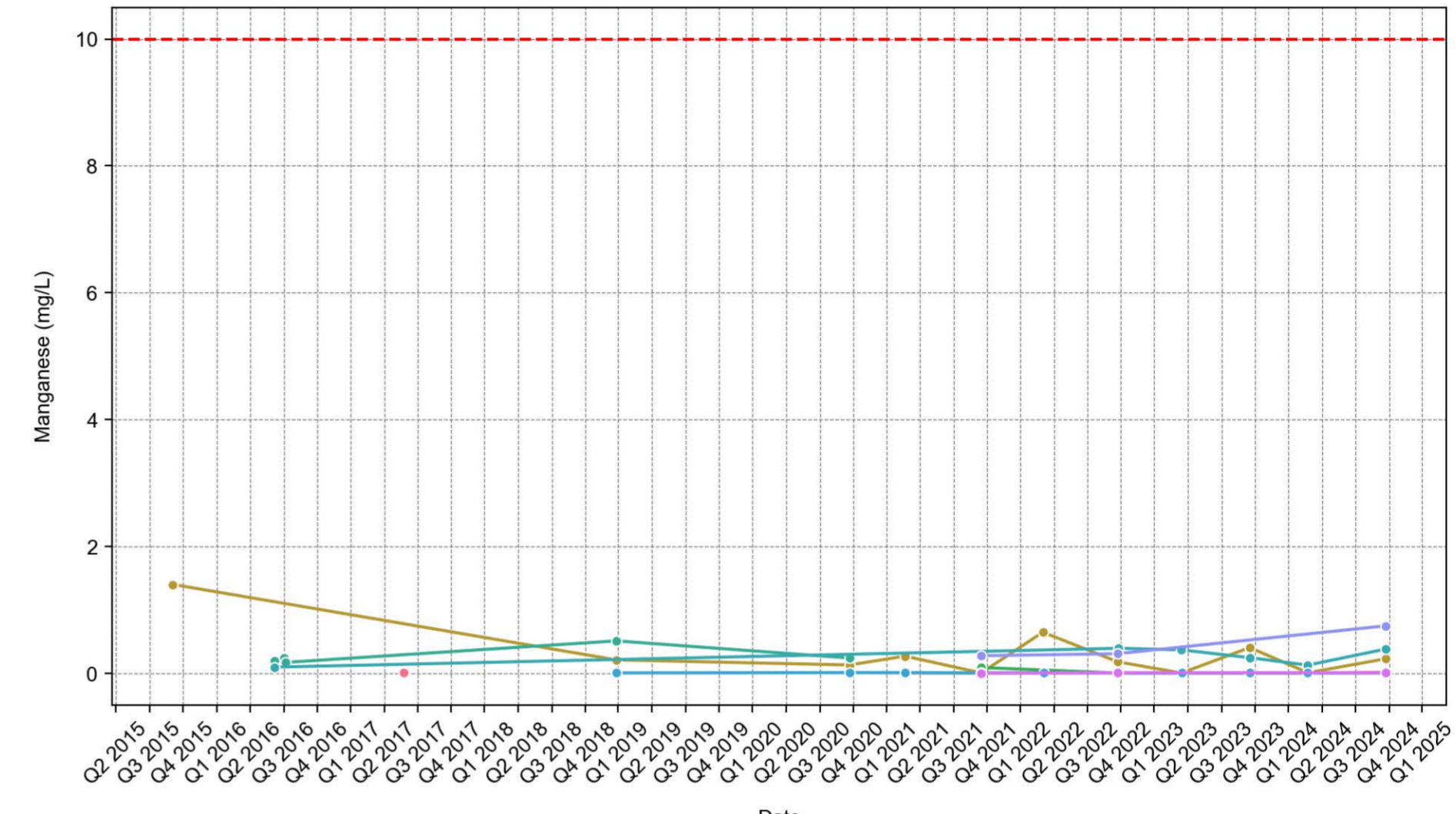
Lead



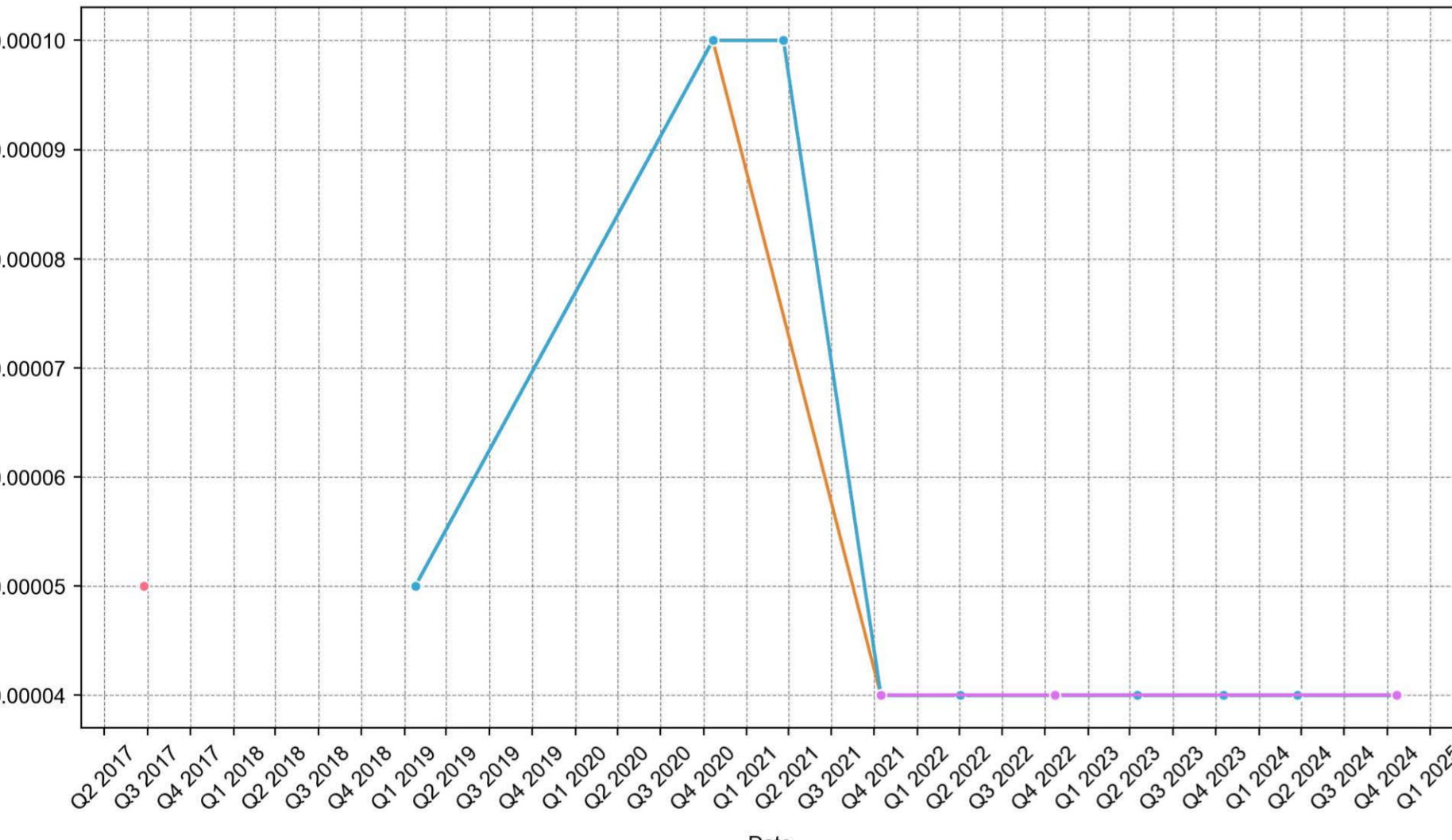
Magnesium



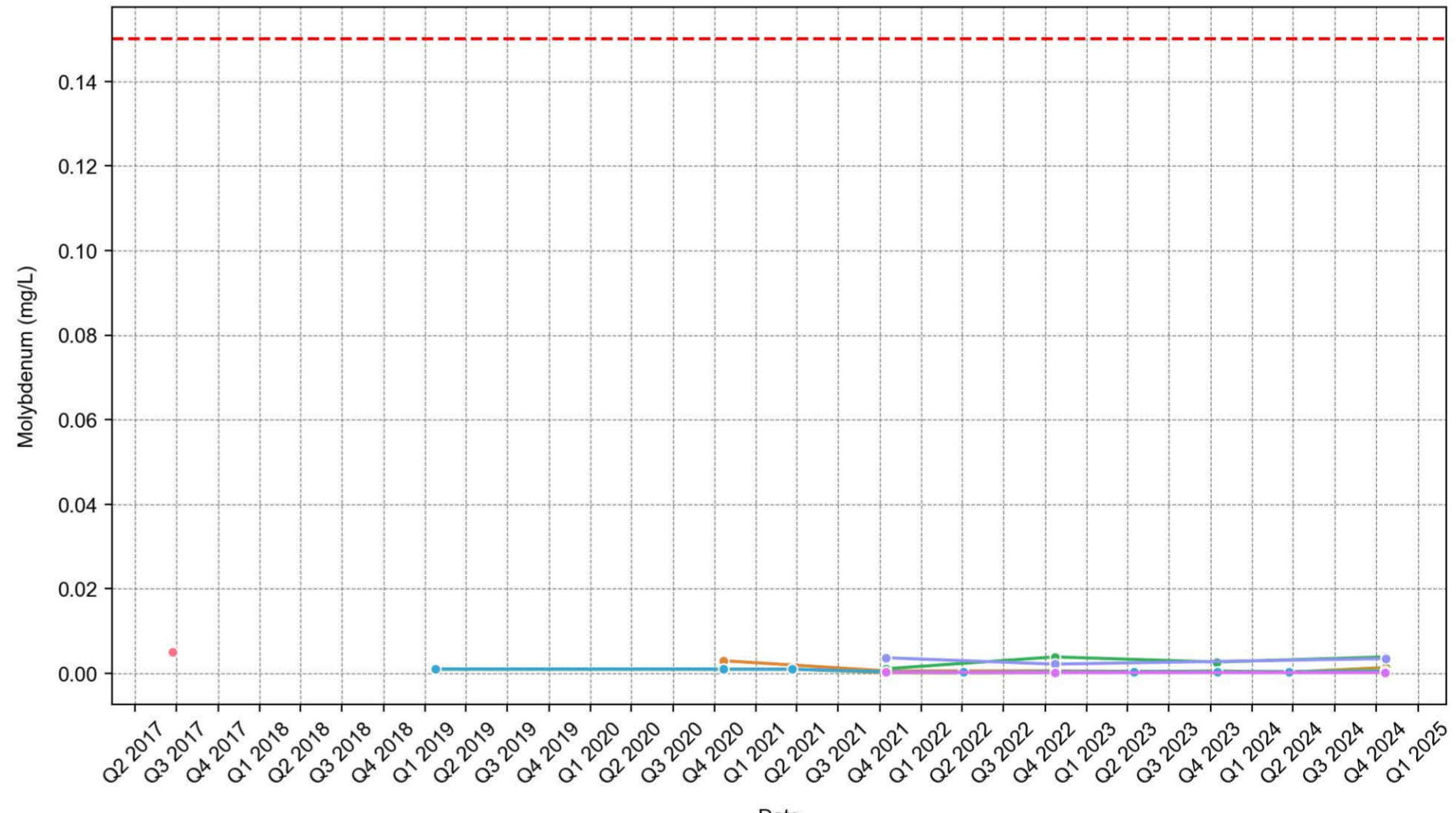
Manganese



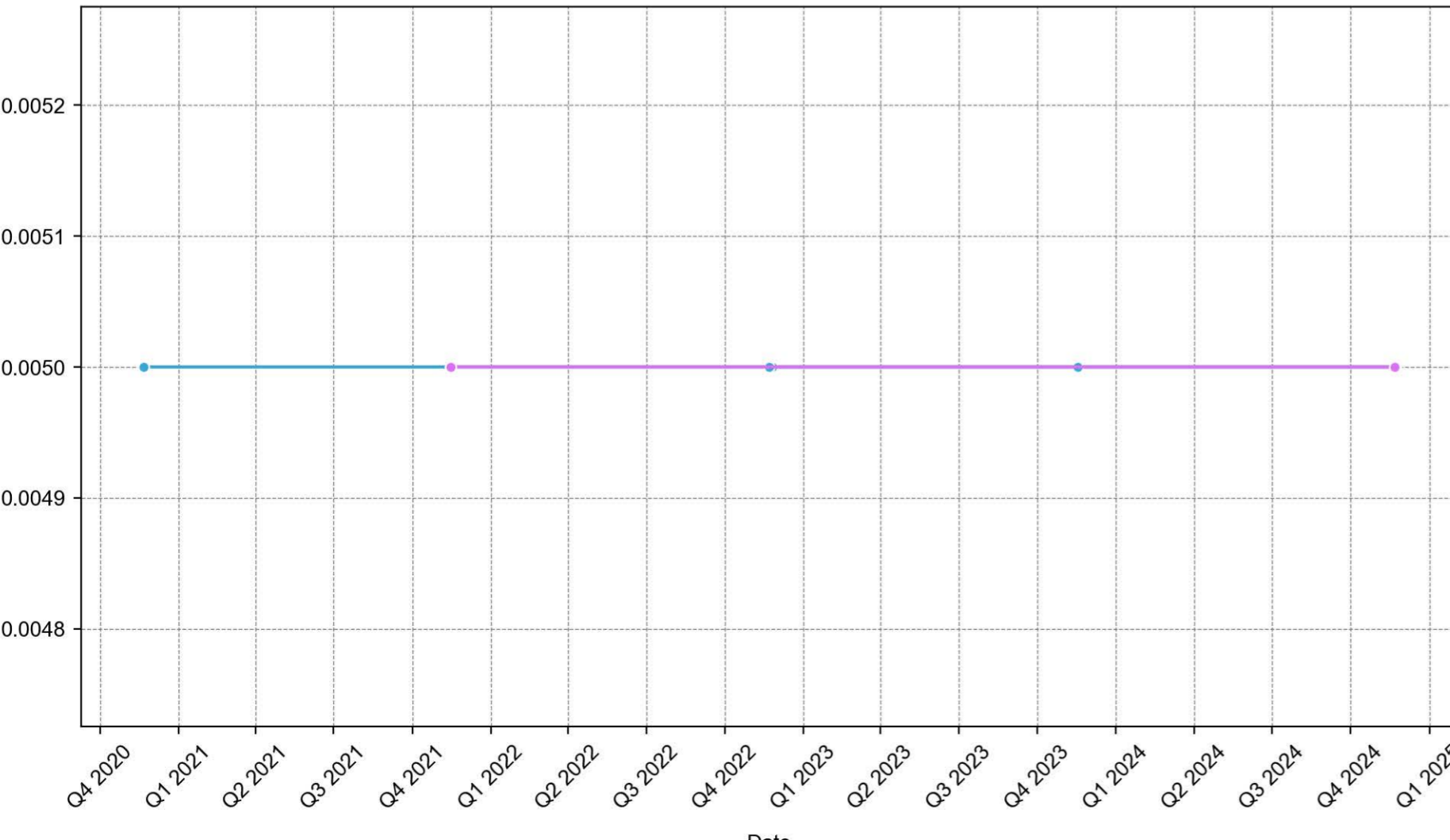
Mercury



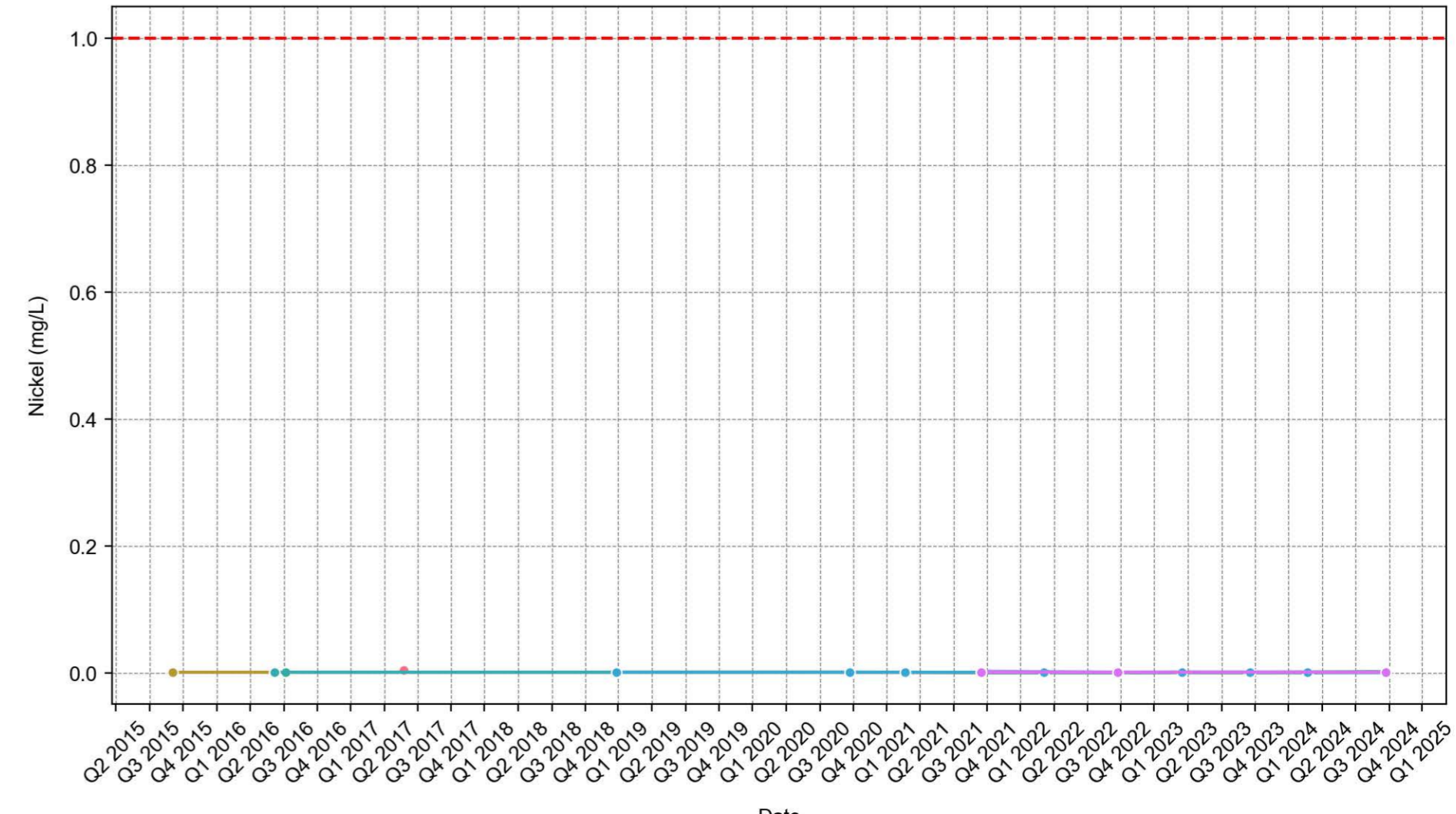
Molybdenum



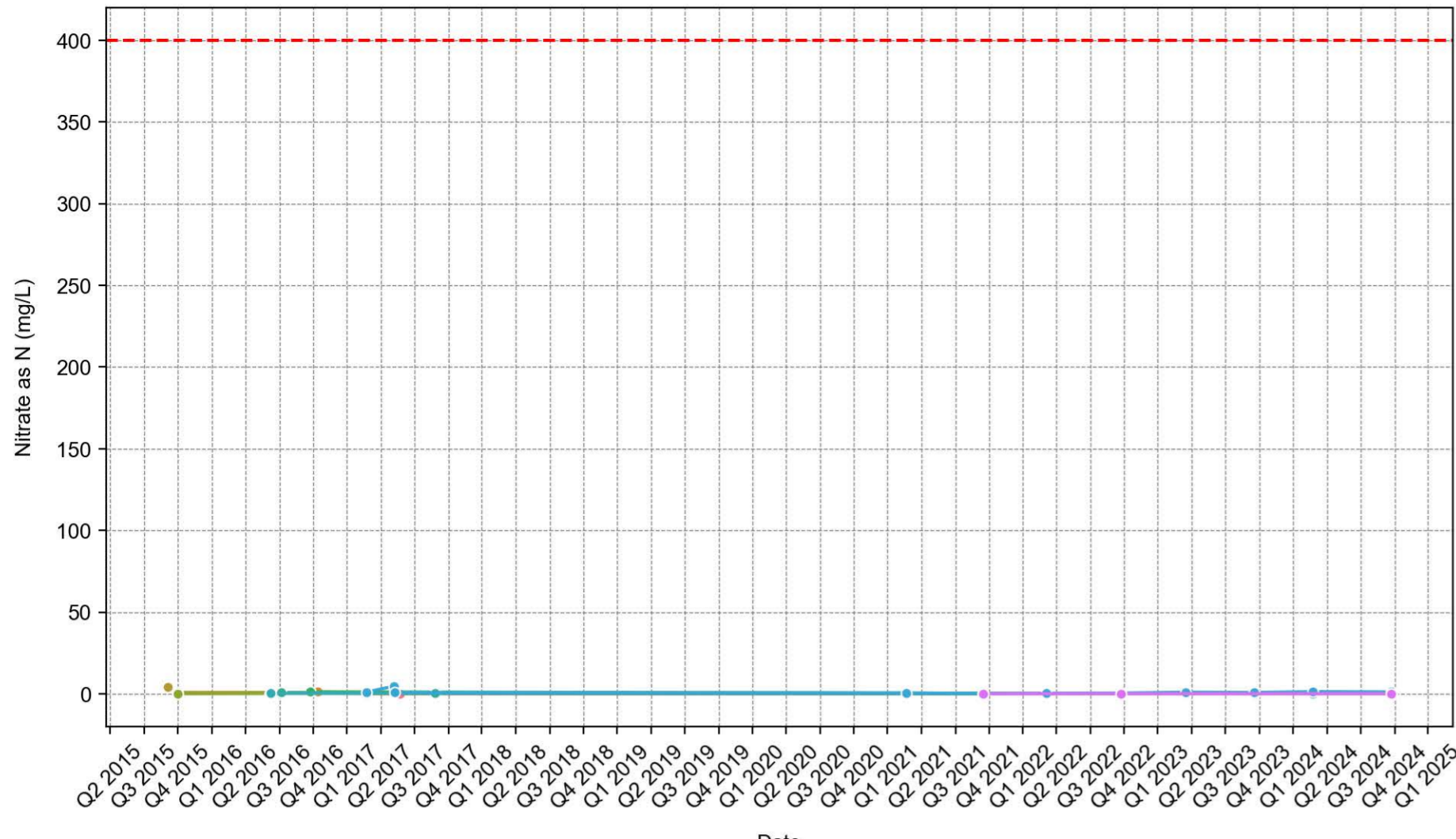
Naphthalene



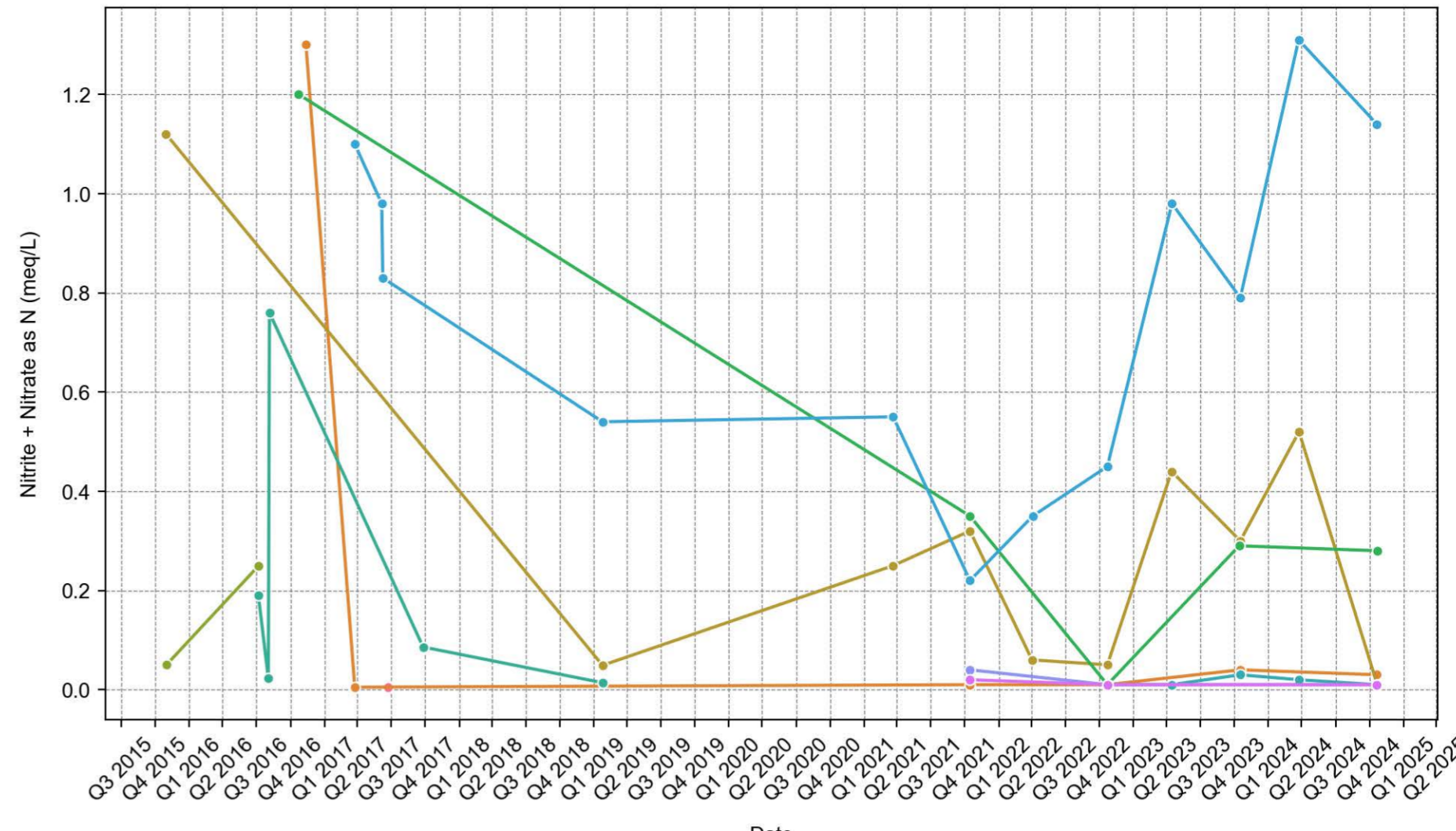
Nickel



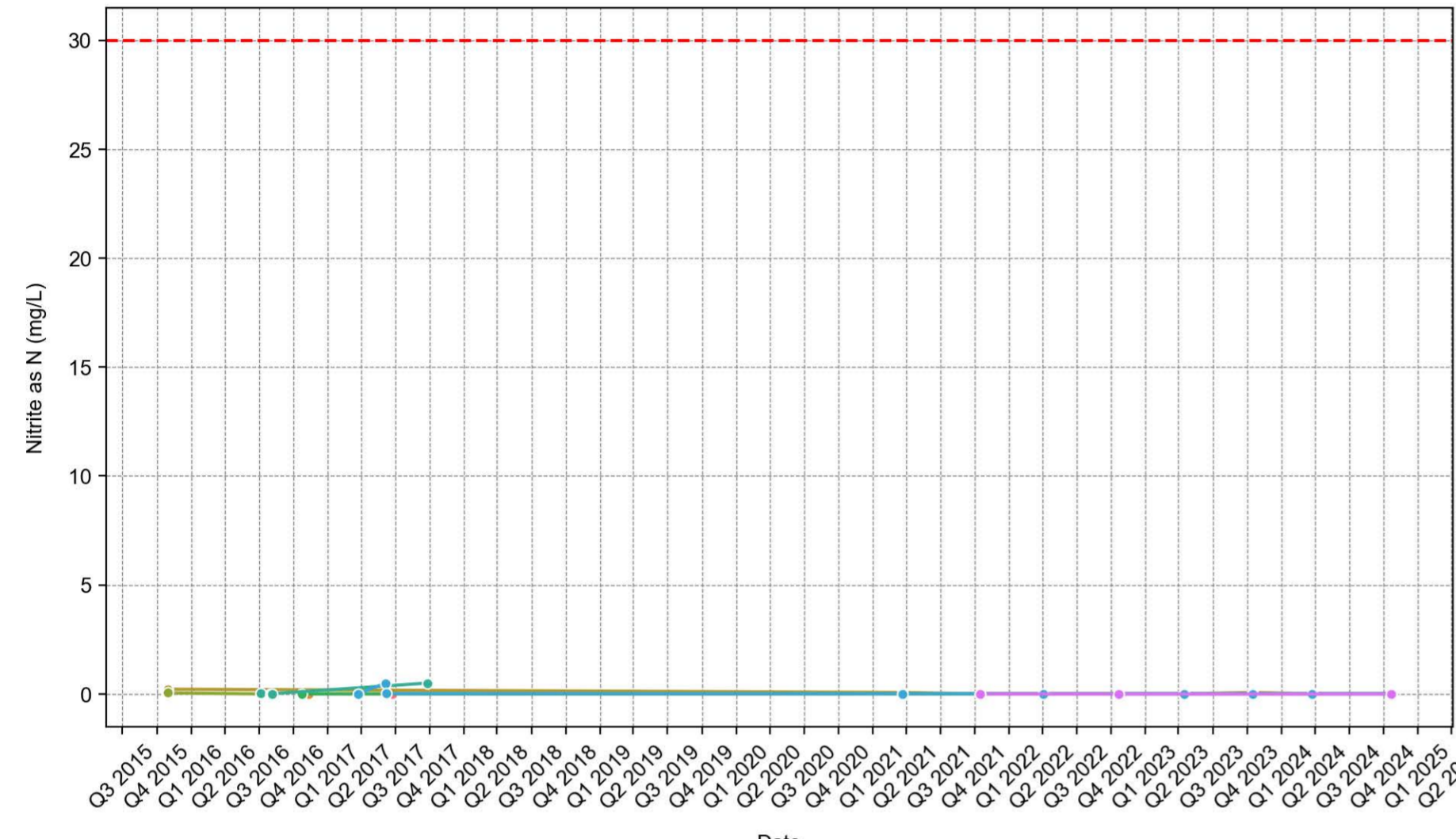
Nitrate as N



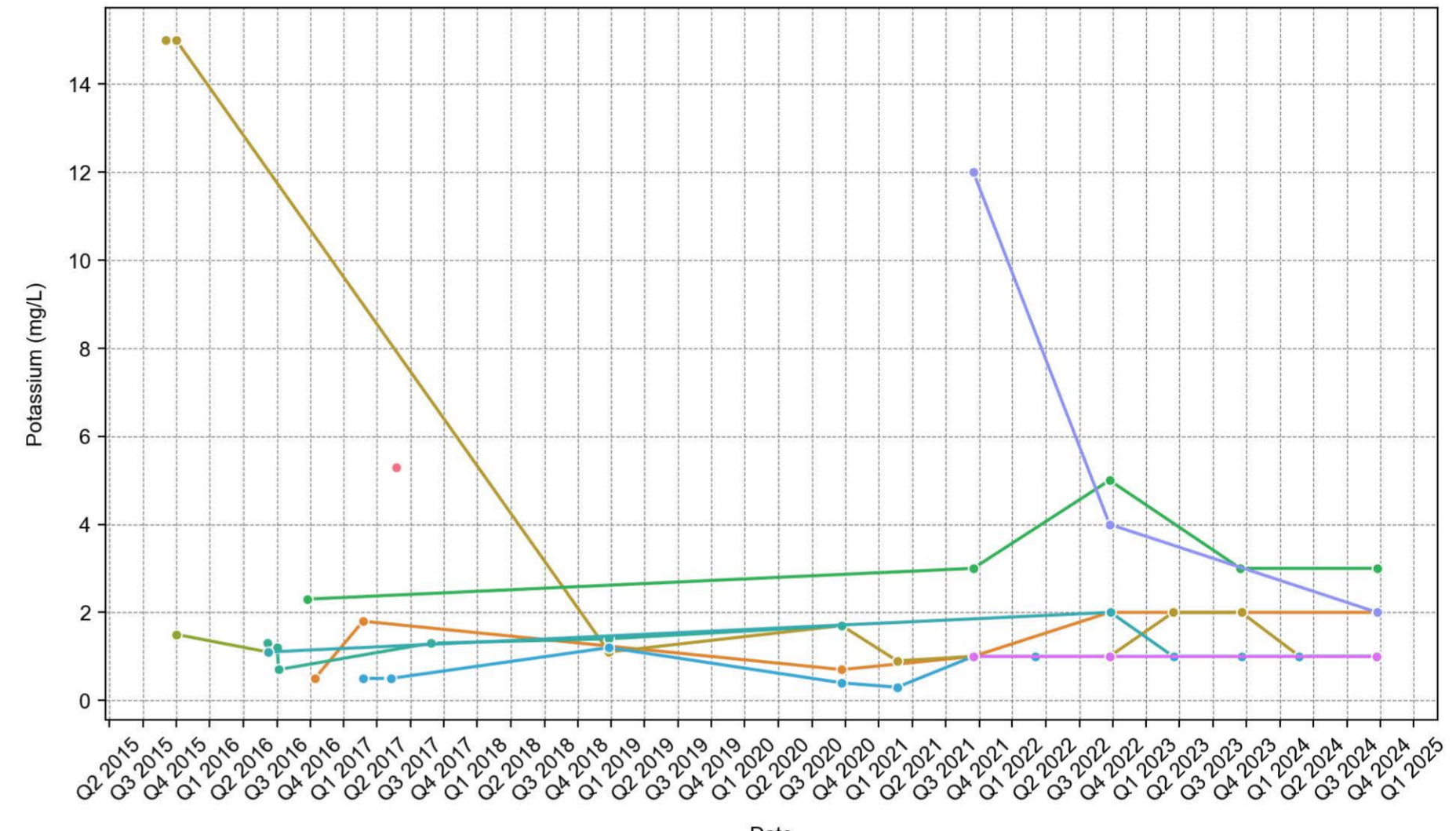
Nitrite + Nitrate as N



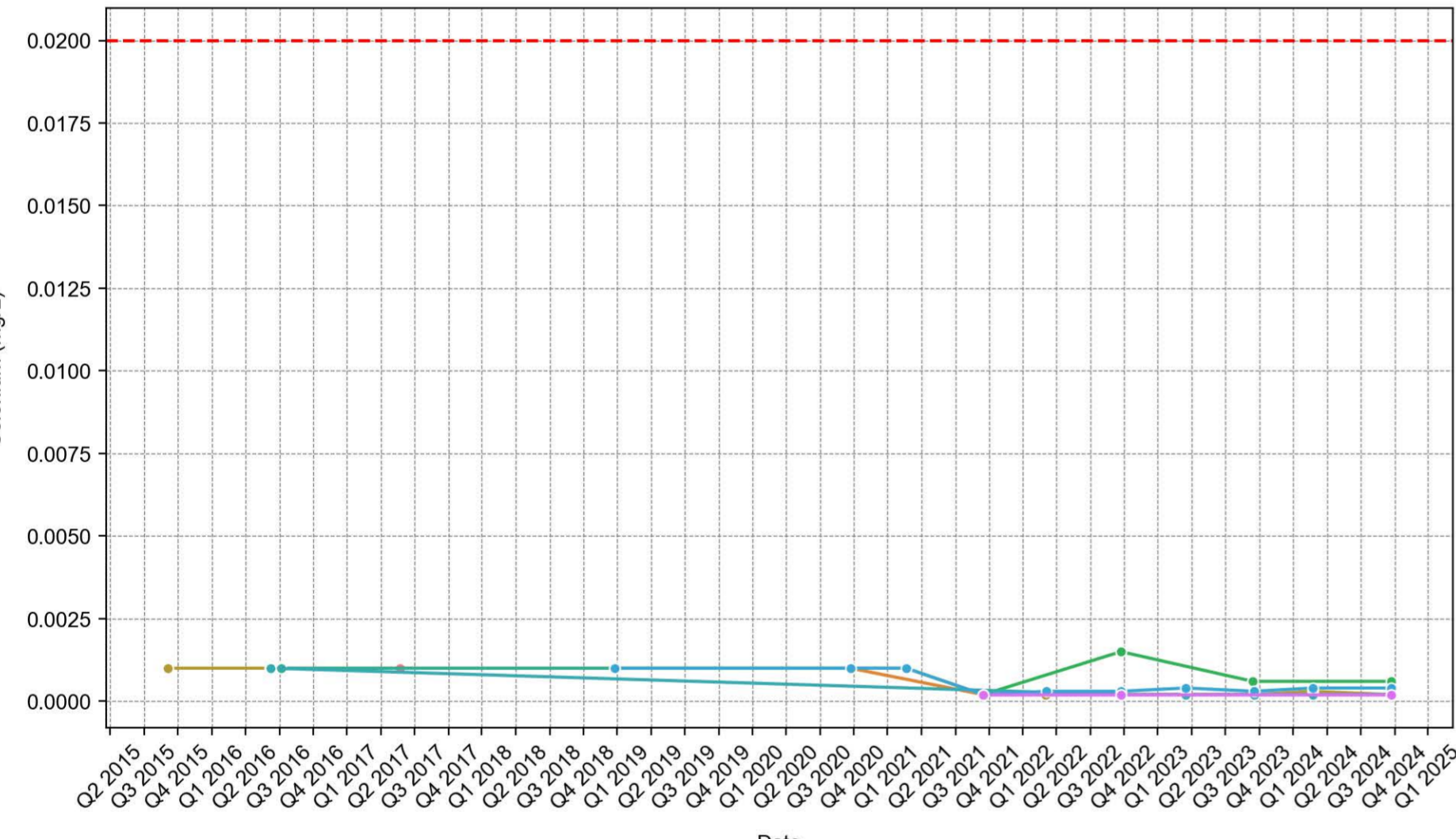
Nitrite as N



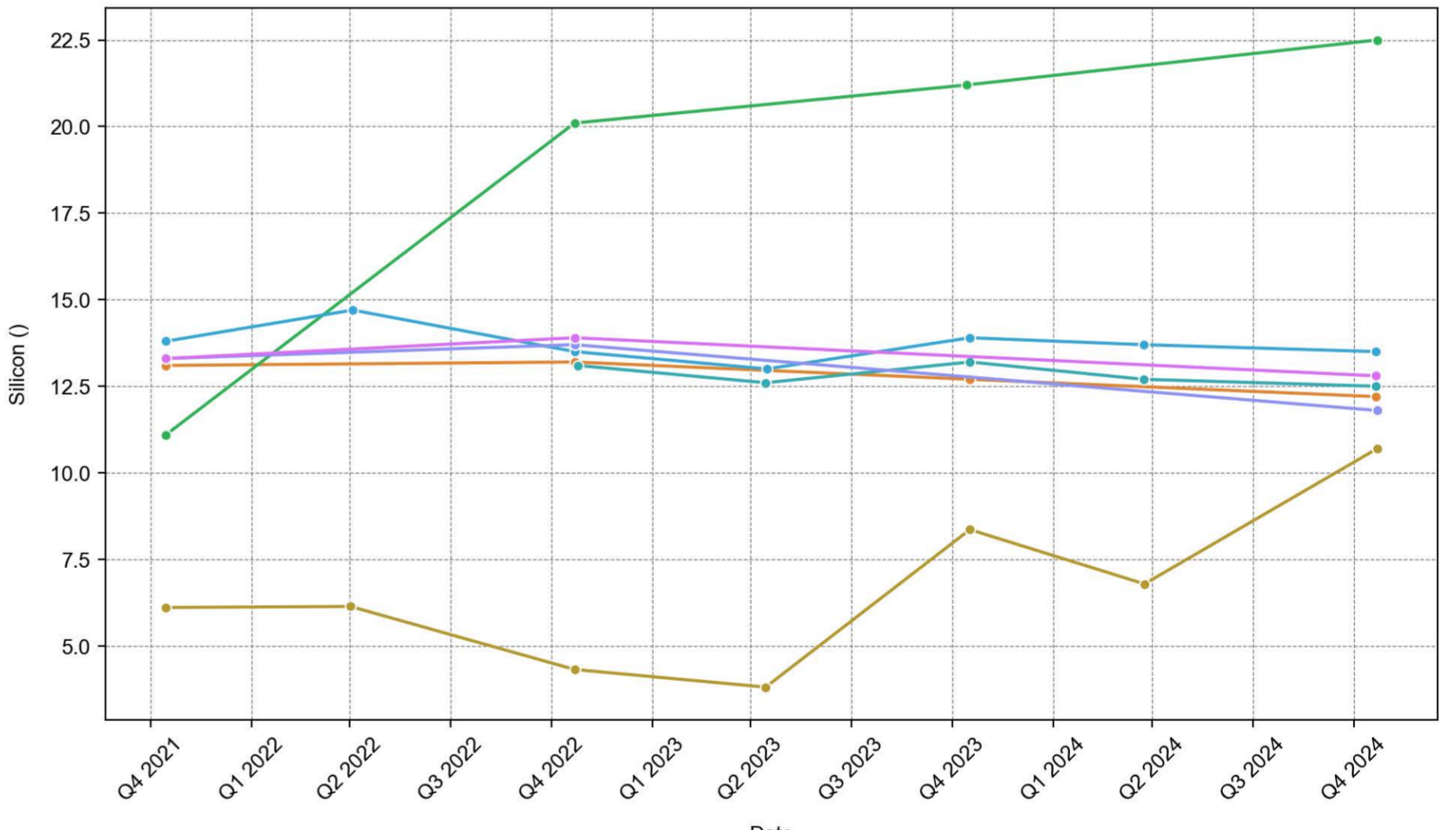
Potassium



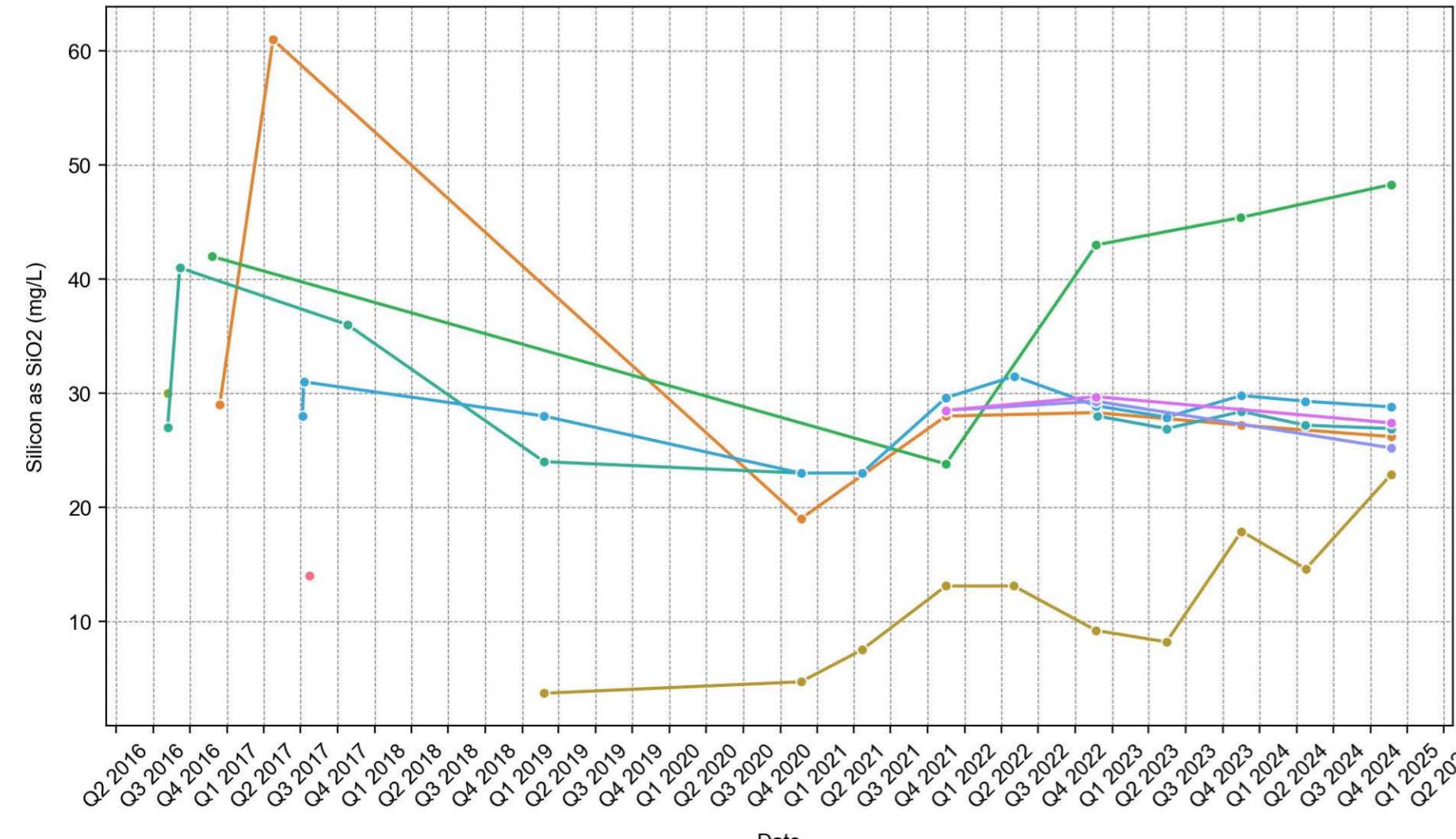
Selenium



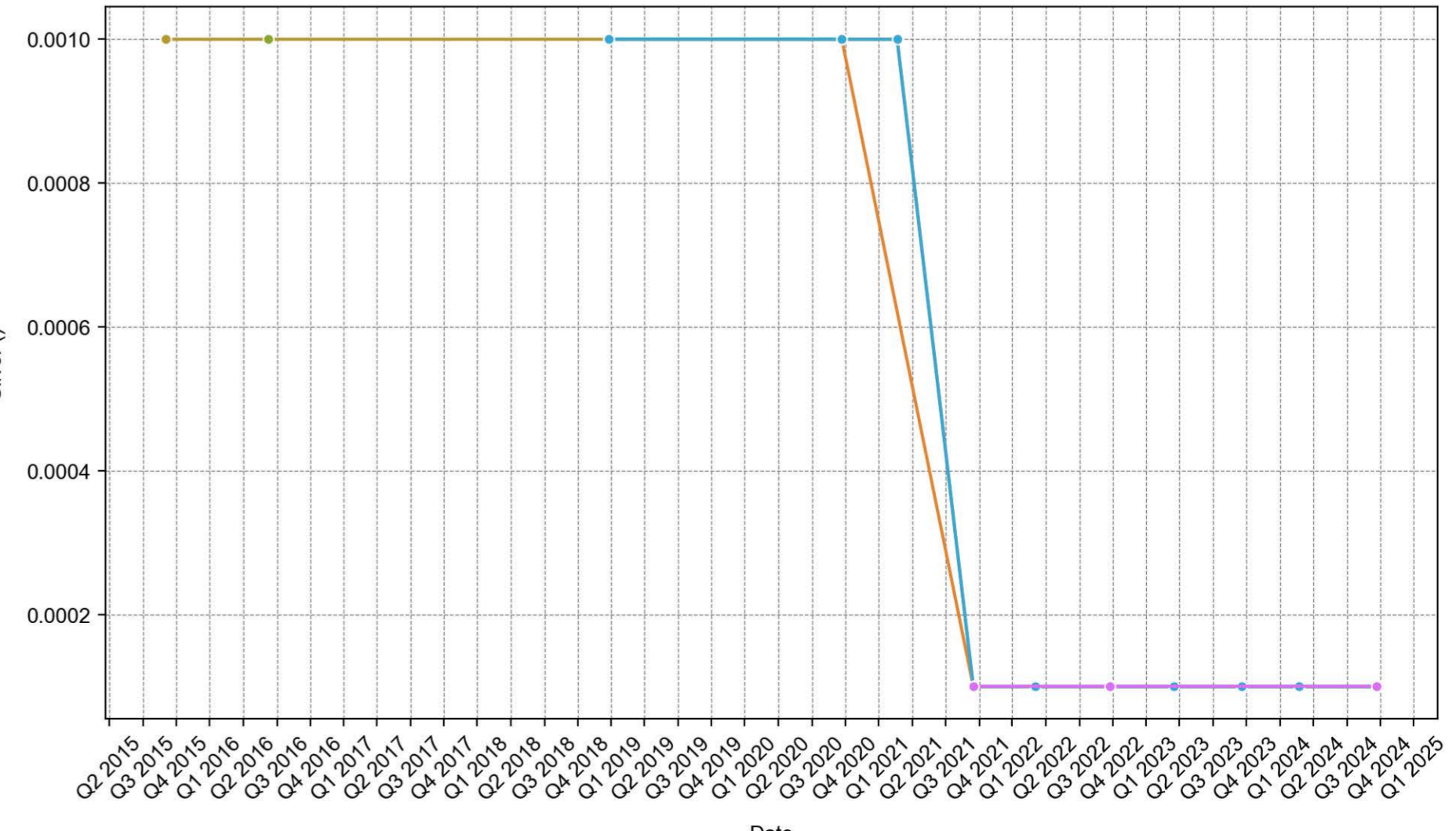
Silicon



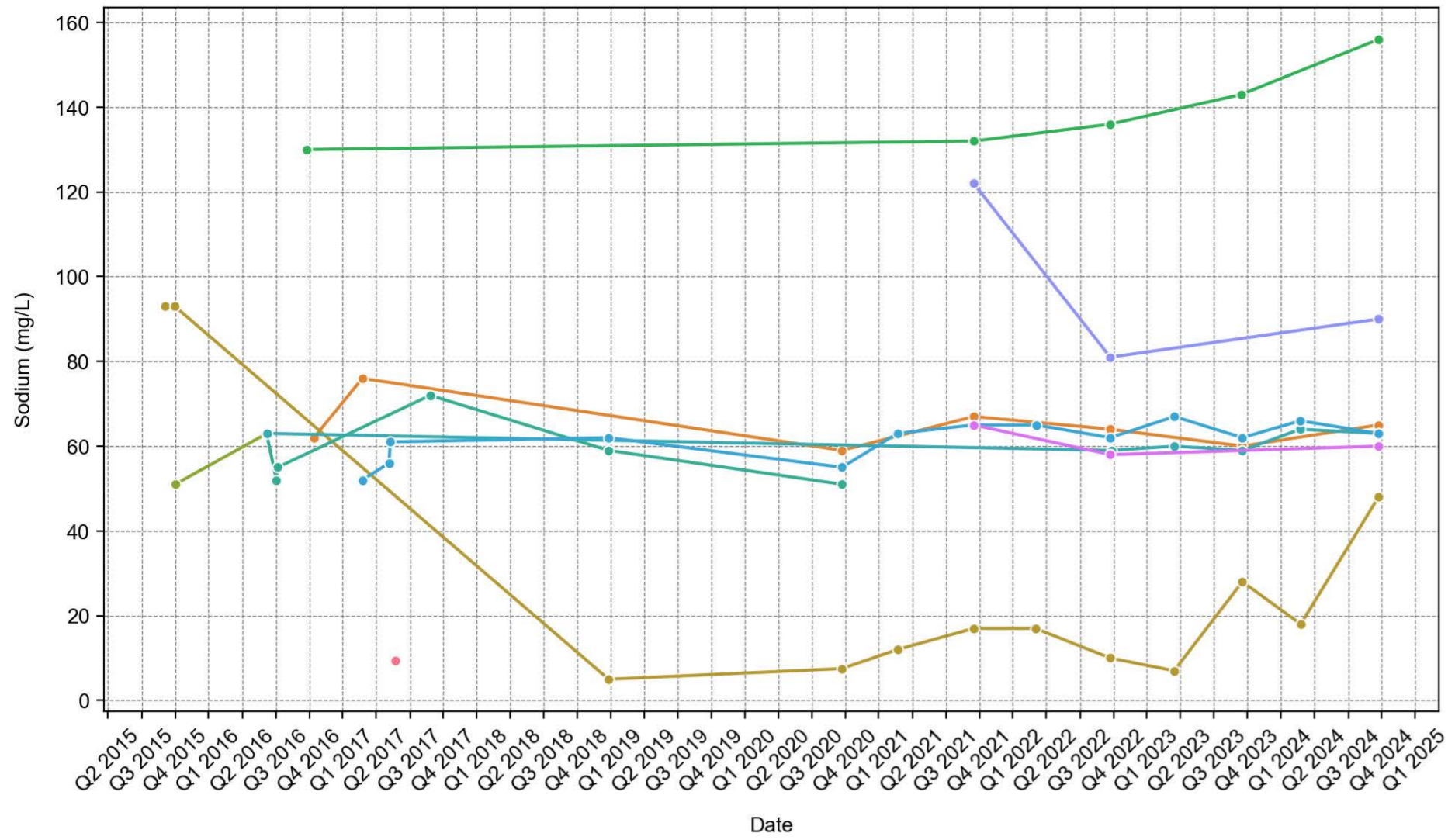
Silicon as SiO2



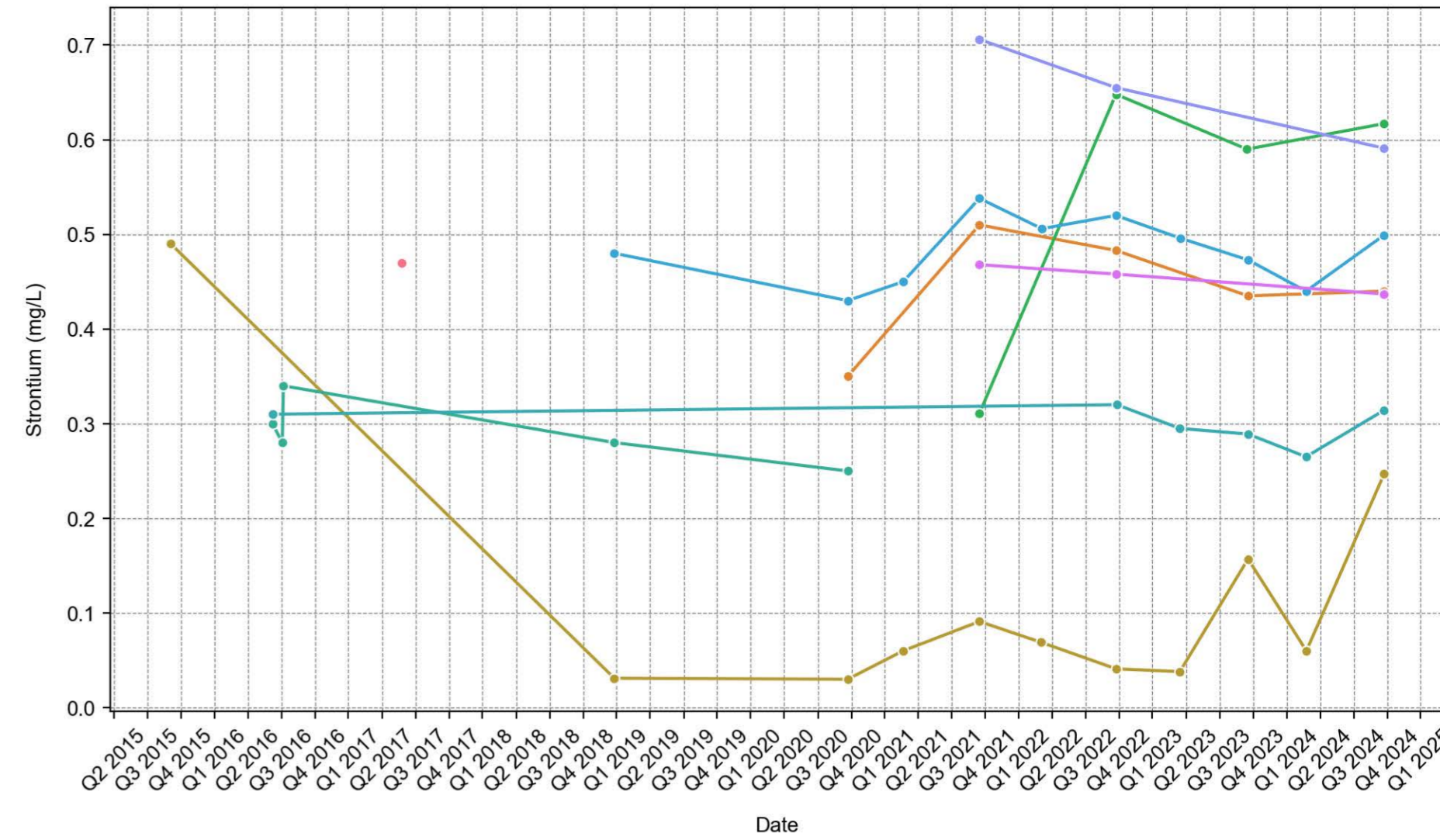
Silver



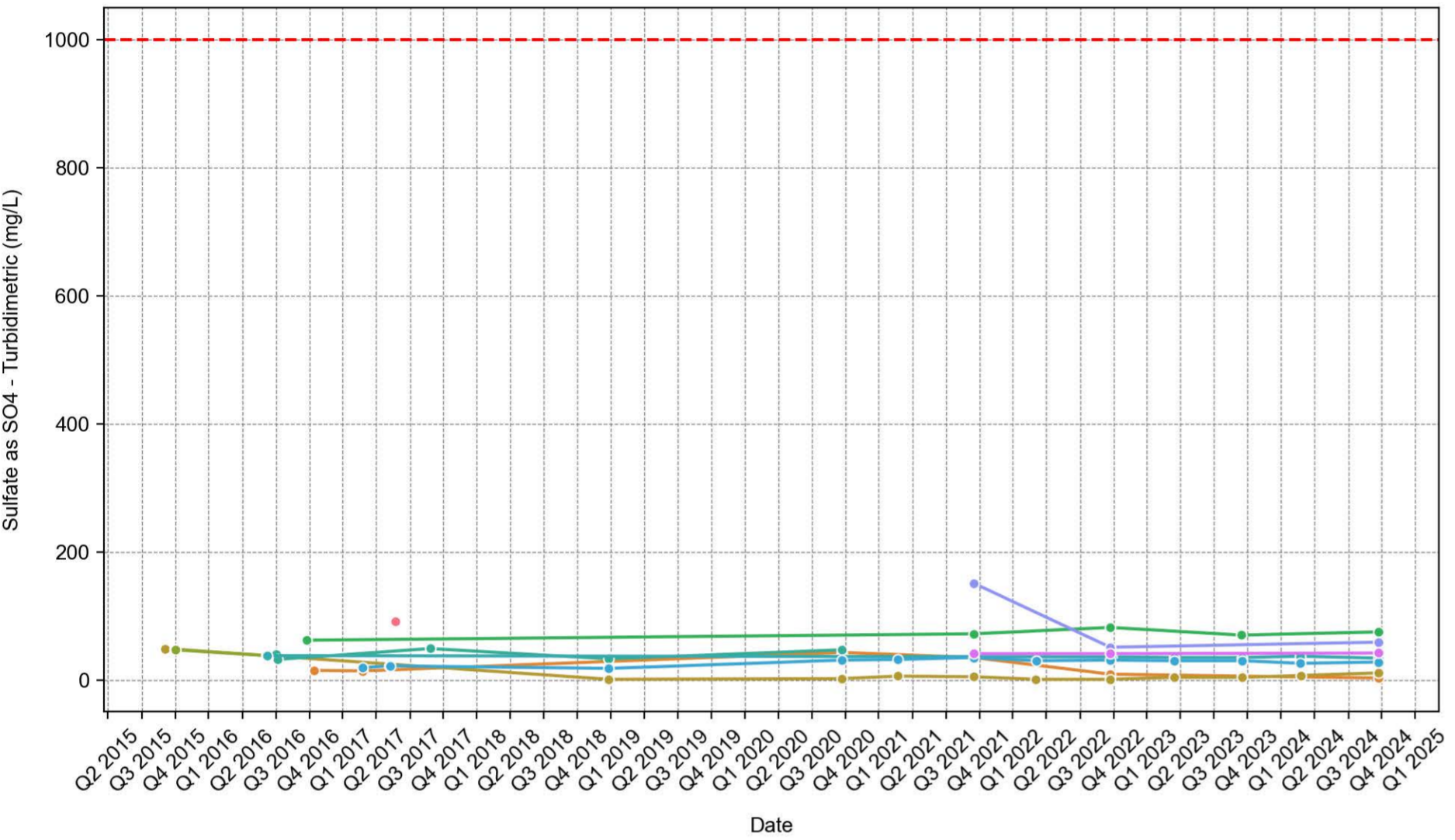
Sodium



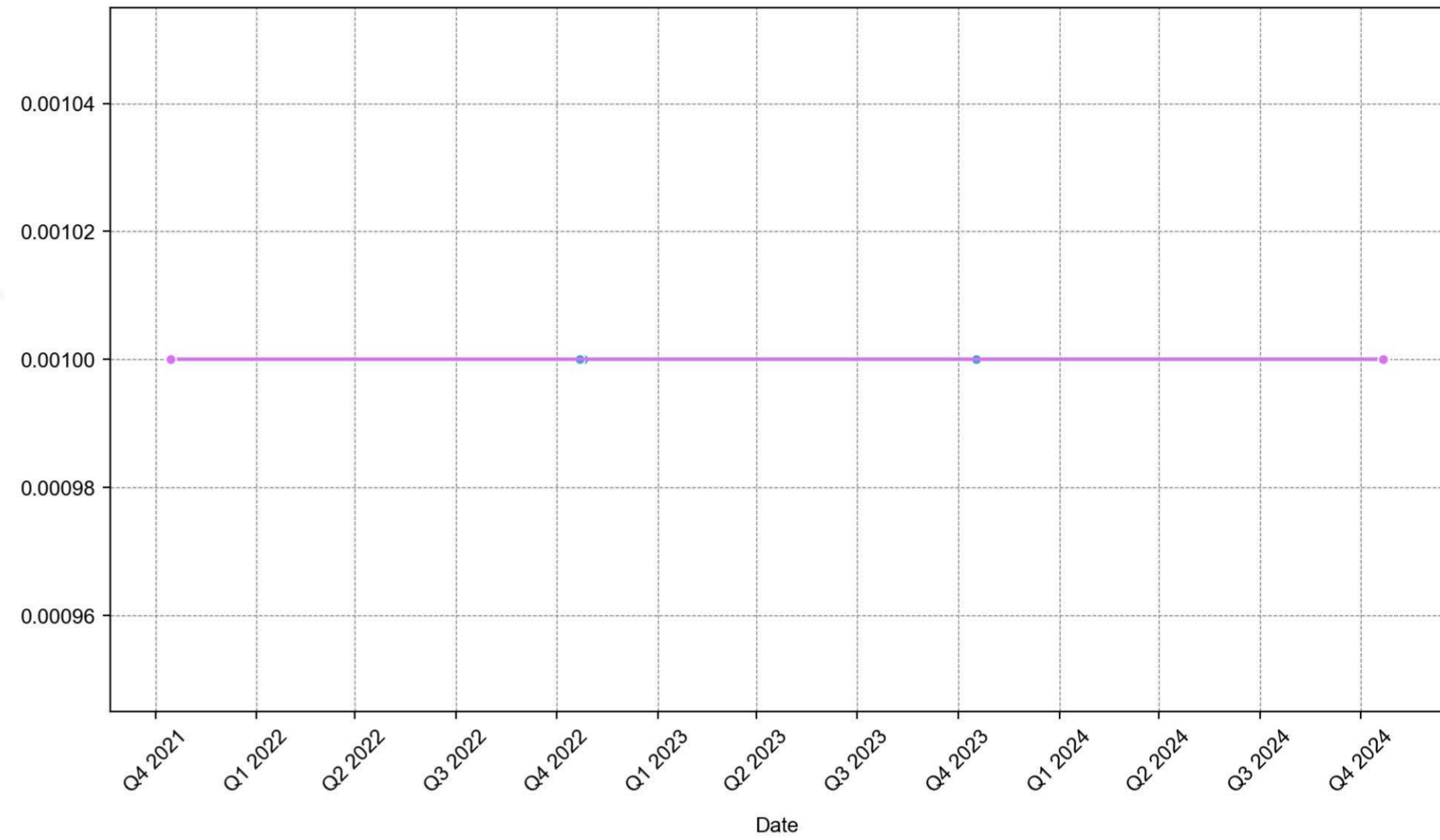
Strontium



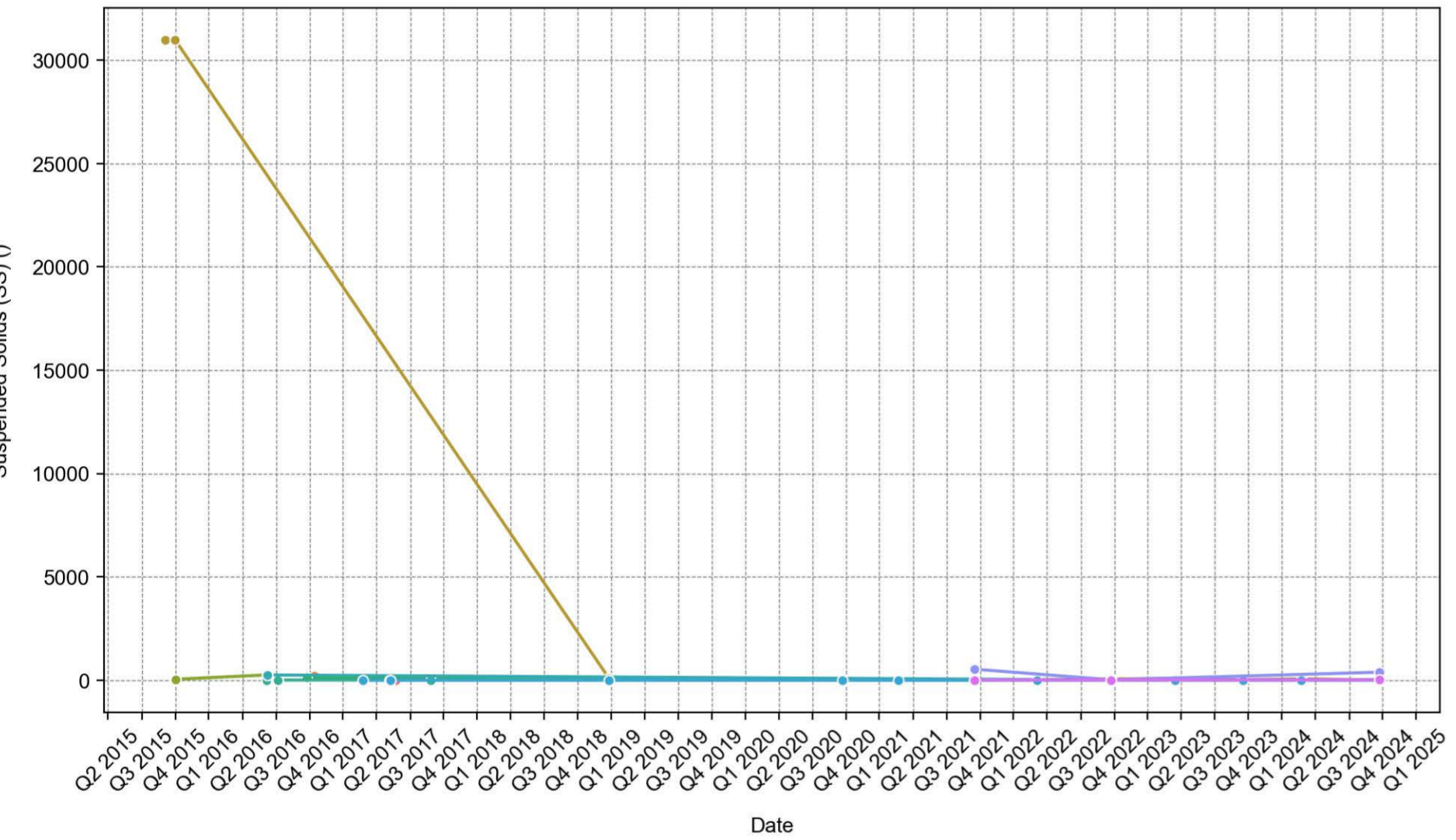
Sulfate as SO4 - Turbidimetric



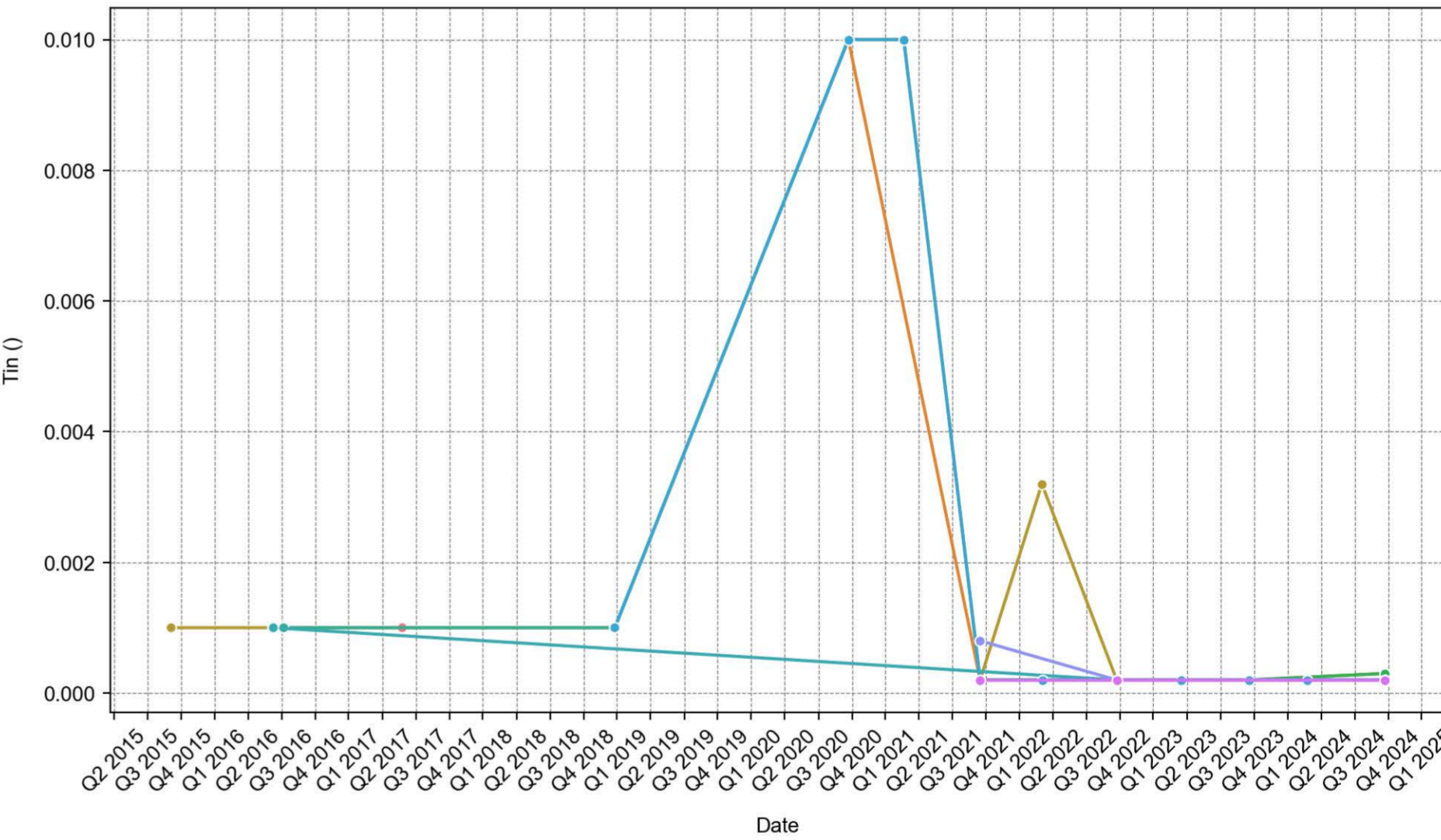
Sum of BTEX



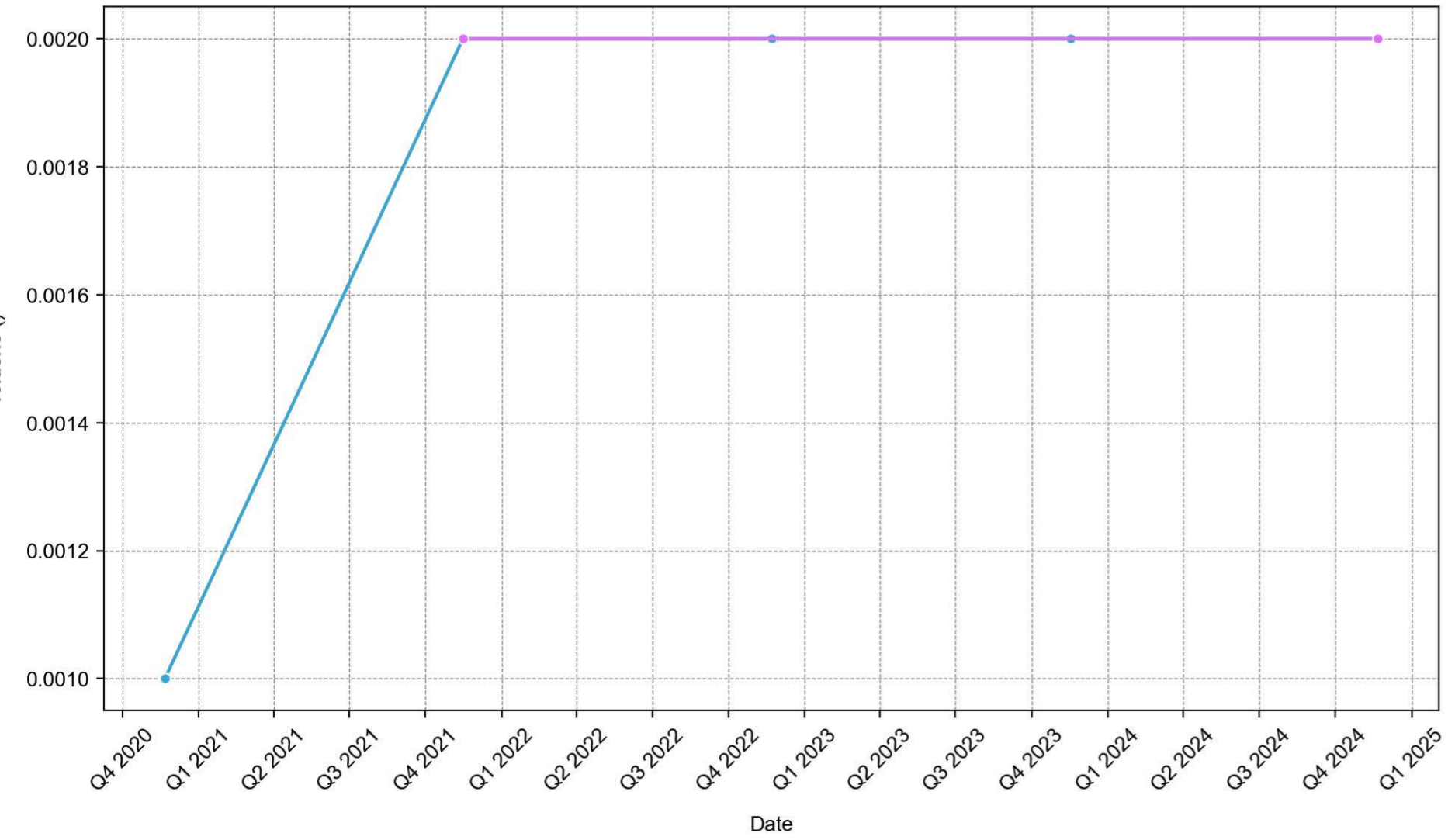
Suspended Solids (SS)



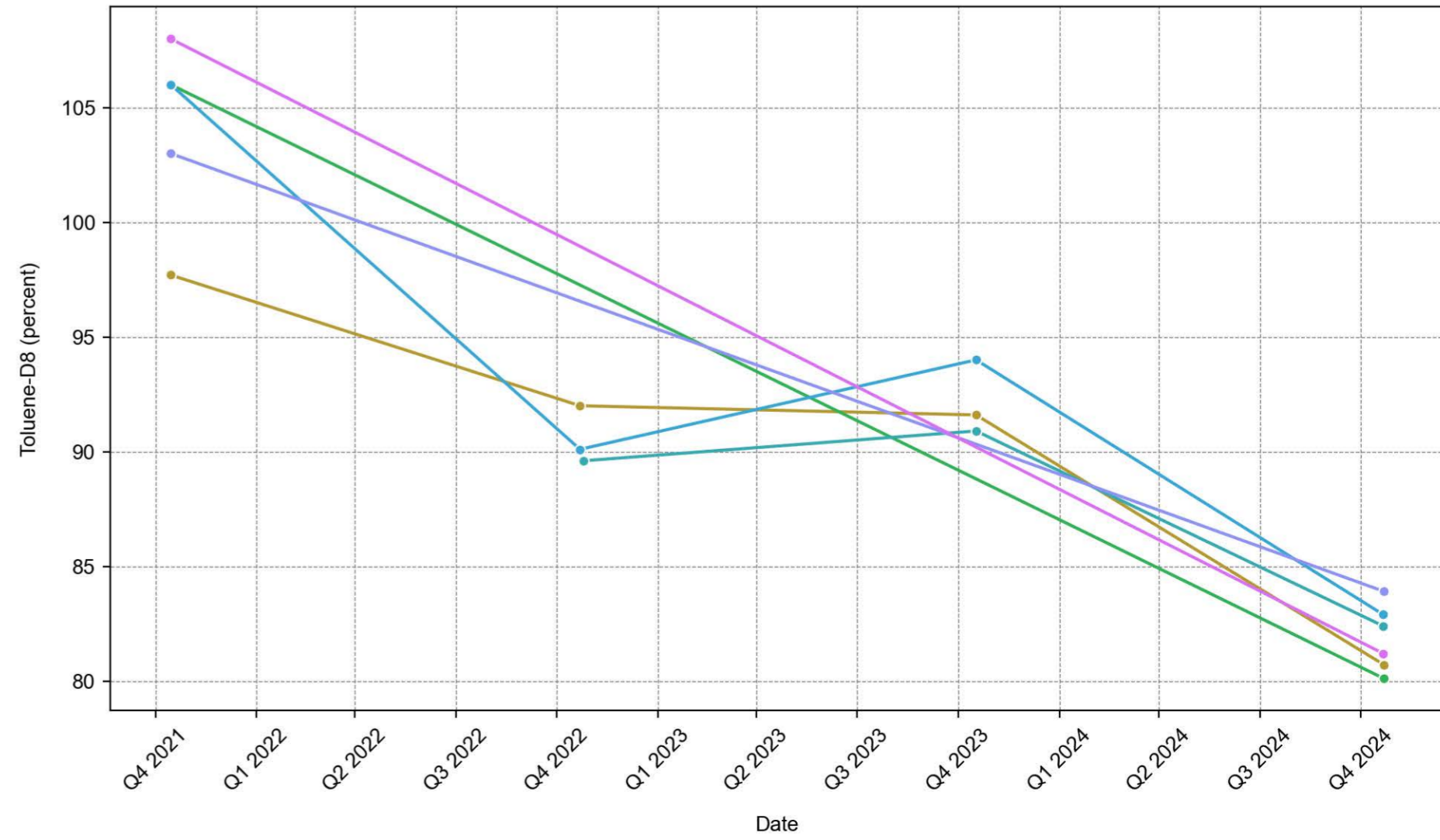
Tin



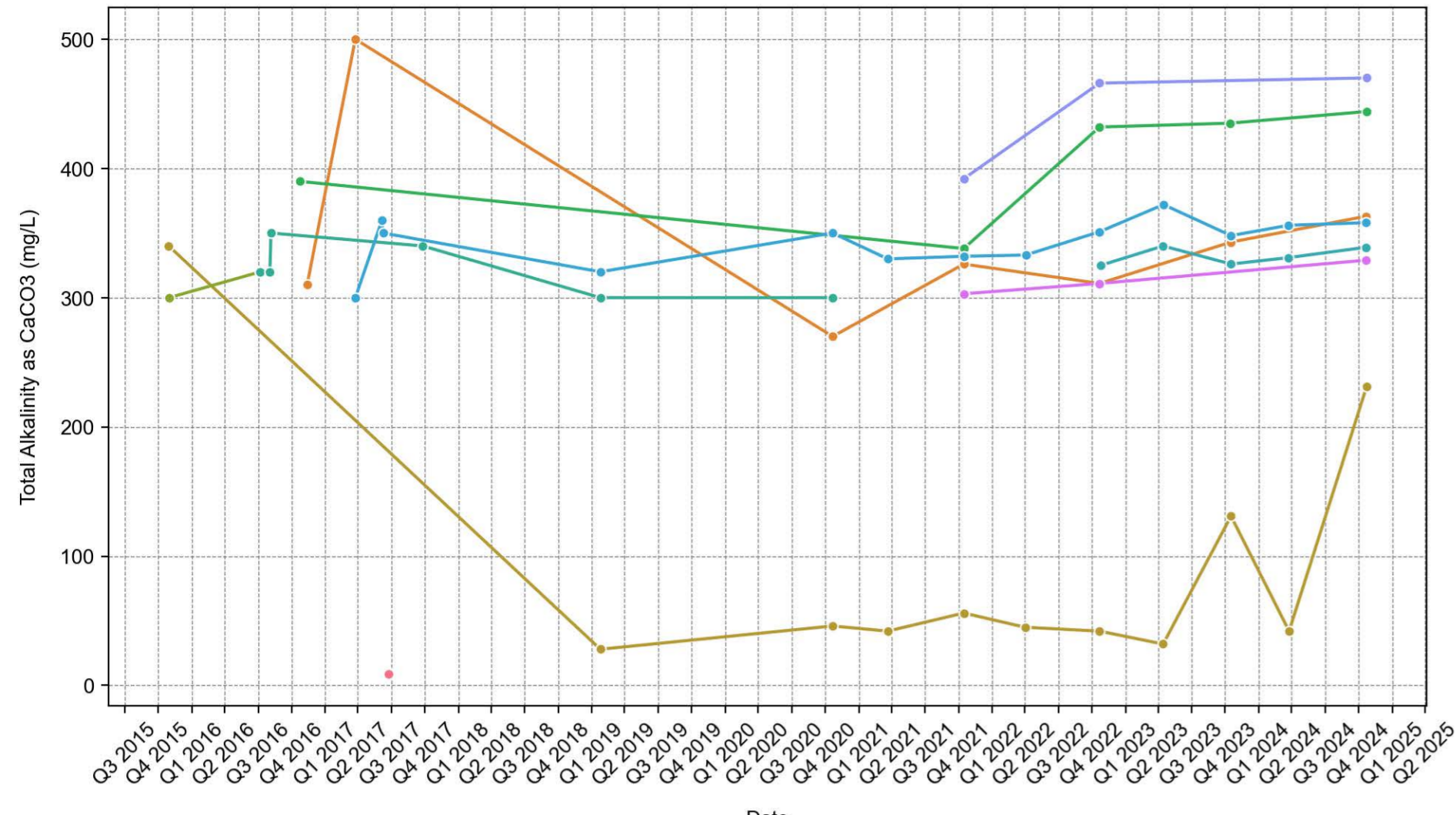
Toluene



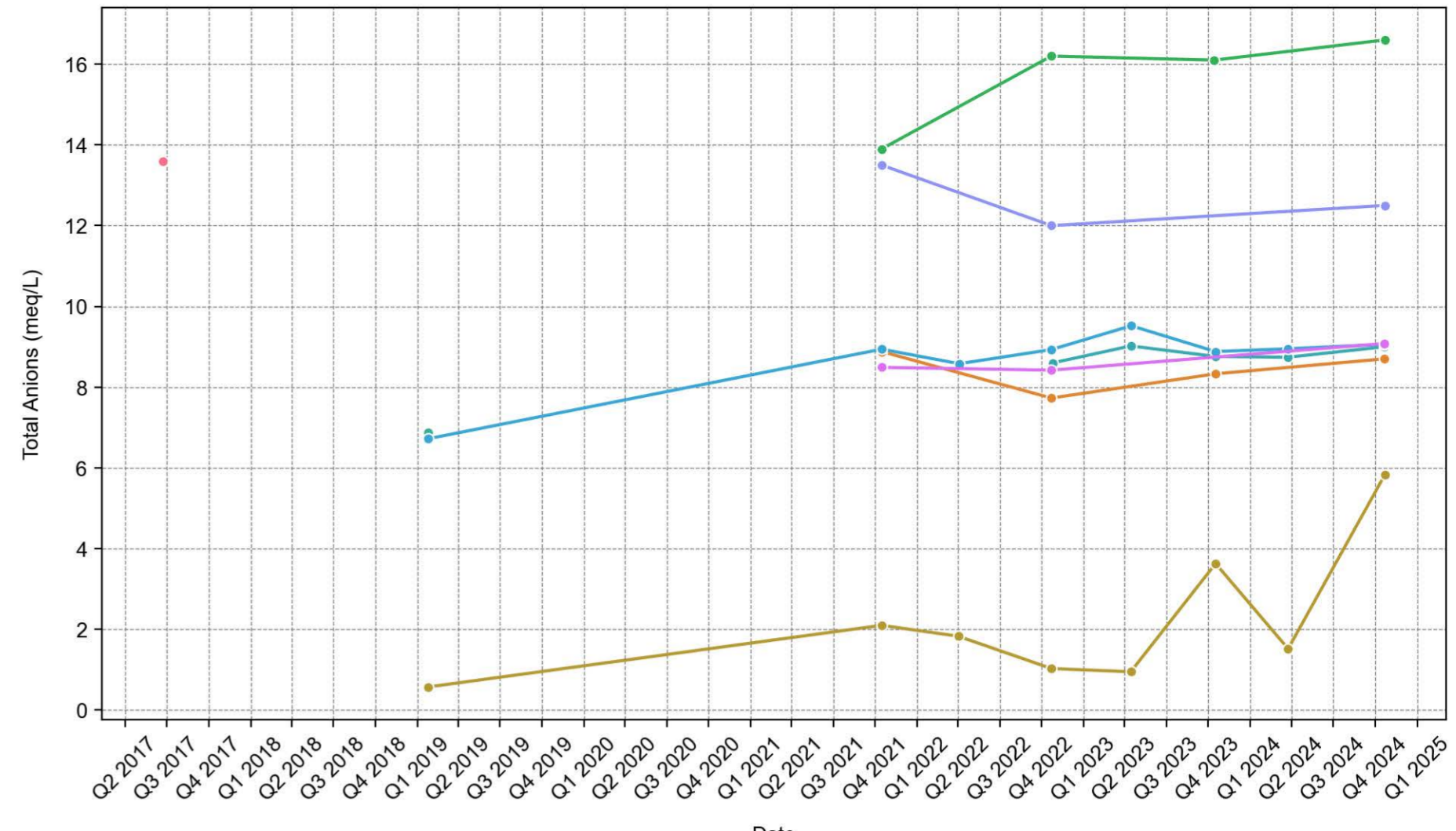
Toluene-D8



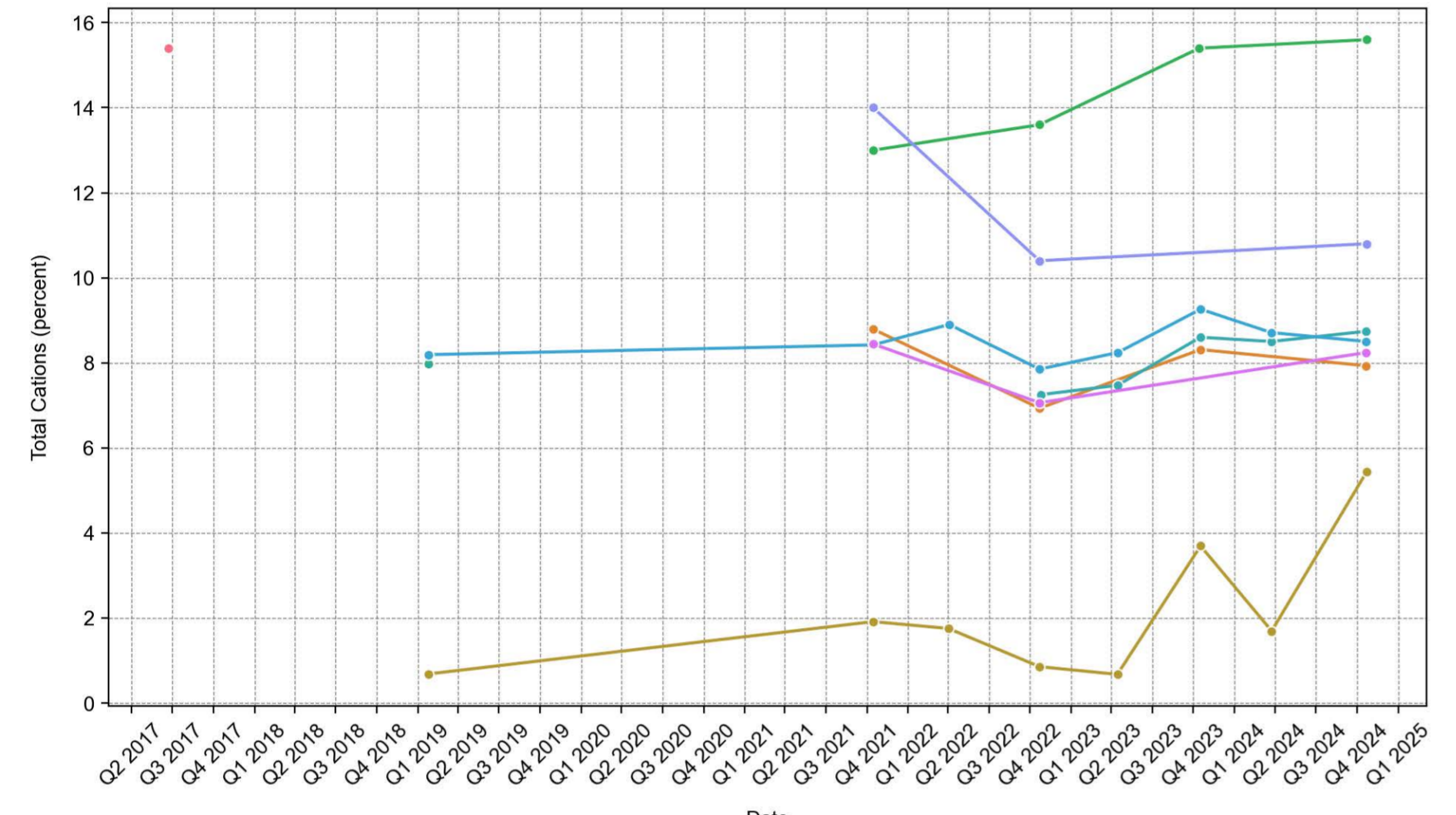
Total Alkalinity as CaCO3



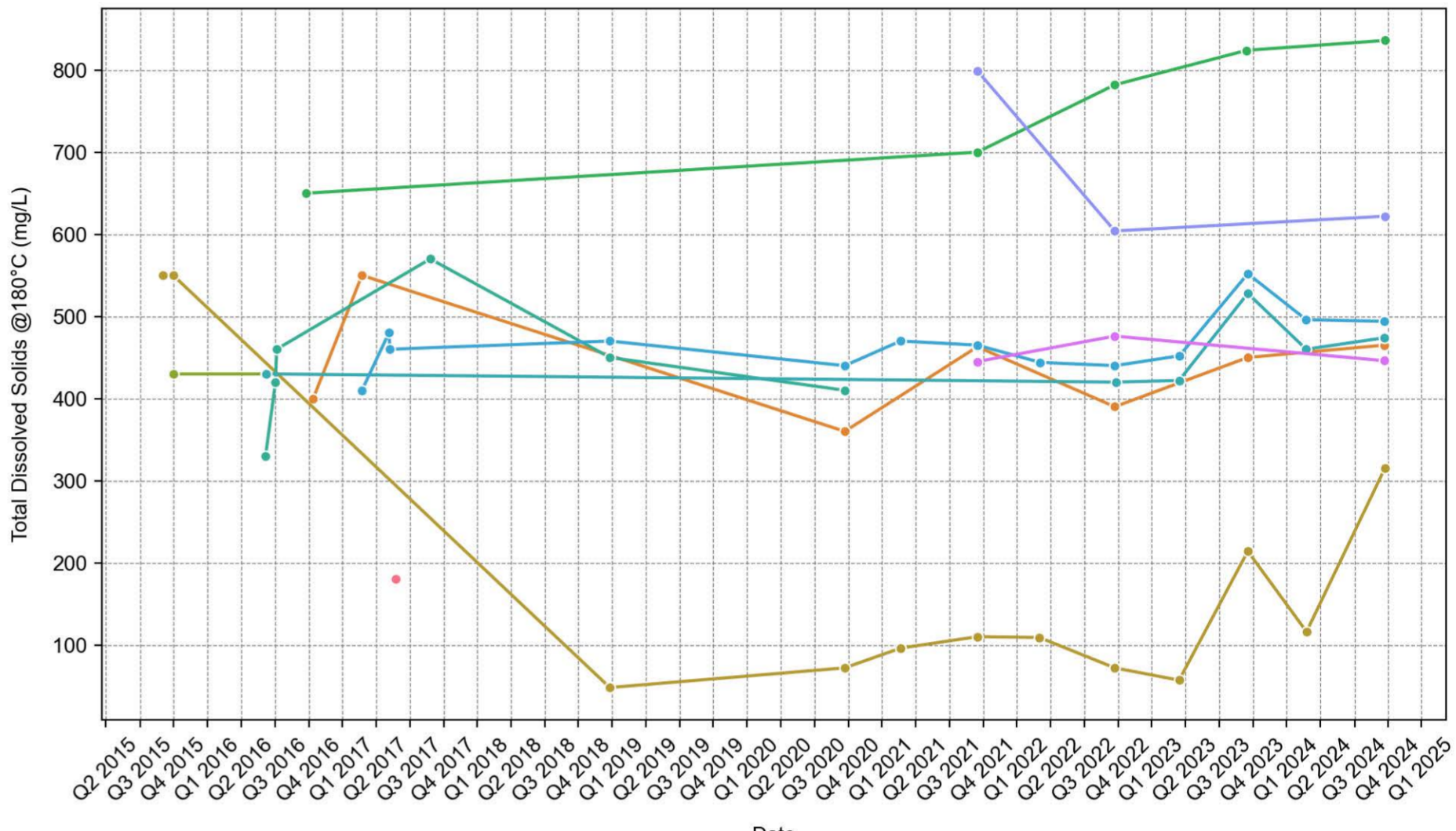
Total Anions



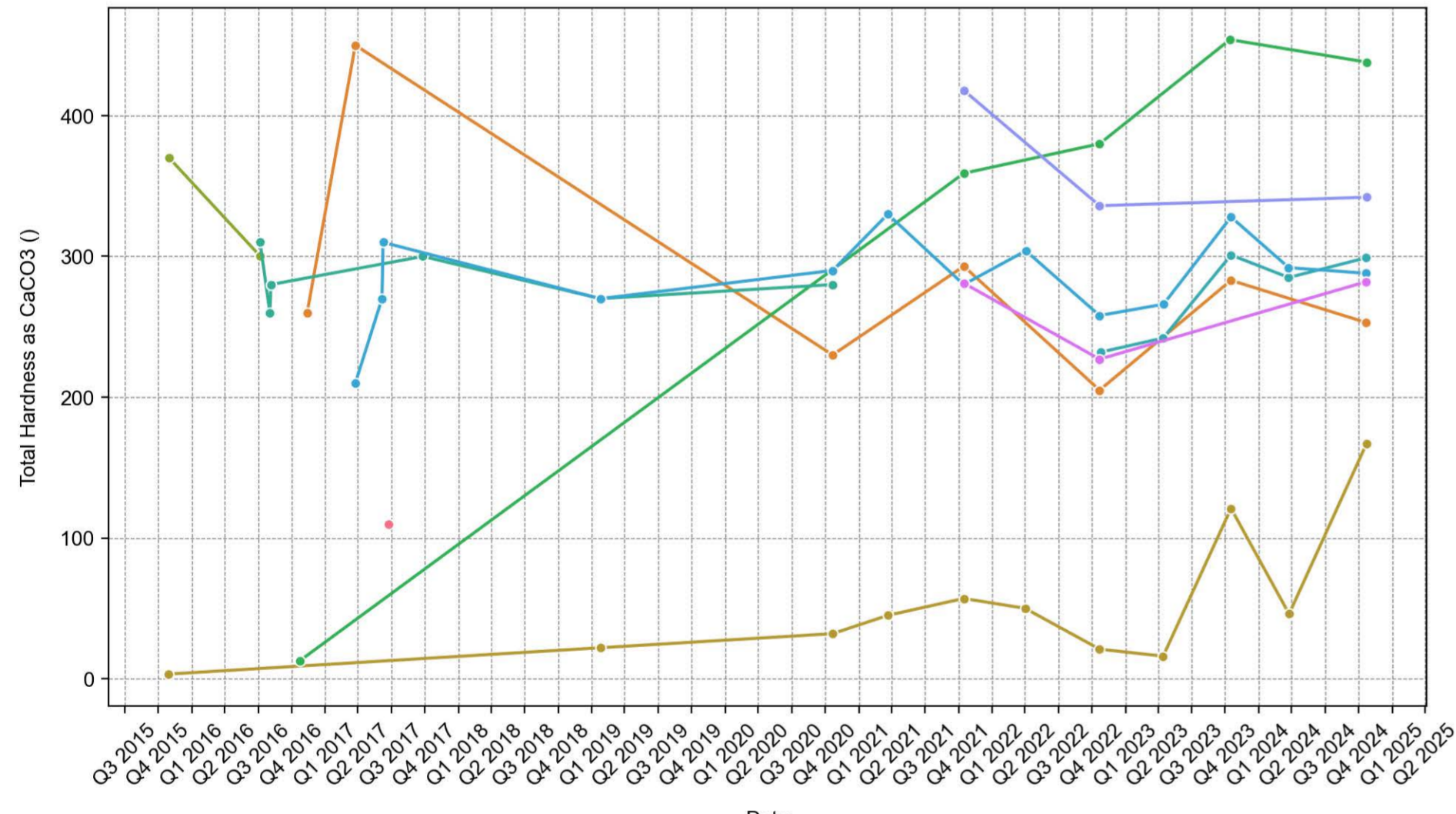
Total Cations



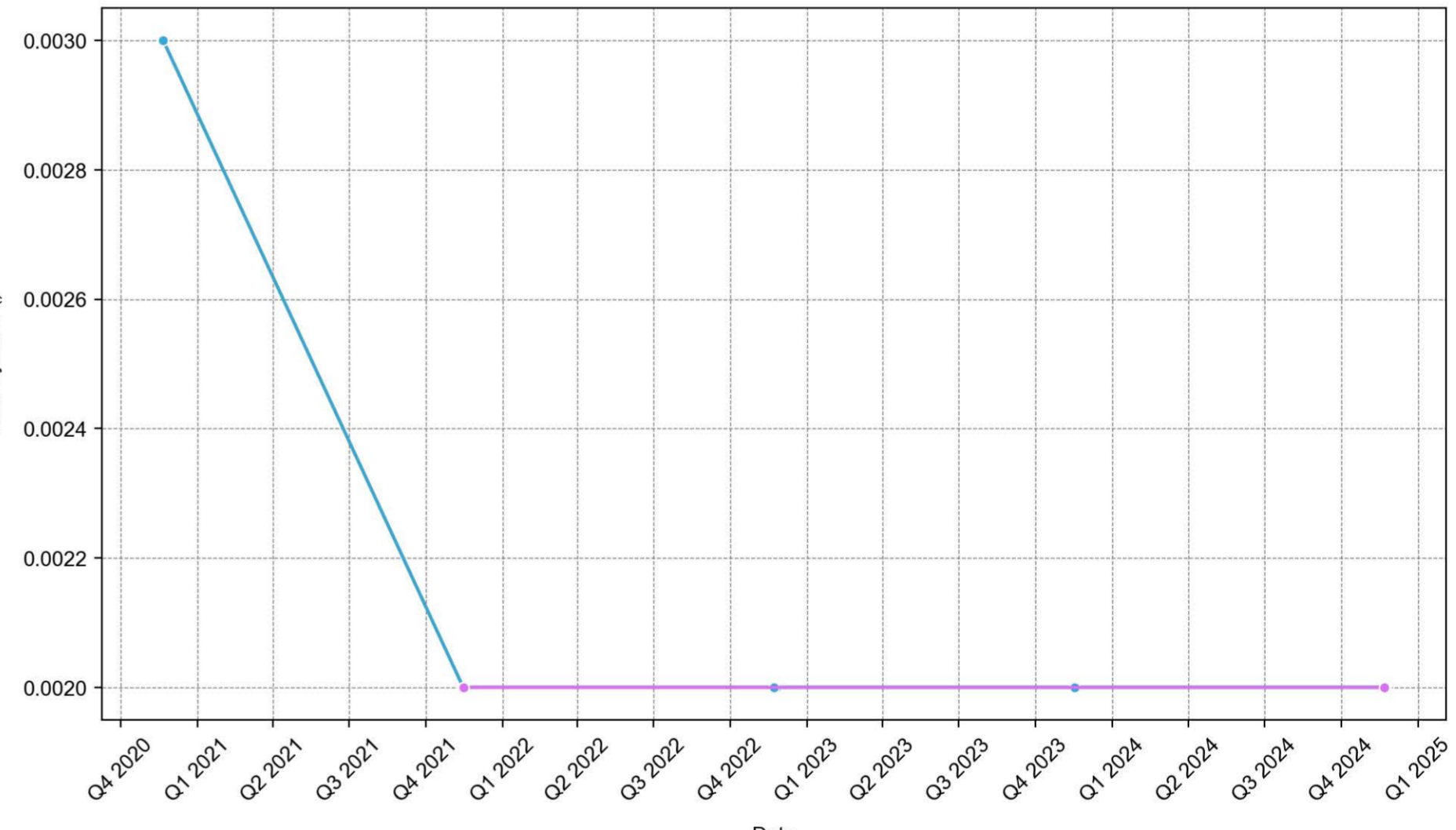
Total Dissolved Solids @180°C



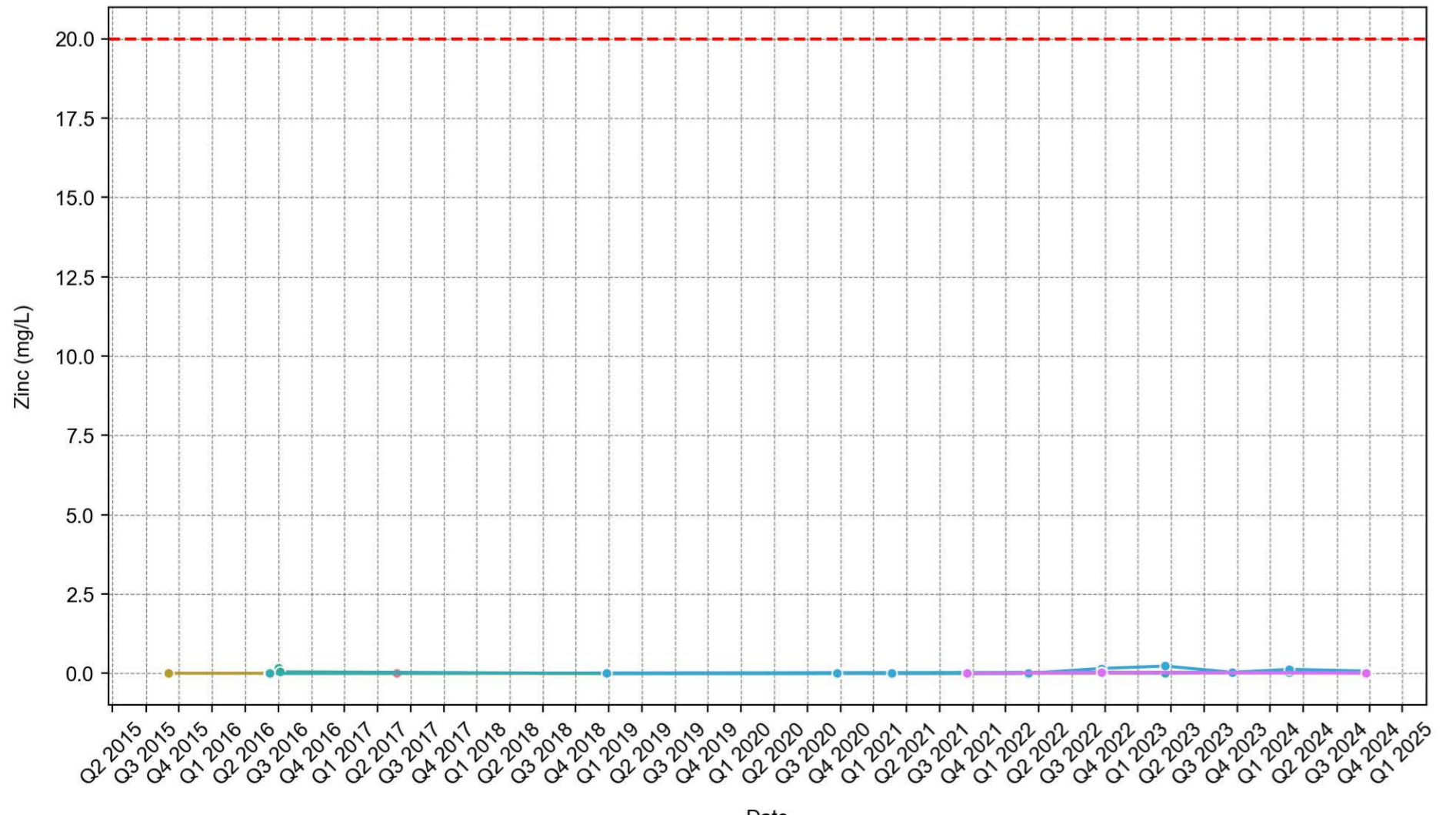
Total Hardness as CaCO3



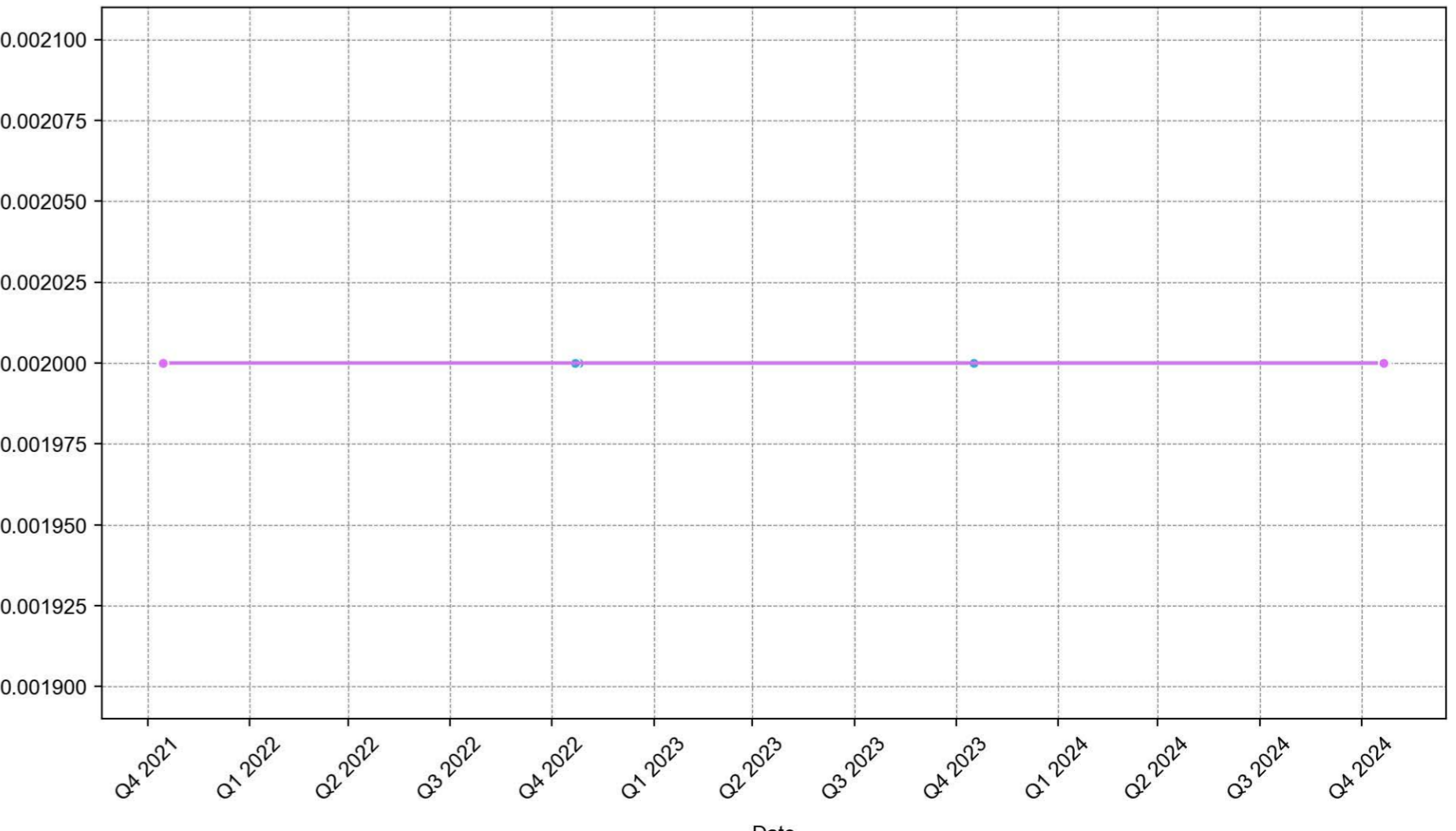
Total Xylenes



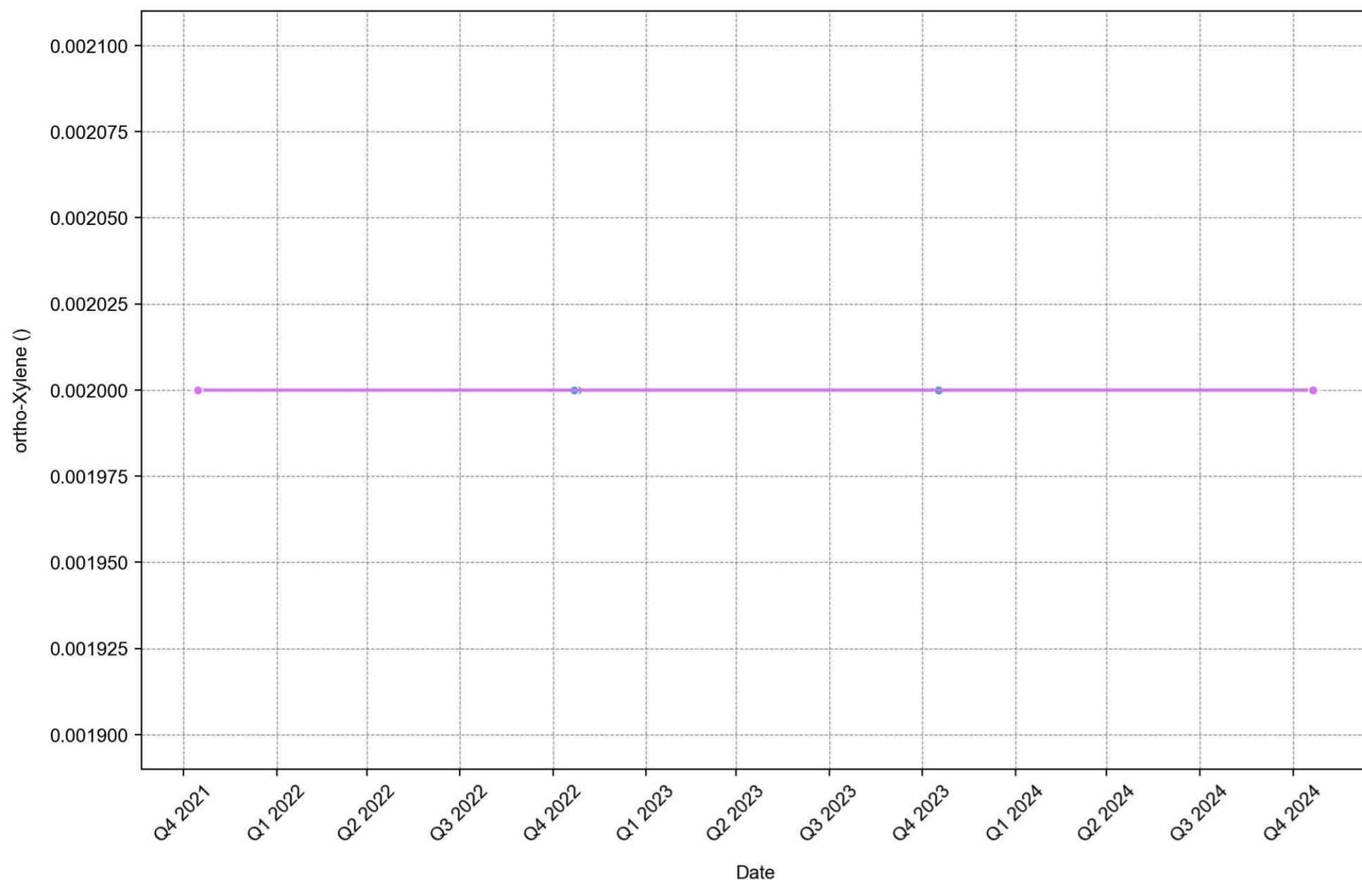
Zinc



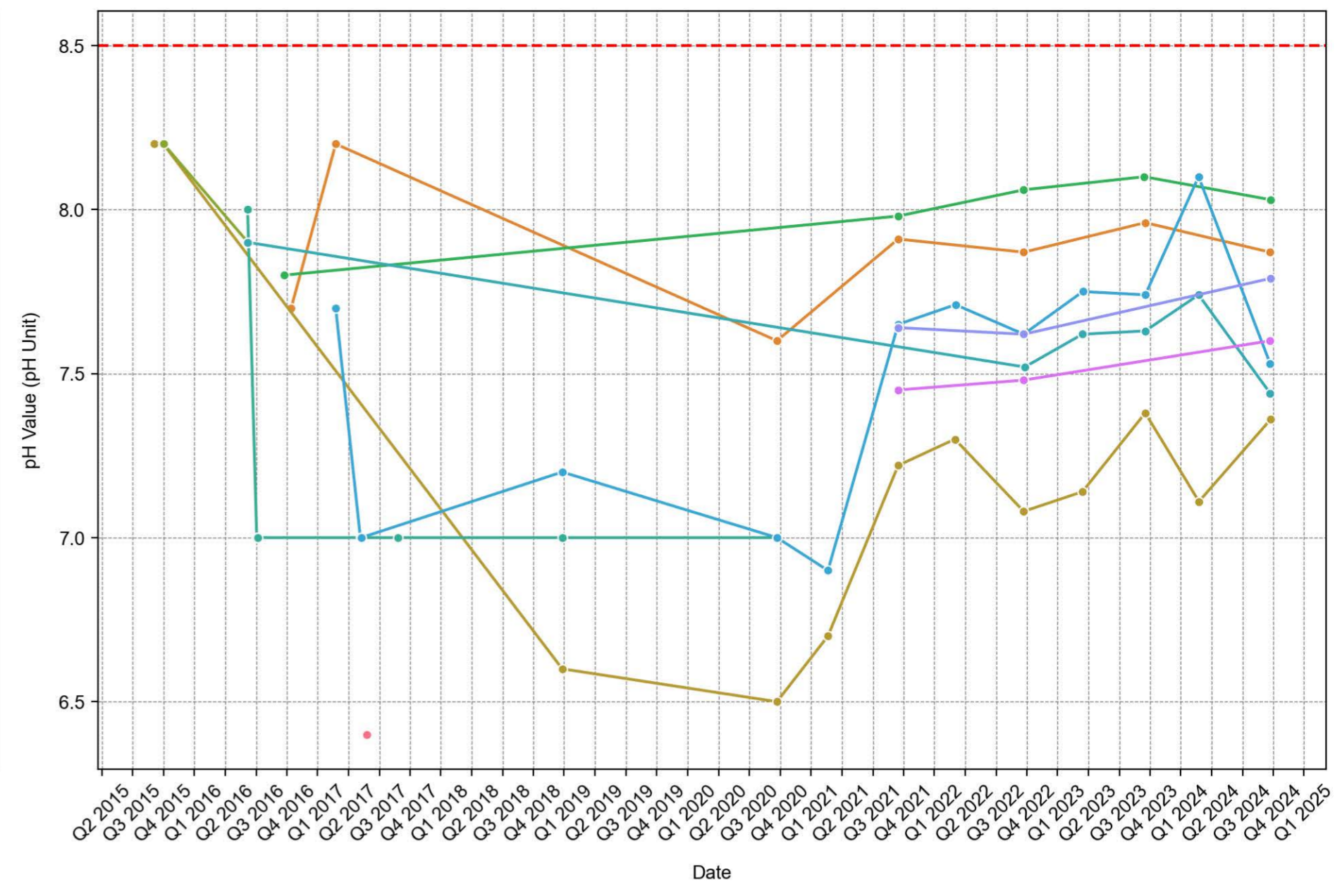
meta- & para-Xylene



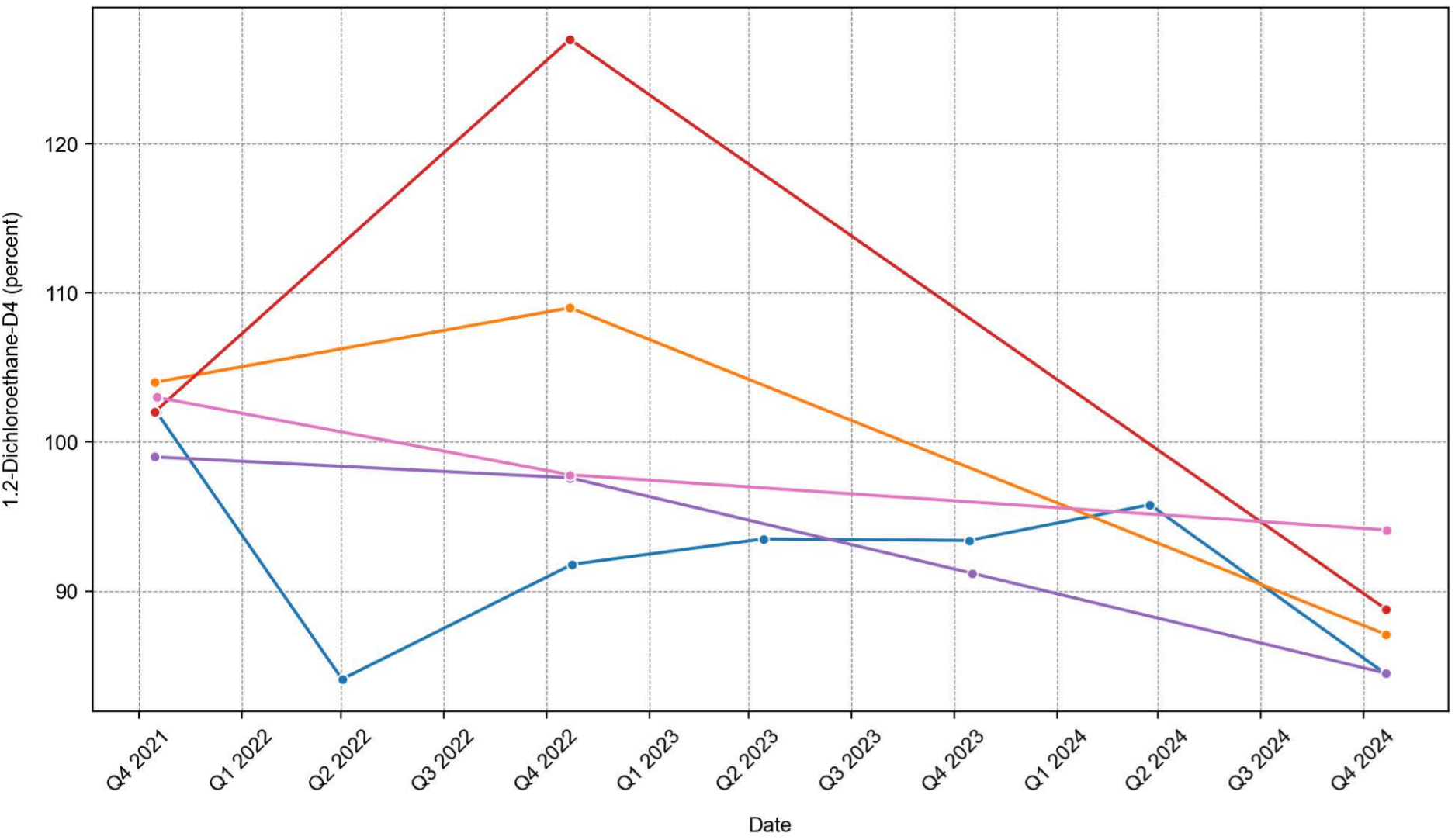
ortho-Xylene



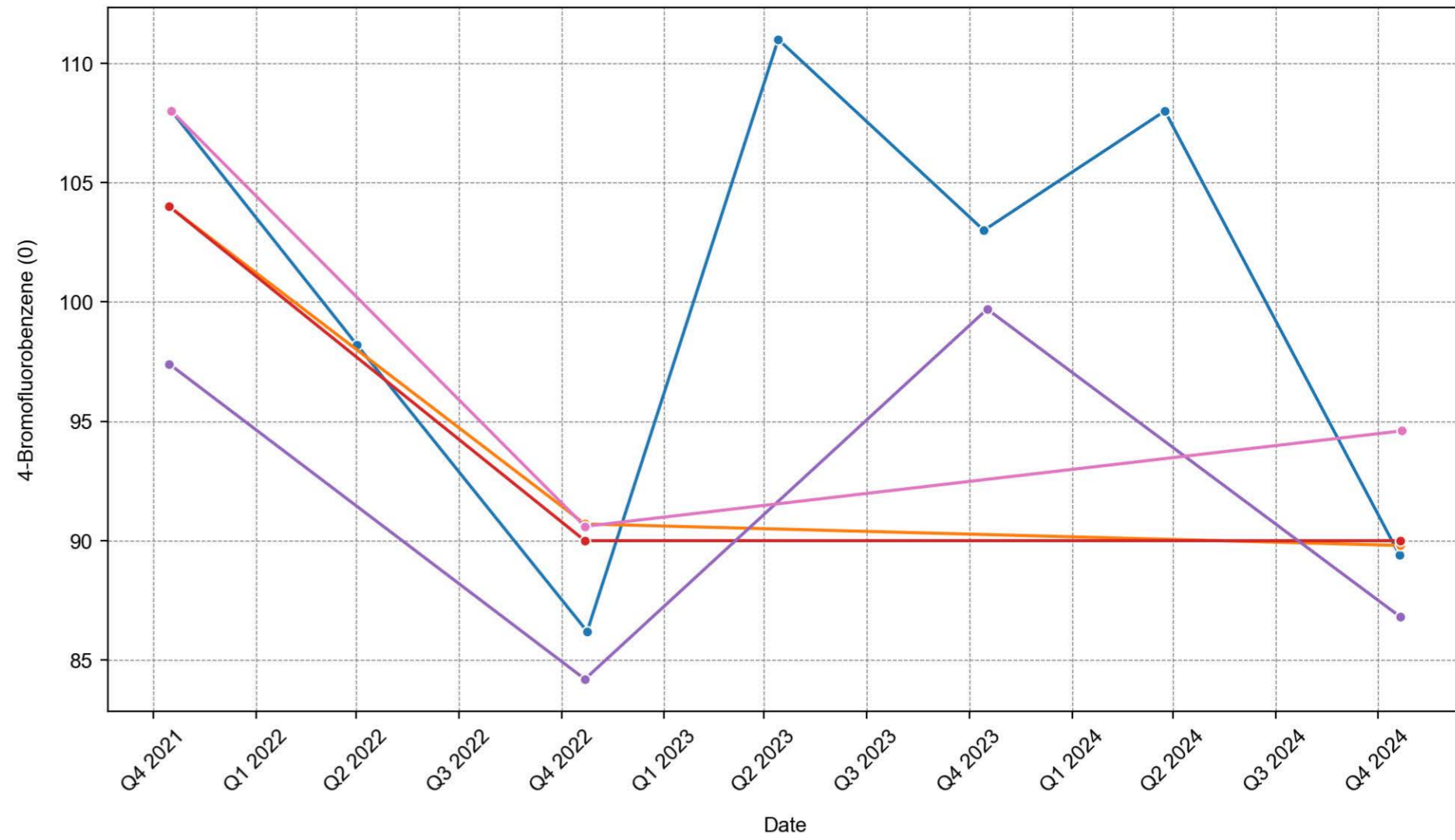
pH Value



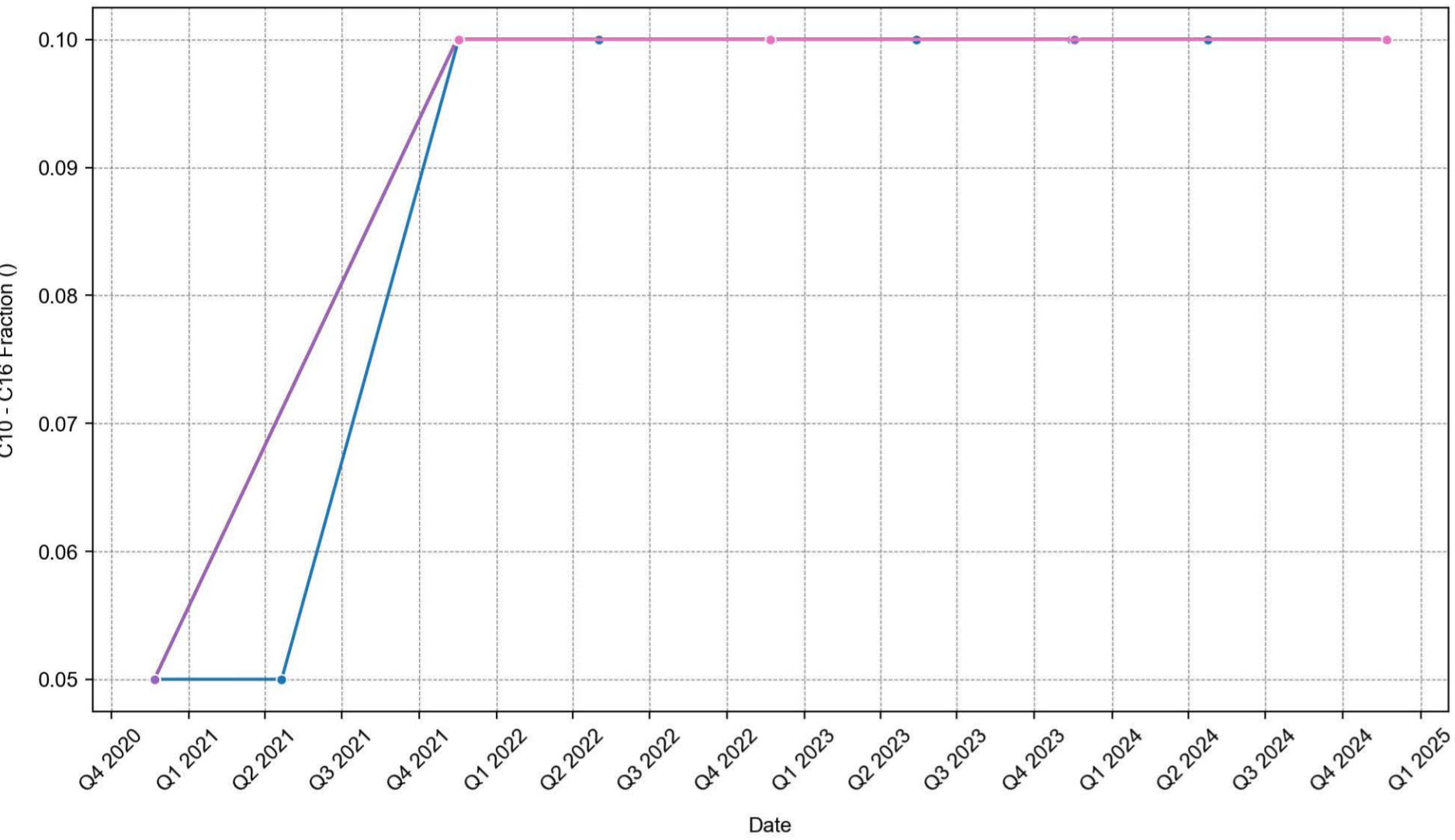
1,2-Dichloroethane-D4



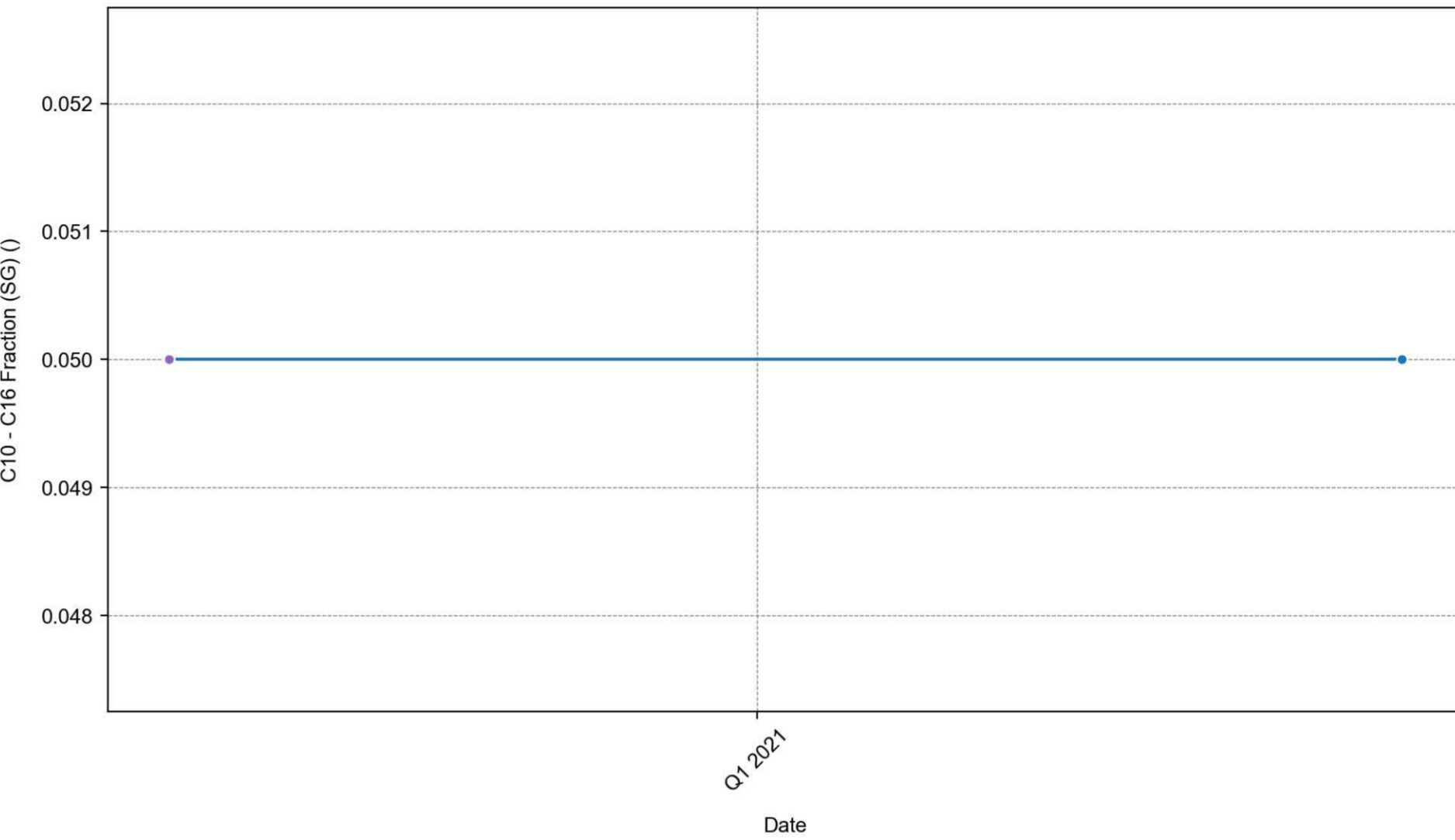
4-Bromofluorobenzene



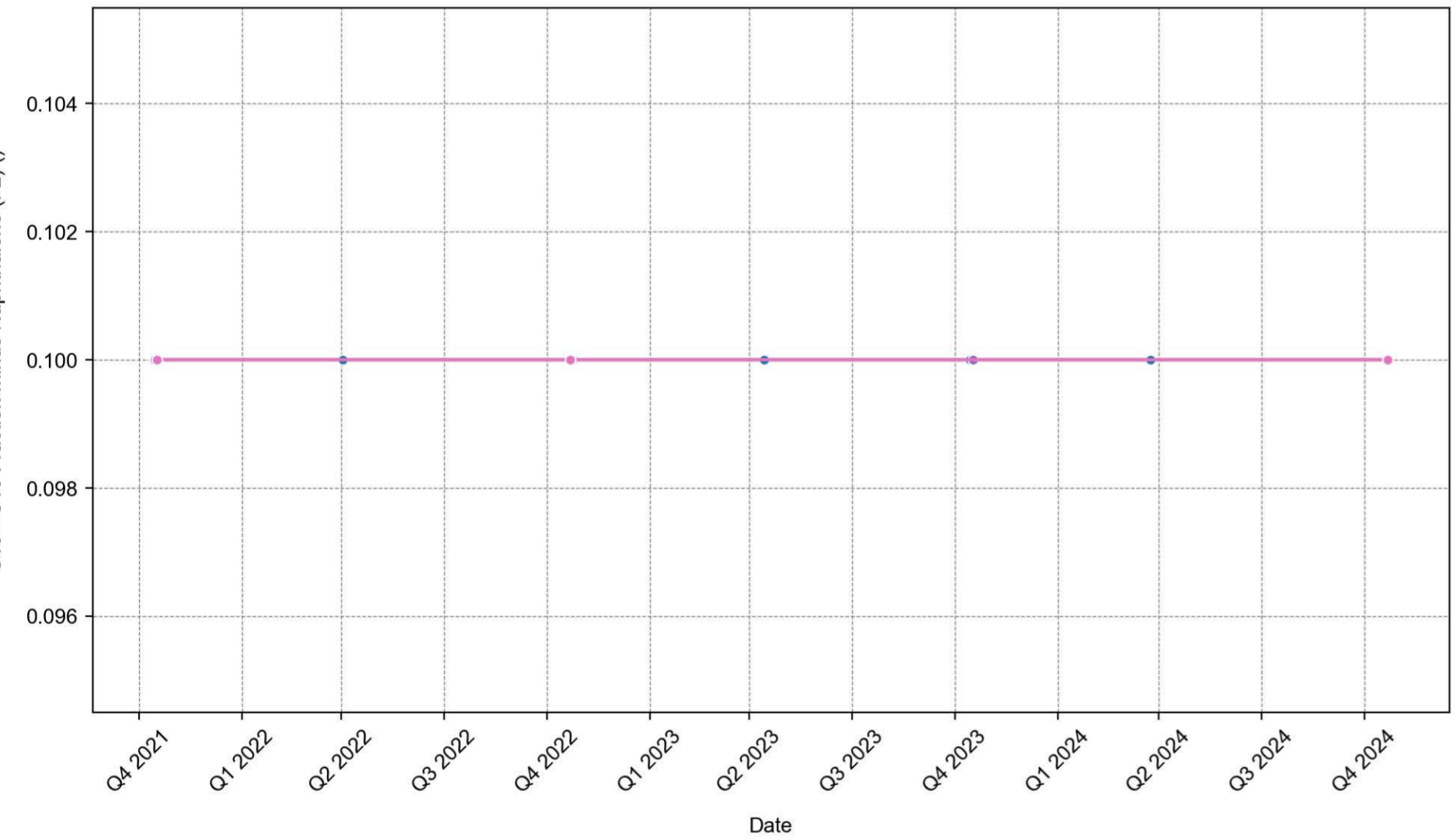
C10 - C16 Fraction



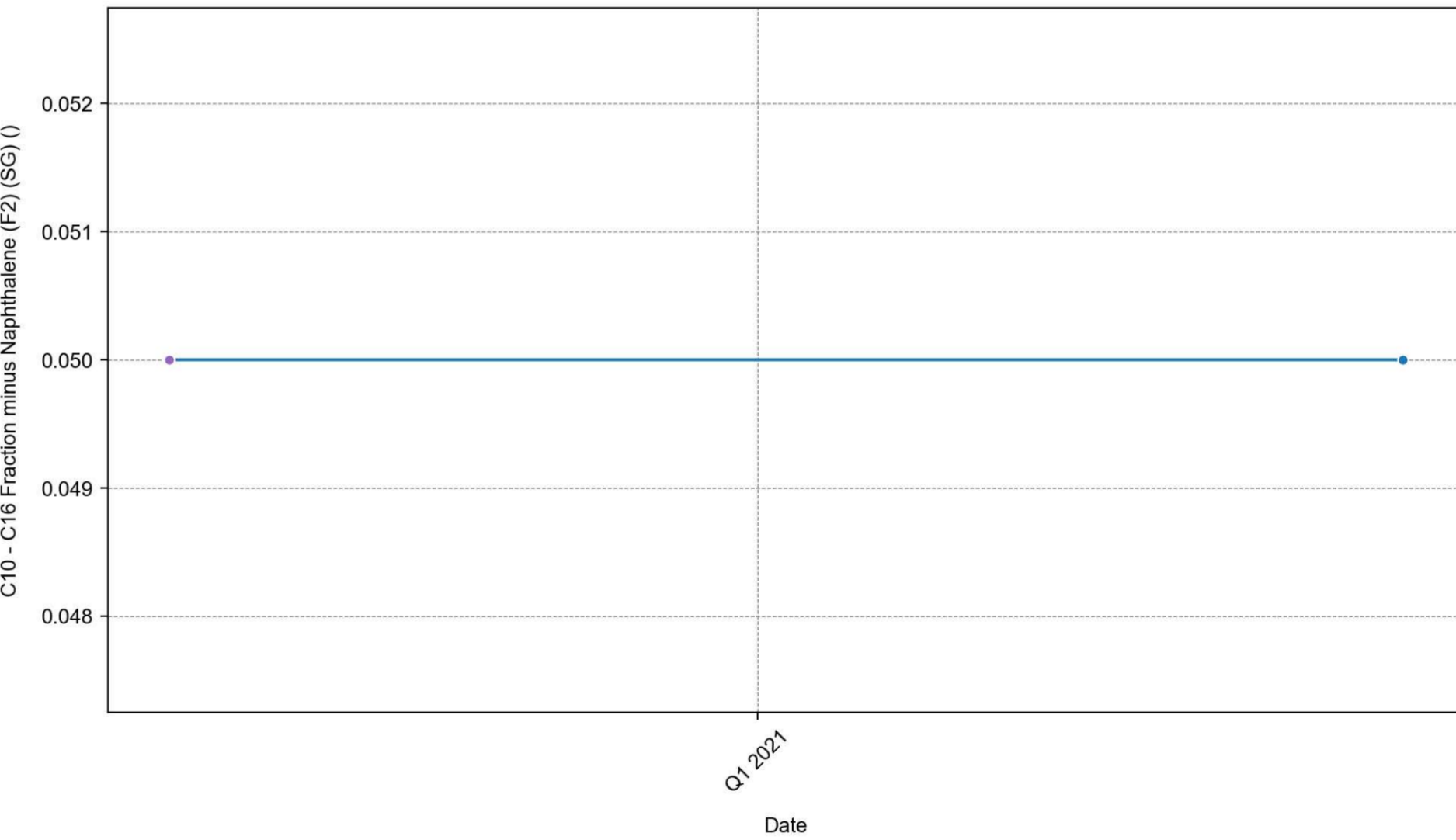
C10 - C16 Fraction (SG)



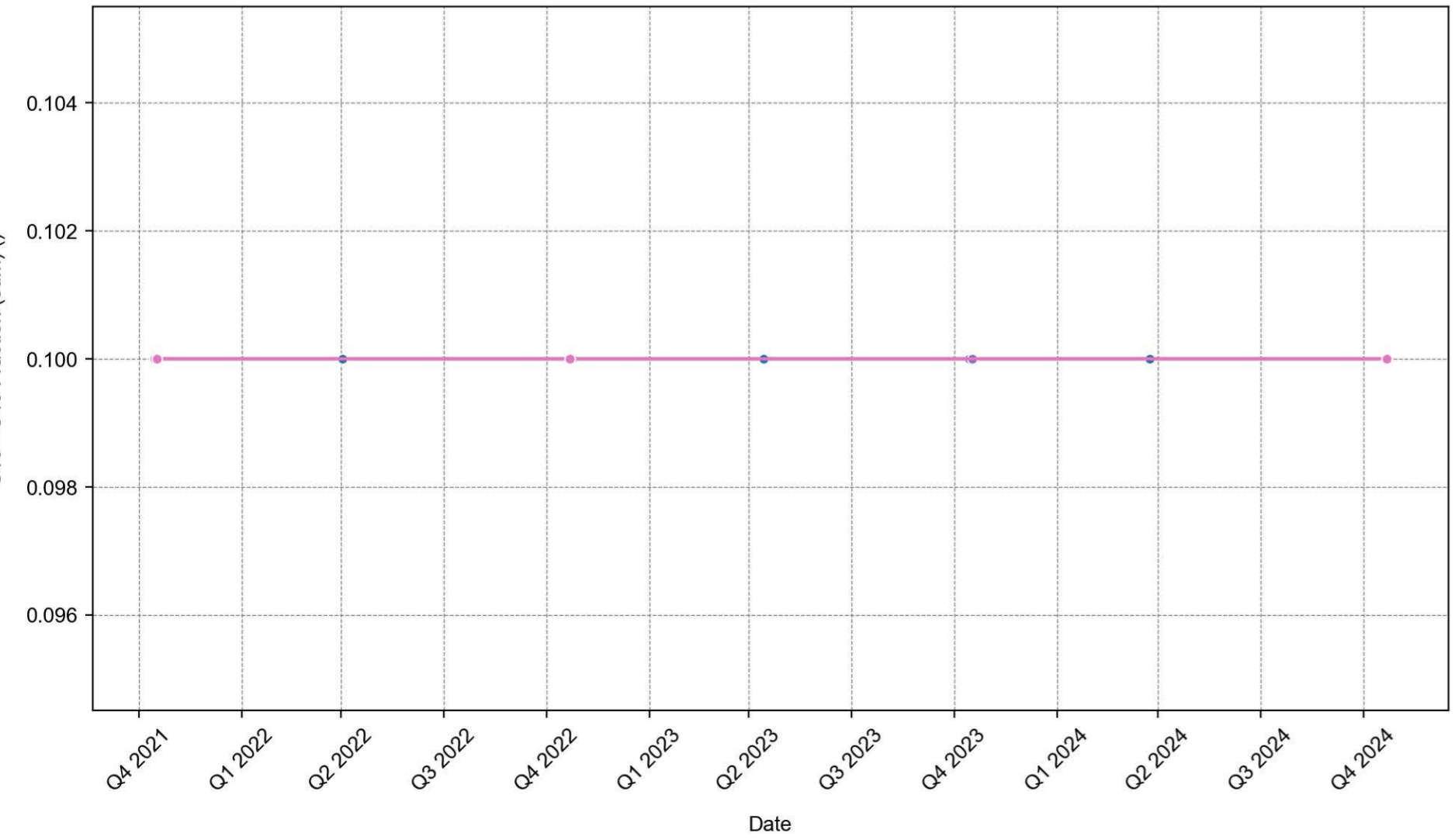
C10 - C16 Fraction minus Naphthalene (F2)



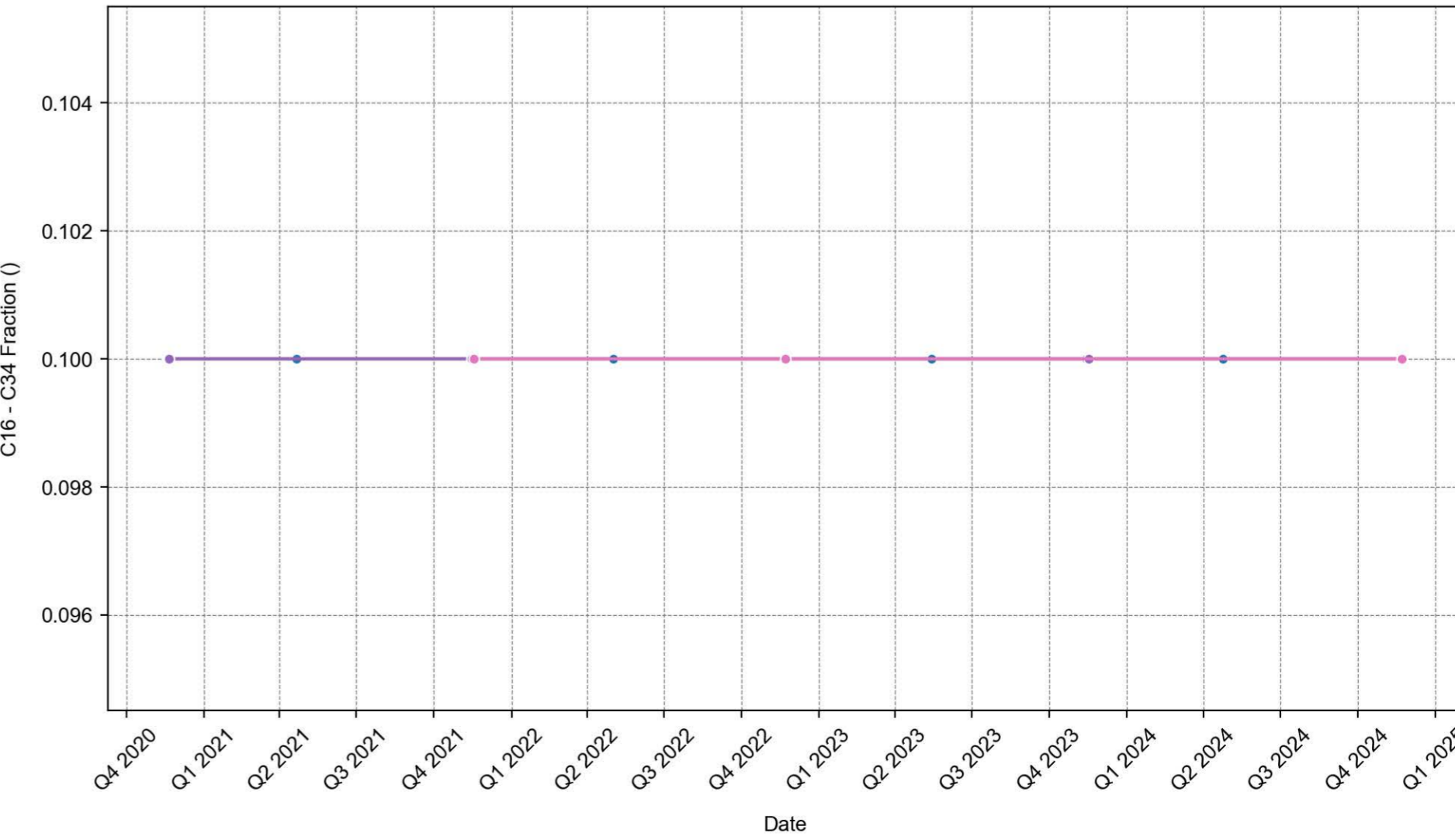
C10 - C16 Fraction minus Naphthalene (F2) (SG)



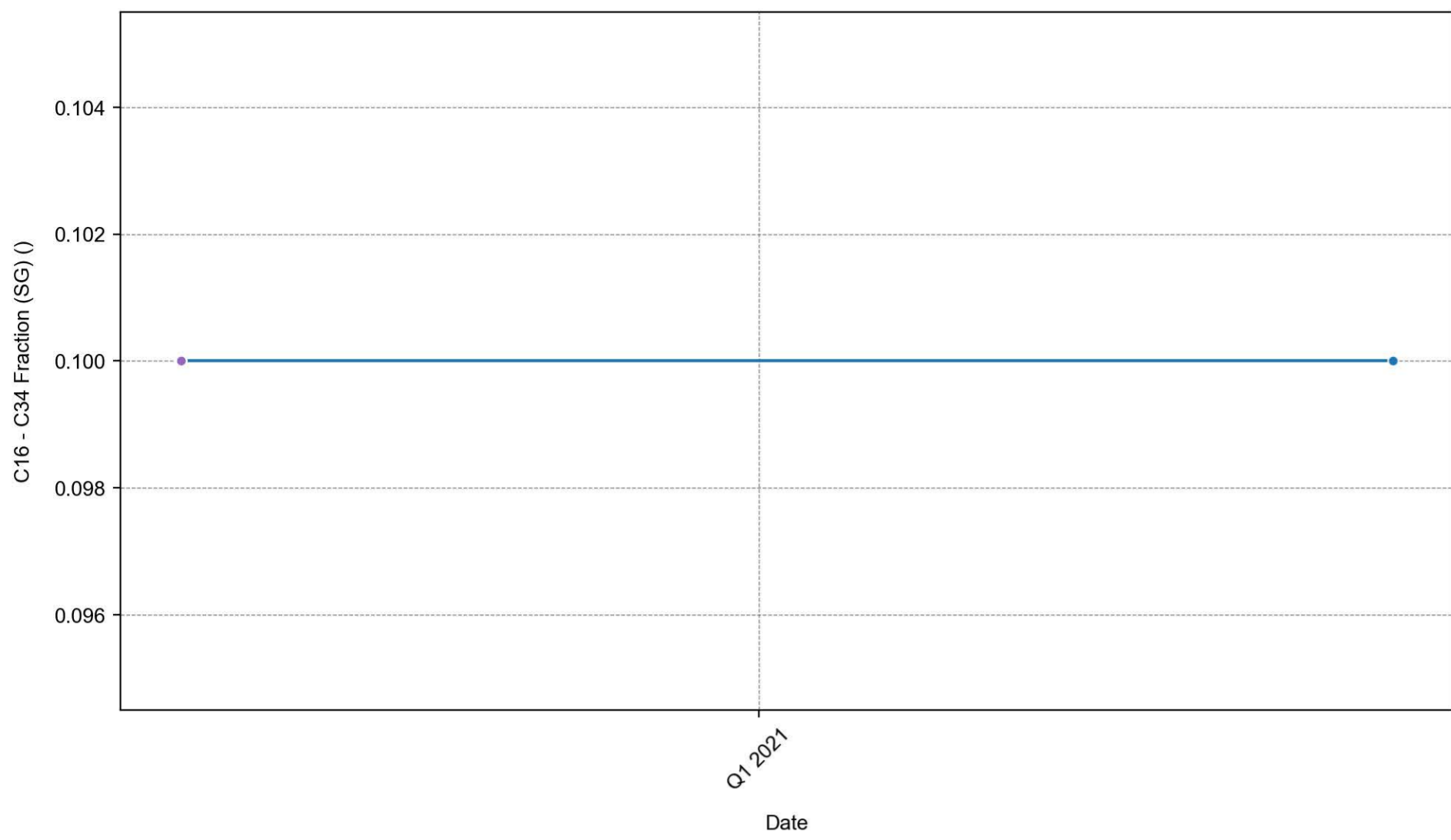
C10 - C40 Fraction (sum)



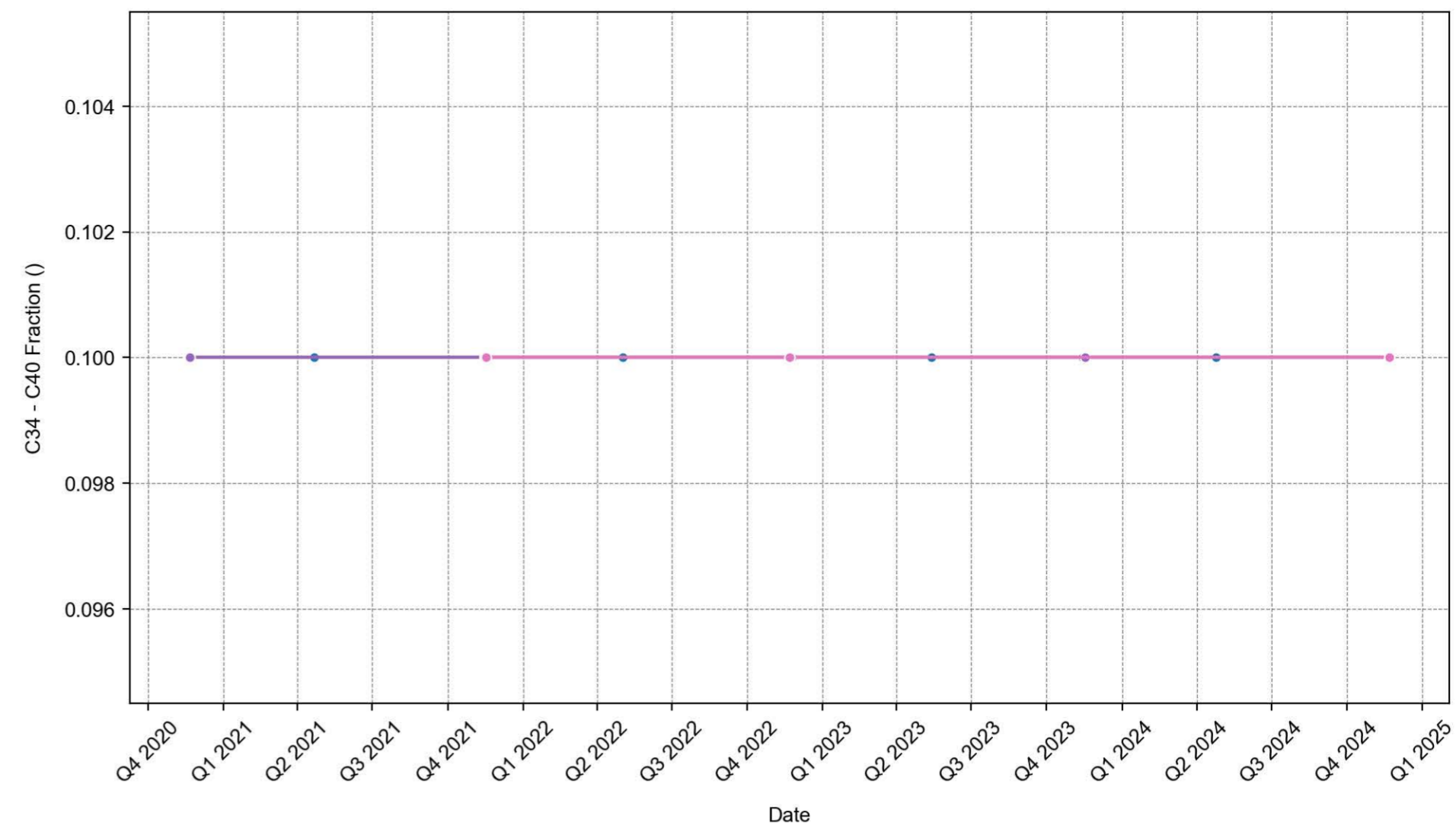
C16 - C34 Fraction



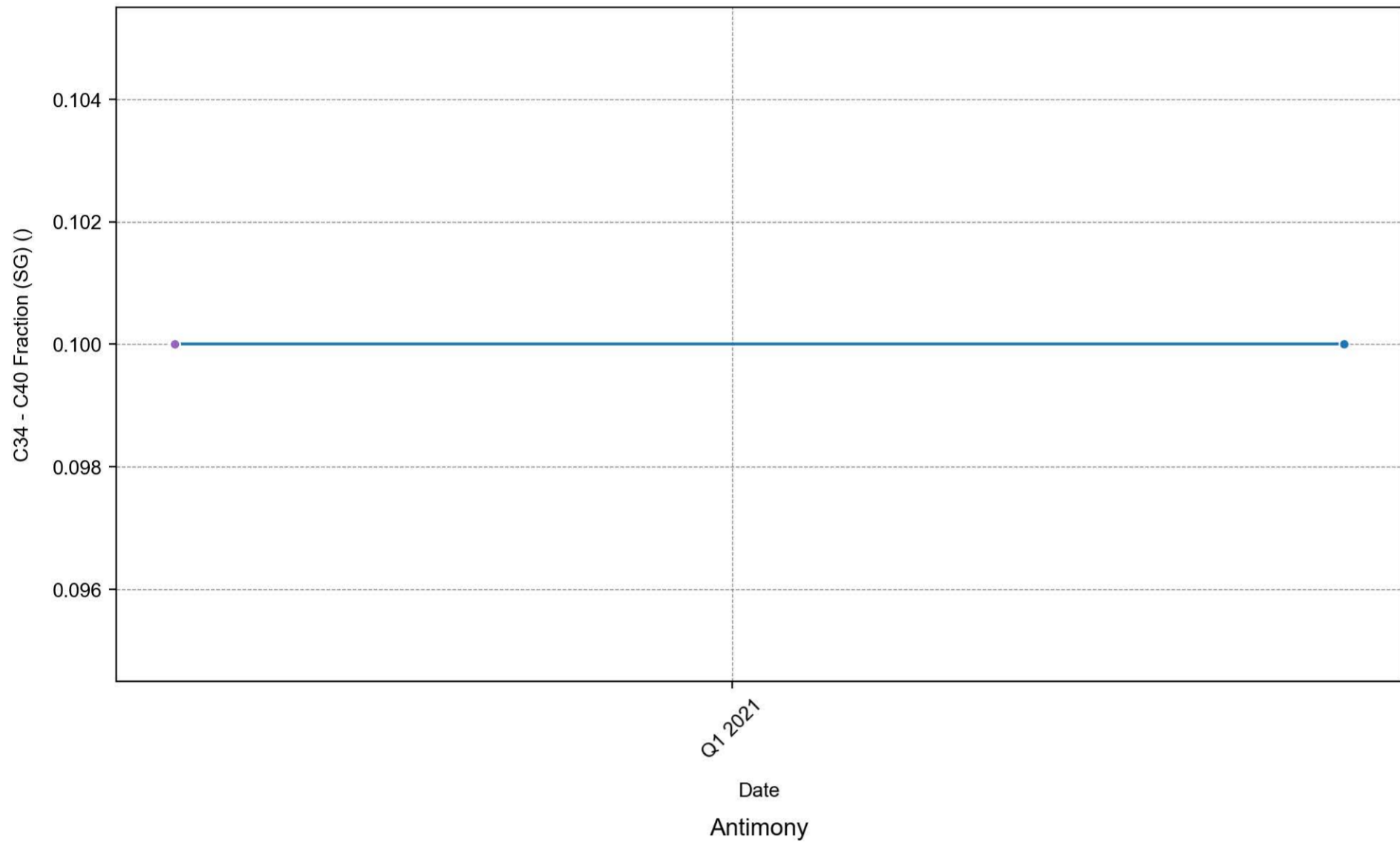
C16 - C34 Fraction (SG)



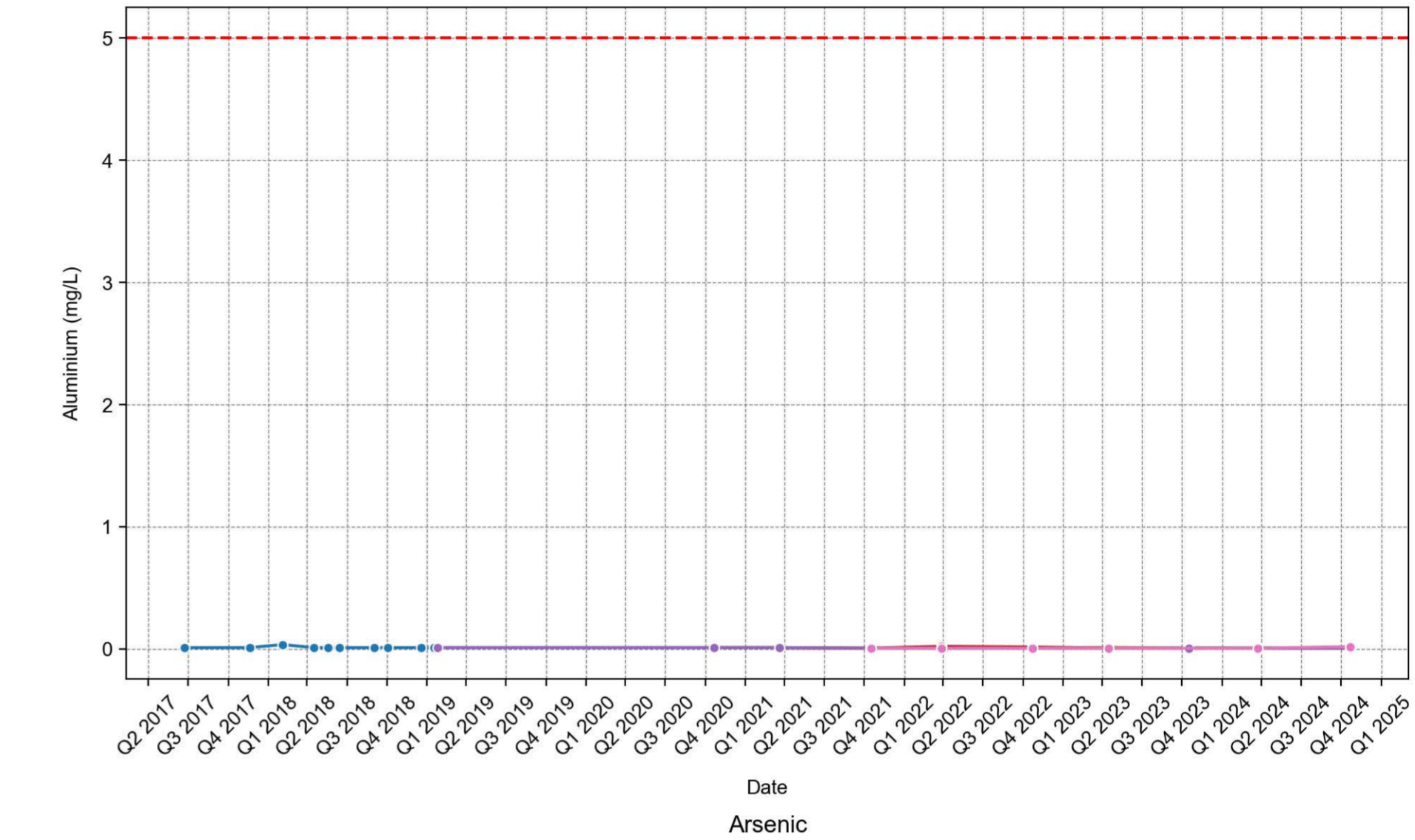
C34 - C40 Fraction



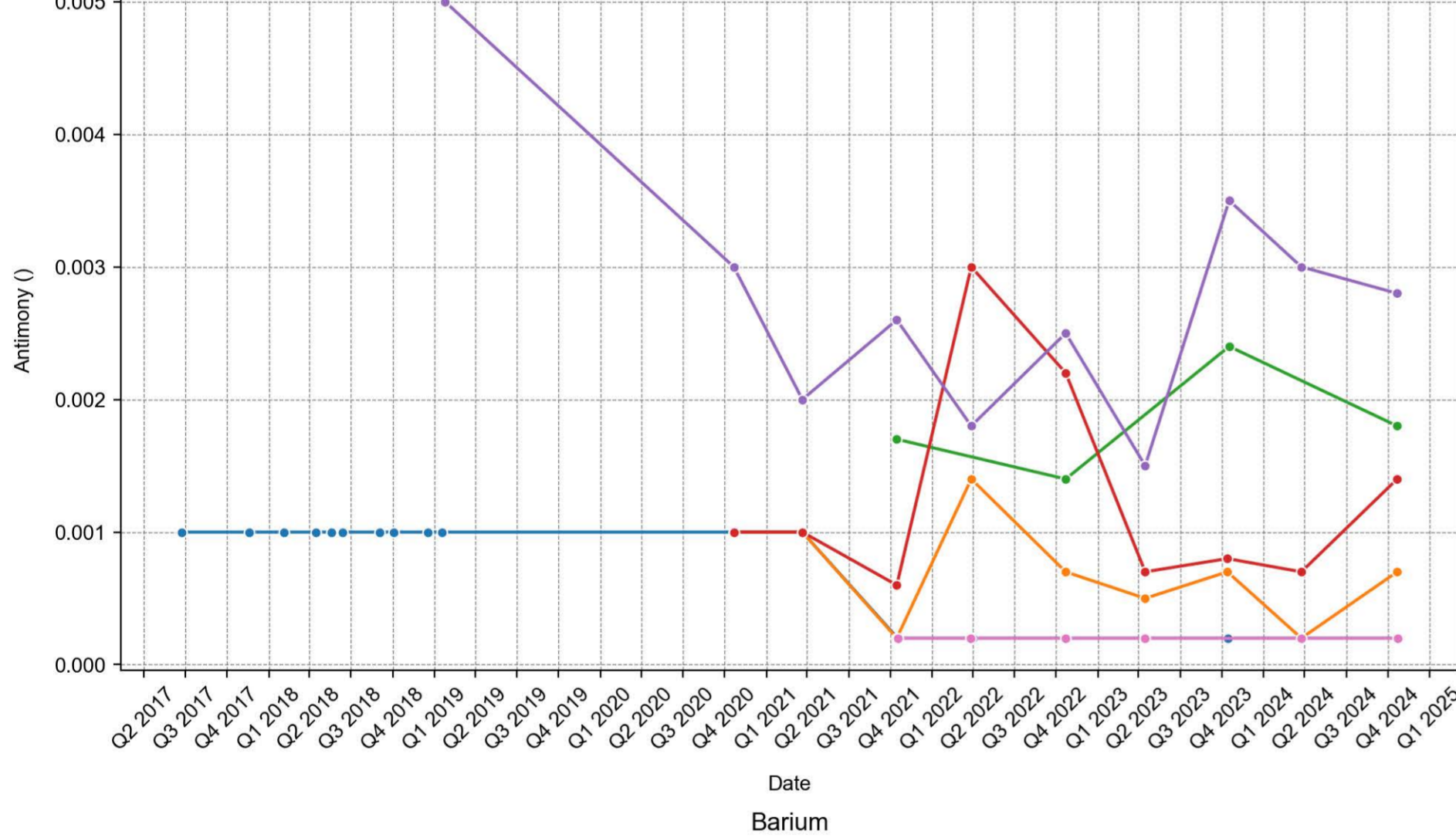
C34 - C40 Fraction (SG)



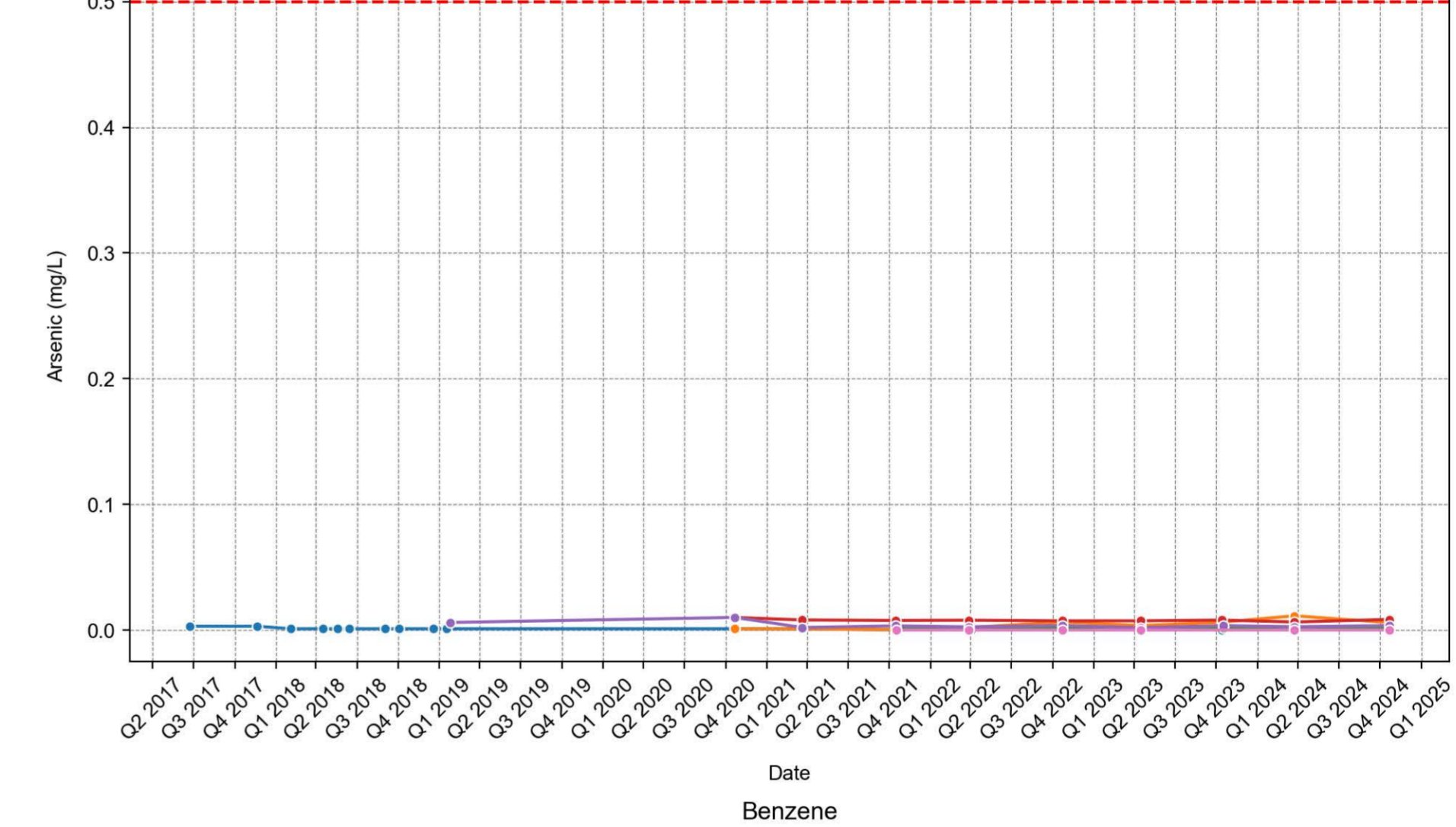
Aluminium



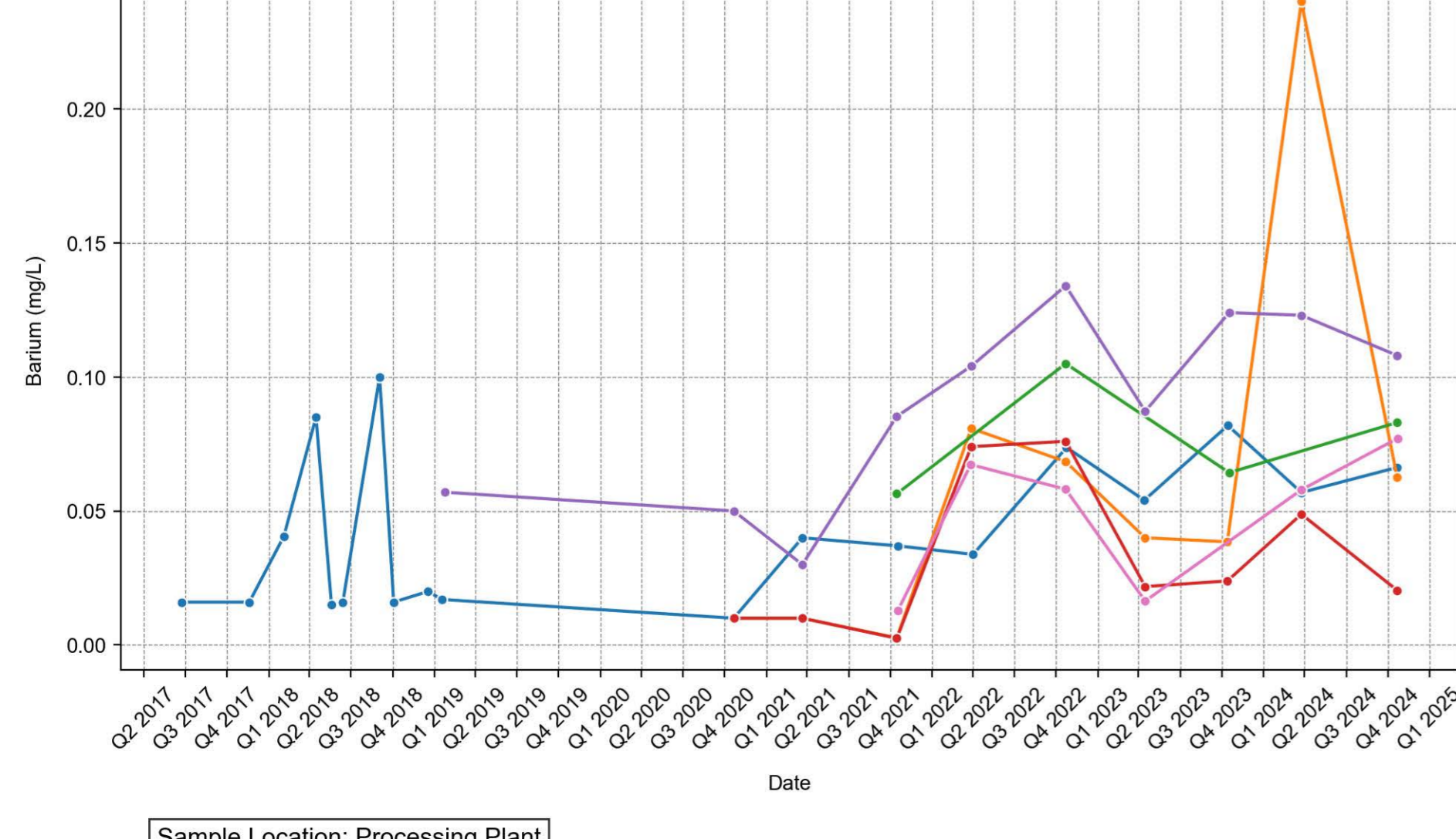
Antimony



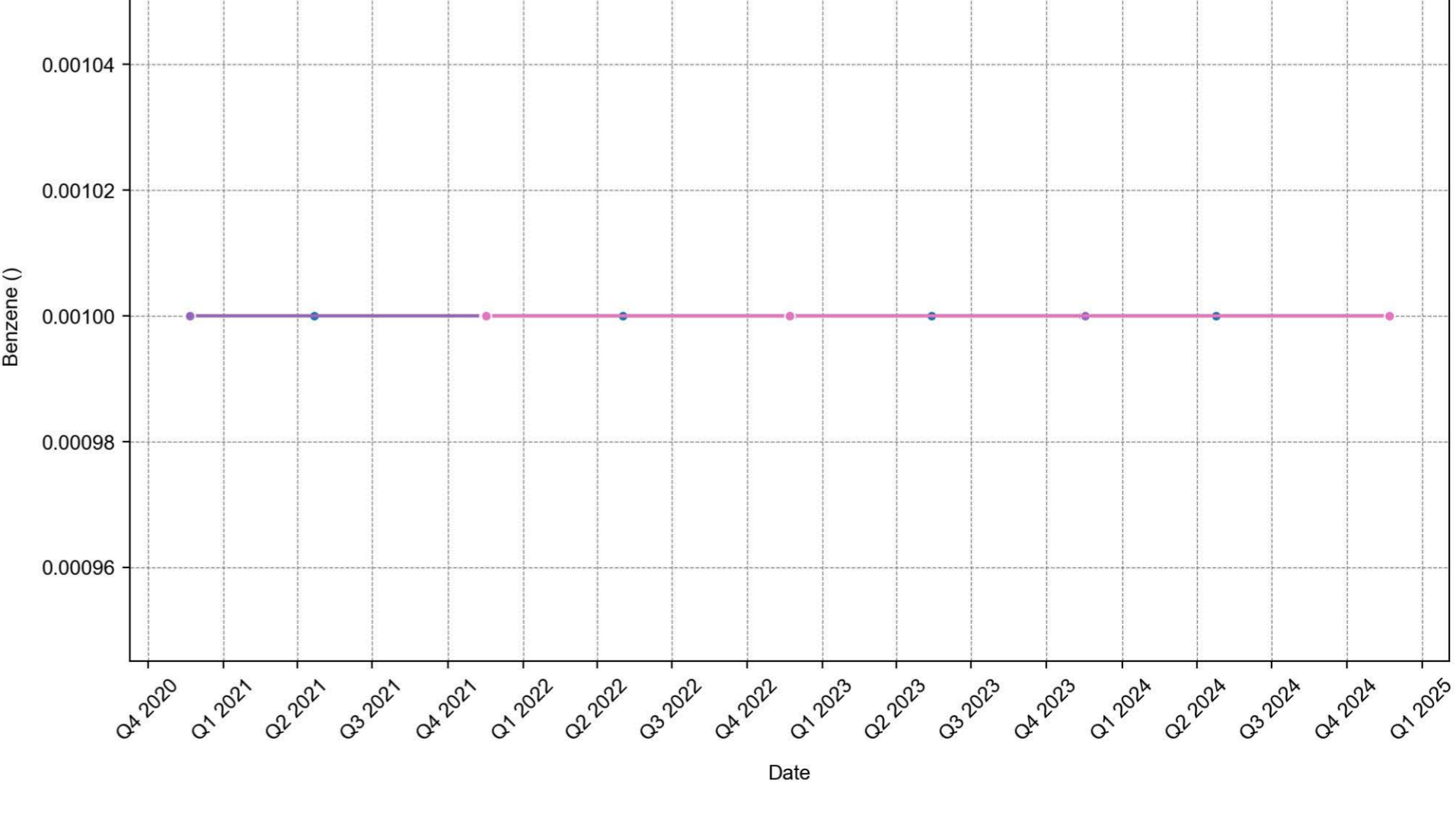
Arsenic



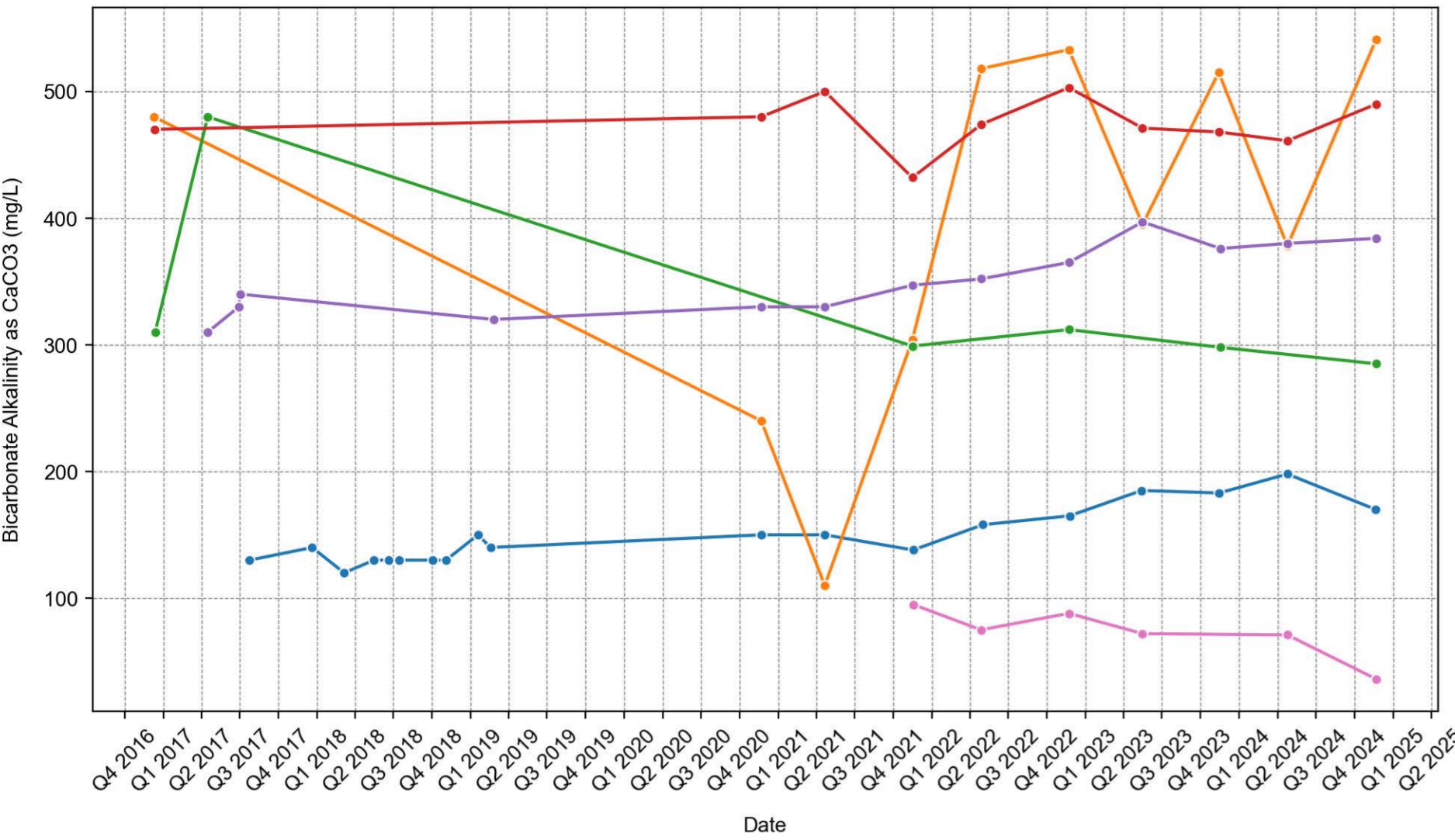
Barium



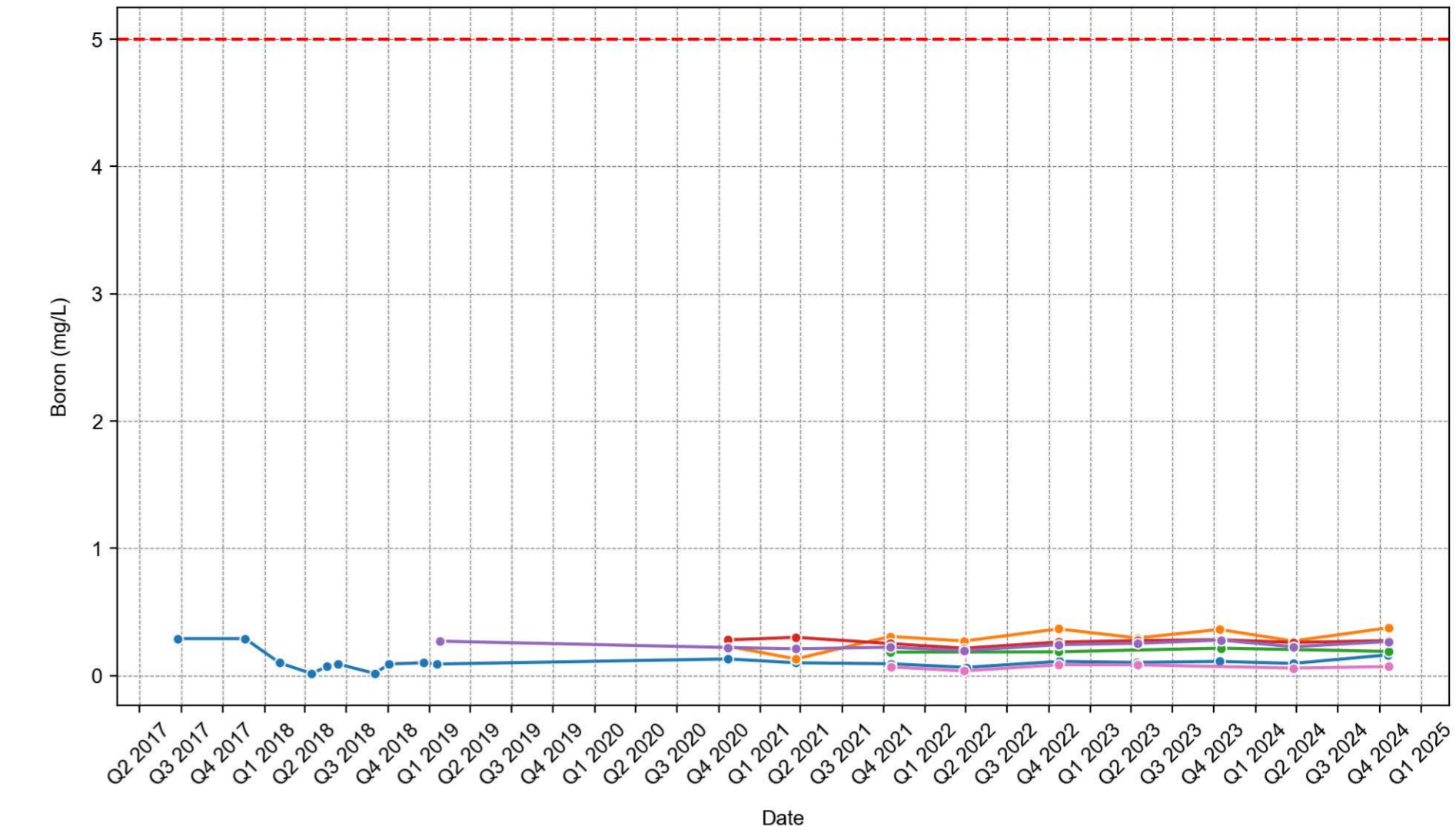
Benzene



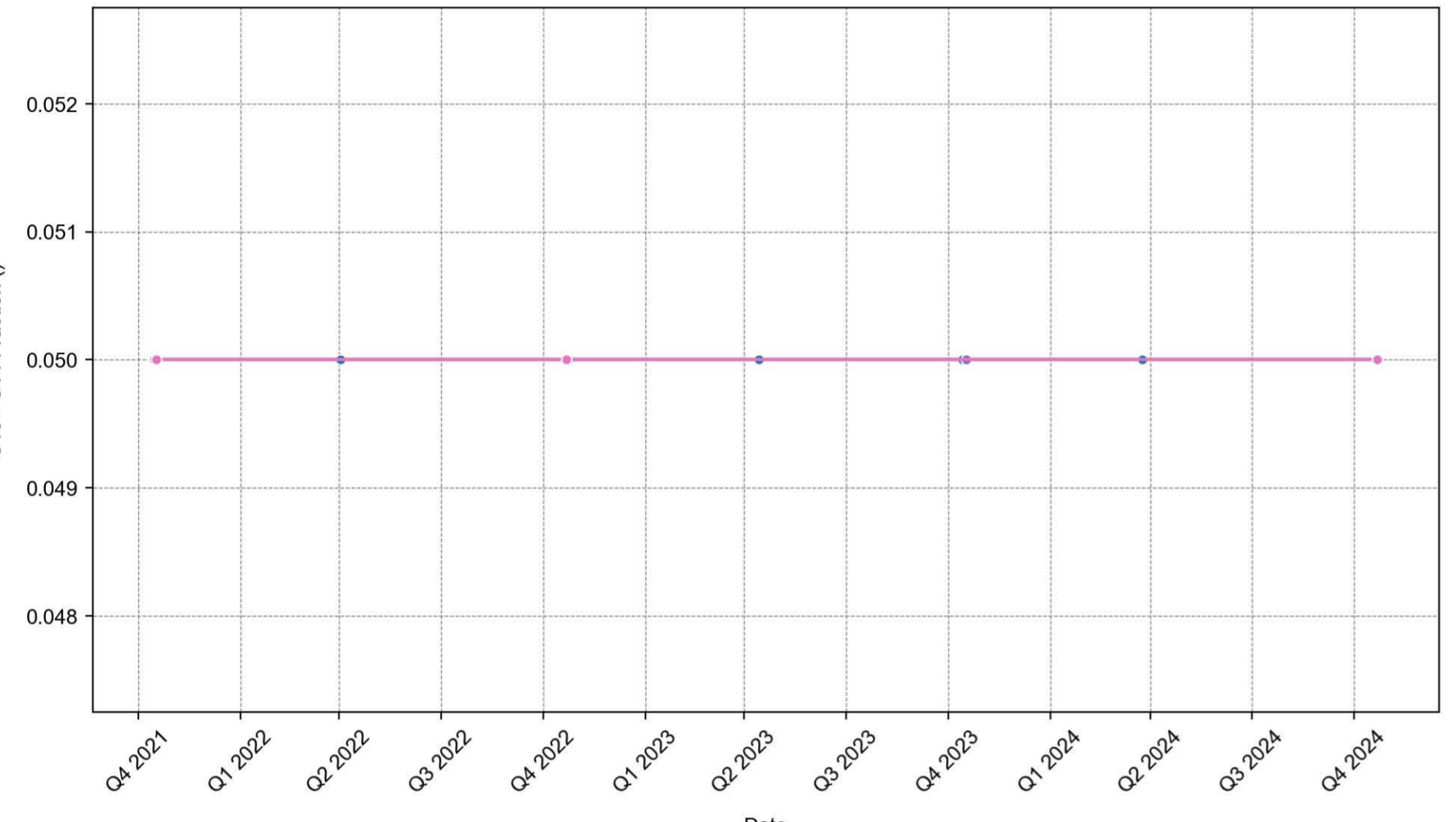
Bicarbonate Alkalinity as CaCO3



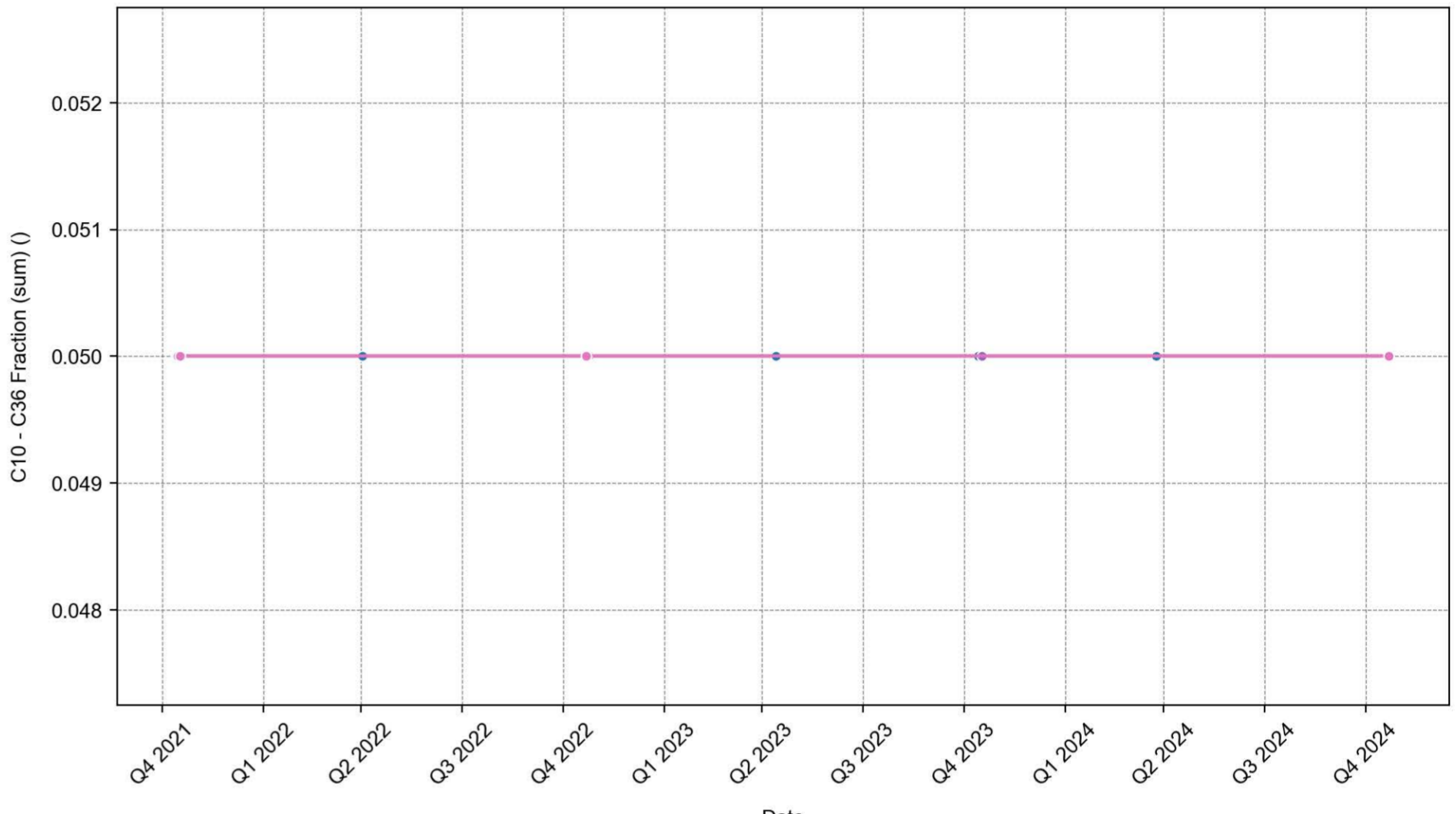
Boron



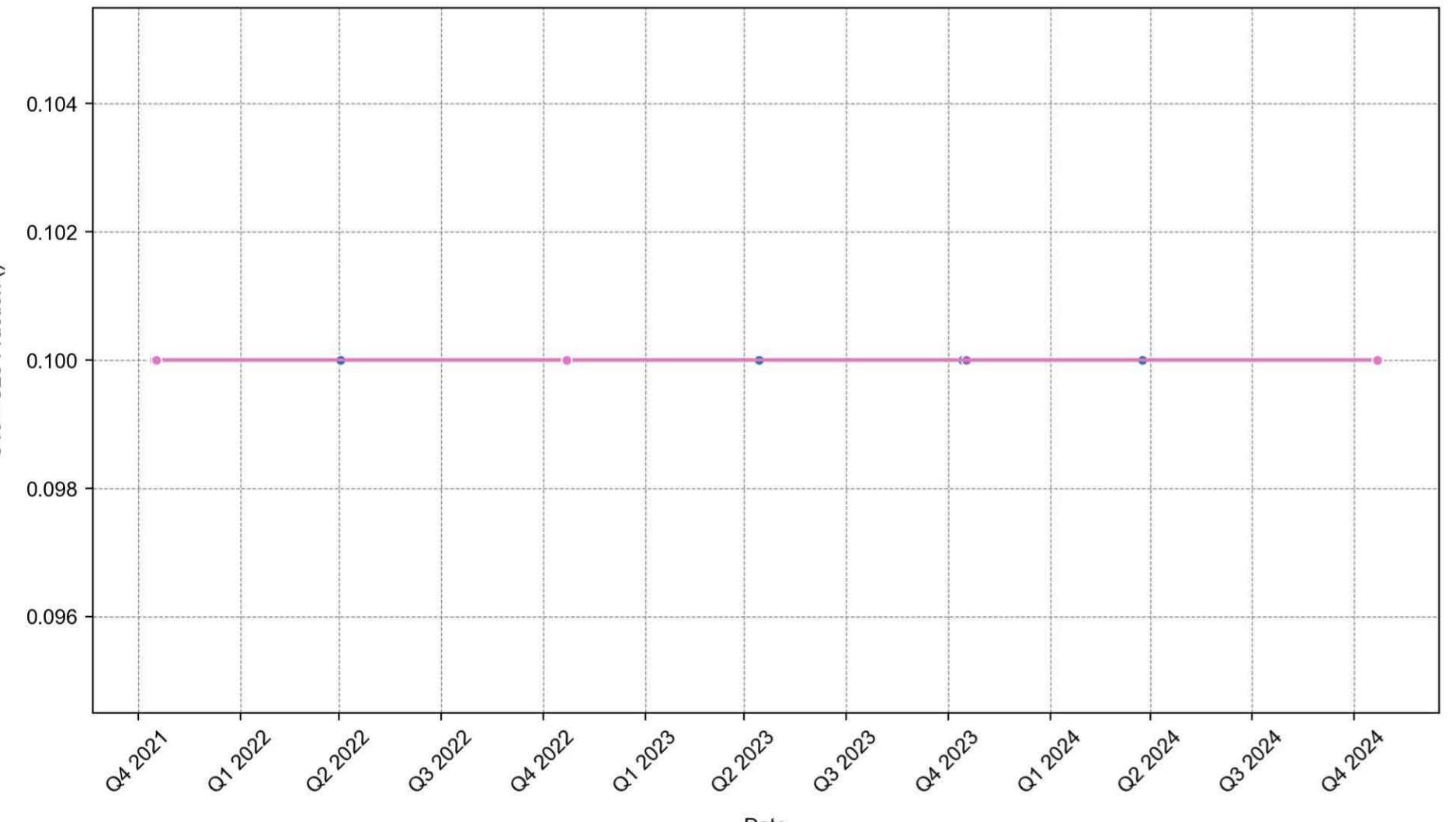
C10 - C14 Fraction



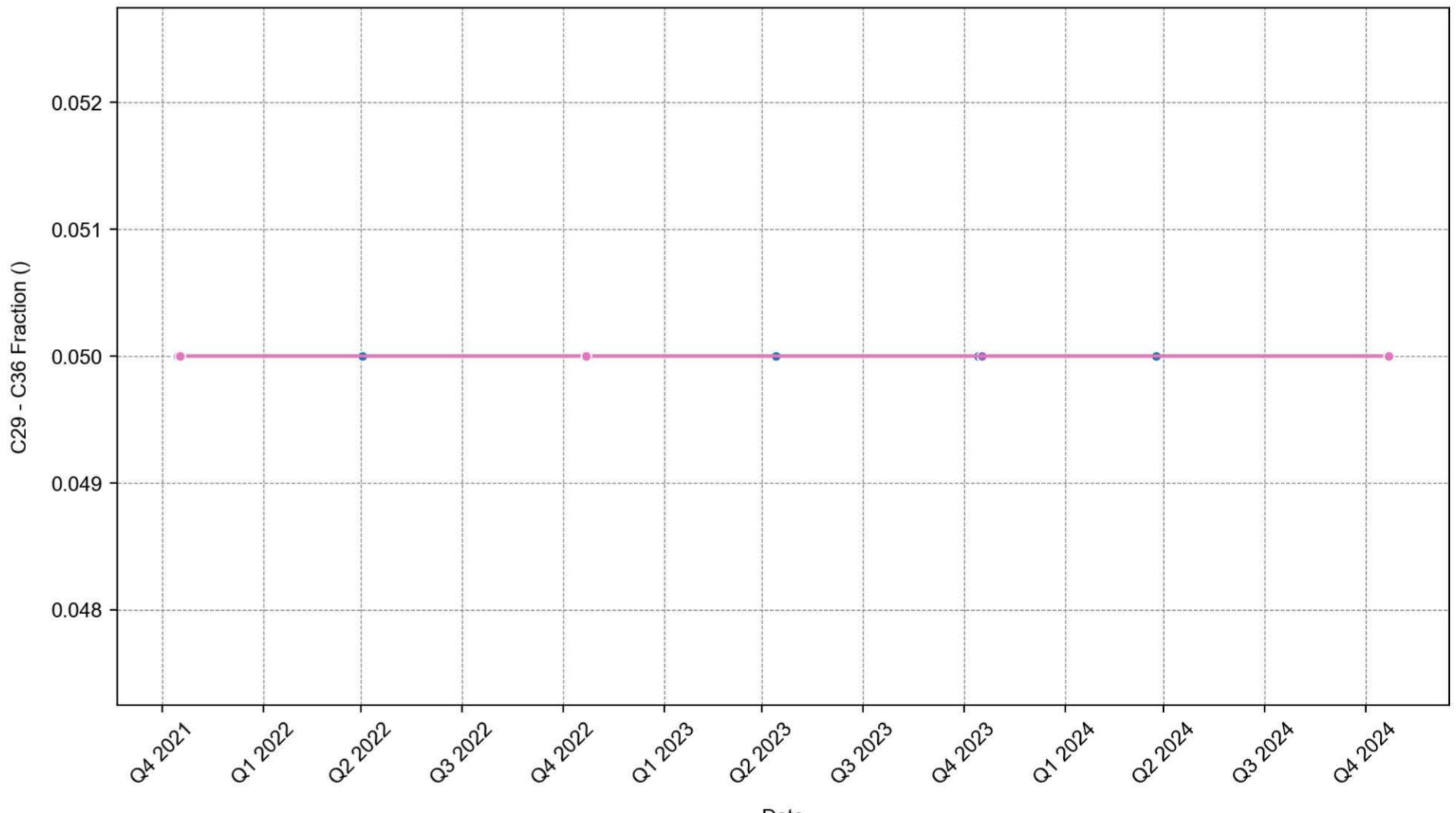
C10 - C36 Fraction (sum)



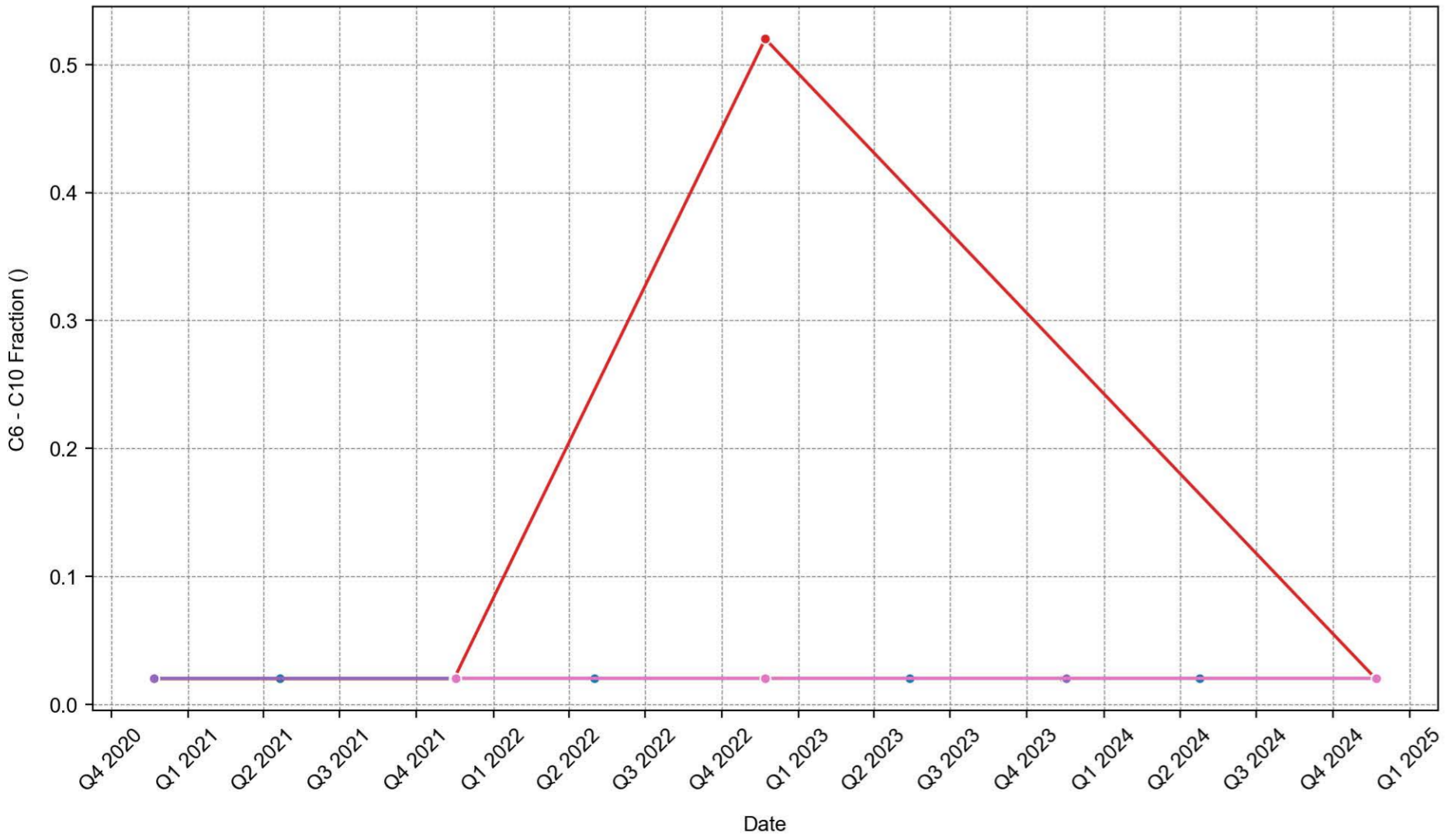
C15 - C28 Fraction



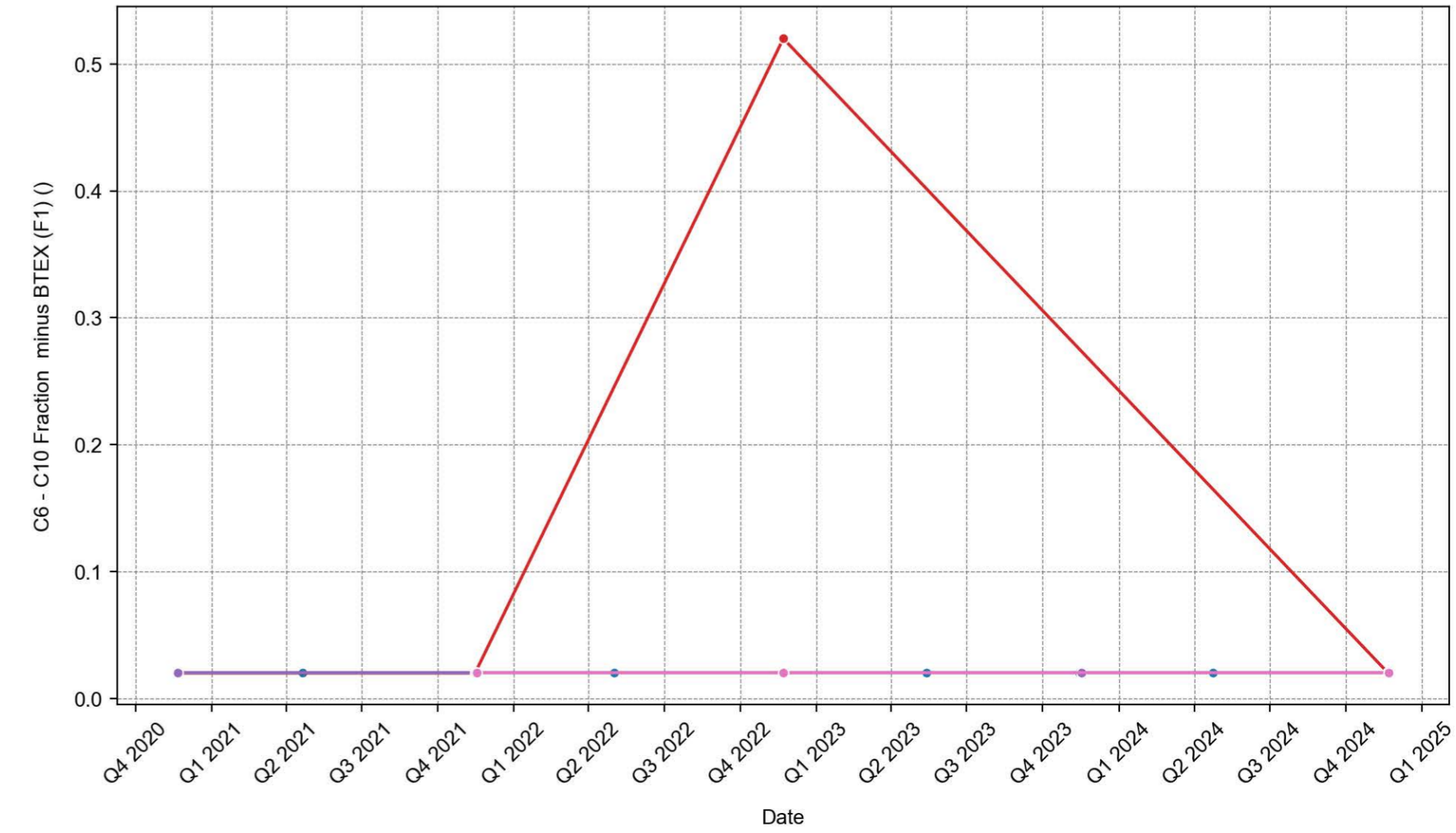
C29 - C36 Fraction



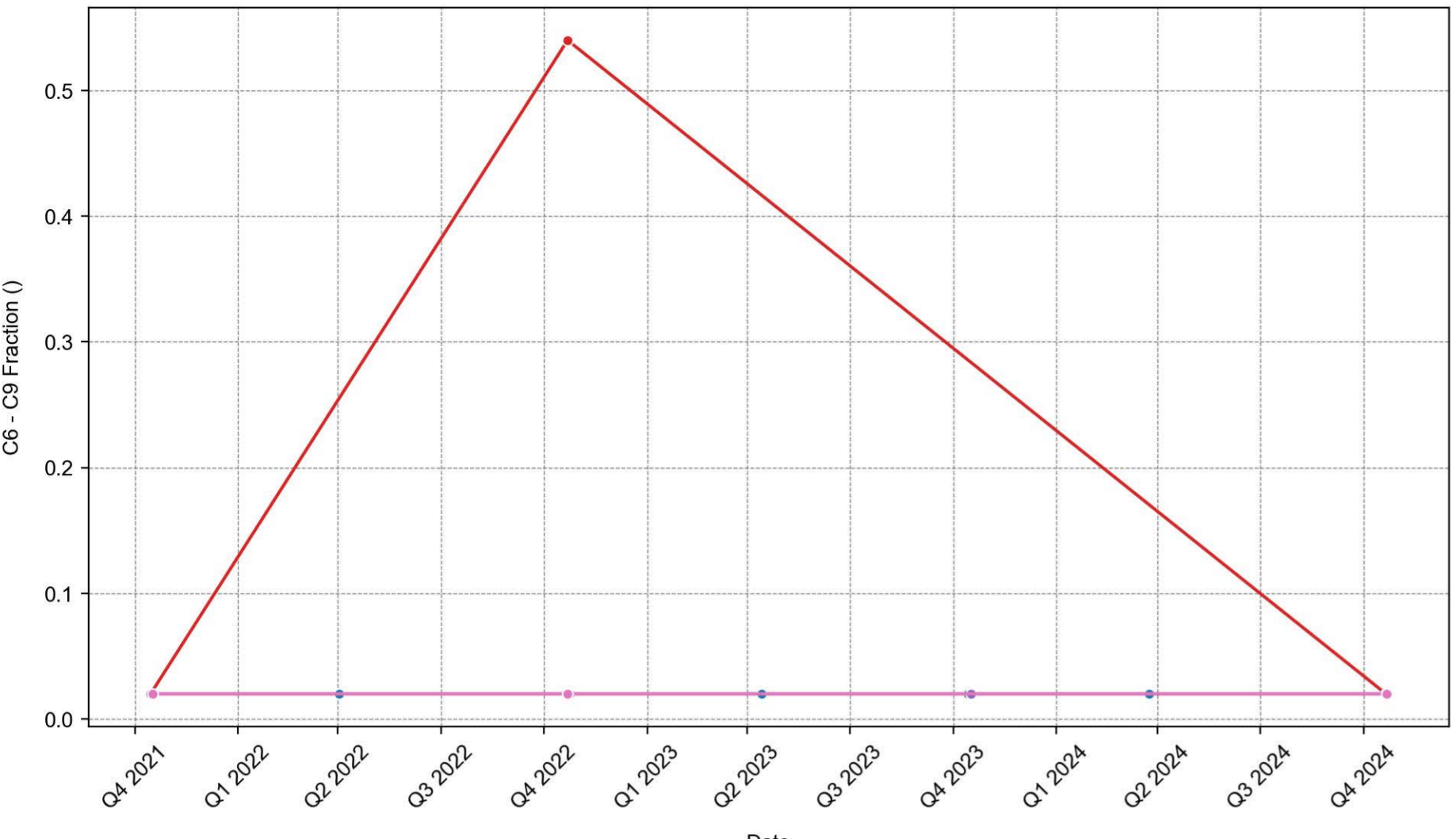
C6 - C10 Fraction



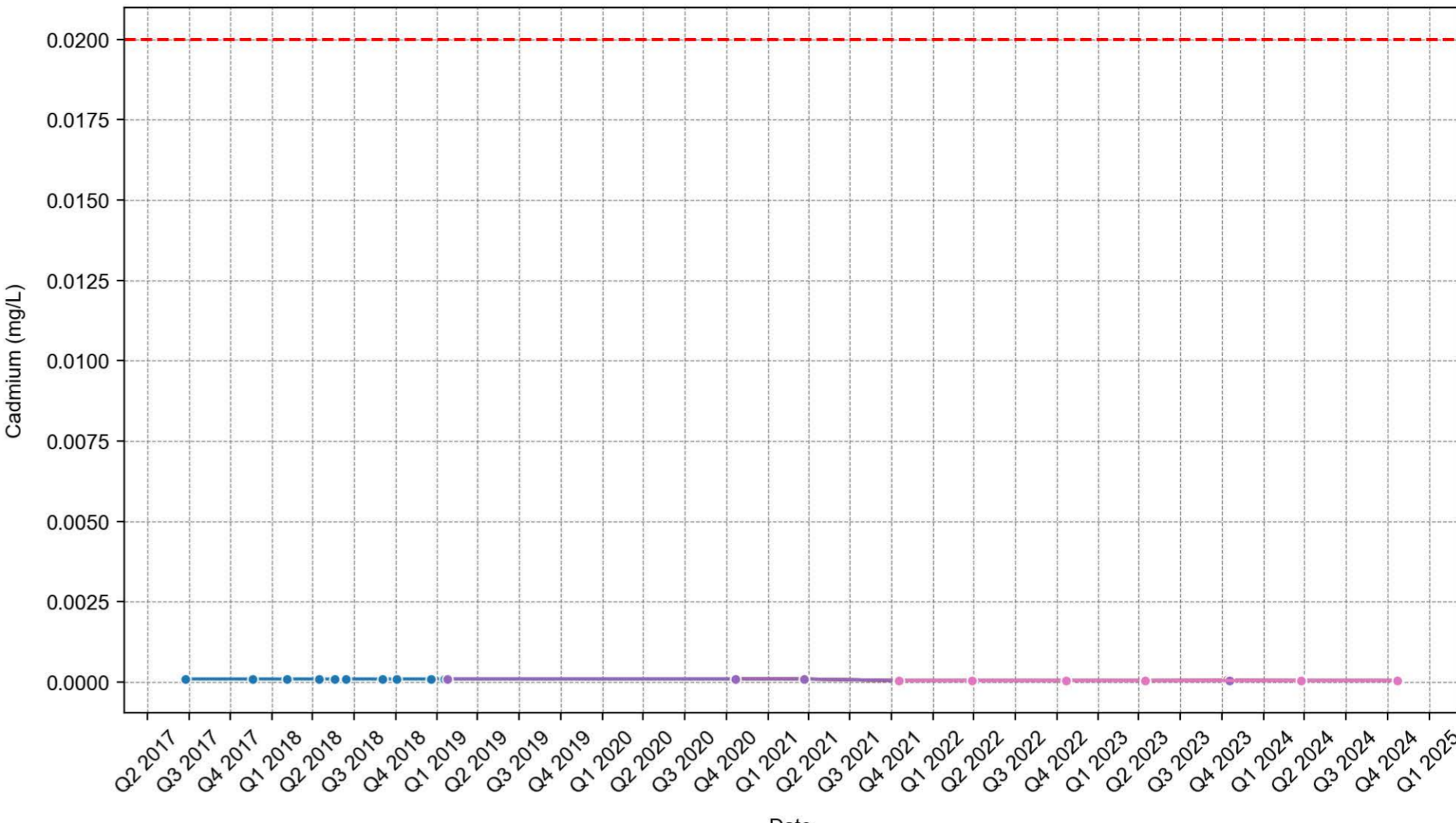
C6 - C10 Fraction minus BTEX (F1)



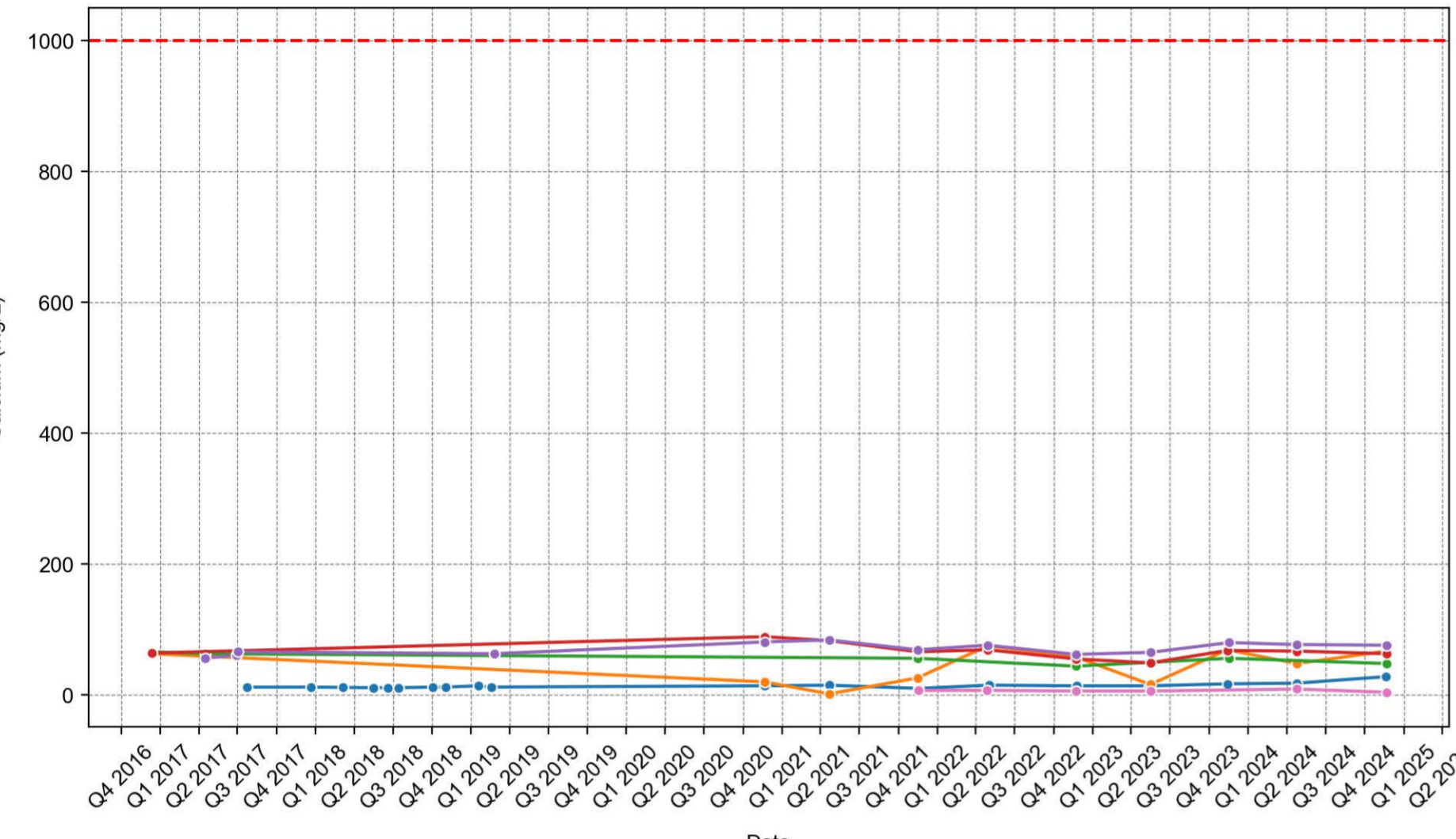
C6 - C9 Fraction



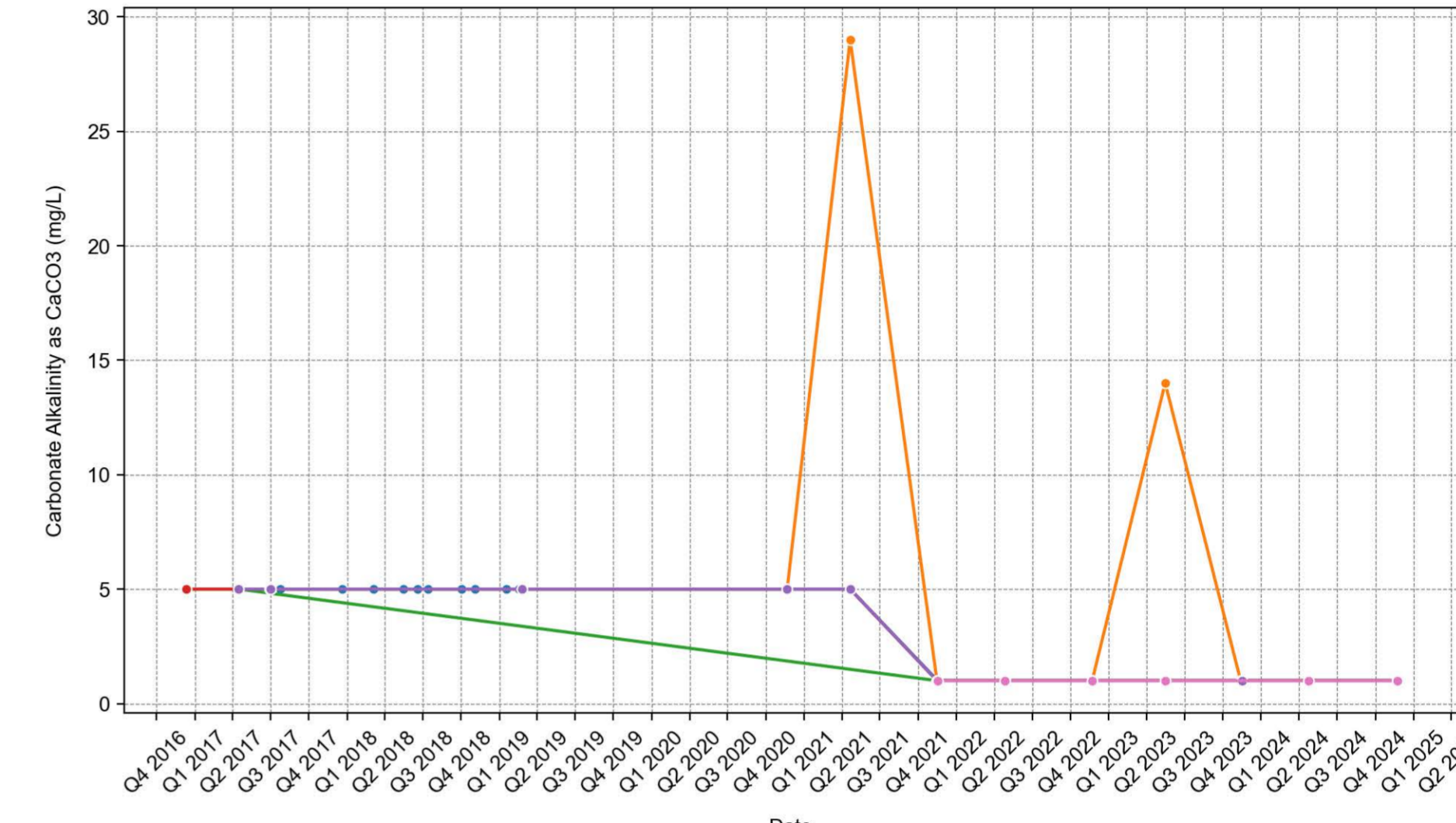
Cadmium



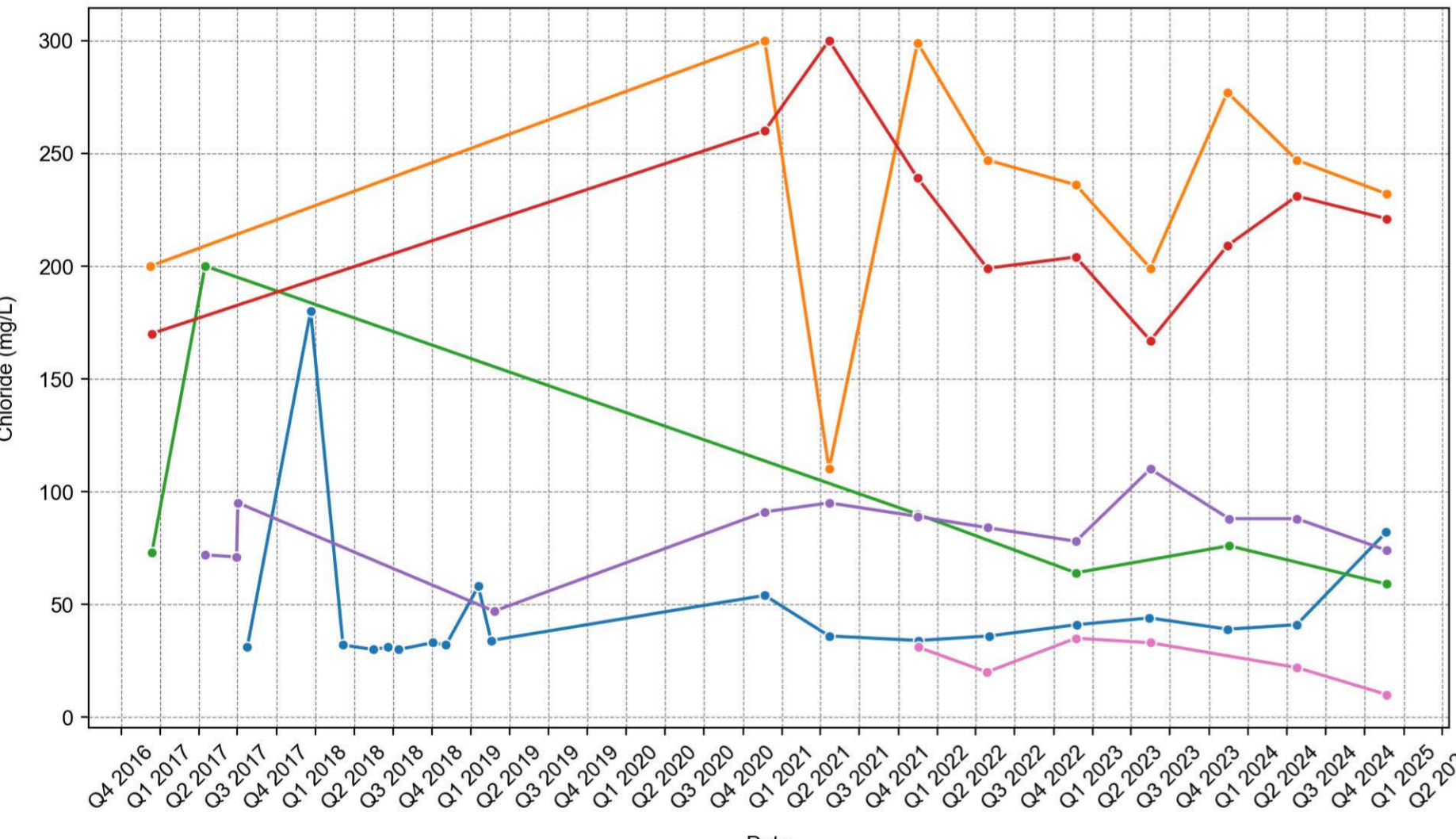
Calcium



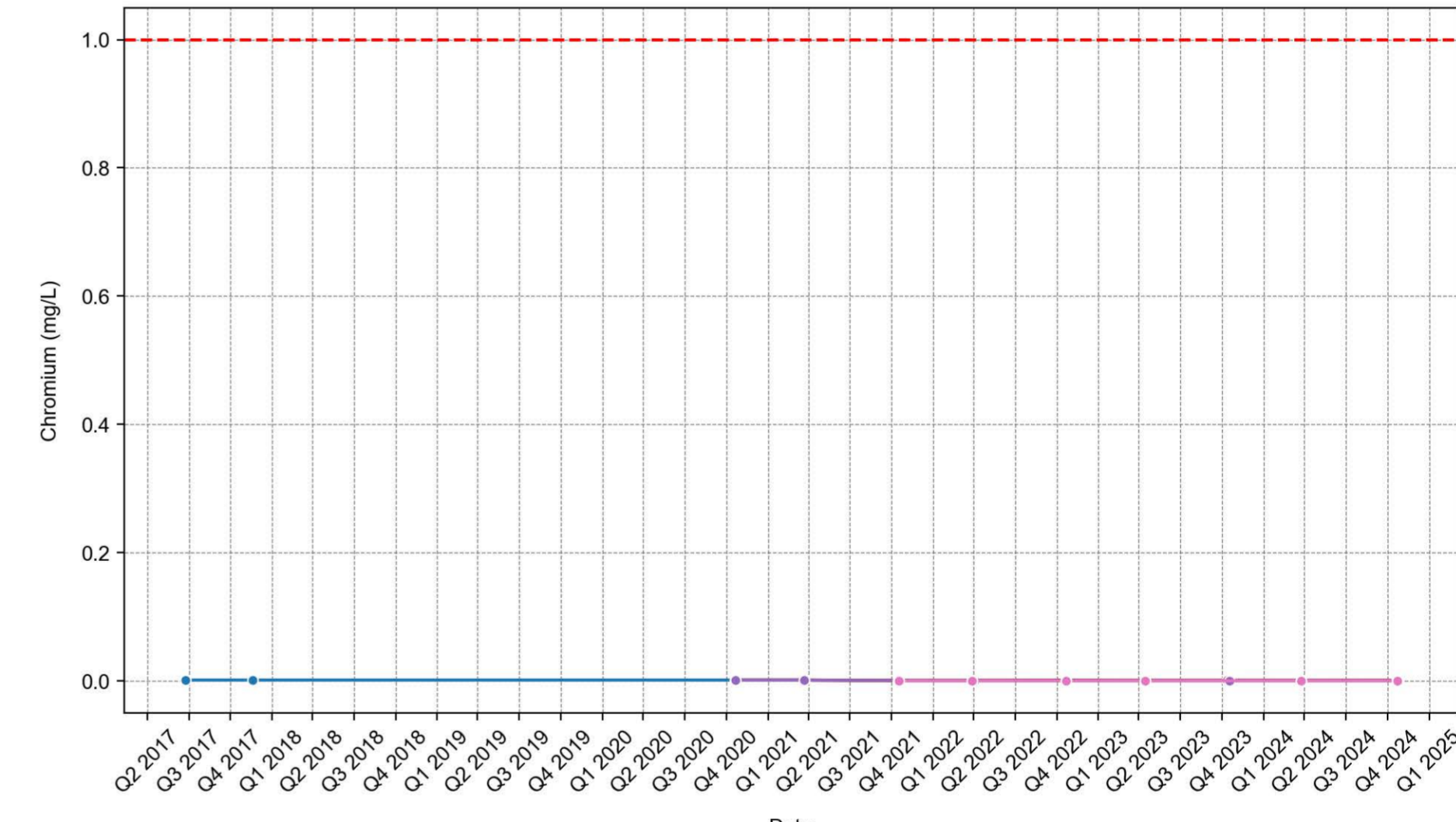
Carbonate Alkalinity as CaCO3



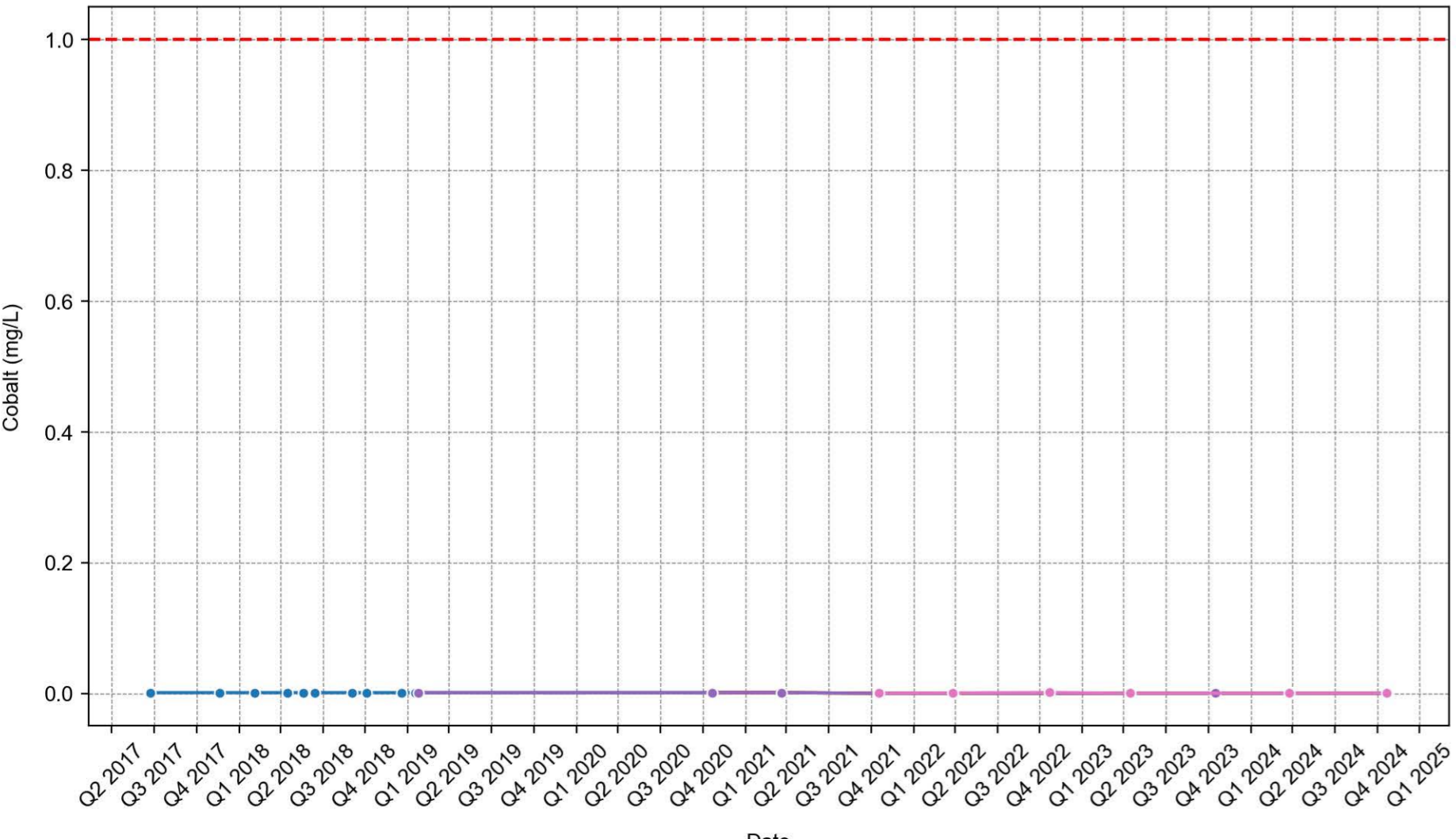
Chloride



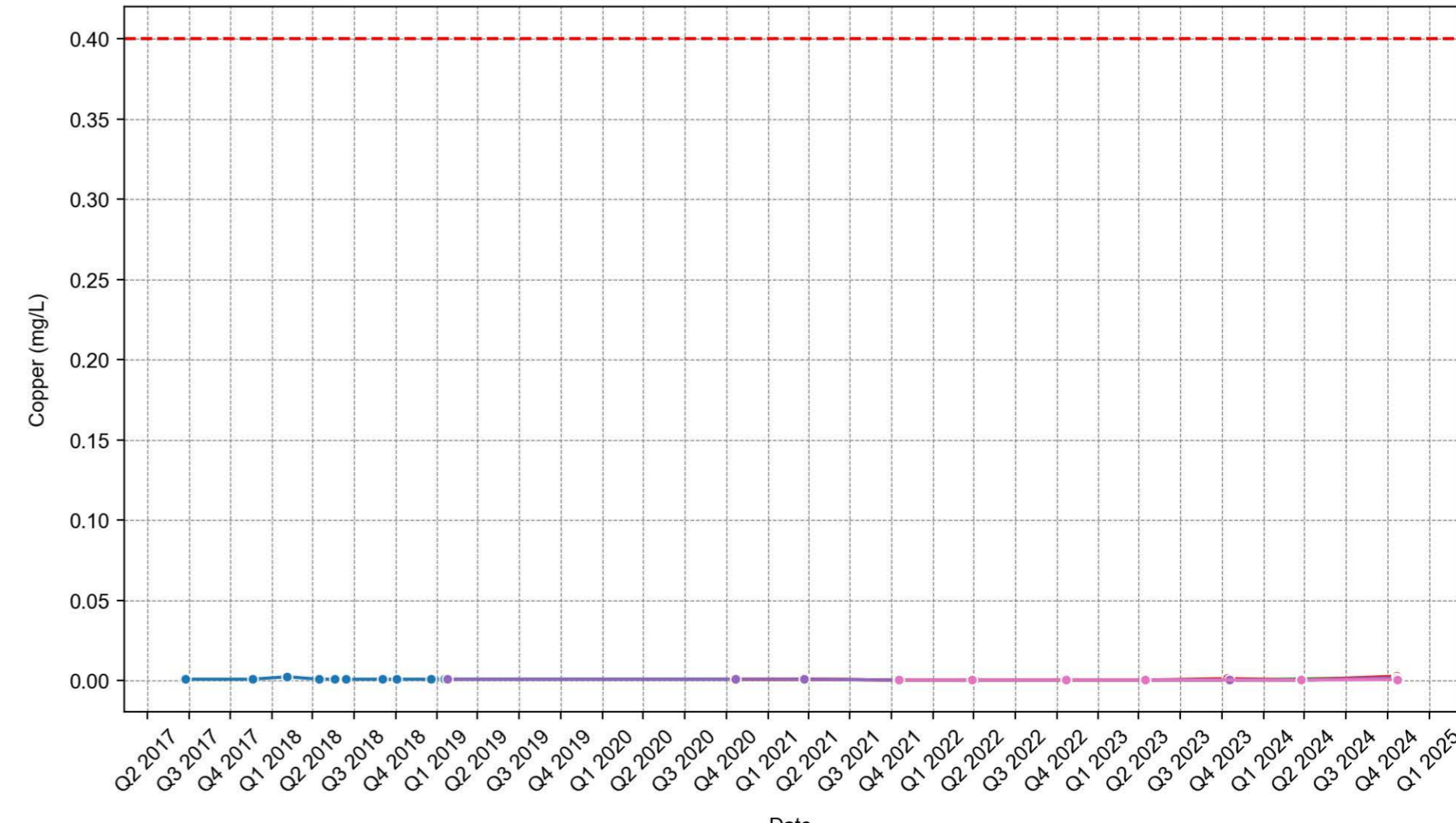
Chromium



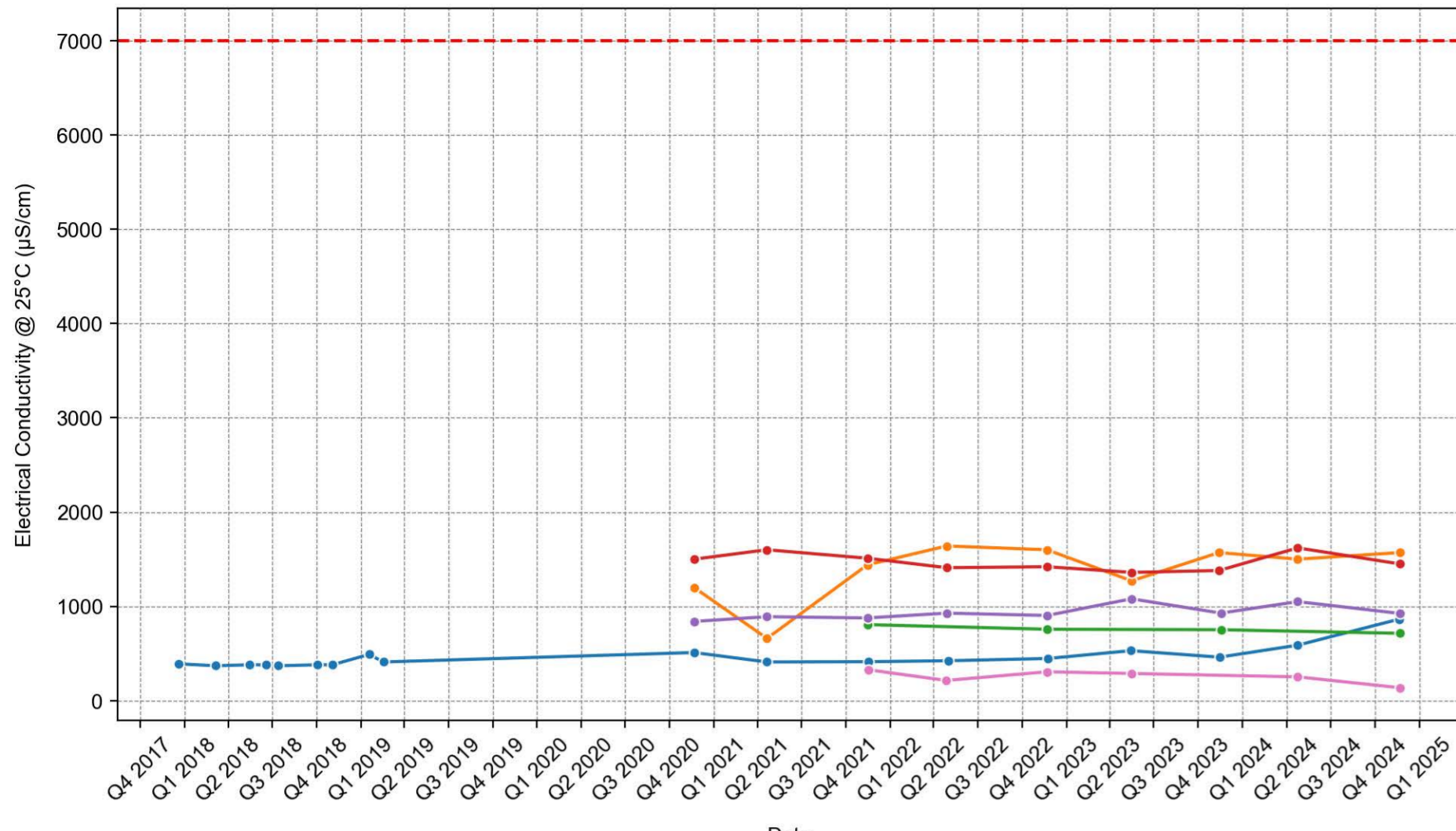
Cobalt



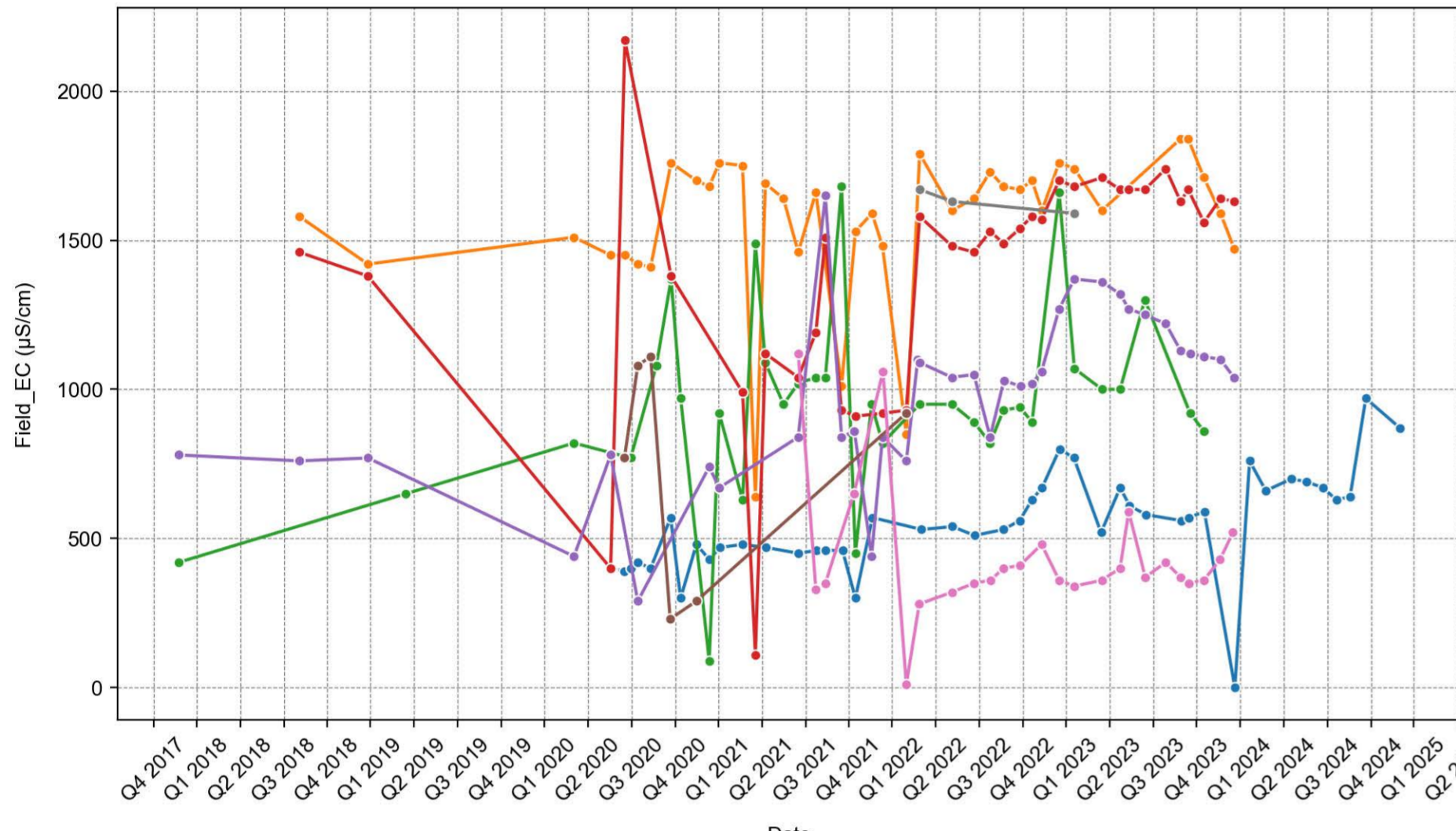
Copper



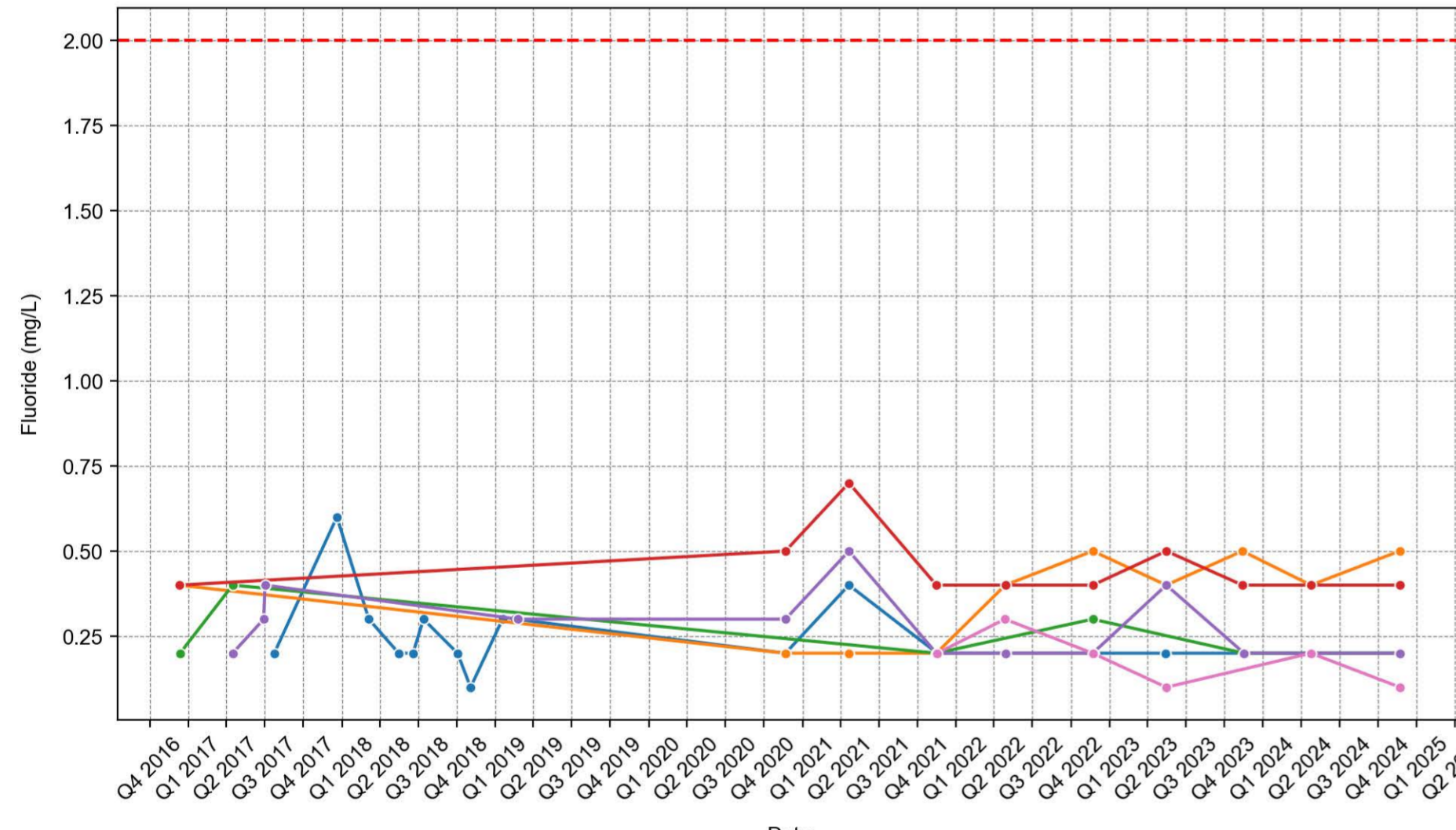
Electrical Conductivity @ 25°C



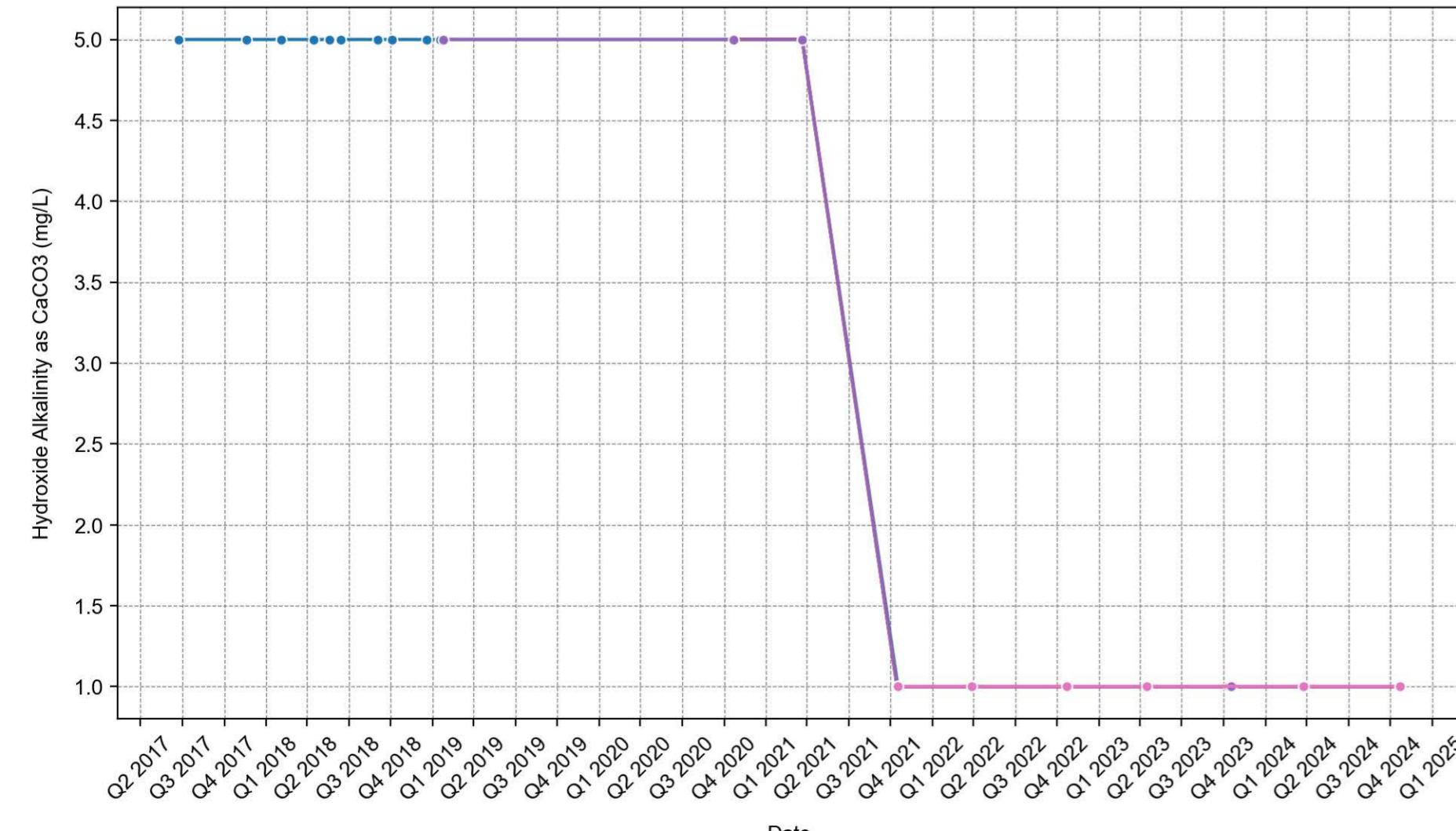
Field_EC



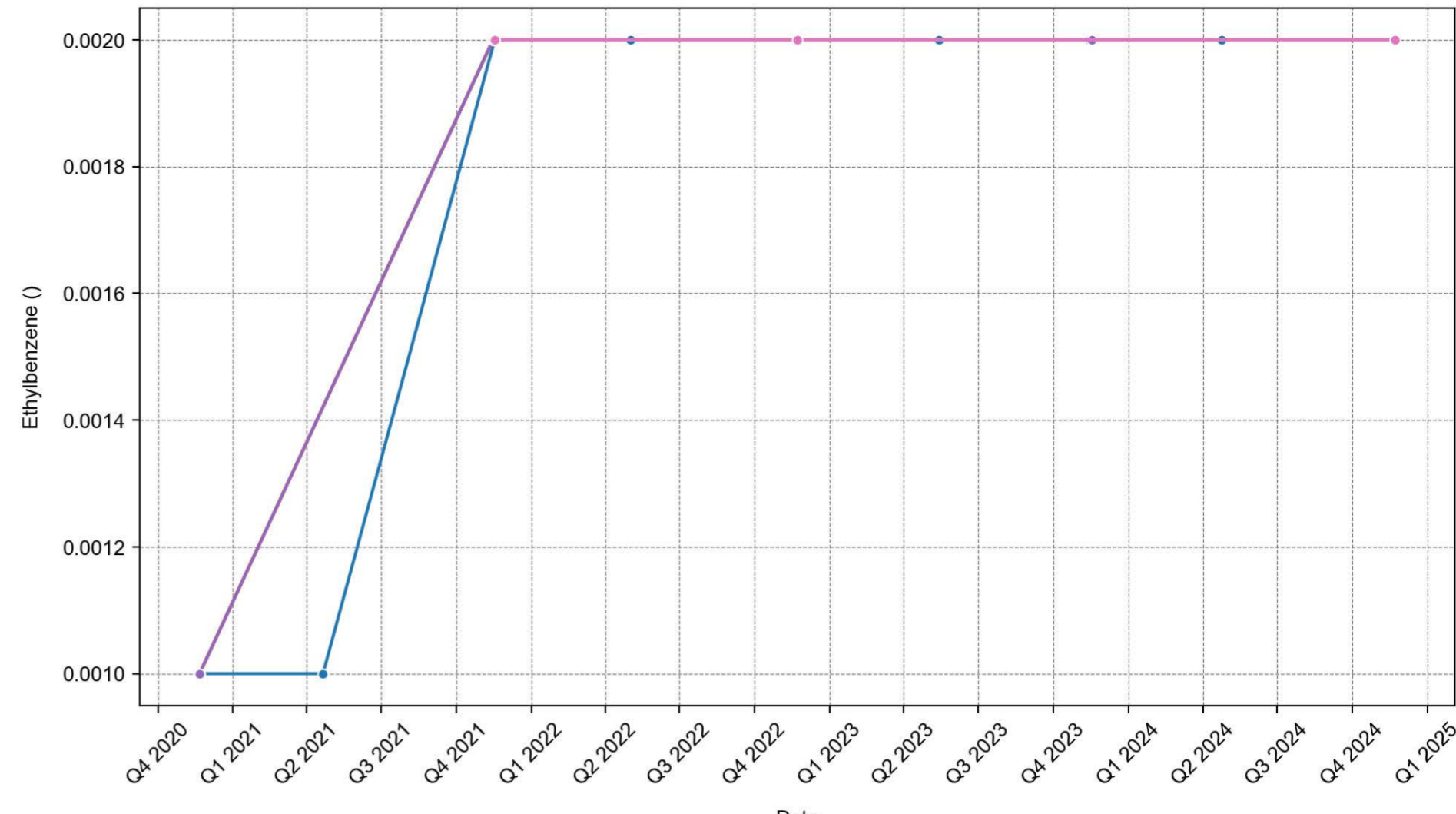
Fluoride



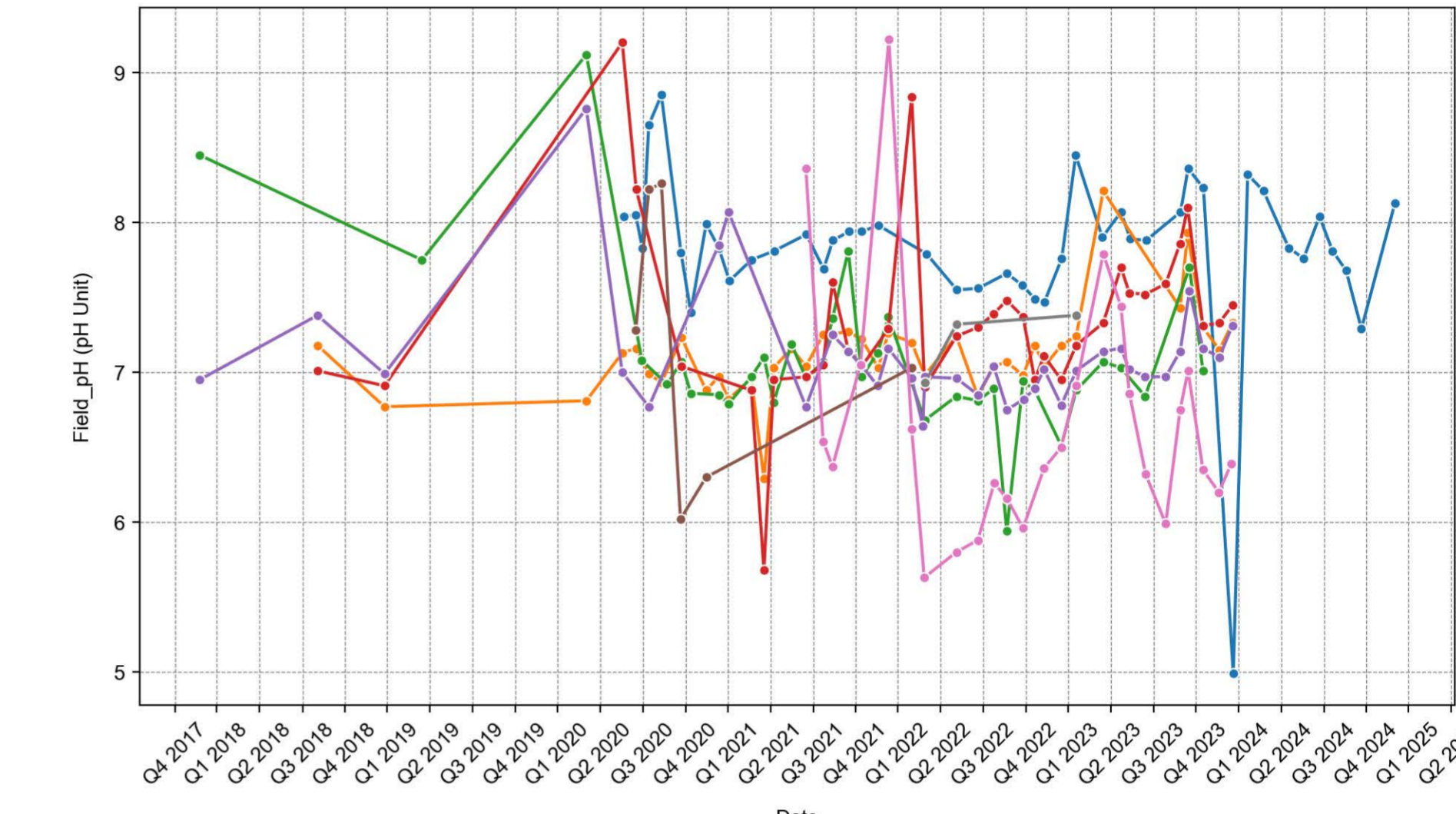
Hydroxide Alkalinity as CaCO3



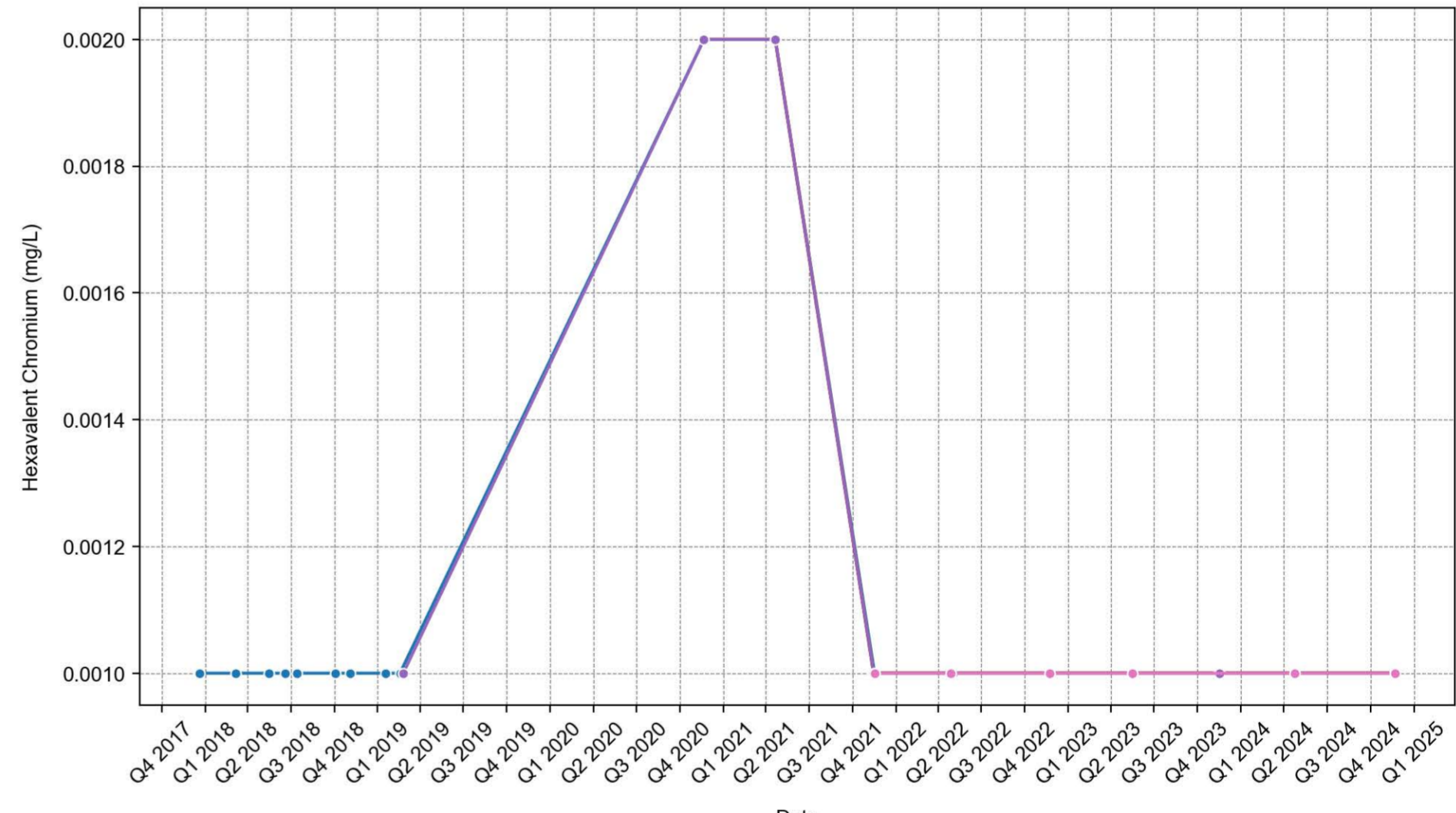
Ethylbenzene



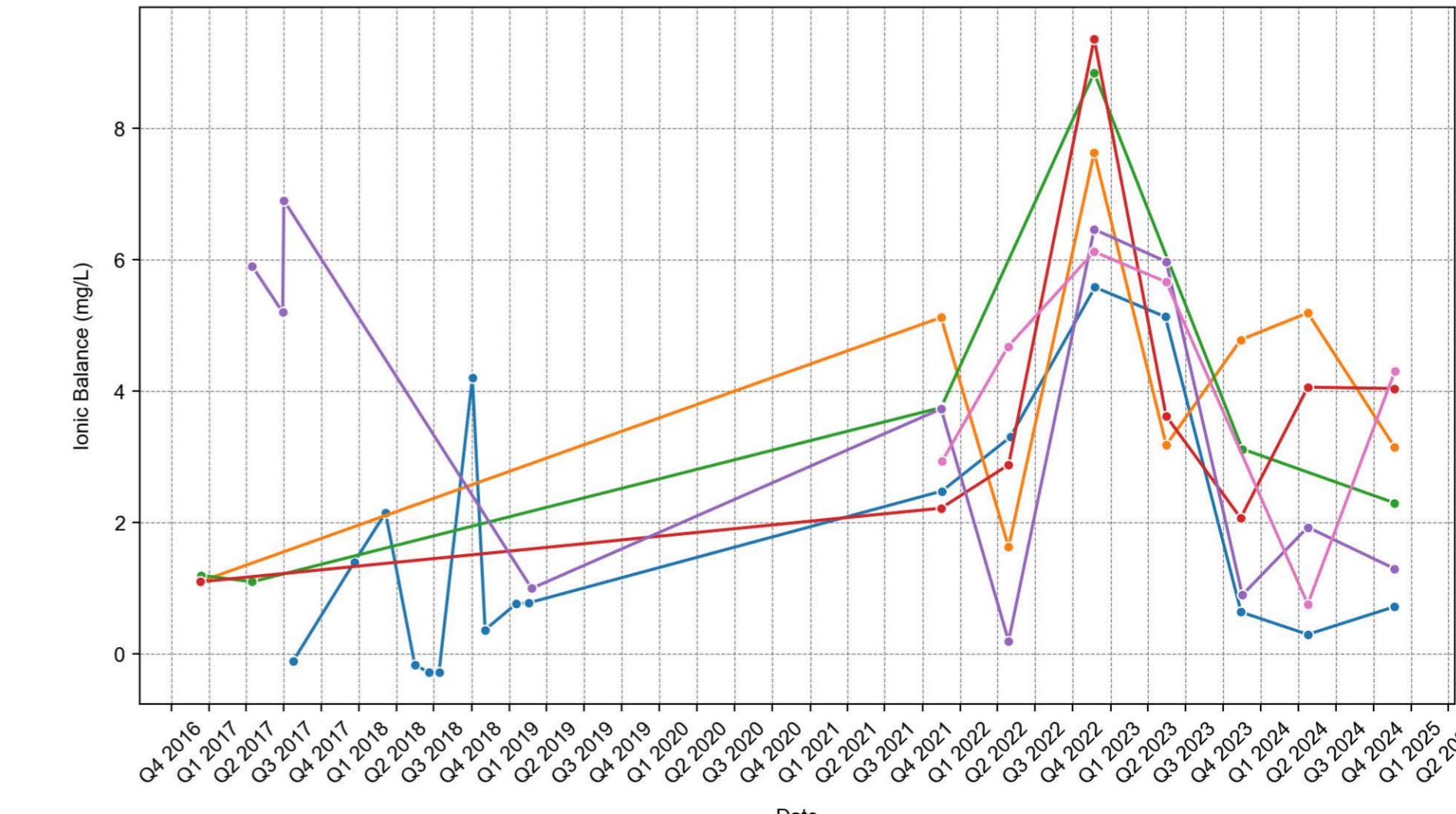
Field_pH



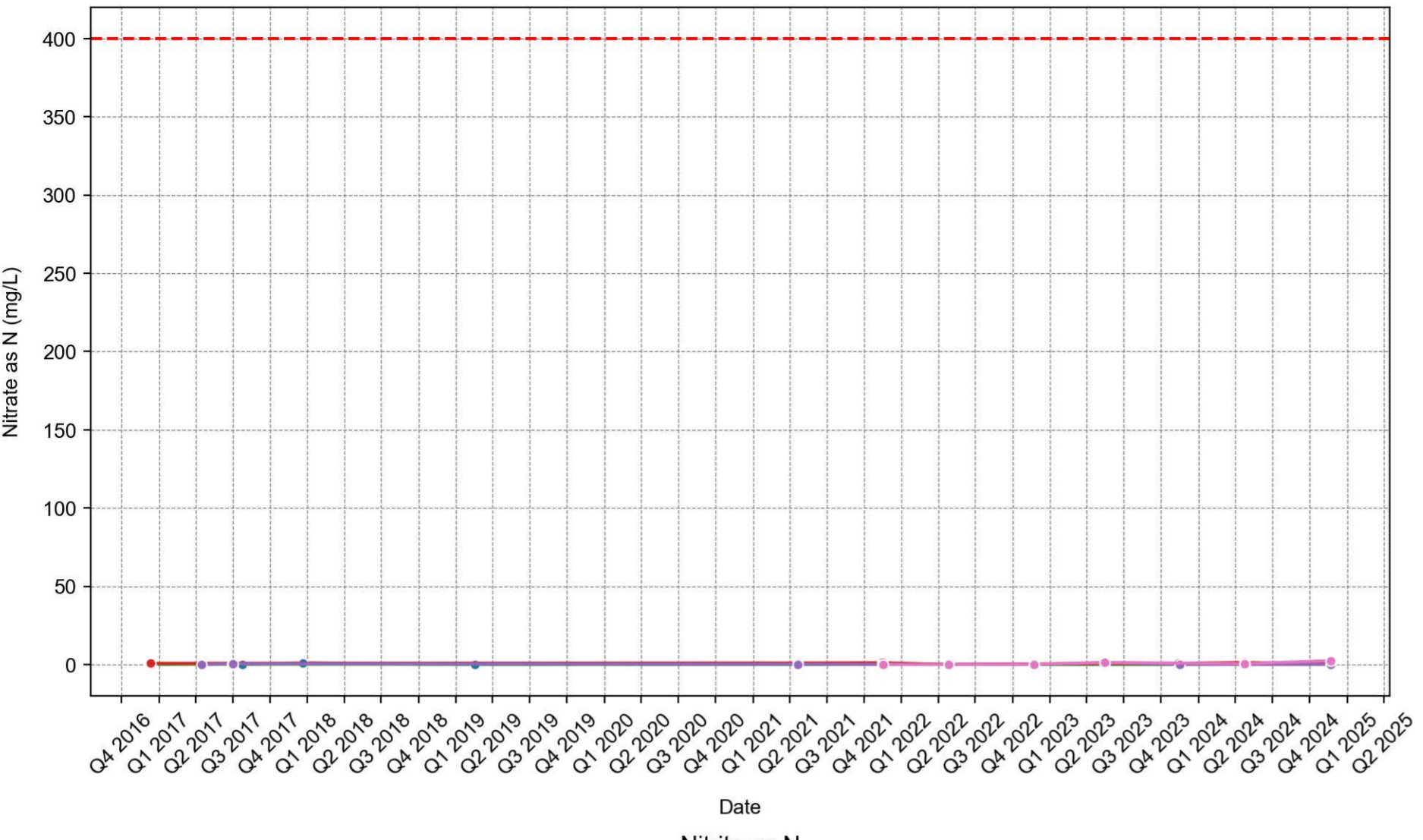
Hexavalent Chromium



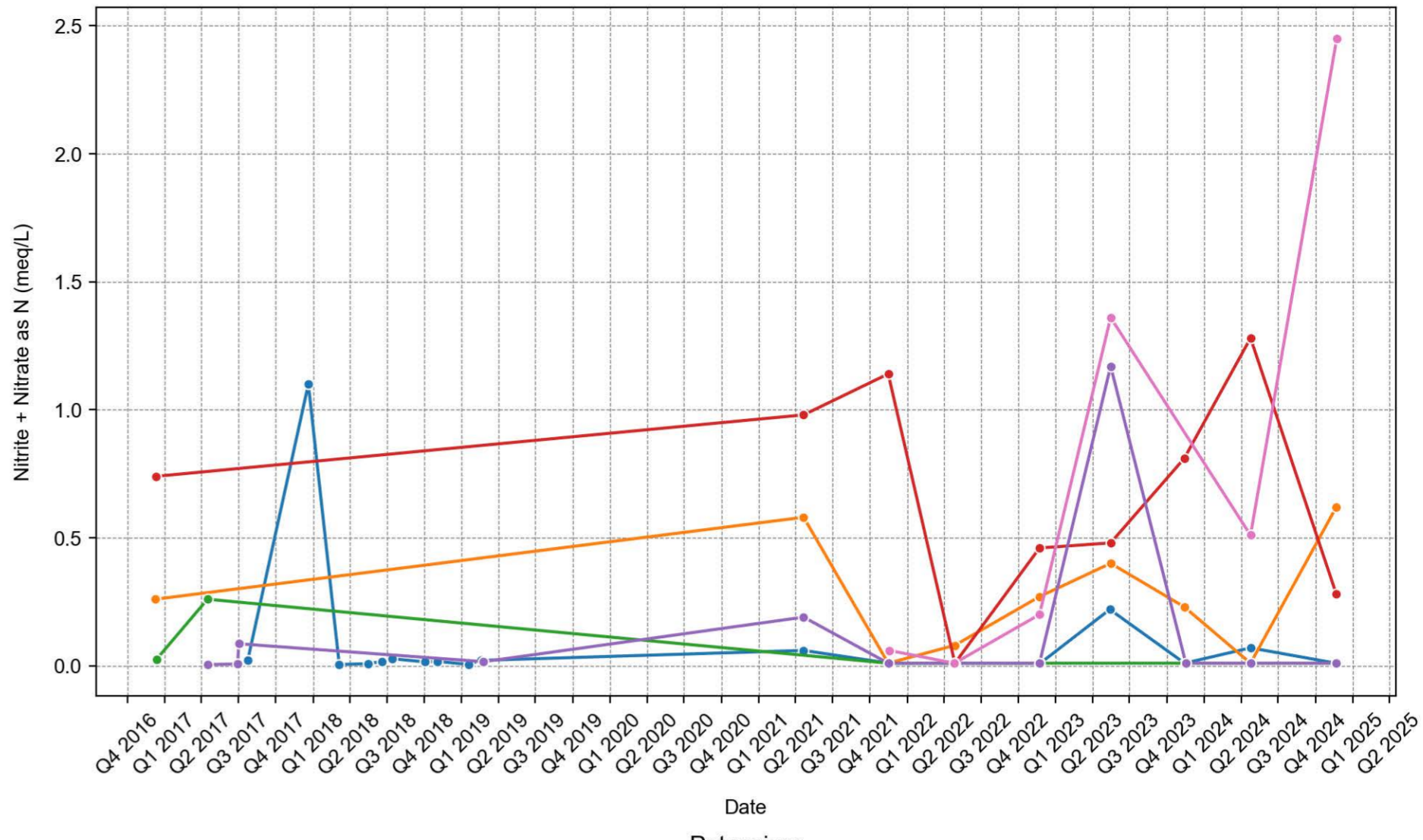
Ionic Balance



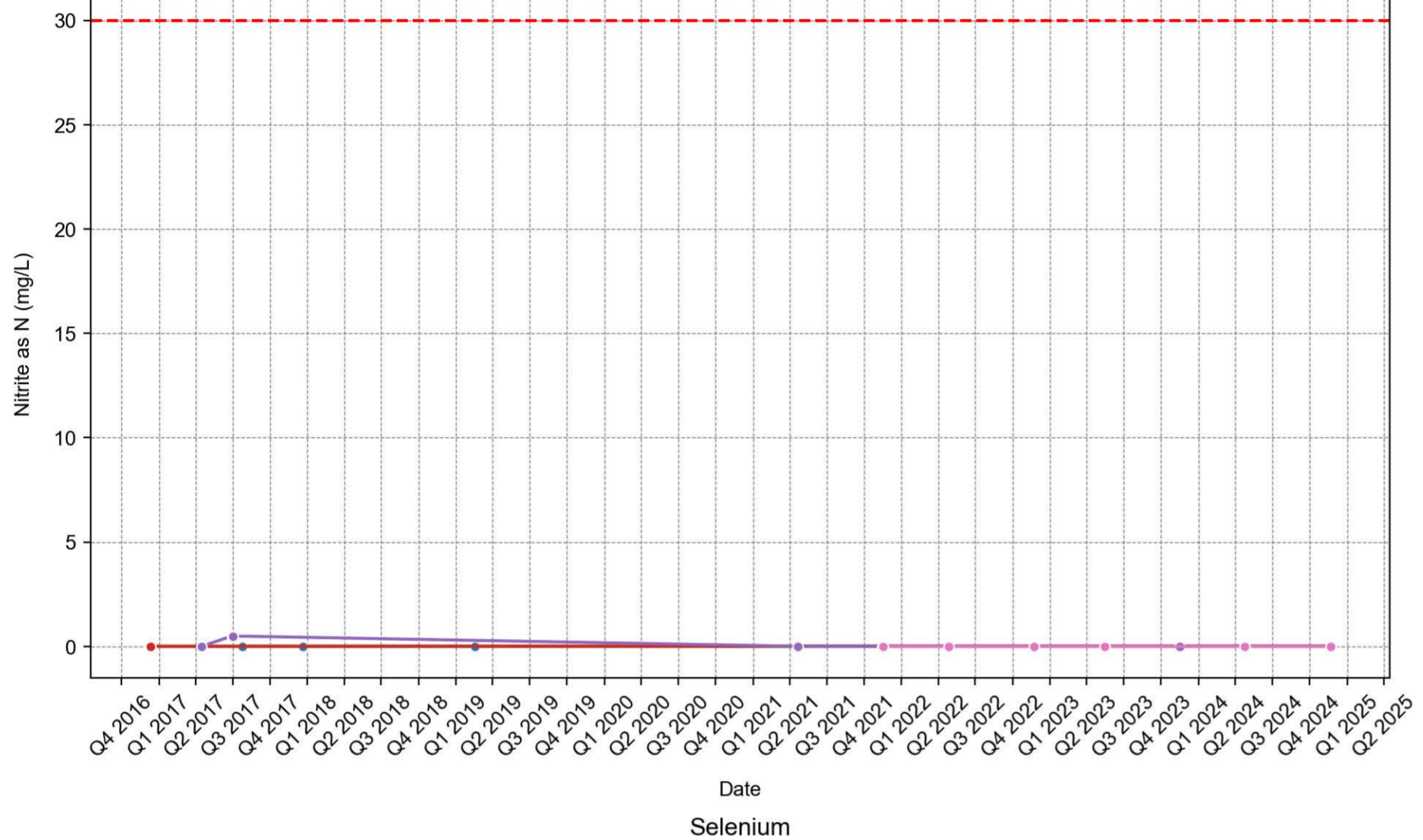
Nitrate as N



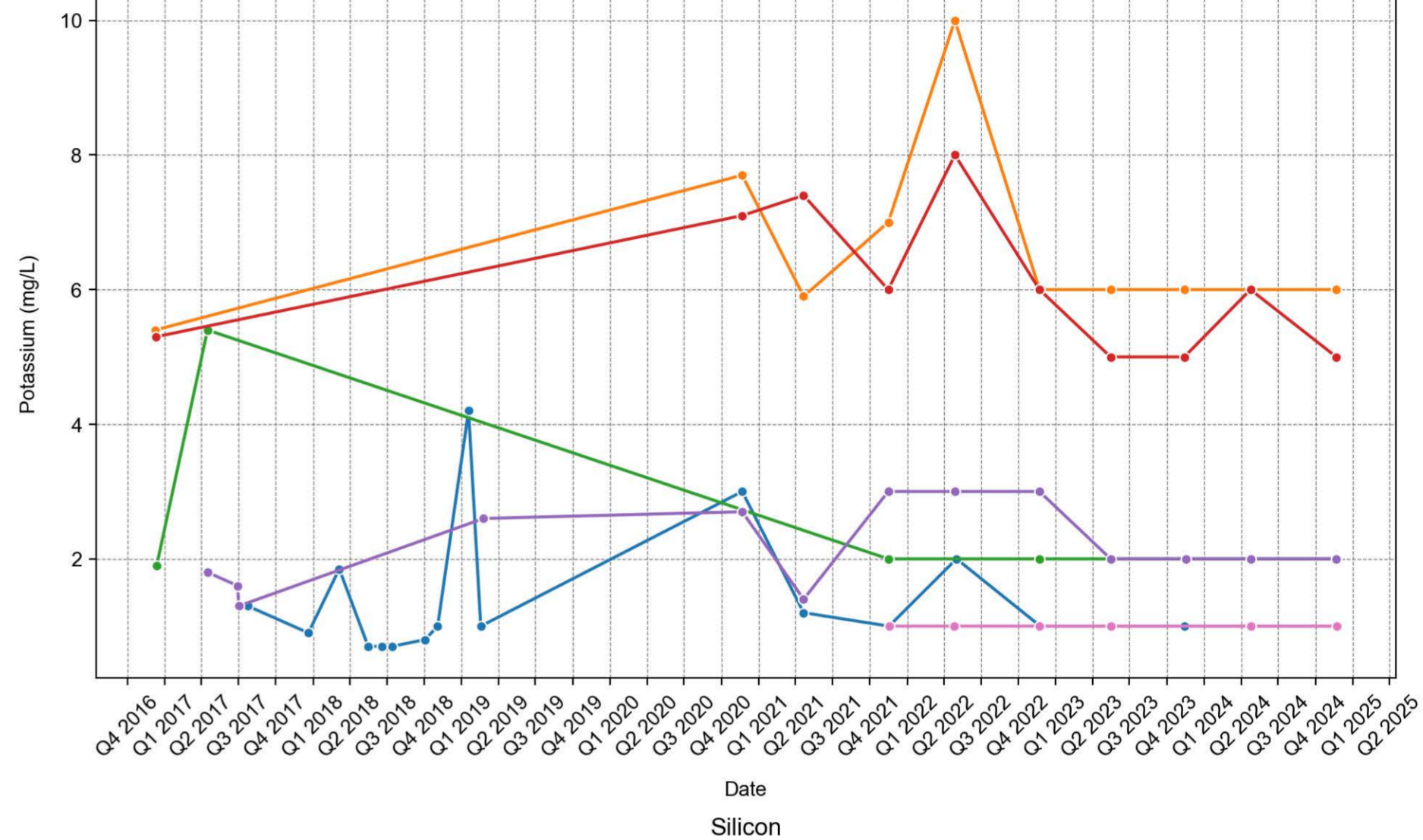
Nitrite + Nitrate as N



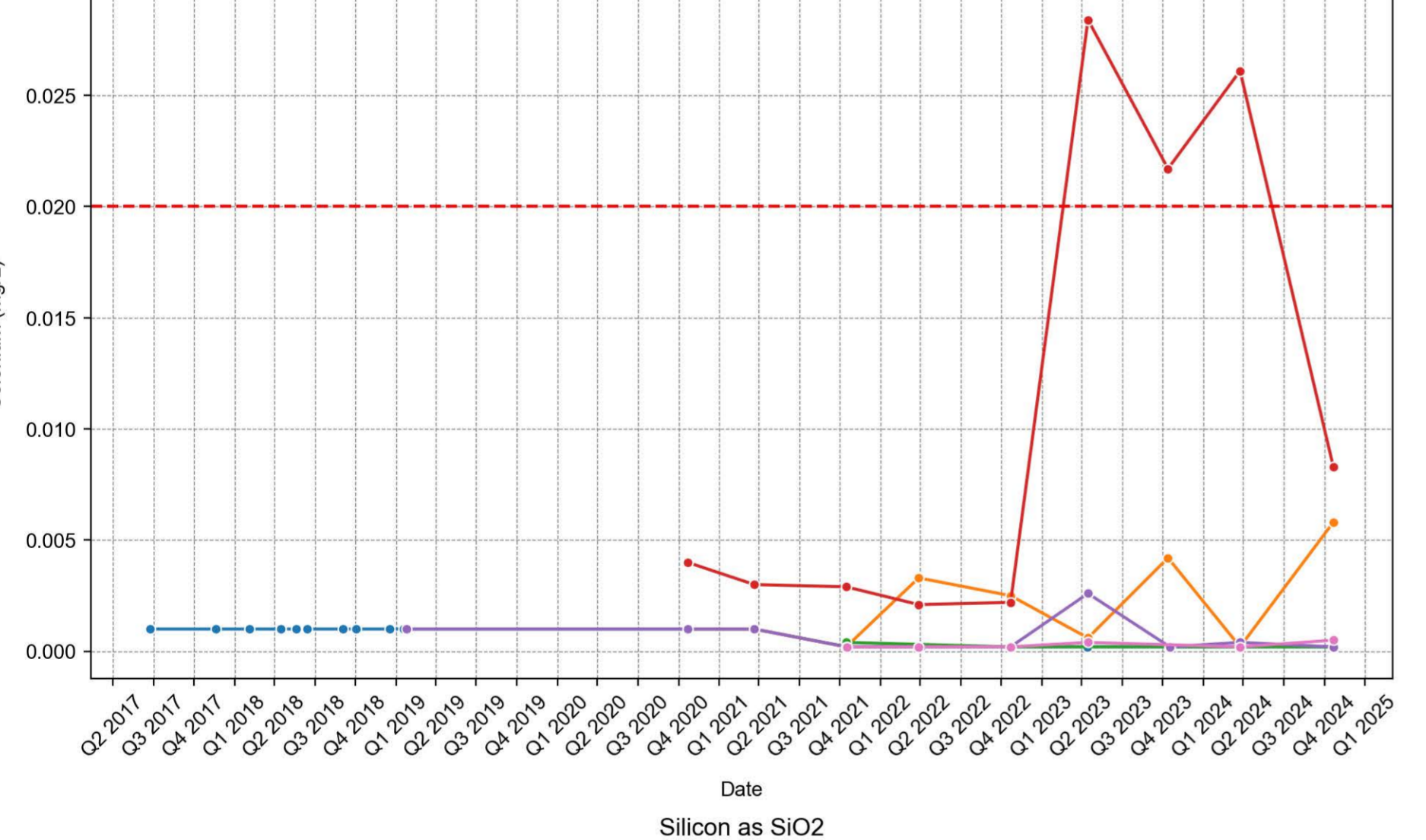
Nitrite as N



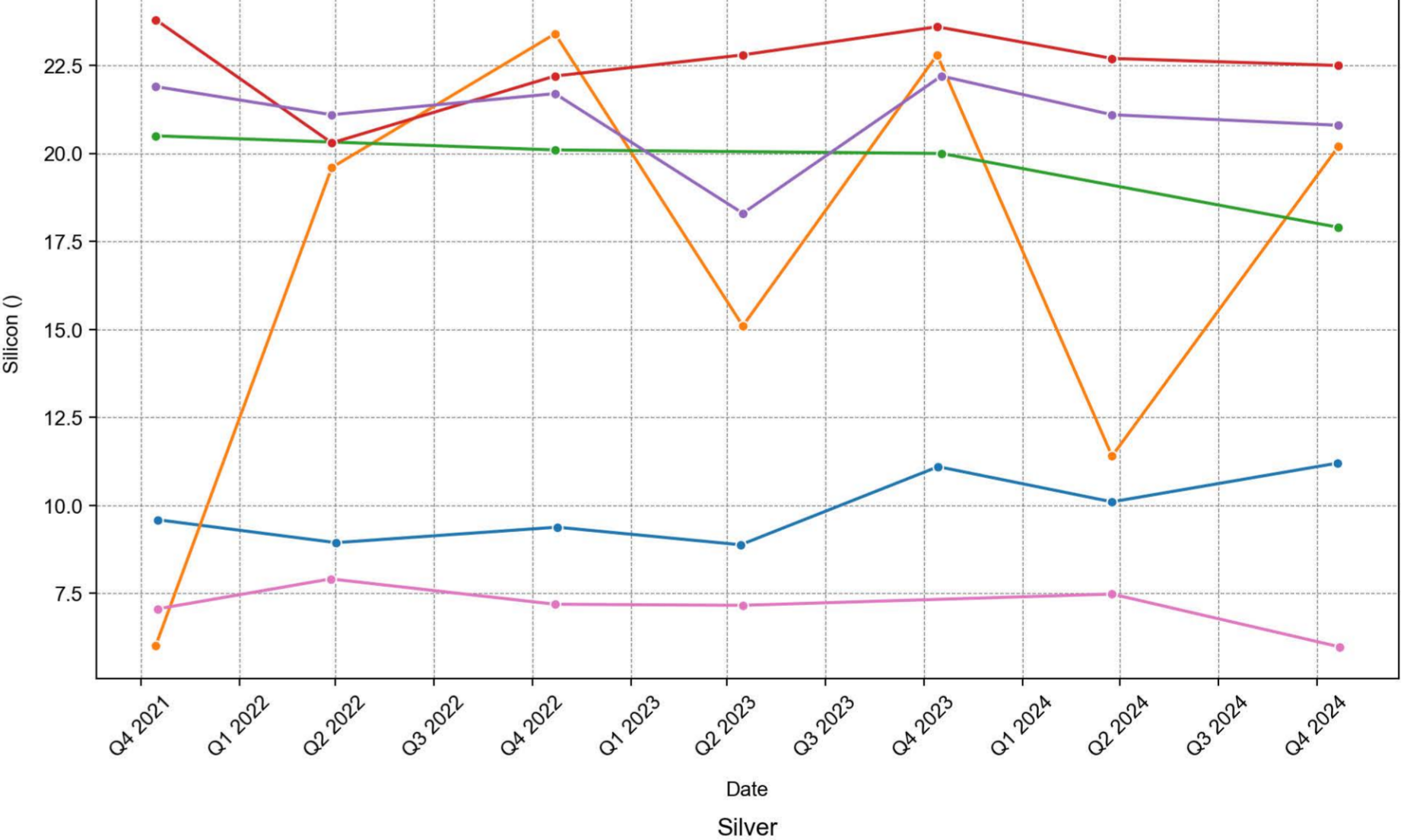
Potassium



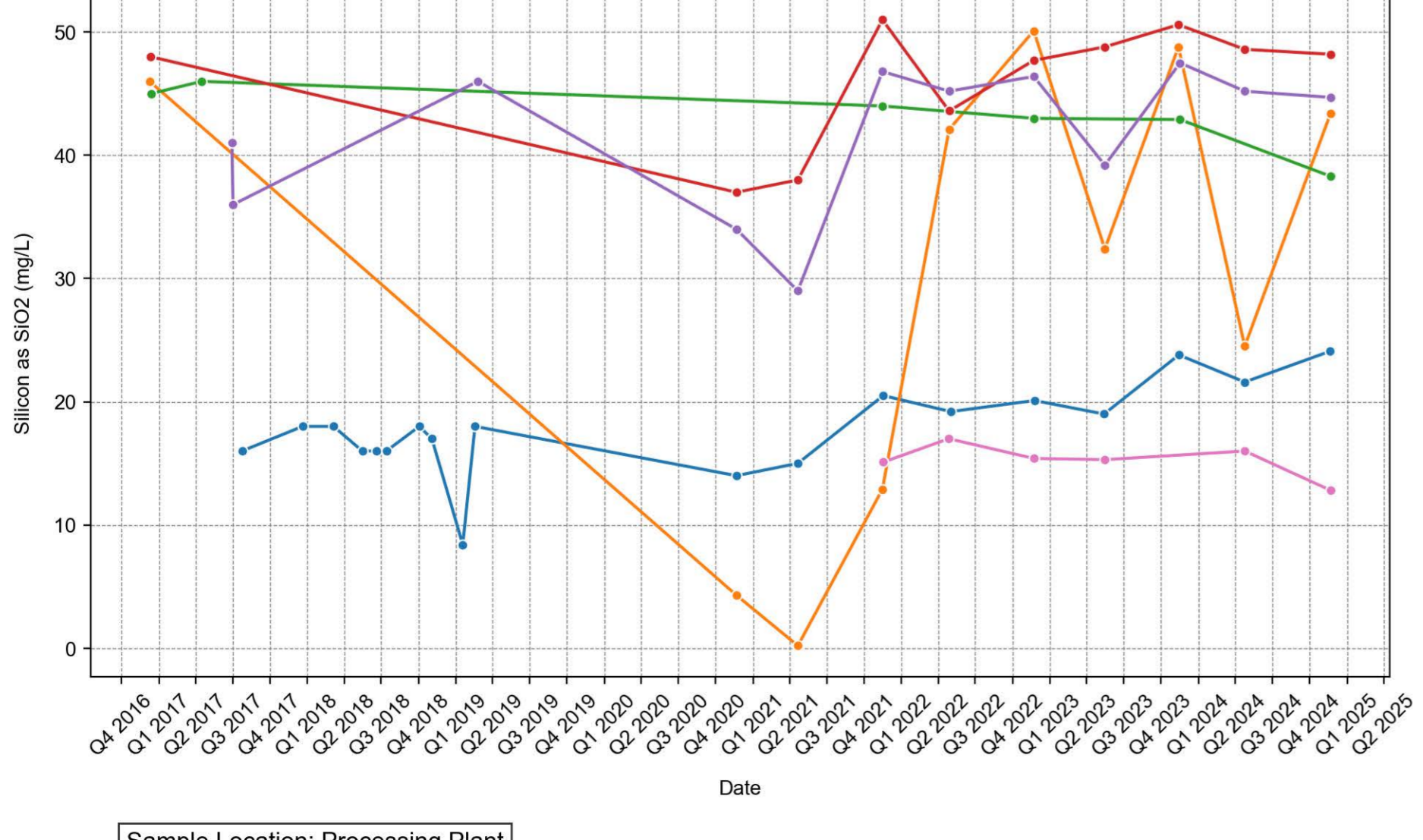
Selenium



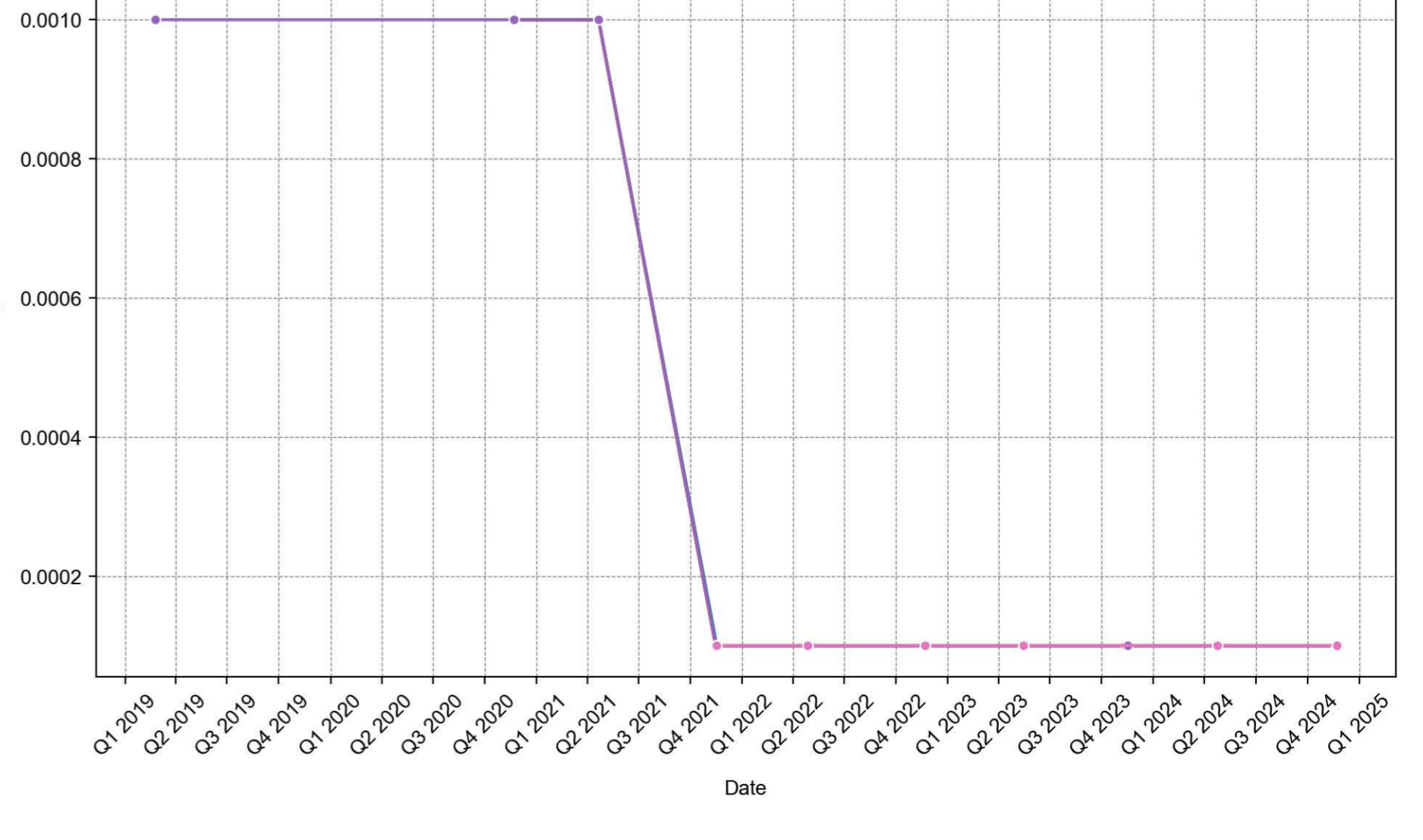
Silicon



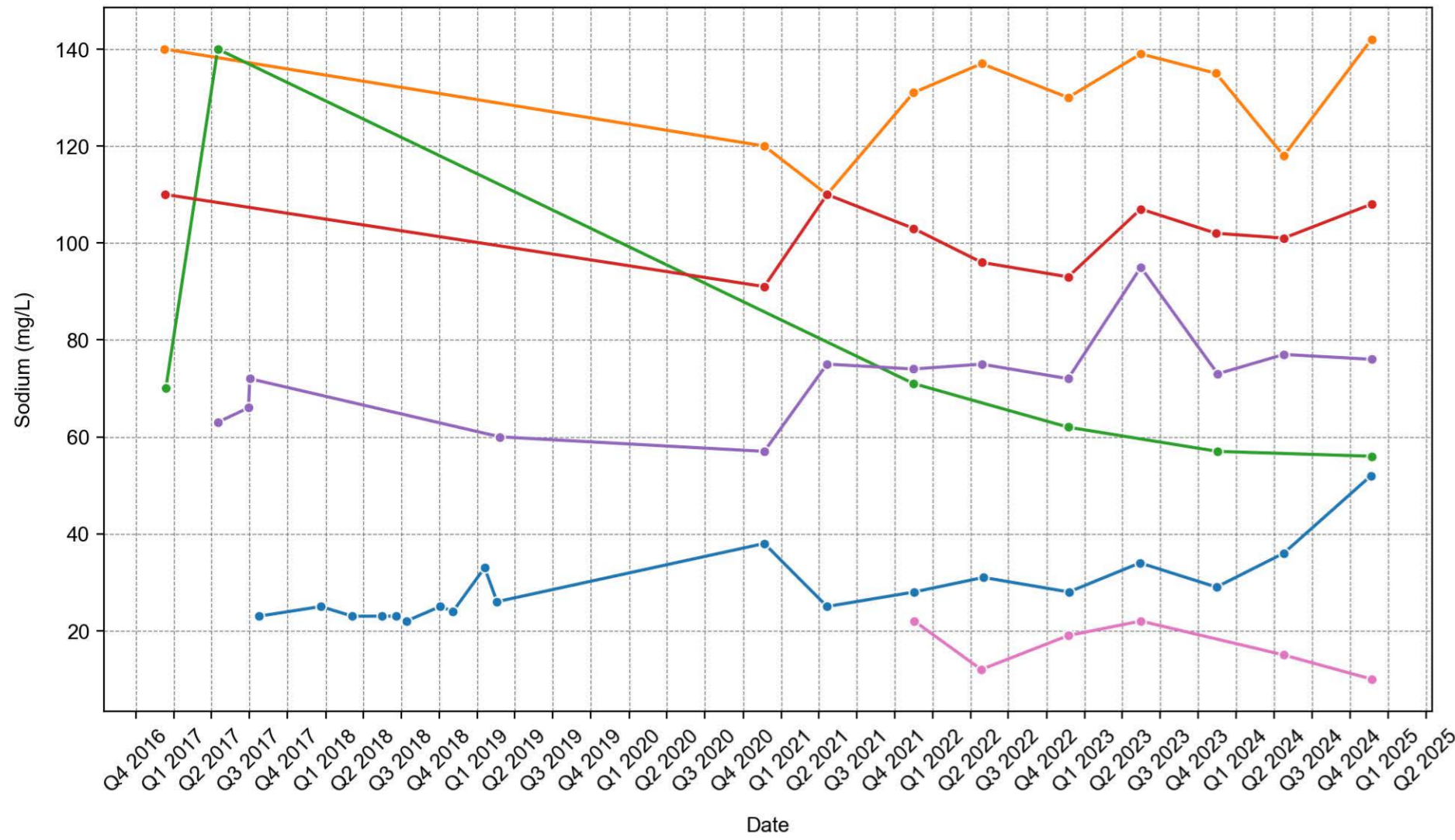
Silicon as SiO2



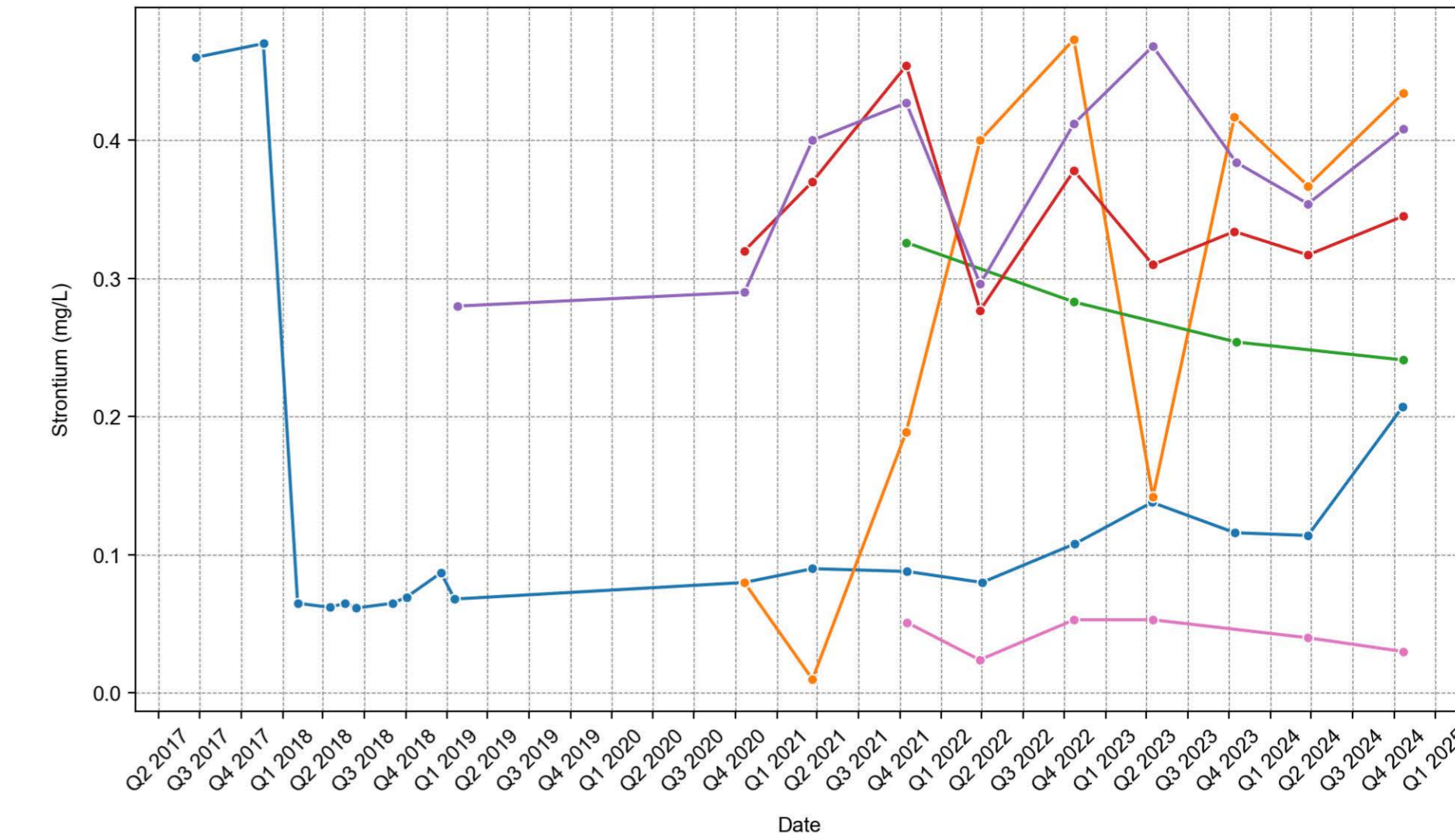
Silver



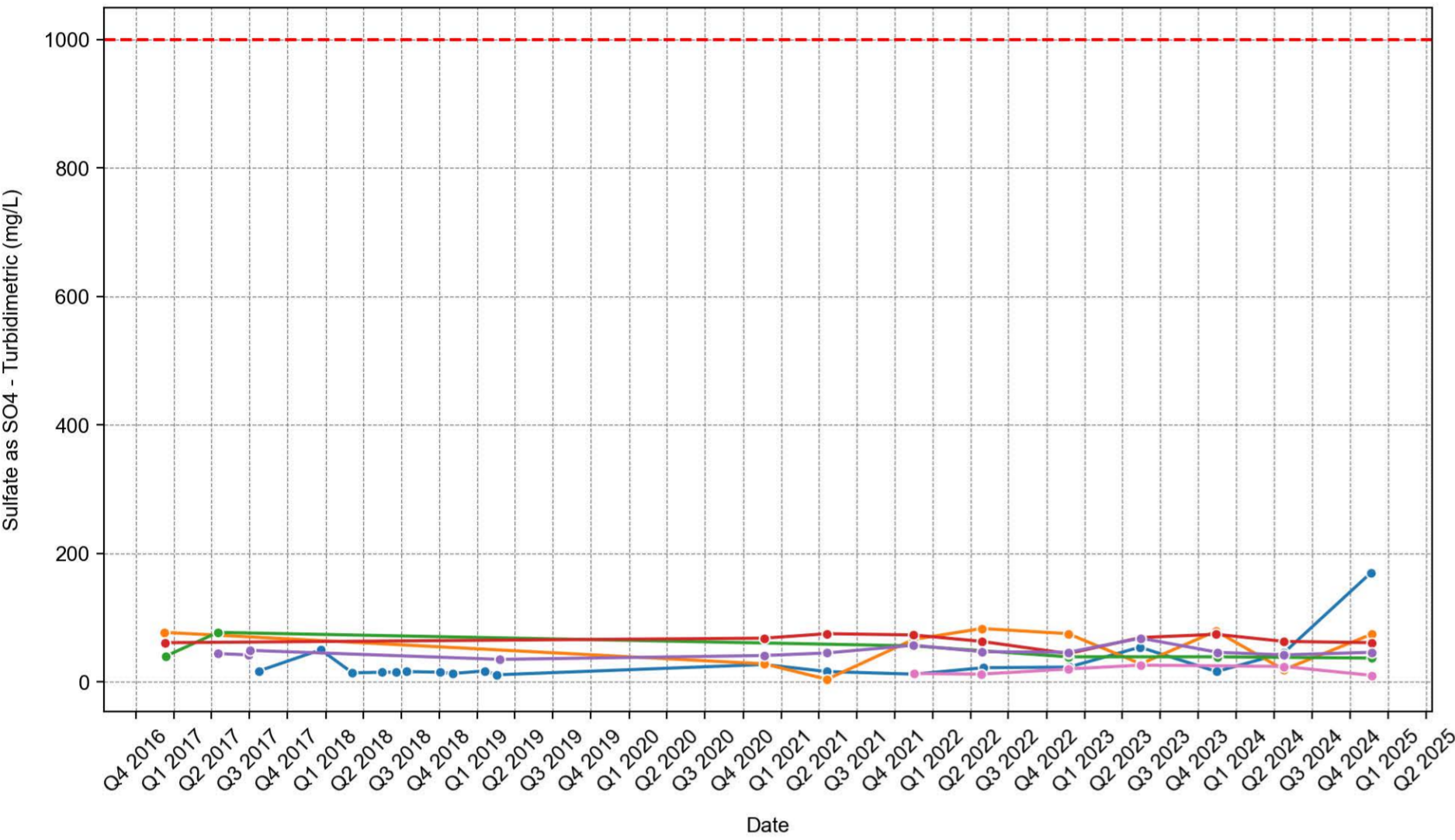
Sodium



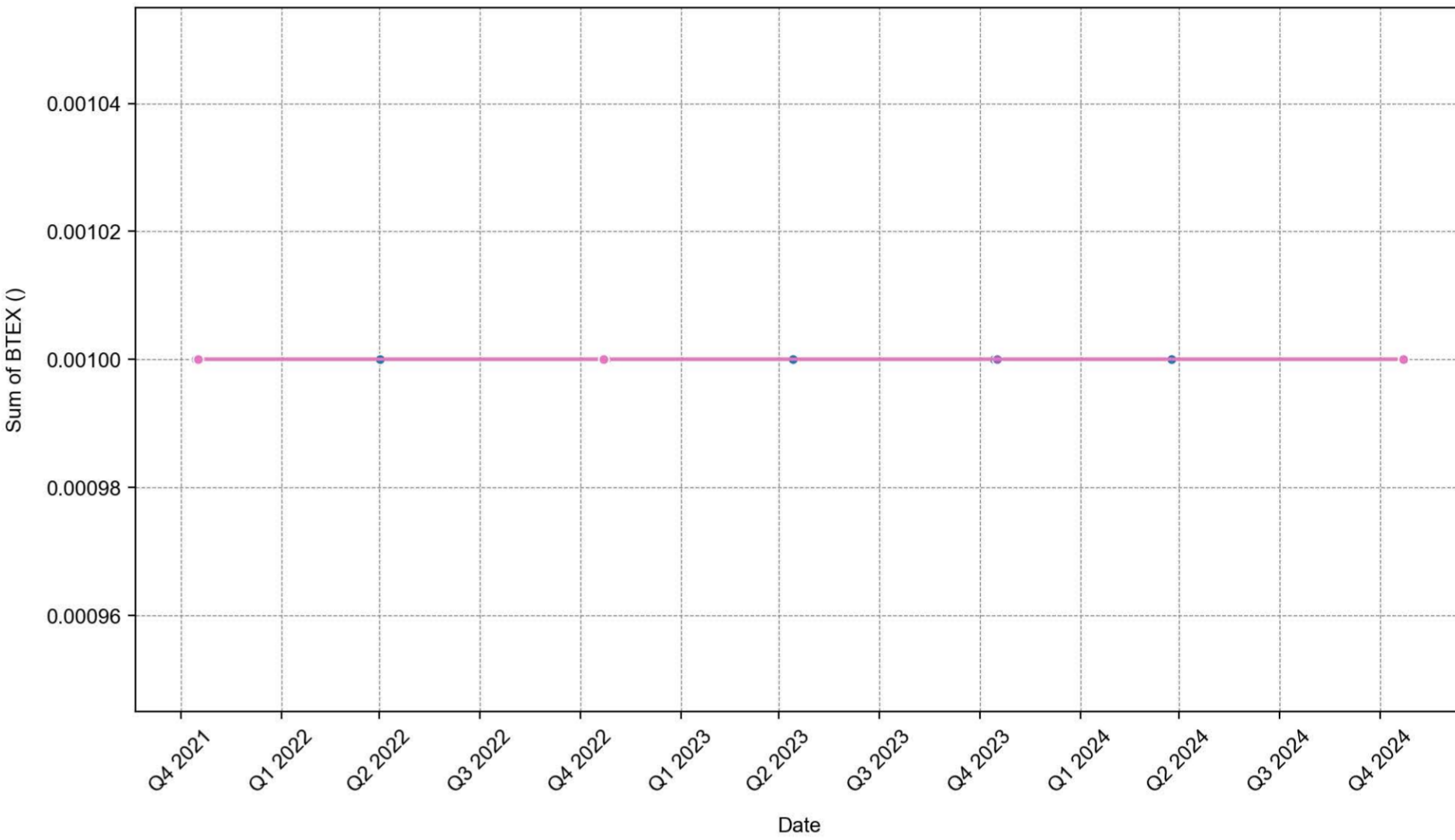
Strontium



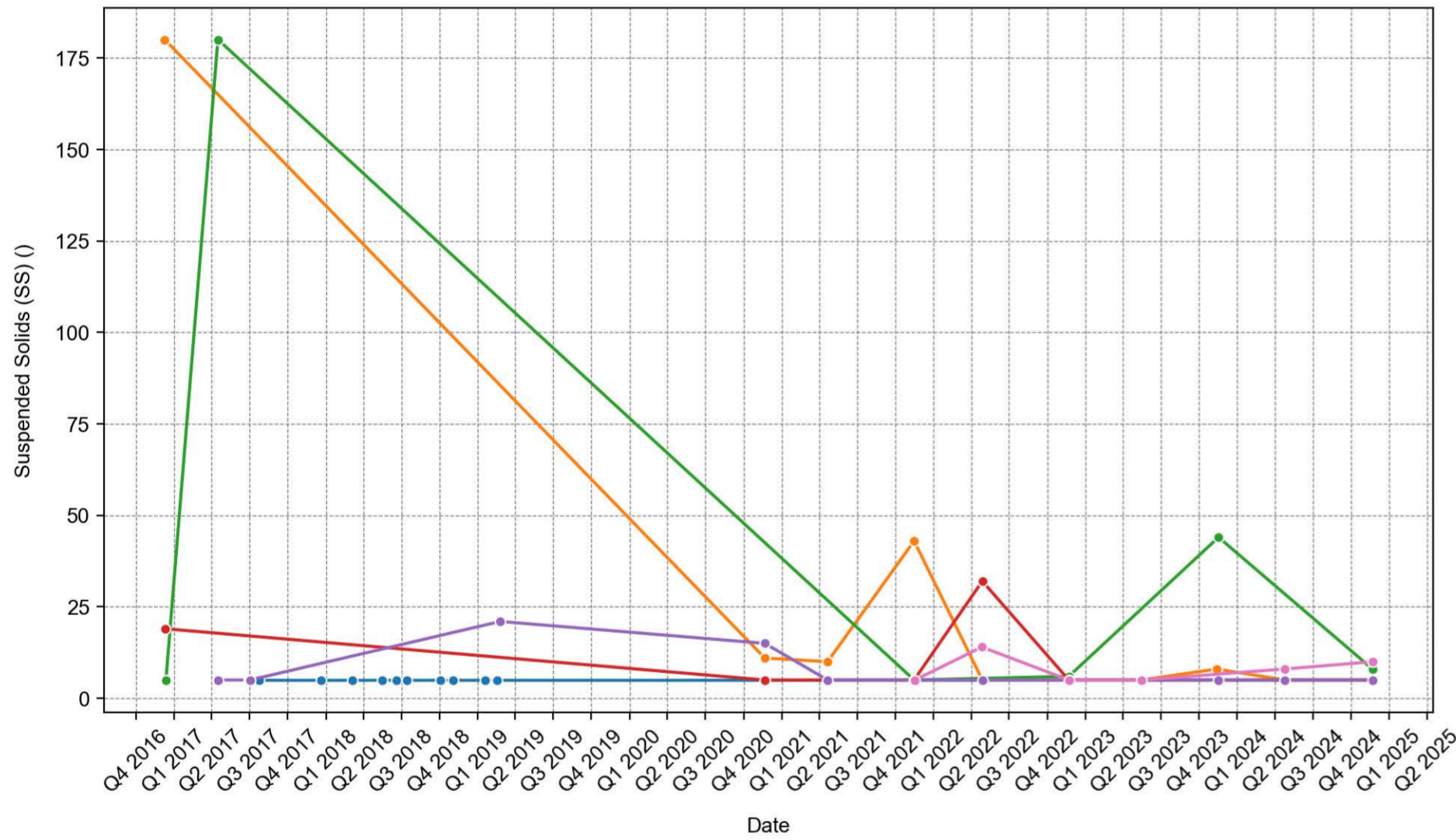
Sulfate as SO4 - Turbidimetric



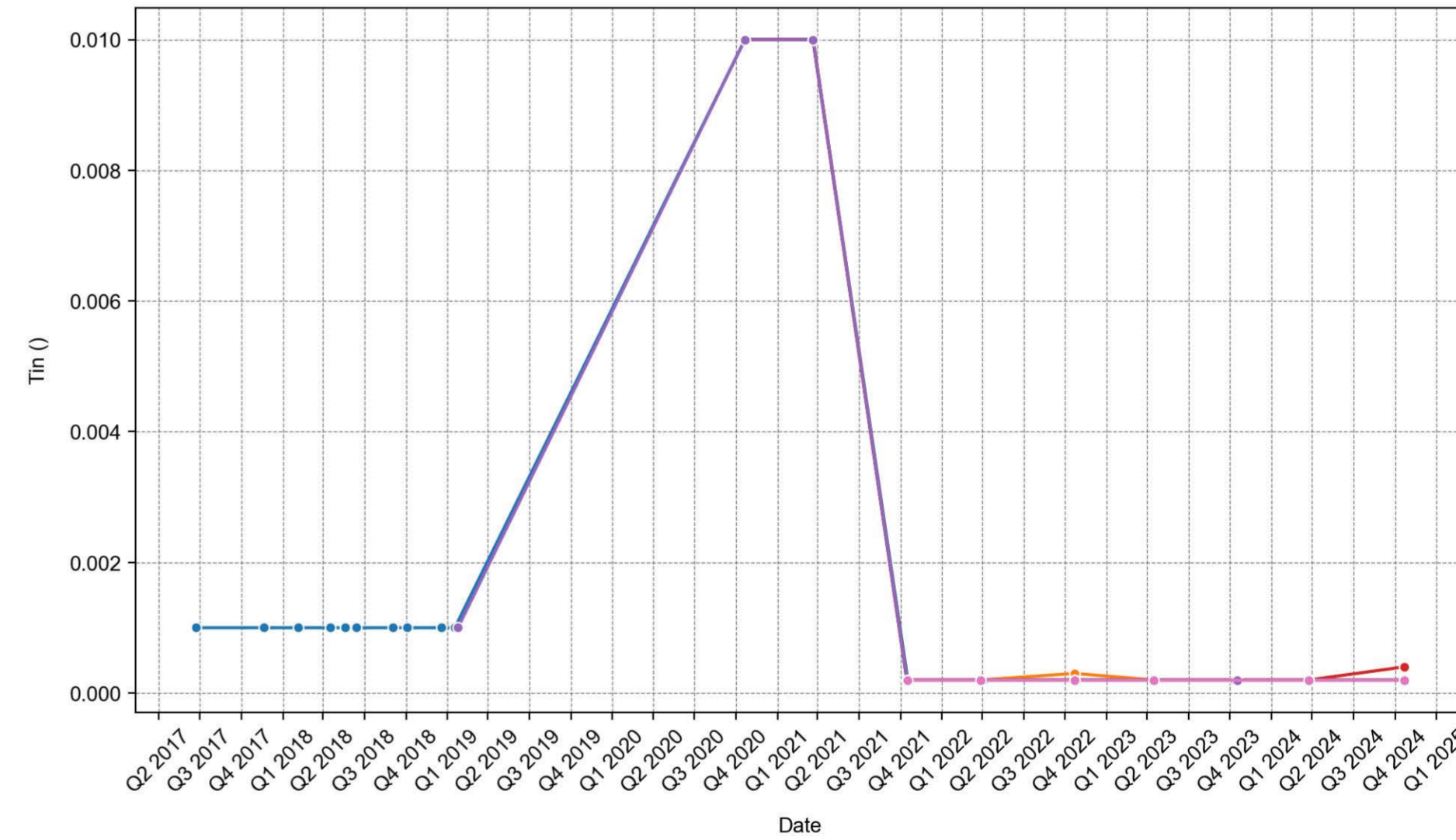
Sum of BTEX



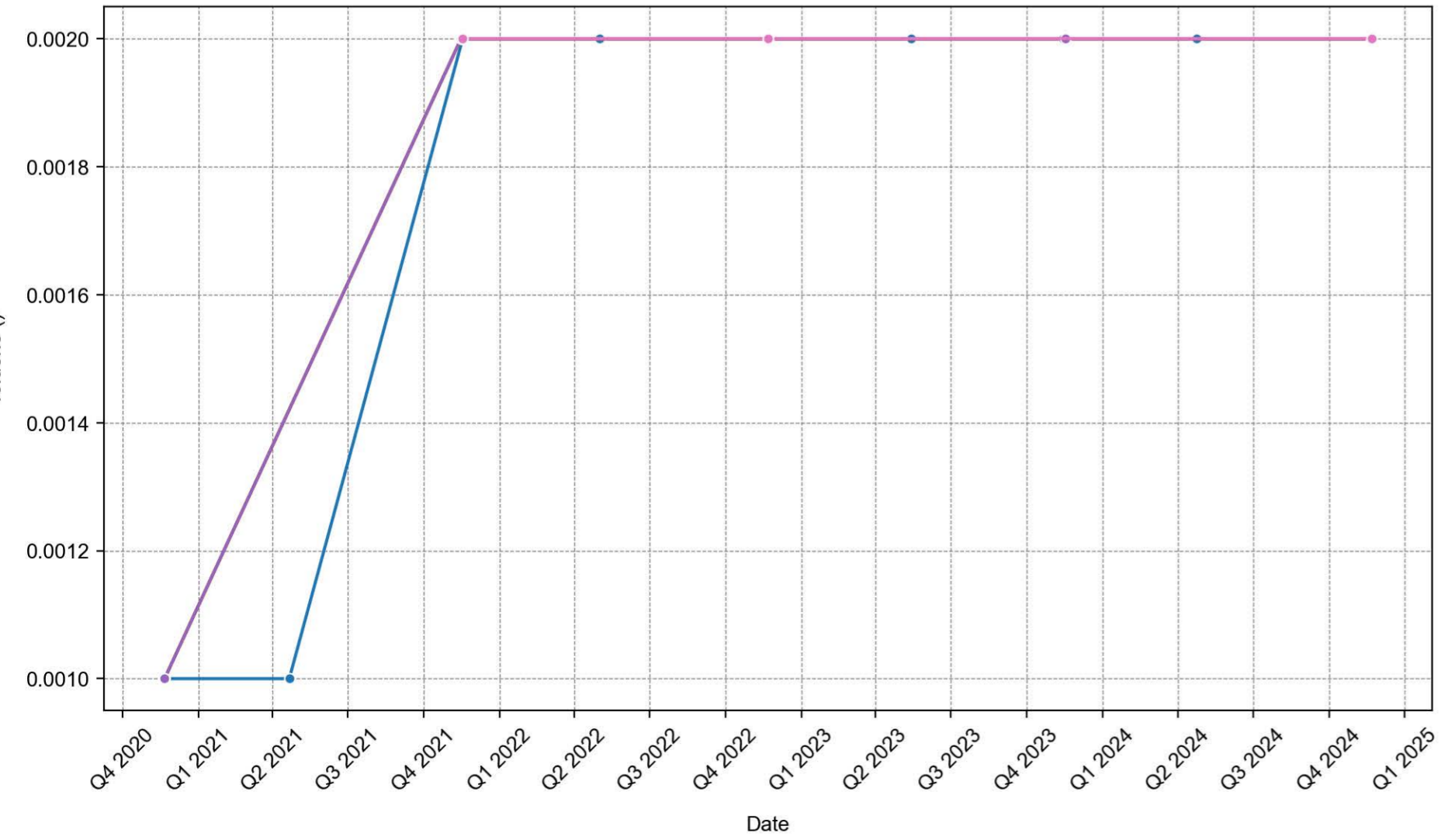
Suspended Solids (SS)



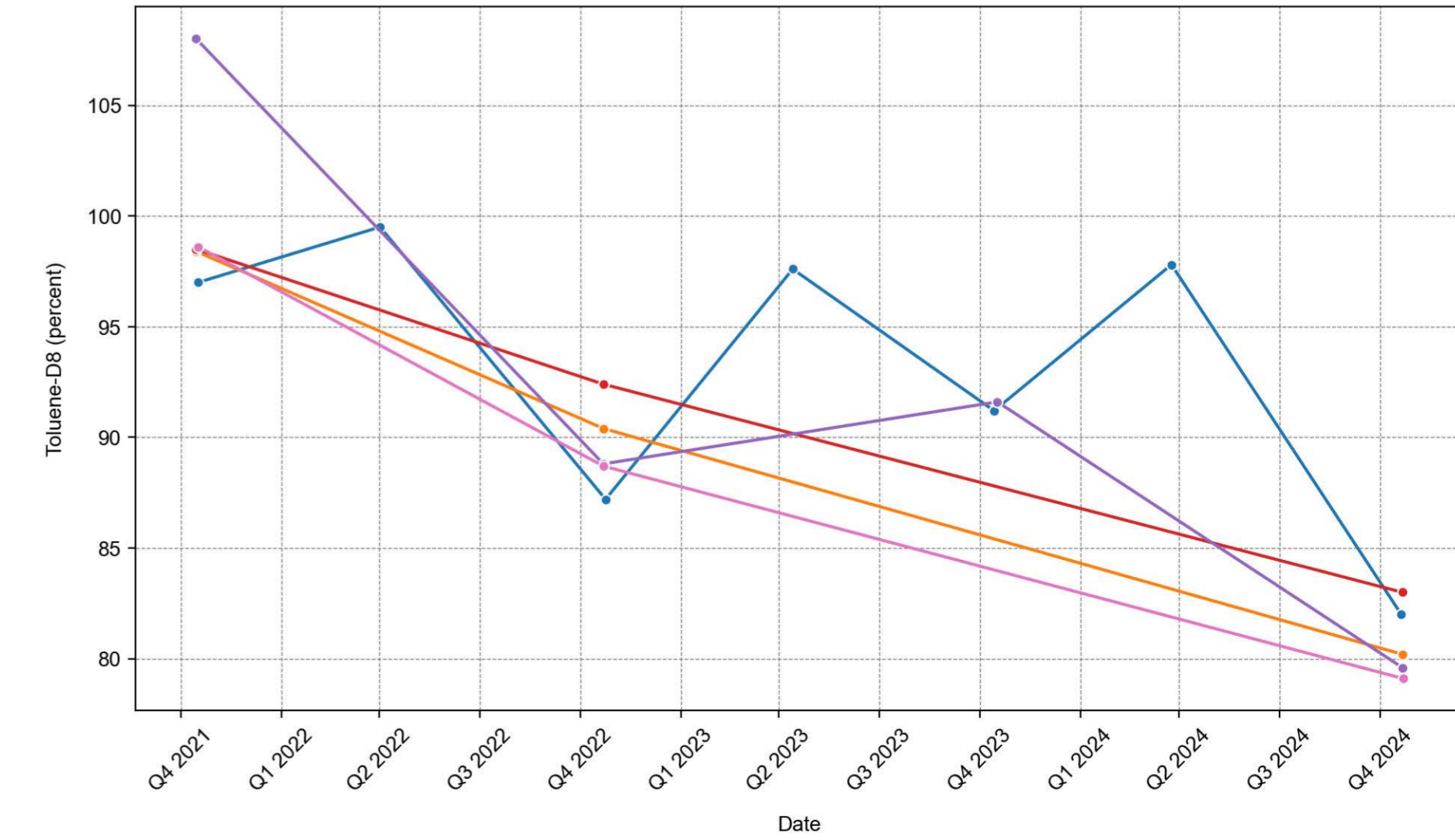
Tin



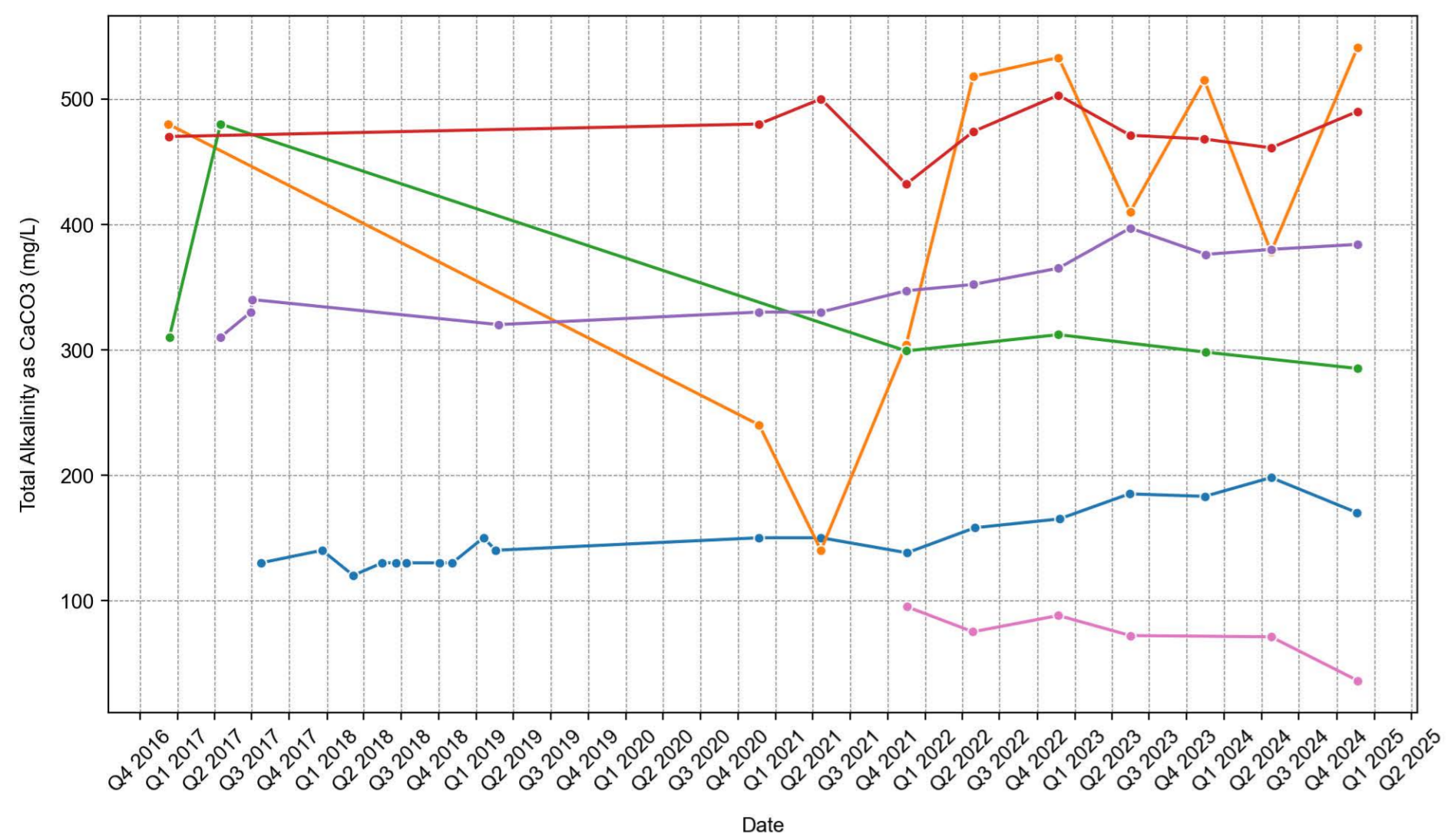
Toluene



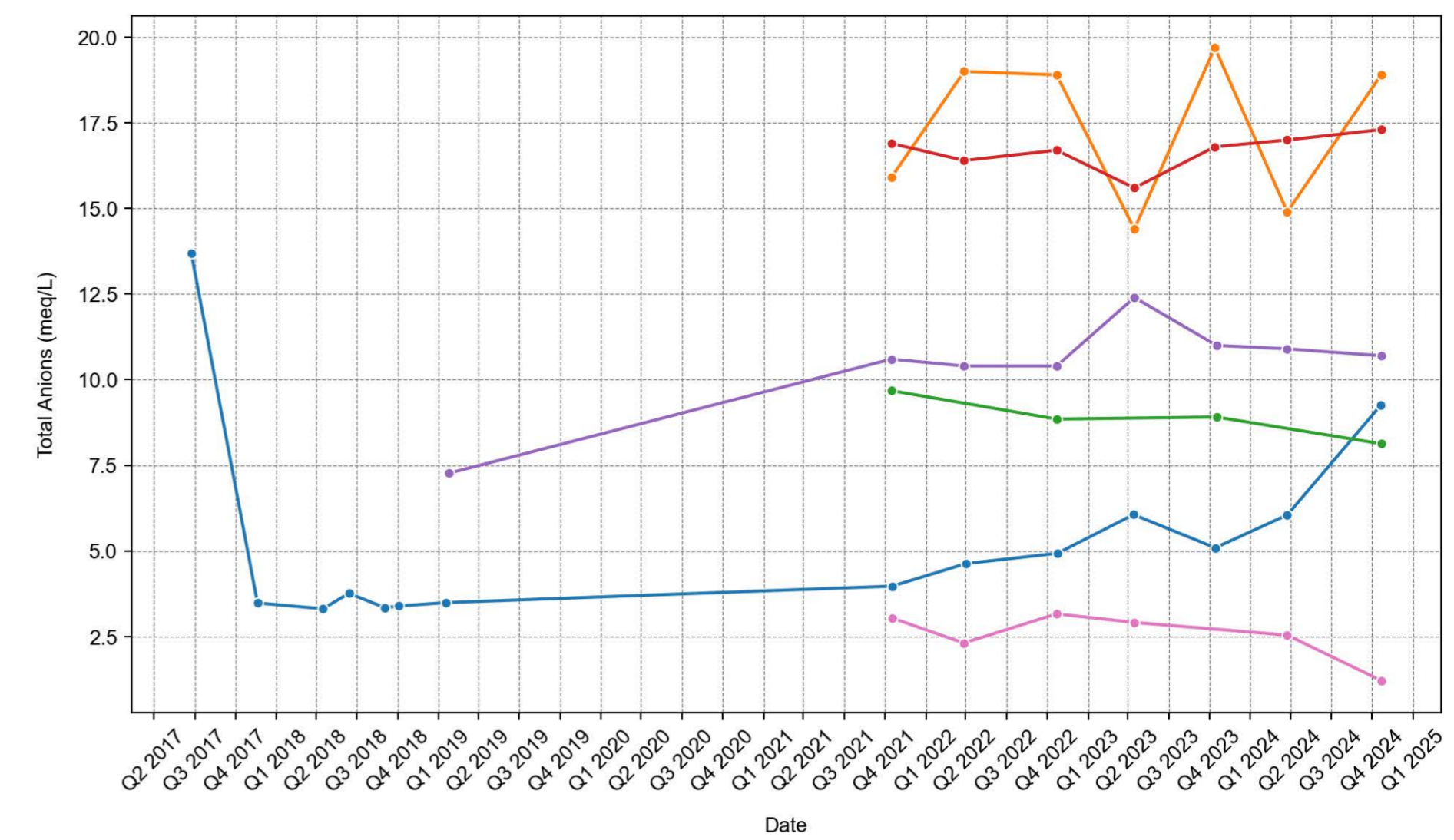
Toluene-D8



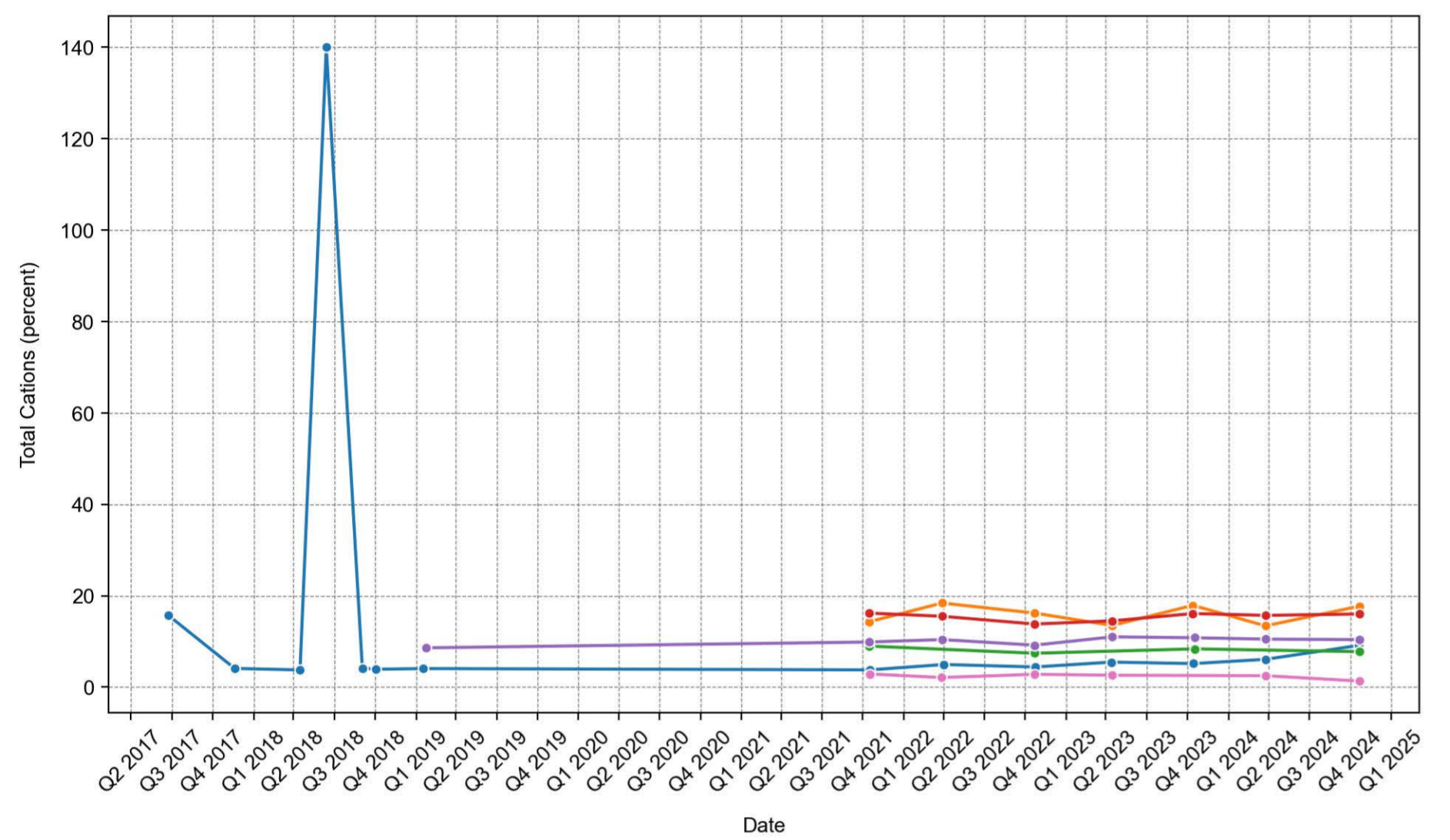
Total Alkalinity as CaCO3



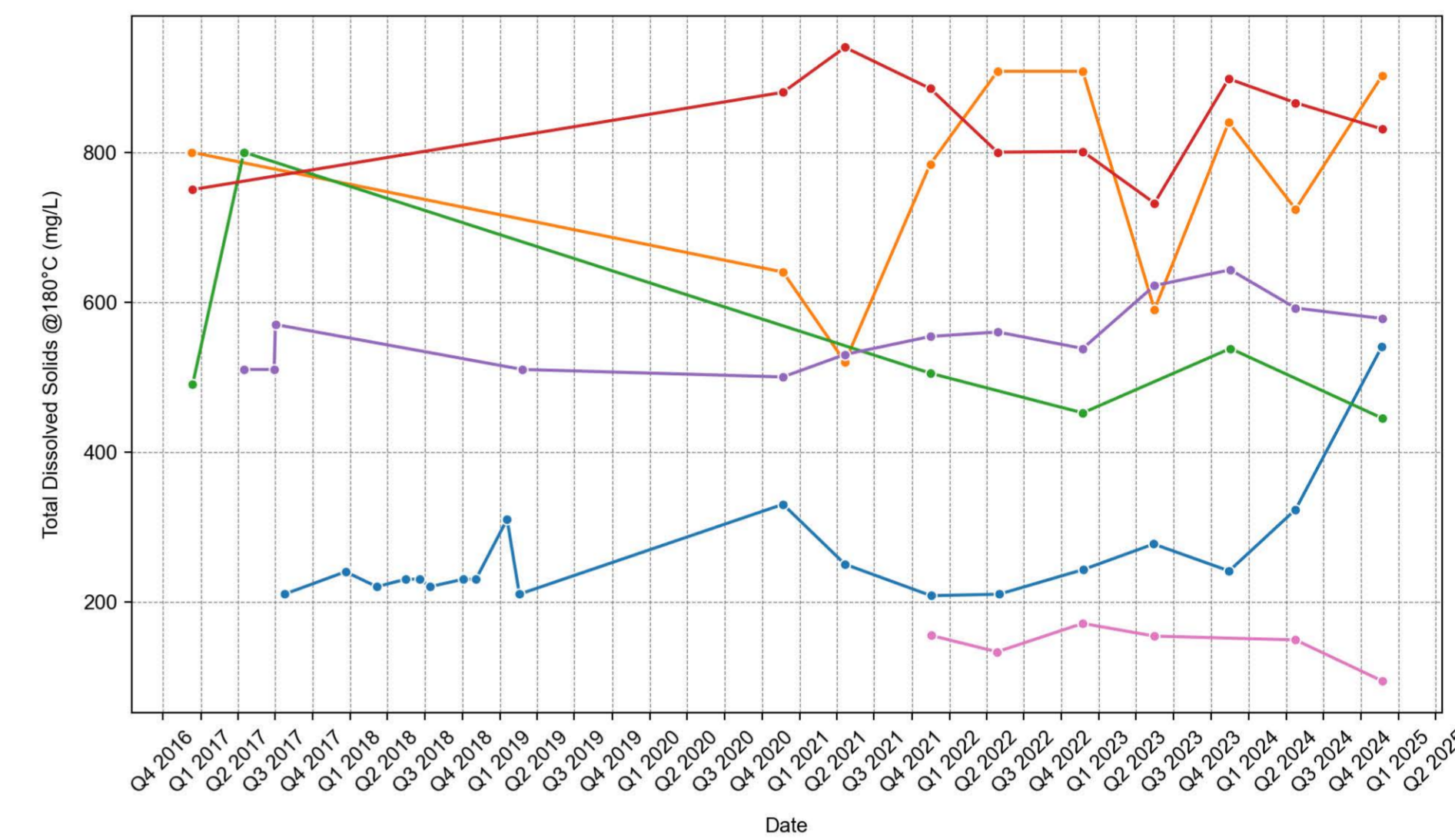
Total Anions



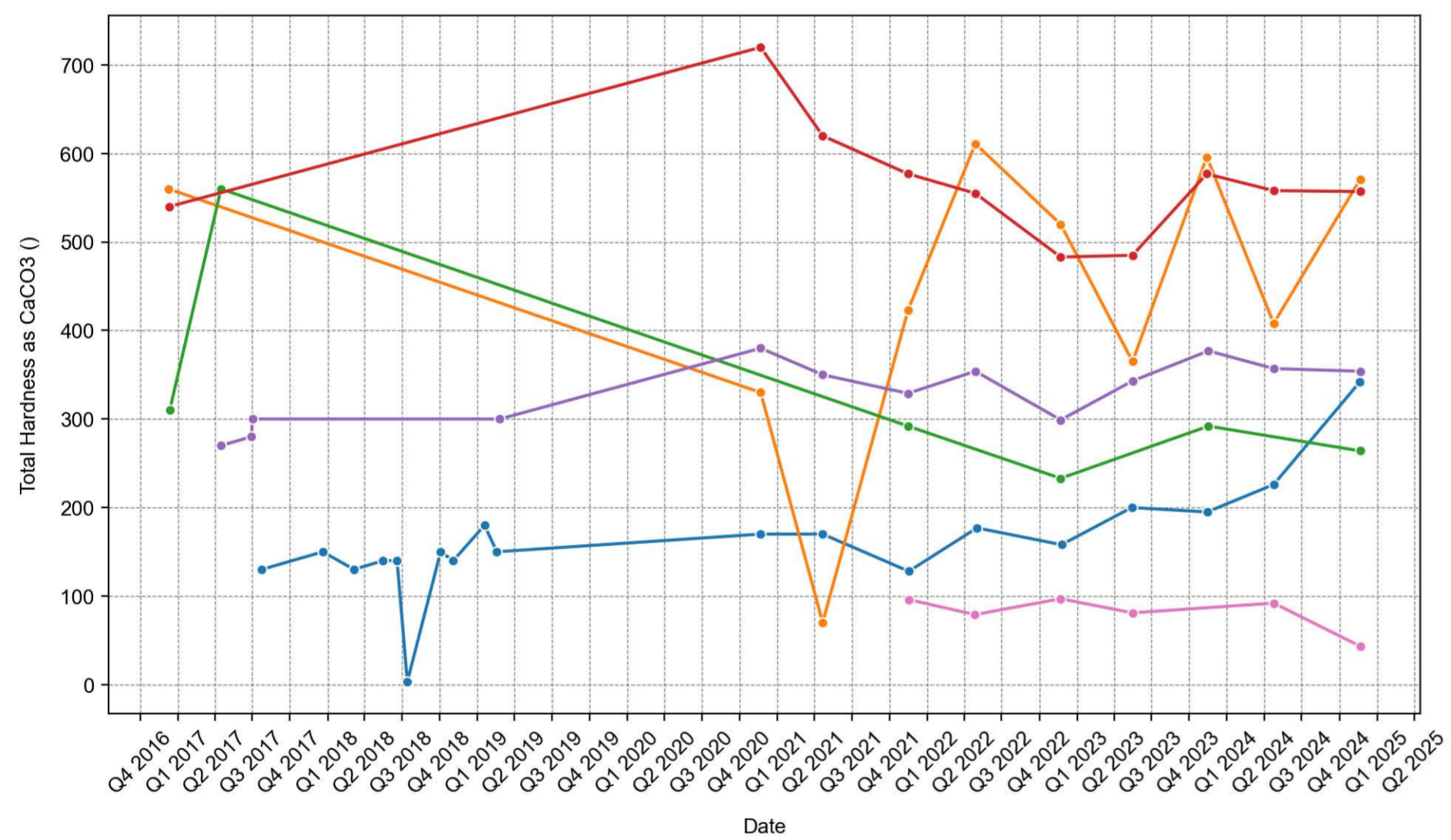
Total Cations



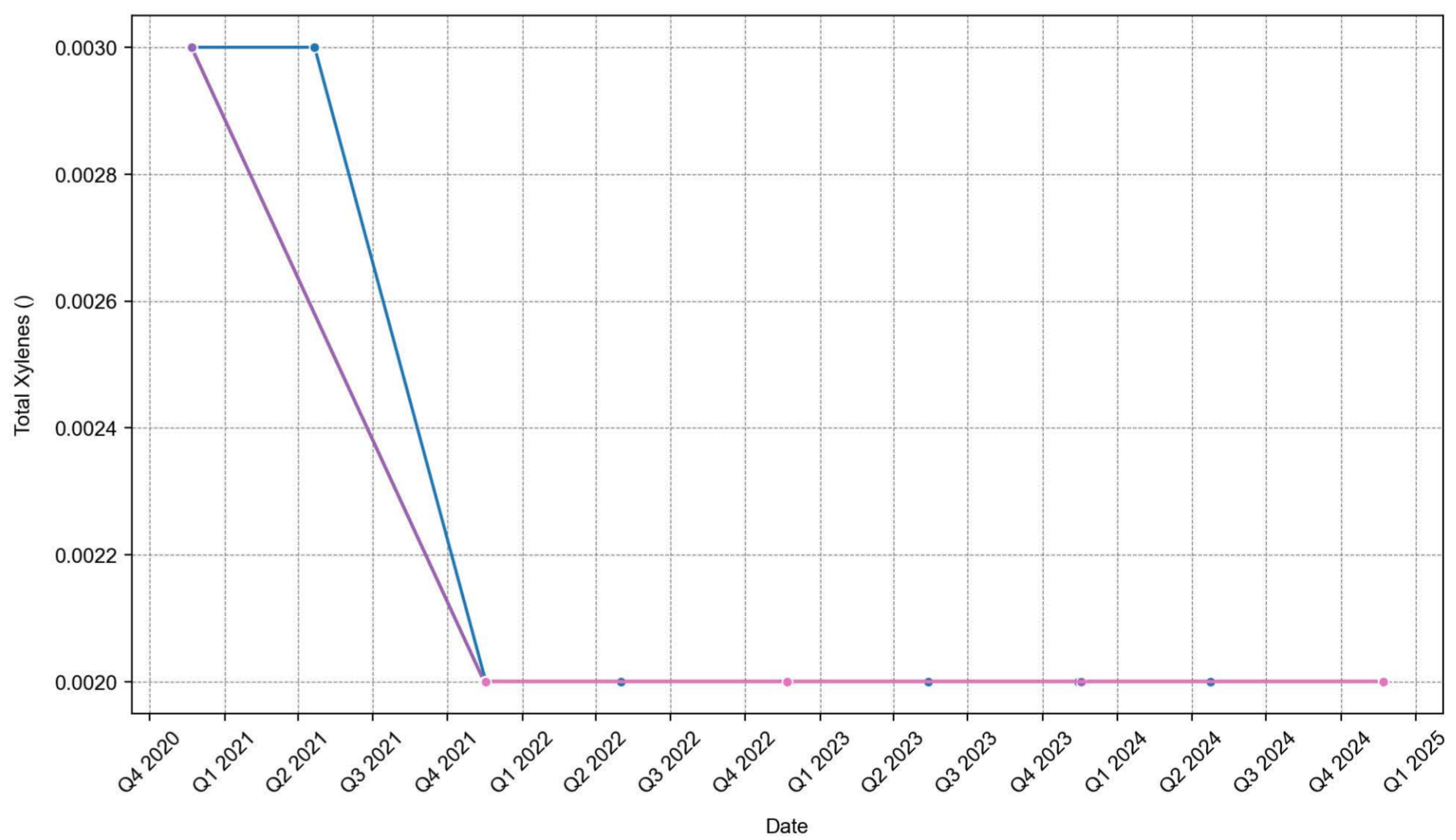
Total Dissolved Solids @180°C



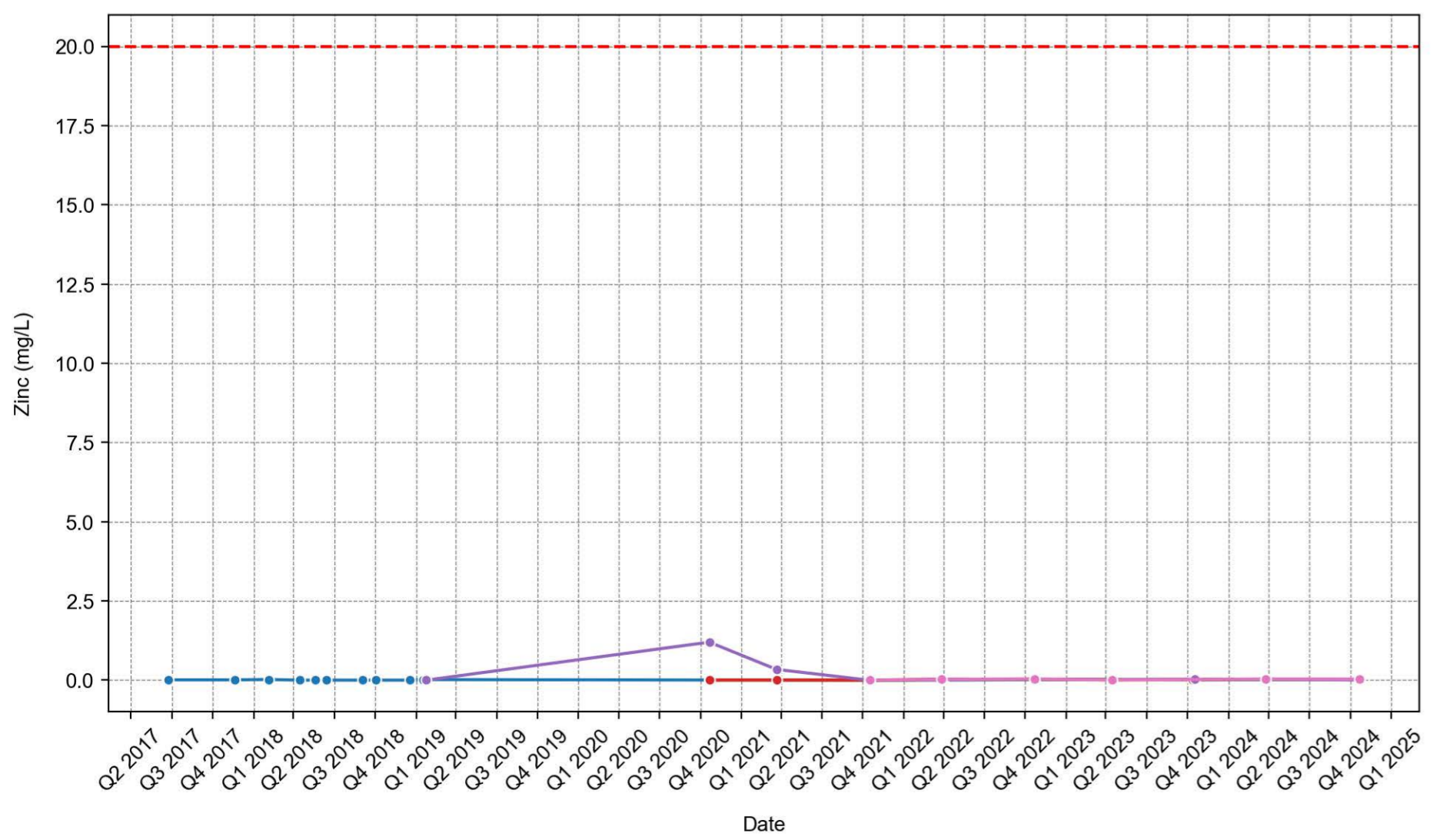
Total Hardness as CaCO3



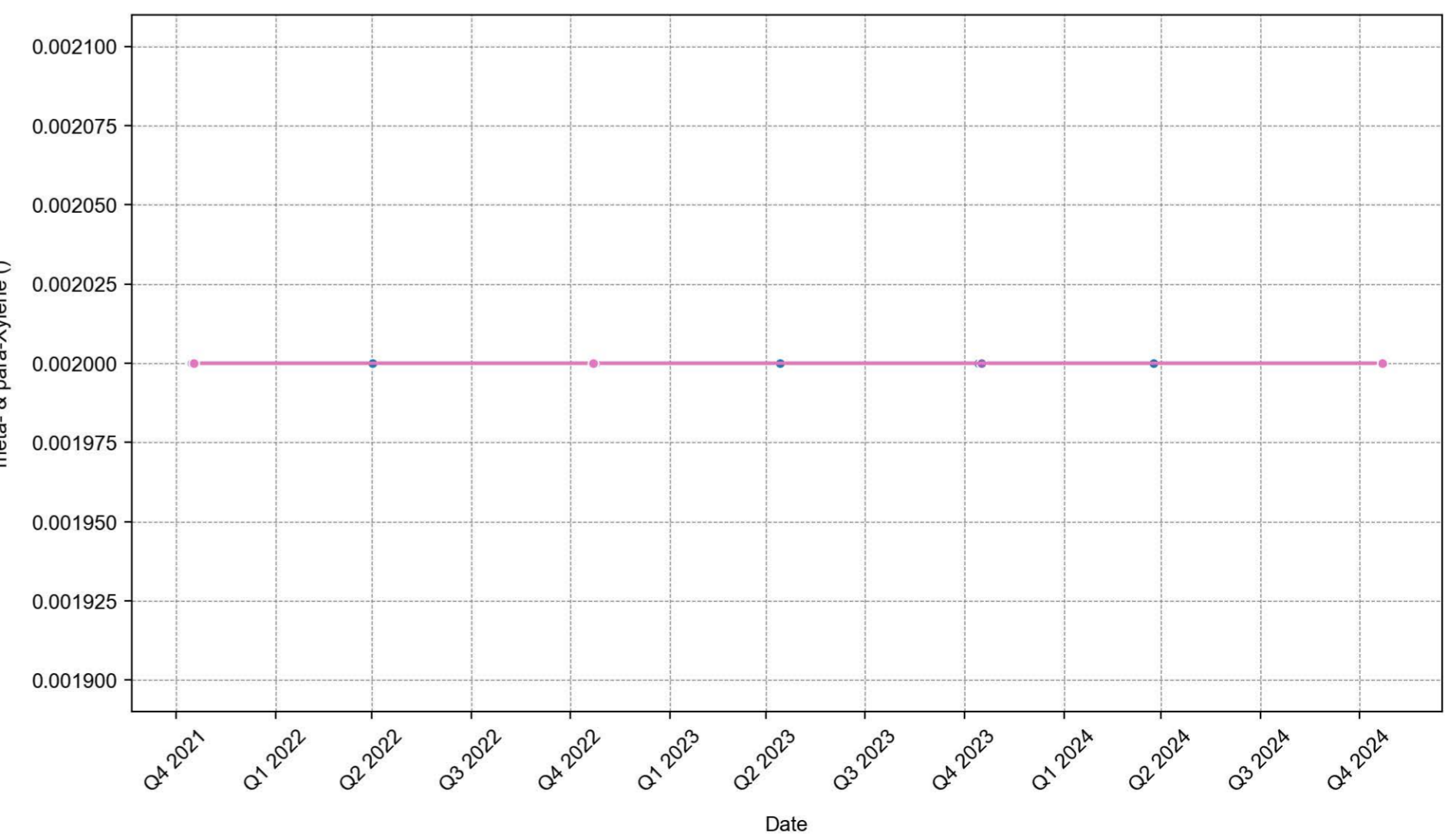
Total Xylenes



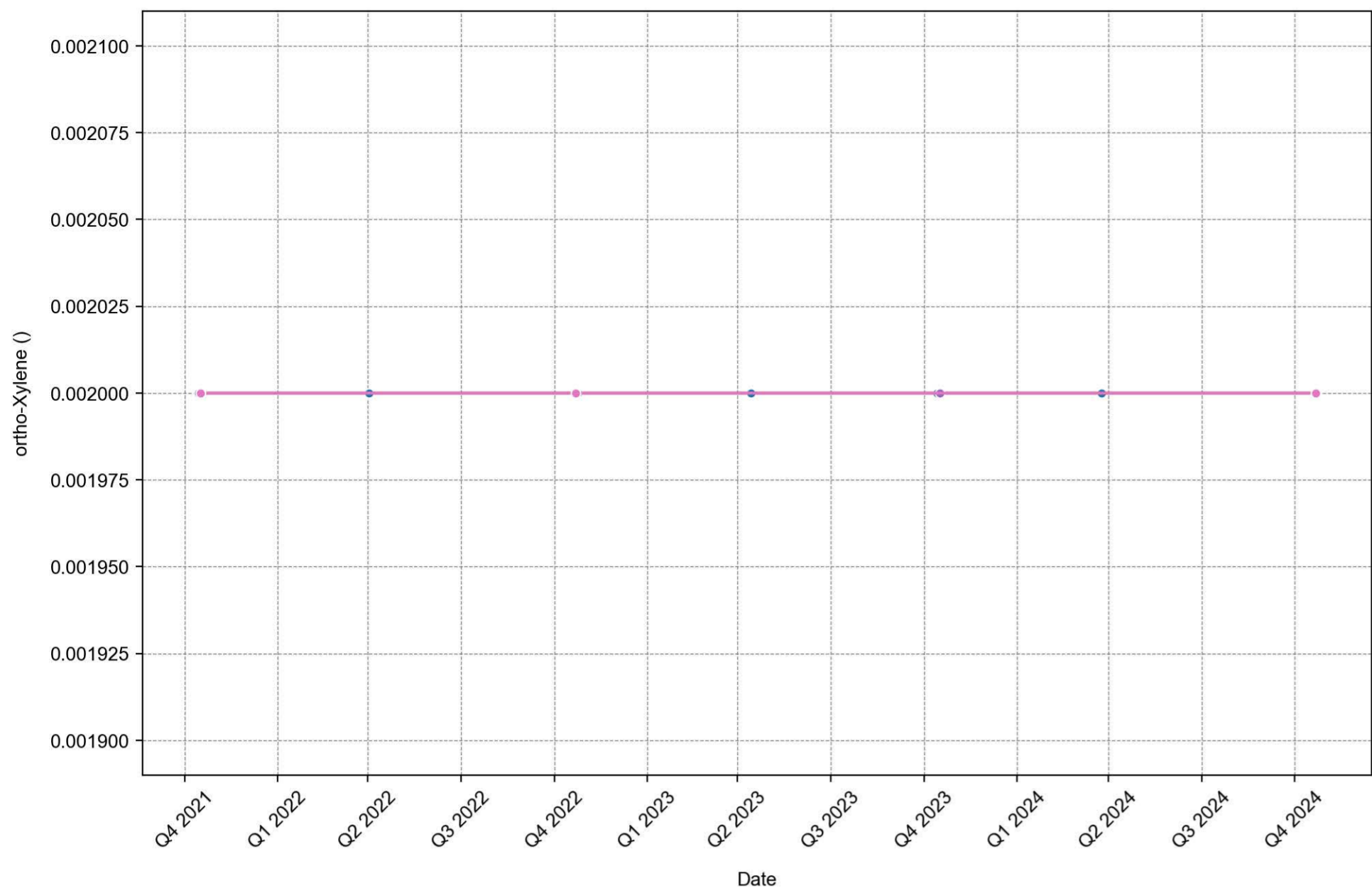
Zinc



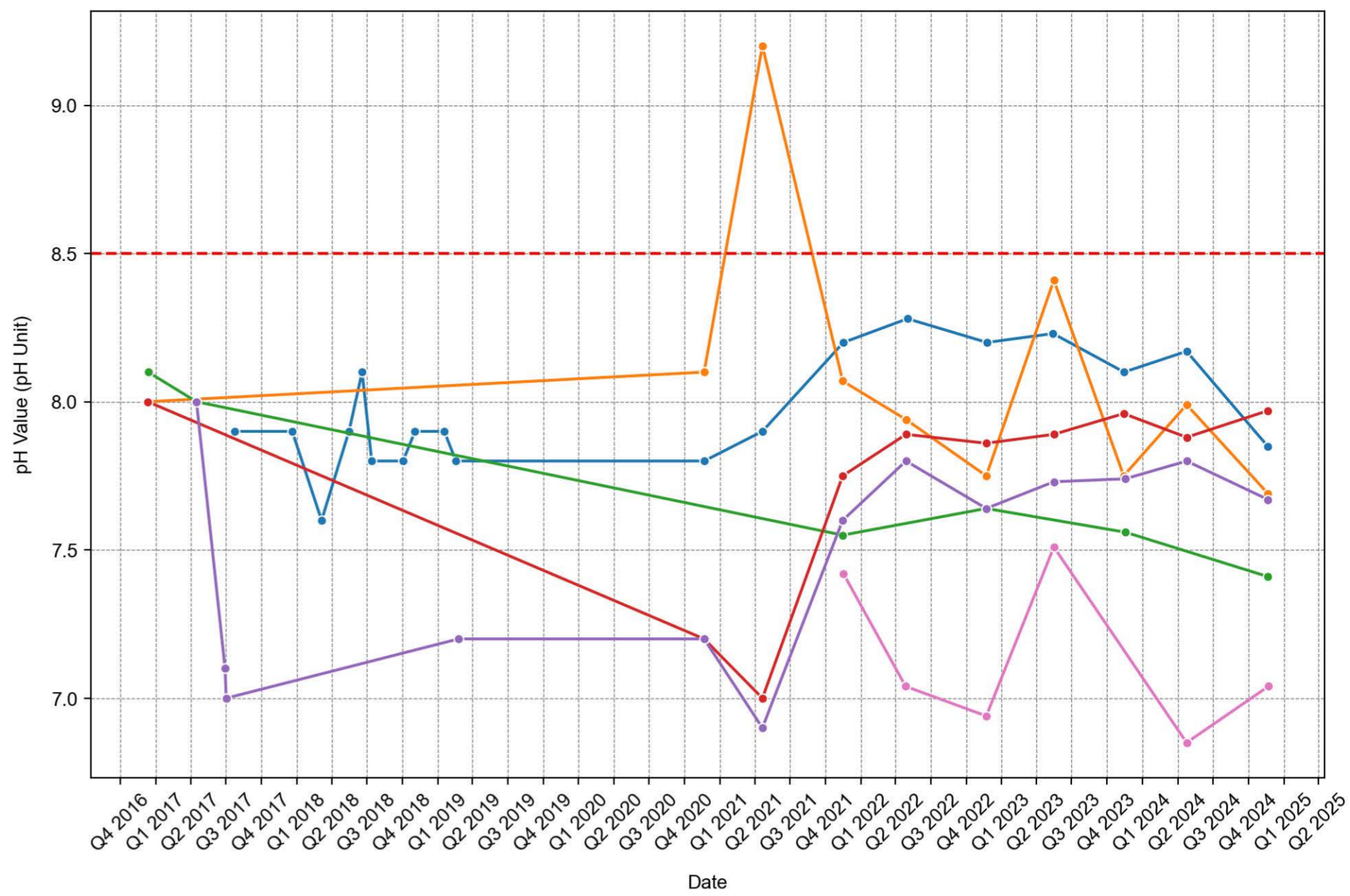
meta- & para-Xylene



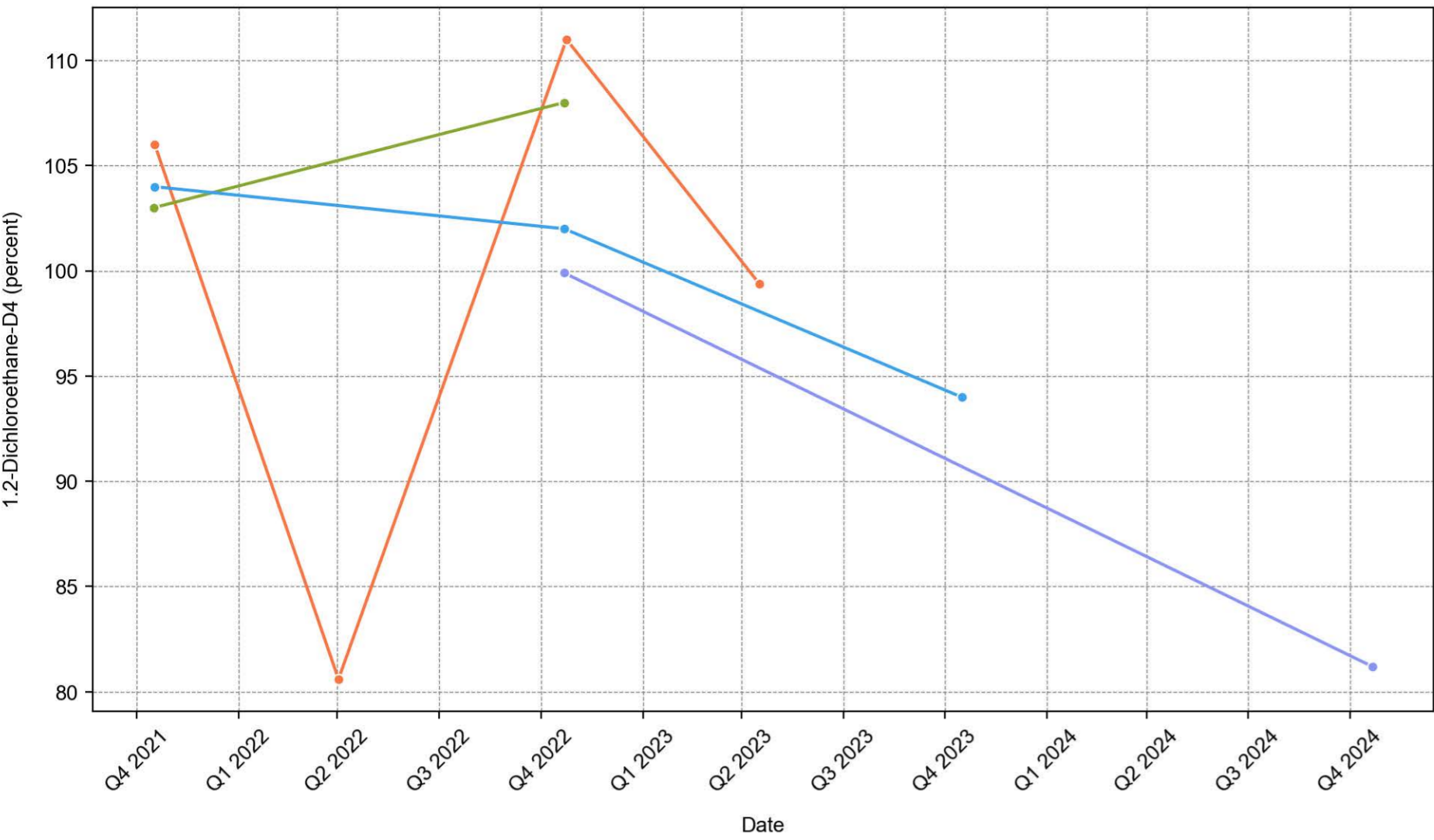
ortho-Xylene



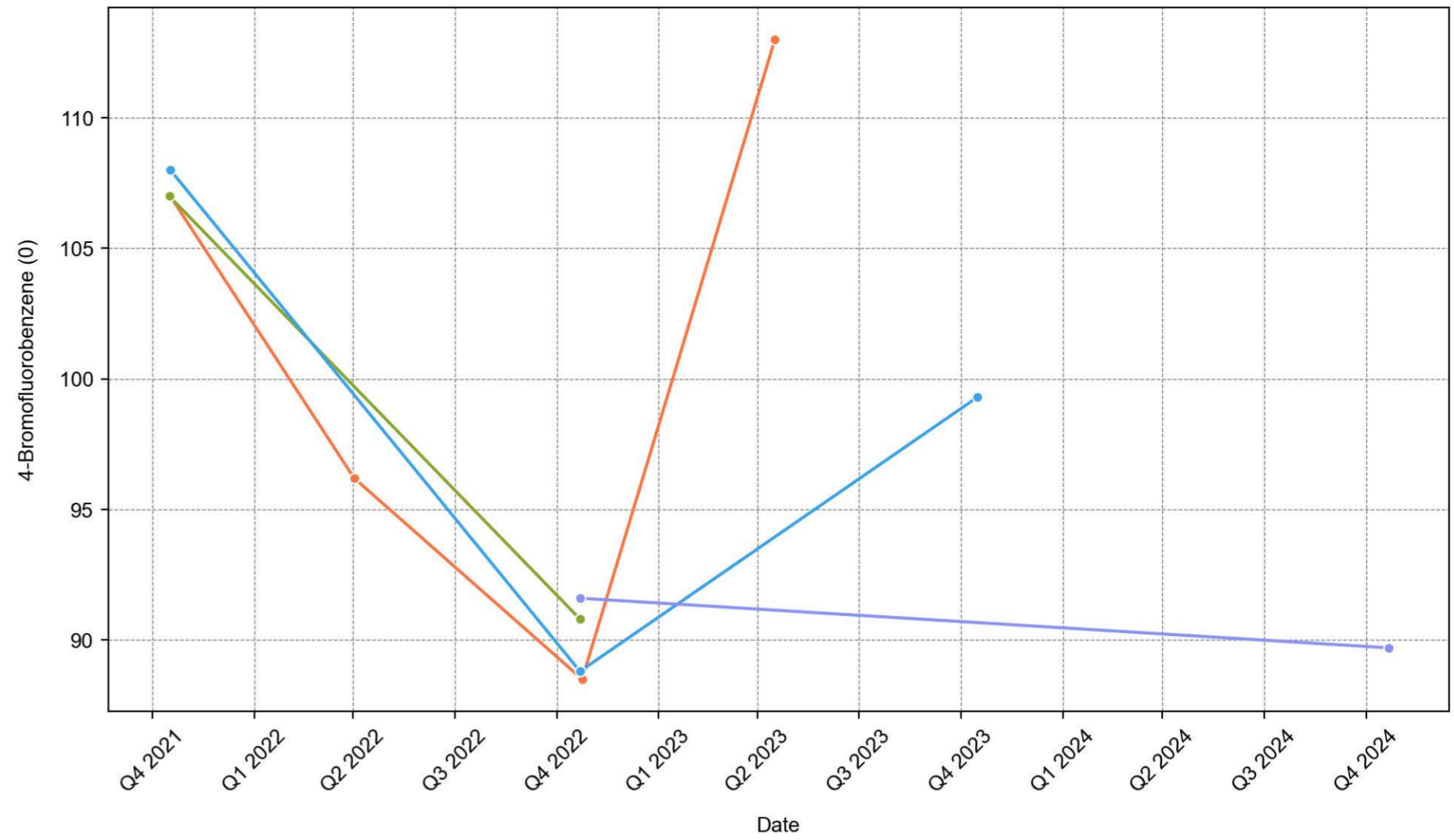
pH Value



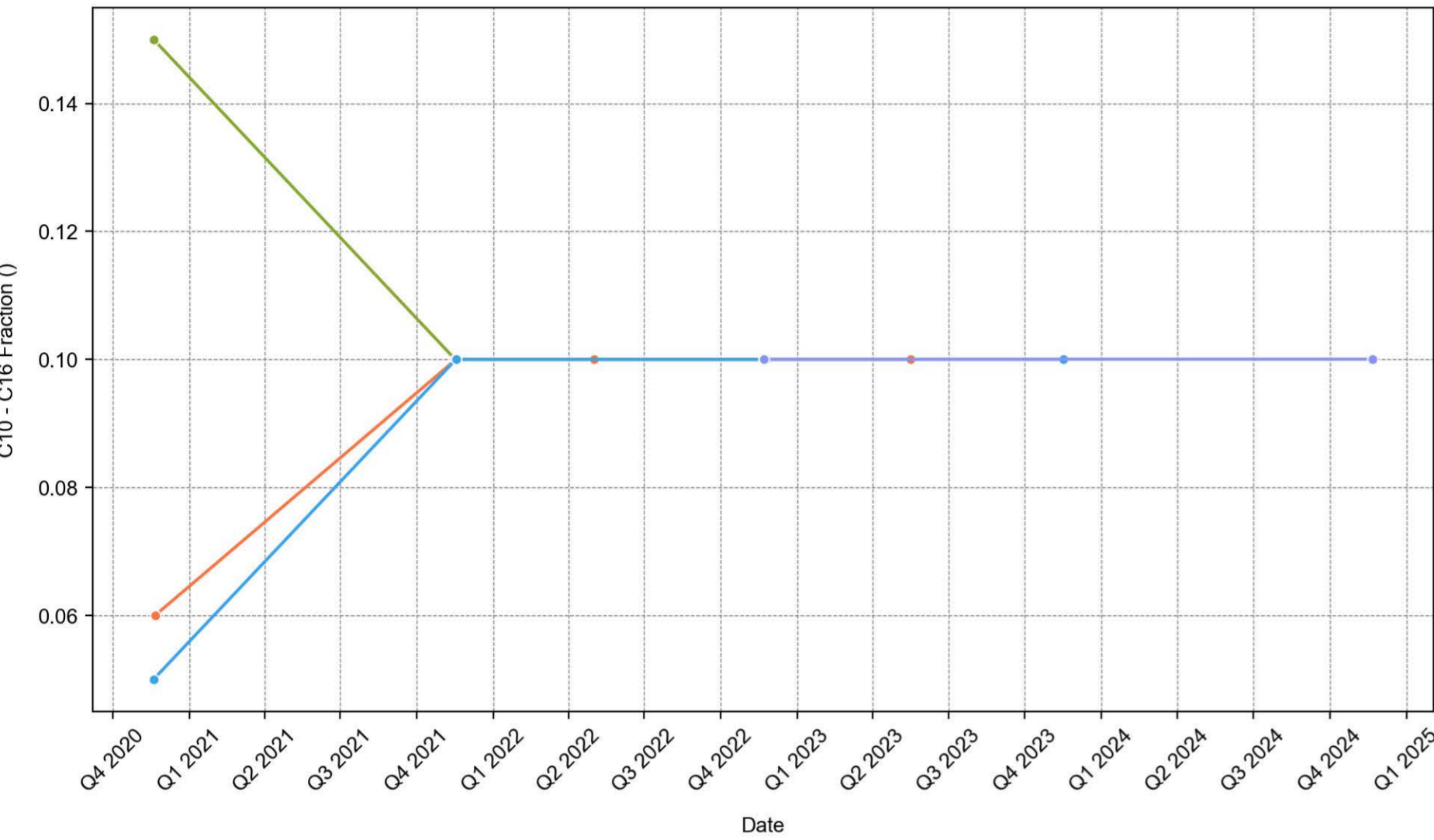
1,2-Dichloroethane-D4



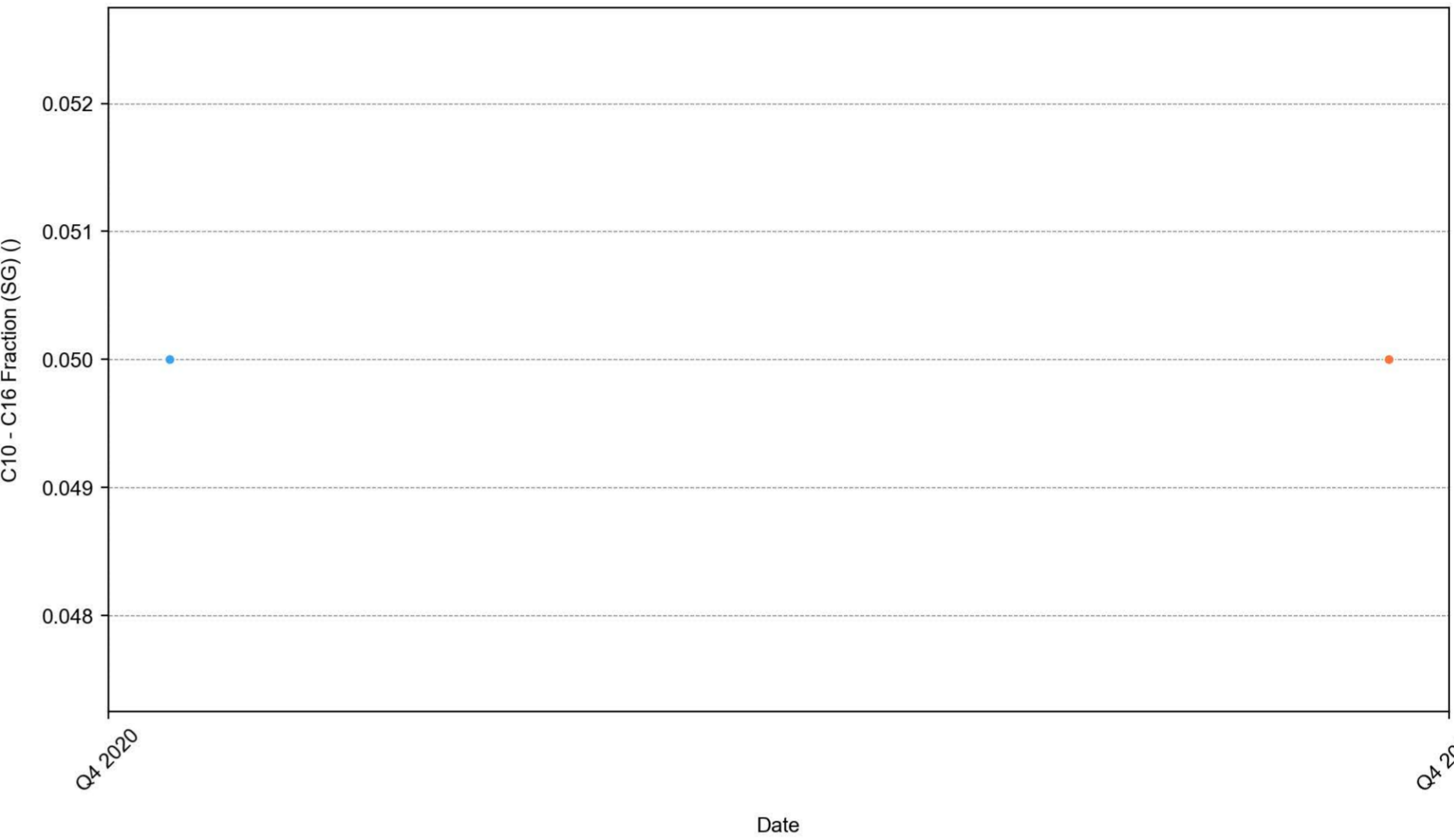
4-Bromofluorobenzene



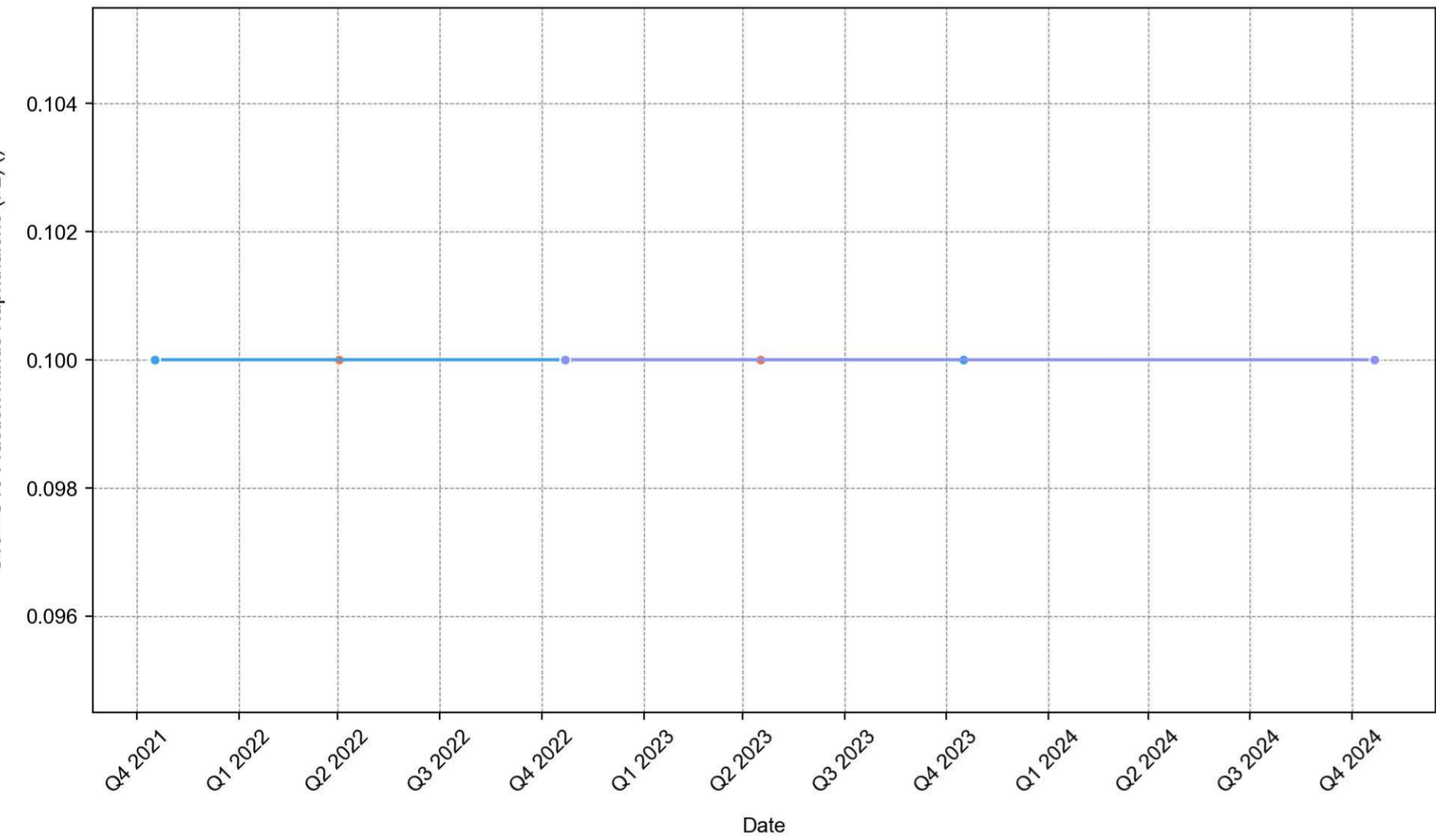
C10 - C16 Fraction



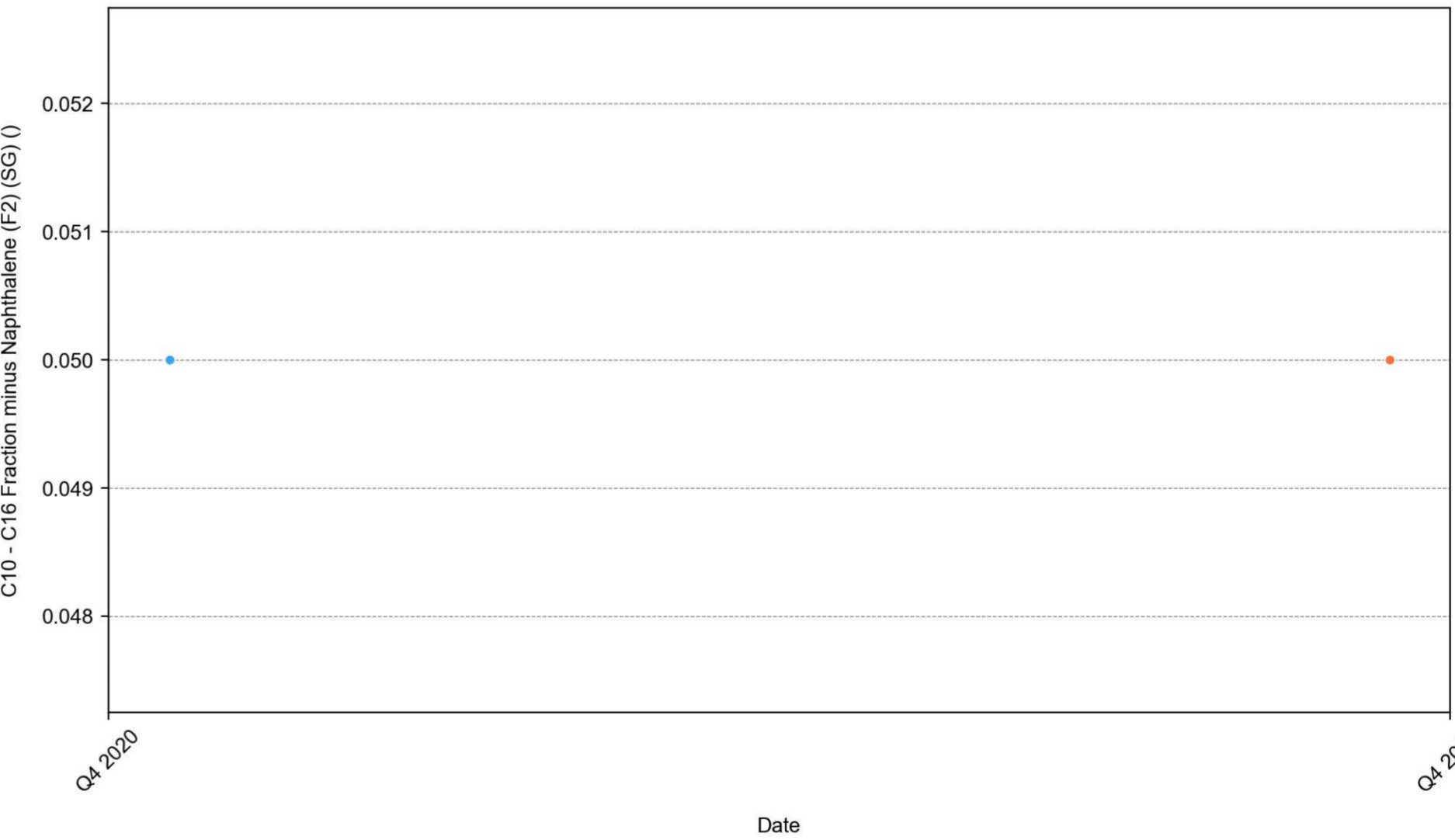
C10 - C16 Fraction (SG)



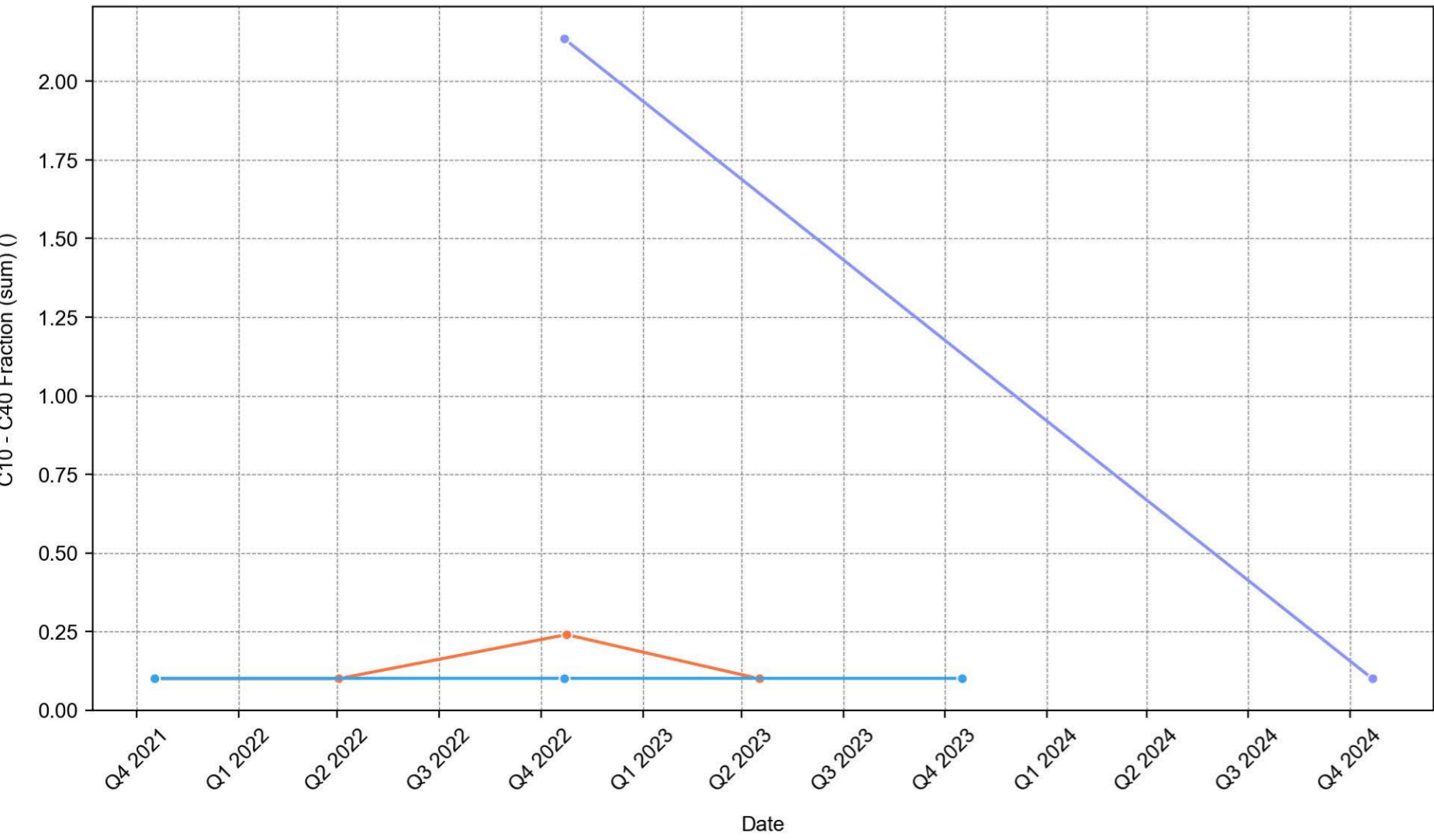
C10 - C16 Fraction minus Naphthalene (F2)



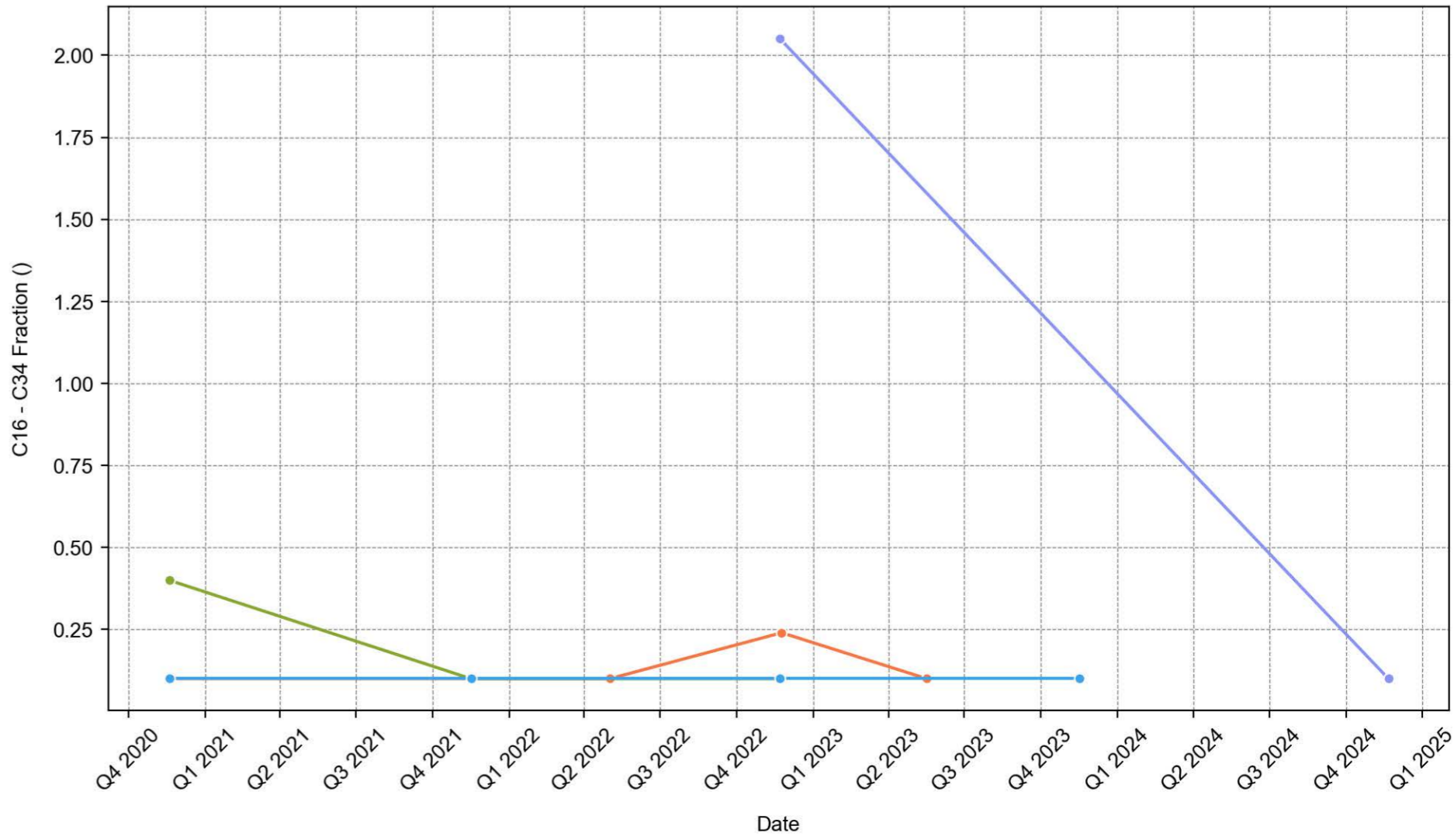
C10 - C16 Fraction minus Naphthalene (F2) (SG)



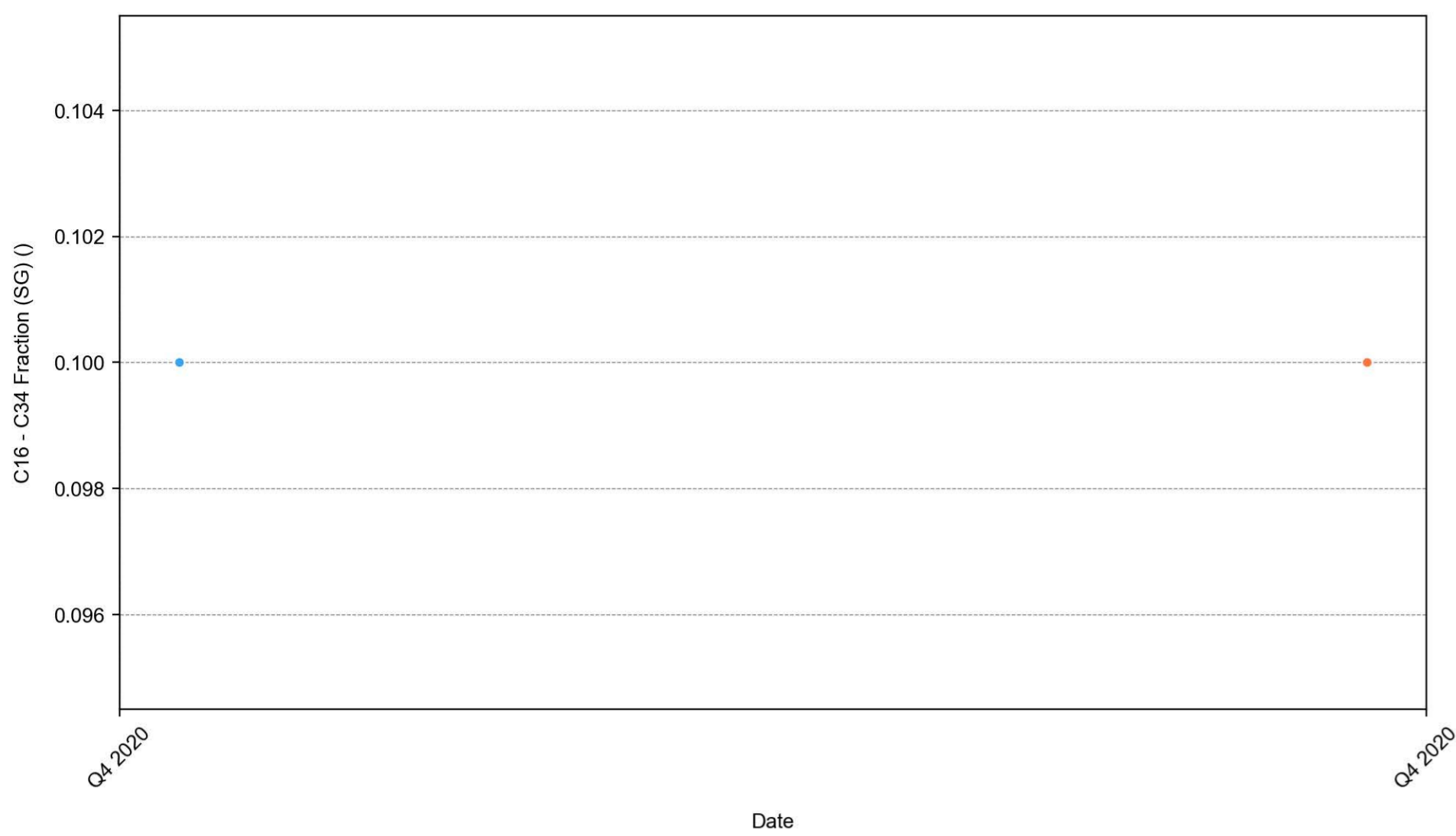
C10 - C40 Fraction (sum)



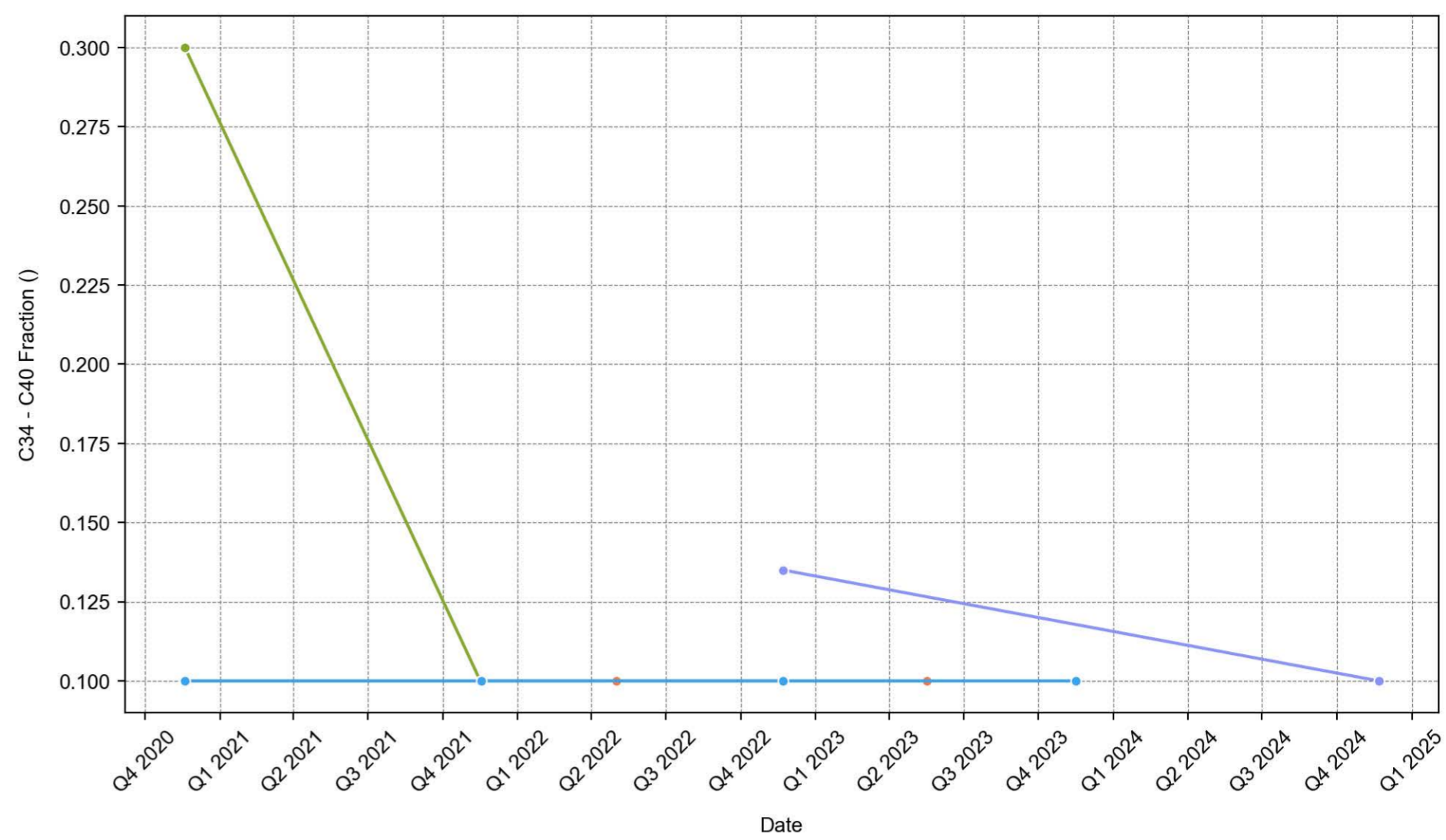
C16 - C34 Fraction



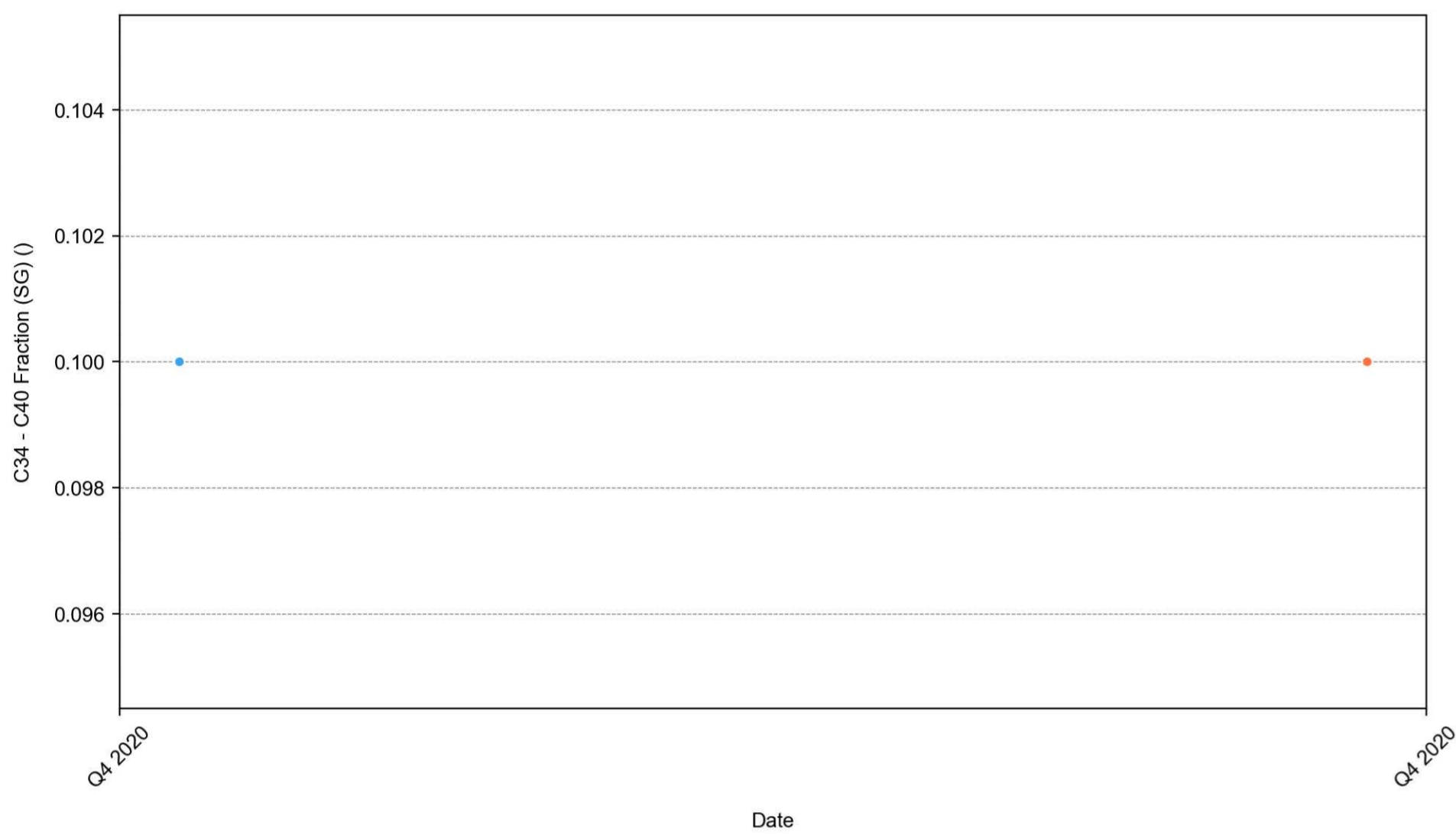
C16 - C34 Fraction (SG)



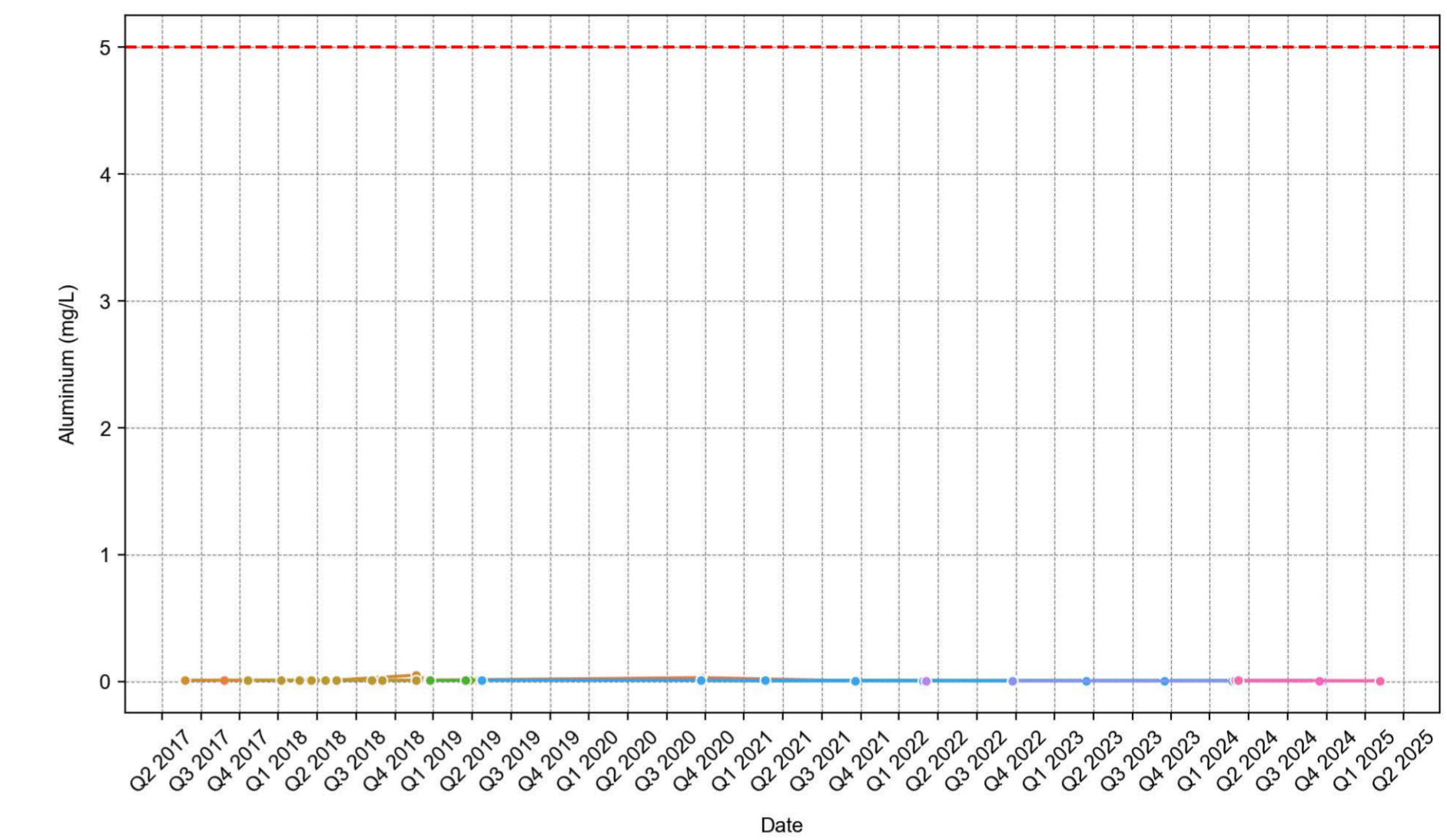
C34 - C40 Fraction



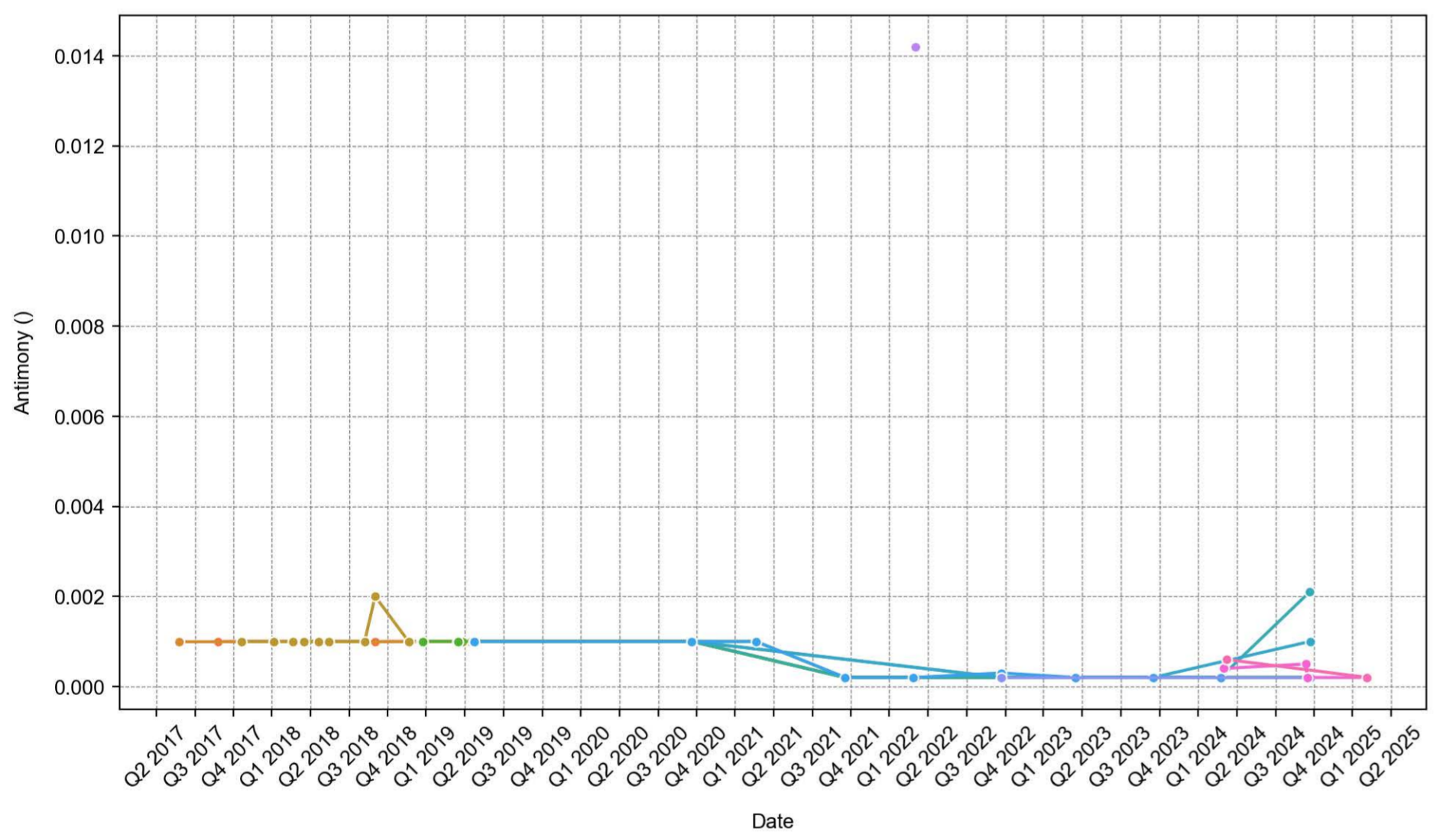
C34 - C40 Fraction (SG)



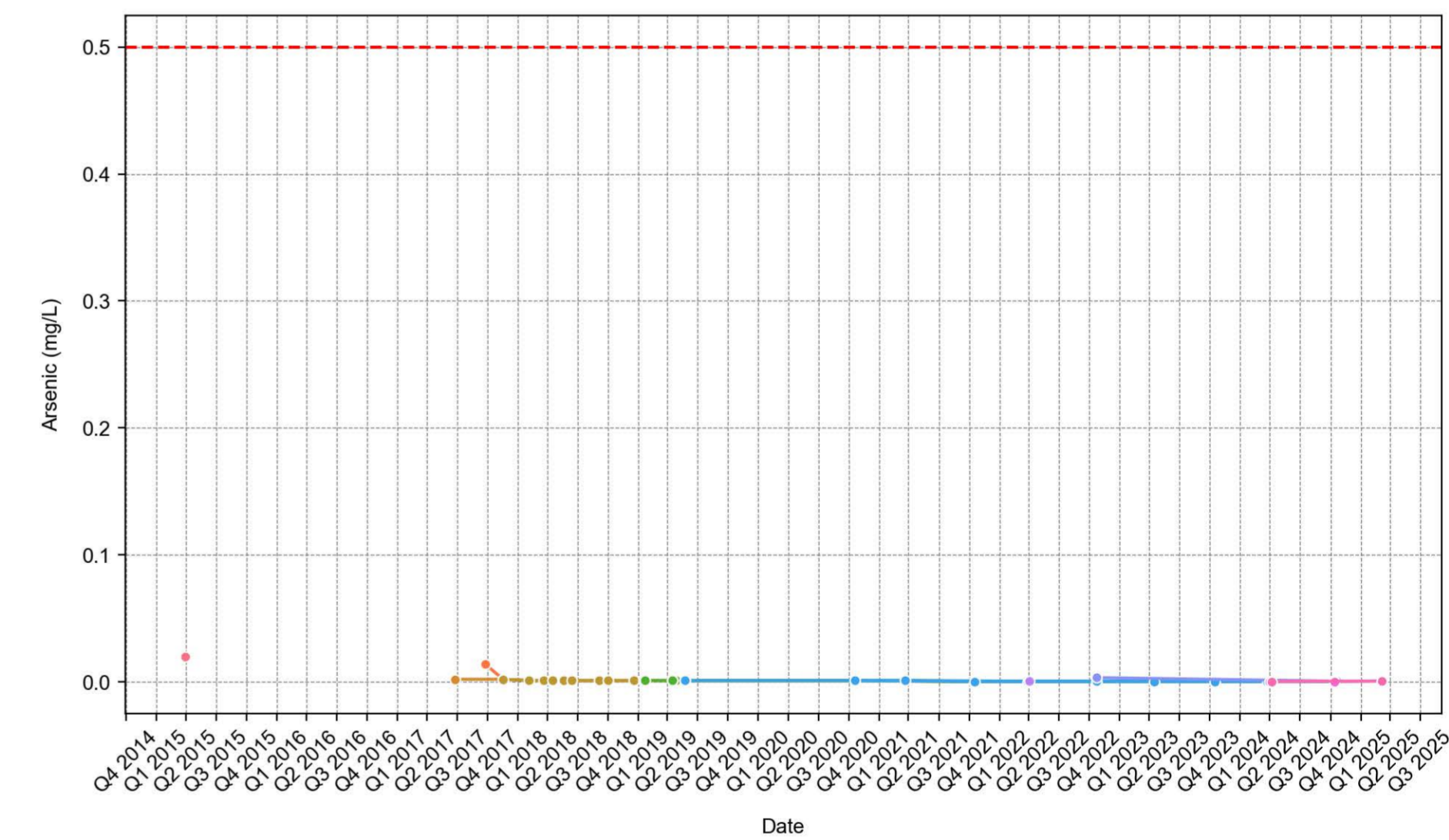
Aluminium



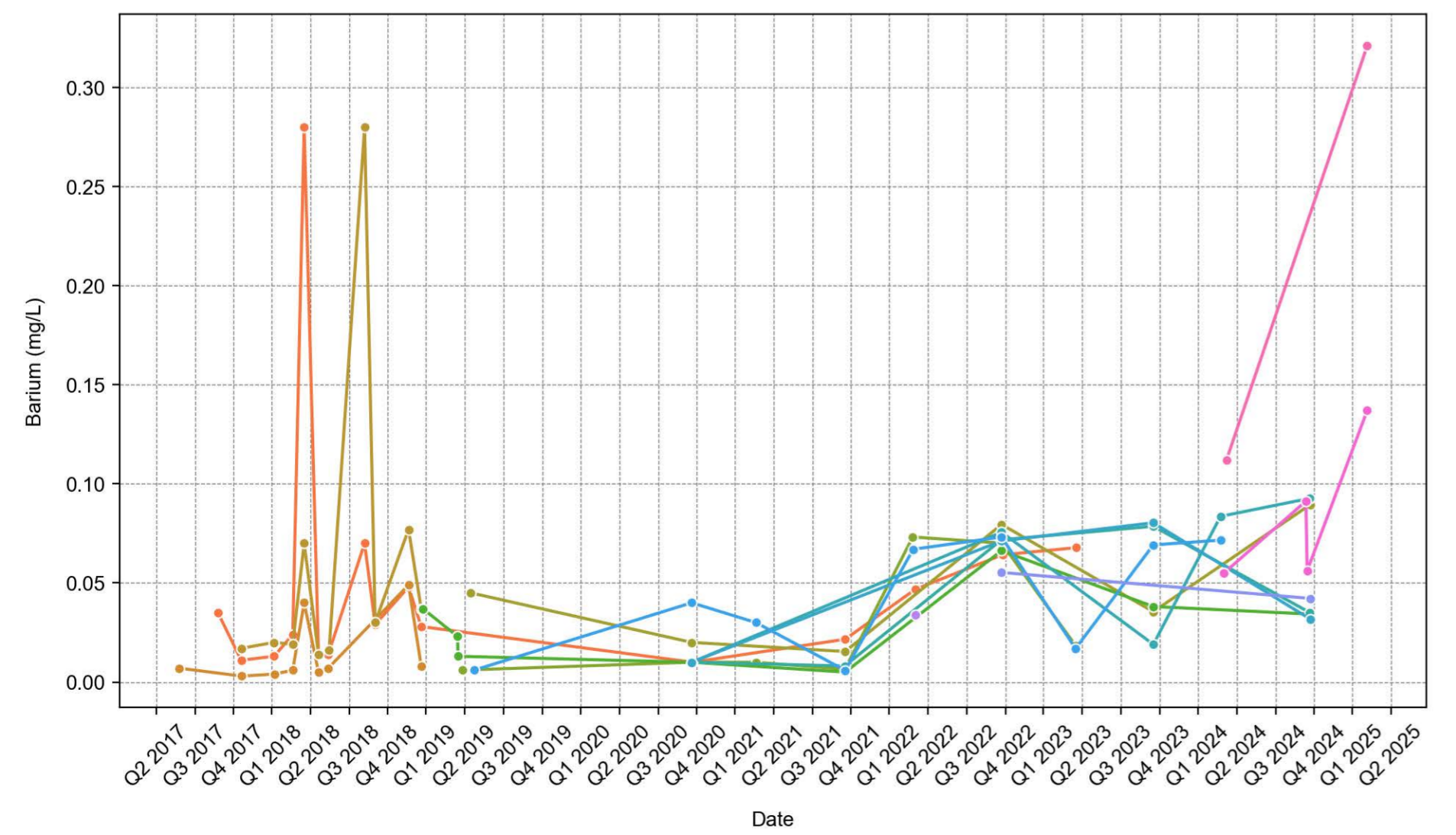
Antimony



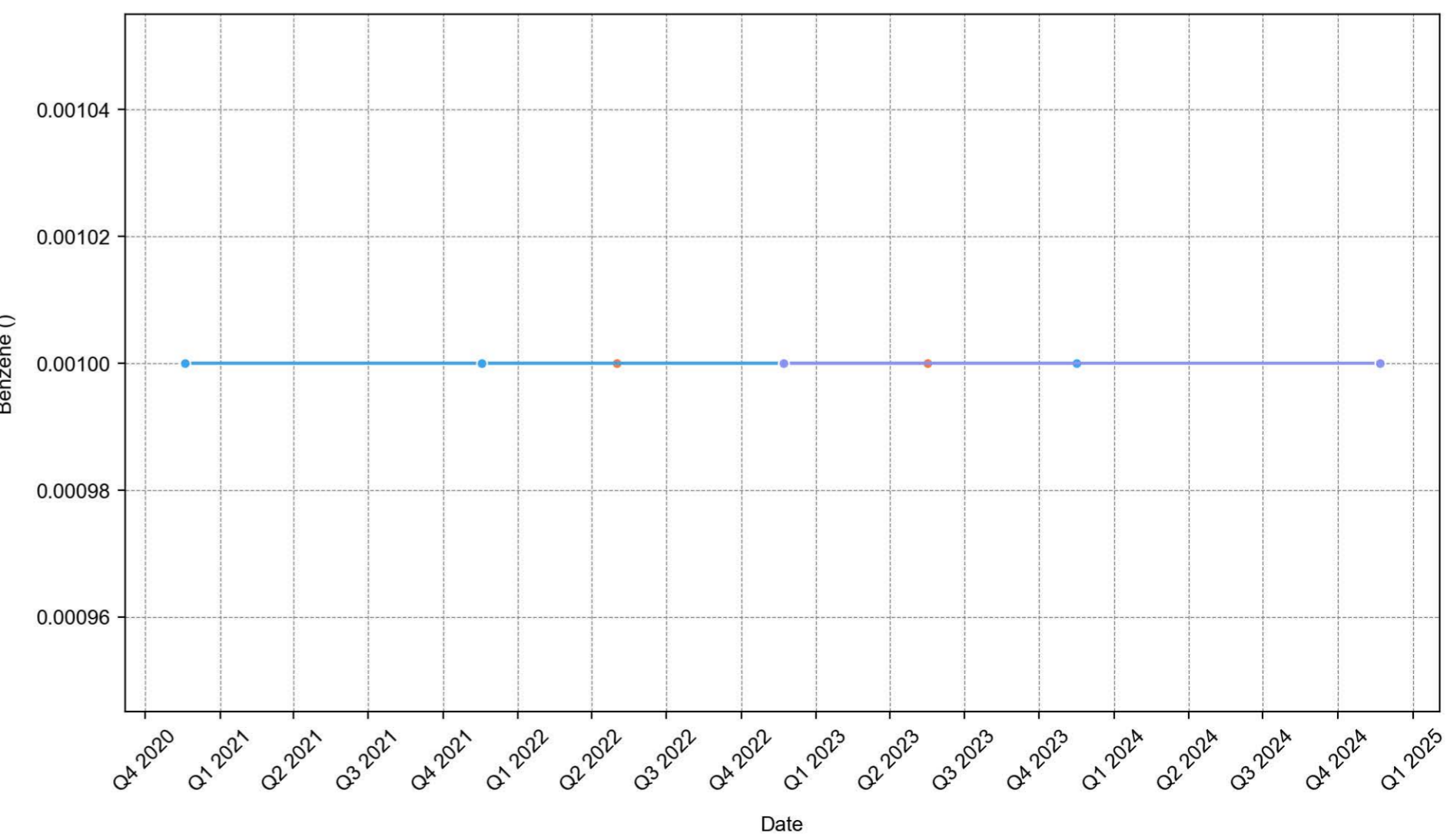
Arsenic



Barium

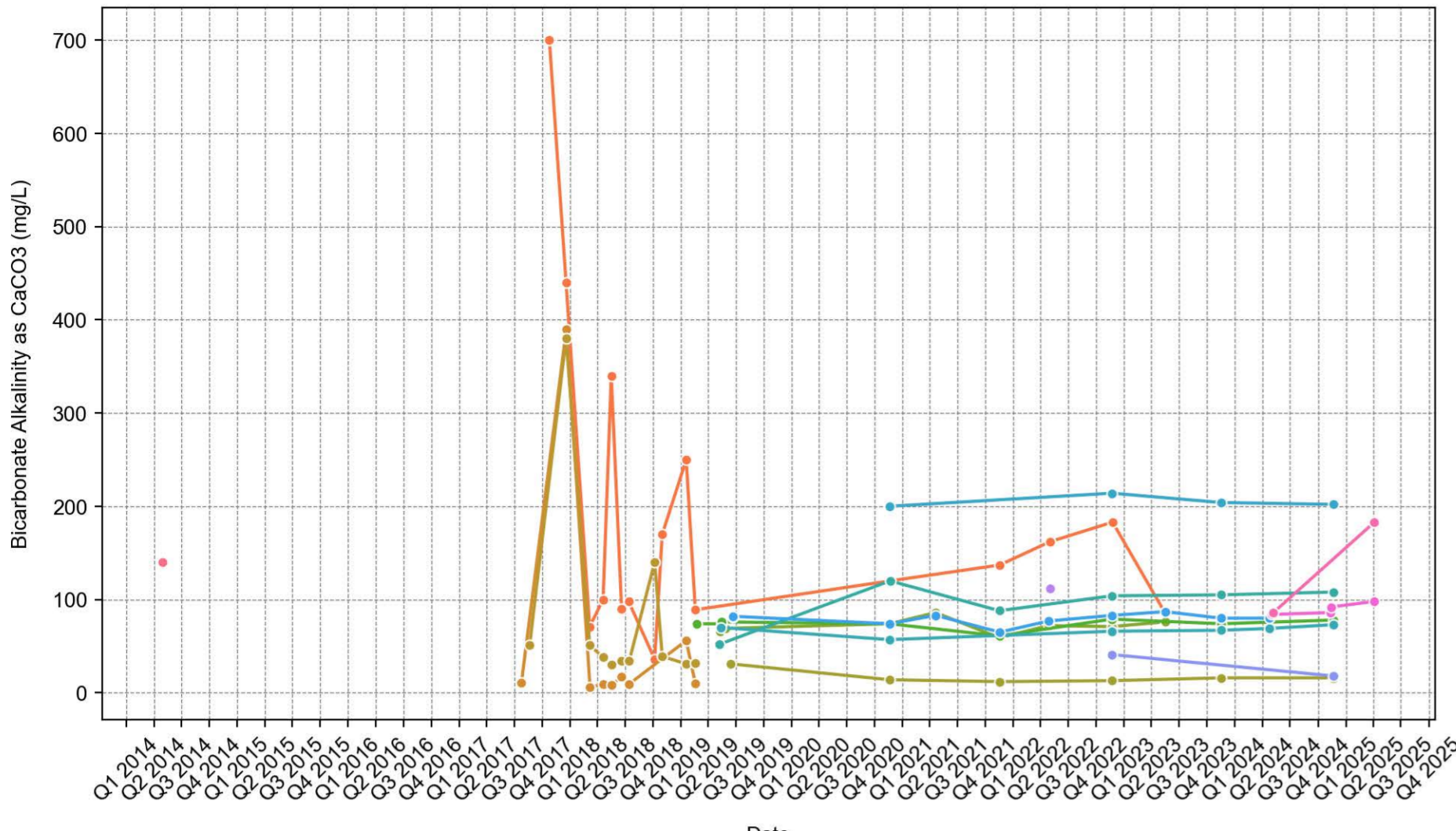


Benzene

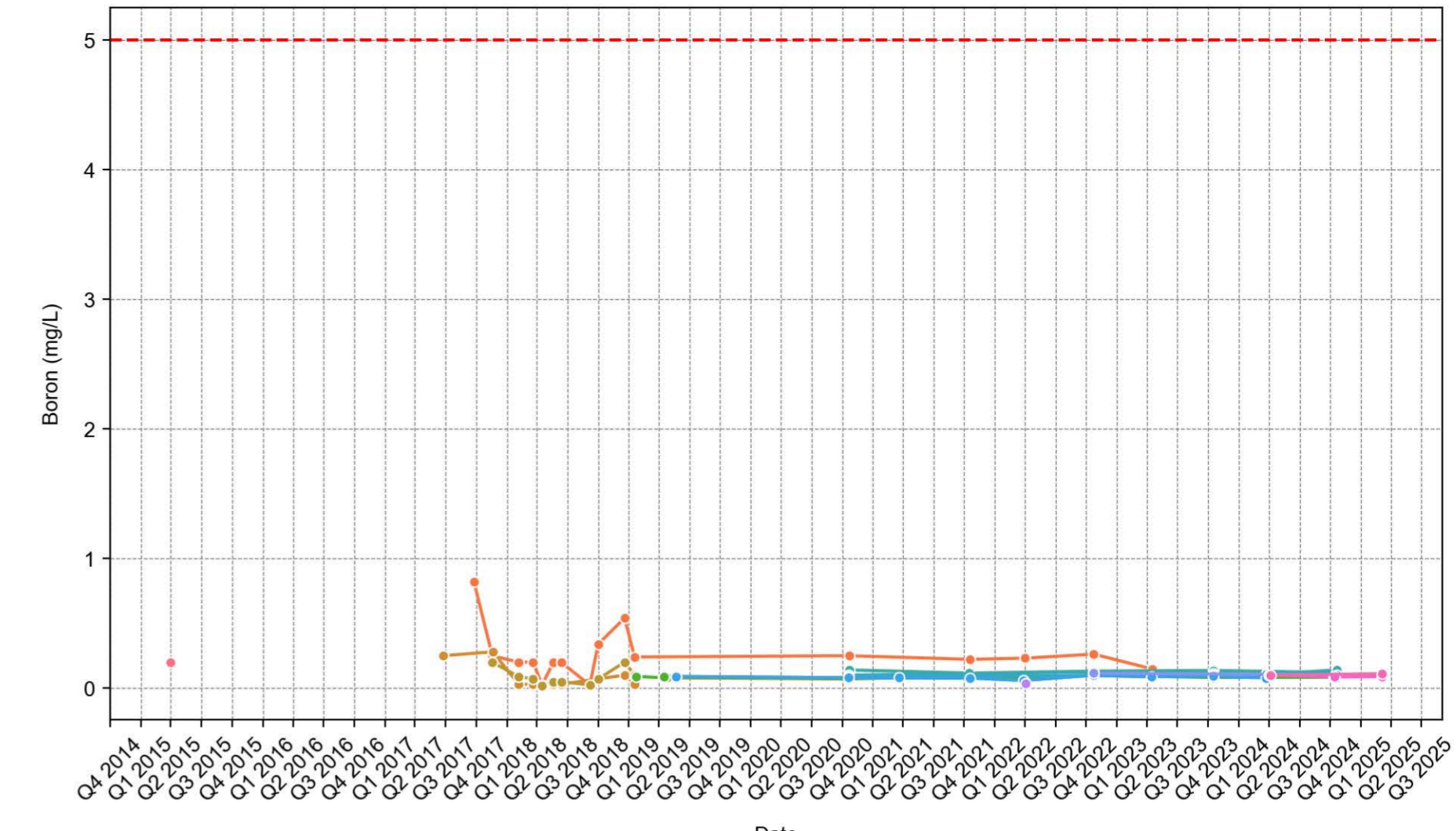


- CRD0034
- CRD0006
- CRD0018
- CRD0095
- CRD0105
- CRD0137
- CO-WS-10
- CRD0014
- CRD0092
- CRD0096
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- CRD0015
- CRD0094
- CRD0101
- CRD0127
- ANZECC Limit
- CO-WS-12

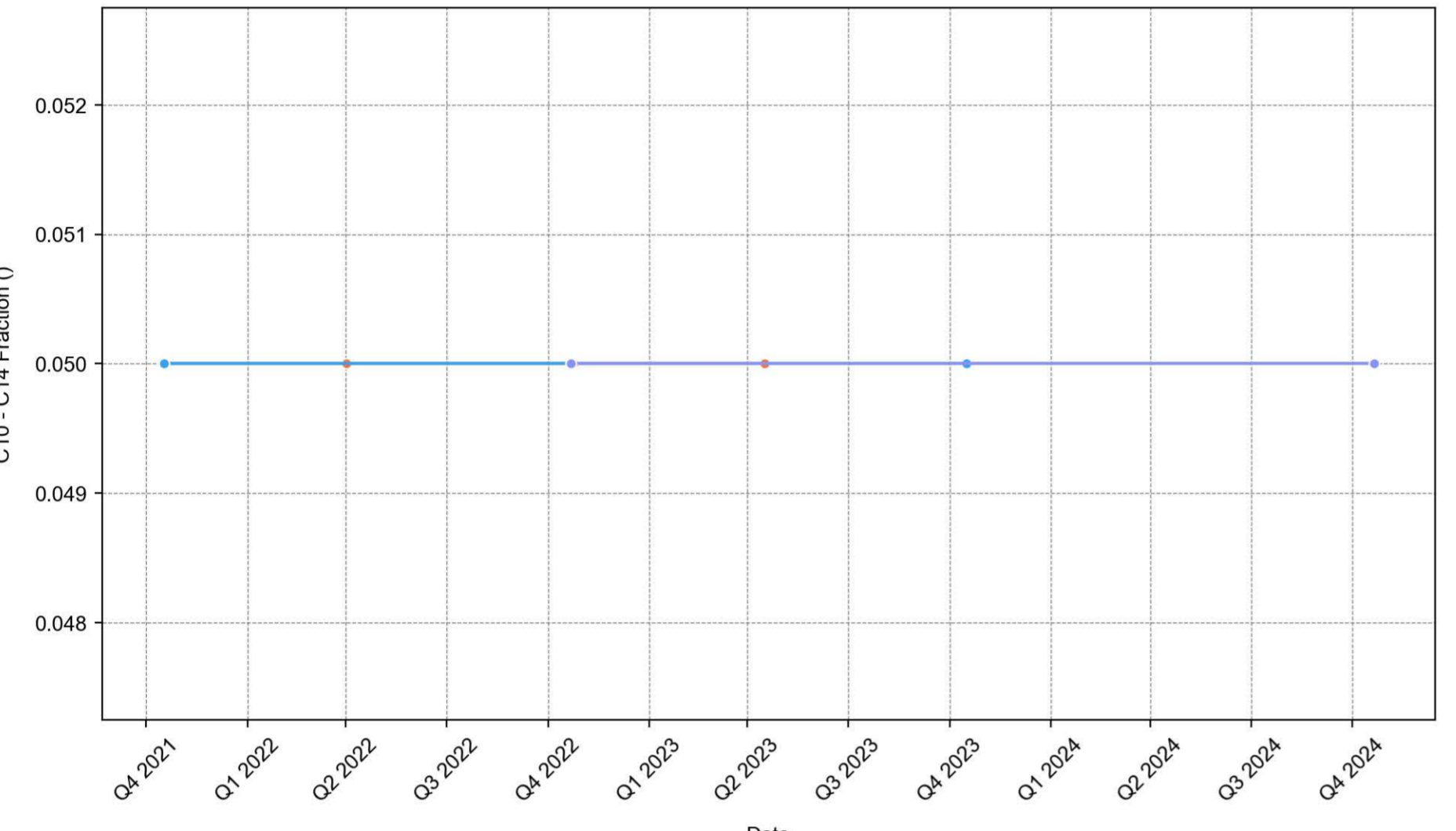
Bicarbonate Alkalinity as CaCO3



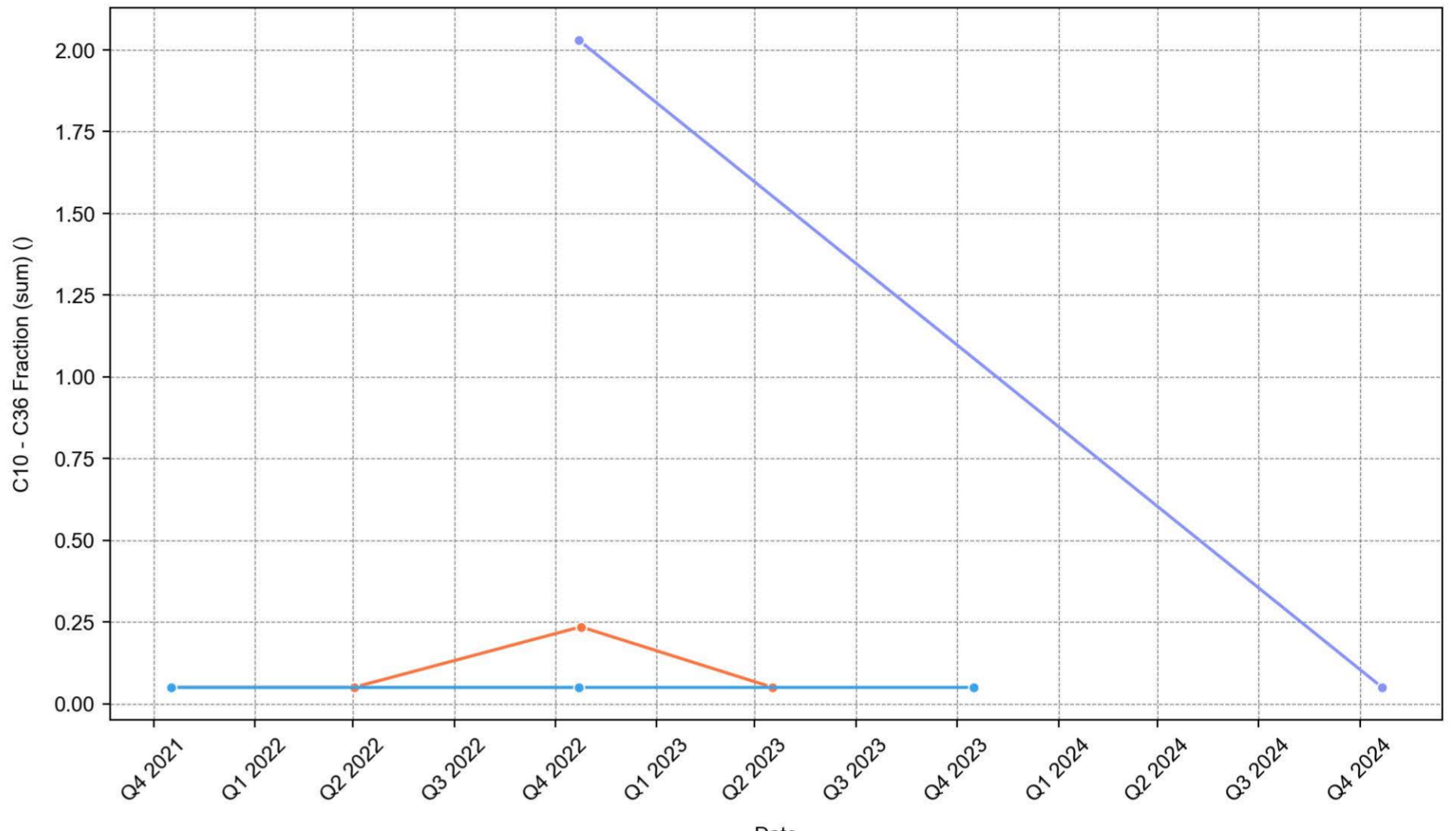
Boron



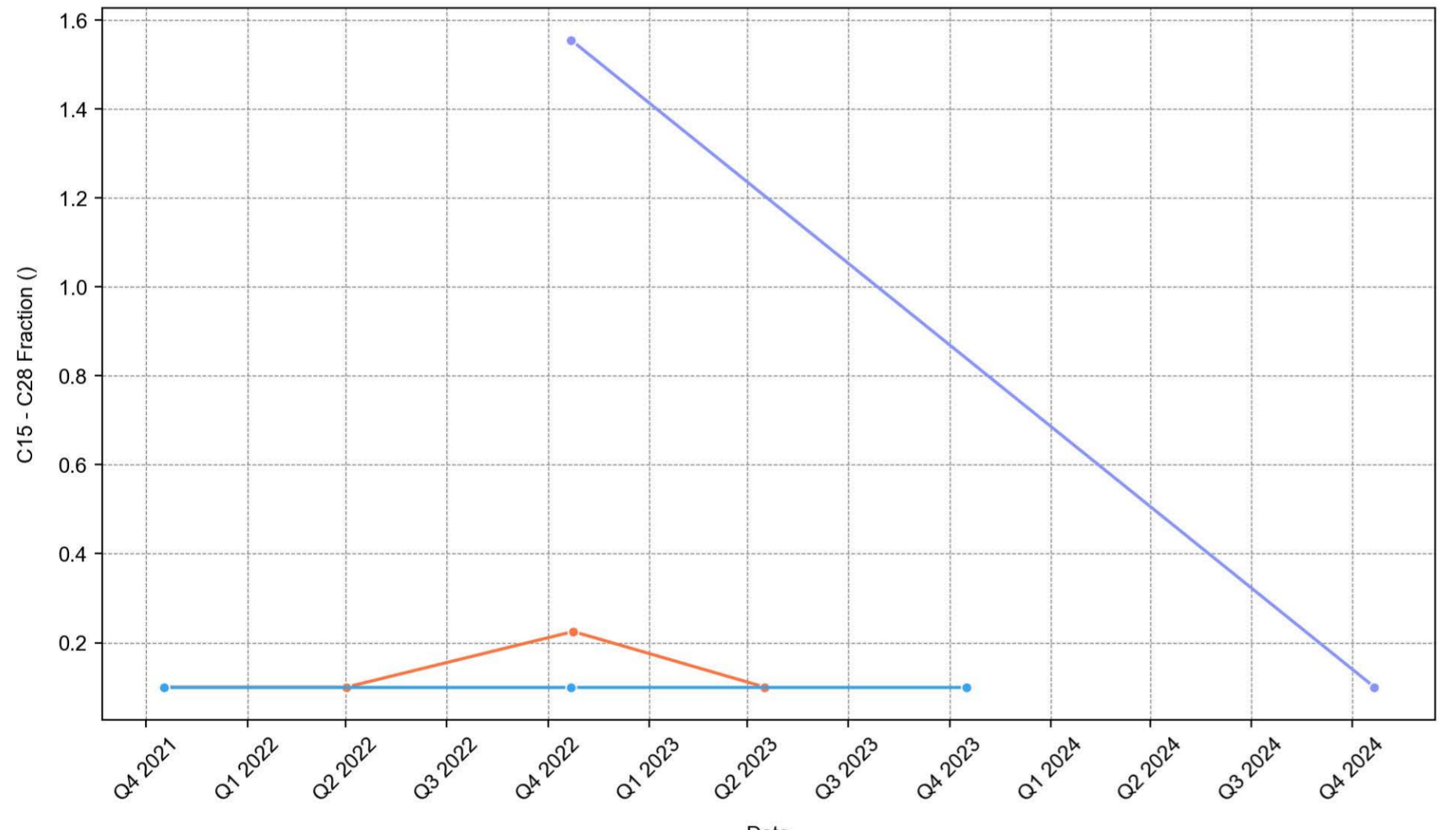
C10 - C14 Fraction



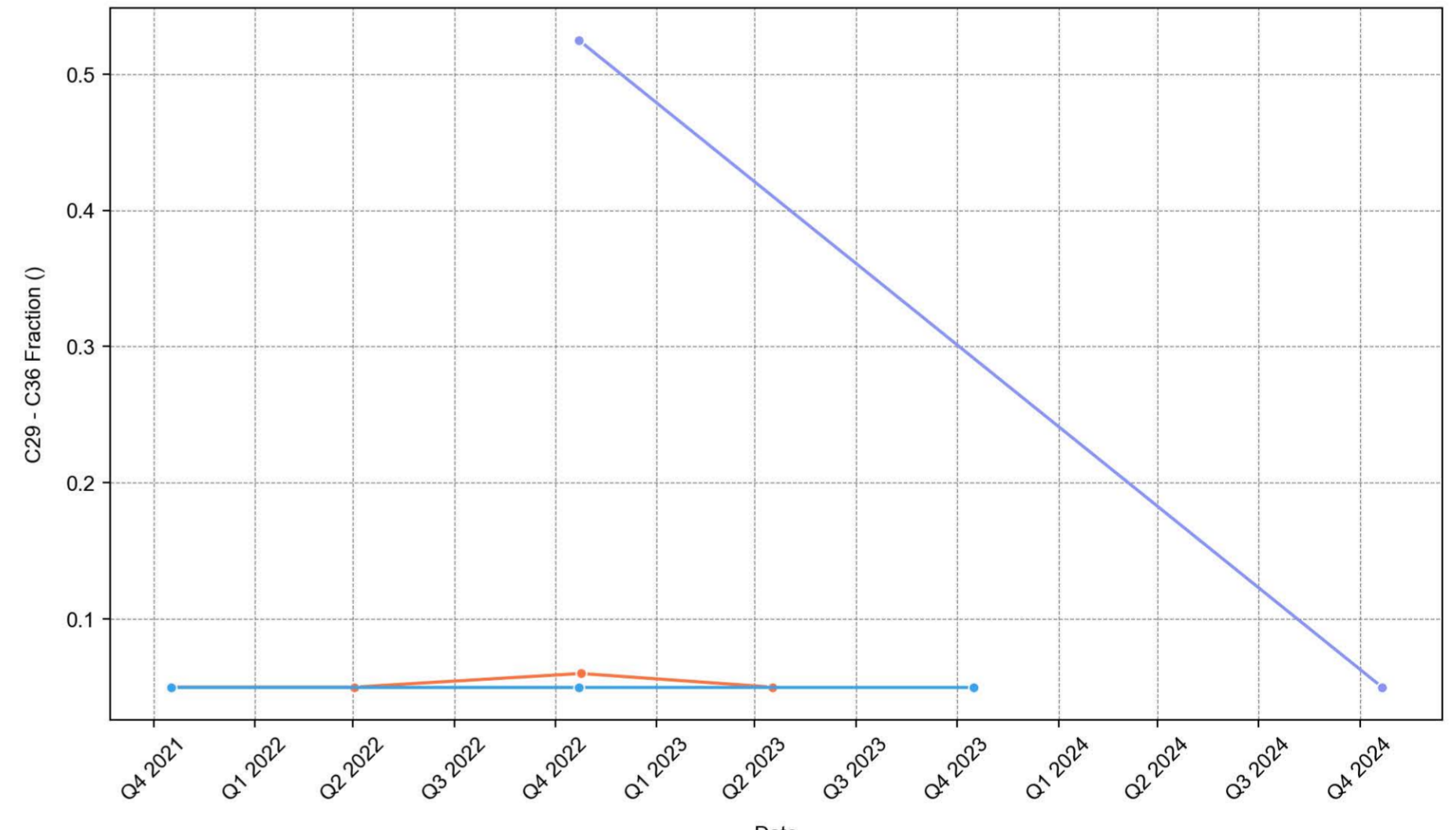
C10 - C36 Fraction (sum)



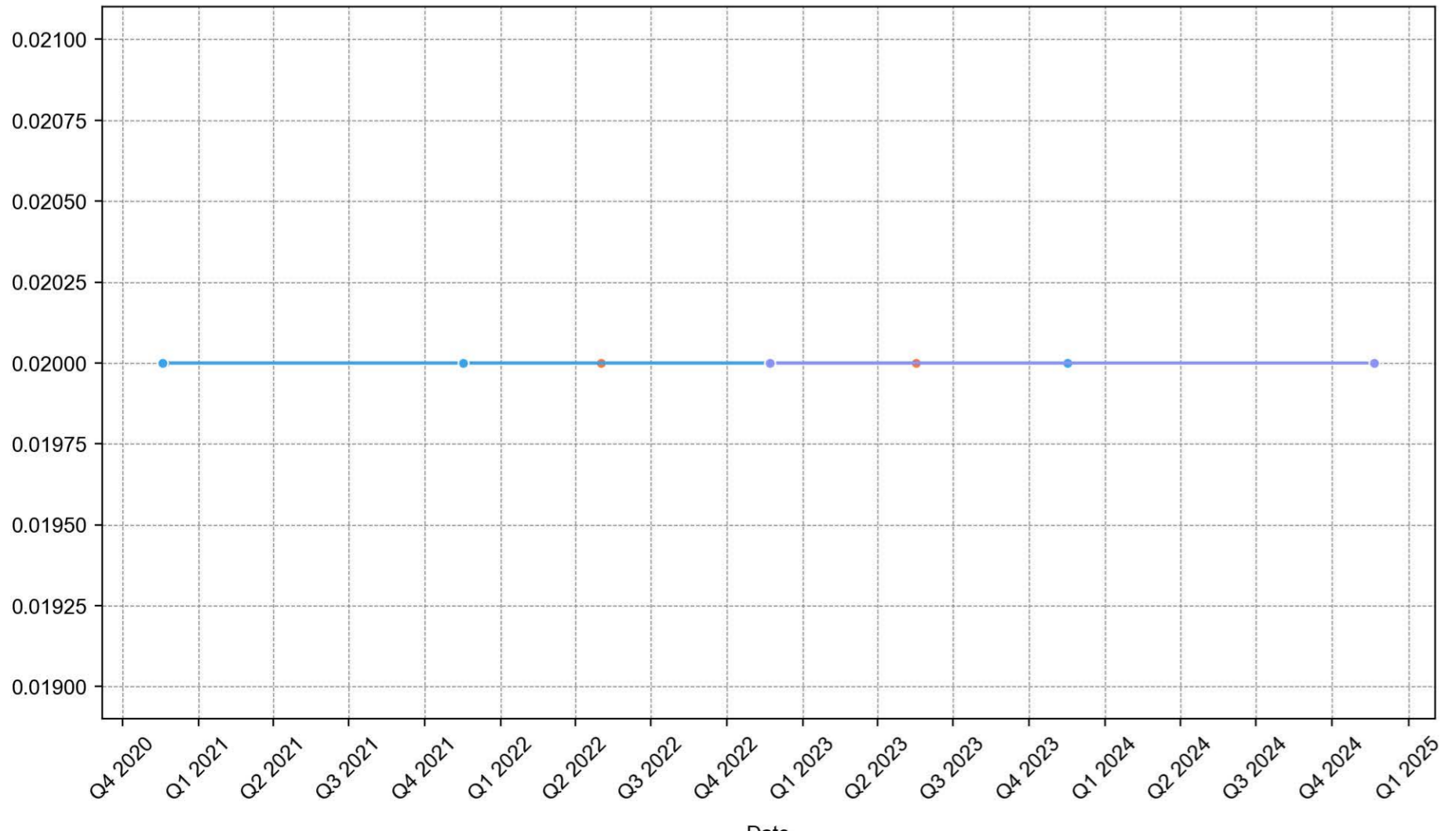
C15 - C28 Fraction



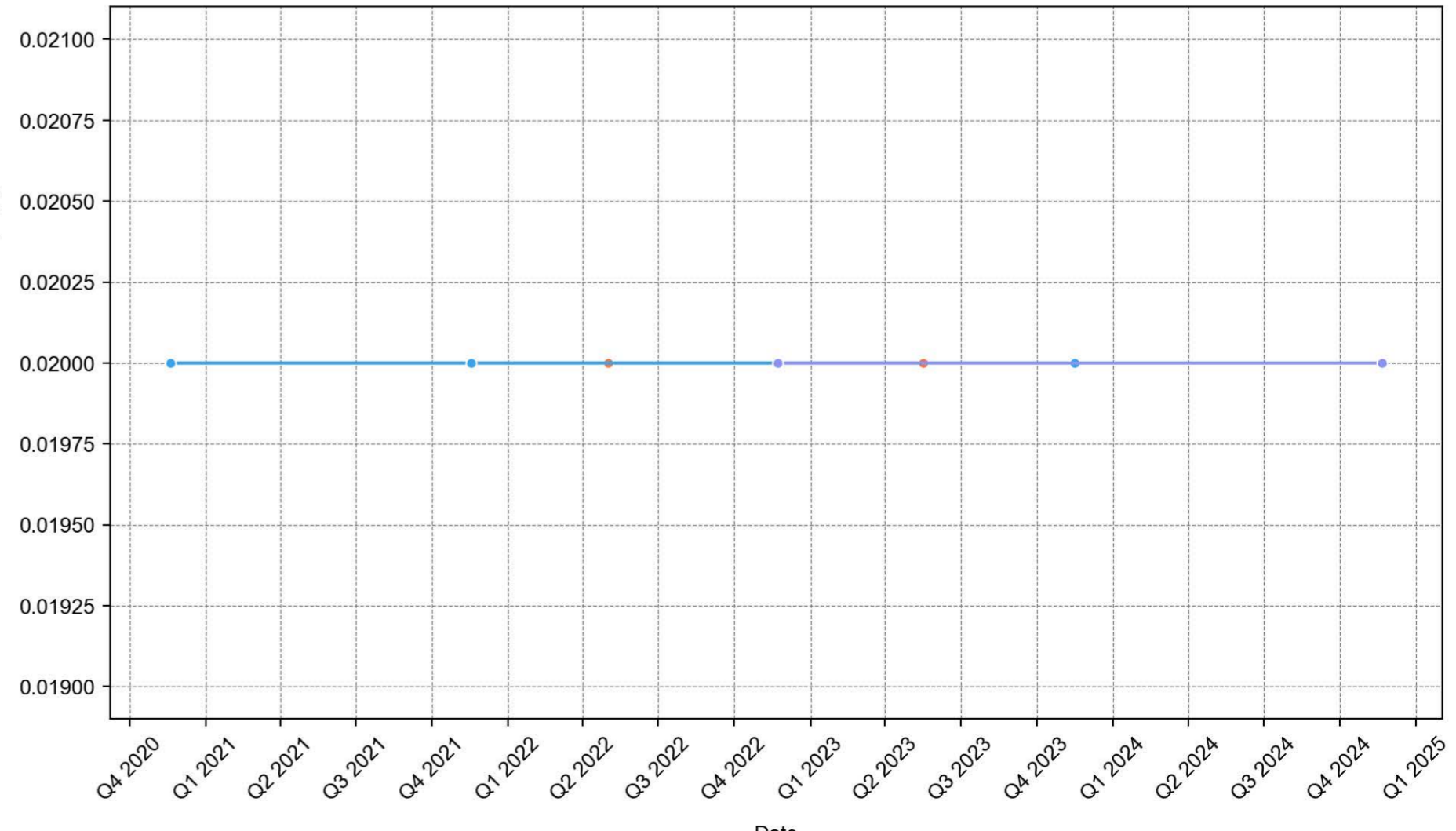
C29 - C36 Fraction



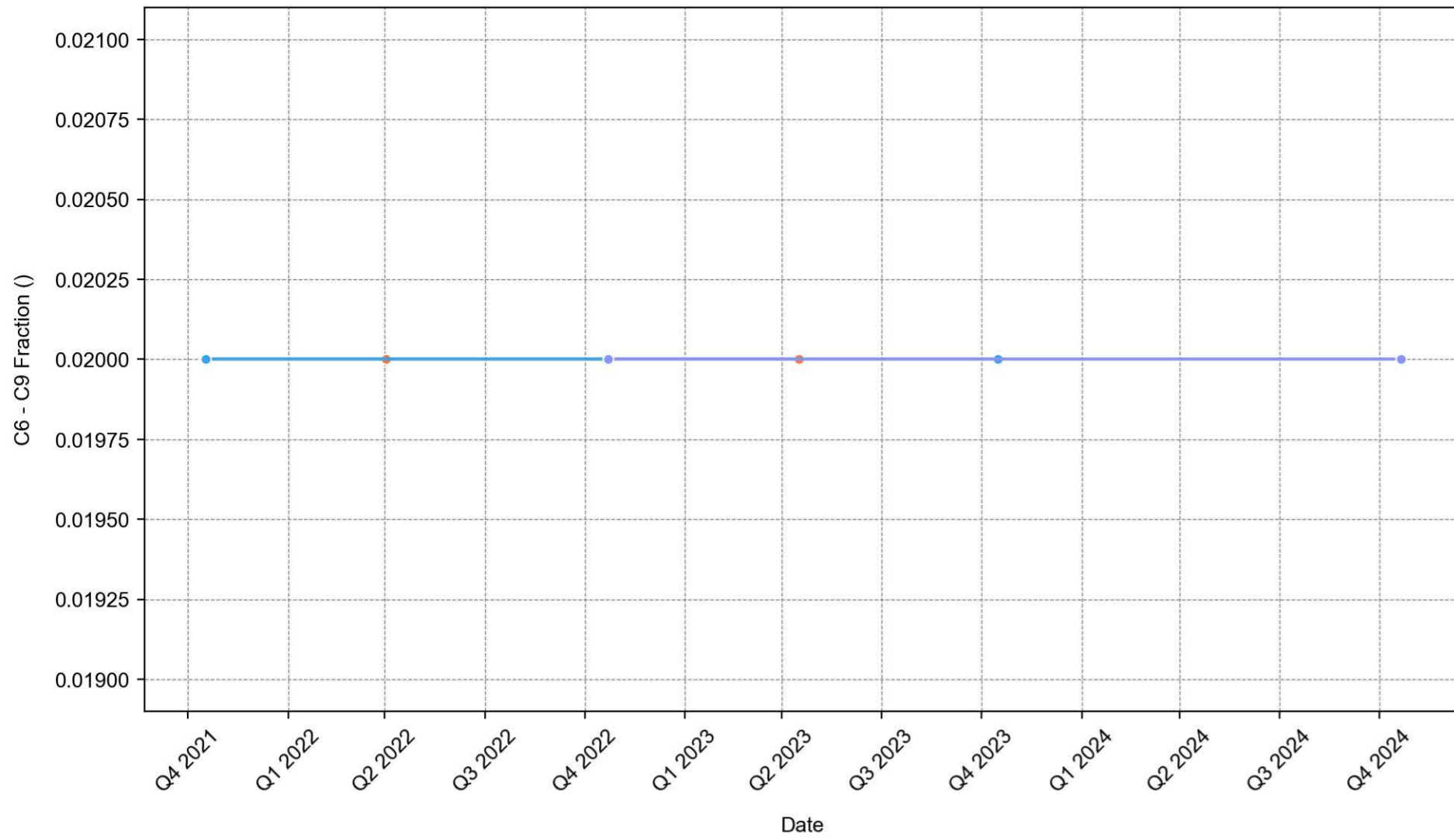
C6 - C10 Fraction



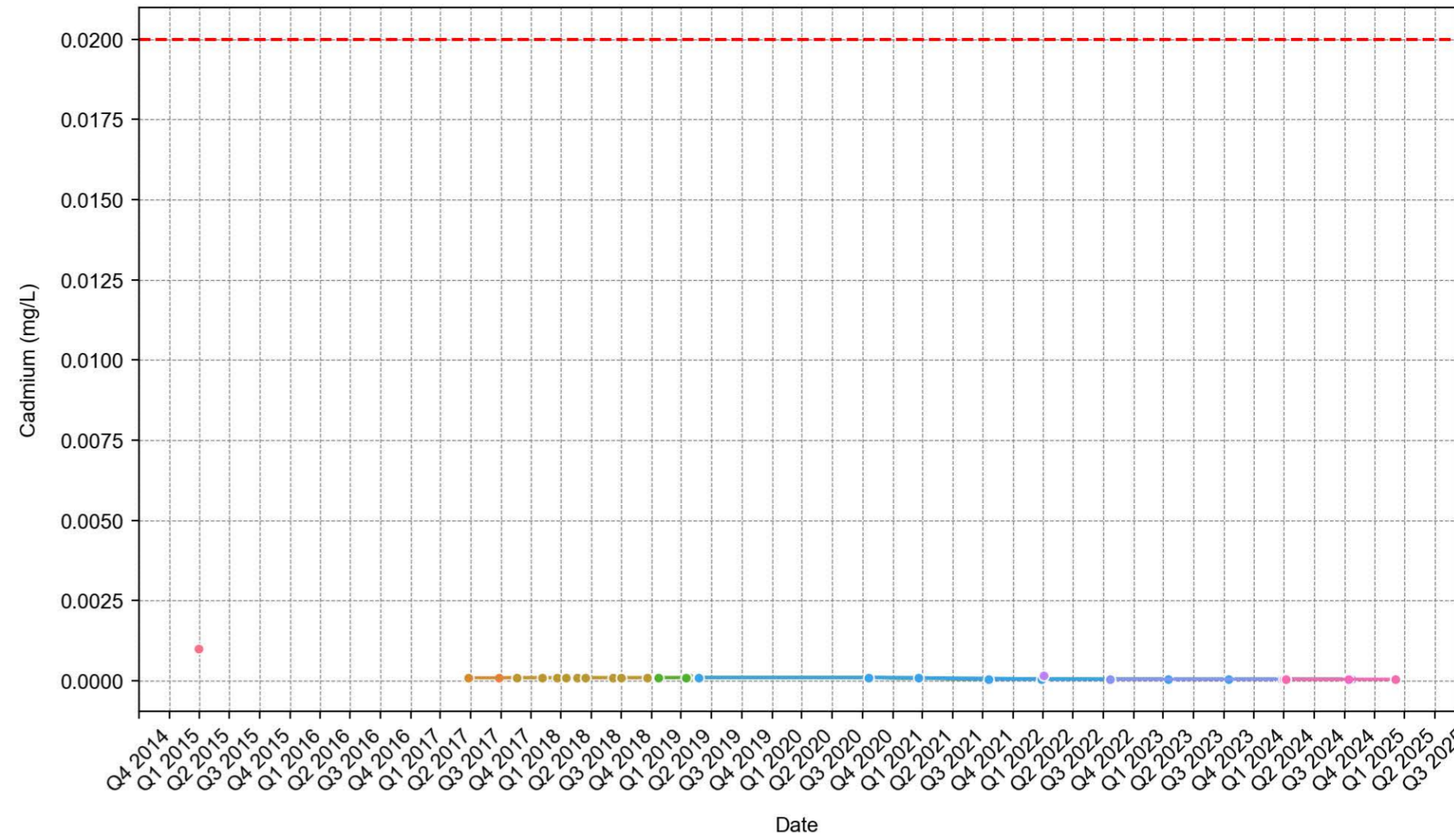
C6 - C10 Fraction minus BTEX (F1)



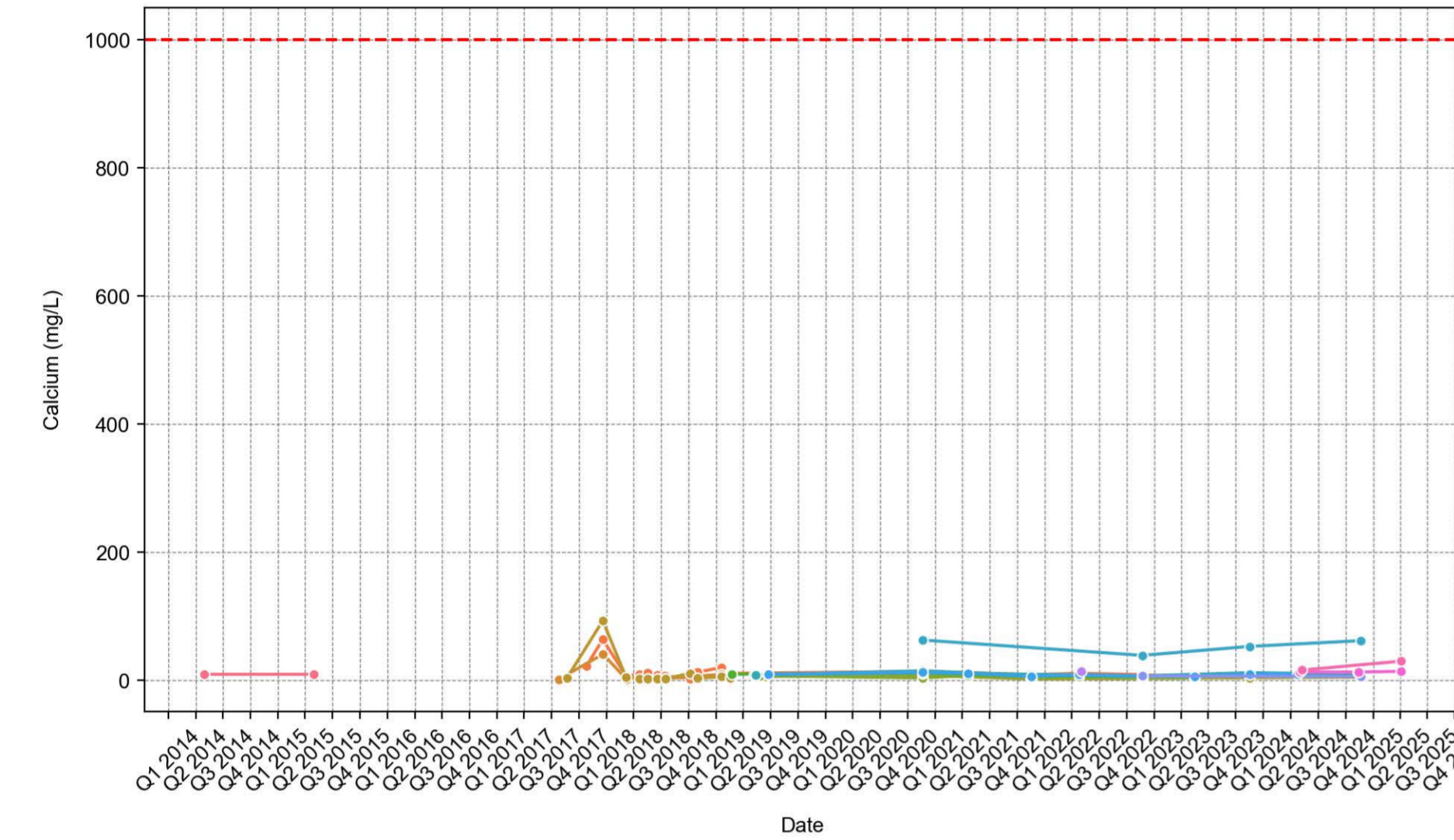
C6 - C9 Fraction



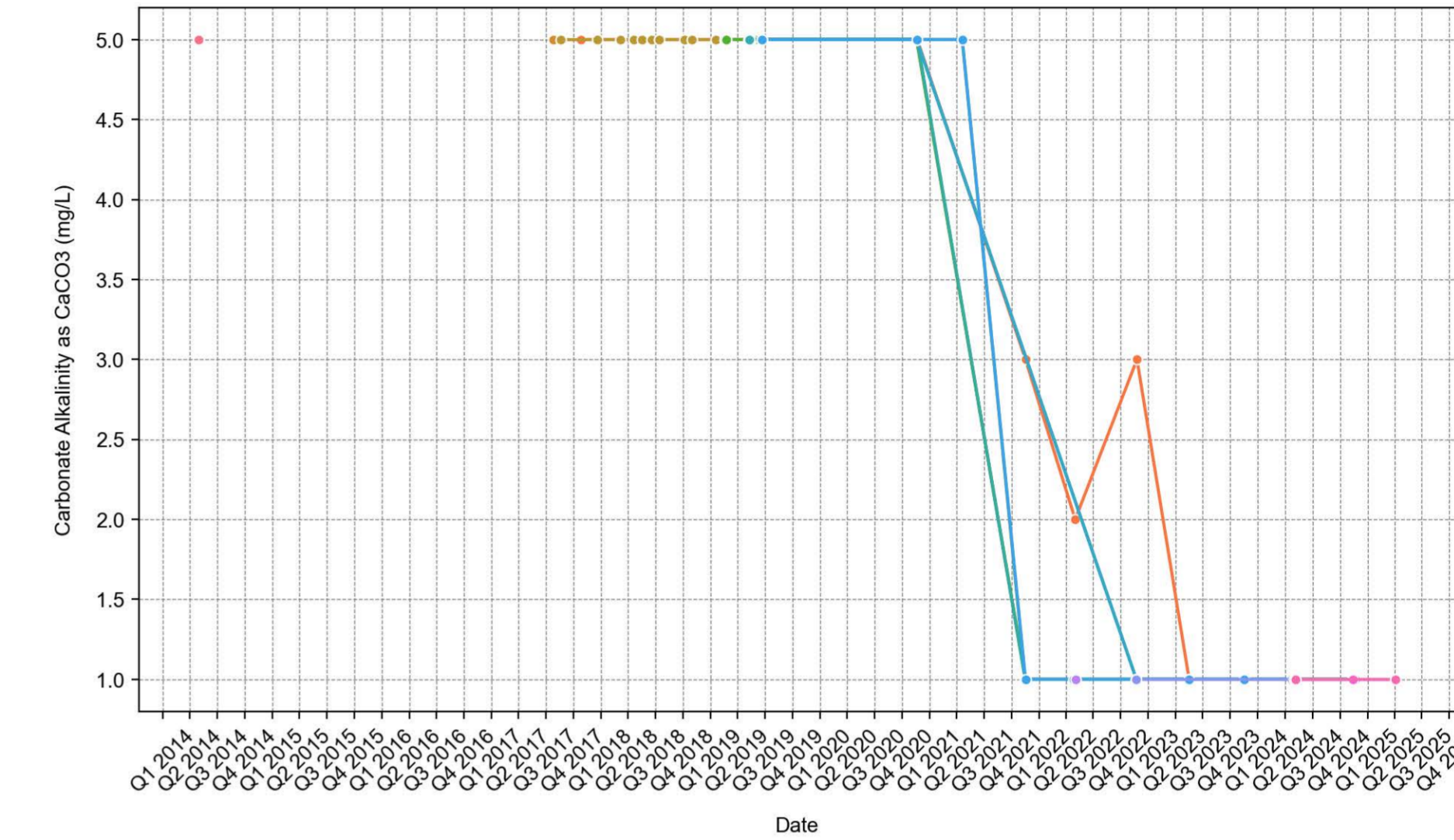
Cadmium



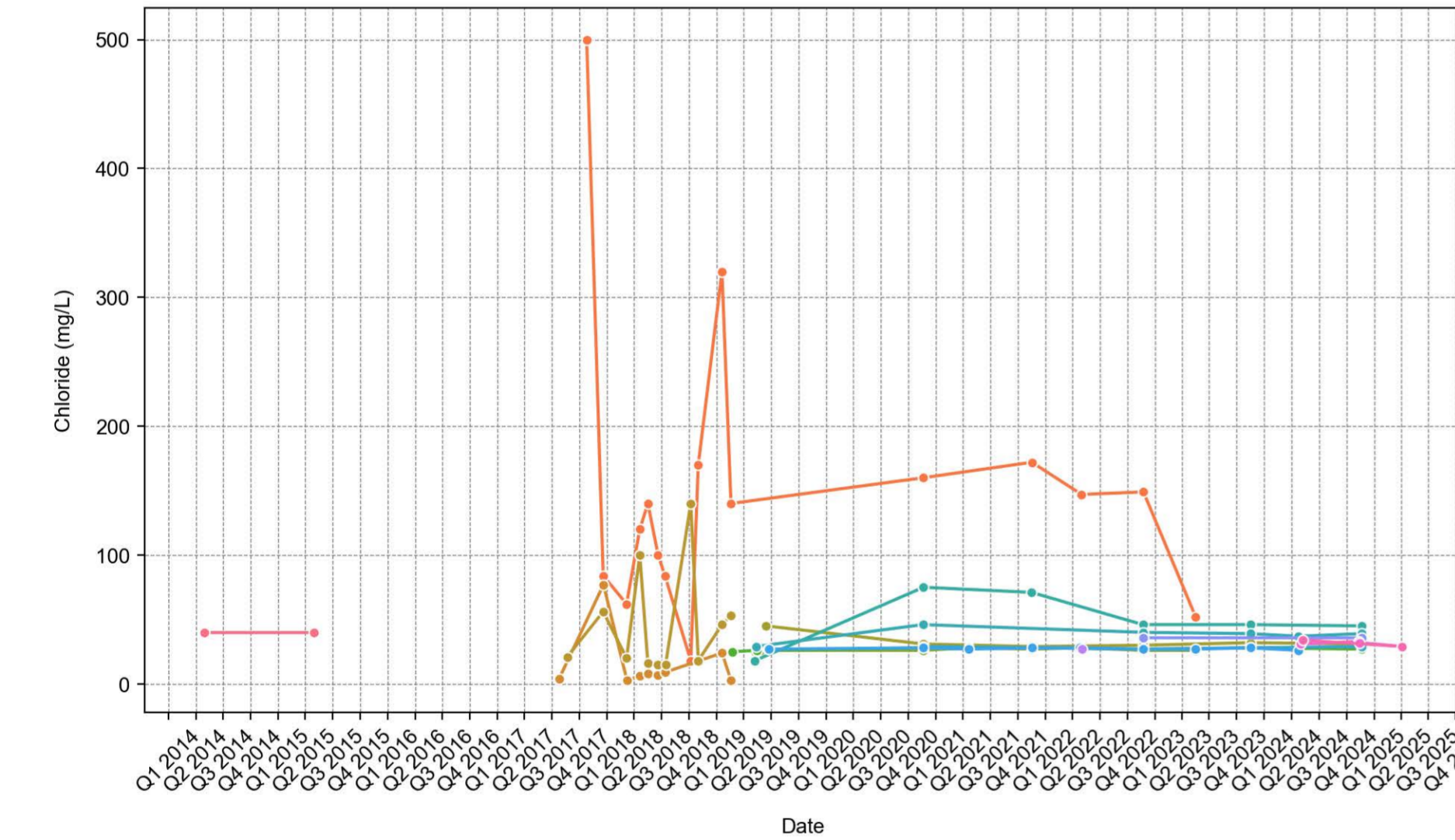
Calcium



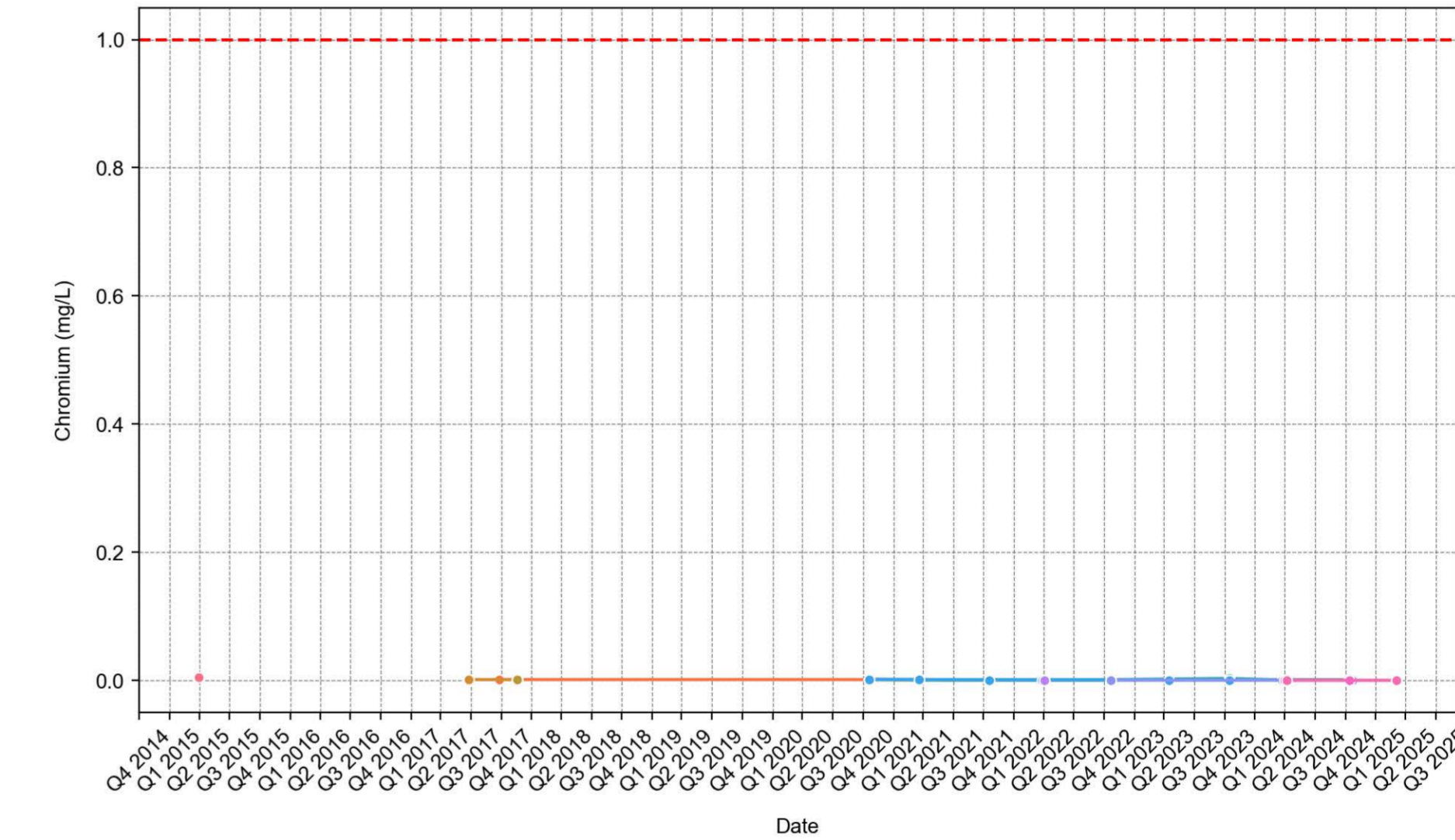
Carbonate Alkalinity as CaCO3



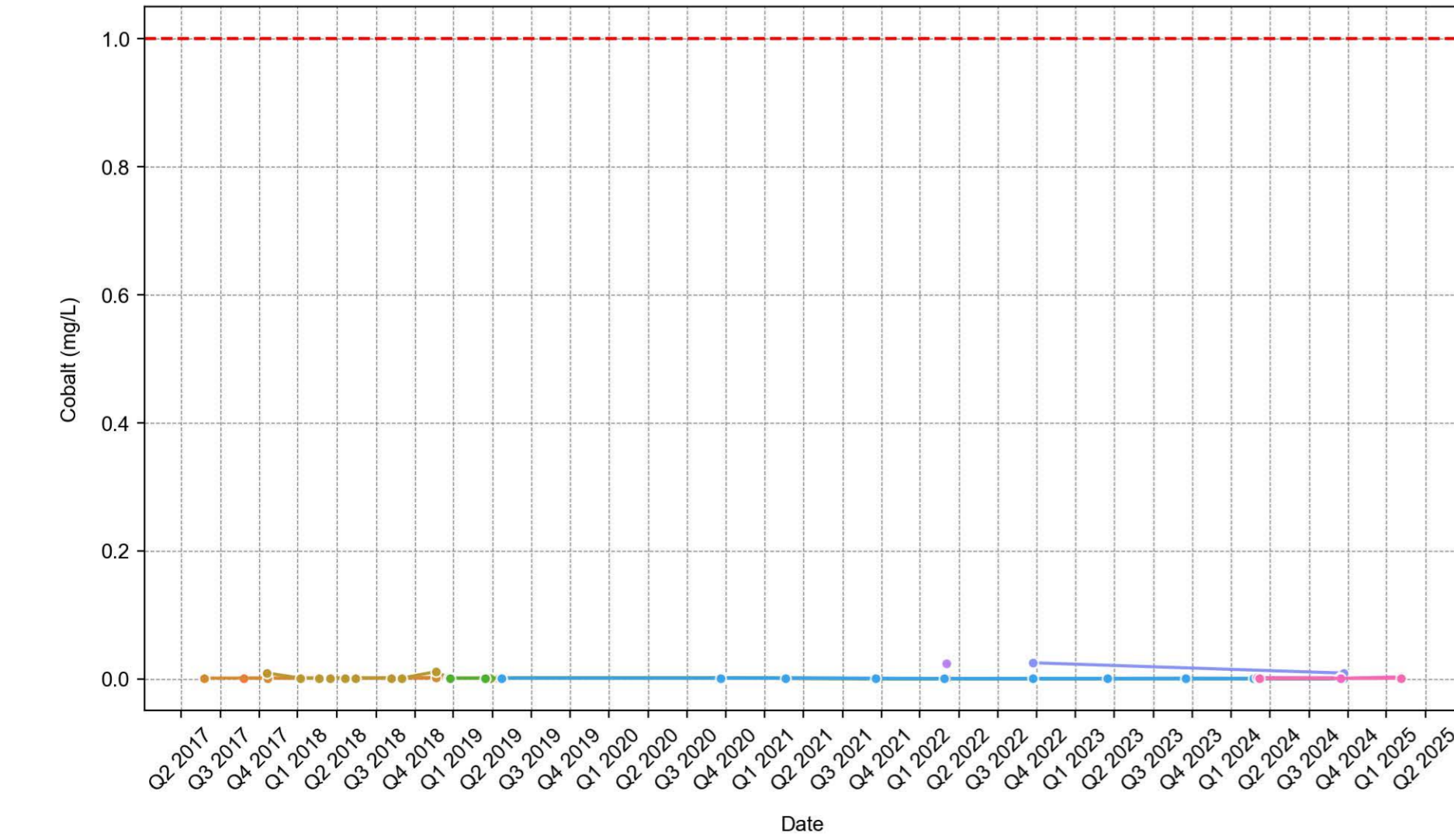
Chloride



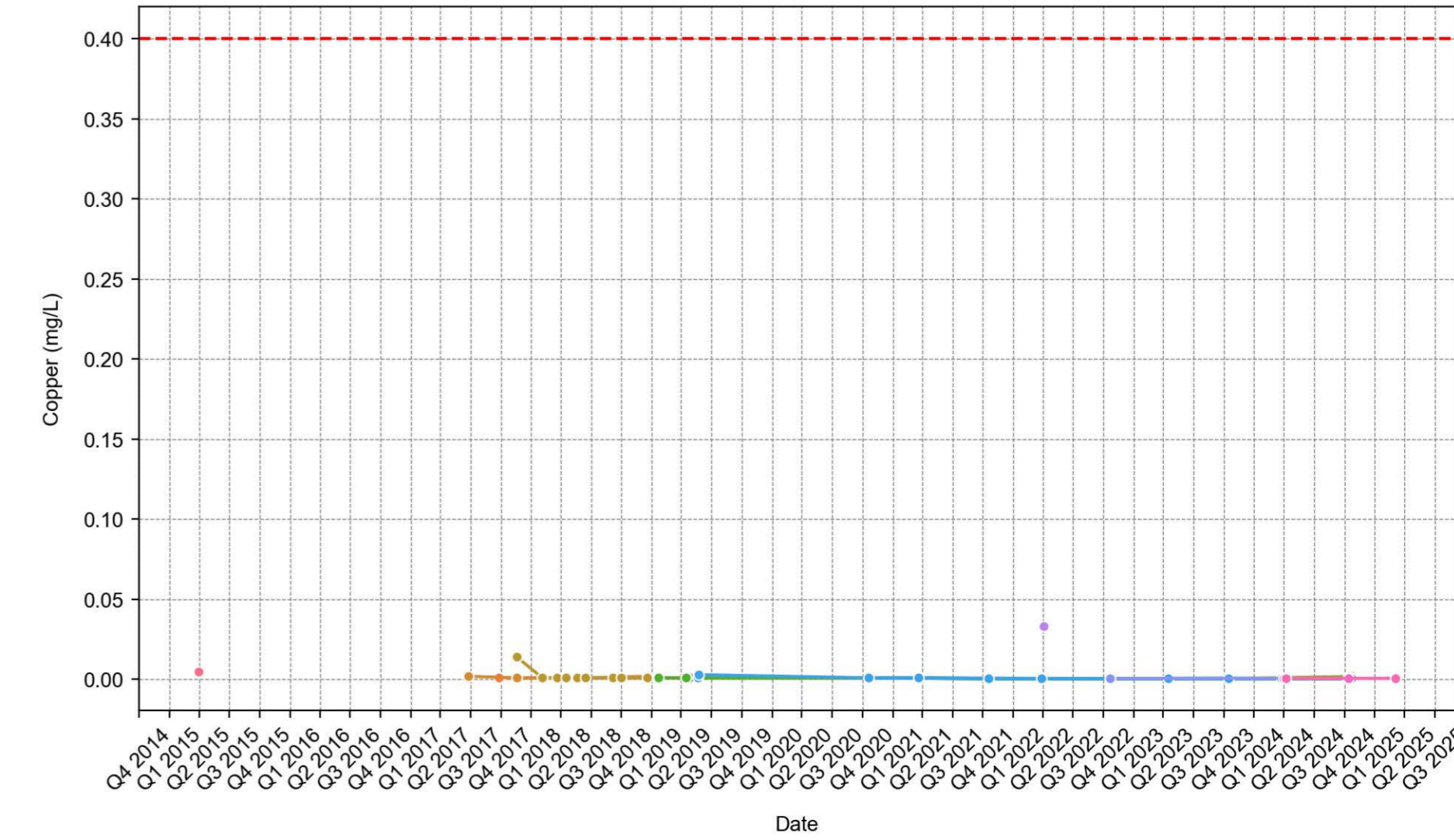
Chromium



Cobalt

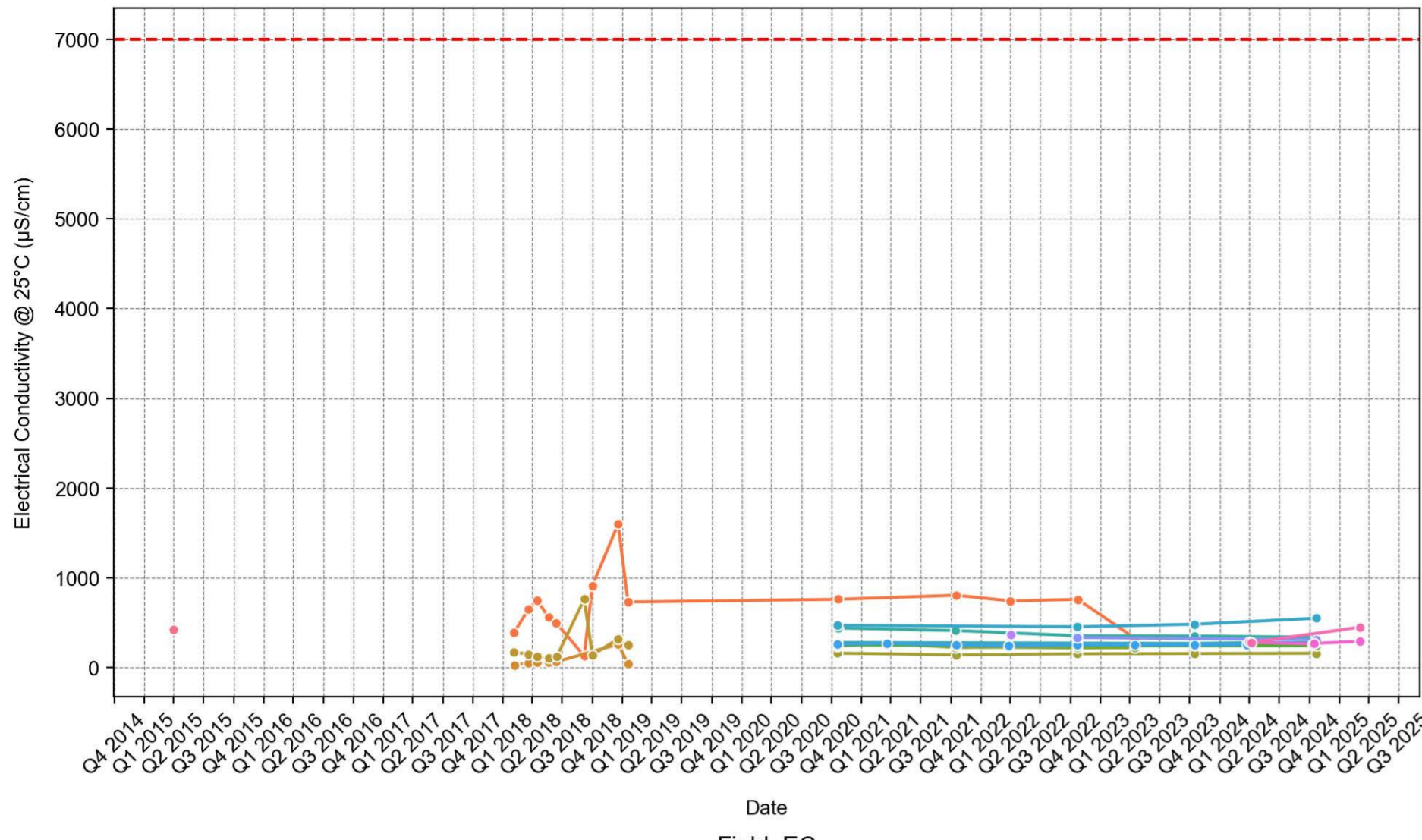


Copper

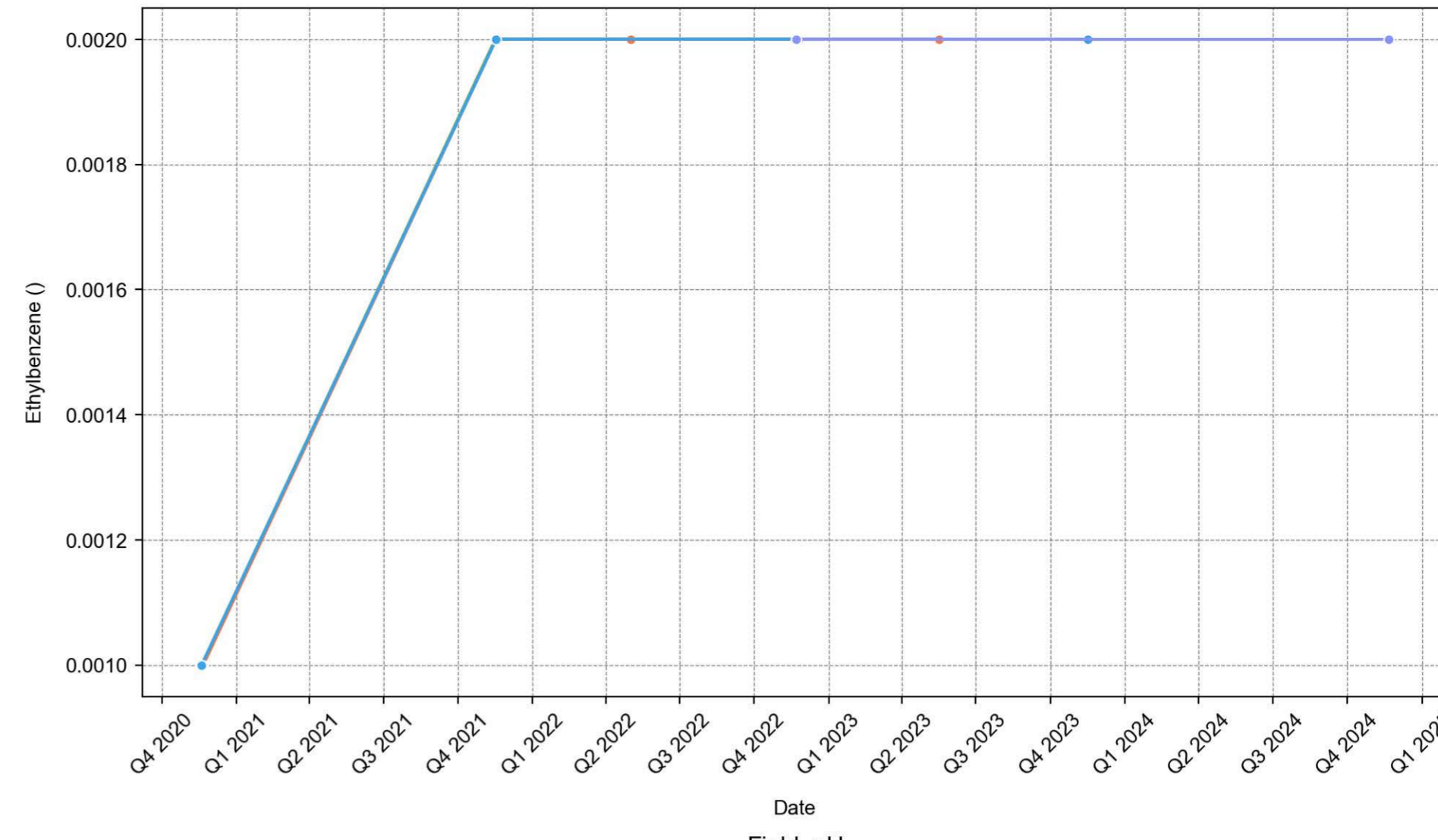


- CDRC0334
- CRD0006
- CRD0018
- CRD0095
- CRD0105
- CRD0137
- CO-WS-10
- CRD0014
- CRD0092
- CRD0096
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- ANZECC Limit
- CO-WS-12

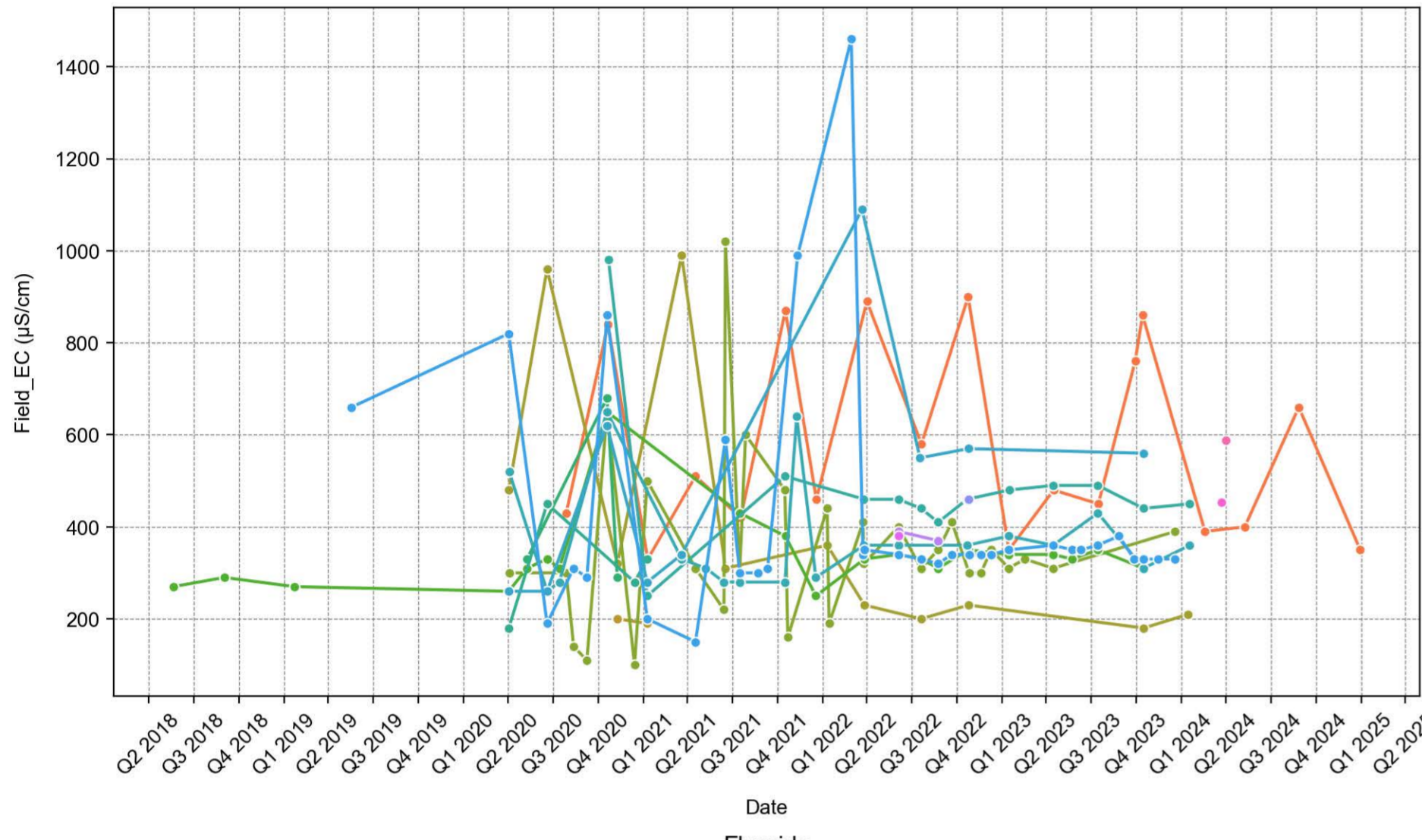
Electrical Conductivity @ 25°C



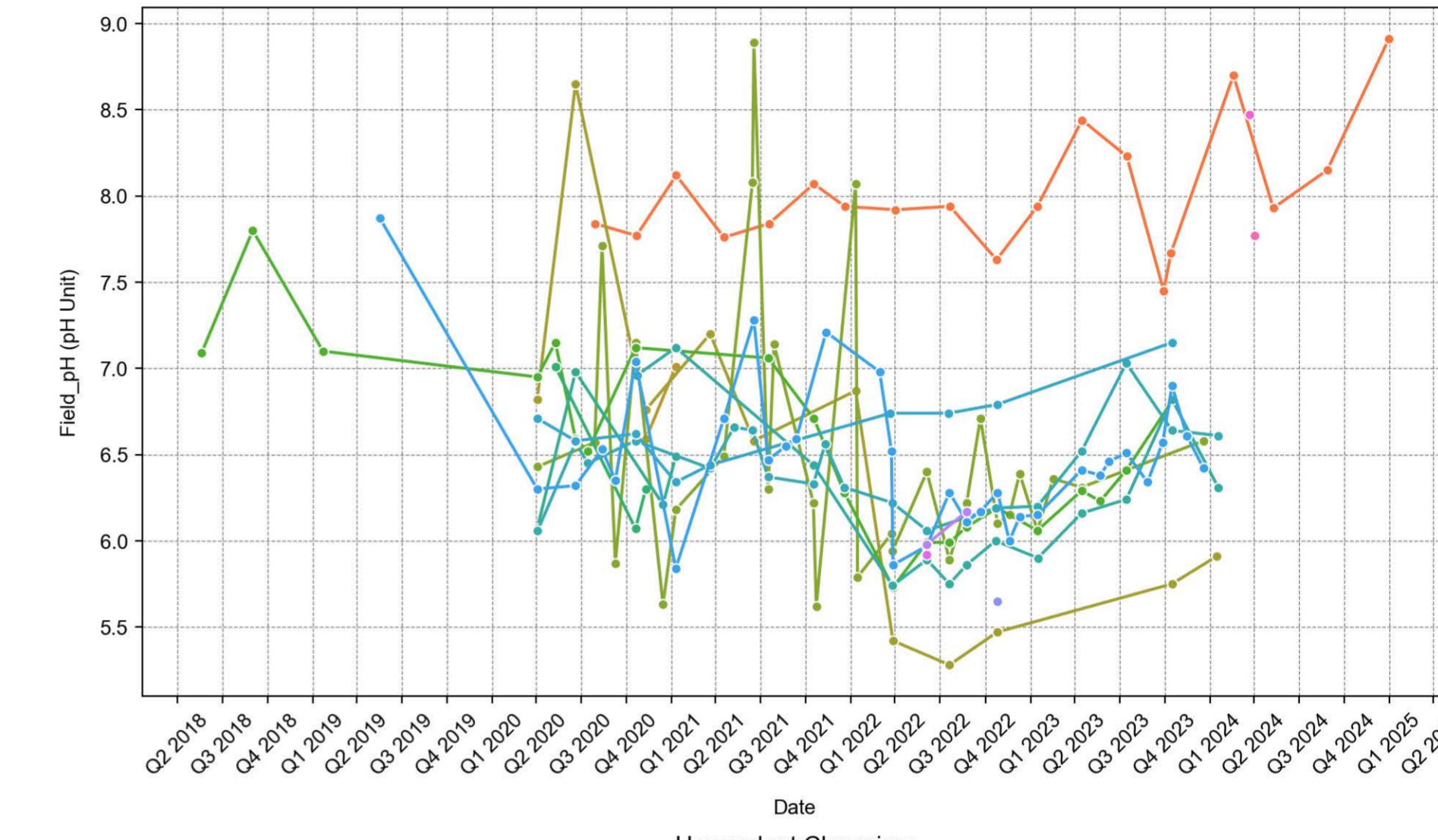
Ethylbenzene



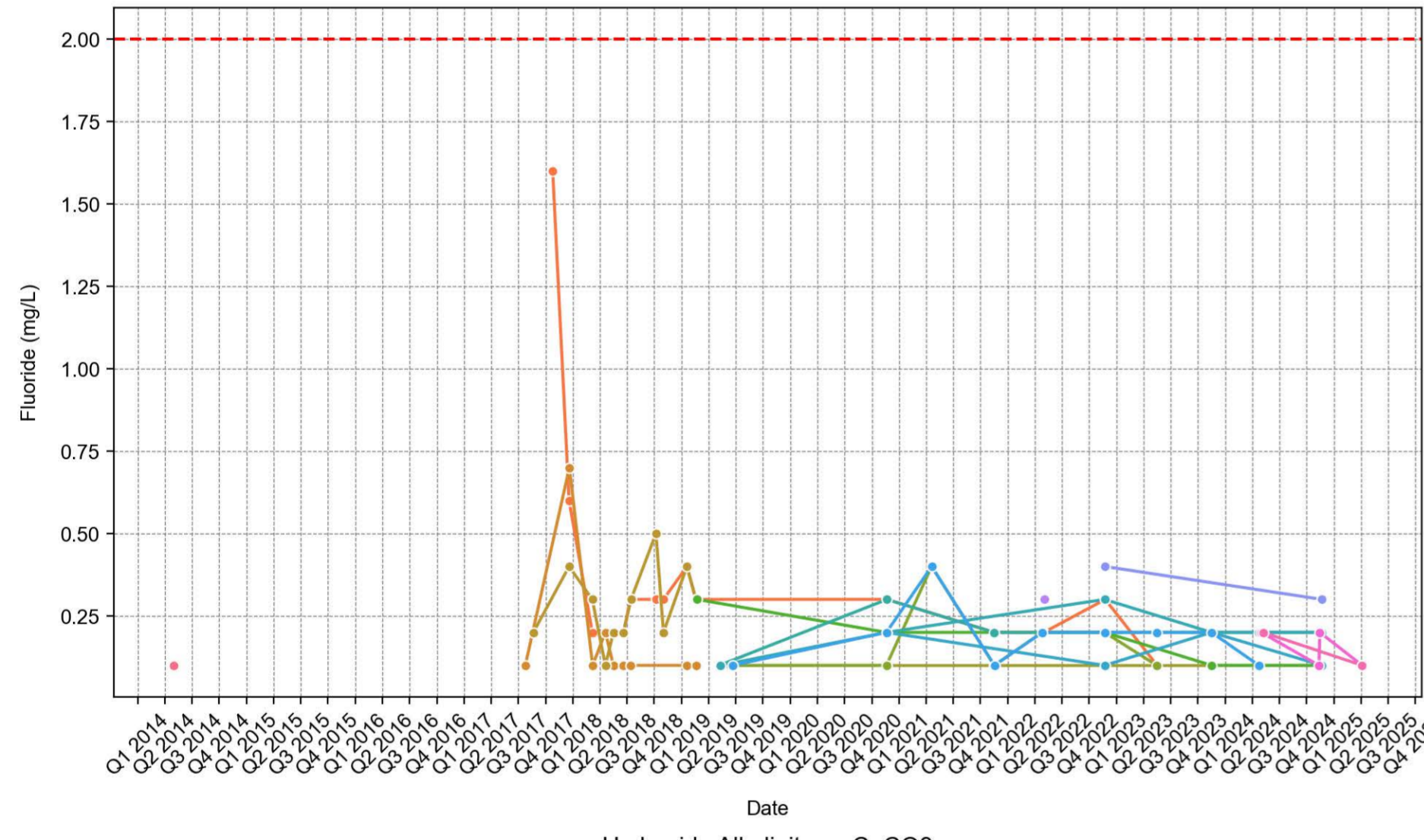
Field_EC



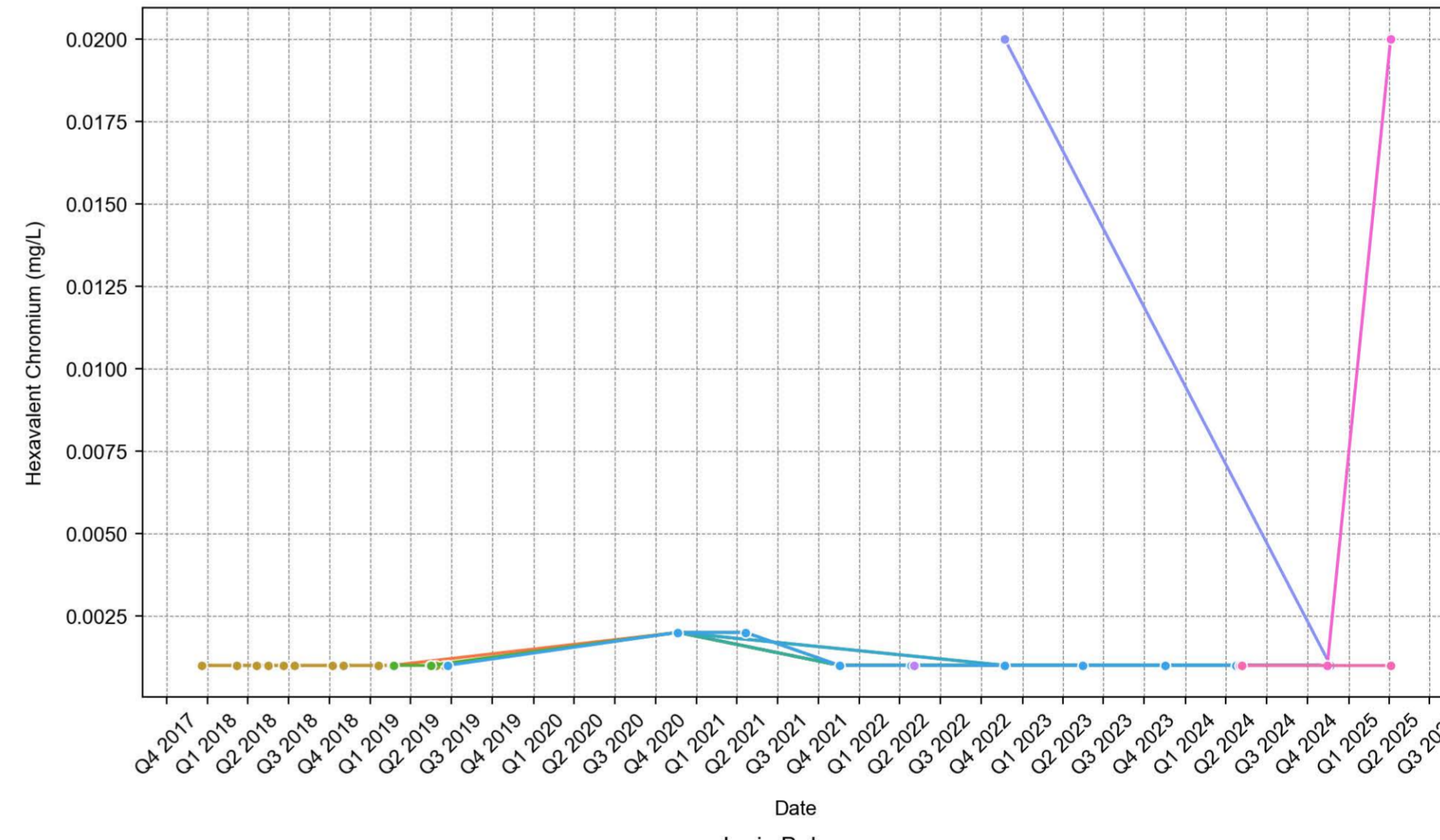
Field_pH



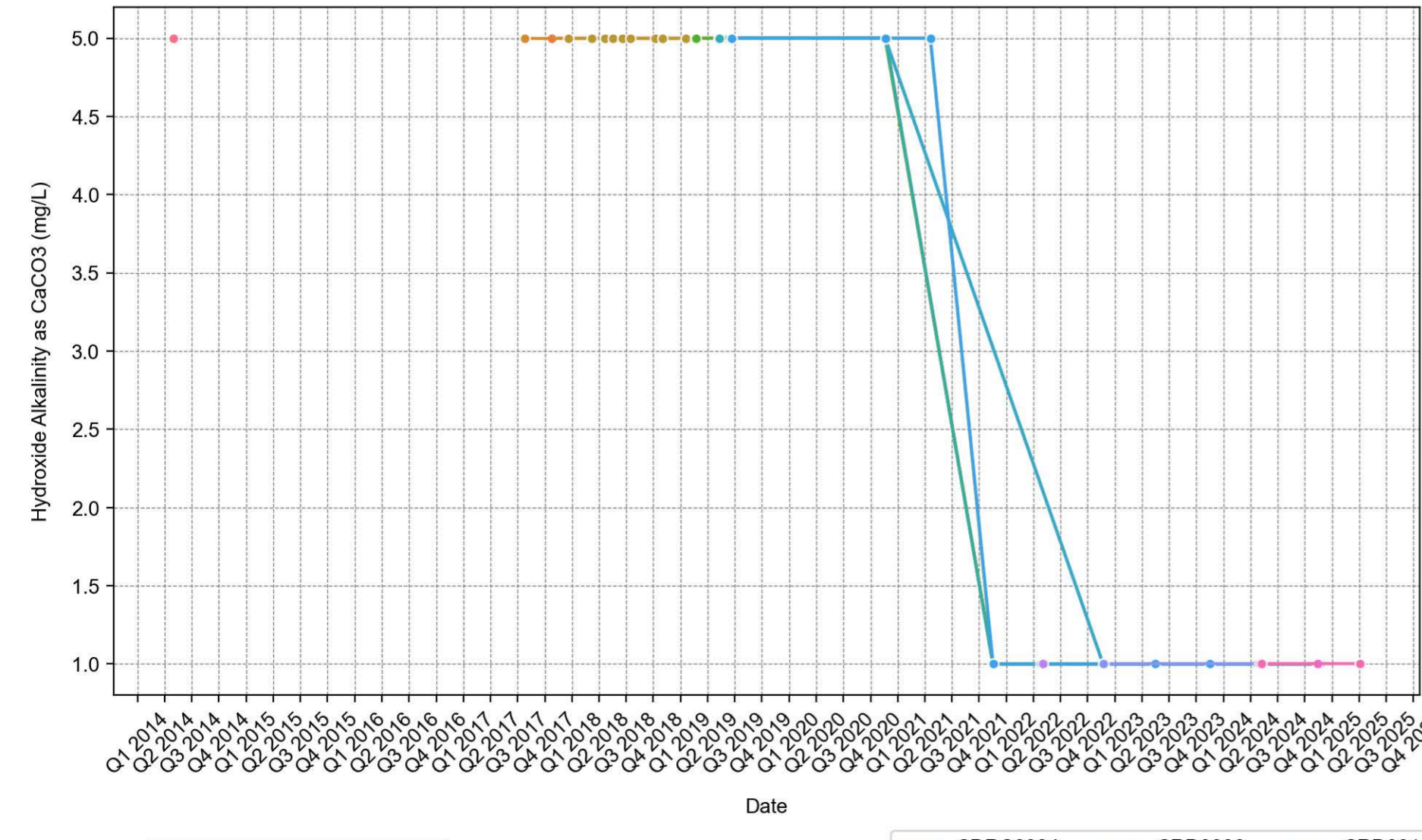
Fluoride



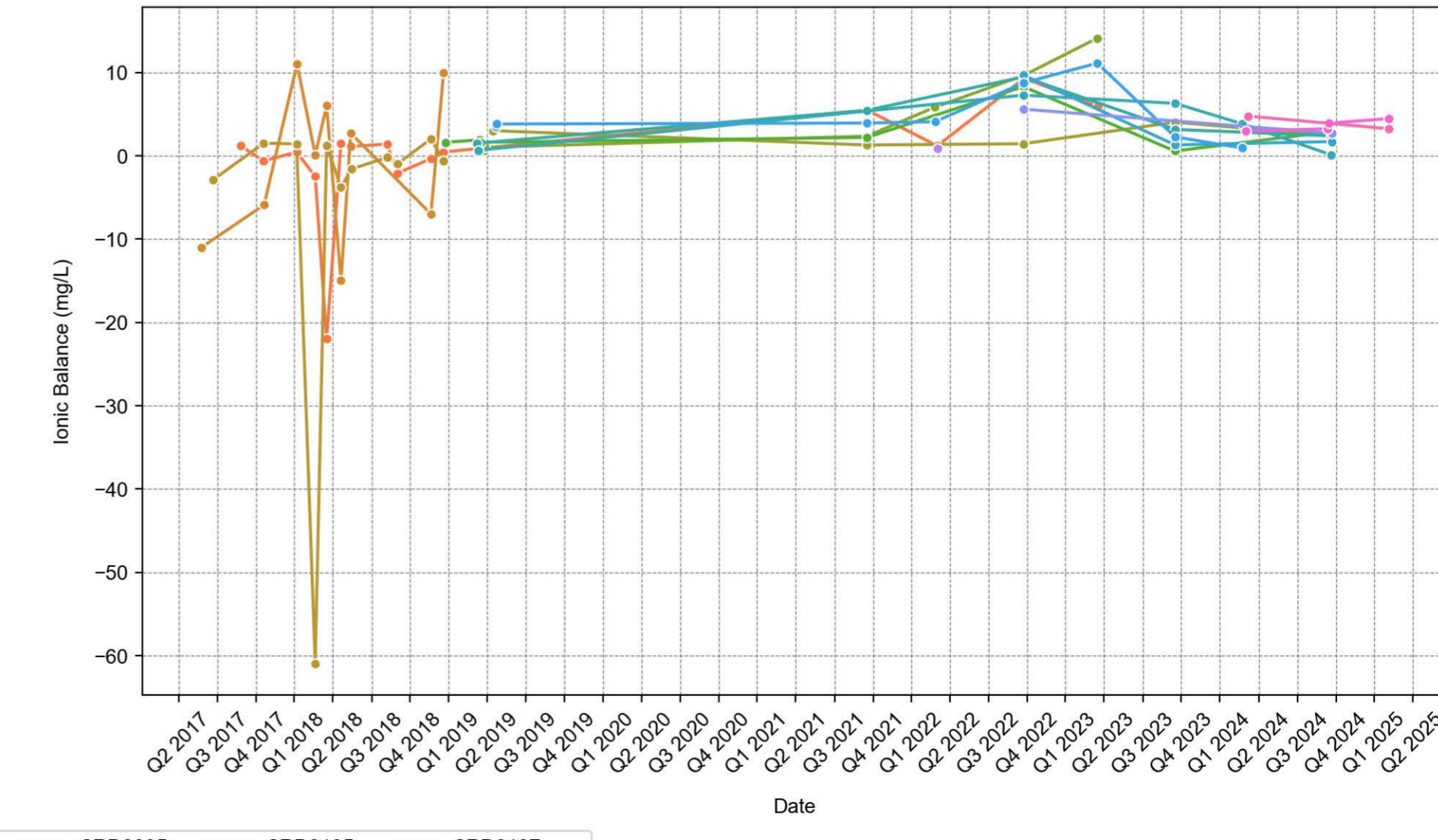
Hexavalent Chromium



Hydroxide Alkalinity as CaCO3

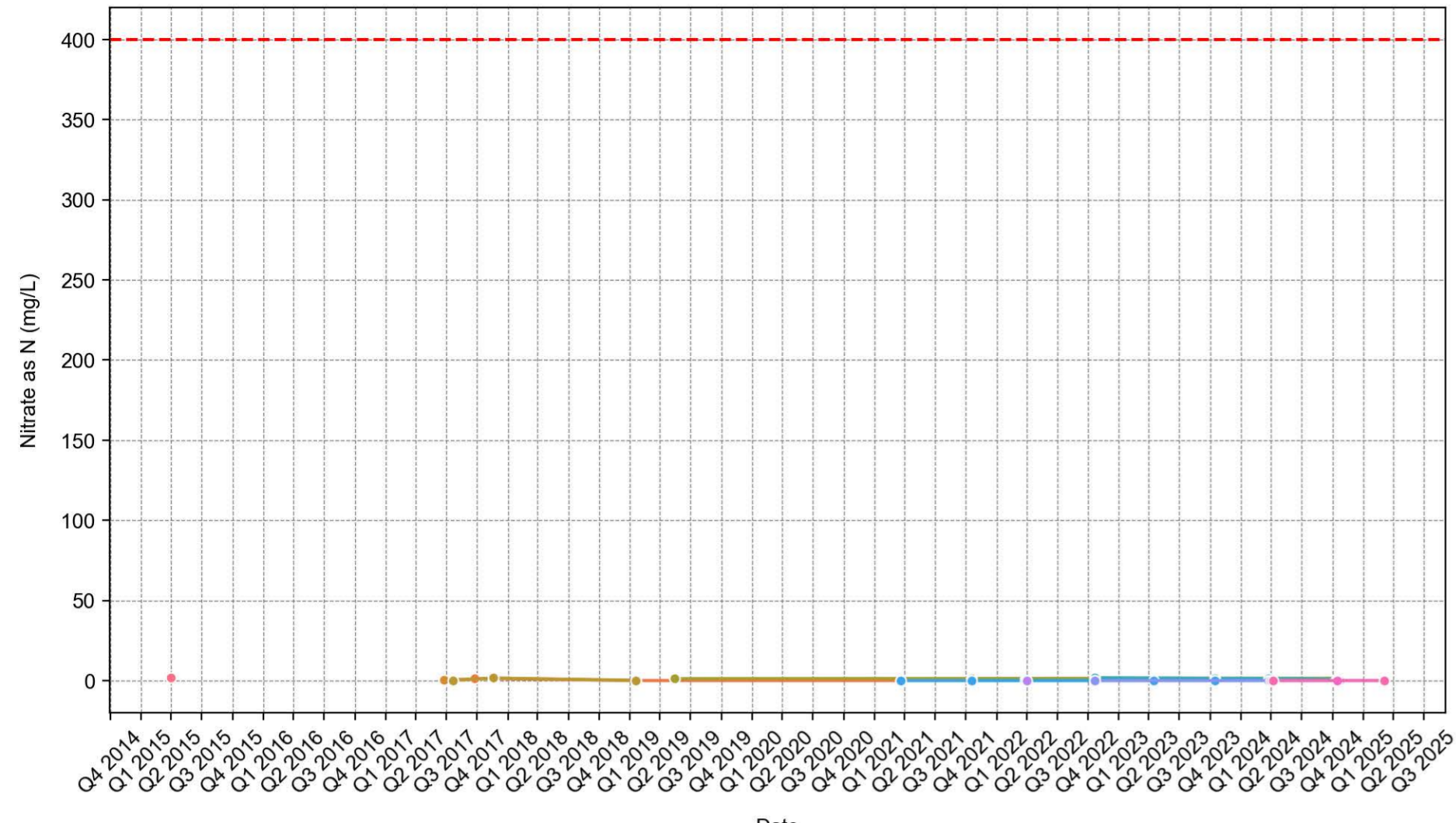


Ionic Balance

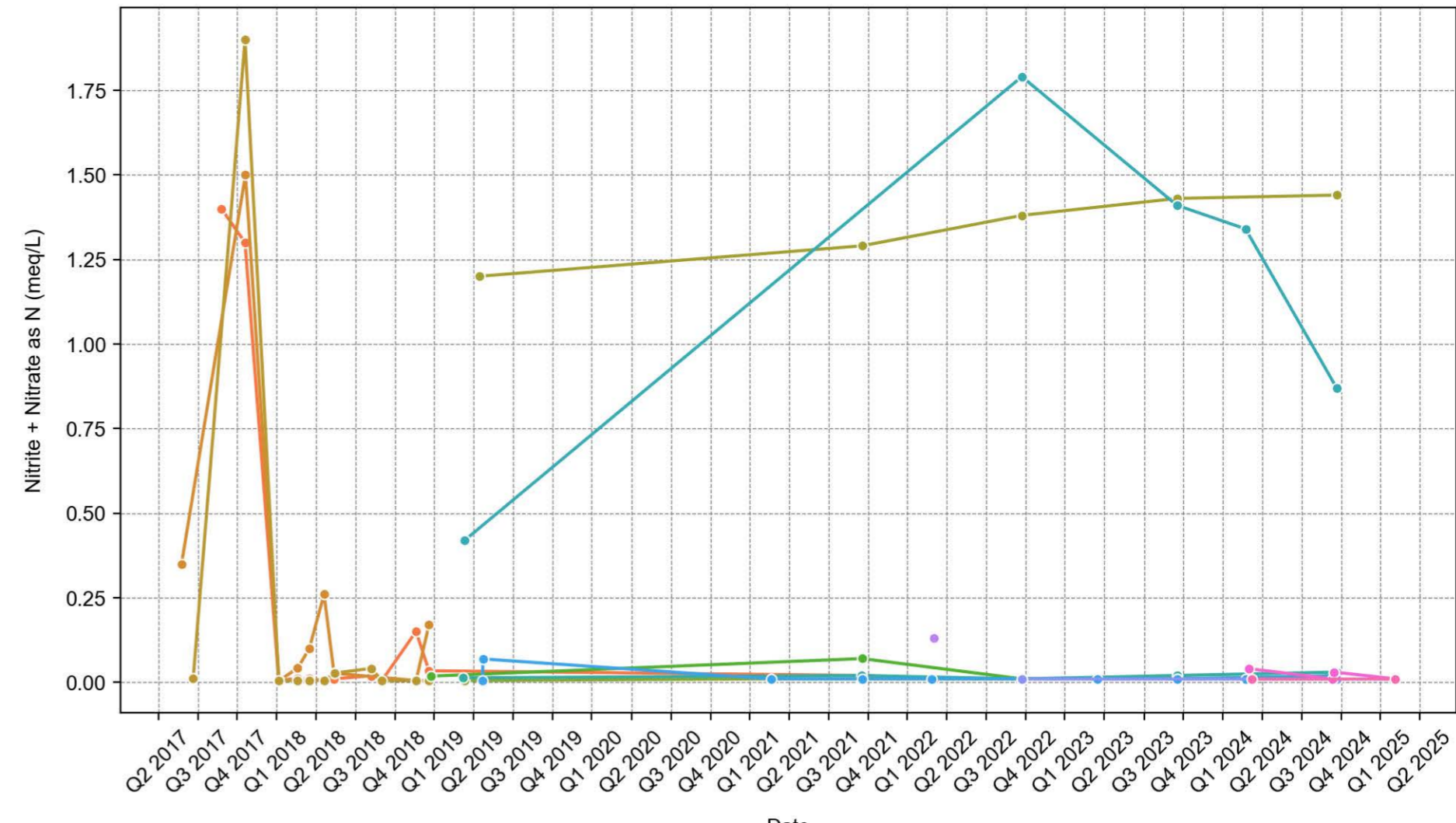


- CDRC0334
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- ANZECC Limit
- CO-WS-12

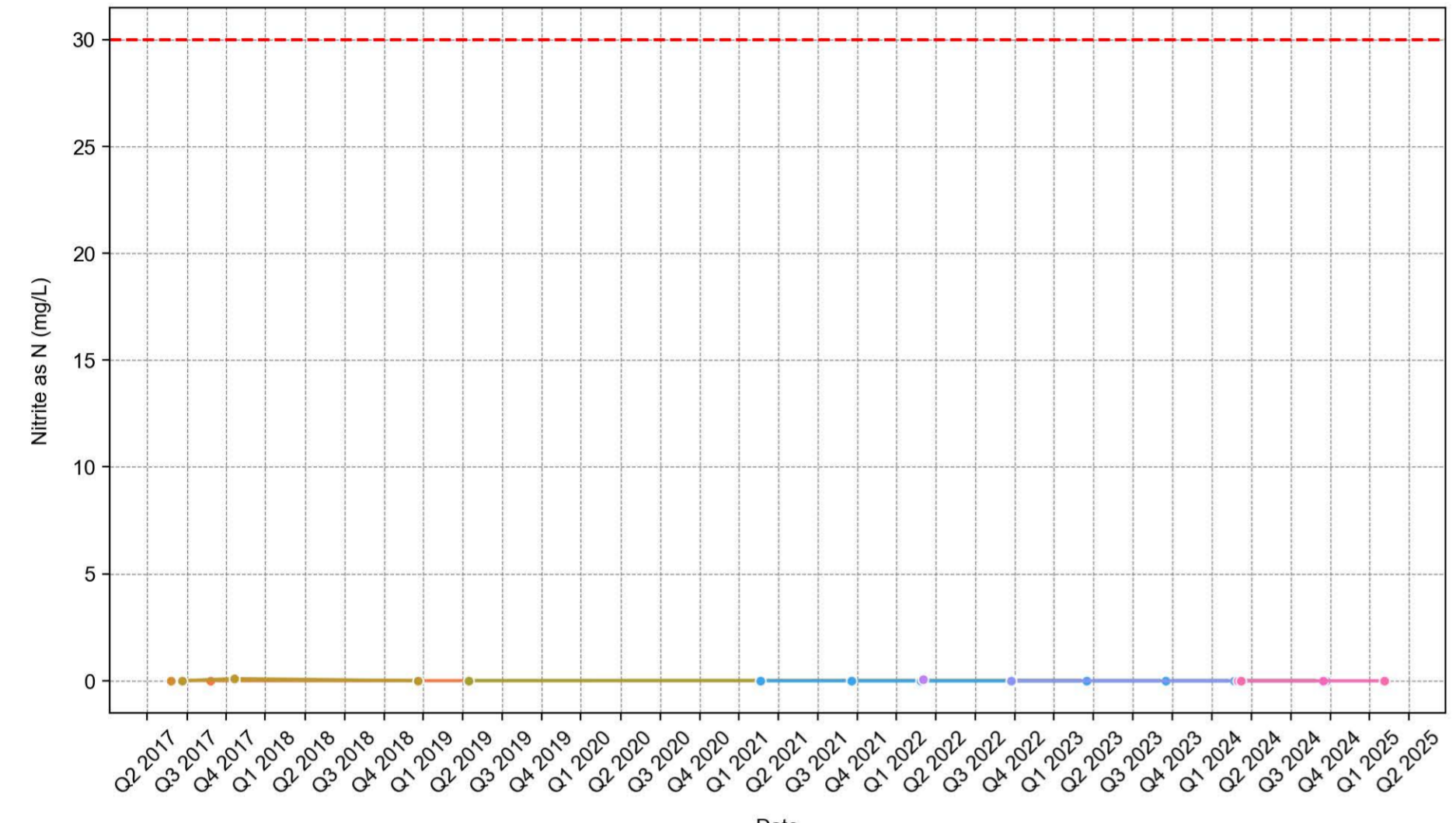
Nitrate as N



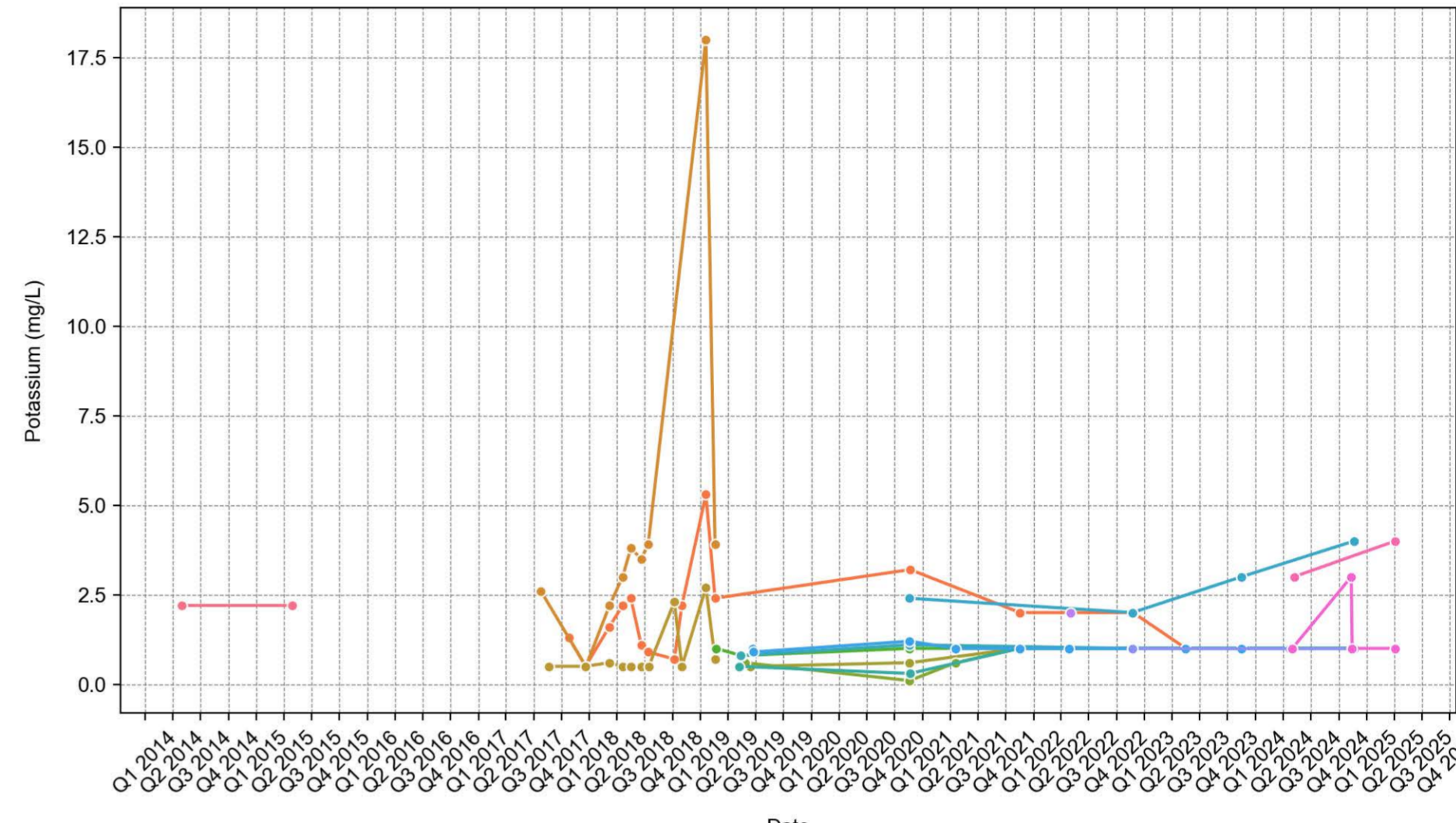
Nitrite + Nitrate as N



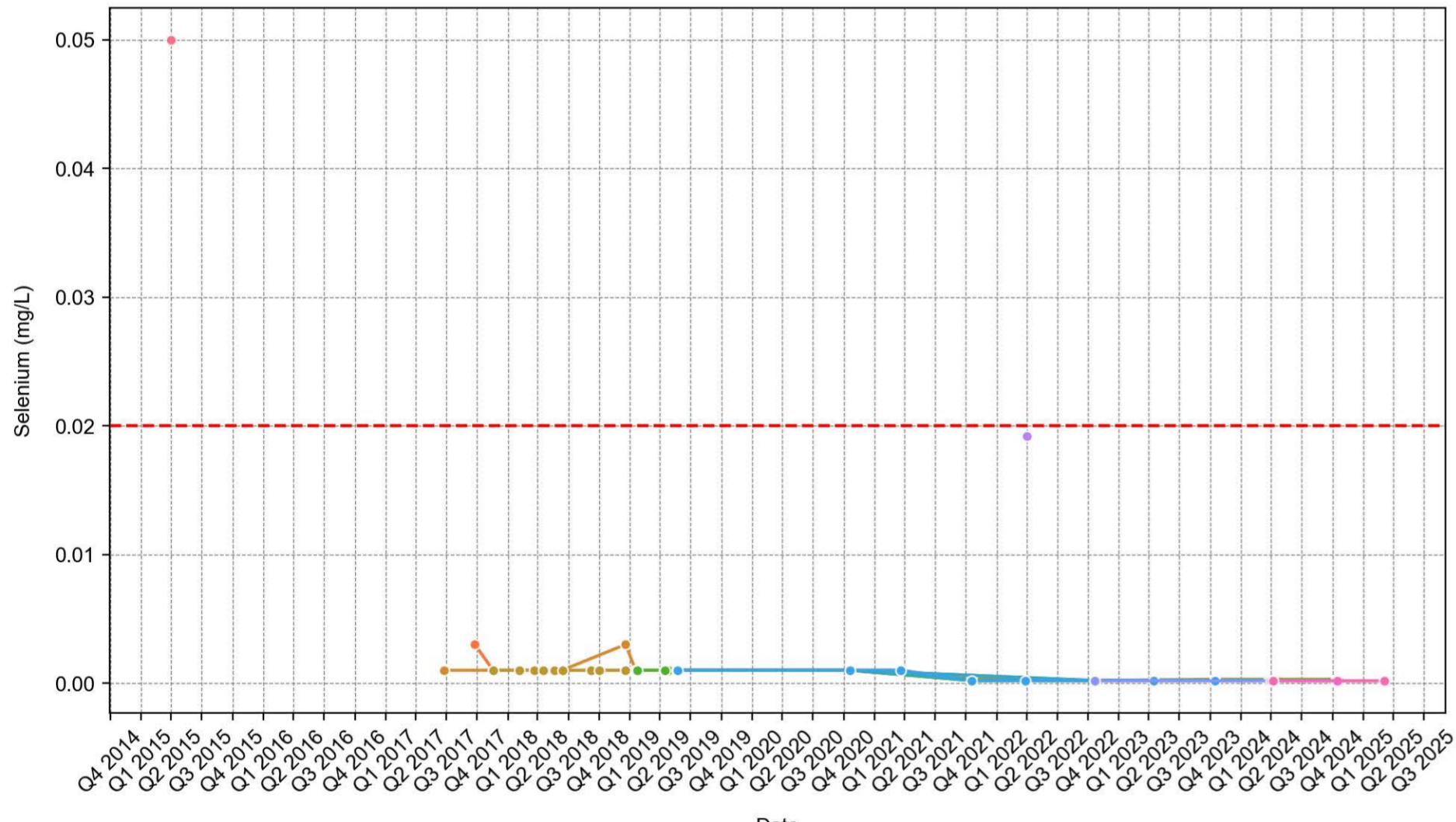
Nitrite as N



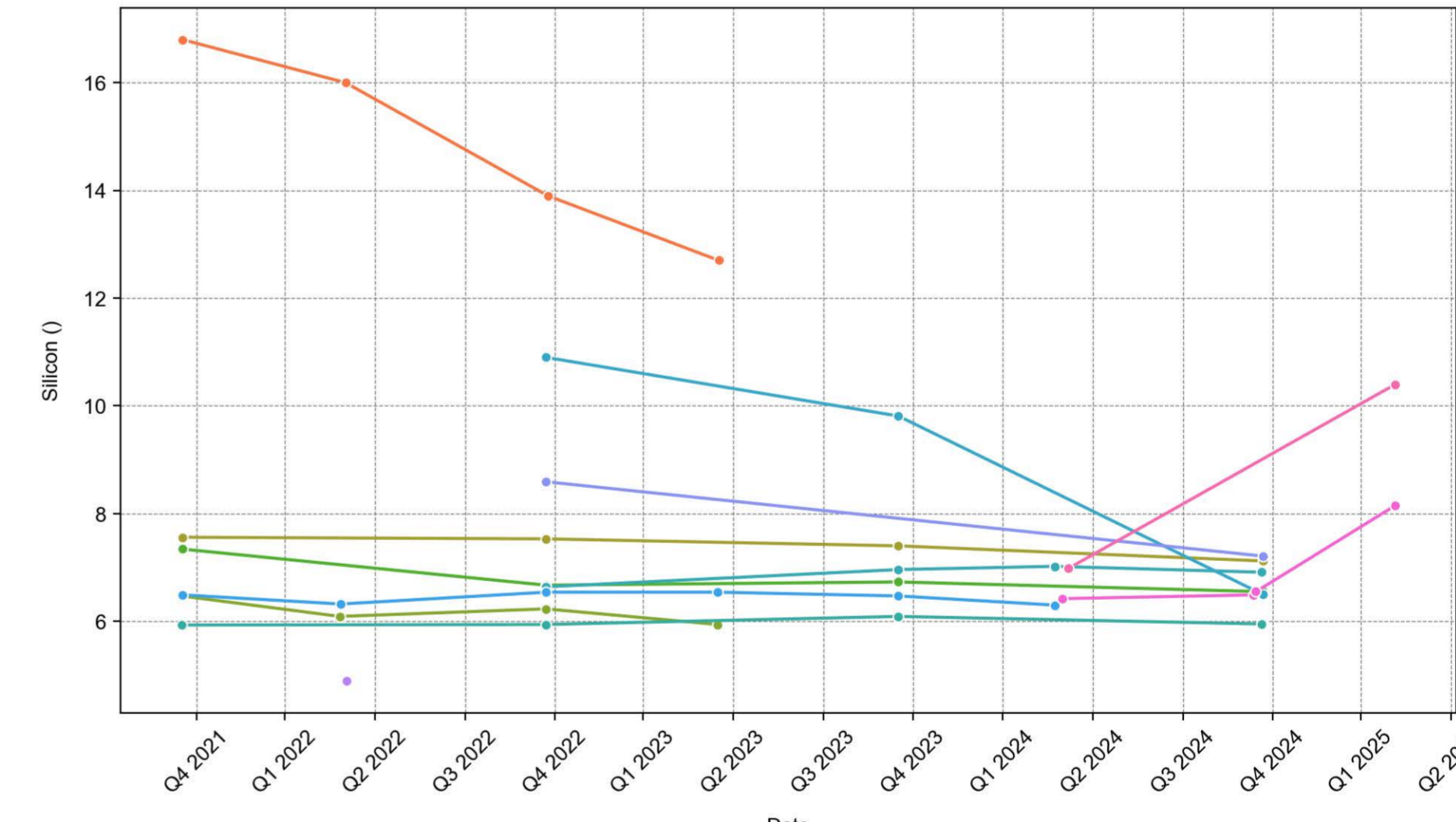
Potassium



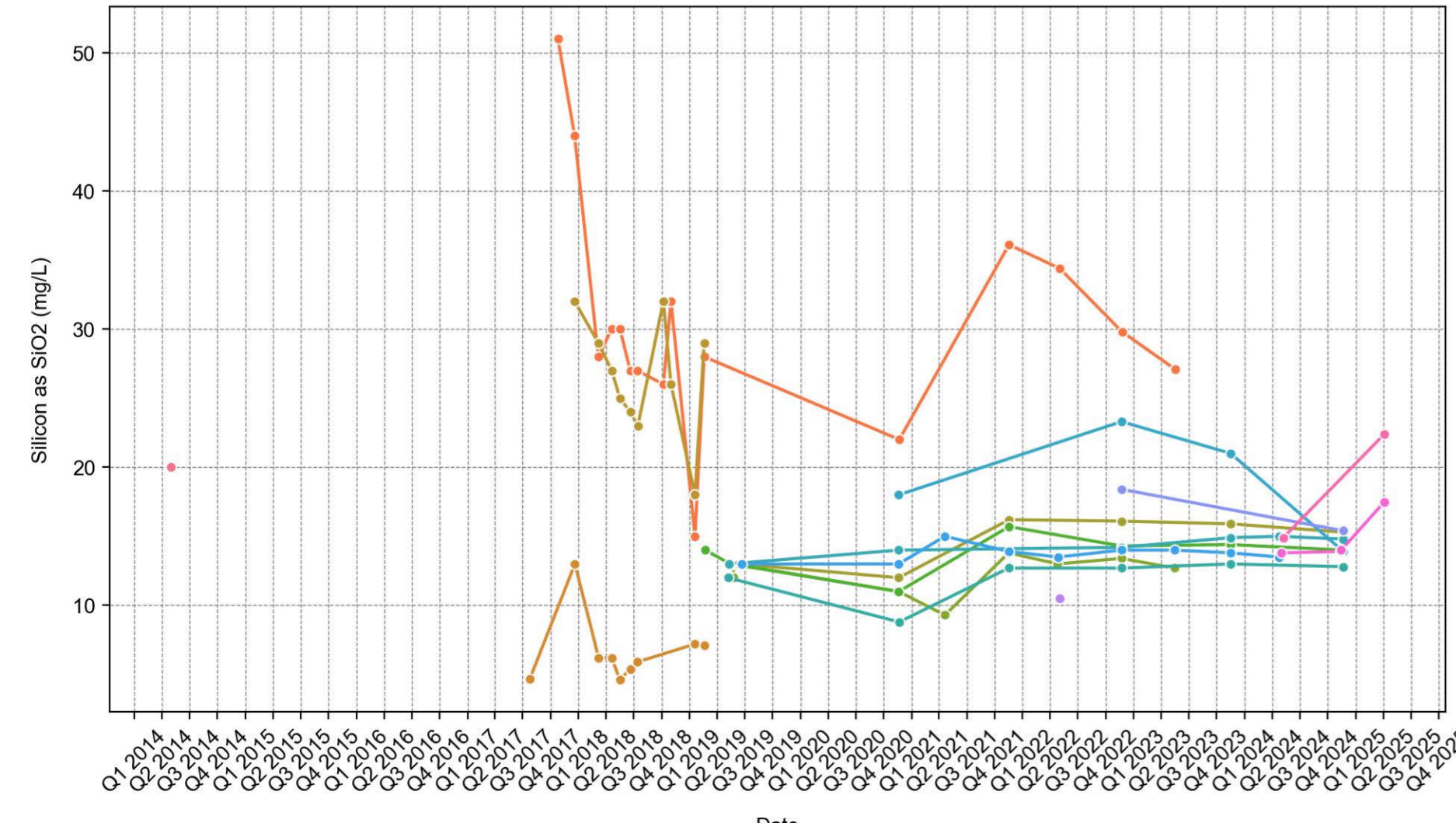
Selenium



Silicon



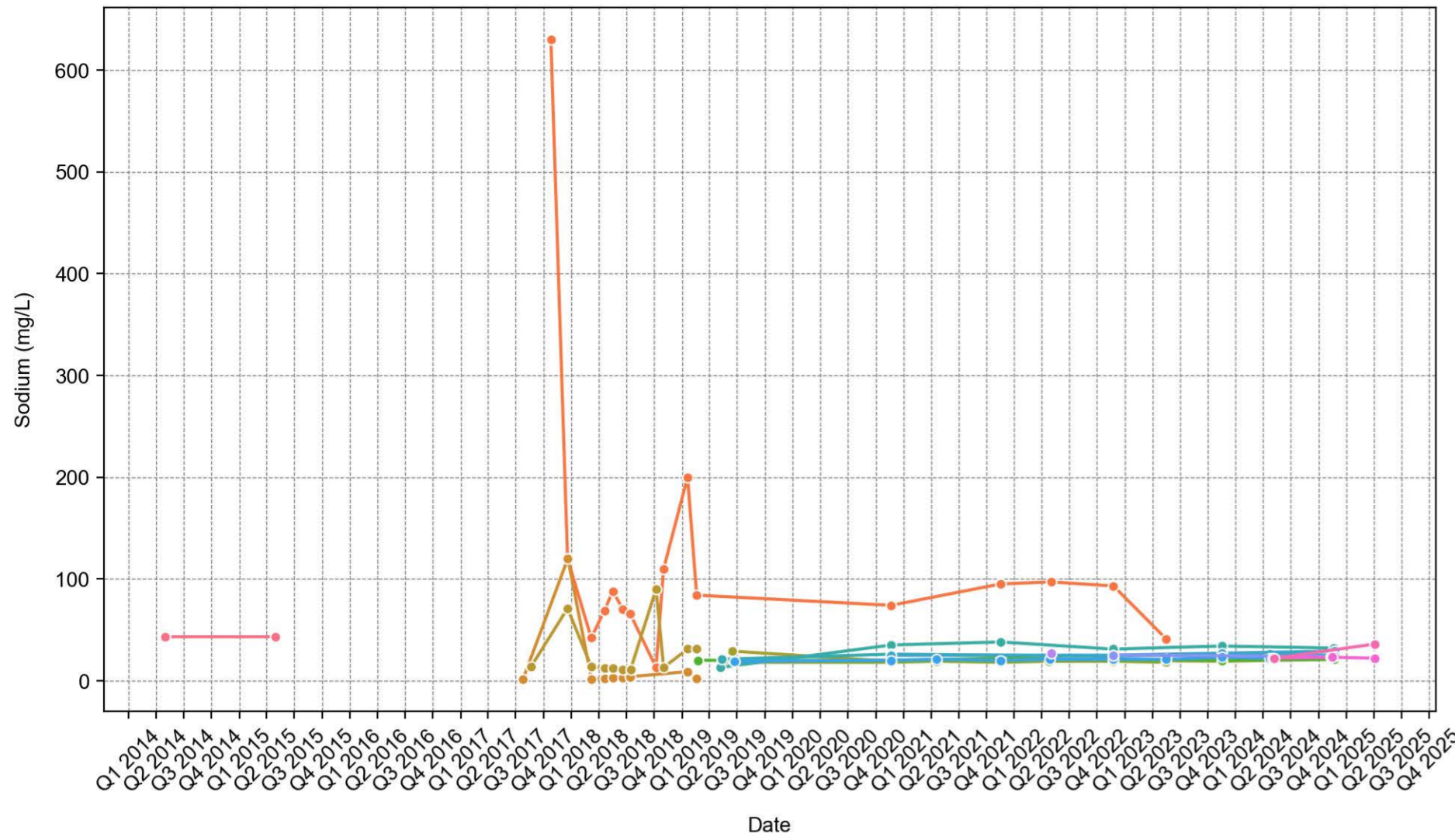
Silicon as SiO2



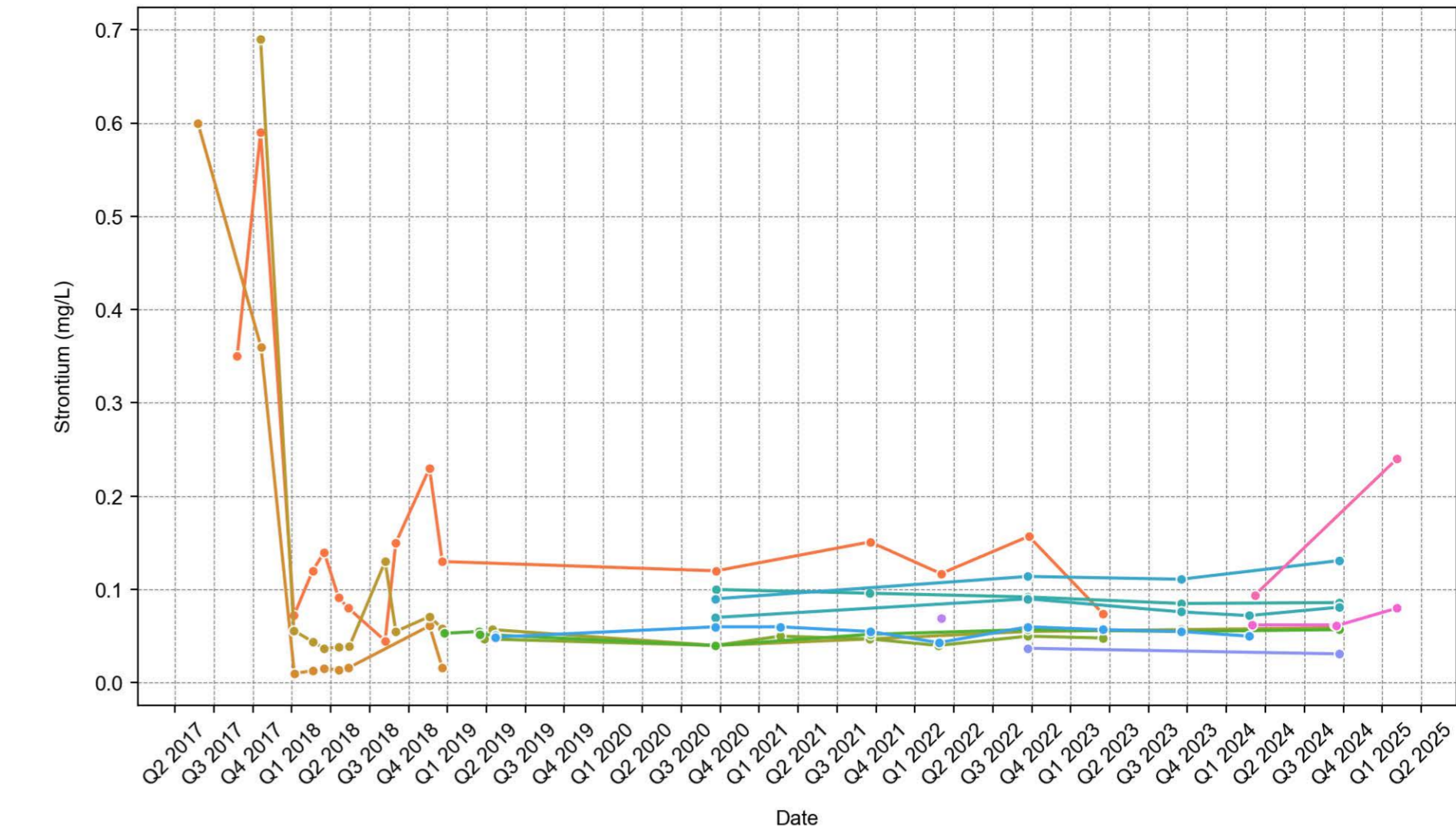
Silver



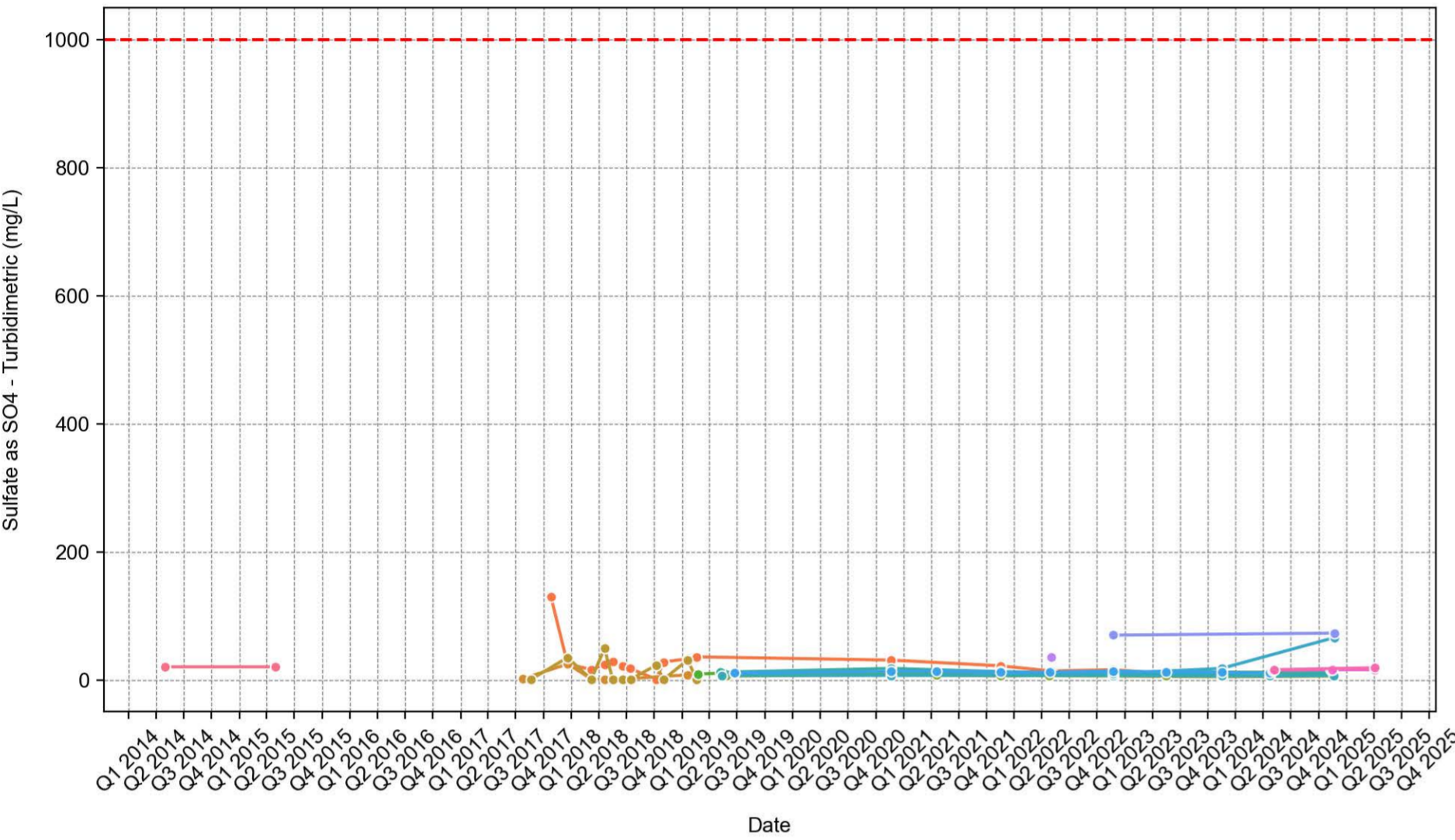
Sodium



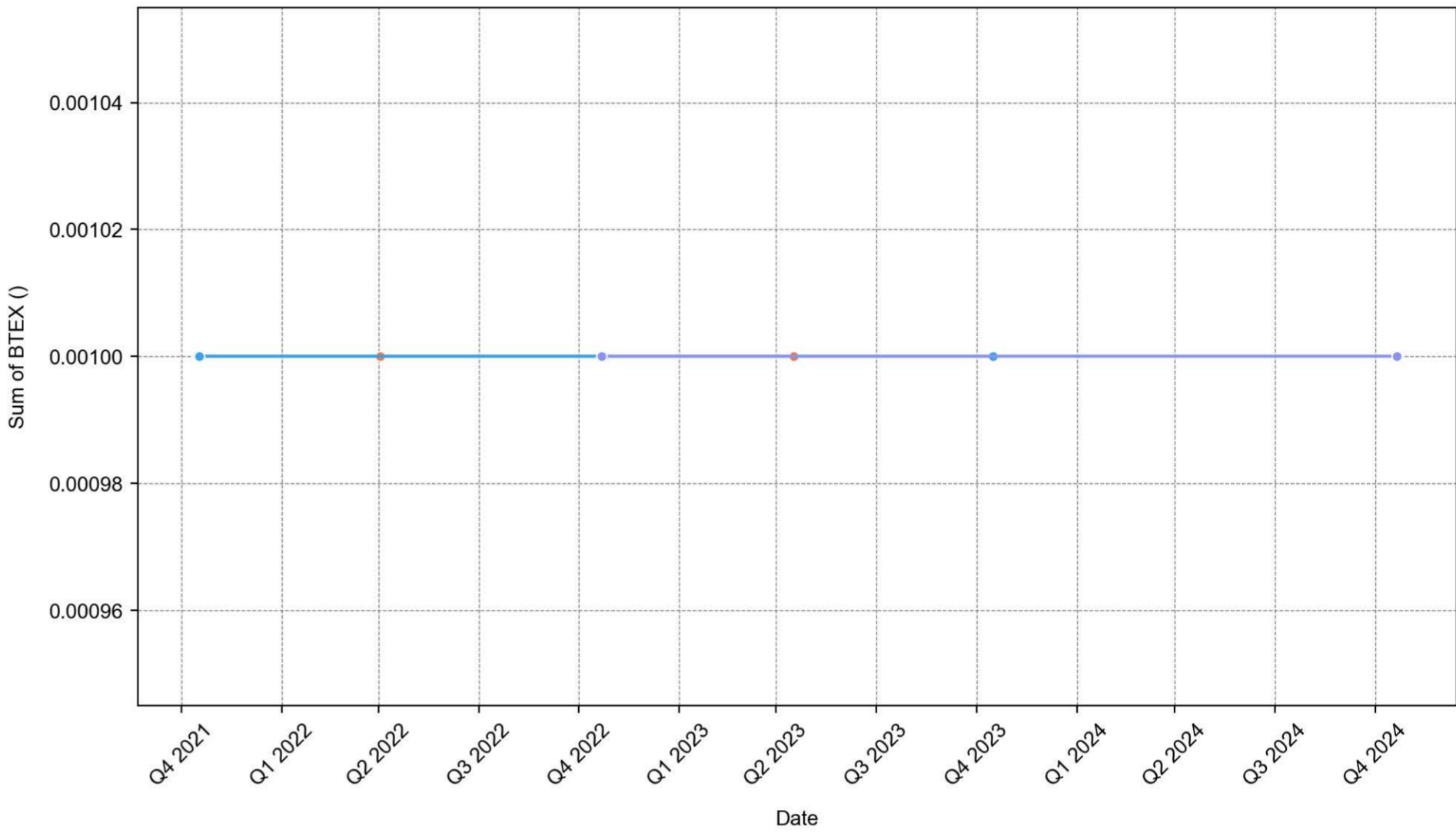
Strontium



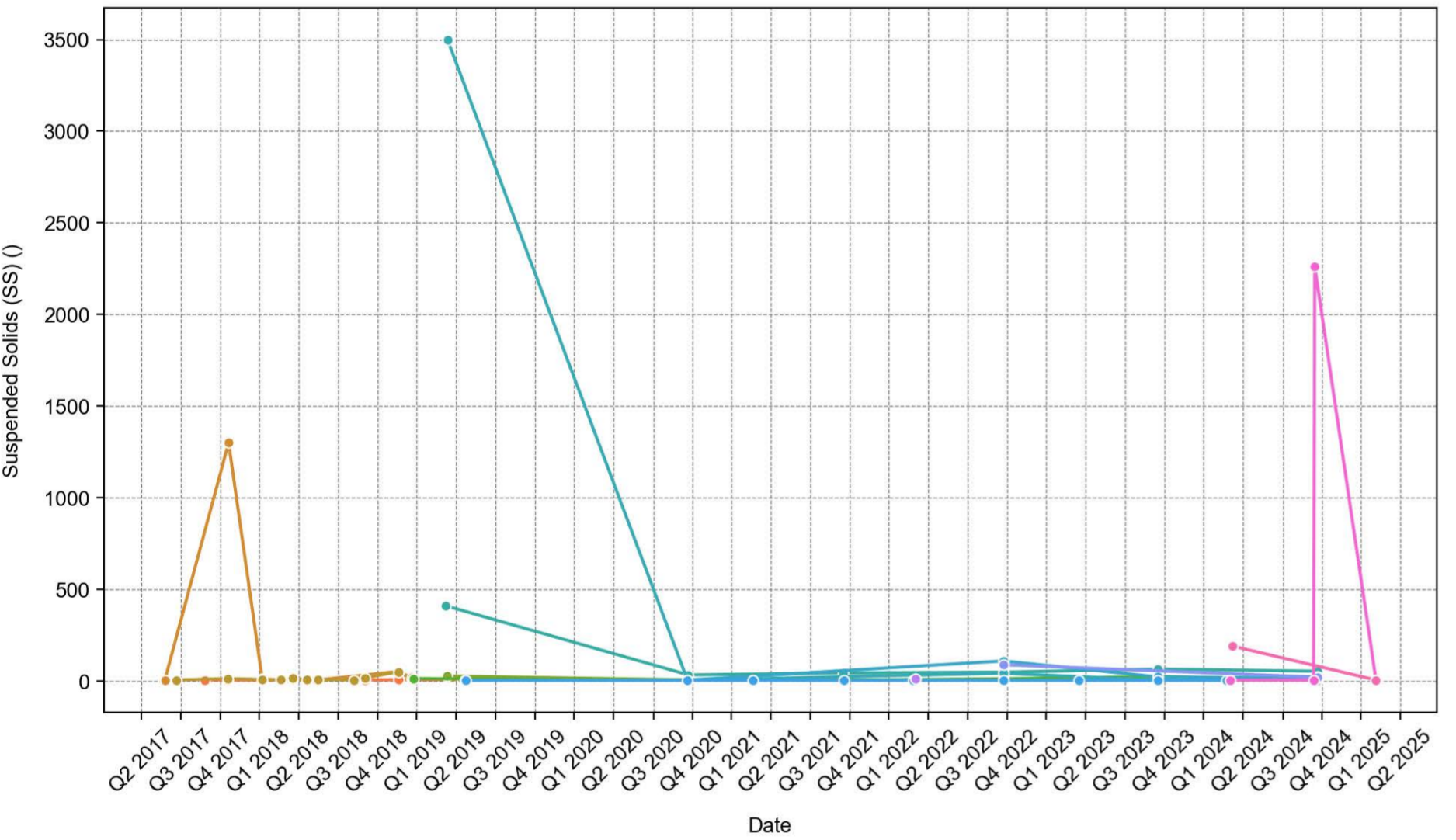
Sulfate as SO4 - Turbidimetric



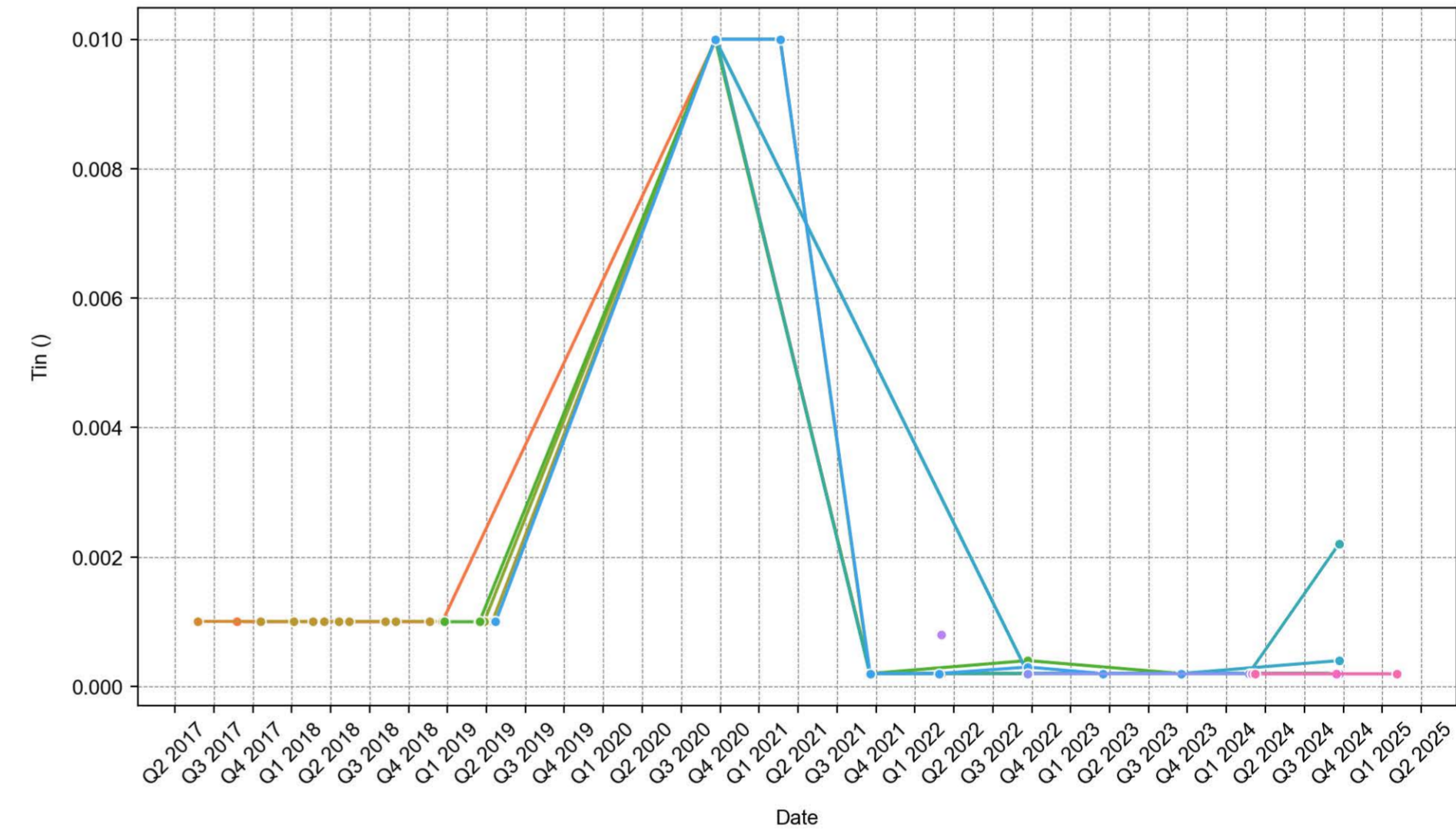
Sum of BTEX



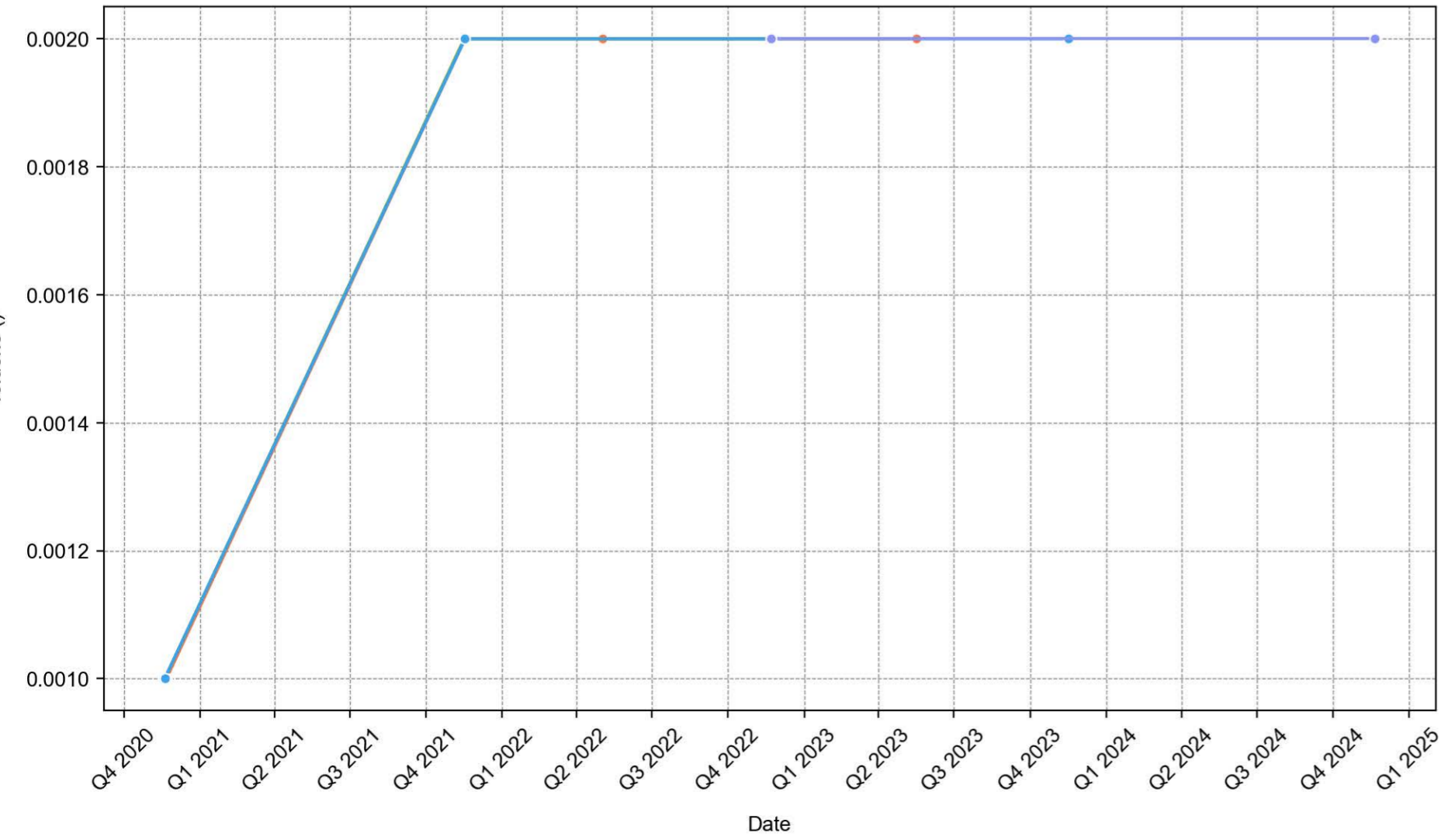
Suspended Solids (SS)



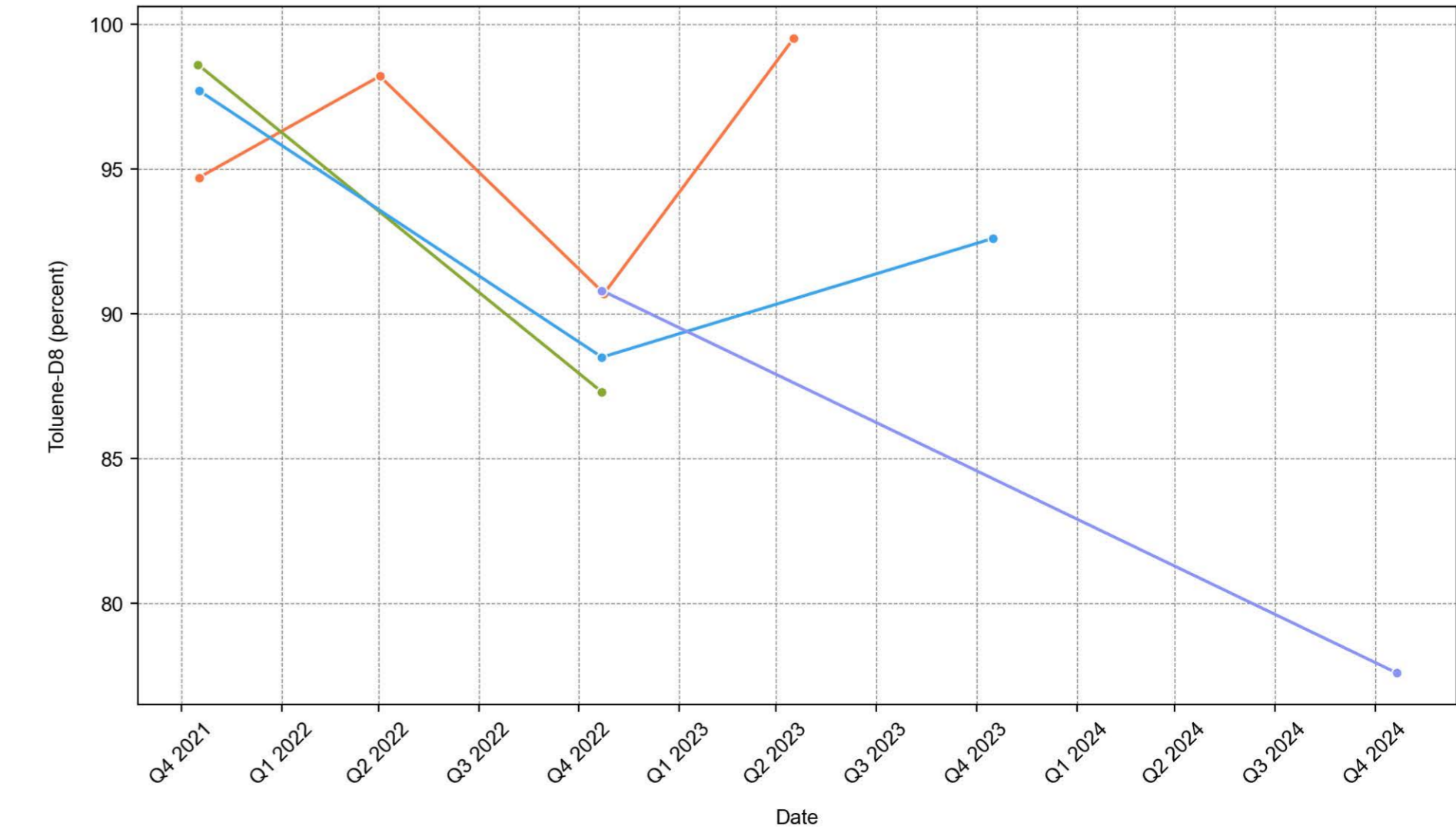
Tin



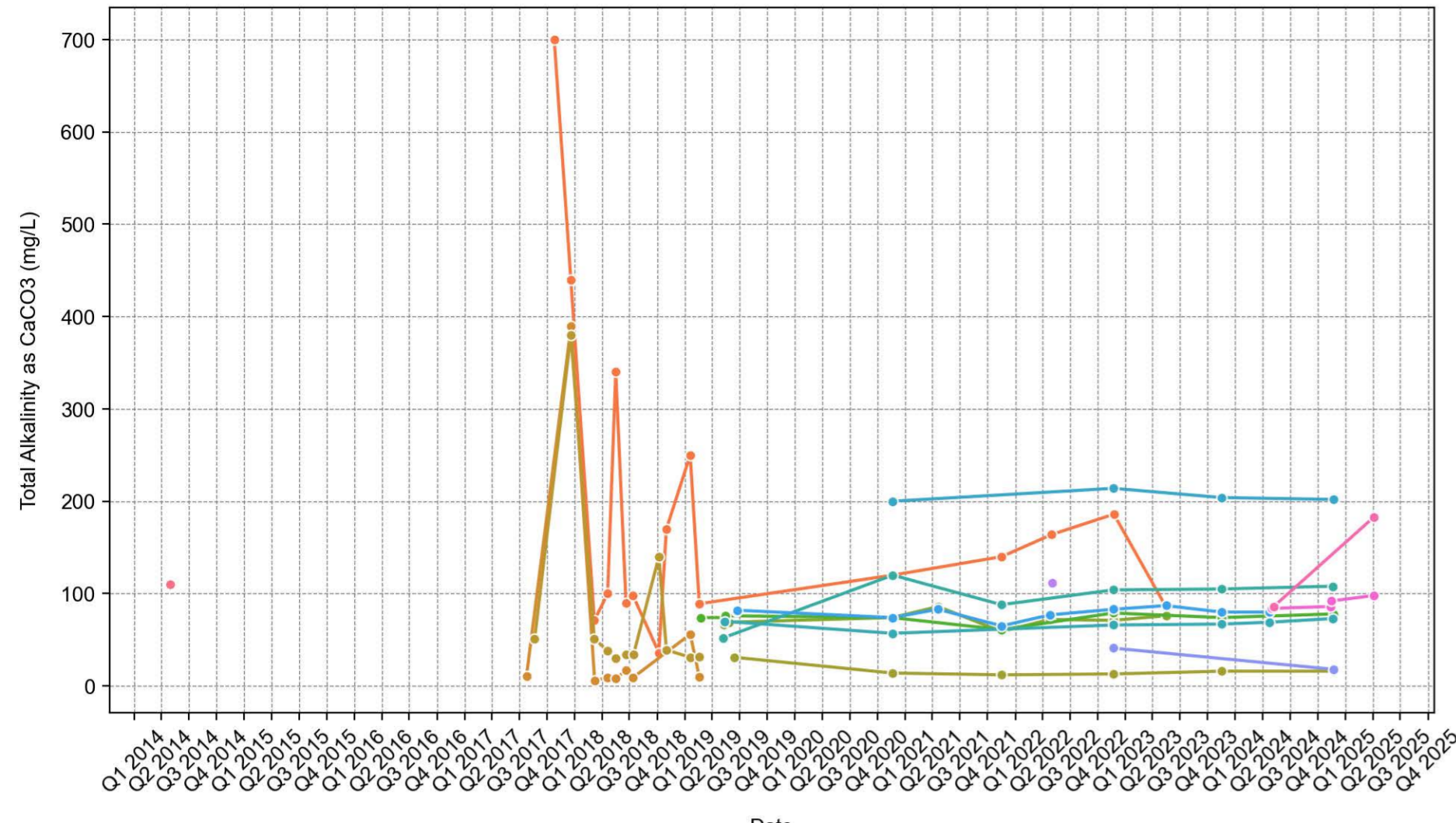
Toluene



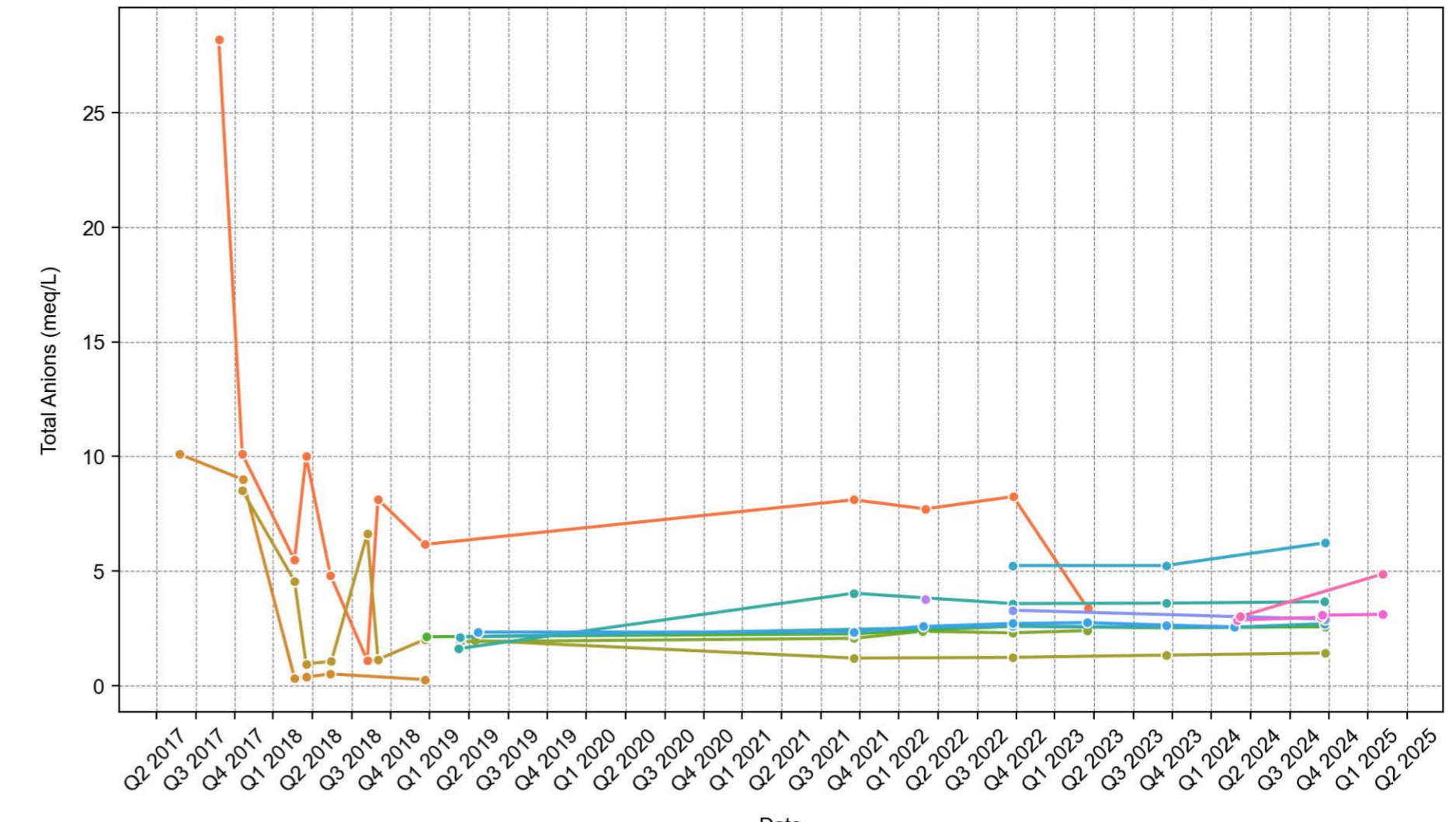
Toluene-D8



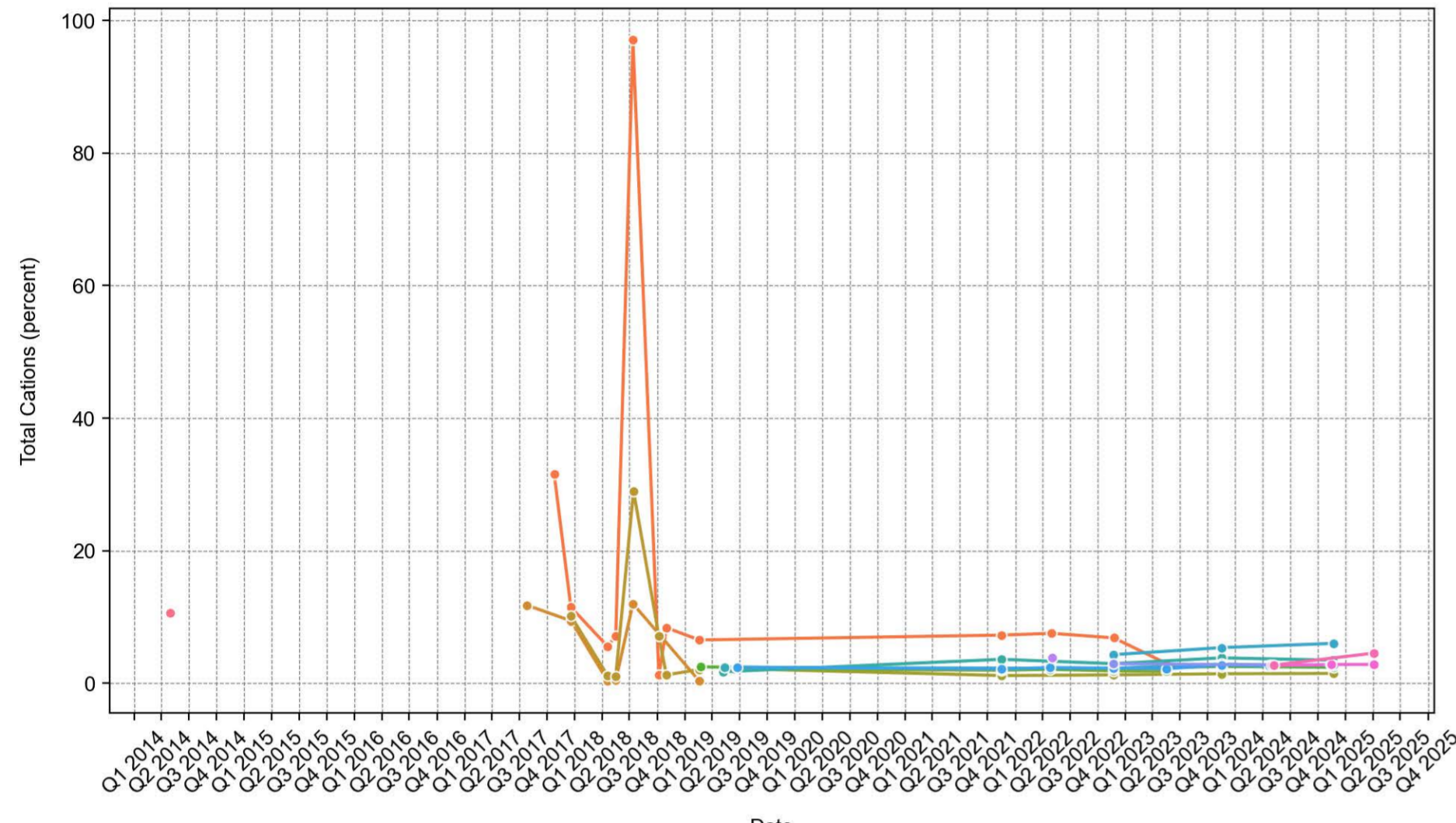
Total Alkalinity as CaCO3



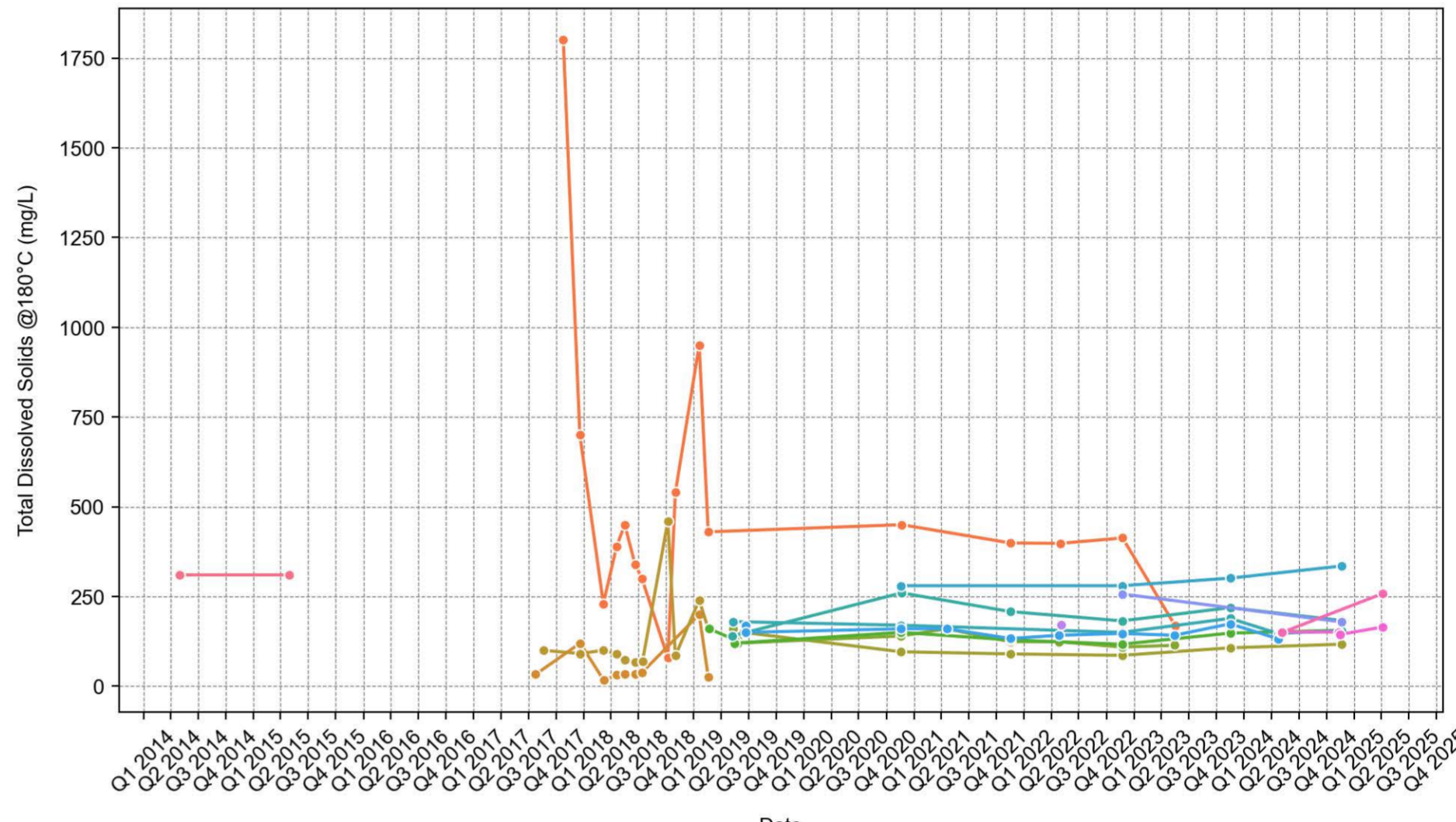
Total Anions



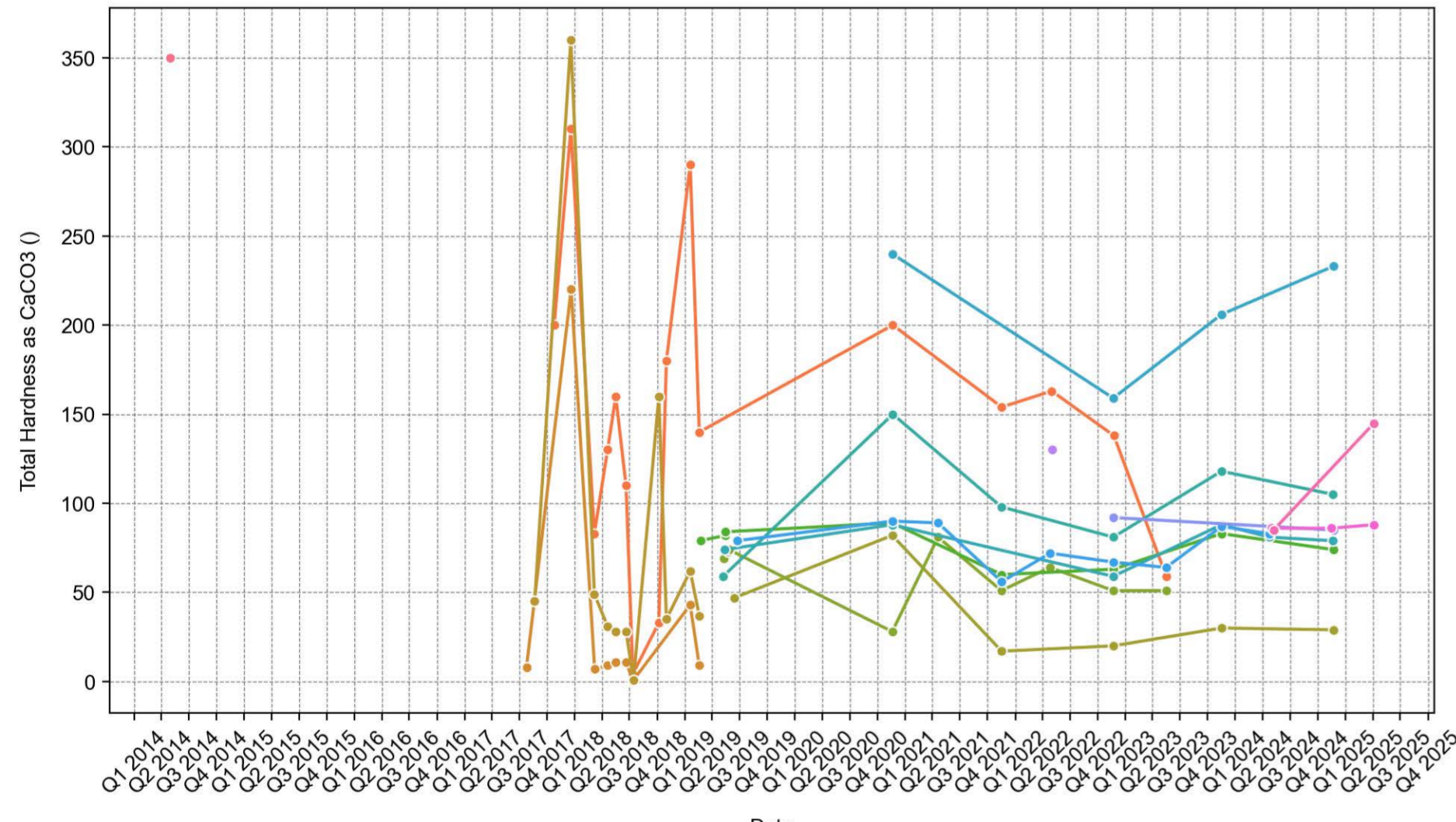
Total Cations



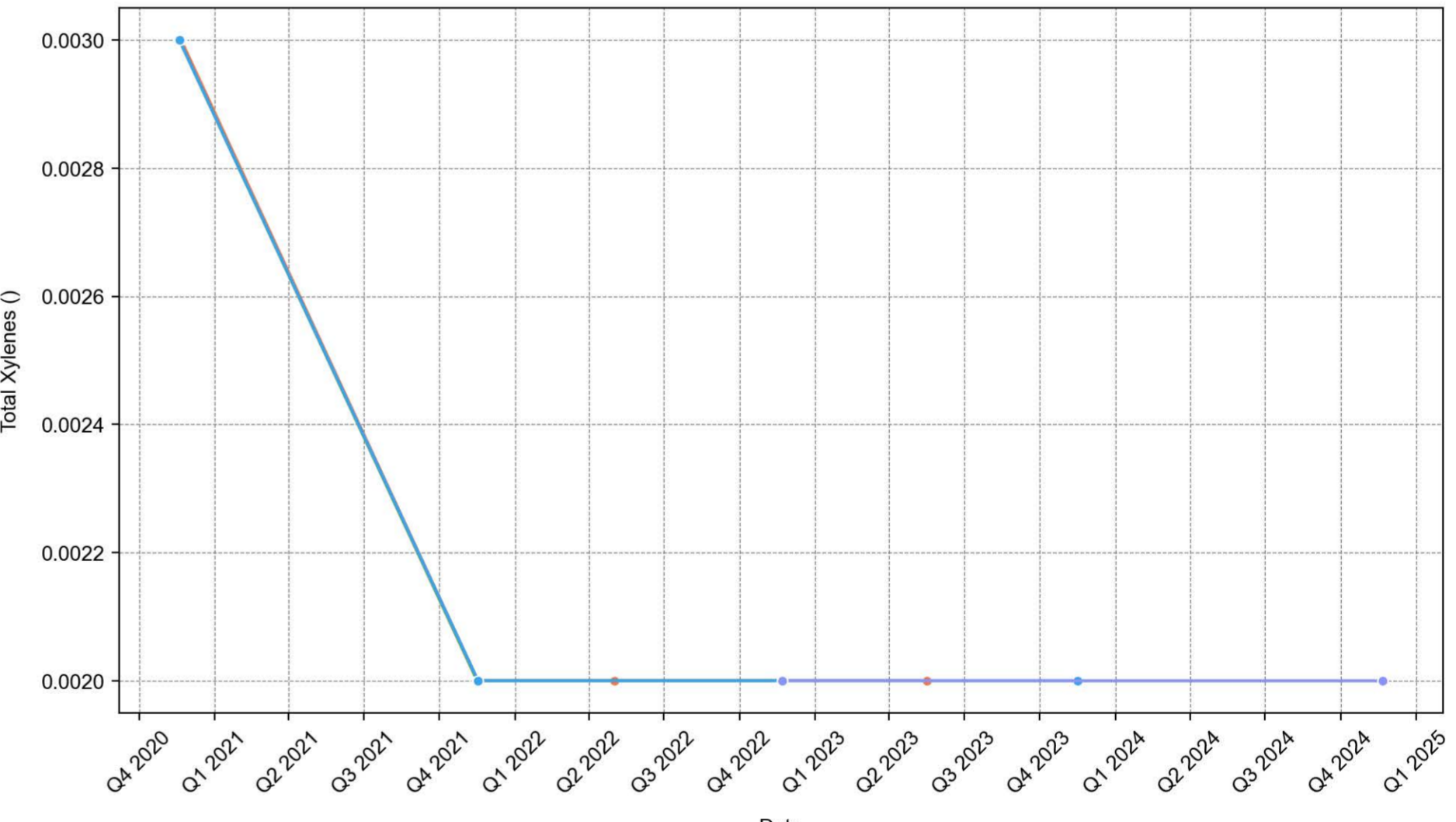
Total Dissolved Solids @180°C



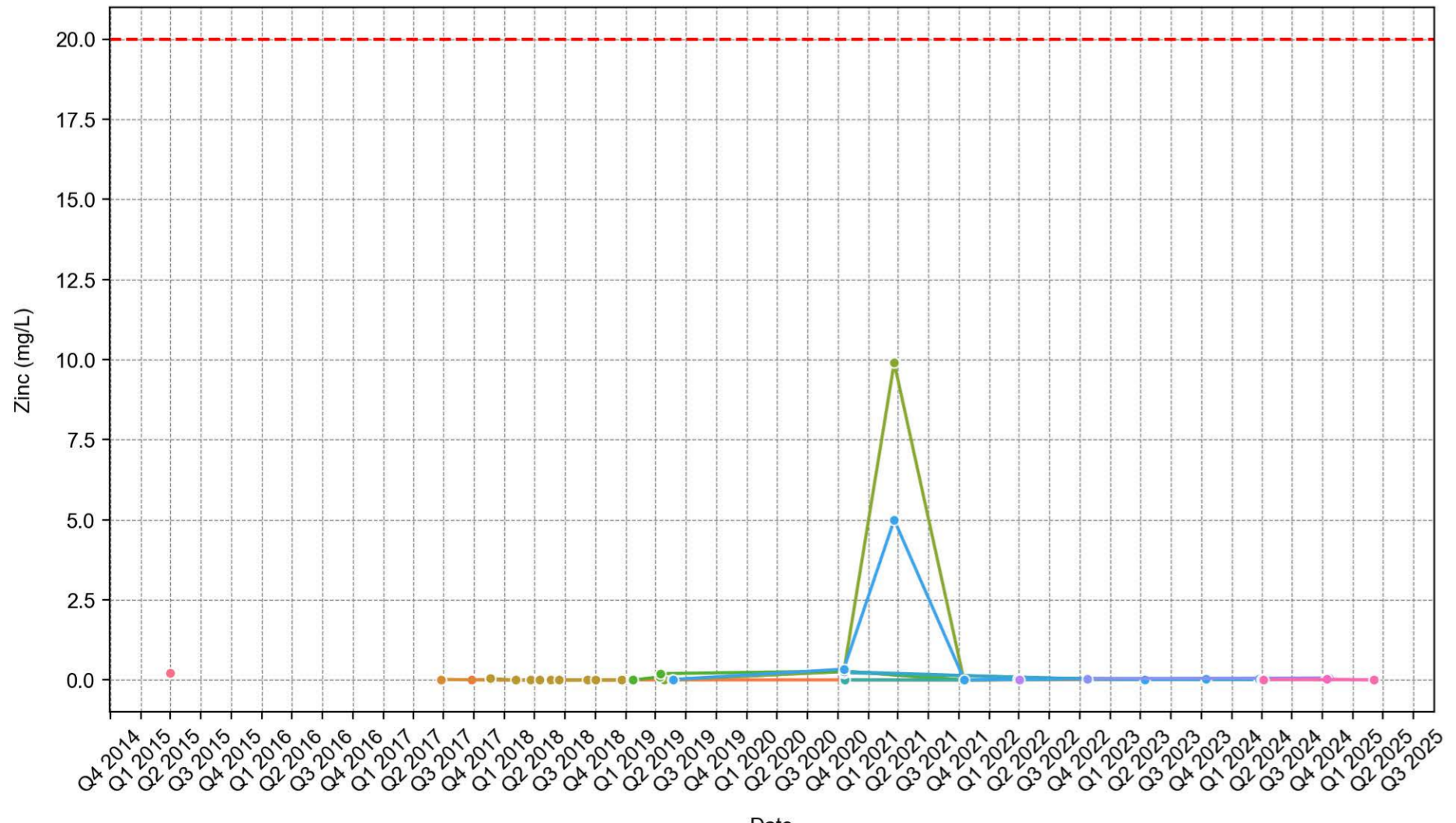
Total Hardness as CaCO3



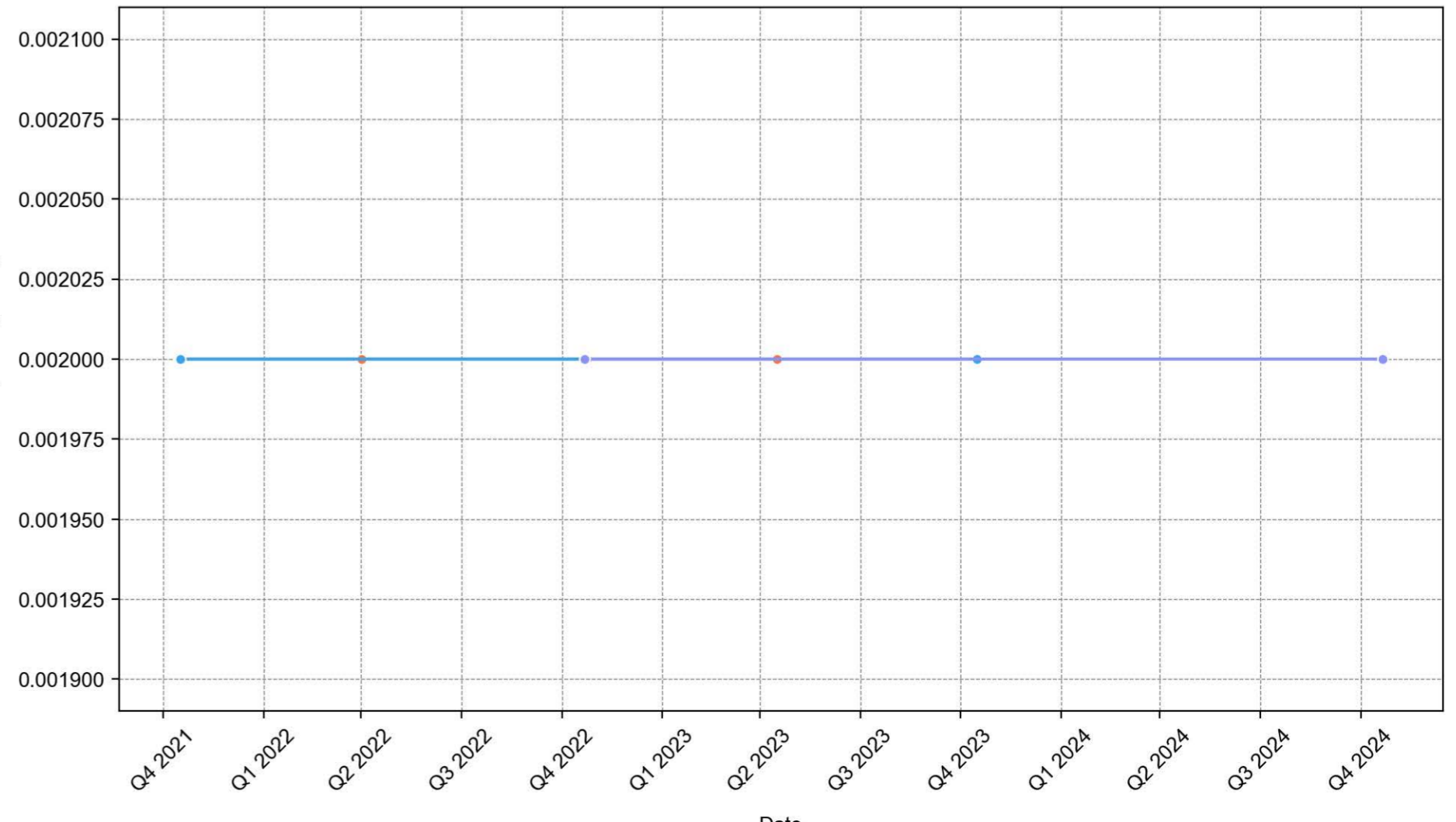
Total Xylenes



Zinc



meta- & para-Xylene



- CDCR0334
- CRD0006
- CRD0018
- CRD0095
- CRD0105
- CRD0137
- CO-WS-10
- CRD0014
- CRD0092
- CRD0096
- CRD0123
- CRD0149
- CO-WS-11
- CRD0015
- CRD0094
- CRD0101
- CRD0127
- ANZECC Limit
- CO-WS-12