GROUNDWATER MONITORING OF SHALLOW WELL NETWORKS

South Bruce Chemistry Data Annual Report 2023

APM-REP-01332-0451 **January 2025**

KGS Group

NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

This report has been prepared under contract to NWMO. The report has been reviewed by NWMO, but the views and conclusions are those of the authors and do not necessarily represent those of the NWMO.

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Groundwater Monitoring of Shallow Well Network – South Bruce Chemistry Data Annual Report 2023

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TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

STATEMENT OF LIMITATIONS AND CONDITIONS

Limitations

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1.0 INTRODUCTION

1.1 Overview

The Groundwater Monitoring of Shallow Well Network project is part of the Phase 2 Geoscientific Preliminary Field Investigations of the NWMO's Adaptive Phased Management (APM) Site Selection Phase. As part of the Phase 2 Preliminary Field Investigations, NWMO has established a shallow groundwater monitoring network at the two potential candidate sites in Canada. The sites are located in the Wabigoon Lake Ojibway Nation (WLON)-Ignace Area in Northwestern Ontario and Saugeen Ojibway Nation (SON)-South Bruce area in Southern Ontario. The objective of this project is to retrieve, on a quarterly basis, measurements of groundwater pressures and temperatures that are collected on installed dataloggers, and to collect groundwater samples for chemical analyses. The collection of this information is necessary to evaluate shallow groundwater system behavior and characteristics.

A separate test plan was prepared for each of the two locations so that details specific to each site can be properly captured and planned for. The field work for each Site started in the beginning of the third quarter (Q3) of year 2022, i.e., in the month of July, followed by two additional field events in September and December 2022. The first field event of 2023 for the South Bruce Site was completed during the first quarter (Q1) month of March. Then one event in each quarter (Q2, Q3 and Q4 and Q1 of 2024.

Each groundwater monitoring and sampling program involved the collection of groundwater pressure measurements and baseline groundwater samples from a selection of the 26 permanently installed monitoring well intervals for each of the 2022, 2023 and 2024 field sampling events. The groundwater pressure and temperature measurements were recorded with 26 non-vented Solinst Levelogger pressure transducers (7 overburden wells and 19 bedrock wells) hung in the well on aircraft cable, taking measurements at 6-hour intervals. The quarterly groundwater testing included the analysis of field parameters (Table 1), dissolved metals, routine parameters (see Table 2 for the complete list of parameters), nutrients, iodide, stable isotopes of oxygen and hydrogen ($\delta^{18}O$ and $\delta^{2}H$). Other specialized radioactive isotopes and dissolved ruthenium were sampled and analyzed once in 2022 and once in Q2-2023.

KGS Group prepared a separate annual chemistry report for the data collected in 2022. This annual report presents the work completed, the data, findings, and analysis for the groundwater chemistry data collected in 2023 and during Q1 of 2024 from the shallow well network at the South Bruce site.

Scope of Work

The overall objective of the groundwater monitoring and sampling program is to collect groundwater pressure measurements and baseline groundwater samples from each of the 26 permanently installed monitoring well intervals over two (2) years, starting in July 2022 until April 2024. Since the data collected during the 2022 field events as well as their interpretations were reported on in the 2022 annual chemistry report APM-REP-01332-0450, this report focuses on the data collected from the four field events of 2023 and one field event of Q1 2024. Hence, the period between Q1 of 2023 and Q1 of 2024 has been defined as the "*current monitoring period*" further in this report. However, the current report also incorporates and

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references the interpretations of data trends with time for the “*entire monitoring period*” (between Q3 July of 2022 and Q1 of 2024) at the South Bruce site under this project.

The five field events within the *current monitoring period* were conducted during the months of March, June, September, and November of 2023, as well as February of 2024. A separate report will present the groundwater pressure results for the same monitoring period.

Specifically, this report addresses the results of the field and laboratory measurements and groundwater physicochemical characteristics. The laboratory results of the groundwater samples collected during the current monitoring period were assessed and analysed to characterize groundwater chemistry at the South Bruce Site. A total of 61 groundwater samples were collected in 2023 and 10 samples were collected in Q1 of 2024. All samples were analyzed for dissolved metals, routine parameters (see Table 2 for the complete list of parameters), nutrients, iodide and stable isotopes of oxygen and hydrogen ($\delta^{18}O$ and $\delta^{2}H$). Other specialized radioactive isotopes (gross alpha, gross beta, Strontium 87/86 ratio ($^{87}Sr/^{86}Sr$), Carbon-13 ($\delta^{13}C$ DIC), Chlorine-37 ($\delta^{37}Cl$) and Carbon-14 (^{14}C) and Tritium (^{3}H)) and dissolved ruthenium were analyzed only for the samples collected in Q2 of 2023.

The characterization of groundwater was done based on the chemical composition of major ions. The software tool AquaChem, by Waterloo Hydrogeologic, was used to visualize and assess the water chemistry. Groundwater laboratory results were plotted on Durov and Stiff diagrams to visualize physicochemical characteristics of groundwater and trend analysis for the complete monitoring period. In addition to concentration of major ions in water, a discussion of trends of concentrations and ratios of stable and radioisotopes was completed.

2.0 PROJECT LOCATION

2.1 Land Acknowledgment

It is important to acknowledge that this project was completed on the traditional territory of the Anishinaabe people of the Saugeen Treaty 45 ½, 1836. KGS Group and its subcontractors are grateful for being given the opportunity to complete work within the area and are thankful for the generations of people who have taken care of the land for thousands of years.

2.2 Study Area

The South Bruce site is located approximately 7 km north-west of the Town of Teeswater in southwestern Ontario (Figure 1). This area is in the Western St. Lawrence Lowland that comprises of a gently undulating land surface and occupies much of southwestern Ontario. The area is covered with a surficial layer of glacial sediments. The land surface ranges from a maximum of 249 meters above sea level (masl) in the southeast corner of the Municipality of South Bruce to a minimum of 176 masl along the shore of Lake Huron in the Township of Huron-Kinloss (Gierszewski & Parmenter, 2022). The regional topography shows a general slope down towards Lake Huron from southeast to northwest. The municipality of South Bruce and the surrounding areas are landscaped predominantly with an agricultural land use with terrestrial features such as valley lands, along with watercourses and wetlands. The Teeswater River is the predominant drainage feature in the area that flows from east to west in the Municipality of South Bruce, and bends to flow in the north direction to eventually discharge into the Saugeen River at Paisley (NWMO, 2023).

Within the South Bruce site, a total of seven (7) shallow groundwater monitoring well groups were drilled and installed in 2021/2022. The seven (7) groups consist of MW01, MW02, MW03, MW04, MW05, MW06, and MW07. Monitoring well group MW06 contains a separate redrilled well which is designated MW09 and should be considered as part of the MW06 group. MW09 was drilled as a replacement for a compromised interval in MW06, located approximately 50 m away. It was constructed in late December 2022 and was therefore not included in the 2022 field events. MW08 was a potential monitoring well group that did not proceed with drilling and testing, and therefore will not be further discussed. Six (6) of the monitoring well groups (MW02 through MW07) consist of a standalone overburden monitoring well and three nested bedrock monitoring wells installed in a single borehole at various depth intervals. One site (MW01) consists of a single overburden monitoring well and a single six-inch open bedrock well.

Each monitoring well was instrumented with a non-vented, Solinst Levelogger pressure transducer to measure and record groundwater pressures and temperatures, and Waterra tubing installed with foot valves. A single barologger is installed at site SB_MW01 to measure and record barometric pressures for compensation of the non-vented pressure transducers. In total, the eight sites subject to this project include (Figure 1):

- SB_MW01
- SB_MW02
- SB_MW03
- SB_MW04
- SB_MW05
- SB_MW06 (includes MW09)
- SB_MW07

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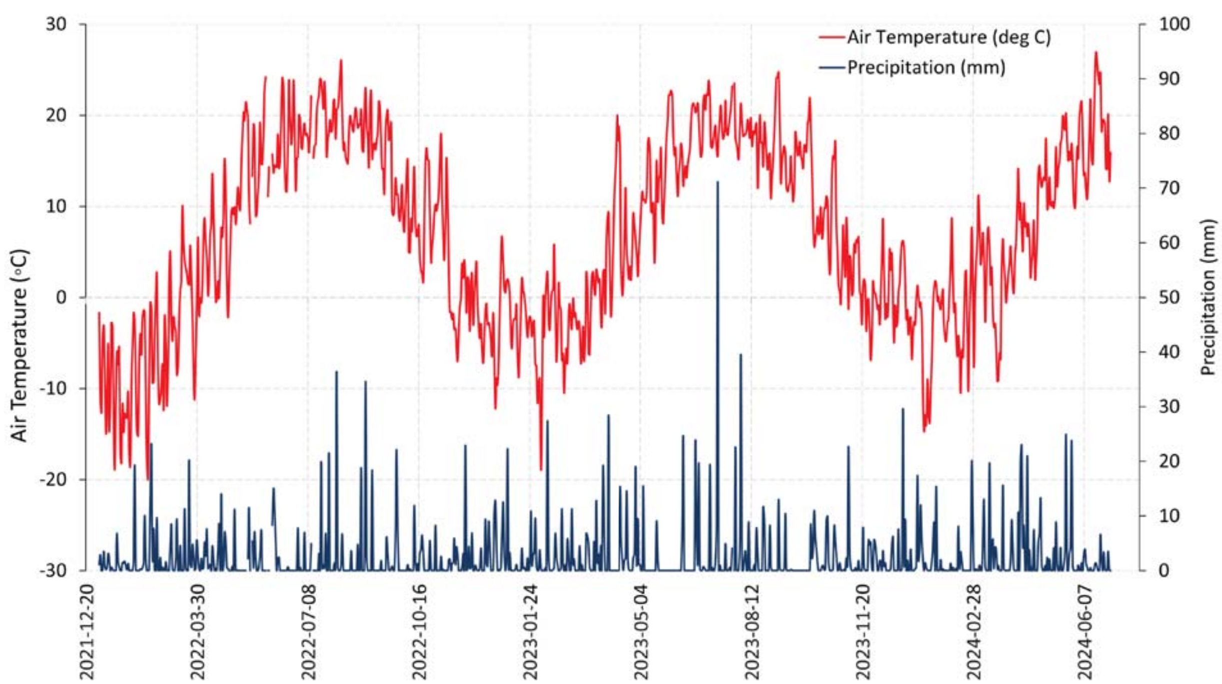
FIGURE 1: SITE LOCATION

2.3 Climate

The study area is subject to a humid continental climate of the warm summer subtype (Dfb under the Köppen climate classification defined by Kottek et al., (2006)). The closest weather station that exhibits the 1981-2010 Climate Normal Data is located in Hanover, ON, and is located approximately 14 kms Northeast of the South Bruce Site (Environment and Climate Change Canada, 2017). The monthly average temperature varies from -6.8 ^{o}C in January to 19.6 ^{o}C in July as per the 1981 – 2010 Canadian Climate Normal (Environment and Climate Change Canada, 2017). The area receives an average annual rainfall precipitation of 819.7 mm and 271.3 mm of snowfall precipitation, with a total annual precipitation of 1087.1 mm. The wettest months are July and September (Environment and Climate Change Canada, 2017). The daily temperature and precipitation data for the period between January 1, 2022, until July 1, 2024, was available from the Mount Forest (AUT) weather station that is located at about 31 kms Southeast of the South Bruce site and is presented below on Figure 2:

FIGURE 2: SITE CLIMATE



2.4 Geology and Hydrogeology

The South Bruce site is located on the eastern portion of the Michigan Basin that consists of laterally extensive sedimentary rock formations deposited during the Cambrian (485 to 540 million years ago), Ordovician (444 to 485 million years ago), Silurian (419 to 444 million years ago) and Devonian (360 to 419 million years ago) periods. As the name suggests, the Michigan Basin is centered in the State of Michigan, United States of America, and extends across southern Ontario (NWMO, 2023). The depth of the Michigan Basin varies from about 4800 m at its centre, to about 900 m deep at the South Bruce Site, below which exists a Precambrian (older than 540 million years) basement granitic rock of Canadian Shield. The bedrock is

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overlain with Quaternary sediments that are comprised of sand, clays, and more recent soil deposits (NWMO, 2023).

Shallow sedimentary bedrock aquifers in the region are formed within the fractured bedrock zones which occur within the upper few metres, to over 100 m of the uppermost sedimentary bedrock formations (Devonian and Silurian). Transmissive zones for groundwater flow are formed by the network of vertical to subvertical joints, horizontal bedding plane partings, and paleokarst features that exist regionally within the upper sedimentary bedrock strata. Thus, groundwater quantity and quality within the shallow bedrock aquifers varies across the region based on the different chemical and physical characteristics of the individual bedrock formations, and subregional to regional groundwater flow paths.

The shallow bedrock is the most important source of drinking water in the area and is the primary source for municipal well water supplies. For this project, seven (7) overburden and nineteen (19) bedrock wells were drilled and installed at the South Bruce site in 2021, with the addition of a replacement well MW09_BR-B installed in December 2022. The borehole logs (Geofirma Engineering, 2024) indicate that the overburden wells are installed within sand, gravel, till and clay overburden deposits, whereas the bedrock wells are installed within the Devonian Lucas (dolostone), Amherstburg (limestone) and Bois Blanc (limestone) sedimentary bedrock formations.

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3.0 METHODOLOGY

3.1 Overview

Monitoring and sampling activities were scheduled to be completed by KGS Group on a quarterly basis. Each quarterly event within the *current monitoring period* consisted of measuring static water levels, checking and downloading all 27 pressure transducers (26 Solinst Leveloggers (water level and temperature) and 1 Solinst Barologger (barometric pressure)), followed by purging select intervals, measuring water chemistry field parameters and collecting groundwater samples and submitting them for laboratory analysis. A detailed Test Plan for the South Bruce site was prepared in advance of the first field event of 2022. The Test Plan outlines all the equipment, methodologies, criteria, and steps needed to achieve the desired outcomes of the project within the confines of the approved scope of work.

Wells to be sampled were pre-determined, together with the NWMO project team, in advance of the event. For each quarterly event, technical work followed the same general procedures as outline below, but were not limited to:

- Pre-mobilization equipment and material checks.
- Mobilization of all personnel.
- Manually measured the depth to water level before removing and downloading all 27 pressure transducers, verified that they were in good working condition, field verified the data, and saved data following the DMP (data management plan) requirements on the field laptop (See Section 3.3).
- Purged selected monitoring wells using the installed Waterra tubing and an electric Hydrolift pump until purging criteria were met, collected and contained all purge water and disposed of purge water at a licensed wastewater treatment facility.
- Measured and recorded water chemistry and physical parameters while purging (See Section 3.4).
- Collected one groundwater sample for the quarterly sample analysis package from each purged well once the purge criteria was met (See Section 3.4 and 3.5).
- Collected three additional QA/QC samples (field duplicate, field blank, and trip blank), where applicable, as part of the 10% QA/QC requirements (See Section 3.5).
- Submitted samples for analysis to approved laboratories.
- Stored, processed, and prepared transducer and analytical data for analysis and submission to NWMO.
- Prepared separate pressure data and chemistry data quarterly reports.

The steps outlined above are detailed further as pre-mobilization and mobilization activities, fluid pressure and temperature monitoring, purging and field parameters, groundwater sampling, data assessment and reporting activities.

3.2 Health, Safety and Environment Activities

While the field team was working on site, the Field Lead/Supervisor held daily tailgate meetings with the field crew at the beginning of their workday to review the planned work activities, the related health, safety and environmental issues related to the planned work and specific hazards associated with each task and mitigation and control measures related to the hazards. All Job Safety Analysis (JSA) forms were updated as needed and signed off by the field team. Completed JSAs have been provided with the data package. An example of some of the specific hazards identified during the field event included:

- Heavy lifting.
- Generator and Hydrolift Pump use including fuel handling and storage.
- Water containment.
- Slips, trips, and falls.
- Hand Tool Safety.
- Use/handling of cleaning detergents, sample preservatives.
- Highway driving.
- Tire punctures from driving on gravel roads, narrow forest road access, and farm field access, etc.
- Wildlife crossings/encounters.
- Travel to and from the work site including safely and respectfully navigating around horse and buggies on roadways and safely approaching blind hills on the road.
- Handling of preservatives when collecting samples.
- Weather (e.g., heavy rain, thunderstorms, lightning protocols).

No health and safety or environmental incidents occurred during any of the field events. The field lead conducted a daily environmental inspection at each of the sites using a prescribed checklist. The completed checklist was included in the data package.

3.3 Fluid Pressure and Temperature Monitoring

Fluid pressure and temperature monitoring was also completed during each monitoring event in 2023-24. The annual pressure data for the *current monitoring period* is addressed in a separate report.

3.4 Groundwater Sampling

The collection of groundwater samples comprises a significant portion of the scope of work of this project. The methodology for conducting the field work is described in the following sections.

3.4.1 SAMPLE LOCATION SELECTION

Monitoring well sample location selection was made in collaboration between the KGS Group project team and the NWMO project team several weeks prior to mobilizing to the field for each quarterly event. The rationale for selecting the monitoring wells to be sampled was documented on *DQCF01-Sample Location Rationale*, which provides the criteria and rationale for the sample location selection process. Completed DQCF01s were included with the data deliverable package for each quarterly event.

Well selection was done collaboratively and applying selection criteria such as: (i) time of year, (ii) even sample distribution over time, (iii) site access conditions.

3.4.2 GROUNDWATER FIELD CHEMISTRY EQUIPMENT CALIBRATION AND DECONTAMINATION

As per the South Bruce Test Plan, KGS Group field staff did a field verification of each piece of equipment at the beginning of each day. If the instrument was not within manufacturer tolerance ranges when reading the calibration standards, then the instrument was re-calibrated in the field using valid National Institute of Standards and Technology (NIST) certified calibration standards and following the manufacturer's instructions. All field verifications and calibrations were recorded on *DQCF03-Equipment Calibration Log*. Completed DQCF03s have been provided with each of the quarterly data deliverables packages.

Certificates of calibration for each instrument used to measure a groundwater parameter in the field and Certificate of Analysis for all calibration standards have also been provided with each data deliverable package.

Decontamination and cleaning of each piece of equipment used to measure groundwater parameters was completed before purging was started as per the test plan. The decontamination process was recorded on *DQCF04-Equipment Decontamination Log* every time an interval was purged/pumped. Completed DQCF04s have been provided with each quarterly data deliverable package.

3.4.3 MONITORING WELL PURGING CRITERIA

The defined criteria agreed to by NWMO for when a groundwater sample can be collected is described in the South Bruce Test Plan, which describes how purging activities would be completed and the criteria that should be used to determine when a groundwater sample can be collected. The criteria used for determining when a sample could be collected must be one of two possible scenarios:

I. **Stabilization of Field Parameters:** Three consecutive readings that do not deviate more than the defined ranges as shown on Table 1 below for all field parameters (e.g., pH, electrical conductivity, temperature, total dissolved solids, turbidity, oxygen reduction potential, fluorescein, dissolved oxygen, density).
II. **Three well volumes purged:** Calculated total volume of water in each monitoring interval is purged three times before scenario I is observed.

The groundwater chemistry stabilization criteria (Criteria I) are given on Table 1 below and are also provided on *DQCF05-Field Parameter Data Sheet* provided with each quarterly data deliverable package.

TABLE 1: FIELD PARAMETER STABILIZATION TARGETS

Field Parameters	Measurement Instrument	Units	Stabilization targets
Fluoresceine Dye	Pyxis Handheld Fluorometer, SP-380	ppb	<1 ppb Change
Hydraulic Density	Polycarbonate Buoyant Hydraulic Densometer	g/cm^3	N/A
Total Dissolved Solids (TDS)	Hanna DiST1 Total Dissolved Solids Meter	mg/L	± 10% Change
Turbidity	Hach 2100Q	NTU	± 10% or ± 5 NTU, if initial NTU measurement is >50 NTU
Dissolved Oxygen (DO)	YSI 556 Water Chemistry Kit	mg/L	± 10% Change

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Field Parameters	Measurement Instrument	Units	Stabilization targets
Electrical Conductivity (EC)		mS/cm	± 10% Change
Temperature		Degrees Celsius	± 0.5 ºC Change
pH		pH unit	± 0.1 standard pH units Change
Oxidation-Reduction Potential (ORP)		mV	± 10% Change

3.4.4 PURGING METHODOLOGY

The South Bruce Test Plan describes how purging of the monitoring well intervals at the South Bruce site was completed using the dedicated Waterra tubing installed in each nested well standpipe interval. Purging was completed by attaching the previously installed Waterra ball-valve and tubing to a Waterra Hydrolift II mechanical pump, powered by a small portable generator. The Hydrolift pump was set so that a steady flow rate was achieved so that water quality parameter measurements could be taken to track stabilization progress in each well to ensure a representative groundwater sample could be collected. The flow rates ranged between 1.0 and 8.6 L/min. All purge water was diverted into pails and pumped using a battery powered Whaler pump or poured manually into a 1000 L tote contained in the KGS vehicle. The tote of purge water was disposed of at one of two licenced facilities that were approved for use by NWMO, mainly at the Teeswater Concrete Waste Water Treatment Lagoon.

3.4.5 GROUNDWATER PARAMETER MONITORING

As per the South Bruce Test Plan, a flow-thru cell was used with the field verified YSI 556 multi-probe testing unit that allowed the measurement of water quality parameters every 5 minutes. Water quality parameters that were not measured using the YSI 556 multi-probe unit were measured with field verified/calibrated instruments from water collected from the discharge tubing of the flow-thru cell in a clean/decontaminated plastic cup or instrument-specific sample containers. Field measurements were recorded directly onto DQCF05. All completed DQCF05s and excel files were included with the quarterly data deliverable packages and reported on in the Quarterly Chemistry Data Reports.

3.4.6 QA/QC OF FIELD DATA

KGS Group completed the QA/QC of the field data that was captured on Data Quality Confirmation Forms used to capture transducer data at the time of downloading (DQCF02-*Transducer Download*), equipment calibration log (DQCF03), verify decontamination of field equipment (DQCF04), collect groundwater chemistry field measurements (DQCF05) and sample collection logs (DQCF06-*Sample Collection Log*).

This was completed as part of preparation for each of the quarterly data delivery packages. Each DQCF was reviewed by a senior reviewer for formatting, consistency of information being recorded, errors in the values and identification of values that were outside of the expected ranges. Where an error was found that error was highlighted, and a note was made of the correction. When a reading or value was outside of the expected range, that value was highlighted either by bolding or the cell was coloured on the DQCF.

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After the review was completed, the DQCF was signed off on by both the person who prepared the DQCF and the person who verified it.

3.5 Groundwater Analysis

During each of the field programs, KGS Group field staff presented the field parameter measurements recorded on DQCF05 to the KGS Group technical lead for verification that the purge criteria had been met and documented correctly before each sample was collected. Then groundwater sampling was completed by KGS Group field staff as described in Section 3.5.1 in the South Bruce Test Plan.

The specifics and details for sample collection for all the field events are included on DQCF06 provided with the quarterly data deliverable packages.

QA/QC blanks were prepared as described in the South Bruce Test Plan by ALS Laboratories LTD. All samples (including QA/QC samples) were analyzed for the Quarterly and Annual analytical packages as detailed on Table 2 below.

TABLE 2: SUMMARY OF LABORATORY PARAMETERS

Analysis Group	Parameters	Analysis Frequency
Dissolved Metals	Aluminum (Al), Antinomy (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Bismuth (Bi), Boron (B), Cadmium (Cd), Calcium (Ca), Cesium (Cs), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Lithium (Li), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Phosphorous (P), Potassium (K), Rubidium (Rb), Ruthenium (Ru), Selenium (Se), Silicon (Si), Silver (Ag), Sodium (Na), Strontium (Sr), Sulfur (S), Tellurium (Te), Thallium (Tl), Thorium (Th), Tin (Sn), Titanium (Ti), Tungsten (W), Uranium (U), Vanadium (V), Zinc (Zn), Zirconium (Zr)	Quarterly
Routine and Nutrients	Conductivity, pH, Alkalinity (Total, as CaCO3), Ammonia (Total, as N), Bicarbonate (HCO3), Bromide (Br), Carbonate (CO3), Chloride (Cl), Fluoride (F), Hydroxide (OH), Nitrate and Nitrite as N, Nitrate (as N), Nitrite (as N), Orthophosphate-Dissolved (as P), Phosphorus (P)-Total, Phosphorus (P)-Total Reactive, Silica (SiO2)-Reactive, Sulfate (SO4), Total Kjeldahl Nitrogen, Total Nitrogen	Quarterly
Dissolved Inorganic Carbon	Dissolved Inorganic Carbon (DIC)	Quarterly
Iodide	Iodide	Quarterly
$\delta^{18}O$, $\delta^{2}H$	Oxygen-18 ($\delta^{18}O$), Deuterium ($\delta^{2}H$)	Quarterly
Ruthenium – dissolved	Ruthenium – dissolved	Annually
$^{87}Sr/^{86}Sr$, $\delta^{13}C$ DIC, $\delta^{37}Cl$	Strontium 87/86 ratio ($^{87}Sr/^{86}Sr$), Carbon-13 ($\delta^{13}C$ DIC), Chlorine-37 ($\delta^{37}Cl$)	Annually
Gross Alpha/ Beta	Gross Alpha/ Beta	Annually
^{14}C and ^{3}H	Carbon-14 (^{14}C) and Tritium (^{3}H)	Annually

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For all quarterly events, all the collected samples were submitted to ALS Laboratories located in Waterloo, Ontario by KGS Group.

All Certificates of Analysis (COA) (in both PDF and excel file formats), Sample Reception Confirmation (SRC) forms, Chain of Custody (CoC) forms, and electronic data deliverable (EDD) files have been provided with the data deliverable packages from each quarterly event.

3.5.1 QA/QC OF LABORATORY RESULTS

KGS Group completed a verification of the laboratory reports and data sets. Each set of reports and data have been identified and detailed on *DQCF07-Laboratory Data Quality Confirmation* forms and recorded per ALS work order #. These have been provided with each quarterly data deliverable package. The verification of the laboratory reports and data sets included the following checklist items:

- All results and data were received from the laboratory.
- All submitted samples requiring analysis were tested.
- Laboratory QA/QC procedures are outlined in the report.
- Laboratory results are in the proper format/unit.
- Laboratory results are in expected/reasonable ranges.
- Laboratory detection limits are correct.
- Chain-of-Custody contains the required information (dates, signatures, etc.).
- Hold time issues are identified.
- Additional notes (such as any other pertinent observations made by the reviewer of the lab reports).

Details regarding the results of the Quality Assurance/Quality Control checks and verifications done for the 2023-2024 analytical data are described below.

Laboratory Results are Reported in the Proper Format/Unit

The laboratory reported the concentration of nitrogen in both nitrate and nitrite ions for each sample throughout the 2023 monitoring. These concentrations are designated as Nitrate (as N) and Nitrite (as N), however, these concentrations were converted to nitrate (as NO_3) and nitrite (as NO_2) ion concentrations by KGS Group to meet the NWMO project objectives. Overall, the laboratory results for the 2023 data were analyzed and reported in units and detection limits that met the NWMO project objectives.

Hold Time Exceedances

Table 3 below summarizes the total number of samples and which parameters exceeded the laboratory recommended hold times for each of the quarterly sample events. Important to note that the hold time for pH is 15 minutes and was exceeded for all samples submitted to the lab, which is an unavoidable exceedance, but is mitigated by collecting field measurements with a calibrated pH meter during purging. The field measured pH results are provided on Table 6.

Possible reasons for a sample to exceed a hold time can be due to travel time to deliver the samples from the site to the lab, time of travel of a sample between laboratories for specific analysis (i.e. nitrate (as N), nitrite (as N), Total alkalinity (as $CaCO_3$) or some other issue at the lab, which is detailed on each of the quarterly DQCF07 and on Table 3.

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TABLE 3: SAMPLE HOLD TIME EXCEEEDANCES

Analysis Group	Recommended Hold Times	Hold Time Exceedances				
		Q1 2023	Q2 2023	Q3 2023	Q4 2023	Q1 2024
Dissolved Metals	180 days	None	None	None	None	None
Routine and Nutrients	Br, F, Cl, SiO_2, EC – 28 days ALK – 14 days ortho-PO_4^{3-} , NO_2^-, NO_3^- – 3 days All other nutrients – 28 days	18 samples for total reactive phosphorus. (1)	10 samples for total reactive phosphorus. (1)	13 samples for total reactive phosphorus. (1)	10 samples for total reactive phosphorus. (1)	10 samples for total reactive phosphorus. (1)
Dissolved Inorganic Carbon	14 days	None	None	None	None	None
Iodide	28 days	None	None	None	None	None
$\delta^{18}O$, $\delta^{2}H$	Unlimited if no headspace and chilled	None	None	None	None	None
Ruthenium – dissolved	180 days	None	None	None	None	None
$^{87}Sr/^{86}Sr$, $\delta^{13}C$ DIC, $\delta^{37}Cl$	Unlimited if no headspace and chilled	None	None	None	None	None
Gross Alpha/ Beta	Unlimited	None	None	None	None	None
^{14}C and ^{3}H	Unlimited	None	None	None	None	None

Note: (1) Freezing of the reactive phosphorus samples by the laboratory was done in accordance with ISO-5667-3 (2012) and does not affect the validity of the analysis.

3.5.2 ASSESSMENT OF LABORATORY RESULTS

Assessment of the laboratory data for this 2023 annual report by KGS Group was principally done by preparation of two distinct geochemistry plots, Durov and Stiff Diagrams. These plots were generated using AquaChem 11.0.

AquaChem 11.0 is a commercially available software developed by Waterloo Hydrogeologic. The version 11.0 and build 19.22.0516.1 of AquaChem was used to display data by generaterating the Durov and Stiff Diagrams for the 2022-2024 shallow groundwater quality data for each quarterly sampling event. The Durov and Stiff plots were used for making interpretations of the groundwater types and trend analysis.

Data Processing: KGS Group received the laboratory data from ALS Laboratories LTD as an Electronic Data Deliverable file format (.EDD) which was imported into an environmental database management system called ESdat. The file generated by the lab reporting system consists of three files (a header file in a .xml format, a sample file in a .csv format, and a chemistry file in a .csv format) compressed in a zip folder. Within ESdat, the chemistry data was then arranged to be exported into the excel based acQuire import templates and as the primary data input into AquaChem to generate the geochemical plots.

Durov Plots: Multiple water types can be compared using a Durov plot. AquaChem 11.0 calculates the milliequivalents per litre (meq/L) of each cation and anion from the laboratory water quality data. The total cations and the total anions are expected to balance each other, however, there were inequalities in the sum totals of cations and anions as measured by the laboratory within the accepted margin of error of +/= 10% difference for majority of the samples. A total of three samples of the seventy-one total samples (including field duplicate, trip blank, and field blank samples) analyzed by the lab had charge balance error greater than +/- 10%

On the Durov plots, the cations and anions are plotted on adjacent ternary plots. The intersection of the data is shown on a central rectangular plot. Side plots show the lab measured pH and conductivity values for each point. Durov plots can be used to differentiate between different water types, which plot in different sections of the graph. Similar water types tend to cluster within the same region of the central rectangular plot. The plot can also be used to infer the origin of the water or mixing processes between water types. Durov plots can also be used to plot changes in water quality data with time, which could be applied at this site in the future. Specific Durov Plots grouped by water type (Figures 3 to 5) and grouped by quarter (Figures 6 to 10) are provided below. All other Durov plots are provided in Appendix A for each set of wells (sites SB_MW01 to SB_MW07, Figures A1 to A7), then by depth interval (i.e., A, B, C and Overburden, Figures A8 to A11) and a compiled plot showing all intervals from all sites on Figure A12.

Stiff Diagrams: Individual water types can be compared using Stiff diagrams that display the relative concentrations of major ions expressed in milliequivalents per litre (meq/L). The lengths of the polygon sides illustrate the major ion concentrations, and plots of different shapes indicate different “fingerprints” of water qualities. Waters of similar type have a similar plot shape and would be generally expected to originate from the same source. Water can be named using the major cations and anions found on a percentage basis in the laboratory water analysis, see Table 7.

Stiff diagrams for all samples collected from Q3 July 2022 to Q1 2024 are provided in Appendix B.

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4.0 RESULTS

4.1 Sample Selection

4.1.1 SAMPLE LOCATION SELECTION

As indicated previously, the team selected all monitoring wells to be sampled in the Q1 2023 event except SB_MW01, whereas only two monitoring wells SB_MW02 and SB_MW03 (seven monitoring well intervals except SB_MW03_BR-A) were sampled in the Q2 2023 event. In the Q3 2023 event, the monitoring well groups SB_MW01, SB_MW05, and SB_MW06 (ten monitoring well intervals total) were sampled, whereas the monitoring well groups SB_MW03 and SB_MW04 (ten monitoring well intervals) were sampled during the Q4 2023 field event. Monitoring well groups SB_MW03 and SB_MW04 (ten monitoring well intervals) were sampled in Q1 2024. Table 4 below shows which samples were collected during each quarterly event.

TABLE 4: LOCATIONS SAMPLED

Field Event	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Q1 2024
Dates of Event	February 28 to March 5, 2023	June 6 to 8, 2023	September 12 to 15, 2023	November 21 to 22, 2023	February 27 to 29, 2023
Well Nest Group Sampled	SB_MW02, SB_MW03, SB_MW04, SB_MW05, SB_MW06 and SB_MW07	SB_MW02 and SB_MW03	SB_MW01, SB_MW05 and SB_MW06	SB_MW03 and SB_MW04	SB_MW03 and SB_MW06
Well Nest Group Not Sampled	SB_MW01	SB_MW01, SB_MW04, SB_MW05, SB_MW06 and SB_MW07	SB_MW02, SB_MW03, SB_MW04 and SB_MW07	SB_MW01, SB_MW02, SB_MW05, SB_MW06 and SB_MW07	SB_MW01, SB_MW02, SB_MW04, SB_MW05 and SB_MW07
Total Samples Collected	24 groundwater samples + 4 QA/QC samples	7 groundwater samples + 3 QA/QC samples	10 groundwater samples + 3 QA/QC samples	10 groundwater samples + 3 QA/QC samples	10 groundwater samples + 3 QA/QC samples

.

Each well group comprised of three nested bedrock stand pipes (e.g. SB_MW03_BR-A, SB_MW03_BR-B, SB_MW03_BR-C), where (A - deep, B –intermediate, and C – shallowest within the nest) and one overburden standpipe for each (e.g. SB_MW03_OB-INT), except for the well group SB_MW01 which comprises of only a single nested bedrock stand pipe (SB_MW01_BR-A) and one overburden stand pipe (SB_MW01_OB-INT). Purging of the monitoring wells during each quarterly events was completed as per the Test Plan, except that a sample SB_MW03_BR-A that was supposed to be collected as a part of the Test Plan during the Q2 2023 event, was not collected due to presence of sediments at the bottom of the well.

4.2 Purging and Field Chemistry

The sections below present the results and a discussion of the purging and field chemistry results from 2023-24 field events.

4.2.1 FIELD PURGING RESULTS

4.2.1.1 Purge Volumes

A summary of purge volumes corresponding to each quarterly event is shown on Table 5 below, these measurements are also included on DQCF05 provided with the data deliverable package of each quarterly event.

TABLE 5: PURGING RESULTS SUMMARY

Monitoring Well ID	Purging Results			Field Event
	Total Purge Volume (L)	Purge Method	Purge Criteria Achieved (I or II)	
SB_MW02_BR-A	282	Waterra Pump	II – Three well volumes purged	Q1 2023
SB_MW02_BR-B	223	Waterra Pump	II – Three well volumes purged	
SB_MW02_BR-C	52	Waterra Pump	II – Three well volumes purged	
SB_MW02_OB-INT	42	Waterra Pump	II – Three well volumes purged	
SB_MW03_BR-A	198	Waterra Pump	II – Three well volumes purged	
SB_MW03_BR-B	132	Waterra Pump	II – Three well volumes purged	
SB_MW03_BR-C	72	Waterra Pump	II – Three well volumes purged	
SB_MW03_OB-INT	60	Waterra Pump	II – Three well volumes purged	
SB_MW04_BR-A	270	Waterra Pump	I – Field chemistry stabilized	
SB_MW04_BR-B	150	Waterra Pump	II – Three well volumes purged	
SB_MW04_BR-C	86	Waterra Pump	II – Three well volumes purged	
SB_MW04_OB-INT	30	Waterra Pump	II – Three well volumes purged	
SB_MW05_BR-A	257	Waterra Pump	II – Three well volumes purged	
SB_MW05_BR-B	169	Waterra Pump	II – Three well volumes purged	
SB_MW05_BR-C	95	Waterra Pump	II – Three well volumes purged	
SB_MW05_OB-INT	13	Waterra Pump	Neither (1)	
SB_MW06_BR-A	264	Waterra Pump	II – Three well volumes purged	
SB_MW06_BR-C	120	Waterra Pump	II – Three well volumes purged	

.

Monitoring Well ID	Purging Results			Field Event
	Total Purge Volume (L)	Purge Method	Purge Criteria Achieved (I or II)	
SB_MW06_OB-INT	21	Waterra Pump	II – Three well volumes purged	
SB_MW09_BR-B	300	Waterra Pump	II – Three well volumes purged	
SB_MW07_BR-A	304	Waterra Pump	II – Three well volumes purged	
SB_MW07_BR-B	212	Waterra Pump	II – Three well volumes purged	
SB_MW07_BR-C	102	Waterra Pump	II – Three well volumes purged	
SB_MW07_OB-INT	18	Waterra Pump	II – Three well volumes purged	
SB_MW02_BR-A	272	Waterra Pump	II – Three well volumes purged	Q2 2023
SB_MW02_BR-B	235	Waterra Pump	II – Three well volumes purged	
SB_MW02_BR-C	54	Waterra Pump	II – Three well volumes purged	
SB_MW02_OB-INT	34	Waterra Pump	II – Three well volumes purged	
SB_MW03_BR-A	92	Waterra Pump	Purging stopped. No sample collected (2)	
SB_MW03_BR-B	128	Waterra Pump	II – Three well volumes purged	
SB_MW03_BR-C	72	Waterra Pump	II – Three well volumes purged	
SB_MW03_OB-INT	53	Waterra Pump	II – Three well volumes purged	
SB_MW01_BR	569	Submersible pump	I – Parameters stabilized	Q3 2023
SB_MW01_OB-INT	14	Waterra Pump	II – Three well volumes purged	
SB_MW05_OB-INT	21	Waterra Pump	Purged dry, then recovered to 80%	
SB_MW05_BR-A	252	Waterra Pump	II – Three well volumes purged	
SB_MW05_BR-B	166	Waterra Pump	II – Three well volumes purged	
SB_MW05_BR-C	97	Waterra Pump	II – Three well volumes purged	
SB_MW06_OB-INT	18	Waterra Pump	II – Three well volumes purged	
SB_MW06_BR-A	280	Waterra Pump	II – Three well volumes purged	
SB_MW06_BR-C	131	Waterra Pump	II – Three well volumes purged	
SB_MW09_BR-B	216	Waterra Pump	II – Three well volumes purged	
SB_MW03_OB-INT	56	Waterra Pump	II – Three well volumes purged	Q4 2023
SB_MW03_BR-A	-	Waterra Pump	Interval not sampled due to sediment infiltration and well integrity concerns that may cause further impacts to the well from purging.	
SB_MW03_BR-B	148	Waterra Pump	II – Three well volumes purged	
SB_MW03_BR-C	70	Waterra Pump	II – Three well volumes purged	
SB_MW04_OB-INT	24	Waterra Pump	II – Three well volumes purged	
SB_MW04_ BR-A	258	Waterra Pump	II – Three well volumes purged	
SB_MW04_BR-B	147	Waterra Pump	II – Three well volumes purged	
SB_MW04_BR-C	84	Waterra Pump	II – Three well volumes purged	

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Monitoring Well ID	Purging Results			Field Event
	Total Purge Volume (L)	Purge Method	Purge Criteria Achieved (I or II)	
SB_MW03_OB-INT	65	Waterra Pump	II – Three well volumes purged	Q1 2024
SB_MW03_BR-A	-	Waterra Pump	Interval not sampled due to sediment ingress and well integrity concerns that may cause further impacts to the well from purging.	
SB_MW03_BR-B	125	Waterra Pump	II – Three well volumes purged	
SB_MW03_BR-C	65	Waterra Pump	II – Three well volumes purged	
SB_MW06_OB-INT	22	Waterra Pump	II – Three well volumes purged	
SB_MW06_ BR-A	274	Waterra Pump	II – Three well volumes purged	
SB_MW09_BR-B	221	Waterra Pump	II – Three well volumes purged	
SB_MW06_BR-C	130	Waterra Pump	II – Three well volumes purged	

Note: (1) Well was purged dry once and sampled 5 hours later that day.
(2) NWMO requested no further purging or attempts to sample at this well due to sedimentation from bottom of well up to 36.8 m depth below top of casing.

4.2.2 FIELD CHEMISTRY RESULTS

KGS Group has reviewed the field chemistry results from all the field events of 2023 and Q1 2024 which includes a discussion of the results in the sections below.

The results of the field chemistry monitoring results are presented on Table 6 below. These field measurements were recorded during the purging of each of the well intervals in preparation for collecting a representative groundwater sample for laboratory analysis and are discussed in the section below.

4.2.2.1 Field Parameters Data Discussion

The groundwater temperature values during the field work ranged between 6.4 and 11.0 °C. The values of pH in groundwater of the area of study ranges from 7.08 to 8.41, revealing the circumneutral to slightly alkaline nature of the groundwater.

The values of field EC in samples ranged between 261 and 1515 µS/cm at field groundwater temperatures, whereas the field TDS values ranged between 216 mg/L and 796 mg/L. To understand the accuracy of field EC and field TDS measurements, the field EC values were compared against the EC values reported by the laboratory, whereas the field TDS measurements were compared with the calculated TDS values using the expression:

$TDS = k.EC_{field}$

Where, TDS is represented in mg/L, “k” is a unitless conversion factor, and EC is represented in µS/cm (Rusydi, 2018). The value of “k” is derived from the literature to be in the range 0.55 – 0.75 (Hem & Survey, 1985). During the Q1 2023 field event, it was noted that the field TDS values appeared to be slightly lower than calculated TDS values using a conversion factor of 0.55 (as noted by KGS Group on the acQuire Importers SB_IMP-29_SH included with the Q1 2023 Chemistry Data Deliverables).

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There were instances where dissolved oxygen (DO) and turbidity of the samples were higher than expected or remained elevated after purging three well volumes. Elevated DO and turbidity readings in field samples that are noted in Table 6 below, correspond primarily with overburden wells (OB-INT).

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TABLE 6: FIELD CHEMISTRY PARAMETERS SUMMARY

Monitoring Interval	Sample Event	Field DO (Multimeter) [mg/L]	Field EC [mS/cm]	Field ORP [mV]	Field Turbidity (NTU)	Field Fluorescein [ppb]	Field pH	Field TDS [mg/L]	Field Temp [°C]	Field Density (g/cm^3)	Comments
SB_MW01_OB-INT	Q3 2023	2.1	0.543	87.3	**103**	0	7.74	268	**10.99**	1.001	Field turbidity and temperature values were higher than expected
SB_MW01_BR-A	Q3 2023	2.82	0.426	-137.2	1.18	0	7.63	238	9.66	1.001	-
SB_MW02_OB-INT	Q1 2023	**6.41**	0.61	61.1	**>1000**	0	7.61	330	8.5	1.001	Field DO and turbidity values were higher than expected
	Q2 2023	1.19	0.513	148.1	**>999**	1.8	7.58	300	9.80	1.003	Field turbidity was higher than expected
SB_MW02_BR-A	Q1 2023	**4.21**	0.761	52.2	12.1	0	7.54	420	8.7	1	Field DO was higher than expected
	Q2 2023	0.07	0.669	26.4	4.76	0	7.37	383	8.63	1.001	-
SB_MW02_BR_R-B	Q1 2023	1.55	0.476	-3	0.6	0	7.64	260	8.1	1	-
	Q2 2023	0.11	0.400	-65.8	0.70	0	7.41	235	9.19	1.001	-
SB_MW02_BR-C	Q1 2023	**3.49**	0.481	6.9	**758**	0	7.71	260	9.1	1.001	Field DO and turbidity values were higher than expected
	Q2 2023	0.7	0.412	-183.7	**649**	0	7.52	235	8.95	1.001	Field turbidity was higher than expected
SB_MW03_OB-INT	Q1 2023	**7.75**	0.458	-4.5	**814**	**12.5**	7.73	228	9	1	Field DO, turbidity, and fluorescein values were higher than expected
	Q2 2023	0.33	0.351	-97.6	**>999**	6.5	7.49	225	9.06	1.001	Field turbidity was higher than expected

Monitoring Interval	Sample Event	Field DO (Multimeter) [mg/L]	Field EC [mS/cm]	Field ORP [mV]	Field Turbidity (NTU)	Field Fluorescein [ppb]	Field pH	Field TDS [mg/L]	Field Temp [°C]	Field Density (g/cm³)	Comments
	Q4 2023	0.64	0.437	-164.5	**225**	0	7.17	230	9.43	1.000	Field turbidity was higher than expected
	Q1 2024	0.99	0.261	-170.2	**781**	0	7.11	231	7.81	0.999	Field turbidity was higher than expected
SB_MW03_BR-A	Q1 2023	**7.55**	0.444	11.9	**107.1**	7.1	7.51	236	8.8	1	Field DO and turbidity values were higher than expected
SB_MW03_BR-B	Q1 2023	**6.15**	0.454	-1.4	4.32	4.4	7.42	230	8.8	1	Field DO was higher than expected
	Q2 2023	0.11	0.370	-124.9	4.44	1.8	7.45	234	9.81	1.000	-
	Q4 2023	0.32	0.468	-208.0	2.25	0	7.38	232	8.69	0.999	-
	Q1 2024	0.19	0.289	-141.1	0.59	0	7.28	233	7.61	0.999	-
SB_MW03_BR-C	Q1 2023	**11.91**	0.456	-24.8	**57.4**	5.5	7.46	225	9.1	1	Field DO and turbidity values were higher than expected
	Q2 2023	0.19	0.366	-123.0	**>999**	7.3	7.48	227	9.78	1.001	Field turbidity was higher than expected
	Q4 2023	0.47	0.450	-211.1	**>999**	0	7.31	230	8.89	1.000	Field turbidity was higher than expected
	Q1 2024	1.5	0.271	-216.4	**610**	0	7.13	231	7.62	0.997	Field turbidity was higher than expected
SB_MW04_OB-INT	Q1 2023	**9.27**	0.541	4.18	**>1000**	0	7.98	252	8.7	1.001	Field DO and turbidity values were higher than expected
	Q4 2023	**4.45**	0.54	10.8	**343**	0	7.44	294	8.14	1.000	Field DO and turbidity values were higher than expected

Monitoring Interval	Sample Event	Field DO (Multimeter) [mg/L]	Field EC [mS/cm]	Field ORP [mV]	Field Turbidity (NTU)	Field Fluorescein [ppb]	Field pH	Field TDS [mg/L]	Field Temp [°C]	Field Density (g/cm³)	Comments
SB_MW04_BR-A	Q1 2023	0.47	0.961	35.3	**65.1**	0	7.45	535	8.3	1.001	Field turbidity was higher than expected
	Q4 2023	0.22	1.090	-0.6	1.74	0	7.10	570	8.00	1.000	-
SB_MW04_BR-B	Q1 2023	**4.81**	1.079	50	**68.9**	0.3	7.5	501	8.3	1.001	Field DO and turbidity values were higher than expected
	Q4 2023	0.99	0.988	6.9	7.78	0	7.11	542	7.96	1.000	-
SB_MW04_BR-C	Q1 2023	**4.65**	1.033	30.8	**107**	0	7.53	495	8.3	1	Field DO and turbidity values were higher than expected
	Q4 2023	0.87	0.957	-14.5	**136**	0	7.08	541	7.94	1.000	Field turbidity was higher than expected
SB_MW05_OB-INT	Q1 2023	**12.15**	0.791	9.8	**>1000**	2.5	8.41	373	6.4	1.001	Field DO and turbidity values were higher than expected
	Q3 2023	**6.69**	0.891	-137.5	**>999**	2.2	7.31	440	**10.21**	1.002	Field DO, turbidity, and temperature values were higher than expected
SB_MW05_BR-A	Q1 2023	**4.22**	1.515	40.7	17.6	6.6	7.62	723	8.7	1	Field DO was higher than expected
	Q3 2023	0.21	1.414	-284.6	2.57	0	7.44	796	8.62	1.001	-
SB_MW05_BR-B	Q1 2023	**4.87**	0.951	7.4	654	0.6	7.67	453	8.8	1	Field DO and turbidity values were higher than expected
	Q3 2023	0.82	0.844	-316	488	1.1	7.48	474	8.7	1.001	Field turbidity was higher than expected
SB_MW05_BR-C	Q1 2023	**4.99**	0.94	-27.9	18.7	2.8	7.86	444	8.8	1.001	Field DO was higher than expected

Monitoring Interval	Sample Event	Field DO (Multimeter) [mg/L]	Field EC [mS/cm]	Field ORP [mV]	Field Turbidity (NTU)	Field Fluorescein [ppb]	Field pH	Field TDS [mg/L]	Field Temp [°C]	Field Density (g/cm³)	Comments
	Q3 2023	1.12	0.843	-176.6	26.9	0	7.58	468	8.77	1.001	-
SB_MW06_OB-INT	Q1 2023	**7.93**	0.498	-23	**167**	5.2	7.79	245	7.1	1	Field DO and turbidity values were higher than expected
	Q3 2023	**5.55**	0.449	-202.7	**>999**	0	7.88	269	8.74	1.001	Field DO and turbidity values were higher than expected
	Q1 2024	**4.51**	0.442	-221.1	**35.50**	0	7.88	247	8.55	0.999	Field DO and turbidity values were higher than expected
SB_MW06_BR-A	Q1 2023	**2.21**	0.642	8.9	5.32	3.6	7.62	304	7.5	1	Field DO was higher than expected
	Q3 2023	0.44	0.547	-315.8	0.49	0	7.51	333	7.85	1.001	-
	Q1 2024	0.47	0.564	-321.1	0.38	0	7.60	310	7.51	1.000	-
SB_MW09_BR-B	Q1 2023	**4.86**	0.659	4.2	10.2	0	7.67	307	7.7	1	Field DO was higher than expected
	Q3 2023	0.62	0.495	-271.1	7.91	0	7.45	324	7.65	1.001	-
	Q3 2023	0.62	0.495	-271.1	7.91	0	7.45	324	7.65	1.001	-
	Q1 2024	0.37	0.486	-255.4	1.04	0	7.41	333	7.50	1.001	-
SB_MW06_BR-C	Q1 2023	**4.44**	0.505	-15.4	**99.1**	1.1	7.6	238	7.6	0.999	Field DO and turbidity values were higher than expected
	Q3 2023	1.2	0.425	-340.8	3.04	0	7.53	264	7.74	1.001	-

Monitoring Interval	Sample Event	Field DO (Multimeter) [mg/L]	Field EC [mS/cm]	Field ORP [mV]	Field Turbidity (NTU)	Field Fluorescein [ppb]	Field pH	Field TDS [mg/L]	Field Temp [ºC]	Field Density (g/cm^3)	Comments
	Q1 2024	0.82	0.411	-341.5	8.42	0	7.55	247	7.47	0.999	-
SB_MW07_OB-INT	Q1 2023	**7.76**	0.739	41.4	**>1000**	9.1	7.61	348	8.4	1	Field DO and turbidity values were higher than expected
SB_MW07_BR-A	Q1 2023	**3.01**	0.557	17.1	**329**	5.1	7.34	273	8.8	1	Field DO and turbidity values were higher than expected
SB_MW07_BR-B	Q1 2023	**4.79**	0.604	19.4	1.5	2.9	7.54	284	8.7	1	Field DO was higher than expected
SB_MW07_BR-C	Q1 2023	**8.55**	0.449	-2.2	21	5.8	7.54	216	8.8	1	Field DO was higher than expected

Notes: **Bolded** values indicate a reading/measurement is flagged as not representative or erroneous and should be treated with caution, see comments.

4.3 Groundwater Sampling Results

The Q1 2023 event comprised collection of twenty-four groundwater samples, two field duplicates, one trip blank, and one field blank, for a total of twenty-eight samples. The Q2 2023 event comprised collection of seven groundwater samples, one field duplicate, one trip blank and one field blank samples, for a total of ten samples. The Q3 2023, Q4 2023, and Q1 2024 events comprised collection of ten groundwater samples, one field duplicate, one trip blank, and one field blank sample for a total of thirteen samples from each event.

All samples were submitted for analysis at ALS Laboratories LTD. All sample IDs were provided by the NWMO Geoscientific Data Management (GDMS) Administrator prior to mobilizing to the field. Table 4 provides a summary of the total number of samples collected each quarterly sample event and the location of the samples.

KGS Group has compiled and assessed all the laboratory chemistry data for the reporting period and is discussed in the sections below.

4.3.1 LABORATORY RESULTS

KGS Group has reviewed the laboratory results from all the field events of *current monitoring period* and included an assessment of the hydrogeochemical characteristics of groundwater at the South Bruce site.

4.3.1.1 Concentrations of Major Ions

There are many natural factors that can affect the groundwater quality of an area. The primary factors include the chemical composition and the source of recharge water, the lithological and hydrogeological properties of the water-bearing geological unit and the groundwater residence time.

The most abundant cations present in water are calcium (Ca), magnesium (Mg), sodium (Na), and potassium (K). The most abundant anions are bicarbonate (HCO_3), chloride (Cl), and sulfate (SO_4). Durov plots were prepared for all samples based on the concentration of these ions and are provided in Appendix A. Durov plots were also prepared for each quarterly sample event seen on Figures 6 to 10 below. The concentration of major ions listed above are also shown for reference on all stiff diagrams presented in Appendix B, Figures B1 to B26.

The groundwater water type is based on the dominant dissolved cation and anion, expressed in milliequivalents per liter (meq/L). The dominant dissolved ion must be greater than 50% of the total. For example, the sodium-bicarbonate ($Na\text{-}HCO_3$) type water contains greater than 50% of total cation milliequivalents as sodium and more than 50% of total anion milliequivalents in water as bicarbonate. If no cation or anion is dominant, the water is classified as mixed, and the two most common anions (or anions in decreasing order of their composition) are used to describe the water type.

The results of groundwater sampling for the South Bruce site during *monitoring period* indicate the following ranges of constituents: 1.33–144 mg/L for Na, 57.5–173 mg/L for Ca, 20.9–66.4 mg/L for Mg, 0.53–3.6 mg/L for K, 0.52–195 mg/L for Cl, 4.42–457 mg/L for SO_4, and 208–526 mg/L for HCO_3. The water type of each sample is provided below grouped by sample location and water type and excludes the trip blank, field blank and field duplicate samples:

TABLE 7: WATER TYPES AT THE SOUTH BRUCE SITE

Monitoring Interval	Sample ID	Sample Event	Sample Date (dd-mm-yyyy)	Water Type
SB_MW01_BR	**SB_MW01_BR_GW0001**	Q3-Sept 2022	12-09-2022	Ca-Mg-HCO3
	SB_MW01_BR_GW0003	Q4-Dec 2022	16-12-2022	Mg-Ca-HCO3
	SB_MW01_BR_GW0005	Q3 2023	12-09-2023	Ca-Mg-HCO3
SB_MW01_OB-INT	**SB_MW01_OB-INT_GW0001**	Q3-Sept 2022	12-09-2022	Ca-Mg-HCO3
	SB_MW01_OB-INT_GW0002	Q4-Dec 2022	14-12-2022	Ca-Mg-HCO3
	SB_MW01_OB-INT_GW0003	Q3 2023	12-09-2023	Ca-Mg-HCO3
SB_MW02_BR_R-B	**SB_MW02_BR_R-B_GW0001**	Q3-Sept 2022	16-09-2022	Ca-Mg-HCO3
	SB_MW02_BR_R-B_GW0002	Q4-Dec 2022	13-12-2022	Ca-Mg-HCO3
	SB_MW02_BR_R-B_GW0003	Q1 2023	28-02-2023	Ca-Mg-HCO3
	SB_MW02_BR_R-B_GW0004	Q2 2023	06-06-2023	Ca-Mg-HCO3
SB_MW02_BR-A	**SB_MW02_BR-A_GW0001**	Q3-Sept 2022	16-09-2022	Ca-Mg-SO4-HCO3
	SB_MW02_BR-A_GW0002	Q4-Dec 2022	13-12-2022	Ca-Mg-HCO3-SO4
	SB_MW02_BR-A_GW0004	Q1 2023	28-02-2023	Ca-Mg-SO4-HCO3
	SB_MW02_BR-A_GW0005	Q2 2023	06-06-2023	Ca-Mg-SO4-HCO3
	SB_MW02_BR-A_GW0006	Q2 2023	06-06-2023	Ca-Mg-SO4-HCO3
SB_MW02_BR-C	**SB_MW02_BR-C_GW0001**	Q3-Sept 2022	16-09-2022	Ca-Mg-HCO3
	SB_MW02_BR-C_GW0002	Q4-Dec 2022	13-12-2022	Na-Ca-HCO3
	SB_MW02_BR-C_GW0003	Q1 2023	28-02-2023	Ca-Mg-HCO3
	SB_MW02_BR-C_GW0004	Q2 2023	06-06-2023	Ca-Mg-HCO3
SB_MW02_OB-INT	**SB_MW02_OB-INT_GW0001**	Q3-Sept 2022	16-09-2022	Ca-Mg-HCO3
	SB_MW02_OB-INT_GW0002	Q4-Dec 2022	13-12-2022	Ca-Mg-HCO3
	SB_MW02_OB-INT_GW0003	Q1 2023	28-02-2023	Ca-Mg-HCO3
	SB_MW02_OB-INT_GW0004	Q2 2023	06-06-2023	Ca-Mg-HCO3
SB_MW03_BR-A	**SB_MW03_BR-A_GW0001**	Q3-Sept 2022	15-09-2022	Ca-Mg-HCO3
	SB_MW03_BR-A_GW0002	Q1 2023	04-03-2023	Ca-Mg-HCO3
SB_MW03_BR-B	**SB_MW03_BR-B_GW0001**	Q3-Sept 2022	15-09-2022	Ca-Mg-HCO3
	SB_MW03_BR-B_GW0003	Q2 2023	07-06-2023	Ca-Mg-HCO3
	SB_MW03_BR-B_GW0005	Q4 2023	21-11-2023	Ca-Mg-HCO3
	SB_MW03_BR-B_GW0006	Q1 2024	28-02-2024	Ca-Mg-HCO3
SB_MW03_BR-C	**SB_MW03_BR-C_GW0001**	Q3-Sept 2022	15-09-2022	Ca-Mg-HCO3
	SB_MW03_BR-C_GW0002	Q1 2023	04-03-2023	Ca-Mg-HCO3
	SB_MW03_BR-C_GW0004	Q2 2023	07-06-2023	Ca-Mg-HCO3
	SB_MW03_BR-C_GW0005	Q4 2023	21-11-2023	Ca-Mg-HCO3
	SB_MW03_BR-C_GW0007	Q1 2024	28-02-2024	Ca-Mg-HCO3
SB_MW03_OB-INT	**SB_MW03_OB-INT_GW0001**	Q3-Sept 2022	15-09-2022	Ca-Mg-HCO3
	SB_MW03_OB-INT_GW0002	Q1 2023	04-03-2023	Ca-Mg-HCO3
	SB_MW03_OB-INT_GW0003	Q2 2023	07-06-2023	Ca-Mg-HCO3
	SB_MW03_OB-INT_GW0004	Q4 2023	21-11-2023	Ca-Mg-HCO3
	SB_MW03_OB-INT_GW0005	Q1 2024	28-02-2024	Ca-Mg-HCO3

Monitoring Interval	Sample ID	Sample Event	Sample Date (dd-mm-yyyy)	Water Type
SB_MW04_BR-A	SB_MW04_BR-A_GW0001	Q3-Sept 2022	13-09-2022	Ca-Mg-SO4-HCO3
	SB_MW04_BR-A_GW0002	Q4-Dec 2022	14-12-2022	Ca-Mg-SO4-HCO3
	SB_MW04_BR-A_GW0003	Q1 2023	01-03-2023	Ca-Mg-SO4-HCO3
	SB_MW04_BR-A_GW0004	Q4 2023	21-11-2023	Ca-Mg-SO4-HCO3
SB_MW04_BR-B	SB_MW04_BR-B_GW0001	Q3-Sept 2022	13-09-2022	Ca-Mg-SO4-HCO3
	SB_MW04_BR-B_GW0003	Q4-Dec 2022	14-12-2022	Ca-Mg-SO4-HCO3
	SB_MW04_BR-B_GW0005	Q1 2023	01-03-2023	Ca-Mg-SO4-HCO3
	SB_MW04_BR-B_GW0006	Q4 2023	21-11-2023	Ca-Mg-SO4-HCO3
SB_MW04_BR-C	SB_MW04_BR-C_GW0001	Q3-Sept 2022	13-09-2022	Ca-Mg-SO4-HCO3
	SB_MW04_BR-C_GW0002	Q4-Dec 2022	14-12-2022	Ca-Mg-SO4-HCO3
	SB_MW04_BR-C_GW0004	Q1 2023	01-03-2023	Ca-Mg-SO4-HCO3
	SB_MW04_BR-C_GW0005	Q4 2023	21-11-2023	Ca-Mg-SO4-HCO3
SB_MW04_OB-INT	SB_MW04_OB-INT_GW0001	Q3-Sept 2022	13-09-2022	Ca-Mg-HCO3
	SB_MW04_OB-INT_GW0002	Q4-Dec 2022	14-12-2022	Ca-Mg-HCO3
	SB_MW04_OB-INT_GW0003	Q1 2023	01-03-2023	Ca-Mg-HCO3
	SB_MW04_OB-INT_GW0004	Q4 2023	21-11-2023	Ca-Mg-HCO3
SB_MW05_BR-A	SB_MW05_BR-A_GW0001	Q3-Sept 2022	13-09-2022	Ca-Na-Mg-SO4-Cl-HCO3
	SB_MW05_BR-A_GW0002	Q4-Dec 2022	15-12-2022	Ca-Na-Mg-SO4-Cl-HCO3
	SB_MW05_BR-A_GW0003	Q1 2023	02-03-2023	Ca-Na-Mg-SO4-Cl-HCO3
	SB_MW05_BR-A_GW0005	Q3 2023	13-09-2023	Ca-Na-Mg-SO4-Cl
SB_MW05_BR-B	SB_MW05_BR-B_GW0001	Q3-Sept 2022	13-09-2022	Ca-Na-Mg-HCO3-SO4-Cl
	SB_MW05_BR-B_GW0002	Q4-Dec 2022	15-12-2022	Ca-Na-Mg-HCO3-SO4-Cl
	SB_MW05_BR-B_GW0004	Q1 2023	02-03-2023	Ca-Na-Mg-HCO3-SO4-Cl
	SB_MW05_BR-B_GW0005	Q3 2023	13-09-2023	Ca-Na-Mg-HCO3-SO4-Cl
SB_MW05_BR-C	SB_MW05_BR-C_GW0001	Q3-Sept 2022	13-09-2022	Ca-Na-Mg-HCO3-SO4-Cl
	SB_MW05_BR-C_GW0002	Q4-Dec 2022	15-12-2022	Ca-Mg-Na-HCO3-SO4-Cl
	SB_MW05_BR-C_GW0003	Q1 2023	02-03-2023	Ca-Mg-Na-HCO3-SO4-Cl
	SB_MW05_BR-C_GW0004	Q3 2023	13-09-2023	Ca-Na-Mg-HCO3-SO4-Cl
SB_MW05_OB-INT	SB_MW05_OB-INT_GW0001	Q3-Sept 2022	14-09-2022	Ca-Mg-Na-HCO3
	SB_MW05_OB-INT_GW0002	Q4-Dec 2022	16-12-2022	Ca-Mg-HCO3
	SB_MW05_OB-INT_GW0003	Q1 2023	02-03-2023	Mg-Ca-HCO3
	SB_MW05_OB-INT_GW0004	Q3 2023	13-09-2023	Ca-Mg-Na-HCO3
SB_MW06_BR-A	SB_MW06_BR-A_GW0001	Q3-July 2022	27-07-2022	Ca-Mg-HCO3-Cl
	SB_MW06_BR-A_GW0003	Q3-Sept 2022	14-09-2022	Ca-Mg-HCO3-Cl
	SB_MW06_BR-A_GW0005	Q1 2023	01-03-2023	Ca-Mg-HCO3
	SB_MW06_BR-A_GW0006	Q3 2023	14-09-2023	Ca-Mg-HCO3-Cl
	SB_MW06_BR-A_GW0007	Q1 2024	27-02-2024	Ca-Mg-HCO3
SB_MW06_BR-B	SB_MW06_BR-B_GW0001	Q3-July 2022	27-07-2022	Ca-Na-Mg-HCO3-Cl
SB_MW06_BR-C	SB_MW06_BR-C_GW0001	Q3-July 2022	27-07-2022	Ca-Mg-HCO3
	SB_MW06_BR-C_GW0003	Q3-Sept 2022	14-09-2022	Ca-Mg-HCO3
	SB_MW06_BR-C_GW0004	Q1 2023	01-03-2023	Ca-Mg-HCO3

Monitoring Interval	Sample ID	Sample Event	Sample Date (dd-mm-yyyy)	Water Type
	SB_MW06_BR-C_GW0005	Q3 2023	14-09-2023	Ca-Mg-HCO3
	SB_MW06_BR-C_GW0006	Q1 2024	27-02-2024	Ca-Mg-HCO3
SB_MW06_OB-INT	**SB_MW06_OB-INT_GW0001**	Q3-July 2022	27-07-2022	Ca-Mg-HCO3
	SB_MW06_OB-INT_GW0002	Q3-Sept 2022	14-09-2022	Ca-Mg-HCO3
	SB_MW06_OB-INT_GW0003	Q1 2023	01-03-2023	Ca-Mg-HCO3
	SB_MW06_OB-INT_GW0004	Q3 2023	14-09-2023	Ca-Mg-HCO3
	SB_MW06_OB-INT_GW0006	Q1 2024	27-02-2024	Ca-Mg-HCO3
SB_MW07_BR-A	**SB_MW07_BR-A_GW0001**	Q3-July 2022	26-07-2022	Ca-Mg-HCO3
	SB_MW07_BR-A_GW0003	Q3-Sept 2022	17-09-2022	Ca-Mg-HCO3
	SB_MW07_BR-A_GW0004	Q4-Dec 2022	16-12-2022	Ca-Mg-HCO3
	SB_MW07_BR-A_GW0005	Q1 2023	03-03-2023	Ca-Mg-HCO3
SB_MW07_BR-B	**SB_MW07_BR-B_GW0001**	Q3-July 2022	26-07-2022	Ca-Mg-HCO3
	SB_MW07_BR-B_GW0002	Q3-Sept 2022	17-09-2022	Ca-Mg-HCO3
	SB_MW07_BR-B_GW0004	Q4-Dec 2022	16-12-2022	Ca-Mg-HCO3
	SB_MW07_BR-B_GW0005	Q1 2023	03-03-2023	Ca-Mg-HCO3
SB_MW07_BR-C	**SB_MW07_BR-C_GW0001**	Q3-July 2022	26-07-2022	Ca-Mg-HCO3
	SB_MW07_BR-C_GW0002	Q3-Sept 2022	18-09-2022	Ca-Mg-HCO3
	SB_MW07_BR-C_GW0003	Q4-Dec 2022	16-12-2022	Ca-Mg-HCO3
	SB_MW07_BR-C_GW0004	Q1 2023	03-03-2023	Ca-Mg-HCO3
SB_MW07_OB-INT	**SB_MW07_OB-INT_GW0001**	Q3-July 2022	28-07-2022	Ca-Mg-Na-HCO3-Cl
	SB_MW07_OB-INT_GW0002	Q3-Sept 2022	17-09-2022	Ca-Mg-HCO3
	SB_MW07_OB-INT_GW0003	Q4-Dec 2022	16-12-2022	Ca-HCO3
	SB_MW07_OB-INT_GW0004	Q1 2023	03-03-2023	Ca-Mg-Na-HCO3
SB_MW09_BR-B	**SB_MW09_BR-B_GW0001**	Q1 2023	01-03-2023	Ca-Mg-HCO3
	SB_MW09_BR-B_GW0002	Q3 2023	14-09-2023	Ca-Mg-HCO3
	SB_MW09_BR-B_GW0004	Q1 2024	27-02-2024	Ca-Mg-HCO3

The predominant groundwater type of the overburden and upper bedrock horizons at the South Bruce site is **Ca-Mg-HCO_3** which was the characteristic water type at sites SB_MW01, SB_MW02, SB_MW03, SB_MW06 and SB_MW07. The samples with this water type are primarily from the overburden (OB) and upper bedrock (intervals C and B). The upper bedrock units were typically Lucas Formation (dolostone) and Amherstburg Formation (limestone). The resulting water types for the 2023 and 2024 samples are consistent with the 2022 findings. The results are plotted on a Durov plot shown on Figure 3.

The second most observed water type is **Ca-Mg- SO_4- HCO_3** due to sulphate (SO_4) ions being more prevalent than bicarbonate ions. This water type was observed in samples collected from the bedrock intervals at SB_MW04. The results are plotted together on a Durov plot seen on Figure 4.

All other water types were present where higher concentrations of sodium, chloride and sulphate were found in varying proportions are plotted together on the Figure 5 Durov plot. Higher percentages of chloride were detected in the SB_MW06_BR-A monitoring interval, whereas higher percentages of sodium and chloride were found in the samples SB_MW06_BR-B, SB_MW05_BR-C and SB_MW07_OB-INT intervals.

Higher percentages of sulphate (SO_4) and chloride (Cl) were also found in samples collected from the SB_MW05_BR-B and SB_MW05_BR-C monitoring intervals during each of the monitoring events.

The Durov plots were used to characterize the samples collected from the South Bruce site according to their water types (Figures 3 to 5) and then by their sample events (Figures 6 to 10). All other Durov plots are included in Appendix A (Figures A1 to A12).

FIGURE 3: DUROV PLOT OF Ca-Mg-HCO_3 WATER TYPE

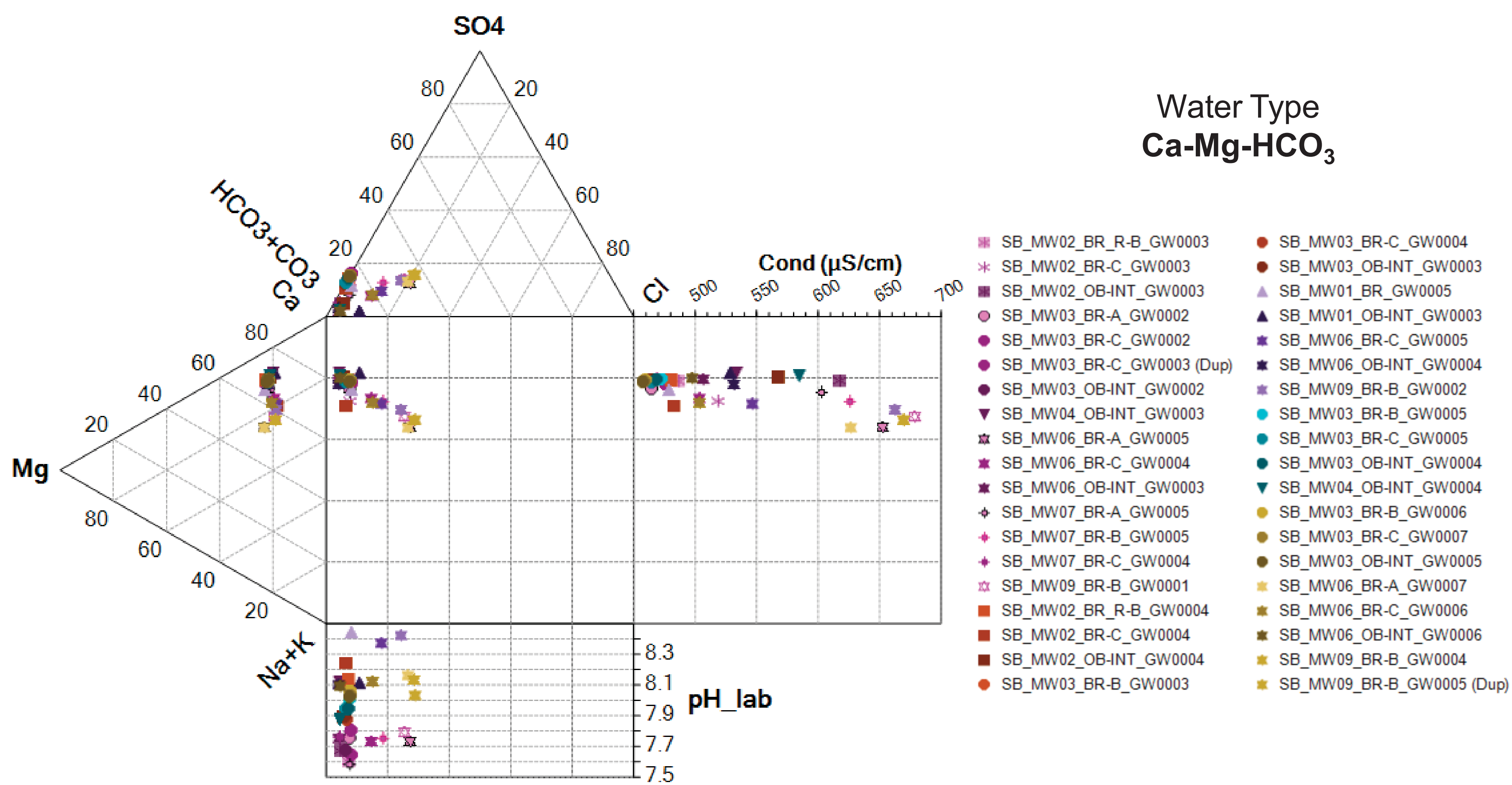
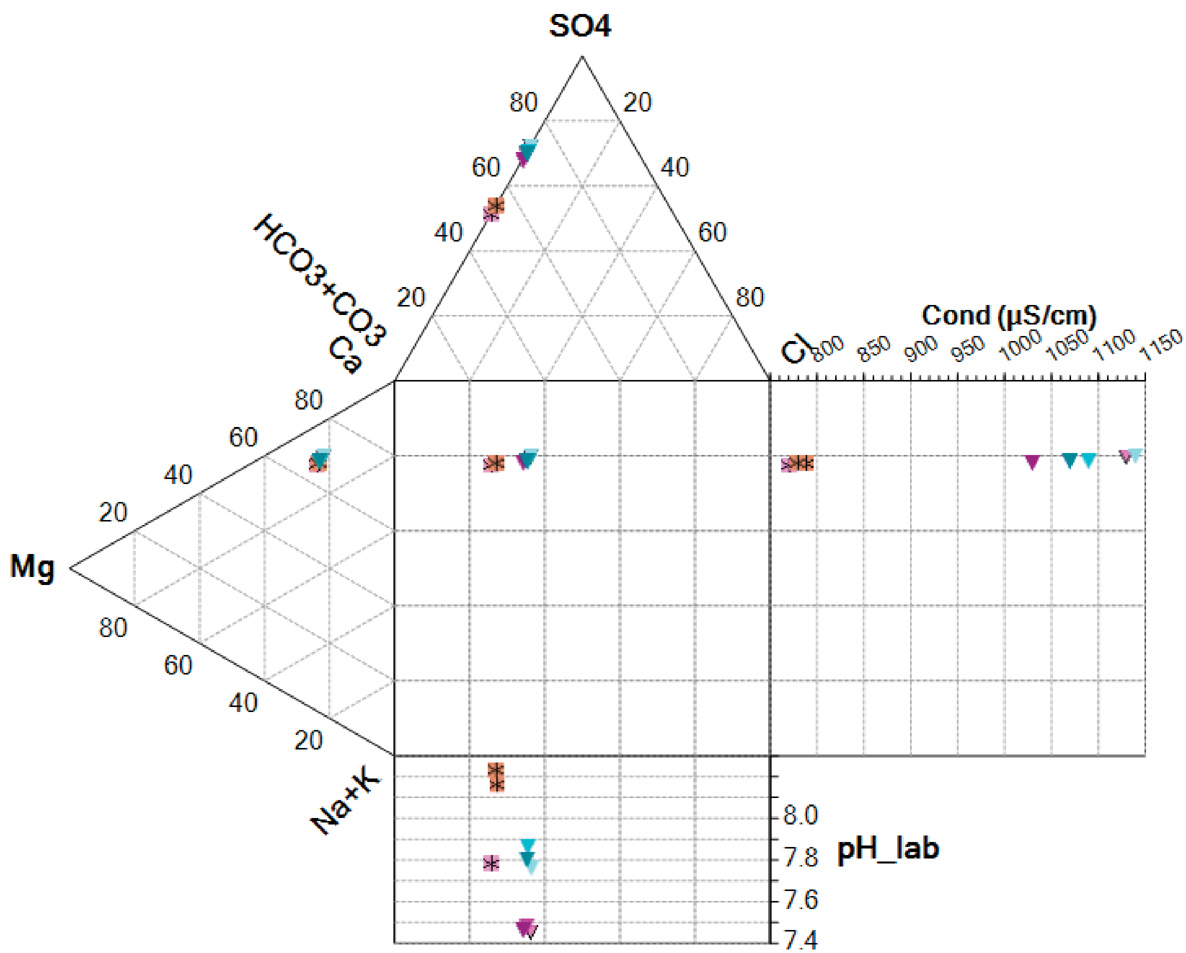


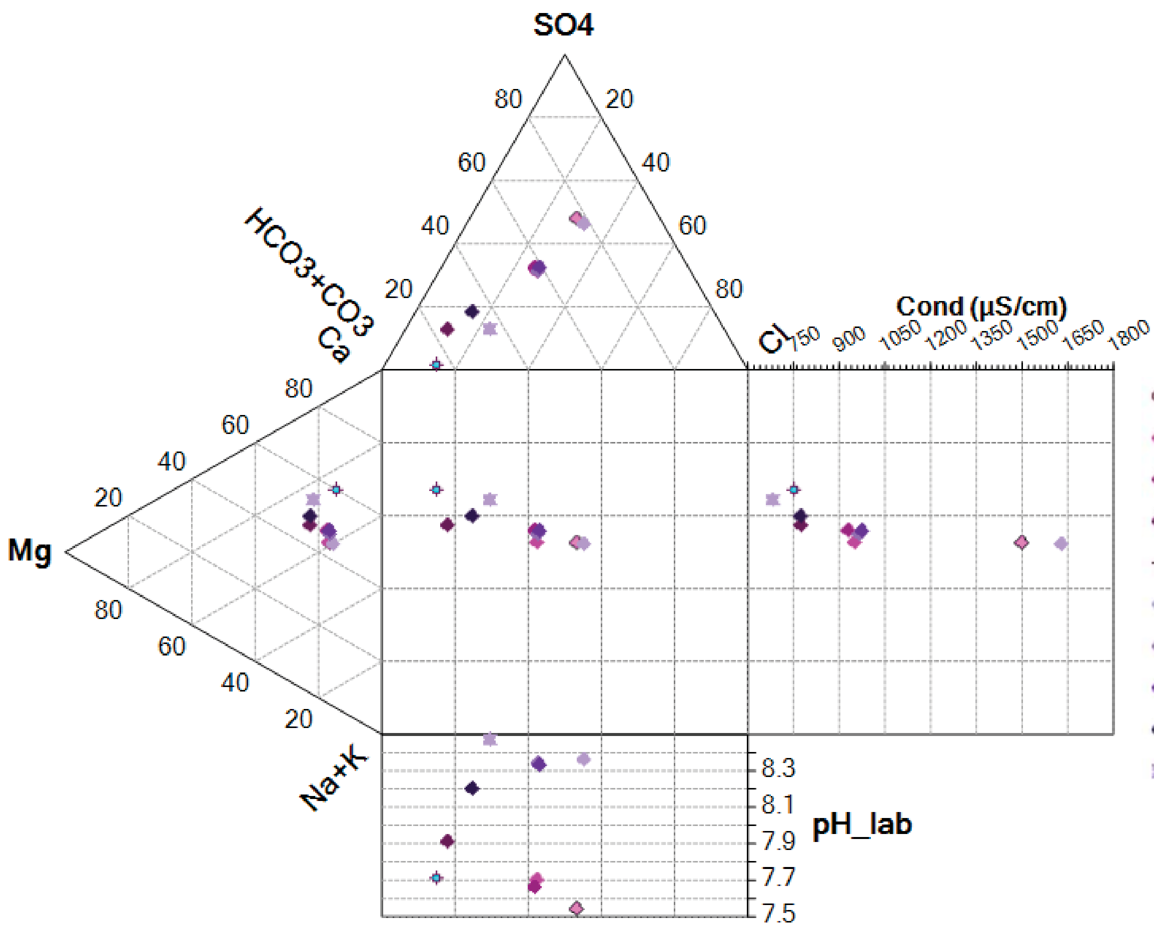
FIGURE 4: DUROV PLOT OF Ca-Mg-SO_4-HCO_3 WATER TYPE



Water Type
Ca-Mg-SO_4-HCO_3

Sample ID	Water Type
SB_MW02_BR-A_GW0004	Ca-Mg-SO_4-HCO_3
SB_MW04_BR-A_GW0003	Ca-Mg-SO_4-HCO_3
SB_MW04_BR-B_GW0005	Ca-Mg-SO_4-HCO_3
SB_MW04_BR-C_GW0004	Ca-Mg-SO_4-HCO_3
SB_MW02_BR-A_GW0005	Ca-Mg-SO_4-HCO_3
SB_MW02_BR-A_GW0006	Ca-Mg-SO_4-HCO_3
SB_MW04_BR-A_GW0004	Ca-Mg-SO_4-HCO_3
SB_MW04_BR-B_GW0006	Ca-Mg-SO_4-HCO_3
SB_MW04_BR-C_GW0005	Ca-Mg-SO_4-HCO_3

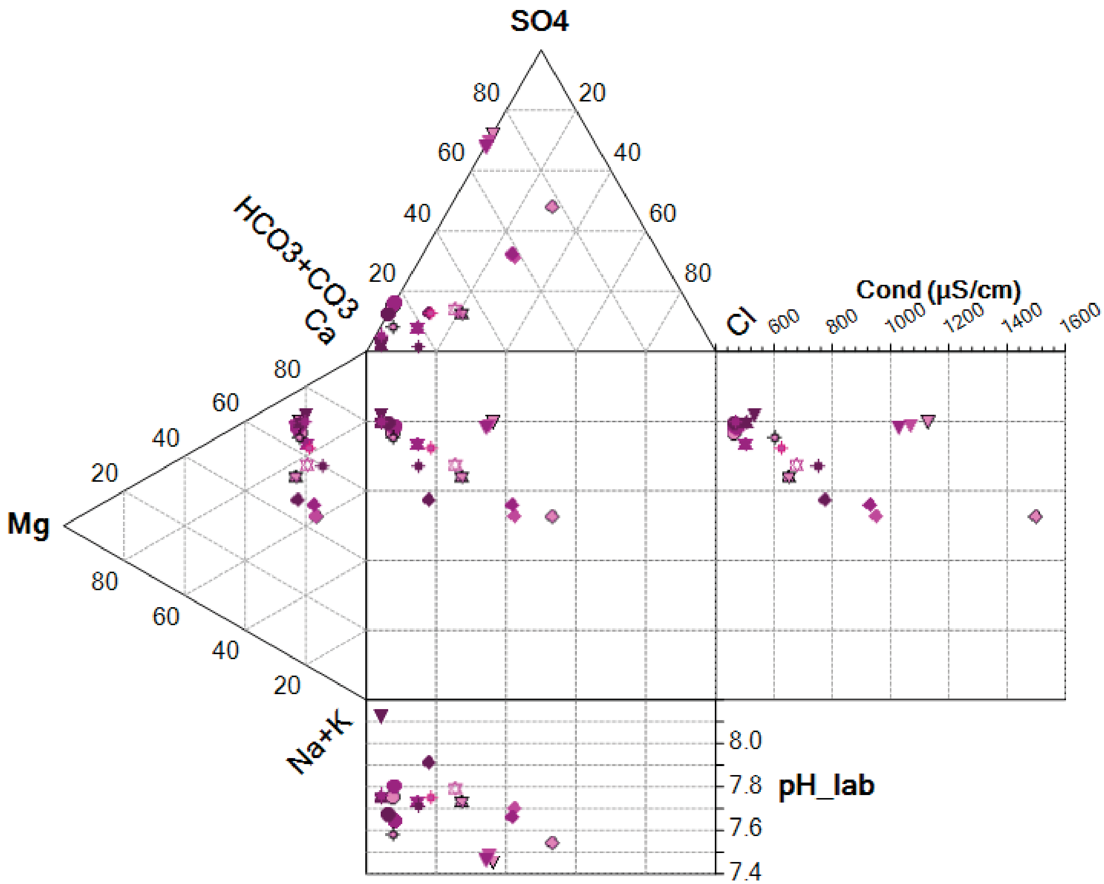
FIGURE 5: DUROV PLOT OF ALL OTHER WATER TYPES



Water Type
"Other"

Sample ID	Water Type
SB_MW05_BR-A_GW0003	Ca-Na-Mg-SO_4-Cl-HCO_3
SB_MW05_BR-B_GW0004	Ca-Na-Mg-HCO3-SO_4-Cl
SB_MW05_BR-C_GW0003	Ca-Mg-Na-HCO3-SO_4-Cl
SB_MW05_OB-INT_GW0003	Mg-Ca-HCO3
SB_MW07_OB-INT_GW0004	Ca-Mg-Na-HCO3
SB_MW05_BR-A_GW0005	Ca-Na-Mg-SO_4-Cl
SB_MW05_BR-B_GW0005	Ca-Na-Mg-HCO3-SO_4-Cl
SB_MW05_BR-C_GW0004	Ca-Na-Mg-HCO3-SO_4-Cl
SB_MW05_OB-INT_GW0004	Ca-Mg-Na-HCO3
SB_MW06_BR-A_GW0006	Ca-Mg-HCO3-Cl

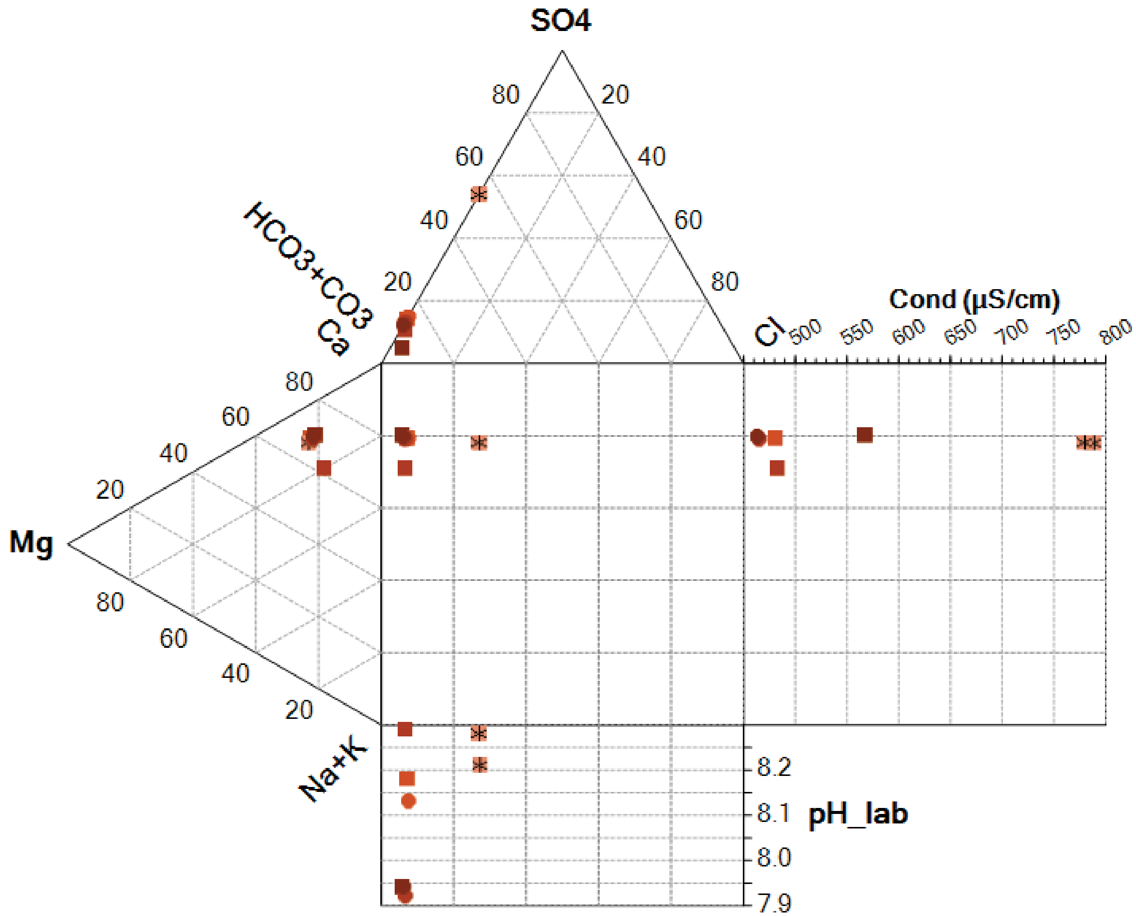
FIGURE 6: DUROV PLOT FOR Q1 2023 SAMPLES



Monitoring Event:
Q1 2023

Sample ID	Water Type
SB_MW03_BR-A_GW0002	Ca-Mg-HCO_3
SB_MW03_BR-C_GW0002	Ca-Mg-HCO_3
SB_MW03_BR-C_GW0003 (Dup)	Ca-Mg-HCO_3
SB_MW03_OB-INT_GW0002	Ca-Mg-HCO_3
SB_MW04_BR-A_GW0003	Ca-Mg-SO_4-HCO_3
SB_MW04_BR-B_GW0005	Ca-Mg-SO_4-HCO_3
SB_MW04_BR-C_GW0004	Ca-Mg-SO_4-HCO_3
SB_MW04_OB-INT_GW0003	Ca-Mg-HCO_3
SB_MW05_BR-A_GW0003	Ca-Na-Mg-SO_4-Cl-HCO_3
SB_MW05_BR-B_GW0004	Ca-Na-Mg-HCO_3-SO_4-Cl
SB_MW05_BR-C_GW0003	Ca-Mg-Na-HCO_3-SO_4-Cl
SB_MW05_OB-INT_GW0003	Mg-Ca-HCO_3
SB_MW06_BR-A_GW0005	Ca-Mg-HCO_3
SB_MW06_BR-C_GW0004	Ca-Mg-HCO_3
SB_MW06_OB-INT_GW0003	Ca-Mg-HCO_3
SB_MW07_BR-A_GW0005	Ca-Mg-HCO_3
SB_MW07_BR-B_GW0005	Ca-Mg-HCO_3
SB_MW07_BR-C_GW0004	Ca-Mg-HCO_3
SB_MW07_OB-INT_GW0004	Ca-Mg-Na-HCO_3
SB_MW09_BR-B_GW0001	Ca-Mg-HCO_3

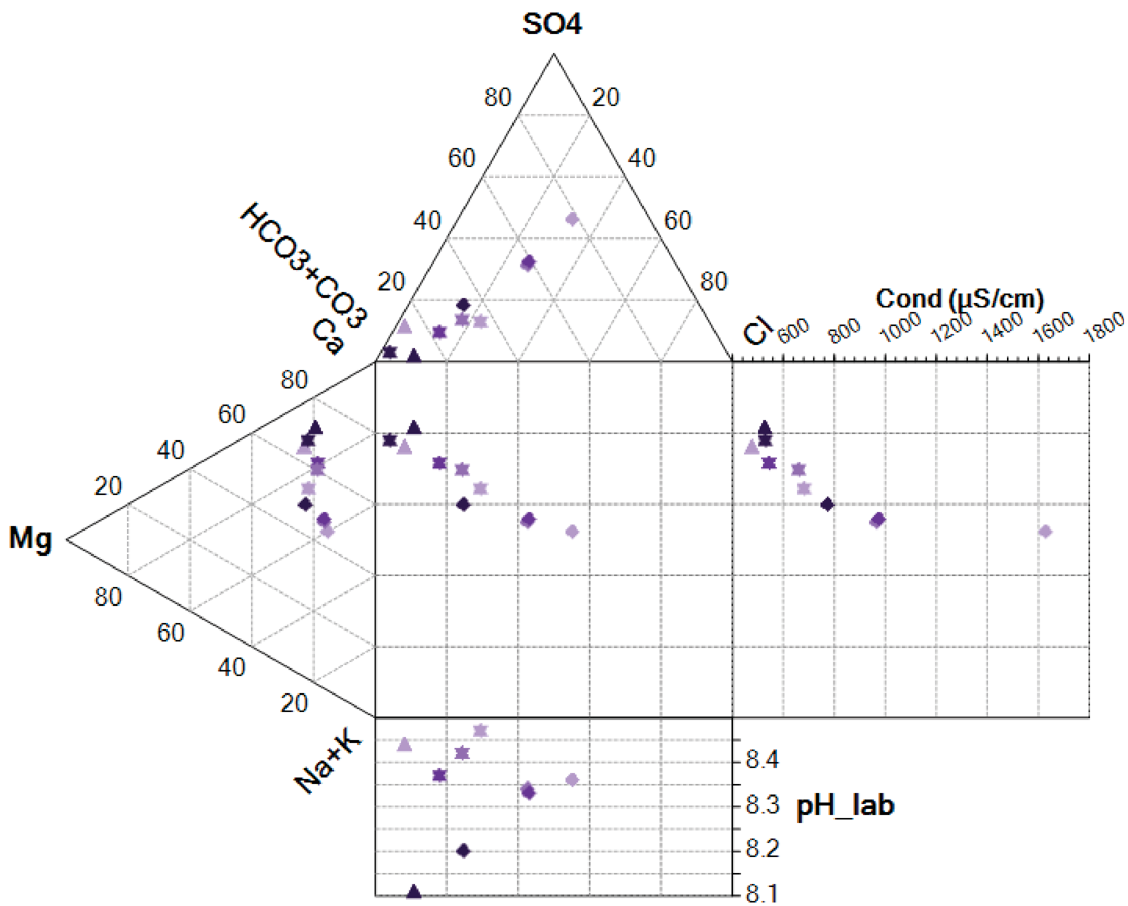
FIGURE 7: DUROV PLOT FOR Q2 2023 SAMPLES



Monitoring Event:
Q2 2023

Sample ID	Water Type
SB_MW02_BR-R-B_GW0004	Ca-Mg-HCO_3
SB_MW02_BR-A_GW0005	Ca-Mg-SO_4-HCO_3
SB_MW02_BR-A_GW0006	Ca-Mg-SO_4-HCO_3
SB_MW02_BR-C_GW0004	Ca-Mg-HCO_3
SB_MW02_OB-INT_GW0004	Ca-Mg-HCO_3
SB_MW03_BR-B_GW0003	Ca-Mg-HCO_3
SB_MW03_BR-C_GW0004	Ca-Mg-HCO_3
SB_MW03_OB-INT_GW0003	Ca-Mg-HCO_3

FIGURE 8: DUROV PLOT FOR Q3 2023 SAMPLES



Monitoring Event:
Q3 2023

Sample ID	Water Type
SB_MW01_BR_GW0005	Ca-Mg-HCO_3
SB_MW01_OB-INT_GW0003	Ca-Mg-HCO_3
SB_MW05_BR-A_GW0005	Ca-Na-Mg-SO_4-Cl
SB_MW05_BR-B_GW0005	Ca-Na-Mg-HCO_3-SO_4-Cl
SB_MW05_BR-C_GW0004	Ca-Na-Mg-HCO_3-SO_4-Cl
SB_MW05_OB-INT_GW0004	Ca-Mg-Na-HCO_3
SB_MW06_BR-A_GW0006	Ca-Mg-HCO_3-Cl
SB_MW06_BR-C_GW0005	Ca-Mg-HCO_3
SB_MW06_OB-INT_GW0004	Ca-Mg-HCO_3
SB_MW09_BR-B_GW0002	Ca-Mg-HCO_3

FIGURE 9: DUROV PLOT FOR Q4 2023 SAMPLES

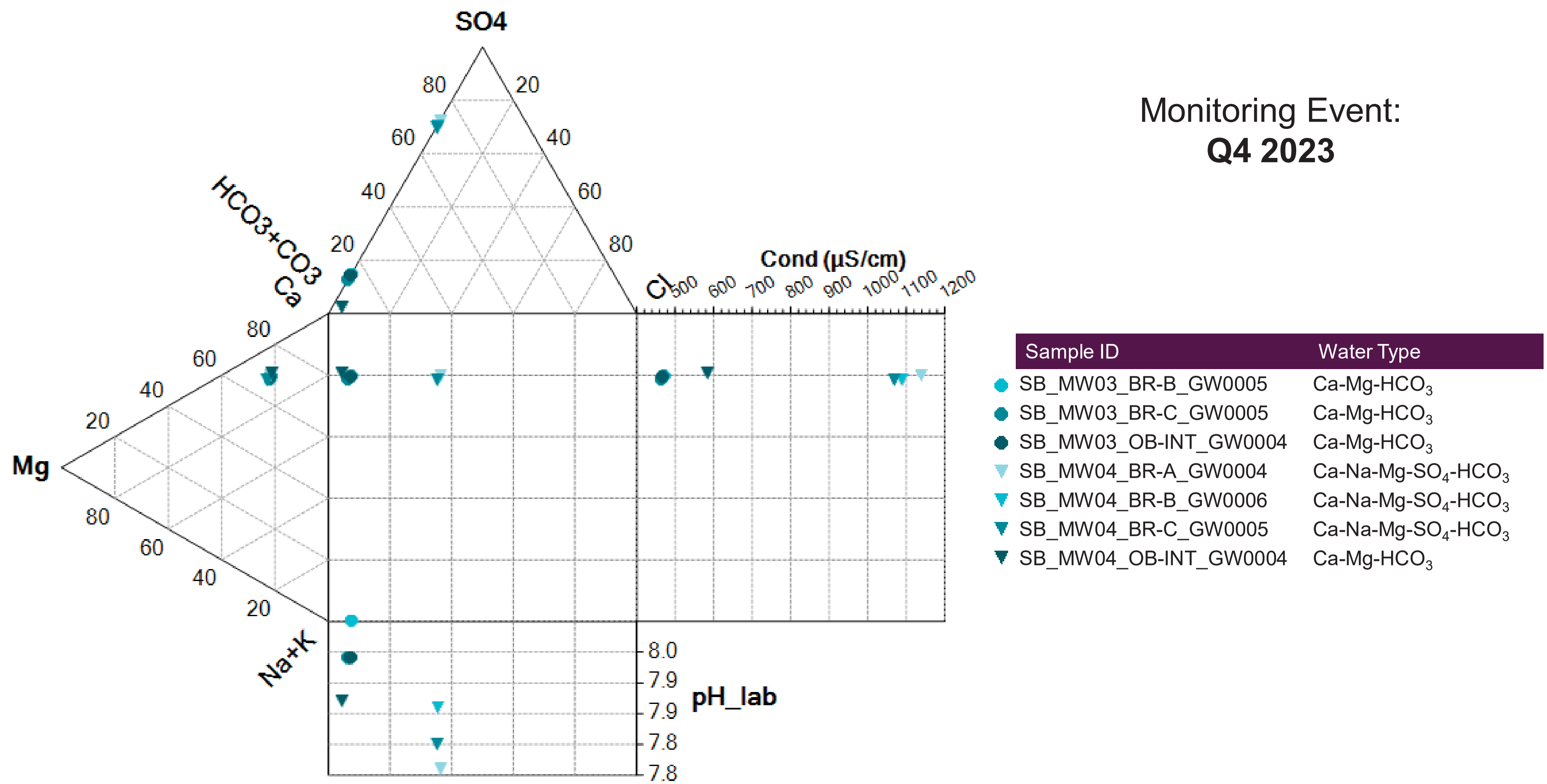
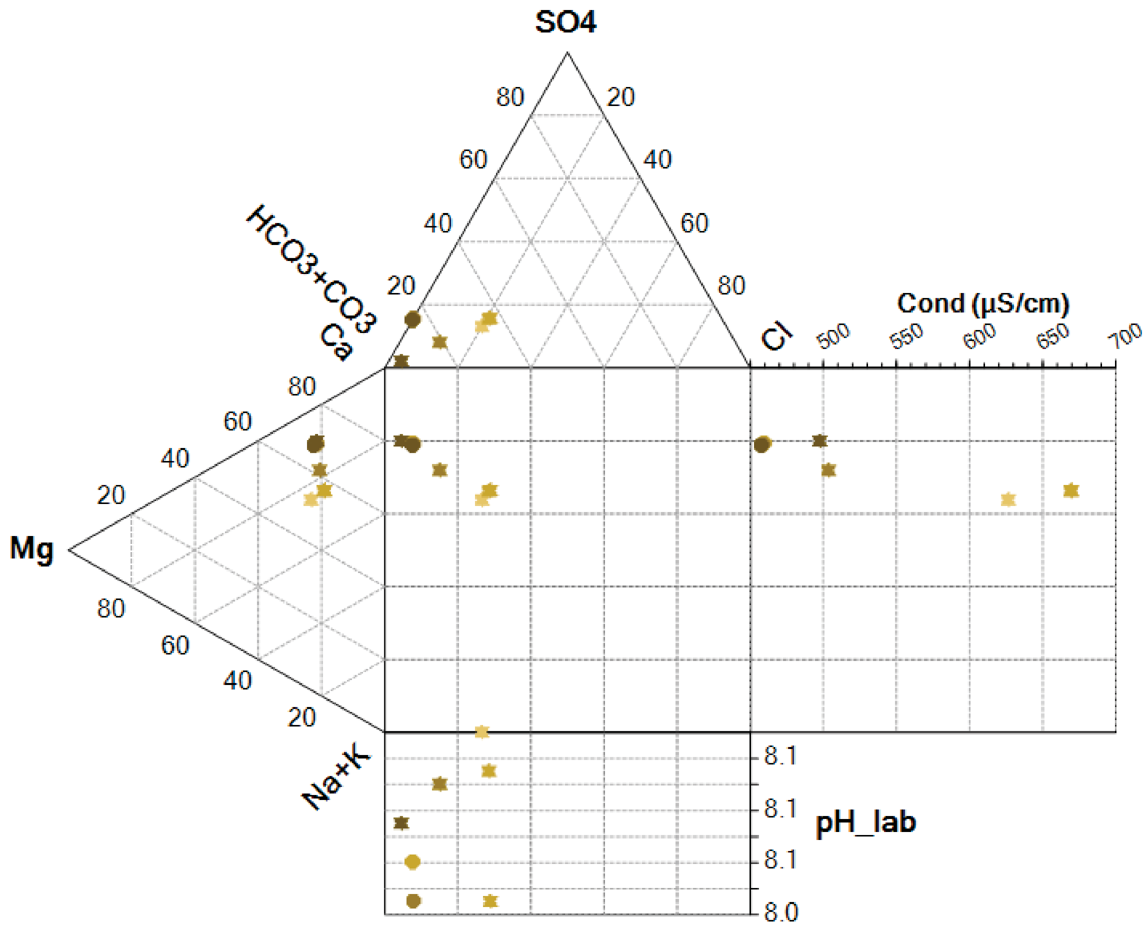


FIGURE 10: DUROV PLOT FOR Q1 2024 SAMPLES



Monitoring Event:
Q1 2024

Sample ID	Water Type
SB_MW03_BR-B_GW0006	Ca-Mg-HCO_3
SB_MW03_BR-C_GW0007	Ca-Mg-HCO_3
SB_MW03_OB-INT_GW0005	Ca-Mg-HCO_3
SB_MW06_BR-A_GW0007	Ca-Mg-HCO_3
SB_MW06_BR-C_GW0006	Ca-Mg-HCO_3
SB_MW06_OB-INT_GW0006	Ca-Mg-HCO_3
SB_MW09_BR-B_GW0004	Ca-Mg-HCO_3
SB_MW09_BR-B_GW0005	Ca-Mg-HCO_3

Additional Durov plots were prepared for each well site SB_MW01, SB_MW02, SB_MW03, SB_MW04, SB_MW05, SB_MW06 and SB_MW07 on Figures A1 through A7, respectively in Appendix A. Data was then grouped by monitoring interval type (i.e., overburden or bedrock) on Figures A8 through A11, respectively in Appendix A. Finally, all data was grouped and plotted together on Figure A12 of Appendix A. Each sample has a unique symbol, allowing comparisons over time as well as location.

The specific well site plots can be used to look for any variations in groundwater quality with depth at a single location and for changes over time. The monitoring interval plots can be used to look at variations with a single depth interval over the project area. The composite plot (Appendix A-Figure A12) can be used to summarize the characteristics of the site as a whole.

The major ion concentrations of individual water samples collected from the South Bruce Site in 2022, 2023 and Q1 2024 were also compared using Stiff diagrams that displayed the relative concentrations of major ions expressed in milliequivalents per liter (meq). Stiff diagrams for the South Bruce Site are included in Appendix B of this report. The plots are organized by well and then by monitoring interval from overburden to bedrock intervals C, B and A in order of depth. Each diagram can be "read" by reading down the page and noting the differences in the plots. A uniform scale was used for all plots for comparison.

Calcium-magnesium-bicarbonate ions are derived from dissolution of the underlying dolostone and limestone rocks and overburden. Natural sources for higher proportions of chloride, sodium, and sulphate likely represent dissolution of minor minerals within the same rock formations such as gypsum (calcium, sulphate) and halite (albeit at depth).

4.3.2 PARAMETERS OF INTEREST

Nitrate: KGS Group observed high concentrations of nitrate (as NO_3) in groundwater for the samples listed on Table 8 below. Generally, elevated concentrations of nitrate are associated with groundwater in the overburden and upper bedrock. A likely cause of the elevated nitrate levels is agricultural activities through the use of manure and fertilizer. The area surrounding the South Bruce site is primarily used for agriculture and could explain the elevated concentration of nitrate found in the overburden groundwater. Elevated nitrate concentrations were also found in the upper bedrock at MW02 during the Q4 2022 field event (MW02_BR-C_GW0002), however the concentration at this monitoring well interval was below the laboratory detection limit on subsequent sampling events.

Elevated nitrate concentrations were also found in the deep bedrock at MW-07 (SB_MW07_BR-A) for all of the field events this well was sampled.

TABLE 8: ELEVATED NITRATE CONCENTRATIONS

Monitoring interval	Sample ID	Quarter Sample Collected	Nitrate (as NO3) mg/L
SB_MW01_OB-INT	SB_MW01_OB-INT_GW0001	Q3 Sept 2022	57.15
	SB_MW01_OB-INT_GW0002	Q4 2022	39.60
	SB_MW01_OB-INT_GW0003	Q3 2023	46.07
SB_MW02_OB-INT	SB_MW02_OB-INT_GW0001	Q3 Sept 2022	36.70
	SB_MW02_OB-INT_GW0002	Q4 2022	24.90
	SB_MW02_OB-INT_GW0003	Q1 2023	22.28
	SB_MW02_OB-INT_GW0004	Q2 2023	35.48

Monitoring interval	Sample ID	Quarter Sample Collected	Nitrate (as NO3) mg/L
SB_MW02_BR-C	SB_MW02_BR-C_GW0002	Q4 2022	7.53
SB_MW04_OB-INT	SB_MW04_OB-INT_GW0001	Q3 Sept 2022	20.51
	SB_MW04_OB-INT_GW0002	Q4 2022	22.42
	SB_MW04_OB-INT_GW0003	Q1 2023	24.94
	SB_MW04_OB-INT_GW0004	Q4 2023	24.63
SB_MW06_OB-INT	SB_MW06_OB-INT_GW0001	Q3 July 2022	9.78
	SB_MW06_OB-INT_GW0002	Q3 Sept 2022	11.52
	SB_MW06_OB-INT_GW0003	Q1 2023	9.92
	SB_MW06_OB-INT_GW0004	Q3 2023	12.05
	SB_MW06_OB-INT_GW0006	Q1 2024	14.09
SB_MW07_OB_INT	SB_MW07_OB_INT_GW0003	Q4 2022	2.02
	SB_MW07_OB-INT_GW0001	Q3 July 2022	2.42
	SB_MW07_OB-INT_GW0004	Q1 2023	3.55
SB_MW07_BR_A	SB_MW07_BR_A_GW0001	Q3 July 2022	5.49
	SB_MW07_BR-A_GW0003	Q3 Sept 2022	5.80
	SB_MW07_BR-A_GW0004	Q4 2022	6.11
	SB_MW07_BR-A_GW0005	Q1 2023	5.49

Chloride: In general, chloride concentrations in the monitoring wells SB_MW01, SB_MW02, SB_MW03 and SB_MW04 for all depth intervals except SB_MW01_OB-INT, were below 10 mg/L, and no trend changes with depth were noted for these wells. Other wells showed variations in concentration with depth. At monitoring well SB_MW05, chloride concentration increased between the overburden interval and bedrock interval A for the entire dataset between Q3 July 2022 and Q3 2023. The monitoring well SB_MW05 was not sampled after the Q3 2023 field event. For the monitoring well location SB_MW06, an increasing trend in chloride concentration was observed in 2022 from the overburden interval to bedrock interval B; however, bedrock well interval A had lower concentrations of chloride. This trend has changed slightly for the 2023 data that implies an increase in chloride concentration from the overburden interval to the deepest bedrock interval at SB_MW06. In contrast, the highest concentration of chloride was observed in the overburden interval at the SB_MW07, whereas lower concentrations were observed at the deeper depths within the bedrock aquifer. The concentrations of chloride remained consistent for observations across all the field events between Q3 July 2022 and Q1 2024. Figure 11 below shows the chloride concentration results by sample and with depth.

Sodium: Like chloride concentrations, sodium concentrations were in general higher (>10 mg/L) in monitoring wells SB_MW05, SB_MW06, and SB_MW07 for all intervals except SB_MW06_OB-INT and SB_MW07_BR-C (<10 mg/L). In monitoring well SB_MW05, chloride concentrations increased between the overburden interval and bedrock interval A for all data between Q3 July 2022 and Q1 2024. Like the trend observed for chloride, the monitoring well location SB_MW06 showed an increasing trend in sodium concentrations from the overburden interval to bedrock interval B, whereas, the bedrock interval A had lower concentrations of sodium. In contrast, the highest concentration of sodium was observed in the overburden interval at the monitoring well SB_MW07, whereas lower concentrations were observed at the deeper intervals within the bedrock aquifer. The concentrations of sodium also remained consistent for observations across all the field events between Q3 July 2022 and Q1 2024. Figure 12 below shows the chloride concentration results by sample and with depth.

FIGURE 11 CHLORIDE CONCENTRATIONS WITH DEPTH

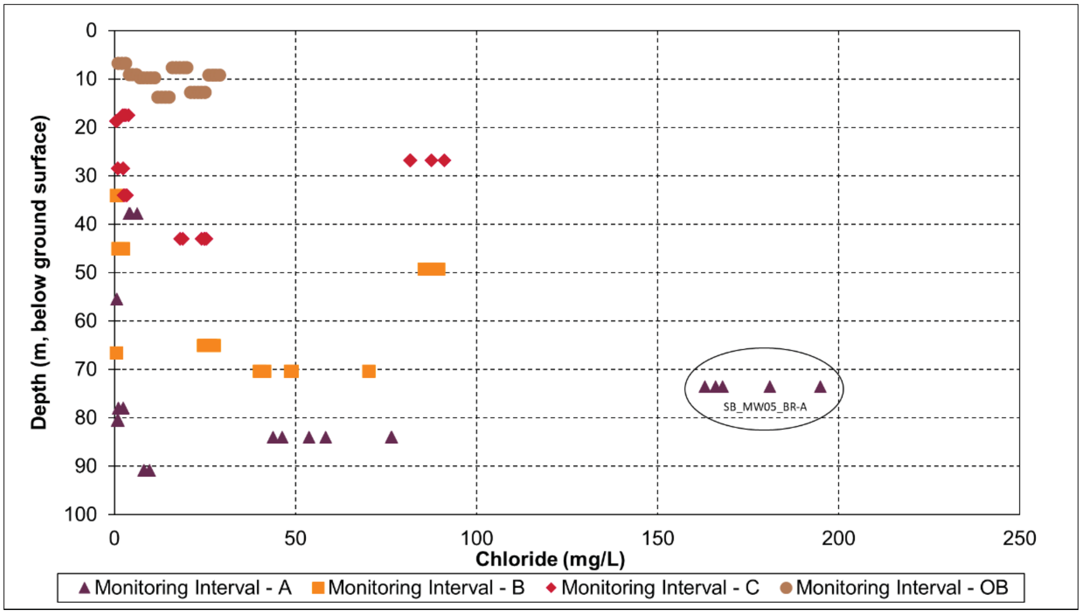
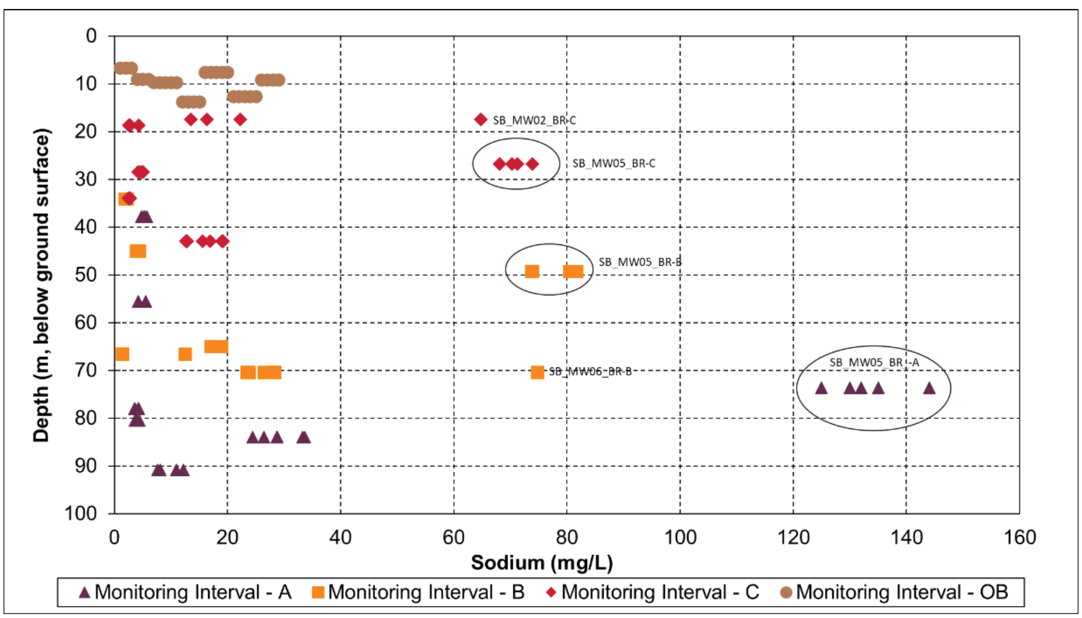
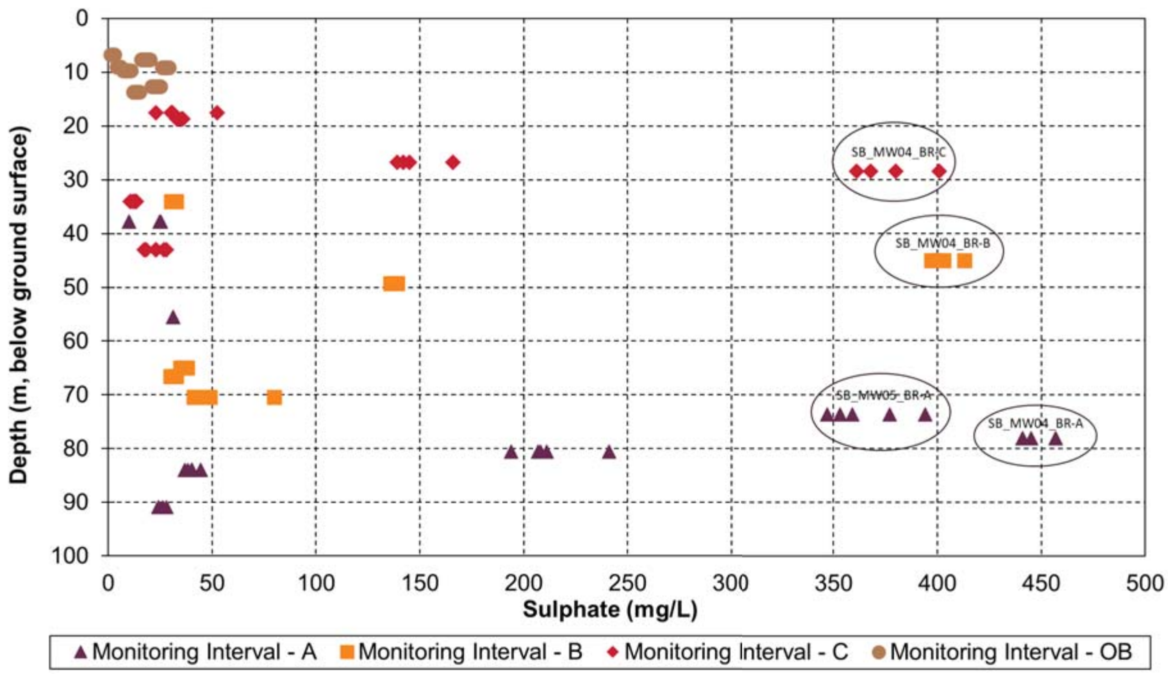


FIGURE 12 SODIUM CONCENTRATIONS WITH DEPTH



Sulphate: Sulphate concentrations between Q3 July 2022 and Q1 2024 increased from the overburden interval to the deepest bedrock interval (A) at monitoring well locations SB_MW02, SB_MW04, and SB_MW05. Like the trend observed for chloride and sulphate, the monitoring well location SB_MW06 showed increasing sulphate concentrations from the overburden interval to the bedrock interval B, whereas, the bedrock interval A had lower concentrations of sulphate. In general, sulphate concentrations were higher in the bedrock intervals (at levels of few hundred milligrams) in contrast to the overburden interval (less than 100 mg/L). The concentrations of sulphate remained consistent for observations across all the field events between 2022 and 2024. Figure 13 below shows the sulphate concentration results by sample and with depth.

FIGURE 13 SULPHATE CONCENTRATIONS WITH DEPTH



Calcium and Magnesium: No specific trends of concentrations were observed for calcium and magnesium concentrations at the South Bruce site. The calcium and magnesium concentrations are typical for the limestone bedrock formation. The concentrations of both calcium and magnesium remained consistent for observations across all the field events between Q3 July 2022 and Q1 2024.

Alkalinity:

The alkalinity of water is a measure of its acid-naturalizing capacity that maintains a stable pH level of the water. It is a function of bicarbonate, carbonate and hydroxide concentration levels of the water, and is expressed in terms of an equivalent quantity of calcium carbonate. The total alkalinity of groundwater at the South Bruce site is in the range of 200 mg/L (as $CaCO_3$) to 385 mg/L (as $CaCO_3$). The primary contributing parameter of these concentrations of total alkalinity in all samples is bicarbonate. The bicarbonate-alkalinity was in the range of 208 mg/L (as $CaCO_3$) to 470 mg/L (as $CaCO_3$) while the carbonate-alkalinity (as $CaCO_3$) remained below the laboratory detection limit for most of the samples. The highest concentration of carbonate-alkalinity (as $CaCO_3$) ions was observed in the sample SB_MW06_BR-A_GW0006 (14.8 mg/L as $CaCO_3$), collected during the Q3 2023 monitoring event.

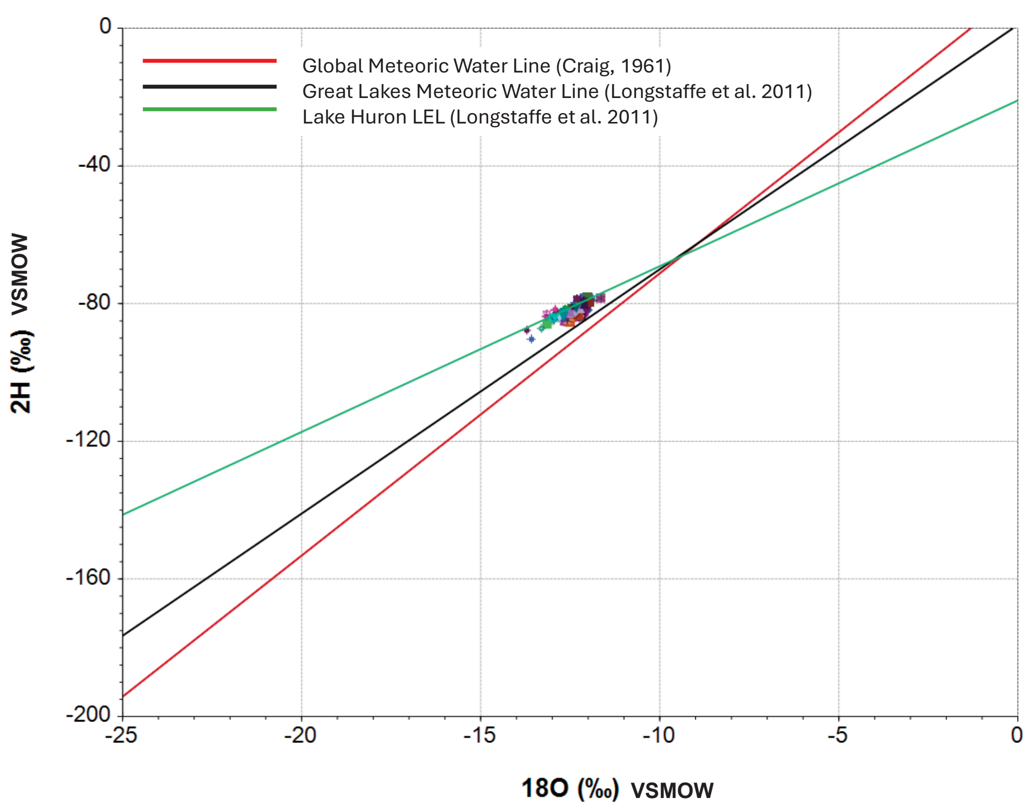
4.3.3 QUARTERLY ISOTOPE ANALYSIS

Oxygen-18 ($\delta^{18}O$) and Deuterium ($\delta^{2}D$)

Isotope parameters Oxygen-18 ($\delta^{18}O$) and Deuterium ($\delta^{2}D$), O-18 and H2 isotopes in water serve as valuable indicators in hydrology. The ratio of O-18 to O-16 can provide insights into temperature variations during water formation, while H2 isotopes can indicate the water source and its geographical origin. Analyzing these isotopes aids in understanding hydrological cycles, climate patterns, and tracing water movement in ecosystems and aquifers. O-18 and H2 samples were collected during quarterly sample events between Q3 July 2022 and Q1 2024 from all the wells, for a total of 118 samples collected, not including any QA/QC samples (i.e. duplicates or blanks).

The 2022-24 data is presented on Figure 14 relative to the Great Lakes Meteoric Water Line (GLMWL) ($\delta^{2}H=7.1*\delta^{18}O+1.0$; (Longstaffe et al., 2011)), the Global Meteoric Water Line (GMWL, $\delta^{2}H=8.13*\delta^{18}O+10.8$; (Craig, 1961)) and the Lake Huron Local Evaporation Line ($\delta^{2}H=4.8*\delta^{18}O - 20.9$) ; Longstaffe et al., 2011), for comparison purposes. The GLMWL is a local meteoric water line, comprised of samples taken on a more frequent basis specifically in the region of the Great Lakes, and is helpful for interpreting local water movements, water sources, and evaporative/precipitation processes these waters have undergone, over and above the coarser resolution the GMWL provides. Moreover, the Lake Huron LEL is helpful to understand more specifically the evaporation processes that have occurred in the various water sources being analysed isotopically, and local to the region of Lake Huron, where the South Bruce project site is located. This LEL is a regression line through isotopic compositions of evaporating surface waters, specific to the region of Lake Huron.

FIGURE 14: SHALLOW GROUNDWATER $\delta^{2}H$ VS $\delta^{18}O$



The 18O and 2H groundwater isotope data collected at the South Bruce project site reflects local meteoric precipitation source (Figure 14). Portions of the data cluster slightly below the Lake Huron LEL, and plot more closely to (but above) the GLMWL, however the interpretation remains that the 18O and 2H groundwater signature, when analysed in this manner, reflects normal meteoric precipitation of the region.

4.3.4 ANNUAL ISOTOPE ANALYSIS

A summary of the 2023 annual isotope analytical results is provided on Table 9 below. Environmental isotope analysis was planned to be completed once in 2023 for SB_MW02 and SB_MW03 wells. This information would be used for baselining the shallow groundwater geochemistry.

TABLE 9: ISOTOPE RESULTS

Sample ID	Quarter Sample Collected	Gross Alpha (Bq/L)	Gross Beta (Bq/L)	Tritium (^{3}H) Bq/L	Tritium (^{3}H) +/-0.8 T.U.	Carbon-13 of DIC (d13C-DIC) per mil VPDB	Carbon-14 of DIC (^{14}C-DIC) pmC	Chlorine-37 (d37Cl) per mil SMOC	Strontium Isotope Ratio ($^{87}Sr/^{86}Sr$)
SB_MW02_BR_R-B_GW0004	Q2 2023	0.275	0.066	<0.094	<0.8	-10.1	48.32	-1.05	0.708487
SB_MW02_BR-A_GW0005	Q2 2023	**0.917**	0.267	<0.094	<0.8	-14.5	33.64	0.07	0.708513
SB_MW02_BR-C_GW0004	Q2 2023	**1.2**	0.866	0.247	2.1	-10.84	58.96	0.23	0.708593
SB_MW02_OB-INT_GW0004	Q2 2023	**0.662**	0.862	NES	NES	-12.26	91.08	-0.69	0.70926
SB_MW03_BR-B_GW0003	Q2 2023	**0.941**	0.445	0.106	0.9	-10.61	46.1	-1.11	0.708563
SB_MW03_BR-C_GW0004	Q2 2023	**4.24**	**3.03**	<0.094	<0.8	-11	44.21	-1.37	0.708547
SB_MW03_OB-INT_GW0003	Q2 2023	**0.868**	0.815	<0.094	<0.8	-10.9	45.77	-0.01	0.708582

Note: (1) NES = Not Enough Sample, (2) pmC = percent modern carbon, (3) Tritium is reported in Tritium Units, 1TU= 0.11919 Bq/L per IAEA, 2000 report

Gross Alpha/Beta

Radionuclides are found in the environment as naturally occurring elements and as products or by-products of nuclear technologies. Gross alpha and gross beta determination is an initial screening for the presence of radioactivity, and the procedures used to analyze the samples are not the same procedures used to determine the identity of the contributing radionuclides. To help with a relative comparison of the presence of radionuclides in groundwater at the study site, it is important to know that the recommended screening values for gross alpha and gross beta activity have been set at 0.5 Bq/L and 1 Bq/L, respectively by Health Canada Canadian Drinking Water Quality Guidelines (HC-CDWQG). Using the HC-CDWQG, there were five samples collected in Q2 2023 that exceeded the HC-CDWQG for Gross Alpha, which included: SB_MW02_BR-A_GW0005 (0.917 Bq/L), SB_MW02_BR-C_GW0004 (1.2 Bq/L), SB_MW02_OB-INT_GW0004 (0.662 Bq/L), SB_MW03_BR-B_GW0003 (0.941 Bq/L), and SB_MW03_OB-INT_GW0003 (0.868 Bq/L), however, the sample SB_MW03_BR-C_GW0004 exceeded the HC-CDWQG for both gross alpha and gross beta (4.24 Bq/L and 3.03 Bq/L respectively).

Tritium (^{3}H) and Carbon-14 (^{14}C)

Tritium and Carbon-14 are naturally occurring radionuclides at very low levels and contribute to natural radioactivity exposure to Canadians. However, these radionuclides have been introduced in greater concentrations into the global environment via the use and expansion of nuclear technologies over the past 60 years, and in particular due to nuclear weapon testing prior to 1963. Therefore, tritium as an example, is an important parameter to measure and baseline, because its presence and concentration provides insight to the relative "age" or atmospheric interconnection/origin of a groundwater sample, depending on its origin and exposure within the hydrological system prior to, or during activities that occurred globally related to the nuclear industry.

Health Canada has a recommended Maximum Allowable Concentration (MAC) in water for Tritium of 7000 Bq/L or 834.33 T.U. All samples submitted for analysis had reported concentrations of <0.8 T.U., except for samples SB_MW02_BR-C with a concentration of 2.1 T.U. and SB_MW03_BR-B with a concentration of 0.9 T.U., both below the HC-CDWQG MAC.

For Carbon-14 results, as mentioned earlier in section 3.5.1, Carbon-14 was analyzed by Accelerator Mass Spectrometry (AMS), and the results of Carbon-14 for all samples collected during the *current monitoring period* were reported in the pmC (Percent Modern Carbon) units and were in the range between 33.6 and 91.0 pmC.

Chlorine Isotope ($\delta^{37}Cl$)

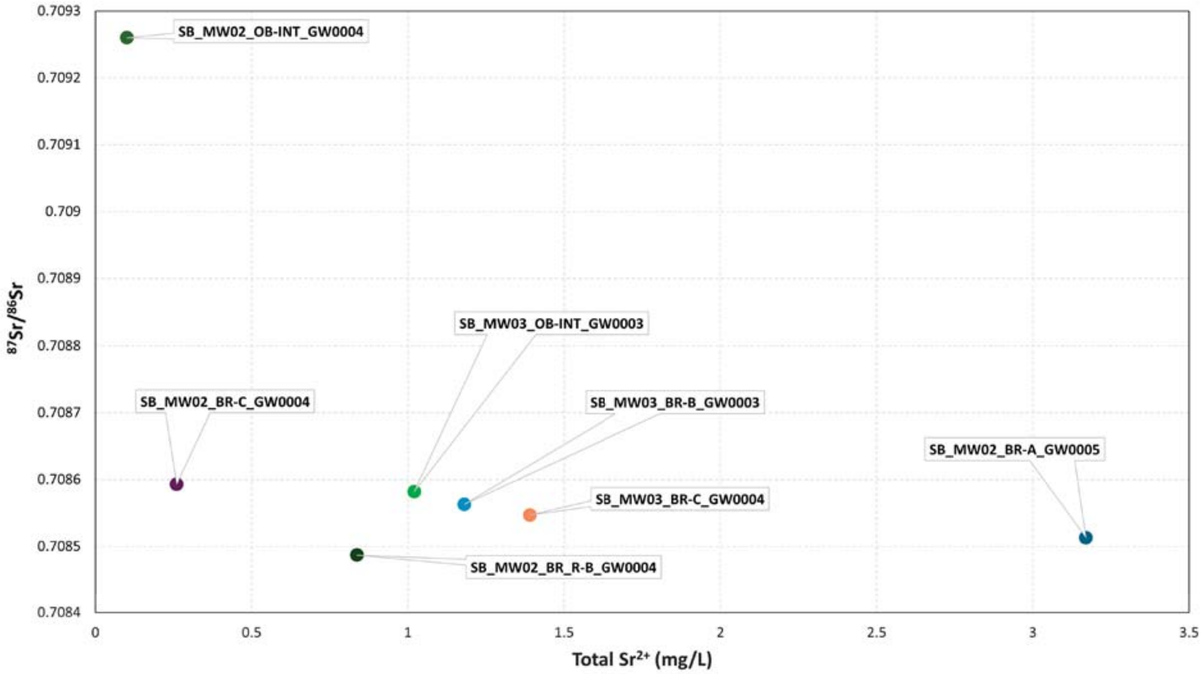
The stable isotope of Chlorine (Cl) has been used to estimate the origin of salts and fluids which help in characterization of groundwater. The $\delta^{37}Cl$ results ranged from a low of -1.37‰ in SB_MW03_BR-C_GW0004 monitoring the dolostone bedrock of the Lucas Formation, to a high of 0.23‰ in the SB_MW02_BR-C_GW0004 which also is taken from the dolostone bedrock of Lucas Formation.

Strontium Isotope Ratio $^{87}Sr/^{86}Sr$

The $^{87}Sr/^{86}Sr$ ratio reflects the source of Sr in the rock and water. The present $^{87}Sr/^{86}Sr$ ratio in seawater is a relatively constant value of 0.709 (Qing et al. 1998). The Upper Devonian (Lucas and Amherstburg Formations) strontium isotope curve varies according to Qing et al. 1998, between 0.7077 and 0.7087.

The samples collected during the *current monitoring period* have an overall variation in $^{87}Sr/^{86}Sr$ with a low of 0.708487 in the Amherstburg Formation bedrock well SB_MW02_BR_R-Bto a high of 0.70926 in the overburden well SB_MW02_OB-INT. These Strontium isotope ratios are within the typical range for groundwater from the Lucas and Amherstburg formations.

FIGURE 15: STRONTIUM ISOTOPIC RATIOS VS. TOTAL SR^{2+} CONCENTRATIONS



5.0 SUMMARY

The NWMO Groundwater Monitoring of Shallow Well Network study objective at the South Bruce site was to measure groundwater pressures and temperatures on a quarterly basis, from the installed dataloggers, and to collect groundwater samples for their chemical analyses. This information is collected to allow NWMO to evaluate the shallow groundwater system behavior and geochemical characteristics.

The field work for the South Bruce site started in the beginning of the third quarter (Q3) of year 2022, i.e., in the month of July, followed by two additional field events in September and December 2022. The first field event of 2023 was completed during the first quarter (Q1) month of March, followed by field events conducted in each quarter of rest of the year (Q2, Q3 and Q4). The final field event discussed in this report was conducted during Q1 of 2024 at the South Bruce site. Each groundwater monitoring and sampling event involved the collection of groundwater pressure measurements and baseline groundwater samples from a selection of the 26 permanently installed shallow groundwater monitoring wells. The quarterly groundwater quality testing included the analysis of parameters including dissolved metals, routine parameters (see Table 2 for complete list of parameters) nutrients, iodide, stable isotopes of oxygen and hydrogen ($\delta^{18}O$ and $\delta^{2}H$). An annual sample (during both 2022 and 2023) from two shallow groundwater monitoring well sites was collected and analyzed for dissolved ruthenium and other specialized radioactive isotopes such as oxygen-18, deuterium, tritium, carbon-14, chlorine-37 and strontium ratio Sr^{87}/Sr^{86}.

The predominant groundwater type at the South Bruce site is calcium-magnesium-bicarbonate (Ca-Mg-HCO_3) however, elevated concentrations of chloride and sulphate ions were also detected in several samples in the entire dataset. The samples characterized by Ca-Mg-HCO_3 water type were from all depth intervals at the Site including the overburden (OB), Lucas Formation (dolostone) – (Interval C), Amherstburg Formation (limestone) – (Interval B), and Bois Blanc (limestone) Formation – (Interval A). The second most observed water type is Ca-Mg- SO_4-HCO_3 due to sulphate (SO4) ions being more prevalent than bicarbonate ions. This water type was observed in samples collected from the bedrock intervals at SB_MW04 and SB_MW02. No obvious trends of concentration changes with time were observed for major ions (Cl, Na, and SO_4) in samples collected at the South Bruce site. Generally increasing concentrations of major ions were seen with increasing depth at two locations: monitoring well location SB_MW05, where chloride and sodium concentrations increased from the overburden interval to the deepest bedrock interval A; and monitoring well location SB_MW06 where chloride, sodium and sulphate increased from the overburden interval to bedrock interval B (however, the deepest bedrock interval A had lower concentrations of these ions). In contrast, decreasing chloride and sodium concentrations were seen at monitoring well location SB_MW07 where the highest concentrations of chloride and sodium were observed in the overburden interval, whereas lower concentrations were observed at the deeper bedrock intervals (i.e. A and B). The 2023-2024 concentrations of all major ions were observed to be consistent with the 2022 data.

Elevated nitrate concentrations were found in most of the overburden groundwater wells and in one upper bedrock interval (MW02) and may be due to the agricultural activities in the area surrounding the South Bruce site and region in general. Nitrate concentrations were also detected at depth in the bedrock at MW07.

Generally, oxygen-18 ($\delta^{18}O$) and deuterium ($\delta^{2}D$) isotope analyses indicated that the shallow groundwater is largely recharged from modern regional precipitation. Other isotopes measured during the reporting period, including tritium (^{3}H), carbon-14 (^{14}C), chlorine-37 $\delta^{37}Cl$, and strontium isotope ratio $^{87}Sr/^{86}Sr$, were all within the expected values for groundwaters of the shallow bedrock aquifer, however, gross alpha and gross beta values were above the health Canada Drinking Water Guidelines and were outside the expected range of values.

6.0 REFERENCES

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APPENDIX A

Durov Plots

DUROV PLOTS – (Q3 July 2022 to Q1 2024)

Q3 July 2022 samples

Overburden Interval C Interval B Interval A

Q3 September 2022 samples

Overburden Interval C Interval B Interval A

Q4 2022 samples

Overburden Interval C Interval B Interval A

Q1 2023 samples

Overburden Interval C Interval B Interval A

Q2 2023 samples

Overburden Interval C Interval B Interval A

Q3 2023 samples

Overburden Interval C Interval B Interval A

Q4 2023 samples

Overburden Interval C Interval B Interval A

Q1 2024 samples

Overburden Interval C Interval B Interval A

FIGURE A1: MW01 DUROV (ALL FIELD EVENTS)

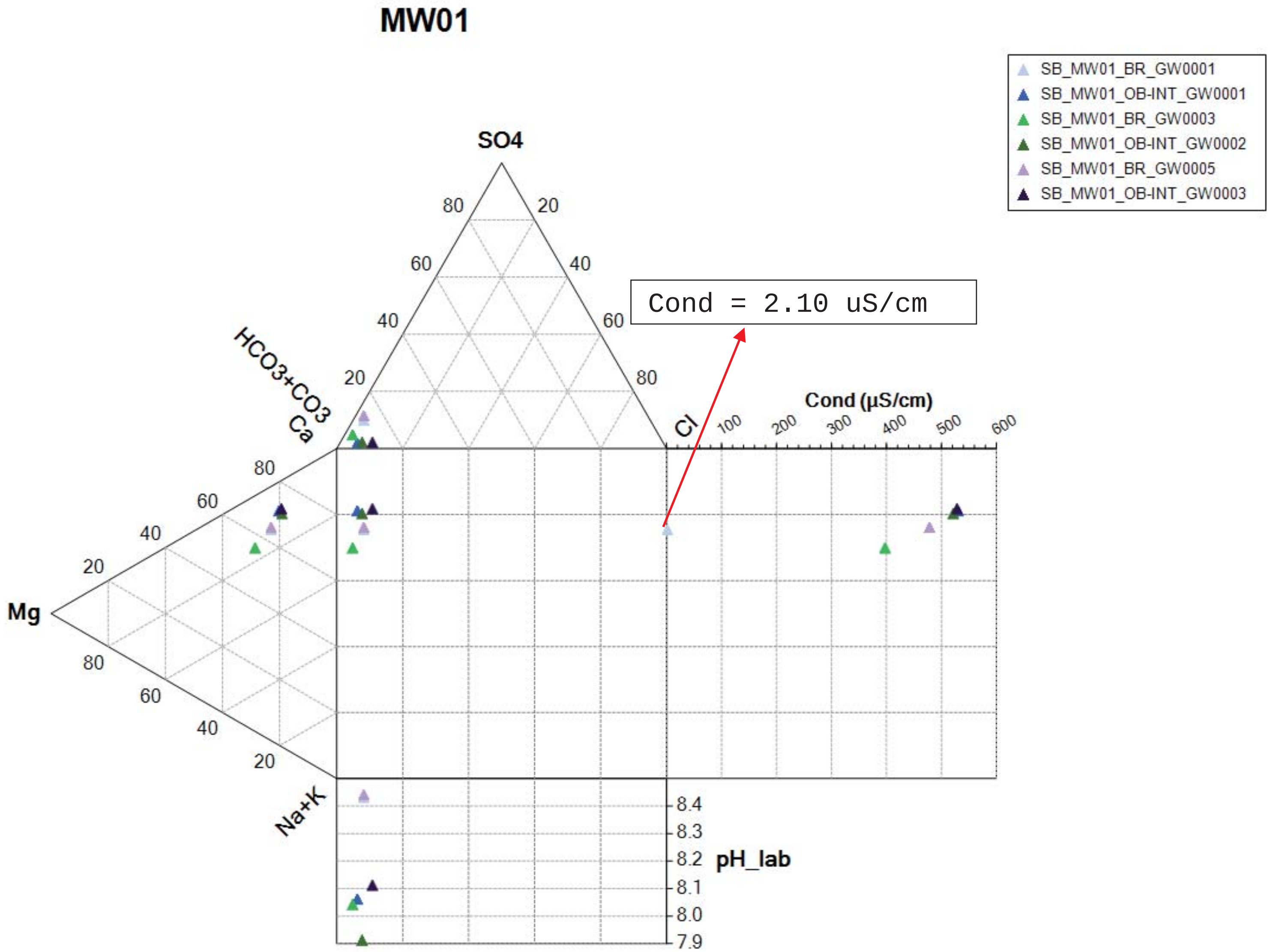


FIGURE A2: MW02 DUROV (ALL FIELD EVENTS)

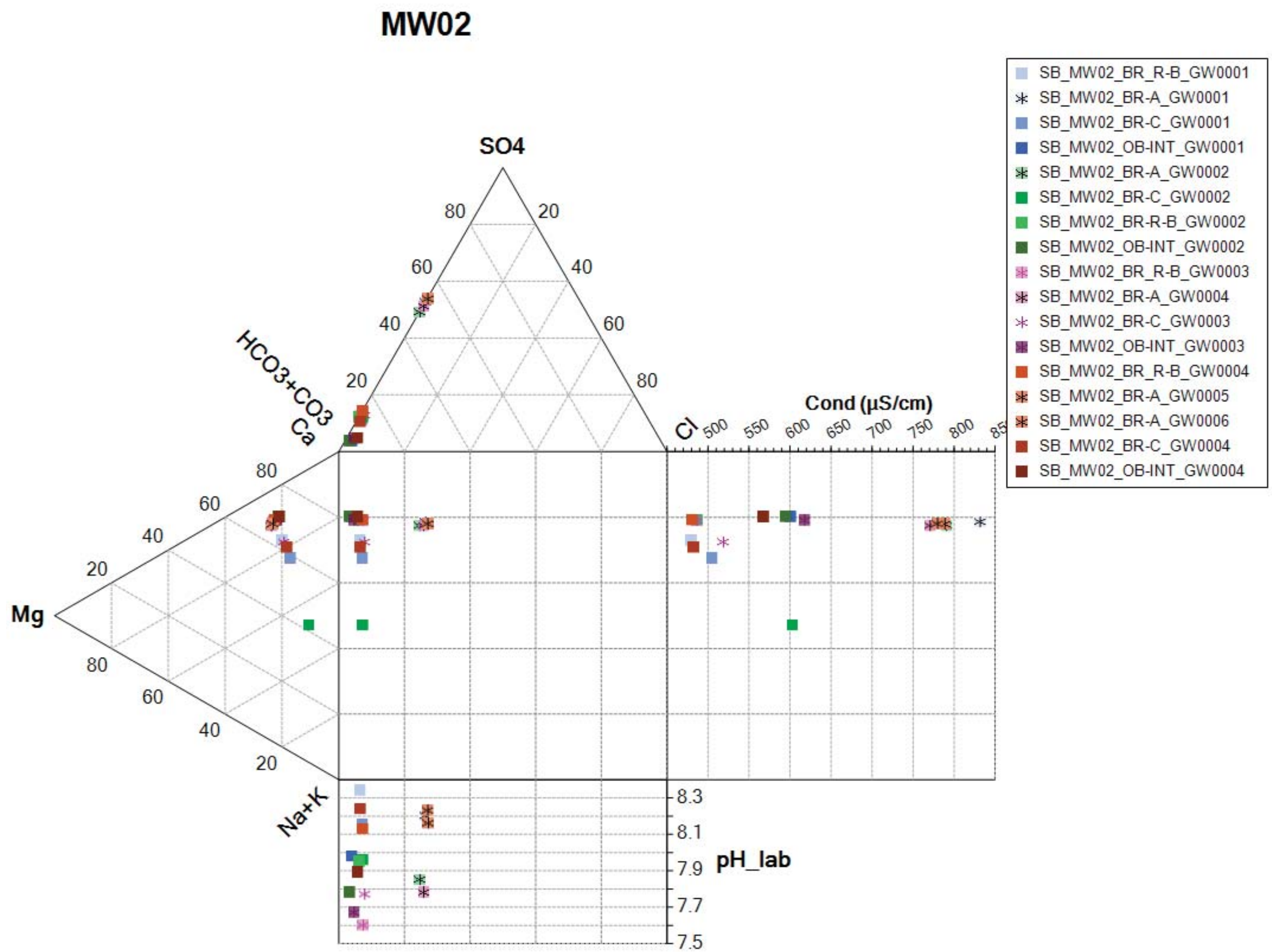


FIGURE A3: MW03 DUROV (ALL FIELD EVENTS)

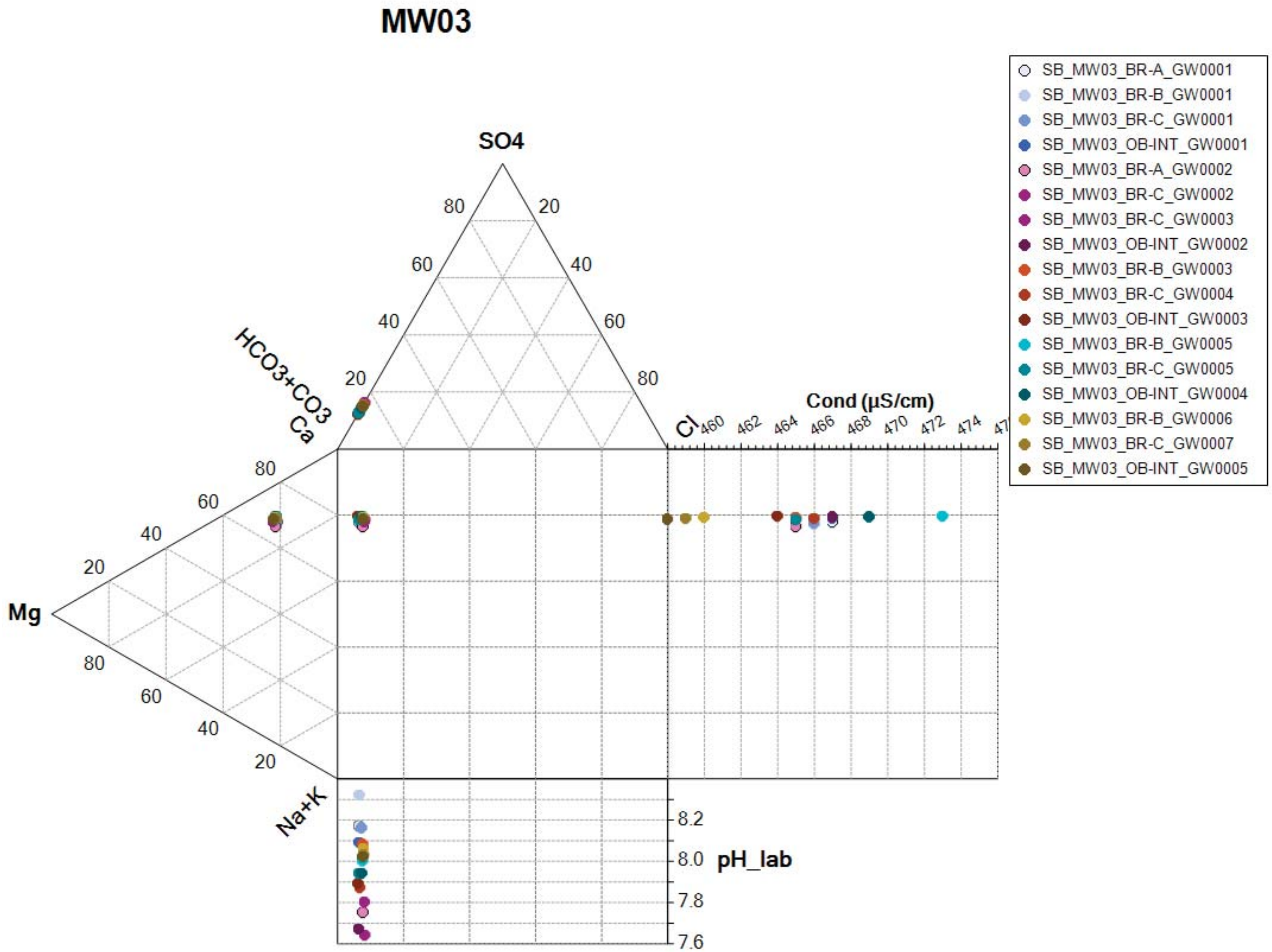


FIGURE A4: MW04 DUROV (ALL FIELD EVENTS)

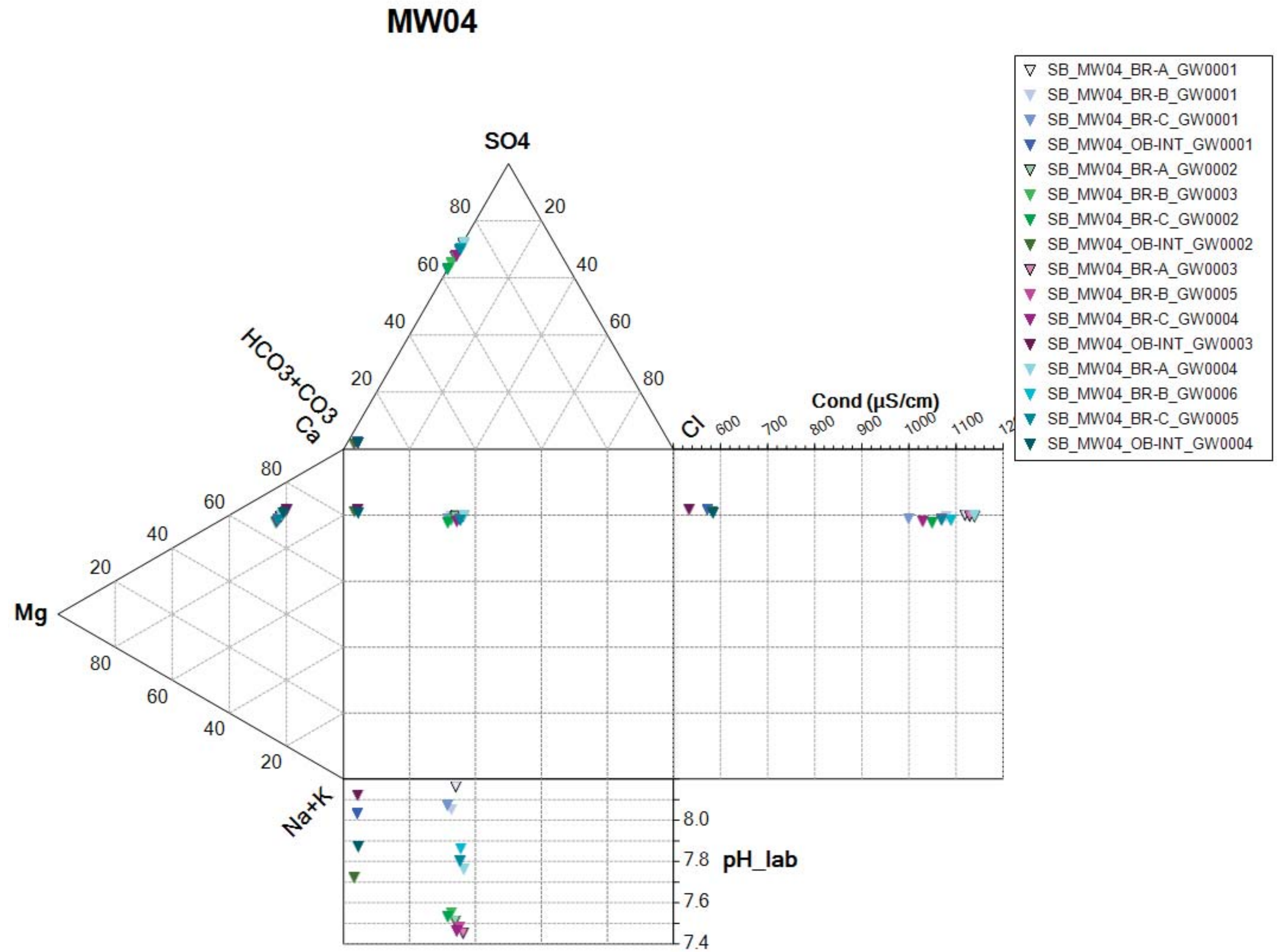


FIGURE A5: MW05 DUROV (ALL FIELD EVENTS)

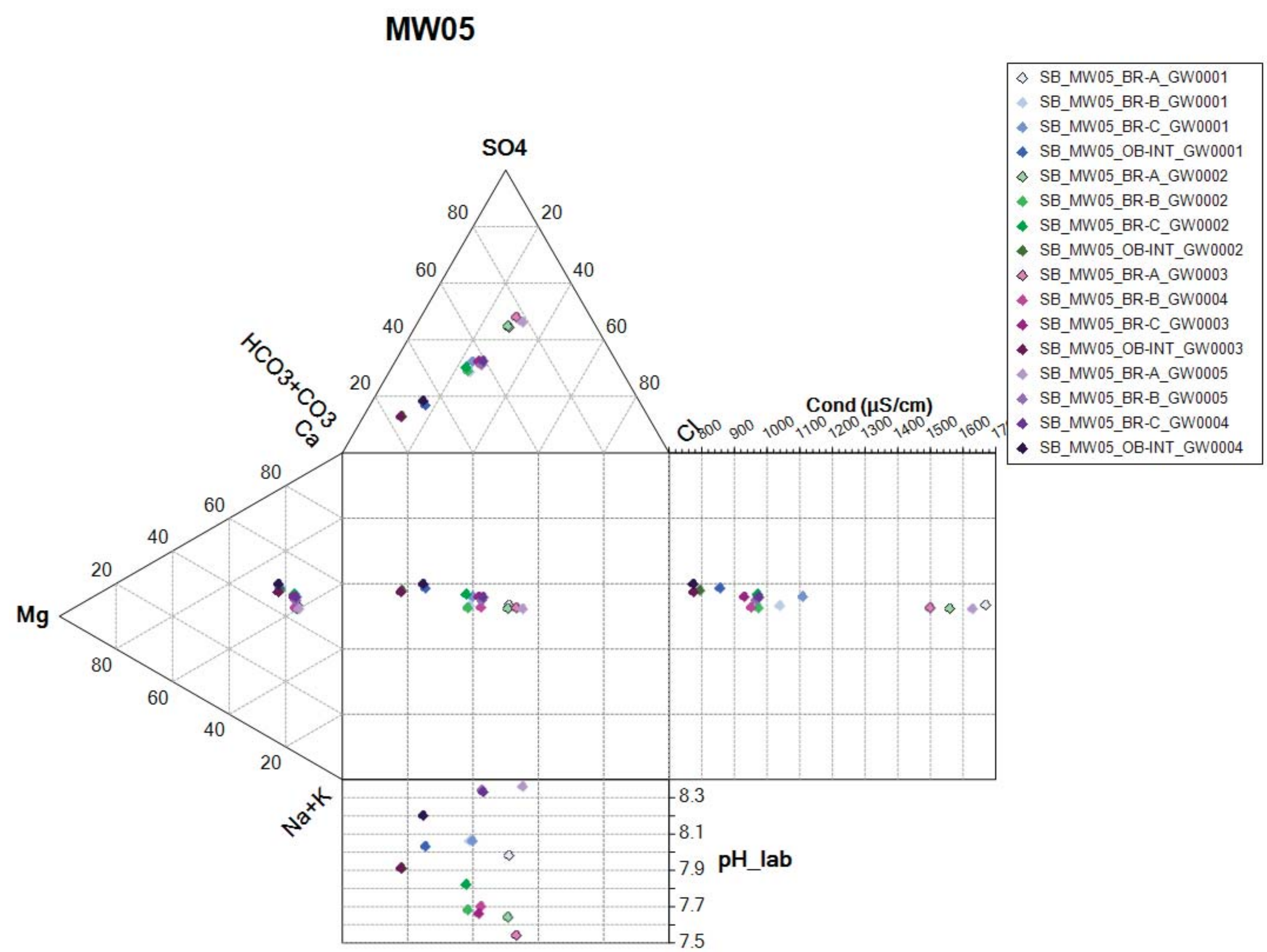


FIGURE A6: MW06 DUROV (ALL FIELD EVENTS)

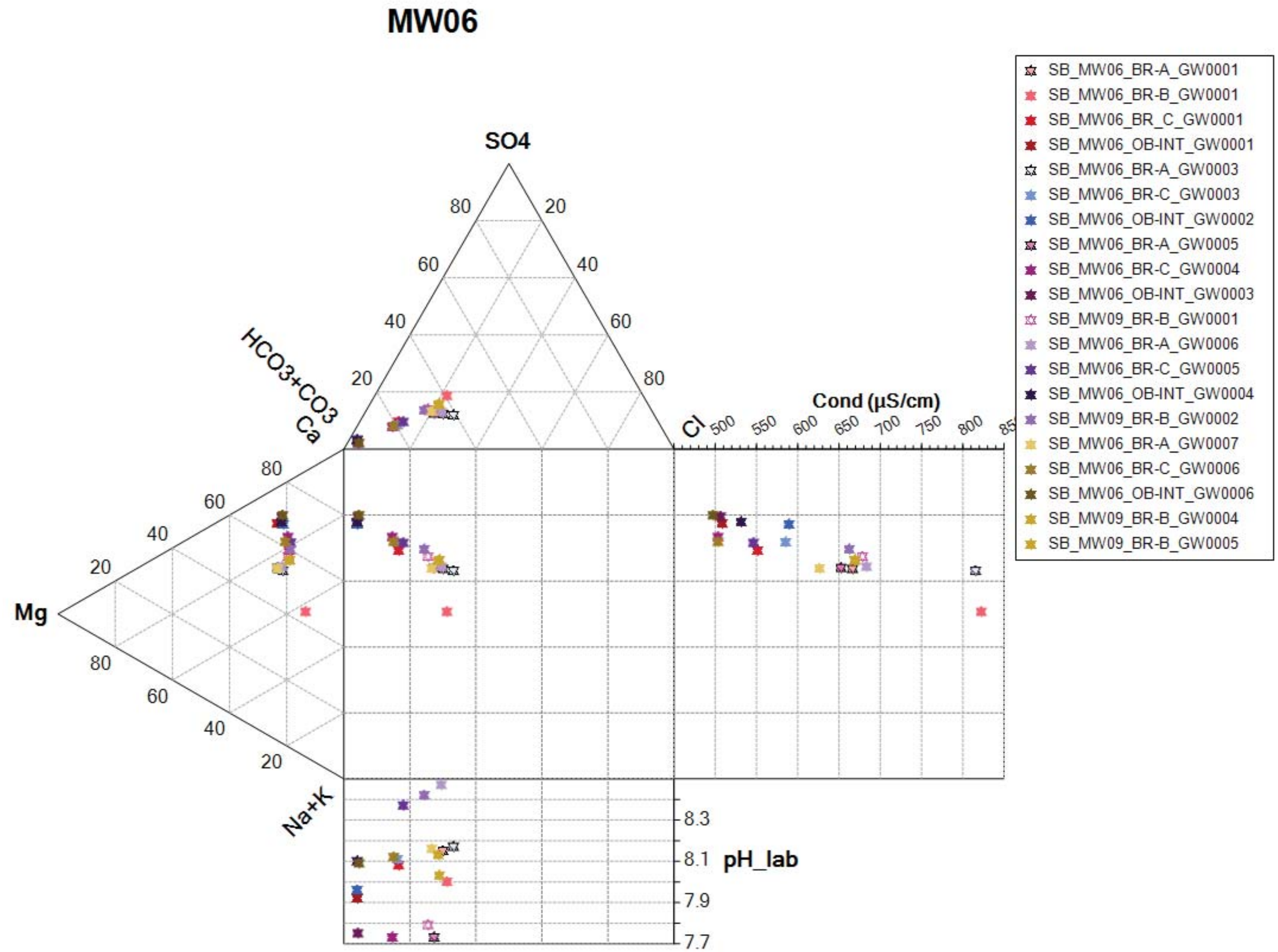


FIGURE A7: MW07 DUROV (ALL FIELD EVENTS)

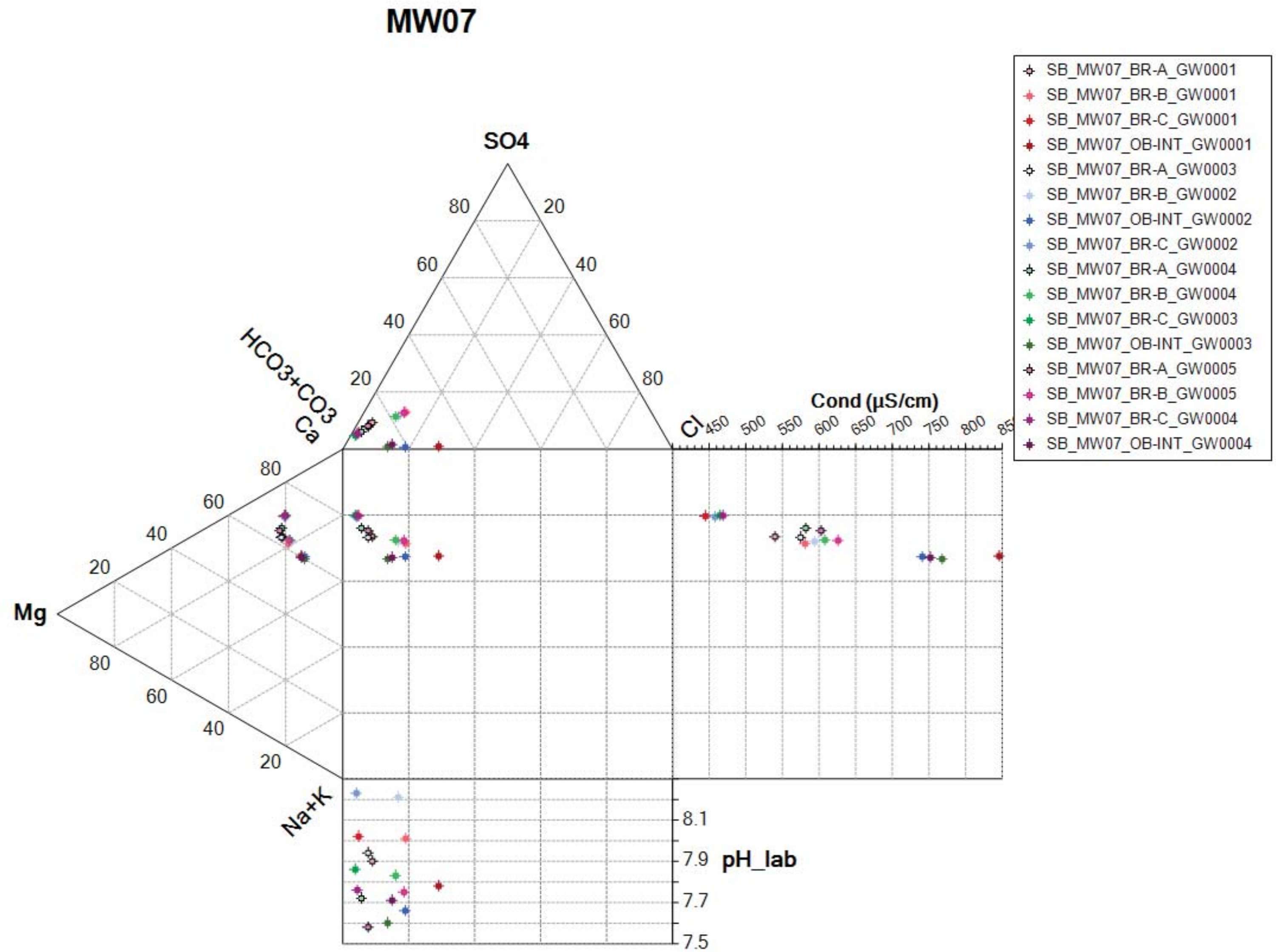


FIGURE A8: OVERBURDEN WELLS DUROV (ALL FIELD EVENTS)

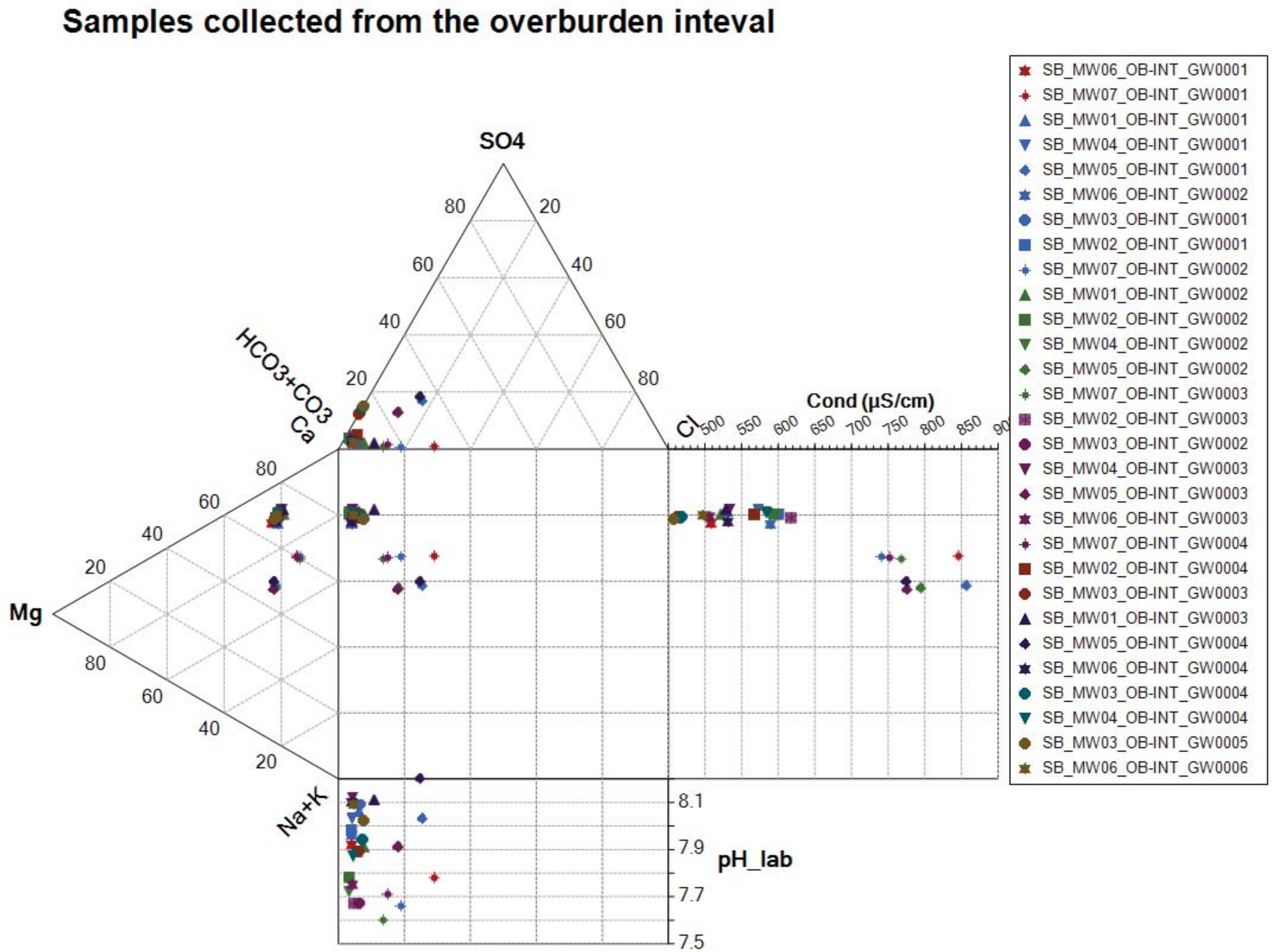


FIGURE A9: C-INTERVAL WELLS DUROV (ALL FIELD EVENTS)

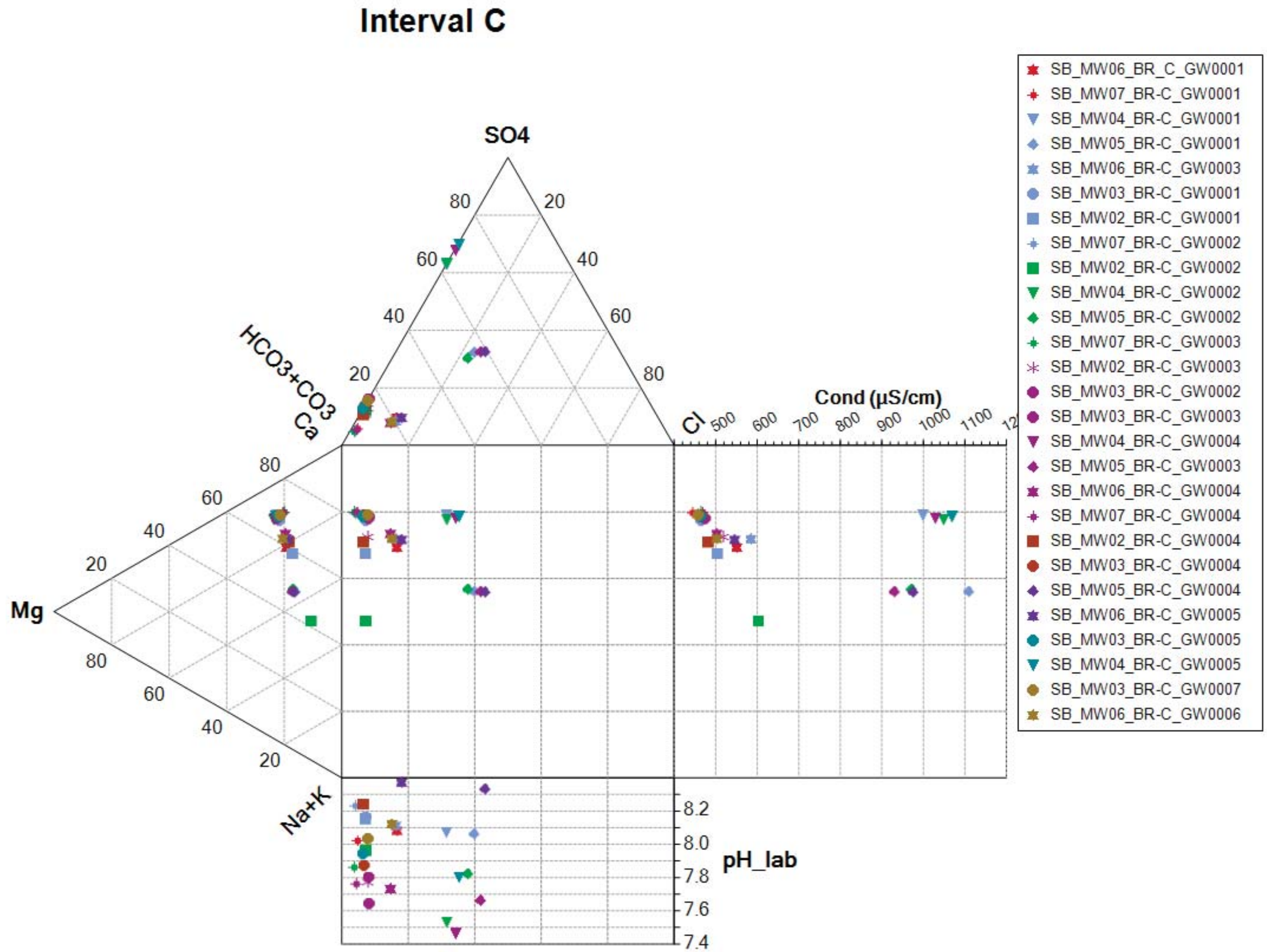


FIGURE A10: B-INTERVAL WELLS DUROV (ALL FIELD EVENTS)

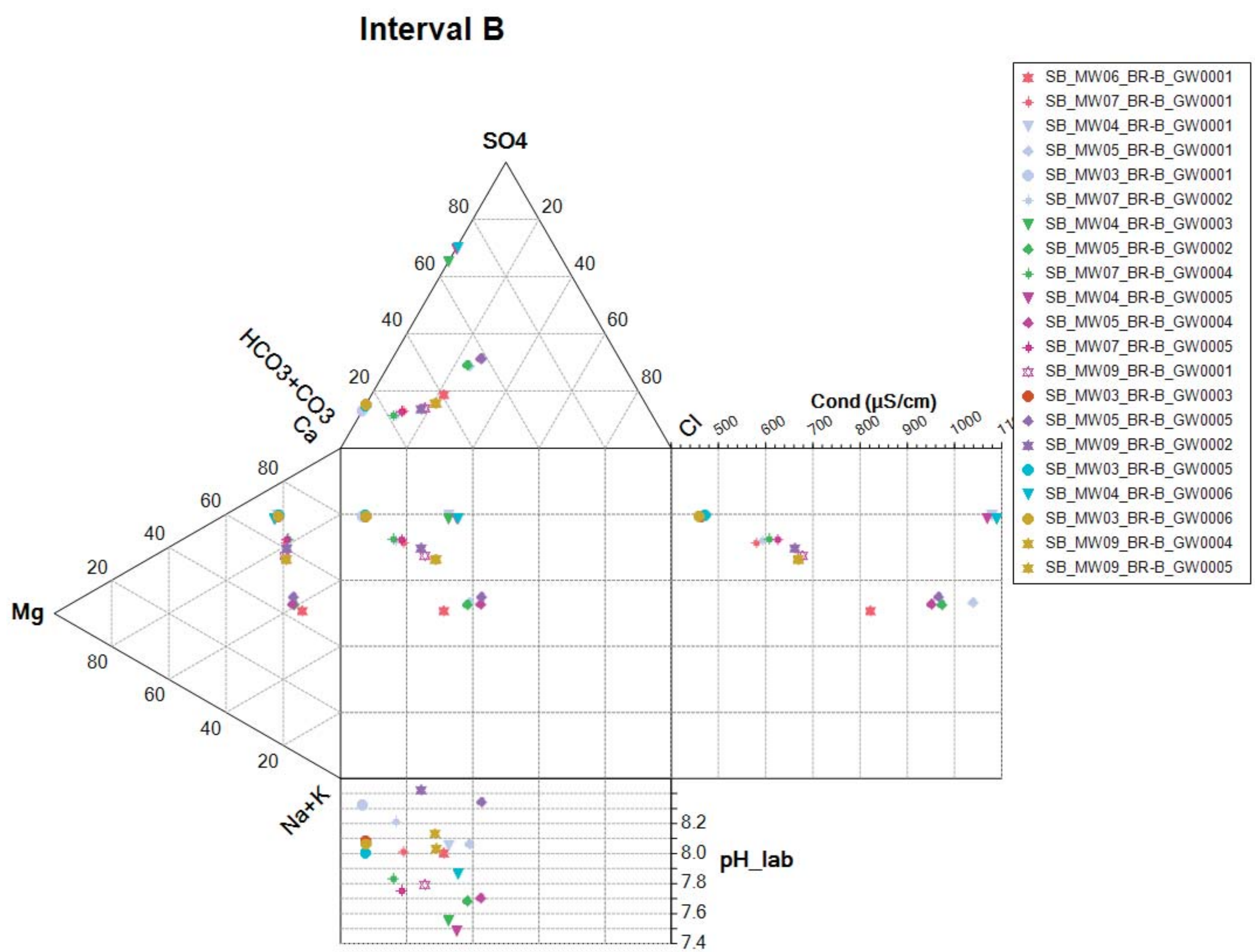


FIGURE A11: A-INTERVAL WELLS DUROV (ALL FIELD EVENTS)

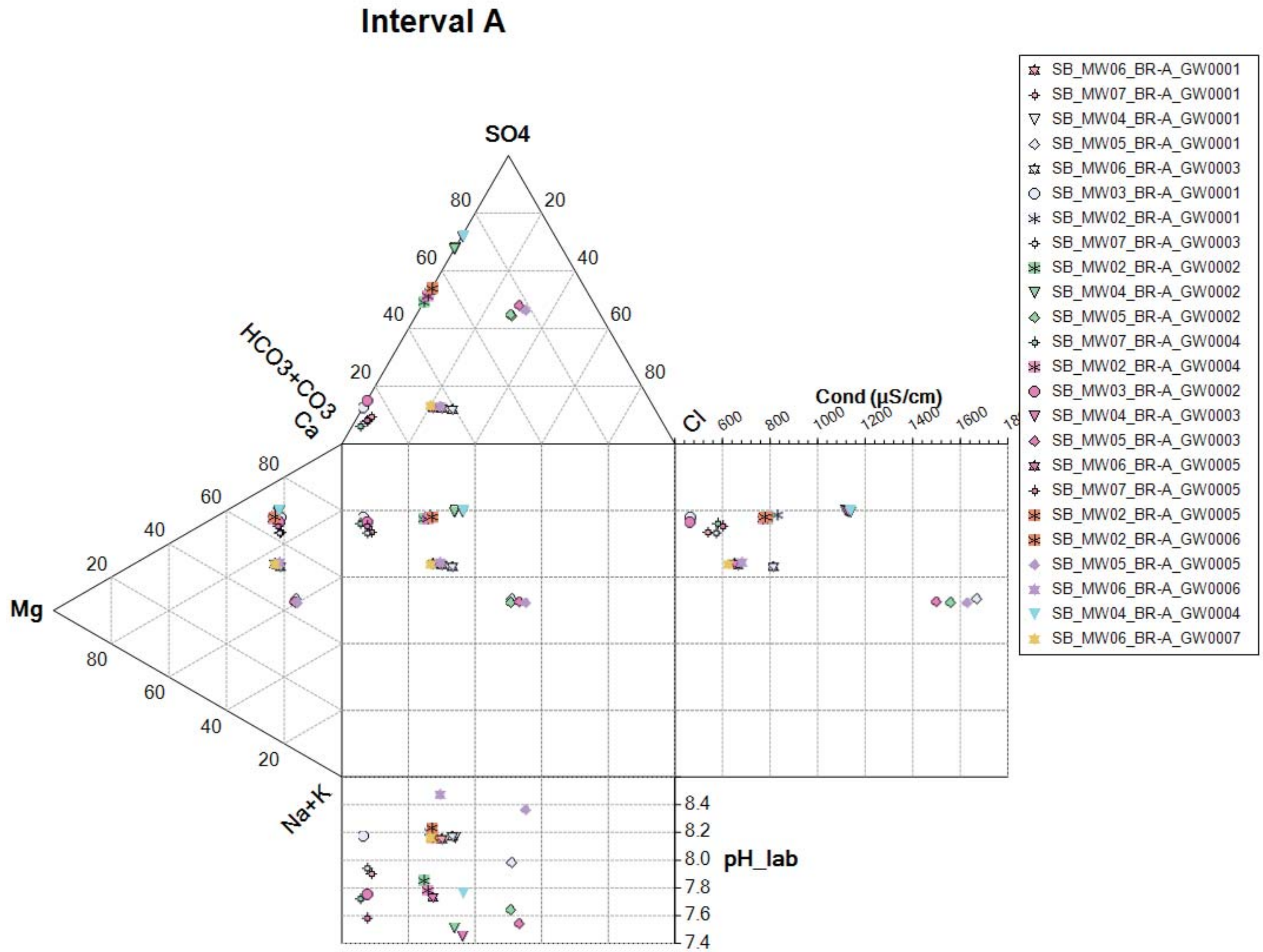
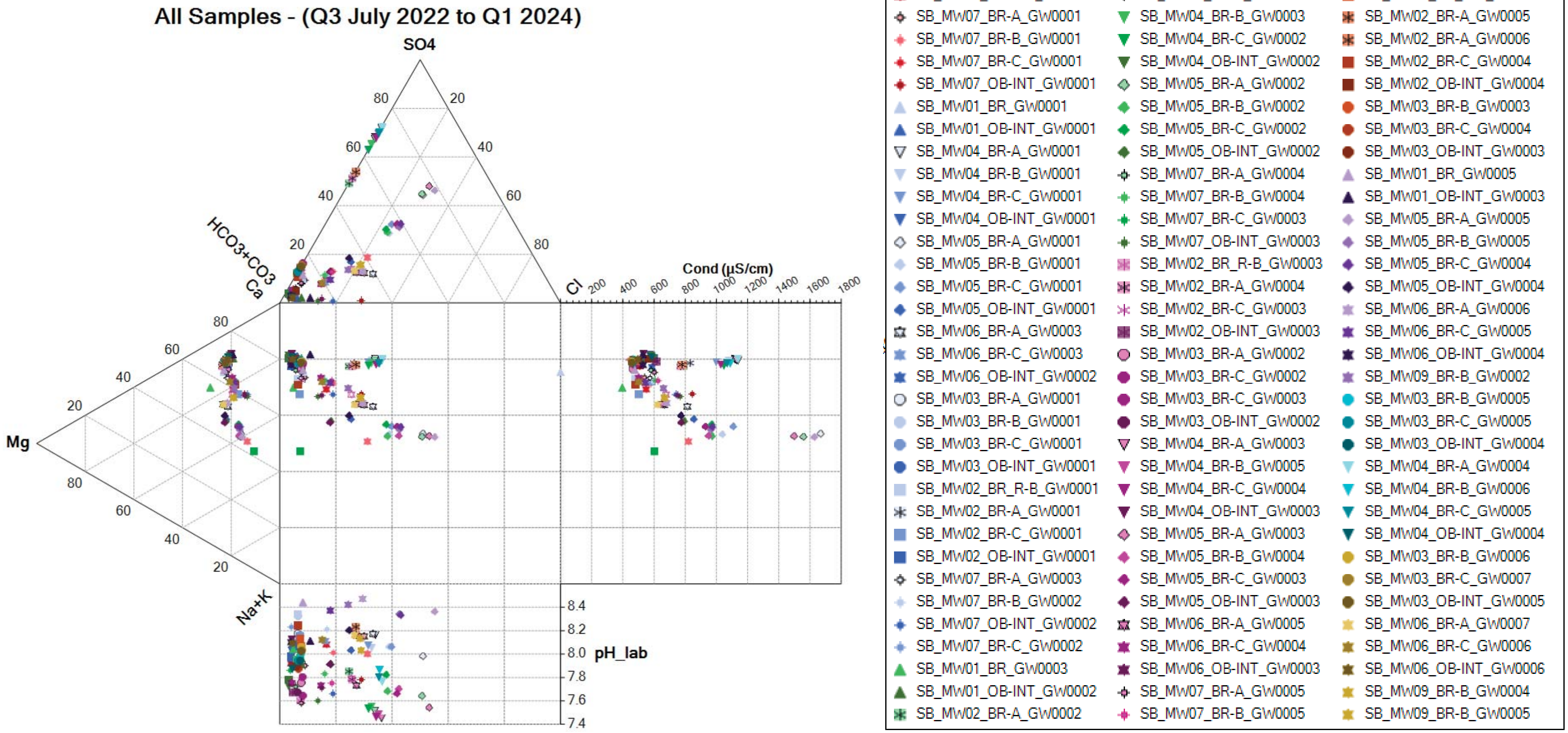


FIGURE A12: ALL WELLS DUROV (ALL FIELD EVENTS)



APPENDIX B

Stiff Diagrams

FIGURE B1: STIFF DIAGRAMS FOR WELLS SB_MW01_OB-INT

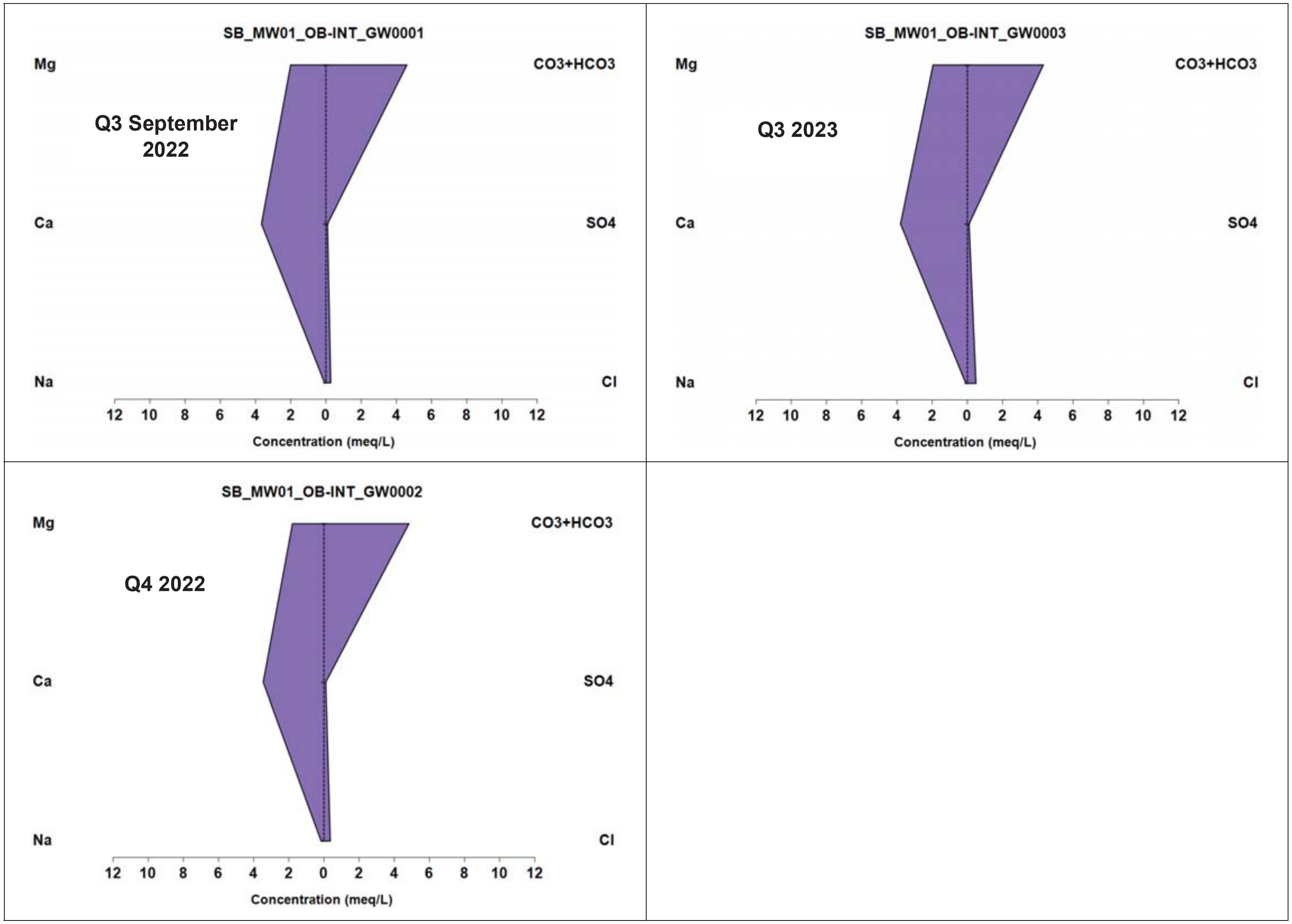


FIGURE B2: STIFF DIAGRAMS FOR WELLS SB_MW01_BR

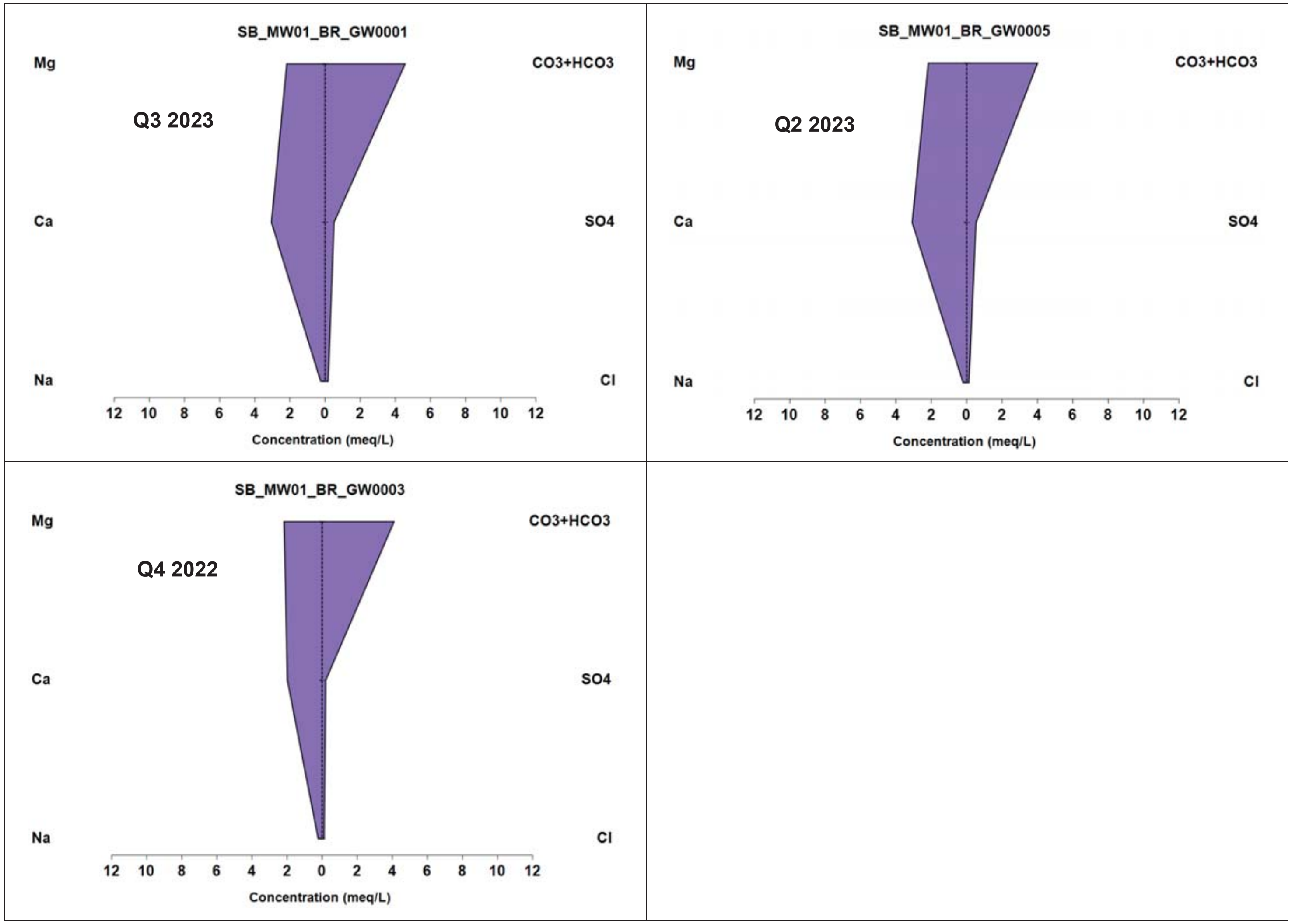


FIGURE B3: STIFF DIAGRAMS FOR WELLS SB_MW02_OB-INT

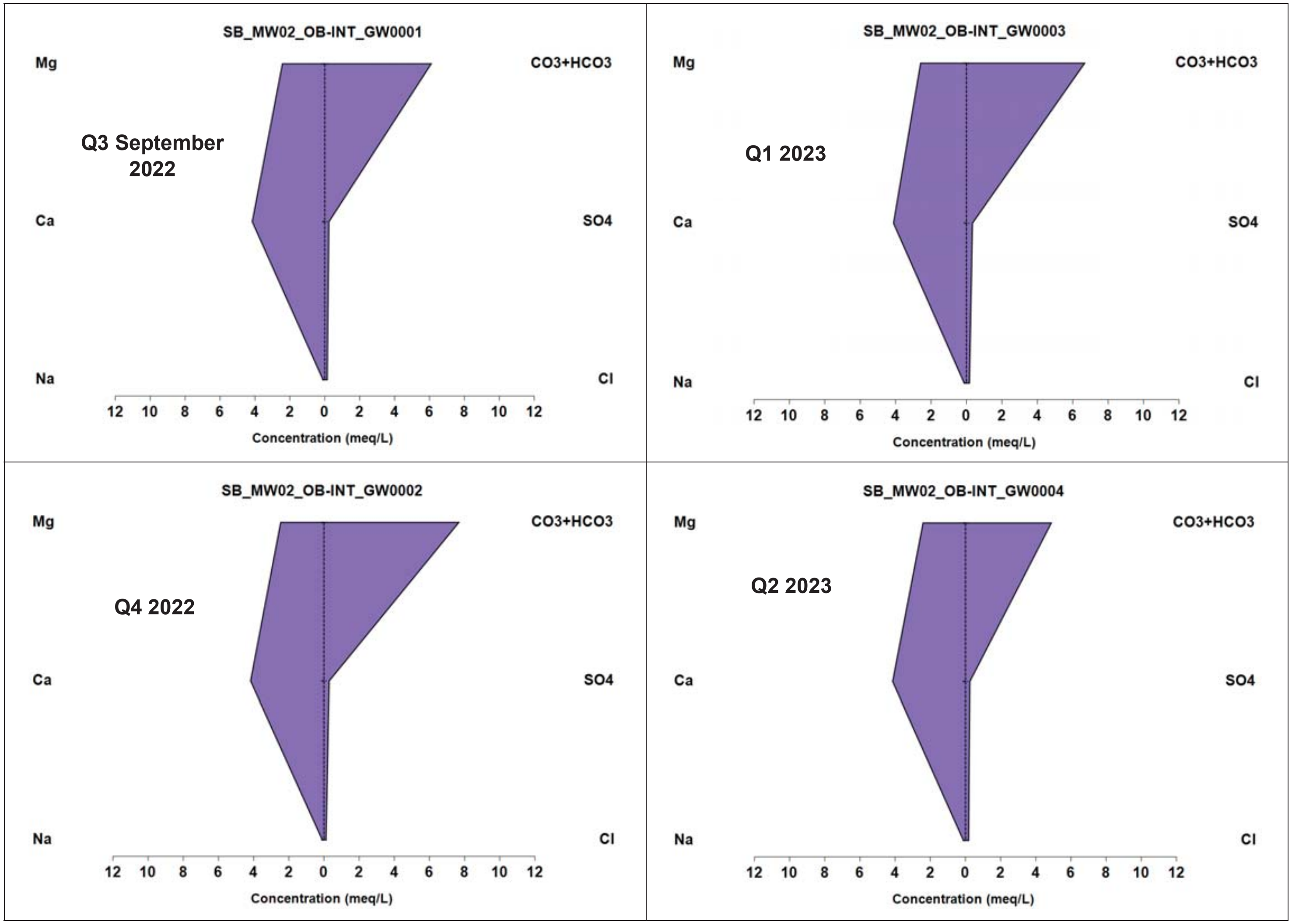


FIGURE B4: STIFF DIAGRAMS FOR WELLS SB_MW02_BR-C

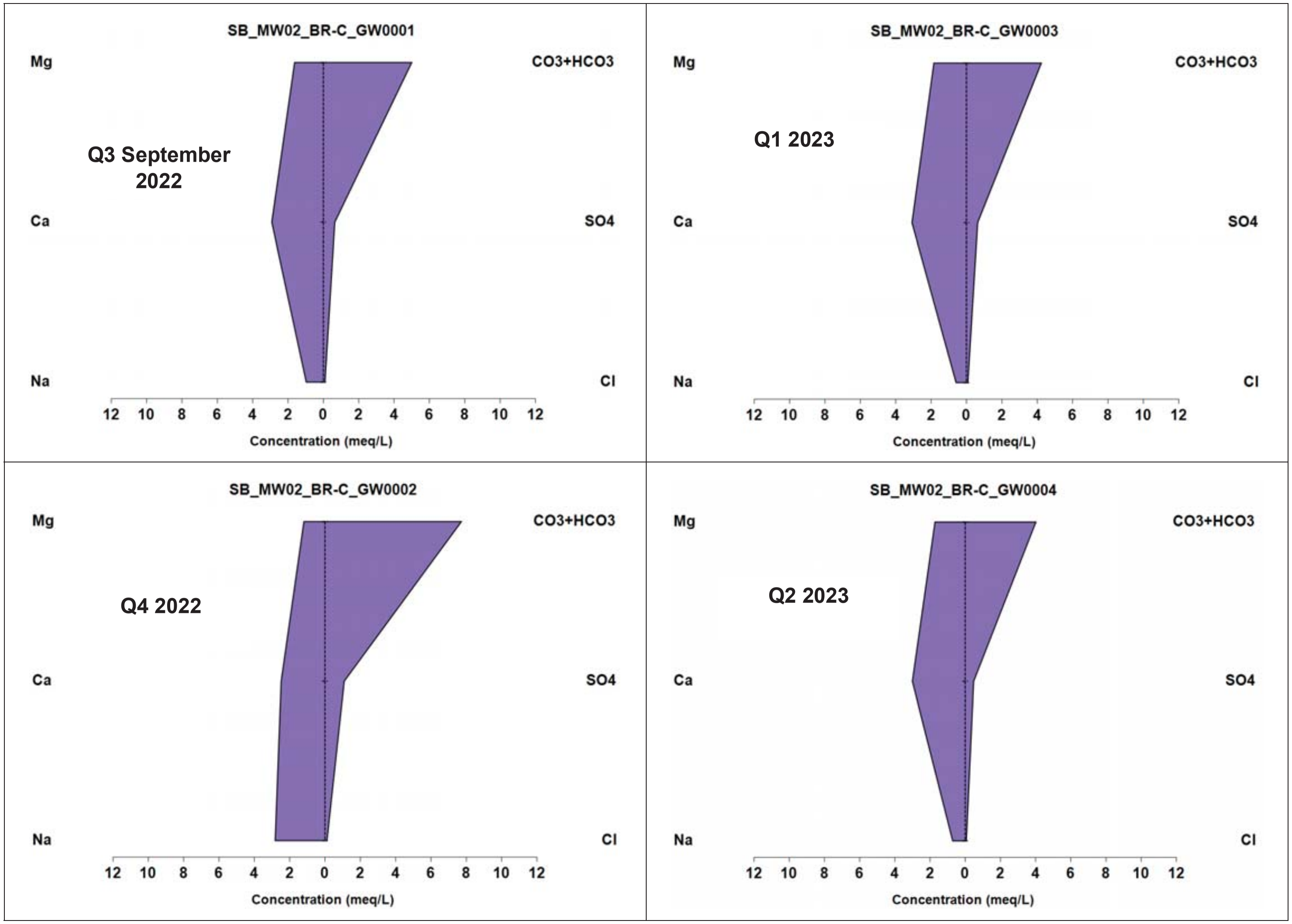


FIGURE B5: STIFF DIAGRAMS FOR WELLS SB_MW02_BR-R-B

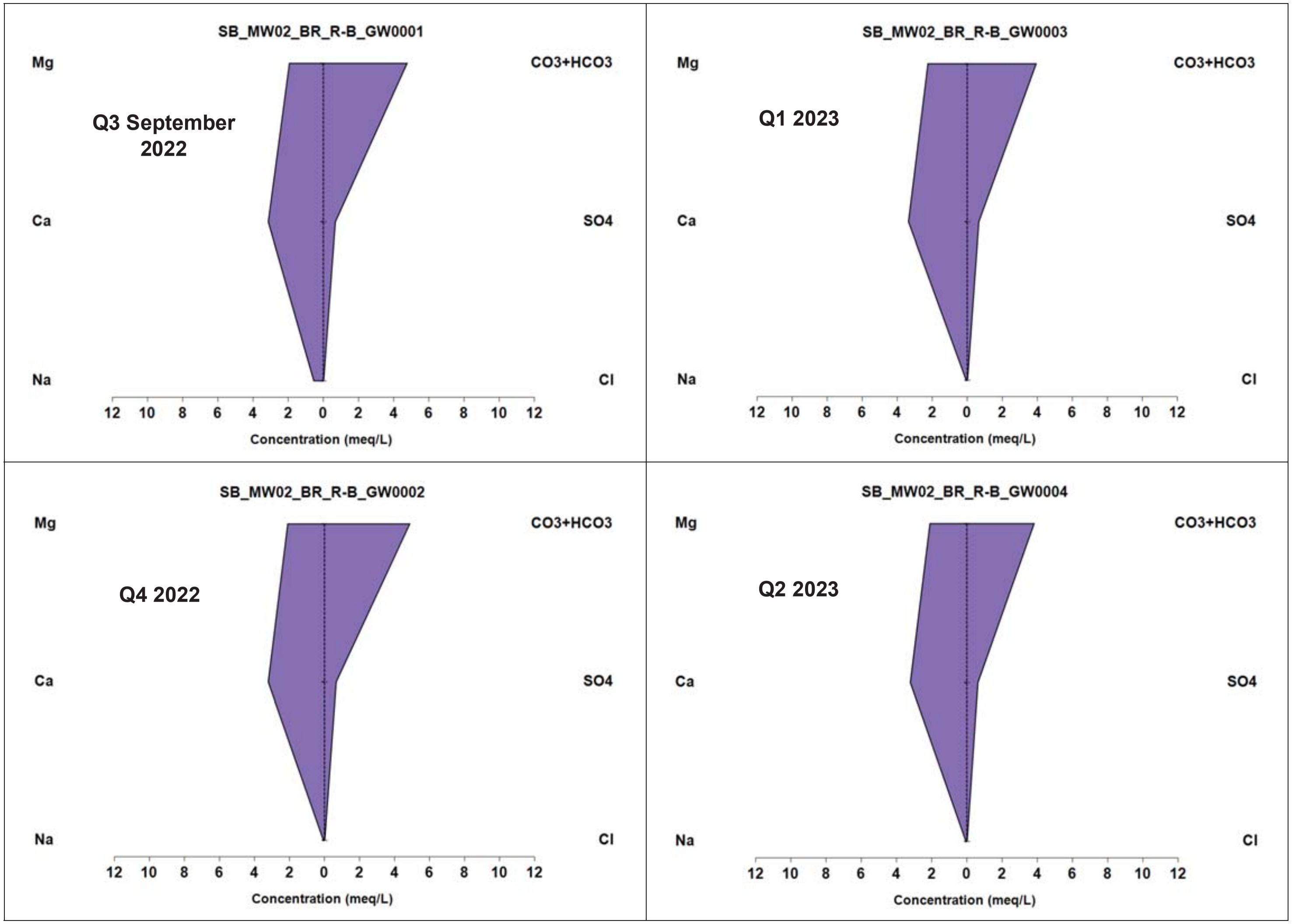


FIGURE B6: STIFF DIAGRAMS FOR WELLS SB_MW02_BR-A

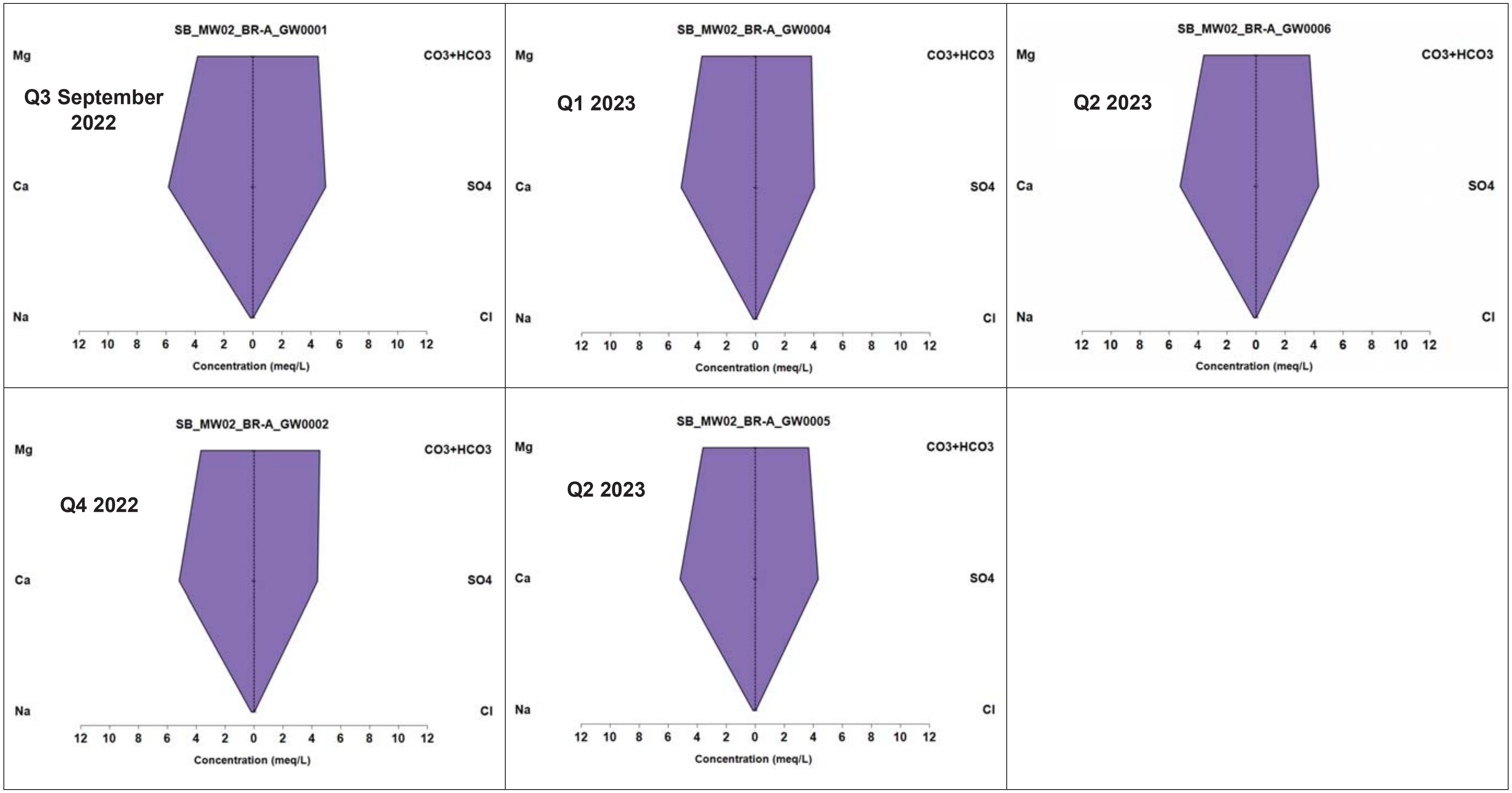


FIGURE B7: STIFF DIAGRAMS FOR WELLS SB_MW03_OB-INT

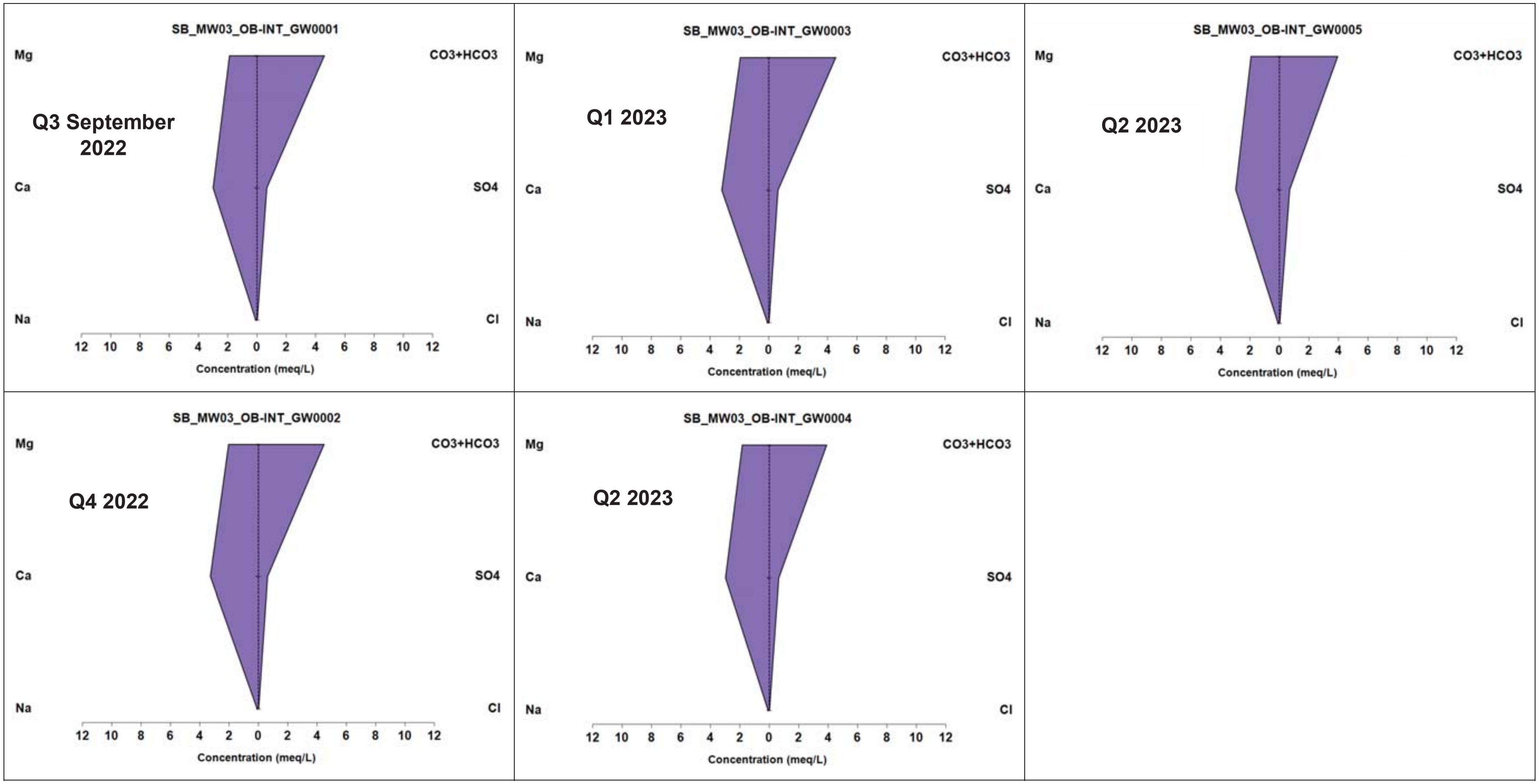


FIGURE B8: STIFF DIAGRAMS FOR WELLS SB_MW03_BR-C

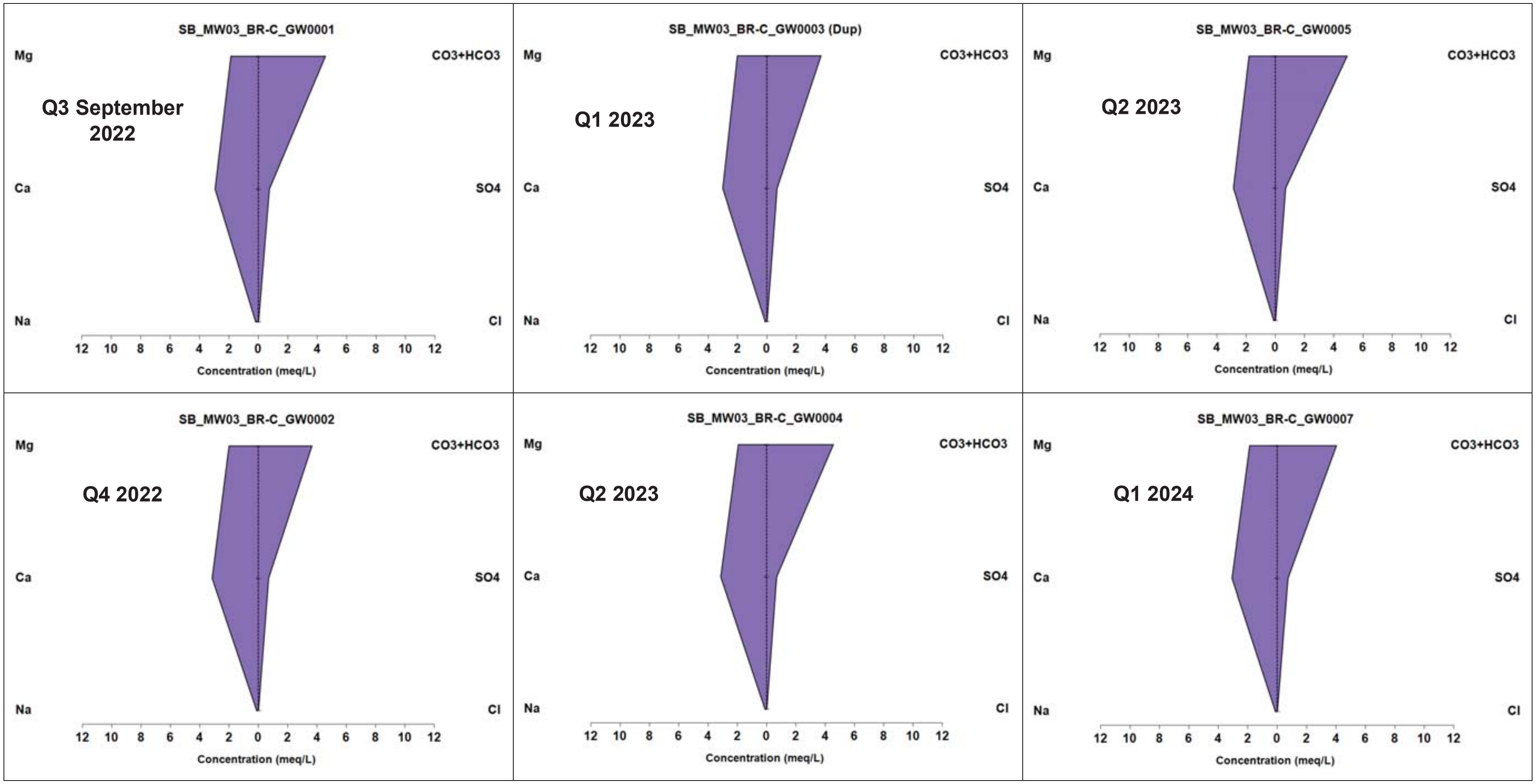


FIGURE B9: STIFF DIAGRAMS FOR WELLS SB_MW03_BR-B

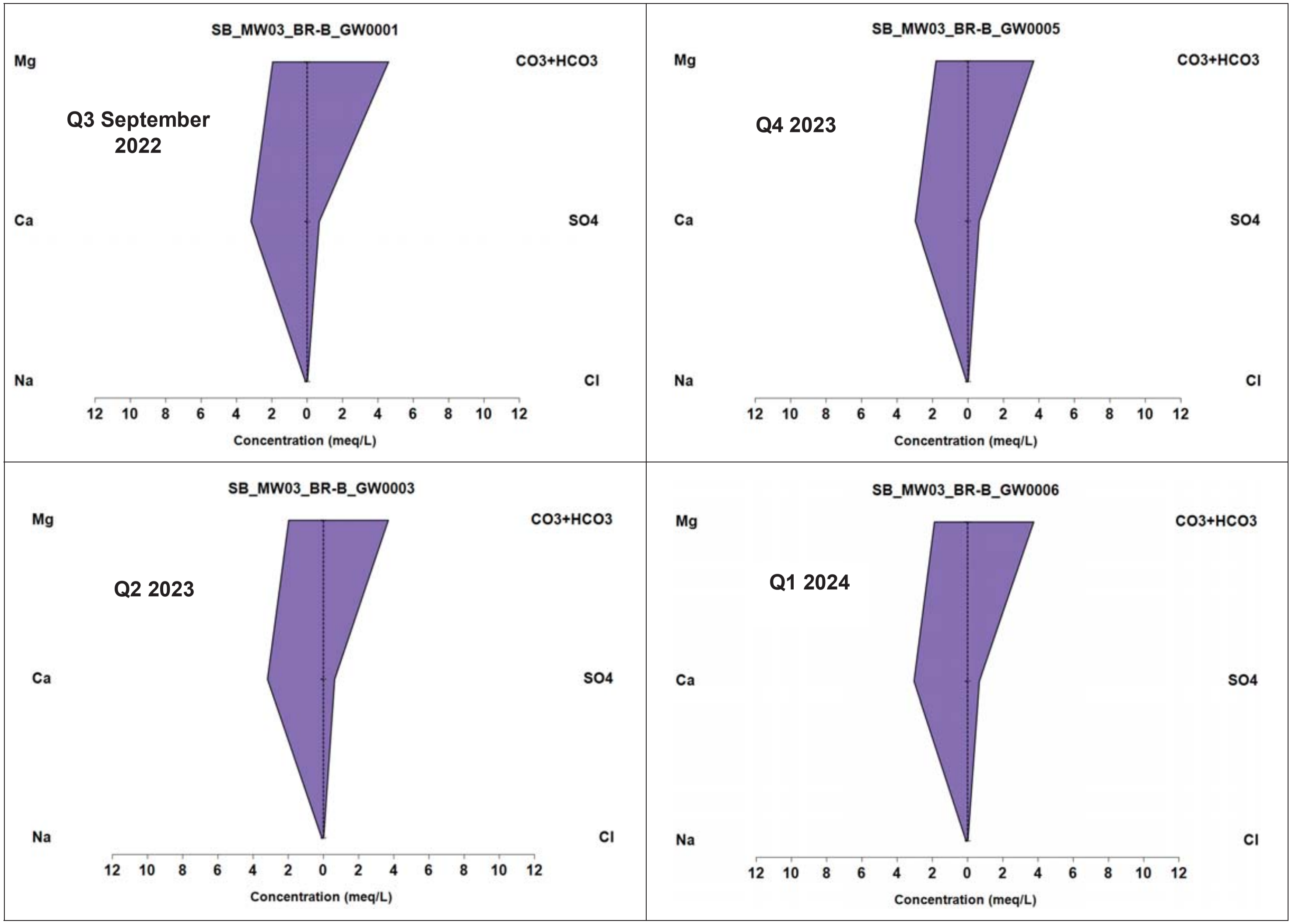


FIGURE B10: STIFF DIAGRAMS FOR WELLS SB_MW03_BR-A

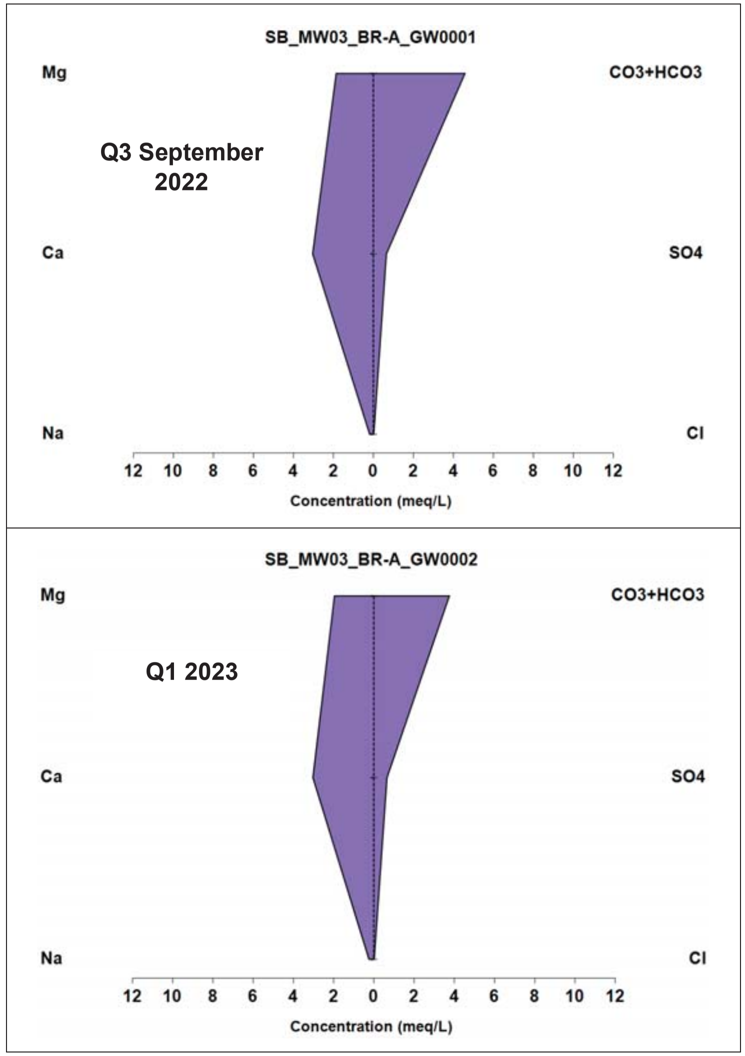


FIGURE B11: STIFF DIAGRAMS FOR WELLS SB_MW04_OB-INT

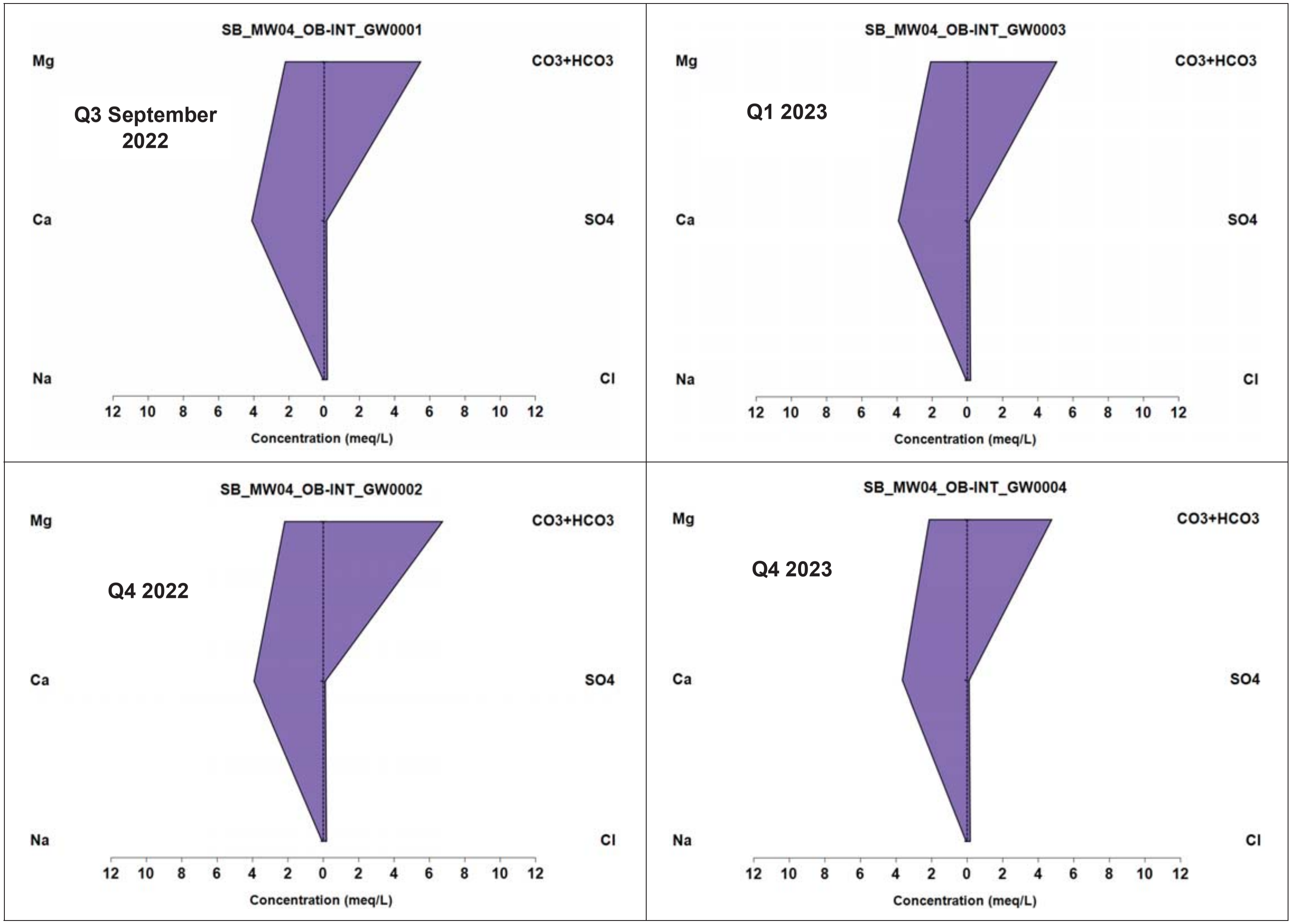


FIGURE B12: STIFF DIAGRAMS FOR WELLS SB_MW04_BR-C

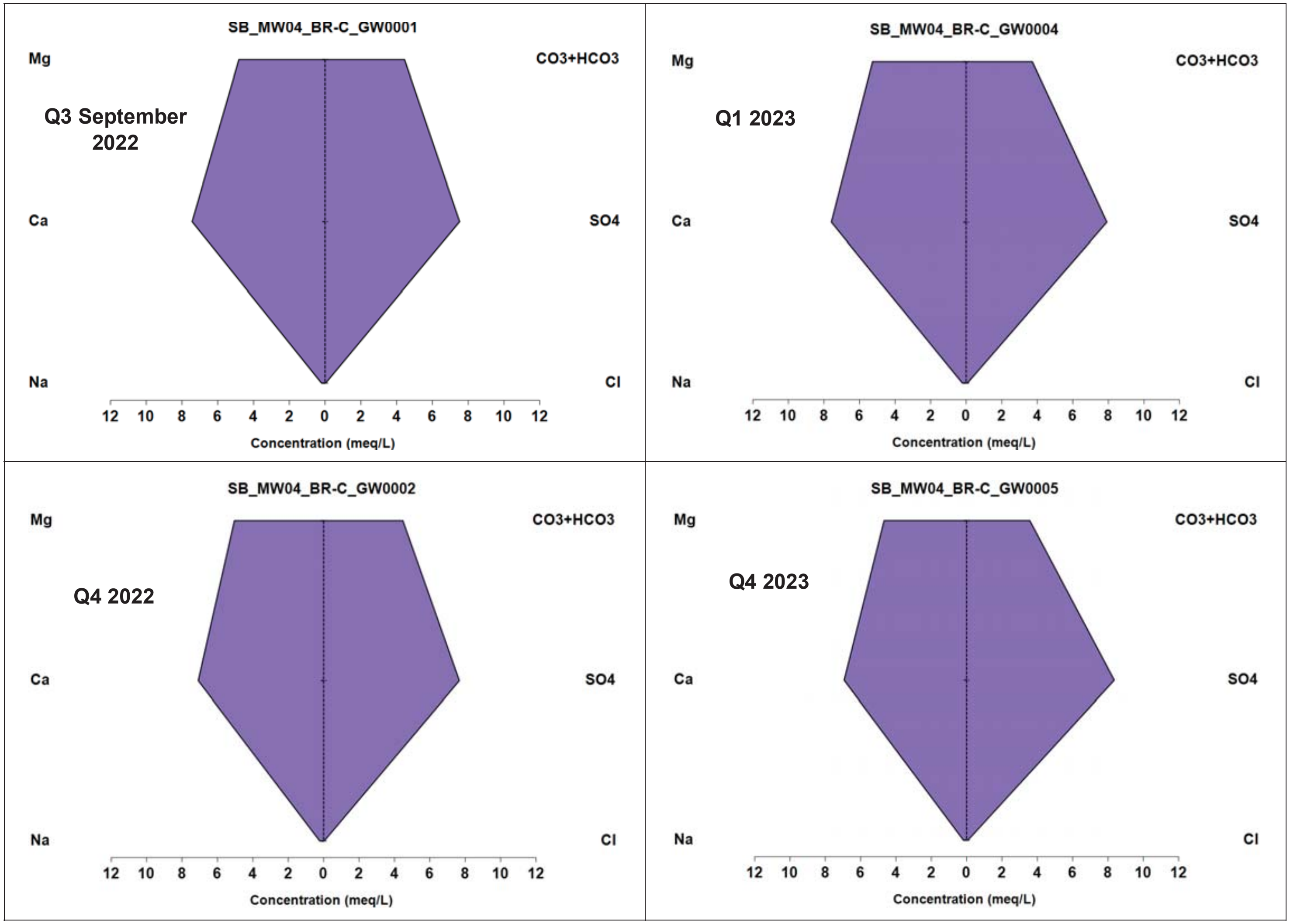


FIGURE B13: STIFF DIAGRAMS FOR WELLS SB_MW04_BR-B

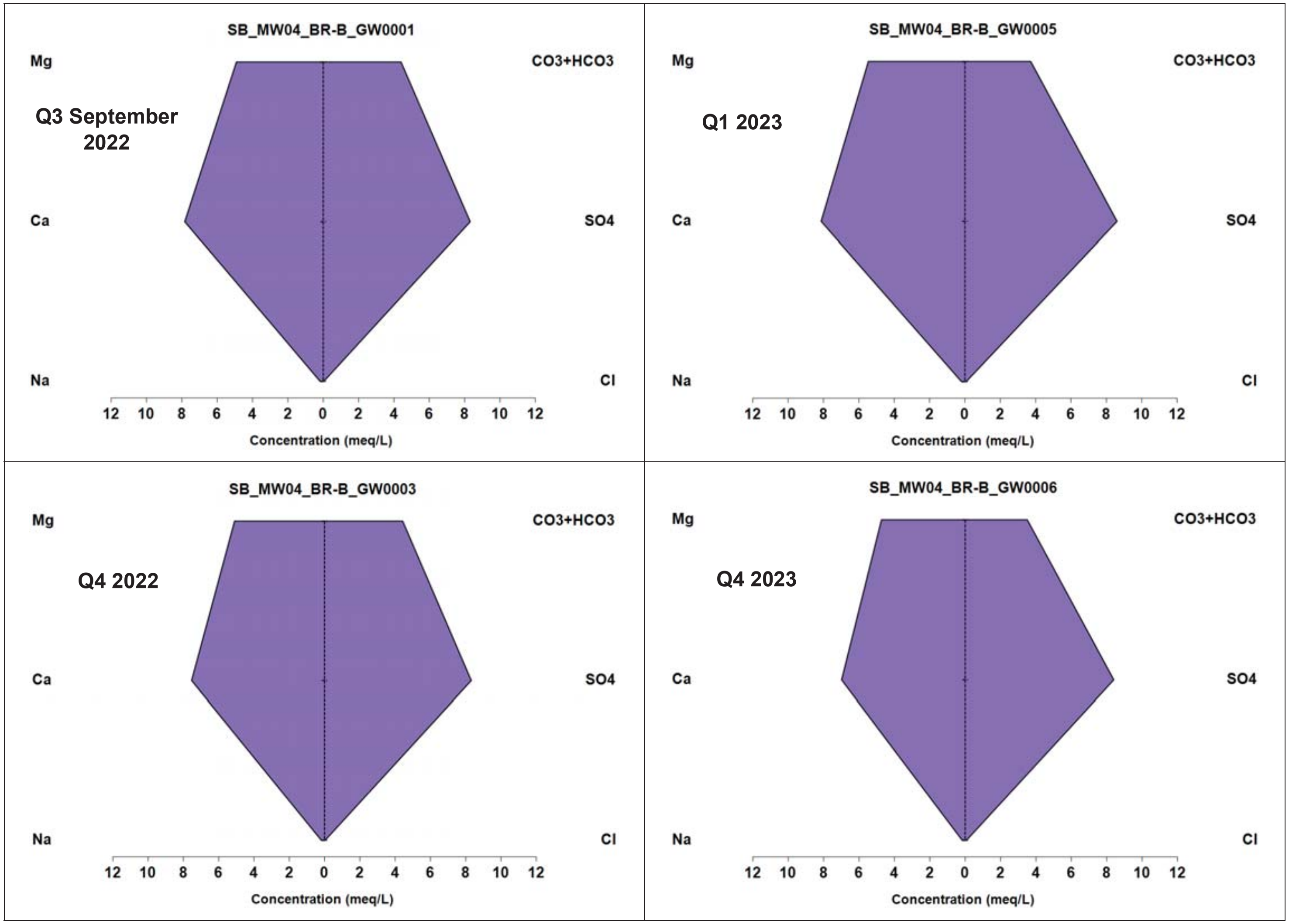


FIGURE B14: STIFF DIAGRAMS FOR WELLS SB_MW04_BR-A

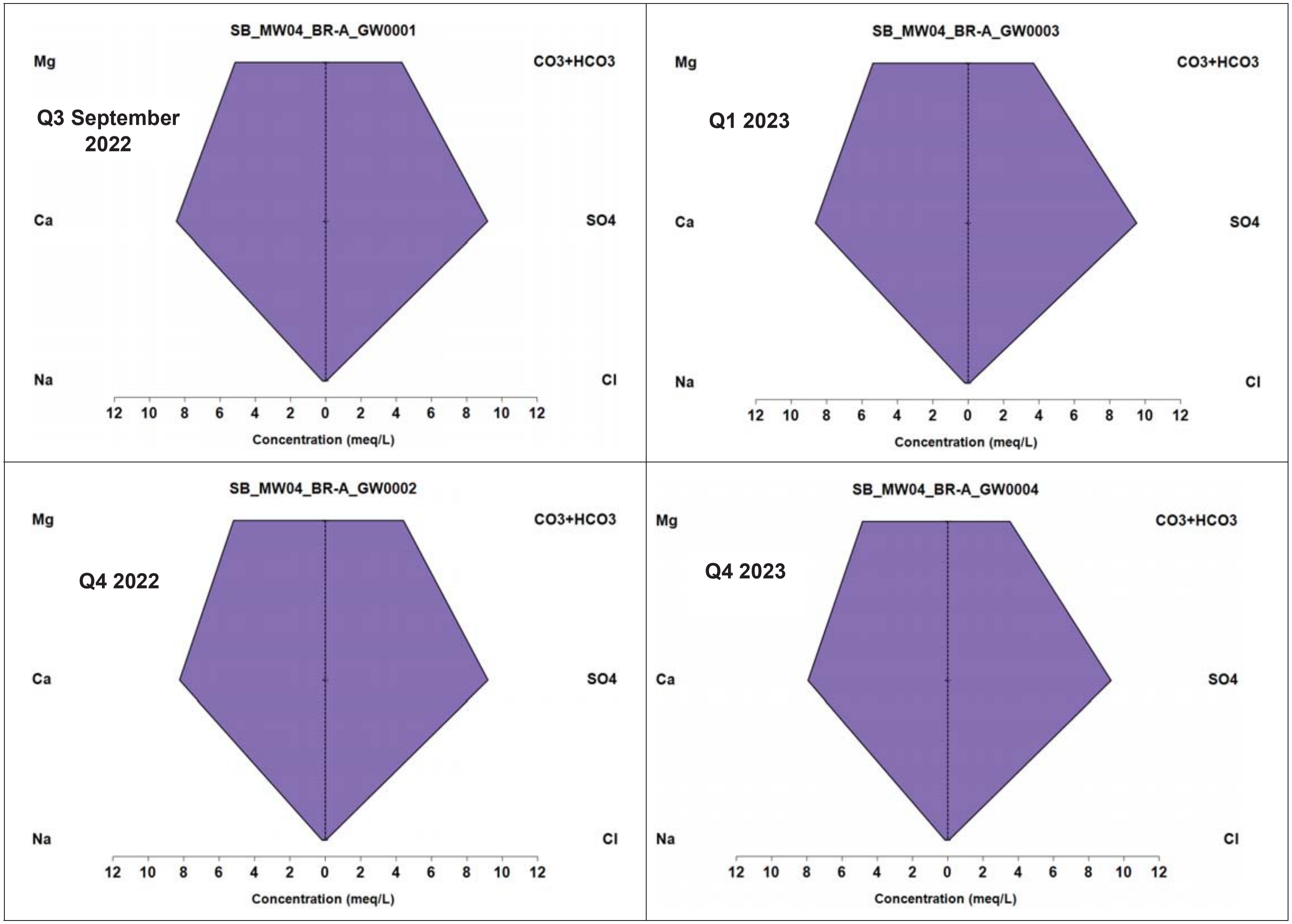


FIGURE B15: STIFF DIAGRAMS FOR WELLS SB_MW05_OB-INT

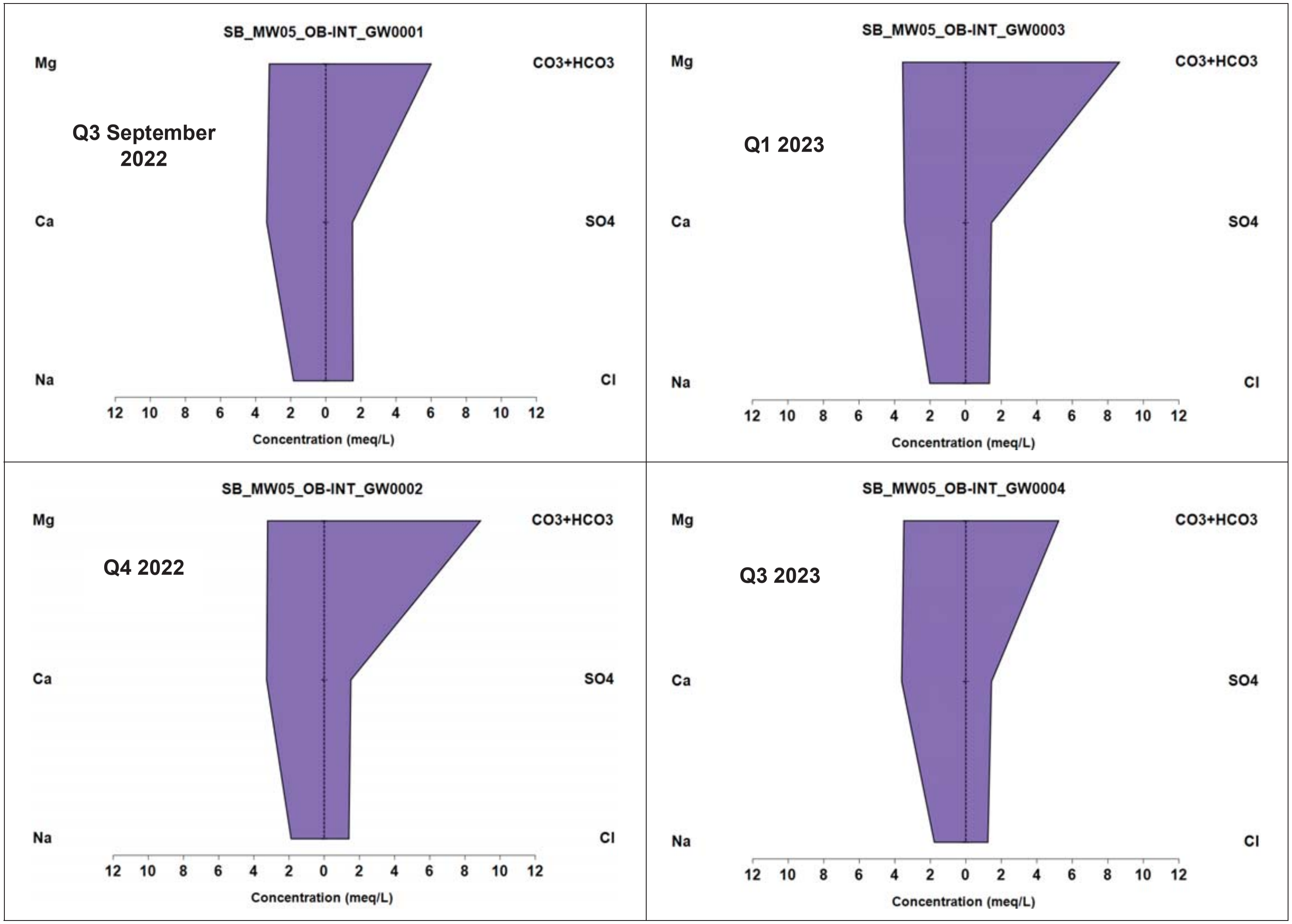


FIGURE B16: STIFF DIAGRAMS FOR WELLS SB_MW05_BR-C

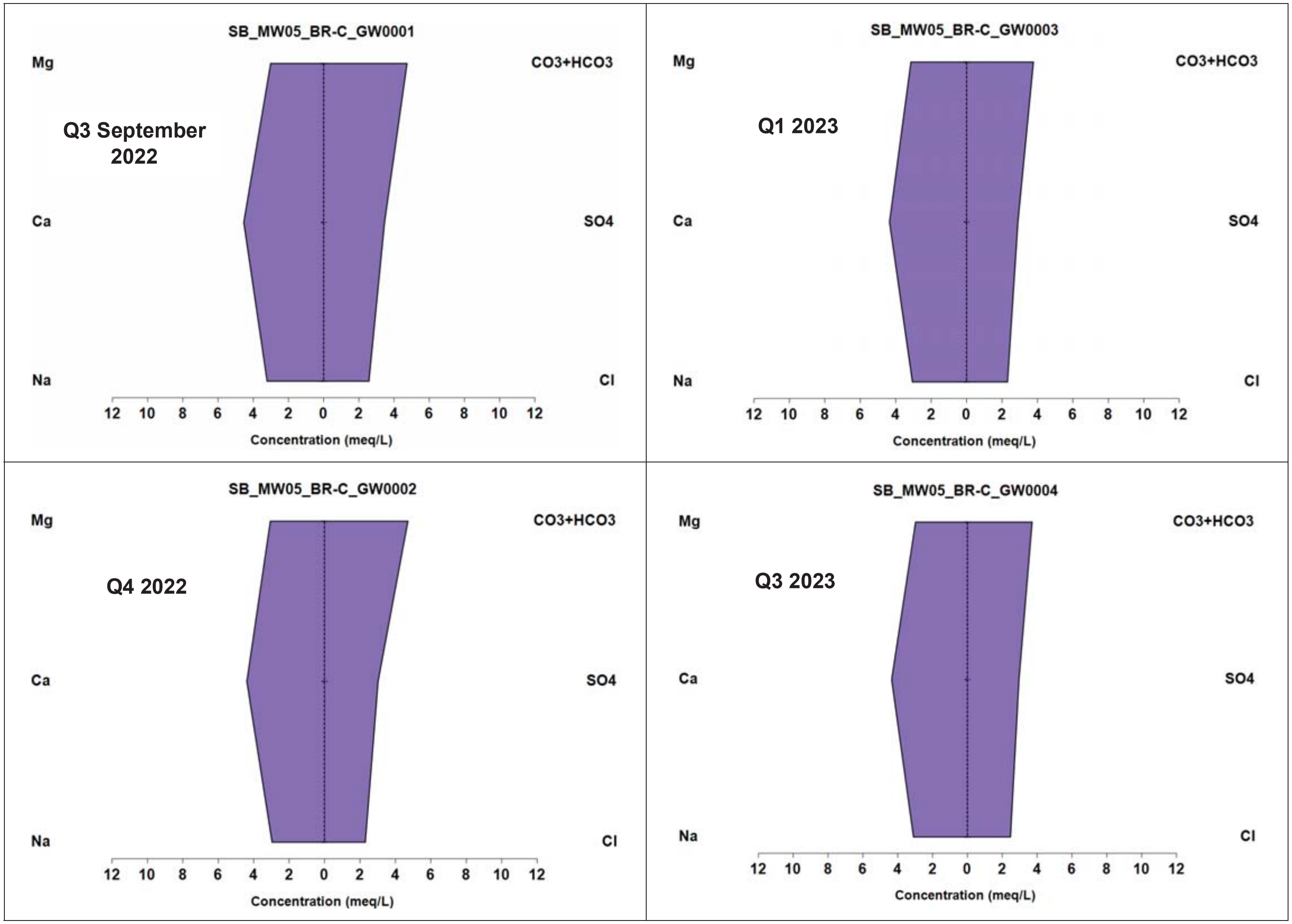


FIGURE B17: STIFF DIAGRAMS FOR WELLS SB_MW05_BR-B

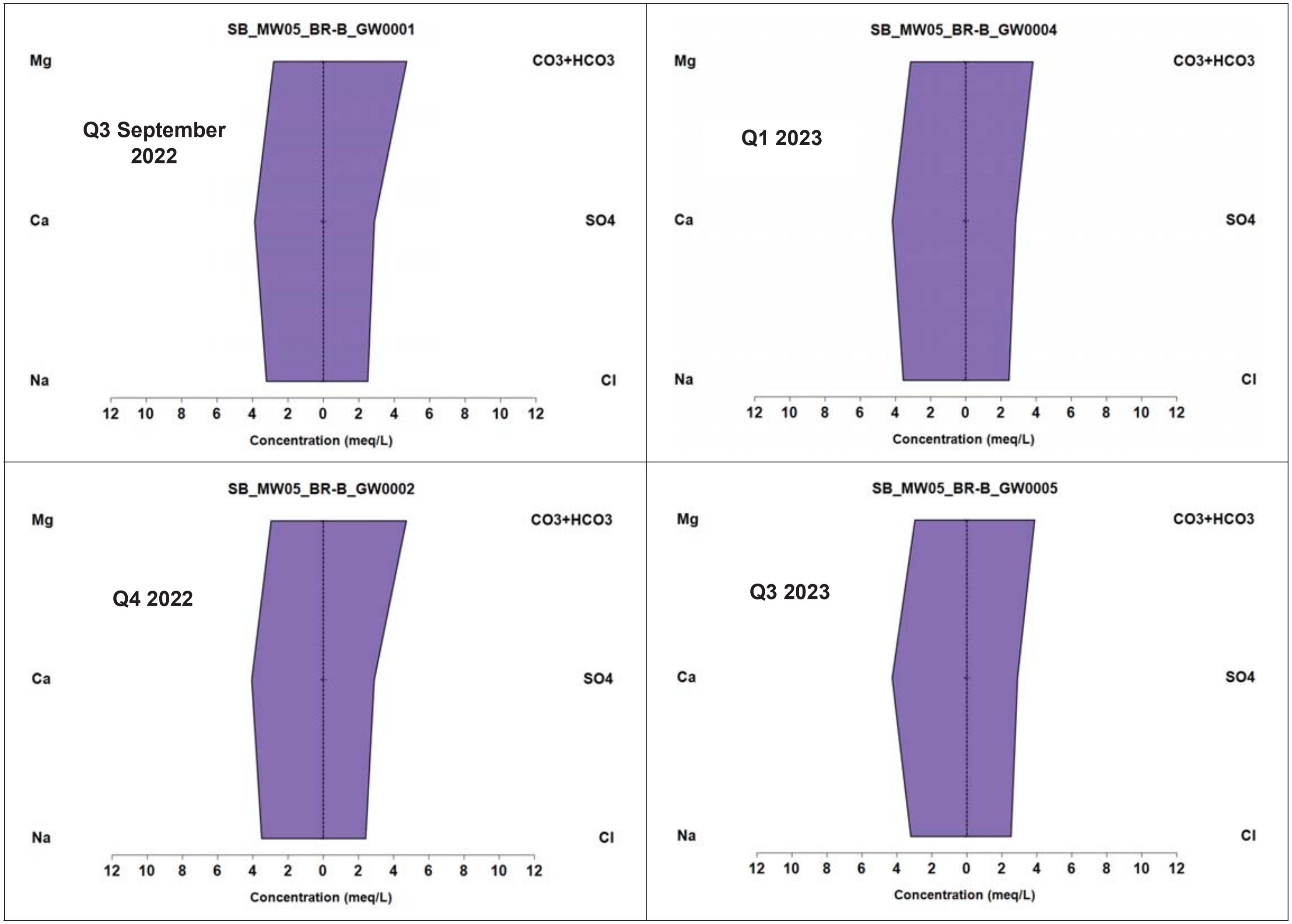


FIGURE B18: STIFF DIAGRAMS FOR WELLS SB_MW05_BR-A

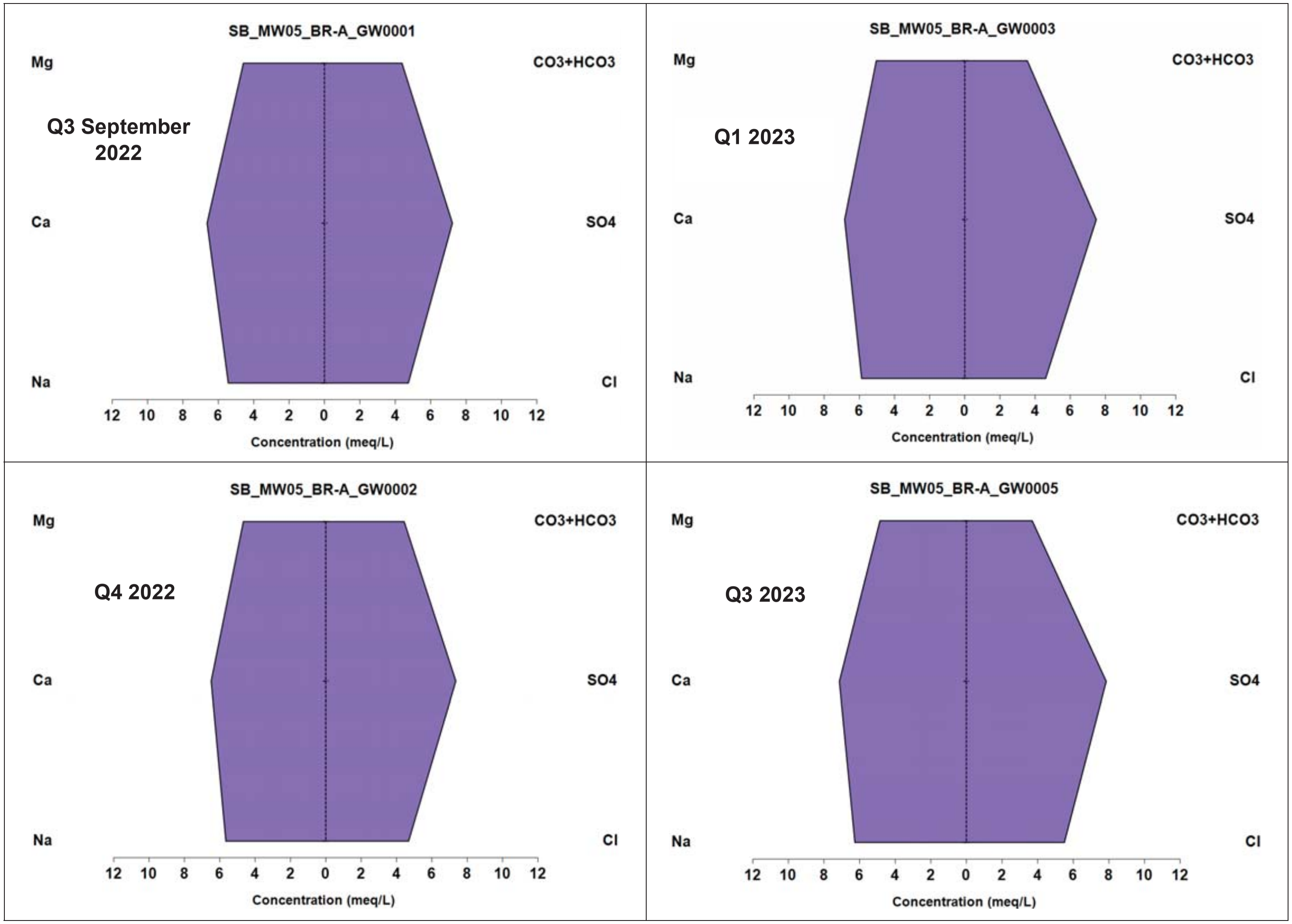


FIGURE B19: STIFF DIAGRAMS FOR WELLS SB_MW06_OB-INT

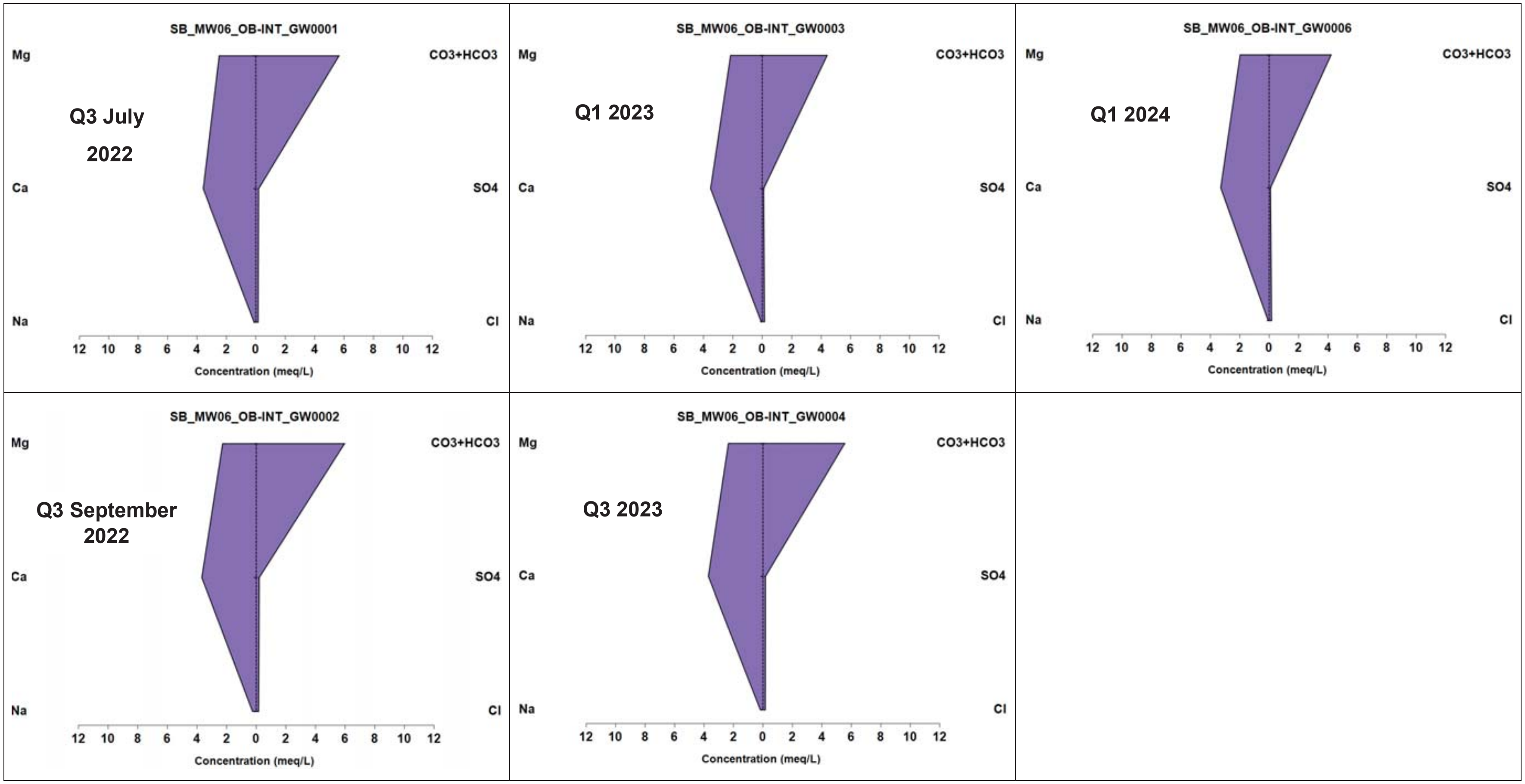


FIGURE B20: STIFF DIAGRAMS FOR WELLS SB_MW06_BR-C

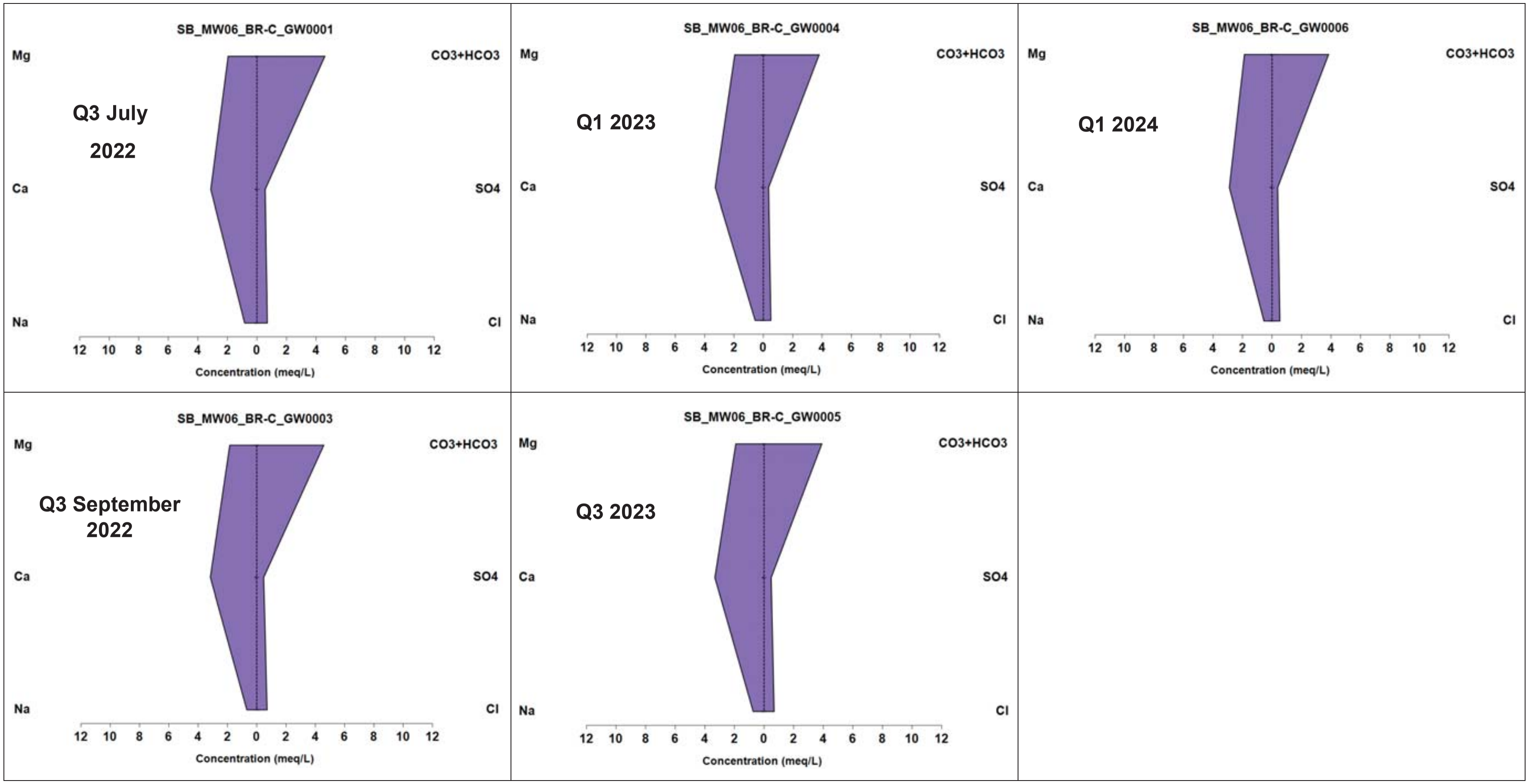


FIGURE B21: STIFF DIAGRAMS FOR WELLS SB_MW06_BR-B

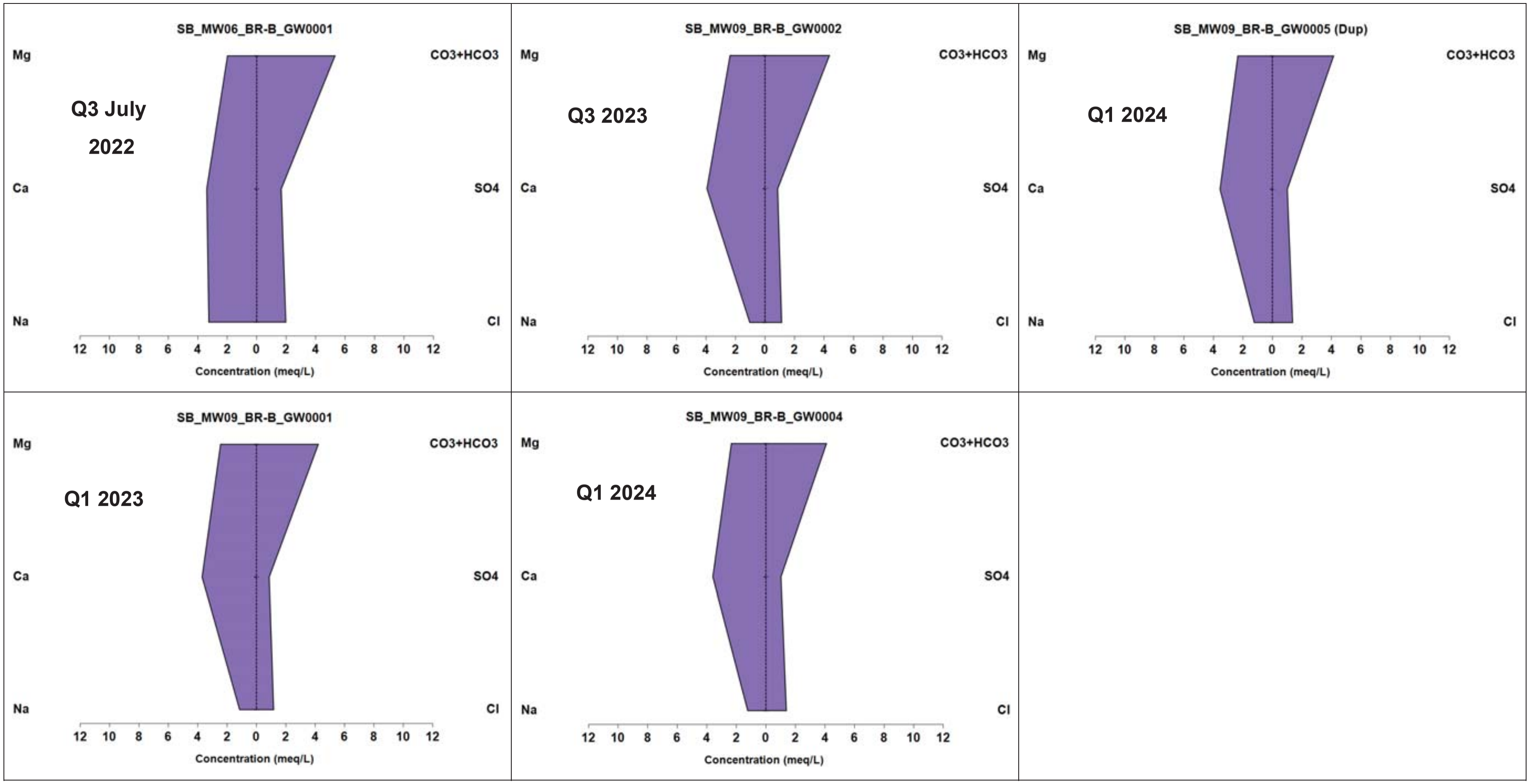


FIGURE B22: STIFF DIAGRAMS FOR WELLS SB_MW06_BR-A

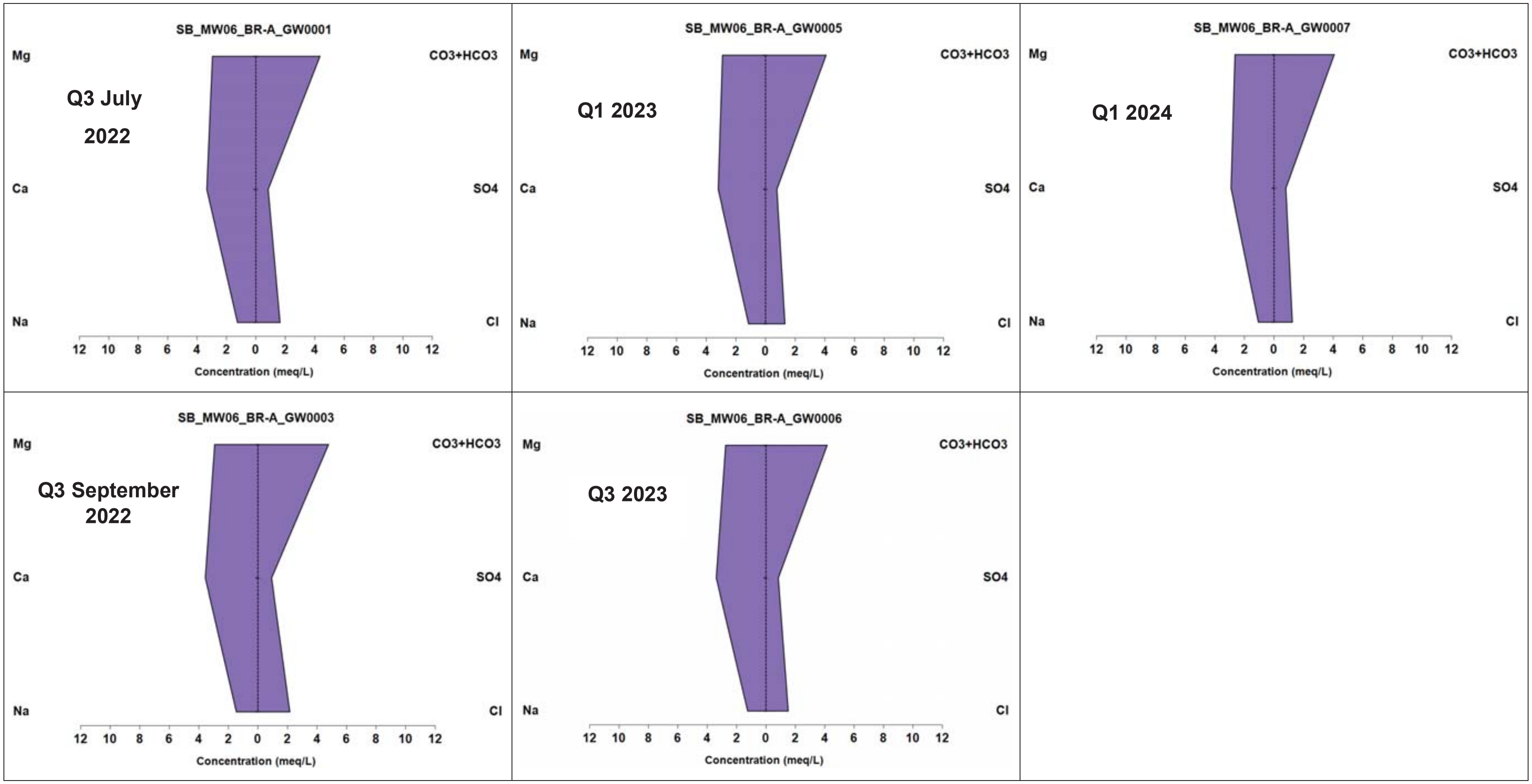


FIGURE B23: STIFF DIAGRAMS FOR WELLS SB_MW07_OB-INT

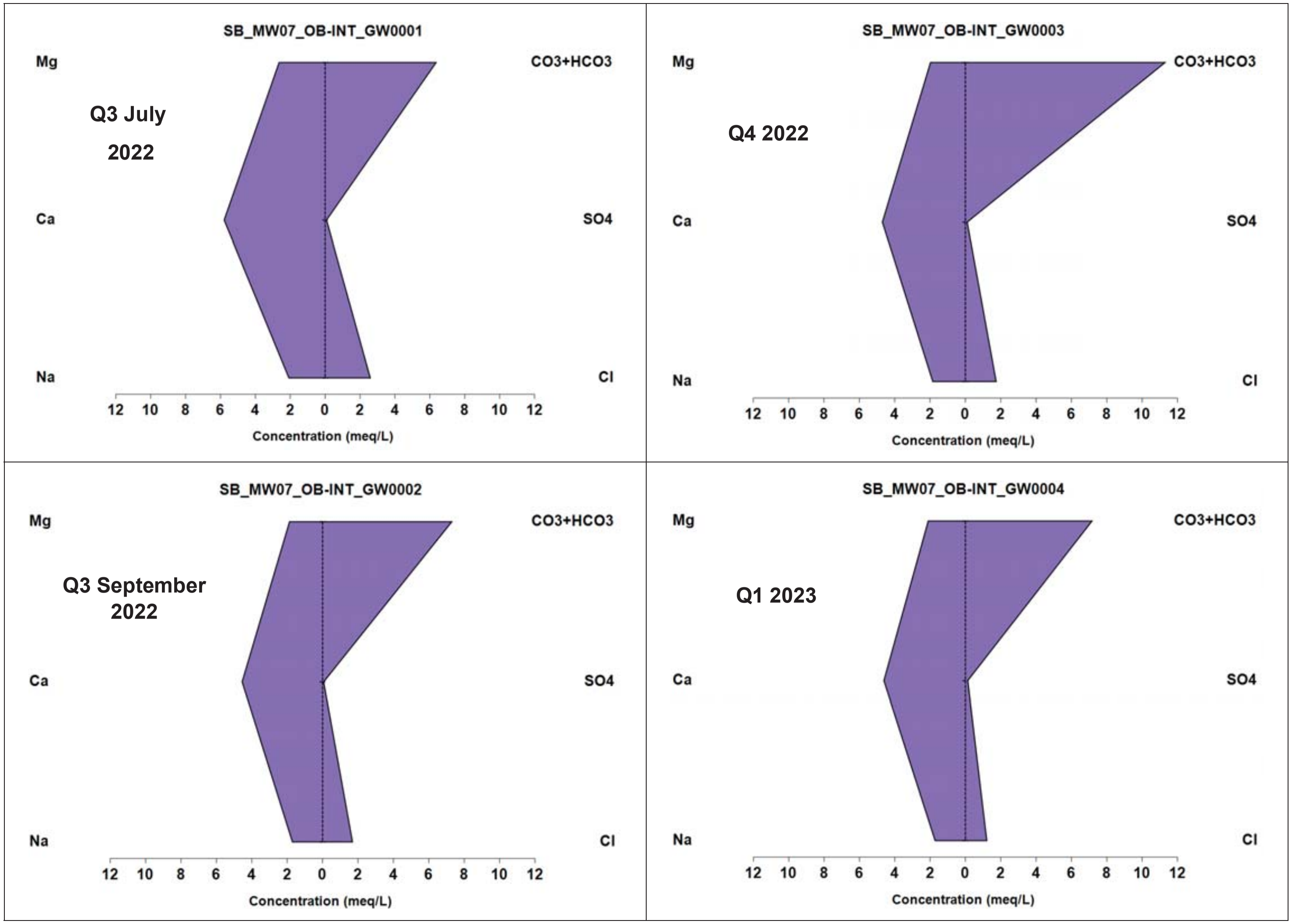


FIGURE B24: STIFF DIAGRAMS FOR WELLS SB_MW07_BR-C

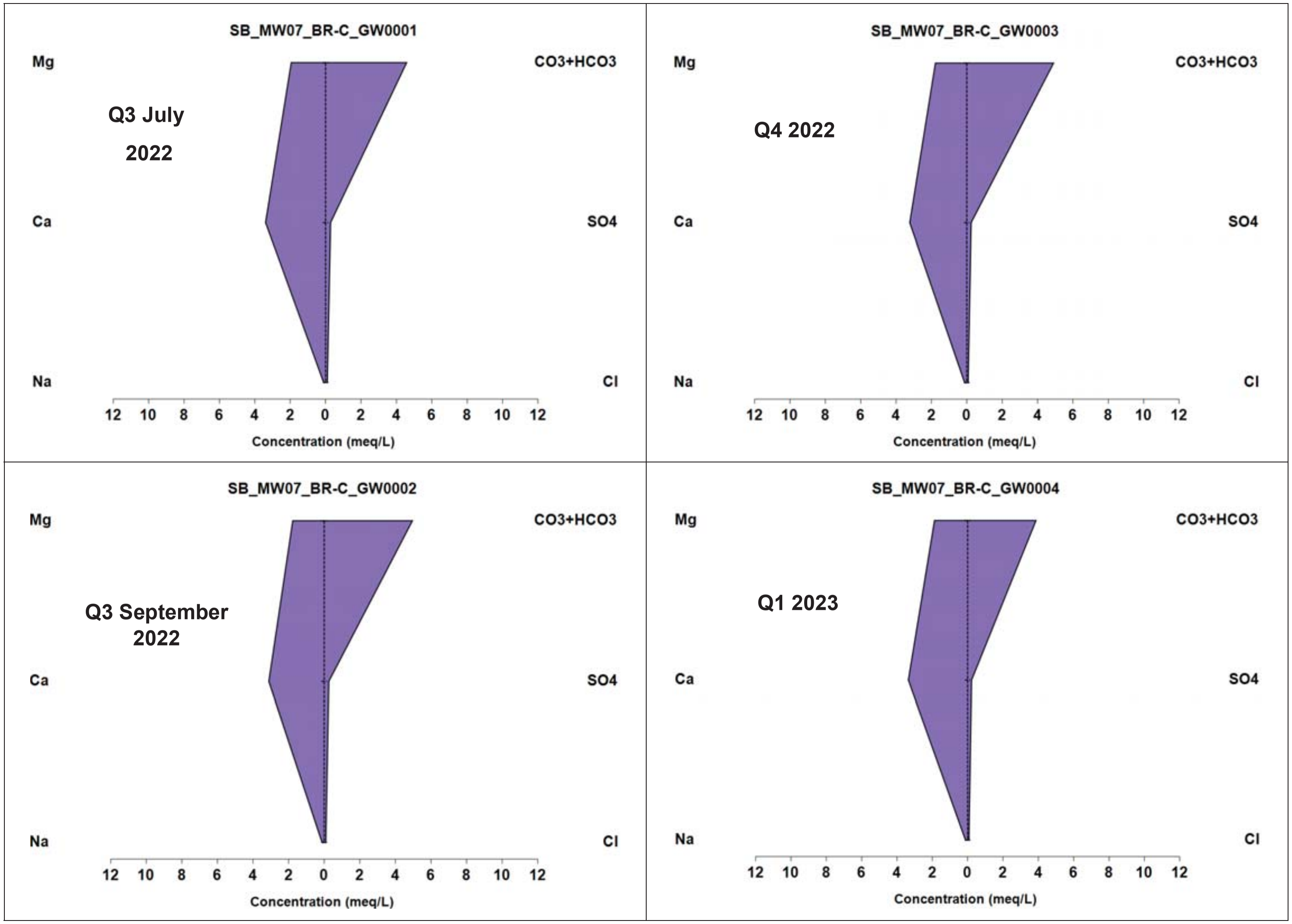


FIGURE B25: STIFF DIAGRAMS FOR WELLS SB_MW07_BR-B

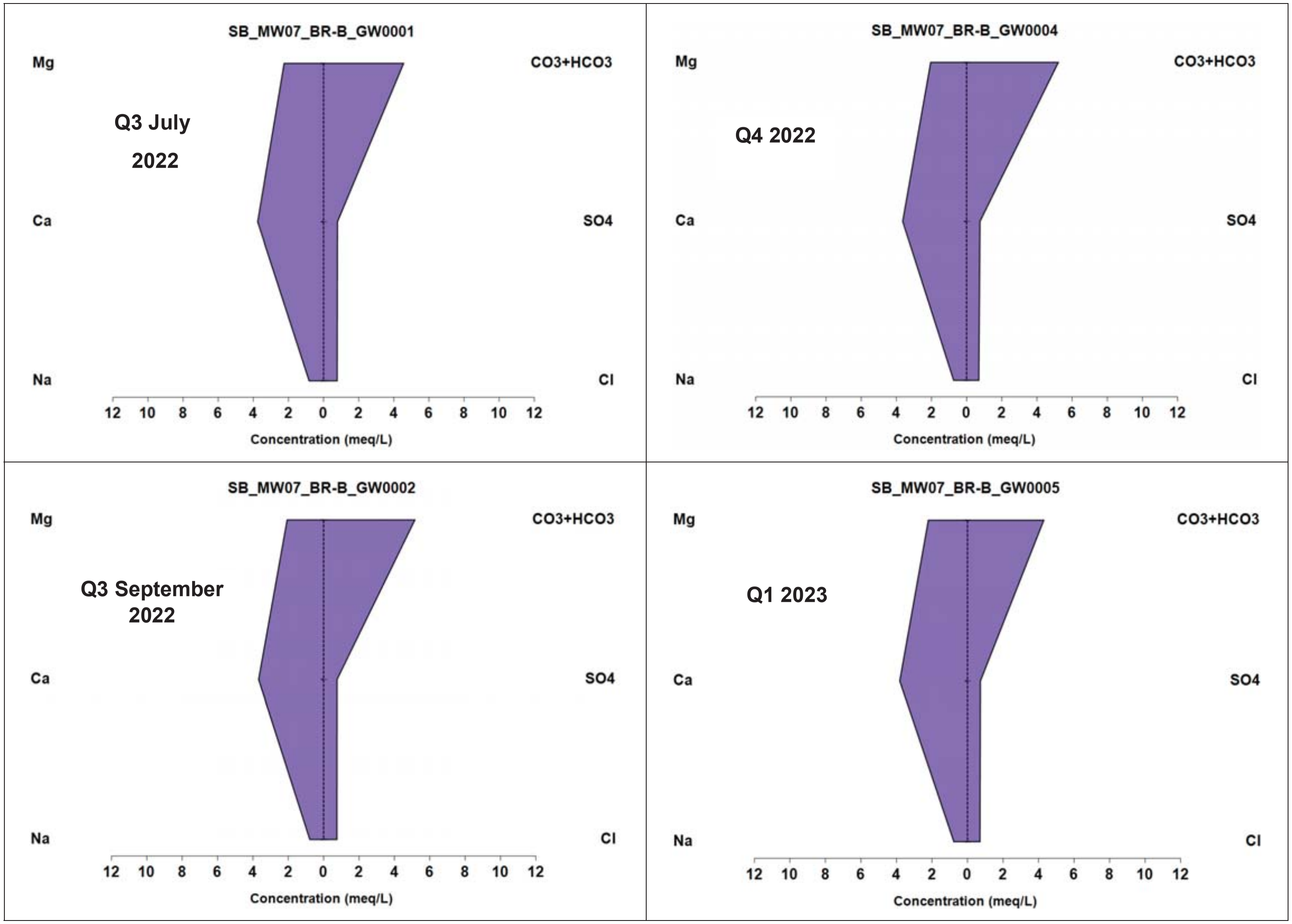
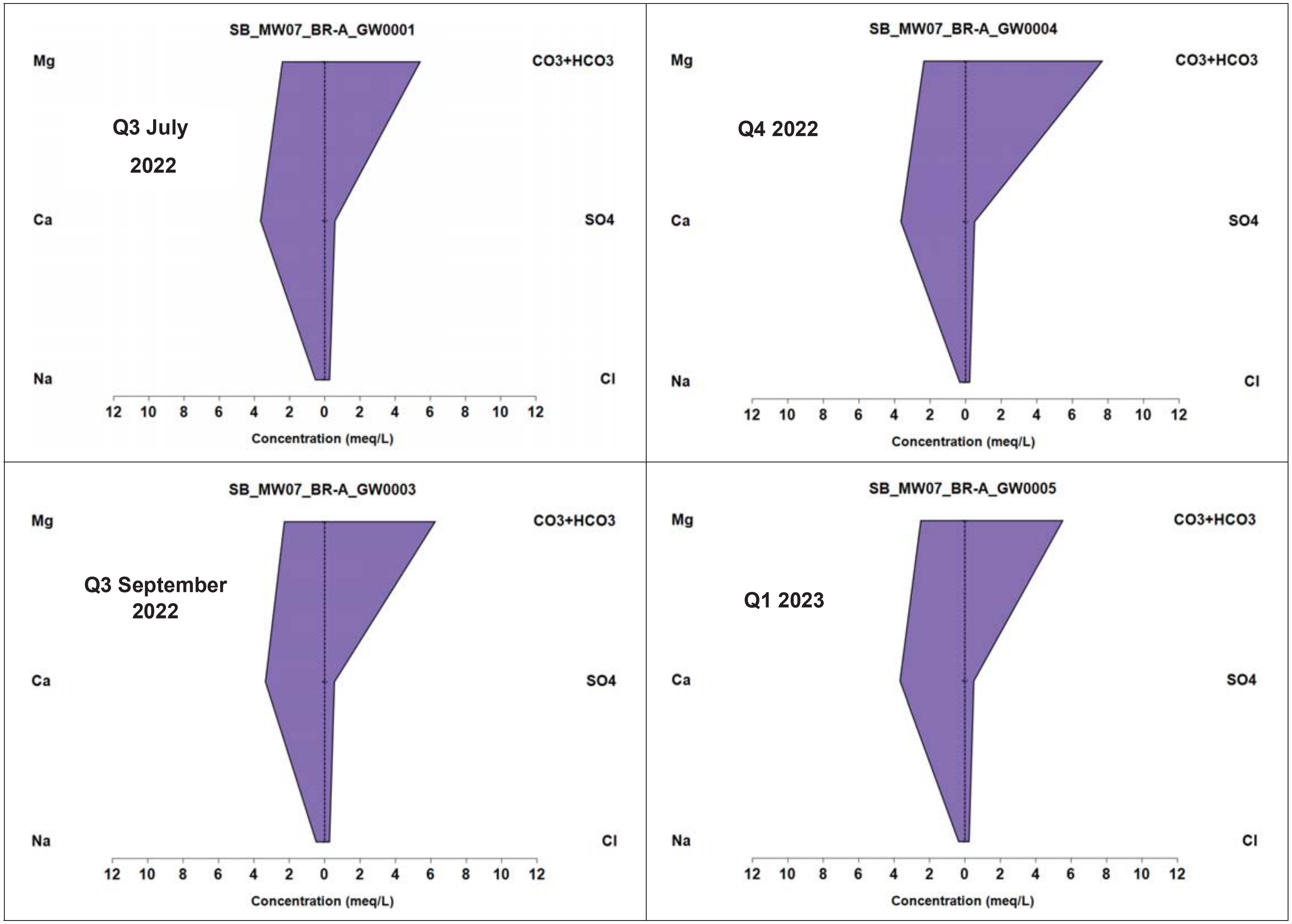


FIGURE B26: STIFF DIAGRAMS FOR WELLS SB_MW07_BR-A



APPENDIX C

2023 General Chemistry Laboratory Results Summary Table

Sample ID	Lab Tracking Numbe	Date & Time Sampled (dd/mm/yyyy hh:mm)	Comments	pH (Lab)	Alkalinity (Bicarbonate, as $CaCO_3$)	Alkalinity (Carbonate, as $CaCO_3$)	Alkalinity (Hydroxide, as $CaCO_3$)	Total Alkalinity (as $CaCO_3$)	Ammonia as N	Bromide	Chloride	Fluoride	Iodide	Nitrate (as NO_3)	Nitrite (as NO_2)	Kjeldahl Nitrogen Total	Total Nitrogen	Orthophosphate (PO_4)	Total Phosphorus (P_{tot})	Total Reactive Phosphorus (TRP)	Sulphate (SO_4)
			Units:	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			Detection Limit:	0.1	1	1	1	1	0.005	0.1	0.5	0.02	0.2	0.089	0.033	0.05	0.055	0.001	0.002	0.003	0.3
SB_MW01_BR_GW0005	WT2329676-001	12 Sep 2023 12:10PM		8.44	219	12.5	<1.0	232	0.0393	<0.10	4.38	1.38	<0.20	<0.089	<0.033	0.069	0.069	-	0.0092	<0.0030	25.4
	WT2329676-014	14 Sep 2023 03:30PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	-	-	-
SB_MW01_OB-INT_GW0003	WT2329676-002	12 Sep 2023 01:45PM		8.11	261	<1.0	<1.0	261	<0.0050	<0.10	17.3	0.567	<0.20	46.072	<0.033	0.293 TKNI	10.7	-	0.119	0.0347	4.53
	WT2329676-015	14 Sep 2023 03:45PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	-	-	-
SB_MW01_OB-INT_GW0004	WT2329676-012	14 Sep 2023	Trip Blank	5.97	1.2	<1.0	<1.0	1.2	<0.0050	<0.10	<0.50	<0.020	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	<0.0020	<0.0030	<0.30
SB_MW02_BR_R-B_GW0003	WT2304773-002	28 Feb 2023 05:05PM		7.60	238	<1.0	<1.0	238	<0.0050	<0.10	<0.50	1.32	<0.20	<0.089	<0.033	<0.500 DLM	<0.500[#1]	0.0016	0.0030	<0.0030	31.7
SB_MW02_BR_R-B_GW0004	WT2316238-002	06 Jun 2023 04:30PM		8.13	231	<1.0	<1.0	231	0.0093	<0.10	<0.50	1.33	<0.20	<0.089	<0.033	<0.050	<0.055	0.0015	<0.0020	-	30.1
	WT2316238-012	07 Jun 2023 05:30PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW02_BR-A_GW0004	WT2304773-001	28 Feb 2023 02:45PM		7.78	232	<1.0	<1.0	232	0.0103	<0.10	0.98	1.16	<0.20	0.669	<0.033	0.084	0.235[#1]	<0.0010	0.0074	<0.0030	194
SB_MW02_BR-A_GW0005	WT2304773-027	28 Feb 2023	Trip Blank	6.17	<1.0	<1.0	<1.0	<1.0	<0.0050	<0.10	<0.50	<0.020	<0.20	<0.089	<0.033	<0.050	<0.055[#1]	<0.0010	<0.0020	<0.0030	<0.30
SB_MW02_BR-A_GW0005	WT2316238-001	06 Jun 2023 12:45PM		8.16	222	<1.0	<1.0	222	0.0080	<0.10	1.06	1.18	<0.20	0.483	<0.033	0.327	0.436	<0.0010	0.0198	-	208
	WT2316238-011	07 Jun 2023 05:00PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW02_BR-A_GW0006	WT2316238-008	06 Jun 2023 12:45PM	Field Duplicate of SB_MW02_BR-A_GW0005	8.23	223	<1.0	<1.0	223	0.0073	<0.10	0.88	1.15	<0.20	0.470	<0.033	0.230	0.336	<0.0010	0.0251	-	207
	WT2316238-015	07 Jun 2023 05:00PM	Field Duplicate of SB_MW02_BR-A_GW0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW02_BR-C_GW0003	WT2304773-003	28 Feb 2023 03:25PM		7.77	256	<1.0	<1.0	256	<0.0050	<0.10	2.72	1.23	<0.20	<0.089	<0.033	0.067	0.067[#1]	<0.0010	0.0129	<0.0150 DLM	30.2
SB_MW02_BR-C_GW0004	WT2316238-003	06 Jun 2023 02:40PM		8.24	243	<1.0	<1.0	243	<0.0050	<0.10	2.22	1.29	<0.20	0.244	<0.033	<0.050	0.055	<0.0010	0.0050	-	23.0
	WT2316238-013	07 Jun 2023 05:15PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW02_BR-C_GW0005	WT2316238-009	06 Jun 2023	Trip Blank	5.56	<1.0	<1.0	<1.0	<1.0	<0.0050	<0.10	<0.50	<0.020	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	<0.0020	<0.0030	<0.30
SB_MW02_OB-INT_GW0003	WT2304773-004	28 Feb 2023 06:35PM		7.67	405	<1.0	<1.0	405	<0.0050	<0.10	5.89	0.564	<0.20	22.283	<0.033	0.438 TKNI	5.47[#1]	0.0017	0.0528	<0.0300 DLM	16.2
SB_MW02_OB-INT_GW0004	WT2316238-004	06 Jun 2023 05:35PM		7.89	296	<1.0	<1.0	296	<0.0050	<0.10	6.42	0.551	<0.20	35.484	<0.033	0.394 TKNI	8.40	0.0015	0.0322	-	12.1
	WT2316238-014	07 Jun 2023 05:55PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW03_BR-A_GW0002	WT2304773-005	04 Mar 2023 12:30PM		7.75	227	<1.0	<1.0	227	0.0401	<0.10	0.66	1.33	<0.20	<0.089	<0.033	0.143	0.143[#1]	0.0021	0.0671	<0.0030	31.3
SB_MW03_BR-B_GW0002	WT2304773-006	04 Mar 2023 01:50PM		7.67	226	<1.0	<1.0	226	0.0633	<0.10	<0.50	1.33	<0.20	<0.089	<0.033	0.101	0.101[#1]	0.0013	0.0106	0.0188	30.4
SB_MW03_BR-B_GW0003	WT2316238-005	07 Jun 2023 12:30PM		8.08	223	<1.0	<1.0	223	0.0477	<0.10	0.56	1.42	<0.20	<0.089	<0.033	0.080	0.080	0.0017	0.0046	0.0057	30.7
SB_MW03_BR-B_GW0004	WT2316238-010	07 Jun 2023 02:30PM	Field Blank	5.73	1.5	<1.0	<1.0	1.5	<0.0050	<0.10	<0.50	<0.020	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	<0.0020	<0.0030	<0.30
SB_MW03_BR-B_GW0005	WT2338314-001	22 Nov 2023 10:30AM		8.00	224	<1.0	<1.0	224	0.0385	<0.10	0.52	1.40	<0.20	<0.089	<0.033	0.074	0.074	0.0016	0.0112	0.0092	30.6
SB_MW03_BR-B_GW0006	WT2404535-001	28 Feb 2024 12:30PM		8.06	227	<1.0	<1.0	227	0.0458	<0.10	0.54	1.48	<0.20	<0.089	<0.033	0.063	0.063	0.0020	0.0110	0.0058	32.0
SB_MW03_BR-C_GW0002	WT2304773-007	04 Mar 2023 03:00PM		7.64	221	<1.0	<1.0	221	0.0546	<0.10	<0.50	1.31	<0.20	<0.089	<0.033	0.086	0.086[#1]	<0.0010	0.0089	<0.0030	33.7
SB_MW03_BR-C_GW0003	WT2304773-025	04 Mar 2023 03:00PM	Field Duplicate of SB_MW03_BR-C_GW0002	7.80	223	<1.0	<1.0	223	0.0463	<0.10	0.52	1.41	<0.20	<0.089	<0.033	0.063	0.063[#1]	<0.0010	0.0075	<0.0030	33.4
SB_MW03_BR-C_GW0004	WT2316238-006	07 Jun 2023 01:50PM		7.87	276	<1.0	<1.0	276	0.0464	<0.10	0.60	1.50	<0.20	<0.089	<0.033	<0.500 DLM	<0.500	0.0016	0.568 DLM	<0.300	32.9
SB_MW03_BR-C_GW0005	WT2338314-002	22 Nov 2023 11:55AM		7.94	298	<1.0	<1.0	298	0.0579	<0.10	0.55	1.44	<0.20	<0.089	<0.033	0.578 DLM	0.578	0.0018	0.985 DLHC	0.0762	33.9
SB_MW03_BR-C_GW0006	WT2338314-010	22 Nov 2023 11:00AM	Field Blank	5.87	<1.0	<1.0	<1.0	<1.0	<0.0050	<0.10	<0.50	0.150	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	<0.0020	<0.0030	<0.30
SB_MW03_BR-C_GW0007	WT2404535-002	28 Feb 2024 02:15PM		8.03	244	<1.0	<1.0	244	0.0512	<0.10	0.55	1.50	<0.20	<0.089	<0.033	<0.500 DLM	<0.500	0.0014	0.265	<0.0600 DLM	35.3
SB_MW03_OB-INT_GW0002	WT2304773-008	04 Mar 2023 03:55PM		7.67	271	<1.0	<1.0	271	0.0230	<0.10	0.66	1.46	<0.20	<0.089	<0.033	0.120	0.120[#1]	0.0018	0.128	0.0193	30.0
SB_MW03_OB-INT_GW0003	WT2316238-007	07 Jun 2023 04:00PM		7.89	276	<1.0	<1.0	276	0.0269	<0.10	0.55	1.54	<0.20	<0.089	<0.033	0.141	0.141	0.0011	0.187	<0.0030	30.0
SB_MW03_OB-INT_GW0004	WT2338314-003	22 Nov 2023 01:45PM		7.94	236	<1.0	<1.0	236	0.0263	<0.10	0.53	1.47	<0.20	<0.089	<0.033	0.092	0.092	<0.0010	0.0590	<0.0030	31.1
SB_MW03_OB-INT_GW0005	WT2404535-003	28 Feb 2024 04:00PM		8.02	239	<1.0	<1.0	239	0.0357	<0.10	0.59	1.57	<0.20	<0.089	<0.033	<0.500 DLM	<0.500	0.0014	0.178	<0.0600 DLM	33.3
SB_MW03_OB-INT_GW0006	WT2404535-009	27 Feb 2024	Trip Blank	6.10	<1.0	<1.0	<1.0	<1.0	<0.0050	<0.10	<0.50	0.296	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	<0.0020	<0.0030	<0.30
SB_MW04_BR-A_GW0003	WT2304773-009	01 Mar 2023 11:40AM		7.45	223	<1.0	<1.0	223	0.0178	<0.50 DLDS	<2.50 DLDS	1.15 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	0.055	<0.122[#1]	0.0011	<0.0020	<0.0030	457 DLDS
SB_MW04_BR-A_GW0004	WT2338314-004	21 Nov 2023 12:10PM		7.76	213	<1.0	<1.0	213	0.0327	<0.50 DLDS	<2.50 DLDS	1.13 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	<0.050	<0.122	<0.0010	0.0025	-	445 DLDS
	WT2338314-011	22 Nov 2023 03:00PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW04_BR-A_GW0005	WT2338314-008	21 Nov 2023 12:10PM	Field Duplicate of SB_MW04_BR-A_GW0004	7.83	213	<1.0	<1.0	213	0.0230	<0.50 DLDS	<2.50 DLDS	1.16 DLDS	0.27	<0.443 DLDS	<0.164 DLDS	0.057	<0.122	<0.0010	0.0020	-	457 DLDS
	WT2338314-015	22 Nov 2023 03:00PM	Field Duplicate of SB_MW04_BR-A_GW0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW04_BR-B_GW0005	WT2304773-010	01 Mar 2023 12:35PM		7.48	225	<1.0	<1.0	225	0.0183	<0.50 DLDS	<2.50 DLDS	1.15 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	<0.050	<0.122[#1]	<0.0010	<0.0020	<0.0030	413 DLDS
SB_MW04_BR-B_GW0006	WT2338314-005	21 Nov 2023 01:50PM		7.86	212	<1.0	<1.0	212	0.0214	<0.50 DLDS	<2.50 DLDS	1.16 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	<0.050	<0.122	<0.0010	<0.0020	-	403 DLDS
	WT2338314-012	22 Nov 2023 03:20PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW04_BR-C_GW0004	WT2304773-011	01 Mar 2023 02:25PM		7.46	225	<1.0	<1.0	225	0.0275	<0.50 DLDS	<2.50 DLDS	1.30 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	0.064	<0.122[#1]	<0.0100 DLM	0.0048	<0.0030	380 DLDS
SB_MW04_BR-C_GW0005	WT2338314-006	21 Nov 2023 03:00PM		7.80	216	<1.0	<1.0	216	0.0238	<0.50 DLDS	<2.50 DLDS	1.26 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	0.058	<0.122	<0.0010	0.0050	-	401 DLDS
	WT2338314-013	22 Nov 2023 03:35PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW04_OB-INT_GW0003	WT2304773-012	01 Mar 2023 03:15PM		8.12	307	<1.0	<1.0	307	<0.0050	<0.10	6.28	0.261	<0.20	24.941	<0.033	0.413 TKNI	6.04[#1]	<0.0010	0.136	<0.0150 DLM	5.50
SB_MW04_OB-INT_GW0004	WT2338314-007	21 Nov 2023 04:00PM		7.87	288	<1.0	<1.0	288	<0.0050	<0.10	6.17	0.224	<0.20	24.631	<0.033	0.300 TKNI	5.86	<0.0010	0.0365	-	5.29
	WT2338314-014	22 Nov 2023 04:00PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW04_OB-INT_GW0005	WT2338314-009	21 Nov 2023	Trip Blank	6.52	1.8	<1.0	<1.0	1.8	<0.0050	<0.10	<0.50	0.024	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	<0.0020	<0.0030	<0.30
SB_MW05_BR-A_GW0003	WT2304773-013	02 Mar 2023 12:50PM		7.54	215	<1.0	<1.0	215	0.0434	<0.50 DLDS	163 DLDS	1.58 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	0.066	<0.122[#1]	<0.0010	0.0027	0.0685	359 DLDS
SB_MW05_BR-A_GW0004	WT2304773-026	02 Mar 2023 12:50PM	Field Duplicate of SB_MW05_BR-A_GW0003	7.72	223	<1.0	<1.0	223	0.0517	<0.50 DLDS	181 DLDS	1.83 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	0.058	<0.122[#1]	<0.0010	0.0021	<0.0060 DLM	394 DLDS
SB_MW05_BR-A_GW0005	WT2329676-003	13 Sep 2023 11:30AM		8.36	208	8.5	<1.0	217	0.0519	<0.50 DLDS	195 DLDS	1.59 DLDS	<0.20	<0.443 DLDS	<0.164 DLDS	<0.050	<0.122	-	0.0026	<0.0030	377 DLDS
	WT2329676-016	14 Sep 2023 04:20PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	-	-	-
SB_MW05_BR-B_GW0004	WT2304773-014	02 Mar 2023 02:25PM		7.70	231	<1.0	<1.0	231	0.0219	<0.10	87.1	1.67	<0.20	<0.089	<0.033	<0.050	<0.055[#1]	<0.0010	0.0082	<0.0300 DLM	136
SB_MW05_BR-B_GW0005	WT2329676-004	13 Sep 2023 01:00PM		8.34	221	7.5	<1.0	228	0.0389	<0.10	89.5	1.66	<0.20	<0.089	<0.033	<0.050	<0.055	-	0.0496	<0.0030	139
	WT2329676-017	14 Sep 2023 04:30PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	-	-	-
SB_MW05_BR-C_GW0003	WT2304773-015	02 Mar 2023 03:30PM		7.66	228	<1.0	<1.0	228	0.0231	<0.10	81.8	1.68	<0.20	<0.089	<0.033	0.054	<0.055[#1]	<0.0010	0.0042	<0.0030	139
SB_MW05_BR-C_GW0004	WT2329676-005	13 Sep 2023 01:50PM		8.33	214	6.1	<1.0	220	0.0256	<0.10	87.5	1.69	<0.20	<0.089	<0.033	<0.050	<0.055	-	0.0090	<0.0030	[illegible]

Sample ID	Lab Tracking Numbe	Date & Time Sampled (dd/mm/yyyy hh:mm)	Comments	pH (Lab)	Alkalinity (Bicarbonate, as $CaCO_3$)	Alkalinity (Carbonate, as $CaCO_3$)	Alkalinity (Hydroxide, as $CaCO_3$)	Total Alkalinity (as $CaCO_3$)	Ammonia as N	Bromide	Chloride	Fluoride	Iodide	Nitrate (as NO_3)	Nitrite (as NO_2)	Kjeldahl Nitrogen Total	Total Nitrogen	Orthophosphate (PO_4)	Total Phosphorus (P_{tot})	Total Reactive Phosphorus (TRP)	Sulphate (SO_4)
			Units:	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			Detection Limit:	0.1	1	1	1	1	0.005	0.1	0.5	0.02	0.2	0.089	0.033	0.05	0.055	0.001	0.002	0.003	0.3
SB_MW05_BR-C_GW0004	WT2329676-018	14 Sep 2023 04:40PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0010	-	-	-
SB_MW05_OB-INT_GW0003	WT2304773-016	02 Mar 2023 04:15PM		7.91	526	<1.0	<1.0	526	0.0944	<0.10	47.4	0.694	<0.20	0.199	<0.033	0.273	0.318[#1]	0.0043	0.0373	<0.0060 DLM	69.6
SB_MW05_OB-INT_GW0004	WT2329676-006	13 Sep 2023 02:30PM		8.20	317	<1.0	<1.0	317	0.145	<0.10	44.0	0.744	<0.20	<0.089	<0.033	0.406	0.406	-	1.26 DLHC	<0.0030	69.4
	WT2329676-019	14 Sep 2023 04:50PM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0041	-	-	-
SB_MW06_BR-A_GW0005	WT2304773-017	01 Mar 2023 05:20PM		7.73	247	<1.0	<1.0	247	<0.0050	<0.10	46.4	1.31	<0.20	<0.089	<0.033	<0.050	<0.055[#1]	<0.0010	0.0037	0.0206	36.7
SB_MW06_BR-A_GW0006	WT2329676-007	14 Sep 2023 10:45AM		8.47	224	14.8	<1.0	239	0.0157	<0.10	53.7	1.30	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	0.0040	<0.0030	40.3
SB_MW06_BR-A_GW0007	WT2404535-004	27 Feb 2024 01:00PM		8.16	246	<1.0	<1.0	246	0.0267	<0.10	43.8	1.41	<0.20	<0.089	<0.033	<0.050	<0.055	0.0014	0.0059	-	38.3
	WT2404535-011	29 Feb 2024 08:00AM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW06_BR-C_GW0004	WT2304773-018	01 Mar 2023 06:00PM		7.73	230	<1.0	<1.0	230	0.0191	<0.10	18.2	1.60	<0.20	<0.089	<0.033	<0.050	<0.055[#1]	<0.0010	0.0056	<0.0030	17.3
SB_MW06_BR-C_GW0005	WT2329676-008	14 Sep 2023 11:35AM		8.37	218	10.0	<1.0	228	<0.0050	<0.10	24.1	1.58	<0.20	<0.089	<0.033	0.060	0.060	<0.0010	0.0073	<0.0030	23.0
SB_MW06_BR-C_GW0006	WT2404535-005	27 Feb 2024 02:20PM		8.12	232	<1.0	<1.0	232	0.0261	<0.10	18.9	1.72	<0.20	<0.089	<0.033	<0.050	<0.055	0.0017	0.0088	-	18.3
	WT2404535-012	29 Feb 2024 08:20AM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW06_OB-INT_GW0003	WT2304773-019	01 Mar 2023 06:45PM		7.75	267	<1.0	<1.0	267	<0.0050	<0.10	5.60	0.421	<0.20	9.923	<0.033	0.288	2.53[#1]	<0.0010	0.0095	<0.0060 DLM	4.51
SB_MW06_OB-INT_GW0004	WT2329676-009	14 Sep 2023 12:45PM		8.10	337	<1.0	<1.0	337	<0.0050	<0.10	5.73	0.618	<0.20	12.050	<0.033	0.353	3.07	0.0011	0.190	<0.0030	8.38
SB_MW06_OB-INT_GW0005	WT2329676-013	14 Sep 2023	Field Blank	5.86	1.1	<1.0	<1.0	1.1	0.0079	<0.10	<0.50	<0.020	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	<0.0020	<0.0030	<0.30
SB_MW06_OB-INT_GW0006	WT2404535-006	27 Feb 2024 03:00PM		8.09	255	<1.0	<1.0	255	0.0296	<0.10	5.86	0.384	<0.20	14.087	<0.033	0.321	3.50	0.0012	0.0097	-	4.42
	WT2404535-013	29 Feb 2024 08:40AM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW06_OB-INT_GW0007	WT2404535-010	27 Feb 2024 12:30PM	Field Blank	6.32	<1.0	<1.0	<1.0	<1.0	<0.0050	<0.10	<0.50	0.101	<0.20	<0.089	<0.033	<0.050	<0.055	<0.0010	<0.0020	-	<0.30
	WT2404535-016	29 Feb 2024 07:50AM	Field Blank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW07_BR-A_GW0005	WT2304773-020	03 Mar 2023 11:15AM		7.58	335	<1.0	<1.0	335	<0.0050	<0.10	8.20	1.23	<0.20	5.493	<0.033	0.236	1.48[#1]	<0.0010	0.0164	<0.0060 DLM	24.2
SB_MW07_BR-B_GW0005	WT2304773-021	03 Mar 2023 12:45PM		7.75	260	<1.0	<1.0	260	<0.0050	<0.10	24.8	1.56	<0.20	0.204	<0.033	<0.050	<0.055[#1]	0.0025	0.0045	0.0031	34.8
SB_MW07_BR-B_GW0006	WT2304773-028	04 Mar 2023 04:10PM	Field Blank	6.00	<1.0	<1.0	<1.0	<1.0	<0.0050	<0.10	<0.50	<0.020	<0.20	<0.089	<0.033	<0.050	<0.055[#1]	<0.0010	<0.0020	<0.0030	<0.30
SB_MW07_BR-C_GW0004	WT2304773-022	03 Mar 2023 02:25PM		7.76	234	<1.0	<1.0	234	0.0162	<0.10	2.64	1.50	<0.20	0.115	<0.033	0.050	0.076[#1]	<0.0010	0.0078	<0.0030	10.6
SB_MW07_OB-INT_GW0004	WT2304773-023	03 Mar 2023 03:50PM		7.71	435	<1.0	<1.0	435	<0.0050	<0.10	42.8	0.066	<0.20	3.553	<0.033	0.186	0.988[#1]	<0.0010	0.0200	0.0237	6.27
SB_MW09_BR-B_GW0001	WT2304773-024	01 Mar 2023 08:25PM	SB_MW09_BR-B replaces SB_MW06_BR-B	7.79	255	<1.0	<1.0	255	<0.0050	<0.10	41.4	1.17	<0.20	0.204	<0.033	<0.050	<0.055[#1]	<0.0020 DLM	0.0032	<0.0030	41.6
SB_MW09_BR-B_GW0002	WT2329676-010	14 Sep 2023 02:30PM		8.42	238	14.0	<1.0	252	<0.0050	<0.10	40.0	1.12	<0.20	<0.089	<0.033	<0.050	<0.055	0.0016	0.0076	0.0030	41.2
SB_MW09_BR-B_GW0003	WT2329676-011	14 Sep 2023 12:00PM	Field Duplicate of SB_MW09_BR-B_GW0002	8.42	240	13.5	<1.0	254	0.0134	<0.10	40.1	1.12	<0.20	<0.089	<0.033	<0.050	<0.055	0.0014	0.0057	0.0129	41.3
SB_MW09_BR-B_GW0004	WT2404535-007	27 Feb 2024 05:00PM		8.03	248	<1.0	<1.0	248	<0.0050	<0.10	49.0	1.25	<0.20	<0.089	<0.033	<0.050	<0.055	0.0022	0.0040	-	48.9
	WT2404535-014	29 Feb 2024 09:10AM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0030	-
SB_MW09_BR-B_GW0005	WT2404535-008	27 Feb 2024 05:00PM	Field Duplicate of SB_MW09_BR-B_GW0004	8.13	251	<1.0	<1.0	251	0.0070	<0.10	48.6	1.24	<0.20	<0.089	<0.033	<0.050	<0.055	0.0021	0.0046	-	48.4
	WT2404535-015	29 Feb 2024 09:10AM	Field Duplicate of SB_MW09_BR-B_GW0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0032	-

Notes

#1 - Calculated by lab

DLA - Detection Limit Adjusted for required dilution

DLDS - Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity

DLHC - Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

DLM - Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

DLUI - Detection Limit Raised: Unknown interference generated an apparent false positive test result.

TKNI - TKN result may be biased low due to Nitrate interference. Nitrate-N is >10x TKN.

RRV - Reported Result Verified By Repeat Analysis

Nitrate is reported by lab as Nitrate (as N) in mg/L. "Nitrate as N" is converted to "Nitrate as NO3" using the expression: Nitrate-NO3 = (Nitrate-N)*4.43. Nitrate molecule weighs 62 g/mole; the nitrogen content of nitrate is 22.5% of the total weight of the molecule.

Nitrite is reported by lab as Nitrite (as N) in mg/L. "Nitrite as N" is converted to "Nitrite as NO2" using the expression: Nitrite-NO2 = (Nitrate-N)*3.28. Nitrite molecule weighs 46 g/mole; the nitrogen content of nitrite is 30.4% of the total weight of the molecule.

Dissolved Inorganic Carbon (DIC)	Silica	Aluminum (Al) diss.	Antimony (Sb) diss.	Arsenic (As) diss.	Barium (Ba) diss.	Beryllium (Be) diss.	Bismuth (Bi) diss.	Boron (B) diss.	Cadmium (Cd) diss.	Calcium (Ca) diss.	Cesium (Cs) diss.	Chromium (Cr, III+VI) diss.	Cobalt (Co) diss.	Copper (Cu) diss.	Iron (Fe) diss.	Lead (Pb) diss.	Lithium (Li) diss.	Magnesium (Mg) diss.	Manganese (Mn) diss.	Molybdenum (Mo) diss.	Nickel (Ni) diss.	Phosphorus (P) diss	Potassium (K) diss.	Rubidium (Rb) diss.	Ruthenium (Ru) diss.	Selenium (Se) diss.	Silicon (Si) diss	Silver (Ag) diss
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	0.5	0.001	0.0001	0.0001	0.0001	0.00002	0.00005	0.01	0.000005	0.05	0.00001	0.0005	0.0001	0.0002	0.01	0.00005	0.001	0.005	0.0001	0.00005	0.0005	0.05	0.05	0.0002	0.000005	0.00005	0.05	0.00001
-	13.2	<0.0010	<0.00010	0.00205	0.0981	<0.000020	<0.000050	0.011	<0.0000050	61.8	<0.000010	<0.00050	<0.00010	<0.00020	1.35	<0.000050	0.0033	26.4	0.0195	0.00119	<0.00050	<0.050	0.854	0.00028	-	<0.000050	7.01	<0.000010
48.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	7.75	0.0051	<0.00010	<0.00010	0.0198	<0.000020	<0.000050	<0.010	<0.0000050	76.1	<0.000010	<0.00050	<0.00010	0.00233	<0.010	<0.000050	<0.0010	23.7	0.00014	0.000157	<0.00050	<0.050	0.642	0.00049	-	0.000474	3.80	<0.000010
42.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1.0	<0.50	<0.0010	<0.00010	<0.00010	<0.00010	<0.000020	<0.000050	<0.010	<0.0000050	<0.050	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	-	<0.000050	<0.050	<0.000010
53.3	7.23	0.0041	<0.00010	0.00212	0.0988	<0.000020	<0.000050	0.016	<0.0000050	67.3	<0.000010	<0.00050	<0.00010	0.00173	0.068	0.000134	0.0025	27.3	0.00592	0.00667	0.00080	<0.050	0.558	0.00048	-	<0.000500 DLM	3.52	<0.000010
-	-	0.0022	<0.00010	0.00232	0.103	<0.000020	<0.000050	0.014	<0.0000050	64.4	<0.000010	<0.00050	<0.00010	<0.00020	0.066	<0.000050	0.0022	25.5	0.00572	0.00706	<0.00050	<0.050	0.597	0.00047	<0.0000050	<0.000050	3.78	<0.000010
50.2	7.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51.4	7.31	<0.0010	0.00014	0.00366	0.0610	<0.000020	<0.000050	0.048	<0.0000050	103	0.000013	<0.00050	<0.00010	<0.00020	0.060	<0.000050	0.0059	45.1	0.00434	0.00717	0.00080	<0.050	0.993	0.00099	-	<0.000500 DLM	3.48	<0.000010
<1.0 DLM	<0.50	<0.0010	<0.00010	<0.00010	<0.00010	<0.000020	<0.000050	0.016 RRV	<0.0000050	<0.050	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	-	<0.000050	0.099 RRV	<0.000010
-	-	<0.0010	0.00013	0.00515	0.0720	<0.000020	<0.000050	0.048	<0.0000050	104	0.000014	<0.00050	0.00014	<0.00020	0.056	<0.000050	0.0060	43.8	0.00520	0.00650	0.00090	<0.050	1.05	0.00096	<0.0000050	0.000246	3.66	0.000011
50.0	7.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	<0.0010	0.00013	0.00496	0.0727	<0.000020	<0.000050	0.047	<0.0000050	105	0.000015	<0.00050	0.00014	<0.00020	0.056	<0.000050	0.0059	43.8	0.00521	0.00659	0.00090	<0.050	1.07	0.00102	<0.0000050	0.000190	3.62	<0.000010
50.2	7.42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54.9	11.7	0.0170	<0.00010	0.0103	0.228	<0.000020	<0.000050	<0.010	<0.0000100 DLHC	61.8	0.000028	<0.00050	0.00016	0.00089	0.346	0.000080	0.0037	22.4	0.0110	0.0274	0.00080	<0.050	0.799	0.00130	-	0.00102 DLM	5.74	<0.000010
-	-	0.0012	<0.00010	0.0109	0.217	<0.000020	<0.000050	<0.010	<0.0000050	60.2	0.000019	<0.00050	0.00012	<0.00020	0.335	<0.000050	0.0039	20.9	0.00953	0.0352	0.00071	<0.050	0.784	0.00094	<0.0000050	0.00128	6.05	<0.000010
52.7	11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1.0	<0.50	<0.0010	<0.00010	<0.00010	<0.00010	<0.000020	<0.000050	<0.010	<0.0000050	<0.050	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	<0.0000050	<0.000050	0.243 RRV	<0.000010
69.4	9.74	0.0014	<0.00010	0.00022	0.125	<0.000020	<0.000050	<0.010	<0.0000050	82.6	<0.000010	<0.00050	<0.00010	0.00029	<0.010	<0.000050	0.0017	31.5	<0.00010	0.000469	<0.00050	<0.050	0.528	0.00040	-	<0.000500 DLM	5.60	<0.000010
-	-	0.0015	<0.00010	0.00023	0.122	<0.000020	<0.000050	<0.010	<0.0000050	83.0	<0.000010	<0.00050	<0.00010	0.00032	<0.010	<0.000050	0.0016	29.3	0.00118	0.000292	<0.00050	<0.050	0.545	0.00044	<0.0000050	0.000416	5.09	<0.000010
60.3	9.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51.5	7.69	0.0150	<0.00010	0.00285	0.121	<0.000020	<0.000050	0.020	<0.0000050	60.7	<0.000010	<0.00050	<0.00010	0.00154	0.167	0.000128	0.0031	23.8	0.00700	0.00173	0.00087	<0.050	0.836	0.00054	-	<0.000500 DLM	3.96	<0.000010
51.6	7.91	0.0013	<0.00010	0.00382	0.121	<0.000020	<0.000050	0.016	<0.0000050	63.2	<0.000010	<0.00050	<0.00010	0.00138	0.155	0.000071	0.0027	24.7	0.00209	0.00214	0.00060	<0.050	0.751	0.00046	-	<0.000500 DLM	4.10	<0.000010
48.5	8	0.0012	<0.00010	0.00354	0.118	<0.000020	<0.000050	0.015	<0.0000050	63.8	<0.000010	<0.00050	<0.00010	<0.00020	0.247	<0.000050	0.0026	24.0	0.00207	0.00234	0.00056	<0.050	0.798	0.00049	<0.0000050	0.000074	4.15	<0.000010
<1.0	0.52	<0.0010	<0.00010	<0.00010	<0.00010	<0.000020	<0.000050	<0.010	<0.0000050	<0.050	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	<0.0000050	<0.000050	0.253 RRV	<0.000010
44.6	7.9	0.0011	<0.00010	0.00335	0.112	<0.000020	<0.000050	0.015	<0.0000050	59.6	<0.000010	<0.00050	<0.00010	0.00026	0.225	<0.000050	0.0022	21.9	0.00189	0.00230	0.00052	<0.050	0.685	0.00045	-	<0.000050	3.85	<0.000010
52.1	8.07	0.0011	<0.00010	0.00335	0.111	<0.000020	<0.000050	0.015	<0.0000050	61.0	<0.000010	<0.00050	<0.00010	<0.00020	0.246	<0.000050	0.0025	22.9	0.00193	0.00226	0.00054	<0.050	0.707	0.00040	-	<0.000050	4.13	<0.000010
50.2	7.9	0.0013	<0.00010	0.00596	0.104	<0.000020	<0.000050	0.019	<0.0000050	63.2	<0.000010	<0.00050	<0.00010	0.00176	0.274	0.000078	0.0031	24.3	0.00473	0.00201	0.00203	<0.050	0.800	0.00052	-	<0.000500 DLM	3.83	<0.000010
48.8 DLM	8.06	0.0011	<0.00010	0.00582	0.0966	<0.000020	<0.000050	0.018	<0.0000050	60.2	<0.000010	<0.00050	<0.00010	<0.00020	0.269	<0.000050	0.0028	24.4	0.00480	0.00198	0.00200	<0.050	0.804	0.00054	-	<0.000050	3.94	<0.000010
48.2	7.91	<0.0010	<0.00010	0.00580	0.0986	<0.000020	<0.000050	0.017	<0.0000050	62.8	<0.000010	<0.00050	0.00011	<0.00020	0.256	<0.000050	0.0028	23.5	0.0140	0.00226	0.00203	<0.050	0.871	0.00061	<0.0000050	0.000064	4.14	<0.000010
45.3	7.99	0.0017	<0.00010	0.00494	0.0930	<0.000020	<0.000050	0.017	<0.0000050	57.5	<0.000010	<0.00050	<0.00010	<0.00020	0.240	<0.000050	0.0022	21.9	0.00796	0.00198	0.00185	<0.050	0.754	0.00047	-	<0.000050	3.90	<0.000010
<1.0	6.53	0.0030	<0.00010	<0.00010	0.00045	<0.000020	<0.000050	<0.010	<0.0000050	0.081	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	0.0100	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	-	<0.000050	<0.050	<0.000010
51.2	7.7	0.0677	<0.00010	0.00460	0.0959	<0.000020	<0.000050	0.018	<0.0000050	61.5	0.000013	<0.00050	<0.00010	0.00030	0.311	0.000075	0.0029	22.7	0.0121	0.00198	0.00185	<0.050	0.789	0.00057	-	<0.000050	4.32	<0.000010
50.9	8.35	0.0021	<0.00010	0.00178	0.131	<0.000020	<0.000050	0.016	<0.0000050	65.7	<0.000010	<0.00050	<0.00010	0.00197	0.132	0.000076	0.0027	24.7	0.00994	0.00233	0.00105	<0.050	0.770	0.00045	-	<0.000500 DLM	4.10	<0.000010
48.9	8.21	0.0020	<0.00010	0.00168	0.127	<0.000020	<0.000050	0.017	<0.0000050	64.2	<0.000010	<0.00050	<0.00010	0.00168	0.135	0.000148	0.0024	23.6	0.0102	0.00249	0.00153	<0.050	0.800	0.00045	<0.0000050	<0.000050	4.22	<0.000010
45.4	8.15	<0.0010	<0.00010	0.00287	0.122	<0.000020	<0.000050	0.015	<0.0000050	59.6	<0.000010	<0.00050	<0.00010	<0.00020	0.245	<0.000050	0.0020	22.3	0.0106	0.00229	0.00126	<0.050	0.693	0.00040	-	<0.000050	3.95	<0.000010
49.1	7.8	<0.0010	<0.00010	0.00380	0.127	<0.000020	<0.000050	0.016	<0.0000050	59.4	<0.000010	<0.00050	<0.00010	<0.00020	0.321	<0.000050	0.0024	23.4	0.0115	0.00226	0.00132	<0.050	0.728	0.00044	-	<0.000050	4.24	<0.000010
<1.0	<0.50	0.0107 RRV	<0.00010	<0.00010	0.00066 RRV	<0.000020	<0.000050	<0.010	<0.0000050	0.099 RRV	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	0.0127 RRV	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	-	<0.000050	<0.050	<0.000010
48.5	6.77	<0.0010	<0.00010	0.00204	0.0104	<0.000020	<0.000050	0.076	<0.0000050	173	<0.000010	<0.00050	<0.00010	<0.00020	0.181	<0.000050	0.0099	65.4	0.00435	0.00268	<0.00050	<0.050	1.36	0.00098	-	<0.000500 DLM	3.47	0.000014
44.1	-	0.0012	<0.00010	0.00210	0.00961	<0.000020	<0.000050	0.073	<0.0000050	159	<0.000010	<0.00050	<0.00010	<0.00020	0.167	<0.000050	0.0087	58.8	0.00412	0.00250	<0.00050	<0.050	1.26	0.00092	-	<0.000050	3.28	<0.000010
-	6.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43.1	-	<0.0010	<0.00010	0.00206	0.00956	<0.000020	<0.000050	0.072	<0.0000050	157	<0.000010	<0.00050	<0.00010	0.00114	0.164	<0.000050	0.0084	58.4	0.00411	0.00248	0.00051	<0.050	1.23	0.00092	-	<0.000050	3.19	<0.000010
-	6.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48.2	6.72	0.0012	<0.00010	0.00046	0.00931	<0.000020	<0.000050	0.083	<0.0000050	163	<0.000010	<0.00050	<0.00010	<0.00020	0.064	<0.000050	0.0102	66.4	0.00481	0.00242	<0.00050	<0.050	1.42	0.00092	-	<0.000500 DLM	3.47	<0.000010
44.6	-	<0.0010	<0.00010	0.00056	0.00911	<0.000020	<0.000050	0.073	<0.0000050	140	<0.000010	<0.00050	<0.00010	<0.00020	0.064	<0.000050	0.0080	57.5	0.00456	0.00224	<0.00050	<0.050	1.28	0.00093	-	<0.000050	3.09	<0.000010
-	6.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48.9	7.36	0.0014	<0.00010	0.00700	0.0192	<0.000020	<0.000050	0.073	<0.0000050	152	0.000012	<0.00050	0.00013	<0.00020	0.139	<0.000050	0.0094	64.0	0.00906	0.00302	<0.00050	<0.050	1.30	0.00074	-	<0.000500 DLM	3.89	<0.000010
44.4	-	0.0014	<0.00010	0.00645	0.0190	<0.000020	<0.000050	0.071	<0.0000050	139	<0.000010	<0.00050	0.00013	0.00046	0.154	<0.000050	0.0076	56.8	0.00844	0.00261	<0.00050	<0.050	1.19	0.00077	-	<0.000050	3.41	<0.000010
-	7.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58.2	5.69	0.0035	<0.00010	0.00012	0.0507	<0.000020	<0.000050	<0.010	<0.0000050	78.6	<0.000010	<0.00050	<0.00010	0.00296	<0.010	0.000121	<0.0010	25.4	0.00039	0.000236	<0.00050	<0.050	0.574	0.00032	-	<0.000500 DLM	2.70	<0.000010
58.4	-	0.0017	<0.00010	<0.00010	0.0580	<0.000020	<0.000050	<0.010	<0.0000050	73.1	<0.000010	<0.00050	<0.00010	0.00219	<0.010	<0.000050	<0.0010	25.9	<0.00010	0.000196	<0.00050	<0.050	0.589	0.00034	-	0.000178	2.70	<0.000010
-	5.93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1.0	<0.50	<0.0010	<0.00010	<0.00010	<0.00010	<0.000020	<0.000050	<0.010	<0.0000050	<0.050	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	-	<0.000050	0.138	<0.000010
49.1	6.82	0.0024	<0.00010	0.00144	0.0129	<0.000020	<0.000050	0.118	<0.0000050	137	<0.000010	<0.00050	<0.00010	<0.00020	0.256	<0.000050	0.0181	61.2	0.00326	0.00207	<0.00050	<0.050	3.22	0.00180	-	<0.000500 DLM	3.54	0.000010
48.3 DLM	6.67	0.0022	<0.00010	0.00144	0.0124	<0.000020	<0.000050	0.115	<0.0000050	133	<0.000010	<0.00050	<0.00010	<0.00020	0.260	<0.000050	0.0173	60.4	0.00324	0.00207	<0.00050	<0.050	3.23	0.00188	-	<0.000050	3.46	<0.000010
-	6.57	0.0019	<0.00010	0.00151	0.0193	<0.000020	<0.000050	0.124	<0.0000050	143	<0.000010	<0.00050	<0.00010	0.00104	0.248	0.000061	0.0183	59.0	0.00308	0.00216	<0.00050	<0.050	3.38	0.00203	-	<0.000050	3.61	0.000014
45.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52.2	8.93	0.0026	<0.00010	0.0115	0.0262	<0.000020	<0.000050	0.061	<0.0000050	83.7	<0.000010	<0.00050	<0.00010	<0.00020	0.266	<0.000050	0.0110	38.1	0.0229	0.00372	0.00066	<0.050	2.09	0.00085	-	<0.000500 DLM	4.38	<0.000010
-	8.73	0.0040	<0.00010	0.0115	0.0273	<0.000020	<0.000050	0.061	<0.0000050	85.6	<0.000010	<0.00050	<0.00010	<0.00020	0.282	<0.000050	0.0101	36.1	0.0314	0.00335	0.00056	<0.050	2.06	0.00082	-	<0.000050	4.49	<0.000010
47.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49.8 DLM	9.21	0.0047	<0.00010	0.00568	0.0454	<0.000020	<0.000050	0.056	<0.0000050	87.2	<0.000010	<0.00050	<0.00010	0.00046	1.21	0.000071	0.0104	38.2	0.0329	0.00267	0.00078	<0.050	2.01	0.00094	-	<0.000500 DLM	4.84	<0.000010
-	9.19	0.0030	<0.00010	0.00622	0.0490	<0.000020	<0.000050	0.060	<0.0000050	87.2	<0.000010	<0.00050	<0.00010	0.00085	1.41	0.000063	0.0099	36.2	0.0383	0.00256	0.00062	<0.050	2.03	0.00097	-	<0.000050	[illegible]	[illegible]

Dissolved Inorganic Carbon (DIC)	Silica	Aluminum (Al) diss.	Antimony (Sb) diss.	Arsenic (As) diss.	Barium (Ba) diss.	Beryllium (Be) diss.	Bismuth (Bi) diss.	Boron (B) diss.	Cadmium (Cd) diss.	Calcium (Ca) diss.	Cesium (Cs) diss.	Chromium (Cr, III+VI) diss.	Cobalt (Co) diss.	Copper (Cu) diss.	Iron (Fe) diss.	Lead (Pb) diss.	Lithium (Li) diss.	Magnesium (Mg) diss.	Manganese (Mn) diss.	Molybdenum (Mo) diss.	Nickel (Ni) diss.	Phosphorus (P) diss	Potassium (K) diss.	Rubidium (Rb) diss.	Ruthenium (Ru) diss.	Selenium (Se) diss.	Silicon (Si) diss	Silver (Ag) diss
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	0.5	0.001	0.0001	0.0001	0.0001	0.00002	0.00005	0.01	0.000005	0.05	0.00001	0.0005	0.0001	0.0002	0.01	0.00005	0.001	0.005	0.0001	0.00005	0.0005	0.05	0.05	0.0002	0.000005	0.00005	0.05	0.00001
48.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63.1 DLM	9.06	0.0063	<0.00010	0.00068	0.0457	<0.000020	<0.000050	0.069	0.0000066	68.8	<0.000010	<0.00050	0.00040	0.00785	<0.010	0.000066	<0.0010	43.1	0.166	0.0112	0.00170	<0.050	3.59	0.00030	-	<0.000500 DLM	4.69	<0.000010
-	7.64	0.238	0.00014	0.00120	0.0386	<0.000020	<0.000050	0.068	0.0000078	72.4	0.000022	<0.00050	0.00054	0.00058	0.251	0.000206	<0.0010	42.4	0.238	0.0104	0.00162	<0.050	3.40	0.00067	-	0.000106	4.67	<0.000010
11.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54.6 DLM	6.5	0.0023	<0.00010	0.00026	0.0880	<0.000020	<0.000050	0.027	<0.0000050	64.0	<0.000010	<0.00050	<0.00010	<0.00020	0.136	<0.000050	0.0055	35.3	0.00156	0.00287	<0.00050	<0.050	0.895	0.00074	-	<0.000500 DLM	3.30	<0.000010
51.0	6.51	0.0047	<0.00010	0.00032	0.0808	<0.000020	<0.000050	0.032	<0.0000050	67.9	<0.000010	<0.00050	<0.00010	0.00086	0.129	0.000104	0.0057	33.4	0.00199	0.00297	<0.00050	<0.050	0.918	0.00075	-	<0.000050	3.32	<0.000010
56.2	-	0.0014	<0.00010	0.00023	0.0806	<0.000020	<0.000050	0.026	<0.0000050	58.2	<0.000010	<0.00050	<0.00010	<0.00020	0.122	<0.000050	0.0049	32.1	0.00168	0.00279	<0.00050	<0.050	0.850	0.00073	-	<0.000050	3.32	<0.000010
-	6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50.1 DLM	6.78	0.0016	<0.00010	0.00136	0.159	<0.000020	<0.000050	<0.010	<0.0000050	65.7	<0.000010	<0.00050	<0.00010	<0.00020	0.220	<0.000050	0.0017	23.7	0.0104	0.00555	<0.00050	<0.050	0.550	0.00036	-	<0.000500 DLM	3.32	<0.000010
49.4	6.93	0.0016	<0.00010	0.00112	0.145	<0.000020	<0.000050	<0.010	<0.0000050	66.6	<0.000010	<0.00050	<0.00010	0.00060	0.202	<0.000050	0.0015	23.2	0.0107	0.00502	<0.00050	<0.050	0.605	0.00035	-	0.000051	3.34	<0.000010
53.0	-	0.0015	<0.00010	0.00102	0.171	<0.000020	<0.000050	<0.010	<0.0000050	58.1	<0.000010	<0.00050	<0.00010	<0.00020	0.232	<0.000050	0.0013	22.8	0.00981	0.00516	<0.00050	<0.050	0.557	0.00037	-	0.000052	3.47	<0.000010
-	6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58.1 DLM	5.85	0.0033	<0.00010	0.00013	0.0421	<0.000020	<0.000050	<0.010	<0.0000050	70.4	<0.000010	0.00054	<0.00010	0.00846	<0.010	0.000070	<0.0010	26.2	0.00022	0.00124	0.00051	<0.050	0.950	0.00050	-	<0.000500 DLM	2.85	<0.000010
57.3	5.94	0.0097	0.00012	0.00014	0.0496	<0.000020	<0.000050	0.016	<0.0000050	74.3	<0.000010	0.00113	<0.00010	0.00183	<0.010	0.000071	<0.0010	28.5	0.00024	0.00245	<0.00050	<0.050	1.43	0.00066	-	0.000302	3.13	<0.000010
<1.0	<0.50	<0.0010	<0.00010	<0.00010	<0.00010	<0.000020	<0.000050	<0.010	<0.0000050	<0.050	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	-	<0.000050	<0.050	<0.000010
59.8	-	0.0028	<0.00010	0.00012	0.0390	<0.000020	<0.000050	<0.010	<0.0000050	66.1	<0.000010	0.00052	<0.00010	0.00240	<0.010	<0.000050	<0.0010	24.0	0.00016	0.000667	<0.00050	<0.050	0.770	0.00042	-	0.000293	3.04	<0.000010
-	5.61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1.0	-	<0.0010	<0.00010	<0.00010	0.00036 RRV	<0.000020	<0.000050	<0.010	<0.0000050	0.068 RRV	<0.000010	<0.00050	<0.00010	<0.00020	<0.010	<0.000050	<0.0010	0.0066 RRV	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	-	<0.000050	<0.050	<0.000010
-	<0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63.1 DLM	7.34	0.0036	0.00038	0.00046	0.315	<0.000020	<0.000050	<0.010	<0.0000050	73.5	<0.000010	<0.00050	<0.00010	0.00128	0.041	0.000114	<0.0010	30.3	0.00769	0.00303	0.00200	<0.050	0.717	0.00054	-	0.00198 DLM	3.77	<0.000010
57.0 DLM	6.47	0.0028	0.00166	0.00419	0.273	<0.000020	<0.000050	<0.010	0.0000088	76.5	<0.000010	<0.00050	0.00024	<0.00020	0.019	<0.000050	0.0016	26.8	0.0153	0.0179	0.00577	<0.050	0.705	0.00063	-	0.00298 DLM	3.29	<0.000010
<1.0 DLM	<0.50	<0.0010	<0.00010	<0.00010	0.00170 RRV	<0.000020	<0.000050	0.016 RRV	<0.0000050	<0.050	<0.000010	<0.00050	<0.00010	0.00063 RRV	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.000050	<0.00050	<0.050	<0.050	<0.00020	-	<0.000050	0.125 RRV	<0.000010
53.1 DLM	6.69	0.0027	0.00016	0.00532	0.438	<0.000020	<0.000050	<0.010	<0.0000300 DLM	67.3	<0.000010	<0.00050	0.00018	0.00134	0.247	0.000103	0.0010	22.8	0.00881	0.0909	0.00945	<0.050	1.04	0.00066	-	<0.000500 DLM	3.34	<0.000010
79.7 DLM	6.91	0.0035	<0.00010	0.00013	0.0201	<0.000020	<0.000050	<0.010	<0.0000050	92.5	<0.000010	0.00052	<0.00010	0.00072	<0.010	<0.000050	0.0010	25.6	0.00030	0.000935	<0.00050	<0.050	0.535	0.00026	-	0.000157	3.54	<0.000010
56.9 DLM	6.97	0.0018	<0.00010	0.00081	0.172	<0.000020	<0.000050	0.014	<0.0000050	74.2	<0.000010	<0.00050	<0.00010	0.00127	0.124	0.000131	0.0028	29.7	0.00828	0.00449	0.00068	<0.050	0.768	0.00064	-	<0.000050	3.41	<0.000010
53.8	6.84	<0.0010	<0.00010	0.00069	0.172	<0.000020	<0.000050	0.015	<0.0000050	78.9	<0.000010	<0.00050	<0.00010	<0.00020	0.090	<0.000050	0.0027	28.8	0.00506	0.00486	<0.00050	<0.050	0.799	0.00065	-	<0.000050	3.51	<0.000010
53.0	7.12	<0.0010	<0.00010	0.00070	0.171	<0.000020	<0.000050	0.015	<0.0000050	78.5	<0.000010	<0.00050	<0.00010	0.00036	0.092	<0.000050	0.0026	28.4	0.00506	0.00493	<0.00050	<0.050	0.789	0.00064	-	<0.000050	3.50	<0.000010
57.8	-	0.0017	<0.00010	0.00042	0.166	<0.000020	<0.000050	0.015	<0.0000050	72.0	<0.000010	<0.00050	<0.00010	<0.00020	0.062	<0.000050	0.0029	28.4	0.00448	0.00420	<0.00050	<0.050	0.768	0.00060	-	0.000060	3.70	<0.000010
-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58.3	-	0.0012	<0.00010	0.00045	0.174	<0.000020	<0.000050	0.015	<0.0000050	71.2	<0.000010	<0.00050	<0.00010	<0.00020	0.062	<0.000050	0.0030	28.5	0.00445	0.00409	<0.00050	<0.050	0.768	0.00061	-	<0.000050	3.70	<0.000010
-	7.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sodium (Na) diss.	Strontium (Sr) diss.	Sulfur (S) diss.	Tellurium (Te) diss.	Thallium (Tl) diss.	Thorium (Th) diss.	Tin (Sn) diss.	Titanium (Ti) diss.	Tungsten (W) diss.	Uranium (U) diss.	Vanadium (V) diss.	Zinc (Zn) diss.	Zirconium (Zr) diss.	Cations Total	Anions Total	Cation - Anion Balance
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mEq/L	mEq/L	%
0.05	0.0002	0.5	0.0002	0.00001	0.0001	0.0001	0.0003	0.0001	0.00001	0.0005	0.001	0.0003	0.1	0.1	0.01
4.79	0.185	9.79	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000436	<0.00050	<0.0010	<0.00030	5.54	5.36	1.65
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.00	0.0712	1.83	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000267	<0.00050	<0.0010	<0.00030	5.85	6.57	-5.80
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.050	<0.00020	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	-	-	-
1.41	0.877	11.7	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	0.00016	0.00469	<0.00050	0.0075	<0.00030	5.68[#1]	5.48[#1]	1.79[#1]
1.33	0.837	10.6	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	0.00014	0.00478	<0.00050	<0.0010	<0.00030	5.39	5.31	0.75
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.80	3.33 DLHC	78.6	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00803	<0.00050	<0.0010	<0.00030	9.04[#1]	8.77[#1]	1.52[#1]
<0.050	<0.00020	<0.50	<0.00020	<0.000010	<0.00010	0.00026 RRV	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	-	-	-
3.66	3.17 DLHC	74.2	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00852	<0.00050	<0.0010	<0.00030	8.98	8.87	0.62
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.66	3.05 DLHC	72.4	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00841	<0.00050	<0.0010	<0.00030	9.03	8.86	0.95
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.5	0.281	9.00	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.0171	<0.00050	0.0016	<0.00030	5.55[#1]	5.89[#1]	-2.97[#1]
16.4	0.260	9.15	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.0145	<0.00050	<0.0010	<0.00030	5.47	5.47	<0.01
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.063 RRV	<0.00020	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	<0.10	<0.10	<0.01
3.00	0.108	6.21	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000617	<0.00050	<0.0010	<0.00030	6.86[#1]	8.98[#1]	-13.4[#1]
2.66	0.101	4.54	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000503	<0.00050	<0.0010	<0.00030	6.68	6.95	-1.98
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.56	1.31	11.7	<0.00020	<0.000010	<0.00010	0.00017	<0.00030	<0.00010	0.00259	<0.00050	0.0111	<0.00030	5.26[#1]	5.28[#1]	-0.19[#1]
2.18	1.20	11.6	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00288	<0.00050	0.0019	<0.00030	5.31[#1]	5.22[#1]	0.85[#1]
2.16	1.18	10.9	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00306	<0.00050	<0.0010	<0.00030	5.28	5.19	0.86
0.051 RRV	<0.00020	<0.50	<0.00020	<0.000010	<0.00010	0.00097 RRV	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	<0.10	<0.10	<0.01
1.82	1.04	10.5	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00324	<0.00050	<0.0010	<0.00030	4.88	5.20	-3.17
2.03	1.02	10.8	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00356	<0.00050	<0.0010	<0.00030	5.04	5.30	-2.51
2.73	1.35	12.4	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00466	<0.00050	0.0018	<0.00030	5.30[#1]	5.19[#1]	1.05[#1]
2.68	1.36	12.4	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00471	<0.00050	<0.0010	<0.00030	5.16[#1]	5.24[#1]	-0.77[#1]
2.56	1.39	12.0	<0.00020	0.000018	<0.00010	<0.00010	<0.00030	<0.00010	0.00516	<0.00050	<0.0010	<0.00030	5.21	6.30	-9.47
2.58	1.24	12.0	<0.00020	0.000022	<0.00010	<0.00010	<0.00030	<0.00010	0.00476	<0.00050	<0.0010	<0.00030	4.81	6.75	-16.8
<0.050	0.00023	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	-	-	-
2.75	1.21	12.1	<0.00020	0.000017	<0.00010	<0.00010	0.00163	<0.00010	0.00521	<0.00050	0.0015	<0.00030	5.10	5.70	-5.56
1.97	1.14	11.3	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00664	<0.00050	0.0015	<0.00030	5.42[#1]	6.14[#1]	-6.23[#1]
1.88	1.02	10.9	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00622	<0.00050	0.0074	<0.00030	5.25	6.24	-8.62
1.81	0.923	10.8	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00609	<0.00050	<0.0010	<0.00030	4.92	5.46	-5.20
2.07	0.974	11.6	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00642	<0.00050	<0.0010	<0.00030	5.01	5.57	-5.29
0.171 RRV	0.00029 RRV	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	-	-	-
4.32	6.57 DLHC	172	0.00032	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00135	<0.00050	<0.0010	<0.00030	14.2[#1]	14.0[#1]	0.71[#1]
3.62	5.81 DLHC	162	0.00042	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00127	<0.00050	<0.0010	<0.00030	13.0	13.6	-2.26
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.59	5.85 DLHC	160	0.00039	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00127	<0.00050	0.0026	<0.00030	12.8	13.8	-3.76
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.45	6.47 DLHC	164	0.00040	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00101	<0.00050	<0.0010	<0.00030	13.8[#1]	13.2[#1]	2.22[#1]
3.84	5.57 DLHC	143	0.00038	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000981	<0.00050	<0.0010	<0.00030	11.9	12.7	-3.25
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.01	5.21 DLHC	154	0.00035	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00191	<0.00050	<0.0010	<0.00030	13.1[#1]	12.5[#1]	2.34[#1]
4.18	4.85 DLHC	138	0.00038	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00173	<0.00050	<0.0010	<0.00030	11.8	12.7	-3.67
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.39	0.0927	2.31	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000424	<0.00050	0.0064	<0.00030	6.09[#1]	6.84[#1]	-5.80[#1]
1.35	0.0903	1.93	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000415	<0.00050	0.0015	<0.00030	5.85	6.45	-4.88
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.060	<0.00020	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	-	-	-
135	13.0 DLHC	145	0.00049	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000803	<0.00050	<0.0010	<0.00030	17.8[#1]	16.4[#1]	4.09[#1]
132	12.3 DLHC	143	0.00041	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000766	<0.00050	<0.0010	<0.00030	17.4[#1]	17.9[#1]	-1.42[#1]
144	12.8 DLHC	141	0.00058	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000732	<0.00050	0.0015	<0.00030	18.4	17.8	1.66
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81.7	7.88 DLHC	50.7	0.00036	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00438	<0.00050	<0.0010	<0.00030	10.9[#1]	9.99[#1]	4.36[#1]
73.7	8.66 DLHC	50.9	0.00039	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00361	<0.00050	<0.0010	<0.00030	10.5	10.1	1.94
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70.3	7.97 DLHC	55.2	0.00035	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00441	<0.00050	0.0029	<0.00030	10.6[#1]	9.85[#1]	3.67[#1]
71.2	8.11 DLHC	52.7	0.00035	<0.000010	<0.00010	0.00011	<0.00030	<0.00010	0.00393	<0.00050	0.0015	<0.00030	10.5	9.91	2.89

Sodium (Na) diss.	Strontium (Sr) diss.	Sulfur (S) diss.	Tellurium (Te) diss.	Thallium (Tl) diss.	Thorium (Th) diss.	Tin (Sn) diss.	Titanium (Ti) diss.	Tungsten (W) diss.	Uranium (U) diss.	Vanadium (V) diss.	Zinc (Zn) diss.	Zirconium (Zr) diss.	Cations Total	Anions Total	Cation - Anion Balance
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mEq/L	mEq/L	%
0.05	0.0002	0.5	0.0002	0.00001	0.0001	0.0001	0.0003	0.0001	0.00001	0.0005	0.001	0.0003	0.1	0.1	0.01
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46.3	1.78	27.0	<0.00020	<0.000010	<0.00010	0.00011	<0.00030	<0.00010	0.00553	<0.00050	0.0018	<0.00030	9.10[#1]	13.3[#1]	-18.8[#1]
40.8	1.77	25.1	<0.00020	0.000013	<0.00010	<0.00010	<0.0120 DLUI	<0.00010	0.00365	0.00137	0.0011	0.00033	9.02	9.06	-0.22
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.4	5.78 DLHC	13.9	0.00032	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000662	<0.00050	0.0014	<0.00030	7.27[#1]	7.08[#1]	1.32[#1]
28.7	5.27 DLHC	15.2	0.00030	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000858	<0.00050	0.0069	<0.00030	7.41	7.20	1.44
24.4	4.80 DLHC	13.0	0.00032	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000761	<0.00050	<0.0010	<0.00030	6.63	7.02	-2.86
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.9	0.936	6.87	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00166	<0.00050	<0.0010	<0.00030	5.81[#1]	5.55[#1]	2.29[#1]
16.9	1.08	8.67	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00157	<0.00050	<0.0010	<0.00030	5.99	5.80	1.61
12.7	0.724	6.48	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00162	<0.00050	<0.0010	<0.00030	5.35	5.64	-2.64
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.88	0.192	1.94	<0.00020	<0.000010	<0.00010	0.00012	<0.00030	<0.00010	0.000810	<0.00050	0.0020	<0.00030	5.77[#1]	5.77[#1]	<0.01[#1]
4.15	0.206	3.64	<0.00020	<0.000010	<0.00010	0.00014	<0.00030	0.00019	0.00103	<0.00050	0.0018	<0.00030	6.27	7.30	-7.59
<0.050	<0.00020	<0.50	<0.00020	<0.000010	<0.00010	0.00021	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	-	-	-
1.68	0.160	1.61	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.000702	<0.00050	0.0018	<0.00030	5.37	5.60	-2.10
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.050	<0.00020	<0.50	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.14	0.452	9.37	<0.00020	0.000019	<0.00010	<0.00010	<0.00030	<0.00010	0.0112	<0.00050	0.0067	<0.00030	6.53[#1]	7.58[#1]	-7.44[#1]
17.7	0.408	13.4	<0.00020	0.000151	<0.00010	<0.00010	<0.00030	<0.00010	0.0241	<0.00050	0.0143	<0.00030	6.81[#1]	6.70[#1]	0.81[#1]
<0.050	<0.00020	<0.50	<0.00020	<0.000010	<0.00010	0.00013 RRV	<0.00030	<0.00010	<0.000010	<0.00050	<0.0010	<0.00030	-	-	-
2.84	9.26 DLHC	4.25	0.00052	0.000035	<0.00010	<0.00010	<0.00030	<0.00010	0.0170	<0.00050	0.0076	<0.00030	5.39[#1]	5.05[#1]	3.26[#1]
39.5	0.116	2.58	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00138	<0.00050	<0.0010	<0.00030	8.45[#1]	10.1[#1]	-8.89[#1]
26.4	3.21 DLHC	15.7	<0.00020	<0.000010	<0.00010	0.00013	<0.00030	<0.00010	0.00206	<0.00050	0.0067	<0.00030	7.32[#1]	7.19[#1]	0.90[#1]
23.8	3.26 DLHC	15.6	0.00021	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00264	<0.00050	<0.0010	<0.00030	7.36	7.08	1.94
23.4	3.18 DLHC	15.7	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00265	<0.00050	0.0016	<0.00030	7.30	7.12	1.25
28.3	2.82 DLHC	17.1	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00293	<0.00050	<0.0010	<0.00030	7.18	7.42	-1.64
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.3	2.77 DLHC	17.1	<0.00020	<0.000010	<0.00010	<0.00010	<0.00030	<0.00010	0.00298	<0.00050	<0.0010	<0.00030	7.15	7.46	-2.12
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

KGS GROUP

Experience in Action