

Eagle Mine

a subsidiary of **lundin mining**

2023 Annual Mining and Reclamation Report Mine Permit MP 01 2007

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Acronyms and Abbreviations

AEM	Advanced Ecological Management
ALS	Advanced Life Support
CMT	Crisis Management Team
COSA	Coarse Ore Storage Area
CRF	Cemented Rock Fill
CWB	Contact Water Basin
DO	dissolved oxygen
Eagle	Eagle Mine LLC
EE	Eagle East
EGLE	Michigan Department of Environment, Great Lakes & Energy
ft	feet
gal	gallon
gpd	gallons per day
gpm	gallons per minute
GWDP	Groundwater Discharge Permit
ICMM	International Council on Mining & Metals
in	inches
KME	King and MacGregor Environmental
LLSI	Leak Location Services, Inc.
m	<i>meter</i>
m ³	cubic meters
MG	million gallons
MDNR	Michigan Department of Natural Resources
AMSL	Above mean sea level
µg/L	micrograms per liter
µS/cm	micro-Siemens per centimeter
mg/L	milligrams per liter
MNFI	Michigan Natural Features Inventory
MPBX	Multi-Point Borehole Extensometer
MRR	Mining and Reclamation Report
NCWIB	Non-Contact Water Infiltration Basin
NJC	North Jackson Company
NLG	Narrow-Leaved Gentian
NREPA	Natural Resources & Environmental Protection Act
ORP	Oxidation Reduction Potential
Part 632	Part 632 Mining Permit
PIPP	Pollution Incident Prevention Plan
QAPP	Quality Assurance Project Plan
Q1	Quarter One
RO	Reverse Osmosis

SESC	Soil Erosion and Sedimentation Control
SOP	Standard Operating Procedure
SLST	Siltstone
SU	standard units
t	metric ton (tonne)
TDRSA	Temporary Development Rock Storage Area
TDS	total dissolved solids
Trimedia	Trimedia Environmental & Engineering Services, LLC
TWIS	Treated Water Infiltration System
VOC	Volatile Organic Compound
WSP	WSP Global, Inc.
WTP	Water Treatment Plant

1. Document Preparers and Qualifications

This Mining and Reclamation Report (MRR) was prepared by the Eagle Mine (Eagle) Environmental Department and incorporates information prepared by other qualified professionals. Table 1.1 lists the individuals and organizations responsible for preparing this MRR and those who contributed information for inclusion in the report.

Table 1.1 – Document Preparation – List of Contributors

Organization	Name	Title
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2. Introduction

Eagle Mine is an underground nickel and copper mine in Michigamme Township that was constructed in 2010 and began underground development in September 2011. Accordingly, Eagle Mine is required to submit the annual MRR under Mining Permit MP 01 2007. Background information regarding the Eagle Mine site is provided in Appendix A and a copy of the current site map is provided in Appendix B.

3. Site Modifications, Amendments, and Submittals

Tables 3.1 and 3.2 below list the routine and non-routine notifications and required submittals and approvals that were provided to the Department in 2023 as required under the Part 632 Mining Permit. Table 3.3 lists other submittals under Eagle’s other permits. Table 3.4 lists spills reported under Part 5 Rules of Part 31 (Spillage of Oil and Polluting Materials) in 2023. In addition, site modifications completed in 2023 are described below.

Table 3.1 – Routine Submittals and Approvals Required Under Part 632

Date	Description	Approval
01/19/23	Q4 2022 Groundwater and Surface Water Monitoring Data	N/A
03/15/23	2022 Annual Mining and Reclamation Report	N/A
04/11/23	Q1 2023 Groundwater and Surface Water Monitoring Data	N/A
08/03/23	Q2 2023 Groundwater and Surface Water Monitoring Data	N/A
10/04/23	Q3 2023 Groundwater and Surface Water Monitoring Data	N/A

Table 3.2 – Non-Routine Submittals and Approvals Under Part 632

Date	Description	Approval
04/12/23	2022 Annual Mining and Reclamation Report – Sections 5.1.1 and 5.4.1 Updates	04/06/23
06/20/23	Management of RO Concentrate Acknowledgement	07/10/23
11/01/23	Modifications to the Mine Administration Building and Road	11/30/23
11/07/23	Upper Eagle East Expansion	12/20/23

Table 3.3 – Submittals and Approvals Under Other Permits

Date	Description	Approval
04/06/23	Q1 2023 – QAL051D Vanadium Results – Non-Exceedance	N/A
06/22/23	Q2 2023 – QAL051D Vanadium Results – Exceedance	N/A
06/28/23	Beryllium & Copper Re-Sample Results – Beryllium Non-Exceedance	07/07/23
07/31/23	QA/QC Lab Results for Beryllium & Copper Notification	N/A
09/21/23	Q3 2023 – QAL051D Vanadium Results – Exceedance	N/A
10/12/23	Authorization to Lower Contact Water Basin (CWB) Water Levels	10/17/23
12/14/23	Q4 2023 – QAL051D Vanadium Results – Exceedance	N/A
12/19/23	Notification of Change in Facility Operations – 4th Crystallizer	N/A

Table 3.4 – Report of Incident – Part 5 Rules Release Submittals

Date	Description	Approval
05/12/23	Form Oil Spill Notification	05/15/23

On May 2nd, 2023, a form oil tote was punctured by a forklift. Approximately 200 gallons of form oil was immediately cleaned up from the soil. An investigation was conducted, and improvements were implemented to manage tote materials on paved areas.

3.1 Site Project Work

Modifications to the Mine Administration Building and Road

Approximately 3,600 square feet of office space was added to the existing administrative building. A gravel road was built south of the addition for vehicle access to the maintenance offices.

Water Treatment Plant 4th Crystallizer Installation

A fourth crystallizer was installed at the Eagle Mine Water Treatment Plant (WTP). The crystallizer equipment treats Reverse Osmosis (RO) concentrate to reduce the brine concentrate to a dry solid. This addition's main purpose was to further debottleneck the crystallized waste production portion of the WTP operation.



Figure 1 – Inside of the New 4th Crystallizer

4. Mining Activities and Data Report

4.1 Underground Operations

Subsidence Monitoring

Per special condition E-8 of the mining permit, an annual review of the rock stability was completed to ensure that the modeling provided in the permit application is still valid. The Operations Manager signed a letter certifying the rock stability (Appendix C). Subsidence monitoring was also conducted throughout 2023 following Eagle’s Subsidence Monitoring Plan and as required by permit condition L-17. For more information about Eagle’s subsidence monitoring system, reference Appendix A.

In spring of 2022, geotechnical engineers reviewing data from the existing surface monuments above the ore body and determined that the monuments may not be seated at a depth sufficient to resist the effects of frost heave. The engineers designed an array of supplemental monuments which are installed below the frost line and within feet of the bedrock contact. Installation of these monuments was completed in 2023, and monthly measurements were collected starting in July 2023. Both sets of monuments will continue to be surveyed until data is collected that proves the original setup is compromised, and approval is granted by EGLE (Michigan Department of Environment, Great Lakes & Energy) to discontinue monitoring of the original monuments.

4.1.1 Underground Development Progress

Table 4.1.1a through Table 4.1.1d breaks out underground development progress and exploration drilling information for Eagle, Eagle East, and ramp development to Upper Eagle East. Maps showing the 2023 development and progress can be found in Appendix D.

Table 4.1.1a – 2023 Eagle Underground Meters of Development

Eagle Mine Development	Meters
Sills	446
Vertical	0
General/Horizontal	225
Total	671

Source: Mine Engineering Department

Table 4.1.1b – 2023 Eagle East Decline Meters of Development

Eagle East Decline Development	Meters
Sills	3,017
Vertical	0
General/Horizontal	407
Total	3,424

Source: Mine Engineering Department

Table 4.1.1c – 2023 Upper Eagle East Decline Meters of Development

Upper Eagle East Decline Development	Meters
Sills	0
Vertical	0
General/Horizontal	579
Total	579

Source: Mine Engineering Department

Table 4.1.1d – 2023 Drilling Program

Location	Drill Holes	Meters
Eagle	26	3,897
Eagle East	0	0
Upper Eagle East	31	4,346
Exploration	10	6,877
Total	67	15,120

Source: Mine Engineering Department

4.1.2 Geochemistry Program

Previously, the geochemistry program was comprised of two parts; the water quality of the underground as it is representative of ore, and sampling of development rock from either Eagle or Eagle East decline development. Since the decline development is completed in Eagle and Eagle East, the program focused on underground water quality in those areas. Additional discussion of underground water quality is included in Section 4.1.5 of the MRR below.

However, development to Upper Eagle East workings began in 2023, so Upper Eagle East development ramp sampling began in May of 2023. The reinstated development rock sampling program includes geochemical characterization (i.e., static testing program). Samples are logged and visually characterized, with percentage of sulfides noted in a comprehensive spreadsheet. Rock types identified in the Upper Eagle East decline have been consistent with those observed in Eagle with siltstone (SLST) being the most prevalent. On average, 1-2% sulfides have been visually observed along the bedding in siltstone which is like observations reported in the Eagle decline. After observations

are recorded, the samples are sent to SGS Laboratories for analysis. As sample results are received from the laboratory, they are reviewed to determine if they are consistent with baseline values.

4.1.3 Underground Ore Production – Stoping & Backfilling

Primary stopes are backfilled using underground haul trucks after the extraction of ore. Cemented rock fill (CRF) for backfill is produced at the onsite batch plant. In 2023, 411,800 tonnes (t) of CRF was produced. Table 4.1.2a through Table 4.1.2c breaks out number stopes mined, amount of CRF used for backfilling and tonnes of ore mined in 2023. For additional information about Eagle’s production methods, reference Appendix A.

Table 4.1.3a – Number of Stopes Fully Mined & Backfilled in 2023

Stope Type	Total (Number)
Primary Stopes	19
Secondary Stopes	10

Source: Mine Engineering Department; 1 of the 10 stopes were backfilled with development rock; the remaining 9 secondary stopes were filled with CRF.

Table 4.1.3b – Tonnage of Cemented Rock Fill

Backfill	Tonnage of CRF
CRF	237,456 (58%)
Jamming	174,344 (42%)
Total	411,800

Source: Mine Engineering Department

Table 4.1.3c – Tonnes of Ore Mined in 2023

Ore Mined	Tonnage of Ore Mined (tonnes)
Eagle Sills	43,235
Eagle East Sills	306,718
Upper Eagle East Sills	0
Eagle Stopes	166,548
Eagle East Stopes	181,818
Upper Eagle East Stopes	0
Survey Actual Adjustment	26,446
Total	724,765

Source: Mine Engineering Department



Figure 2 – Haul Truck Loading Material Underground

4.1.4 Mining Forecast

The 2024 mining forecast is included in Table 4.1.4.

Table 4.1.4 – 2024 Mining Forecast

Production Area	Lateral Advance (m)*	Ore Production (t)*	
		Sills	Stopes
Eagle	754	54,693	201,010
Eagle East	4,445	197,969	285,847
Upper Eagle East	1,733	9,919	-
Total	6,932	749,438	

Source: Mine Engineering Department

*All estimates are subject to change.

4.1.5 Underground Dewatering Volume and Quality

Underground Dewatering Volume

Water is required underground to complete drilling, bolting, dust suppression activities, and to knock down loose material after a stope blast. Water usage increased in 2023 due to the drilling program. To mitigate this, a system to reuse water reuse drill water for drilling and dust suppression was implemented. The groundwater consumption decreased from 108,900 gallons per month in 2022 to 87,613 gallons per month in 2023. Inspections of the underground found only a few areas in which groundwater infiltration is visible and is significantly less than was predicted during the permit application process. Some small but isolated pockets of water were periodically encountered during the drilling and blasting operations which temporarily resulted in a slight increase in water flow. Table 4.1.5 summarizes water consumption and dewatering in 2023.

Table 4.1.5 – Average Monthly Water Volume Provided to Underground and Dewatering Volume

Month	Average Water Supplied Underground (gpd)	Average Water Pumped from Underground (gpd)	Average Dewatering Volume*(gpd)	Average Dewatering Volume* (gpm)
January	68,438	74,029	5,590	3.9
February	62,096	52,918	-9,178	-6.4
March	80,677	67,596	-13,081	-9.1
April	75,619	59,102	-16,517	-11.5
May	77,165	77,395	230	0.16
June	72,879	77,245	4,366	3.0
July	80,377	83,295	2,919	2.0
August	89,528	93,272	3,743	2.6
September	106,110	104,533	-1,576	-1.1
October	110,163	125,662	15,499	10.8
November	112,997	113,439	442	0.31
December	115,301	104,835	-10,466	-7.3

* Dewatering volume is calculated by subtracting the volume of water provided to the mine from the volume of water removed from the mine. Dewatering volume is broadly indicative of the amount of groundwater infiltration occurring. GPM = gallons per minute and GPD = gallons per day.

Underground Water Quality

Underground water quality samples were collected quarterly in February, May, July, and November 2023 from Jump Tank 1 located in the main decline underground. Water from the lower levels of the mine is pumped to Jump Tank 1 which then pumps the water to the contact water basins (CWBs). Samples were analyzed for the annual parameter list in the second quarter and the full parameter list in Q1, Q3, and Q4. A summary table and graph of the results are available in Appendix E.

4.2 Temporary Development Rock Storage Area (TDRSA)

Development rock crushing occurred in 2023. Eagle contracted Associated Constructors LLC to crush development rock to three-inch minus to be used as backfill.

4.2.1 Development Rock Storage Volume

In 2023, the total amount of development rock mined was 109,075 t (38,955 m³)^A. The amount of development rock placed on the TDRSA from underground was 102,009 t (56,672 m³)^B. The remaining 7,067 t (3,926 m³)^B of development rock was utilized as uncemented backfill in secondary stopes.

Once development rock is mined, the density factor decreases to account for swell, or void space of the blasted rock. The table below shows the swell factors used to calculate tonnes/m³ of material of development rock, mined development rock, and crushed development rock. There was no development rock removed from the TDRSA for use in uncemented rock fill.

Table 4.2.1a – Swell Factor

Reference	Density (tonnes/m3)
A	2.8
B	1.8
C	1.91

No limestone was added to the TDRSA in 2023. Eagle verifies the continued effectiveness of limestone added in previous years through quarterly pH readings of the TDRSA contact water (discussed in more detail below in Section 4.2.2). Table 4.2.1b summarizes the surveyed volume of material stored in the TDRSA as well as the volumes of development rock and limestone added and/or removed for use in backfill in 2023.

Table 4.2.1b – 2023 TDRSA Volume Totals

Month	Volume of Waste Rock Added to TDRSA (m ³)	Limestone Delivered (m ³)	Development Rock Removed from TDRSA for Backfill (m ³)	End of Year TDRSA Survey Volume (m ³)
2023 Total	56,672	0	0	116,468

Note: Development rock volume added to the TDRSA was based on the difference between the amount of development rock mined and the amount of development rock remaining underground as GOB fill.



Figure 3 – Temporary Development Rock Storage Area

4.2.2 TDRSA Sump Dewatering Volume and Quality

Primary Contact Sump Volume Monitoring

WTP operators conducted weekly inspections of the TDRSA primary sump, and the Environmental Department conducted an additional weekly inspection. The water level was recorded in a compliance logbook kept onsite and available upon request. Results of the weekly inspections indicate that water levels in the sump were maintained within the ranges specified by the Part 632 permit or returned to those ranges within seven days following a significant wet weather event (rain and/or snowmelt).

In 2023, approximately 10.7 million gallons (MG) of water was pumped from the TDRSA contact water sump to the CWBs for eventual treatment in the WTP.

Primary Contact Sump Water Quality

Quarterly water quality monitoring of the contact water sump was conducted in February, May, July, and November. The chemistry of the TDRSA contact water sump fluctuated between sampling quarters which was expected because the material from both Eagle and Eagle East was added during the year and precipitation/snow melt events contributed fresh water to the system. The concentration-based results for several parameters decreased from 2022 to 2023, specific

conductivity, sodium, and chloride while metals slightly increased (e.g., nickel and selenium). pH remained in the neutral to slightly basic range of 7.2 – 8.1 SU, indicating that the limestone present is still providing sufficient neutralizing capacity. Table 4.2.2a summarizes the contact water sump water quality.

Table 4.2.2a – TDRSA Primary Contact Sump Results for 2023

Parameter	02/20/23	05/08/23	07/17/23	11/06/23
Sodium (mg/L)	612	366	342	353
Chloride (mg/L)	612	477	417	312
Magnesium (mg/L)	237	158	134	180
Nitrate (mg/L)	368	193	176	151
Nickel (ug/L)	4,930	2,870	3,900	5,170
Selenium (ug/L)	12.9	11.5	12.9	14.9
pH (SU)	8.1	6.9	7.4	7.2
Specific Conductivity (µS/cm)	6,533	4,369	4,346	4,572

Leak Detection Sump Volume Monitoring

Permit conditions require that the leak detection sump be purged and sampled as accumulation occurs. “Accumulation” was determined to be a volume of water significant enough to allow for three minutes of purging before sample collection. The volume pumped is used to calculate the average daily rate of accumulation into the sump. The daily rate of accumulation was estimated throughout the year at approximately 0.02 gal/acre/day which is well below the 25 gal/acre/day threshold indicated in the permit.

In 2023, no water accumulations occurred based on weekly monitoring records of the level sensor readings for the leak detection sump. Inflows and sustained level changes would indicate an accumulation during weekly inspections. A total of approximately 69 gallons of water were pumped from the leak detection sump from precipitation that was retained within the liner system during construction (reference Appendix A for further information).

Leak Detection Sump Water Quality

Quarterly water quality monitoring of the leak detection sump was conducted in February, May, July, and November 2023. Upon sample collection, the pH and specific conductance of the sample was immediately measured, and the remaining sample aliquot was sent to an offsite laboratory for analysis. Although only pH and sulfate analysis is required by the permit, additional parameters were also analyzed.

Table 4.2.2b summarizes the TDRSA leak detection sump analytical results for 2023. The pH results were consistent and ranged from a low of 7.5 SU to a high of 8.6 SU which is neutral to slightly basic in nature, like the 2022 results. Sulfate results fluctuated throughout the year, with levels ranging from a minimum of 701 milligrams per liter (mg/L) in February to a maximum of 1,650 mg/L in July. Though sulfate is the most prominent constituent no trend was observed. Increases in some parameters may be the result of the decreased volume of water present in the sump, leading to less dilution of constituents.

Table 4.2.2b – TDRSA Secondary Leak Detection Sump Results for 2023

Parameter	02/20/23	05/08/23	07/17/23	11/06/23
Magnesium (mg/L)	20.8	26.7	42.0	48.5
Sodium (mg/L)	766	721	586	609
Chloride (mg/L)	61.5	69.0	81.1	83.9
Sulfate (mg/L)	701	853	1,650	863
Nitrate (mg/L)	69.2	78.2	98.9	102
Nitrite (mg/L)	<1.0	2.2	1.5	<1.0
Ammonia (mg/L)	<0.10	<0.10	<0.10	<0.10
Average Daily Flow Rate (gal/acre/day)*	0.02	0.02	0.02	0.02
Purged Volume (gal)*	5.0	5.0	5.0	5.0
pH (SU)	8.6	7.5	8.0	7.6
Specific Conductivity (µS/cm)	3,543	3,483	3,537	3,583

*estimated volume; flow rate was too low to register on the flow meter.

Comparison of Sump Water Quality Results

The decreased water level in the leak detection sump is a very good indication that the liner system of the contact water sump is intact and not leaking. In addition to the water level, results from the leak detection sump are compared to the contact water sump to determine if a relationship exists. The water from the contact water sump is indicative of the water quality found in Eagle East while the concentrations in the leak sump are significantly lower and do not share the same signatures. Notably, there are clear differences in the concentrations of magnesium, sulfate, and chloride between the two sumps. The source of sulfate was likely introduced during the construction of the lining system.

A summary of the 2023 monitoring results and graphs comparing results from the TDRSA leak detection and contact water sump can be found in Appendix E. For more information about the construction of the TDRSA containment and leak detection monitoring systems, reference Appendix A.

4.3 Site Water Usage, Control, Treatment, and Discharge

Site-wide water consumption includes three features: supply water to surface activities, supply to underground mining activities, and the management of process water in the CWBs for eventual treatment in the water treatment plant. This is accomplished by the domestic (QALPSW001) and the utility (QAL011D) supply wells and storm water management in the CWBs for eventual treatment and discharge to the Treated Water Infiltration System (TWIS).

4.3.1 Supply Water Sources and Usage

The domestic well (QALPSW001) was used to supply potable water to the surface facilities and fire water tank if necessary. The mine services well (QAL011D) was primarily used to supply water for the truck wash, underground operations, dust suppression, and the fire water tank which supplies water to the network of fire hydrants onsite. The third water source on the mine site is the treated utility water supplied and used by the WTP. Utility water is produced by treatment of water collected in the CWBs.



Figure 4 – Domestic Well at the Mine Site

4.3.2 Storm Water Control

The mine site storm water is either defined as non-contact storm water or contact storm water. The non-contact storm water is collected in four non-contact water infiltration basins (NCWIBs) where it then infiltrates into the ground. This water does not require treatment because it is from areas of the site that have no contact with operations. Contact stormwater is defined as water in contact with mine material and collected in two lined basins where it is held before treatment through the water treatment facility.

4.3.3 Contact Water Basins

CWB Monitoring

Three primary sources of site water were discharged to the CWBs before treatment in the WTP. These included dewatering from the underground mine, the TDRSA, and precipitation and storm water that falls on the paved contact area. Additional intermittent sources include dewatering from the sumps located in the COSA, truck wash, fuel area, batch plant, boot wash, and truck shop.



Figure 5 – Layout of the CWB's

CWB levels are continuously recorded and saved to a database maintained by WTP operators. This log with daily readings is in Appendix E. All rainfall and snow melt that occurred in 2023 was collected and managed within the capacity of the CWBs. Basin dredging and leak testing to monitor CWB liner integrity is detailed below in Section 5.5.4.

CWB Water Quality

As a best practice, samples were collected from CWB #2 in February, May, July and November 2023 to provide the WTP operators with valuable data that may affect process control and provides information to identify any parameter trending in water quality as mining progresses. Additionally, results can be compared to downgradient water quality to confirm the liners are intact and functioning as designed. A summary of the results can be found in Appendix E.

Like previous years, the CWB monitoring results fluctuate from quarter to quarter and are dependent on the areas being mined underground, TDRSA sump inputs, and the amount of dilution from precipitation. pH results ranged from 9.3 SU in Q2 to 10.3 SU in Q1. The elevated concentrations in CWB #2 are due to water being recirculated back to the basins from the WTP. Water in CWB #1 can be transferred into CWB #2 and vice versa, to optimize WTP operations which in turn can change water quality in each basin.



Figure 6 – View looking southeast at CWB #1

4.3.4 Non-Contact Water Infiltration Basins (NCWIB)

NCWIB Monitoring

There are three NCWIBs in the main surface facility area and one near the ventilation air raise. Inspections of the NCWIBs following wet weather events continue to indicate the basins are operating as expected with storm water readily infiltrating back into the ground. The only exception is following spring melt or excessive rain events in which water ponds in the NCWIBs briefly before infiltrating. The basins are monitored for excess silt that would prevent infiltration and ideal operation as designed.

NCWIB Water Quality

Per the mining permit, monitoring wells are required to be located downgradient of each NCWIB and must be sampled in the event of a surface discharge from the basin. Eagle Mine has chosen to sample these wells at least annually as surface discharge is not expected to occur. Monitoring wells QAL070A and QAL073A, located down gradient of NCWIBs #2 and #3, are monitored annually. Monitoring wells QAL071A and QAL024A are located downgradient of NCWIB #1 and #4 and are monitored quarterly as part of the overall mine monitoring well network.

The analytical results from QAL070A and QAL073A were compared to the established benchmarks calculated for each. Sampling results from QAL070A detected mainly cations and anions including bicarbonate alkalinity, chloride, nitrate, sulfate, calcium, magnesium, sodium, and hardness, that were outside of calculated benchmarks. Although this location only requires sampling following a surface discharge from the NCWIB, Eagle will continue to monitor annually to identify trends. This well is located adjacent to the site's main access road which is graded to direct run-off from the roadway toward the monitoring well location. Several elevated levels at location QAL070A are likely due to a sand/salt mixture applied to the roadway during winter. Results at QAL073A were outside of benchmarks for pH, iron, bicarbonate alkalinity, nitrate, calcium, magnesium, sodium, and hardness. Groundwater monitoring results from QAL071A and QAL073A are further discussed in Section 5.1 and all results are summarized in Appendix G.



Figure 7 – Non-Contact Water Infiltration Basin (NCWIB) #1 Near the WTP

4.3.5 Water Treatment Plant Discharge

The WTP discharged over 61 MG of water in 2023. A summary of the monthly discharge rates can be found below in Table 4.3.5.

Table 4.3.5 – Volume of Water Discharged in 2023

Month	Volume of Water Discharged (gallons)
January	2,817,247
February	2,397,199
March	3,890,375
April	8,202,172
May	9,393,132
June	4,866,779
July	5,414,361
August	5,355,933
September	6,468,184
October	4,616,852
November	3,584,988
December	4,556,174
Total	61,563,396

Source: Eagle Mine WTP

5. Monitoring Activities

5.1 Water Quality Monitoring

A significant amount of surface water and groundwater quality monitoring is required both on and surrounding the mine site. The following is a summary of the water quality monitoring activities.

5.1.1 Quarterly Groundwater Quality Monitoring

Groundwater quality is monitored through a network of monitoring wells located both inside and outside the mine site perimeter fence. A map of the well locations can be found in Appendix F.

Four quarterly sampling events were completed in February, May, July, and October 2023. The permit prescribes a parameter list for annual monitoring events (conducted in Q2) and an abbreviated list to be used quarterly (Q1, Q3, Q4). In addition to the permit-required sampling lists, locations QAL061A, QAL062A, and QAL067A are analyzed for volatile organic compounds (VOCs) annually in response to comments provided during the permit application process. VOC samples were collected in Q3 2023 at these three locations and all results were found to be non-detect (i.e., below the laboratory reporting limit). Samples are collected following the Eagle Project Quality Assurance Project Plan (QAPP) and Standard Operating Procedures (SOP) (North Jackson, 2004a and 2004b) and the results are summarized and compared to benchmarks, where applicable, in the tables found in Appendix G.

Two sets of benchmarks were calculated for all mine permit groundwater monitoring locations based on the guidance provided by the Mine Permit and Part 632, with the lower of the two being used for comparison. In late 2015, the results were reviewed and statistically analyzed. The consultant calculated an updated benchmark value for those results that were not trending, and the updated benchmarks were used for comparison in 2023.

Monitoring Results

Twenty-three monitoring well samples were collected during each of the four quarterly sampling events. Samples collected from two additional monitoring wells were collected once in 2023 and the results are summarized in below. Samples were collected using low-flow sampling techniques, and field parameters (dissolved oxygen (DO), oxidation reduction potential (ORP), pH, specific conductivity, temperature, and turbidity) are collected and analyzed using a flow-through cell and YSI probe.



Figure 8 – Groundwater Monitoring Location QAL008A

Most of the parameters that were analyzed had reported values below the analytical reporting limit and the calculated benchmark and are therefore non-detect. The greatest number of detections were reported for anion and cation parameters. In certain wells, the measured value for bicarbonate alkalinity has increased over the previous several quarters to years. Bicarbonate levels in background A-zone wells are typically from 20-60 mg/L, but in some wells the bicarbonate concentrations are over 100 mg/L. There is a potential for there to be a relationship between higher chloride concentrations and bicarbonate concentrations in that the bicarbonate formation could be enhanced by increased chloride in the water. A summary of quarterly data of the groundwater wells can be found in Appendix G.

Per Part 632, R425.406 (6) when a result was greater than a benchmark for two consecutive sampling events at a compliance monitoring location, Eagle notified EGLE and determined the potential source or cause resulting in the deviation from the benchmark. The results can also be summarized as follows:

- **Location:** QAL024A – Vent Raise Area
 - **Quarterly Parameters Above Benchmark:** bicarbonate alkalinity, chloride, sodium, nitrate
 - **Summary:** Elevated levels of sodium chloride were first reported at this location in 2013. This was due to the use of a sand/salt mixture to minimize ice build-up and subsequent storage of stockpiled snow near the monitoring well location. Results for

chloride and sodium have both decreased overall since 2013 and are much less than the peak concentrations reported in Q2 2013. In 2023 nitrate results were similar to 2022, with an observed decrease in the second half of 2023. A pattern was observed in 2016, 2019 and 2021 where nitrate results trended up, followed by periods of downward trending back toward baseline values. Alkalinity results remained elevated from baseline but were consistent with results reported since 2016.

- **Locations:** QAL060A and QAL061A – North of the TDRSA and CWBs
 - **Quarterly Parameters Above Benchmark:** bicarbonate alkalinity, nitrate
 - **Annual Parameters Above Benchmark:** calcium, magnesium, hardness
 - **Summary:** Nitrates were detected above the benchmark during all four sampling quarters in 2023 at monitoring wells QAL060A and QAL061A, fluctuating slightly throughout the year. The fluctuation may be a function of the historic use of salt at the mine site as road salts have the potential to affect nutrient cycling (such as for nitrogen/ammonia) and cation exchange reactions within the affected soil profiles. Changes in these parameters in groundwater are characteristic of the sand/salt applications due to the ion exchange processes occurring in shallow groundwater. In addition, bicarbonate alkalinity, calcium, magnesium, and hardness were greater than benchmarks at QAL061A and QAL060A. Cyclical increases and decreases have occurred in these wells for years.

Results from QAL060A and QAL061A were compared to the TDRSA contact water sump and CWB results to determine if they were a potential source of the elevated values. Elevated levels of sulfate and metals were reported in the TDRSA sump and CWB but were below benchmark or non-detect in the monitoring wells indicating that the elevated results are likely not related to the immediately upgradient facilities.

- **Location:** QAL062A – East berm of the TDRSA
 - **Quarterly Parameters Above Benchmark:** pH, bicarbonate alkalinity, chloride, nitrate, sodium
 - **Annual Parameters Above Benchmark:** calcium, magnesium, potassium, hardness
 - **Summary:** Bicarbonate alkalinity, chloride, nitrate, and sodium above benchmark levels at QAL062A are most likely due to the historic use of salt at the mine site. The results for QAL062A were compared to the TDRSA contact water sump and CWB results to determine if they were a potential source of elevated values, but there is no relationship between the concentrations. Metals are present in the TDRSA contact water sump but are not above the benchmark in QAL062A.

The pH results at QAL062A continued to be below the calculated benchmark range by at least 0.5 SU for more than two consecutive sampling quarters. The pH results have consistently been between 7.4 – 7.8 SU for the past fourteen sampling quarters indicating a period of stabilization and equilibrium. Results for pH at surrounding locations downgradient of QAL062A (i.e., QAL060A and QAL061A) are within benchmark values.

- **Location:** QAL063A – East of the CWBs near the WTP
 - **Quarterly Parameters Above Benchmark:** pH, bicarbonate alkalinity, chloride, nitrate, sodium
 - **Annual Parameters Above Benchmark:** calcium, magnesium, potassium, hardness
 - **Summary:** Elevated analytes in this well are consistent with upgradient well QAL062A, which likely indicates that the concentrations are related to the chloride plume. Constituents above benchmark levels at QAL062A and QAL063A trended up in 2023 which suggests migration of the chloride plume across the site. The water quality in these wells does not match signatures of the water found in the CWBs. The pH results at QAL063A were consistently below calculated benchmark range between 7.3 and 7.4 SU across all four quarters. A source investigation will be completed in 2024.

- **Location:** QAL064D – South of the Yellow Dog River
 - **Annual Parameters Above Benchmark:** magnesium, hardness
 - **Summary:** Magnesium and hardness both decreased from 2022 into 2023.

- **Location:** QAL065D – North of the Yellow Dog River
 - **Annual Parameters Above Benchmark:** calcium, hardness
 - **Summary:** Calcium and hardness both slightly increased from 2022 to 2023.

- **Location:** QAL066D – Above the Ore Body
 - **Quarterly Parameters Above Benchmark:** pH, iron, mercury, alkalinity bicarbonate, sodium
 - **Summary:** The elevated iron is likely the result of iron oxides or iron hydroxides in the clay soils within the formation in which this well is located. In 2022, purging of this well was completed to remove sediment present in the well. The sample result for iron decreased in concentration but has since increased in 2023. This location has historically had groundwater results for metals including arsenic, mercury and iron which were attributed to fine-grained sediment present in the well from improper grouting during well installation. Mercury concentrations were in the 7.5 to 12 ng/L range in 2012, the year following well construction, and is an example of the improper construction. Sodium concentrations remained fairly constant throughout 2023 at QAL066D. Continued purging is planned for 2024 to remove sediment present in the well.

- **Location:** QAL067A – Southeast Corner of the TDRSA
 - **Quarterly Parameters Above Benchmark:** alkalinity bicarbonate, chloride, nitrate, sulfate, sodium
 - **Annual Parameters Above Benchmark:** calcium, magnesium, hardness
 - **Summary:** The elevated quarterly and annual results at this location are still suspected to be associated with the historic use of salt on the contact area as no additional

changes have occurred in the area. However, bicarbonate alkalinity, sodium, chloride, nitrate and sulfate trended down throughout 2023. Jersey barriers were placed at this location in December 2020 to prevent snow from being pushed into the vicinity of well QAL067A and curbing was enhanced along the berm in 2021. The chloride and sodium levels have decreased since 2021. The chloride results are expected to continue to trend toward baseline levels as the chloride plume moves away from the area.



Figure 9 – Curbing Located Near QAL067A

- **Location:** QAL071A – Northwest Corner of the Septic Drain Field
 - **Quarterly Parameters Above Benchmark:** pH, alkalinity bicarbonate, chloride, nitrate, sodium
 - **Annual Parameters Above Benchmark:** calcium, magnesium, hardness
 - **Summary:** The quarterly parameters above benchmark at QAL071A continue to decrease, with pH staying consistent around 8.0 SU from 2022 to 2023. The results for calcium, hardness, and magnesium also stayed consistent with the annual sampling event in 2022. As noted in previous annual reports, the parameters were over benchmark values at this location and are still suspected to be due to the well's location near the septic drain field. In Q3 2014, the action level for nitrate was met so Eagle conducted supplementary sampling at location QAL074A located downgradient of the septic system to investigate the source of the elevated results. Results continue to meet the action level for nitrate so the investigation continued in 2023.

- **Location:** QAL074A – Downgradient of the Septic System
 - **Quarterly Parameters Above Benchmark:** bicarbonate alkalinity, chloride, nitrate, sodium
 - **Summary:** This location has been sampled quarterly since 2014 when the action level for nitrate was met at QAL071A. All parameters above benchmark at this location have decreased since 2022.

- **Location:** QAL071A and QAL074A – Nitrate Source Investigation
 - At the time of installation, QAL071A and QAL074A were installed to monitor groundwater flowing northeasterly from CWBs and TDRSA. However, the groundwater flow direction in this area is currently to the east, therefore the wells are now not directly downgradient of the CWBs and TDRSA. The monitoring location does not have obvious sources of nitrates further upgradient, so the septic tank effluent cannot be excluded as a source of the elevated nitrate levels reported at QAL074A as well. Additional information from the source investigation is as follows:
 - Snow storage activities that are occurring near NCWIB #1 began after the elevated nitrate results were initially reported, thus eliminating them as the potential source.
 - Chloride, sodium, and nitrates are all present in human wastes and are good indicators of septic system waters. All three constituents are present in the groundwater at QAL071A and QAL074A.
 - A review of monitoring results from locations downgradient of QAL071A and QAL074A near the TWIS (e.g., QAL056A) do not show any signs of elevated nitrate levels. Currently there is no threat of elevated nitrate levels migrating offsite.

The septic system upgrades completed and documented in the 2022 MRR are expected to improve nitrate conditions in the groundwater over time and have already shown signs of a decrease since 2022.

Overall Trend Analysis

As required by MP 01 2007 special condition N2, a statistical trend analysis has been conducted for all monitoring locations/parameters. Possible trends were identified for one or more parameters at fifteen compliance locations and eight background monitoring locations using data collected from baseline sampling events (2011) through October 2023. Magnesium, nitrate, sodium, and sulfate were the most frequently noted as possibly trending. Changes in these parameters indicate the overall change in site storm water infiltration changes and ion exchange processes occurring from de-icing products. A table summarizing the potential groundwater trends can be found in Appendix H. For compliance monitoring locations in which results were outside of established benchmarks for at least two consecutive quarters and a potential trend was identified, the trend charts are also provided in Appendix H. A full report outlining groundwater trending results for all the parameters and the locations is available upon request.

Piper diagrams were created for select monitoring locations that have exhibited possible trends in one or more chemical parameters. Monitoring locations QAL025A, QAL026A, QAL044B, QAL060A, QAL061A, QAL064D, QAL068A, QAL071A, and QAL073A are all classified as having a calcium bicarbonate water chemistry and have shown no signs of a change in water chemistry. Of note, the water volume at QAL026A was insufficient to sample in 2023.

The following monitoring locations exhibited a change in water chemistry evidenced by plotting data between the years 2012 and 2023:

- QAL024A – The water type was originally classified as calcium bicarbonate in 2012 but changed to a sodium chloride classification in 2013. From 2014 through 2023, the water chemistry was classified as mixed-cation chloride but has started to revert to the classification of calcium bicarbonate. The change in chemistry from 2013 to the present may have been associated with the previous construction of the vent raise as well as salt use and snow storage practices near monitoring well QAL024A.
- QAL029A & QAL029D – Water chemistry data from these locations were originally classified as calcium bicarbonate from 2008 to 2012 but shifted to sodium chloride up until recent years which correlates with the chloride plume moving through the site. Sulfate ion increases that are observed in the A-locations were reviewed by a hydrogeologist in 2022. The piper diagrams do not indicate that sulfate is becoming a dominant ion, therefore the likely source of sulfate is due to mineral dissolution due to road deicer salts. Both QAL029A and QAL029D appear to be trending toward calcium bicarbonate.
- QAL062A & QAL063A – Water chemistry data from these locations were originally classified as calcium bicarbonate in 2011 and continue to be in 2023, but there has been a slight shift towards sodium chloride chemistry within the last five years. This shift indicates historic road salt use on the contact area and the corresponding chloride plume moving across the site.
- QAL066D – Samples before 2016 were classified as calcium bicarbonate and then alternated between sodium and calcium bicarbonate several times between 2016 into 2023. This is attributed to fine-grained sediment present in the well resulting from improper grouting during installation. This well requires aggressive purging on a routine basis to remove the accumulating sediment. The 2023 results are trending back towards calcium bicarbonate.
- QAL067A – All samples before May 2014 were classified as having a water type of calcium bicarbonate. In 2014, the water chemistry began to change and was classified as mixed-cation chloride and then continued to shift to the classification of sodium chloride waters from 2015 through 2023. This change in water chemistry indicates an external source of contamination and is likely due to deicers.
- QAL069A – Water chemistry from this location was classified as calcium bicarbonate until 2018 when it shifted towards a mixed-cation chloride classification. Water chemistry then shifted back towards the historical classification of calcium bicarbonate in 2019 where it remained in 2023. This well is located near the security building and site access road where salt is used as a deicer.
- QAL070A – Samples collected before May 2015 were classified as having a water type of calcium bicarbonate indicating shallow fresh groundwater. From May 2015 through 2023, a shift in water chemistry occurred in which the water was classified as a mixed type, however, the water does not display a dominant cation type though it does correspond with a chloride type chemistry. This monitoring location is also found near the site access road where salt is used as a deicer and drainage from the roadway is routed near this well.

Piper diagrams for each monitoring location referenced above are in Appendix I.

5.1.2 Quarterly Surface Water Quality Monitoring

Surface water sampling was conducted quarterly in 2023 at 11 locations: nine on the Salmon-Trout River and one each on the Yellow Dog River and Cedar Creek. The samples represent winter base flow, spring snowmelt/run-off, summer base flow, and the fall rainy season. A map of the surface water sampling locations is found in Appendix J. Samples are collected following the Eagle Project QAPP and SOP and the results are summarized and compared to benchmarks in Appendix K. In 2015, all surface water benchmarks were reviewed and updated using results that were not determined to be trending based on statistical analysis. These updated benchmarks were used for comparison in 2023.

Monitoring Results

Grab samples were collected from each location during the quarterly sampling events completed in February, May-June, August, and October 2023. The Eagle Mine Permit prescribes a parameter list for annual monitoring events (completed in Q2) and a shorter list to be used quarterly (Q1, Q3, and Q4). In addition to the grab samples, field measurements (DO, pH, specific conductivity, and temperature) were collected and determined using a YSI probe. The stream stage and flow measurements were obtained using a wading rod and current meter. The following is a summary of the 2023 events that occurred.

- At compliance monitoring location STRM005, pH was above the benchmark for two consecutive third quarter sampling events. pH results in Q2 and Q4 2023 were within benchmarks indicating the change may have been the result of seasonal variation.
- Compliance locations STRE005 and STRE010 had results for alkalinity bicarbonate, calcium, magnesium, and hardness that were just above the established benchmark for two consecutive annual Q2 sampling events. Iron was also slightly above the Q4 benchmark at location STRE010. The Q4 sampling event is conducted for fall precipitation and iron is likely from impacts from precipitation related runoff.
- STRE009 was above the benchmark for two consecutive second quarter sampling events for calcium and hardness in Q2.
- Location YDRM002 was slightly above benchmark for manganese for two consecutive Q2 sampling events.

Overall Trend Analysis

A trend analysis was also conducted for the surface water monitoring locations. The same statistical analysis as groundwater was utilized with the exception that each parameter was also analyzed for each quarter, rather than just parameter and location, to consider seasonal variations.

Trends were identified for one or more parameters at all the eleven monitoring locations using data collected from baseline sampling events (2011) through October 2023. Calcium and sodium were most frequently noted as possibly trending. The largest number of the trends identified occurred in Q2. The elevated results and associated trends return to baseline levels in subsequent quarters indicating that the results are likely due to seasonal variation.

A table summarizing the potential surface water trends can be found in Appendix L. For compliance monitoring locations in which results were outside of established benchmarks for at least two consecutive seasonal quarters and a potential trend was identified, the trend charts are also provided in Appendix L. A full report outlining surface water trending results for all parameters and locations including graphs is available upon request.

5.2 Regional Hydrologic Monitoring

5.2.1 Continuous, Daily and Monthly Groundwater Elevations

Water levels are monitored in two distinct hydrologic zones near the mine site: in the shallow, unconfined unit (QAL024A, and wetland locations WLD022, WLD023, WLD025, WLD026, WLD027, WLD028), and a clay layer-confined aquifer located beneath the A-zone (QAL023B, QAL044B, QAL064D, QAL065D, QAL066D). The B- and D-zone wells are in the same confining unit as Eagle’s industrial supply well and are affected by limited recharge that occurs seasonally during spring melt or significant precipitation. All the locations are instrumented with continuous water level meters. Water level meters were connected to a telemetry network in 2020 which allows for real-time data review and analysis rather than monthly downloads as was previously the practice. A map of these locations can be found in Appendix M.

Eagle Mine is located within a regional groundwater basin. Water levels in the background reference location QAL007A are reflective of regional groundwater trends. QAL007A water level was four feet higher than the 2022 low water level, as shown in Figure 10. Regional precipitation rates were above average in 2023, with drought conditions in the last four months of the year and reflected in the Q4 water elevation reading at this monitoring location. As historically observed, precipitation rates influence the shallower zone wells.

In addition, some of the short-lived fluctuations in deeper D-zone groundwater levels below the confining layer may be attributed to blasting events. In a confined aquifer, the impacts of blasting may be observed as an instantaneous pulse in groundwater levels due to increased pressure or changes in pressure. Water levels return to pre-blast levels typically within the hour after the blasting cycle is complete.

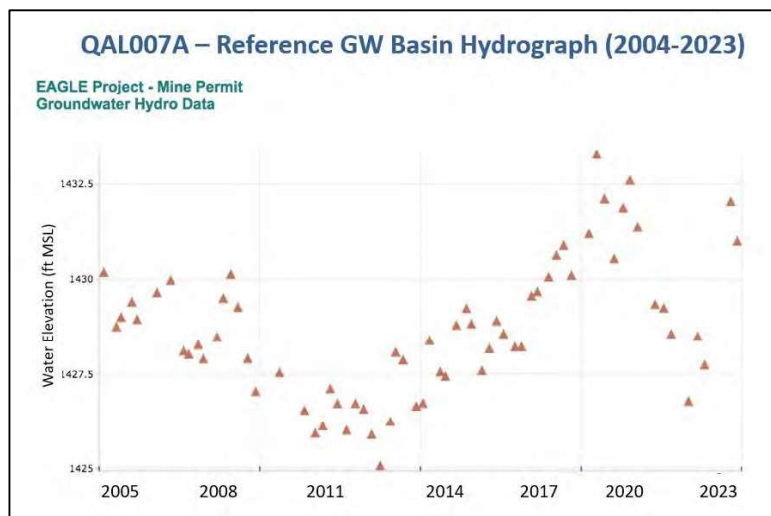


Figure 10 – QAL007A – Regional Increase in Water Levels due to Higher Precipitation in 2023

Continuous groundwater monitoring locations are reported by water year (October 1 – September 30). Calculated background water levels and monthly water level results are based on mean daily values and summarized in Appendix O. The following is a summary of the findings:

- QAL024A – The mean water level readings were less than the minimum background baseline levels from October 2022 – April 2023, and June through September 2023. The lowest reading was recorded in March 2023 and was 1.1 feet (ft) below the minimum baseline level.
- QAL023B – The mean water level readings were less than the minimum background baseline levels October 2022 – September 2023. The lowest reading was recorded in 3.8 ft below the minimum baseline level in April 2023. Water levels increased following the April water levels after recharge from spring snowmelt and precipitation.
- QAL044B – The mean water level reading from October 2022 – May 2023 was a maximum of 1.6 ft below the minimum baseline level calculated for this location. The lowest reading was recorded in March 2023.
- QAL064D – The mean water level reading from October 2022 – April 2023 was a maximum of 0.4 ft below the minimum baseline level calculated for this location.
- QAL065D – The mean water level reading was approximately 1.1 ft below the baseline water levels from October 2022 – April 2023, June 2023, and September 2023.
- QAL066D – The mean water level readings were less than minimum background baseline levels from October 2022 – June 2023, and September 2023. The lowest water level was recorded in March 2023, 2.3 ft below the minimum baseline level calculated for this location.



Figure 11 – Piezometer with a Level Troll Located at QAL008A

In addition to continuous monitoring, Eagle Mine implemented a regional hydrologic monitoring program to assess potential groundwater elevation changes due to mine dewatering. The regional monitoring wells cover about 14 square miles. Discrete water elevations are measured every quarter at 120 locations. Several wetland locations were unable to be monitored due to frozen or unsafe conditions throughout the quarters.

A map of the hydrologic monitoring locations can be found in Appendix M and a map of the A- and D-zone groundwater contour maps for each sampling quarter can be found in Appendix N, and summarized as follows:

- No significant changes or shifts in calculated groundwater contours were reported for calendar year 2023.
- Regionally, the overall water levels were higher than in 2022. The exception is in the D-zone water levels in monitoring wells located above the ore body near the mine services well QAL011D and QAL004D, located within direct influence of the mine services well.
- QAL004D is located within the direct influence of the mine services well and water levels fluctuate based on the use of the well. As stated in section 4.3.1, the mine services well (QAL011D) is used to supply water for underground operations, dust suppression, fire water, etc. Previous studies indicate that the drawdown in QAL004D occurs when the mine services well is operating, but then rebounds when the well is not in use. The hydrographs indicate the mine service is well influence water levels in the confined aquifer (B- and D-zones) extending to the area above the orebody. The change in water levels is not reflected in either the A-zone water table aquifer hydrographs or the wetland hydrographs. In addition, wetlands lying above the deeper aquifer and orebody have not shown any hydrological response to the mine service well or potable water supply well pumping. Though this drawdown is observed in the D-zone aquifer, regionally the water levels increased in 2023.
- Changes in water level in the monitoring wells located within the vicinity of the orebody (i.e., QAL023B, QAL044B, QAL064D, QAL065D, and QAL066D), are mostly likely attributed to precipitation rates, water withdrawal from the mine services well and/or infiltration of water encountered during mining activities.

Wetland Water Levels

Wetland water levels above the orebody (e.g., wetland wells WLD025-4.5, WLD027-4.5, and WLD028-4.5) remained above the permit threshold in 2023. In some instances, the water levels in 2023 did fall below the minimum baseline levels. The wetlands are heavily influenced by precipitation levels as seen in the hydrographs. There were higher precipitation rates in 2023, and water levels generally increased in the wetland piezometers in 2023. Water levels can be cyclical depending on precipitation and regional climate conditions.

- WLD022-4.5 had a mean water level below the baseline minimum in October 2022 – April 2023. The lowest reading was 0.2 ft below the baseline minimum.
- The WLD025-9.5 quarterly water levels were below the baseline minimum in November 2022, February and June 2023. Though the largest deviation was 0.25 ft below the baseline minimum, wetland water levels remained above the 6-inch limit throughout the year.
- Mean water levels at WLD026-9.5 were above the background in May 2023, with water levels 0.1 ft above baseline maximum. The increase in water levels is attributed to spring melt and precipitation.

Hydrographs of each groundwater and wetland monitoring location can be found in Appendix P. A summary of discrete water elevation results from Q1 – Q4 2023 is included in Appendix Q.

Groundwater Infiltration

In 2023, three stopes were mined between the 352 and 381 levels, and eight sill headings (five in 352L and three in 381L) were developed. The Crown Pillar Management Plan established a series of triggers in which actions would be initiated if discrete inflows that occur in the Eagle ore body are greater than 5 gallons per minute (gpm). No discrete inflows of greater than 5 gpm were identified during mining in 2023. The wireless radio telemetry network provided continuous, real-time monitoring of water levels from bedrock piezometers, quaternary wells, and wetland piezometers.

5.2.2 Continuous Surface Water Monitoring

Locations STRE002, STRM004, STRM005, and YDRM002 are each instrumented with meters that continuously monitor for temperature, conductivity, and flow rate. The meters were originally installed in 2004 and are downloaded quarterly by North Jackson Company.

The results for surface water locations are also being reported by water year (October 1 – September 30). Continuous readings during the water year were averaged over each month of operation from October 1st, 2022 through September 30th, 2023, and are based on mean daily values. Background levels are based on data collected from September 2004 through August 2011 for all locations. The monthly temperature, flow, and specific conductivity are summarized in Appendix R. The following is a summary of the findings:

- Continuous flow readings were not collected from locations STRE002 from December 2022 – March 2023, STRM004 in March 2023, STRM005 from December 2022 – January 2023, and YDRM002 from December 2022 – February 2023 due to ice build-up.
- Location YDRM002 mean specific conductivity was below the background minimum level by 3.1 uS/cm in November 2022. Results returned to normal in the following months.
- At location STRE002 the mean temperature was higher than the background maximum by 0.7 degrees in January 2023. Temperature returned to normal at STRE002 in the following months.
- Overall results were consistent with previous years. The pattern of flow and hydraulics of the watershed have not changed. Changes in stream discharge rates were observed throughout the watershed which is strongly influenced by precipitation and snowmelt events. The changes are the result of the above-average precipitation rates for the region in 2023.
- As expected, temperature changes correlate with changes in specific conductivity because temperature affects conductivity by increasing ionic mobility and the solubility of many salts and minerals. In addition, higher flow rates, as observed during spring melt, result in lower specific conductivity due to dilution.

Hydrographs for each location are found in Appendix S.

5.3 Biological Monitoring

Biological monitoring events conducted in 2023 included flora and fauna surveys, wetland monitoring, fish and macroinvertebrate surveys, and a Narrow-Leaved Gentian (NLG) survey. Results from each survey completed in 2023 have been compiled into reports attached as Appendices T and U.

5.4 Fish Tissue Survey

Eagle Mine discussed fish tissue surveying frequency in 2023 with the Michigan Department of Natural Resources (DNR), EGLE, and Advanced Ecological Management (AEM) due to brook trout population concerns. The DNR recommended a reduction in fish tissue sampling due to the brook trout population concerns. Experts from EGLE and the DNR determined that adequate information has been collected to support a conclusion that future fish tissue sampling events shall only be conducted if quarterly surface water monitoring indicate impacts to streams from mining activity, or during the first fisheries and aquatic survey after cessation of mining.

5.5 Miscellaneous Monitoring

5.5.1 Soil Erosion Control Measures (SESC)

There were no temporary SESC measures in place on site in 2023. If areas are identified that need temporary SESC measures in the future, the measures will be installed and maintained in compliance with the requirements of Part 91 (NREPA, 1994 PA 451, as amended). Permanent SESC measures are in place and continue to be effective, monitored, and improved, as necessary.

5.5.2 Berms, Embankments and Basins

All containment berms and embankments of the TDRSA, CWB, NCWIBs, and facility perimeter are inspected monthly, or after a 0.5" rain event, to ensure cracking, settlement, or erosion is not affecting the integrity of the berms. Inspections were completed as required in 2023 with observations and/or repair recommendations recorded in the surface inspection log stored in the compliance binder at the mine site. Issues identified are immediately reported and corrected by onsite staff. A follow-up inspection is completed to ensure that repairs have been made.

In 2023, tree removal was completed on the exterior berms and TDRSA berms. The trees were removed due to their height beneath overhead power lines. In addition, the trees on the exterior roads were removed for visibility safety reasons. After tree removal was completed, follow up seeding was completed by Eagle personnel. Eagle will evaluate if hydroseeding on the TRDSA berm is necessary in the spring of 2024.

5.5.3 Impermeable Surface Inspections

The impermeable surface monitoring plan outlines the requirements of integrity monitoring of surfaces exposed to contact storm water. Areas inspected in 2023 include concrete or asphalt in the WTP, truck wash, truck shop floors, sumps, trench drains, the contact area, and travel ways. Per the monitoring plan, inspections of the contact area and travel ways are suspended during the months when snow covers much of the surface and winter weather prevents effective patching efforts.

All inspection results are recorded on the impermeable surface inspection form and stored in the compliance binder at the Eagle Mine Site. Any issues identified during the inspections are reported to and repaired. Follow-up inspections are completed to ensure the repairs were made. In November 2023, cold patches were completed in house by maintenance staff including an area north of CWB #1 and the travel way between the TDRSA and batch plant. Larger contact area repairs are typically completed in the summer months.

Wear and vegetative growth are visible along the CWB edges. In November 2023, WSP (WSP Global, Inc.) completed an inspection of the contact water basins to evaluate the CWB perimeter where the asphalt and liner meet. WSP provided recommendations for asphalt repair and realignment of the metal sheeting along the basin edges. These repairs are tentatively planned to be completed by the contractors that are performing the impermeable surface repairs.

5.5.4 NCWIB & CWB Sediment Accumulation Measurements

Sediment accumulation is monitored and measured at both the non-contact and contact water basins. This requirement is in place as sediment accumulation in the NCWIBs could result in diminished infiltration capacities and decreased water storage capacity in the CWBs.

Non-Contact Water Infiltration Basins

As required by the mining permit, sediment accumulation measurements are conducted annually for the NCWIBs. Each of the four NCWIBs was inspected in 2023. No visible changes were observed. Minimal vegetation was observed and removed and will continue to be monitored.

Contact Water Basins

Two sediment thickness measurements were completed in CWB #1 and #2 utilizing a boat and sludge judge to measure the accumulation. The first inspection was conducted in May 2023, and the second was completed in November 2023. The sediment accumulation in CWB #1 was approximately 50 inches near the south end where the underground water is pumped into the basin. The average sediment accumulation in CWB #1 was approximately 17 inches and CWB #2 was approximately 7 inches. CWB #2 had sediment accumulation over four feet in thickness at the northwest corner.

Dredging of both basins was completed in 2023 with the addition of a weir installed around the CWB #2 intake to help prevent sediment build-up from impacting the intake pump. The dredge pumped sediment to geo tubes placed on the contact area to allow the dredged material to dewater. To ensure the CWB liners were not damaged during the dredging operations, the dredging head was kept 12 inches off the liners. Approximately 2,906 cubic yards of material from CWB #1 and 1,851 cubic yards from CWB #2 was removed during dredging. After dredging was completed, a second sediment thickness test was completed in November 2023 to confirm the amount of removal. Once the dredged sediment is dewatered, the material will be used as backfill in secondary stopes underground.

A leak location survey was performed by Leak Location Services, Inc. (LLSI) in CWB #2 in September 2023. A towed probe survey method was used, which is completed by personnel systematically pulling a probe back and forth across the bottom of the pond along temporary survey lines. The probe works by detecting electrical paths from the probe inside the basin to an electrode connected to the earth ground. This process can detect a leak that is 0.001 square inches or greater in size. No leaks were detected in CWB #2 in 2023.

The inspection in 2024 is tentatively planned to be performed in CWB #1 by LSSI.

6. Reclamation Activities

In 2023, Eagle conducted a 0.25-acre revegetation trial plot of Jackpine, red pine, white pine, blueberry and select native species were planted to test revegetation methods and growth in the existing soil conditions. Plants were watered with the contractor's hydroseeder immediately after planting, however, there was a high tree mortality rate from this trial because of drought conditions in the proceeding weeks. The trial demonstrated the sensitivity that tree planting can have to seasonal variability in precipitation. Soil nutrient samples were collected to determine if improvements would have influenced the trial outcome. The revegetation plan was modified to accommodate the need for irrigation, and a new trial will be completed in the future.



Figure 12 – Approximate Location of the Native Species Trial Plot in Green

Closure Planning

Closure planning continued in 2023 with the assistance of Ramboll US Consulting of Denver, Colorado. Work in 2023 primarily consisted of updating the temporary and final closure plans. The demolition company retained to visit the site produced cost estimates close to the engineer's estimates.

7. Contingency Plan Update

An updated contingency plan can be found in Appendix V. This plan will also be submitted to the Local Emergency Management Coordinator.



Figure 13 – Mine Rescue Exercise – CPR/First Aid Certification

8. Financial Assurance Update

Updated reclamation costs were submitted to the Department on February 22, 2024. Eagle Mine understands that if these costs require updating of the current bond for financial assurance EGLE will notify Eagle Mine.

9. Organizational Information

An updated organization report can be found in Appendix W.

Appendix A

Eagle Mine Background Information

1. Background Information

The Eagle Mine Site is located in the Upper Peninsula of Michigan, within Michigamme Township, Marquette County. Eagle Mine is an underground nickel and copper mine. Underground activities began in September 2011, with drilling operations in preparation for blasting. On September 22, 2011, blasting at the Eagle Mine constituted the commencement of mining activities and Eagle initiated all monitoring programs per the Part 632 Mining Permit. Beginning in 2014, ore that is mined is brought to the surface via haul truck, and transported offsite for processing at the Humboldt Mill.



Figure 1 - Eagle Mine Location

2. Underground Operations

Two mining methods are being utilized at Eagle Mine; longhole open stoping and cut and fill mining. Longhole open stoping is utilized in the Eagle orebody while Eagle East uses both longhole stoping and cut and fill mining methods. The majority of Upper Eagle East is longhole stoping with a small area of cut and fill mining at the top of the ore body. Only development mining has been completed in Upper Eagle East in 2023.

When utilizing the longhole stoping method, the stopes are mined in an alternating sequence of primary and secondary stopes. Cemented rock fill (CRF) is used in the primary stopes, while uncemented rock fill is used in the secondary stopes below the 327.5 meter (m) above mean sea level (AMSL) levels. Both primary and secondary stopes were mined and backfilled in Eagle and Eagle East in 2023.

Cut and fill mining areas in Eagle East and Upper Eagle East are being mined in lifts from the bottom up and jam filled with CRF as they are completed. Cut and fill is utilized as it is a more efficient mining method for higher-grade irregularly shaped orebodies.

All CRF is made onsite at the batch plant and is transported underground using underground haul trucks. The CRF is currently composed of development rock or offsite aggregate, sand, cement, water, and a concrete admixture.



Figure 2 - Cemented Rock Fill (CRF) Plant

3. Subsidence Monitoring

Deflection of the crown pillar bedrock is monitored via one multi-point borehole extensometer (MPBX) installed from the surface. The MPBX is grouted in a vertical hole and has six points of measurement, or anchors, at incremental depths along the hole. As the anchors move, fiberglass rods separating the anchors produce a change in resistance, which is converted to a voltage used to calculate displacement. Data for the surface MPBX is downloaded manually monthly using a handheld data logger.

Deflection at the surface is monitored via the monthly surveying of five monuments that are installed within the crown pillar footprint. The change in elevation of each monument is measured in reference to a backsight point fixed to exposed bedrock, and the accuracy of the measurements is within one millimeter or less.

In addition to the subsidence monitoring required by permit condition L-17, additional extensometers are installed at various locations in Eagle and Eagle East, including in the back of each stope sill in Eagle's two uppermost levels. Data from these instruments are reported in real-time using a Load sensing telemetry system, and the measurements are used to better understand the ground conditions throughout the mine and identify early indicators of potential changing conditions. This information is used to guide mitigation measures to help ensure the safety of Eagle employees and contractors.

4. TDRSA Construction and History

The Temporary Development Rock Storage Area (TDRSA) was created to hold development rock until the material can be placed back underground as backfill. The storage area has multiple protective layers between the surface and the development rock. The TRDSA has two collection sumps; the contact water sump and the leak detection sump. The contact water sump collects drainage from the primary TDRSA liner where the water is in contact with development rock. The purpose of the leak detection sump is to capture water within the secondary liner system in the event of a failure of the primary liner.

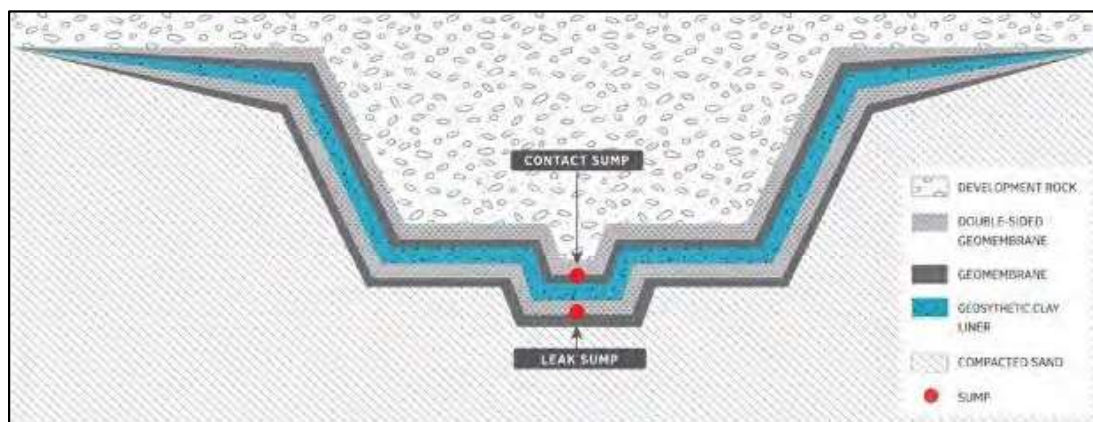


Figure 3 - Eagle Mine Rock Storage Area (TDRSA) Cross Section

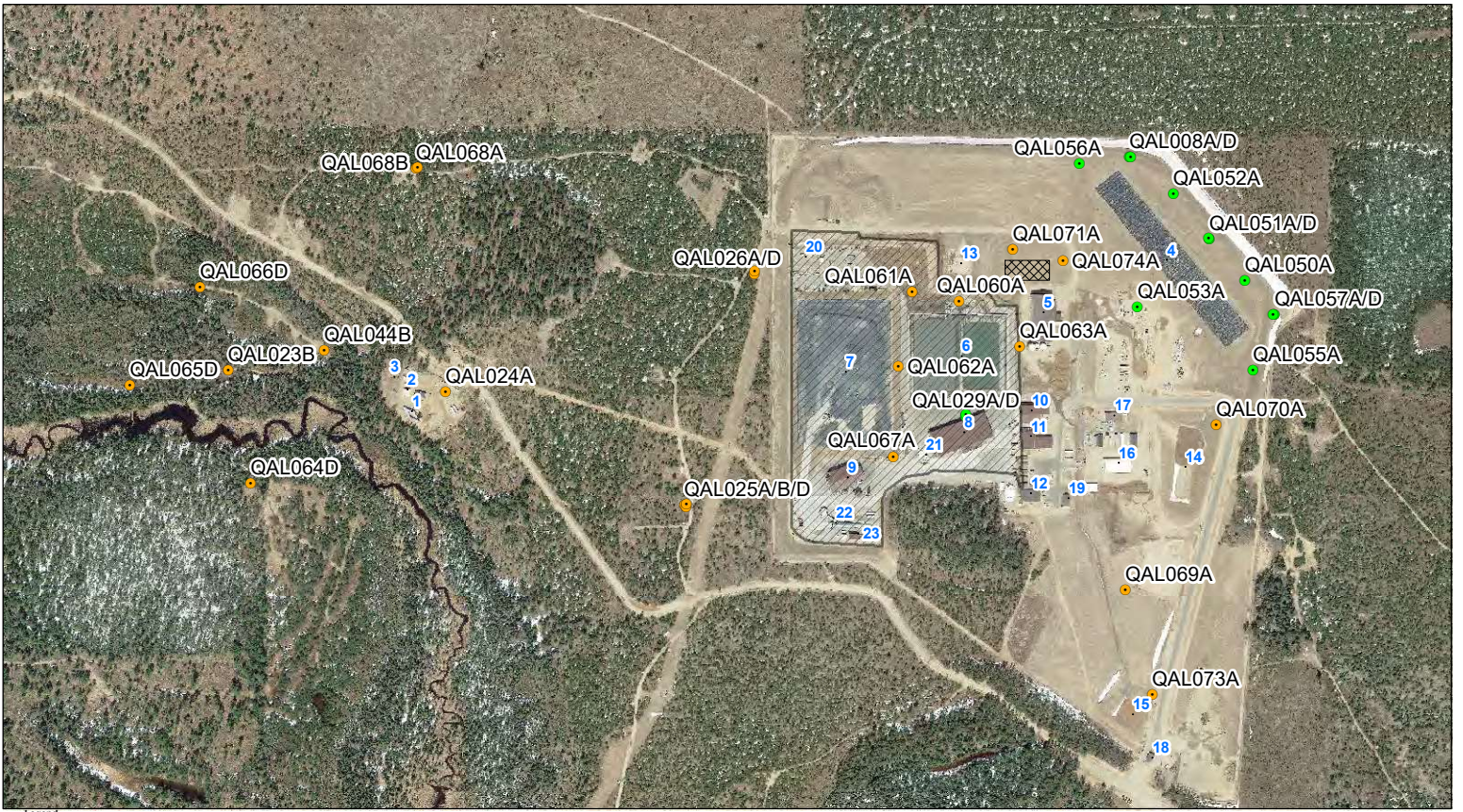
The water currently in the leak detection sump is rainwater that entered the secondary collection system during construction in 2011 via rainfall and has been encapsulated in the secondary lining system since construction (estimated 26,000 gallons). Since that time, water has been pumped from the leak detection monthly.

The contact water pumping system is equipped with an automatic pump start and high-water alarm to indicate when the water level is approaching the one-foot maximum head level. Both sumps are continuously monitored using pressure transducers. The leak detection sump is manually pumped, as necessary. Eagle implemented operational controls including operator training and control panel lockout to ensure the systems operate as designed, and that the required sampling and volume collection occur when the pumps are operated.

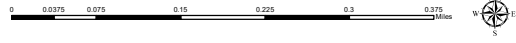
Appendix B

Eagle Mine Site Map

Eagle Mine LLC Mine Monitoring Map

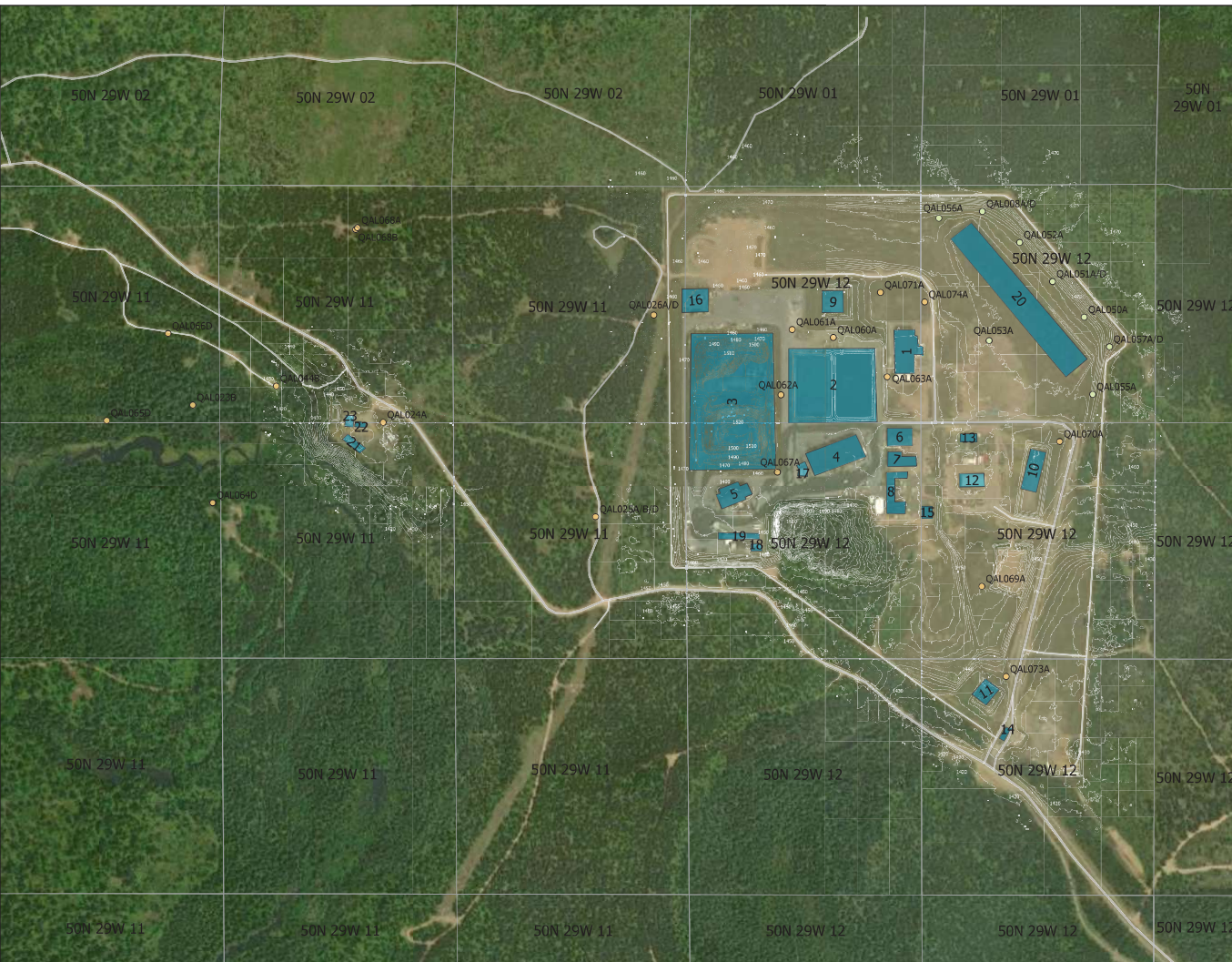


- Legend**
- 1 - Main Ventilation Air Raise
 - 2 - Air Intake / Alimak Emergency Egress
 - 3 - Non-Contact Water Basin #4
 - 4 - Treated Water Infiltration System
 - 5 - Water Treatment Plant
 - 6 - Contact Water Basins
 - 7 - Temporary Development Rock Storage Area
 - 8 - Coarse Ore Storage Area
 - 9 - Aggregate Storage and Batch Plant
 - 10 - Truck Wash
 - 11 - Truck Shop
 - 12 - Administration Building and Mine Digs
 - 13 - Non-Contact Water Basin #1
 - 14 - Non-Contact Water Basin #2
 - 15 - Non-Contact Water Basin #3
 - 16 - Warehouse
 - 17 - Powerhouse
 - 18 - Guardhouse
 - 19 - Ambulance Garage
 - 20 - Explosives Magazine
 - 21 - Fuel Storage Area
 - 22 - Portal
 - 23 - Compressor Building
 - Ground Water Discharge Permit Wells
 - Part 632 Mining Permit Wells
 - ▨ Mine Septic Field
 - ▨ Contact Area



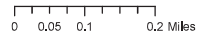
Map 07/2023

Eagle Mine
Buildings and Features

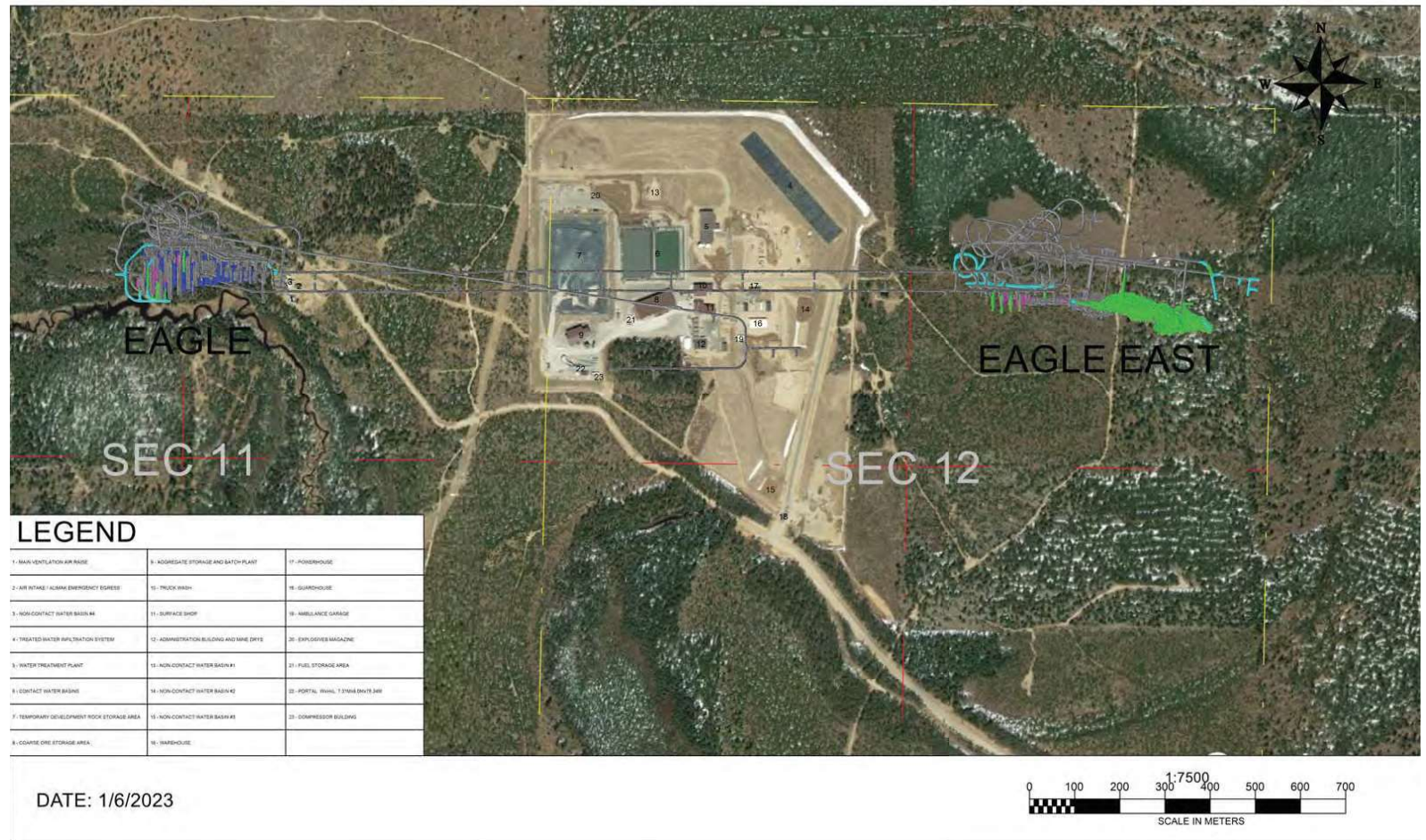


- Public Land Survey Sections
- Eagle Mine Buildings and Features
- Roads
- Topographic Contours
- Monitoring Well Locations
- Part 632 Mining Permit Wells

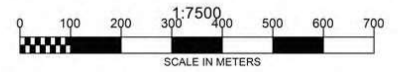
- 1 - Water Treatment Plant
- 2 - Contact Water Basins
- 3 - Temporary Development Rock Storage Area
- 4 - Coarse Ore Storage Area
- 5 - Aggregate Storage and Batch Plant
- 6 - Truck Wash
- 7 - Truck Shop
- 8 - Admin Building and Mine Dries
- 9 - Non-Contact Water Basin #1
- 10 - Non-Contact Water Basin #2
- 11 - Non-Contact Water Basin #3
- 12 - Warehouse
- 13 - Powerhouse
- 14 - Guardhouse
- 15 - Ambulance Garage
- 16 - Previous Explosives Storage
- 17 - Fuel Storage Area
- 18 - Compressor Building
- 19 - Portal
- 20 - Treated Water Infiltration System
- 21 - Main Ventilation Air Raise
- 22 - Air Intake / Alimak Egress
- 23 - Vent Raise Electrical Building



EAGLE MINE LLC AERIAL MAP



DATE: 1/6/2023



Appendix C

Eagle Mine Rock Stability Certification

Monday, January 29, 2024

Ms. Melanie Humphrey
Michigan Department of Environment, Great Lakes, and Energy
1504 W. Washington Street
Marquette, Michigan 49855

**Subject: Rock Stability Certification – Eagle Mine, Marquette County Michigan
Mining Permit (MP 01 2007)**

In accordance with condition E-8 of mining permit MP 01 2007, I certify that the rock stability modelling provided in the mine permit application is still valid. Rock mass and hydrologic conditions encountered during mining in 2023 are consistent with inputs used in rock stability modelling. Eagle also continues to perform daily visual inspections to verify ground stability and identify any early indicators of changing conditions.

Sincerely,

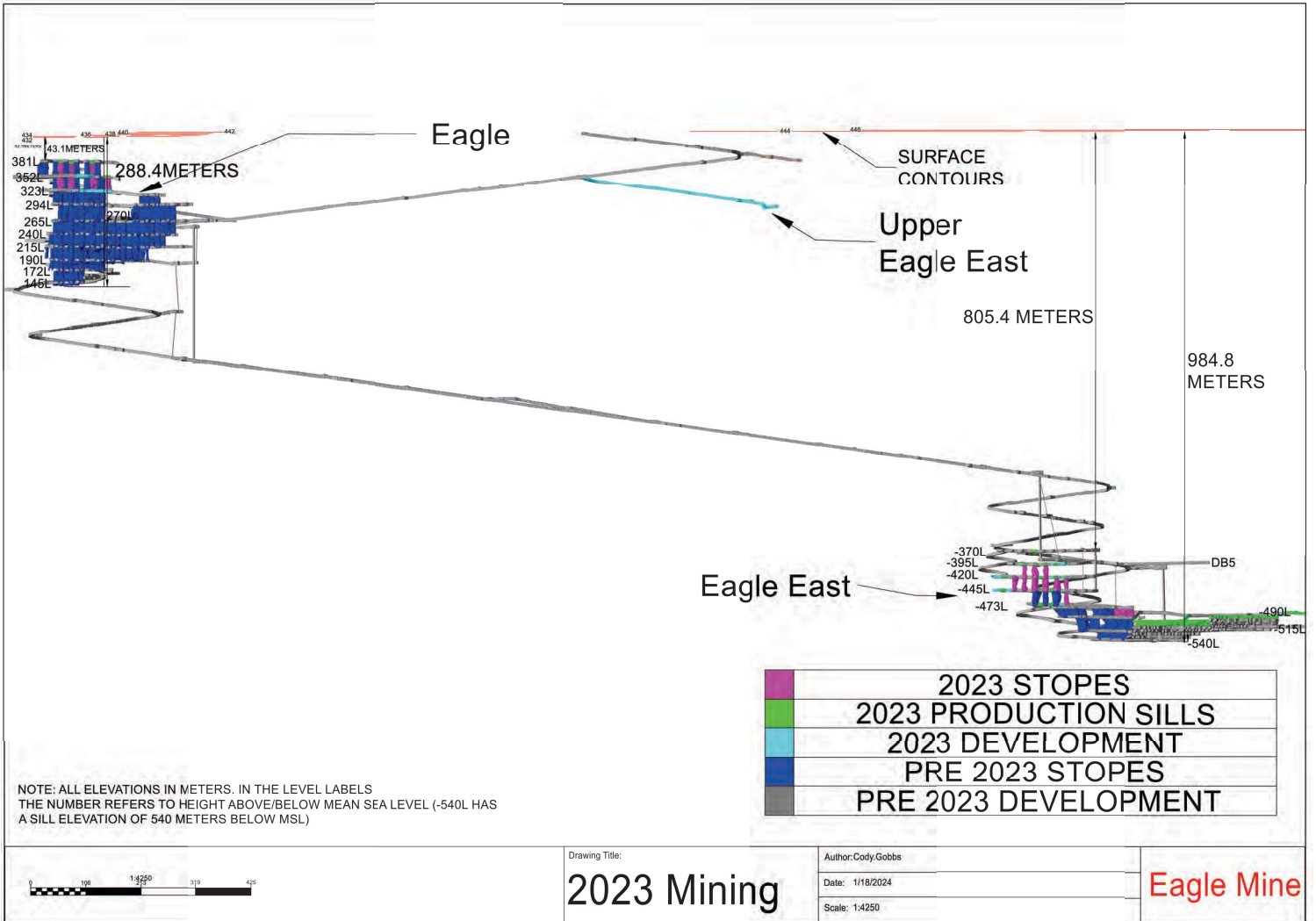


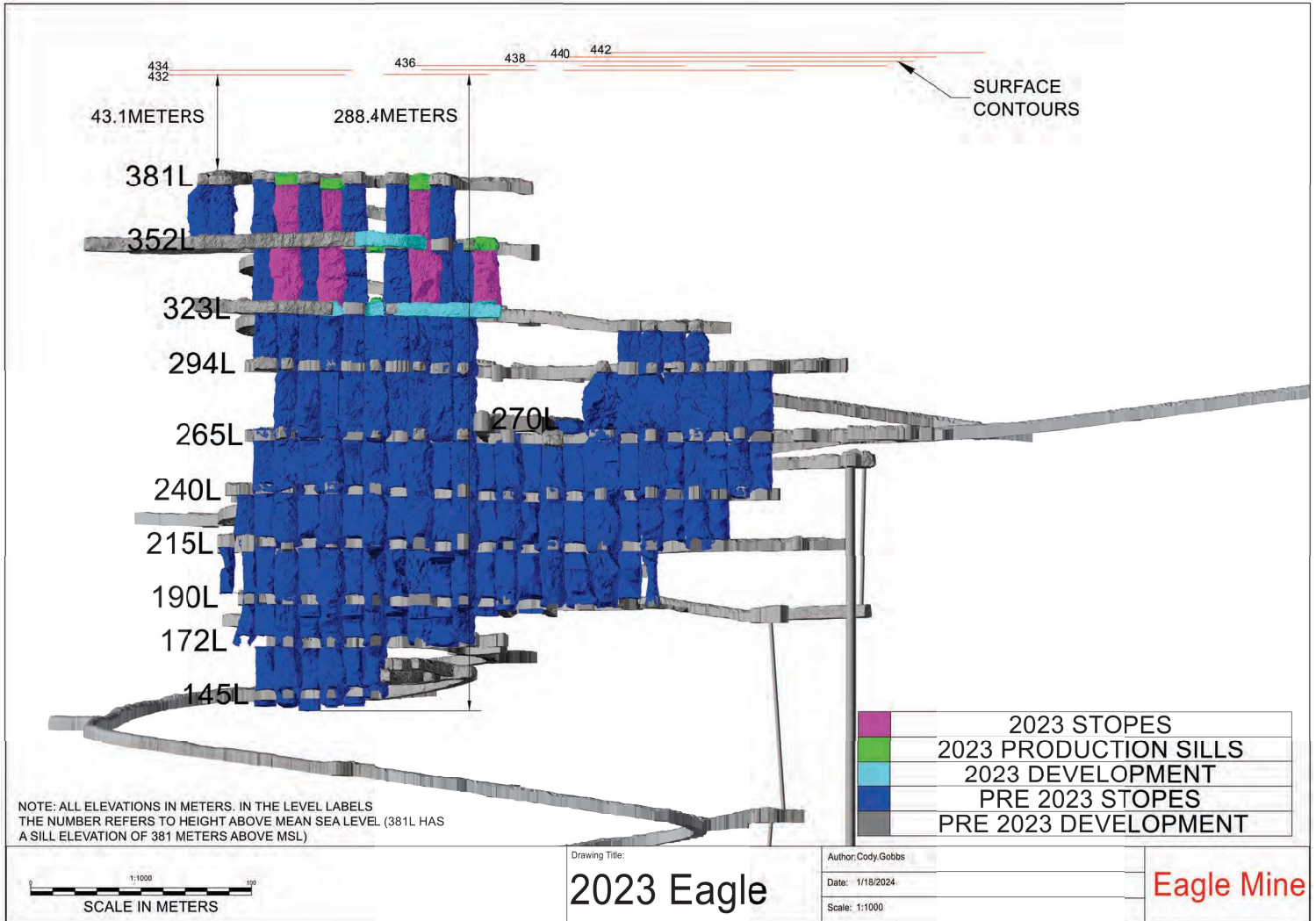
Peter Prochotsky
Operations Manager
Eagle Mine, LLC.

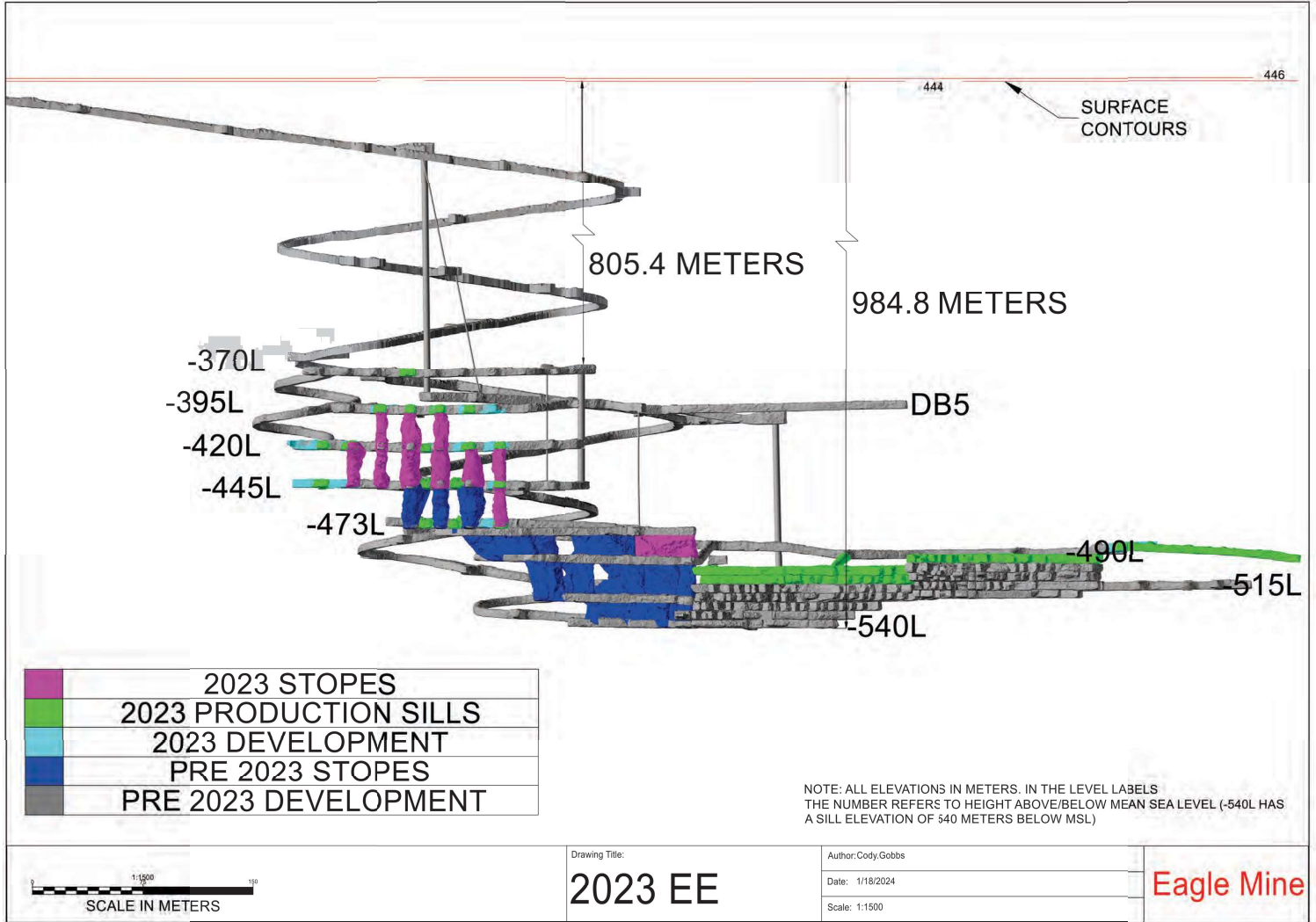
Appendix D

Eagle Mine

Maps of Eagle, Eagle East and Upper
Eagle East Development and Production
Mining Progress







	2023 STOPES
	2023 PRODUCTION SILLS
	2023 DEVELOPMENT
	PRE 2023 STOPES
	PRE 2023 DEVELOPMENT

NOTE: ALL ELEVATIONS IN METERS. IN THE LEVEL LABELS THE NUMBER REFERS TO HEIGHT ABOVE/BELOW MEAN SEA LEVEL (-540L HAS A SILL ELEVATION OF 40 METERS BELOW MSL)



Drawing Title:
2023 EE

Author: Cody Gobbs
Date: 1/18/2024
Scale: 1:1500

Eagle Mine

Appendix E

Eagle Mine Facilities Water Quality Monitoring Results

2023
Mine Permit Water Quality Monitoring Data
TDRSA Contact Water Sump
Eagle Mine

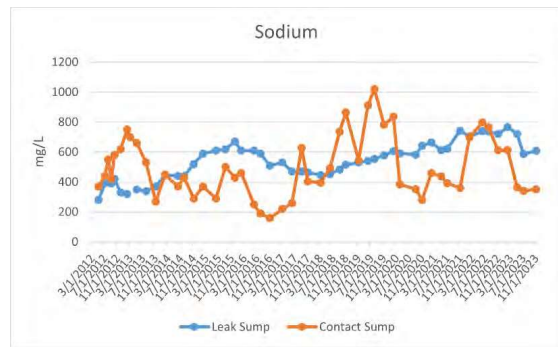
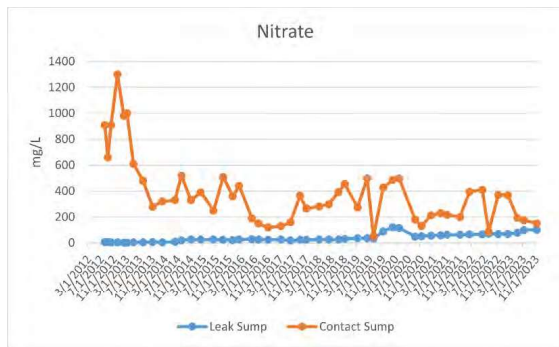
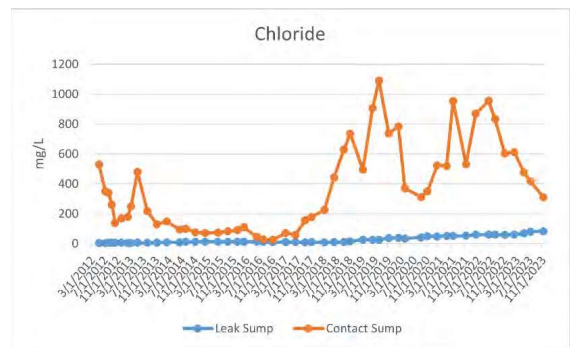
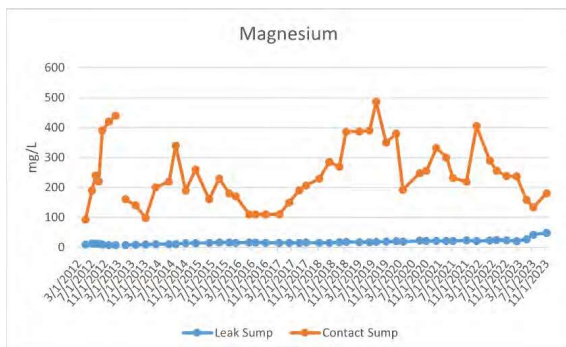
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Parameter	Unit	2/20/2023	5/8/2023	7/17/2023	11/6/2023
Field					
pH	SU	8.1	6.9	7.4	7.2
Specific Conductivity	µS/cm	6,533	4,369	4,346	4,572
Metals					
Aluminum, Total	µg/L	—	<50.0	—	—
Antimony, Total	µg/L	—	1.3	—	—
Arsenic, Total	µg/L	<1.0	<1.0	<1.0	<1.0
Barium, Total	µg/L	—	46.2	—	—
Beryllium, Total	µg/L	—	<1.0	—	—
Boron, Total	µg/L	861	787	810	766
Cadmium, Total	µg/L	—	3.6	—	—
Chromium, Total	µg/L	—	<1.0	—	—
Cobalt, Total	µg/L	—	87.6	—	—
Copper, Total	µg/L	9.6	6.5	11.5	9.2
Iron, Total	µg/L	<100	<100	<100	<100
Lead, Total	µg/L	—	<1.0	—	—
Lithium, Total	µg/L	—	—	—	—
Manganese, Total	µg/L	1,260	638	930	1,020
Mercury, Total	µg/L	0.001	0.005	0.001	0.001
Molybdenum, Total	µg/L	—	18.6	—	—
Nickel, Total	µg/L	4,930	2,870	3,900	5,170
Selenium, Total	µg/L	12.9	11.5	12.9	14.9
Silver, Total	µg/L	—	<0.20	—	—
Strontium, Total	µg/L	—	3,890	—	—
Thallium, Total	µg/L	—	<2.0	—	—
Vanadium, Total	µg/L	—	<1.0	—	—
Zinc, Total	µg/L	972	445	679	791
Major Anions					
Alkalinity, Bicarbonate	mg/L	70.0	72.6	52.8	46.8
Alkalinity, Carbonate	mg/L	<10.0	<10.0	<10.0	<10.0
Chloride	mg/L	612	477	417	312
Fluoride	mg/L	—	<0.10	—	—
Nitrogen, Ammonia	mg/L	<0.10	18.3	1.0	<0.10
Nitrogen, Nitrate	mg/L	368	193	176	151
Nitrogen, Nitrite	mg/L	<5.0	3.6	1.4	<1.0
Sulfate	mg/L	2,620	889	2,220	927
Major Cations					
Calcium, Total	mg/L	—	433	—	—
Magnesium, Total	mg/L	237	158	134	180
Potassium, Total	µg/L	—	57,100	—	—
Sodium, Total	mg/L	612	366	342	353

— Analyte not included in the quarterly parameter list.

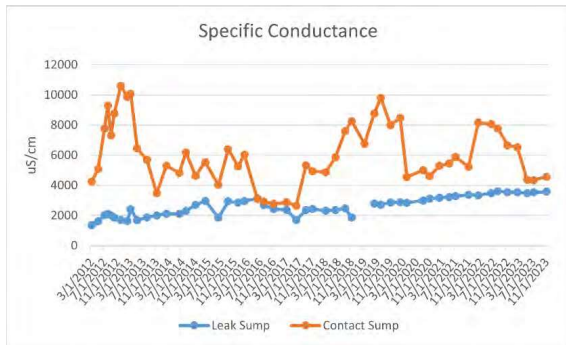
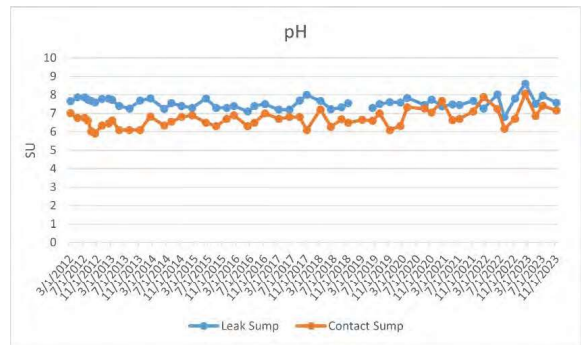
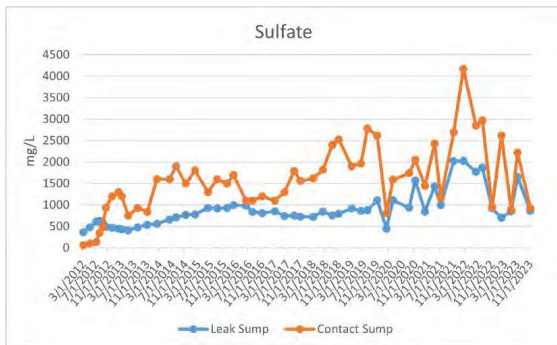
2023
Mine Permit Water Quality Monitoring Data
TDRSA Leak Detection Sump
Eagle Mine

		Q1 2023	Q2 2023	Q3 2023	Q4 2023
Parameter	Unit	2/20/2023	5/8/2023	7/17/2023	11/6/2023
Field					
pH	SU	8.6	7.5	8.0	7.6
Specific Conductivity	μS/cm	3,543	3,483	3,537	3,583
Major Anions					
Chloride	mg/L	61.5	69.0	81.1	83.9
Nitrogen, Ammonia	mg/L	<0.10	<0.10	<0.10	<0.10
Nitrogen, Nitrate	mg/L	69.2	78.2	98.9	102
Nitrogen, Nitrite	mg/L	<1.0	2.2	1.5	<1.0
Sulfate	mg/L	701	853	1,650	863
Major Cations					
Magnesium, Total	mg/L	20.8	26.7	42.0	48.5
Sodium, Total	mg/L	766	721	586	609

2023
Mine Permit Water Quality Monitoring Data
TDRSA Contact Water & Leak Sump
Eagle Mine



2023
Mine Permit Water Quality Monitoring Data
TDRSA Contact Water & Leak Sump
Eagle Mine

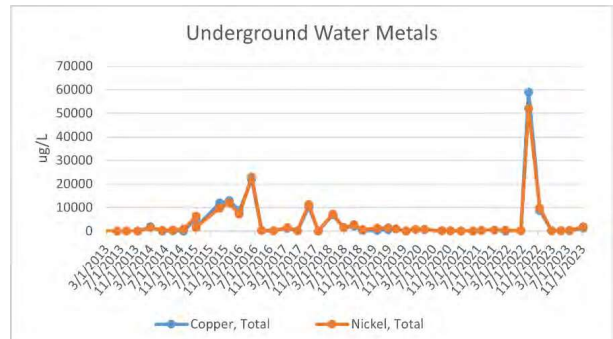
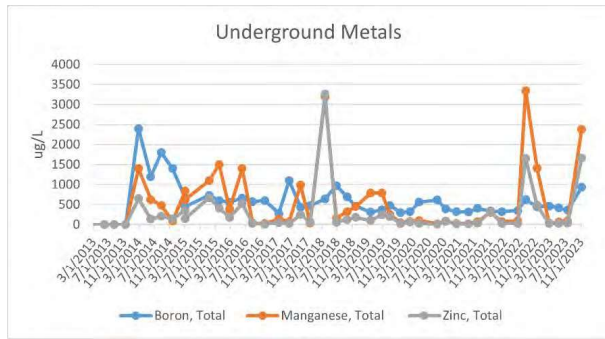
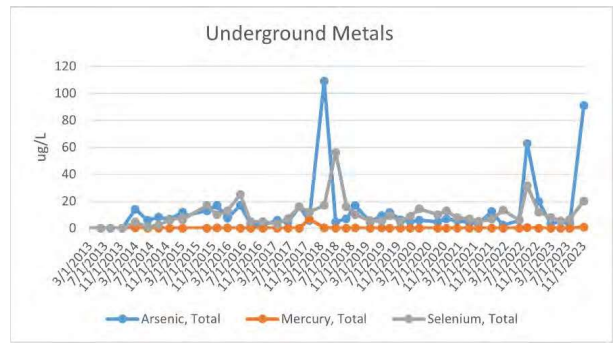
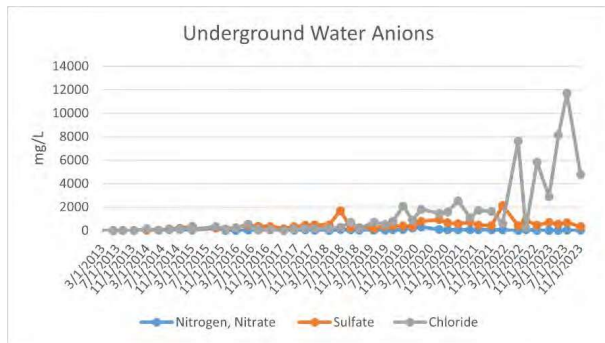


2023
Mine Permit Water Quality Monitoring Data
Underground Influent
Eagle Mine

		Q1 2023	Q2 2023	Q3 2023	Q4 2023
Parameter	Unit	2/20/2023	5/8/2023	7/17/2023	11/6/2023
Field					
pH	SU	8.4	9.5	9.5	7.9
Specific Conductivity	µS/cm	9,251	17,920	28,560	10,610
Metals					
Aluminum, Total	µg/L	—	3,820	—	—
Antimony, Total	µg/L	—	3.7	—	—
Arsenic, Total	µg/L	3.3	5.1	3.0	91.1
Barium, Total	µg/L	—	727	—	—
Beryllium, Total	µg/L	—	<2.0	—	—
Boron, Total	µg/L	464	418	366	934
Cadmium, Total	µg/L	—	0.55	—	—
Chromium, Total	µg/L	—	33.2	—	—
Cobalt, Total	µg/L	—	<15.0	—	—
Copper, Total	µg/L	177	197	172	1,410
Iron, Total	µg/L	5,060	9,390	7,800	408,000
Lead, Total	µg/L	—	3.1	—	—
Lithium, Total	µg/L	—	288	—	—
Manganese, Total	µg/L	39.5	64.4	91.0	2,380
Mercury, Total	µg/L	0.010	0.015	0.009	0.808
Molybdenum, Total	µg/L	—	53.9	—	—
Nickel, Total	µg/L	229	247	252	1,780
Selenium, Total	µg/L	8.1	5.5	6.5	20.2
Silver, Total	µg/L	—	0.59	—	—
Strontium, Total	µg/L	—	47,700	—	—
Thallium, Total	µg/L	—	<2.0	—	—
Vanadium, Total	µg/L	—	13.3	—	—
Zinc, Total	µg/L	27.6	28.9	38.6	1,660
Major Anions					
Alkalinity, Bicarbonate	mg/L	55.5	26.8	<10.0	84.4
Alkalinity, Carbonate	mg/L	21.2	16.0	92.8	<10.0
Chloride	mg/L	2,890	8,130	11,700	4,790
Fluoride	mg/L	—	0.12	—	—
Nitrogen, Nitrate	mg/L	0.51	22.6	26.8	33.4
Nitrogen, Nitrite	mg/L	—	—	—	—
Sulfate	mg/L	687	560	675	347
Major Cations					
Calcium, Total	mg/L	—	1,630	—	—
Magnesium, Total	mg/L	—	126	—	—
Potassium, Total	µg/L	—	182,000	—	—
Sodium, Total	mg/L	—	2,220	—	—

— Analyte not included in the quarterly parameter list.

2023
Mine Permit Water Quality Monitoring Data
Underground Influent
Eagle Mine

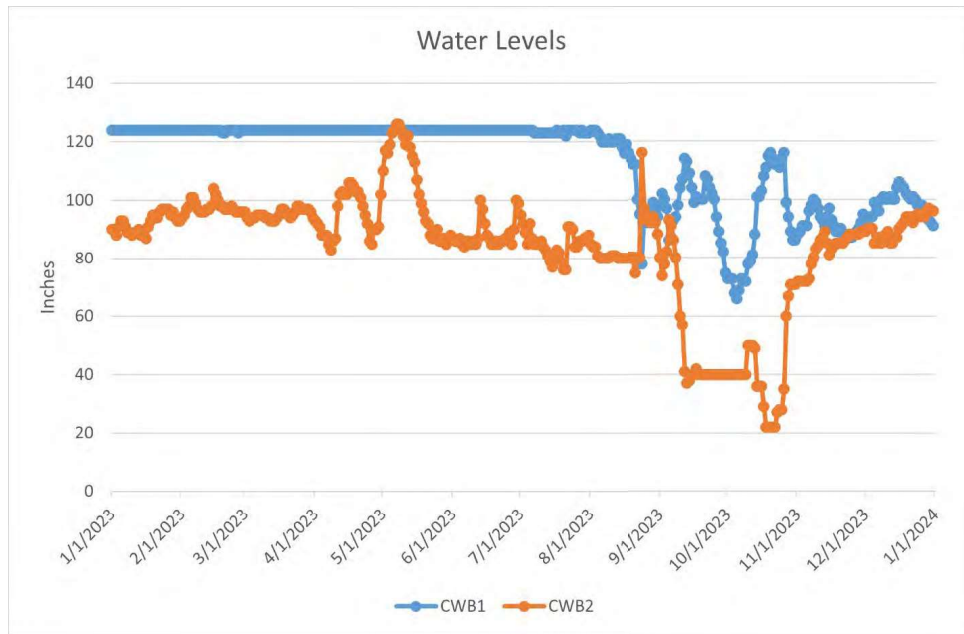


2023
Mine Permit Water Quality Monitoring Data
Contact Water Basins
Eagle Mine

		Q1 2023	Q2 2023	Q3 2023	Q4 2023
Parameter	Unit	2/20/2023	5/8/2023	7/17/2023	11/6/2023
Field					
pH	SU	10.3	9.3	10.2	8.3
Specific Conductivity	µS/cm	11,530	8,787	13,850	10,450
Metals					
Aluminum, Total	µg/L	<50.0	172	<50.0	582
Antimony, Total	µg/L	3.2	2.2	3.5	4.5
Arsenic, Total	µg/L	2.7	1.6	2.5	2.9
Barium, Total	µg/L	113	113	29.0	332
Beryllium, Total	µg/L	<1.0	<1.0	<1.0	<1.0
Boron, Total	µg/L	371	407	747	374
Cadmium, Total	µg/L	<0.20	0.40	<0.20	0.21
Chromium, Total	µg/L	1.2	3.3	1.8	3.6
Cobalt, Total	µg/L	<15.0	<15.0	<15.0	<15.0
Copper, Total	µg/L	4.6	13.6	4.6	15.9
Iron, Total	µg/L	<100	232	<100	1,070
Lead, Total	µg/L	<1.0	<1.0	<1.0	1.2
Lithium, Total	µg/L	124	85.2	217	211
Manganese, Total	µg/L	<5.0	24.9	10.5	56.7
Mercury, Total	µg/L	<0.0005	0.001	<0.00051	0.003
Molybdenum, Total	µg/L	51.2	33.8	45.6	27.6
Nickel, Total	µg/L	27.0	239	70.9	261
Selenium, Total	µg/L	4.6	5.3	9.2	2.9
Silver, Total	µg/L	<20.0	<0.20	<0.20	<0.20
Strontium, Total	µg/L	6,820	5,410	2,830	22,200
Thallium, Total	µg/L	<2.0	<2.0	<2.0	<2.0
Vanadium, Total	µg/L	3.5	10.7	5.3	6.4
Zinc, Total	µg/L	<10.0	28.9	<10.0	20.4
Major Anions					
Alkalinity, Bicarbonate	mg/L	<10.0	74.0	<10.0	36.6
Alkalinity, Carbonate	mg/L	87.2	36.8	65.2	<10.0
Chloride	mg/L	3,660	4,000	4,450	4,320
Fluoride	mg/L	<0.10	0.14	<0.10	<0.10
Nitrogen, Nitrate	mg/L	59.9	65.7	93.9	27.2
Sulfate	mg/L	471	712	1,330	484
Major Cations					
Calcium, Total	mg/L	106	164	52.3	760
Magnesium, Total	mg/L	34.0	50.0	20.8	70.4
Potassium, Total	µg/L	121,000	87,000	130,000	84,900
Sodium, Total	mg/L	2,610	1,660	3,000	1,360

— Analyte not included in the quarterly parameter list.

2023
Mine Permit Water Level Monitoring Data
Contact Water Basins
Eagle Mine

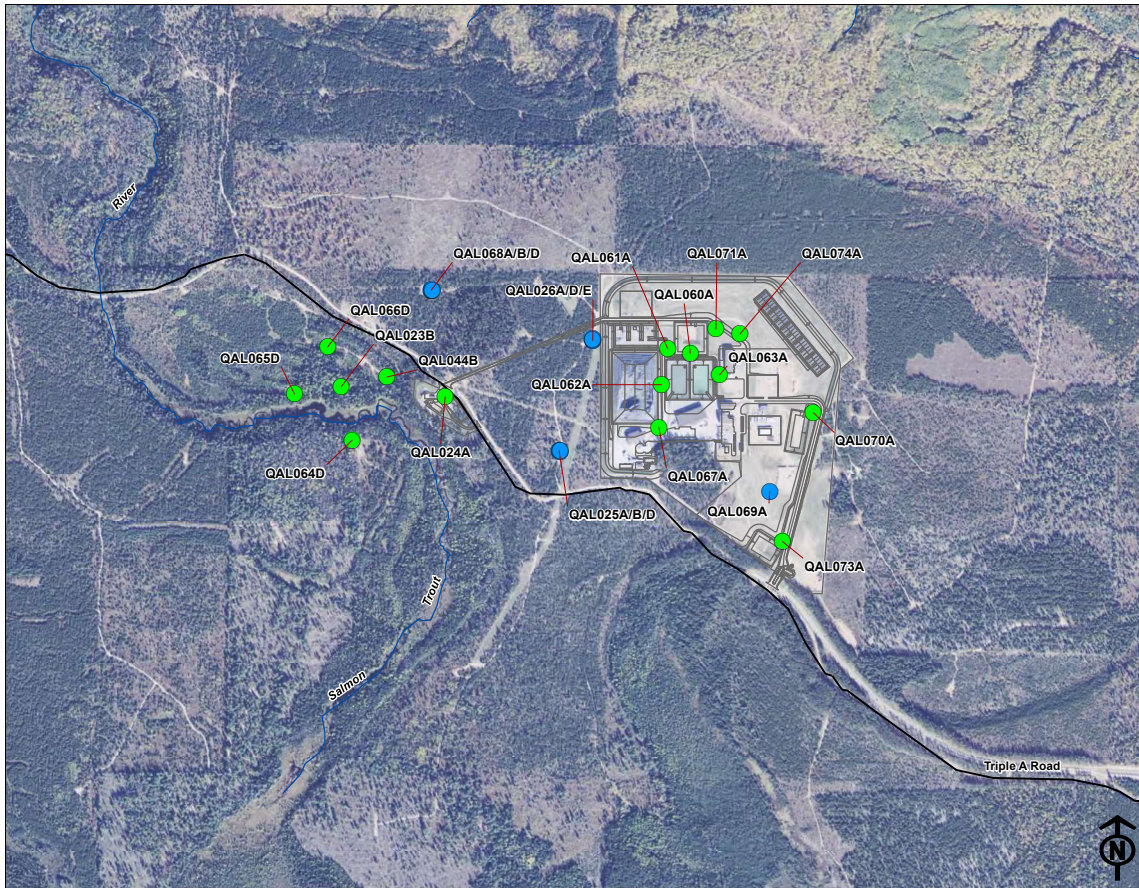


Appendix F

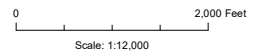
Eagle Mine Groundwater Monitoring Well Location Map

**MINE PERMIT
GROUNDWATER QUALITY
MONITORING LOCATIONS
Project View**

- COMPLIANCE WATER QUALITY
- BACKGROUND WATER QUALITY
- ROAD
- ~ HYDROGRAPHY
- MINE FACILITY



Reference
Data provided by: Eagle Mine and North Jackson Company
Projection & Datum: UTM NAD 83 Zone 16N



Eagle Mine
a subsidiary of **lunda mining**

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Appendix G

Eagle Mine Groundwater Monitoring Well Results and Benchmark Summary Table

2023
Mine Permit Groundwater Quality Monitoring Data
Benchmark Comparison Summary

Location	Location Classification	Q1	Q2	Q3	Q4
QAL023B	Compliance		magnesium, hardness	mercury	
QAL024A	Compliance	alkalinity bicarbonate, chloride, nitrate, sodium	alkalinity bicarbonate, chloride, nitrate, sodium	alkalinity bicarbonate, chloride, nitrate, sodium	alkalinity bicarbonate, chloride, nitrate, sodium
QAL025A	Background	pH, alkalinity bicarbonate	alkalinity bicarbonate	alkalinity bicarbonate	alkalinity bicarbonate
QAL025B	Background	chloride, sulfate			
QAL025D	Background	vanadium, chloride	chloride, calcium, magnesium, hardness	vanadium	vanadium
QAL026A	Background			pH, nitrate	
QAL026D	Background	alkalinity bicarbonate	alkalinity bicarbonate	alkalinity bicarbonate	alkalinity bicarbonate
QAL026E	Background	arsenic	arsenic	arsenic	arsenic
QAL044B	Compliance		iron, calcium		
QAL060A	Compliance	nitrate	nitrate	alkalinity bicarbonate, nitrate	alkalinity bicarbonate, nitrate
QAL061A	Compliance	pH, alkalinity bicarbonate, nitrate	alkalinity bicarbonate, nitrate, calcium, magnesium, hardness	alkalinity bicarbonate, nitrate	alkalinity bicarbonate, nitrate
QAL062A	Compliance	pH, alkalinity bicarbonate, chloride, nitrate, sodium	pH, alkalinity bicarbonate, chloride, nitrate, calcium, magnesium, potassium, sodium, hardness	pH, alkalinity bicarbonate, chloride, nitrate, sodium	pH, alkalinity bicarbonate, chloride, nitrate, sodium
QAL063A	Compliance	pH, alkalinity bicarbonate, chloride, nitrate, sodium	pH, alkalinity bicarbonate, chloride, nitrate, calcium, magnesium, potassium, sodium, hardness	pH, alkalinity bicarbonate, chloride, nitrate, sodium	pH, iron, alkalinity bicarbonate, chloride, nitrate, sodium
QAL064D	Compliance		magnesium, hardness		
QAL065D	Compliance		calcium, hardness		
QAL066D	Compliance	arsenic, iron, sodium	pH, alkalinity bicarbonate, sodium	pH, iron, mercury, alkalinity bicarbonate, sodium	pH, iron, mercury, alkalinity bicarbonate, sodium
QAL067A	Compliance	alkalinity bicarbonate, chloride, nitrate, sulfate, sodium	alkalinity bicarbonate, chloride, nitrate, sulfate, calcium, magnesium, sodium, hardness	alkalinity bicarbonate, chloride, nitrate, sulfate, sodium	alkalinity bicarbonate, chloride, nitrate, sulfate, sodium
QAL068A	Background				
QAL068B	Background	pH, alkalinity bicarbonate	alkalinity bicarbonate, calcium, hardness	alkalinity bicarbonate	
QAL068D	Background	arsenic	magnesium, hardness	arsenic	arsenic
QAL069A	Background	pH, alkalinity bicarbonate, chloride, nitrate, sulfate, sodium	pH, alkalinity bicarbonate, chloride, nitrate, calcium, sodium	pH, chloride, nitrate, sodium	pH, chloride, nitrate, sodium
QAL070A*	Compliance		alkalinity bicarbonate, chloride, nitrate, sulfate, calcium, magnesium, sodium, hardness		
QAL071A	Compliance	pH, alkalinity bicarbonate, chloride, nitrate, sodium	pH, alkalinity bicarbonate, chloride, nitrate, calcium, magnesium, sodium, hardness	pH, alkalinity bicarbonate, chloride, nitrate, sodium	pH, alkalinity bicarbonate, chloride, nitrate, sodium
QAL073A*	Compliance		pH, iron, alkalinity bicarbonate, nitrate, calcium, magnesium, sodium, hardness		
QAL074A	Compliance	pH, alkalinity bicarbonate, chloride, nitrate, sodium	pH, chromium, alkalinity bicarbonate, chloride, nitrate, sodium	alkalinity bicarbonate, chloride, nitrate, sodium	alkalinity bicarbonate, chloride, nitrate, sodium

Parameters listed in this table had values reported that were equal to or greater than a site-specific benchmark. *Monitoring location is only sampled on an annual basis in Q2.

2023
Mine Permit Groundwater Quality Monitoring Data
QAL023B (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/07/23 ^T	Q2 2023 05/17/23 ^T	Q3 2023 07/26/23 ^T	Q4 2023 10/31/23 ^T
Field						
D.O. ¹	ppm	--	0.40	0.20	<0.10	0.20
ORP	mV	--	96.0	-328	-322	-209
pH	SU	7.8-8.8	8.1	8.4	8.2	8.3
Specific Conductance	µS/cm @ 25°C	--	122	115	115	121
Temperature	°C	--	6.9	7.0	7.5	7.0
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1412.61	1412.98	1413.91	1414.68
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.5	4.2	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	159	<100 e	56.6 J	41.7 J	36.8 J
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	11.7 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	67.0	60.0	65.0	59.0	60.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.050 e	<0.050 e	<0.050	<0.050
Sulfate	mg/L	8.0	<2.0	5.4	5.2	4.3 e
Major Cations						
Calcium	mg/L	16.0	--	15.8	--	--
Magnesium	mg/L	3.7	--	3.7	--	--
Potassium	mg/L	2.0	--	<0.50	--	--
Sodium	mg/L	11	9.0 e	4.4	3.8	3.8
General						
Hardness	mg/L	55.0	--	55.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL023B (UMB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL024A (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/30/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	11.0	11.0	11.0	11.0
ORP	mV	--	303	153	-80	177
pH	SU	6.1-7.1	6.7	6.4	6.2	6.3
Specific Conductance	µS/cm @ 25°C	--	159	122	144	174
Temperature	°C	--	7.6	10.1	8.8	7.5
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1416.49	1418.38	1419.58	1418.81
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	86.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	105	<100 e	50.9 J	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	1.13	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	24.0	33.0	38.0	31.0	26.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	23.1	12.6	22.0	30.7
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	1.1 e	1.2 e	0.31	0.69
Sulfate	mg/L	8.0	3.2	4.2	2.7	3.0 e
Major Cations						
Calcium	mg/L	48.0	--	9.9	--	--
Magnesium	mg/L	8.1	--	1.6	--	--
Potassium	mg/L	3.7	--	1.3	--	--
Sodium	mg/L	2.0	15.4 e	13.4	11.8	17.4
General						
Hardness	mg/L	153	--	31.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL024A (UMB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL025A (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/30/23 ^T	Q2 2023 05/17/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	11.0	12.0	12.0	12.0
ORP	mV	--	293	169	-92	174
pH	SU	6.4-7.4	7.5	6.8	7.0	6.8
Specific Conductance	µS/cm @ 25°C	--	80.0	44.0	66.0	70.0
Temperature	°C	--	7.1	7.3	7.2	6.7
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1413.14	1416.17	1418.82	1414.55
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	126	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	0.45	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	25.0	42.0	25.0	35.0	34.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	1.1	0.23 e	0.18 e	0.098	0.18
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0 e
Major Cations						
Calcium	mg/L	8.5	--	6.3	--	--
Magnesium	mg/L	2.0	--	1.2	--	--
Potassium	mg/L	2.0	--	0.71	--	--
Sodium	mg/L	2.0	<1.0 e	<1.0	<1.0	<1.0
General						
Hardness	mg/L	28.0	--	21.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL025A (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL025B (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/30/23 ^T	Q2 2023 05/17/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	11.0	11.0	11.0	11.0
ORP	mV	--	297	119	-95	145
pH	SU	8.5-9.5	9.1	9.2	9.1	9.0
Specific Conductance	µS/cm @ 25°C	--	64.0	62.0	61.0	64.0
Temperature	°C	--	7.0	6.9	7.3	7.0
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1414.91	1416.05	1418.77	1417.75
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	56.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	1.1	1.1	1.1	1.1
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	36.0	33.0	32.0	29.0	28.0
Alkalinity, Carbonate	mg/L	12.0	<2.0	3.1	<2.0	4.1
Chloride	mg/L	4.0	45.4	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	0.12 e	0.11 e	0.090	0.091
Sulfate	mg/L	8.0	16.9	<2.0	<2.0	<2.0 e
Major Cations						
Calcium	mg/L	10.0	--	9.7	--	--
Magnesium	mg/L	2.0	--	1.7	--	--
Potassium	mg/L	2.0	--	<0.50	--	--
Sodium	mg/L	4.5	1.2 e	1.2	1.2	1.2
General						
Hardness	mg/L	33.0	--	31.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL025B (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL025D (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/30/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	4.8	4.9	4.8	4.7
ORP	mV	--	301	82	-128	98
pH	SU	8.2-9.2	8.5	8.9	8.7	8.5
Specific Conductance	µS/cm @ 25°C	--	111	104	106	111
Temperature	°C	--	6.8	7.1	7.3	7.1
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1410.97	1405.52	1413.79	1413.87
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.5	2.8	2.6	2.6	2.8
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	137	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	4.0	3.8	4.1	4.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	52.0	48.0	46.0	45.0	43.0
Alkalinity, Carbonate	mg/L	14.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	4.0	4.1	3.8	3.9
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	0.089 e	0.090 e	0.088	0.090
Sulfate	mg/L	8.0	5.1	5.2	5.3	4.7 e
Major Cations						
Calcium	mg/L	12.0	--	14.3	--	--
Magnesium	mg/L	2.7	--	3.3	--	--
Potassium	mg/L	2.0	--	0.79	--	--
Sodium	mg/L	12.0	2.8 e	2.6	2.5	2.7
General						
Hardness	mg/L	42.0	--	49.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL025D (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL026A (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 Sampled	Not Sampled	Q2 2023 Not Sampled	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field							
D.O. ¹	ppm	--	i		i	12.0	i
ORP	mV	--	i		i	329	i
pH	SU	6.2-7.2	i		i	6.2	i
Specific Conductance	µS/cm @ 25°C	--	i		i	49.0	i
Temperature	°C	--	i		i	8.6	i
Turbidity	NTU	--	i		i	<1.0	i
Water Elevation	ft MSL	--	<1415.4	BP	<1415.4	BP	1418.69
Metals							
Aluminum	ug/L	236	--		i	--	--
Antimony	ug/L	5.5	--		i	--	--
Arsenic	ug/L	6.0	i		i	<2.0	i
Barium	ug/L	80.0	--		i	--	--
Beryllium	ug/L	2.5	--		i	--	--
Boron	ug/L	400	i		i	<100	i
Cadmium	ug/L	2.0	--		i	--	--
Chromium	ug/L	20.0	--		i	--	--
Cobalt	ug/L	40.0	--		i	--	--
Copper	ug/L	20.0	i		i	<5.0	i
Iron	ug/L	368	i		i	212	i
Lead	ug/L	4.0	--		i	--	--
Lithium	ug/L	32.0	--		i	--	--
Manganese	ug/L	80.0	i		i	<20.0	i
Mercury	ng/L	2.0	i		i	0.91 a	i
Molybdenum	ug/L	40.0	--		i	--	--
Nickel	ug/L	100	i		i	<25.0	i
Selenium	ug/L	4.0	i		i	<1.0	i
Silver	ug/L	0.80	--		i	--	--
Strontium	ug/L	200	--		i	--	--
Thallium	ug/L	2.0	--		i	--	--
Vanadium	ug/L	4.0	i		i	<1.0	i
Zinc	ug/L	40.0	i		i	<10.0	i
Major Anions							
Alkalinity, Bicarbonate	mg/L	114	i		i	19.0	i
Alkalinity, Carbonate	mg/L	8.0	i		i	<2.0	i
Chloride	mg/L	4.0	i		i	<1.0	i
Fluoride	mg/L	0.40	--		i	--	--
Nitrogen, Nitrate	mg/L	0.73	i		i	1.7	i
Sulfate	mg/L	8.0	i		i	<2.0	i
Major Cations							
Calcium	mg/L	40.0	--		i	--	--
Magnesium	mg/L	5.9	--		i	--	--
Potassium	mg/L	2.0	--		i	--	--
Sodium	mg/L	2.4	i		i	<1.0	i
General							
Hardness	mg/L	124	--		i	--	--

Explanations of abbreviations are included on the final page of this table.

QAL026A (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL026D (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/30/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	11.0	12.0	12.0	12.0
ORP	mV	--	62	314	255	248
pH	SU	8.4-9.4	9.2	9.1	8.9	8.7
Specific Conductance	µS/cm @ 25°C	--	75.0	66.0	68.0	81.0
Temperature	°C	--	5.8	6.9	7.4	7.1
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1407.78	1408.10	1410.91	1410.64
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	31.0	38.0	35.0	35.0	34.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	3.2	<2.0	<2.0
Chloride	mg/L	4.0	1.6	1.3	1.4	1.8
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	0.14 e	0.13 e	0.12	0.14
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0 e
Major Cations						
Calcium	mg/L	13.0	--	12.1	--	--
Magnesium	mg/L	2.4	--	1.8	--	--
Potassium	mg/L	2.0	--	0.64	--	--
Sodium	mg/L	2.0	<1.0 e	<1.0	<1.0	<1.0
General						
Hardness	mg/L	43.0	--	38.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL026D (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL026E (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/30/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	<0.10	0.20	0.10	0.20
ORP	mV	--	-25	138	64.0	80.0
pH	SU	8.1-9.1	8.8	8.7	8.6	8.4
Specific Conductance	µS/cm @ 25°C	--	119	104	106	123
Temperature	°C	--	6.8	7.0	7.2	7.1
Turbidity	NTU	--	<1.0	<10	<1.0	<1.0
Water Elevation	ft MSL	--	1407.72	1408.00	1410.57	1410.38
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	7.8	8.0	7.8	8.1	7.9
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	62.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	91.0	60.0	61.0	55.0	55.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.050 e	<0.050 e	<0.050	<0.050
Sulfate	mg/L	8.6	7.5	7.6	7.6	6.7 e
Major Cations						
Calcium	mg/L	17.0	--	16.5	--	--
Magnesium	mg/L	4.3	--	4.2	--	--
Potassium	mg/L	2.0	--	1.6	--	--
Sodium	mg/L	2.0	1.7 e	1.7	1.6	1.8
General						
Hardness	mg/L	60.0	--	58.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL026E (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL044B (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/06/23 ^T	Q2 2023 05/15/23 ^T	Q3 2023 07/25/23 ^T	Q4 2023 10/31/23 ^T
Field						
D.O. ¹	ppm	--	0.40	0.10	0.20	0.30
ORP	mV	--	48	-408	-155	-178
pH	SU	8.3-9.3	8.7	9.0	9.1	9.2
Specific Conductance	µS/cm @ 25°C	--	119	114	93	92
Temperature	°C	--	6.3	7.8	7.7	7.4
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1413.40	1414.35	1415.75	1415.38
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	86.4 J	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	29.2	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	64.0	56.0	57.0	48.0	36.0
Alkalinity, Carbonate	mg/L	8.0	2.2	2.5	<2.0	4.2
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.050 e	<0.050 e	<0.050	<0.050
Sulfate	mg/L	24.0	6.9	6.5	6.5	6.2 e
Major Cations						
Calcium	mg/L	17.0	--	18.5	--	--
Magnesium	mg/L	4.0	--	2.6	--	--
Potassium	mg/L	2.0	--	1.2	--	--
Sodium	mg/L	2.6	2.1 e	2.2	2.2	2.2
General						
Hardness	mg/L	58.0	--	57.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL044B (UMB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL060A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/31/23 ^T	Q2 2023 05/15/23 ^T	Q3 2023 07/25/23 ^T	Q4 2023 10/31/23 ^T
Field						
D.O. ¹	ppm	--	8.8	7.5	9.2	11.0
ORP	mV	--	253	122	-76	186
pH	SU	8.1-9.1	8.7	8.8	8.4	8.6
Specific Conductance	µS/cm @ 25°C	--	107	102	134	125
Temperature	°C	--	7.2	8.2	8.4	8.0
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1403.57	1403.64	1405.98	1405.97
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	7.2	2.8	2.9	<2.0	2.2
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	62.0	52.0	52.0	74.0	63.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	1.4	1.5	1.3	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	0.32 e	0.31 e	0.28	0.20
Sulfate	mg/L	8.0	3.4	3.9	2.7	<2.0 e
Major Cations						
Calcium	mg/L	17.0	--	15.6	--	--
Magnesium	mg/L	4.2	--	3.4	--	--
Potassium	mg/L	2.0	--	0.90	--	--
Sodium	mg/L	2.1	<1.0 e	1.0	1.2	1.0
General						
Hardness	mg/L	61.0	--	53.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL060A (TDRSA-CWB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL061A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/31/23 ^T	Q2 2023 05/15/23 ^T	Q3 2023 07/25/23 ^T	Q4 2023 11/01/23 ^T
Field						
D.O. ¹	ppm	--	10.0	10.0	11.0	11.0
ORP	mV	--	304	132	-90	110
pH	SU	8.1-9.1	8.1	8.3	8.4	8.3
Specific Conductance	µS/cm @ 25°C	--	202	199	157	153
Temperature	°C	--	7.3	8.3	8.4	8.2
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1404.80	1402.93	1407.48	1407.32
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	40.0	110	120	85.0	78.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	1.2
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.27	0.32 e	0.30 e	0.29	0.27
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0 e
Major Cations						
Calcium	mg/L	15.0	--	34.0	--	--
Magnesium	mg/L	2.2	--	6.3	--	--
Potassium	mg/L	2.0	--	1.1	--	--
Sodium	mg/L	2.0	1.1 e	1.1	1.1	<1.0
General						
Hardness	mg/L	37.0	--	111	--	--

Explanations of abbreviations are included on the final page of this table.

QAL061A (TDRSA-CWB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL062A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/31/23 ^T	Q2 2023 05/15/23 ^T	Q3 2023 07/25/23 ^T	Q4 2023 11/01/23 ^T
Field						
D.O. ¹	ppm	--	7.6	7.3	7.6	7.3
ORP	mV	--	326	127	-108	108
pH	SU	8.3-9.3	7.4	7.5	7.4	7.4
Specific Conductance	µS/cm @ 25°C	--	675	619	617	582
Temperature	°C	--	7.4	8.1	8.2	7.6
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1406.18	1406.31	1409.00	1408.49
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	50.4	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	119	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	48.0	280	290	260	270
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	53.9	45.2	50.0	26.7
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.41	2.0 e	2.0 e	2.1	1.8
Sulfate	mg/L	8.0	5.2	5.1	4.5	4.1 e
Major Cations						
Calcium	mg/L	12.0	--	85.3	--	--
Magnesium	mg/L	2.2	--	17.8	--	--
Potassium	mg/L	2.0	--	2.9	--	--
Sodium	mg/L	2.0	30.3 e	29.1	28.3	23.6
General						
Hardness	mg/L	40.0	--	286	--	--

Explanations of abbreviations are included on the final page of this table.

QAL062A (TDRSA-CWB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL063A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/31/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/25/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	7.7	8.0	8.4	7.4
ORP	mV	--	36	201	145	134
pH	SU	8.1-9.1	7.4	7.4	7.3	7.3
Specific Conductance	µS/cm @ 25°C	--	738	630	625	747
Temperature	°C	--	8.5	8.7	8.5	8.5
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1400.37	1400.62	1402.20	1402.60
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	56.1	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	90.7 J
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	127	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	42.0	280	290	270	280
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	84.4	82.3	69.9	69.4
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.29	1.9 e	2.0 e	2.0	2.0
Sulfate	mg/L	8.0	6.8	6.6	6.7	6.8 e
Major Cations						
Calcium	mg/L	12.0	--	86.0	--	--
Magnesium	mg/L	2.0	--	18.2	--	--
Potassium	mg/L	2.0	--	3.2	--	--
Sodium	mg/L	2.0	45.5 e	44.1	42.2	44.2
General						
Hardness	mg/L	40.0	--	290	--	--

Explanations of abbreviations are included on the final page of this table.

QAL063A (TDRSA-CWB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL064D (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/06/23 ^T	Q2 2023 05/24/23 ^T	Q3 2023 07/26/23 ^T	Q4 2023 10/31/23 ^T
Field						
D.O. ¹	ppm	--	0.50	0.20	0.20	0.40
ORP	mV	--	73	-189	-196	-195
pH	SU	8.0-9.0	8.7	8.6	8.7	8.6
Specific Conductance	µS/cm @ 25°C	--	142	115	116	145
Temperature	°C	--	6.6	7.0	7.1	6.8
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1415.35	1415.66	1416.82	1416.59
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	25.2	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	1.95 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	98.4	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	82.0	73.0	75.0	69.0	73.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.2	2.4	2.1	2.0	2.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.050 e	<0.050 e	<0.050	<0.050
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0 e
Major Cations						
Calcium	mg/L	22.0	--	19.4	--	--
Magnesium	mg/L	3.3	--	3.9	--	--
Potassium	mg/L	2.0	--	1.3	--	--
Sodium	mg/L	6.9	3.8 e	4.4	4.1	4.2
General						
Hardness	mg/L	51.0	--	64.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL064D (UMB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL065D (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/07/23 ^T	Q2 2023 05/17/23 ^T	Q3 2023 07/26/23 ^T	Q4 2023 10/31/23 ^T
Field						
D.O. ¹	ppm	--	0.60	0.10	<0.10	0.20
ORP	mV	--	121	-232	-277	-150
pH	SU	7.9-8.9	8.1	8.4	8.5	8.5
Specific Conductance	µS/cm @ 25°C	--	153	140	140	143
Temperature	°C	--	6.2	7.2	7.9	6.7
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1415.21	1416.13	1416.28	1416.93
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.6	<2.0	4.2	4.3	4.4
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	53.8 J	50.6 J	36.0 J
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	195	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	86.0	82.0	82.0	79.0	77.0
Alkalinity, Carbonate	mg/L	8.7	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	0.13	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.050 e	<0.050 e	<0.050	<0.050
Sulfate	mg/L	8.0	5.6	<2.0	<2.0	<2.0 e
Major Cations						
Calcium	mg/L	14.0	--	14.5	--	--
Magnesium	mg/L	4.8	--	4.7	--	--
Potassium	mg/L	3.0	--	2.8	--	--
Sodium	mg/L	12.0	4.6 e	8.9	8.6	9.2
General						
Hardness	mg/L	53.0	--	56.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL065D (UMB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL066D (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/06/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/26/23 ^T	Q4 2023 10/31/23 ^T
Field						
D.O. ¹	ppm	--	2.1	5.7	4.5	3.6
ORP	mV	--	107	328	105	230
pH	SU	8.7-9.7	9.0	8.3	8.6	8.7
Specific Conductance	µS/cm @ 25°C	--	138	120	123	145
Temperature	°C	--	6.2	7.0	8.3	6.8
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1413.99	1415.02	1416.27	1415.81
Metals						
Aluminum	ug/L	557	--	88.5	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	8.9	9.4	7.0	8.0	8.8
Barium	ug/L	80.00	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	288	1,300 e	84.8 J	754	2,060
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	1.91	1.29	2.39 a	3.89
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	367	--	50.2	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	2.5	<1.0	1.5	3.5
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	61.0	20.0	72.0	71.0	70.0
Alkalinity, Carbonate	mg/L	52.0	2.9	2.4	<2.0	2.7
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	0.073 e	0.10 e	0.079	0.10
Sulfate	mg/L	11.0	7.7	6.9	7.0	6.3 e
Major Cations						
Calcium	mg/L	58.0	--	16.2	--	--
Magnesium	mg/L	2.9	--	2.2	--	--
Potassium	mg/L	2.6	--	0.88	--	--
Sodium	mg/L	8.0	13.0 e	11.9	12.1	14.4
General						
Hardness	mg/L	146	--	50.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL066D (UMB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL067A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/31/23 ^T	Q2 2023 05/15/23 ^T	Q3 2023 07/25/23 ^T	Q4 2023 11/01/23 ^T
Field						
D.O. ¹	ppm	--	8.4	8.4	8.8	9.1
ORP	mV	--	323	148	-117	137
pH	SU	5.6-6.6	6.3	6.4	6.3	6.2
Specific Conductance	µS/cm @ 25°C	--	353	307	234	253
Temperature	°C	--	7.5	8.7	8.6	7.7
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1412.00	1413.42	1415.86	1415.73
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	29.7	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	1.02	1.09	0.69 a	0.78
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	72.2	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	51.0	83.0	82.0	77.0	64.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	44.0	38.9	23.5	26.7
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.25	1.9 e	1.6 e	1.4	1.3
Sulfate	mg/L	8.4	18.0	16.5	9.9	10.5 e
Major Cations						
Calcium	mg/L	8.2	--	15.8	--	--
Magnesium	mg/L	2.0	--	5.0	--	--
Potassium	mg/L	2.0	--	1.9	--	--
Sodium	mg/L	2.0	38.9 e	41.2	30.7	23.9
General						
Hardness	mg/L	26.0	--	60.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL067A (TDRSA-CWB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL068A (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/06/23 ^T	Q2 2023 05/17/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	12.0	12.0	14.0	13.0
ORP	mV	--	112	410	328	328
pH	SU	6.2-7.2	6.9	6.8	6.5	6.5
Specific Conductance	µS/cm @ 25°C	--	34.0	27.0	27.0	42.0
Temperature	°C	--	7.0	6.6	7.2	6.8
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1420.05	1419.55	1424.51	1420.46
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	35.0	18.0	18.0	14.0	30.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.050 e	<0.050 e	<0.050	<0.050
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0 e
Major Cations						
Calcium	mg/L	6.7	--	4.3	--	--
Magnesium	mg/L	2.0	--	<1.0	--	--
Potassium	mg/L	2.0	--	0.79	--	--
Sodium	mg/L	2.0	<1.0 e	<1.0	<1.0	<1.0
General						
Hardness	mg/L	21.0	--	<3.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL068A (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL068B (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/06/23 ^T	Q2 2023 05/17/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	11.0	12.0	12.0	11.0
ORP	mV	--	81.0	376	230	261
pH	SU	8.4-9.4	9.4	9.3	9.2	9.0
Specific Conductance	µS/cm @ 25°C	--	62.0	52.0	53.0	63.0
Temperature	°C	--	7.1	7.1	7.6	7.4
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1412.09	1412.28	1415.69	1415.24
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	184	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	1.1	1.2	1.1
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	30.0	31.0	30.0	31.0	21.0
Alkalinity, Carbonate	mg/L	9.9	<2.0	4.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.050 e	0.059 e	0.054	0.060
Sulfate	mg/L	8.0	2.0	<2.0	<2.0	<2.0 e
Major Cations						
Calcium	mg/L	9.4	--	9.5	--	--
Magnesium	mg/L	2.0	--	1.8	--	--
Potassium	mg/L	2.0	--	0.77	--	--
Sodium	mg/L	2.0	<1.0 e	<1.0	<1.0	<1.0
General						
Hardness	mg/L	31.0	--	31.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL068B (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL068D (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/06/23 ^T	Q2 2023 05/17/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	2.6	3.6	2.8	4.6
ORP	mV	--	69.0	389	213	244
pH	SU	8.0-9.0	8.8	8.7	8.6	8.4
Specific Conductance	µS/cm @ 25°C	--	115	98.0	101	117
Temperature	°C	--	5.0	6.4	9.4	6.7
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1412.21	1412.37	1415.82	1415.35
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	7.2	7.4	7.0	7.3	7.8
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	119	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.12	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	3.3	3.6	3.8	3.6
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	67.0	59.0	61.0	59.0	57.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0	<1.0	<1.0
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.21	<0.050 e	<0.050 e	0.050	<0.050
Sulfate	mg/L	10	5.0	4.6	4.6	4.1 e
Major Cations						
Calcium	mg/L	16.0	--	15.1	--	--
Magnesium	mg/L	3.9	--	3.9	--	--
Potassium	mg/L	2.0	--	1.4	--	--
Sodium	mg/L	6.1	3.8 e	3.8	3.5	4.2
General						
Hardness	mg/L	52.0	--	54.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL068D (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL069A (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 02/06/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/24/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	8.5	7.9	6.8	8.5
ORP	mV	--	259	122	-95	150
pH	SU	7.8-8.8	7.3	7.2	6.8	6.9
Specific Conductance	µS/cm @ 25°C	--	448	365	407	319
Temperature	°C	--	7.8	7.8	8.1	7.7
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1381.71	1382.75	1386.23	1385.84
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	0.56
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	62.8	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	138	150	150	130	89.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	53.5	31.6	44.9	39.1
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.57	1.1 e	0.98 e	1.3	0.88
Sulfate	mg/L	8.0	8.5	6.3	5.3	5.9 e
Major Cations						
Calcium	mg/L	35.0	--	39.6	--	--
Magnesium	mg/L	18.0	--	12.7	--	--
Potassium	mg/L	2.0	--	1.8	--	--
Sodium	mg/L	2.0	20.7 e	22.2	18.4	23.7
General						
Hardness	mg/L	162	--	151	--	--

Explanations of abbreviations are included on the final page of this table.

QAL069A (Background)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL070A (NCWIB) (Annual Only)
Eagle Mine

Parameter	Unit	Benchmark	Q2 2019 05/07/19 ^T	Q2 2020 05/06/20 ^T	Q2 2021 05/10/21 ^T	Q2 2022 06/07/22 ^T	Q2 2023 05/16/23 ^T
Field							
D.O. ¹	ppm	--	11.0	11.0	10.0	10.0	11.0
ORP	mV	--	185	248	257	60.0	111
pH	SU	8.3-9.3	8.3	8.0	8.4	8.2	8.4
Specific Conductance	µS/cm @ 25°C	--	479	393	403	547	383
Temperature	°C	--	9.0	10.0	8.0	13.0	10.0
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1371.85	1372.70	1371.95	1369.06	1369.75
Metals							
Aluminum	ug/L	200	<50.0	<50	<50.0	52.0	<50.0
Antimony	ug/L	5.5	<5.0	<5.0	<5.0	<5.0	<5.0
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	27.3	30.2	27.9	29.7	<20.0
Beryllium	ug/L	2.5	<1.0	<1.0	<1.0	<1.0	<1.0
Boron	ug/L	400	<100	<100	<100	<100	<100
Cadmium	ug/L	2.0	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	ug/L	20.0	<5.0	<5.0	<5.0	20.4	<5.0
Cobalt	ug/L	40.0	<10.0	<10	<10.0	<10.0	<10.0
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80.0	<50.0	<50	79.9	184	<100
Lead	ug/L	4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Lithium	ug/L	32.0	<8.0	<8.0	<8.0	<8.0	<8.0
Manganese	ug/L	80.0	<20.0	<20	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	0.62	<0.50	0.52	1.80	1.17
Molybdenum	ug/L	40.0	<10.0	<10	<10.0	<10.0	<10.0
Nickel	ug/L	100	<25.0	<25	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	ug/L	0.80	<0.20	<0.20	<0.20	<0.20	<0.20
Strontium	ug/L	200	72.9	92.2	88.8	68.9	<50.0
Thallium	ug/L	2.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10	<10.0	<10.0	<10.0
Major Anions							
Alkalinity, Bicarbonate	mg/L	42.0	75.1	80.7	87.7	105	110
Alkalinity, Carbonate	mg/L	8.0	<2.0 e	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	107 e	102 e	93.1 e	102 e	70.2
Fluoride	mg/L	0.40	<0.10 e	<0.10	<0.10	<0.10	<0.10
Nitrogen, Nitrate	mg/L	0.22	1.4 e	1.3 e	1.0 e	1.1	0.85 e
Sulfate	mg/L	8.0	10.3 e	8.9	9.1	12.4	8.0
Major Cations							
Calcium	mg/L	11.0	38.6 e	51.9	47.5	39.0	29.9
Magnesium	mg/L	3.0	7.0	9.8	8.4	8.0	5.4
Potassium	mg/L	2.0	1.9	2.2	2.0	2.0	1.9
Sodium	mg/L	2.0	48.4 e	28.4	35.2	57.1	44.0
General							
Hardness	mg/L	40.0	125	170	153	130	97.0

Explanations of abbreviations are included on the final page of this table.

QAL070A (NCWIB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL071A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/30/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/25/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	12.0	12.0	12.0	11.0
ORP	mV	--	182	384	265	249
pH	SU	8.1-9.1	8.0	8.0	8.0	8.1
Specific Conductance	µS/cm @ 25°C	--	340	338	304	292
Temperature	°C	--	8.4	8.4	8.7	8.2
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1404.80	1406.18	1408.87	1407.35
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	21.6	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	<5.0	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	14.4	9.5	7.6	5.2
Iron	ug/L	178	<100 e	<100	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	<0.50	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	58.5	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	44.0	120	95.0	81.0	78.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	13.8	14.1	12.9	8.6
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.31	18.0 e	21.4 e	18.9	12.6
Sulfate	mg/L	8.0	6.7	7.1	7.8	6.5 e
Major Cations						
Calcium	mg/L	12.0	--	52.8	--	--
Magnesium	mg/L	2.0	--	7.2	--	--
Potassium	mg/L	2.0	--	1.6	--	--
Sodium	mg/L	2.0	13.0 e	14.5	11.8	11.0
General						
Hardness	mg/L	38.0	--	162	--	--

Explanations of abbreviations are included on the final page of this table.

QAL071A (TDRSA-CWB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL073A (NCWIB) (Annual Only)
Eagle Mine

Parameter	Unit	Benchmark	Q2 2019 05/07/19 ^T	Q2 2020 05/06/20 ^T	Q2 2021 05/10/21 ^T	Q2 2022 06/07/22 ^T	Q2 2023 05/16/23 ^T
Field							
D.O. ¹	ppm	--	11.0	11.0	11.0	10.0	11.0
ORP	mV	--	220	265	267	111	138
pH	SU	6.1-7.1	6.8	6.5	6.9	7.1	7.1
Specific Conductance	µS/cm @ 25°C	--	178	116	110	126	128
Temperature	°C	--	9.0	8.4	7.4	11.0	8.6
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1383.74	1384.72	1384.83	1382.39	1382.39
Metals							
Aluminum	ug/L	200	<50.0	72.7	57.9	66.8	126
Antimony	ug/L	5.5	<5.0	<5.0	<5.0	<5.0	<5.0
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	<20.0	<20	<20.0	<20.0	<20.0
Beryllium	ug/L	2.5	<1.0	<1.0	<1.0	<1.0	<1.0
Boron	ug/L	400	<100	<100	<100	<100	<100
Cadmium	ug/L	2.0	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	ug/L	20.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/L	40.0	<10.0	<10	<10.0	<10.0	<10.0
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	132	95.3	78.7	100	103	153
Lead	ug/L	4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Lithium	ug/L	32.0	<8.0	<8.0	<8.0	<8.0	<8.0
Manganese	ug/L	80.0	<20.0	<20	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	0.82	<0.50	0.55	<0.50	1.32
Molybdenum	ug/L	40.0	<10.0	<10	<10.0	<10.0	<10.0
Nickel	ug/L	100	<25	<25	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	ug/L	0.80	<0.20	<0.20	<0.20	<0.20	<0.20
Strontium	ug/L	200	92.7	68.7	54.8	54.2	52.8
Thallium	ug/L	2.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10	<10	<10.0	<10.0	<10.0
Major Anions							
Alkalinity, Bicarbonate	mg/L	44.0	78.6	52.5	42.4	49.7	61.0
Alkalinity, Carbonate	mg/L	8.0	<2.0 e	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	20.0	3.4 e	3.0 e	8.7 e	8.5 e	<1.0
Fluoride	mg/L	0.40	<0.10 e	<0.10	<0.10	<0.10	<0.10
Nitrogen, Nitrate	mg/L	0.60	1.1 e	0.84 e	0.57 e	0.50	0.78 e
Sulfate	mg/L	8.0	7.5 e	7.0	4.9	4.5	<2.0
Major Cations							
Calcium	mg/L	9.2	27.7 e	19.7	17.9	17.0	18.8
Magnesium	mg/L	2.5	5.2	4.0	3.4	3.4	4.0
Potassium	mg/L	2.0	1.3	1.1	1.2	1.0	1.2
Sodium	mg/L	2.0	2.4 e	2.6	2.3	2.3	2.2
General							
Hardness	mg/L	33.0	91.0	66.0	59.0	56.0	63.0

Explanations of abbreviations are included on the final page of this table.

QAL073A (NCWIB)

2023
Mine Permit Groundwater Quality Monitoring Data
QAL074A (Septic & WWTP)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2023 01/31/23 ^T	Q2 2023 05/16/23 ^T	Q3 2023 07/25/23 ^T	Q4 2023 10/30/23 ^T
Field						
D.O. ¹	ppm	--	10.0	10.0	11.0	11.0
ORP	mV	--	1.0	208	174	71
pH	SU	8.4-9.4	8.4	8.4	8.5	8.5
Specific Conductance	µS/cm @ 25°C	--	219	197	204	177
Temperature	°C	--	6.0	8.0	9.0	8.0
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	1403.13	1405.01	1406.73	1405.67
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80.0	--	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	<100
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20.0	--	30.8	--	--
Cobalt	ug/L	40.0	--	<10.0	--	--
Copper	ug/L	20.0	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	212	112 e	122	<100	<100
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32.0	--	<8.0	--	--
Manganese	ug/L	80.0	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.0	1.07	<0.50	<0.50 a	<0.50
Molybdenum	ug/L	40.0	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	<25.0
Selenium	ug/L	4.0	<1.0 e	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Zinc	ug/L	40.0	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	39.0	84.0	91.0	89.0	80.0
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	34.3	17.2	21.2	13.3
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.43	1.2 e	0.85 e	1.0	0.61
Sulfate	mg/L	8.0	5.0	4.7	5.2	4.1 e
Major Cations						
Calcium	mg/L	31.0	--	25.0	--	--
Magnesium	mg/L	5.9	--	5.0	--	--
Potassium	mg/L	2.0	--	1.2	--	--
Sodium	mg/L	3.5	15.2 e	12.4	15.3	11.2
General						
Hardness	mg/L	103	--	83.0	--	--

Explanations of abbreviations are included on the final page of this table.

QAL074A (Septic & WWTP)

2023
Mine Permit Groundwater Quality Monitoring Data
Supplemental Volatile Organic Compounds Monitoring Results
QAL061A (TDRSA-CWB) (Annual Only)
Eagle Mine

Parameter	Unit	Q2 2019 05/07/19 ^T	Q2 2020 05/07/20 ^T	Q2 2021 05/10/21 ^T	Q2 2022 06/08/22 ^T	Q2 2023 05/15/23 ^T
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Acetone	ug/L	<10	<10	<10	<10	<10
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide	ug/L	<5.0 e	<5.0	<5.0	<5.0	<5.0
Carbon Tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0 e	<1.0	<1.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Acetate	ug/L	<5.0 e	<5.0 e	<5.0	<5.0	<25.0
Methyl tert-Butyl Ether	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methylcyclohexane	ug/L	<5.0	<5.0 e	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene (Total)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0

2023
Mine Permit Groundwater Quality Monitoring Data
Supplemental Volatile Organic Compounds Monitoring Results
QAL062A (TDRSA-CWB) (Annual Only)
Eagle Mine

Parameter	Unit	Q2 2019 05/07/19 ^T	Q2 2020 05/07/20 ^T	Q2 2021 05/11/21 ^T	Q2 2022 06/08/22 ^T	Q2 2023 05/15/23 ^T
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Acetone	ug/L	<10	<10	<10	<10	<10
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide	ug/L	<5.0 e	<5.0	<5.0	<5.0	<5.0
Carbon Tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0 e	<1.0	<1.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Acetate	ug/L	<5.0 e	<5.0 e	<5.0	<5.0	<25.0
Methyl tert-Butyl Ether	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methylcyclohexane	ug/L	<5.0	<5.0 e	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene (Total)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0

2023
Mine Permit Groundwater Quality Monitoring Data
Supplemental Volatile Organic Compounds Monitoring Results
QAL067A (TDRSA-CWB) (Annual Only)
Eagle Mine

Parameter	Unit	Q2 2019 05/07/19 ^T	Q2 2020 05/07/20 ^T	Q2 2021 05/11/21 ^T	Q2 2022 06/08/22 ^T	Q2 2023 05/15/23 ^T
Volatile Organic Compounds						
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Acetone	ug/L	<10	<10	<10	<10	<10
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide	ug/L	<5.0 e	<5.0	<5.0	<5.0	<5.0
Carbon Tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0 e	<1.0	<1.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Acetate	ug/L	<5.0 e	<5.0 e	<5.0	<5.0	<25.0
Methyl tert-Butyl Ether	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Methylcyclohexane	ug/L	<5.0	<5.0 e	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0 e	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene (Total)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0

2023
Mine Permit Groundwater Quality Monitoring Data
Explanation of Abbreviations and Data Qualifiers
Eagle Mine

Abbreviation or Data Qualifier	Explanation
1	Many D.O. values are elevated due to well screen configuration and aquifer characteristics and the low-flow sampling method. Super-saturated DO values are rejected (see R data qualifier) as not being representative of true conditions.
a	Estimated value. Duplicate precision for this parameter exceeded quality control limit.
b	Estimated value. Sample received after EPA established hold time expired.
BP	Below pump. Maximum water elevation is shown.
CWB	Contact Water Basin
D	Sample for metal and major cation parameters was filtered and values are dissolved concentrations.
e	Estimated value. The laboratory statement of data qualifications indicates that a quality control limit for this parameter was exceeded.
f	Value should be considered an estimate because field stabilization was not achieved of at least one parameter.
i	Insufficient water for collection of field parameters and/or sample.
J	Estimated value. Reported concentration is between the method detection limit and reporting limit. Used for iron since some benchmarks are below current 100 ug/L RL.
NM	Not measured.
p	Pending. Some parameters/locations require additional baseline data to calculate a benchmark.
Q	Quarter.
R	Measured value was rejected based on quality control procedures.
RL	Laboratory reporting limit.
s	Potential false positive value. Compound present in blank sample.
t	Trending. Benchmarks are not proposed for baseline datasets that appear to be trending (using samples collected through Q4 2012) because the data do not represent a random distribution about the baseline mean. Trend analysis is recommended in place of benchmark screening for parameters that appear to be trending.
T	Sample was not filtered and all values are total concentrations.
TDRSA	Temporary Development Rock Storage Area
UMB	Underground Mine Boundary
	Value is equal to or above site-specific benchmark at a compliance monitoring location. An exceedance occurs if there are 2 consecutive sampling events with a value equal to or greater than the benchmark. Color also indicates compliance monitoring location when applied to column headers.

Appendix H

Eagle Mine Groundwater Monitoring Well Results Trend Analysis Summary & Trending Charts

**Mine Permit Groundwater Trend Analysis
Identified Trends for 2023**

Eagle Mine

Location	Classification	Parameter	Unit	# Samples	# NDs	Non-detects handling	# used in Runs Test	Min	Max	Mean	St. Dev.	# Above Mean	# Below Mean	# Equal Mean	# Runs	Critical Value	Sig Level	Trend?	Remarks
QAL023B	Compliance	Sodium	mg/L	23	0	No NDs	23	3.8	7.7	5.4	1.00	9	14	0	6	7	0.05	Y	Non-unique RL in data
QAL023B	Compliance	Sulfate	mg/L	23	0	No NDs	23	2.6	5.5	4.6	0.79	15	8	0	3	7	0.05	Y	
QAL024A	Compliance	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	26.0	58.6	39	8.07	11	12	0	8	8	0.05	Y*	
QAL024A	Compliance	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	0.28	3.9	1.4	1.10	7	16	0	5	6	0.05	Y*	Non-unique RL in data
QAL024A	Compliance	Sodium	mg/L	23	0	No NDs	23	11.8	53.7	26	12.00	8	15	0	7	7	0.05	Y*	Non-unique RL in data
QAL024A	Compliance	Sulfate	mg/L	23	0	No NDs	23	2.7	7.0	4.9	1.20	11	12	0	6	8	0.05	Y	Non-unique RL in data
QAL025B	Background	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	0.068	0.40	0.2	0.10	8	15	0	5	7	0.05	Y	
QAL025B	Background	Sodium	mg/L	23	0	No NDs	23	1.0	1.6	1.3	0.16	12	11	0	6	8	0.05	Y	Non-unique RL in data
QAL025D	Background	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	37.7	50.4	44	3.14	12	11	0	7	8	0.05	Y	
QAL025D	Background	Calcium	mg/L	13	0	No NDs	13	10.0	14.3	12	1.27	6	7	0	4	4	0.05	Y	Non-unique RL in data
QAL025D	Background	Chloride	mg/L	23	8	Included as RL	23	1.0	4.2	2.2	1.30	10	13	0	2	8	0.05	Y	
QAL025D	Background	Magnesium	mg/L	13	0	No NDs	13	2.4	3.3	2.7	0.25	6	7	0	4	4	0.05	Y	Non-unique RL in data
QAL025D	Background	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	0.087	0.16	0.1	0.02	8	15	0	6	7	0.05	Y	
QAL025D	Background	Sodium	mg/L	23	0	No NDs	23	2.5	3.8	3.1	0.34	13	10	0	6	8	0.05	Y	Non-unique RL in data
QAL026A	Background	Nitrogen, Nitrate	mg/L	16	0	No NDs	16	0.35	1.7	0.7	0.34	6	10	0	3	5	0.05	Y	Non-unique RL in data
QAL026D	Background	Chloride	mg/L	23	16	Included as RL	23	1.0	1.8	1.1	0.20	6	17	0	5	6	0.05	Y	
QAL026D	Background	pH	SU	25	0	No NDs	25	7.8	9.8	8.9	0.39	14	11	0	7	8	0.05	Y	
QAL026E	Background	Potassium	mg/L	12	0	No NDs	12	1.6	2.0	1.8	0.11	4	4	4	2	2	0.05	Y	
QAL026E	Background	Sulfate	mg/L	23	0	No NDs	23	6.7	8.2	7.7	0.31	9	14	0	7	7	0.05	Y	
QAL044B	Compliance	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	3.0	57.0	33	16.00	11	12	0	4	8	0.05	Y	
QAL044B	Compliance	Alkalinity, Carbonate	mg/L	23	11	Included as RL	23	2.0	22.2	5.5	5.87	6	17	0	4	6	0.05	Y	
QAL044B	Compliance	Magnesium	mg/L	12	2	Included as RL	12	0.79	3.5	1.9	0.85	5	7	0	3	3	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL044B	Compliance	pH	SU	24	0	No NDs	24	8.7	10.9	9.3	0.43	9	15	0	6	8	0.05	Y	
QAL044B	Compliance	Potassium	mg/L	12	3	Included as RL	12	0.50	1.8	1.0	0.48	7	5	0	2	3	0.05	Y	
QAL044B	Compliance	Sodium	mg/L	23	0	No NDs	23	2.2	3.7	2.7	0.40	10	13	0	5	8	0.05	Y	Non-unique RL in data
QAL060A	Compliance	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	29.6	74.0	50	9.52	11	12	0	6	8	0.05	Y*	
QAL060A	Compliance	Arsenic	ug/L	23	1	Included as RL	23	2.0	4.4	3.3	0.65	9	14	0	4	7	0.05	Y	
QAL060A	Compliance	Calcium	mg/L	14	0	No NDs	14	10.0	16.6	13	2.23	9	5	0	3	4	0.05	Y	Non-unique RL in data
QAL060A	Compliance	Chloride	mg/L	23	17	Included as RL	23	1.0	1.5	1.1	0.16	6	17	0	5	6	0.05	Y	
QAL060A	Compliance	Magnesium	mg/L	14	0	No NDs	14	2.4	3.7	3.0	0.45	8	6	0	3	4	0.05	Y	Non-unique RL in data
QAL060A	Compliance	Potassium	mg/L	14	0	No NDs	14	0.69	1.1	0.9	0.13	5	9	0	4	4	0.05	Y	
QAL060A	Compliance	Sulfate	mg/L	23	12	Included as RL	23	2.0	3.9	2.2	0.45	5	18	0	3	5	0.05	Y	
QAL061A	Compliance	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	47.4	120	72	22.58	8	15	0	4	7	0.05	Y*	
QAL061A	Compliance	Calcium	mg/L	14	0	No NDs	14	11.0	34.0	17	7.52	6	8	0	2	4	0.05	Y*	Non-unique RL in data
QAL061A	Compliance	Magnesium	mg/L	14	0	No NDs	14	1.9	6.3	3.0	1.40	6	8	0	2	4	0.05	Y*	Non-unique RL in data
QAL061A	Compliance	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	0.27	0.44	0.3	0.04	12	11	0	5	8	0.05	Y*	
QAL061A	Compliance	pH	SU	24	0	No NDs	24	8.1	8.9	8.6	0.19	14	10	0	8	8	0.05	Y	
QAL061A	Compliance	Potassium	mg/L	14	1	Included as RL	14	0.50	1.1	0.7	0.17	6	8	0	4	4	0.05	Y	
QAL062A	Compliance	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	159	290	212	43.50	9	14	0	4	7	0.05	Y*	
QAL062A	Compliance	Barium	ug/L	14	6	Included as RL	14	20.0	51.3	30	12.50	5	9	0	2	4	0.05	Y	
QAL062A	Compliance	Calcium	mg/L	14	0	No NDs	14	11.0	85.3	45	28.80	8	6	0	2	4	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	Chloride	mg/L	23	0	No NDs	23	26.7	78.8	62	11.90	12	11	0	5	8	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	Magnesium	mg/L	14	0	No NDs	14	2.0	17.8	9.1	6.19	8	6	0	2	4	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	0.61	2.1	1.3	0.46	9	14	0	6	7	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	Potassium	mg/L	14	0	No NDs	14	0.70	2.9	1.8	0.88	7	7	0	2	4	0.05	Y*	
QAL062A	Compliance	Sodium	mg/L	23	0	No NDs	23	20.5	36.6	28	3.87	13	10	0	3	8	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	Strontium	ug/L	14	6	Included as RL	14	50.0	123	75	28.98	6	8	0	2	4	0.05	Y	
QAL062A	Compliance	Sulfate	mg/L	23	0	No NDs	23	2.2	5.1	3.5	0.91	8	15	0	2	7	0.05	Y	Non-unique RL in data
QAL063A	Compliance	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	165	290	218	43.10	9	14	0	4	7	0.05	Y*	
QAL063A	Compliance	Barium	ug/L	14	8	Included as RL	14	20.0	56.8	32	15.20	5	9	0	2	4	0.05	Y	
QAL063A	Compliance	Calcium	mg/L	14	0	No NDs	14	11.0	86.0	45	32.60	7	7	0	2	4	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	Chloride	mg/L	23	0	No NDs	23	43.0	117	90	21.23	12	11	0	3	8	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	Magnesium	mg/L	14	0	No NDs	14	1.9	18.2	8.8	6.72	7	7	0	2	4	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	0.70	2.0	1.3	0.42	10	13	0	2	8	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	pH	SU	24	0	No NDs	24	6.9	7.8	7.5	0.18	12	7	5	4	6	0.05	Y*	
QAL063A	Compliance	Potassium	mg/L	14	0	No NDs	14	0.62	3.2	1.7	1.05	6	8	0	2	4	0.05	Y*	
QAL063A	Compliance	Sodium	mg/L	23	0	No NDs	23	9.5	53.9	36	14.50	14	9	0	2	7	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	Strontium	ug/L	14	7	Included as RL	14	50.0	127	77	31.92	6	8	0	2	4	0.05	Y	
QAL063A	Compliance	Sulfate	mg/L	23	0	No NDs	23	2.1	6.8	4.0	1.70	9	14	0	2	7	0.05	Y	Non-unique RL in data
QAL064D	Compliance	Chloride	mg/L	23	0	No NDs	23	1.6	3.1	2.4	0.38	12	11	0	7	8	0.05	Y	
QAL065D	Compliance	Arsenic	ug/L	23	0	No NDs	23	3.2	4.7	4.0	0.42	11	12	0	6	8	0.05	Y	
QAL065D	Compliance	Calcium	mg/L	13	0	No NDs	13	12.0	15.6	13	1.14	5	8	0	2	3	0.05	Y*	Non-unique RL in data
QAL065D	Compliance	Magnesium	mg/L	13	0	No NDs	13	4.1	4.8	4.5	0.21	7	6	0	4	4	0.05	Y	Non-unique RL in data
QAL066D	Compliance	Arsenic	ug/L	23	0	No NDs	23	7.0	11.2	9.2	1.05	12	11	0	7	8	0.05	Y	
QAL066D	Compliance	Calcium	mg/L	13	0	No NDs	13	10.0	54.0	18	11.40	3	10	0	2	3	0.05	Y	Non-unique RL in data
QAL066D	Compliance	Iron	ug/L	23	1	Included as RL	23	20.0	2,060	688	513.52	8	15	0	6	7	0.05	Y*	Non-unique RL in data (NDs included as RL)
QAL066D	Compliance	pH	SU	24	0	No NDs	24	8.2	9.1	8.8	0.25	12	12	0	7	8	0.05	Y*	
QAL066D	Compliance	Sodium	mg/L	23	0	No NDs	23	9.6	23.5	18	4.31	14	9	0	5	7	0.05	Y*	Non-unique RL in data

Mine Permit Groundwater Trend Analysis
Identified Trends for 2023
Eagle Mine

Location	Classification	Parameter	Unit	# Samples	# NDs	Non-detects handling	# used in Runs Test	Min	Max	Mean	St. Dev.	# Above Mean	# Below Mean	# Equal Mean	# Runs	Critical Value	Sig Level	Trend?	Remarks
QAL066D	Compliance	Strontium	ug/L	13	3	Included as RL	13	50.0	340	82	78.56	2	11	0	2	2	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL066D	Compliance	Vanadium	ug/L	23	7	Included as RL	23	1.0	3.5	1.6	0.73	7	16	0	6	6	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL067A	Compliance	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	56.0	110	78	16.19	11	12	0	3	8	0.05	Y*	
QAL067A	Compliance	Chloride	mg/L	23	0	No NDs	23	23.5	199	95	45.86	12	11	0	4	8	0.05	Y*	Non-unique RL in data
QAL067A	Compliance	Mercury	ng/L	23	0	No NDs	23	0.69	2.2	1.2	0.41	10	13	0	6	8	0.05	Y	
QAL067A	Compliance	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	0.24	2.3	1.4	0.62	15	8	0	6	7	0.05	Y*	Non-unique RL in data
QAL067A	Compliance	Potassium	mg/L	15	0	No NDs	15	0.75	9.2	2.9	2.40	4	11	0	3	3	0.05	Y	
QAL067A	Compliance	Sodium	mg/L	23	0	No NDs	23	23.9	132	61	23.86	11	12	0	4	8	0.05	Y*	Non-unique RL in data
QAL067A	Compliance	Sulfate	mg/L	23	0	No NDs	23	2.7	22.3	11	4.98	9	14	0	6	7	0.05	Y*	Non-unique RL in data
QAL068B	Background	Nitrogen, Nitrate	mg/L	23	1	Included as RL	23	0.050	0.072	0.06	0.01	12	11	0	8	8	0.05	Y	
QAL068B	Background	Sulfate	mg/L	23	5	Included as RL	23	2.0	2.5	2.2	0.15	11	12	0	8	8	0.05	Y	
QAL068D	Background	Arsenic	ug/L	23	0	No NDs	23	4.7	7.8	6.4	0.71	13	10	0	8	8	0.05	Y	
QAL068D	Background	pH	SU	24	0	No NDs	24	8.0	8.8	8.5	0.25	11	13	0	6	8	0.05	Y	
QAL068D	Background	Potassium	mg/L	13	0	No NDs	13	1.2	1.7	1.4	0.15	6	7	0	3	4	0.05	Y	
QAL068D	Background	Sodium	mg/L	23	0	No NDs	23	3.1	4.7	3.9	0.42	12	11	0	7	8	0.05	Y	Non-unique RL in data
QAL068D	Background	Sulfate	mg/L	23	0	No NDs	23	4.1	5.5	5.1	0.33	13	10	0	6	8	0.05	Y	
QAL069A	Background	Magnesium	mg/L	13	0	No NDs	13	5.4	24.0	14	5.93	5	8	0	3	3	0.05	Y	Non-unique RL in data
QAL069A	Background	Mercury	ng/L	23	6	Included as RL	23	0.50	10.8	1.9	2.35	7	16	0	6	6	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL069A	Background	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	0.21	1.3	0.7	0.28	13	10	0	5	8	0.05	Y	Non-unique RL in data
QAL069A	Background	Sodium	mg/L	23	0	No NDs	23	2.3	70.2	25	19.00	7	16	0	4	6	0.05	Y	Non-unique RL in data
QAL069A	Background	Sulfate	mg/L	23	1	Included as RL	23	2.0	10.2	7.0	2.20	13	10	0	6	8	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL070A	Compliance	Alkalinity, Bicarbonate	mg/L	6	0	No NDs	6	63.0	110	87	17.95	3	3	0	2	2	0.1	Y*	
QAL070A	Compliance	Barium	ug/L	13	6	Included as RL	13	20.0	30.2	24	4.24	6	7	0	3	4	0.05	Y	
QAL070A	Compliance	Calcium	mg/L	13	0	No NDs	13	8.5	51.9	32	16.30	7	6	0	3	4	0.05	Y*	Non-unique RL in data
QAL070A	Compliance	Iron	ug/L	6	4	Included as RL	6	20.0	184	81	57.64	2	4	0	2	2	0.25	Y	Non-unique RL in data (NDs included as RL)
QAL070A	Compliance	Magnesium	mg/L	13	0	No NDs	13	2.1	9.9	6.3	2.90	8	5	0	3	3	0.05	Y*	Non-unique RL in data
QAL070A	Compliance	Mercury	ng/L	6	2	Included as RL	6	0.50	1.8	0.9	0.53	2	4	0	2	2	0.25	Y	
QAL070A	Compliance	Nitrogen, Nitrate	mg/L	6	0	No NDs	6	0.85	1.4	1.2	0.21	3	3	0	2	2	0.1	Y*	Non-unique RL in data
QAL070A	Compliance	Potassium	mg/L	13	0	No NDs	13	0.54	2.2	1.5	0.65	8	5	0	2	3	0.05	Y	
QAL070A	Compliance	Strontium	ug/L	13	5	Included as RL	13	50.0	92.2	66	15.40	7	6	0	3	4	0.05	Y	
QAL071A	Compliance	Barium	ug/L	14	5	Included as RL	14	20.0	39.0	26	7.59	5	9	0	3	4	0.05	Y	
QAL071A	Compliance	Calcium	mg/L	15	0	No NDs	15	11.0	94.9	52	28.40	9	6	0	4	4	0.05	Y*	Non-unique RL in data
QAL071A	Compliance	Chloride	mg/L	23	0	No NDs	23	5.9	25.1	15	5.60	10	13	0	6	8	0.05	Y*	Non-unique RL in data
QAL071A	Compliance	Copper	ug/L	23	4	Included as RL	23	5.0	28.6	11	6.03	10	13	0	5	8	0.05	Y	
QAL071A	Compliance	Magnesium	mg/L	15	0	No NDs	15	1.4	15.0	7.6	4.41	8	7	0	3	4	0.05	Y*	Non-unique RL in data
QAL071A	Compliance	Nitrogen, Nitrate	mg/L	23	0	No NDs	23	1.5	33.6	20	8.21	12	11	0	4	8	0.05	Y*	Non-unique RL in data
QAL071A	Compliance	pH	SU	24	0	No NDs	24	7.5	8.1	7.9	0.17	13	11	0	8	8	0.05	Y*	
QAL071A	Compliance	Potassium	mg/L	15	0	No NDs	15	0.70	1.8	1.3	0.43	9	6	0	4	4	0.05	Y	
QAL071A	Compliance	Sodium	mg/L	23	0	No NDs	23	8.7	19.9	14	2.81	12	11	0	8	8	0.05	Y*	Non-unique RL in data
QAL071A	Compliance	Strontium	ug/L	13	4	Included as RL	13	50.0	105	71	20.72	6	7	0	3	4	0.05	Y	
QAL071A	Compliance	Sulfate	mg/L	23	0	No NDs	23	5.8	12.6	8.2	1.89	9	14	0	7	7	0.05	Y	Non-unique RL in data
QAL073A	Compliance	Alkalinity, Bicarbonate	mg/L	6	0	No NDs	6	42.4	88.2	62	17.80	2	4	0	2	2	0.25	Y*	
QAL073A	Compliance	Calcium	mg/L	13	0	No NDs	13	5.6	34.0	23	9.02	7	6	0	3	4	0.05	Y*	Non-unique RL in data
QAL073A	Compliance	Magnesium	mg/L	13	0	No NDs	13	1.1	7.5	4.8	2.00	7	6	0	3	4	0.05	Y*	Non-unique RL in data
QAL073A	Compliance	Nitrogen, Nitrate	mg/L	6	0	No NDs	6	0.50	1.2	0.8	0.28	3	3	0	2	2	0.1	Y	Non-unique RL in data
QAL073A	Compliance	pH	SU	6	0	No NDs	6	6.5	7.1	6.8	0.25	3	3	0	2	2	0.1	Y*	
QAL073A	Compliance	Sodium	mg/L	6	0	No NDs	6	2.2	2.6	2.4	0.15	3	3	0	2	2	0.1	Y*	Non-unique RL in data
QAL073A	Compliance	Sulfate	mg/L	6	1	Included as RL	6	2.0	9.0	5.8	2.50	3	3	0	2	2	0.1	Y	
QAL074A	Compliance	Alkalinity, Bicarbonate	mg/L	23	0	No NDs	23	66.7	110	91	12.34	14	9	0	5	7	0.05	Y*	
QAL074A	Compliance	Calcium	mg/L	12	0	No NDs	12	9.1	43.3	28	10.90	7	5	0	3	3	0.05	Y	Non-unique RL in data
QAL074A	Compliance	Chloride	mg/L	23	0	No NDs	23	13.3	66.4	45	14.60	12	11	0	8	8	0.05	Y*	Non-unique RL in data
QAL074A	Compliance	Magnesium	mg/L	12	0	No NDs	12	1.7	8.3	5.6	2.20	7	5	0	3	3	0.05	Y	Non-unique RL in data
QAL074A	Compliance	pH	SU	24	0	No NDs	24	7.7	8.7	8.3	0.19	13	11	0	3	8	0.05	Y*	
QAL074A	Compliance	Potassium	mg/L	12	0	No NDs	12	0.59	1.7	1.2	0.38	7	5	0	2	3	0.05	Y	
QAL074A	Compliance	Sodium	mg/L	23	0	No NDs	23	11.2	27.8	22	5.01	14	9	0	3	7	0.05	Y*	Non-unique RL in data
QAL074A	Compliance	Sulfate	mg/L	23	0	No NDs	23	4.1	8.5	7.0	1.20	18	5	0	4	5	0.05	Y	Non-unique RL in data

Mine Permit Groundwater Trend Analysis
Notes and Abbreviations Used in Statistical Summary Tables
Eagle Mine

Abbreviation	Explanation
N	Null Hypothesis that the sequence was produced in a random manner cannot be rejected at the indicated significance level (i.e. a trend in data not indicated).
Y	Null Hypothesis that the sequence was produced in a random manner cannot be accepted at the indicated significance level (i.e. a trend in data cannot be ruled out).
Y*	In addition to a trend being identified, the parameter exceeded the limit at least two times in a row.
ND	Non detect (reported concentration was below the analytical reporting limit).
RL	Reporting limit.
TF	Too few observations to run the test.
TFA	Too few observations remaining after exclusion of values=mean.
TFPN	Too few + or - values in the logic series (n1 or n2 = 1).

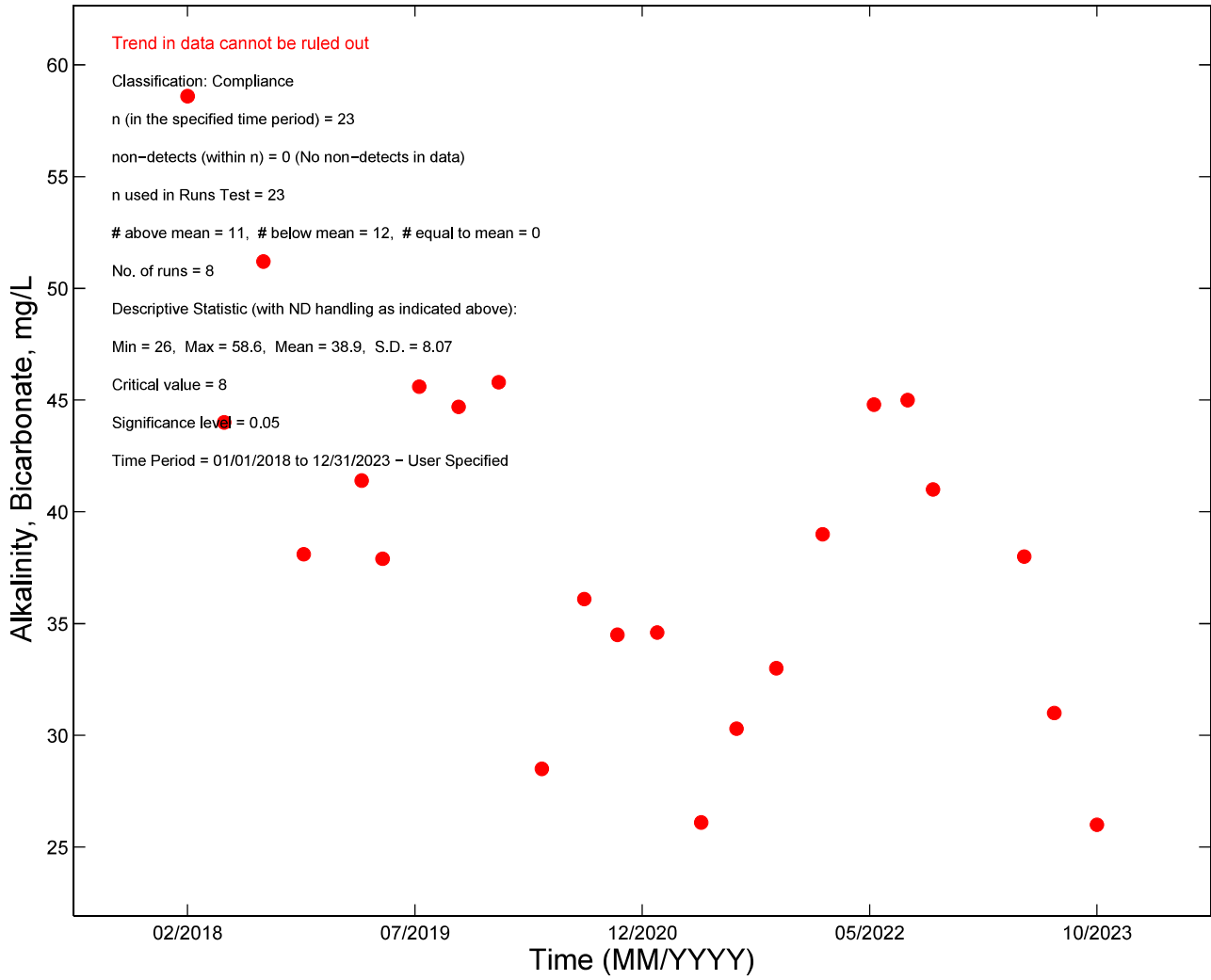
Notes:

Trend analysis period is baseline (March 2011) through Q4 2022 for parameters sampled annually and Q1 2018 through Q4 2023 for parameters sampled quarterly.

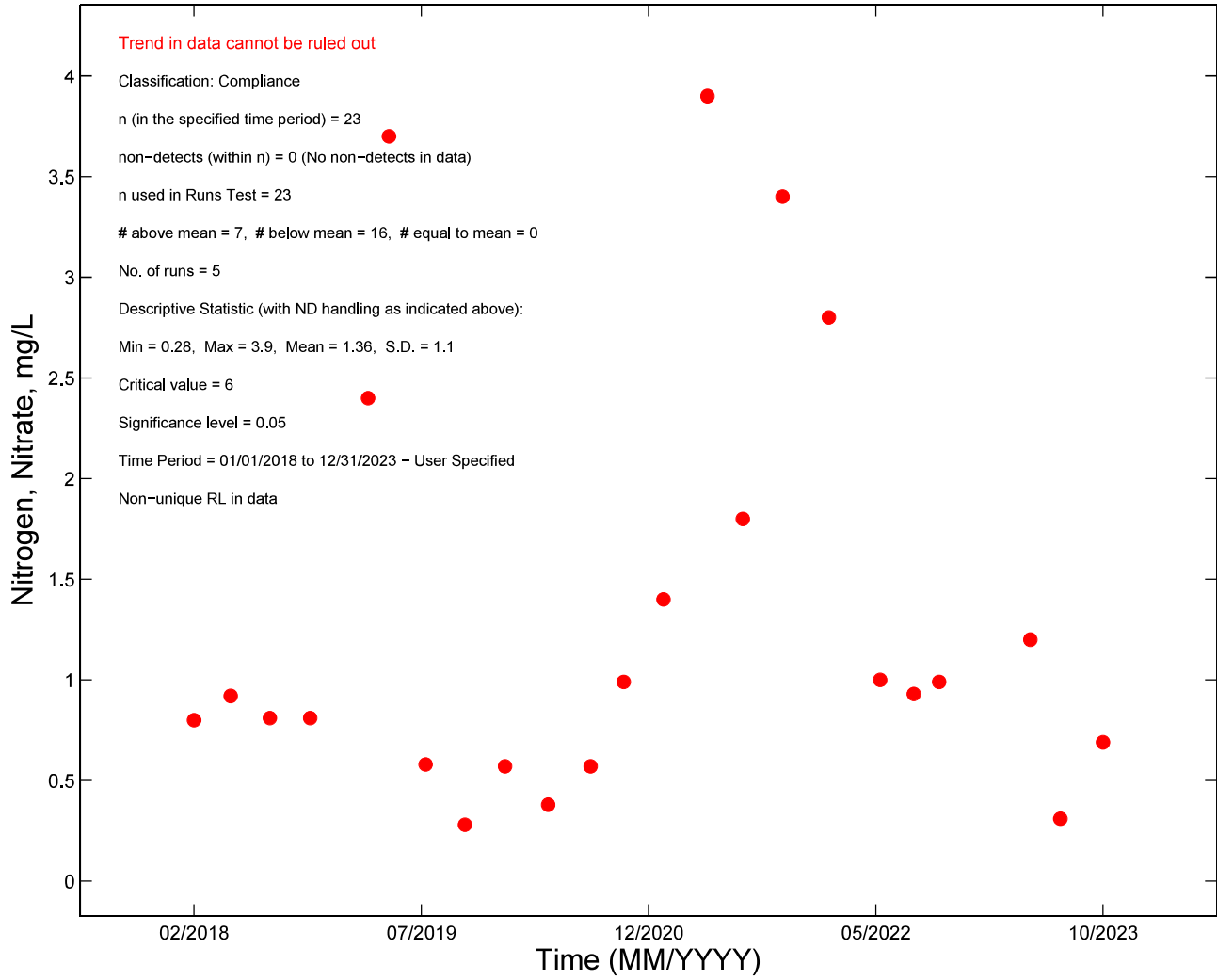
Charts are included for compliance locations with trends that also had two exceedances in a row in 2023.

Trends rejected if they appear to be an artifact of non-detect values and/or inconsistent RLs.

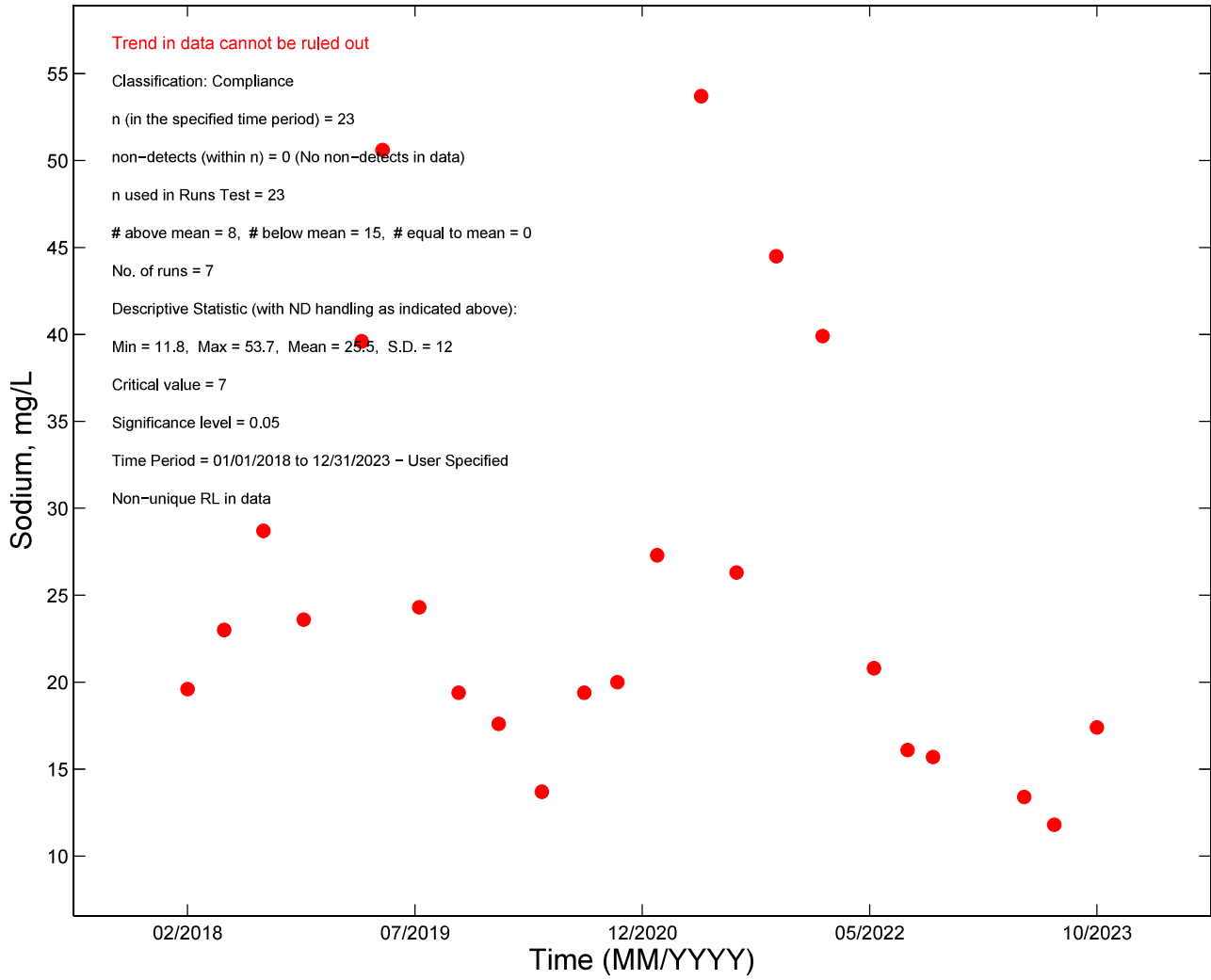
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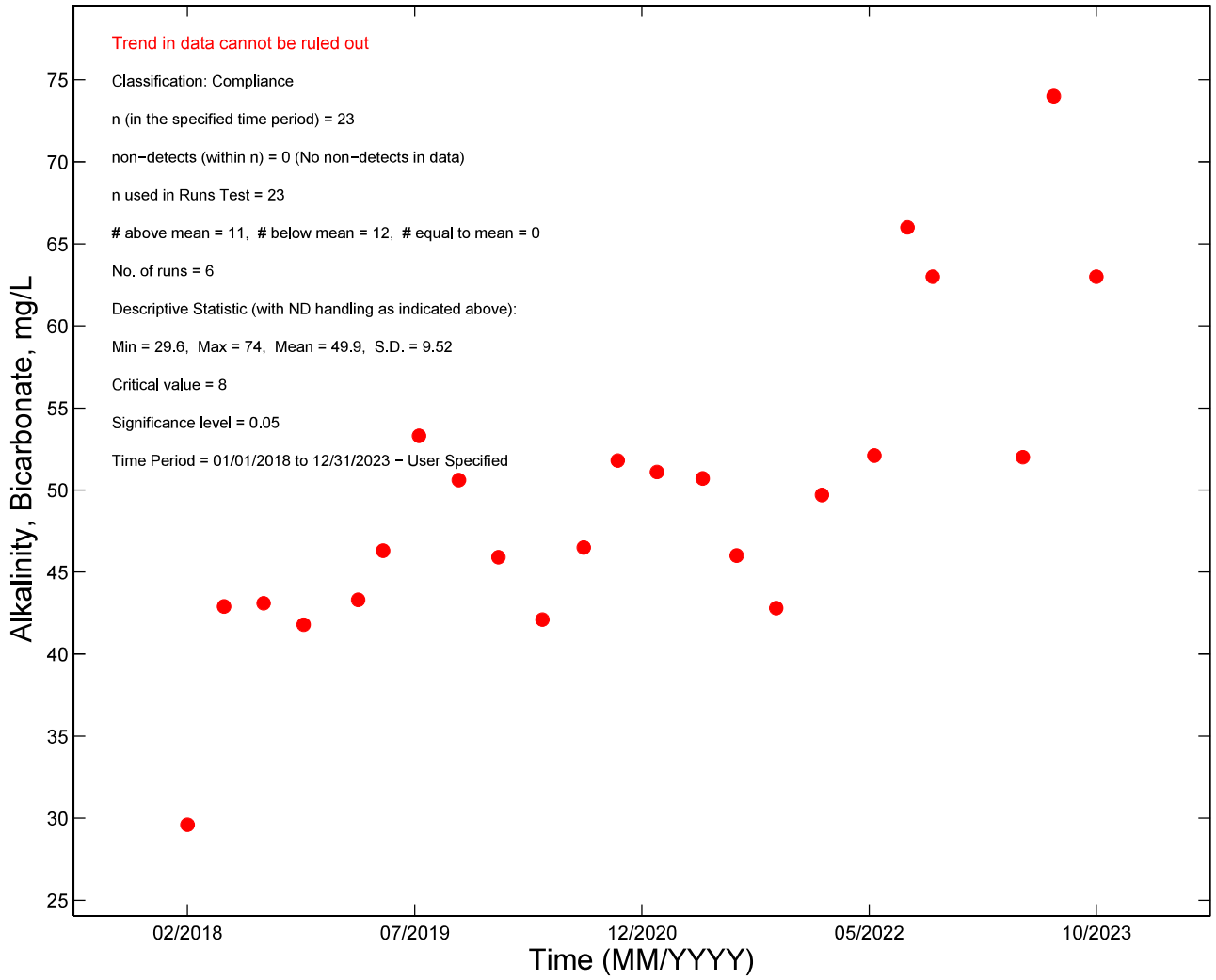
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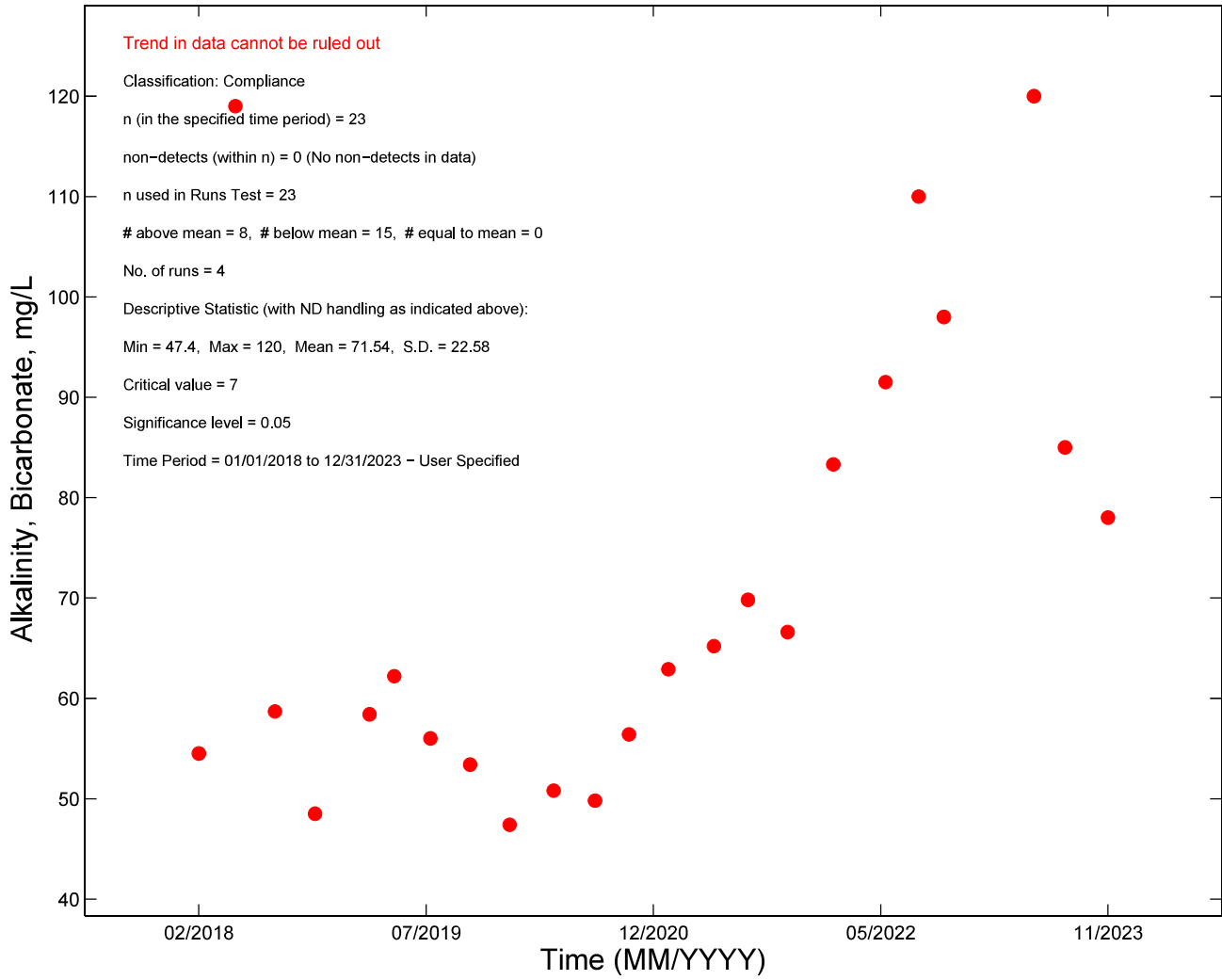
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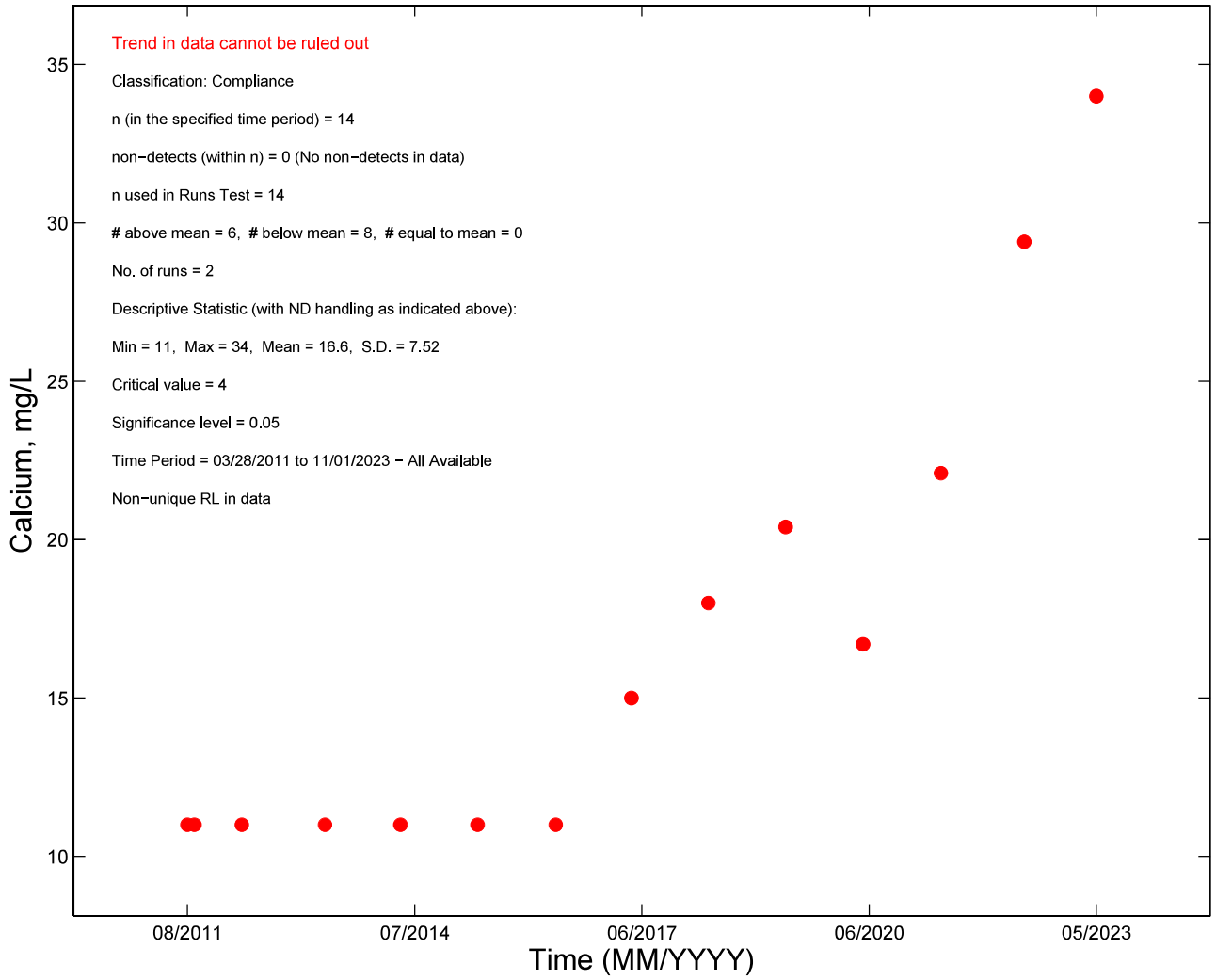
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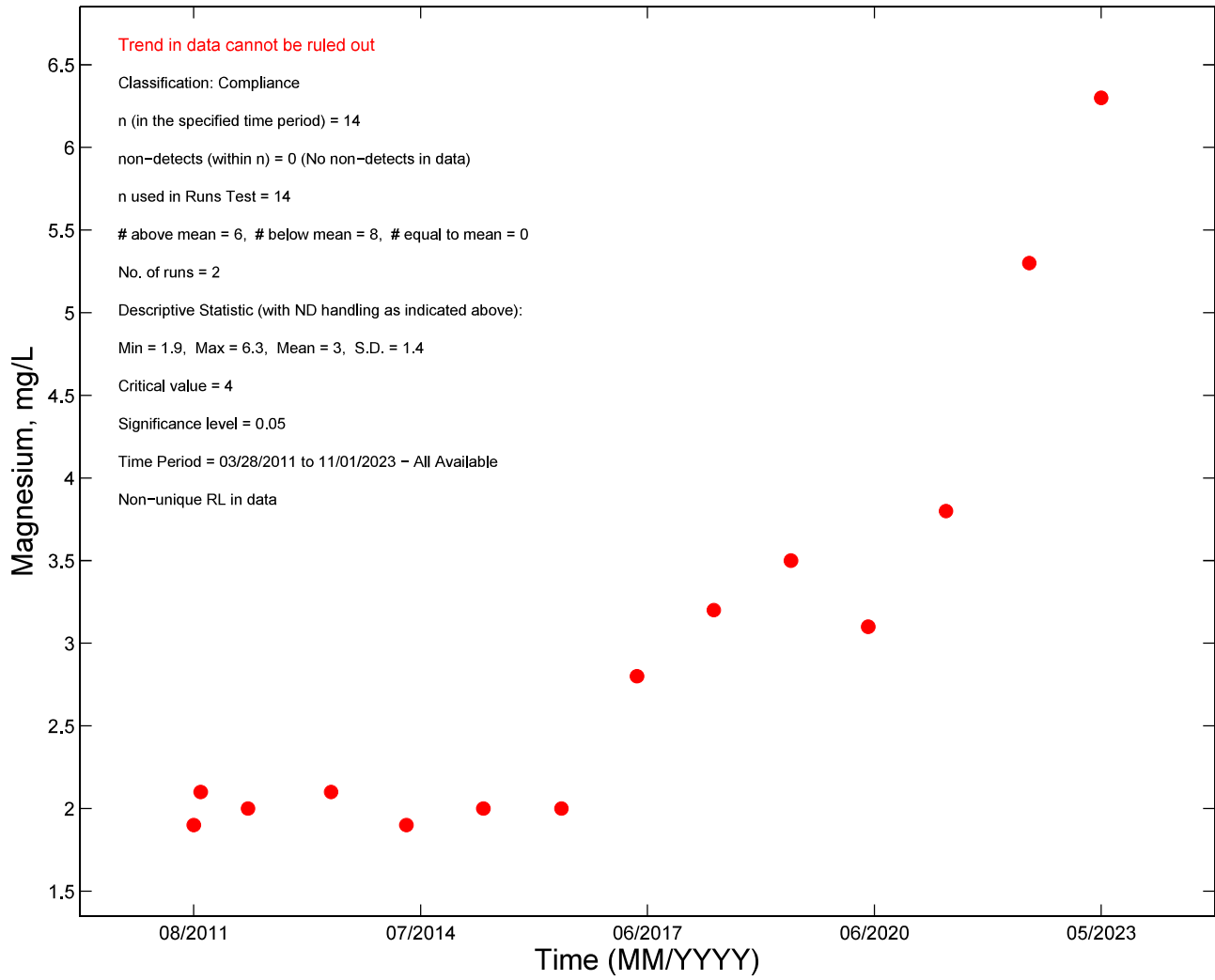
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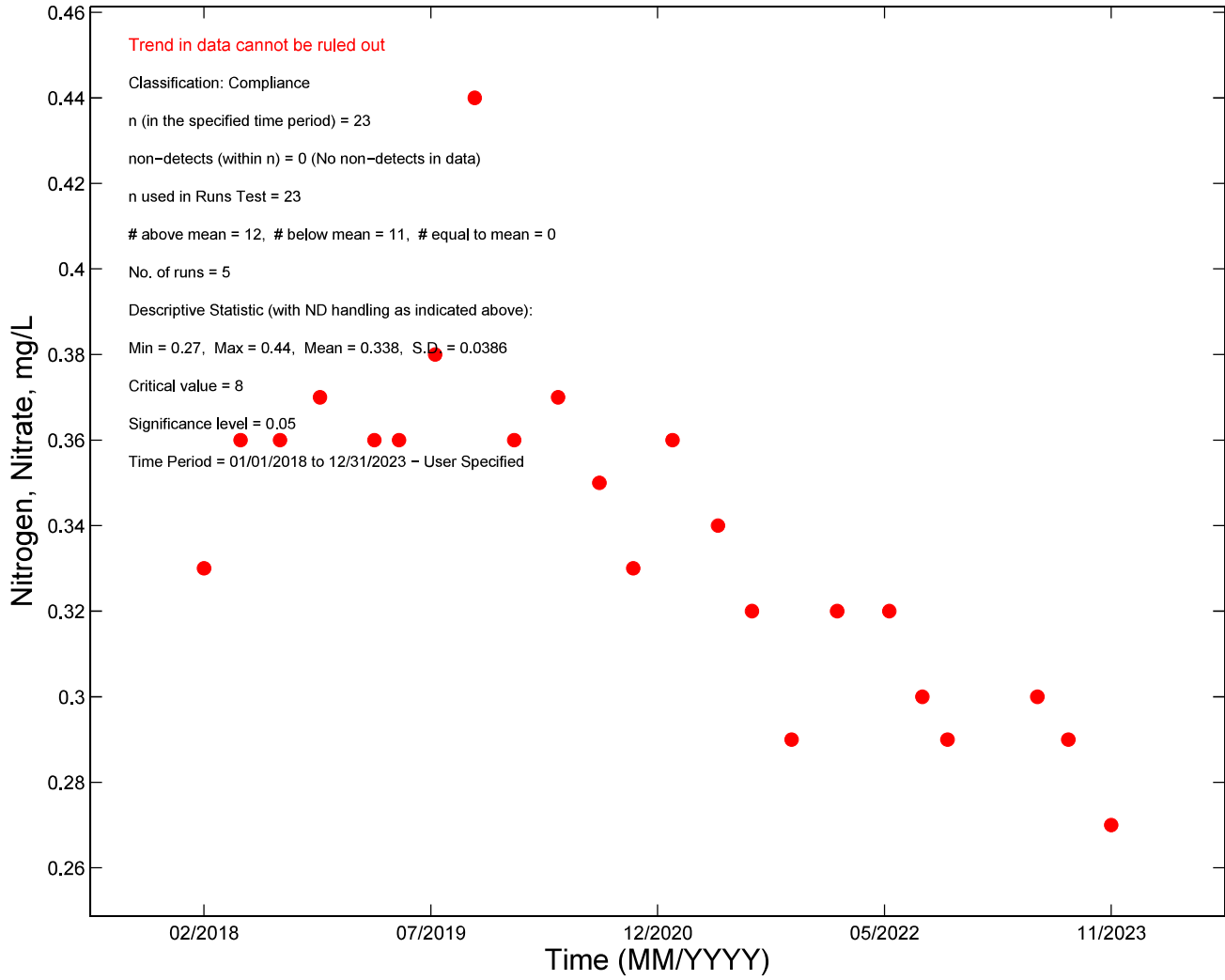
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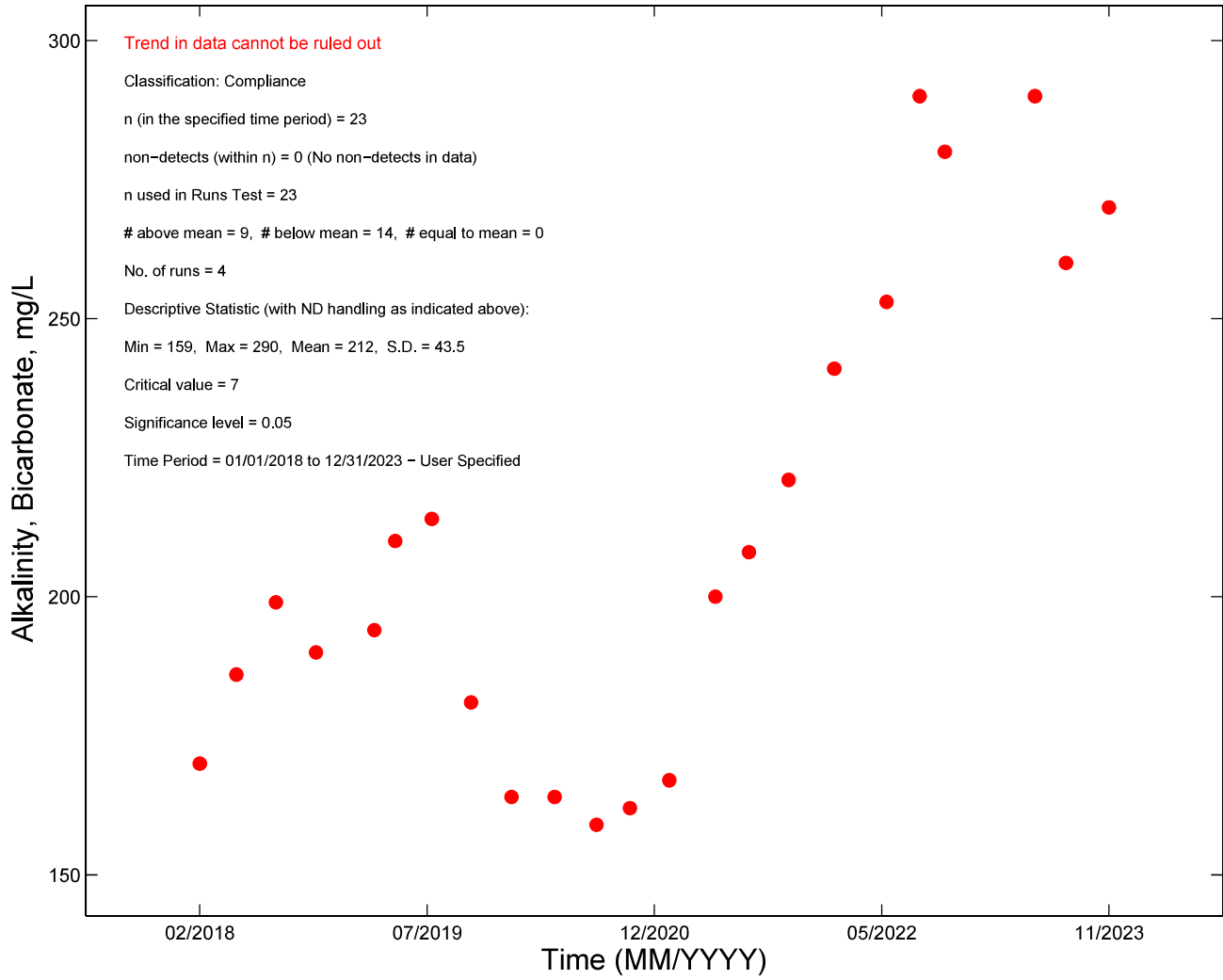
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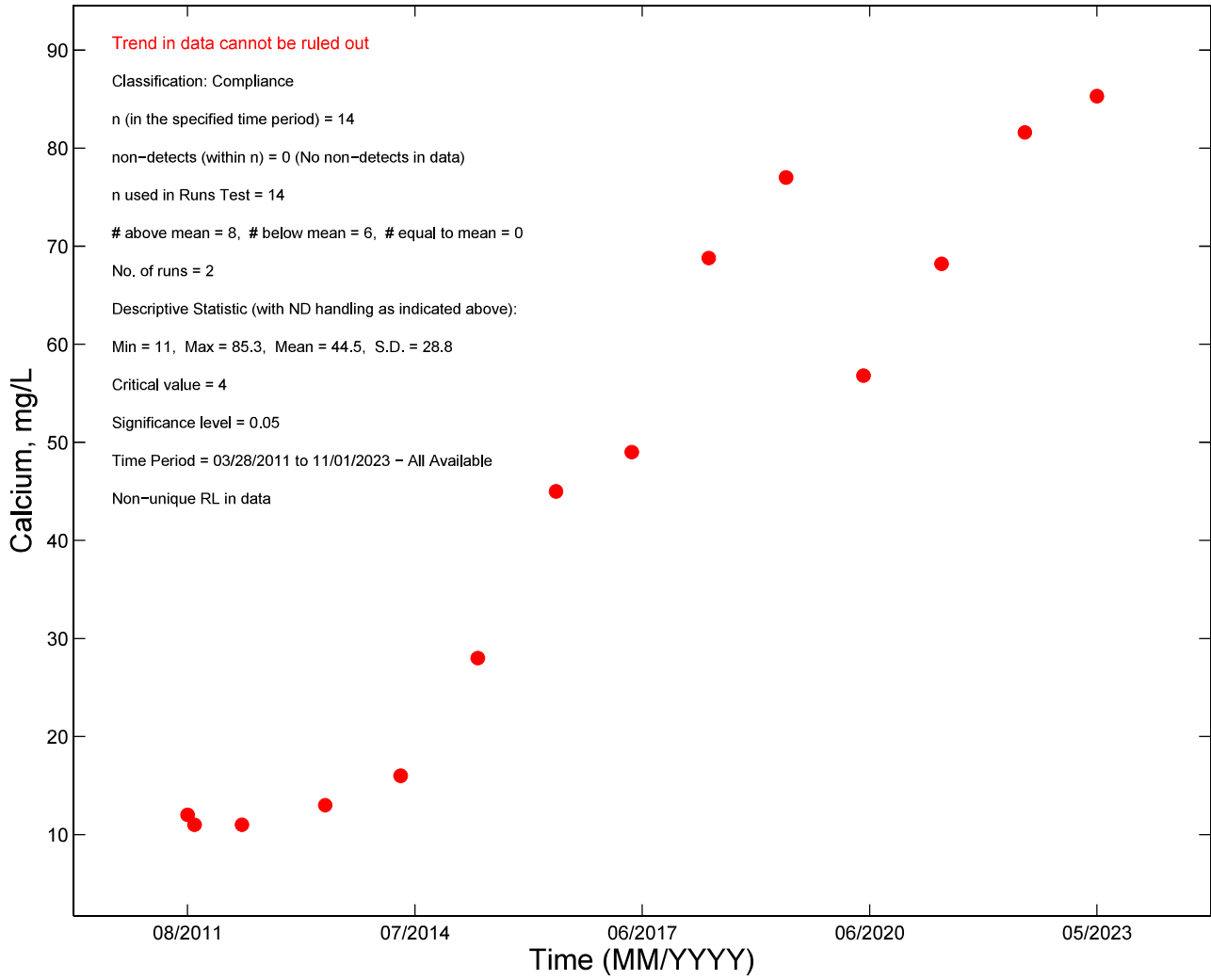
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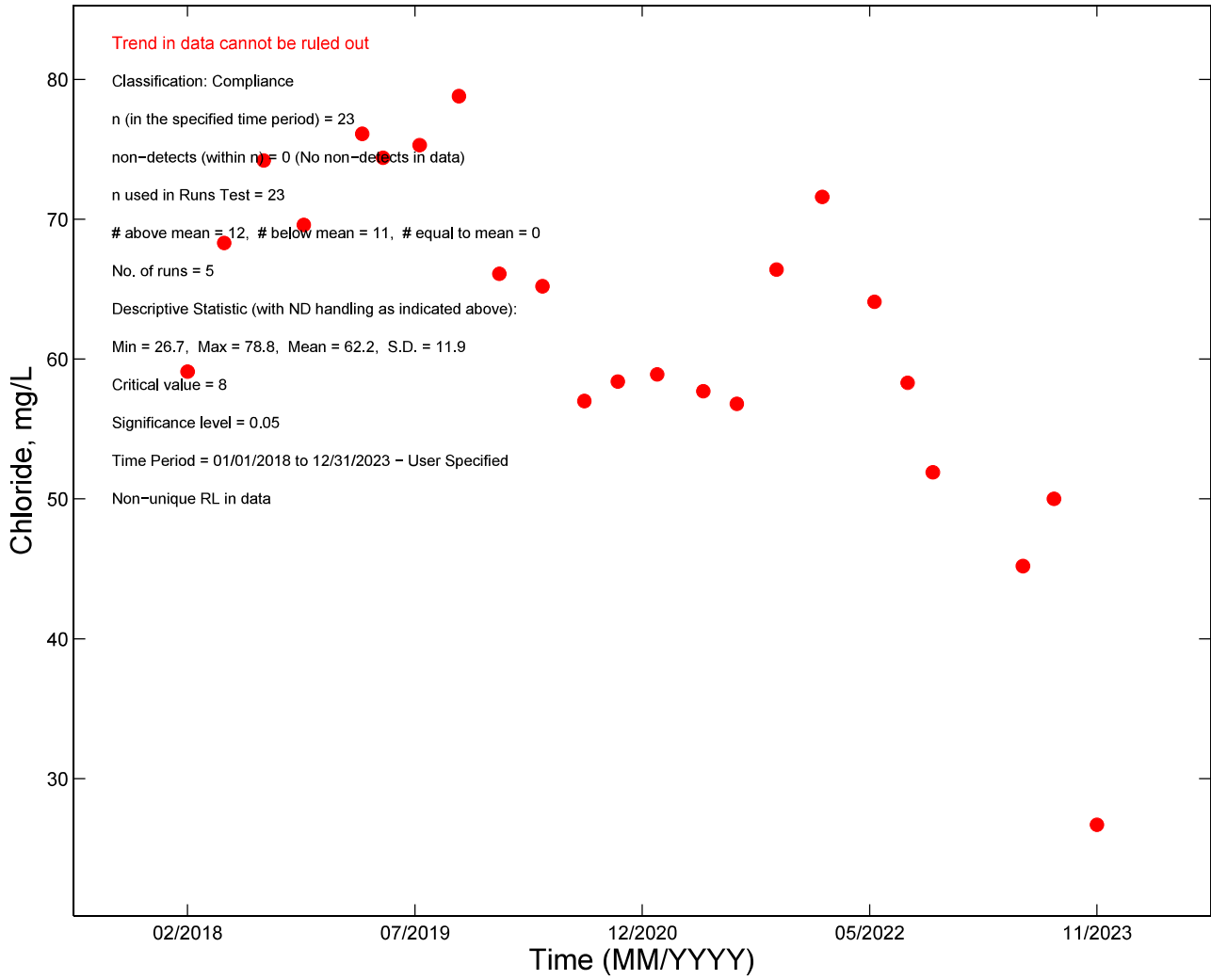
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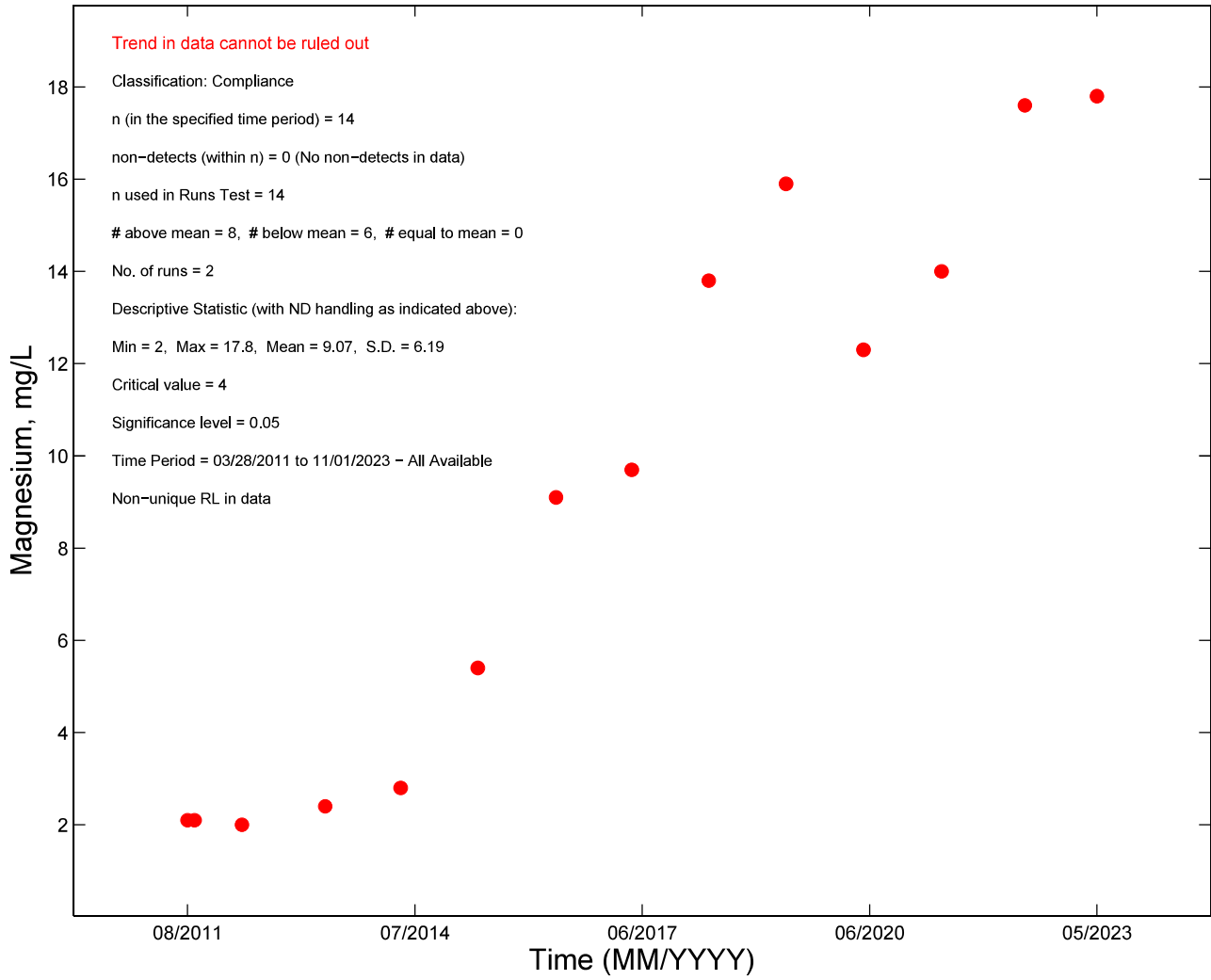
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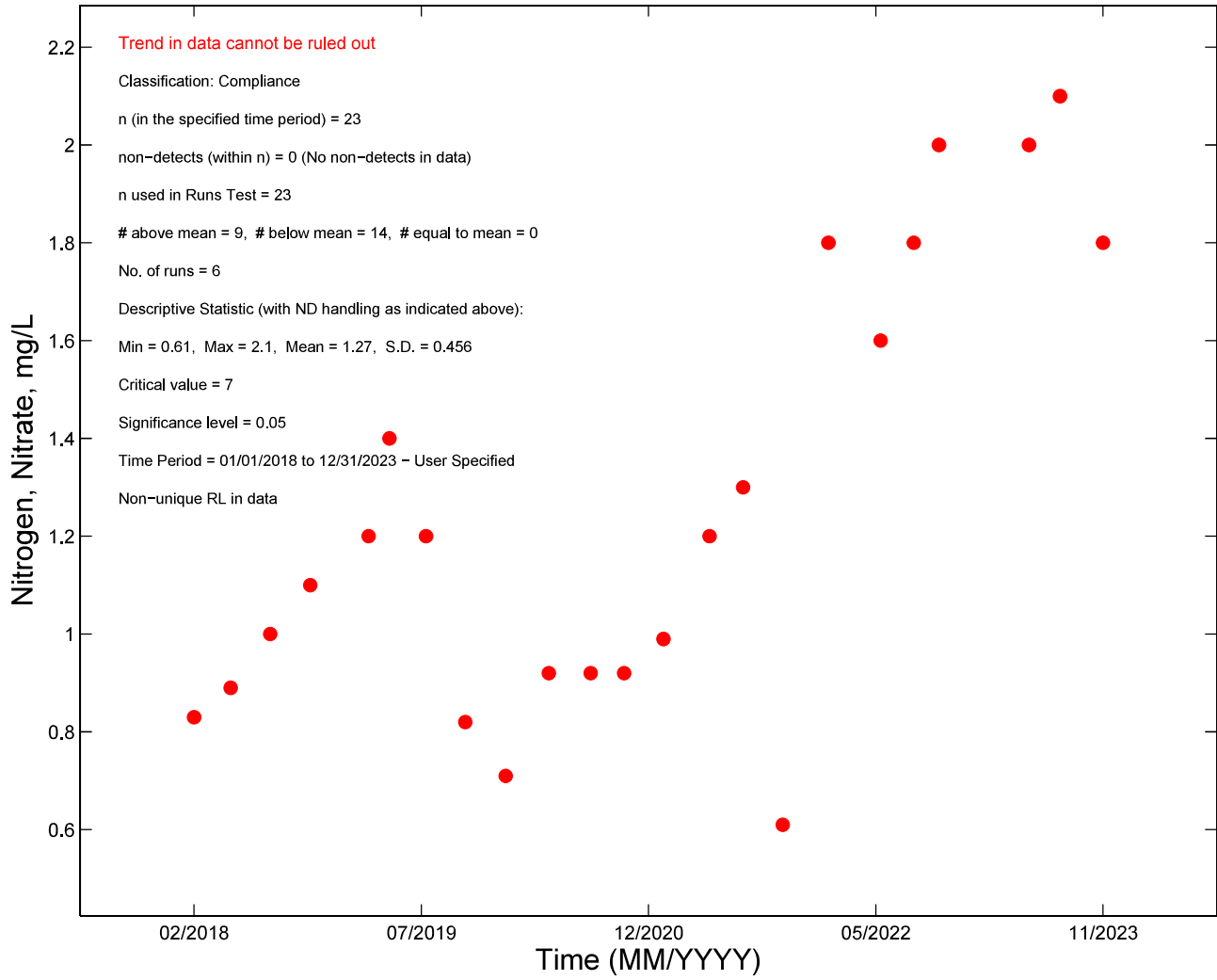
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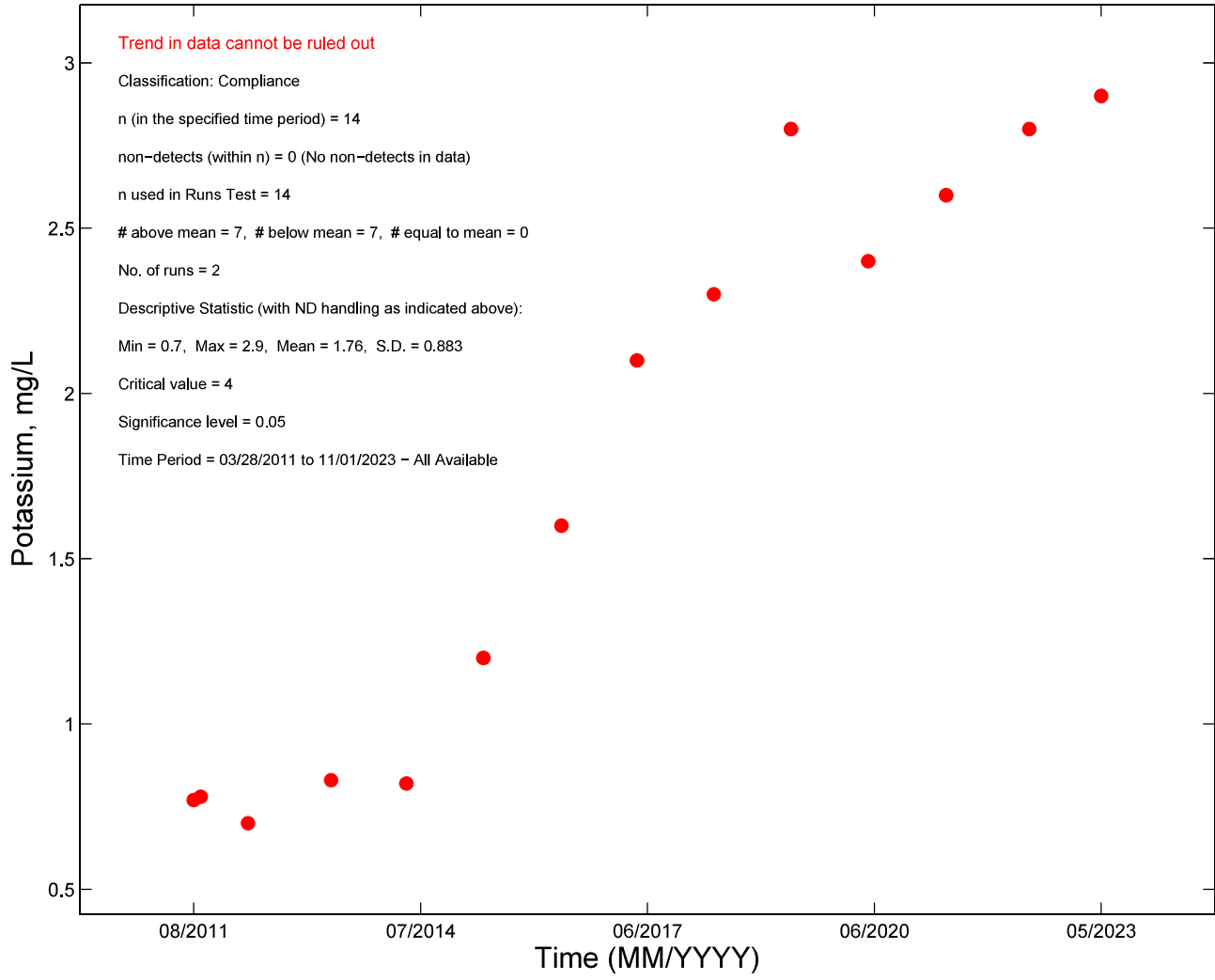
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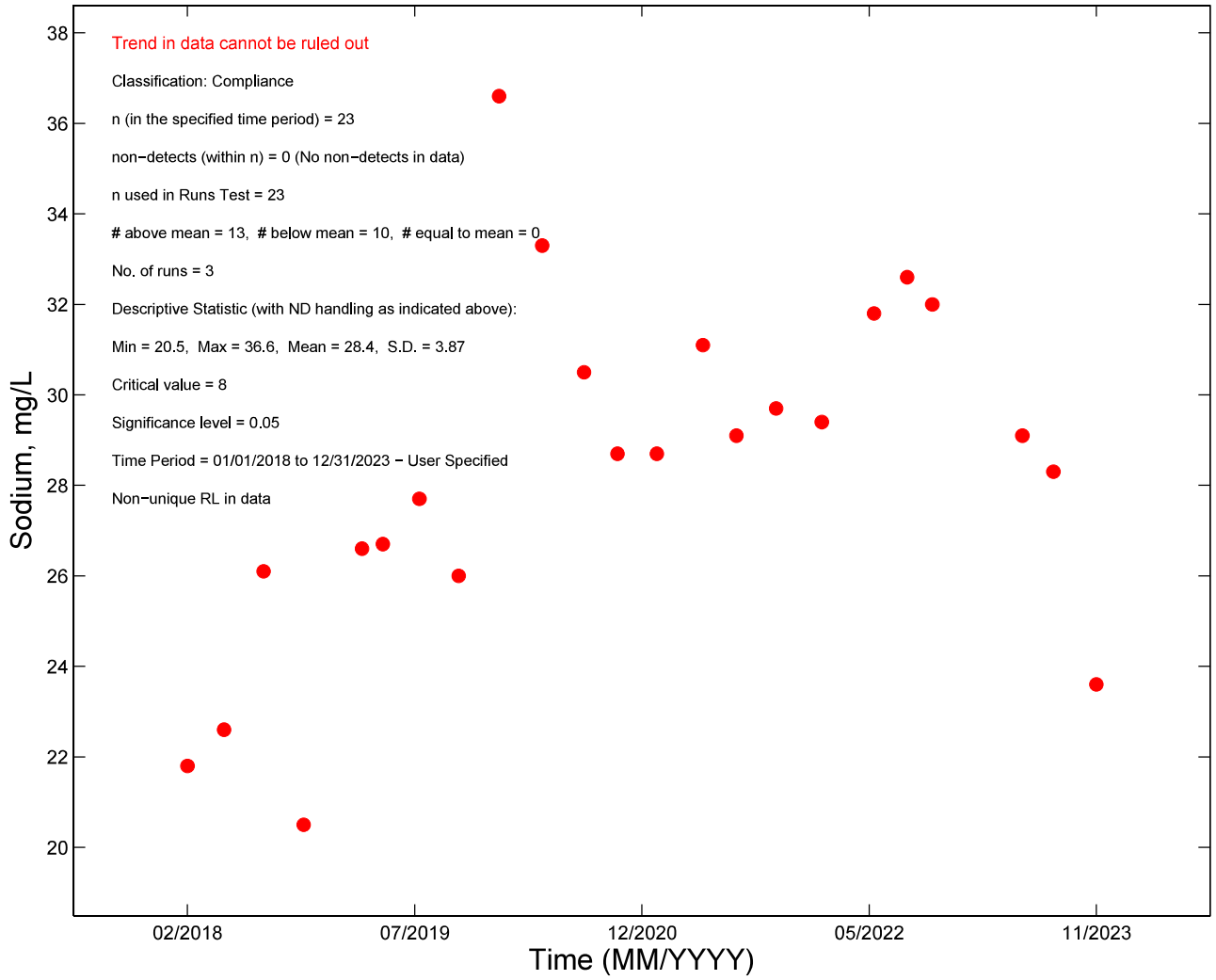
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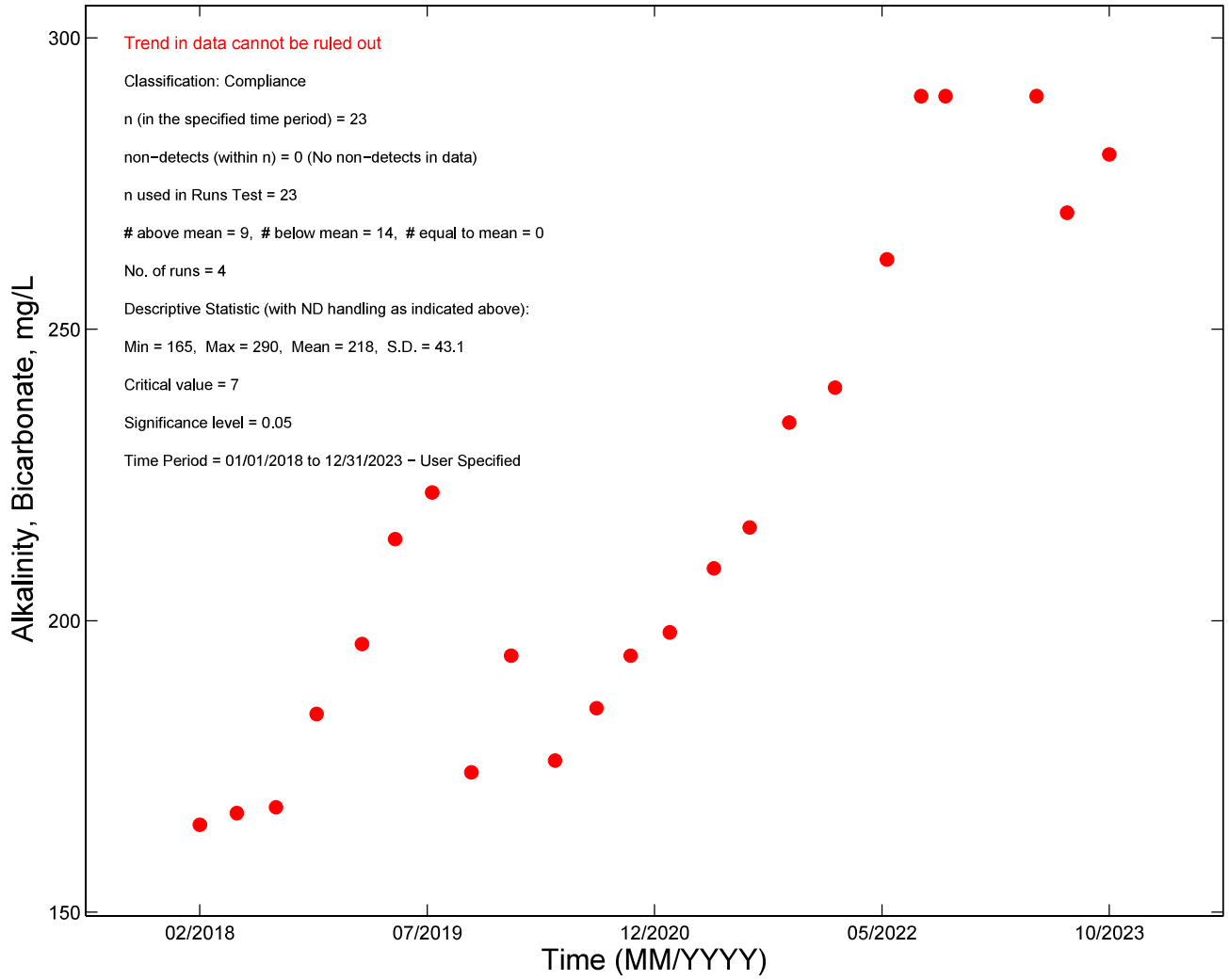
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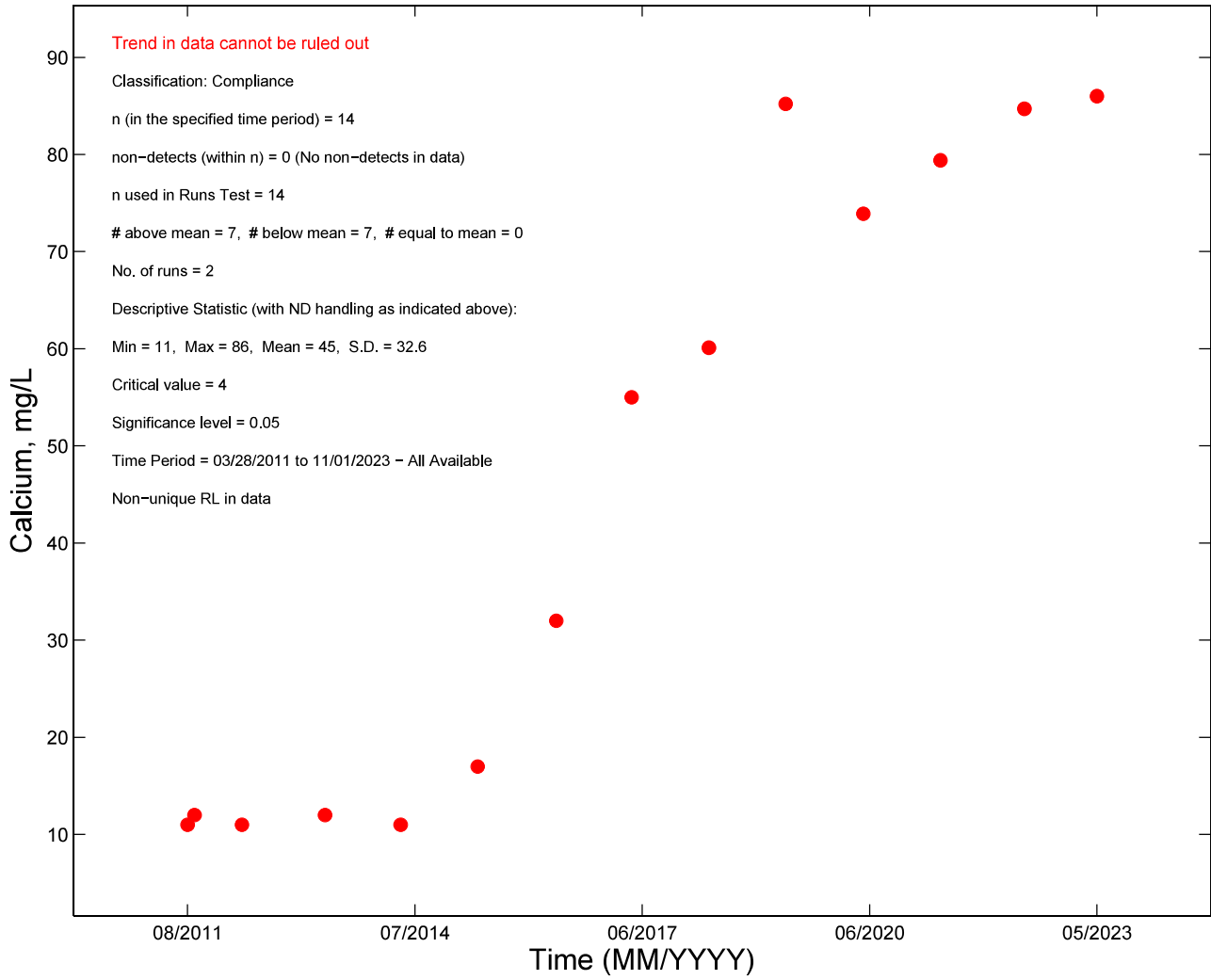
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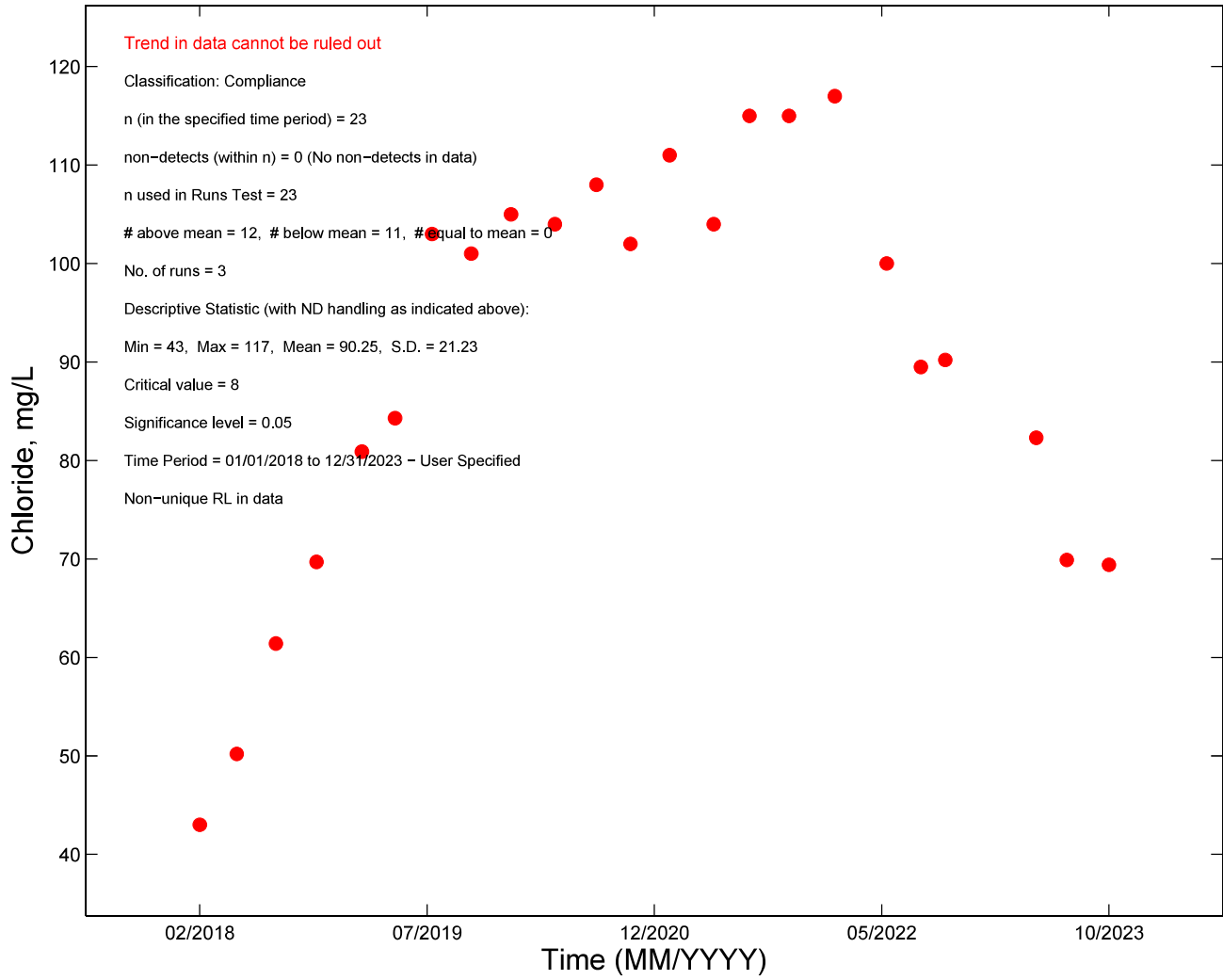
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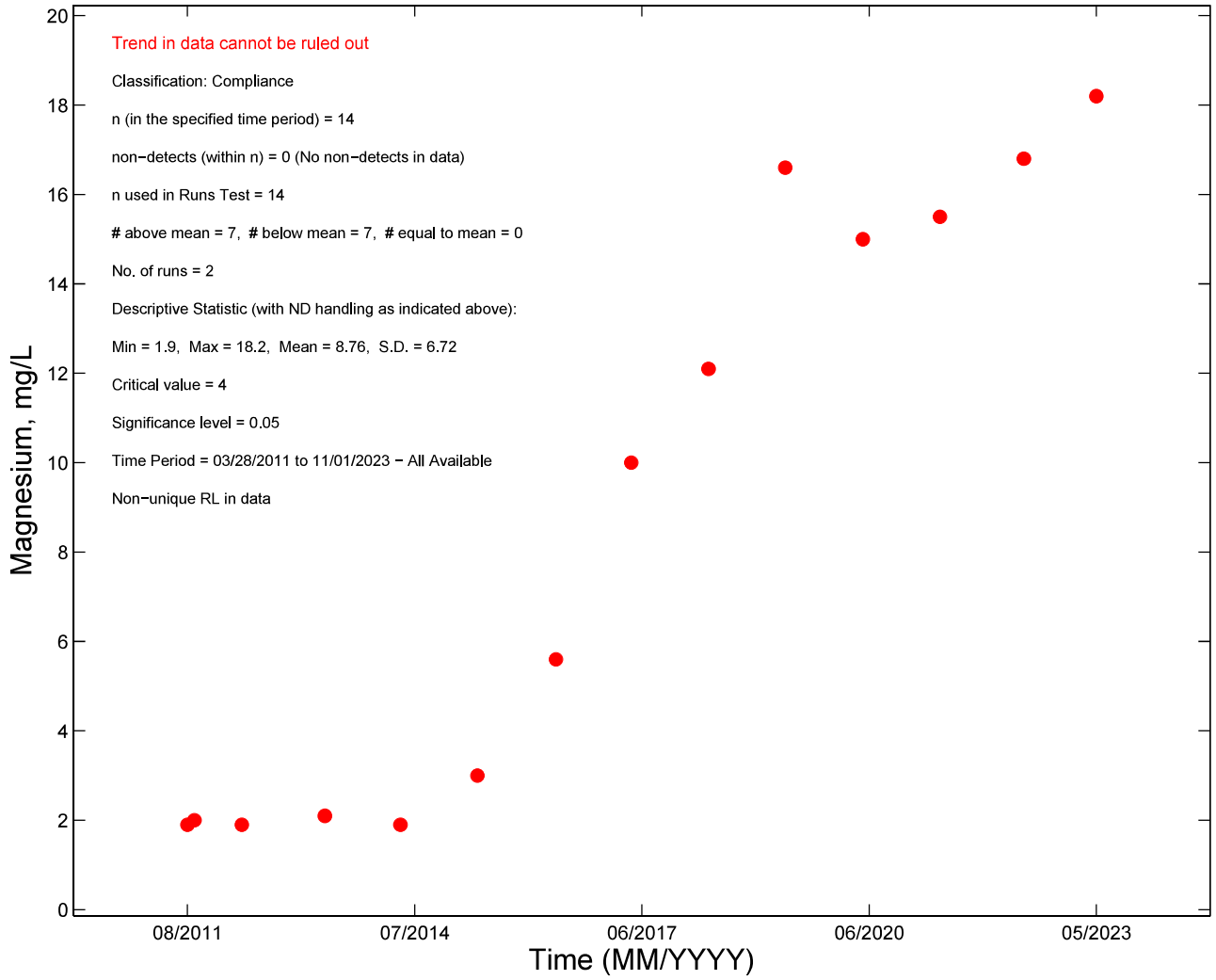
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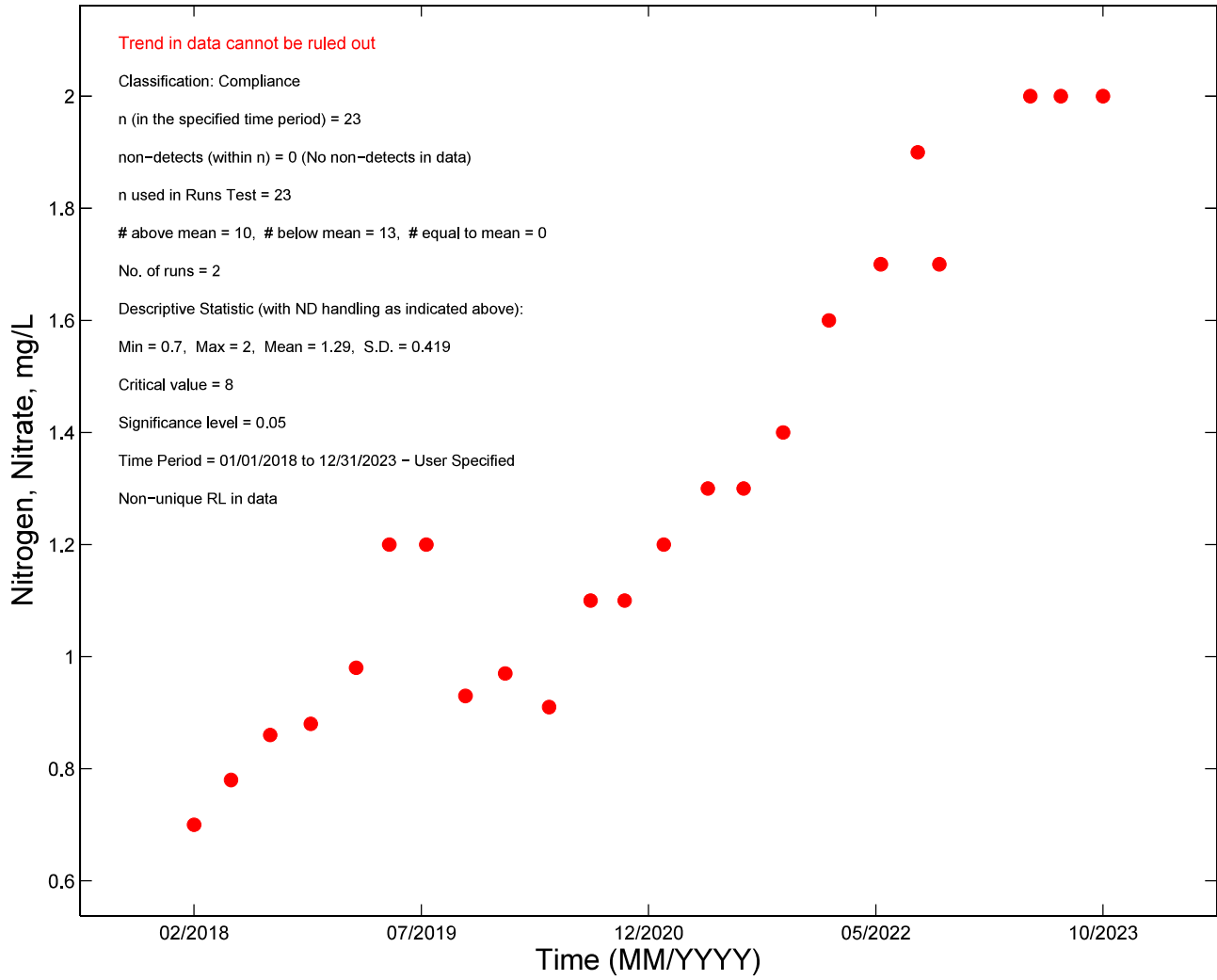
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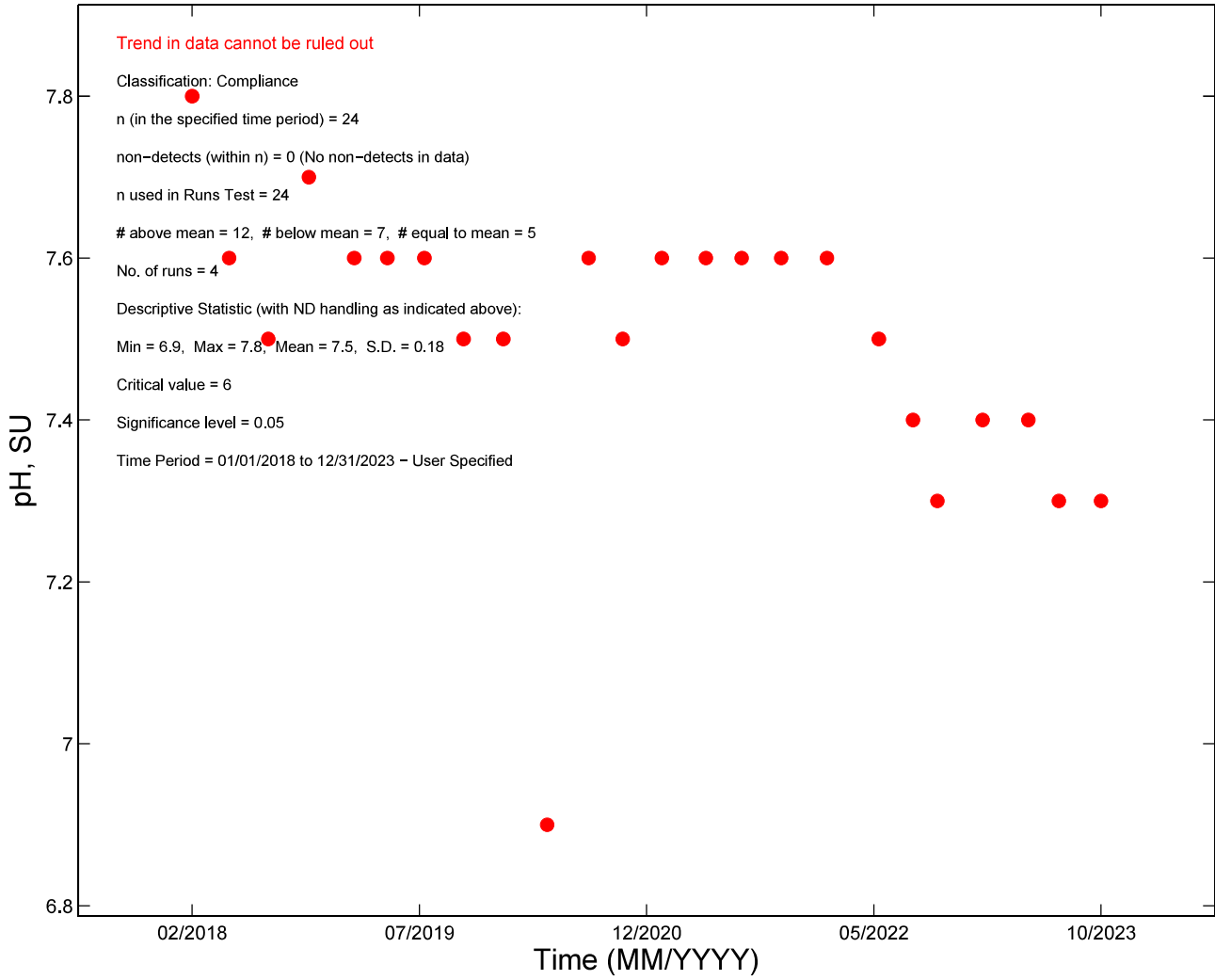
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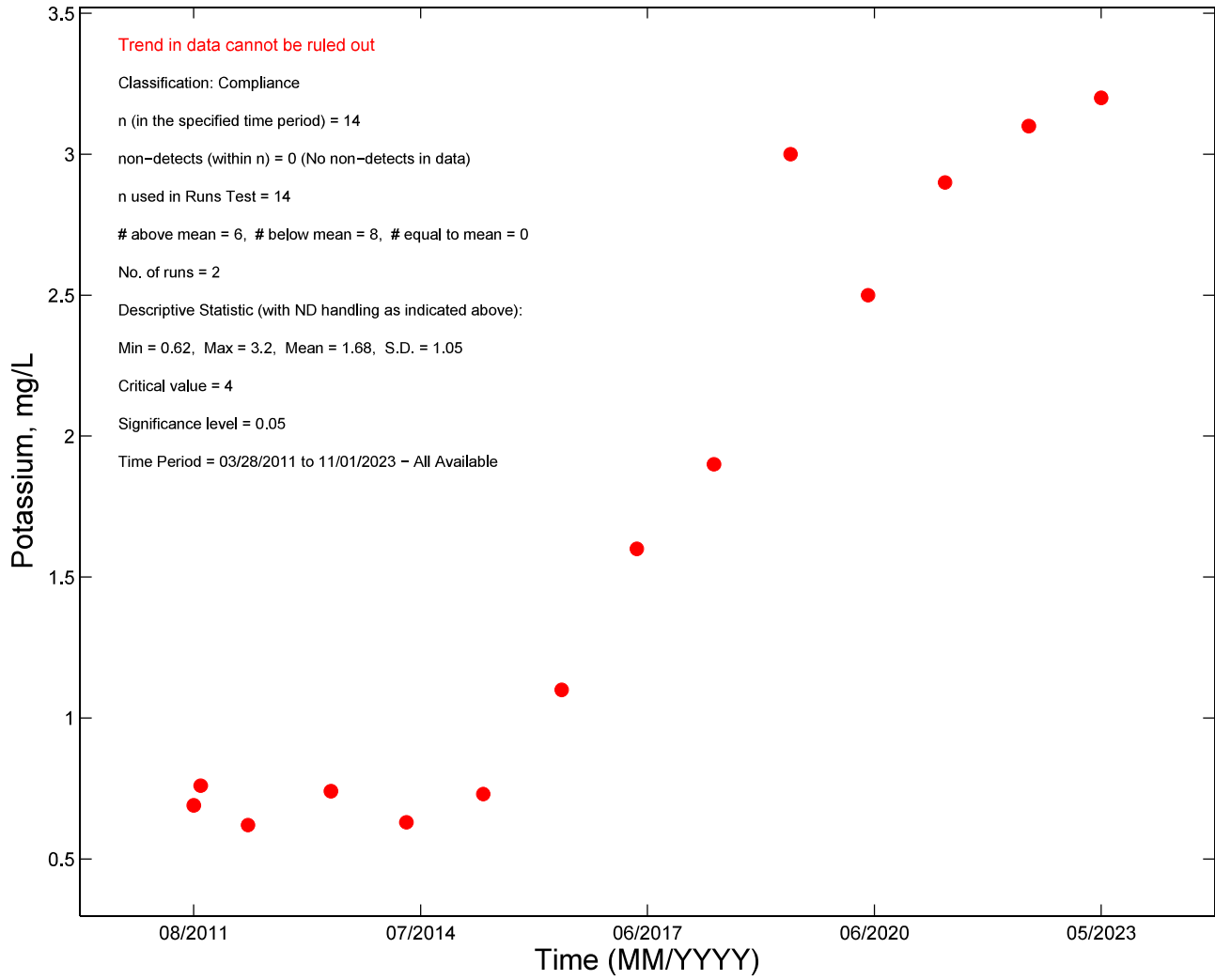
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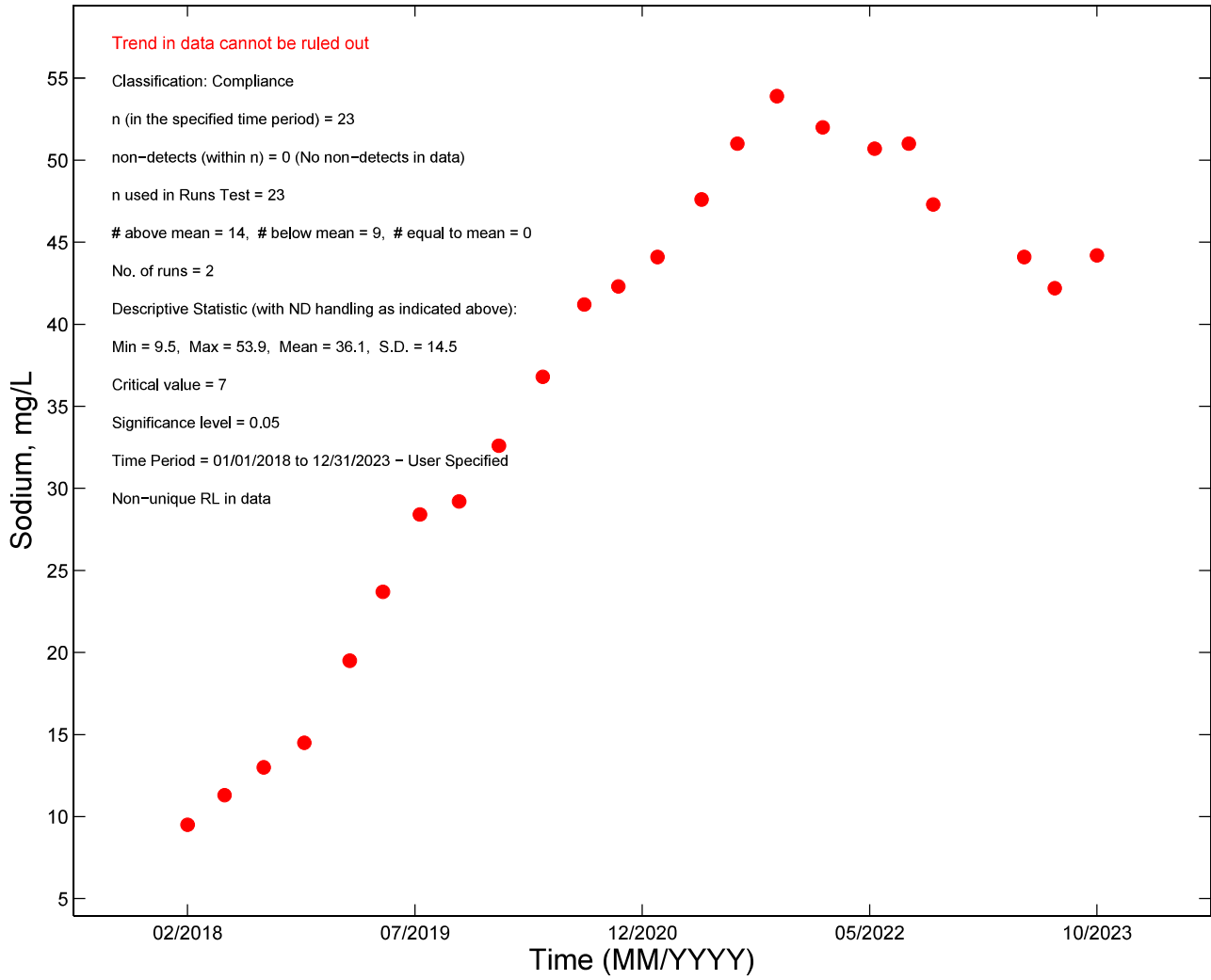
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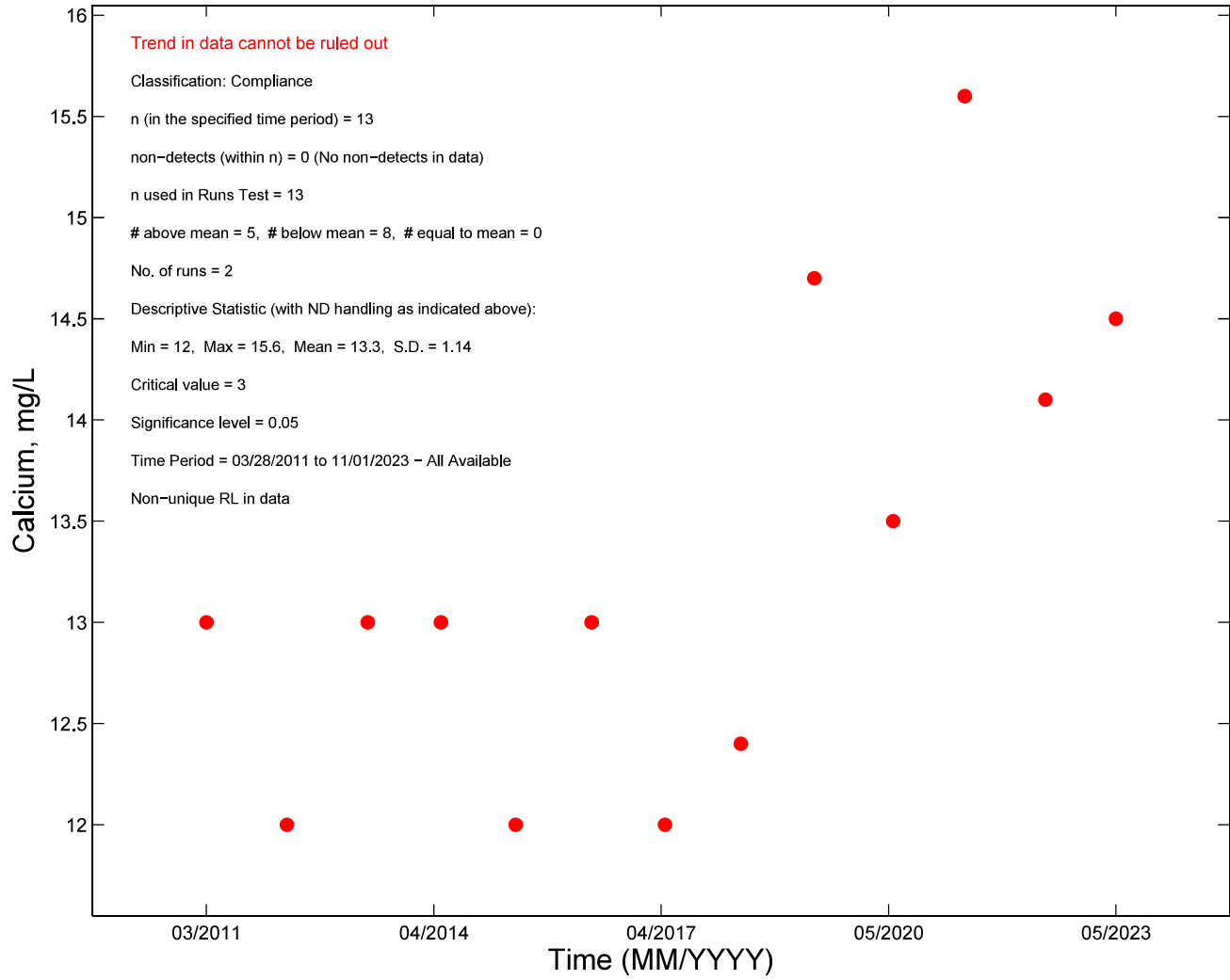
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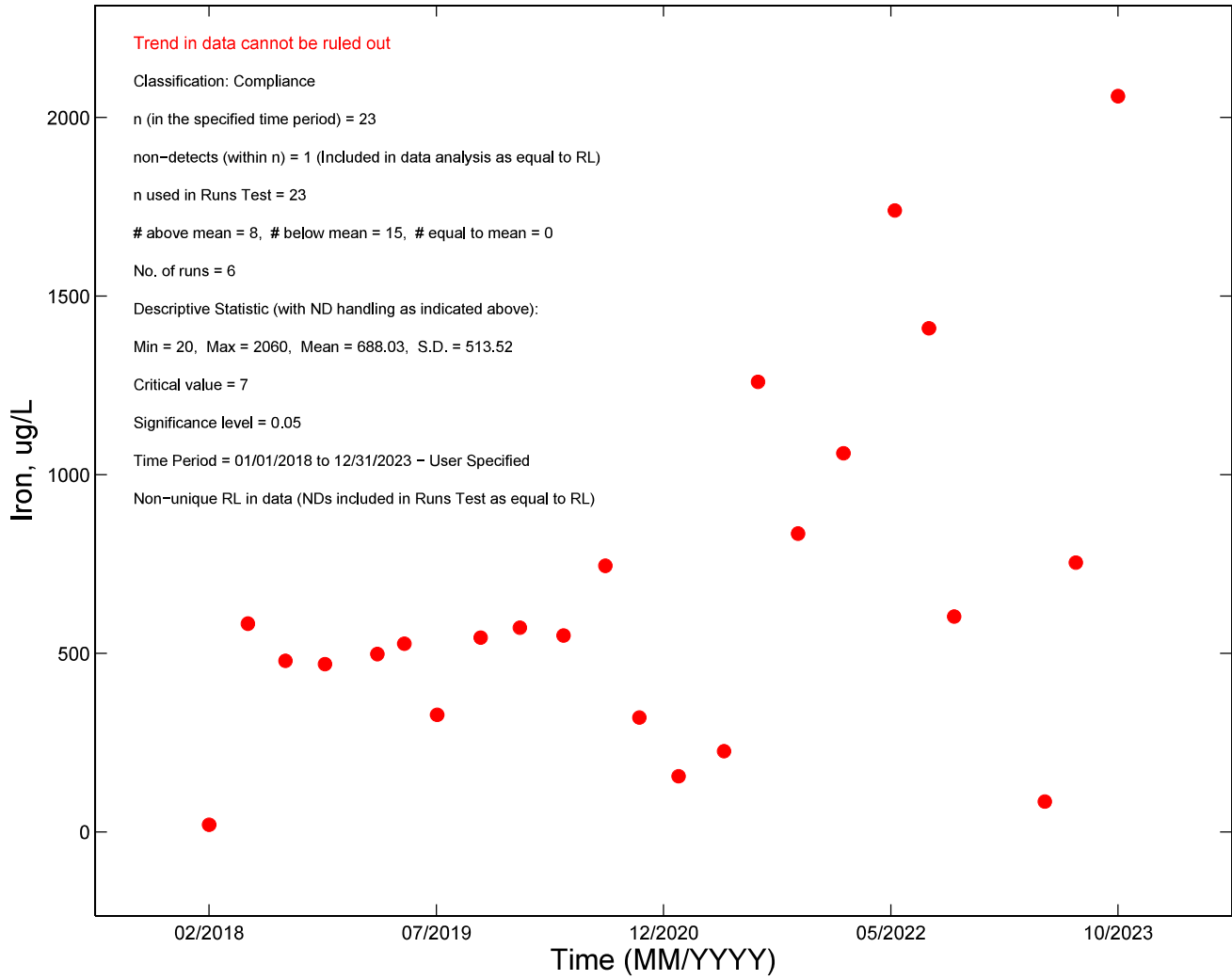
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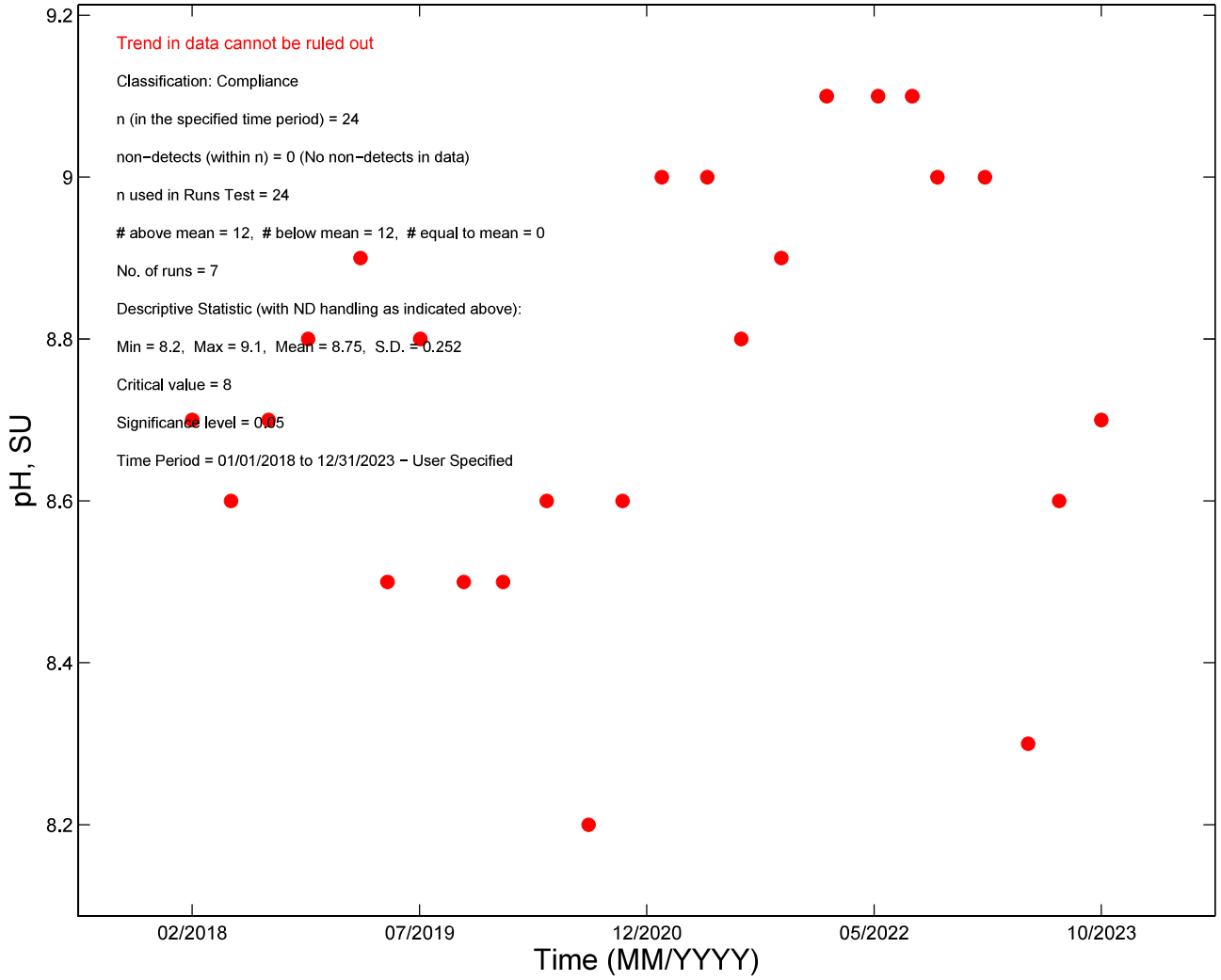
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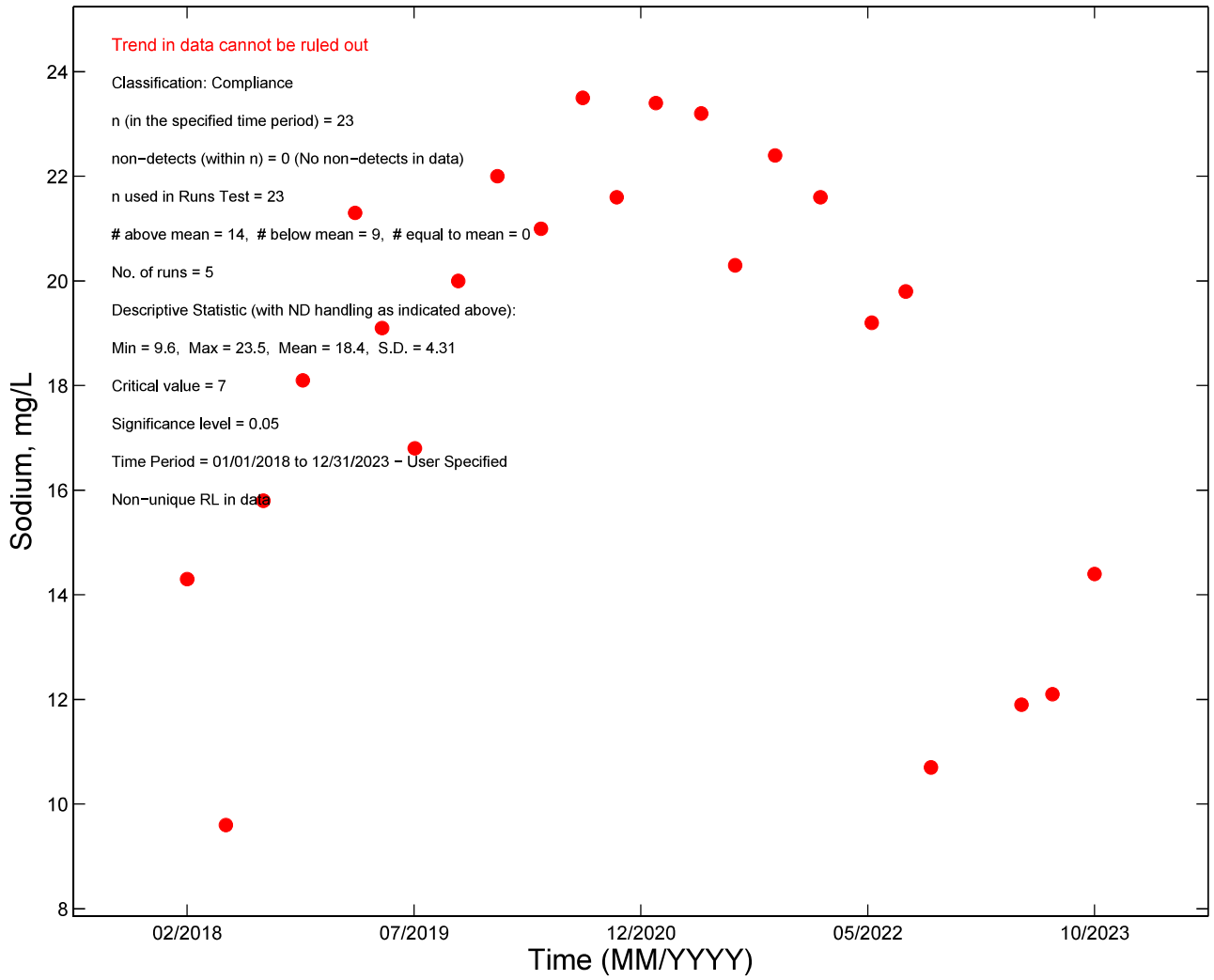
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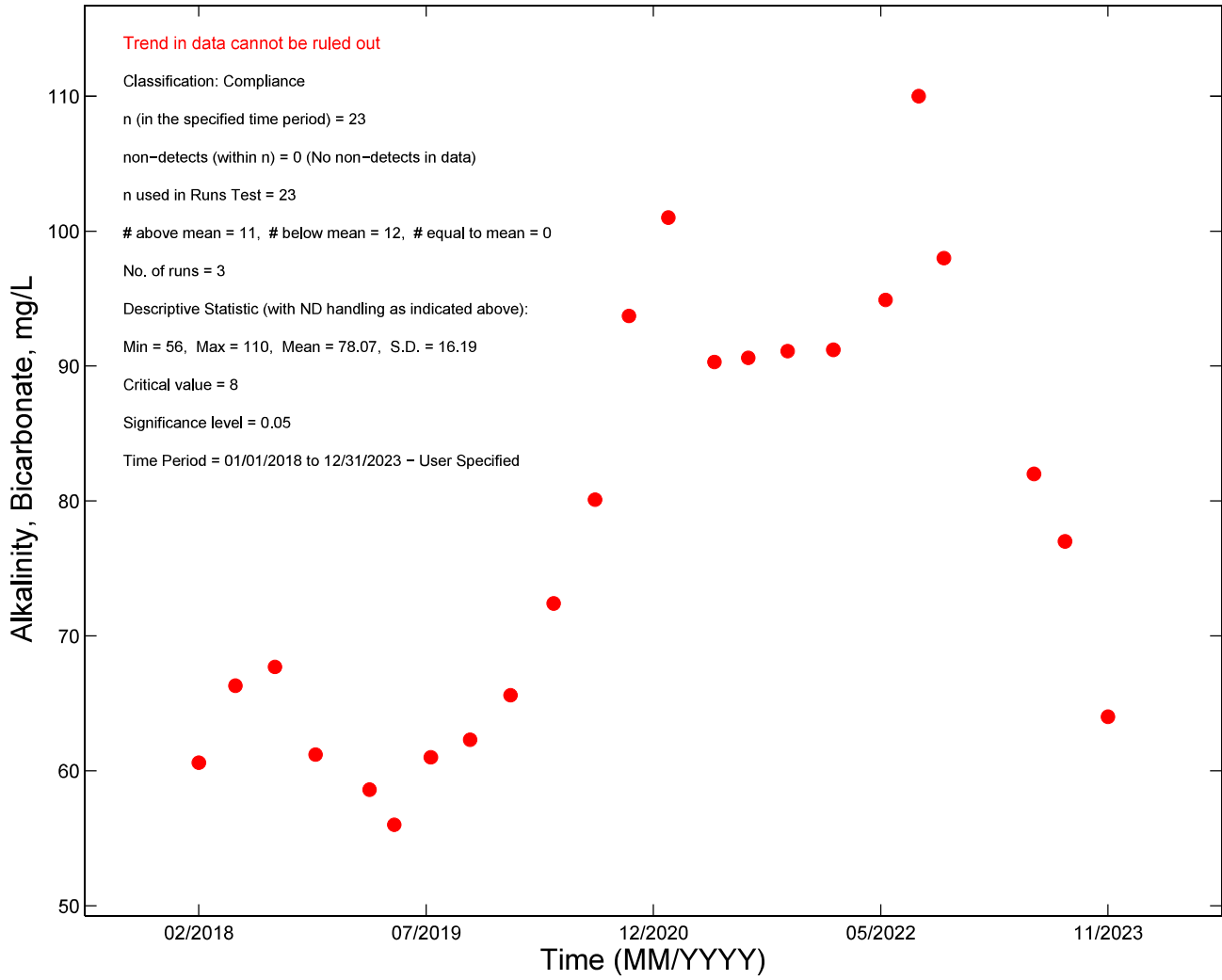
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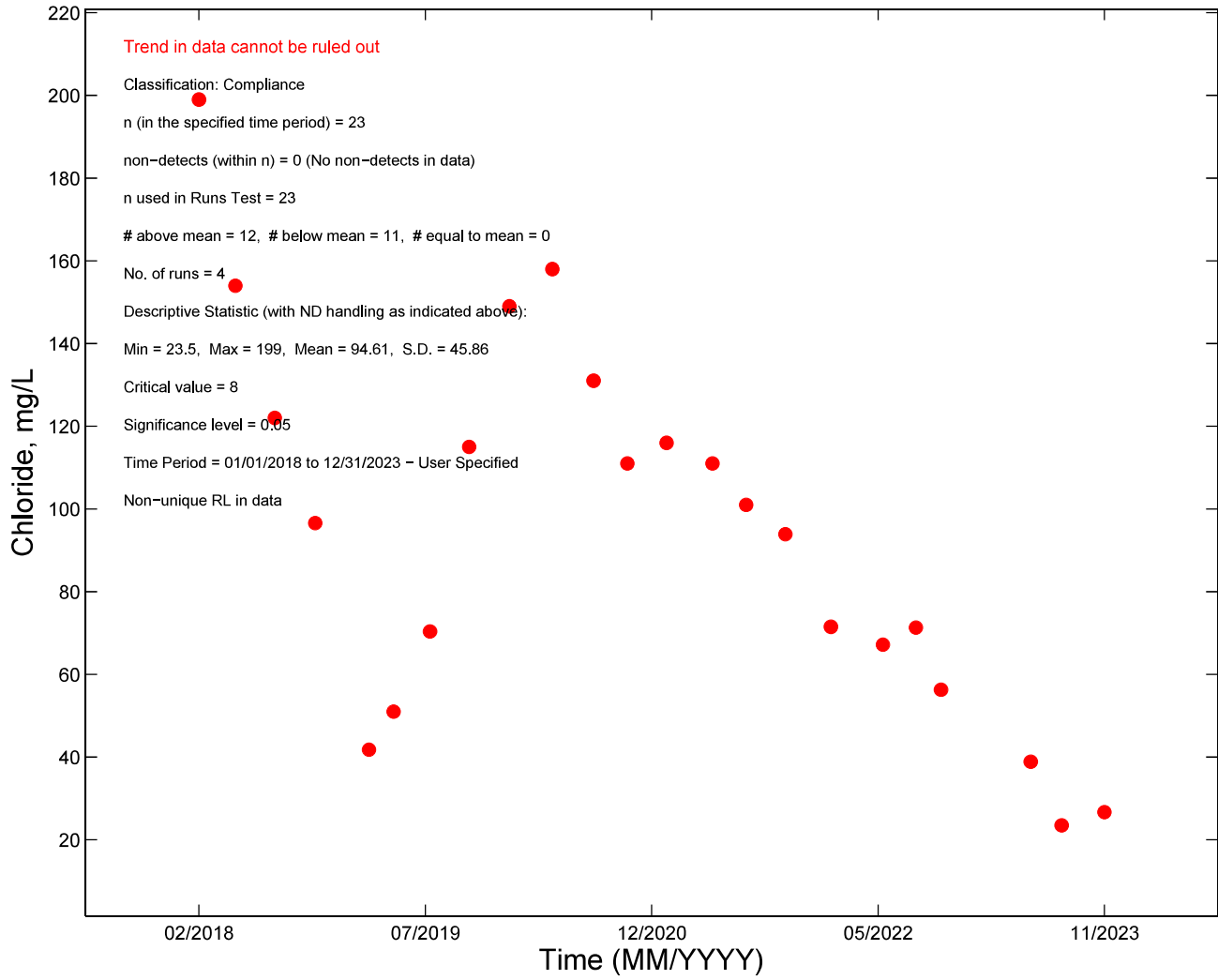
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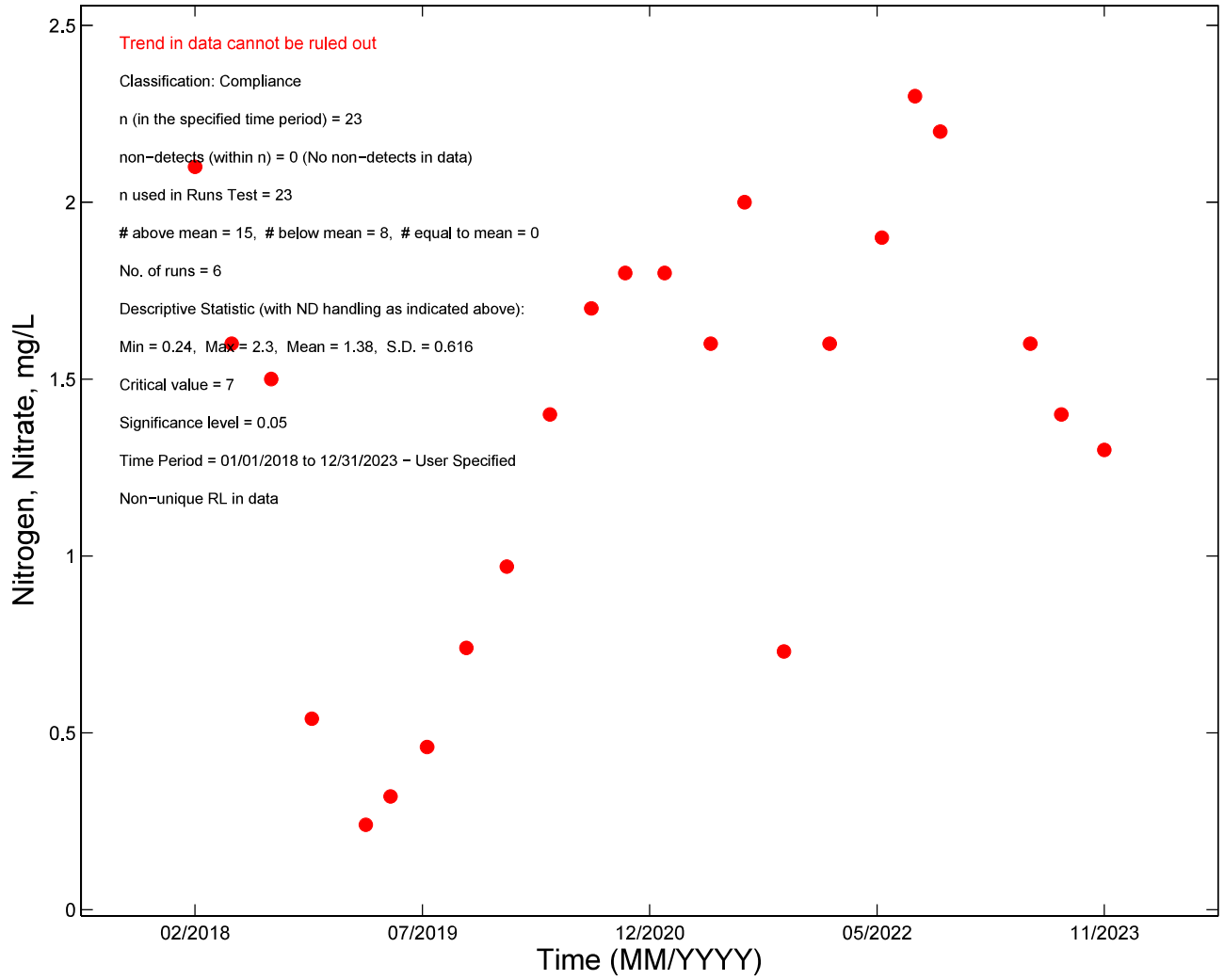
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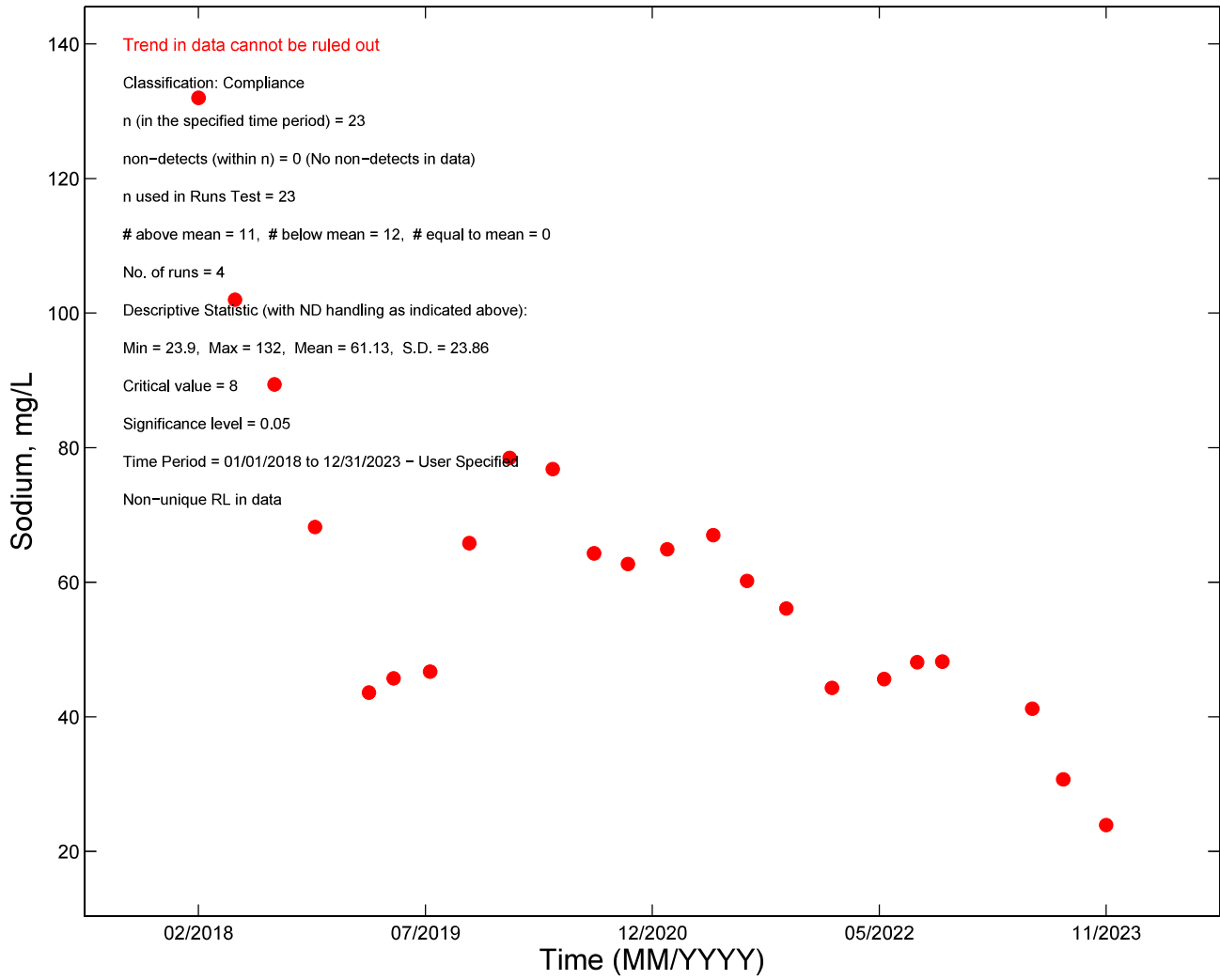
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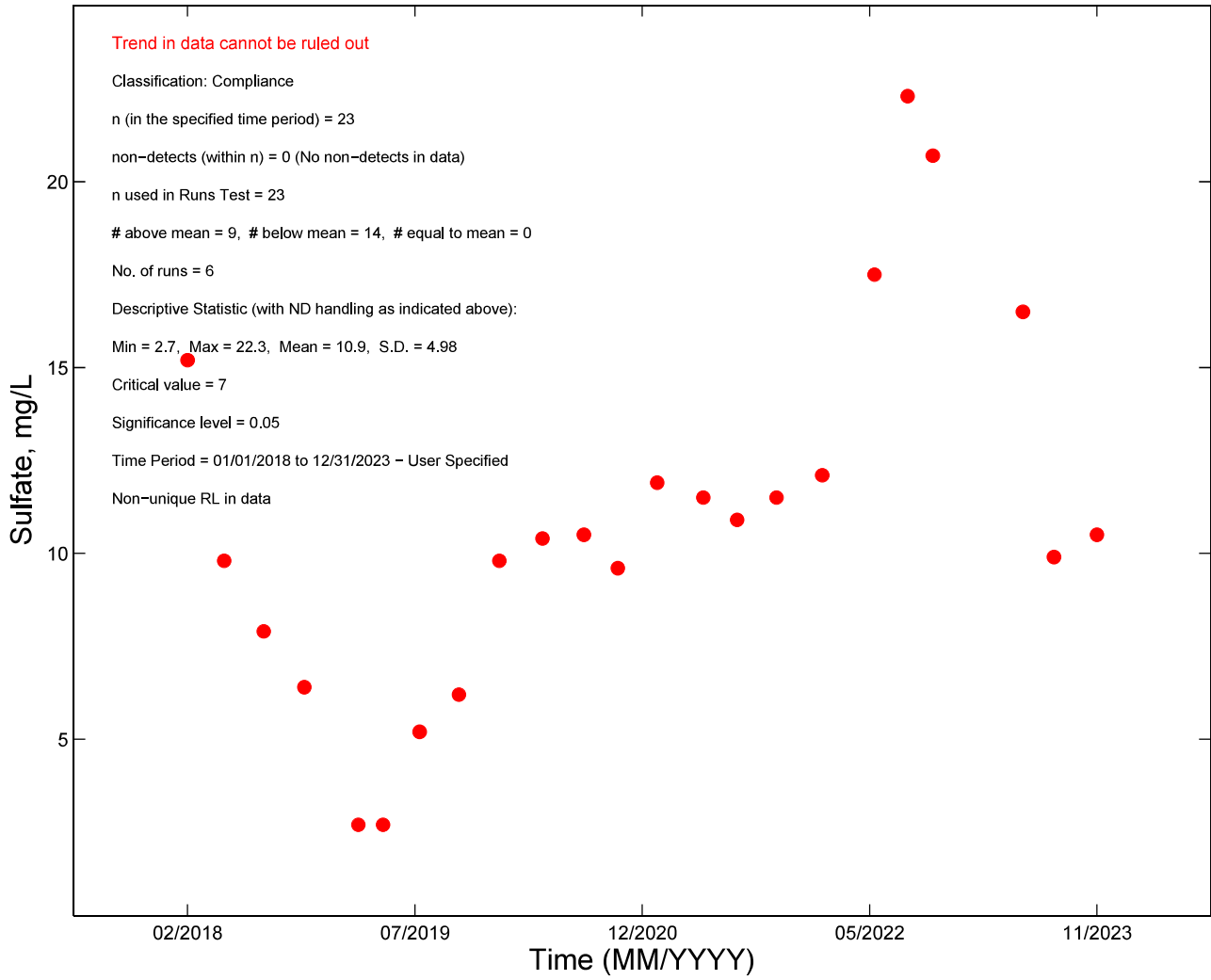
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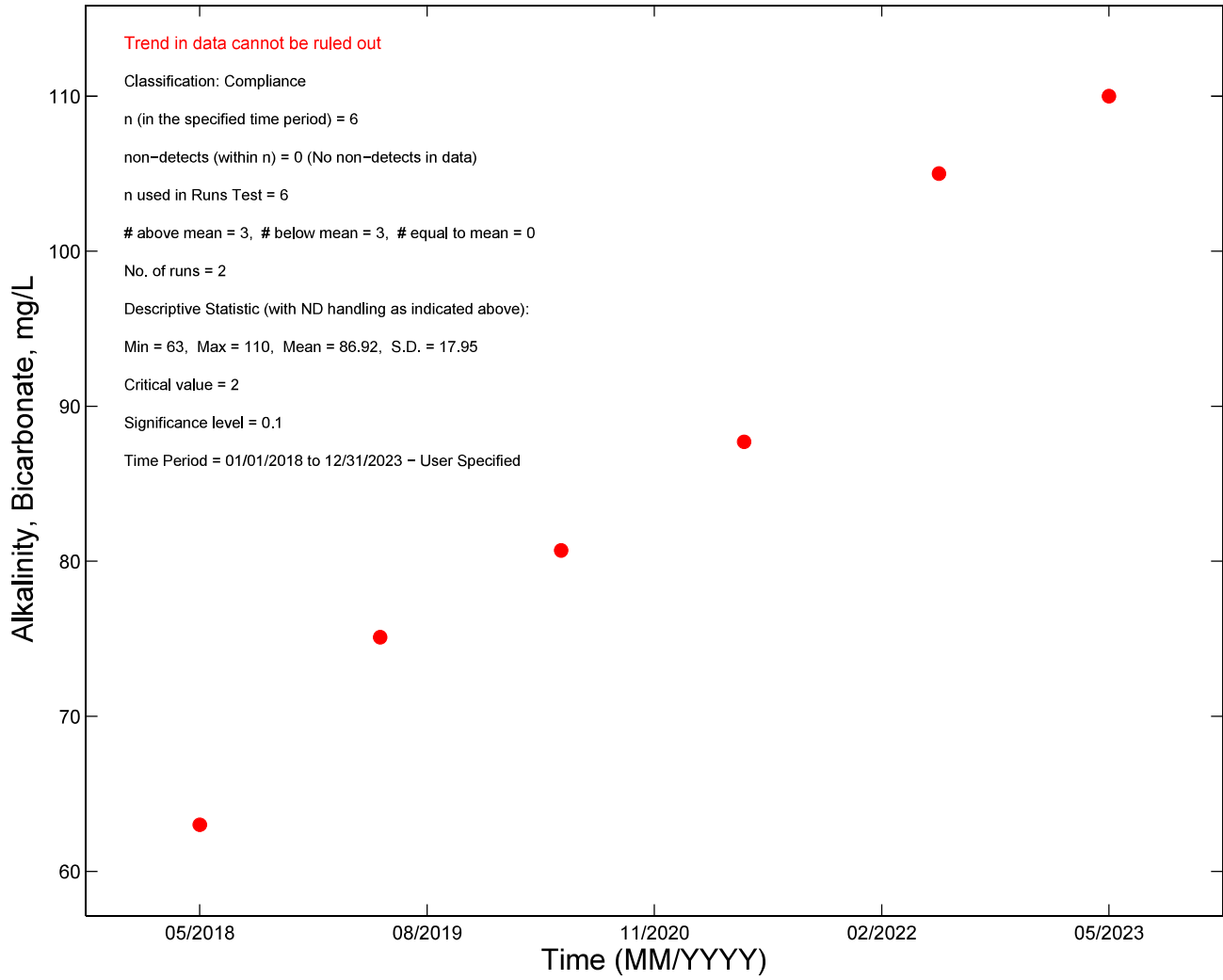
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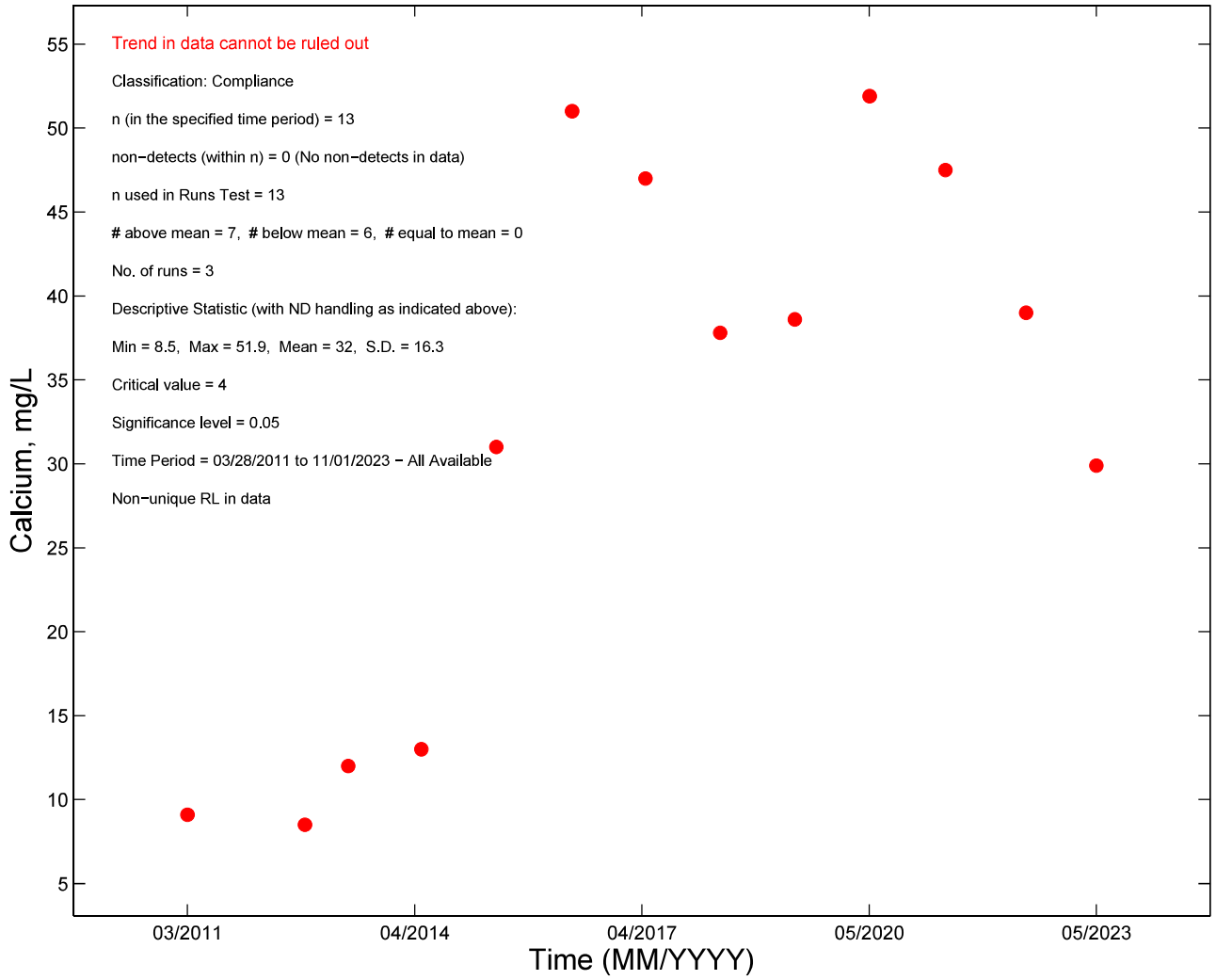
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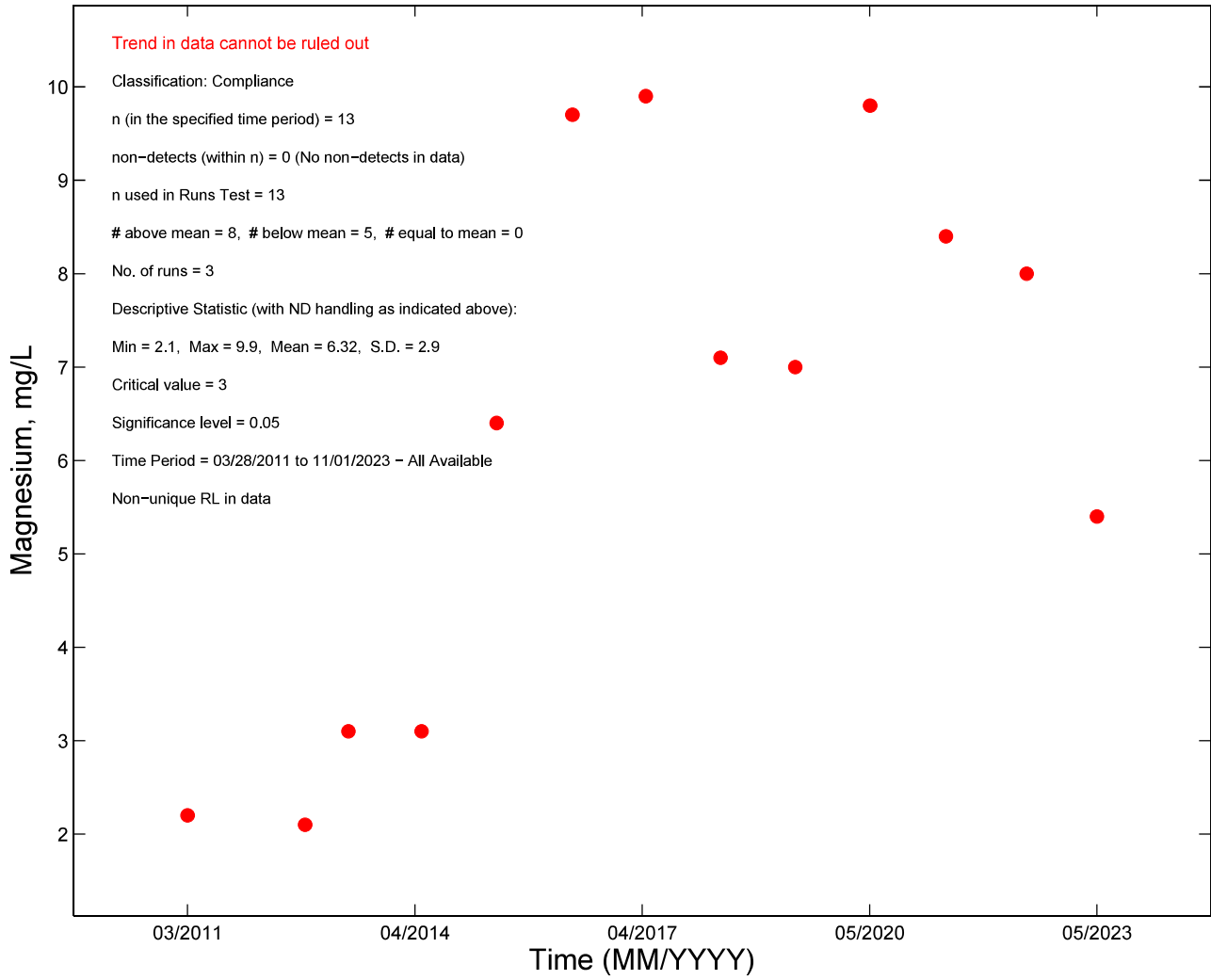
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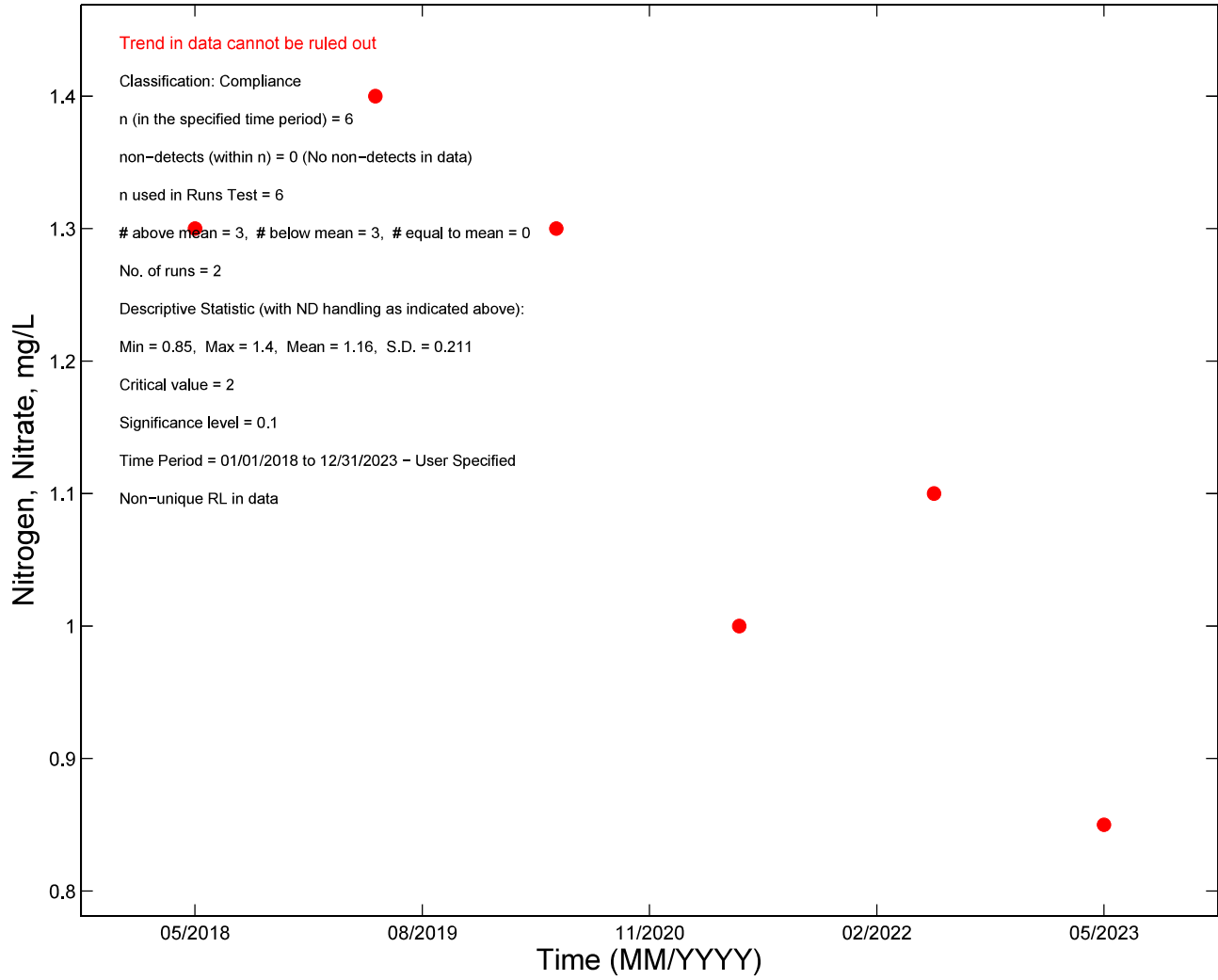
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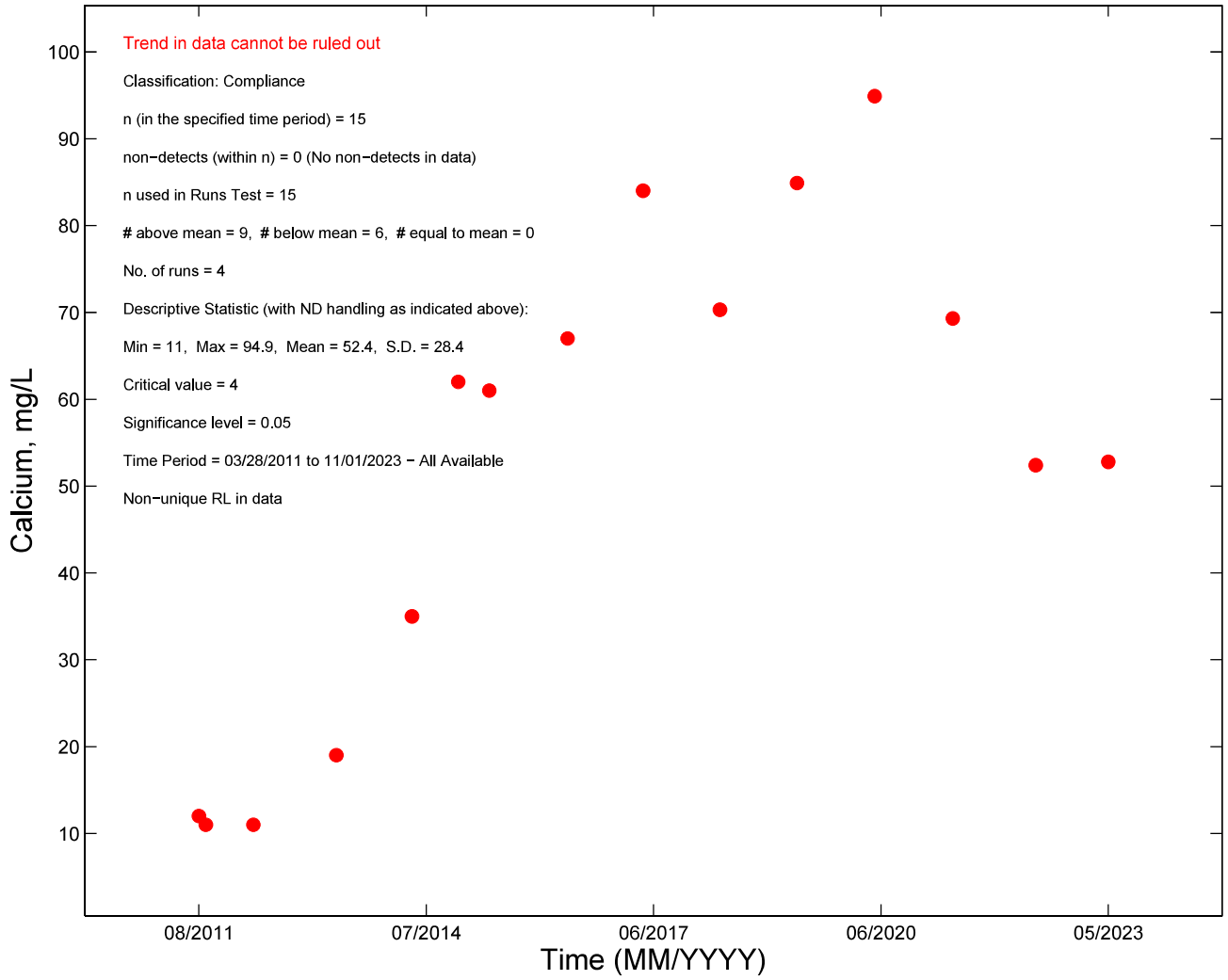
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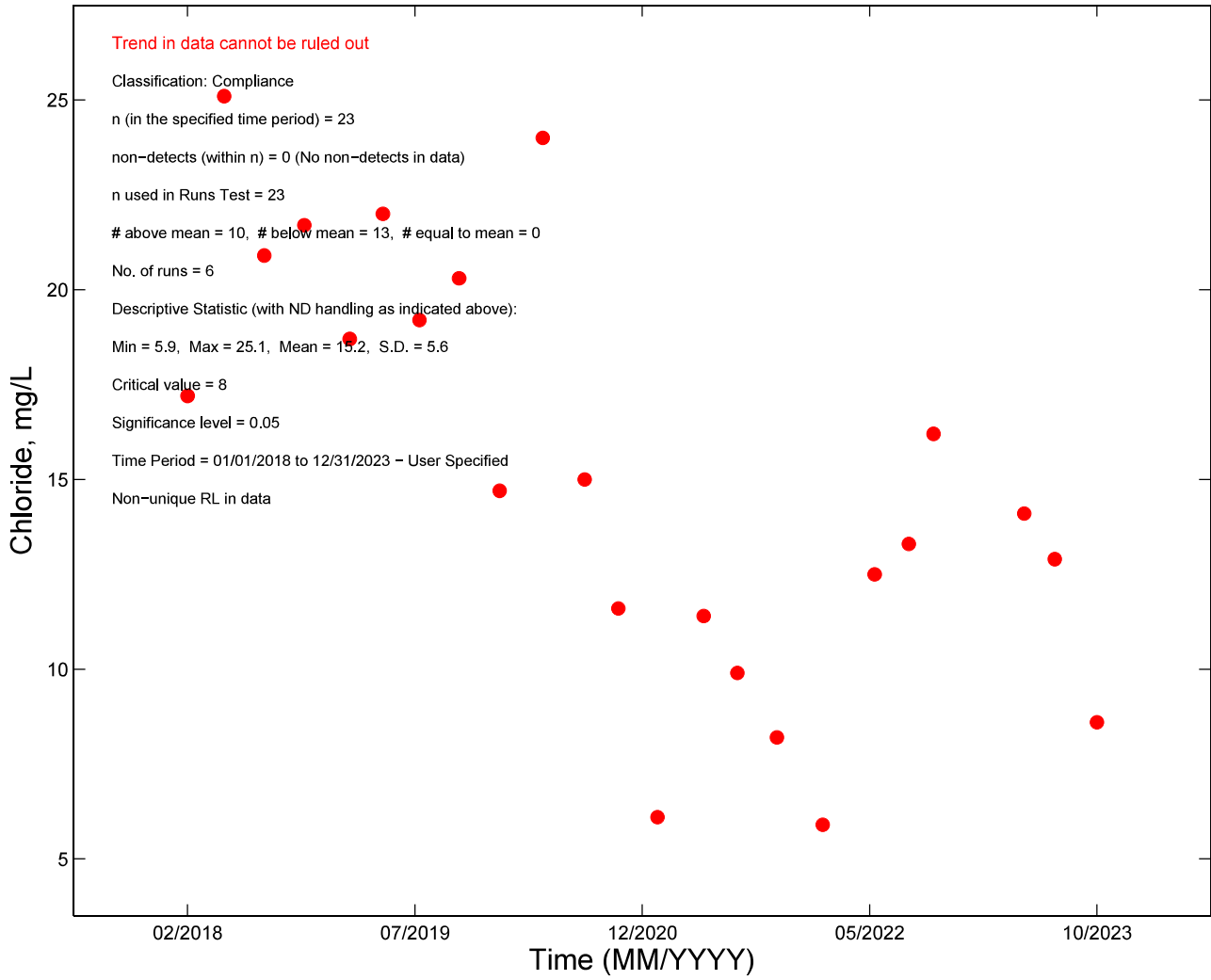
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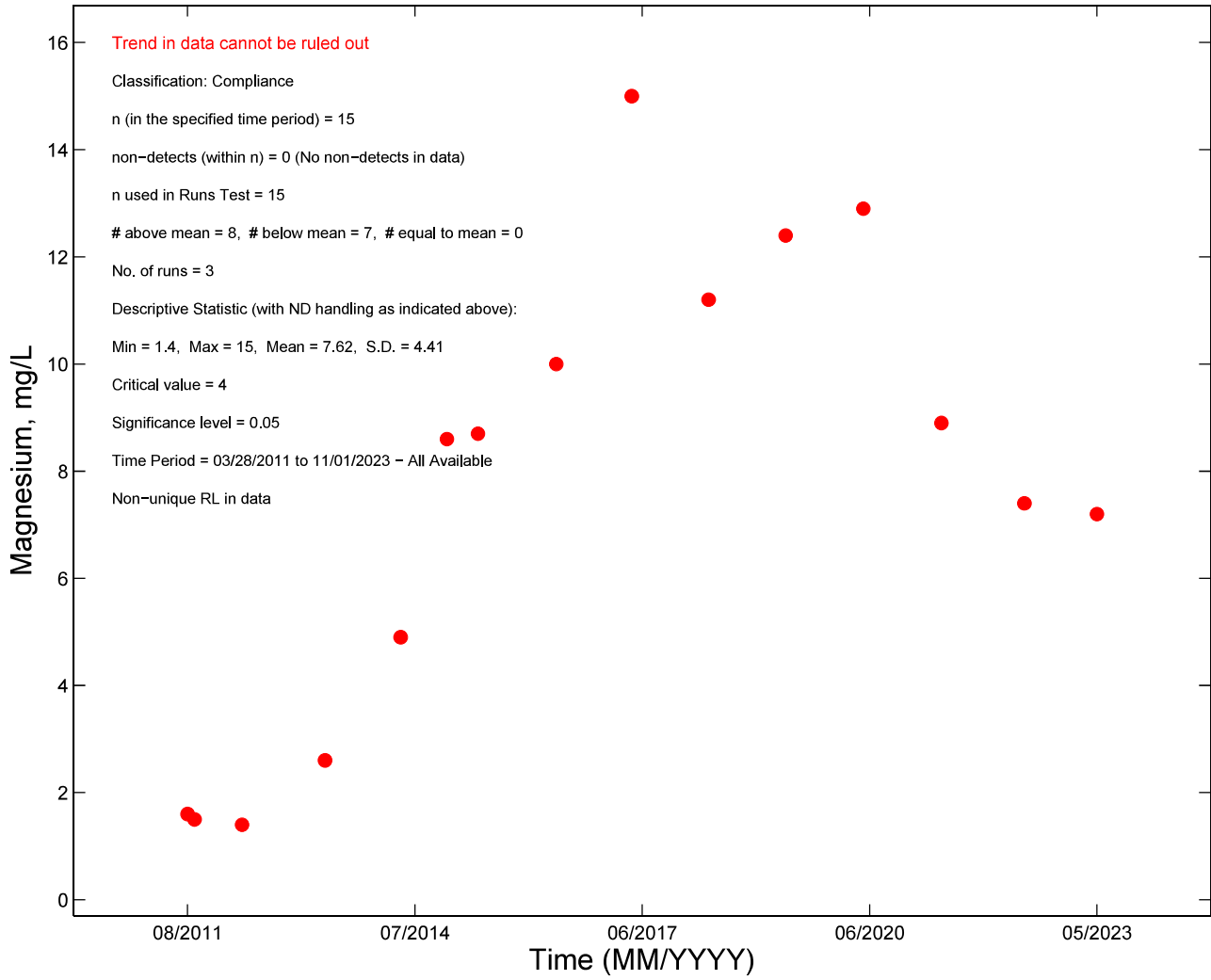
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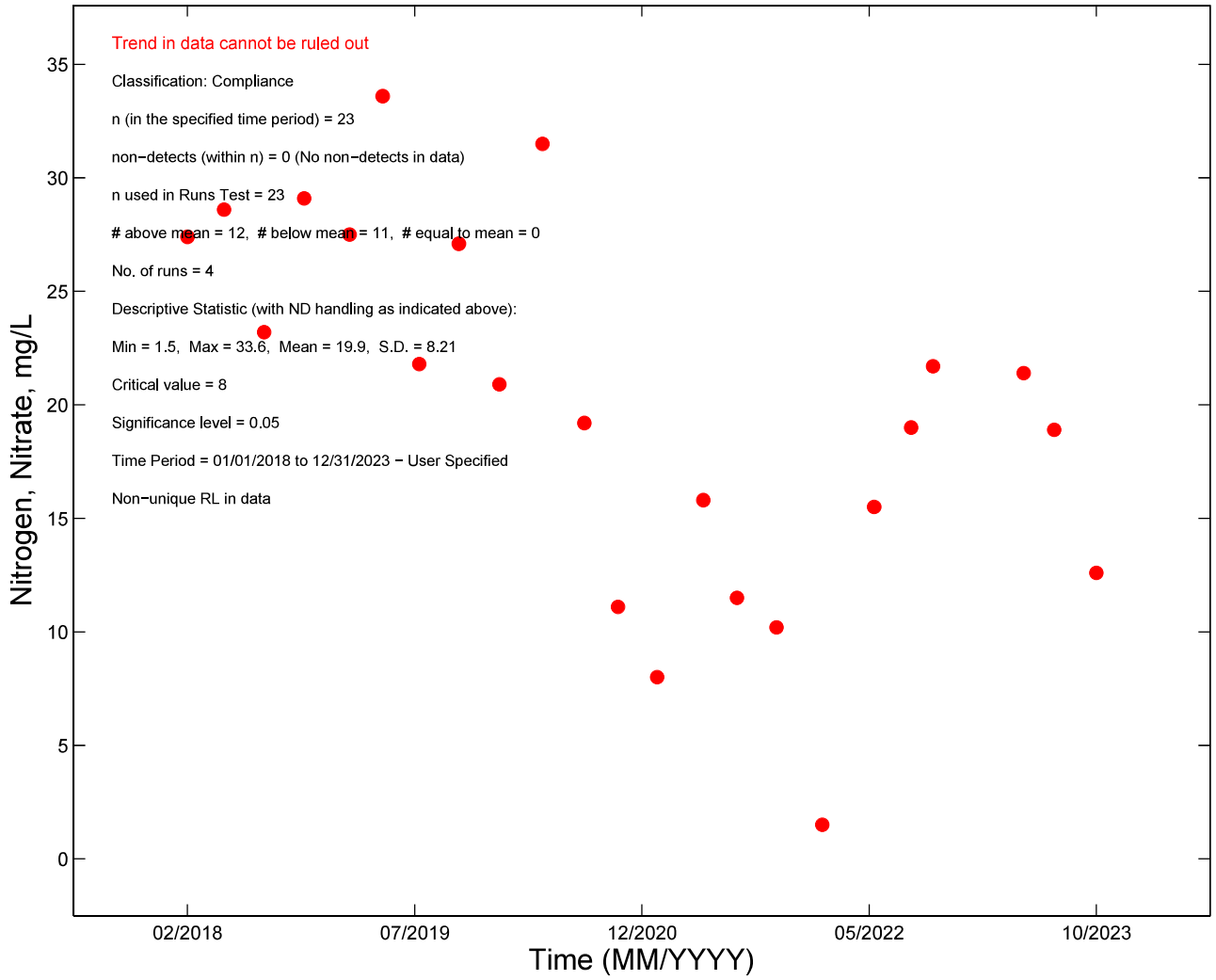
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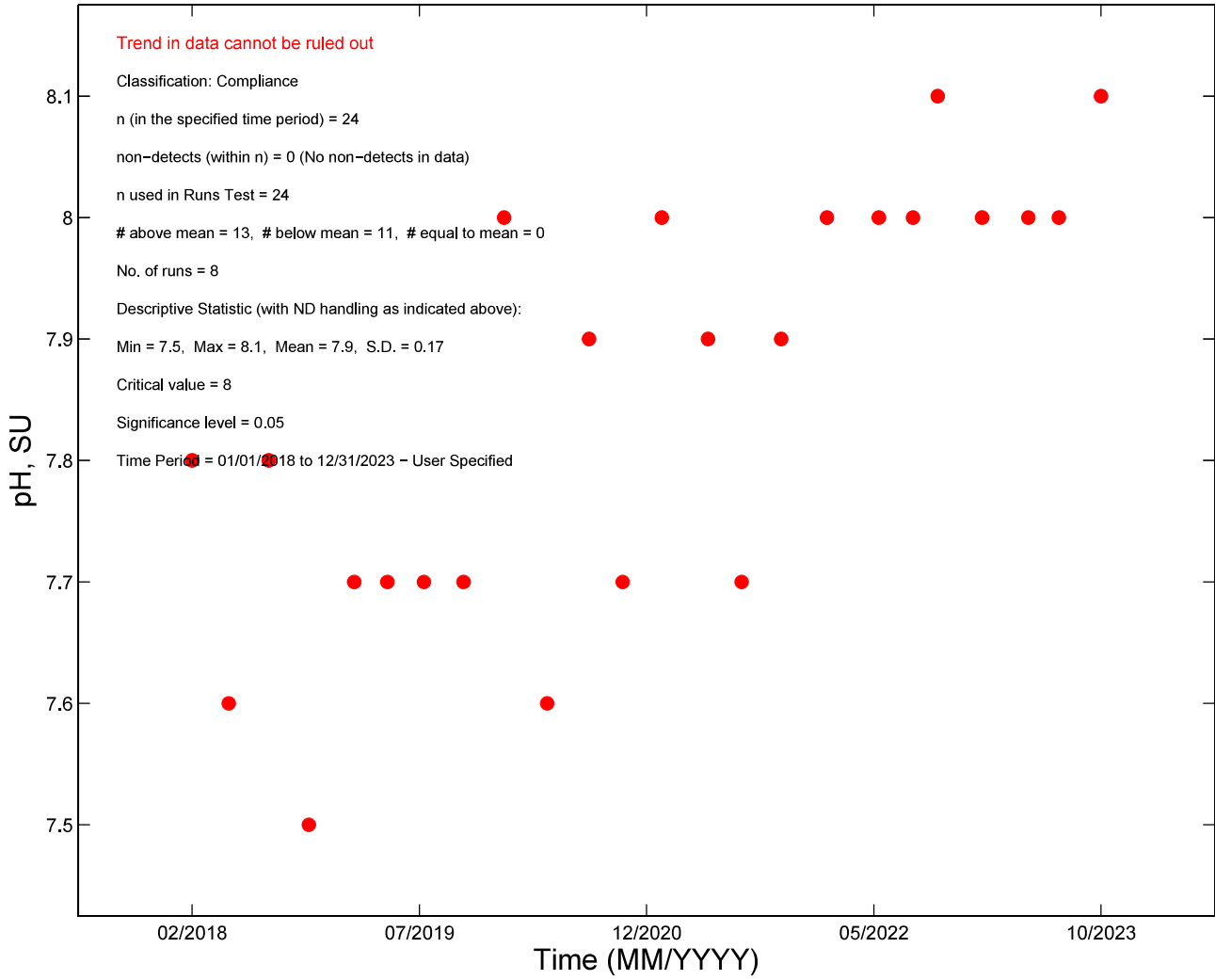
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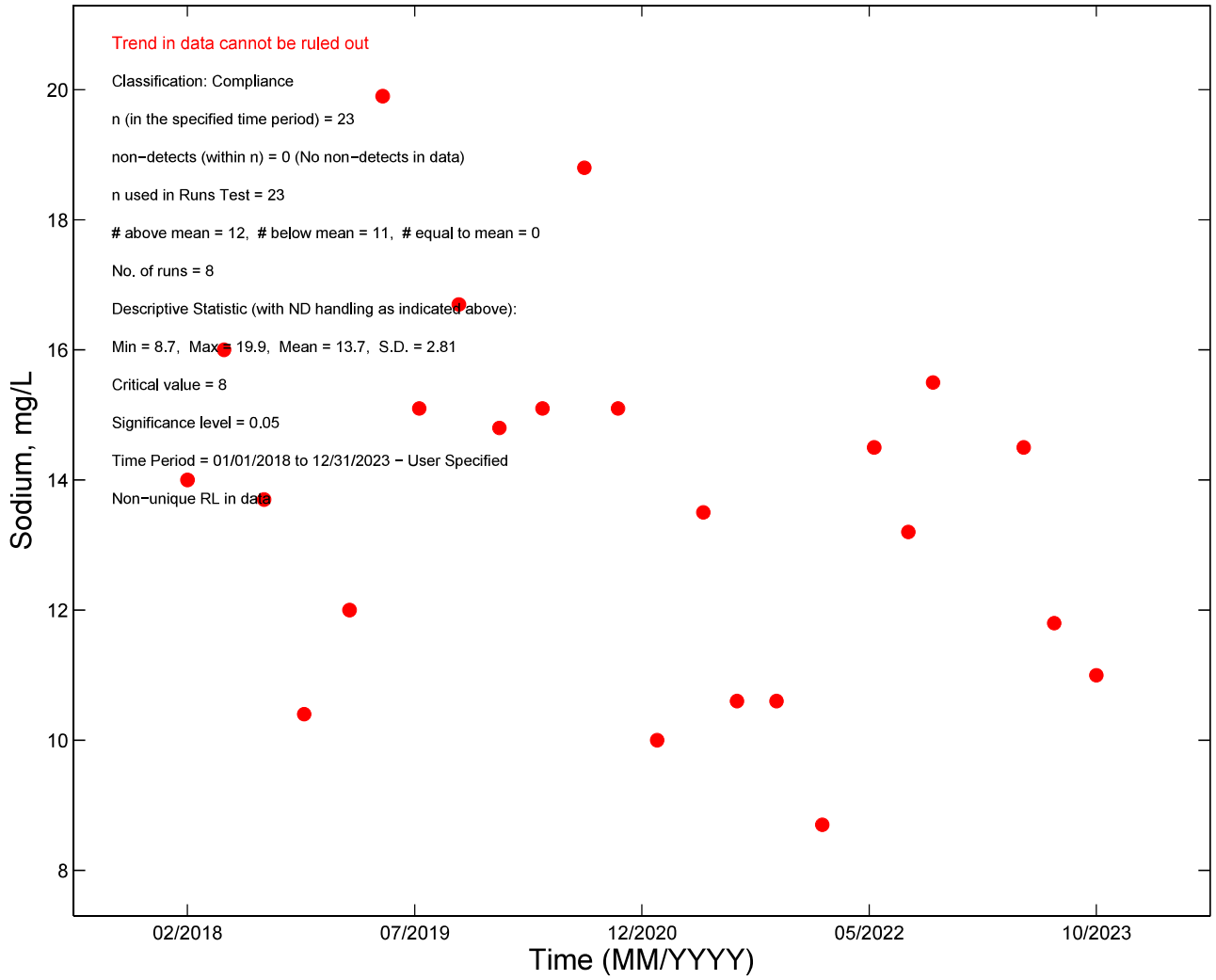
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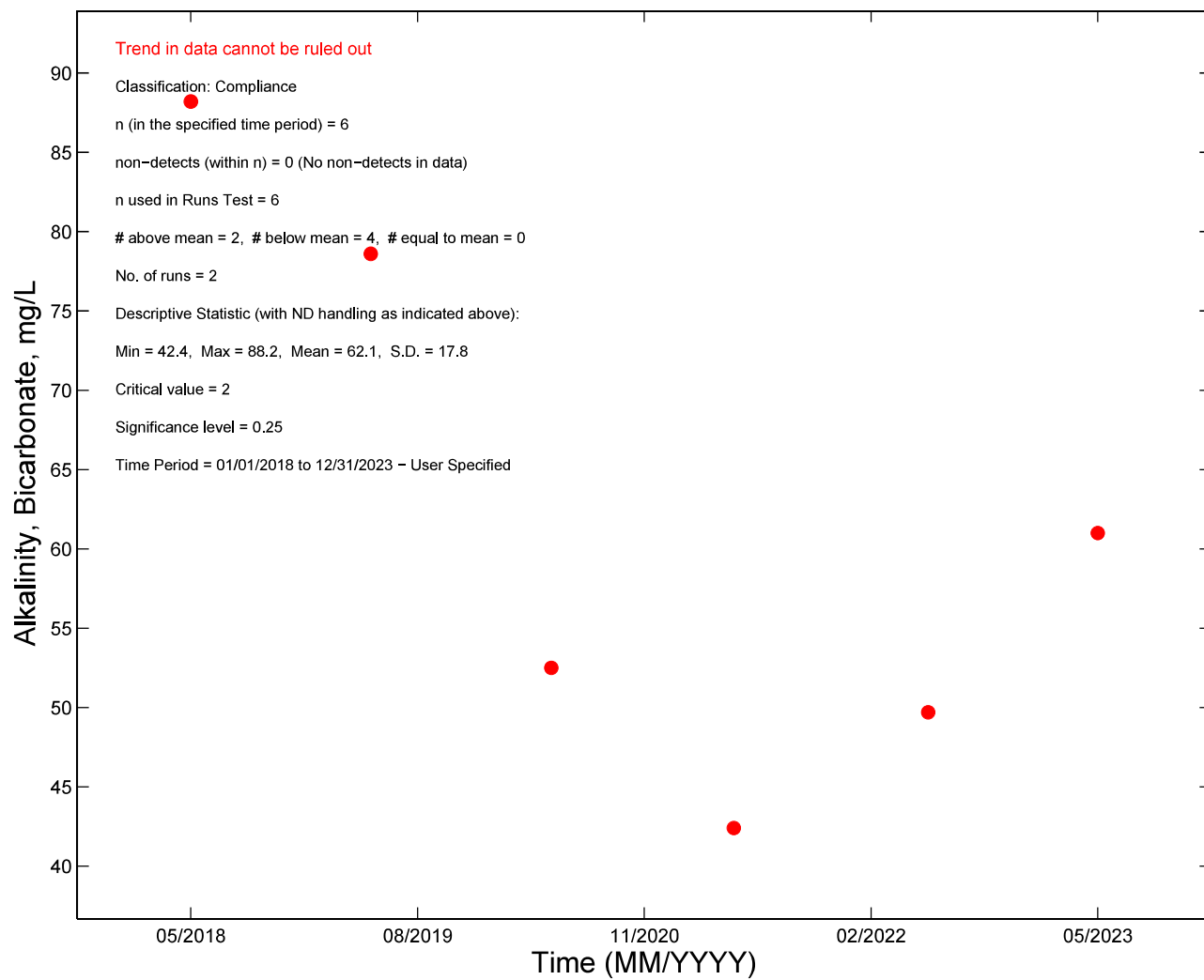
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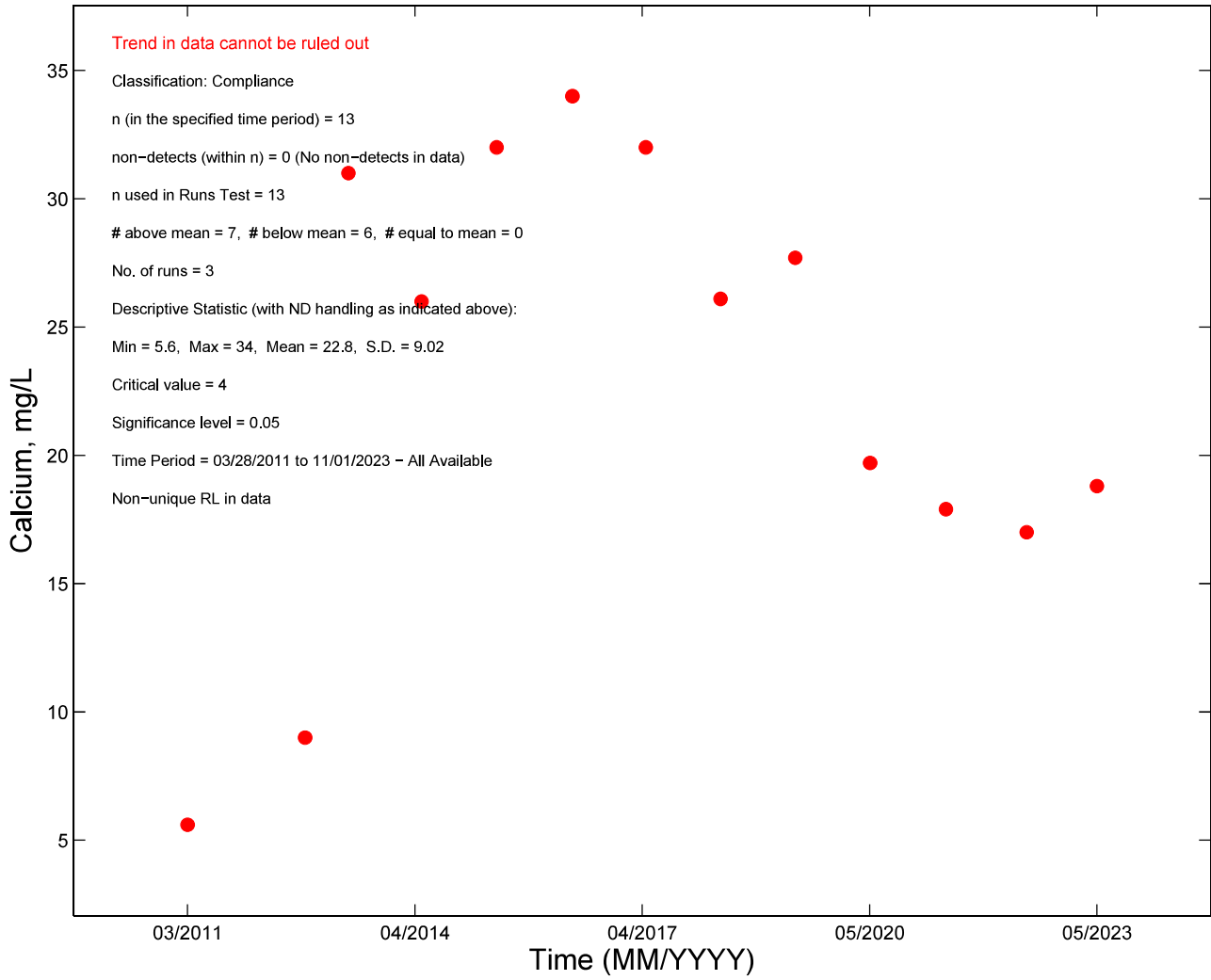
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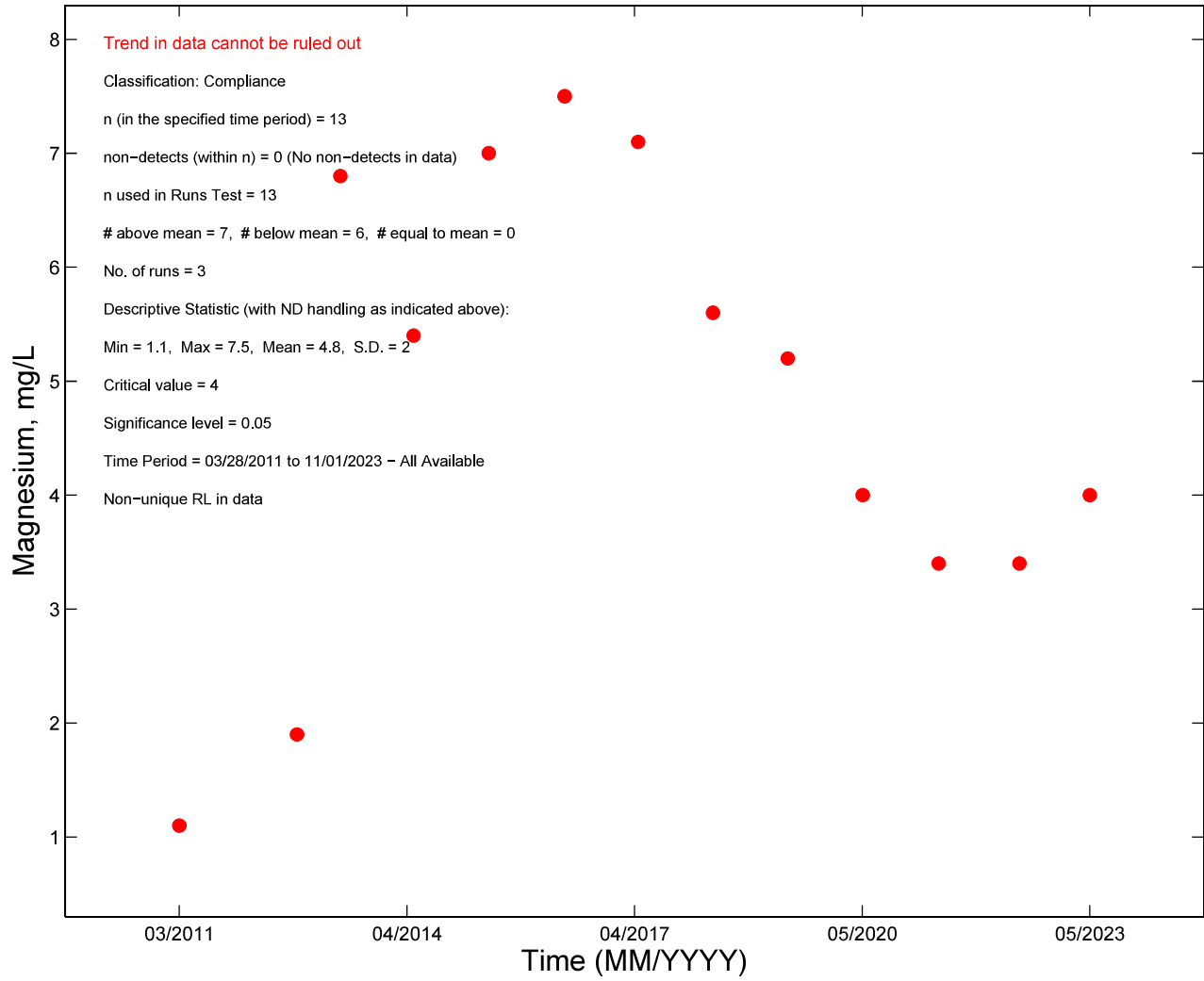
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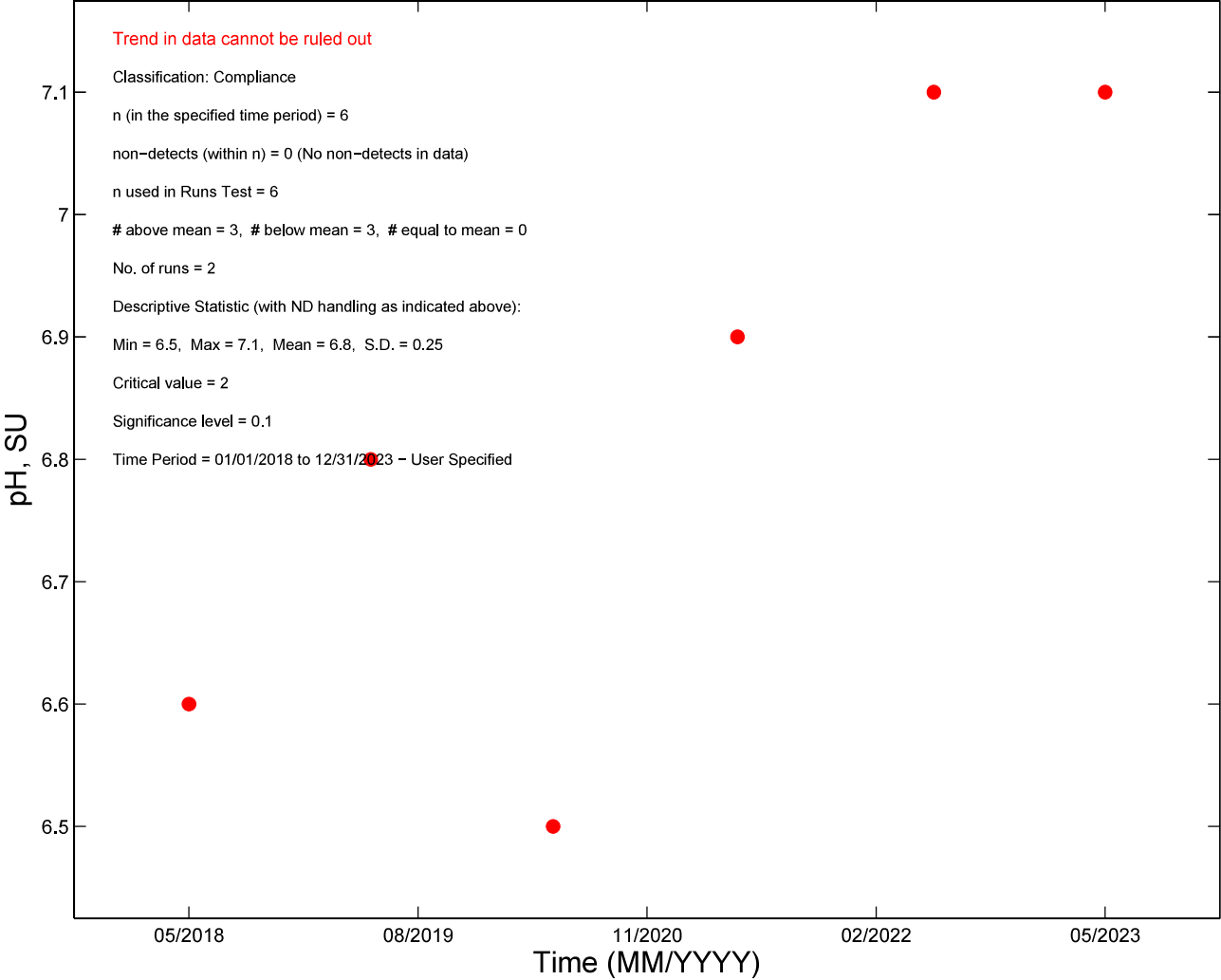
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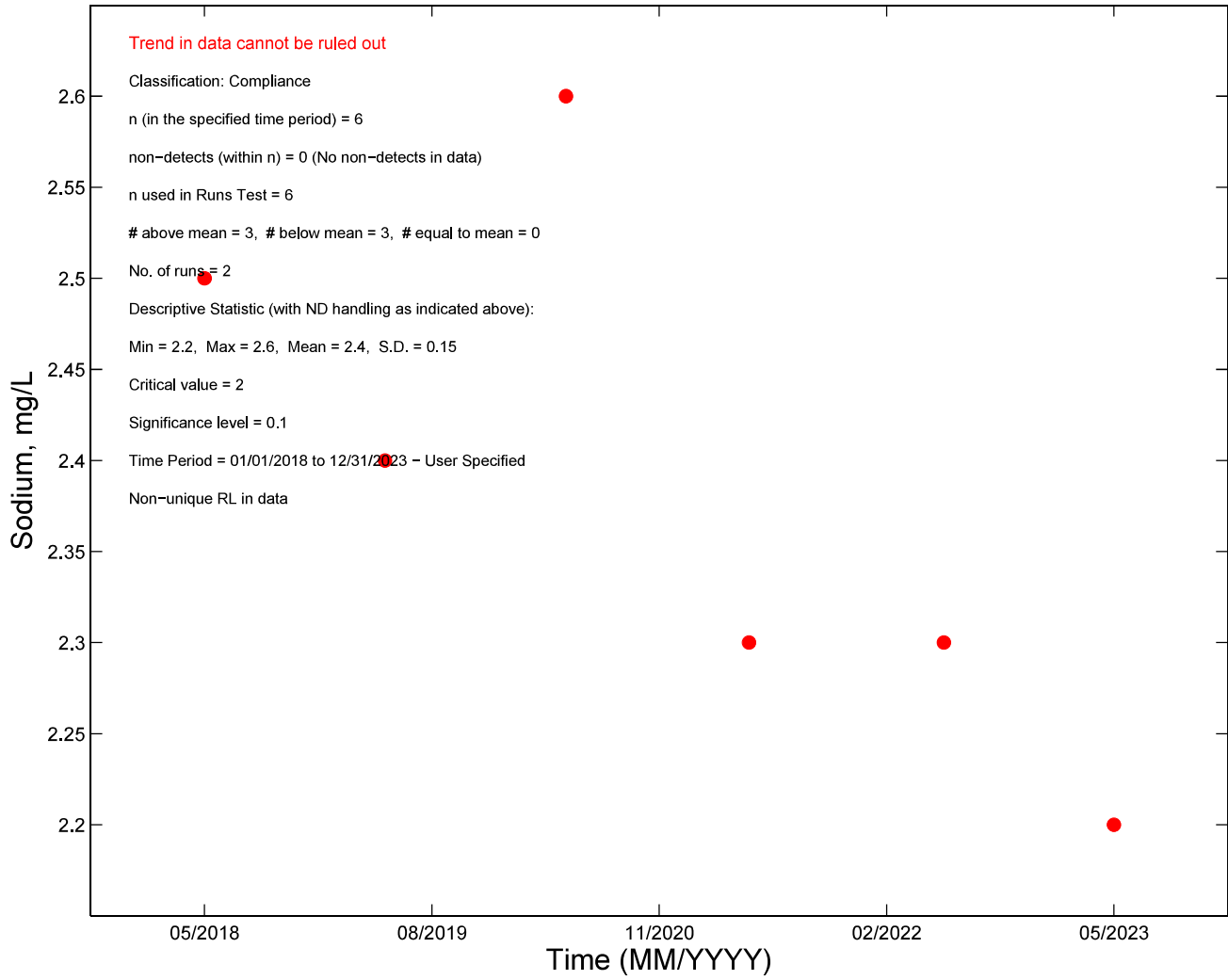
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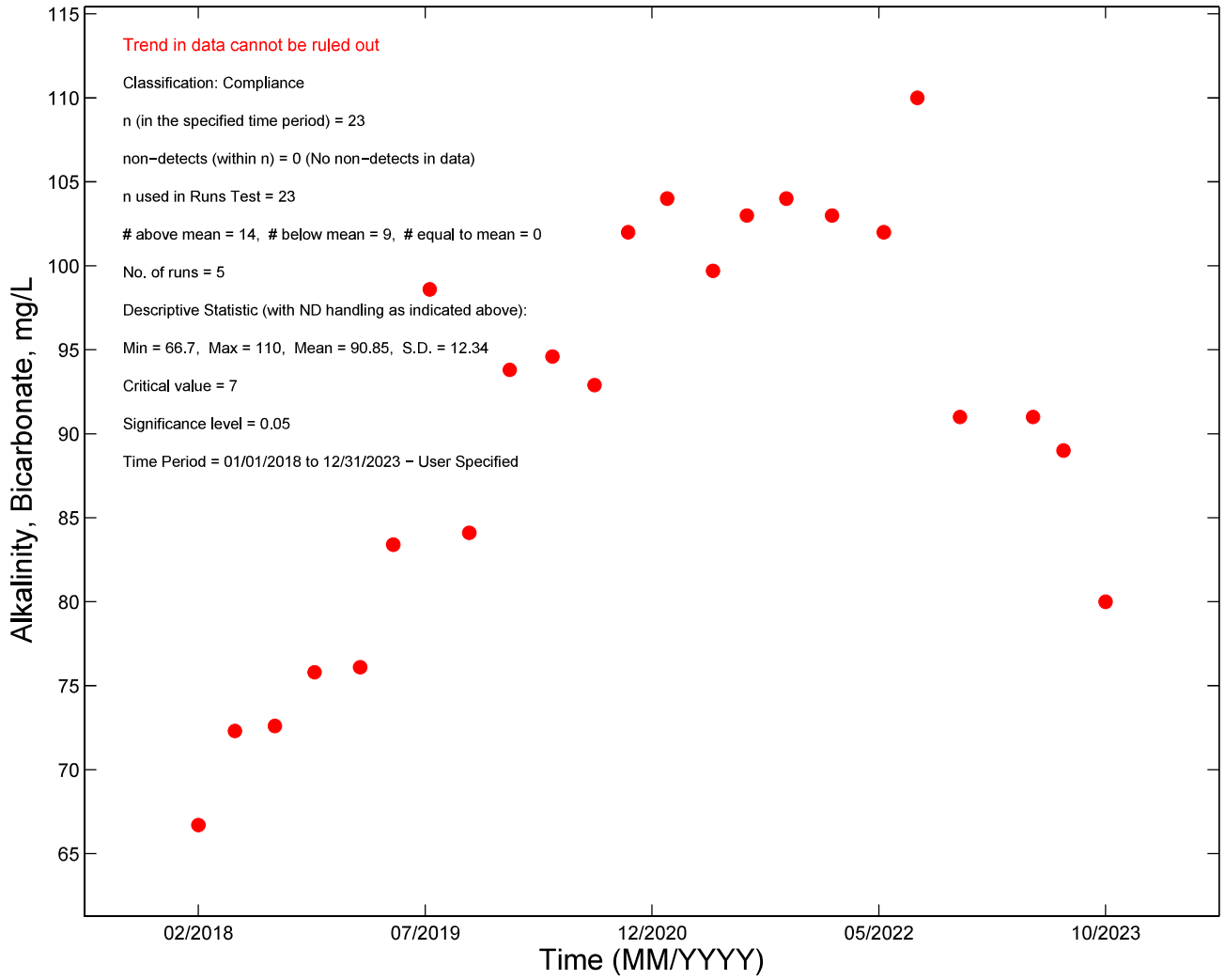
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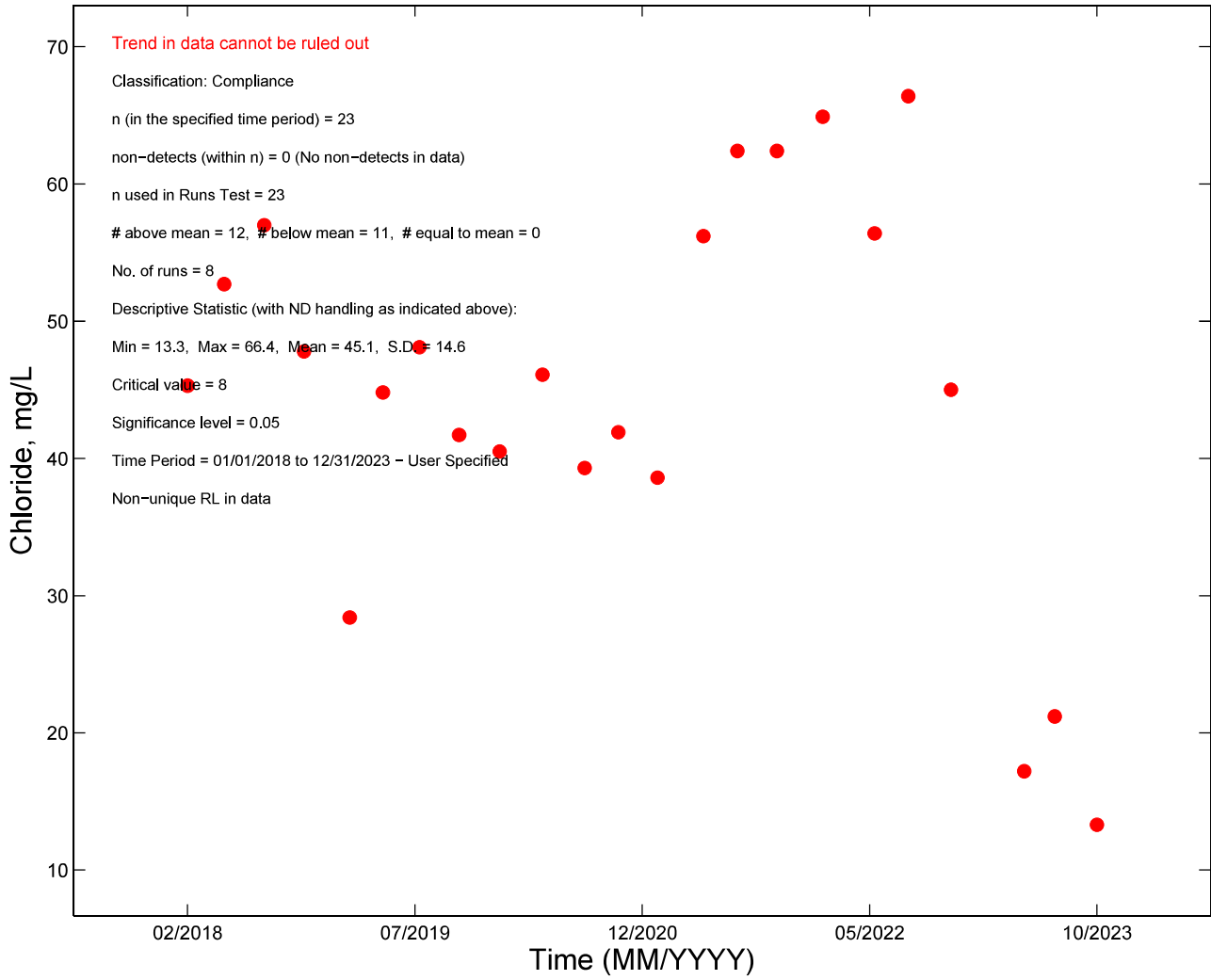
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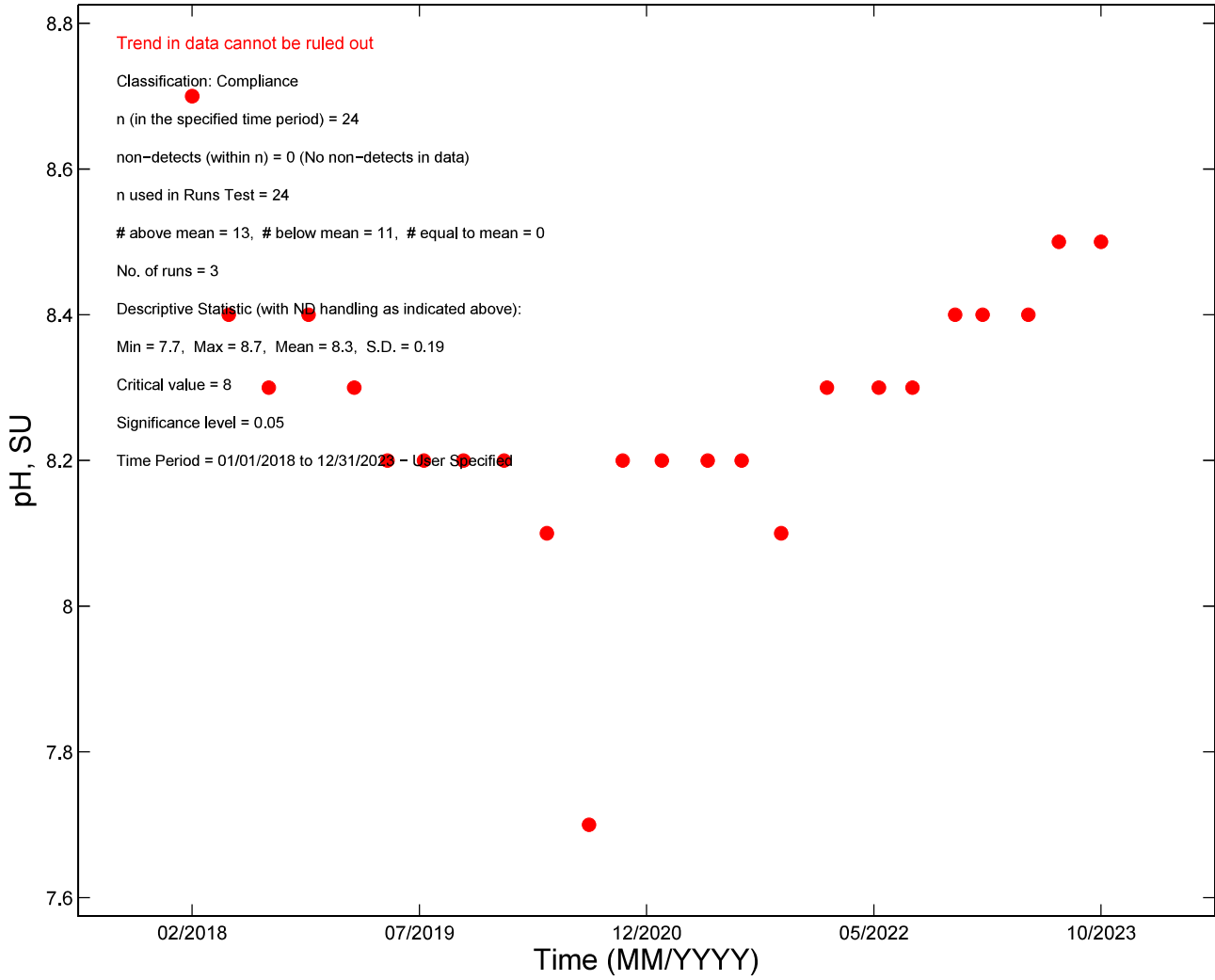
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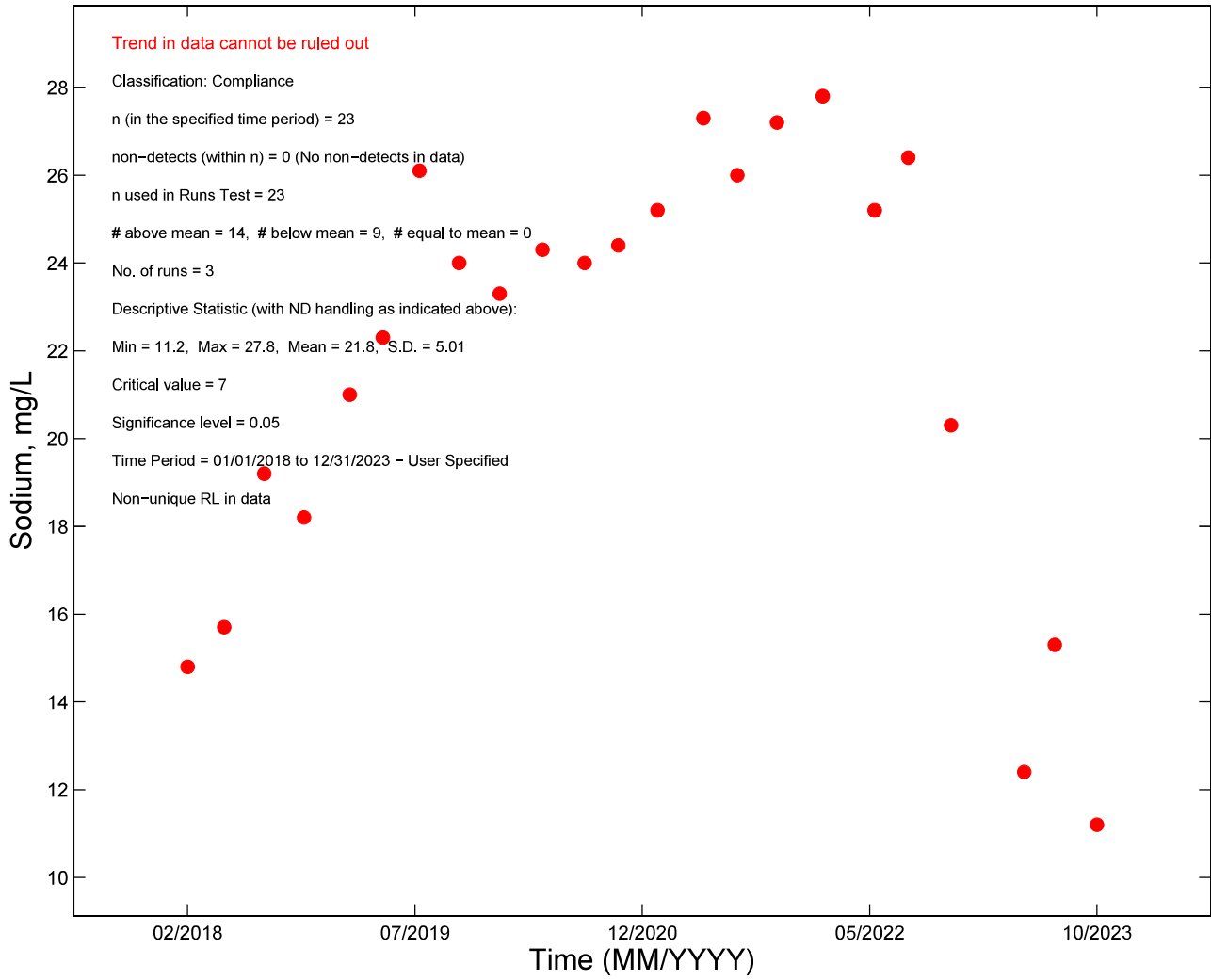
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QAL074A



QAL074A

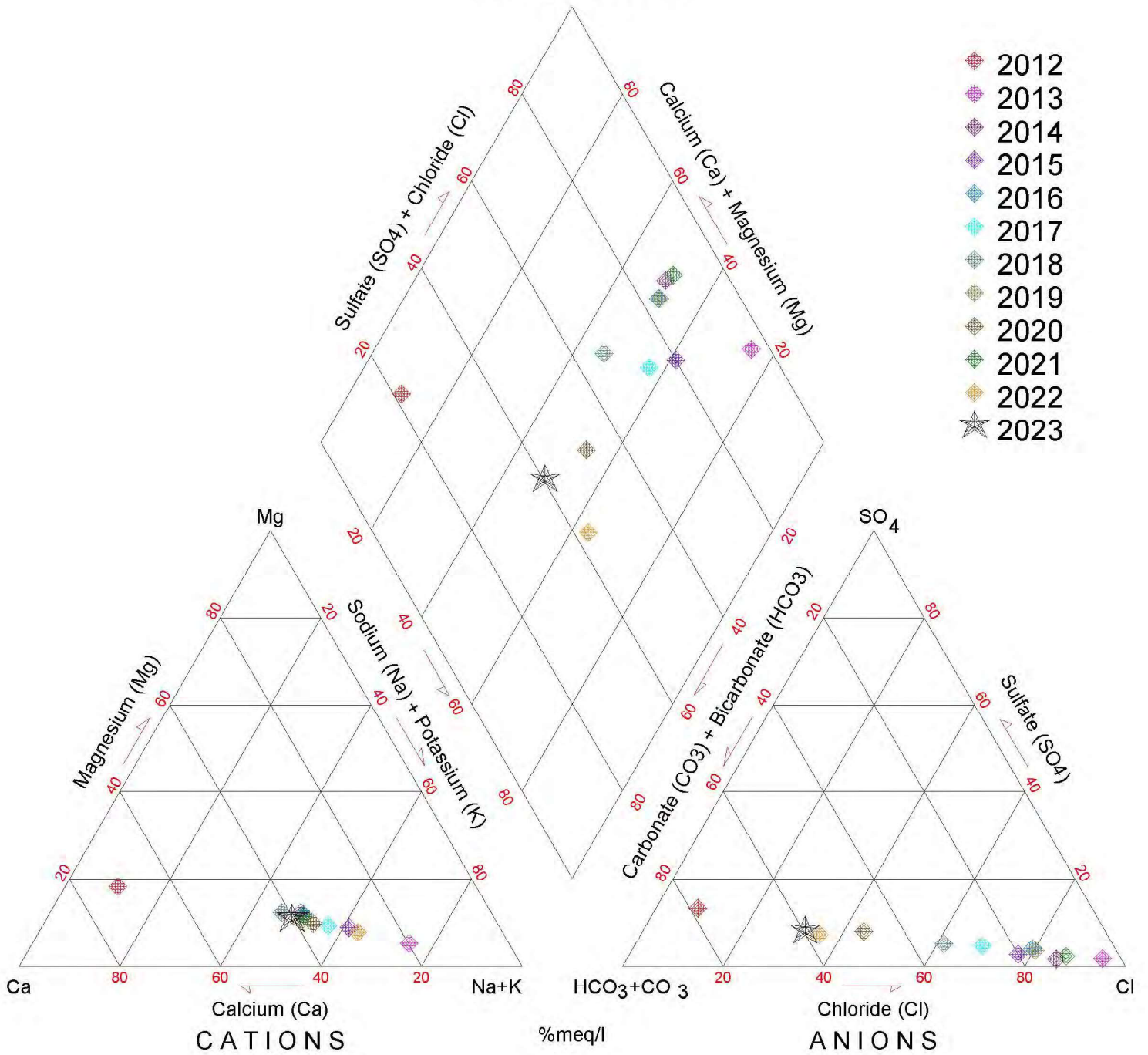


Appendix I

Eagle Mine Groundwater Piper Diagrams

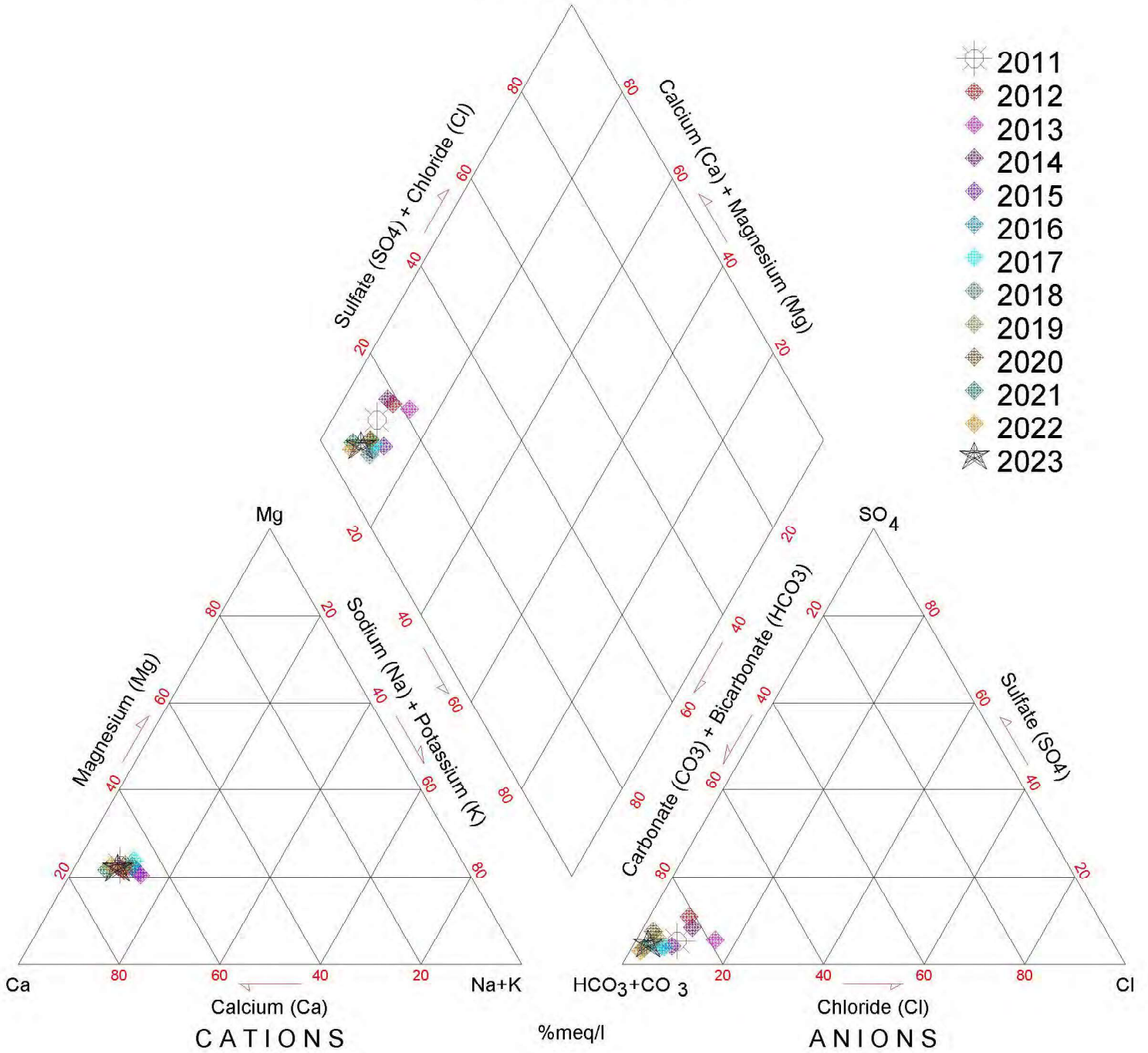
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2023 Piper Diagram



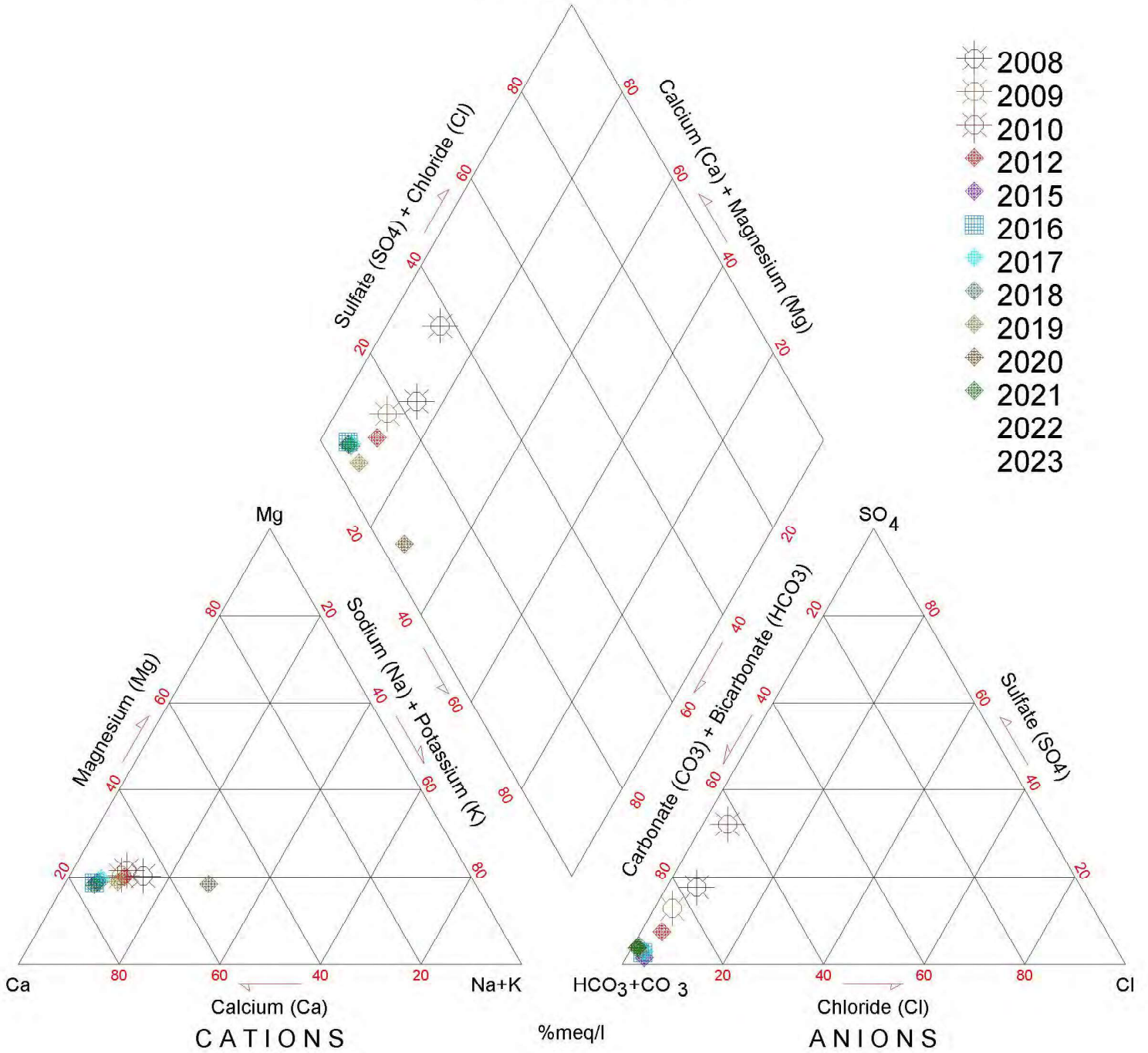
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2023 Piper Diagram



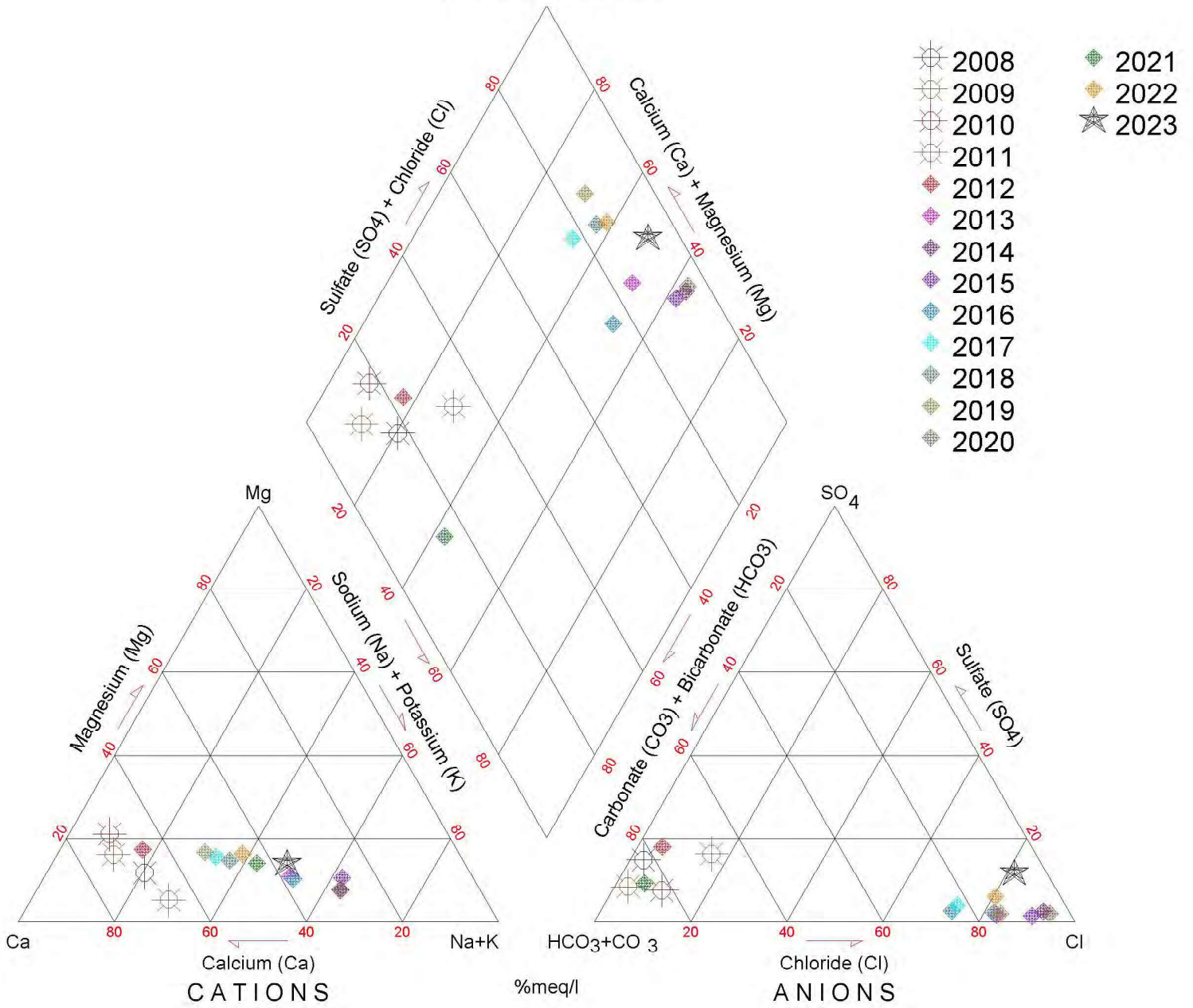
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2023 Piper Diagram



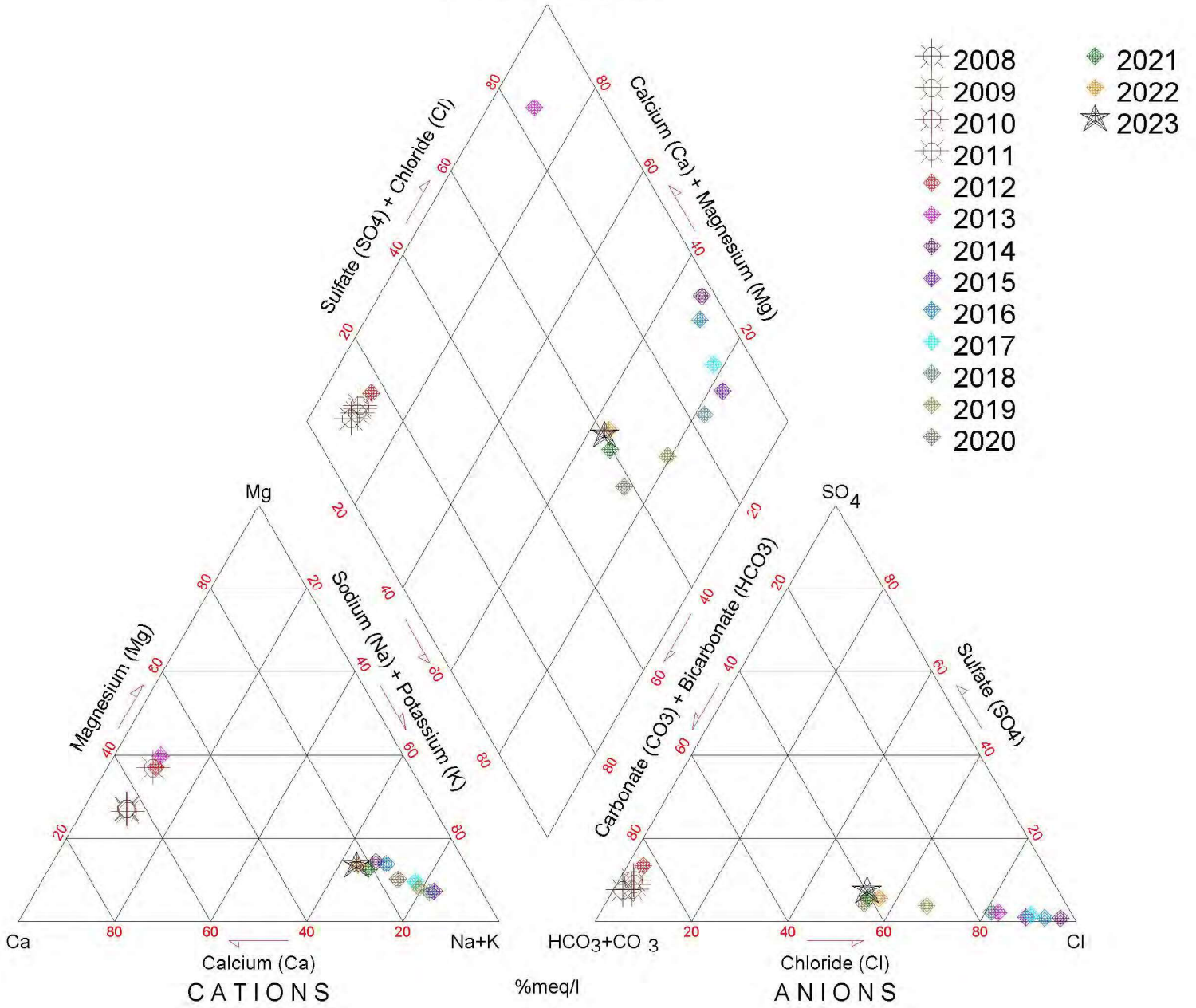
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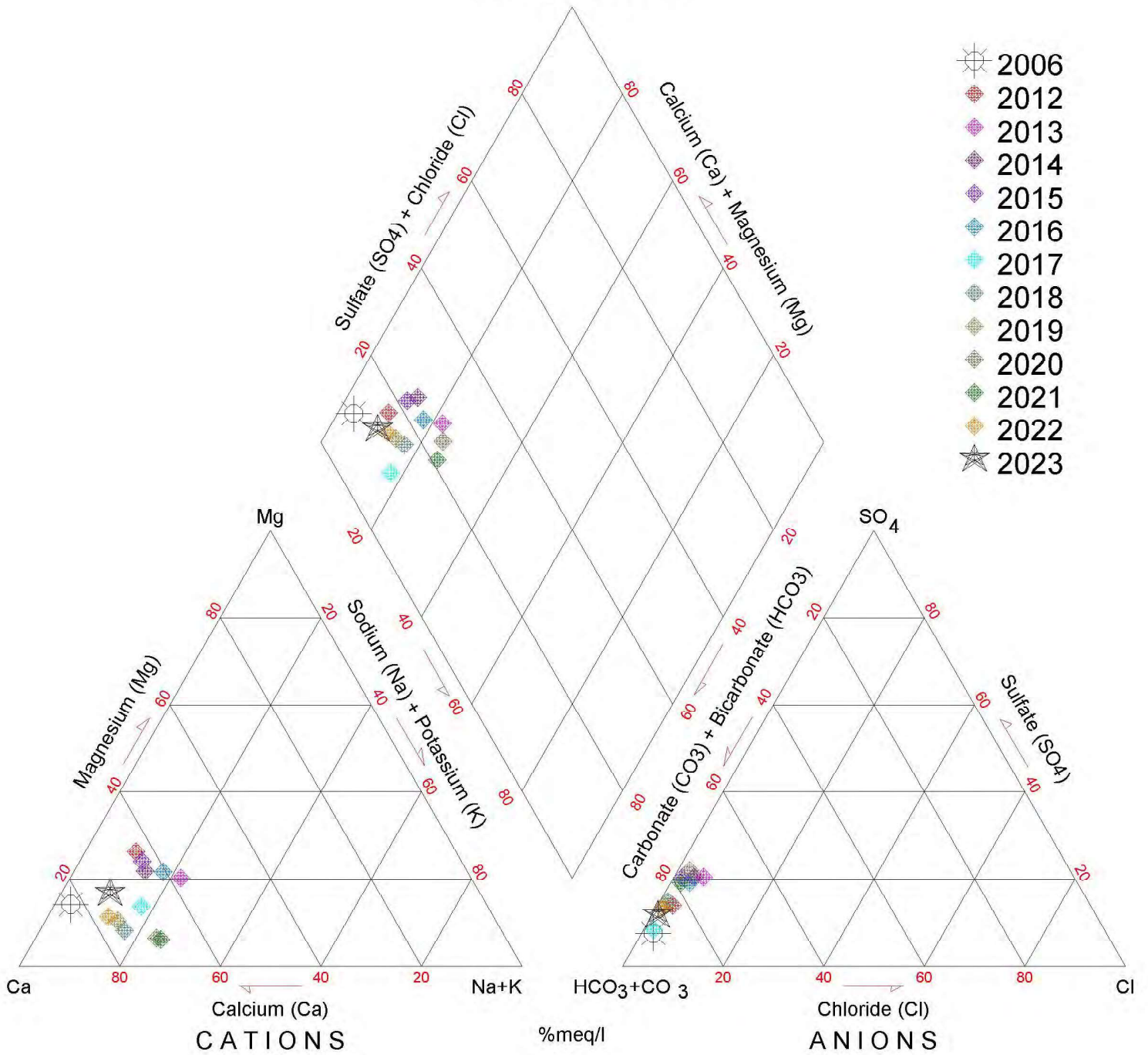
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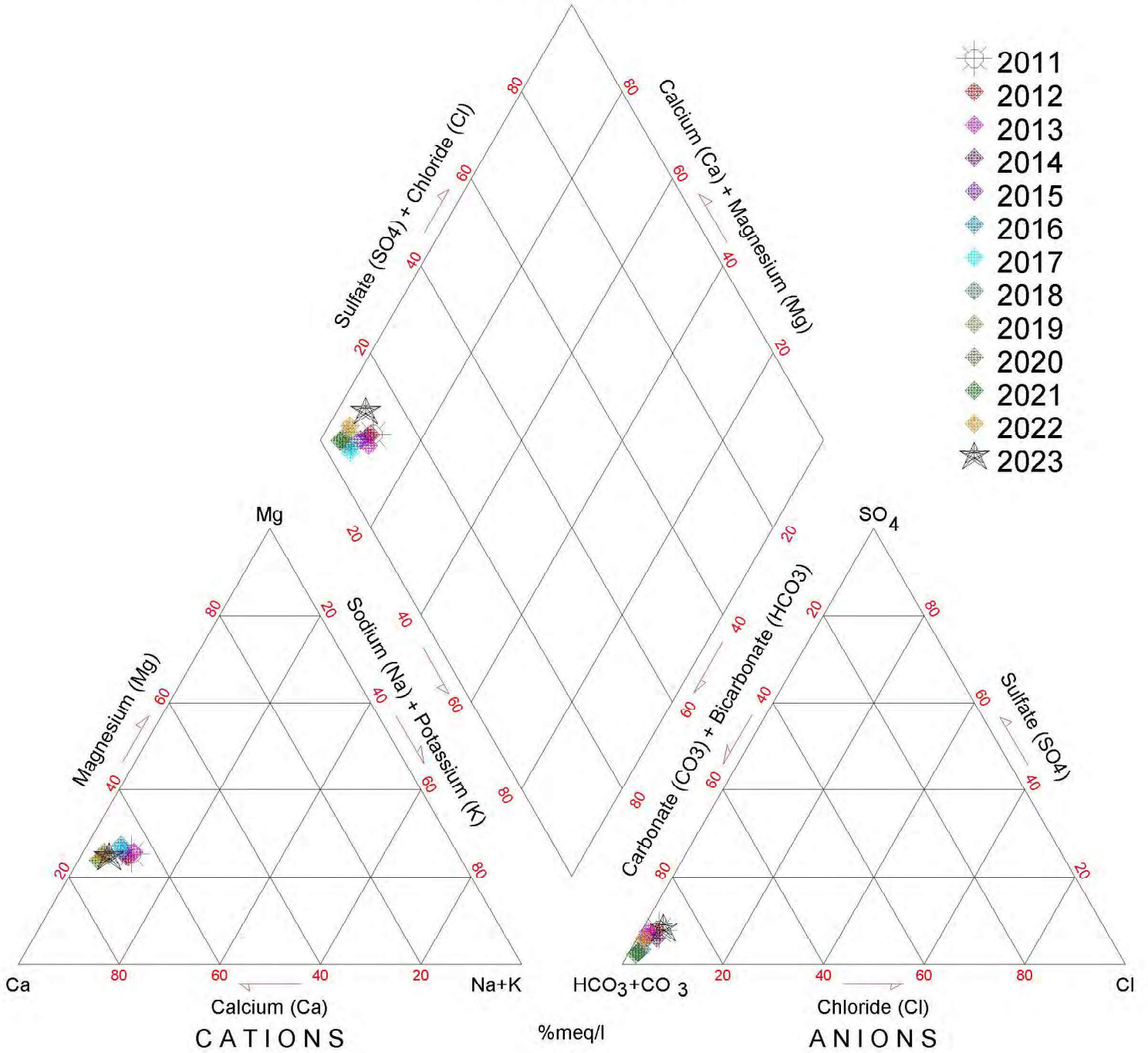
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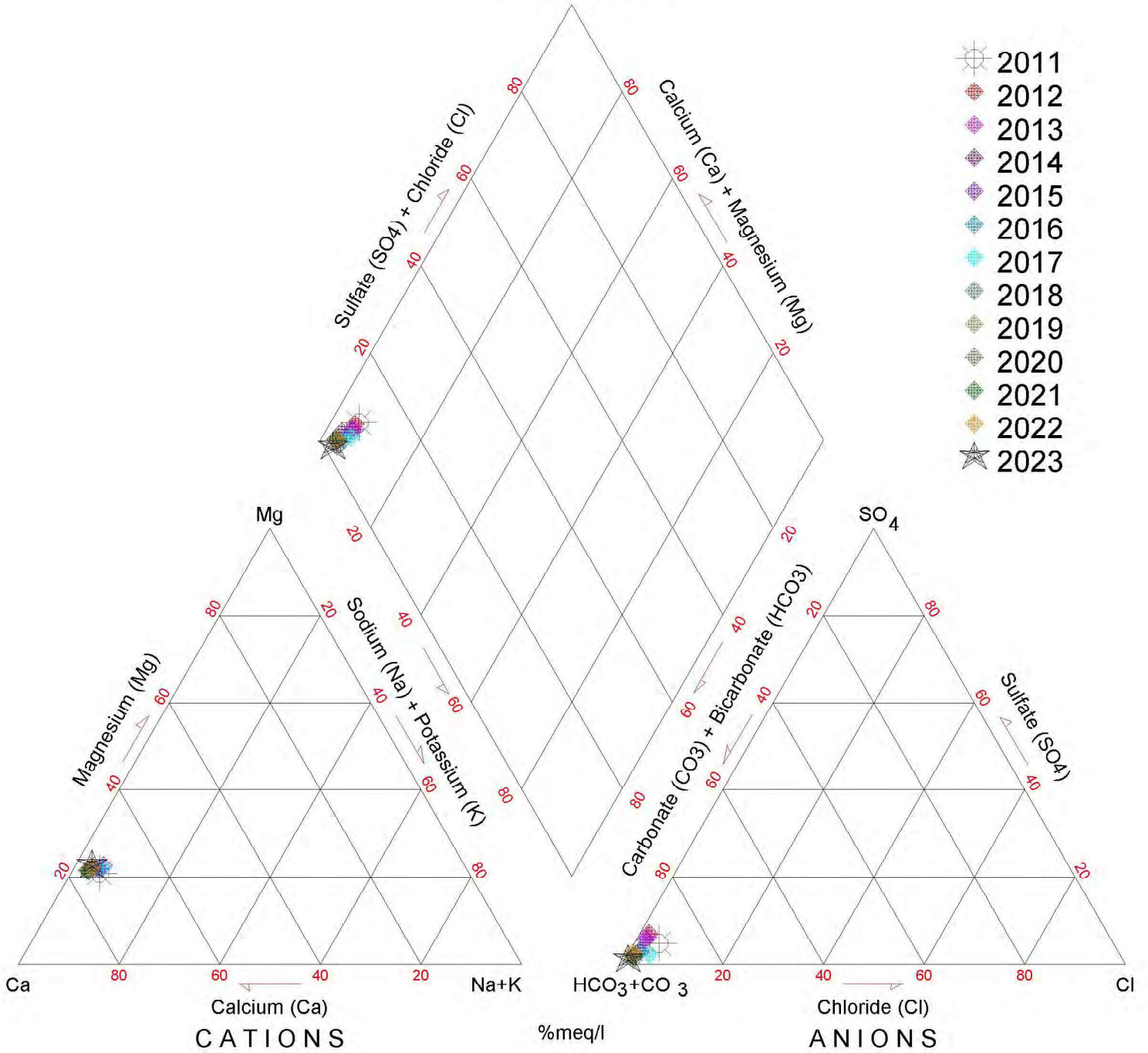
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2023 Piper Diagram



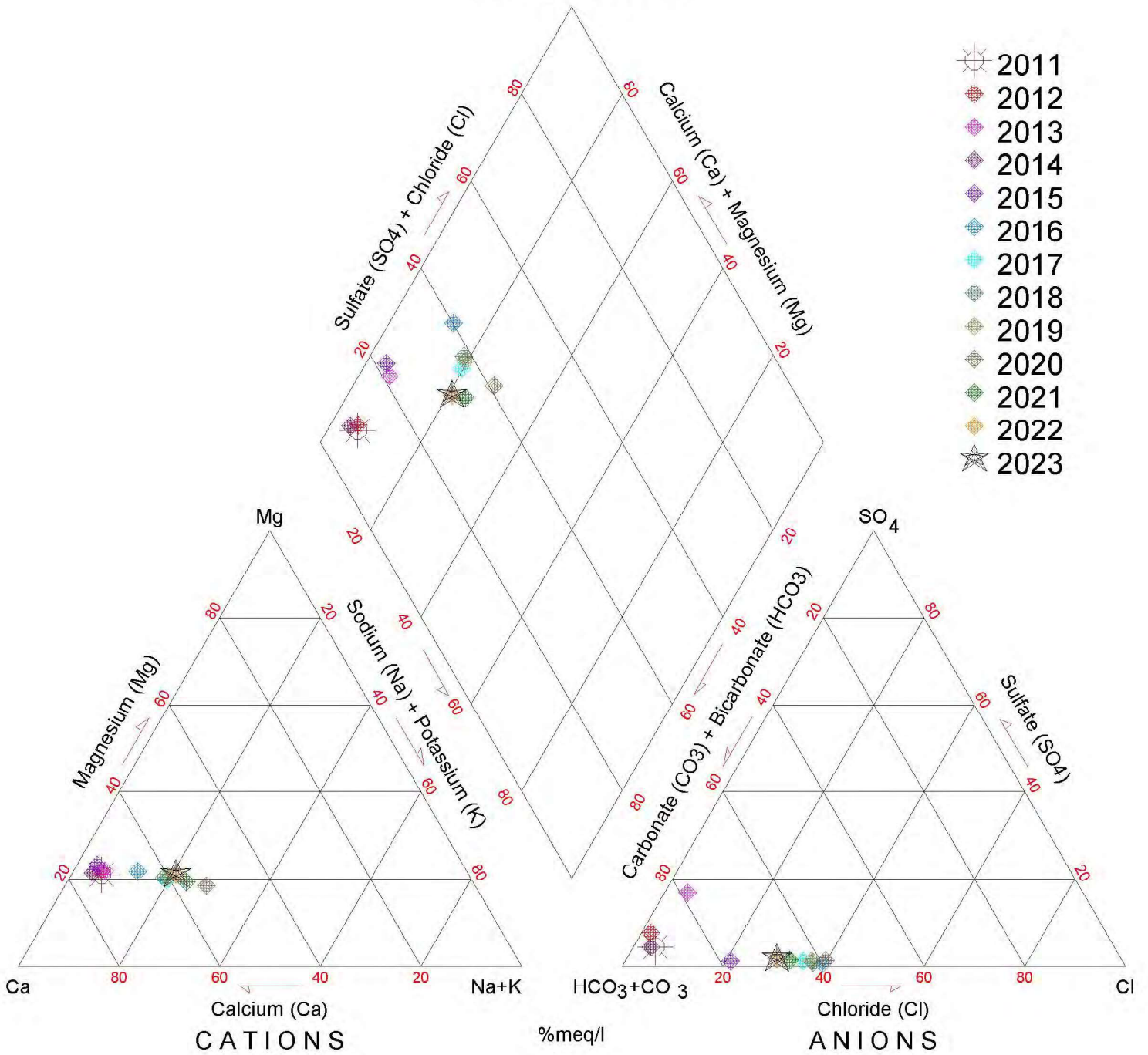
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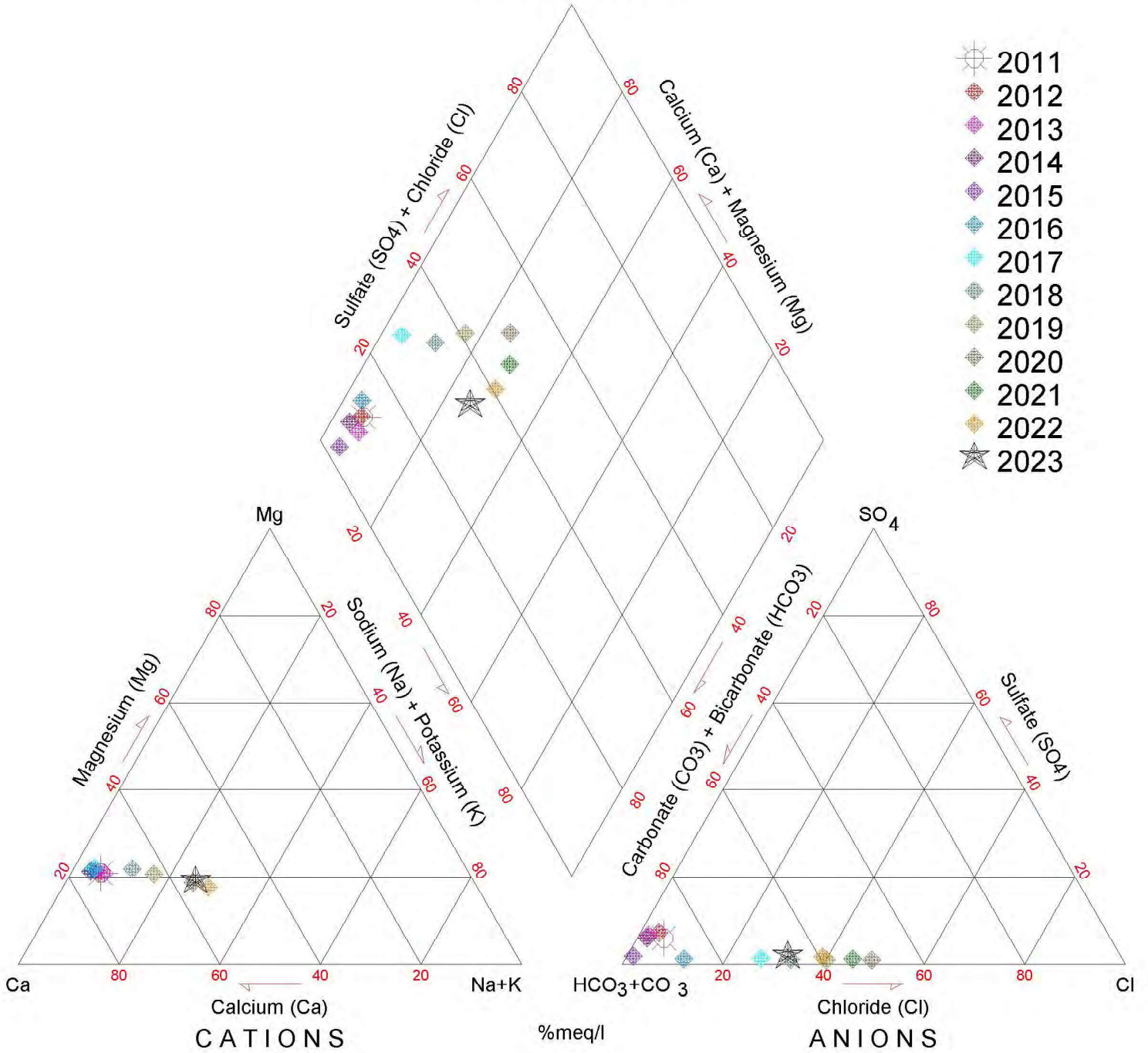
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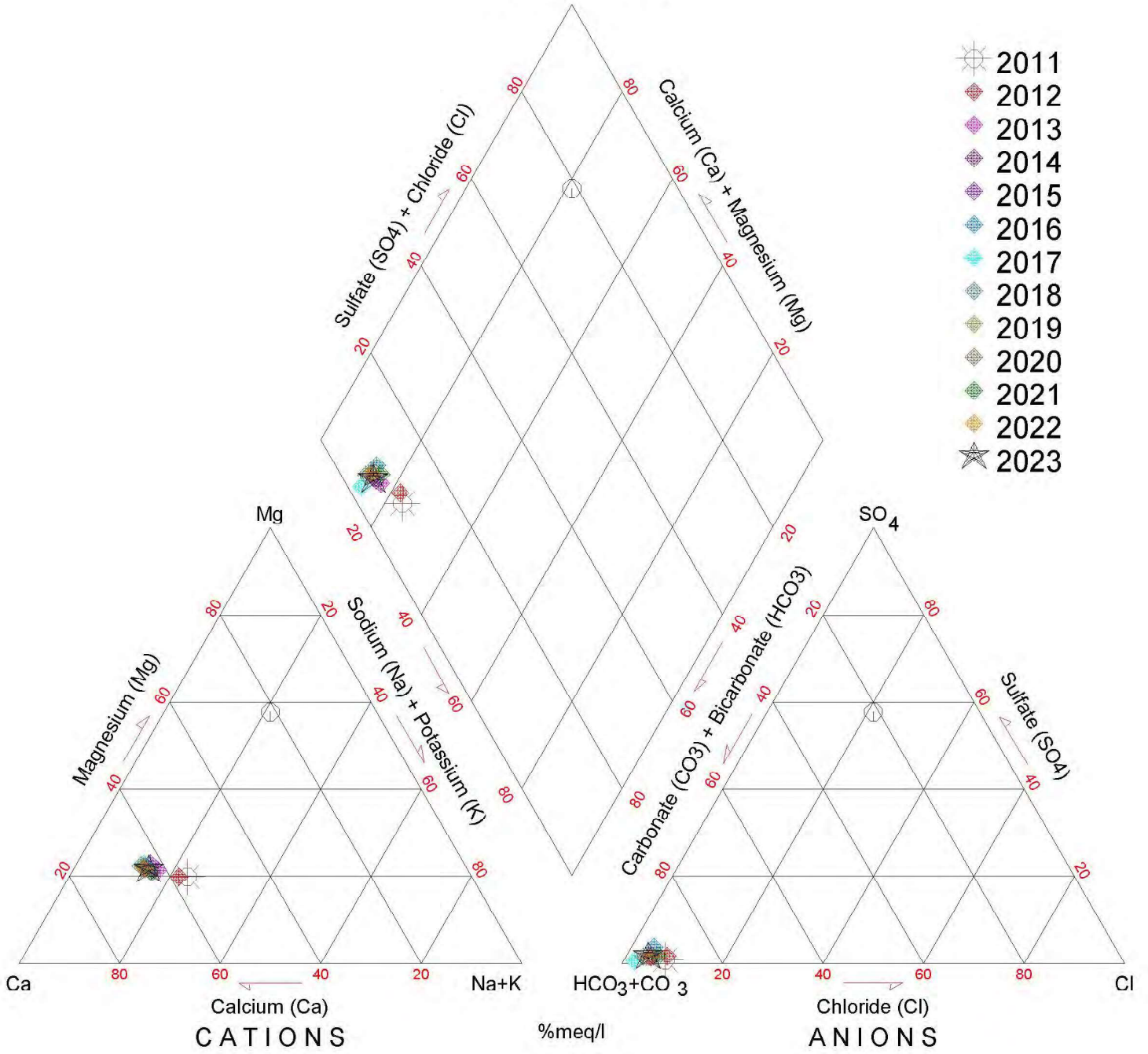
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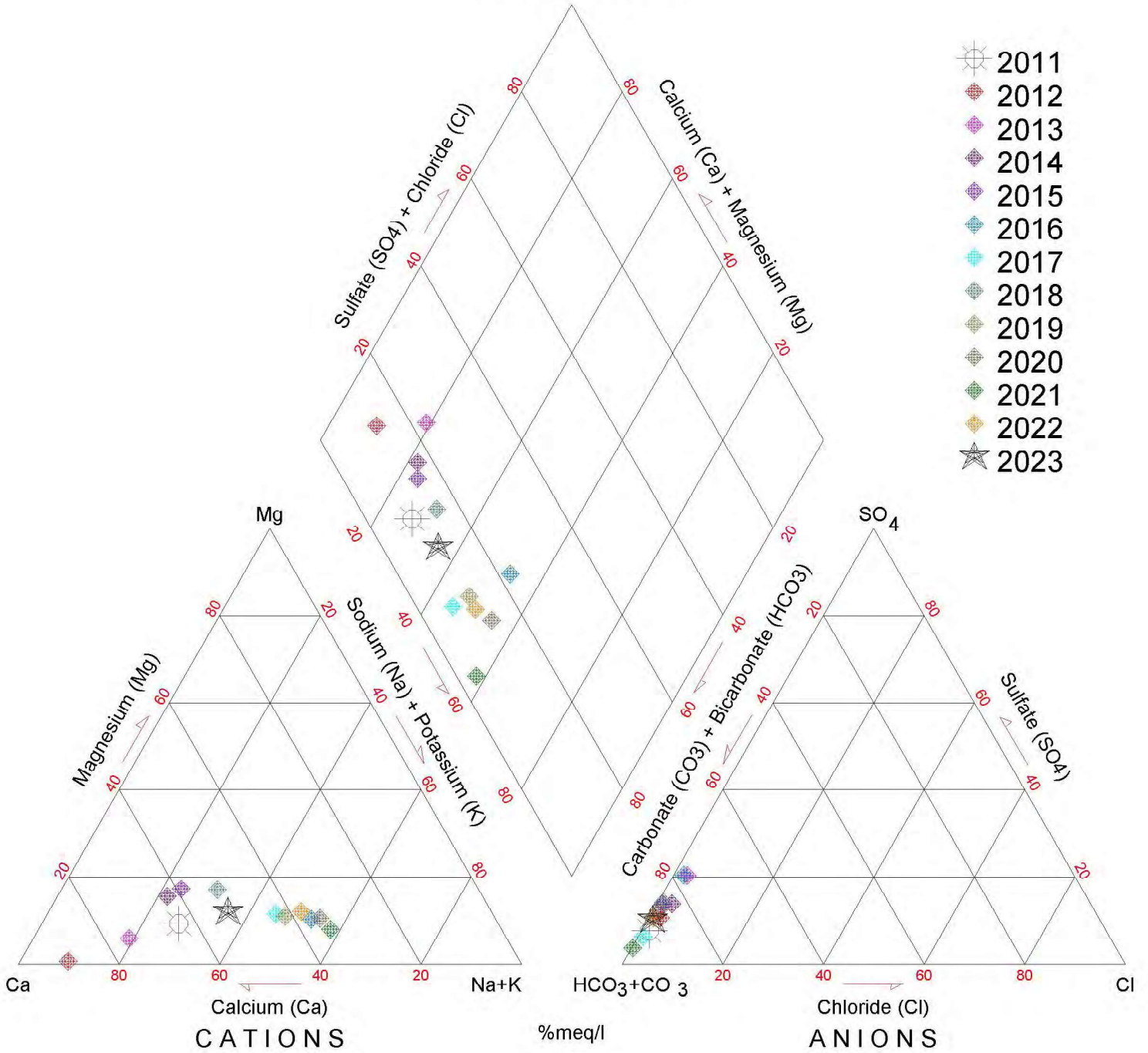
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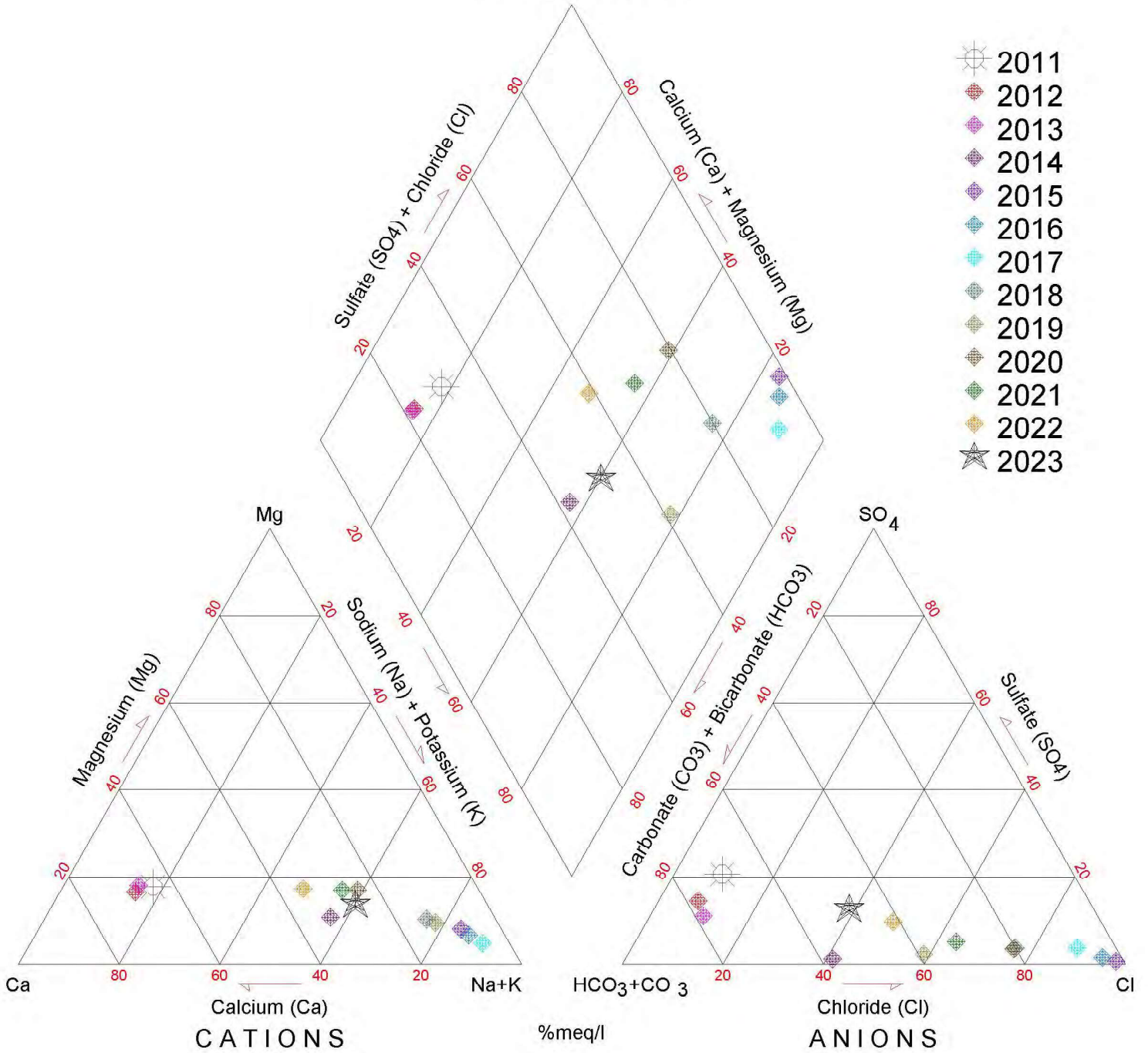
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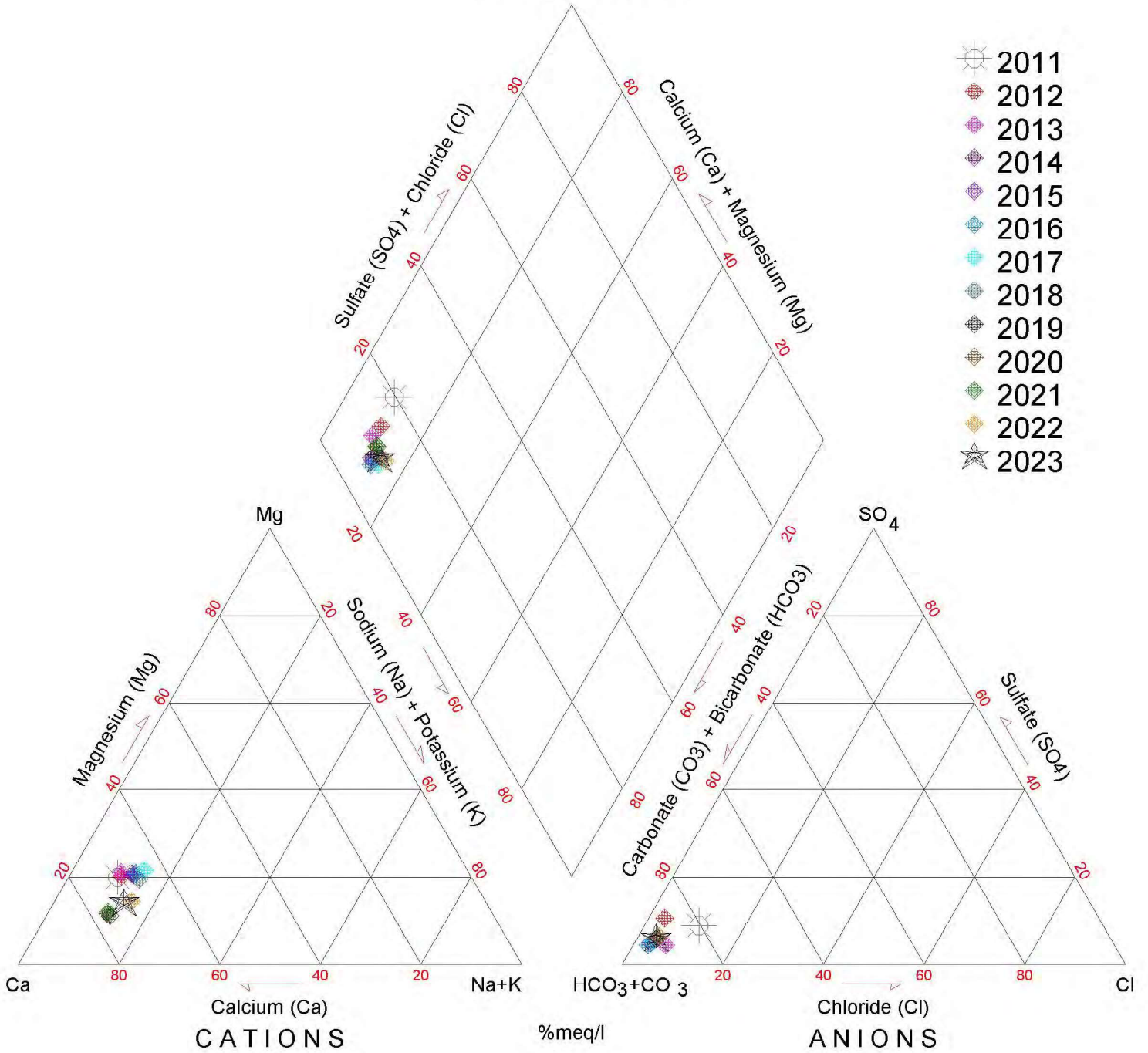
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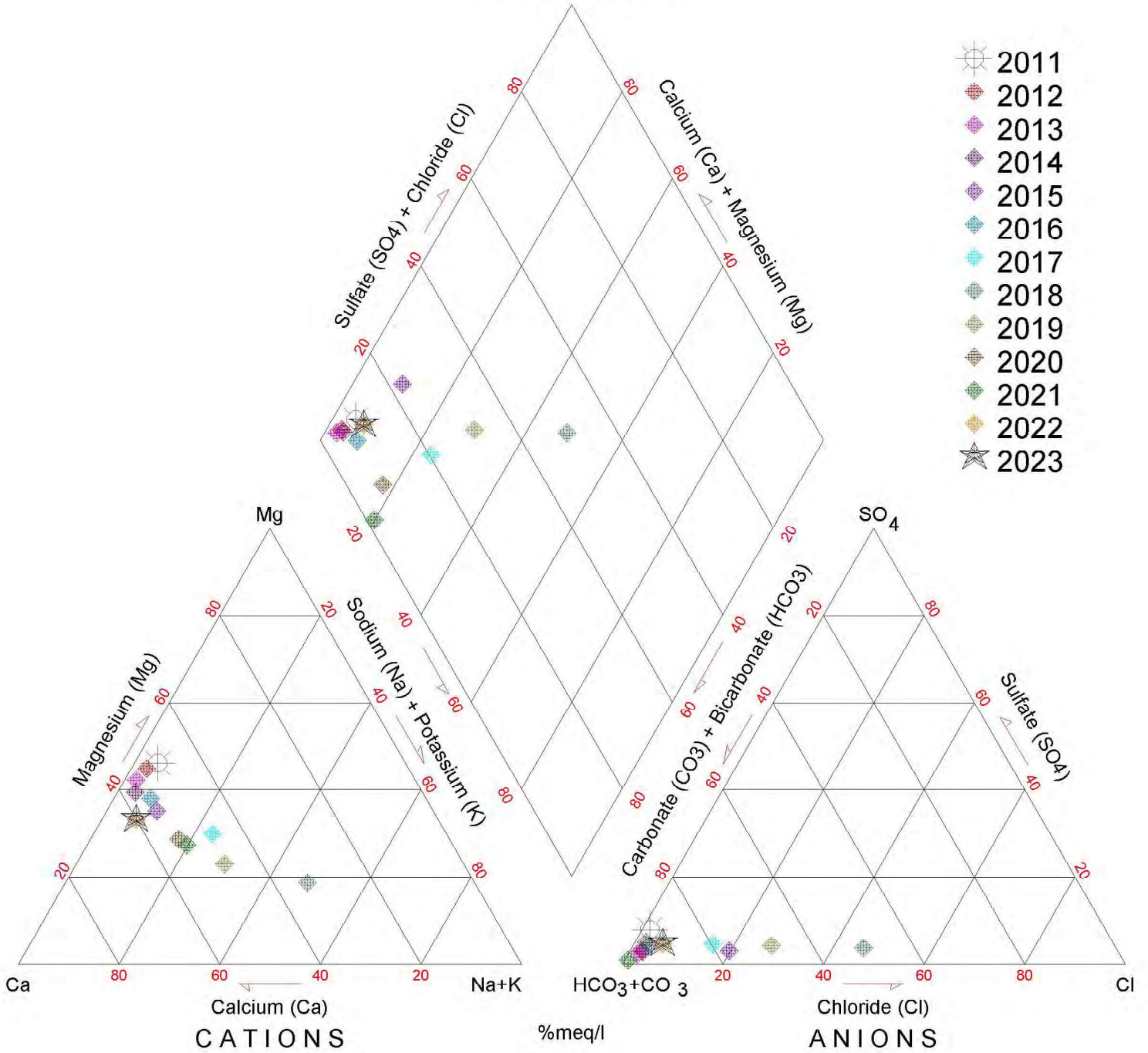
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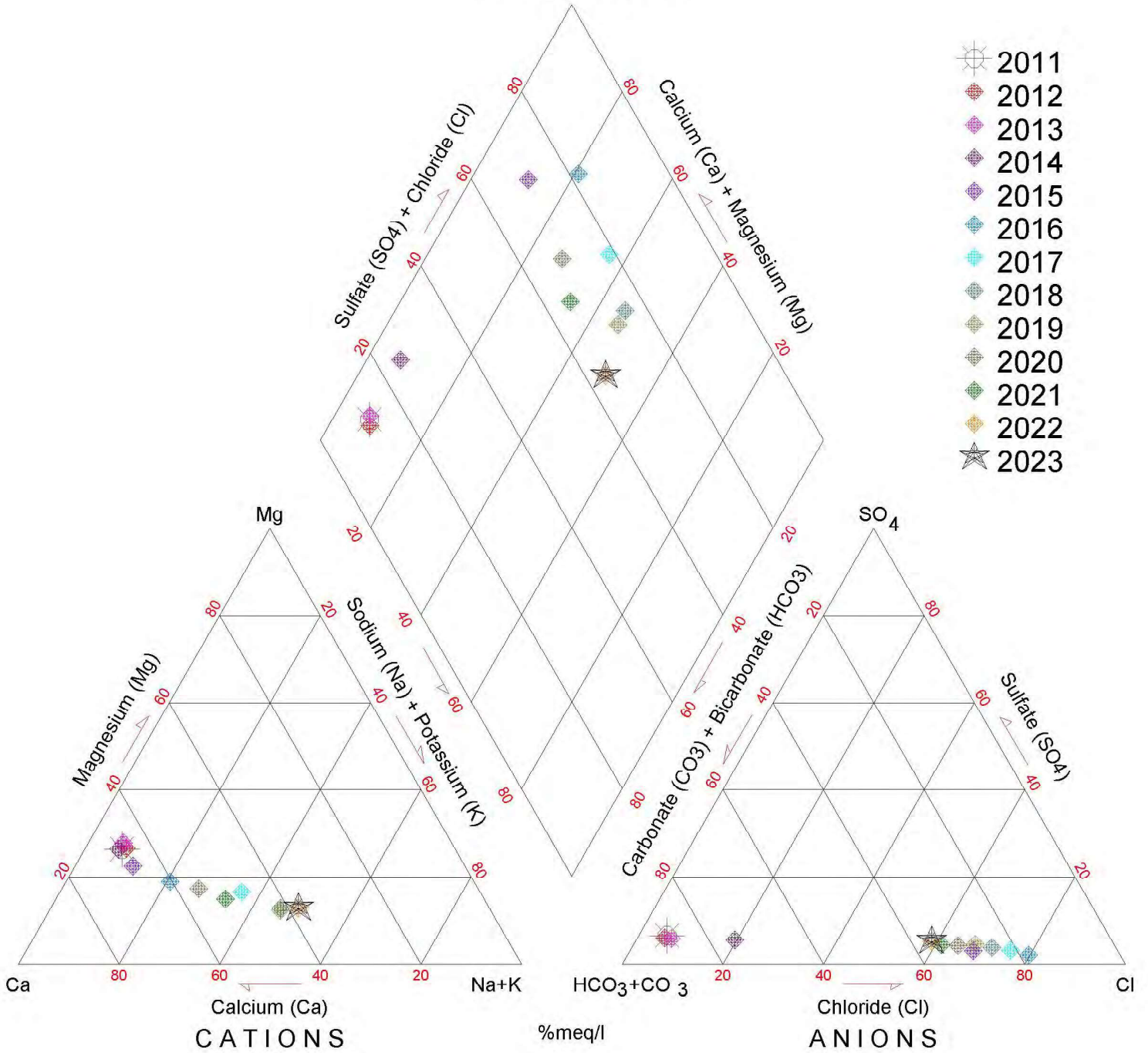
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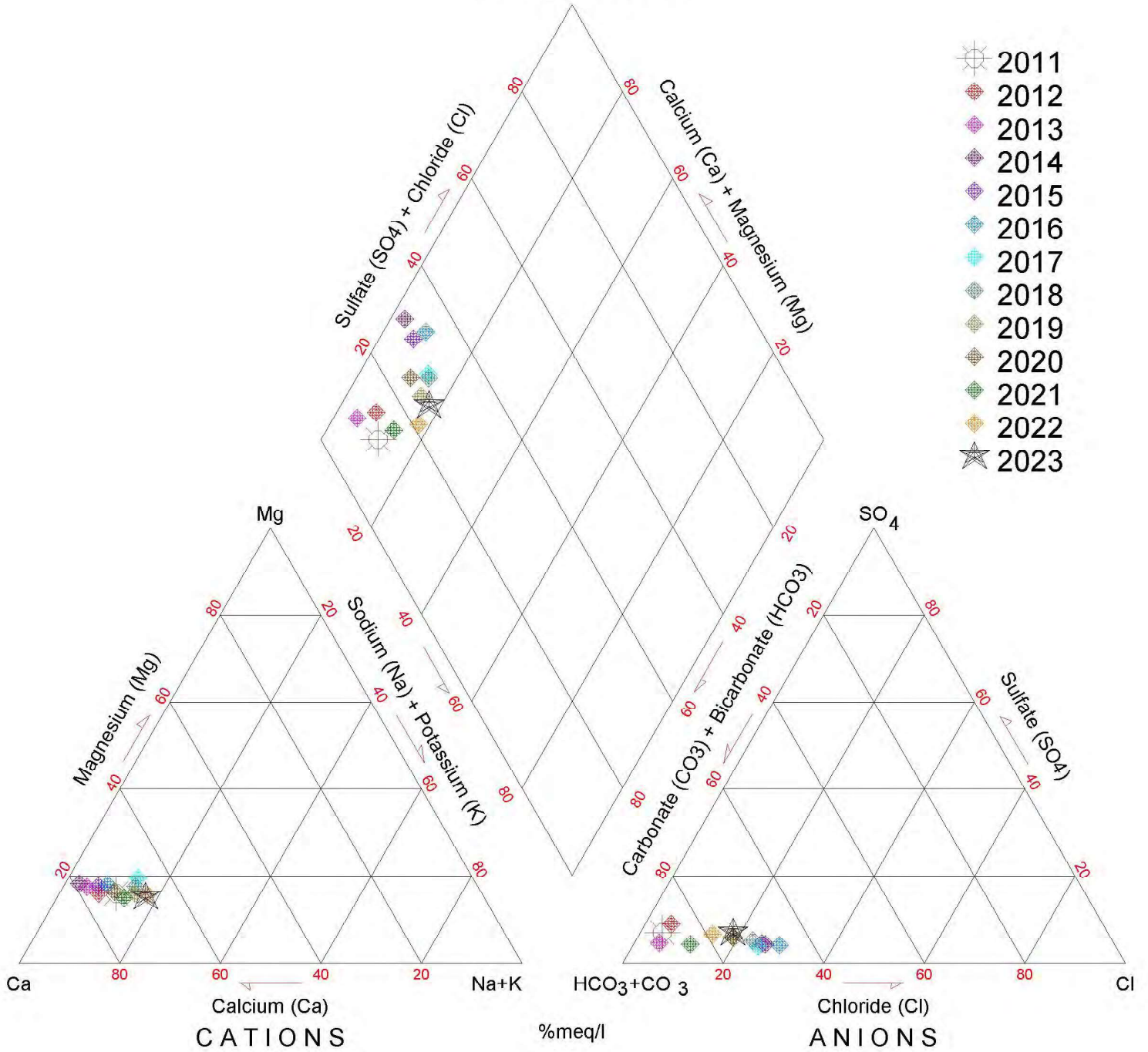
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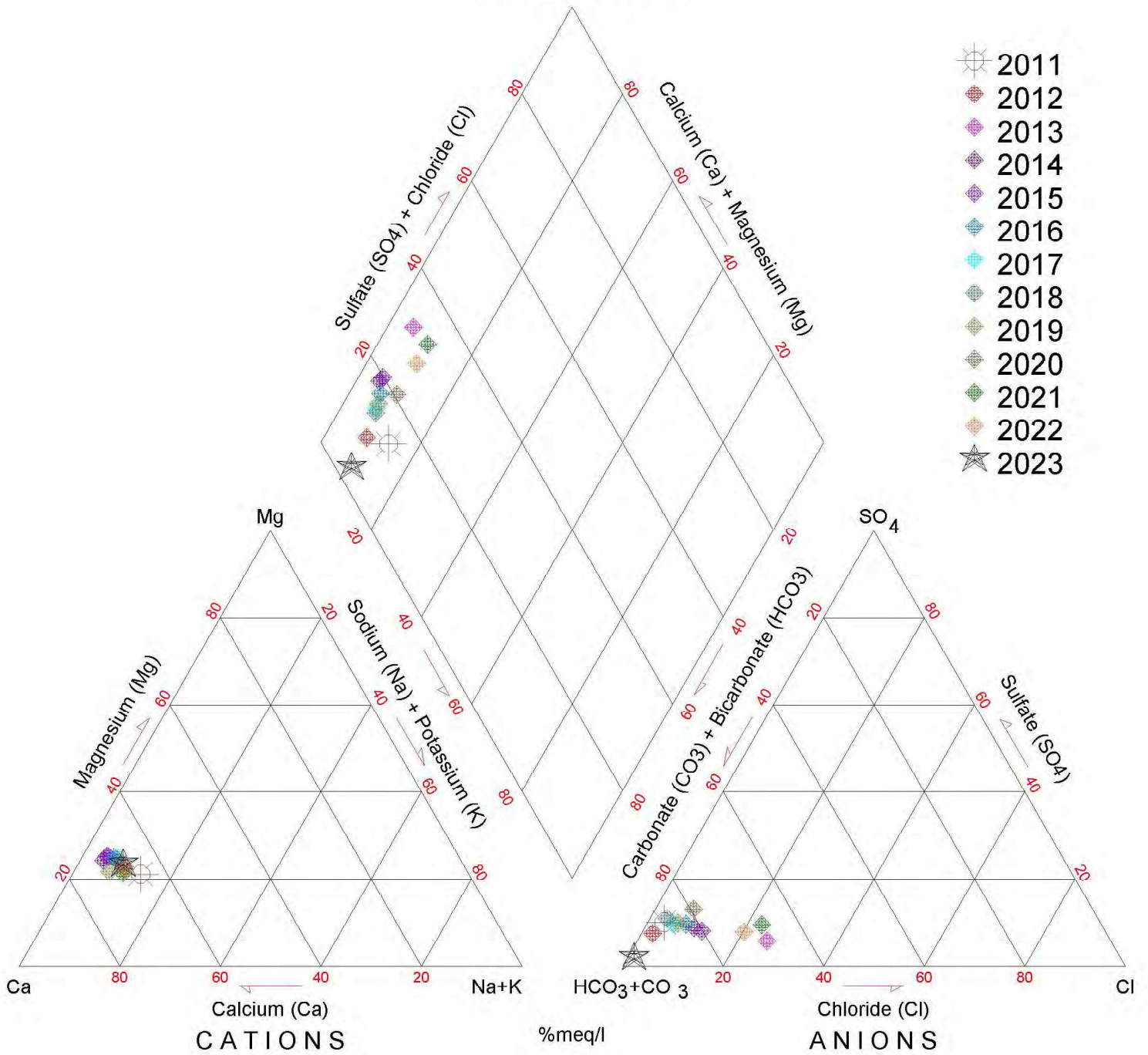
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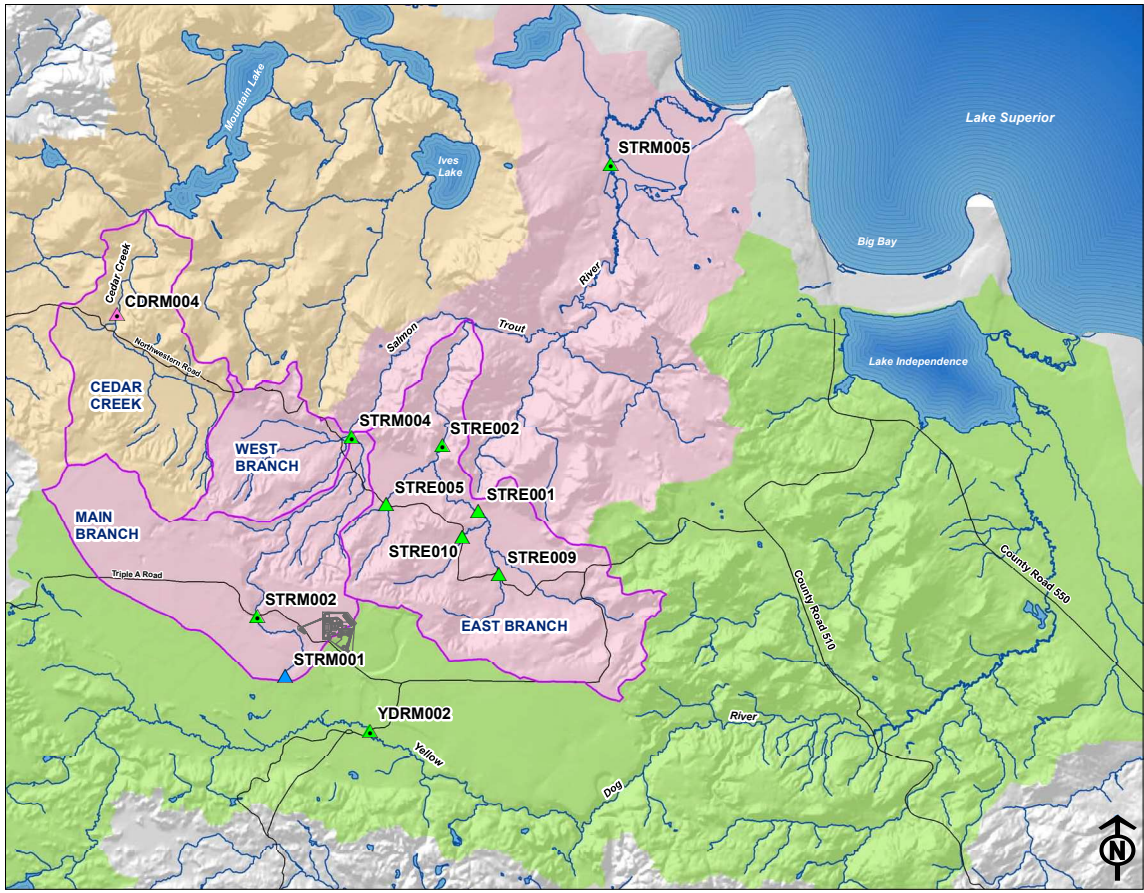
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2023 Piper Diagram



Appendix J

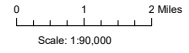
Eagle Mine Surface Water Location Map



**MINE PERMIT
SURFACE WATER
MONITORING LOCATIONS**

- ▲ COMPLIANCE WATER QUALITY
- ▲ BACKGROUND WATER QUALITY
- ▲ REFERENCE WATER QUALITY
- *Instrumented for continuous monitoring*
- PINE RIVER WATERSHED
- SALMON TROUT RIVER WATERSHED
- YELLOW DOG RIVER WATERSHED
- SUBWATERSHED
- ROAD
- ~ HYDROGRAPHY
- MINE FACILITY

Reference
 Data provided by: Eagle Mine and North Jackson Company
 Projection & Datum: UTM NAD 83 Zone 16N



Eagle Mine
 a subsidiary of **huntington**

North Jackson Company
 ENVIRONMENTAL SCIENCE & ENGINEERING



Appendix K

Eagle Mine Surface Water Results and Benchmark Summary Table

2023
 Mine Permit Surface Water Quality Monitoring Data
 Benchmark Summary Table

Location	Location Classification	Q1	Q2	Q3	Q4
STRM001	Background	pH	Iron	pH	
STRM002	Compliance				pH
STRM004	Compliance		Alkalinity Bicarbonate		
STRM005	Compliance		Alkalinity Bicarbonate, Calcium, Hardness	pH	
STRE001	Compliance	Copper			
STRE002	Compliance				
STRE005	Compliance		Alkalinity Bicarbonate, Calcium, Magnesium, Hardness		
STRE009	Compliance	Iron, Mercury	Alkalinity Bicarbonate, Calcium, Magnesium, Hardness		
STRE010	Compliance		Alkalinity Bicarbonate, Calcium, Magnesium, Hardness		Iron
YDRM002	Compliance		Iron, Manganese	Iron	
CDRM004	Compliance		Alkalinity Bicarbonate		

Parameters listed in this table had values reported that were equal to or greater than a site-specific benchmark.

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRM001 (Background)
 Eagle Mine

Parameter	Unit	Permit RL	STRM001 Seasonal Benchmark				STRM001 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain
					02/20/23	06/05/23	08/08/23	10/24/23		
Field										
D.O.	ppm	--	--	--	--	--	6.7	3.3	2.7	5.3
Flow	cfs	--	--	--	--	--	0.10	0.20	0.30	0.20
pH	SU	--	6.2-7.2	6.2-7.2	6.2-7.2	6.0-7.0	7.8	6.3	6.1	6.2
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	37.0	49.0	60.0	42.0
Temperature	°C	--	--	--	--	--	0.10	21.0	17.0	8.4
Metals										
Aluminum	ug/L	50.0	--	200	--	--	--	<50.0	--	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0	--	--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Barium	ug/L	10.0	--	40.0	--	--	--	18.7	--	--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0	<50.0	<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Cobalt	ug/L	10.0	40	40.0	40	40	<10.0	<10.0	<10.0	<10.0
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Iron	ug/L	20	875	1,616	6,195	675	379	2,630	a	2,090
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--
Manganese	ug/L	10.0	44	179	392	40	12.4	104	a	154
Mercury	ng/L	0.50	2.0	3.6	2.9	2.0	0.80	1.9		0.75
Molybdenum	ug/L	10	--	40.0	--	--	--	<10.0	--	--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0	<2.0	<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Zinc	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0	<10.0	e
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	40.0	--	--	--	29.0	--	--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0	--	--
Chloride	mg/L	1.0	--	7.3	--	--	--	<1.0	e	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e	--
Sulfate	mg/L	1.0	4.0	10.0	4.0	4.0	1.1	<1.0	e	<1.0
Major Cations										
Calcium	mg/L	0.50	--	11.0	--	--	--	7.6	--	--
Magnesium	mg/L	0.50	--	2.4	--	--	--	1.6	--	--
Potassium	mg/L	0.50	--	2.0	--	--	--	0.58	--	--
Sodium	mg/L	0.50	--	2.0	--	--	--	<1.0	--	--
General										
Hardness	mg/L	3.0	--	36.0	--	--	--	26.0	--	--
TDS	mg/L	50.0	200	200	200	200	<50.0	<50.0	e	<50.0

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRM002 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	STRM002 Seasonal Benchmark				STRM002 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow 02/15/23	Spring Snowmelt & Runoff 06/01/23	Summer Baseflow 08/08/23	Fall Rain 10/23/23
Field										
D.O.	ppm	--	--	--	--	--	12.0	7.4	7.7	10.0
Flow	cfs	--	--	--	--	--	2.6	2.4	1.8	1.9
pH	SU	--	6.8-7.8	6.5-7.5	6.3-7.3	6.5-7.5	7.1	6.5	6.6	6.4
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	56.0	47.0	57.0	50.0
Temperature	°C	--	--	--	--	--	0.30	17.0	15.0	5.5
Metals										
Aluminum	ug/L	50.0	--	200	--	--	--	75.1	a	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0	--	--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Barium	ug/L	10.0	--	40.0	--	--	--	11.4	--	--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0	<50.0	<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Cobalt	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0	<10.0	<10.0
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Iron	ug/L	20.0	304	651	703	504	224	547	a	514
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--
Manganese	ug/L	10.0	40.0	58.0	40.0	40.0	<10.0	29.9	a	16.6
Mercury	ng/L	0.50	2.0	5.8	2.4	2.8	1.5	2.7	1.4	2.0
Molybdenum	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0	<2.0	<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Zinc	ug/L	10.0	250	40.0	40.0	40.0	<10.0	<10.0	<10.0	e
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	34.0	--	--	--	28.0	--	--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0	--	--
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e	--
Sulfate	mg/L	1.0	4.0	6.2	4.0	4.0	1.9	1.4	e	1.0
Major Cations										
Calcium	mg/L	0.50	--	10.3	--	--	--	7.5	--	--
Magnesium	mg/L	0.50	--	2.0	--	--	--	1.5	--	--
Potassium	mg/L	0.50	--	2.0	--	--	--	0.61	--	--
Sodium	mg/L	0.50	--	2.0	--	--	--	<1.0	--	--
General										
Hardness	mg/L	3.0	--	32.0	--	--	--	25.0	--	--
TDS	mg/L	50.0	200	200	200	200	<50.0	<50.0	<50.0	e

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRM004 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	STRM004 Seasonal Benchmark				STRM004 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain
					02/13/23	06/05/23	08/08/23	10/24/23		
Field										
D.O.	ppm	--	--	--	--	--	14.0	9.4	9.2	11.0
Flow	cfs	--	--	--	--	--	3.5	6.1	5.2	5.8
pH	SU	--	7.0-8.0	7.3-8.3	7.2-8.2	7.2-8.2	7.8	7.5	7.5	7.2
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	83.0	87.0	94.0	97.0
Temperature	°C	--	--	--	--	--	0.30	16.0	16.0	7.9
Metals										
Aluminum	ug/L	50.0	--	993	--	--	--	332	a	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0		--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	1.6		1.4
Barium	ug/L	10.0	--	40	--	--	--	12.1		--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0		--
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0		<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20		--
Chromium	ug/L	1.0	--	4.0	--	--	--	1.1		--
Cobalt	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0		<10.0
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0		<1.0
Iron	ug/L	20.0	312	984	500	406	160	668	a	256
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0		--
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0		--
Manganese	ug/L	10.0	40.0	61.0	40.0	40.0	12.0	44.9	a	14.8
Mercury	ng/L	0.50	2.5	14	3.5	2.9	1.4	2.6		1.4
Molybdenum	ug/L	10.0	--	40	--	--	--	<10.0		--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0		<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0		<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20		--
Zinc	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0		<10.0
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	52.0	--	--	--	52.0		--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0		--
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10		--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e	--
Sulfate	mg/L	1.0	4.5	4.0	4.0	4.0	2.6	1.7	e	1.6
Major Cations										
Calcium	mg/L	0.50	--	16.0	--	--	--	14.3		--
Magnesium	mg/L	0.50	--	3.0	--	--	--	2.8		--
Potassium	mg/L	0.50	--	2.0	--	--	--	0.73		--
Sodium	mg/L	0.50	--	2.0	--	--	--	1.0		--
General										
Hardness	mg/L	3.0	--	54.0	--	--	--	47.0		--
TDS	mg/L	50.0	200	200	200	200	66.0	<50.0		<50.0

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRM005 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	STRM005 Seasonal Benchmark				STRM005 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain
					02/20/23	06/01/23	08/08/23	10/24/23		
Field										
D.O.	ppm	--	--	--	--	--	14.0	9.1	10.0	11.0
Flow	cfs	--	--	--	--	--	45.0	40.0	31.0	41.0
pH	SU	--	7.1-8.1	6.6-7.6	6.6-7.6	7.2-8.2	8.0	7.6	7.9	7.5
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	108	124	139	135
Temperature	°C	--	--	--	--	--	0.0	18.0	17.0	8.4
Metals										
Aluminum	ug/L	50.0	--	568	--	--	--	<50.0	--	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0	--	--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	1.0	<1.0	<1.0
Barium	ug/L	10.0	--	40.0	--	--	--	13.0	--	--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0	<50.0	<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Cobalt	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0	<10.0	<10.0
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	1.0	<1.0	<1.0	<1.0
Iron	ug/L	20.0	166	470	201	309	140	163	a	168
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--
Manganese	ug/L	10.0	40	40.0	40	40	<10.0	18.1	a	10.4
Mercury	ng/L	0.50	2.0	11.2	2.0	2.5	1.8	1.6		0.71
Molybdenum	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0	<2.0	<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Zinc	ug/L	10.0	40.0	89.0	40.0	40.0	<10.0	<10.0	<10.0	e
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	66.0	--	--	--	74.0		--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0		--
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10		--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e	--
Sulfate	mg/L	1.0	6.6	4.0	4.0	4.0	3.0	2.8	e	2.7
Major Cations										
Calcium	mg/L	0.50	--	19.0	--	--	--	19.7		--
Magnesium	mg/L	0.50	--	3.9	--	--	--	3.8		--
Potassium	mg/L	0.50	--	2.0	--	--	--	0.85		--
Sodium	mg/L	0.50	--	2.0	--	--	--	1.2		--
General										
Hardness	mg/L	3.0	--	65.0	--	--	--	65.0		--
TDS	mg/L	50.0	200	200	200	200	63.0	61.0		80.0

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRE001 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	STRE001 Seasonal Benchmark				STRE001 Data (Q1-Q4 2023)					
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023		
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain		
			02/14/23	05/31/23	08/09/23	10/24/23						
Field												
D.O.	ppm	--	--	--	--	--	13.0	10.0	9.8	11.0		
Flow	cfs	--	--	--	--	--	13.0	13.0	12.0	13.0		
pH	SU	--	7.3-8.3	7.0-8.0	7.1-8.1	7.2-8.2	7.8	7.7	7.8	7.7		
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	111	132	135	137		
Temperature	°C	--	--	--	--	--	2.6	13.0	13.0	8.5		
Metals												
Aluminum	ug/L	50.0	--	339	--	--	--	<50.0	--	--		
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0	--	--		
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	1.2	1.3	1.0		
Barium	ug/L	10.0	--	40.0	--	--	--	10.2	--	--		
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--		
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0	<50.0	<50.0		
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--		
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--		
Cobalt	ug/L	10.0	40	40.0	40	40	<10.0	<10.0	<10.0	<10.0		
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	4.7	<1.0	<1.0	<1.0		
Iron	ug/L	20.0	96	327	109	160	<100	119	a	100	64.7	J
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--		
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--		
Manganese	ug/L	10.0	40	40.0	40	94	10.4	14.7	a	17.5	<10.0	
Mercury	ng/L	0.50	2.0	8.6	2.0	2.2	0.64	1.1		0.68	<0.50	
Molybdenum	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--		
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0		
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0	<2.0	<2.0		
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--		
Zinc	ug/L	10.0	40	40.0	40	40	<10.0	<10.0	<10.0	e	<10.0	
Major Anions												
Alkalinity, Bicarbonate	mg/L	2.0	--	81.0	--	--	--	78.0		--	--	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0		--	--	
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e	--	--	
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10		--	--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e	--	--	
Sulfate	mg/L	1.0	6.1	4.0	4.0	4.0	3.6	2.9	e	3.0	3.0	
Major Cations												
Calcium	mg/L	0.50	--	24.0	--	--	--	21.3		--	--	
Magnesium	mg/L	0.50	--	4.6	--	--	--	4.2		--	--	
Potassium	mg/L	0.50	--	2.0	--	--	--	0.68		--	--	
Sodium	mg/L	0.50	--	2.0	--	--	--	1.2		--	--	
General												
Hardness	mg/L	3.0	--	78.0	--	--	--	70.0		--	--	
TDS	mg/L	50.0	200	200	200	200	70.0	80.0		82.0	e	55.0

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRE002 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	STRE002 Seasonal Benchmark				STRE002 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow 02/13/23	Spring Snowmelt & Runoff 6/5/23	Summer Baseflow 8/10/23	Fall Rain 10/24/23
Field										
D.O.	ppm	--	--	--	--	--	14.0	10.0	10.0	11.0
Flow	cfs	--	--	--	--	--	16.0	15.0	14.0	17.0
pH	SU	--	7.3-8.3	7.6-8.6	7.4-8.4	7.2-8.2	7.9	7.9	7.9	7.6
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	112	137	138	140
Temperature	°C	--	--	--	--	--	1.8	13.0	13.0	7.8
Metals										
Aluminum	ug/L	50	--	200	--	--	--	<50.0	--	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0	--	--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	1.4	1.3	1.0
Barium	ug/L	10.0	--	40	--	--	--	11.0	--	--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Boron	ug/L	50	200	200	200	200	<50.0	<50.0	<50.0	<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Cobalt	ug/L	10.0	40	40	40	40	<10.0	<10.0	<10.0	<10.0
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Iron	ug/L	20	165	194	191	182	124	108	a 82.0	J 79.1
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Lithium	ug/L	10.0	--	40	--	--	--	<10.0	--	--
Manganese	ug/L	10.0	40	40	40	40	<10.0	14.8	a 11.7	10.4
Mercury	ng/L	0.50	2.0	4.8	2.0	2.0	1.1	0.98	1.2	0.54
Molybdenum	ug/L	10.0	--	40	--	--	--	<10.0	--	--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0	<2.0	<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Zinc	ug/L	10.0	40	40	40	40	<10.0	<10.0	<10.0	e <10.0
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	81	--	--	--	80.0	--	--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0	--	--
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e	--
Sulfate	mg/L	1.0	5.7	4.0	4.0	4.0	3.7	3.1	e 3.2	3.1
Major Cations										
Calcium	mg/L	0.50	--	24	--	--	--	22.1	--	--
Magnesium	mg/L	0.50	--	4.7	--	--	--	4.4	--	--
Potassium	mg/L	0.50	--	2.0	--	--	--	0.64	--	--
Sodium	mg/L	0.50	--	2.0	--	--	--	1.3	--	--
General										
Hardness	mg/L	3.0	--	80	--	--	--	73.0	--	--
TDS	mg/L	50	200	200	200	200	72.0	66.0	e 66.0	<50.0

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRE005 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	STRE005 Seasonal Benchmark				STRE005 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain
					02/13/23	05/31/23	08/09/23	10/26/23		
Field										
D.O.	ppm	--	--	--	--	--	12.0	9.4	9.4	11.0
Flow	cfs	--	--	--	--	--	2.7	0.5	0.50	0.90
pH	SU	--	7.1-8.1	6.8-7.8	7.3-8.3	7.0-8.0	7.9	7.6	7.9	7.5
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	106	147	160	146
Temperature	°C	--	--	--	--	--	2.6	16.0	15.0	7.9
Metals										
Aluminum	ug/L	50.0	--	1,722	--	--	--	96.9	a	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0		--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0		<1.0
Barium	ug/L	10.0	--	40.0	--	--	--	10.6		--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0		--
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0		<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20		--
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0		--
Cobalt	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0		<10.0
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0		<1.0
Iron	ug/L	20.0	489	1,218	501	259	108	230	a	198
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0		--
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0		--
Manganese	ug/L	10.0	66.0	93.0	40.0	40.0	12.9	23.9	a	23.9
Mercury	ng/L	0.50	2.0	17.2	2.0	2.0	1.6	1.1		0.99
Molybdenum	ug/L	10.0	--	40.0	--	--	--	<10.0		--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0		<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0		<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20		--
Zinc	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0		<10.0
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	60.0	--	--	--	89.0		--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0		--
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10		--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e	--
Sulfate	mg/L	1.0	6.1	4.0	4.0	6.4	2.9	1.7	e	1.8
Major Cations										
Calcium	mg/L	0.50	--	17.0	--	--	--	26.0		--
Magnesium	mg/L	0.50	--	3.0	--	--	--	4.3		--
Potassium	mg/L	0.50	--	2.0	--	--	--	0.74		--
Sodium	mg/L	0.50	--	2.0	--	--	--	1.0		--
General										
Hardness	mg/L	3.0	--	55.0	--	--	--	87.0		--
TDS	mg/L	50.0	200	200	200	200	69.0	90.0		98.0

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRE009 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	STRE009 Seasonal Benchmark				STRE009 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow 02/13/23	Spring Snowmelt & Runoff 05/31/23	Summer Baseflow 08/09/23	Fall Rain 10/24/23
Field										
D.O.	ppm	--	--	--	--	--	14.0	8.9	7.8	9.6
Flow	cfs	--	--	--	--	--	R	2.3	4.2	5.2
pH	SU	--	7.3-8.3	6.9-7.9	7.2-8.2	6.8-7.8	7.9	7.2	7.1	7.2
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	110	117	121	67.0
Temperature	°C	--	--	--	--	--	0.60	11.0	14.0	8.0
Metals										
Aluminum	ug/L	50.0	--	405	--	--	--	<50.0	--	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0	--	--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	1.1	1.2	<1.0
Barium	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0	<50.0	<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Cobalt	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0	<10.0	<10.0
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Iron	ug/L	20.0	165	400	224	114	182	70.7 a	142	109
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--
Manganese	ug/L	10.0	40.0	40.0	36.0	40.0	23.9	16.6 a	24.6	17.7
Mercury	ng/L	0.50	2.0	6.6	2.9	2.0	2.1	0.79	0.97	0.79
Molybdenum	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0	<2.0	<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Zinc	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0	<10.0 e	<10.0
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	57.0	--	--	--	68.0	--	--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0	--	--
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0 e	--	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050 e	--	--
Sulfate	mg/L	1.0	5.7	4.0	4.0	10	2.8	2.6 e	2.5	2.6
Major Cations										
Calcium	mg/L	0.50	--	17.0	--	--	--	18.8	--	--
Magnesium	mg/L	0.50	--	3.3	--	--	--	3.5	--	--
Potassium	mg/L	0.50	--	2.0	--	--	--	0.52	--	--
Sodium	mg/L	0.50	--	2.0	--	--	--	<1.0	--	--
General										
Hardness	mg/L	3.0	--	56.0	--	--	--	61.0	--	--
TDS	mg/L	50.0	200	200	200	200	77.0	66.0	71.0 e	53.0

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 STRE010 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	STRE010 Seasonal Benchmark				STRE010 Data (Q1-Q4 2023)					
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023		
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain		
					02/13/23	05/31/23	08/09/23	10/24/23				
Field												
D.O.	ppm	--	--	--	--	--	13.0	11.0	94.0	10.0		
Flow	cfs	--	--	--	--	--	3.9	2.3	NM	4.0		
pH	SU	--	7.3-8.3	6.9-7.9	7.2-8.2	7.0-8.0	7.9	7.6	7.8	7.2		
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	118	118	125	94.0		
Temperature	°C	--	--	--	--	--	4.2	10.0	11.0	7.9		
Metals												
Aluminum	ug/L	50.0	--	431	--	--	--	<50.0	--	--		
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0	--	--		
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0		
Barium	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--		
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--		
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0	<50.0	<50.0		
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--		
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--		
Cobalt	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0	<10.0	<10.0		
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0		
Iron	ug/L	20.0	165	514	135	97	<100	88.8	a	92.1	J	100
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--		
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--		
Manganese	ug/L	10.0	40.0	43.0	40.0	40.0	10.7	<10.0	13.1	10.9		
Mercury	ng/L	0.50	2.0	9.7	2.0	2.0	0.82	0.99	0.81	1.03		
Molybdenum	ug/L	10.0	--	40.0	--	--	--	<10.0	--	--		
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0		
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0	<2.0	<2.0		
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--		
Zinc	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0	<10.0	e	<10.0	
Major Anions												
Alkalinity, Bicarbonate	mg/L	2.0	--	55	--	--	--	71.0	--	--		
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0	--	--		
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e	--		
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10	--	--		
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	0.075	e	--		
Sulfate	mg/L	1.0	5.7	4.0	4.0	4.0	3.3	2.3	e	2.3		
Major Cations												
Calcium	mg/L	0.50	--	16	--	--	--	19.9	--	--		
Magnesium	mg/L	0.50	--	3.0	--	--	--	3.5	--	--		
Potassium	mg/L	0.50	--	2.0	--	--	--	0.61	--	--		
Sodium	mg/L	0.50	--	2.0	--	--	--	<1.0	--	--		
General												
Hardness	mg/L	3.0	--	52	--	--	--	64.0	--	--		
TDS	mg/L	50.0	200	200	200	200	55.0	66.0	71.0	e	58.0	

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 YDRM002 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	YDRM002 Seasonal Benchmark				YDRM002 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain
			02/14/23	06/01/23	08/08/23	10/24/23				
Field										
D.O.	ppm	--	--	--	--	--	13.0	7.6	7.9	9.7
Flow	cfs	--	--	--	--	--	16.0	28.0	11.0	19.0
pH	SU	--	7.3-8.3	6.1-7.1	6.6-7.6	6.6-7.6	7.1	6.8	6.9	6.8
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	49.0	46.0	76.0	60.0
Temperature	°C	--	--	--	--	--	0.0	19.0	17.0	7.9
Metals										
Aluminum	ug/L	50.0	--	200	--	--	--	119	a	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0		--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0		1.2
Barium	ug/L	10.0	--	40.0	--	--	--	<10.0		--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0		--
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0		<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20		--
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0		--
Cobalt	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0		<10.0
Copper	ug/L	1.0	4.0	6.8	4.0	4.0	<1.0	<1.0		<1.0
Iron	ug/L	20.0	165	1,192	1,270	1,207	680	1,240	a	1,310
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0		--
Lithium	ug/L	10.0	--	40.0	--	--	--	<10.0		--
Manganese	ug/L	10.0	40.0	50.0	40.0	40.0	27.2	50.3	a	29.5
Mercury	ng/L	0.50	2.0	8.1	3.1	6.0	2.0	3.1		1.5
Molybdenum	ug/L	10.0	--	40.0	--	--	--	<10.0		--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0		<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0		<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20		--
Zinc	ug/L	10.0	40.0	40.0	40.0	40.0	<10.0	<10.0		<10.0
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	30.0	--	--	--	25.0		--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0		--
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10		--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e	--
Sulfate	mg/L	1.0	5.7	10	4.0	24	3.0	2.3	e	2.7
Major Cations										
Calcium	mg/L	0.50	--	10.0	--	--	--	7.5		--
Magnesium	mg/L	0.50	--	2.1	--	--	--	1.6		--
Potassium	mg/L	0.50	--	2.0	--	--	--	<0.50		--
Sodium	mg/L	0.50	--	2.0	--	--	--	<1.0		--
General										
Hardness	mg/L	3.0	--	32.0	--	--	--	25.0		--
TDS	mg/L	50.0	200	200	200	200	<50.0	<50.0	e	<50.0

Explanations of abbreviations are included on the final page of this table.

2023
 Mine Permit Surface Water Quality Monitoring Data
 CDRM004 (Compliance)
 Eagle Mine

Parameter	Unit	Permit RL	CDRM004 Seasonal Benchmark				CDRM004 Data (Q1-Q4 2023)			
			Q1	Q2	Q3	Q4	Q1 2023	Q2 2023	Q3 2023	Q4 2023
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow 02/14/23	Spring Snowmelt & Runoff 06/05/23	Summer Baseflow 08/10/23	Fall Rain 10/24/23
Field										
D.O.	ppm	--	--	--	--	--	11.0	10.0	10.0	11.0
Flow	cfs	--	--	--	--	--	13.0	11.0	11.0	13.0
pH	SU	--	7.3-8.3	7.2-8.2	7.2-8.2	7.2-8.2	7.9	7.7	7.9	7.4
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	114	140	144	141
Temperature	°C	--	--	--	--	--	1.8	13.0	13.0	7.4
Metals										
Aluminum	ug/L	50.0	--	258	--	--	--	<50.0	--	--
Antimony	ug/L	2.0	--	8.0	--	--	--	<2.0	--	--
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	1.2	2.2	2.3	1.5
Barium	ug/L	10.0	--	40	--	--	--	12.0	--	--
Beryllium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Boron	ug/L	50.0	200	200	200	200	<50.0	<50.0	<50.0	<50.0
Cadmium	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Chromium	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Cobalt	ug/L	10.0	40	40	40	40	<10.0	<10.0	<10.0	<10.0
Copper	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Iron	ug/L	20.0	165	358	309	195	<100	159	a 143	117
Lead	ug/L	1.0	--	4.0	--	--	--	<1.0	--	--
Lithium	ug/L	10.0	--	40	--	--	--	<10.0	--	--
Manganese	ug/L	10.0	40	57	44	96	<10.0	18.0	a 14.0	11.3
Mercury	ng/L	0.50	2.0	8.1	2.0	2.0	0.67	0.94	0.80	0.64
Molybdenum	ug/L	10.0	--	40	--	--	--	<10.0	--	--
Nickel	ug/L	1.0	4.0	4.0	4.0	4.0	<1.0	<1.0	<1.0	<1.0
Selenium	ug/L	2.0	8.0	8.0	8.0	8.0	<2.0	<2.0	<2.0	<2.0
Silver	ug/L	0.20	--	0.80	--	--	--	<0.20	--	--
Zinc	ug/L	10.0	40	40	40	40	<10.0	<10.0	<10.0	e <10.0
Major Anions										
Alkalinity, Bicarbonate	mg/L	2.0	--	85	--	--	--	86.0	--	--
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--	<2.0	--	--
Chloride	mg/L	1.0	--	4.0	--	--	--	<1.0	e --	--
Fluoride	mg/L	0.10	--	0.40	--	--	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--	<0.050	e --	--
Sulfate	mg/L	1.0	5.7	4.0	4.0	4.0	2.6	1.7	e 1.6	1.9
Major Cations										
Calcium	mg/L	0.50	--	25	--	--	--	24.3	--	--
Magnesium	mg/L	0.50	--	4.0	--	--	--	3.9	--	--
Potassium	mg/L	0.50	--	2.0	--	--	--	0.64	--	--
Sodium	mg/L	0.50	--	2.0	--	--	--	1.3	--	--
General										
Hardness	mg/L	3.0	--	80	--	--	--	77.0	--	--
TDS	mg/L	50.0	200	200	200	200	67.0	78.0	80.0	e 79.0

Explanations of abbreviations are included on the final page of this table.

2023
Mine Permit Surface Water Quality Monitoring Data
Abbreviations & Data Qualifiers
Eagle Mine

Abbreviation or Data Qualifier	Explanation
a	Estimated value. Duplicate precision for this parameter exceeded quality control limit.
b	Estimated value. Sample received after EPA established hold time expired.
e	Estimated value. The laboratory statement of data qualifications indicates that a quality control limit for this parameter was exceeded.
NM	Not measured.
p	Pending. Some parameters/locations require additional baseline data to calculate a benchmark.
Q	Quarter.
R	Measured value was rejected based on quality control procedures.
RL	Laboratory reporting limit.
s	Potential false positive value. Compound present in blank sample.
t	Trending. Benchmarks are not proposed for baseline datasets that appear to be trending (using samples collected through Q4 2012) because the data do not represent a random distribution about the baseline mean. Trend analysis is recommended in place of benchmark screening for parameters that appear to be trending.
	Value is equal to or above site-specific benchmark at a compliance monitoring.

Appendix L

Eagle Mine Surface Water Monitoring Trend Analysis Summary & Trending Charts

**2023 Mine Permit Surface Water
Trend Analysis Summary
Eagle Mine**

Location		Classification	Parameter	Unit	# Samples	# NDs	Non-detects handling	# used in Runs Test	Min	Max	Mean	St. Dev.	# Above Mean	# Below Mean	# Equal Mean	# Runs	Critical value	Sig level	Trend?	Remarks
STRM002	1	Compliance	Calcium	mg/L	5	0	No NDs	5	7.9	9.3	8.62	0.57	3	2	0	2	2	0.25	Y	
STRM002	1	Compliance	Potassium	mg/L	5	0	No NDs	5	0.5	0.67	0.6	0.04	3	2	0	2	2	0.25	Y	
STRM005	1	Compliance	Iron	ug/L	13	0	No NDs	13	120.0	337	164.0	56.20	3	10	0	3	3	0.05	Y	
CDRM004	2	Reference	Calcium	mg/L	16	0	No NDs	16	8.1	24.3	17.2	4.20	9	7	0	4	5	0.05	Y	
CDRM004	2	Reference	Nitrogen, Nitrate	mg/L	16	6	Included as RL	16	0.1	0.1	0.1	0.02	7	9	0	5	5	0.05	Y	
STRE001	2	Compliance	Barium	ug/L	16	12	Included as RL	16	10.0	11.1	10.1	0.29	4	12	0	4	4	0.05	Y	
STRE001	2	Compliance	Sodium	mg/L	16	0	No NDs	16	0.6	1.4	1.0	0.23	10	6	0	4	5	0.05	Y	
STRE002	2	Compliance	Cadmium	ug/L	14	13	Included as RL	14	0.2	0.5	0.2	0.08	2	12	0	2	2	0.05	Y	Non-unique RL in data
STRE002	2	Compliance	Zinc	ug/L	14	12	Included as RL	14	10.0	25	11.0	4.10	2	12	0	2	2	0.05	Y	
STRE005	2	Compliance	Alkalinity, Bicarbonate	mg/L	12	0	No NDs	12	17.0	107	50.0	26.53	6	6	0	2	3	0.05	Y**	
STRE005	2	Compliance	Calcium	mg/L	12	0	No NDs	12	5.7	26	14.3	5.40	6	6	0	2	3	0.05	Y**	
STRE005	2	Compliance	Magnesium	mg/L	12	0	No NDs	12	1.3	4.3	2.6	0.82	6	6	0	2	3	0.05	Y**	
STRE005	2	Compliance	Sodium	mg/L	12	4	Included as RL	12	0.5	1.2	0.9	0.20	6	6	0	2	3	0.05	Y	Non-unique RL in data
STRE010	2	Compliance	Calcium	mg/L	12	0	No NDs	12	8.6	19.9	14.5	3.59	6	6	0	2	3	0.05	Y**	
STRE010	2	Compliance	Sodium	mg/L	12	4	Included as RL	12	0.7	1.1	0.9	0.13	6	6	0	2	3	0.05	Y	Non-unique RL in data
STRM002	2	Compliance	Chloride	mg/L	18	9	Included as RL	18	1.0	1.7	1.2	0.25	9	9	0	5	6	0.05	Y	
STRM002	2	Compliance	Mercury	ng/L	18	0	No NDs	18	1.6	5.54	3.3	1.11	9	9	0	5	6	0.05	Y	
STRM002	2	Compliance	Potassium	mg/L	18	4	Included as RL	18	0.4	0.68	0.6	0.07	9	9	0	5	6	0.05	Y	Non-unique RL in data
STRM004	2	Compliance	TDS	mg/L	15	5	Included as RL	15	48.0	124	63.4	22.10	5	10	0	3	4	0.05	Y	Non-unique RL in data
STRM005	2	Compliance	Barium	ug/L	14	3	Included as RL	14	10.0	13.1	11.3	1.34	7	7	0	4	4	0.05	Y	
STRM005	2	Compliance	Calcium	mg/L	14	0	No NDs	14	4.1	19.7	12.4	4.53	7	7	0	4	4	0.05	Y	
STRM005	2	Compliance	Sodium	mg/L	14	3	Included as RL	14	0.5	1.3	1.0	0.22	7	7	0	4	4	0.05	Y	Non-unique RL in data
YDRM002	2	Compliance	Chloride	mg/L	18	7	Included as RL	18	1.0	1.5	1.2	0.18	9	9	0	5	6	0.05	Y	
CDRM004	3	Reference	Mercury	ng/L	14	0	No NDs	14	0.4	2.63	1.1	0.52	4	10	0	3	3	0.05	Y	Non-unique RL in data
STRE001	3	Compliance	Iron	ug/L	13	0	No NDs	13	72.0	180	120.0	36.30	7	6	0	3	4	0.05	Y	Non-unique RL in data
STRE001	3	Compliance	TDS	mg/L	13	0	No NDs	13	52.0	196	83.2	38.00	3	10	0	3	3	0.05	Y	Non-unique RL in data
STRE002	3	Compliance	Mercury	ng/L	13	1	Included as RL	13	0.5	2.09	1.0	0.40	6	7	0	4	4	0.05	Y	Non-unique RL in data
STRE002	3	Compliance	TDS	mg/L	13	0	No NDs	13	54.0	108	79.8	19.80	6	7	0	4	4	0.05	Y	Non-unique RL in data
STRM001	3	Background	Iron	ug/L	14	0	No NDs	14	651.0	5860	2179.0	1425.00	7	7	0	4	4	0.05	Y	Non-unique RL in data
STRM002	3	Compliance	Manganese	ug/L	14	6	Included as RL	14	10.0	23	12.9	4.62	4	10	0	3	3	0.05	Y	
STRM004	4	Compliance	pH	SU	15	0	No NDs	15	7.0	8	7.5	0.26	10	5	0	4	4	0.05	Y	

Mine Permit Surface Water Trend Analysis
Notes and Abbreviations Used in Statistical Summary Tables
Eagle Mine

Abbreviation	Explanation
Y	Null Hypothesis that the sequence was produced in a random manner cannot be accepted at the indicated significance level (i.e., a trend in data cannot be ruled out).
Y*	In addition to a trend being identified, the parameter exceeded the limit at least two times in a row.
ND	Non detect (reported concentration was below the analytical reporting limit).
RL	Reporting limit.

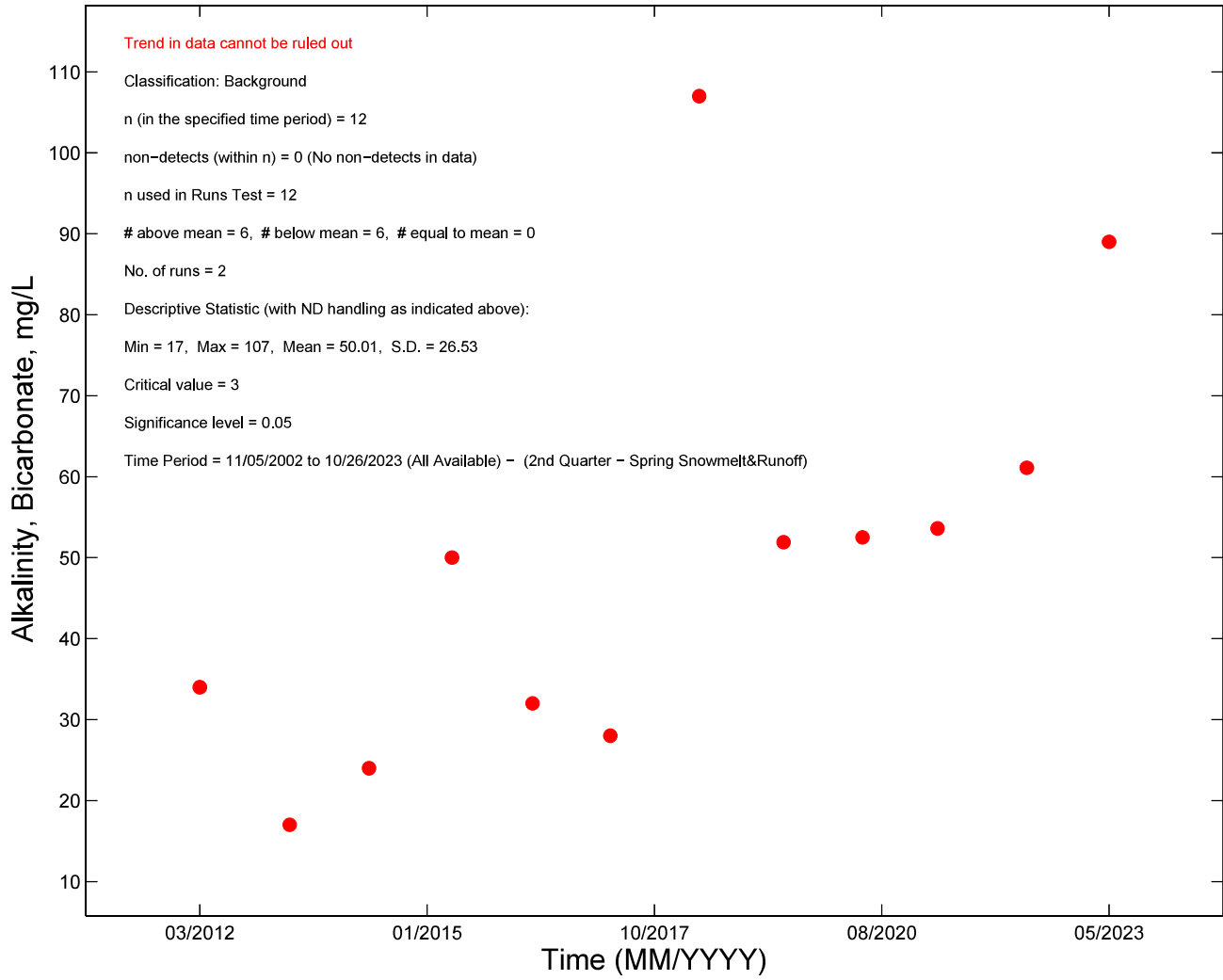
Notes:

Charts are included for compliance locations with trends that also had two exceedances in a row in 2023.

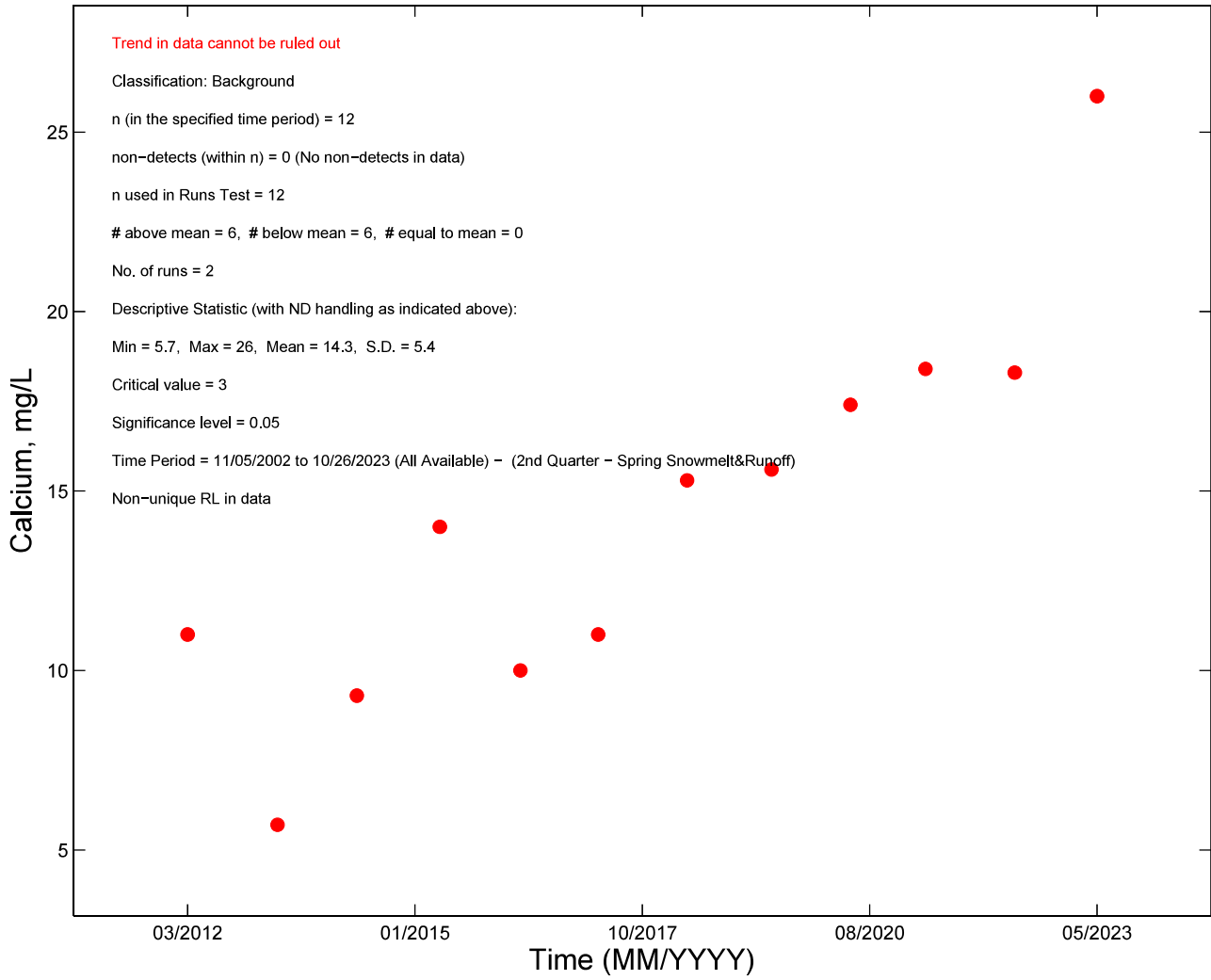
Sulfate trend analysis period is 2005-2023 to eliminate effect of high previous RL.

Trends rejected if they appear to be an artifact of non-detect values and/or inconsistent RLs.

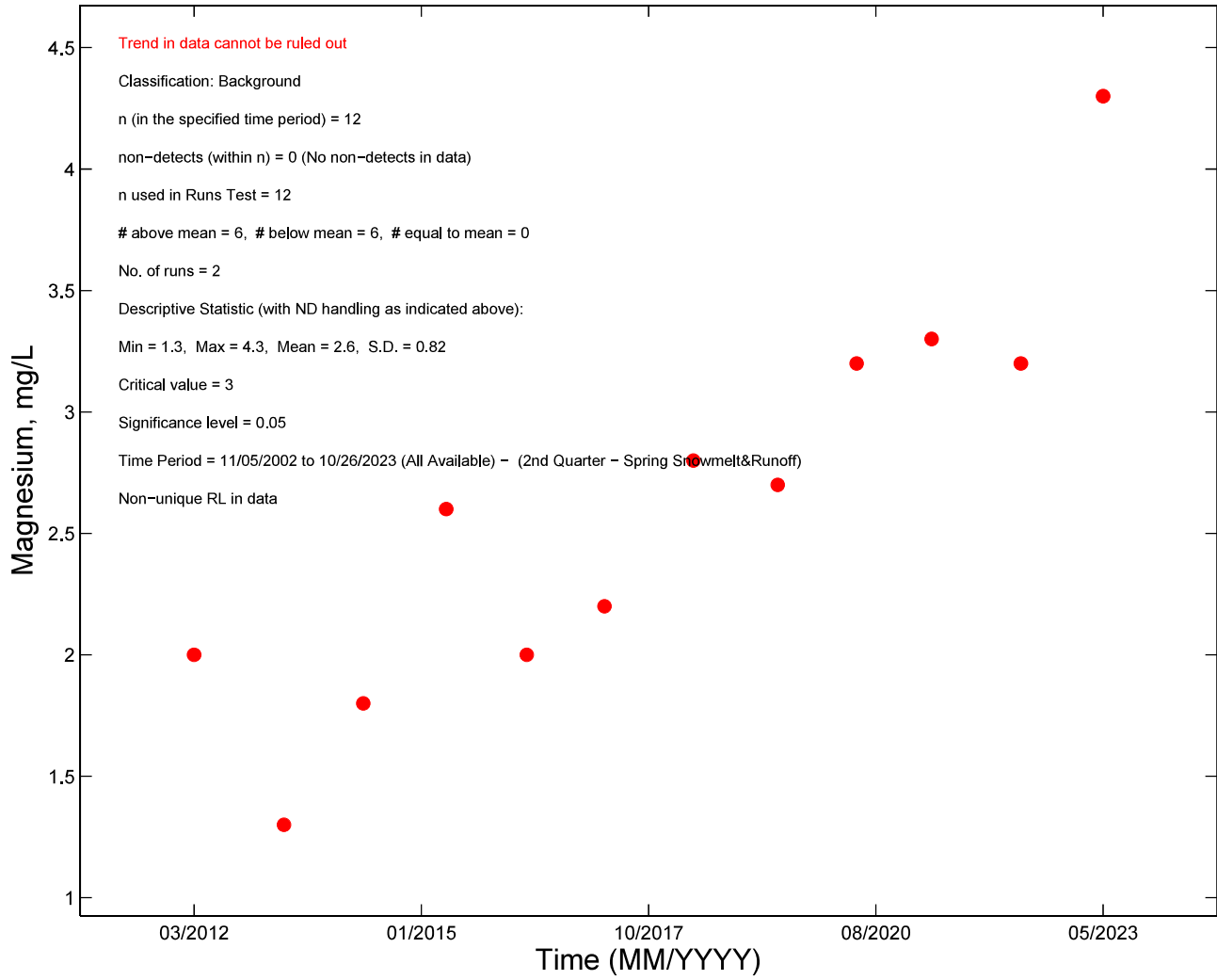
STRE005



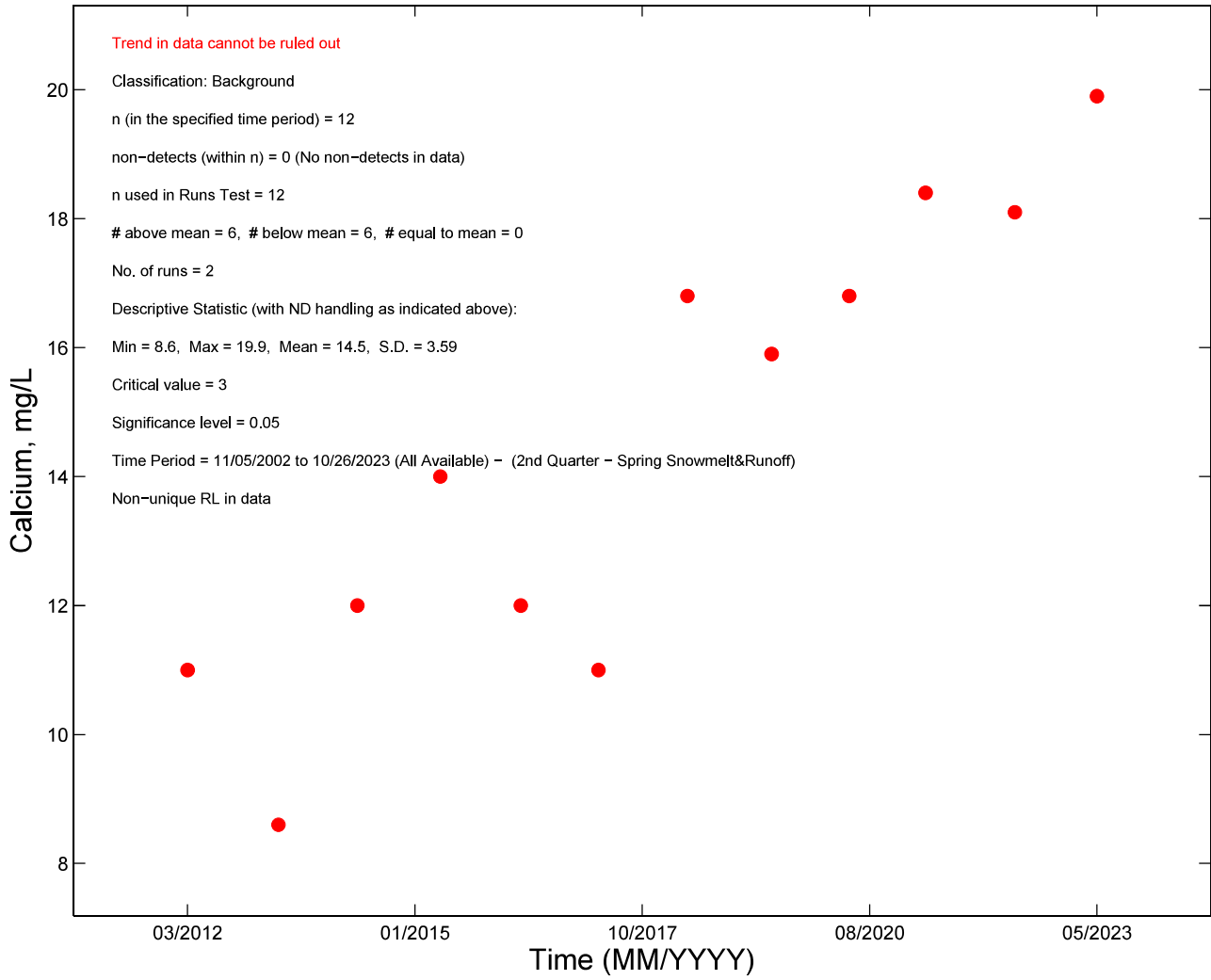
STRE005



STRE005



STRE010



Appendix M

Eagle Mine

Water Level Monitoring Location Map

Appendix N

Eagle Mine Groundwater Contour Maps

**A-ZONE GROUNDWATER ELEVATION
CONTOURS
WINTER BASEFLOW, FEB-MAR 2023**

Legend

-  Monitoring Well
-  Seep Piezometer
-  Surface Water Monitoring Location
-  Wetland Piezometer
-  Stream Elevation Point
(Source: Digital Elevation Model: 98 ft resolution)
-  Groundwater Elevation Contour (10' Interval)
-  Mine Facilities
-  Ore Body
-  Outcrop

Reference

Data provided by: Eagle Mine and North Jackson Company
Projection & Datum: UTM NAD 83 Zone 16N

0 500 1,000 Feet

1:3,600

Eagle Mine
a subsidiary of **metals mining**

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1

