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Tuesday, March 15, 2022

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

Subject: Annual Mining and Reclamation Report, Eagle Mine, LLC
Nonferrous Metallic Mineral Mining Permit (MP 01 2007), Eagle Mine

Dear Ms. Humphrey:

Eagle Mine, LLC has an approved Mining Permit (MP 01 2007) dated December 14, 2007. General Permit Condition G2 states, "The permittee shall file with the MMU supervisor a Mining and Reclamation Report on or before March 15 of each year, both during milling operations and post closure monitoring as required by Section 324.63213 and R 425.501. The report shall include a description of the status of mining and reclamation operations, an update of the contingency plan, monitoring results from the preceding calendar year, tonnage totals of material mined, and amount of metallic product by weight."

Please find enclosed, the 2021 Annual Mining and Reclamation Report for the Eagle Mine.

Should you have any questions about this report, please do not hesitate to contact me at 906-339-7139.

Sincerely,

Alexxa Young
Environmental Advisor

Cc: Michigamme Township

Enclosure

Eagle Mine
a subsidiary of lundin mining

2021 Annual Mining and Reclamation Report
Mine Permit MP 01 2007

March 15, 2022

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Acronyms and Abbreviations

AEM	Advanced Ecological Management
CMT	Crisis Management Team
COSA	Coarse Ore Storage Area
CRF	Cemented Rock Fill
CWB	Contact Water Basin
DO	dissolved oxygen
Eagle	Eagle Mine LLC
EGLE	Michigan Department of Environment, Great Lakes & Energy
ft	feet
gal	gallon
gpd	gallons per day
gpm	gallons per minute
GWDP	Groundwater Discharge Permit
in	inches
KME	King and MacGregor Environmental
m	meter
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
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
Q1	Quarter One
SESC	Soil Erosion and Sedimentation Control
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
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 provides a listing of the individuals and organizations who were responsible for the preparation of this MRR as well as those who contributed information for inclusion in the report.

Table 1.1 – Document Preparation – List of Contributors

Organization	Name	Title
Individuals responsible for the preparation of the report		
Eagle Mine LLC	Amanda Zeidler	HSE & Permitting Manager
Eagle Mine LLC	Alexxa Young	Environmental Advisor
Report Contributors		
Eagle Mine LLC	David Bertucci	Environmental Compliance Supervisor
Eagle Mine LLC	Cody Gobbs	Project Engineer
Eagle Mine LLC	John Mason	Owners Operational Principal
Eagle Mine LLC	Kathryn Dorfschmidt	Geotechnical Engineer Lead
Eagle Mine LLC	Todd Macco	Water Treatment Plant Facilities Engineer
Eagle Mine LLC	Jeff Murray	Operations Manager
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Eagle Mine LLC	Jennifer Nutini	Environmental Superintendent
Eagle Mine LLC	Matthew Taylor	Owners Surface Specialist
Eagle Mine LLC	Christine Bekkala	Controller
Pace Analytical	Jennifer Rice	Client Services Supervisor
Cementation USA	Ken Groves	Safety, Health & Mine Rescue Coordinator
Barr Engineering	Matt MacGregor	Wetland Scientist/Biologist
Advanced Ecological Management, LLC.	Doug Workman	Aquatic Scientist
North Jackson Company	Dan Wiitala	Professional Geologist

2. Introduction

Surface construction of Eagle Mine, an underground nickel and copper mine in Michigamme Township, began in May 2010, followed by the start of underground development in September 2011. Upon commencement of underground operations, per Michigan's Nonferrous Metallic Mining Regulations and the Eagle Mine Part 632 Mining Permit (MP 01 2007), Eagle Mine is required to submit an annual Mining and Reclamation Report.

The MRR is required to provide a description of mining and reclamation activities, updated contingency plan, monitoring results, tonnage of material mined, and a list of incident reports that created, or may create a threat to the environment, natural resources, or public health and safety at the Eagle Mine Site. In addition, this update will serve to memorialize all that has been completed and the decisions and/or modifications that have been approved throughout the process.

3. Site Modifications and Amendments

Table 3.1 below lists the notifications and required submittals and approvals that were provided to the Department in 2021 as required under the Part 632 Mining Permit. Table 3.2 lists submittals and approvals under other required permits. A copy of the current site map is provided in Appendix A.

Table 3.1 – Submittals and Approvals Required Under Part 632

Date	Description	Approval
02/01/21	Q4 2020 Groundwater and Surface Water Monitoring Data	N/A
03/15/21	2020 Annual Mining and Reclamation Report	N/A
04/29/21	Q1 2021 Groundwater and Surface Water Monitoring Data	N/A
07/22/21	Characterized Aggregate Net Neutralization Capacity Results	N/A
08/06/21	Q2 2021 Groundwater and Surface Water Monitoring Data	N/A
10/21/21	Request to Dispose of Eagle Assay Standards Underground	10/21/21
11/22/21	Q3 2021 Groundwater and Surface Water Monitoring Data	N/A
11/22/21	Revised Q1 & Q2 2021 Groundwater and Surface Water Monitoring Data	N/A

- A letter was submitted to the Michigan Department of Environment, Great Lakes & Energy (EGLE) in July 2021 providing lab analysis for offsite quarried aggregate used by Eagle Mine for backfilling. Samples from both aggregate sources demonstrated compliance with the Part 632 permit.

Table 3.2 – Submittals and Approvals Under Other Permits

Date	Description	Approval
03/02/21	Hydrogeological Review of Vanadium – Permit Renewal Follow-up	N/A
07/16/21	Notification to EGLE of a Sodium Hydroxide Spill to Containment	N/A
11/11/21	WTP Additive Supporting Calculation Update for Soda Ash	In Process
11/23/21	WTP Additive Supporting Calculation Update for Hydrochloric Acid	In Process
12/09/21	WTP Additive Supporting Calculation Update for POLEZ 83904	In Process
12/21/21	WTP Additive New Chemical Submittal for Polymer Enact 7880	In Process

- In July 2021, Eagle notified EGLE about a leak discovered at the Mine Water Treatment Plant (WTP) coming from a diaphragm pump on the bulk Sodium Hydroxide (NaOH) tank. Approximately 500 gallons of NaOH spilled into secondary containment. Trimedia Environmental & Engineering Services, LLC (Trimedia) was contacted to help with cleanup. This event is described in more detail in Section 4.1.1 Materials Handling.

- An update of the Mine site WTP approved chemical additive list was completed in 2021 which included updating calculations for Soda Ash, Hydrochloric Acid and POL-E-Z 83904 (a flocculant). Polymer EN/ACT 7880, a clarification aid, was a new chemical submitted for approval through EGLE as well.

- Compliance sampling and reporting required by the Groundwater Discharge Permit (GWDP) is submitted via MiWaters (a web-based reporting system) on a monthly basis.

4. Mining Activities and Data Report

Underground activities began in September 2011, with drilling operations in preparation for blasting. On September 22, 2011, blasting at the Eagle Mine commenced and the project was officially "mining." The commencement of mining activities initiated all monitoring programs per the Part 632 Mining Permit. A description of the monitoring activities can be found in Section 5 of this MRR.

4.1 Underground Operations

2021 marked the seventh year of production mining which is being conducted by underground mining contractor, Cementation. Two mining methods are being utilized at Eagle Mine; longhole open stoping, and cut and fill stoping. Longhole open stoping is utilized in the Eagle orebody while Eagle East uses both longhole stoping and cut and fill mining method. When utilizing the longhole stoping

method, the stopes are mined in an alternating sequence of primary and secondary stopes with cemented rock fill (CRF) being used in the primary and uncemented rock fill 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 in 2021.

Jam Backfill in the 381-1425 Secondary Sill

Cut and fill mining areas in 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 in Eagle East as it is a more efficient mining method for higher grade irregular shaped orebodies. All CRF is made onsite at the batch plant and is transported underground using underground haul trucks. The CRF is currently comprised of development rock or offsite aggregate, sand, cement, water, and a concrete admixture.

In accordance with 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. A letter certifying the rock stability, signed by the Operations Manager, can be found in Appendix B.

Subsidence monitoring was also conducted throughout 2021 in accordance with Eagle's Subsidence Monitoring Plan and as required by permit condition L-17.

Deflection of the crown pillar bedrock is monitored via one multi-point borehole extensometer (MPBX) installed from 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 on a monthly basis using a handheld data logger.

Deflection at the surface is monitored via the monthly surveying of five monuments which 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 accuracy of the measurements is to within less than one millimeter of movement. In 2021, the subsidence monitoring did not indicate any deflection of the bedrock surface.

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 is routinely monitored 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.

There were eight (8) twelve-person and four (4) four-person 36-hour self-contained Mine Arc refuge chambers stationed underground in 2021 to ensure the safety of miners in the event of an emergency.

Underground Refuge Chamber

4.1.1 Underground Development Progress

An additional 4,930 m of total development occurred in 2021 in Eagle and Eagle East. Eagle development included 375 m of sill development which is required in order to access the stopes and 49 m of general development. No vertical development was required in 2021 as all ventilation and escape raises have been completed in Eagle. Eagle East development included 2,977 m of sill development, 1,377 m of general development, and 152 m of vertical development for ventilation. In addition, our 2021 definition drilling program completed 20 drill holes, totaling 5,165 m in Eagle East for the purpose of geologic model optimization. In Eagle, 24 holes were drilled for a total of 1,483 m.

Table 4.1.1a below summarizes the total 2021 development meters by type completed in Eagle, and Table 4.1.1b breaks out the development completed in the Eagle East in 2021. A map showing 2021 Eagle East development progress can be found in Appendix C.

Table 4.1.1a – 2021 Eagle Underground Meters of Development

Eagle Mine Development	Meters
Sills	375
Vertical	0
General/Horizontal	49
Total	**424**

Source: Mine Engineering Department

Table 4.1.1b – 2021 Eagle East Decline Meters of Development

Eagle East Decline Development	Meters
Sills	2,977
Vertical	152
General/Horizontal	1,377
Total	**4,506**

Source: Mine Engineering Department

4.1.2 Underground Ore Production – Stoping & Backfilling

A total of seven primary stopes were mined and backfilled in 2021. Primary stopes are backfilled with CRF after extraction of ore. In 2021, 402,466 tonnes (t) of CRF was produced at the onsite batch plant and returned to stopes and completed lateral development by underground haul trucks. Backfill to stopes accounted for approximately 44% of the CRF made with the remaining 56% used for jamming lateral development. There were 11 secondary stopes mined in 2021, of which nine were backfilled with development rock or CRF depending on elevation. Table 4.1.2a summarizes the number of stopes that were mined and backfilled in 2021. In addition, the total tonnes of ore mined in 2021 is listed in Table 4.1.2b and is categorized as either sill or stope. Eagle and Eagle East produced a total of 365,133 t of sill ore in 2021. A bulk adjustment is applied to the total ore mass based on Coarse Ore Storage Area (COSA) surveys and over-the-road truck scale readings. Ore categorized as sill is excavated using horizontal drill holes and is the material that is removed to access the stope in the stope mining areas. In the cut and fill areas of Eagle East, sills are mined and then jammed after excavation is complete. The stope is excavated using vertical drill holes and is mucked via a remote loader. Appendix C illustrates the current configuration of each mining level and production mining progress through 2021.

Table 4.1.2a – Number of Stopes Fully Mined & Backfilled in 2021

Stope Type	Total (number)
Primary Stopes	7
Secondary Stopes	11

Source: Mine Engineering Department

Table 4.1.2b – Tonnes of Ore Mined in 2021

Ore Mined	Tonnage of ore mined (tonnes)
Eagle Sills	36,099
Eagle East Sills	329,034
Eagle Stopes	276,465
Eagle East Stopes	62,430
Survey Actual Adjustment	(6,986)
Total	**697,042**

Source: Mine Engineering Department

4.1.3 Dewatering Volume and Quality

Water is required underground to complete drilling, bolting, dust suppression activities, and to knock down loose material that remains suspended after a stope blast. In 2021, the mine services well supplied all the water needed to complete underground mining and development activities.

The lines supplying and removing water from the underground are equipped with totalizer meters. These flows are continuously tracked and stored within a database system that is reviewed by Environmental staff.

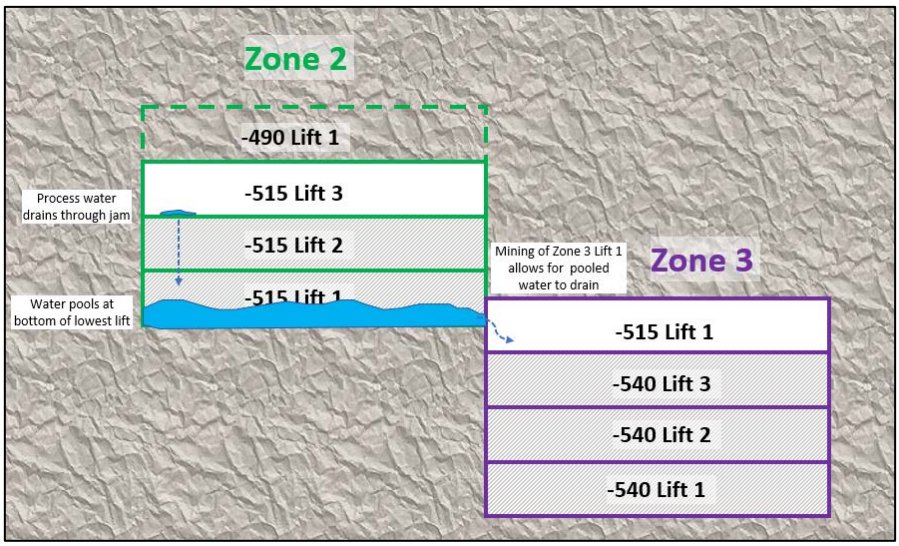
Average water use increased from approximately 43 gallons per minute (gpm) in 2020 to 49 gpm in 2021. The increased demand is attributed to the continued development occurring in Eagle East, and dust suppression in both Eagle and Eagle East. Water is used for dust control on the roadways and as development continues this results in increased spans that require watering and thus increased water demand. The amount of water supplied for underground operations in 2021 ranged from an average of 57,336 gallons per day (gpd)/(40 gpm) in June, to 84,703 gpd (59 gpm) in November.

The total water pumped from the mine to the surface, including water supplied to the underground and natural inflow into the mine, ranged from an average of 52,154 gpd (36 gpm) in January to 74,574 gpd (52 gpm) in September.

The dewatering volume is calculated by subtracting the volume of water provided to the underground from the volume of water pumped to the surface. The difference between the two numbers is indicative of the volume of groundwater that is naturally infiltrating the mine.

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. Similar to previous years, the overall calculated dewatering volume for the mine was negative during the majority of 2021, with only one instance in June in which the dewatering volume was net positive. The increased dewatering in June was not linked to a groundwater inflow event, rather it was related to intersection of stored process water that had accumulated in a mined-out area of Eagle East. The flow occurred from June 10th until approximately June 22nd.

An explanation of the water event is as follows: mining in Eagle East consists of zones of cut and fill lifts. Process water from drilling, bolting and wetting of muck piles on the upper cut and fill areas of the mine is able to drain into lower levels that have already been mined. Water accumulated in a lower lift of Zone 2 on the -515 level over several months. When the first lift of Zone 3 was mined, a drill hole intersected the adjacent Zone 2 lift that was storing water and that water was able to drain into the active workings and needed to be pumped to the surface which temporarily elevated the perceived "inflow" quantity.



Schematic of Level -515 Stored Water Event, June 2021

In addition, smaller more isolated pockets of water were periodically encountered during the drilling and blasting operations which temporarily resulted in a slight increase of water flow. The negative values seen throughout the remainder of the year were likely the result of relatively low groundwater infiltration rates coupled with the fact that a portion of the water supplied to the underground is retained in the fine particles in the roadways where dust suppression occurs and within the ore and development rock as piles are wetted before transporting to the surface to minimize dust. Table 4.1.3 below summarizes the average daily volume of water supplied and pumped to the surface for each month in 2021.

Table 4.1.3 – 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	68,667	52,154	-16,513	-11.5
February	71,512	59,854	-11,658	-8.10
March	67,120	57,180	-9,939	-6.90
April	67,113	57,907	-9,206	-6.39
May	71,616	60,499	-11,117	-7.72
June	57,336	71,423	14,087	9.78
July	74,094	71,028	-3,067	-2.13
August	65,319	64,405	-913	-0.63
September	83,200	74,574	-8,626	-5.99
October	63,895	56,806	-7,089	-4.92
November	84,703	70,500	-14,203	-9.86
December	74,236	53,665	-20,571	-14.3

* 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 indicative of the amount of groundwater infiltration occurring.

4.2 Temporary Development Rock Storage Area (TDRSA)

Crushing of development rock for use in cemented rock fill did not occur in 2021, instead offsite aggregate was utilized for CRF. Eagle has contracted A. Lindberg & Sons Inc. to crush rock to a size of three-inch minus to then be delivered to site for temporary storage before use as backfill. Approximately 313,809 t of offsite aggregate was delivered to site in 2021.

4.2.1 Development Rock Storage Volume

In 2021, the total amount of development rock mined was 126,665 t (45,238 m^3)[A]. The amount of development rock placed on the TDRSA from underground was 67,435 t (37,464 m^3)[B]. The remaining 59,230 t (32,906 m^3)[B] of development rock was utilized as uncemented backfill in secondary stopes. Once development rock is mined, the density decreases to account for swell, or void space of the blasted rock. The table below shows the swell factors used to calculate tonnes/m^3 of material of development rock, mined development rock and crushed development rock.

Also, in 2021, 52,411 t (27,440 m^3)[C] of development rock was removed from the TDRSA for use in cemented rock fill, with approximately 7,634 t (4,241 m^3)[B] of development rock removed for GOB fill from the TDRSA. The total TDRSA rock volume accounts for material mined from 2011 through 2021.

Table 4.2.1 – Swell Factors

Reference	Density (tonnes/m^3)
A	2.8
B	1.8
C	1.91

No limestone was added to the TDRSA in 2021. Eagle verifies the continued effectiveness of limestone added in previous years through quarterly pH readings of the TDRSA contact water. Table 4.2.1 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 2021.

TDRSA, May 2021

Table 4.2.2 – 2021 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)
2021 Total	37,464	0	31,681	110,160

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.
Note: The End of Year survey volume for 2020 was 77,213 m^3, initially reported as 45,500 m^3 which did not include the 31,713 m^3 of crushed development rock. The January 2022 End of Year survey is reported in the table above.

4.2.2 Mining Forecast

The 2022 mining forecast calls for the continued development of extraction drifts and stope accesses for a total of 7,038 m of lateral advance. Eagle East will make up approximately 95% of the planned development with a total of 6,706 m in 2021. The total amount of ore that is planned to be produced for 2022 is forecasted to be about 755,000 t with approximately 79% of the ore being generated from Eagle East. Of the 595,000 t from Eagle East, around 53% will be from sills including the cut and fill mining zones, with the remaining 47% from stopes. All estimates are subject to change.

4.2.3 TDRSA Sump Dewatering Volume and Quality

The TDRSA 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. The water currently in the leak detection sump is rainwater that has been encapsulated in the secondary lining system since construction. Both sumps are continuously monitored using pressure transducers.

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. The leak detection sump is manually pumped and sampled, 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 occurs when the pumps are operated.

Primary Contact Water Sump Monitoring

WTP operators conducted weekly inspections of the TDRSA primary sump, and the Environmental Department conducted an additional weekly inspection. The water level is recorded in a compliance logbook that is 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 2021, approximately 7.5 million gallons (MG) of water was pumped from the TDRSA contact water sump to the contact water basins (CWBs) for eventual treatment in the WTP. The digitalized flow meter tracking the amount of water pumped from the TDRSA to the CWBs reset multiple times throughout the year due to power outages. The total flow for 2021 was estimated based off of weekly inspection data records. A new digital flow meter will be installed in 2022.

Quarterly water quality monitoring of the contact water sump was conducted in February, May, July, and November. The chemistry analytical results from the TDRSA contact water sump fluctuated between sampling quarters which was expected because material from both Eagle and Eagle East was added and removed during the year and precipitation/snow melt events contributed fresh water to the system. The concentration-based results for several parameters decreased in 2020, but increased in 2021, notably alkalinity bicarbonate, specific conductivity, sodium, and chloride. The aforementioned parameters are generally more indicative of water quality from Eagle East which is brinier in nature and therefore may account for the increasing concentrations.

pH remained in the neutral to slightly basic range of 6.6 – 7.7 SU, indicating that the limestone present is still providing sufficient neutralizing capacity. In addition, a comparison of the TDRSA contact water sump results to those from the TDRSA leak detection sump, as well as the volume of water removed from the leak sump indicate that the integrity of the contact water liner is intact and functioning as designed.

A summary of the 2021 monitoring results can be found in Appendix D.

Leak Detection Sump 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 prior to sample collection. In addition to water quality analysis, the volume pumped is used to calculate the average daily rate of accumulation into the sump.

In 2021, a total of approximately 47 gallons of water was purged from the leak detection sump and four samples were collected. The daily rate of accumulation was estimated throughout the year at 0.02 gal/acre/day which is well below the 25 gal/acre/day threshold indicated in the permit. Table 4.2.3 summarizes the estimated flow rate for sampling events from the TDRSA leak detection sump for 2021.

Values are typically calculated, but in 2021 per the approval of EGLE, the values are estimated because the flow did not consistently totalize on the flow meter. From August to October 2021, the leak detection sump pump would not produce any water flow. Eagle determined that the flow meter could seize from infrequent use, or the flow rate may be too low to register on the meter. In October 2016 the Department approved an increased frequency of pumping to prevent the pump from seizing to ensure that the water recovered from the leak detection sump can be accurately tracked. However, in the instances where the water level is too low to register, the increased pumping may not be possible. Moving forward, the leak detection will be tested quarterly at a minimum, with increased pumping when possible. The total volume of water purged to date is only a fraction of the estimated 26,000 gallons of rainfall that entered the secondary collection system during construction.

Samples were collected from the leak detection sump in February, May, July, and November 2021. Upon sample collection, the pH and specific conductance of the sample were 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 (i.e. magnesium, sodium, chloride, nitrate, nitrite, and ammonia) were also analyzed. Once the sample was collected, the remaining water contained in the leak detection sump was purged to the contact water basins.

Table 4.2.3 summarizes the TDRSA leak detection sump analytical results for 2021. The pH results were consistent and ranged from a low of 7.4 SU to a high of 7.7 SU which is neutral to slightly basic in nature, similar to 2020 results. Sulfate results fluctuated throughout the year, with levels ranging from a maximum of 2,020 milligrams per liter (mg/L) in November to a minimum of 848 mg/L in February. Similar to 2020, the sulfate results increased in Q2 and Q4 and returned to lower values in Q1 and Q3. Though sulfate is the most prominent constituent there is no trend that 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.

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. However, in addition to the water level, results from the leak detection sump are compared to the contact water sump to determine if a correlation 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.

As required, EGLE was notified of the elevated sulfate results in the quarterly benchmark summary letters. Comparison of the data from the TDRSA primary contact water and leak sumps identified clear differences in the concentrations of sulfate, magnesium, chloride, and nitrate between the two sumps. This indicates that the water in the leak detection sump is likely not from the primary contact sump and the integrity of the liner is intact. The source of sulfate was likely introduced during construction of the lining system. A summary of the 2021 monitoring results and graphs comparing results from the TDRSA leak detection and contact water sump can be found in Appendix D.

Table 4.2.3 – TDRSA Leak Detection Sump Results for 2021

Parameter	02/11/21	05/17/21	07/26/21	11/09/21
Magnesium (mg/L)	20.1	21.7	21.3	23.2
Sodium (mg/L)	664	613	622	742
Chloride (mg/L)	49.0	52.3	51.7	54.4
Sulfate (mg/L)	848	1,430	993	2,020
Nitrate (mg/L)	57.6	60.0	63.0	63.0
Nitrite (mg/L)	0.011	<0.010	<0.010	0.019
Ammonia (mg/L)	<0.10	0.26	<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	7.4	7.5	7.5	7.7
Specific Conductivity (µS/cm)	3192	3233	3285	3372

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

4.3 Site Water Usage, Treatment, and Discharge

Site wide water consumption includes three separate sources for supplying water to surface and underground mining activities and the management of process in the CWBs for eventual treatment in the water treatment plant. The WTP processes the water and provides a portion for recycle within the WTP itself and for discharge to the Treated Water Infiltration System (TWIS).

4.3.1 Supply Water Sources and Usage

Three separate sources supply water to the mine site to support various operational activities. These sources include the potable well, mine services well, and treated utility water from the WTP. Eagle used site logs to compile the following summary of average water use from each source.

The domestic well (QALPSW001) is used to supply potable water to the surface facilities, final rinse for the truck wash, and fire water tank if necessary. During 2021, the approximate water use was 8,595 gpd (6.0 gpm) which was more than the average of 6,866 gpd (4.8 gpm) utilized in 2020.

Domestic Well at the Mine Site

In 2021, the mine services well (QAL011D) was primarily used to supply water for exploration hole grouting, the truck wash recycled water bay, underground operations, dust suppression, and the fire water tank which supplies water to the network of fire hydrants onsite. Approximately 89,342 gpd (62 gpm) of water was utilized in 2021 which is an increase from an average of 78,336 gpd (54 gpm) supplied in 2020. The increase is due to additional demand for underground operations, specifically the use of core drills for exploration and stoping in Eagle East.

The third source of water on the mine site is the treated utility water which is supplied and utilized by the WTP. This is water that is collected in the CWBs, treated through the first half of the treatment process, and subsequently recycled within the WTP rather than being discharged to the TWIS. This water source is required in various stages of the water treatment process including for dilution, backwash, and in various cleaning processes. In 2021, the WTP instituted a pre-softening process loop which uses the utility water tank as a holding point for water that has been softened prior to the water being returned to the CWBs rather than immediately being processed through the reverse osmosis (RO) process equipment. Due to the location of the existing recycled water flowmeter, the WTP is unable to separate internally recycled water volume from pre-softening volumes. In 2021, the total volume of water characterized as 'recycled water within the WTP' was approximately 265,757 gpd (184 gpm) which is an increase from 16.5 gpm reported in 2020.

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 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. The contact storm water is collected in two lined basins where it is held prior to treatment through the water treatment facility. Contact water is any water that came into contact with material from the underground mine.

4.3.3 CWB Water Management and Water Quality

Three primary sources of site water are discharged to the CWBs prior to treatment in the WTP. These include dewatering from the underground mine, dewatering from the TDRSA, and precipitation and storm water that falls on the 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.

CWB levels are continuously recorded and saved to a database maintained by WTP operators. This log is available on request. All rainfall and snow melt that occurred in 2021 was collected and managed within the capacity of the CWBs.

The water quality of the CWBs is evaluated on a quarterly basis. This characterization provides the WTP operators with valuable data that may affect process control and also provides information to identify any parameter trending in water quality as mining progresses. Samples were collected from the sampling point in the CWB# 2 pumphouse in February, May, July, and November 2021. The annual parameter list was collected during each quarter in 2021 to compare results to downgradient water quality to confirm the liners are intact and functioning as designed. Similar to 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 occurring due to precipitation rates. pH results ranged from 8.4 SU in Q1 (February) to 10.3 in Q3 (July). The elevated result in Q3 is likely attributed to the underground water inflow that was discussed in Section 4.1.2. Water in contact with cemented fill is expected to be more alkaline due to the chemical properties of the cement. As more areas of the mine become backfilled with cement the water coming from the underground areas will likely continue to have an elevated pH and hardness. Sodium and chloride varied throughout the sampling events of 2021, similar to concentrations observed in 2020, which correlates with the water quality found in Eagle East. A summary of the results can be found in Appendix D.

View from NW corner of CWB #1, June 2021

4.3.4 Non-Contact Water Infiltration Basins (NCWIB)

There are three NCWIBs located in the main surface facility area and one NCWIB 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 infiltration occurs. The basins are monitored for excess silting that would prevent infiltration and ideal operation as designed.

In accordance with 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 on an annual basis. Monitoring wells QAL071A and QAL024A are located downgradient of NCWIB #1 and #4 and are monitored on a quarterly basis 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. Similar to 2020, 2021 results from QAL070A did not detect any metals above calculated benchmarks, but did detect cations and anions including alkalinity bicarbonate, sodium, chloride, nitrate, sulfate, potassium, calcium, magnesium, and hardness, that were outside of calculated benchmarks. 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 of the elevated levels at location QAL070A are likely due to a sand/salt mixture that is applied to the roadway during winter conditions. Results at QAL073A were outside of benchmarks for calcium, magnesium, sodium, and hardness, but have continued to trend down since 2018. Groundwater monitoring results from QAL071A and QAL073A are further discussed in Section 5.1 and all results are summarized in Appendix F.

4.3.5 Water Treatment Plant Operations and Discharge

The WTP treated and discharged over 36 MG of water in 2021. A summary of the monthly discharge rates can be found in Table 4.3.5 below.

Effluent discharges to the TWIS are regulated under Groundwater Discharge Permit (GWDP) GW1810162, and the discharge volume and analytical results are reported to the EGLE on a monthly basis through MiWaters. In October 2017, Eagle submitted an application for approval to continue discharge under the current permit per the renewal requirements of the GWDP. This is a routine application that is required to be completed every five years. The permit is still under review by the Department.

Table 4.3.5 – Volume of Water Discharged in 2021

Month	Volume of Water Discharged (gallons)
January	2,116,469
February	1,576,574
March	3,453,934
April	5,161,645
May	3,831,164
June	1,841,294
July	2,888,832
August	2,704,652
September	4,452,923
October	2,446,637
November	3,293,292
December	2,694,140
Total	**36,461,556**

Source: Eagle Mine WTP

The water treatment process generates two waste streams; filter press waste and crystallizer waste. The filter press waste stream is composed of dewatered solids from the clarification treatment process and is primarily comprised of calcium and magnesium, while the crystallizer waste is mainly sodium chloride. Samples of the waste streams were sent to the laboratory for waste characterization as required by the landfill. The wastes are non-hazardous. In 2021, 513 t of crystallizer waste and approximately 33 t of filter press wastes were disposed at a landfill.

4.4 Materials Handling

4.4.1 Chemical Handling, Storage, and Reporting

Eagle Mine's goal is to create a culture of environmental awareness throughout the workforce. Therefore, all employees and subcontractors are trained to immediately respond and report any spills that occur. In 2021, Eagle Mine had one reportable spill under the Part 5 Rules of Part 31, Water Resources Protection of NREPA, 1994 PA 451 as amended (Spillage of Oil and Polluting Materials).

On July 7th, 2021, approximately 500 gallons of sodium hydroxide (NaOH) leaked into secondary containment in the bulk storage room at the Mine WTP. This leak was due to a diaphragm pump failure. The entirety of the leaked NaOH was contained within the designed secondary containment and was not a threat to the environment, however the event was considered reportable due to the elapsed timeframe that occurred during cleanup activities. Trimedia Environmental & Engineering Services (Trimedia) was contacted for material cleanup. NaOH was pumped to the main WTP sump to be diluted with water before being returned to the CWBs to avoid generation of a large amount of cleanup waste. The pump was replaced with a peristaltic pump with an internal leak detection, the containment room was fully cleaned and the plant was returned to service on July 15th, 2021.

The Michigan SARA Title III Program requires reporting of onsite chemicals being stored above threshold quantities. Due to the volume of chemicals stored/used at the site, primarily in the WTP, a Tier II Report was submitted in February 2022 via the online Tier II Reporting System to the State Emergency Response Commission (SERC). Copies of the report were also mailed to the Marquette County Local Emergency Planning Committee (LEPC) and Powell Township Fire Department.

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. 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 E.

Four rounds of quarterly sampling were completed in January, May, July, and October 2021. The Eagle Mine permit prescribes both a long parameter list for annual monitoring events (conducted in Q2 2021) and a short list to be used quarterly (Q1, Q3, Q4 2021). In addition to the permit required sampling lists, locations QAL061A, QAL062A, and QAL067A are analyzed for volatile organic compounds (VOCs) on an annual basis in response to comments provided during the permit application process. VOC samples were collected in Q2 2021 at these three locations and all results were found to be non-detect (i.e. below laboratory reporting limit). Samples are collected in accordance with the Eagle Project Quality Assurance Project Plan and Standard Operating Procedures (North Jackson, 2004a and 2004b) and the results are summarized and compared to benchmarks, where applicable, in the tables found in Appendix F.

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, results were reviewed and statistically analyzed. The consultant calculated an updated benchmark value for those results that were not trending. These updated benchmarks were used for comparison in 2021.

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 2021 and the results are summarized in Section 4.3.4. 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. All samples were shipped overnight to Pace Analytical in Grand Rapids, Michigan, for analysis.

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. These wells generally have trends that increase from the baseline followed by a period of stabilization or new equilibrium. The most likely explanation for this is related to changes in recharge patterns compared to baseline. By concentrating recharge in specific areas (i.e. non-contact water basins, snow piles) in places differently than how this existed prior to the mine facilities being built, the fundamental recharge distribution has changed. As such, there is increased recharge available in certain locations to drive this normal environmental phenomenon. There is also 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 wells that have had one or more parameters exceed a benchmark value can be found in Appendix F.

Groundwater Monitoring Location QAL008A

In accordance with Part 632, R426.406 (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 following is a summary of the events that occurred in 2021:

- Location QAL024A (near the vent raise) had benchmark deviations in alkalinity bicarbonate, chloride, nitrate, and sodium. Elevated levels of sodium chloride were first reported at this location in 2013 which resulted from 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 since 2013 and are approximately three times less than the peak concentrations reported in Q2 2013. Nitrates were higher in 2021 compared

to results reported in 2020. A similar pattern was also observed in 2016 and 2019 where nitrate results trended up, followed by periods of downward trending back towards baseline values. Alkalinity results remained elevated from baseline but were consistent with results reported since 2016.

- Sodium levels were above the benchmark at QAL044B (located above the Eagle ore body) for all four sampling quarters in 2021 as they have been since 2013, however, the sodium results trended down in 2021 and are only just above the calculated benchmark for the location and remain well below the peak concentrations reported in 2013. pH was above the benchmark in Q1 and Q2, decreasing to within the benchmark range in Q3, and increasing to slightly above benchmark in Q4.

- Nitrates were detected above the benchmark during all four sampling quarters in 2021 at monitoring wells QAL060A and QAL061A located downgradient of the TDRSA and CWBs. The nitrate results at both locations trended down over 2021 and are just above baseline levels. Fluctuating nitrate results may be a function of the historic use of salt at the mine site, as described in other monitoring locations on site. Road salts have the potential to affect general 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, alkalinity bicarbonate, calcium, magnesium, and hardness were greater than benchmarks at QAL061A. Alkalinity bicarbonate trended up in 2020 and began to level off over the course of 2021. Calcium and magnesium, measured once per year, their results share a similar pattern of an upward trend from previously reported results that are only slightly greater than their established benchmarks. Hardness at QAL061A continued to increase as it has since in 2017. 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 chloride, sulfate, and metals were reported in the TDRSA sump and CWB, but were non-detect in the monitoring wells indicating that the elevated results are likely not related to the immediately upgradient facilities.

- QAL062A (located on the eastern berm of the TDRSA) had results for pH, alkalinity bicarbonate, chloride, nitrate, and sodium that were outside calculated benchmarks for each sampling event in 2021. Calcium, magnesium, potassium, and hardness were also above benchmark levels for four consecutive Q2 sampling events (2018 – 2021). Although the monitoring well is located next to the TDRSA it is unlikely the source of the elevated results because the results from the TDRSA and monitoring well do not correlate. For example, metals are present in the TDRSA contact water sump but are not above benchmark in QAL062A. The constituents that are above benchmark levels are most likely the result of the chloride plume that is slowly moving across the site through the area of QAL062A. This plume is the result of historical salt use on the contact area. A review of the trend data indicates that concentrations remained below the peak levels observed in 2019 which would correlate with this slow mitigation of the chloride plume.

- 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 7.5 – 7.8 SU for the past ten 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. Upgradient location QAL067A was just over the calculated benchmark from Q2 – Q4 2021. A site wide trend of decreasing pH values is not indicated by the data.

- Alkalinity bicarbonate, chloride, sodium, and nitrate were above benchmark levels at QAL063A (located east of the CWBs near the WTP) and pH levels were below the benchmark for all sampling events in 2021. Calcium, magnesium, potassium, and hardness were also above benchmark levels for three consecutive Q2 sampling events (2019 – 2021). Constituents of this well which are outside of established benchmark are consistent to those reported in QAL062A which is located upgradient of this monitoring location. This indicates that the elevated results are also likely attributed to the chloride plume. Constituents above benchmark levels at QAL063A trended up in 2021 while results at QAL062A were more stable, which suggests migration of the chloride plume across site. pH results were below the benchmark range by at least 0.5 SU for more than two consecutive sampling quarters, but the pH is stable with readings consistently at 7.6 SU for each sampling period. No correlation was found between QAL063A and the CWBs; metal levels for nickel, copper, and iron are present in the CWB water that are not detected at QAL063A.

- QAL064D was elevated above the benchmark for two consecutive Q2 sampling events for magnesium and hardness, however, the concentrations decreased between 2020 and 2021.

- QAL066D had results for sodium and arsenic that were above benchmark levels for all of the sampling events in 2021. Alkalinity bicarbonate was elevated above benchmarks in Q1 – Q2 2021 while iron was elevated the last two quarters of 2021. The elevated iron is likely the result of iron oxides or iron hydroxides in the soils (clay) within the formation in which this well is located. Arsenic fluctuation is typical at this location. This location has historically had groundwater results for metals including arsenic which were attributed to fine grained sediment present in the well resulting from improper grouting during well installation. In the past, the location has been aggressively purged/redeveloped removing the sediment and therefore temporarily removing the source of the elevated metals. The location was not redeveloped in 2021 but purging has been scheduled to be completed in 2022. Sodium fluctuated slightly but stayed consistent with 2020 results.

- Location QAL067A (located on the southeast corner of the TDRSA) had benchmark deviations for chloride, sodium, alkalinity bicarbonate, sulfate, and nitrate for all 2021 sampling events. Calcium, magnesium, potassium, and hardness were also above established benchmarks for at least two consecutive Q2 annual sampling events. In 2021, sodium, alkalinity bicarbonate and chloride results continued to trend down while nitrate and sulfate stayed relatively consistent. The elevated 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. Jersey barriers were placed at this location in December 2020 to assist with preventing snow from being pushed into the vicinity of well QAL067A and curbing was enhanced along the berm in 2021 to further reduce the risk of exposure to the well. The purpose of the jersey barriers is to observe whether adjusting snow management in this area will have any effect on the sodium or chloride levels at this well. The 2021 data shows that chloride and sodium levels have been slightly decreasing over time. Eagle will continue to monitor this location to understand if the enhanced curbing and jersey barriers placed near this well reduce chloride and sodium at this location. The chloride results are expected to likely continue to trend back towards baseline levels as the chloride plume moves away from the area.

New curbing located near QAL067A

- QAL071A (located near the northwest corner of the septic drain field) had detections of pH and anions/cations including alkalinity bicarbonate, chloride, nitrate, and sodium that were outside of calculated benchmarks in 2021, but the 2021 results for these parameters trended down overall in comparison to 2020 results. The annual Q2 results for calcium, hardness and magnesium have been above benchmarks since 2013 and have overall trended upwards since. However, there have been two exceptions: the sample results from 2018 and again in 2021 decreased over the previous year's results. Results for pH remained consistent from 2020 through 2021. As noted in previous annual reports, the elevated values 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 at QAL071A requiring Eagle to conduct supplementary sampling at location QAL074A located downgradient of the septic system and investigate the source of the elevated results. Results continue to meet the action level for nitrate and as such the investigation continued in 2021. Results from the investigation are summarized below.
    - A review of upgradient wells, TDRSA, and CWB analytical data indicated that there is no correlation between those results and elevated levels of nitrates detected at QAL071A. In addition, activities that were identified as occurring near NCWIB #1 (i.e. snow storage) that could have potentially influenced QAL071A both occurred after the elevated nitrate results were initially reported, thus eliminating them as the potential source.
    - Groundwater elevations for QAL071A and QAL074A indicate that there is a localized trend evident following spring snowmelt which is likely due to the influence of NCWIB #1 and the septic system. As such, the groundwater flow in the area is altered and would allow groundwater to flow in the direction of QAL071A, thus potentially exposing the monitoring location to septic tank effluent.
    - Chloride, sodium, and nitrates are all present in human wastes and are considered to be 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 do not show any signs of elevated nitrate levels. Currently there is no threat of elevated nitrate levels migrating offsite from monitoring location QAL071A.

Based on the review of data collected in 2021, the septic tank effluent still cannot be excluded as a source of the elevated nitrate levels reported at QAL071A.

- QAL074A is located directly downgradient of the septic system and has been sampled quarterly since 2014 when the action level for nitrate was met at QAL071A. Like QAL071A the results for pH, alkalinity bicarbonate, chloride, nitrate, hardness, and sodium were greater than benchmarks for at least two consecutive sampling events. Although the concentrations differ between locations, the septic can also not be excluded as the source of the elevated values reported at this monitoring location.

In 2021 Eagle conducted an internal assessment of the septic system and drain field. The system may be undersized for the number of employees who are on site when compared to design criteria for the original system. An engineering company was contracted in February 2022 to perform an evaluation and re-design. Permitting and construction of a new septic system will be completed in 2022, and this is expected to improve the nitrate reducing capacity of the septic system.

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 2021. Alkalinity bicarbonate and nitrate were the most frequently noted as possibly trending. Changes in these parameters are indicative of the overall change in site storm water infiltration changes and ion exchange processes occurring from the use of de-icing products early in mine life. A table summarizing the potential groundwater trends can be found in Appendix G. 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 G. A full report outlining groundwater trending results for all parameters and locations, including graphs is available upon request.

As a component of the trend analysis review, Piper Diagrams were utilized to classify the water types and determine if any changes in water chemistry have occurred over time. 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 over time.

The following monitoring locations did exhibit a change in water chemistry and are further explained below:

- QAL024A – Water chemistry data from ten samples collected during Q2 in years 2012 – 2021 were plotted. The water type was originally classified as calcium bicarbonate in 2012 but changed to a sodium chloride classification in 2013. From 2014 through 2021 the water chemistry was classified as mixed-cation chloride but has started to migrate back towards the classification of calcium bicarbonate. The change in chemistry from 2013 to 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. Future quarterly sampling will increase understanding of the water chemistry at this location.

- 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. Both QAL029A and QAL029D appear to be trending back towards calcium bicarbonate in 2021.

- QAL062A & QAL063A – Water chemistry data from these locations were originally classified as calcium bicarbonate in 2011 and continue to be in 2021, but there has been a slight shift towards sodium chloride chemistry within the last four years. This shift is indicative of historic

road salt use that occurred on the contact area and corresponding chloride plume that is slowly moving across site.

- QAL066D – Water chemistry data from eleven samples collected from years 2011 – 2021 were plotted. Samples prior to 2016 were classified as calcium bicarbonate then alternated between sodium and calcium bicarbonate several times between 2016 into 2021. This is attributed to fine grained sediment that is present in the well resulting from improper grouting during installation. This well requires aggressive purging on a routine basis to remove the accumulating sediment to achieve an accurate assessment of water quality.

- QAL067A – Water chemistry data from eleven samples collected during years 2011 – 2021 were plotted. All samples prior to 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 – 2021. This change in water chemistry is indicative of an external source of contamination and is likely due to contact area salt use as discussed above.

- QAL069A – Water chemistry from this location was classified as calcium bicarbonate until 2018 when it shifted towards mixed-cation chloride classification. Water chemistry then shifted back towards the historical classification of calcium bicarbonate in 2019 where it remained in 2021. This well is located near the security building and site access road where salt is used as a deicer.

- QAL070A – Water chemistry from eleven samples collected during years 2011 – 2021 were plotted. All samples collected prior to May 2015 were classified as having a water type of calcium bicarbonate which is indicative of shallow fresh groundwater. In May 2015 through 2021, a shift in water chemistry occurred in which the water was classified as a mixed type, however the water does not display a dominate 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 a deicer and drainage from the roadway is routed near this well.

Piper diagrams for each of the monitoring locations referenced above can be found in Appendix H.

5.1.2 Quarterly Surface Water Quality Monitoring

Surface water sampling was conducted on a quarterly basis in 2021 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 rain season. A map of the surface water sampling locations is found in Appendix I. Samples are collected in accordance with the Eagle Project Quality Assurance Project Plan and Standard Operating Procedures (North Jackson, 2004a and 2004b) and the results are summarized and compared to benchmarks in Appendix J. 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 2021.

Monitoring Results

Grab samples were collected from each location during the quarterly sampling events completed in February, April, August, and October 2021. The Eagle Mine Permit prescribes a parameter list for annual monitoring events (completed in Q2 2021) and a shorter list to be used quarterly (Q1, Q3, and Q4 2021). 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. All water quality samples were

shipped overnight to Pace Analytical in Grand Rapids, Michigan for analysis. Following is a summary of the 2021 events that occurred.

- At compliance monitoring location STRM005, the results for iron were above the benchmark for at least two consecutive Q4 sampling events. This location is the most northern surface water monitoring point and is well outside of the direct influence of the mine site. pH was also above benchmark for two consecutive 2020 and 2021 Q3 sampling events. pH results in Q1, Q2, and Q4 2021 were within benchmarks indicating the change may have been the result of seasonal variation.

- Compliance location STRE001 had results for iron above the established benchmark for six consecutive Q3 sampling events. Results for iron at nearby upstream monitoring locations STRE009 and STRE010 were within established benchmarks. The elevated iron may be associated with iron oxides or iron hydroxides found in the soils (clay) within the waterbody and may fluctuate based on precipitation rates and flow rates of the river.

- Compliance locations STRE005 and STRE010 had results for calcium, magnesium and hardness that were above the established benchmark for two consecutive Q2 sampling events. In addition, results for manganese at location STRE005 was above the benchmark for Q3 2020 and 2021 sampling events.

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 take into account seasonal variations.

Possible trends were identified for one or more parameters at all of the eleven monitoring locations using data collected from baseline sampling events (2011) through October 2021. Sulfate was 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 showing that the results are likely due to seasonal variation.

A table summarizing the potential surface water trends can be found in Appendix K. No trends were identified for parameters that were outside of two consecutive seasonal quarters and therefore no trend charts are included with Appendix K. 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

Monitoring wells QAL023B, QAL024A, QAL044B, QAL064D, QAL065D, QAL066D and wetland locations WLD022, WLD023, WLD025, WLD026, WLD027, and WLD028 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 L.

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 N. The following is a summary of the findings:

- QAL023B – The mean water level readings from October 2020 – May 2021 and August – September 2021 were a maximum of 1.7 feet (ft) below the calculated minimum background baseline level. The lowest reading was recorded in May 2021. Water levels were not measured at this location from June through September because the water levels fell far enough below the equipment at this monitoring location that it didn't take readings.

- QAL024A – The mean water level readings were less than the minimum background baseline levels in August – September 2021. The lowest reading was recorded in September 2021 and was 0.3 ft below the minimum baseline level.
- QAL044B – The mean water level readings from January – September 2021 were a maximum of 1.1 ft below the minimum baseline level calculated for this location. The lowest reading was recorded in September 2021.
- QAL064D – The mean water level readings from July – September 2021 were a maximum of 0.3 ft below the minimum baseline level calculated for this location.
- QAL065D – The mean water level readings from January – September 2021 were a maximum of 1.1 ft below the minimum baseline level calculated for this location. The lowest water level was recorded in August and September 2021.
- QAL066D – The mean water level readings from October 2020 – September 2021 were a maximum of 2.0 ft below the minimum baseline level calculated for this location. The lowest reading was reported in September 2021.

The changes in groundwater levels observed in 2021 are most likely attributed to precipitation levels, pumping of the mine services well and groundwater infiltration into the mine. In 2021, precipitation rates were well below average by 8 – 9 inches with four months of what was defined as drought conditions based on the Palmer Hydrological Drought Data Index. As historically observed, precipitation rates influence the shallower zone wells. During winter months, water levels may decrease as little recharge from precipitation and infiltration occurs and during spring melt or heavy rain, water levels may increase as recharge occurs within the proximity of the monitoring location. The same concept applies to drought conditions; lower precipitation rates result in less recharge and lower water level elevations.

In addition, some of the short-lived fluctuations in groundwater levels may be attributed to blasting events. In a confined aquifer, the impacts of blasting may be observed due to increased pressure or changes in pressure. These changes are short-lived (blasting causes an instantaneous pulse in groundwater levels) and water levels return to pre-blast levels typically within the hour after the blasting cycle is complete.

Piezometer with a level troll located at QAL008A

Groundwater Infiltration

In 2021, seven stopes were mined between the 352 and 381 levels, and five 381L sill headings were developed. The Crown Pillar Management Plan established a series of triggers in which actions shall be initiated if discrete inflows that occur in the Eagle ore body are greater than 5 gpm. No discrete inflows of greater than 5 gpm were identified during mining in 2021. The wireless radio telemetry network provided continuous, real-time monitoring of water levels from bedrock piezometers, quaternary wells, and wetland piezometers. Monitoring data is reviewed regularly for potential impacts from mining on water levels. In a discrete inflow event, this data could also be used to identify any response in water levels and aid in the selection and initiation of appropriate response actions. In the event of a discrete inflow greater than 5 gpm, additional information would be collected by the mining crews including the elevation at which water is intercepted, flow rates, and water quality samples would be collected.

Water levels at the wetland locations did not fall more than six inches (in) below pre-mining baseline levels. The following deviations were reported from baseline levels.

- WLD022-4.5 had a mean water level below the baseline minimum in December 2020 – March 2021, and May – September 2021. The lowest reading was reported in August 2021 and was 0.4 ft below the baseline minimum.
- The WLD025-9.5 mean water level was below the minimum baseline in June and July 2021. The largest deviation was 0.2 feet below the baseline minimum in July 2021.
- WLD026-9.5 had a mean water level 0.1 feet below the baseline minimum in July 2021.
- The WLD028-9.5 mean water level was 0.1 ft below the baseline minimum in August and September 2021.

Water levels returned to baseline ranges at locations WLD025-9.5 and WLD026-9.5 following the deviations and the mean water levels remained below baseline minimums at locations WLD022-4.5 and WLD028-9.5. Lower than average precipitation is the main explanation for the lower water levels. Hydrographs of each groundwater and wetland monitoring location can be found in Appendix O.

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 an area of approximately 14 square miles. Discrete water elevations are measured on a quarterly basis 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 L and a map of the A and D-zone groundwater contour maps for each sampling quarter can be found in Appendix M. A review of the results determined the following:

- No significant changes or shifts in calculated ground contours were reported for calendar year 2021.
- Regionally, the overall water levels were lower in 2021. Average precipitation rates in 2021 were 8 – 9 inches less compared to average precipitation for the area with four months of drought conditions based on Palmer Hydrological Drought Index data. The exception, as described above, remains in the D-zone water levels in monitoring wells located above the ore body and near the mine services well (QAL011D) extraction area.
    - 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 above, the mine services well (QAL011D) is used to supply water for underground operations, dust suppression,

fire water, etc. A study completed in May 2016 found that when the mine services well is operating, monitoring location QAL004D shows drawdown of the water level which rebounds when the well is not in use. Based on a review of hydrographs from area monitoring locations, it appears that there is some degree of influence from the use of the mine service well on water levels in the confined aquifer (B and D-zones) that extends 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 do not currently show any hydrological response to the mine service well or potable water supply well pumping.

  - Changes in water level in the monitoring wells located within the vicinity of the orebody (i.e. QAL023B, QAL044B, QAL064D, QAL065D, and QAL066D) are most likely attributed to precipitation rates, water withdrawal from the mine services well and/or infiltration of water encountered during mining activities.

- Wetland water levels above the orebody (e.g. reflected in wetland wells WLD025-4.5, WLD027-4.5 and WLD028-4.5) did not fall more than six inches below pre-mining baseline levels but in some instances the water levels in 2021 did fall below the minimum baseline levels. If drought conditions continue, wetlands water levels may reach levels requiring a notification under permit condition L4c. The wetlands are heavily influenced by precipitation levels as seen in the hydrographs.

Water levels were in a sustained wet period for the past several years. However, 2021 saw lower than average precipitation rates for the region. As a result, groundwater levels throughout the region were lower than previous years, even those not directly influenced by Eagle. Water levels can be cyclical depending on precipitation and regional climate conditions. A summary of discrete water elevation results from Q1 – Q4 2021 are summarized in Appendix P.

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 field technicians.

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, 2020 through September 30th, 2021 and are based on mean daily values. Background levels are based on data collected from September 2004 through August 2011 for all locations. Monthly temperature, flow, and specific conductivity are summarized in Appendix Q. The following is a summary of the findings:

- Continuous flow readings were not collected from locations STRE002 and STRM004 from December 2020 – January 2021, STRM005 in January 2021, and YDRM December 2020 – January 2021 and August – September 2021 due to ice build-up.

- Specific conductance measurements were not reported in December 2020 – January 2021 at locations STRE002 and STRM005. YDRM002 was not reported in January, February, August, and September 2021. This is due to missing values or data that failed to meet quality control requirements.

- Location STRE002 mean specific conductivity was below the background minimum level by 12 uS/cm in February 2021 and by 11.1 uS/cm at STRM005 in February 2021. Results were back to normal in the months following at this location. Location STRM004 mean specific

conductivity was higher than the background minimum by 41.3 and 48.6 uS/cm in January and February 2021 respectively.

- Overall results were consistent with previous years. The pattern of flow and hydraulics of the watershed have not changed. However, changes in stream discharge rates were observed throughout the watershed which are strongly influenced by precipitation and snowmelt events. The changes are the result of the lower-than-average precipitation rates for the region in 2021.
- As expected, changes in temperature correlate with changes in specific conductivity because temperature affects conductivity by increasing ionic mobility as well as 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 R.

5.3 Biological Monitoring

Biological monitoring events conducted in 2021 included flora and fauna surveys, wetland monitoring, fish and macro invertebrate surveys, and a Narrow-Leaved Gentian (NLG) survey. Results from each survey have been compiled into annual reports which are available upon request. A brief summary of each survey is provided below.

5.3.1 Flora and Fauna/Wetland Monitoring Report

The 2021 flora, fauna, and wetland vegetation surveys were conducted by Barr Engineering (formerly King & MacGregor Environmental, Inc. (KME)). Table 5.3.1 below summarizes the type and duration of the surveys that were completed in 2021. A map of the survey locations is available in Appendix S.

Table 5.3.1 – Type and Duration of 2021 Flora, Fauna, and Wetland Surveying Events

Survey Type	Survey Date
Bird	June 16 – 17; September 20, 22, & 23
Small Mammals	September 21 – 23
Large Mammals	May 4, June 2 and 15 – 17, July 7, August 16 – 17, September 20 – 23
Toads/Frogs	May 4, June 2, and July 7
Wetland Vegetative Monitoring	June 15 and 17
Upland Vegetative Monitoring	June 15 – 17; August 16 –17
Narrow-Leaved Gentian	August 17, 2021

The wildlife and plant species identified during the 2021 surveys within the Study Area are similar to those identified during previous KME surveys. Following is a summary of the survey results:

- A combined total of 960 birds representing 48 species, none of which are threatened or endangered, were observed during the bird surveys conducted in June and September 2021. The number of birds increased from the 2020 survey when 814 birds were observed. Consistent with previous studies, the Nashville warbler was the most abundant bird observed during the June survey and the Canada goose (Branta canadensis) was the most abundant recorded during the September survey. Overall, the bird species identified during the 2021 bird surveys are similar to those bird species identified in previous surveys conducted within the Study Area and are consistent with the bird species expected to be found in the habitats present.

- Forty-nine small mammals representing seven species were collected during the September survey period. The most common small mammal identified in the 2021 survey was the deer mouse, while red squirrels and chipmunk species were also observed, similar to 2020. No threatened, endangered, or special concern small mammals were observed during any of the surveys. Red squirrels appeared to be relatively common throughout the Study Area, and are usually highly adept at trap avoidance. The small mammals encountered within the Study Area during the 2021 surveys are typical of those expected in the habitats present and are generally consistent with previous survey results. Other regionally common species possibly present or previously observed within the Study Area but not noted during the 2021 surveys include American pygmy shrew (Sorex hoyi), American water shrew (Sorex palustris), beaver (Castor canadensis), fisher (Martes pennant), muskrat (Ondatra zibethicus), long-tailed weasel (Mustela frenata), masked shrew (Sorex cinereus), northern short-tailed shrew (Blarina brevicauda), raccoon (Procyon lotor), river otter (Lutra canadensis), snowshoe hare (Lepus americanus), and white-footed mouse (Peromyscus leucopus). Small mammals appear to be distributed throughout wooded and open areas, in both upland and wetland habitats.

- Evidence of white-tailed deer (Odocoileus virginianus), American black bear (Ursus americanus) and moose (Alces alces) were observed during the 2021 surveys. Similar to previous years, fresh scat and tracks of coyote (Canis latrans) were observed occasionally throughout the Study Area.

- Four frog species American Toad (Bufo americanus), Gray Treefrog (Hyla versicolor), Green Frog (Rana clamitans), and Northern Spring Peeper (Pseudacris crucifer) were heard during the survey; none of which are threatened or endangered. All three of the sampling points exhibited use by frogs for breeding. The Northern Spring Peeper exhibited the highest Call Index Values. The frog species identified are typical of those expected in the habitats present in the Study Area and results are consistent with observations made during previous surveys. Operations noise from the vent raise area fan was again noted at all three surveys. At Survey Points 2 and 3, the fan sounds may be enough to diminish the ability for observers to hear and/or distinguish calls.

- Vegetative sampling plots in both wetland and upland communities identified plant species common to this region. The overall richness and distribution of wetland and upland vegetation in 2021 was found to be very similar to previous years. No threatened or endangered plant species were encountered within the vegetative survey plots. The population of NLG observed within the Study Area remains robust. All of the wildlife and plant species identified within the Study Area are typically associated with vegetative communities that are relatively common within the region.

Upland Vegetation Survey Plot 12, North View

Wetland Vegetation Survey, Plot 8W, Quadrat View

5.3.2 Threatened and Endangered Species

The Michigan Natural Features Inventory (MNFI) maintains a database of rare plants and animals in Michigan. Barr requested a Rare Species Review to determine if any protected species had been found in or near the Study Area. MNFI lists the NLG as a threatened species in Michigan. In accordance with Michigan Department of Natural Resources (MDNR) guidelines (MDNR 2001), Barr surveyed for any MNFI listed species and their habitats during the appropriate season.

Similar to previous years, Kirtland's warbler was not detected at any time during any of the 2021 ecological surveys. Spruce grouse is a state special concern species; this species was again occasionally observed during the 2021 ecological surveys near the Salmon-Trout River. Scat and tracks of moose (state special concern) was observed, and no observations of the yellow-banded bumble bee or gray wolf were recorded.

5.3.3 Narrow-Leaved Gentian (NLG)

The methods used to conduct the 2021 NLG field investigation were consistent with the previous NLG studies. Photographic and Global Positioning System documentation were collected on August 17, 2021. In addition, the local climate changes and overall health of the NLG colonies were assessed relative to previous years.

According to the National Oceanic and Atmospheric Administration data, mean precipitation totals were below average for the area. However, flow in the Salmon-Trout River and Yellow Dog River appeared normal in August. Mean monthly temperatures were below average in February, near average for July and above average for in April, May, June, September, November, December, and much above average for January, March, and August. The NLG colonies continued to appear healthy in 2021. However, significant herbivory (animal browsing) was observed unlike previous years. As in previous years, flowering NLG were found in abundance (hundreds of individual plants) both along the Salmon-Trout River and in the area north of the Yellow Dog River.

Large Colony of NLG North of Yellow Dog River, August 2021

5.3.4 Fisheries and Macro Invertebrate Report

The 2021 fisheries and macro-invertebrate annual surveys were conducted by Advanced Ecological Management (AEM). A total of ten stations were surveyed in June 2021, including one station in the Yellow Dog River, one station in Cedar Creek, five stations in the Main Branch of the Salmon-Trout

River, and three stations in tributaries of the East Branch of the Salmon-Trout River. A map of the aquatic sampling locations is available in Appendix T.

A total of 405 fish were collected from all stations in 2021, with 67% of the total being captured at Station 6 located on the main branch of the Salmon-Trout River. In total, there were 24 fewer fish collected in 2021 than 2020. A total of 10 species of fish were observed during the 2021 aquatic survey, which was one more species than were observed in the 2020 aquatic survey. Northern redbelly dace (Chrosomus eos), brook sticklebacks (Culaea inconstans), and brook trout (Salvelinus fontinalis), were the most frequently collected species. No MNFI listed threatened or endangered fish species were identified in the stations investigated in 2021. A total of 271 fish were collected from Station 6 in 2021, which was 58 fewer fish than collected in 2020, but higher than any other station location in 2021. The total number of fish collected from Station 6 has fluctuated annually because of nearby beaver dams, which influence water levels within the station.

Using the State of Michigan P-51 survey protocol, a total of 2,516 macroinvertebrates were collected from all ten stations that were investigated in 2021, which was 765 fewer specimens than the total number collected in 2020 (i.e. 3,281). Due to beaver dams in the vicinity of Stations 6 and 7, the P-51 measurement protocols could not be applied to those areas. The macro-invertebrate communities within the Salmon-Trout River have been scored by AEM as "Excellent" or "Acceptable" communities.

The aquatic and stream habitat at stations sampled during 2021 were rated as "Good" or "Excellent" habitat quality. Station 9 habitat changed from an "Excellent" rating, but has been rated as "Good" since 2014. There appeared to be minor redevelopment of small pools within Station 9 at the time of the 2016 aquatic survey, and the pool development appeared to continue up to the 2021 aquatic survey. The change in the habitat rating of Station 9 was due to logging activities upstream that caused the sand to move into the station, filling these pools. The 2021 P-51 habitat ratings for all other stations have remained consistent with previous surveys. A copy of the full report is available upon request.

Station 3 – Downstream Extent View South, June 2021

Station 6 – Upstream Extent View Southwest, June 2021

Station 9 – Downstream Extent View South, June 2021

Station 10 – Upstream Extent View Northeast, June 2021

5.3.5 Fish Tissue Survey

No fish tissue survey was conducted in 2021. Surveys are only required once every three years, with the next survey tentatively planned for 2023.

5.4 Miscellaneous Monitoring

5.4.1 Soil Erosion Control Measures (SESC)

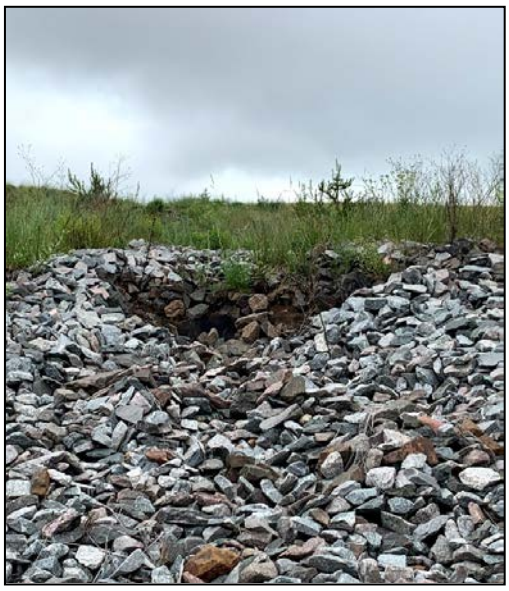
There were no SESC measures in place on site in 2021. If areas are identified that need SESC measures in the future, the measures will be installed and maintained in compliance with the requirements of Part 91 (NREPA, 1994 PA 451, as amended).

5.4.2 Berms, Embankments and Basins

All containment berms and embankments of the TDRSA, CWB, NCWIBs, and facility perimeter are inspected on a monthly basis, 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 2021 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 2021, there was some vegetation noted and subsequently removed on the western berm of the TDRSA near the liner, as well as small vegetation removed near and in the NCWIBs, mainly the basin near the WTP (NCWIB #1). Follow-up inspection (and repairs if needed) will be completed in the spring of 2022.

Repairs were made to two NCWIBs in 2021. NCWIB #3, located near the mine site entrance, required repair due to erosion along the storm water conveyance to the non-contact water basin. Riprap was added to the northwest corner where stormwater flows to the basin to eliminate further erosion. The riprap was also eroded near the bottom of the basin and a small area of erosion was exposing the soil below near the top. In addition, NCWIB #2, located near the cold storage warehouse, needed minimal amounts of riprap replaced along the north wall.



NCWIB #3 – Before riprap repairs

NCWIB #3 – After riprap repairs

5.4.3 Impermeable Surface Inspections

The impermeable surfaces monitoring plan outlines the requirements of integrity monitoring of surfaces exposed to contact storm water. Areas inspected in 2021 include the WTP, truck wash, truck shop floors, sumps, trench drains, the contact area, and travel ways comprised of concrete or asphalt.

The WTP, truck wash and truck shop floors, sumps, and drains were inspected monthly from January through December 2021. Inspections of the contact area and travel ways were completed during the months of May through November. 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, stored in the compliance binder at the Eagle Mine Site. Any issues identified during the inspections are immediately reported and fixed by onsite staff. Follow-up inspections are completed to ensure the repairs were made.

The following repairs were made as a result of the contact area inspections completed in 2021.

Asphalt was removed and replaced in the following areas:

- Entrance to the TDRSA
- Curve on the main site access road
- Entrance to the COSA
- Paved area between the COSA exit and Truck Wash entrance
- Truck Wash exit
- Two locations in the main central travel ways between the portal and COSA
- Curb added near the southwest corner of the TDRSA (by monitoring well QAL067A).

Below are photos from some of the locations in which repairs were made in 2021.

Entrance to the TDRSA (before & after)

Main access road (before & after)

Entrance to the COSA (before & after)

Curb near TDRSA well QAL067A (before & after)

5.4.4 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 decline development is currently complete, in 2021, the program focused on underground water quality.

Four underground water quality samples were collected in February, May, July, and November 2021 from Jump Tank 1 located in the main decline underground. Water from the lower levels of the mine are pumped to Jump Tank 1 which then pumps the water to the CWBs. Samples were analyzed for the annual parameter list in Q2 with analysis of the quarterly parameters list in Q1, Q3 and Q4. A summary table and graph of the results and are available in Appendix D.

5.4.5 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 on an annual basis for the NCWIBs. Each of the four NCWIBs were inspected in 2021. No visible changes were observed. Minimal vegetation was observed and removed and will continue to be monitored. Visible sand accumulation was observed at NCWIB #2, located near the cold storage warehouse. Sand continues to accumulate in the northwest corner of NCWIB #2 due to snow that is stored there during the winter months; when the snow melts the sand is left behind. The accumulating sand has not impacted infiltration but will continue to be monitored and removed if necessary.

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 2021, and the second was completed in August 2021. The sediment accumulation in CWB #1 was over 50 inches in some locations near the south end where the underground water is pumped into the basin, but on average, was approximately 46 inches throughout the rest of CWB #1.

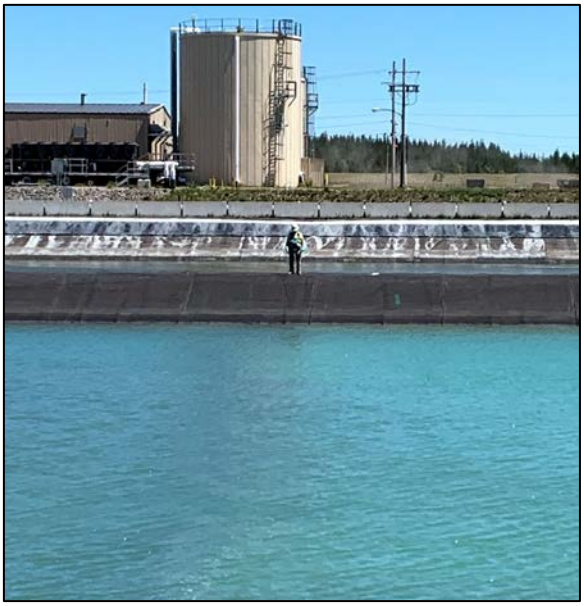
The average sediment accumulation in CWB #2 was approximately 8 inches, with some locations measuring over one foot. The highest sediment accumulations, ranging from 12 to 36 inches were in the north end of the basin near the CWB #2 pump house. The WTP outlet is located in the northwest corner of CWB #2 and is likely the cause of sediment accumulation. This outfall is the point in which recycled or off-spec water from the WTP is deposited back into the basins prior to re-treatment.

Because of the high accumulation of sediment near the southern end of CWB #1, dredging operations took place in May 2021. A dredge was placed in the basin and lines were installed connecting the dredge pump system to two geotubes placed on the contact area to allow the dredged material to dewater. Dredging was completed in the southern half of the basin. Approximately 150 feet of the north end of the basin was not dredged.

As a secondary precaution to ensure the CWB liner wasn't damaged during the dredging operations, the dredging head was kept 12 inches off the floor of the basin which resulted in additional sediment being left behind. Approximately 2,900 yd^3 of material was removed from CWB #1 during the dredging effort. Before dredging started, the estimated volume of sediment in the basin was 5,774 yd^3. After dredging was completed, a second sediment thickness test was completed in August 2021 which estimated that there was 2,874 yd^3 left at the bottom of the basin. Once the dredged sediment was dewatered, the material was used as backfill in secondary stopes underground.

Dredge On the Basin and Full Geotube, May 2021

Following the sediment removal in May, a leak location survey was performed by Leak Location Services, Inc. (LSSI) in both CWB #1 and #2 in June 2021. 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 earth ground. This process can detect a leak that is 0.001 square inches or greater in size.



Leak Location Survey on CWB #1 after dredging, June 2021

Three signals were detected during the survey; one in CWB #1 and two in CWB #2. The signal in CWB #1 was detected on the north end of the basin. Weather and high water levels in CWB #1 required the investigation to be conducted using a boat and magnet. The magnet is used to detect any metal objects that may result in a false positive reading. No metal was found, but based on the location, the signal was likely either the WTP intake pipes or a metal fitting under the sediment. This will be confirmed in 2022 during the next leak location inspection of CWB #1. There is unlikely to be any damage that has occurred to the liner because there was no dredging work done in that area and there is approximately one foot of sediment present on the liner.

CWB #2 had two marked locations, and due to lower water levels, the investigations were completed by wading in the basin and visual inspection. One location near the south end of the basin was previously detected during a survey and at that time the liner was thoroughly checked by isolating the

area using a barrel and pump method. No damage to the liner or leaks were detected at that time, and no changes have occurred that would have impacted the liner. The second location, on the north end of CWB #2, was near the air scour line, and the detection is assumed to be a metal fitting on the supply line. Metal objects (e.g. piping, bolts, etc.) can trigger false positives by the probe during surveys and is expected to be the source of all three anomalies.

Follow Up Inspection to Leak Location Survey in CWB #2, September 2021

A follow-up inspection will be performed by LSSI in 2022 of CWB #1. In addition, a review of the results from monitoring wells located downgradient of the CWBs do not show a correlation in water quality. In the event that a leak was present, the basins are designed with a bentonite/clay layer as part of the liner system. If a leak were to exist, the bentonite would provide a protective layer beneath the liner system.

6. Reclamation Activities

No reclamation activities occurred in 2021 and there are currently no plans to conduct any reclamation activities in 2022. The Department will be notified, in advance, if any activities do commence in 2022.

Closure Planning

Detailed closure planning continued in 2021 with the assistance of Ramboll US Consulting of Denver, Colorado. The closure plan review and update process was initiated in 2017 due to the Lundin corporate requirement to advance the detailed planning for mine closure each year during the final five years of operation of the mine. The closure plan will remain flexible to support change or growth within the business and will undergo revisions and additions on a yearly basis from now until closure occurs. In 2021, Eagle's closure and reclamation implementation plan for the mine site was updated to include an increased level of detail in the following areas:

- Underground closure – a comprehensive demolition and hydrologic closure plan and schedule was developed.
- Surface facility closure – the demolition schedule and sequence was expanded upon and dove-tailed with the underground closure schedule.
- Earthworks (i.e. civil engineering design) for re-grading of the site was completed based on a full review of the pre-existing, current, and final desired ground surface grades.
- Detailed sampling and restoration plan for areas to be revegetated.
- Inclusion of procurement, contracts, and materials management plans.
- Consideration of climate change in the long-term closure monitoring plan.

- Updates to the social transition plan (ie. economic impact, stakeholder engagement, and land management).
- Review/update of the closure cost estimate.

7. Contingency Plan Update

One element of the contingency plan is to test the effectiveness of the plan on an annual basis. Testing is comprised of two components. The first component is participation in adequate training programs for individuals involved in responding to emergencies and the second component is a mock field test.

In accordance with Mine Safety Health Administration (MSHA) regulations, Eagle Mine is required to have a Mine Rescue team that is routinely and adequately trained to respond to underground emergency situations. In 2021 the Mine Rescue team maintained an average of 14 team members (two teams) over the course of 2021 with 2,276 training hours accumulated between all team members. The number of rescue team members was affected by COVID-19 related absences. Teams are comprised of volunteers from Cementation and Lundin.

In 2021, training included exploration in smoke (theatrical), basic first aid & CPR, firefighting, rope rescue hoisting, and operation and maintenance of both the BG4 closed-circuit breathing apparatus (CCBA) and MX6 gas instruments. In addition, the team assessed ventilation with the use of anemometers and smoke tubes. Four underground and one surface employee evacuation drill occurred in 2021 in which the Mine Rescue Team assisted to ensure proper evacuation procedures were followed.

Security personnel are EMTs and paramedics who are trained in accordance with state and federal regulations. Eagle Mine also maintains a state licensed ALS ambulance onsite for immediate response to emergency situations.

A mock field test in the form of a desktop exercise was conducted in May 2021. The exercise tested the emergency response measures of the contingency plan and crisis management plan in place at Eagle. With the assistance of Eagle Mine employees, a third-party consultant developed an emergency scenario. The scenario generally involves a situation in which both safety and environmental risks are considered and in 2021 the emergency involved a fall of ground in Eagle East. In the scenario, material fell onto a haul truck trapping an operator inside the cab. The crisis management team was aware that a test would occur but were unaware of the nature of the emergency. During the crisis management exercise, the team worked through the incident identifying the strategic objectives, key priorities, critical decisions and triggers, and communications that would need to be made to stakeholders. The third-party consultant observed the activity to identify strengths, weaknesses, and opportunities for improvement. Once the exercise was complete, the consultant and crisis management team held a debrief session to capture feedback. The results were captured in a summary report with actions for improvement. As a result of this session, the site risk register was updated, including additional mitigation measures.

Eagle's Crisis Management Team (CMT) also continued to meet regularly in 2021 to manage the COVID-19 pandemic. At the onset of the pandemic, the CMT established three strategic objectives: employee health and safety, site safety, and business continuity. These objectives continued to be the basis of the actions and decisions that were taken by the CMT in 2021 with a focus on risk mitigation.

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

8. Financial Assurance Update

Updated reclamation costs were submitted to the Department for review on January 31, 2022. It is understood that EGLE will notify Eagle Mine if these updated costs require re-negotiation of the current bond for financial assurance.

9. Organizational Information

An updated organization report can be found in Appendix V.

Appendix A

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 Drys
- 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

Date: 4/17/2015

0 0.0375 0.075 0.15 0.225 0.3 0.375 Miles

N W E S

Appendix B

Eagle Mine

Rock Stability Certification

Eagle Mine
a subsidiary of lundin mining

Eagle Mine
4547 County Road 601
Champion, MI 49814, USA
Phone: (906) 339-7000
Fax: (906) 339-7005
www.eaglemine.com

Monday, January 31, 2022

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

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

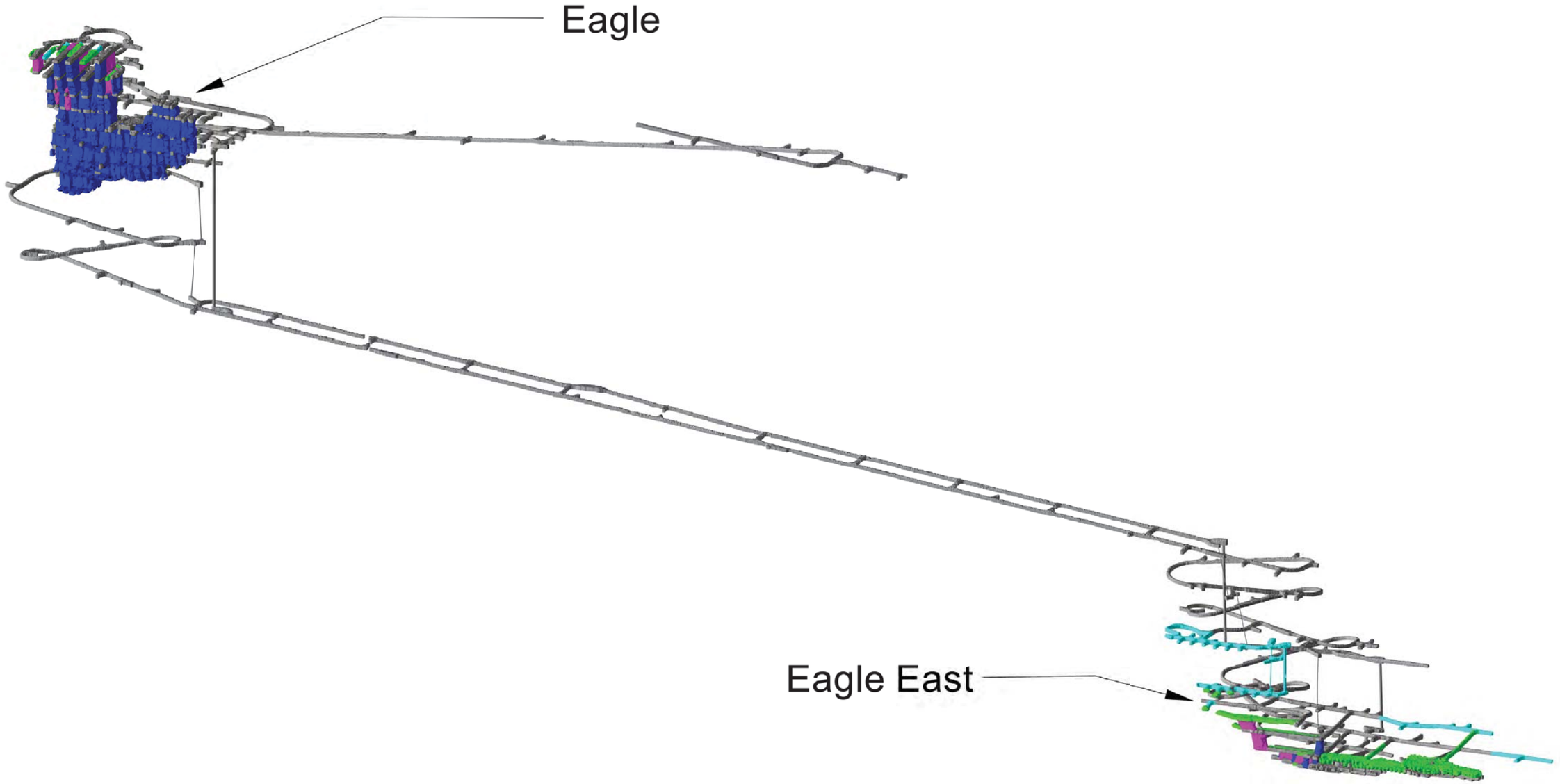
In accordance with condition E-8 of mining permit MP 01 2007, I certify that the rock stability modelling provided in the mine permit application is still valid. Geologic, geotechnical, and hydrogeologic data collected in 2021 do not indicate any changes in rock mass conditions from those used in the soft-coupled 3D geologic/hydrogeologic model. In addition, daily visual inspections are also conducted by Eagle Mine representatives and/or contractor mining personnel to verify ground stability.

Sincerely,

Jeff Murray
Operations Manager
Eagle Mine, LLC.

Appendix C

Eagle Mine
Maps of Eagle East Development
and
Eagle Production Mining Progress



	2021 STOPES
	2021 PRODUCTION SILLS
	2021 DEVELOPMENT
	PRE 2021 STOPES
	PRE 2021 DEVELOPMENT

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0 83 165

Drawing Title:

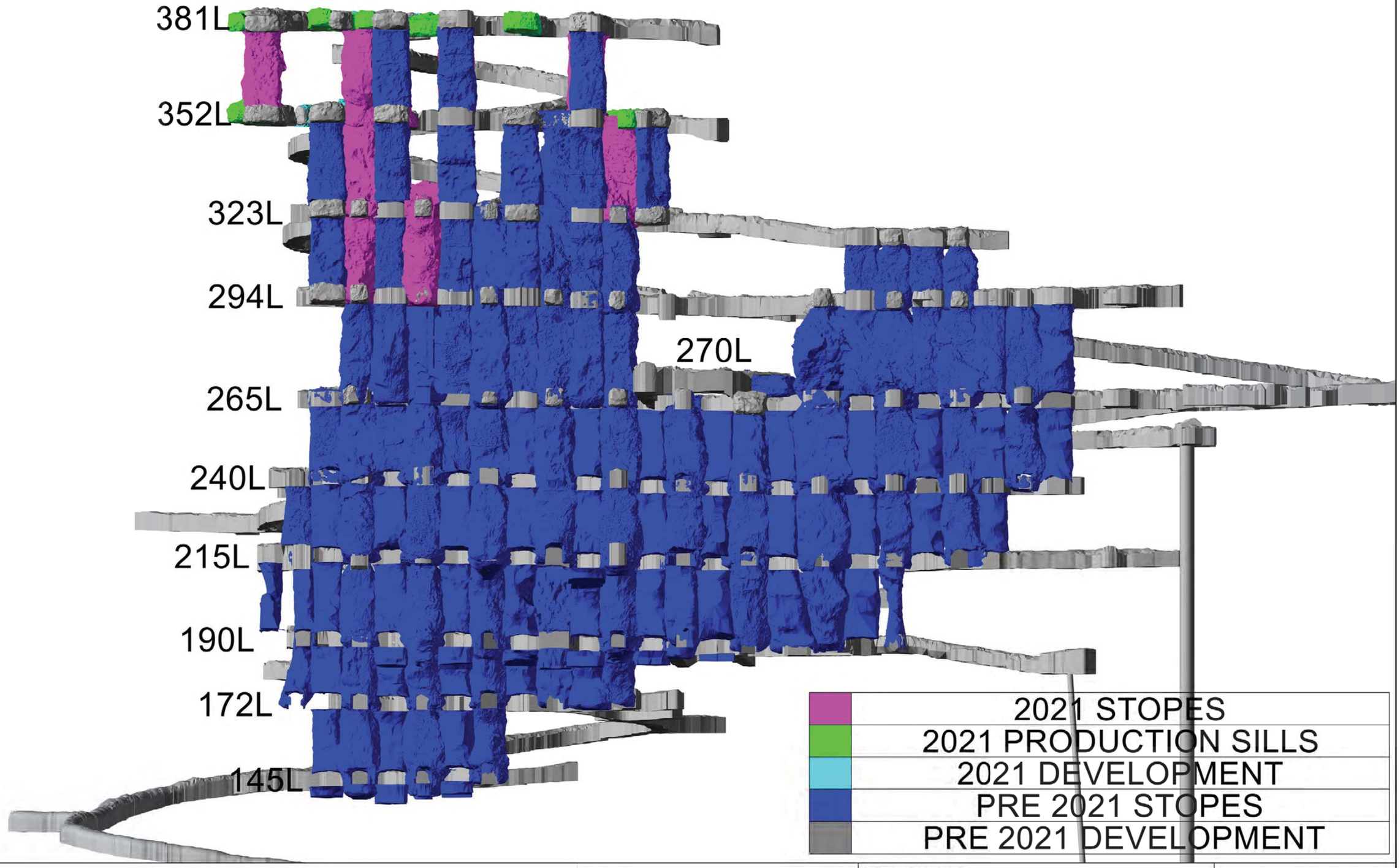
2021 Mining

Author:Michael.Dorfling

Date: 2022-01-26

Scale: 1:4250

Eagle Mine



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Drawing Title:

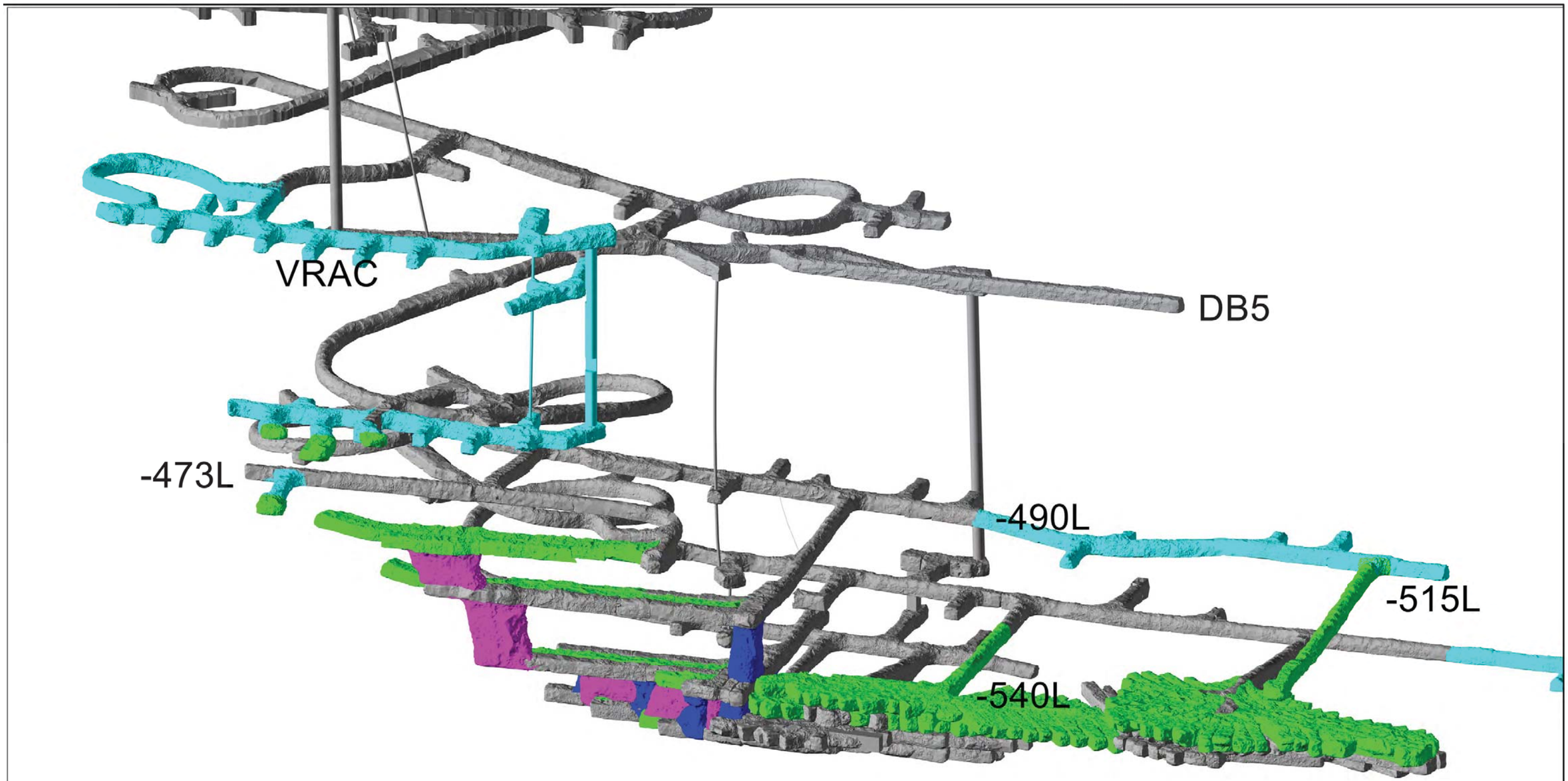
2021 Eagle

Author:Michael.Dorfling

Date: 2022-01-26

Scale: 1:750

Eagle Mine



2021 STOPES
2021 PRODUCTION SILLS
2021 DEVELOPMENT
PRE 2021 STOPES
PRE 2021 DEVELOPMENT

1:1000
0 10 19 29 39

Drawing Title:

2021 EE

Author:Michael.Dorfling

Date: 2022-01-26

Scale: 1:1000

Eagle Mine

Appendix D

Eagle Mine

Facilities Water Quality Monitoring Results

2021
Mine Permit Water Quality Monitoring Data
Contact Water Basins
Eagle Mine

		Q1 2021	Q2 2021	Q3 2021	Q4 2021
Parameter	**Unit**	**2/9/2021**	**5/17/2021**	**7/26/2021**	**11/9/2021**
Field					
pH	SU	**8.4**	**9.0**	**10.3**	**9.4**
Specific Conductivity	µS/cm	**6772**	**6909**	**8490**	**9479**
Metals					
Aluminum, Total	µg/L	<50.0	**487**	**141**	**114**
Antimony, Total	µg/L	**4.2**	**8.7**	**7.7**	**8.9**
Arsenic, Total	µg/L	**2.5**	**3.2**	**4.2**	**4.5**
Barium, Total	µg/L	**68**	**62**	**94**	**67**
Beryllium, Total	µg/L	<1.0	<1.0	<1.0	<1.0
Boron, Total	µg/L	**728**	**699**	**721**	**738**
Cadmium, Total	µg/L	**0.35**	**0.52**	<0.20	<0.20
Chromium, Total	µg/L	**2.8**	**4.3**	**2.7**	**5.4**
Cobalt, Total	µg/L	<15.0	**23**	<15.0	<15.0
Copper, Total	µg/L	**12**	**28**	**14**	**9.4**
Iron, Total	µg/L	**170**	**853**	**378**	**172**
Lead, Total	µg/L	<1.0	**1.8**	<1.0	<1.0
Lithium, Total	µg/L	**59**	**58**	**66**	**87**
Manganese, Total	µg/L	**69**	**93**	**6.6**	**12**
Mercury, Total	µg/L	**0.001**	**0.004**	**0.001**	**0.001**
Molybdenum, Total	µg/L	**71**	**76**	**80**	**88**
Nickel, Total	µg/L	**479**	**344**	**33**	**65**
Selenium, Total	µg/L	**11**	**9.9**	**8.8**	**8.0**
Silver, Total	µg/L	<20.0	<0.20	<0.20	<0.20
Strontium, Total	µg/L	**3970**	**3310**	**5840**	**4040**
Thallium, Total	µg/L	<2.0	<2.0	<2.0	<2.0
Vanadium, Total	µg/L	**1.3**	**3.8**	**2.4**	**4.6**
Zinc, Total	µg/L	**19**	**40**	<10.0	<10.0
Major Anions					
Alkalinity, Bicarbonate	mg/L	**114**	**74**	**6.4**	**54**
Alkalinity, Carbonate	mg/L	<2.0	**39**	**54**	**36**
Chloride	mg/L	**998**	**1520**	**3020**	**2330**
Fluoride	mg/L	<0.10	**0.18**	<0.10	—
Nitrogen, Nitrate	mg/L	**104**	**104**	**80**	**86**
Sulfate	mg/L	**1330**	**1490**	**930**	**1650**
Major Cations					
Calcium, Total	mg/L	**209**	**185**	**116**	**138**
Magnesium, Total	mg/L	**65**	**68**	**15**	**18**
Potassium, Total	µg/L	**111000**	**103000**	**136000**	**179000**
Sodium, Total	mg/L	**1170**	**1170**	**1550**	**2040**

— Analyte not included in the quarterly parameter list.

2021
Mine Permit Water Quality Monitoring Data
TDRSA Contact Water Sump
Eagle Mine

		Q1 2021	Q2 2021	Q3 2021	Q4 2021
Parameter	**Unit**	**2/9/2021**	**5/17/2021**	**7/26/2021**	**11/9/2021**
Field					
pH	SU	**7.7**	**6.6**	**6.7**	**7.1**
Specific Conductivity	µS/cm	**5294**	**5450**	**5880**	**5230**
Metals					
Aluminum, Total	µg/L	—	<50.0	—	—
Antimony, Total	µg/L	—	**1.1**	—	—
Arsenic, Total	µg/L	<1.0	<1.0	<1.0	<1.0
Barium, Total	µg/L	—	**49**	—	—
Beryllium, Total	µg/L	—	<1.0	—	—
Boron, Total	µg/L	**1160**	**951**	**1140**	**1050**
Cadmium, Total	µg/L	—	**3.2**	—	—
Chromium, Total	µg/L	—	**2.5**	—	—
Cobalt, Total	µg/L	—	**140**	—	—
Copper, Total	µg/L	**7.3**	**6.2**	**4.8**	**4.4**
Iron, Total	µg/L	<50.0	<50.0	<50.0	<50.0
Lead, Total	µg/L	—	<1.0	—	—
Lithium, Total	µg/L	—	—	—	—
Manganese, Total	µg/L	**575**	**1120**	**1910**	**1390**
Mercury, Total	µg/L	**0.001**	**0.004**	**0.002**	**0.002**
Molybdenum, Total	µg/L	—	**38**	—	—
Nickel, Total	µg/L	**3350**	**2250**	**3470**	**5460**
Selenium, Total	µg/L	**20**	**13**	**12**	**11**
Silver, Total	µg/L	—	<0.20	—	—
Strontium, Total	µg/L	—	**4060**	—	—
Thallium, Total	µg/L	—	<2.0	—	—
Vanadium, Total	µg/L	—	<1.0	—	—
Zinc, Total	µg/L	**241**	**416**	**845**	**675**
Major Anions					
Alkalinity, Bicarbonate	mg/L	**73**	**94**	**70**	**59**
Alkalinity, Carbonate	mg/L	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	**525**	**520**	**955**	**533**
Fluoride	mg/L	—	<0.10	—	—
Nitrogen, Ammonia	mg/L	<10.0	**2.3**	**8.3**	**0.56**
Nitrogen, Nitrate	mg/L	**212**	**230**	**218**	**201**
Nitrogen, Nitrite	mg/L	<0.010	**0.66**	**1.3**	**0.02**
Sulfate	mg/L	**1450**	**2430**	**1160**	**2690**
Major Cations					
Calcium, Total	mg/L	—	**480**	—	—
Magnesium, Total	mg/L	**332**	**300**	**232**	**219**
Potassium, Total	µg/L	—	**68000**	—	—
Sodium, Total	mg/L	**460**	**438**	**393**	**360**

— Analyte not included in the quarterly parameter list.

2021
Mine Permit Water Quality Monitoring Data
TDRSA Leak Detection Sump
Eagle Mine

		Q1 2021	Q2 2021	Q3 2021	Q4 2021
Parameter	**Unit**	**2/11/2021**	**5/17/2021**	**7/26/2021**	**11/9/2021**
Field					
pH	SU	**7.4**	**7.5**	**7.5**	**7.7**
Specific Conductivity	µS/cm	**3192**	**3233**	**3285**	**3372**
Major Anions					
Chloride	mg/L	**49**	**52**	**52**	**54**
Nitrogen, Ammonia	mg/L	<0.10	**0.26**	<0.10	<0.10
Nitrogen, Nitrate	mg/L	**58**	**60**	**63**	**63**
Nitrogen, Nitrite	mg/L	**0.01**	<0.010	<0.010	**0.02**
Sulfate	mg/L	**848**	**1430**	**993**	**2020**
Major Cations					
Magnesium, Total	mg/L	**21**	**22**	**21**	**23**
Sodium, Total	mg/L	**664**	**613**	**622**	**742**

2021
Mine Permit Water Quality Monitoring Data
Underground Influent
Eagle Mine

		Q1 2021	Q2 2021	Q3 2021	Q4 2021
Parameter	**Unit**	**2/9/2021**	**5/17/2021**	**7/26/2021**	**11/9/2021**
Field					
pH	SU	**10.0**	**9.5**	**10.2**	**7.5**
Specific Conductivity	µS/cm	**8471**	**4995**	**4693**	**6265**
Metals					
Aluminum, Total	µg/L	—	**1160**	—	—
Antimony, Total	µg/L	—	**9.7**	—	—
Arsenic, Total	µg/L	**5.6**	**4.2**	**3.6**	**12**
Barium, Total	µg/L	—	**161**	—	—
Beryllium, Total	µg/L	—	<10.0	—	—
Boron, Total	µg/L	**322**	**315**	**406**	**337**
Cadmium, Total	µg/L	—	<0.20	—	—
Chromium, Total	µg/L	—	**10.5**	—	—
Cobalt, Total	µg/L	—	<15.0	—	—
Copper, Total	µg/L	**46**	**43**	**320**	**490**
Iron, Total	µg/L	**2890**	**2270**	**8300**	**30100**
Lead, Total	µg/L	—	**2.7**	—	—
Lithium, Total	µg/L	—	**79**	—	—
Manganese, Total	µg/L	**30**	**25**	**69**	**309**
Mercury, Total	µg/L	**0.032**	**0.008**	**0.017**	**0.045**
Molybdenum, Total	µg/L	—	**57**	—	—
Nickel, Total	µg/L	**50**	**65**	**363**	**489**
Selenium, Total	µg/L	**7.9**	**6.9**	**5.1**	**6.6**
Silver, Total	µg/L	—	**0.30**	—	—
Strontium, Total	µg/L	—	**7650**	—	—
Thallium, Total	µg/L	—	<2.0	—	—
Vanadium, Total	µg/L	—	**7.6**	—	—
Zinc, Total	µg/L	**22**	**18**	**34**	**327**
Major Anions					
Alkalinity, Bicarbonate	mg/L	**38**	<2.0	**11**	**51**
Alkalinity, Carbonate	mg/L	**100**	**98**	**98**	<2.0
Chloride	mg/L	**2540**	**1130**	**1710**	**1640**
Fluoride	mg/L	—	**0.25**	—	—
Nitrogen, Nitrate	mg/L	**78**	**66**	**58**	**77**
Nitrogen, Nitrite	mg/L	—	—	—	—
Sulfate	mg/L	**586**	**727**	**472**	**441**
Major Cations					
Calcium, Total	mg/L	—	**362**	—	—
Magnesium, Total	mg/L	—	**20**	—	—
Potassium, Total	µg/L	—	**109000**	—	—
Sodium, Total	mg/L	—	**626**	—	—

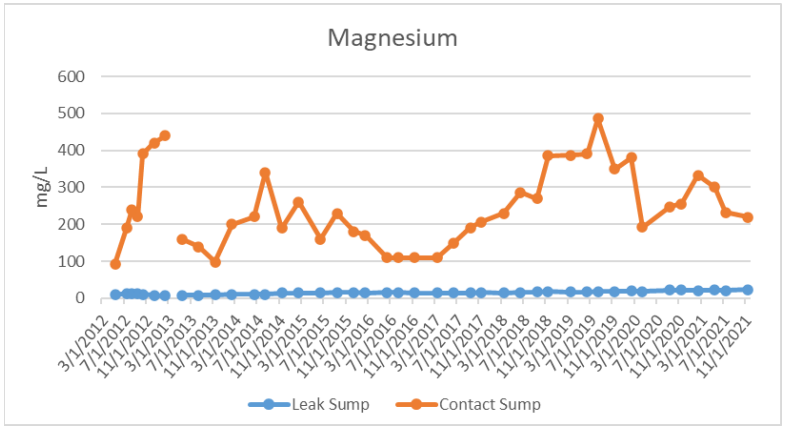
— Analyte not included in the quarterly parameter list.

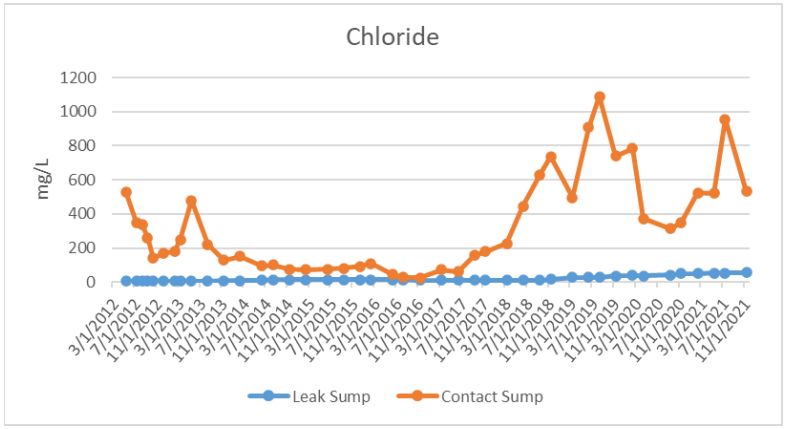
2021

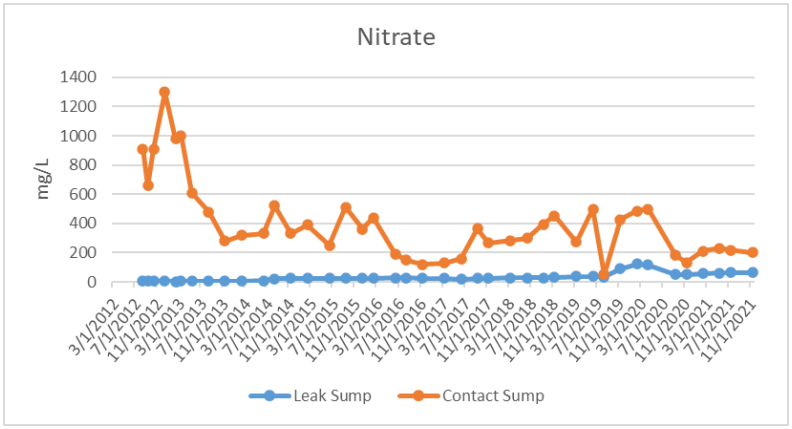
Mine Permit Water Quality Monitoring Data

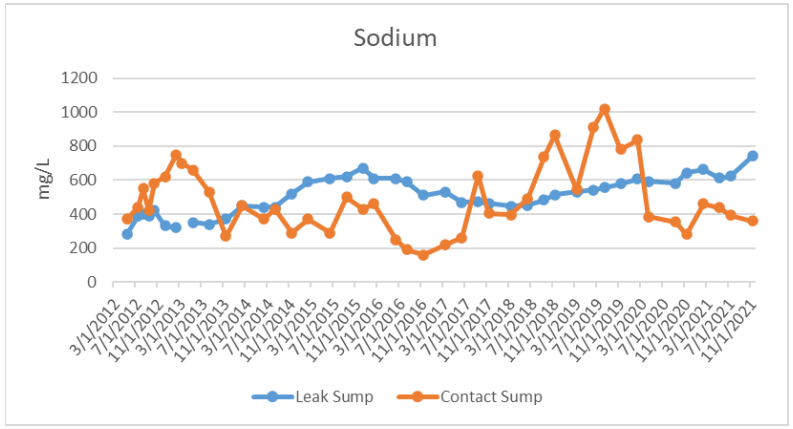
TDRSA Contact Water & Leak Sump

Eagle Mine







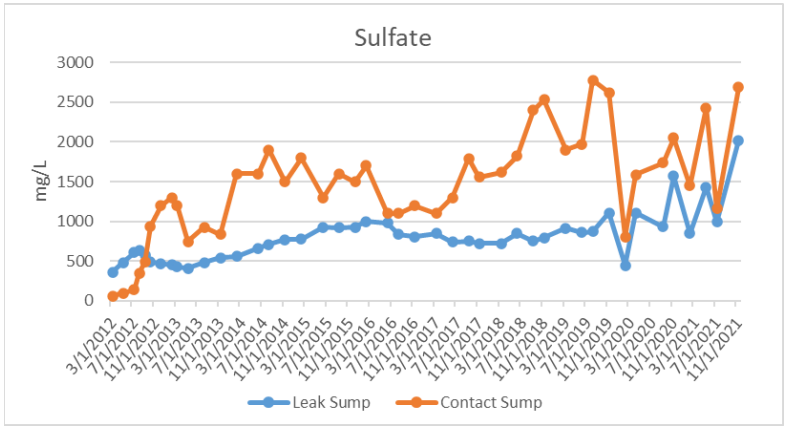


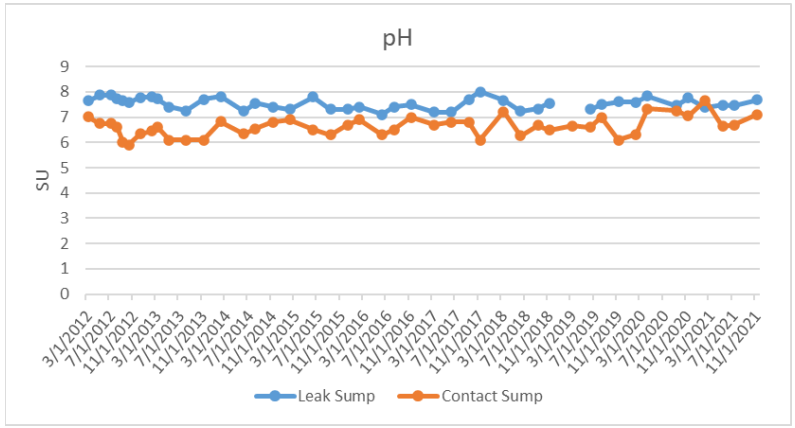
2021

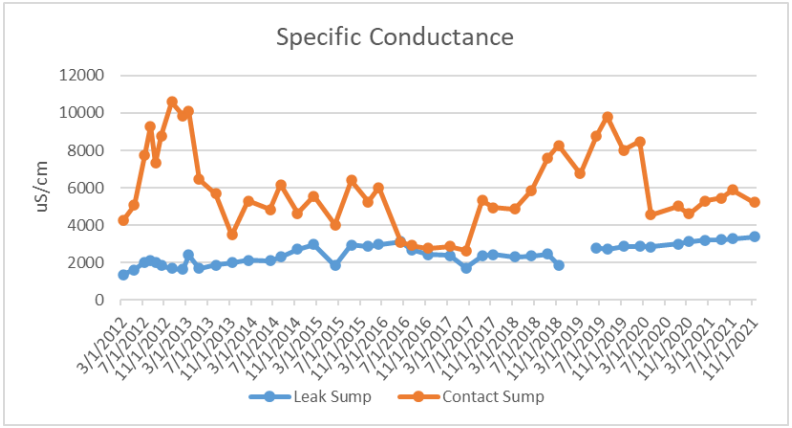
Mine Permit Water Quality Monitoring Data

TDRSA Contact Water & Leak Sump

Eagle Mine





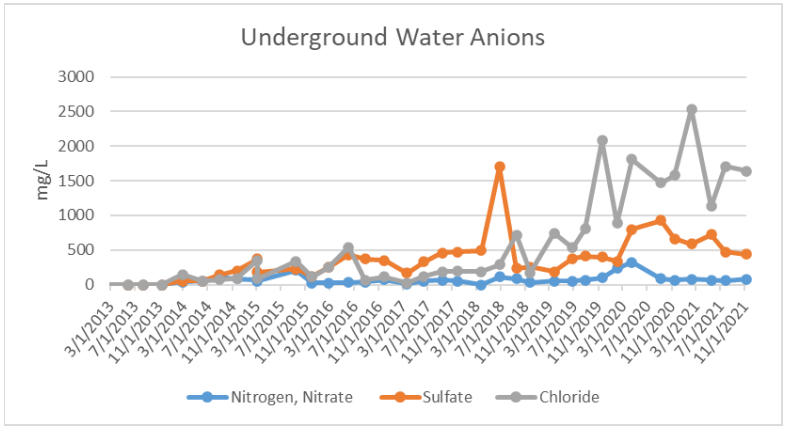


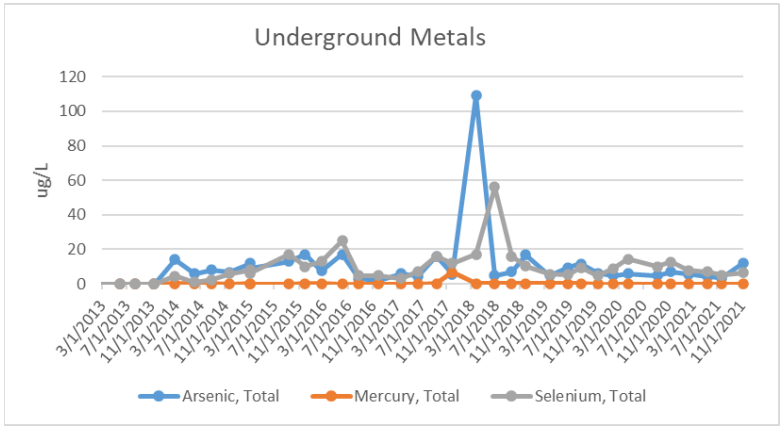
2021

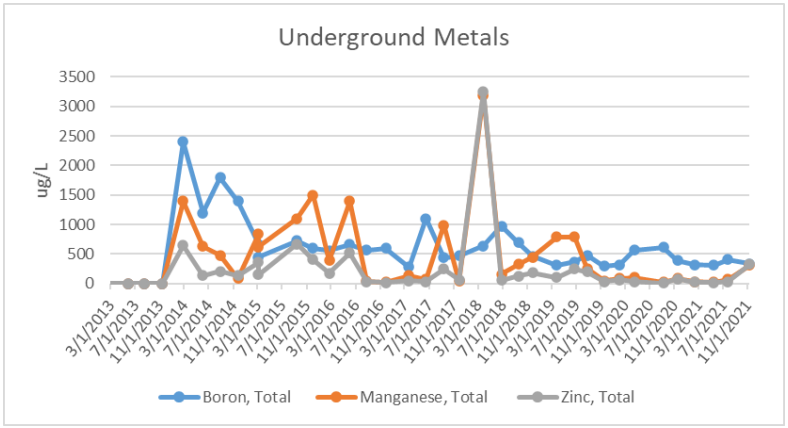
Mine Permit Water Quality Monitoring Data

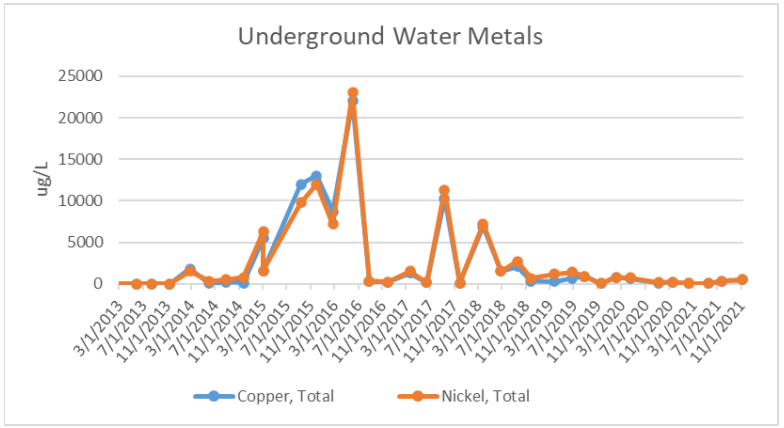
Underground Influent

Eagle Mine







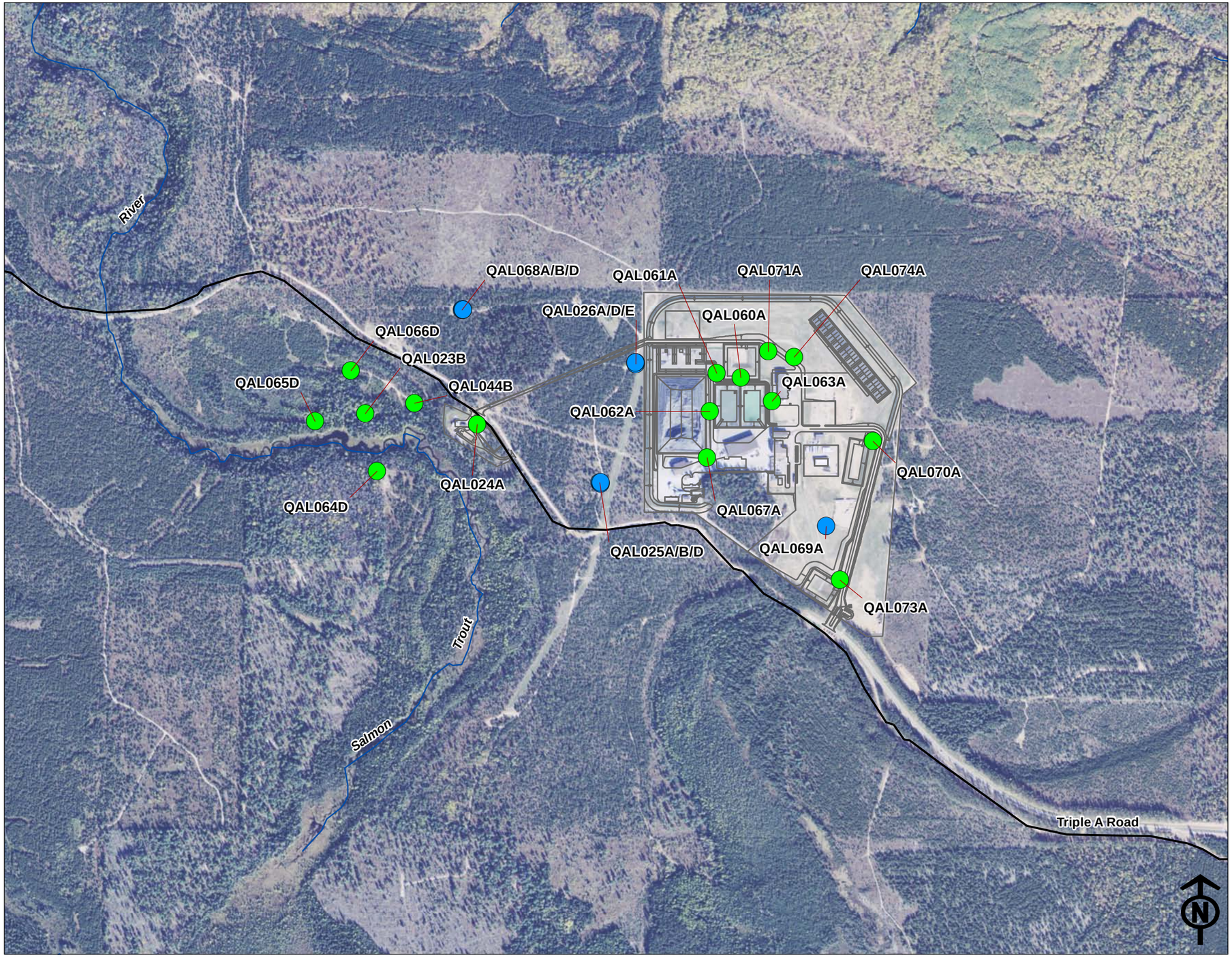


Appendix E

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

0 — 2,000 Feet

Scale: 1:12,000

Eagle Mine
a subsidiary of hudbay mining

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Appendix F

Eagle Mine

Groundwater Monitoring Well Results

and

Benchmark Summary Table

Eagle Mine
2021 Mine Permit Groundwater Monitoring
Benchmark Comparison Summary

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

Parameters listed in this table had values reported that were equal to or greater than a site-specific benchmark. Parameters in **BOLD** are instances in which the Department was notified because benchmark deviations were identified at compliance monitoring locations for two consecutive sampling quarters. If the location is classified as background, Department notification is not required for an exceedance.

*Monitoring locations is only sampled on an annual basis in Q2

2021
Mine Permit Groundwater Quality Monitoring Data
QAL023B (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/27/21[T]	Q2 2021 05/10/21[T]	Q3 2021 07/28/21[T]	Q4 2021 10/27/21[T]
Field						
D.O.[1]	ppm	--	**0.20**	**0.20**	<0.10	**0.20**
ORP	mV	--	**-158**	**-366**	**-410**	**-353**
pH	SU	7.8-8.8	**7.4**	**8.4**	**8.4**	**7.9**
Specific Conductance	µS/cm @ 25°C	--	**129**	**117**	**119**	**120**
Temperature	°C	--	**6.3**	**6.5**	**7.6**	**7.0**
Turbidity	NTU	--	<1.0	**3.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1414.23**	**1414.05**	**1412.95**	**1412.93**
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.5	<2.0	<2.0	<2.0	<2.0
Barium	ug/L	80	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	159	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<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	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	67	**61**	**56**	**58**	**56**
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 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.05	<0.05	<0.05	<0.05
Sulfate	mg/L	8.0	**4.7**	**5.3**	**5.1**	**5.1**
Major Cations						
Calcium	mg/L	16	**--**	**16**	**--**	**--**
Magnesium	mg/L	3.7	**--**	**3.7**	**--**	**--**
Potassium	mg/L	2.0	--	<0.50	--	--
Sodium	mg/L	11	**6.4**	**5.3**	**5.1**	**4.1**
General						
Hardness	mg/L	55	**--**	**55**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL024A (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**11**	**11**	**9.6**	**10**
ORP	mV	--	**83**	**211**	**149**	**-183**
pH	SU	6.1-7.1	**6.4**	**6.3**	**6.5**	**6.5**
Specific Conductance	µS/cm @ 25°C	--	**349**	**561**	**225**	**434**
Temperature	°C	--	**7.7**	**7.9**	**8.5**	**7.8**
Turbidity	NTU	--	<1.0	**2.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1417.90**	**1417.48**	**1417.36**	**1416.86**
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	--	70.2	--	--
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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	**7.2**	**13**	**5.9**	**5.8**
Iron	ug/L	105	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	**110**	**--**	**--**
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	24	**35**	**26**	**30**	**33**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	**48**	**133** e	**42**	**108** e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	**1.4**	**3.9** e	**1.8**	**3.4**
Sulfate	mg/L	8.0	**4.5**	**4.7**	**5.4**	**5.9**
Major Cations						
Calcium	mg/L	48	**--**	**36**	**--**	**--**
Magnesium	mg/L	8.1	**--**	**6.6**	**--**	**--**
Potassium	mg/L	3.7	**--**	**2.8**	**--**	**--**
Sodium	mg/L	2.0	**27**	**54**	**26**	**45**
General						
Hardness	mg/L	153	**--**	**116**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL025A (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/26/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**12**	**11**	**11**	**11**
ORP	mV	--	**62**	**223**	**-56**	**-153**
pH	SU	6.4-7.4	**6.7**	**7.0**	**7.1**	**7.4**
Specific Conductance	µS/cm @ 25°C	--	**73**	**63**	**72**	**75**
Temperature	°C	--	**6.5**	**7.4**	**8.2**	**7.3**
Turbidity	NTU	--	<1.0	**2.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1416.92**	**1416.34**	**1416.32**	**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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	126	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<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	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	25	**35**	**30**	**34**	**37**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	1.1	**0.24**	**0.22** e	**0.19**	**0.15**
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Major Cations						
Calcium	mg/L	8.5	--	**9.3**	--	--
Magnesium	mg/L	2.0	--	**1.7**	--	--
Potassium	mg/L	2.0	--	**0.86**	--	--
Sodium	mg/L	2.0	<1.0	<1.0	<1.0	<1.0
General						
Hardness	mg/L	28	--	**30**	--	--

2021
Mine Permit Groundwater Quality Monitoring Data
QAL025B (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/26/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**11**	**11**	**10**	**11**
ORP	mV	--	**10**	**175**	**-68**	**-153**
pH	SU	8.5-9.5	**8.7**	**9.1**	**9.2**	**9.2**
Specific Conductance	µS/cm @ 25°C	--	**73**	**69**	**71**	**70**
Temperature	°C	--	**7.2**	**7.1**	**7.4**	**7.1**
Turbidity	NTU	--	<1.0	**2.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1416.72**	**1416.12**	**1416.28**	**1415.62**
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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	56	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<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**	**1.1**	**1.1**
Zinc	ug/L	40	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	36	**31**	**31**	**28**	**34**
Alkalinity, Carbonate	mg/L	12	<2.0	<2.0	**5.8**	<2.0
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	**0.36**	**0.40** e	**0.37**	**0.32**
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Major Cations						
Calcium	mg/L	10	**--**	**10**	**--**	**--**
Magnesium	mg/L	2.0	**--**	**1.7**	**--**	**--**
Potassium	mg/L	2.0	--	**0.50**	**--**	**--**
Sodium	mg/L	4.5	**1.4**	**1.4**	**1.4**	**1.3**
General						
Hardness	mg/L	33	**--**	**32**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL025D (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/26/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**5.4**	**5.8**	**4.9**	**4.9**
ORP	mV	--	**-1.0**	**170**	**-155**	**-207**
pH	SU	8.2-9.2	**8.5**	**8.8**	**8.9**	**8.8**
Specific Conductance	µS/cm @ 25°C	--	**162**	**97**	**102**	**104**
Temperature	°C	--	**6.7**	**7.1**	**8.0**	**7.3**
Turbidity	NTU	--	<1.0	**2.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1412.91**	**1412.31**	**1412.25**	**1411.68**
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.5	**2.9**	**3.2**	**3.0**	**2.8**
Barium	ug/L	80	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	137	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<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	**3.8**	**4.6**	**4.3**	**3.9**
Zinc	ug/L	40	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	52	**44**	**42**	**40**	**42**
Alkalinity, Carbonate	mg/L	14	<2.0	<2.0	**2.8**	<2.0
Chloride	mg/L	4.0	**1.8**	**2.4** e	**2.5**	**2.6** e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	**0.10**	**0.11** e	**0.10**	**0.09**
Sulfate	mg/L	8.0	**5.2**	**4.8**	**5.1**	**5.5**
Major Cations						
Calcium	mg/L	12	**--**	**13**	**--**	**--**
Magnesium	mg/L	2.7	**--**	**2.8**	**--**	**--**
Potassium	mg/L	2.0	**--**	**0.64**	**--**	**--**
Sodium	mg/L	12	**3.2**	**3.1**	**3.1**	**2.9**
General						
Hardness	mg/L	42	**--**	**43**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL026A (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 Not Sampled
Field						
D.O.[1]	ppm	--	**10**	**11**	**11**	i
ORP	mV	--	**326**	**359**	**156**	i
pH	SU	6.2-7.2	**7.0**	**7.0**	**6.6**	i
Specific Conductance	µS/cm @ 25°C	--	**128**	**108**	**144**	i
Temperature	°C	--	**5.0**	**6.9**	**9.0**	i
Turbidity	NTU	--	<1.0	<1.0	<1.0	i
Water Elevation	ft MSL	--	**1416.84**	**1416.00**	**1415.56**	**<<1415.4** BP
Metals						
Aluminum	ug/L	236	**--**	**83**	**--**	**--**
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.0	<2.0	<2.0	<2.0	i
Barium	ug/L	80	**--**	<20.0	--	--
Beryllium	ug/L	2.5	--	<1.0	--	--
Boron	ug/L	400	<100	<100	<100	i
Cadmium	ug/L	2.0	--	<0.50	--	--
Chromium	ug/L	20	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	i
Iron	ug/L	368	**227** e	**131**	**66**	i
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	i
Mercury	ng/L	2.00	**0.57**	**0.83**	<0.50	i
Molybdenum	ug/L	40	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	i
Selenium	ug/L	4.0	<1.0	<1.0	<1.0	i
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	i
Zinc	ug/L	40	<10.0	<10.0	<10.0	i
Major Anions						
Alkalinity, Bicarbonate	mg/L	114	**61**	**67**	**78**	i
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	i
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	i
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.73	**0.37**	**0.38** e	**0.55**	i
Sulfate	mg/L	8.0	**2.1**	**2.2**	**2.2**	i
Major Cations						
Calcium	mg/L	40.0	**--**	**22**	**--**	**--**
Magnesium	mg/L	5.9	**--**	**3.2**	**--**	**--**
Potassium	mg/L	2.0	**--**	**1.2**	**--**	**--**
Sodium	mg/L	2.4	**1.3**	**1.3**	**1.5**	i
General						
Hardness	mg/L	124	**--**	**67**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL026D (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**10**	**12**	**12**	**12**
ORP	mV	--	**264**	**304**	**138**	**167**
pH	SU	8.4-9.4	**9.2**	**9.2**	**8.7**	**9.1**
Specific Conductance	µS/cm @ 25°C	--	**67**	**61**	**71**	**71**
Temperature	°C	--	**6.4**	**7.3**	**7.3**	**7.2**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**1409.74**	**1409.07**	**1408.94**	**1408.44**
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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<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	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	31	**34**	**35**	**29**	**35**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	**5.6**	<2.0
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	**0.11**	**0.09** e	**0.11**	**0.09**
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Major Cations						
Calcium	mg/L	13	**--**	**11**	**--**	**--**
Magnesium	mg/L	2.4	**--**	**1.5**	**--**	**--**
Potassium	mg/L	2.0	--	0.51	--	--
Sodium	mg/L	2.0	<1.0	<1.0	<1.0	<1.0
General						
Hardness	mg/L	43	**--**	**34**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL026E (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**0.20**	**0.20**	**0.20**	<0.10
ORP	mV	--	**123**	**68**	**6.0**	**27**
pH	SU	8.1-9.1	**8.8**	**8.8**	**8.5**	**8.8**
Specific Conductance	µS/cm @ 25°C	--	**122**	**106**	**125**	**126**
Temperature	°C	--	**6.9**	**7.1**	**7.2**	**7.1**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**1409.65**	**1409.03**	**1408.88**	**1408.35**
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	7.8	**7.7**	**7.9**	**8.0**	**7.7**
Barium	ug/L	80	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	**--**	**62**	**--**	**--**
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	91	**57**	**55**	**54**	**54**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	**3.6**	<2.0
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.05	<0.05 e	<0.05	<0.05
Sulfate	mg/L	8.6	**8.1**	**7.7**	**7.9**	**8.0**
Major Cations						
Calcium	mg/L	17	**--**	**17**	**--**	**--**
Magnesium	mg/L	4.3	**--**	**4.1**	**--**	**--**
Potassium	mg/L	2.0	**--**	**1.7**	**--**	**--**
Sodium	mg/L	2.0	**1.8**	**1.7**	**1.8**	**1.6**
General						
Hardness	mg/L	60	**--**	**59**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL044B (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/27/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/28/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**1.0**	**2.9**	**2.4**	**2.5**
ORP	mV	--	**-47**	**-7.0**	**-124**	**-93**
pH	SU	8.3-9.3	**9.6**	**9.6**	**9.1**	**9.3**
Specific Conductance	µS/cm @ 25°C	--	**67**	**68**	**86**	**99**
Temperature	°C	--	**5.7**	**8.5**	**10**	**9.2**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**1414.68**	**1414.44**	**1413.81**	**1413.65**
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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	**69**
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	**0.50**	<0.50	<0.50	**1.2**
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	<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	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	64	**18**	**31**	**31**	**39**
Alkalinity, Carbonate	mg/L	8.0	**10**	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.05	<0.05 e	<0.05	<0.05
Sulfate	mg/L	24	**6.6**	**6.3**	**6.8**	**6.7**
Major Cations						
Calcium	mg/L	17	**--**	**9.2**	**--**	**--**
Magnesium	mg/L	4.0	--	<1.0	--	--
Potassium	mg/L	2.0	**--**	**1.3**	**--**	**--**
Sodium	mg/L	2.6	**3.7**	**3.1**	**3.1**	**2.7**
General						
Hardness	mg/L	58	--	<3.0	--	--

2021
Mine Permit Groundwater Quality Monitoring Data
QAL060A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]		Q2 2021 05/10/21[T]		Q3 2021 07/27/21[T]		Q4 2021 10/26/21[T]	
Field										
D.O.[1]	ppm	--	**11**	f	**11**		**10**		**11**	
ORP	mV	--	**10**	f	**120**		**-67**		**-137**	
pH	SU	8.1-9.1	**8.5**	f	**8.8**		**8.9**		**8.8**	
Specific Conductance	µS/cm @ 25°C	--	**117**	f	**101**		**102**		**99**	
Temperature	°C	--	**7.1**	f	**7.7**		**9.2**		**8.1**	
Turbidity	NTU	--	<1.0	f	**2.0**		<1.0		<1.0	
Water Elevation	ft MSL	--	**1405.12**		**1404.53**		**1404.40**		**1404.04**	
Metals										
Aluminum	ug/L	200	--		<50.0		--		--	
Antimony	ug/L	5.5	--		<5.0		--		--	
Arsenic	ug/L	7.2	**3.0**		**3.1**		**3.0**		**2.8**	
Barium	ug/L	80	--		<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	--		<5.0		--		--	
Cobalt	ug/L	40	--		<10.0		--		--	
Copper	ug/L	20	<5.0		<5.0		<5.0		<5.0	
Iron	ug/L	80	<50.0	e	<50.0		<50.0		<50.0	
Lead	ug/L	4.0	--		<1.0		--		--	
Lithium	ug/L	32	--		<8.0		--		--	
Manganese	ug/L	80	<20.0	e	<20.0		<20.0		<20.0	
Mercury	ng/L	2.00	<0.50		<0.50		<0.50		<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		<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**		**1.1**		**1.0**	
Zinc	ug/L	40	<10.0		<10.0		<10.0		<10.0	
Major Anions										
Alkalinity, Bicarbonate	mg/L	62	**51**		**51**		**46**		**43**	
Alkalinity, Carbonate	mg/L	8.0	**3.4**		<2.0		**3.4**		**5.0**	
Chloride	mg/L	4.0	<1.0		<1.0	e	<1.0		<1.0	e
Fluoride	mg/L	0.40	--		<0.10		--		--	
Nitrogen, Nitrate	mg/L	0.20	**0.29**		**0.28**	e	**0.27**		**0.26**	
Sulfate	mg/L	8.0	**2.0**		<2.0		<2.0		**2.1**	
Major Cations										
Calcium	mg/L	17	**--**		**17**		**--**		**--**	
Magnesium	mg/L	4.2	**--**		**3.4**		**--**		**--**	
Potassium	mg/L	2.0	**--**		**0.96**		**--**		**--**	
Sodium	mg/L	2.1	<1.0		<1.0		<1.0		<1.0	
General										
Hardness	mg/L	61	**--**		**55**		**--**		**--**	

2021
Mine Permit Groundwater Quality Monitoring Data
QAL061A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/10/21[T]	Q3 2021 07/27/21[T]	Q4 2021 10/26/21[T]
Field						
D.O.[1]	ppm	--	**11**	**11**	**9.9**	**11**
ORP	mV	--	**-1.0**	**135**	**-58**	**-140**
pH	SU	8.1-9.1	**8.6**	**8.7**	**8.8**	**8.6**
Specific Conductance	µS/cm @ 25°C	--	**141**	**131**	**148**	**143**
Temperature	°C	--	**7.5**	**7.8**	**8.4**	**7.9**
Turbidity	NTU	--	<1.0	**2.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1406.51**	**1405.91**	**1405.73**	**1405.36**
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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<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	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	40	**63**	**65**	**70**	**67**
Alkalinity, Carbonate	mg/L	8.0	**3.8**	<2.0	**2.6**	**4.0**
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.27	**0.36**	**0.34** e	**0.32**	**0.29**
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	**2.0**
Major Cations						
Calcium	mg/L	15	--	**22**	--	--
Magnesium	mg/L	2.2	--	**3.8**	--	--
Potassium	mg/L	2.0	--	**0.83**	--	--
Sodium	mg/L	2.0	<1.0	<1.0	<1.0	**1.0**
General						
Hardness	mg/L	37	--	**71**	--	--

2021
Mine Permit Groundwater Quality Monitoring Data
QAL062A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/11/21[T]	Q3 2021 07/27/21[T]	Q4 2021 10/26/21[T]
Field						
D.O.[1]	ppm	--	**8.4**	**8.1**	**7.4**	**7.7**
ORP	mV	--	**11**	**147**	**-154**	**-170**
pH	SU	8.3-9.3	**7.7**	**7.6**	**7.6**	**7.5**
Specific Conductance	µS/cm @ 25°C	--	**600**	**546**	**587**	**637**
Temperature	°C	--	**7.9**	**7.9**	**8.5**	**8.1**
Turbidity	NTU	--	<1.0	**2.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1407.88**	**1407.22**	**1407.11**	**1406.79**
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	**--**	**39**	**--**	**--**
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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	**--**	**101**	**--**	**--**
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	48	**167**	**200**	**208**	**221**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	**59**	**58** e	**57**	**66** e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.41	**0.99**	**1.2** e	**1.3**	**0.61**
Sulfate	mg/L	8.0	**3.2**	**3.4**	**2.8**	**4.3**
Major Cations						
Calcium	mg/L	12	**--**	**68**	**--**	**--**
Magnesium	mg/L	2.2	**--**	**14**	**--**	**--**
Potassium	mg/L	2.0	**--**	**2.6**	**--**	**--**
Sodium	mg/L	2.0	**29**	**31**	**29**	**30**
General						
Hardness	mg/L	40	**--**	**228**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL063A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/27/21[T]	Q4 2021 10/26/21[T]
Field						
D.O.[1]	ppm	--	**7.8**	**8.3**	**7.6**	**8.3**
ORP	mV	--	**213**	**136**	**-87**	**140**
pH	SU	8.1-9.1	**7.6**	**7.6**	**7.6**	**7.6**
Specific Conductance	µS/cm @ 25°C	--	**714**	**733**	**786**	**834**
Temperature	°C	--	**8.0**	**7.9**	**9.3**	**8.3**
Turbidity	NTU	--	<1.0	**2.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1401.69**	**1402.19**	**1400.99**	**1400.66**
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	**--**	**50**	**--**	**--**
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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	**--**	**111**	**--**	**--**
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	42	**198**	**209**	**216**	**234**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	**111**	**104** e	**115**	**115** e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.29	**1.2**	**1.3** e	**1.3**	**1.4**
Sulfate	mg/L	8.0	**3.5**	**3.6**	**4.0**	**4.3**
Major Cations						
Calcium	mg/L	12	**--**	**79**	**--**	**--**
Magnesium	mg/L	2.0	**--**	**16**	**--**	**--**
Potassium	mg/L	2.0	**--**	**2.9**	**--**	**--**
Sodium	mg/L	2.0	**44**	**48**	**51**	**54**
General						
Hardness	mg/L	40	**--**	**262**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL064D (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/27/21[T]	Q2 2021 05/10/21[T]	Q3 2021 07/28/21[T]	Q4 2021 10/26/21[T]
Field						
D.O.[1]	ppm	--	<0.1.0	<0.1.0	**0.50**	**2.3**
ORP	mV	--	**-129**	**-200**	**-156**	**-224**
pH	SU	8.0-9.0	**8.8**	**8.8**	**8.4**	**8.9**
Specific Conductance	µS/cm @ 25°C	--	**130**	**114**	**137**	**137**
Temperature	°C	--	**6.4**	**6.9**	**7.6**	**7.0**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**1416.22**	**1416.19**	**1415.44**	**1415.36**
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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	**--**	**95**	**--**	**--**
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	82	**65**	**65**	**65**	**65**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.2	**2.6**	**2.7** e	**2.7**	**2.6** e
Fluoride	mg/L	0.40	**--**	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.05	<0.05 e	<0.05	<0.05
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Major Cations						
Calcium	mg/L	22	**--**	**18**	**--**	**--**
Magnesium	mg/L	3.3	**--**	**3.6**	**--**	**--**
Potassium	mg/L	2.0	**--**	**1.2**	**--**	**--**
Sodium	mg/L	6.9	**4.4**	**4.5**	**4.2**	**4.3**
General						
Hardness	mg/L	51	**--**	**61**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL065D (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/27/21[T]	Q2 2021 05/10/21[T]	Q3 2021 07/28/21[T]	Q4 2021 10/27/21[T]
Field						
D.O.[1]	ppm	--	**0.30**	**0.60**	<0.10	**0.20**
ORP	mV	--	**-129**	**-203**	**-255**	**-294**
pH	SU	7.9-8.9	**7.7**	**8.6**	**8.4**	**8.2**
Specific Conductance	µS/cm @ 25°C	--	**249**	**149**	**152**	**156**
Temperature	°C	--	**5.5**	**6.5**	**7.7**	**6.7**
Turbidity	NTU	--	<1.0	**3.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1415.54**	**1415.81**	**1414.97**	**1414.99**
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	6.6	**3.8**	**4.3**	**4.3**	**3.8**
Barium	ug/L	80	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	**68**	**55**	**66**
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	**--**	**197**	**--**	**--**
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	86	**82.7**	**76.5**	**77.8**	**79.7**
Alkalinity, Carbonate	mg/L	8.7	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	**--**	**0.12**	**--**	**--**
Nitrogen, Nitrate	mg/L	0.20	<0.050	<0.050 e	<0.050	<0.050
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Major Cations						
Calcium	mg/L	14	**--**	**16**	**--**	**--**
Magnesium	mg/L	4.8	**--**	**4.8**	**--**	**--**
Potassium	mg/L	3.0	**--**	**3.0**	**--**	**--**
Sodium	mg/L	12	**10**	**10**	**9.7**	**9.3**
General						
Hardness	mg/L	53	**--**	**59**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL066D (UMB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/26/21[T]	Q2 2021 05/10/21[T]	Q3 2021 07/27/21[T]	Q4 2021 10/27/21[T]
Field						
D.O.[1]	ppm	--	**2.2**	**11**	**2.8**	**6.8**
ORP	mV	--	**283**	**281**	**75**	**156**
pH	SU	8.7-9.7	**9.0**	**9.0**	**8.8**	**8.9**
Specific Conductance	µS/cm @ 25°C	--	**158**	**135**	**157**	**157**
Temperature	°C	--	**5.6**	**6.3**	**8.5**	**7.2**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**<<1415.1** BP	**1414.96**	**1414.19**	**1414.04**
Metals						
Aluminum	ug/L	557	**--**	**364**	**--**	**--**
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	8.9	**9.4**	**9.6**	**11**	**10**
Barium	ug/L	80	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	288	**156** e	**226**	**1,260**	**835**
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	**0.76**	**0.90**	**1.7**	**1.7**
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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	367	**--**	<50.0	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	**2.6**	**1.8**
Zinc	ug/L	40	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	61	**64**	**264**	**61**	**59**
Alkalinity, Carbonate	mg/L	52	**12**	<2.0	**11**	**8.6**
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	**0.07**	**0.50** e	**0.09**	**0.08**
Sulfate	mg/L	11	**8.3**	**7.9**	**8.4**	**8.0**
Major Cations						
Calcium	mg/L	58	**--**	**12**	**--**	**--**
Magnesium	mg/L	2.9	**--**	**1.7**	**--**	**--**
Potassium	mg/L	2.6	**--**	**0.91**	**--**	**--**
Sodium	mg/L	8.0	**23**	**23**	**20**	**22**
General						
Hardness	mg/L	146	**--**	**37**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL067A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/11/21[T]	Q3 2021 07/28/21[T]	Q4 2021 10/26/21[T]
Field						
D.O.[1]	ppm	--	**9.3**	**9.1**	**8.3**	**8.8**
ORP	mV	--	**51**	**173**	**-96**	**-169**
pH	SU	5.6-6.6	**6.5**	**6.6**	**6.7**	**6.6**
Specific Conductance	µS/cm @ 25°C	--	**628**	**528**	**535**	**507**
Temperature	°C	--	**8.8**	**9.1**	**12**	**8.7**
Turbidity	NTU	--	<1.0	**3.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1415.04**	**1414.39**	**1414.32**	**1413.87**
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	**--**	**57.5**	**--**	**--**
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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	**0.97**	**1.1**	**2.0**	**1.5**
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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	**--**	**145**	**--**	**--**
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	**101**	**90**	**91**	**91**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	**116**	**111** e	**101**	**94** e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.25	**1.8**	**1.6** e	**2.0**	**0.73**
Sulfate	mg/L	8.4	**12**	**12**	**11**	**12**
Major Cations						
Calcium	mg/L	8.2	**--**	**29**	**--**	**--**
Magnesium	mg/L	2.0	**--**	**11**	**--**	**--**
Potassium	mg/L	2.0	**--**	**2.8**	**--**	**--**
Sodium	mg/L	2.0	**65**	**67**	**60**	**56**
General						
Hardness	mg/L	26	**--**	**118**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL068A (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/26/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**11**	**12**	**12**	**12**
ORP	mV	--	**326**	**335**	**135**	**296**
pH	SU	6.2-7.2	**6.8**	**6.8**	**6.8**	**6.5**
Specific Conductance	µS/cm @ 25°C	--	**41**	**32**	**37**	**37**
Temperature	°C	--	**7.1**	**7.3**	**7.4**	**7.3**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**1422.37**	**1421.45**	**1421.43**	**1421.08**
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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	**60** e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<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	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	35	**20**	**16**	**15**	**16**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	<0.05	<0.05 e	<0.05	<0.05
Sulfate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Major Cations						
Calcium	mg/L	6.7	**--**	**5.3**	**--**	**--**
Magnesium	mg/L	2.0	--	<1.0	--	--
Potassium	mg/L	2.0	**--**	**0.76**	**--**	**--**
Sodium	mg/L	2.0	<1.0	<1.0	<1.0	<1.0
General						
Hardness	mg/L	21	--	<3.0	--	--

2021
Mine Permit Groundwater Quality Monitoring Data
QAL068B (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/26/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**11**	**12**	**12**	**12**
ORP	mV	--	**259**	**262**	**97**	**183**
pH	SU	8.4-9.4	**9.3**	**9.4**	**9.2**	**8.8**
Specific Conductance	µS/cm @ 25°C	--	**64**	**54**	**63**	**64**
Temperature	°C	--	**7.0**	**7.4**	**7.6**	**7.4**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**1414.14**	**1413.48**	**1413.23**	**1412.76**
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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	184	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<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	<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**	**1.2**	**1.0**
Zinc	ug/L	40	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	30	**30**	**29**	**26**	**32**
Alkalinity, Carbonate	mg/L	9.9	**3.2**	<2.0	**5.2**	<2.0
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.20	**0.06**	**0.07** e	**0.07**	**0.06**
Sulfate	mg/L	8.0	**2.1**	**2.1**	**2.2**	**2.1**
Major Cations						
Calcium	mg/L	9.4	**--**	**9.1**	**--**	**--**
Magnesium	mg/L	2.0	**--**	**1.7**	**--**	**--**
Potassium	mg/L	2.0	**--**	**0.62**	**--**	**--**
Sodium	mg/L	2.0	<1.0	<1.0	<1.0	<1.0
General						
Hardness	mg/L	31	**--**	**30**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL068D (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/26/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/26/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**10**	**3.9**	**3.6**	**8.8**
ORP	mV	--	**262**	**260**	**84**	**150**
pH	SU	8.0-9.0	**8.7**	**8.8**	**8.7**	**8.1**
Specific Conductance	µS/cm @ 25°C	--	**118**	**102**	**120**	**121**
Temperature	°C	--	**3.8**	**7.2**	**10.5**	**7.7**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**1414.22**	**1413.57**	**1413.34**	**1412.84**
Metals						
Aluminum	ug/L	200	--	<50.0	--	--
Antimony	ug/L	5.5	--	<5.0	--	--
Arsenic	ug/L	7.2	**6.7**	**6.7**	**6.4**	**6.3**
Barium	ug/L	80	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	119	<50.0 e	**61**	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.12	<0.50	<0.50	<0.50	<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	<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	**2.9**	**4.2**	**3.9**	**3.8**
Zinc	ug/L	40	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	67	**59**	**57**	**54**	**55**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	**2.6**	**<2.0**
Chloride	mg/L	4.0	<1.0	<1.0 e	<1.0	<1.0 e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.21	**0.24**	<0.05 e	<0.05	**0.08**
Sulfate	mg/L	10	**5.2**	**5.0**	**5.1**	**5.0**
Major Cations						
Calcium	mg/L	16	**--**	**15**	**--**	**--**
Magnesium	mg/L	3.9	**--**	**3.8**	**--**	**--**
Potassium	mg/L	2.0	**--**	**1.4**	**--**	**--**
Sodium	mg/L	6.1	**4.2**	**3.4**	**3.7**	**3.4**
General						
Hardness	mg/L	52	**--**	**53**	**--**	**--**

2021
Mine Permit Groundwater Quality Monitoring Data
QAL069A (Background)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/26/21[T]	Q2 2021 05/06/21[T]	Q3 2021 07/27/21[T]	Q4 2021 10/25/21[T]
Field						
D.O.[1]	ppm	--	**9.2**	**9.0**	**8.4**	**9.0**
ORP	mV	--	**44**	**185**	**106**	**-175**
pH	SU	7.8-8.8	**6.9**	**7.1**	**7.6**	**7.2**
Specific Conductance	µS/cm @ 25°C	--	**495**	**305**	**378**	**318**
Temperature	°C	--	**7.5**	**8.0**	**8.5**	**8.0**
Turbidity	NTU	--	<1.0	**2.0**	<1.0	<1.0
Water Elevation	ft MSL	--	**1385.18**	**1384.39**	**1383.85**	**1382.97**
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	--	<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	--	<5.0	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	<5.0	<5.0
Iron	ug/L	80	<50.0 e	<50.0	<50.0	<50.0
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	**0.51**	<0.50	<0.50	<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	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	--	**63**	--	--
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	138	**144**	**131**	**145**	**127**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	**42**	<1.0 e	**23**	**20** e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.57	**0.65**	**0.37** e	**0.52**	**0.41**
Sulfate	mg/L	8.0	**8.1**	<2.0	**8.4**	**7.5**
Major Cations						
Calcium	mg/L	35	--	**35**	--	--
Magnesium	mg/L	18	--	**11**	--	--
Potassium	mg/L	2.0	--	**1.8**	--	--
Sodium	mg/L	2.0	**22**	**14**	**9.8**	**7.4**
General						
Hardness	mg/L	162	--	**131**	--	--

2021
Mine Permit Groundwater Quality Monitoring Data
QAL070A (NCWIB)
Eagle Mine

Parameter	Unit	Benchmark	Q2 2018 05/08/18[T]		Q2 2019 05/07/19[T]		Q2 2020 05/06/20[T]		Q2 2021 05/10/21[T]	
Field										
D.O.[1]	ppm	--	**13**		**11**		**11**		**10**	
ORP	mV	--	**74**		**185**		**248**		**257**	
pH	SU	8.3-9.3	**8.4**		**8.3**		**8.0**		**8.4**	
Specific Conductance	µS/cm @ 25°C	--	**499**		**479**		**393**		**403**	
Temperature	°C	--	**9.5**		**9.0**		**10**		**8.0**	
Turbidity	NTU	--	<1.0		<1.0		<1.0		<1.0	
Water Elevation	ft MSL	--	**1372.25**		**1371.85**		**1372.70**		**1371.95**	
Metals										
Aluminum	ug/L	200	<50.0		<50.0		<50		<50.0	
Antimony	ug/L	5.5	<5.0		<5.0		<5.0		<5.0	
Arsenic	ug/L	6.0	<2.0		<2.0		<2.0		<2.0	
Barium	ug/L	80	**27**		**27**		**30**		**28**	
Beryllium	ug/L	2.5	<1.0		<1.0		<1.0		<1.0	
Boron	ug/L	400	<100		<100		<100		<100	
Cadmium	ug/L	2.0	<0.50		<0.50		<0.50		<0.50	
Chromium	ug/L	20	<5.0		<5.0		<5.0		<5.0	
Cobalt	ug/L	40	<10.0		<10.0		<10		<10.0	
Copper	ug/L	20	<5.0		<5.0		<5.0		<5.0	
Iron	ug/L	80	<20.0		<50.0		<50		**79.9**	
Lead	ug/L	4.0	<1.0		<1.0		<1.0		<1.0	
Lithium	ug/L	32	<8.0		<8.0		<8.0		<8.0	
Manganese	ug/L	80	<20.0		<20.0		<20		<20.0	
Mercury	ng/L	2.00	<0.50	e	**0.62**		<0.50		**0.52**	
Molybdenum	ug/L	40	<10.0		<10.0		<10		<10.0	
Nickel	ug/L	100	<25.0		<25.0		<25		<25.0	
Selenium	ug/L	4.0	<1.0		<1.0		<1.0		<1.0	
Silver	ug/L	0.80	<0.20		<0.20		<0.20		<0.20	
Strontium	ug/L	200	**74**		**73**		**92**		**89**	
Thallium	ug/L	2.0	<2.0		<1.0		<1.0		<1.0	
Vanadium	ug/L	4.0	<1.0		<1.0		<1.0		<1.0	
Zinc	ug/L	40	<10.0		<10.0		<10		<10.0	
Major Anions										
Alkalinity, Bicarbonate	mg/L	42	**63**		**75**		**81**		**88**	
Alkalinity, Carbonate	mg/L	8.0	<2.0		<2.0	e	<2.0		<2.0	
Chloride	mg/L	4.0	**110**		**107**	e	**102**	e	**93**	e
Fluoride	mg/L	0.40	<0.10		<0.10	e	<0.10		<0.10	
Nitrogen, Nitrate	mg/L	0.22	**1.3**		**1.4**	e	**1.3**	e	**1.0**	e
Sulfate	mg/L	8.0	**7.9**		**10**	e	**8.9**		**9.1**	
Major Cations										
Calcium	mg/L	11	**38**		**39**	e	**52**		**48**	
Magnesium	mg/L	3.0	**7.1**		**7.0**		**9.8**		**8.4**	
Potassium	mg/L	2.0	**1.8**		**1.9**		**2.2**		**2.0**	
Sodium	mg/L	2.0	**47**		**48**	e	**28**		**35**	
General										
Hardness	mg/L	40	**124**		**125**		**170**		**153**	

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

2021
Mine Permit Groundwater Quality Monitoring Data
QAL071A (TDRSA-CWB)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]		Q2 2021 05/11/21[T]		Q3 2021 07/27/21[T]		Q4 2021 10/26/21[T]	
Field										
D.O.[1]	ppm	--	**9.9**		**11**		**11**		**11**	
ORP	mV	--	**243**		**307**		**120**		**252**	
pH	SU	8.1-9.1	**8.0**		**7.9**		**7.7**		**7.9**	
Specific Conductance	µS/cm @ 25°C	--	**301**		**369**		**422**		**382**	
Temperature	°C	--	**8.0**		**8.3**		**8.7**		**8.7**	
Turbidity	NTU	--	<1.0		<1.0		<1.0		<1.0	
Water Elevation	ft MSL	--	**1404.88**		**1404.46**		**1403.92**		**1403.62**	
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	**--**		**28**		**--**		**--**	
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	--		<5.0		--		--	
Cobalt	ug/L	40	--		<10.0		--		--	
Copper	ug/L	20	**7.0**		**6.7**		**8.6**		**8.6**	
Iron	ug/L	178	<50.0	e	<50.0		<50.0		<50.0	
Lead	ug/L	4.0	--		<1.0		--		--	
Lithium	ug/L	32	--		<8.0		--		--	
Manganese	ug/L	80	<20.0	e	<20.0		<20.0		<20.0	
Mercury	ng/L	2.00	<0.50		<0.50		<0.50		<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		<1.0		<1.0		<1.0	
Silver	ug/L	0.80	--		<0.20		--		--	
Strontium	ug/L	200	**--**		**72**		**--**		**--**	
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	44	**134**		**140**		**145**		**130**	
Alkalinity, Carbonate	mg/L	8.0	<2.0		<2.0		<2.0		<2.0	
Chloride	mg/L	4.0	**6.1**		**11**	e	**9.9**		**8.2**	e
Fluoride	mg/L	0.40	--		<0.10		--		--	
Nitrogen, Nitrate	mg/L	0.31	**8.0**		**16**	e	**12**		**10**	
Sulfate	mg/L	8.0	**6.0**		**5.8**		**7.0**		**6.6**	
Major Cations										
Calcium	mg/L	12	**--**		**69**		**--**		**--**	
Magnesium	mg/L	2.0	**--**		**8.9**		**--**		**--**	
Potassium	mg/L	2.0	**--**		**1.7**		**--**		**--**	
Sodium	mg/L	2.0	**10**		**14**		**11**		**11**	
General										
Hardness	mg/L	38	**--**		**210**		**--**		**--**	

2021
Mine Permit Groundwater Quality Monitoring Data
QAL073A (NCWIB)
Eagle Mine

Parameter	Unit	Benchmark	Q2 2018 05/08/18[T]		Q2 2019 05/07/19[T]		Q2 2020 05/06/20[T]		Q2 2021 05/10/21[T]	
Field										
D.O.[1]	ppm	--	**12**		**11**		**11**		**11**	
ORP	mV	--	**132**		**220**		**265**		**267**	
pH	SU	6.1-7.1	**6.6**		**6.8**		**6.5**		**6.9**	
Specific Conductance	µS/cm @ 25°C	--	**189**		**178**		**116**		**110**	
Temperature	°C	--	**8.6**		**9.0**		**8.4**		**7.4**	
Turbidity	NTU	--	<1.0		<1.0		<1.0		<1	
Water Elevation	ft MSL	--	**1383.41**		**1383.74**		**1384.72**		**1384.83**	
Metals										
Aluminum	ug/L	200	<50		<50.0		**72.7**		**57.9**	
Antimony	ug/L	5.5	<5.0		<5.0		<5.0		<5.0	
Arsenic	ug/L	6.0	<2.0		<2.0		<2.0		<2.0	
Barium	ug/L	80	<20		<20.0		<20		<20.0	
Beryllium	ug/L	2.5	<1.0		<1.0		<1.0		<1.0	
Boron	ug/L	400	<100		<100		<100		<100	
Cadmium	ug/L	2.0	<0.50		<0.50		<0.50		<0.50	
Chromium	ug/L	20	<5.0		<5.0		<5.0		<5.0	
Cobalt	ug/L	40	<10		<10.0		<10		<10.0	
Copper	ug/L	20	<5.0		<5.0		<5.0		<5.0	
Iron	ug/L	132	**41**		**95**		**79**		**100**	
Lead	ug/L	4.0	<1.0		<1.0		<1.0		<1.0	
Lithium	ug/L	32	<8.0		<8.0		<8.0		<8.0	
Manganese	ug/L	80	<20		<20.0		<20		<20.0	
Mercury	ng/L	2.00	**0.52**	e	**0.82**		<0.50		**0.55**	
Molybdenum	ug/L	40	<10		<10.0		<10		<10.0	
Nickel	ug/L	100	<25		<25		<25		<25.0	
Selenium	ug/L	4.0	<1.0		<1.0		<1.0		<1.0	
Silver	ug/L	0.80	<0.20		<0.20		<0.20		<0.20	
Strontium	ug/L	200	**99.2**		**92.7**		**68.7**		**54.8**	
Thallium	ug/L	2.0	<2.0		<1.0		<1.0		<1.0	
Vanadium	ug/L	4.0	<1.0		<1.0		<1.0		<1.0	
Zinc	ug/L	40	<10		<10		<10		<10.0	
Major Anions										
Alkalinity, Bicarbonate	mg/L	44	**88**		**79**		**53**		**42**	
Alkalinity, Carbonate	mg/L	8.0	<2.0		<2.0	e	<2.0		<2.0	
Chloride	mg/L	20	**2.1**		**3.4**	e	**3.0**	e	**8.7**	e
Fluoride	mg/L	0.40	<0.10		<0.10	e	<0.10		<0.10	
Nitrogen, Nitrate	mg/L	0.60	**1.2**		**1.1**	e	**0.84**	e	**0.57**	e
Sulfate	mg/L	8.0	**9.0**		**7.5**	e	**7.0**		**4.9**	
Major Cations										
Calcium	mg/L	9.2	**26**		**28**	e	**20**		**18**	
Magnesium	mg/L	2.5	**5.6**		**5.2**		**4.0**		**3.4**	
Potassium	mg/L	2.0	**1.3**		**1.3**		**1.1**		**1.2**	
Sodium	mg/L	2.0	**2.5**		**2.4**	e	**2.6**		**2.3**	
General										
Hardness	mg/L	33	**88**		**91**		**66**		**59**	

2021
Mine Permit Groundwater Quality Monitoring Data
QAL074A (Septic & WWTP)
Eagle Mine

Parameter	Unit	Benchmark	Q1 2021 01/25/21[T]	Q2 2021 05/10/21[T]	Q3 2021 07/27/21[T]	Q4 2021 10/26/21[T]
Field						
D.O.[1]	ppm	--	**8.3**	**10**	**10**	**9.5**
ORP	mV	--	**206**	**222**	**30**	**-142**
pH	SU	8.4-9.4	**8.2**	**8.2**	**8.2**	**8.1**
Specific Conductance	µS/cm @ 25°C	--	**338**	**350**	**426**	**482**
Temperature	°C	--	**6.5**	**7.7**	**12**	**8.8**
Turbidity	NTU	--	<1.0	<1.0	<1.0	<1.0
Water Elevation	ft MSL	--	**1402.51**	**1402.79**	**1401.94**	**1402.17**
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	--	**23.1**	--	--
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	**--**	**31**	--	--
Cobalt	ug/L	40	--	<10.0	--	--
Copper	ug/L	20	<5.0	<5.0	**5.1**	<5.0
Iron	ug/L	212	**144** e	**198**	<50.0	**422**
Lead	ug/L	4.0	--	<1.0	--	--
Lithium	ug/L	32	--	<8.0	--	--
Manganese	ug/L	80	<20.0 e	<20.0	<20.0	<20.0
Mercury	ng/L	2.00	<0.50	<0.50	<0.50	<0.50
Molybdenum	ug/L	40	--	<10.0	--	--
Nickel	ug/L	100	<25.0 e	<25.0	<25.0	**34**
Selenium	ug/L	4.0	<1.0	<1.0	<1.0	<1.0
Silver	ug/L	0.80	--	<0.20	--	--
Strontium	ug/L	200	**--**	**59**	--	--
Thallium	ug/L	2.0	--	<1.0	--	--
Vanadium	ug/L	4.0	<1.0	<1.0	<1.0	<5.0
Zinc	ug/L	40	<10.0	<10.0	<10.0	<10.0
Major Anions						
Alkalinity, Bicarbonate	mg/L	39	**104**	**100**	**103**	**104**
Alkalinity, Carbonate	mg/L	8.0	<2.0	<2.0	<2.0	<2.0
Chloride	mg/L	4.0	**39**	**56** e	**62**	**62** e
Fluoride	mg/L	0.40	--	<0.10	--	--
Nitrogen, Nitrate	mg/L	0.43	**1.1**	**1.4** e	**1.7**	**0.80**
Sulfate	mg/L	8.0	**7.4**	**7.2**	**7.5**	**7.2**
Major Cations						
Calcium	mg/L	31	**--**	**43**	--	--
Magnesium	mg/L	5.9	**--**	**8.3**	--	--
Potassium	mg/L	2.0	**--**	**1.7**	--	--
Sodium	mg/L	3.5	**25**	**27**	**26**	**27**
General						
Hardness	mg/L	103	**--**	**142**	**--**	**--**

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

Parameter	Unit	Q2 2016 05/09/16[T]	Q2 2017 05/08/17[T]	Q2 2018 05/07/18[T]	Q2 2019 05/07/19[T]	Q2 2020 05/07/20[T]	Q2 2021 05/10/21[T]
Volatile Organic Compounds							
1,1,1-Trichloroethane	ug/L	<1.0	<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	<1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/L	<1.0	<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	<1.0
1,1-Dichloroethane	ug/L	<1.0	<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	<1.0
1,2,4-Trichlorobenzene	ug/L	<1.0	<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	<1.0
1,2-Dibromoethane	ug/L	<1.0	<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	<1.0
1,2-Dichloroethane	ug/L	<1.0	<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	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<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	<1.0
2-Butanone (MEK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug/L	<5.0	<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	<5.0
Acetone	ug/L	<10	<10	<10	<10	<10	<10
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0 e	<5.0	<5.0
Carbon Tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Chloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 e
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Acetate	ug/L	<5.0	<5.0	<5.0	<5.0 e	<5.0 e	<5.0
Methyl tert-Butyl Ether	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylcyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0 e	<5.0
Methylene Chloride	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene (Total)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

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

Parameter	Unit	Q2 2016 05/09/16[T]	Q2 2017 05/08/17[T]	Q2 2018 05/07/18[T]	Q2 2019 05/07/19[T]	Q2 2020 05/07/20[T]	Q2 2021 05/11/21[T]
Volatile Organic Compounds							
1,1,1-Trichloroethane	ug/L	<1.0	<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	<1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/L	<1.0	<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	<1.0
1,1-Dichloroethane	ug/L	<1.0	<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	<1.0
1,2,4-Trichlorobenzene	ug/L	<1.0	<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	<1.0
1,2-Dibromoethane	ug/L	<1.0	<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	<1.0
1,2-Dichloroethane	ug/L	<1.0	<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	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<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	<1.0
2-Butanone (MEK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug/L	<5.0	<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	<5.0
Acetone	ug/L	<10	<10	<10	<10	<10	<10
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0 e	<5.0	<5.0
Carbon Tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Chloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 e
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Acetate	ug/L	<5.0	<5.0	<5.0	<5.0 e	<5.0 e	<5.0
Methyl tert-Butyl Ether	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylcyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0 e	<5.0
Methylene Chloride	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene (Total)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

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

Parameter	Unit	Q2 2016 05/09/16[T]	Q2 2017 05/08/17[T]	Q2 2018 05/07/18[T]	Q2 2019 05/07/19[T]	Q2 2020 05/07/20[T]	Q2 2021 05/11/21[T]
Volatile Organic Compounds							
1,1,1-Trichloroethane	ug/L	<1.0	<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	<1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/L	<1.0	<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	<1.0
1,1-Dichloroethane	ug/L	<1.0	<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	<1.0
1,2,4-Trichlorobenzene	ug/L	<1.0	<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	<1.0
1,2-Dibromoethane	ug/L	<1.0	<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	<1.0
1,2-Dichloroethane	ug/L	<1.0	<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	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<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	<1.0
2-Butanone (MEK)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-Hexanone	ug/L	<5.0	<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	<5.0
Acetone	ug/L	<10	<10	<10	<10	<10	<10
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide	ug/L	<5.0	<5.0	<5.0	<5.0 e	<5.0	<5.0
Carbon Tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Chloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 e
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Acetate	ug/L	<5.0	<5.0	<5.0	<5.0 e	<5.0 e	<5.0
Methyl tert-Butyl Ether	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylcyclohexane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0 e	<5.0
Methylene Chloride	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	**1.7**	**1.1**	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0 e	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene (Total)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

2021
Groundwater Quality Data
Mine Permit Monitoring
Explanation of Abbreviations and Data Qualifiers
Eagle Project

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.
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 G

Eagle Mine

Groundwater Monitoring

Trend Analysis Summary & Trending Charts

Mine Permit Groundwater Trend Analysis
Identified Trends
Eagle Mine

Location	Classi-fication	Parameter	Unit	# Samples	# NDs	Non-detects handling	# used in Runs Test	Min	Max	Mean	St. Dev.	# Above Mean	# Below Mean	# Equal Mean	# Runs	Criti-cal value	Sig level	Trend?	Remarks
QAL023B	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	54.7	66.0	60.4	3.37	13	11	0	8	8	0.05	Y	
QAL023B	Compliance	Sodium	mg/L	24	0	No NDs	24	4.1	11.0	7.0	2.00	8	16	0	4	7	0.05	Y	Non-unique RL in data
QAL023B	Compliance	Sulfate	mg/L	24	0	No NDs	24	2.2	5.3	4.1	0.81	11	13	0	6	8	0.05	Y	
QAL024A	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	26.1	58.6	40.5	7.36	13	11	0	7	8	0.05	Y*	
QAL024A	Compliance	Chloride	mg/L	24	0	No NDs	24	15.8	150	63.6	37.99	10	14	0	7	8	0.05	Y*	Non-unique RL in data
QAL024A	Compliance	Copper	ug/L	24	20	Included as RL	24	5.0	13.1	5.5	1.69	4	20	0	2	4	0.05	Y	
QAL024A	Compliance	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.28	3.9	1.5	1.06	9	15	0	5	8	0.05	Y*	Non-unique RL in data
QAL024A	Compliance	Sodium	mg/L	24	0	No NDs	24	13.7	53.7	31.3	12.30	10	14	0	7	8	0.05	Y*	Non-unique RL in data
QAL025A	Background	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	16.9	37.2	28.7	4.94	14	10	0	5	8	0.05	Y*	
QAL025A	Background	Chloride	mg/L	24	17	Included as RL	24	1.0	1.4	1.1	0.11	7	17	0	4	7	0.05	Y	
QAL025A	Background	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.15	0.92	0.35	0.19	10	14	0	6	8	0.05	Y	
QAL025B	Background	Alkalinity, Bicarbonate	mg/L	24	1	Included as RL	24	2.0	34.2	27.1	6.38	15	9	0	8	8	0.05	Y	
QAL025B	Background	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.10	0.40	0.19	0.10	8	15	1	4	7	0.05	Y*	
QAL025B	Background	Sodium	mg/L	24	0	No NDs	24	1.2	1.9	1.5	0.21	10	14	0	8	8	0.05	Y	Non-unique RL in data
QAL025D	Background	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	37.7	59.0	43.1	4.04	10	14	0	8	8	0.05	Y	
QAL025D	Background	Chloride	mg/L	24	13	Included as RL	24	1.0	2.6	1.3	0.52	6	18	0	2	6	0.05	Y	
QAL025D	Background	Magnesium	mg/L	11	0	No NDs	11	2.4	2.9	2.7	0.16	6	5	0	2	3	0.05	Y*	Non-unique RL in data
QAL025D	Background	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.087	0.17	0.12	0.03	10	14	0	2	8	0.05	Y	
QAL025D	Background	Sodium	mg/L	24	0	No NDs	24	2.9	4.4	3.5	0.38	10	14	0	6	8	0.05	Y	Non-unique RL in data
QAL026A	Background	Nitrogen, Nitrate	mg/L	21	0	No NDs	21	0.35	1.3	0.71	0.29	9	12	0	6	7	0.05	Y	Non-unique RL in data
QAL026E	Background	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	37.4	59.0	54.6	4.16	13	11	0	8	8	0.05	Y	
QAL044B	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	3.0	42.1	23.1	10.60	13	11	0	7	8	0.05	Y	
QAL044B	Compliance	Alkalinity, Carbonate	mg/L	24	6	Included as RL	24	2.0	38.0	10.1	8.98	11	13	0	5	8	0.05	Y	
QAL044B	Compliance	Arsenic	ug/L	24	19	Included as RL	24	2.0	2.6	2.1	0.14	5	19	0	5	5	0.05	Y	
QAL044B	Compliance	Magnesium	mg/L	10	2	Included as RL	10	0.79	3.5	1.8	0.90	5	5	0	2	3	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL044B	Compliance	pH	SU	24	0	No NDs	24	8.8	10.9	9.4	0.44	11	13	0	7	8	0.05	Y*	
QAL044B	Compliance	Potassium	mg/L	10	3	Included as RL	10	0.50	1.7	0.91	0.44	5	5	0	2	3	0.05	Y	
QAL044B	Compliance	Sodium	mg/L	24	0	No NDs	24	2.1	3.7	2.7	0.40	12	12	0	2	8	0.05	Y*	Non-unique RL in data
QAL060A	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	29.6	53.3	42.4	6.49	13	11	0	6	8	0.05	Y	
QAL060A	Compliance	Arsenic	ug/L	24	0	No NDs	24	2.8	5.9	4.0	0.88	12	12	0	6	8	0.05	Y	
QAL060A	Compliance	Calcium	mg/L	12	0	No NDs	12	10.0	16.6	12.9	2.25	7	5	0	3	3	0.05	Y	Non-unique RL in data
QAL060A	Compliance	Magnesium	mg/L	12	0	No NDs	12	2.4	3.7	3.0	0.47	6	6	0	3	3	0.05	Y	Non-unique RL in data
QAL060A	Compliance	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.15	0.35	0.26	0.06	14	10	0	3	8	0.05	Y	
QAL060A	Compliance	Potassium	mg/L	12	0	No NDs	12	0.69	1.1	0.91	0.14	5	7	0	3	3	0.05	Y	
QAL060A	Compliance	Strontium	ug/L	12	10	Included as RL	12	50.0	54.0	51.0	1.20	2	10	0	2	2	0.05	Y	
QAL060A	Compliance	Vanadium	ug/L	24	6	Included as RL	24	1.0	1.4	1.2	0.13	11	13	0	6	8	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL061A	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	28.0	119	54.9	17.25	11	13	0	8	8	0.05	Y*	
QAL061A	Compliance	Calcium	mg/L	12	0	No NDs	12	11.0	22.1	14.1	4.20	5	7	0	2	3	0.05	Y*	Non-unique RL in data
QAL061A	Compliance	Magnesium	mg/L	12	0	No NDs	12	1.9	3.8	2.5	0.70	5	7	0	2	3	0.05	Y*	Non-unique RL in data
QAL061A	Compliance	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.26	0.44	0.33	0.04	12	12	0	5	8	0.05	Y*	
QAL062A	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	110	221	167	34.30	11	13	0	4	8	0.05	Y*	
QAL062A	Compliance	Barium	ug/L	12	6	Included as RL	12	20.0	47.4	26.1	9.48	4	8	0	2	3	0.05	Y	
QAL062A	Compliance	Calcium	mg/L	12	0	No NDs	12	11.0	77.0	38.0	25.70	6	6	0	2	3	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	Chloride	mg/L	24	0	No NDs	24	39.0	78.8	59.6	11.90	10	14	0	4	8	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	Magnesium	mg/L	12	0	No NDs	12	2.0	15.9	7.6	5.43	6	6	0	2	3	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.39	1.4	0.84	0.30	12	12	0	5	8	0.05	Y*	Non-unique RL in data
QAL062A	Compliance	pH	SU	24	0	No NDs	24	7.4	8.3	7.7	0.24	10	14	0	8	8	0.05	Y*	
QAL062A	Compliance	Potassium	mg/L	12	0	No NDs	12	0.70	2.8	1.6	0.82	6	6	0	2	3	0.05	Y*	
QAL062A	Compliance	Sodium	mg/L	24	0	No NDs	24	5.2	36.6	22.9	8.28	13	11	0	4	8	0.05	Y*	Non-unique RL in data

Mine Permit Groundwater Trend Analysis
Identified Trends
Eagle Mine

Location	Classi-fication	Parameter	Unit	# Samples	# NDs	Non-detects handling	# used in Runs Test	Min	Max	Mean	St. Dev.	# Above Mean	# Below Mean	# Equal Mean	# Runs	Criti-cal value	Sig level	Trend?	Remarks
QAL062A	Compliance	Strontium	ug/L	12	6	Included as RL	12	50.0	118	67.6	23.38	4	8	0	2	3	0.05	Y	
QAL062A	Compliance	Sulfate	mg/L	24	2	Included as RL	24	2.0	4.3	2.7	0.56	12	12	0	2	8	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL063A	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	76.0	234	169	42.60	13	11	0	2	8	0.05	Y*	
QAL063A	Compliance	Barium	ug/L	12	8	Included as RL	12	20.0	49.8	27.4	11.90	4	8	0	2	3	0.05	Y	
QAL063A	Compliance	Calcium	mg/L	12	0	No NDs	12	11.0	85.2	38.3	30.20	5	7	0	2	3	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	Chloride	mg/L	24	0	No NDs	24	3.5	115	68.4	38.52	13	11	0	2	8	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	Magnesium	mg/L	12	0	No NDs	12	1.9	16.6	7.3	6.09	5	7	0	2	3	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.28	1.4	0.87	0.32	13	11	0	2	8	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	pH	SU	24	0	No NDs	24	6.9	8.5	7.7	0.34	7	17	0	4	7	0.05	Y*	
QAL063A	Compliance	Potassium	mg/L	12	0	No NDs	12	0.62	3.0	1.4	0.92	5	7	0	2	3	0.05	Y*	
QAL063A	Compliance	Sodium	mg/L	24	0	No NDs	24	1.0	53.9	21.7	18.20	11	13	0	2	8	0.05	Y*	Non-unique RL in data
QAL063A	Compliance	Strontium	ug/L	12	7	Included as RL	12	50.0	116	69.5	27.03	4	8	0	2	3	0.05	Y	
QAL063A	Compliance	Sulfate	mg/L	24	3	Included as RL	24	2.0	4.3	2.7	0.68	9	14	1	2	7	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL064D	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	64.8	82.0	72.0	5.38	13	11	0	4	8	0.05	Y	
QAL065D	Compliance	Arsenic	ug/L	24	0	No NDs	24	2.7	4.3	3.6	0.44	13	11	0	4	8	0.05	Y	
QAL065D	Compliance	Calcium	mg/L	11	0	No NDs	11	12.0	15.6	13.1	1.15	3	8	0	2	2	0.05	Y	Non-unique RL in data
QAL066D	Compliance	Fluoride	mg/L	11	9	Included as RL	11	0.10	0.13	0.11	0.01	2	9	0	2	2	0.05	Y	
QAL066D	Compliance	Iron	ug/L	24	6	Included as RL	24	20.0	1300	417	362.40	12	12	0	7	8	0.05	Y*	Non-unique RL in data (NDs included as RL)
QAL066D	Compliance	Nitrogen, Nitrate	mg/L	24	16	Included as RL	24	0.05	0.50	0.07	0.09	4	20	0	4	4	0.05	Y	
QAL066D	Compliance	Sodium	mg/L	24	0	No NDs	24	9.6	23.5	18.3	3.82	12	12	0	6	8	0.05	Y*	Non-unique RL in data
QAL066D	Compliance	Strontium	ug/L	11	2	Included as RL	11	50.0	340	87.4	84.68	2	9	0	2	2	0.05	Y	Non-unique RL in data (NDs included as RL)
QAL066D	Compliance	Sulfate	mg/L	24	0	No NDs	24	7.7	23.0	10.6	3.99	7	17	0	4	7	0.05	Y	Non-unique RL in data
QAL067A	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	48.0	101	66.2	16.27	9	15	0	4	8	0.05	Y*	
QAL067A	Compliance	Chloride	mg/L	24	0	No NDs	24	41.8	730	235	207.10	8	16	0	2	7	0.05	Y*	Non-unique RL in data
QAL067A	Compliance	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.24	2.4	1.5	0.68	15	9	0	4	8	0.05	Y*	Non-unique RL in data
QAL067A	Compliance	pH	SU	24	0	No NDs	24	6.0	6.7	6.4	0.24	10	14	0	6	8	0.05	Y*	
QAL067A	Compliance	Potassium	mg/L	13	0	No NDs	13	0.75	9.2	3.0	2.57	4	9	0	3	3	0.05	Y*	
QAL067A	Compliance	Sodium	mg/L	24	0	No NDs	24	43.6	440	146	127.10	8	16	0	2	7	0.05	Y*	Non-unique RL in data
QAL067A	Compliance	Sulfate	mg/L	24	0	No NDs	24	2.7	20.0	11.8	5.21	10	14	0	4	8	0.05	Y*	Non-unique RL in data
QAL068B	Background	Nitrogen, Nitrate	mg/L	24	3	Included as RL	24	0.05	0.072	0.06	0.01	12	12	0	7	8	0.05	Y	
QAL068D	Background	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	48.7	68.3	57.4	3.66	11	13	0	8	8	0.05	Y	
QAL068D	Background	Arsenic	ug/L	24	0	No NDs	24	4.4	6.8	5.7	0.76	14	10	0	2	8	0.05	Y	
QAL068D	Background	Magnesium	mg/L	11	0	No NDs	11	3.3	4.1	3.7	0.22	7	4	0	2	3	0.05	Y	Non-unique RL in data
QAL068D	Background	Potassium	mg/L	11	0	No NDs	11	1.2	1.7	1.4	0.16	4	7	0	3	3	0.05	Y	
QAL068D	Background	Vanadium	ug/L	24	0	No NDs	24	1.6	7.7	3.3	1.20	10	14	0	6	8	0.05	Y	Non-unique RL in data
QAL069A	Background	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	107	230	159	32.80	11	13	0	4	8	0.05	Y	
QAL069A	Background	Calcium	mg/L	11	0	No NDs	11	9.5	55.0	38.4	14.00	7	4	0	3	3	0.05	Y	Non-unique RL in data
QAL069A	Background	Magnesium	mg/L	11	0	No NDs	11	5.4	24.0	15.0	6.08	5	6	0	3	3	0.05	Y	Non-unique RL in data
QAL069A	Background	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.27	1.3	0.75	0.24	12	12	0	6	8	0.05	Y	Non-unique RL in data
QAL069A	Background	Potassium	mg/L	11	0	No NDs	11	0.55	2.1	1.5	0.49	7	4	0	2	3	0.05	Y	
QAL069A	Background	Sodium	mg/L	24	0	No NDs	24	6.6	99.3	30.7	23.11	8	16	0	5	7	0.05	Y*	Non-unique RL in data
QAL070A	Compliance	Alkalinity, Bicarbonate	mg/L	6	0	No NDs	6	45.0	87.7	67.9	16.10	3	3	0	2	2	0.1	Y*	
QAL070A	Compliance	Barium	ug/L	11	5	Included as RL	11	20.0	30.2	24.0	4.09	5	5	1	2	3	0.05	Y	
QAL070A	Compliance	Calcium	mg/L	11	0	No NDs	11	8.5	51.9	31.6	17.70	6	5	0	2	3	0.05	Y*	Non-unique RL in data
QAL070A	Compliance	Chloride	mg/L	6	0	No NDs	6	93.1	120	109	10.47	3	3	0	2	2	0.1	Y*	Non-unique RL in data
QAL070A	Compliance	Magnesium	mg/L	11	0	No NDs	11	2.1	9.9	6.3	3.12	7	4	0	2	3	0.05	Y*	Non-unique RL in data
QAL070A	Compliance	Potassium	mg/L	11	0	No NDs	11	0.54	2.2	1.4	0.67	6	5	0	2	3	0.05	Y*	
QAL070A	Compliance	Strontium	ug/L	11	4	Included as RL	11	50.0	92.2	67.1	16.00	6	5	0	2	3	0.05	Y	
QAL070A	Compliance	Sulfate	mg/L	6	0	No NDs	6	4.3	10.3	7.9	2.13	4	2	0	2	2	0.25	Y*	

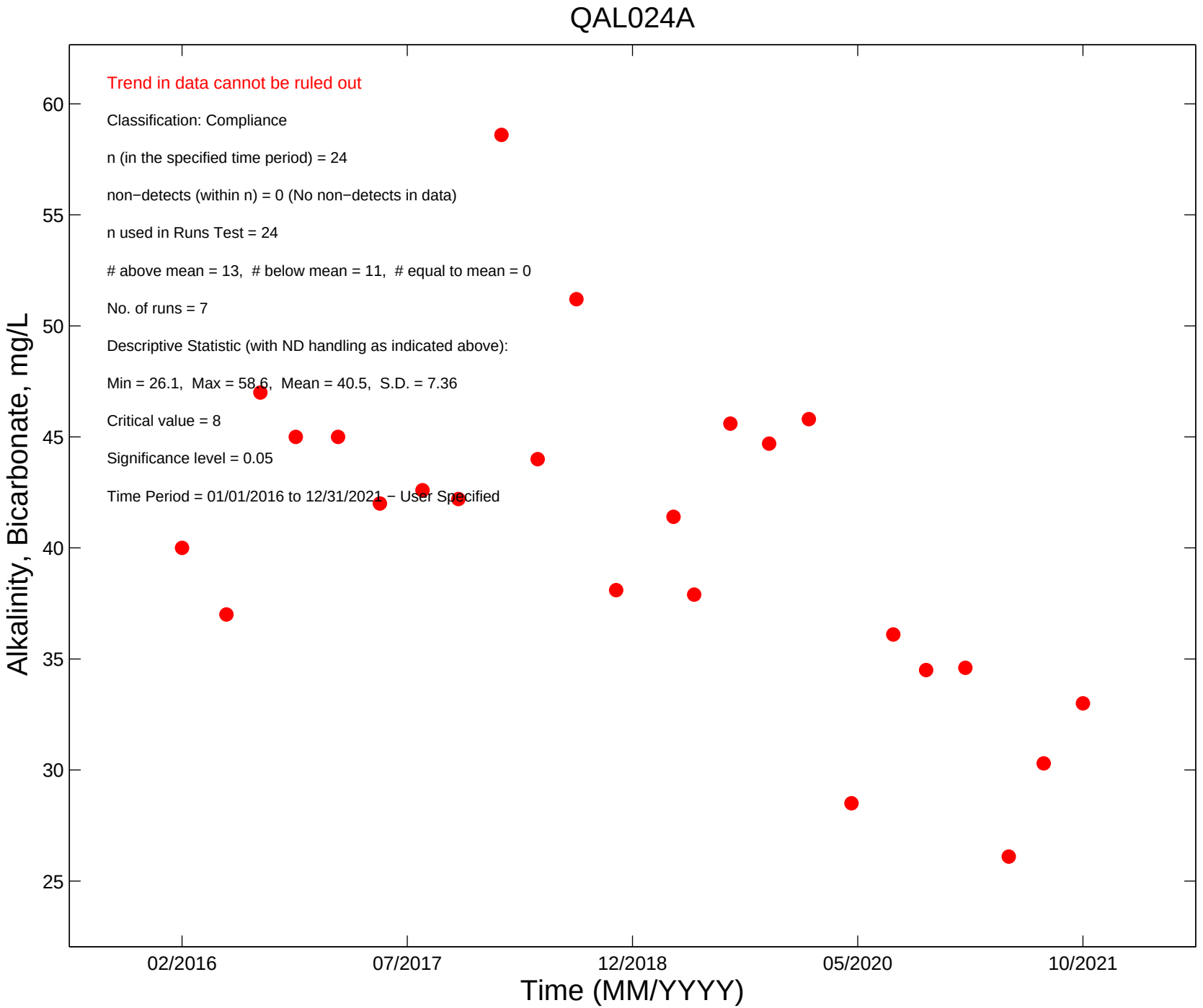
Mine Permit Groundwater Trend Analysis
Identified Trends
Eagle Mine

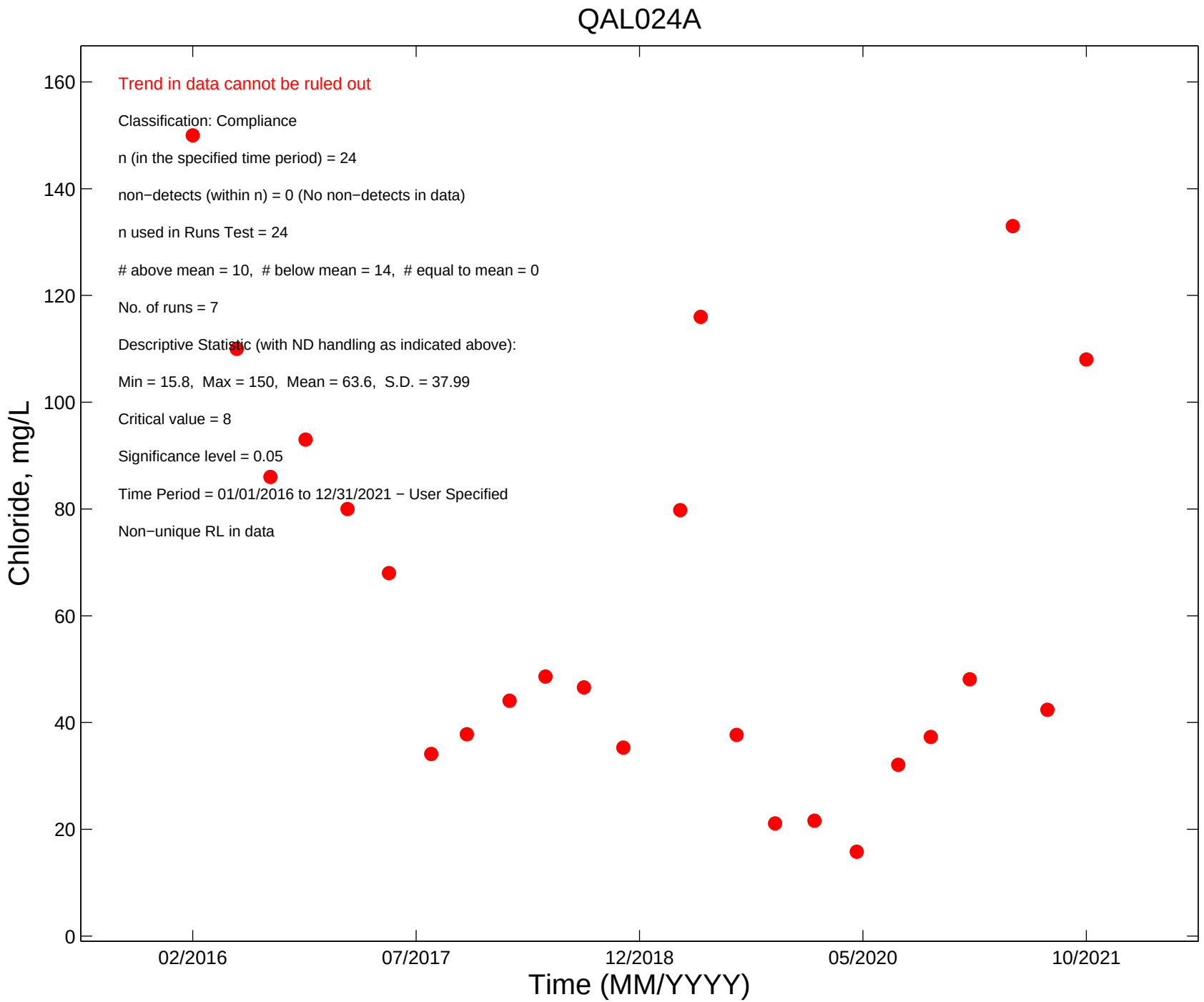
Location	Classi-fication	Parameter	Unit	# Samples	# NDs	Non-detects handling	# used in Runs Test	Min	Max	Mean	St. Dev.	# Above Mean	# Below Mean	# Equal Mean	# Runs	Criti-cal value	Sig level	Trend?	Remarks
QAL071A	Compliance	Barium	ug/L	12	5	Included as RL	12	20.0	39.0	26.8	8.05	5	7	0	2	3	0.05	Y	
QAL071A	Compliance	Calcium	mg/L	13	0	No NDs	13	11.0	94.9	52.4	30.70	8	5	0	2	3	0.05	Y*	Non-unique RL in data
QAL071A	Compliance	Copper	ug/L	24	12	Included as RL	24	5.0	28.6	9.2	6.24	7	17	0	3	7	0.05	Y	
QAL071A	Compliance	Magnesium	mg/L	13	0	No NDs	13	1.4	15.0	7.7	4.76	8	5	0	2	3	0.05	Y*	Non-unique RL in data
QAL071A	Compliance	Nitrogen, Nitrate	mg/L	24	1	Included as RL	24	0.05	38.0	21.7	9.63	14	10	0	7	8	0.05	Y*	Non-unique RL in data (NDs included as RL)
QAL071A	Compliance	Potassium	mg/L	13	0	No NDs	13	0.70	1.8	1.2	0.45	7	6	0	4	4	0.05	Y	
QAL071A	Compliance	Strontium	ug/L	11	4	Included as RL	11	50.0	105	72.9	21.85	5	6	0	3	3	0.05	Y	
QAL071A	Compliance	Sulfate	mg/L	24	0	No NDs	24	5.7	12.6	7.9	1.85	9	15	0	7	8	0.05	Y	Non-unique RL in data
QAL073A	Compliance	Alkalinity, Bicarbonate	mg/L	6	0	No NDs	6	42.4	100	77.0	24.43	4	2	0	2	2	0.25	Y	
QAL073A	Compliance	Calcium	mg/L	11	0	No NDs	11	5.6	34.0	23.7	9.58	7	4	0	3	3	0.05	Y*	Non-unique RL in data
QAL073A	Compliance	Magnesium	mg/L	11	0	No NDs	11	1.1	7.5	5.0	2.20	7	4	0	3	3	0.05	Y*	Non-unique RL in data
QAL073A	Compliance	Nitrogen, Nitrate	mg/L	6	0	No NDs	6	0.57	1.6	1.1	0.39	3	3	0	2	2	0.10	Y	Non-unique RL in data
QAL073A	Compliance	Sodium	mg/L	6	0	No NDs	6	2.3	3.0	2.6	0.26	2	3	1	2	2	0.25	Y*	Non-unique RL in data
QAL073A	Compliance	Sulfate	mg/L	6	0	No NDs	6	4.9	9.4	7.8	1.74	3	3	0	2	2	0.10	Y	Non-unique RL in data
QAL074A	Compliance	Alkalinity, Bicarbonate	mg/L	24	0	No NDs	24	43.0	104	77.3	20.54	11	13	0	2	8	0.05	Y*	
QAL074A	Compliance	Calcium	mg/L	10	0	No NDs	10	9.1	43.3	27.7	11.60	6	4	0	2	3	0.05	Y*	Non-unique RL in data
QAL074A	Compliance	Chloride	mg/L	24	0	No NDs	24	28.4	62.4	47.8	7.71	13	11	0	8	8	0.05	Y*	Non-unique RL in data
QAL074A	Compliance	Magnesium	mg/L	10	0	No NDs	10	1.7	8.3	5.4	2.30	6	4	0	2	3	0.05	Y*	Non-unique RL in data
QAL074A	Compliance	Mercury	ng/L	24	17	Included as RL	24	0.500	1.92	0.70	0.40	7	17	0	4	7	0.05	Y	
QAL074A	Compliance	Nitrogen, Nitrate	mg/L	24	0	No NDs	24	0.80	1.7	1.1	0.25	11	13	0	4	8	0.05	Y*	Non-unique RL in data
QAL074A	Compliance	pH	SU	24	0	No NDs	24	7.7	9.1	8.3	0.28	10	14	0	6	8	0.05	Y*	
QAL074A	Compliance	Potassium	mg/L	10	0	No NDs	10	0.59	1.7	1.1	0.40	5	5	0	2	3	0.05	Y	
QAL074A	Compliance	Sodium	mg/L	24	0	No NDs	24	6.8	27.3	18.7	6.77	13	11	0	4	8	0.05	Y*	Non-unique RL in data

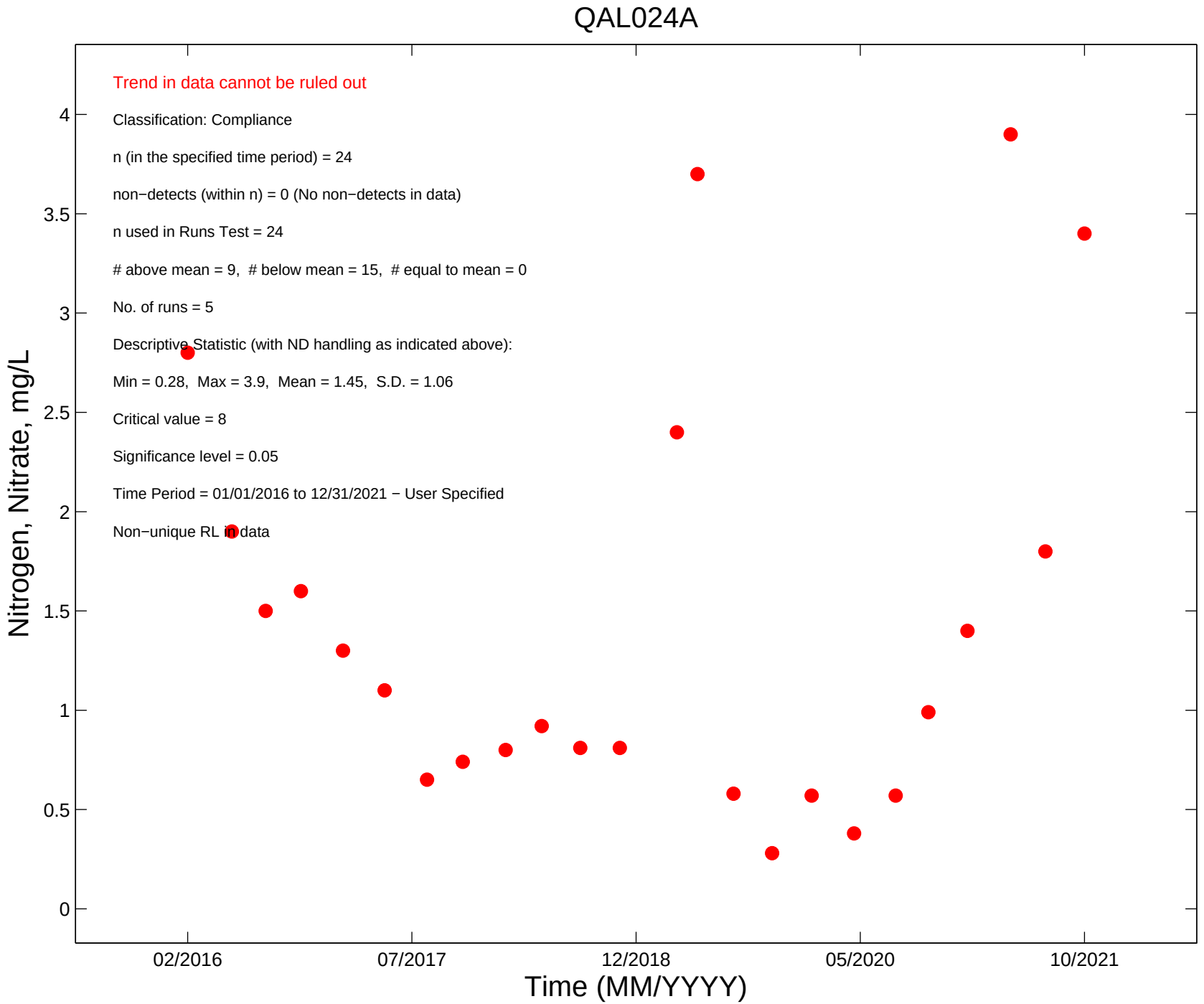
Mine Permit Groundwater Trend Analysis
Notes and Abbreviations Used in Statistical Summary Tables
Eagle Mine

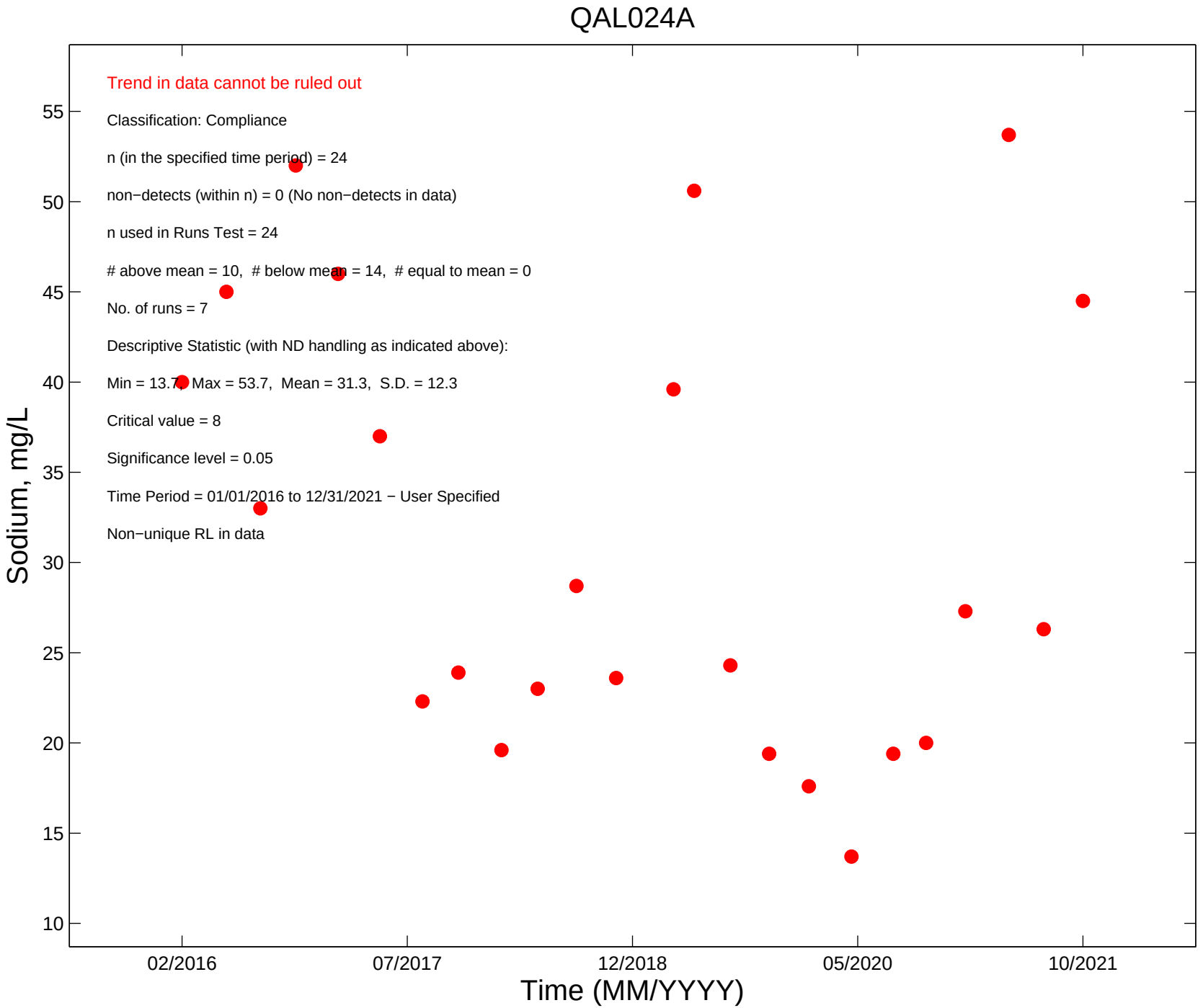
Abbreviation	Explanation
N	Null Hypothesis that the sequence was produced in a random manner cannot be rejected at the indicated significance level (i.e. a trend in data not indicated).
Y	Null Hypothesis that the sequence was produced in a random manner cannot be accepted at the indicated significance 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).
R	Trend rejected because it was an artifact of non-detect values and/or inconsistent RLs.
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).

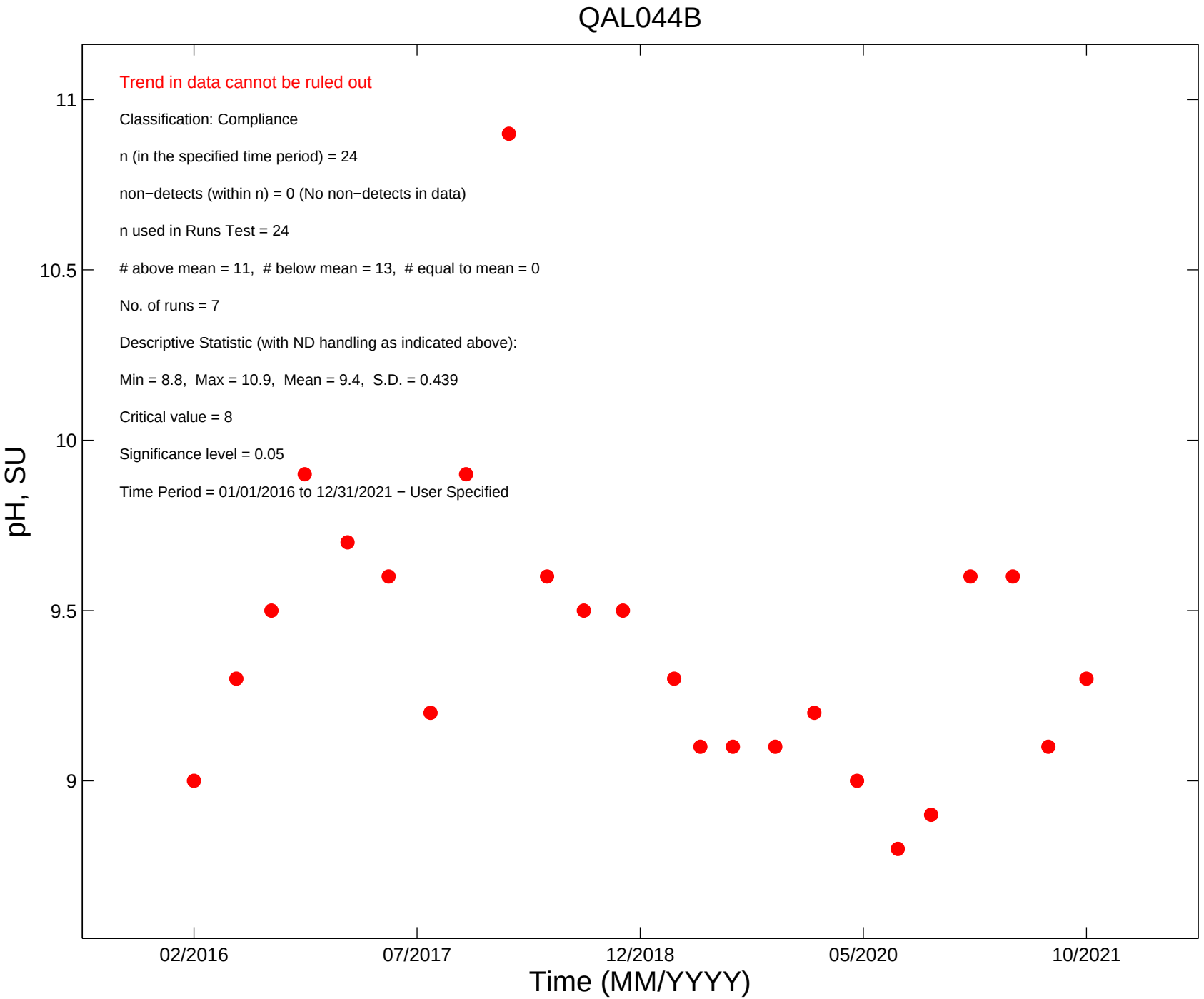
Notes: Trend analysis period is baseline (March 2011) through Q4 2021 for parameters sampled annually and Q1 2016 through Q4 2021 for parameters sampled quarterly.

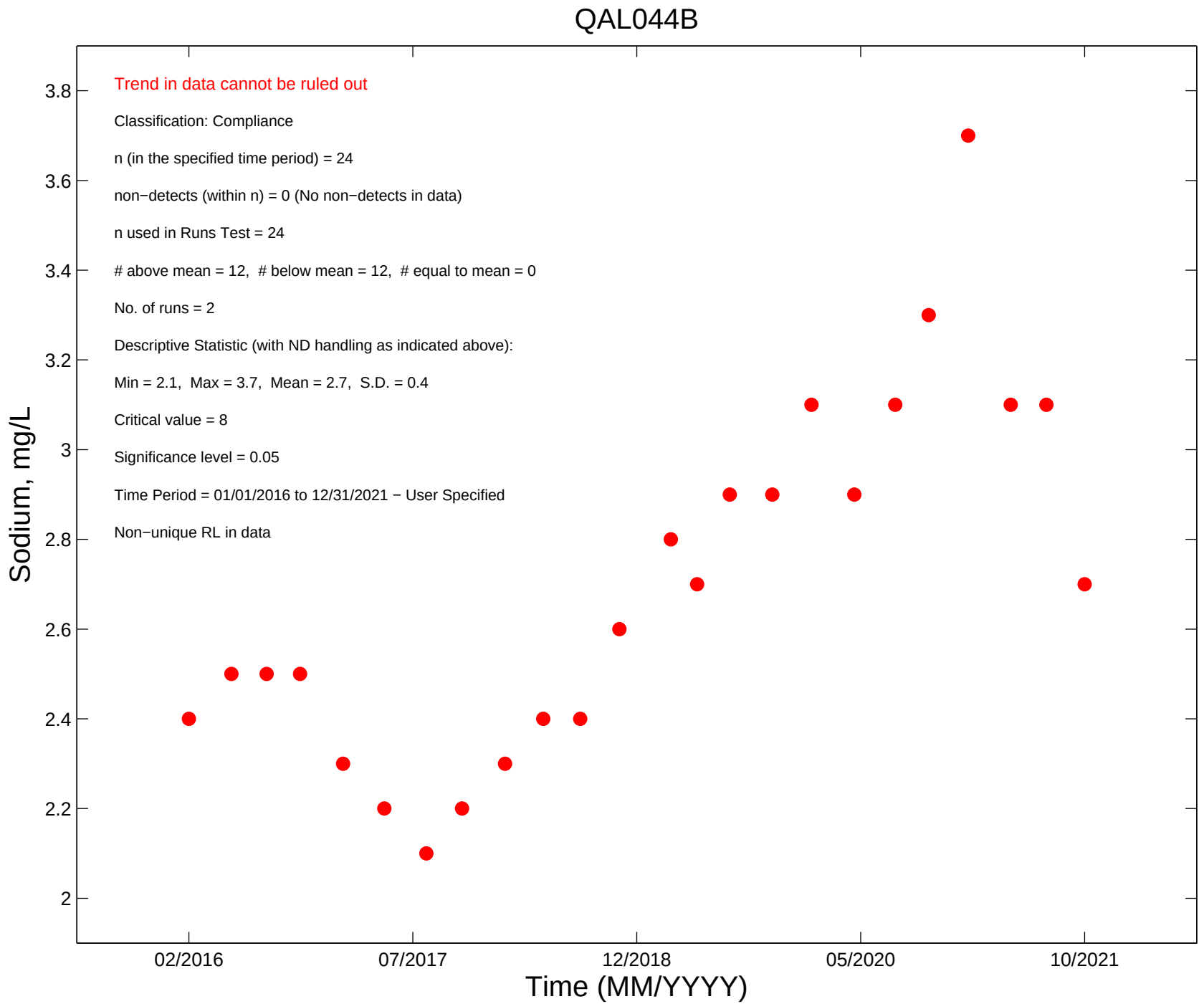

QAL024A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 13, # below mean = 11, # equal to mean = 0
No. of runs = 7
Descriptive Statistic (with ND handling as indicated above):
Min = 26.1, Max = 58.6, Mean = 40.5, S.D. = 7.36
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Alkalinity, Bicarbonate, mg/L
60
55
50
45
40
35
30
25
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

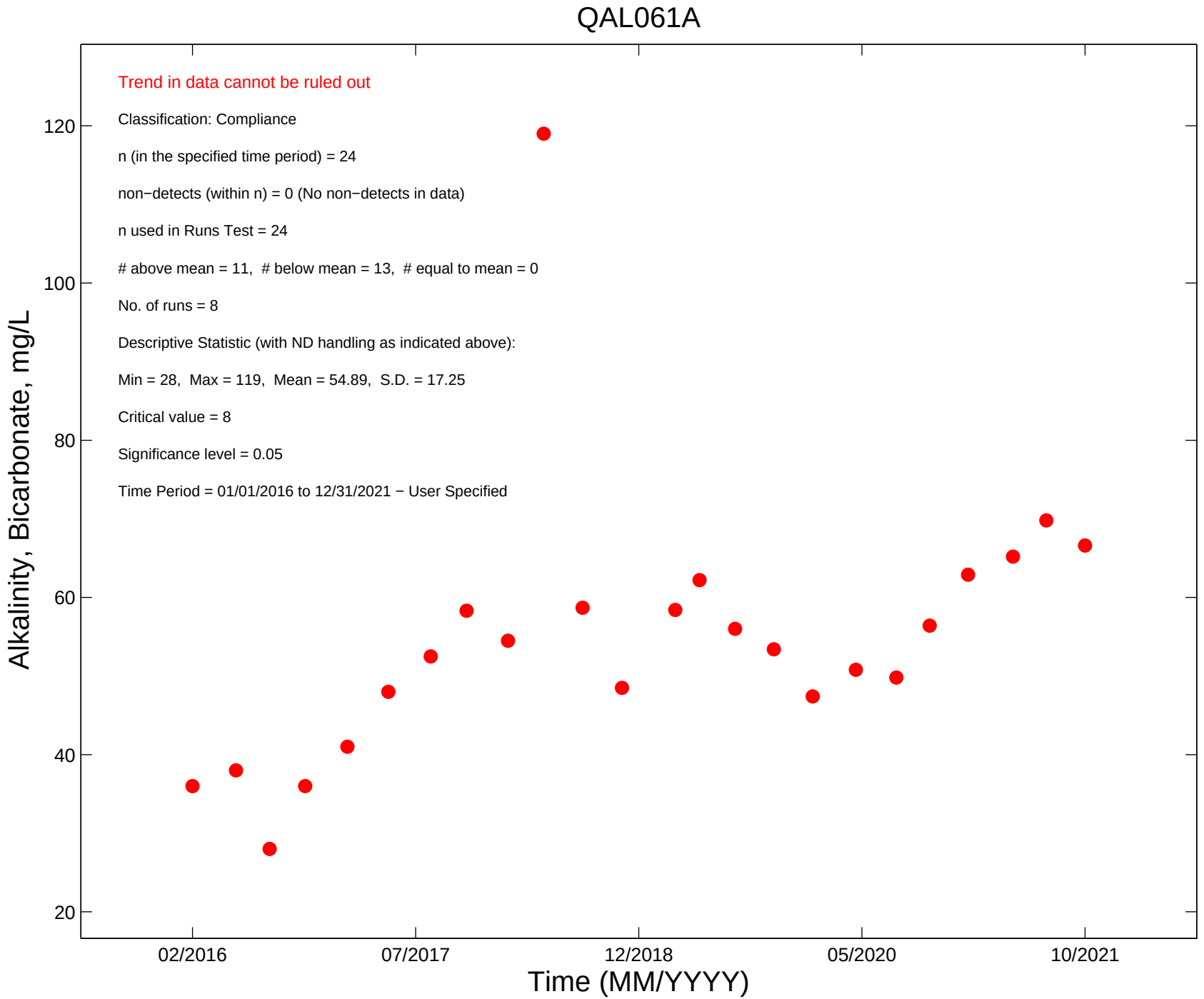

QAL024A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 10, # below mean = 14, # equal to mean = 0
No. of runs = 7
Descriptive Statistic (with ND handling as indicated above):
Min = 15.8, Max = 150, Mean = 63.6, S.D. = 37.99
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Chloride, mg/L
0
20
40
60
80
100
120
140
160
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

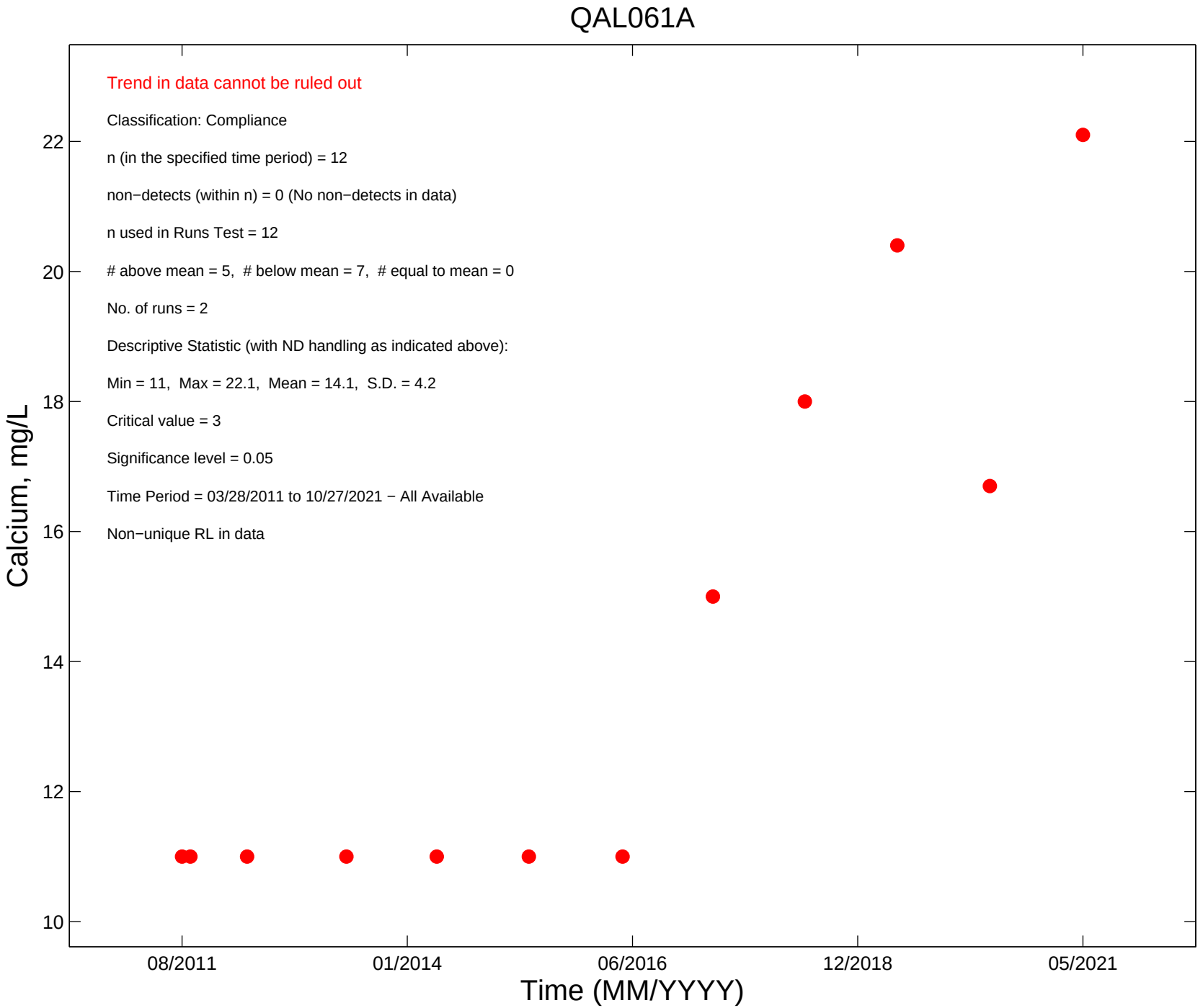

QAL024A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 9, # below mean = 15, # equal to mean = 0
No. of runs = 5
Descriptive Statistic (with ND handling as indicated above):
Min = 0.28, Max = 3.9, Mean = 1.45, S.D. = 1.06
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Nitrogen, Nitrate, mg/L
0
0.5
1
1.5
2
2.5
3
3.5
4
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

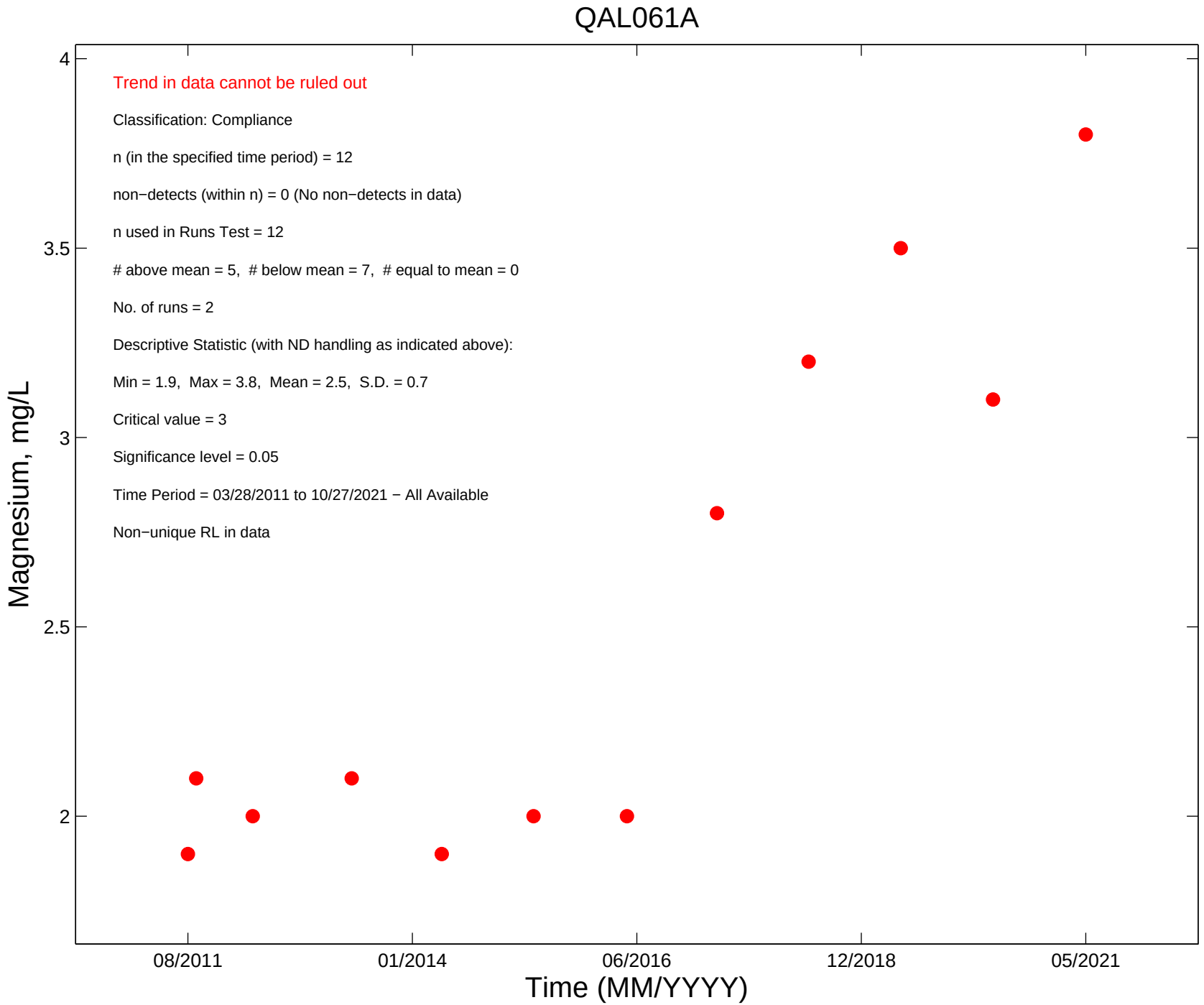

QAL024A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 10, # below mean = 14, # equal to mean = 0
No. of runs = 7
Descriptive Statistic (with ND handling as indicated above):
Min = 13.7, Max = 53.7, Mean = 31.3, S.D. = 12.3
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sodium, mg/L
55
50
45
40
35
30
25
20
15
10
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

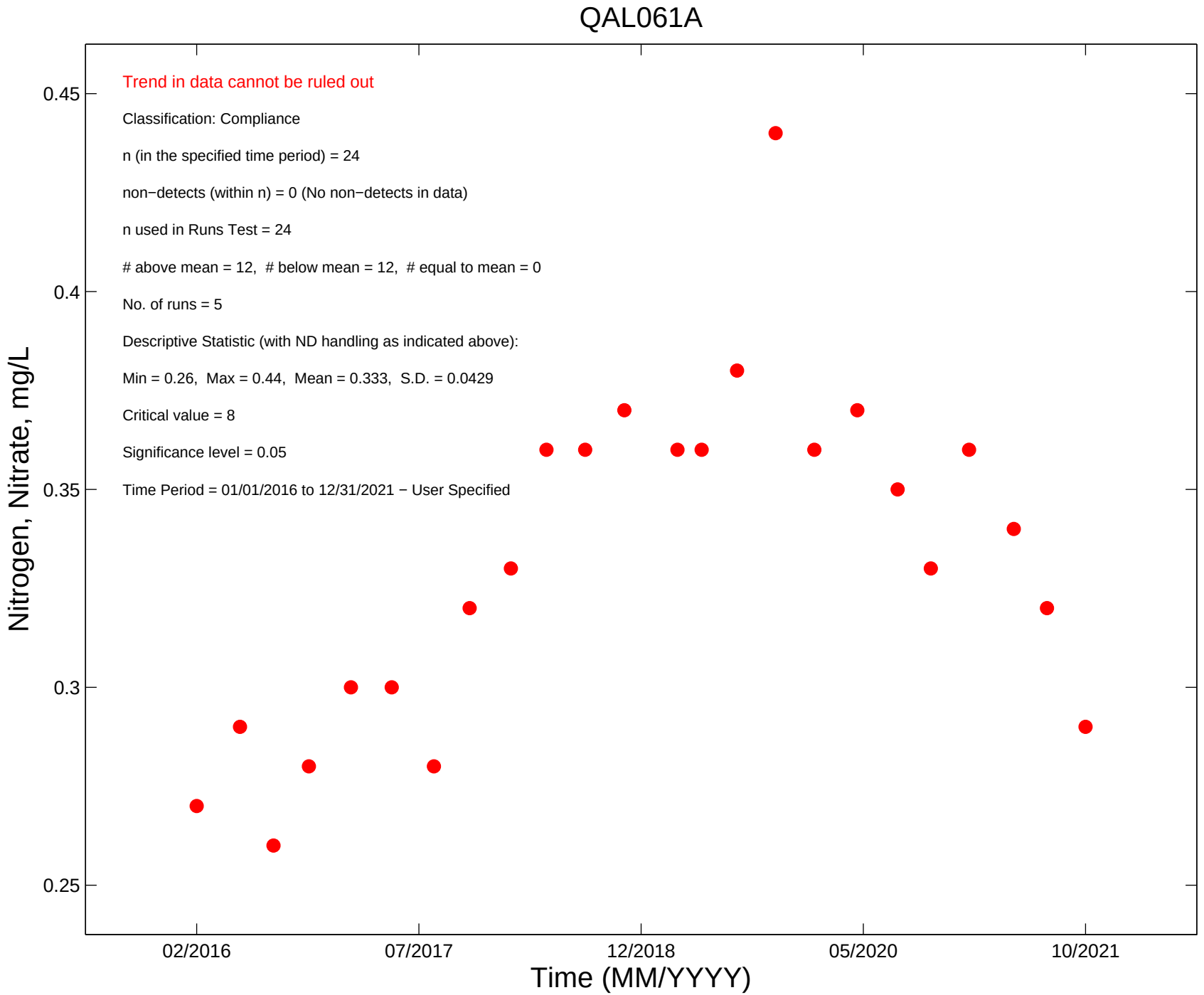

QAL044B
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 11, # below mean = 13, # equal to mean = 0
No. of runs = 7
Descriptive Statistic (with ND handling as indicated above):
Min = 8.8, Max = 10.9, Mean = 9.4, S.D. = 0.439
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
11
10.5
10
9.5
9
pH, SU
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

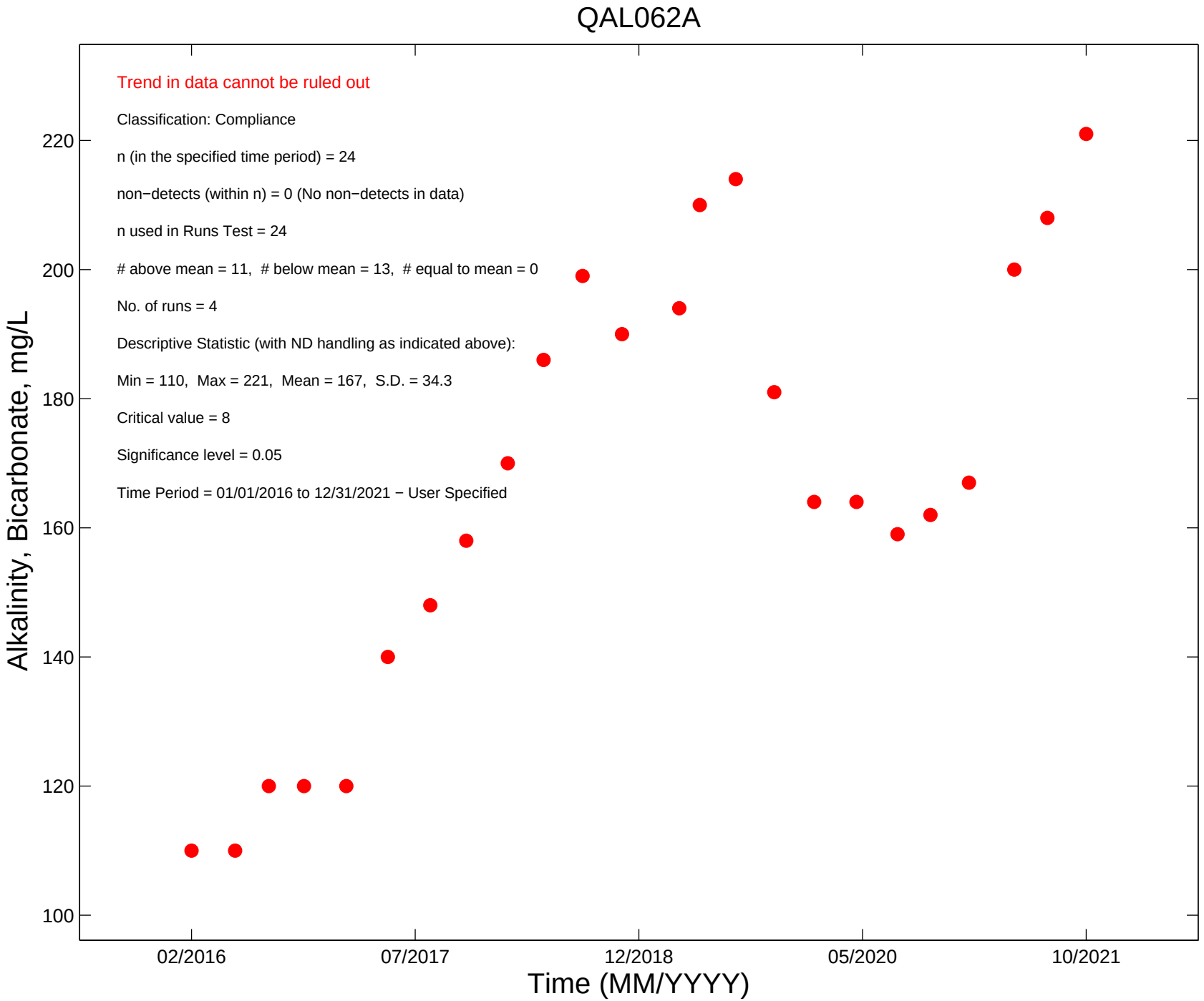

QAL044B
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 12, # below mean = 12, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 2.1, Max = 3.7, Mean = 2.7, S.D. = 0.4
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sodium, mg/L
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

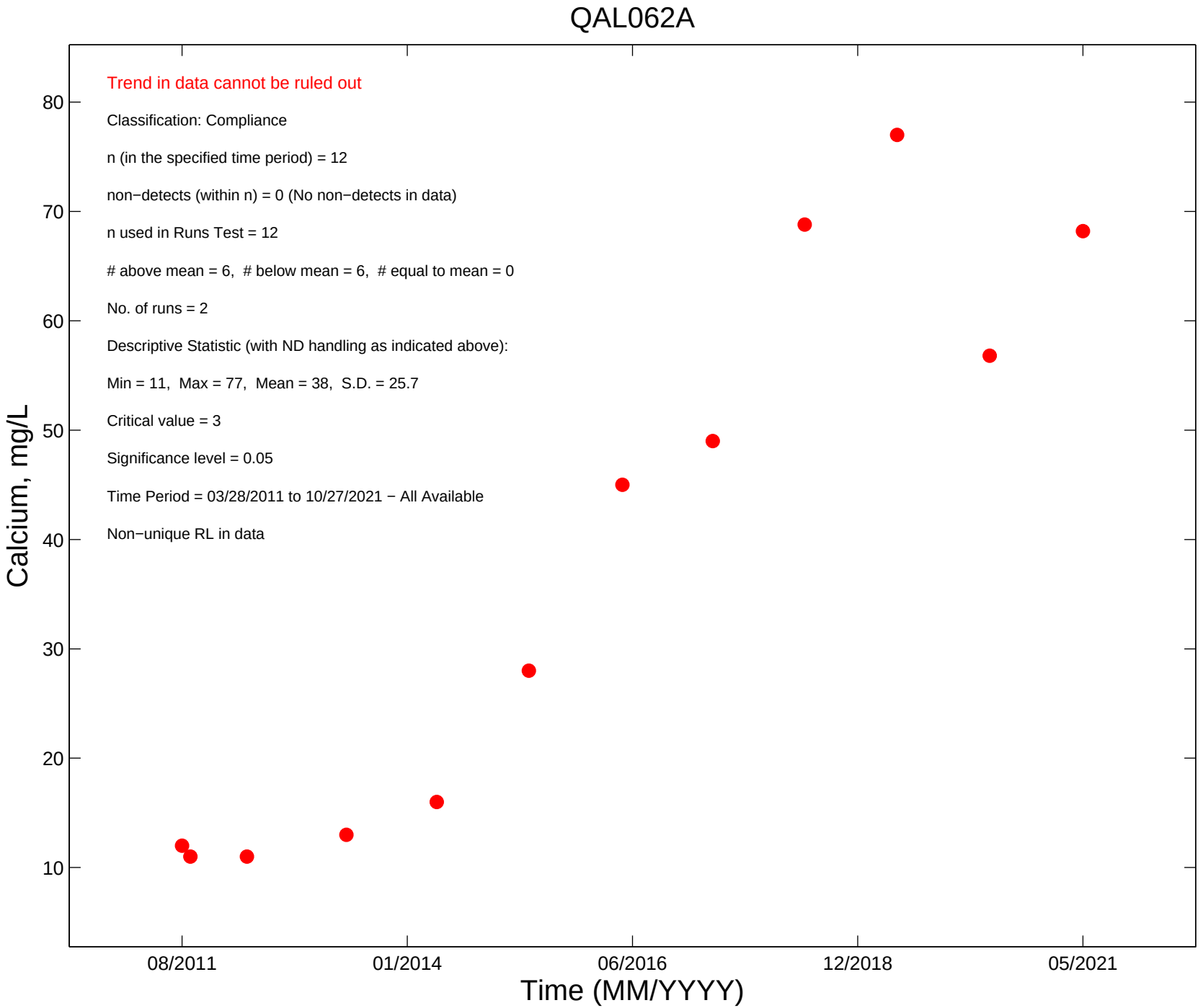

QAL061A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 11, # below mean = 13, # equal to mean = 0
No. of runs = 8
Descriptive Statistic (with ND handling as indicated above):
Min = 28, Max = 119, Mean = 54.89, S.D. = 17.25
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Alkalinity, Bicarbonate, mg/L
120
100
80
60
40
20
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

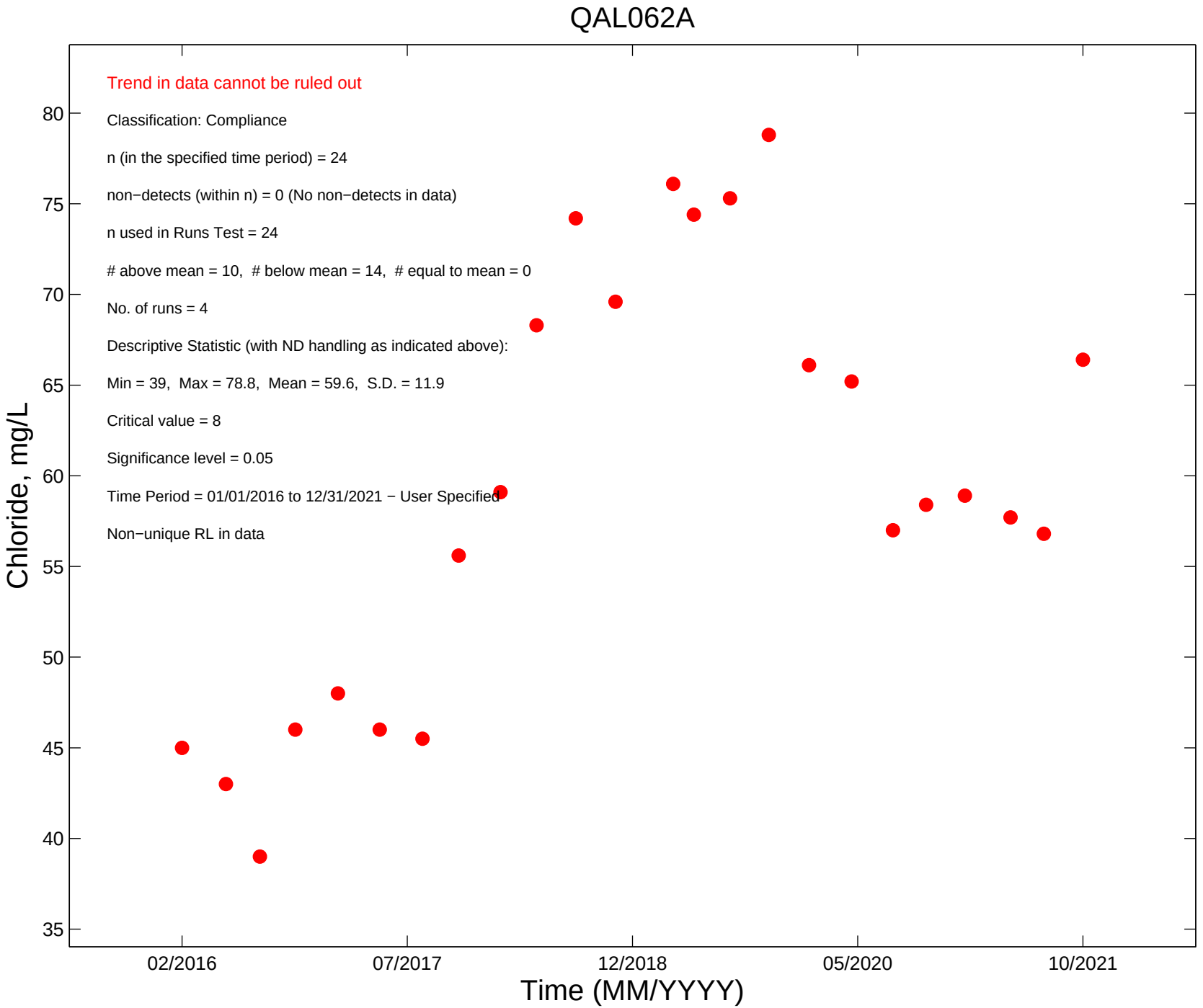

QAL061A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 12
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 12
above mean = 5, # below mean = 7, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 11, Max = 22.1, Mean = 14.1, S.D. = 4.2
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Calcium, mg/L
22
20
18
16
14
12
10
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)

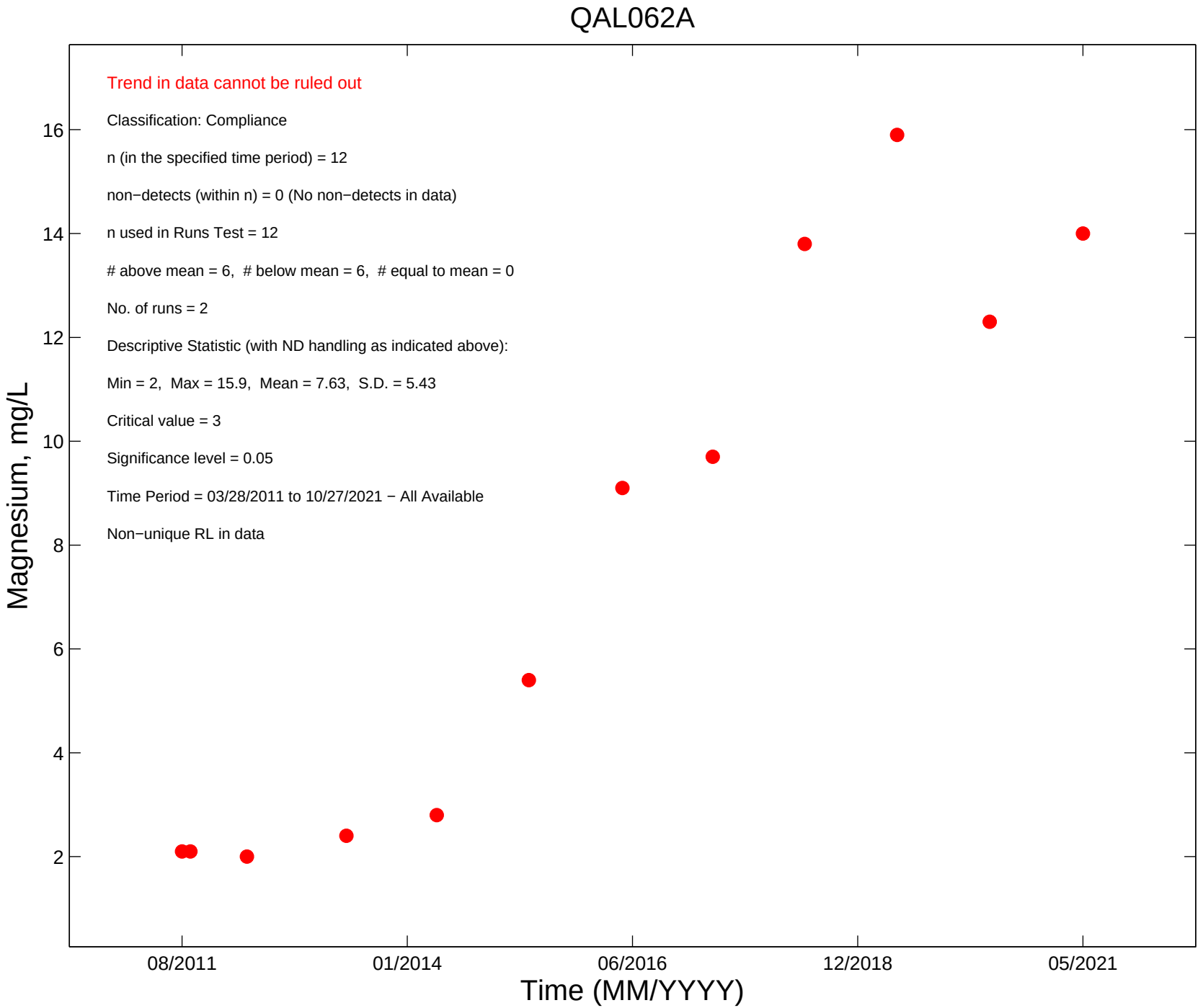

QAL061A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 12
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 12
above mean = 5, # below mean = 7, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 1.9, Max = 3.8, Mean = 2.5, S.D. = 0.7
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Magnesium, mg/L
4
3.5
3
2.5
2
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)

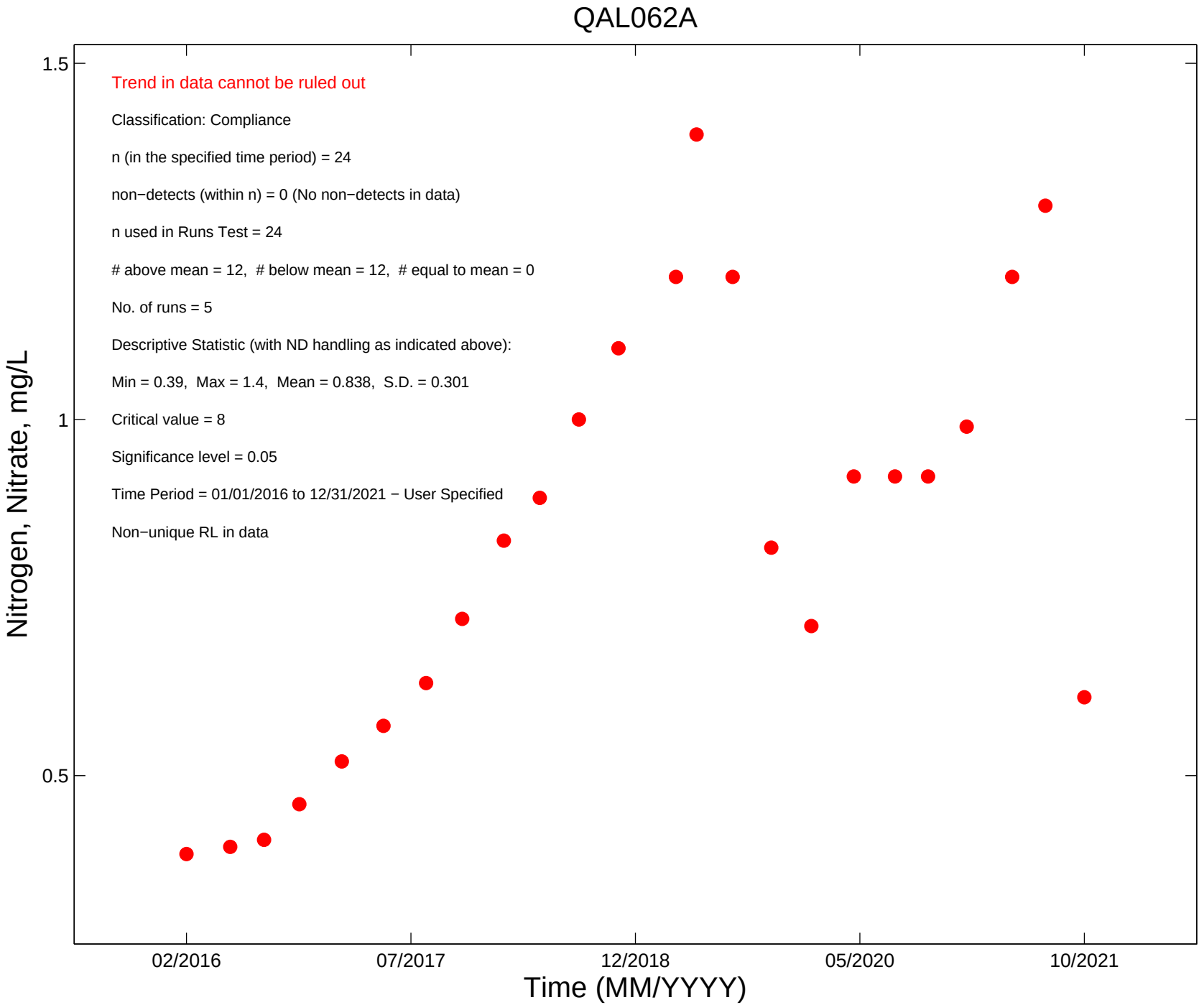

QAL061A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 12, # below mean = 12, # equal to mean = 0
No. of runs = 5
Descriptive Statistic (with ND handling as indicated above):
Min = 0.26, Max = 0.44, Mean = 0.333, S.D. = 0.0429
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Nitrogen, Nitrate, mg/L
0.45
0.4
0.35
0.3
0.25
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

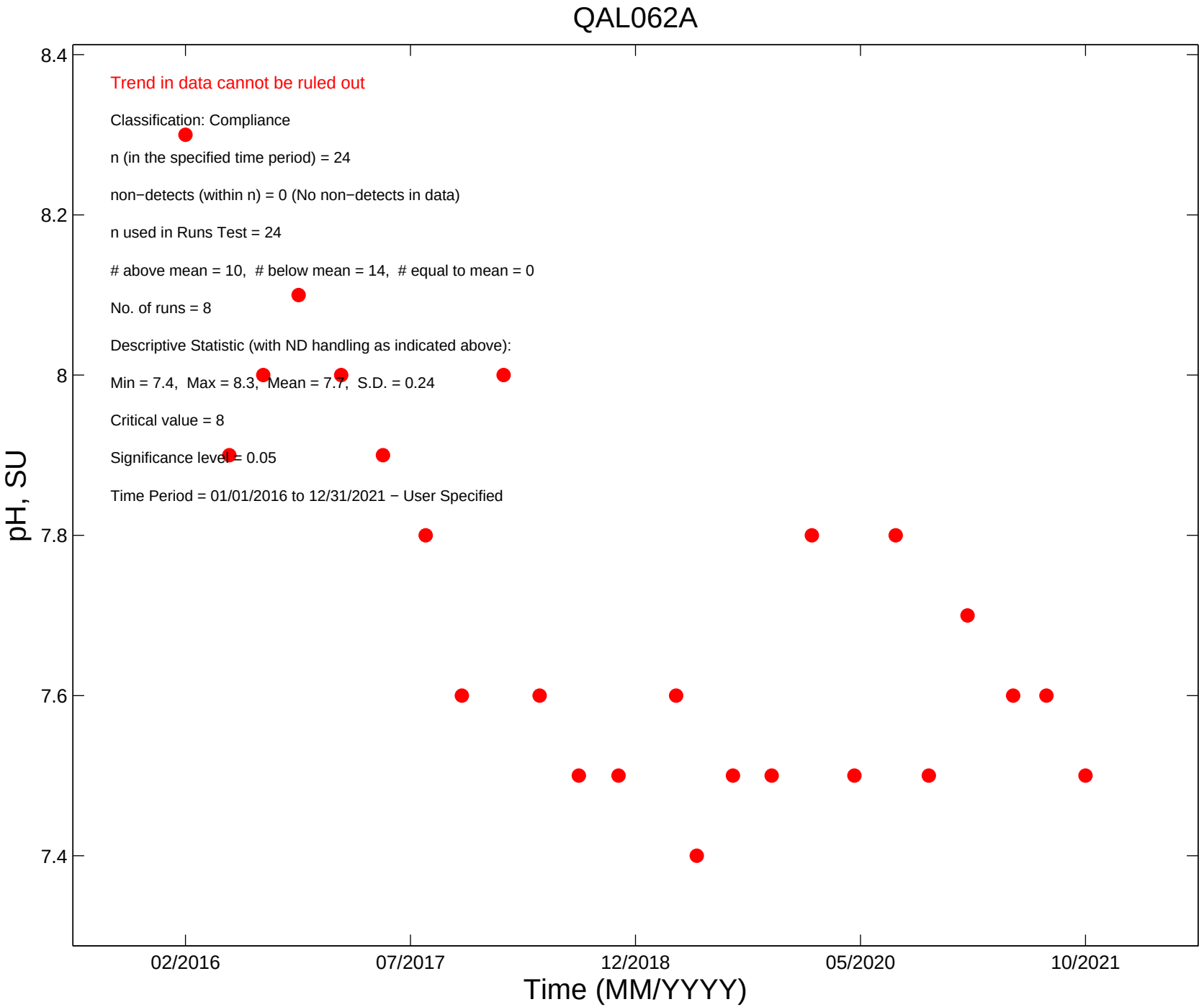

QAL062A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 11, # below mean = 13, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 110, Max = 221, Mean = 167, S.D. = 34.3
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Alkalinity, Bicarbonate, mg/L
220
200
180
160
140
120
100
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

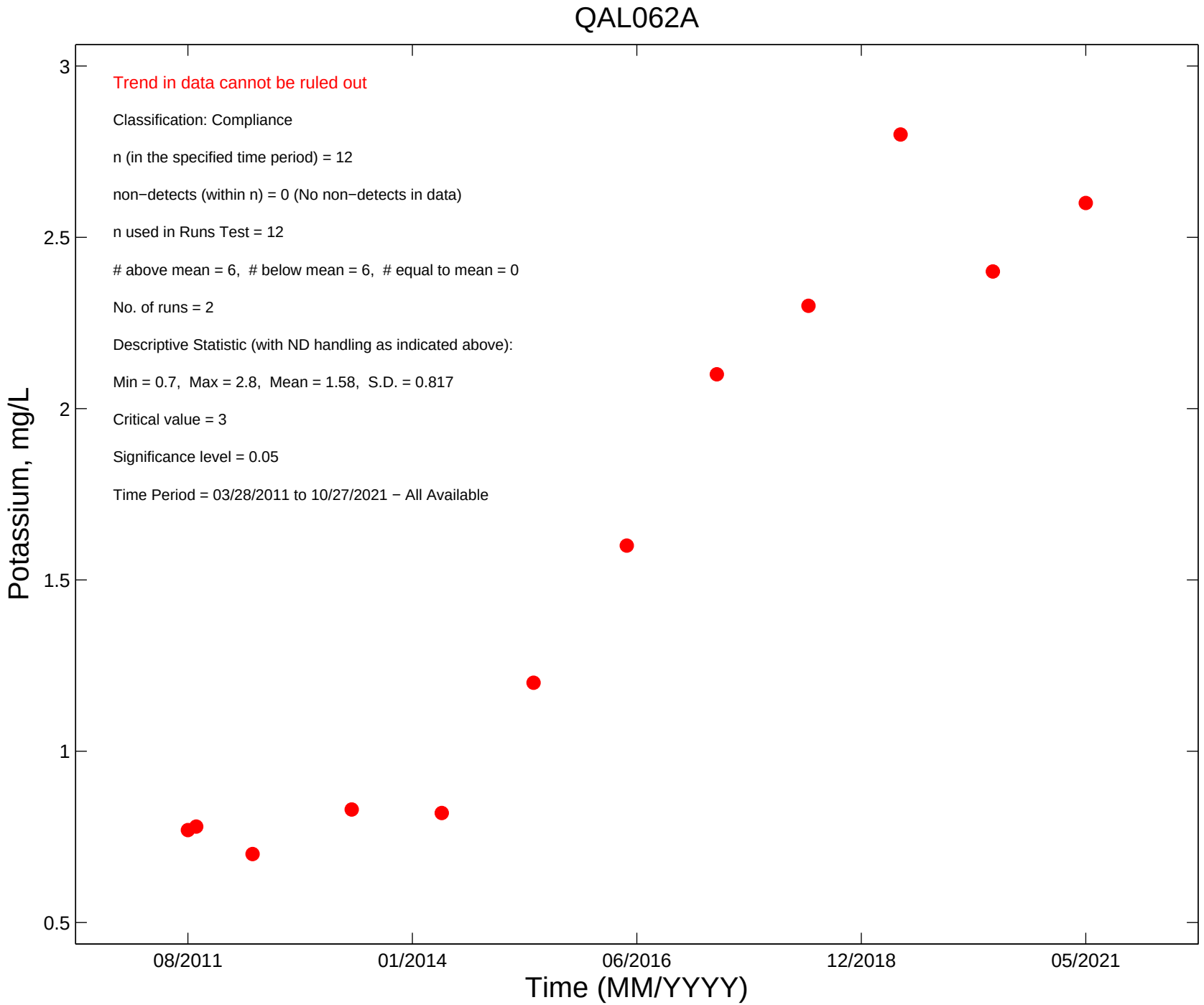

QAL062A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 12
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 12
above mean = 6, # below mean = 6, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 11, Max = 77, Mean = 38, S.D. = 25.7
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Calcium, mg/L
80
70
60
50
40
30
20
10
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)

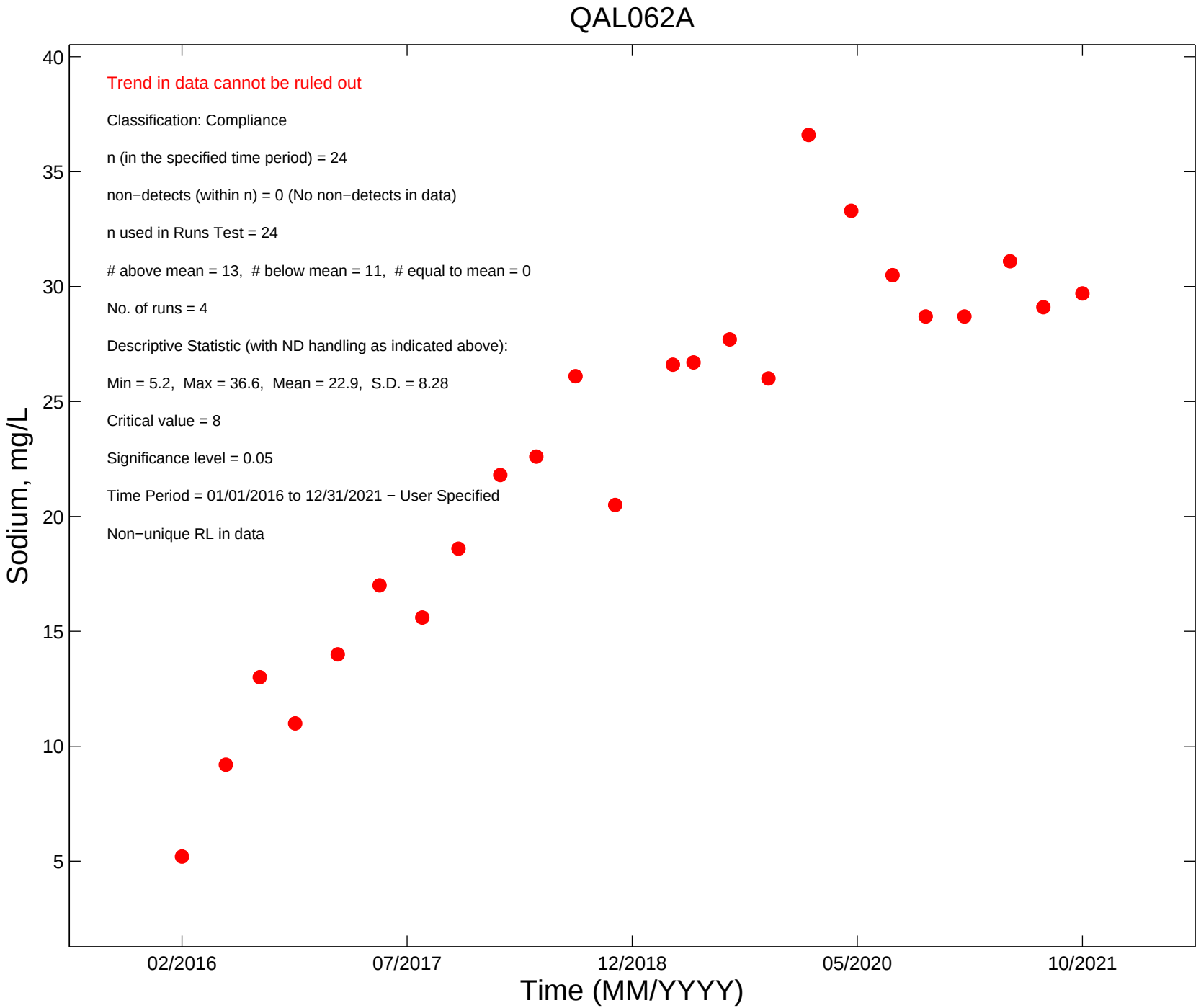

QAL062A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 10, # below mean = 14, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 39, Max = 78.8, Mean = 59.6, S.D. = 11.9
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Chloride, mg/L
80
75
70
65
60
55
50
45
40
35
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

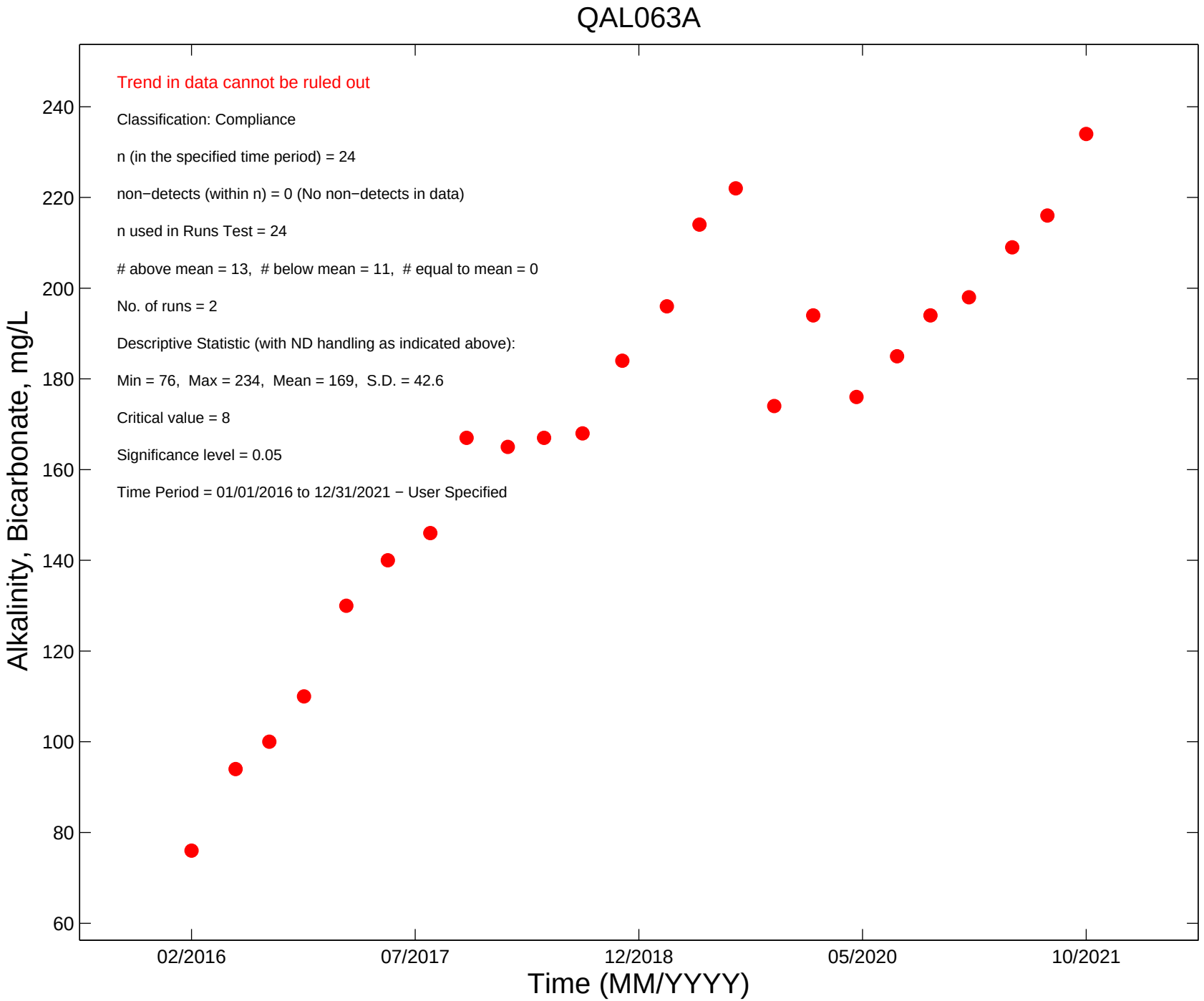

QAL062A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 12
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 12
above mean = 6, # below mean = 6, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 2, Max = 15.9, Mean = 7.63, S.D. = 5.43
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Magnesium, mg/L
16
14
12
10
8
6
4
2
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)

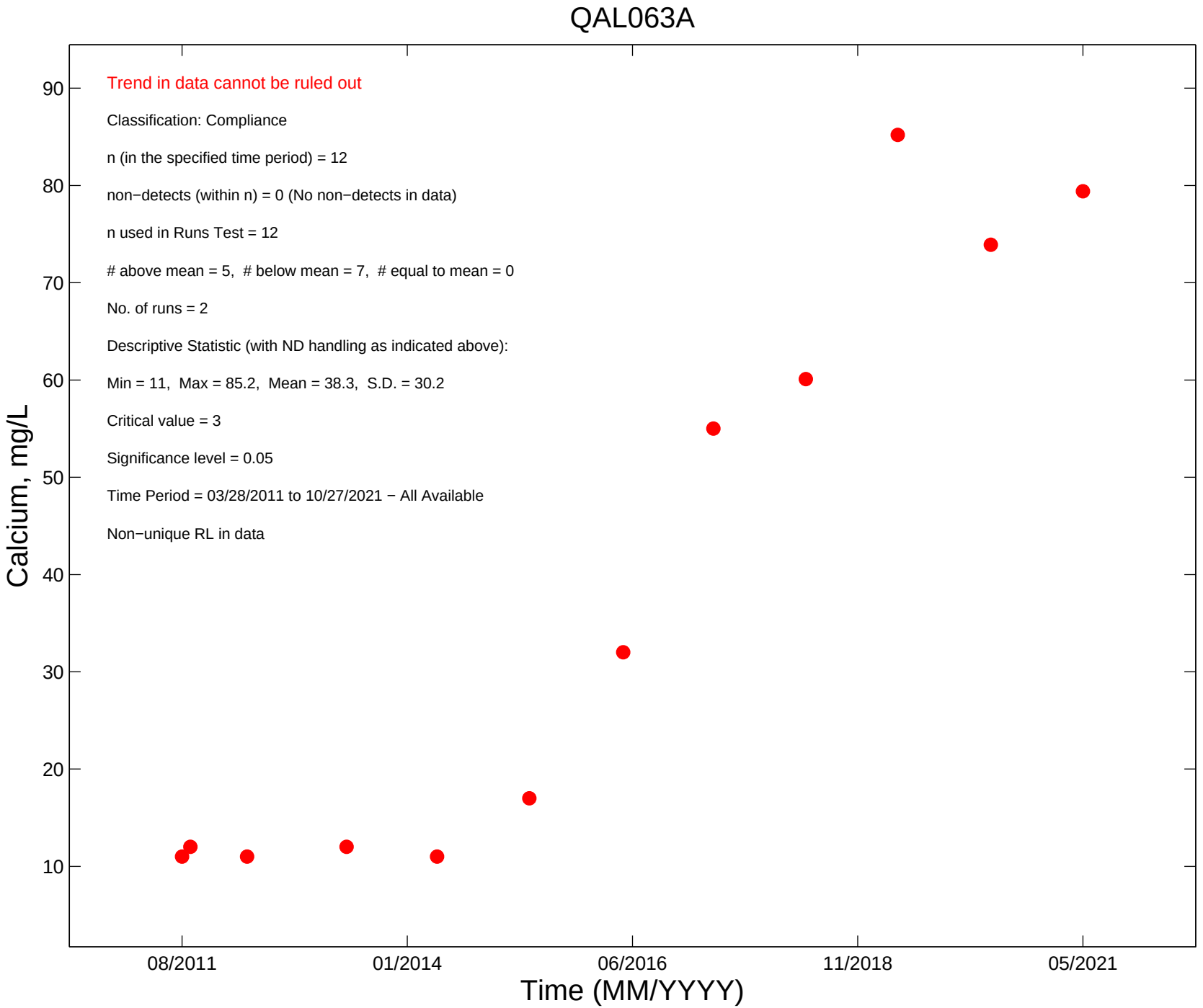

QAL062A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 12, # below mean = 12, # equal to mean = 0
No. of runs = 5
Descriptive Statistic (with ND handling as indicated above):
Min = 0.39, Max = 1.4, Mean = 0.838, S.D. = 0.301
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
1.5
1
0.5
Nitrogen, Nitrate, mg/L
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

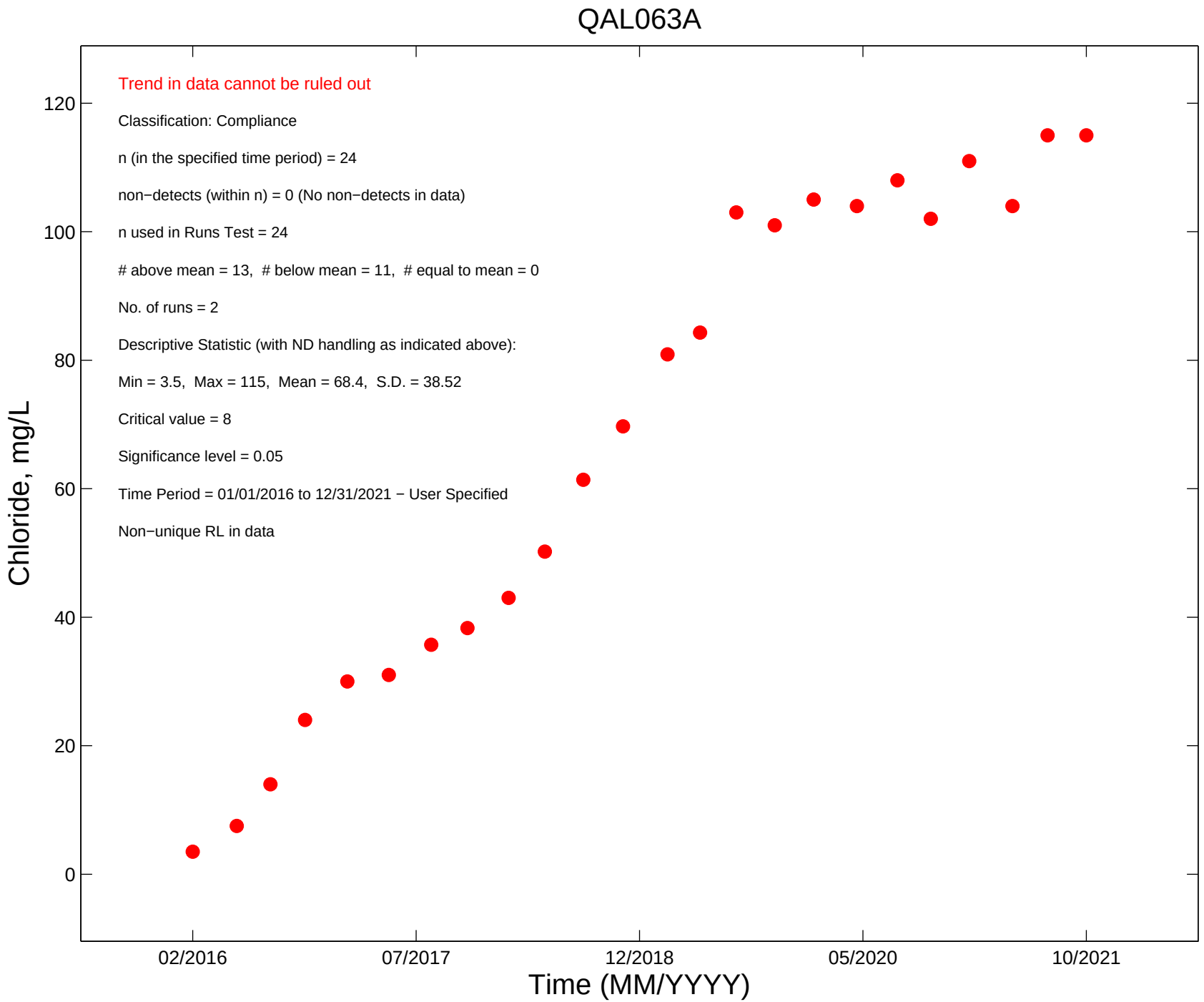

QAL062A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 10, # below mean = 14, # equal to mean = 0
No. of runs = 8
Descriptive Statistic (with ND handling as indicated above):
Min = 7.4, Max = 8.3, Mean = 7.7, S.D. = 0.24
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
8.4
8.2
8
7.8
7.6
7.4
pH, SU
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

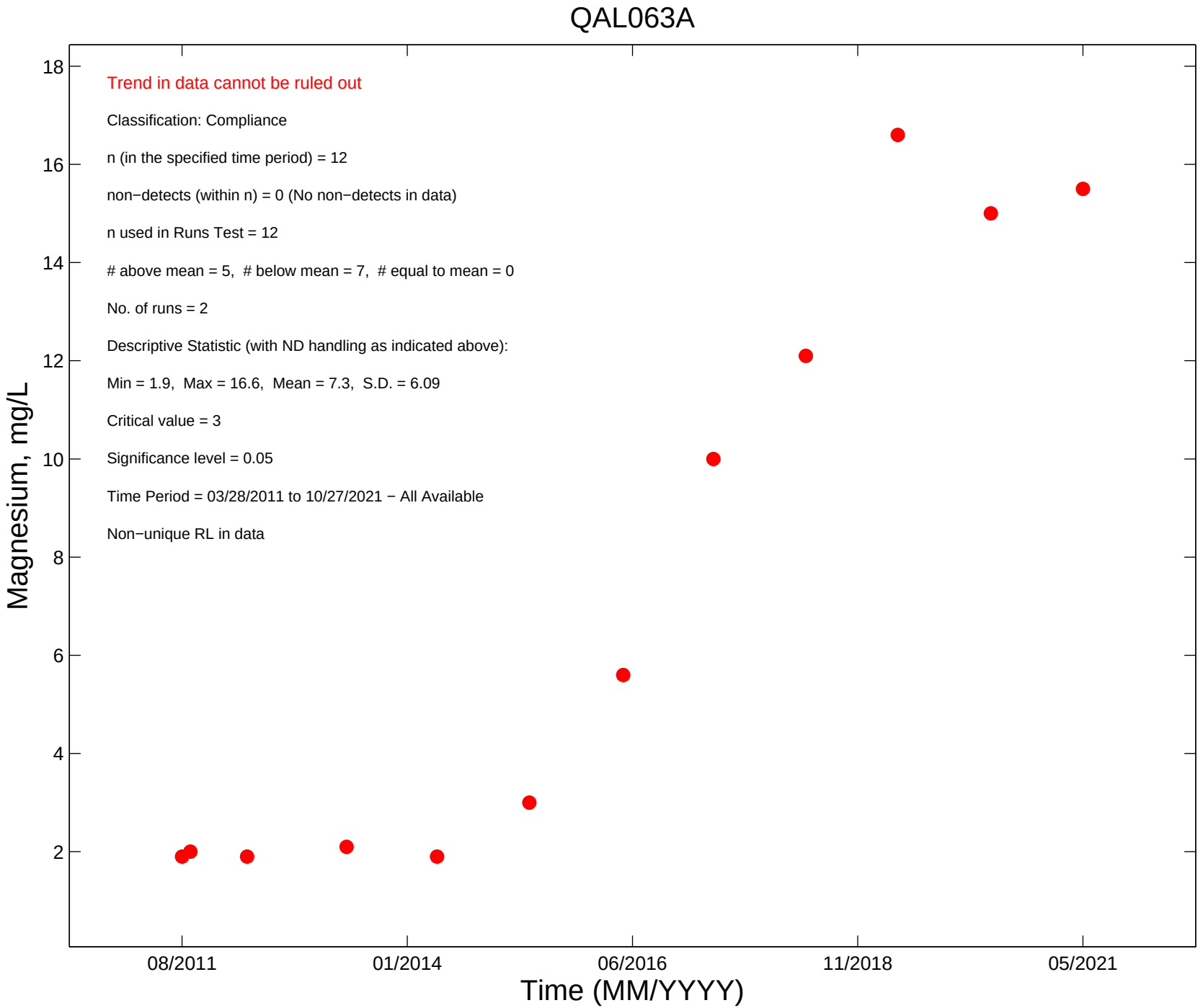

QAL062A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 12
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 12
above mean = 6, # below mean = 6, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 0.7, Max = 2.8, Mean = 1.58, S.D. = 0.817
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Potassium, mg/L
3
2.5
2
1.5
1
0.5
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)

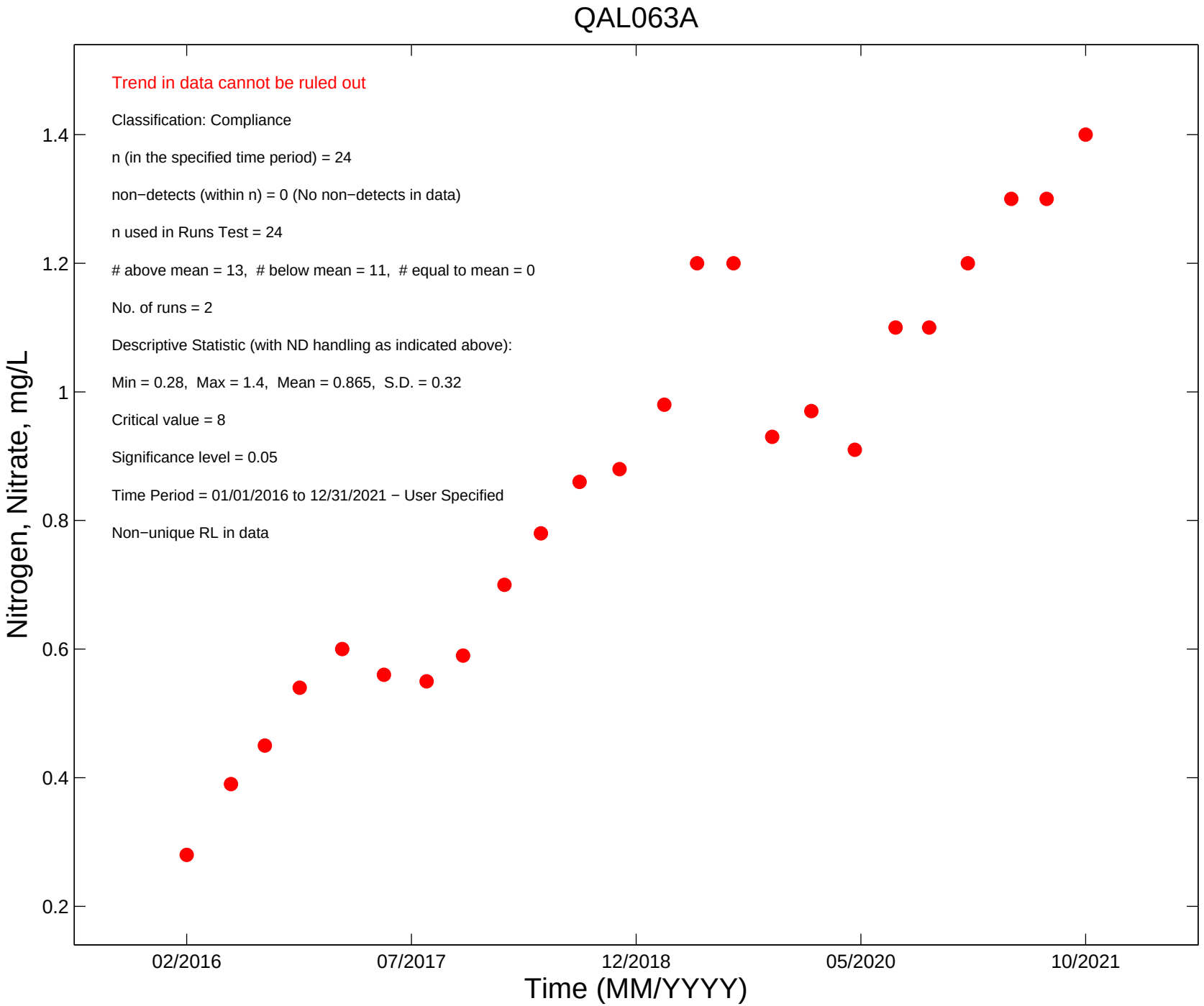

QAL062A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 13, # below mean = 11, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 5.2, Max = 36.6, Mean = 22.9, S.D. = 8.28
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sodium, mg/L
40
35
30
25
20
15
10
5
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

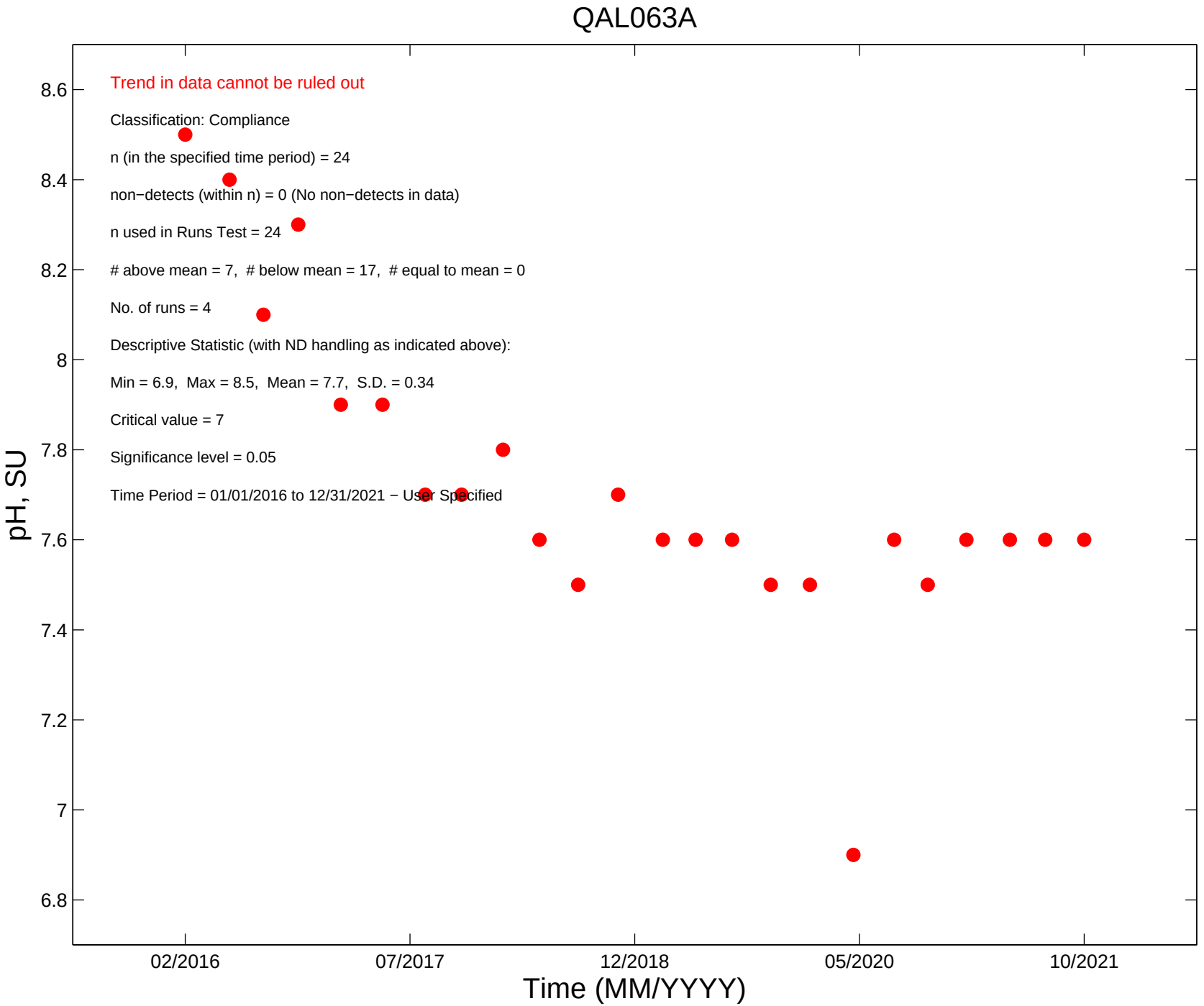

QAL063A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 13, # below mean = 11, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 76, Max = 234, Mean = 169, S.D. = 42.6
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Alkalinity, Bicarbonate, mg/L
240
220
200
180
160
140
120
100
80
60
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

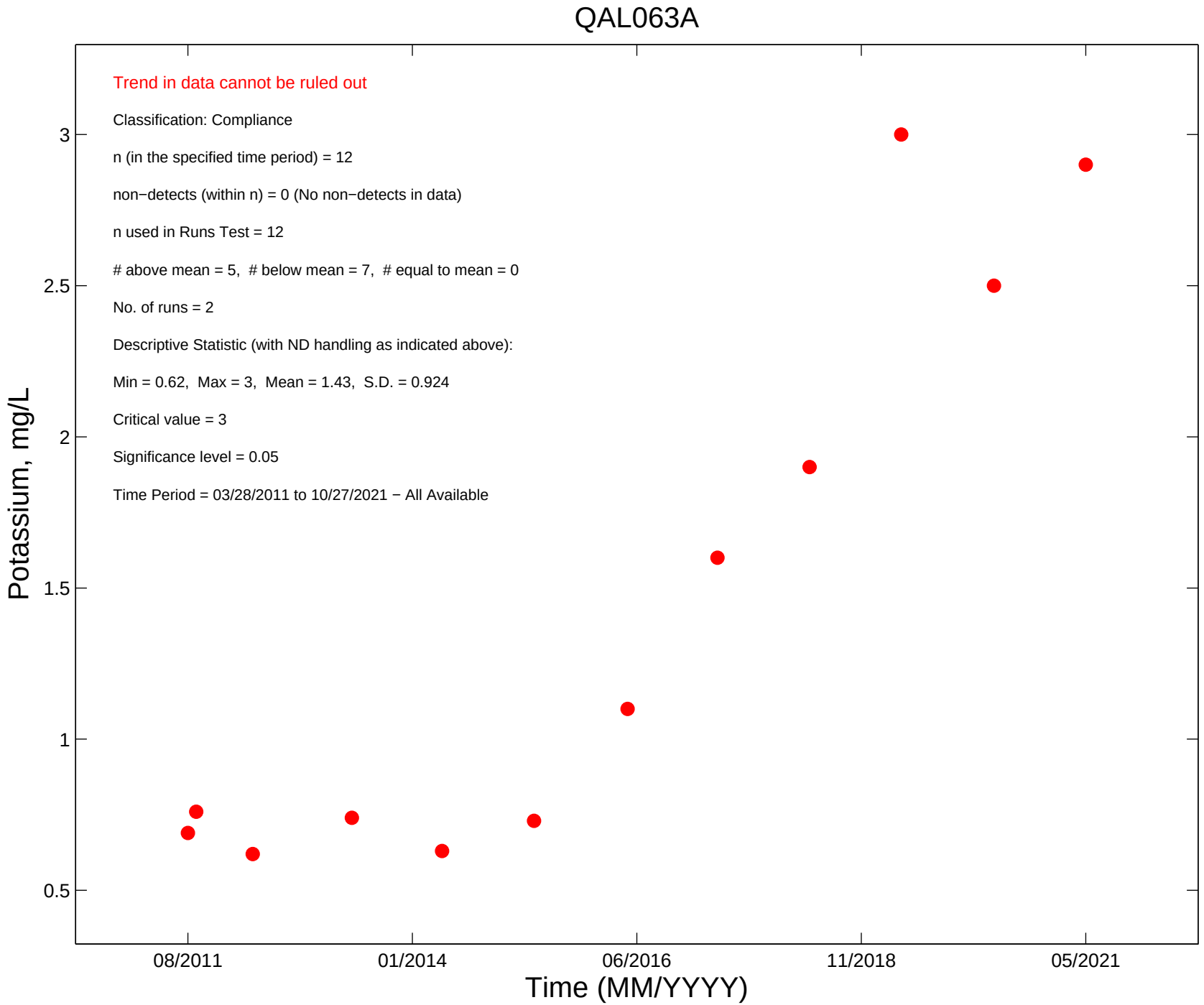

QAL063A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 12
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 12
above mean = 5, # below mean = 7, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 11, Max = 85.2, Mean = 38.3, S.D. = 30.2
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Calcium, mg/L
90
80
70
60
50
40
30
20
10
08/2011
01/2014
06/2016
11/2018
05/2021
Time (MM/YYYY)

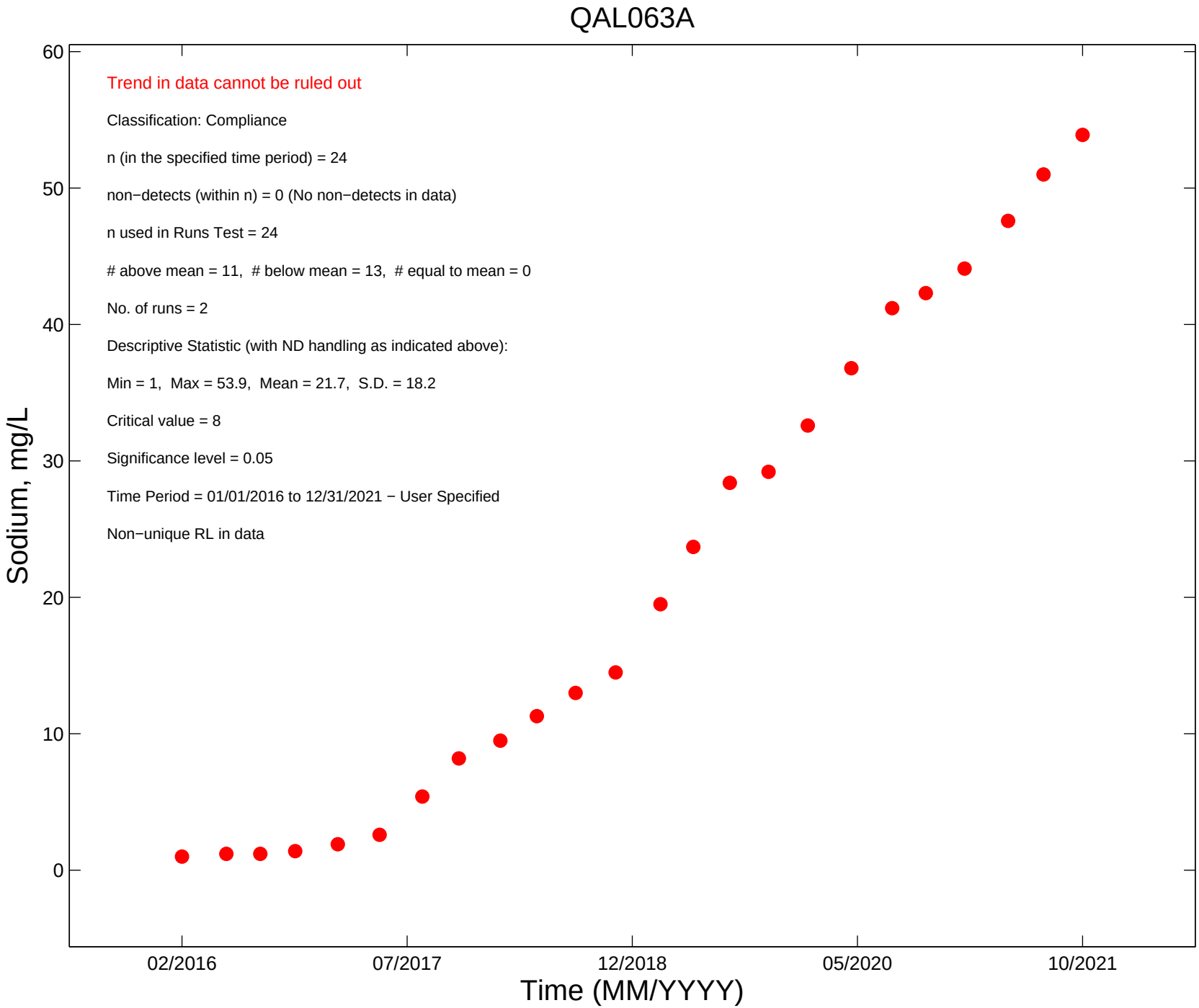

QAL063A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 13, # below mean = 11, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 3.5, Max = 115, Mean = 68.4, S.D. = 38.52
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Chloride, mg/L
0
20
40
60
80
100
120
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

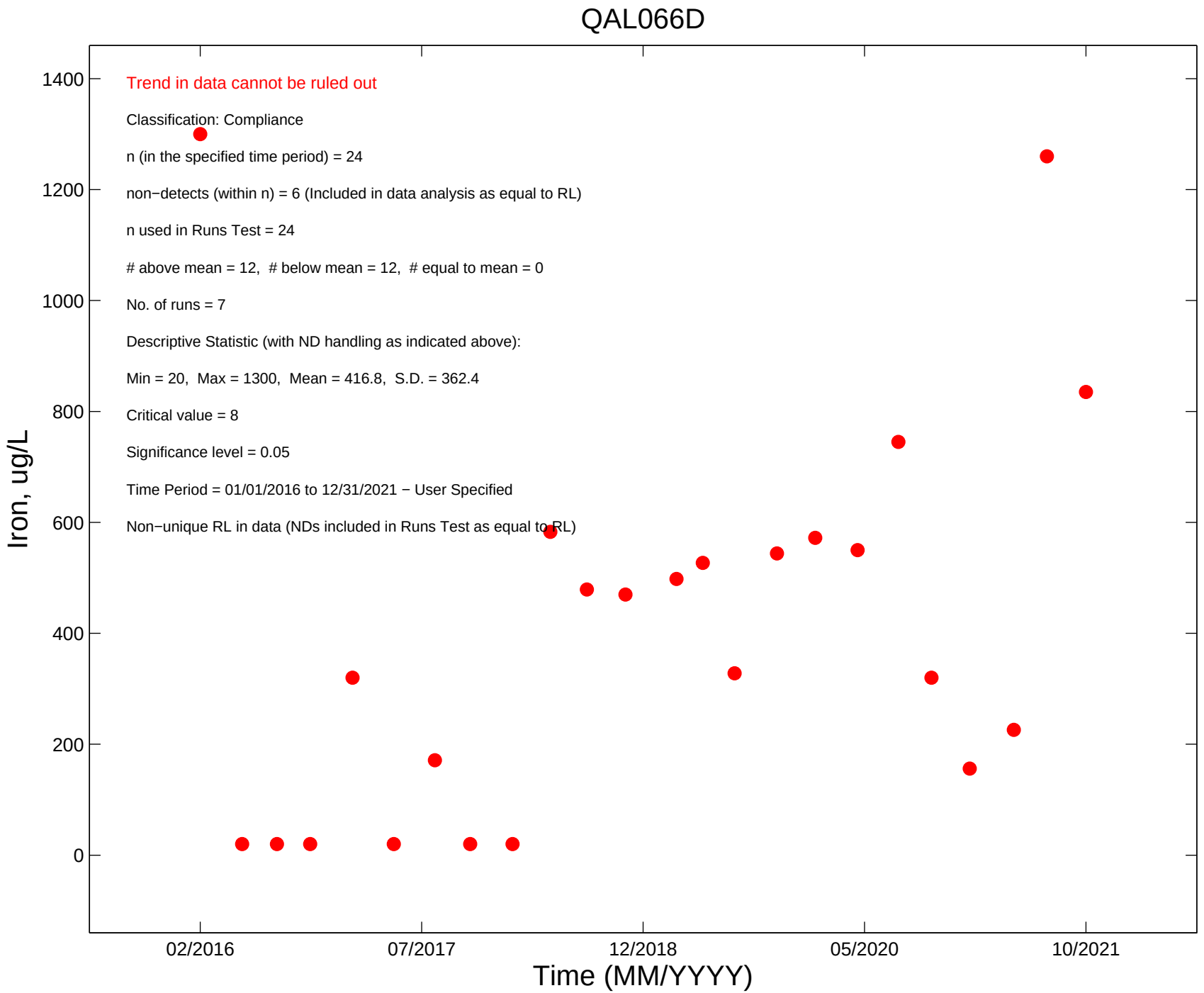

QAL063A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 12
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 12
above mean = 5, # below mean = 7, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 1.9, Max = 16.6, Mean = 7.3, S.D. = 6.09
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Magnesium, mg/L
18
16
14
12
10
8
6
4
2
08/2011
01/2014
06/2016
11/2018
05/2021
Time (MM/YYYY)

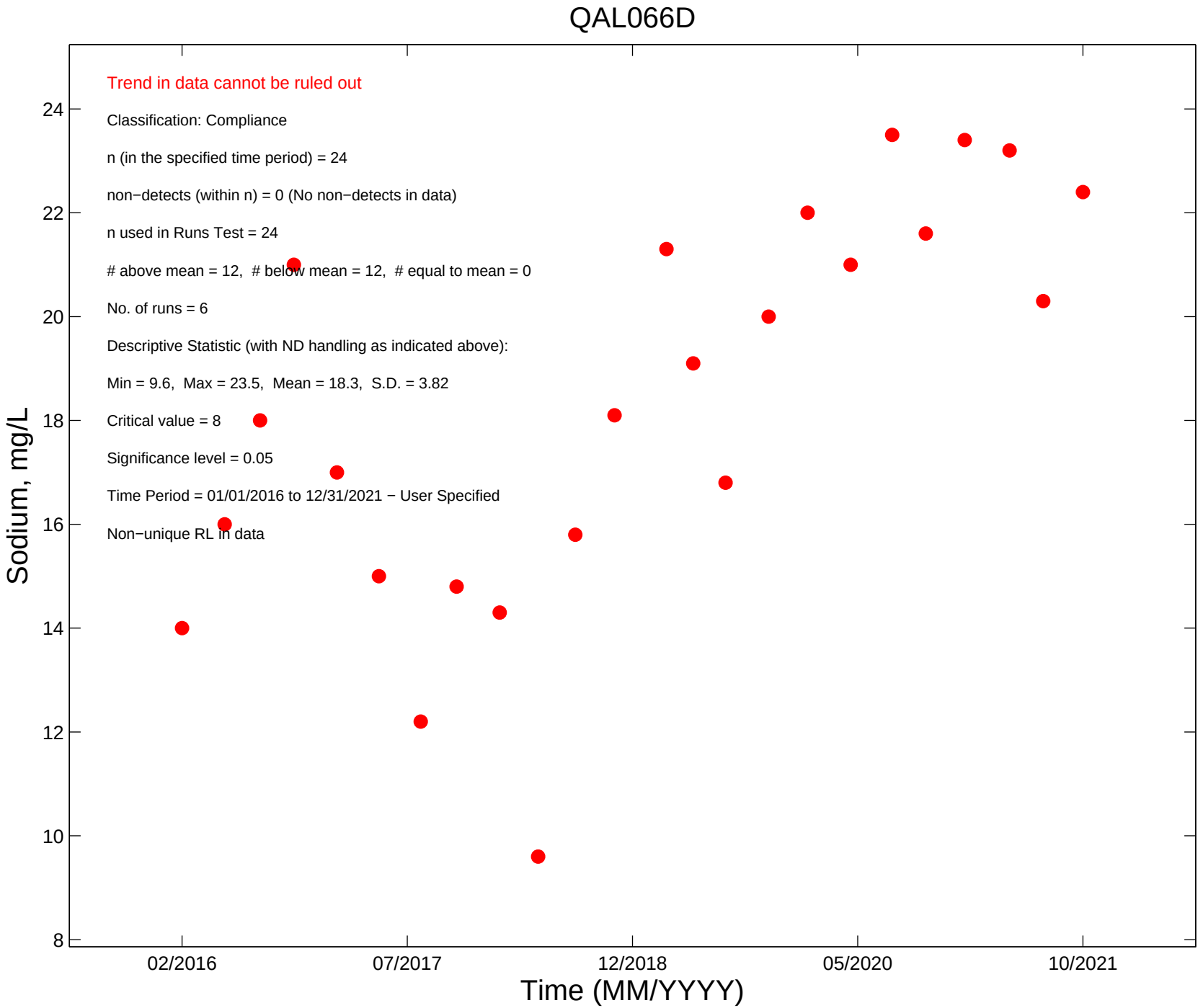

QAL063A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 13, # below mean = 11, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 0.28, Max = 1.4, Mean = 0.865, S.D. = 0.32
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Nitrogen, Nitrate, mg/L
0.2
0.4
0.6
0.8
1
1.2
1.4
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

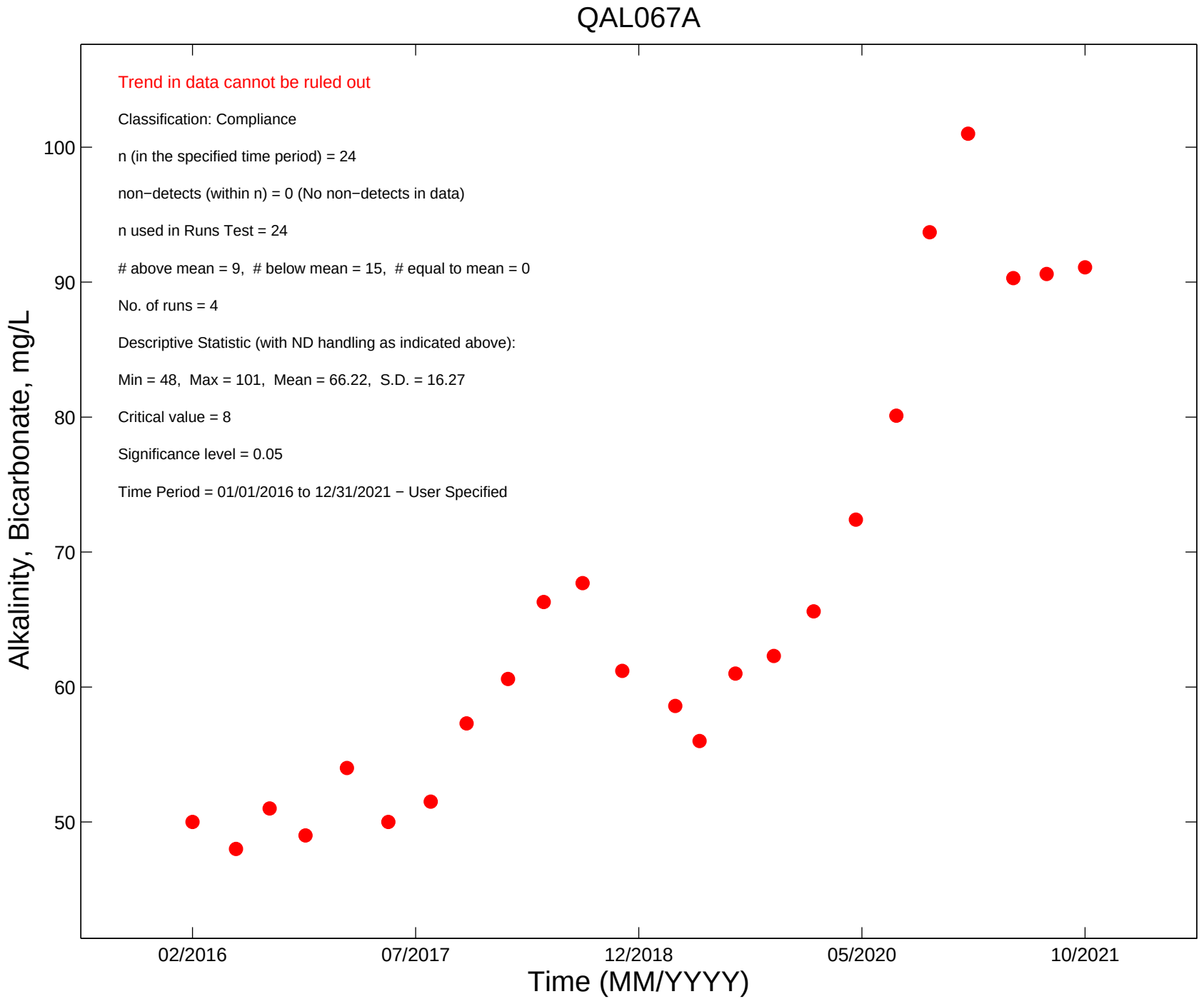

QAL063A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 7, # below mean = 17, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 6.9, Max = 8.5, Mean = 7.7, S.D. = 0.34
Critical value = 7
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
pH, SU
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
6.8
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

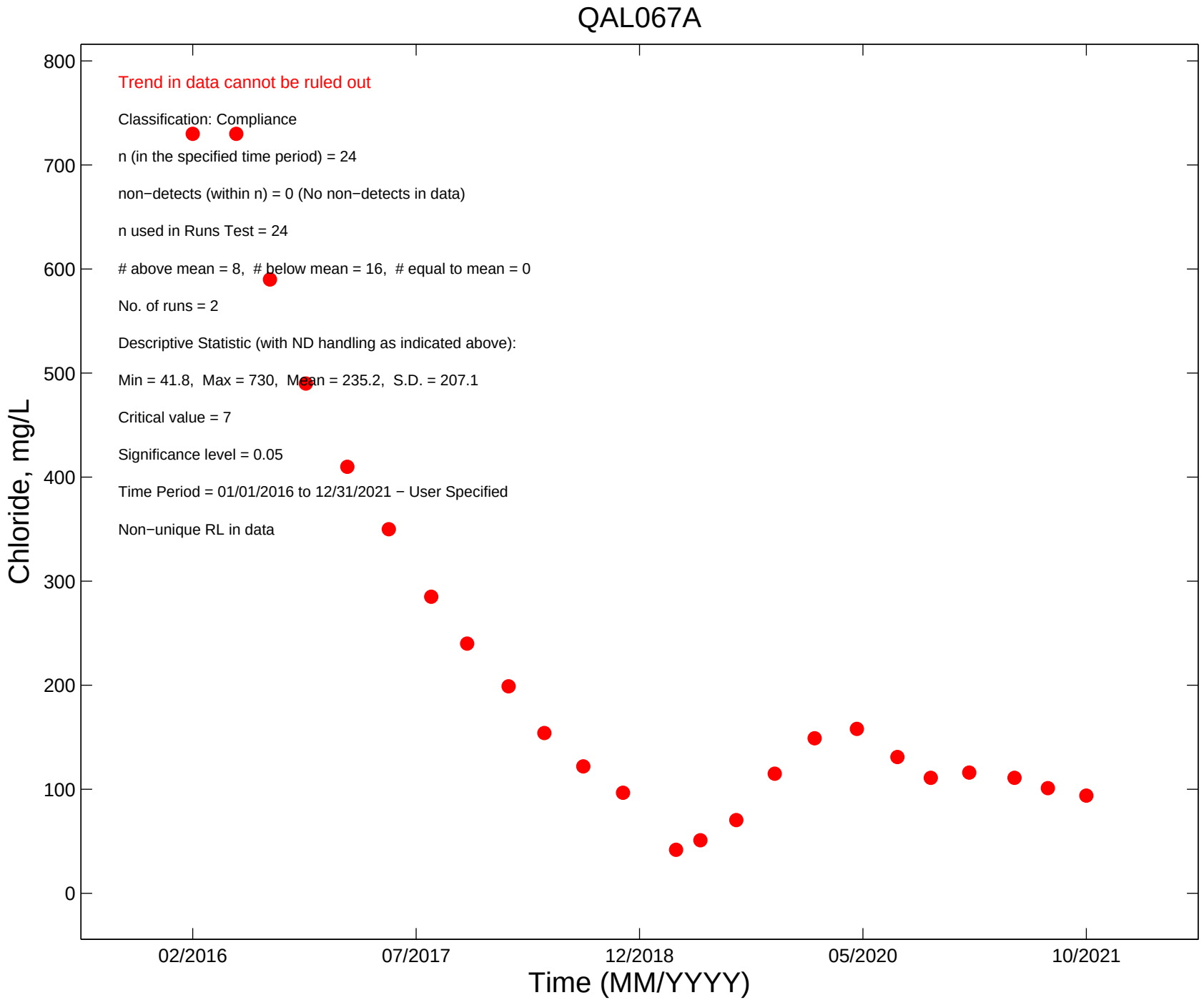

QAL063A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 12
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 12
above mean = 5, # below mean = 7, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 0.62, Max = 3, Mean = 1.43, S.D. = 0.924
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Potassium, mg/L
3
2.5
2
1.5
1
0.5
08/2011
01/2014
06/2016
11/2018
05/2021
Time (MM/YYYY)

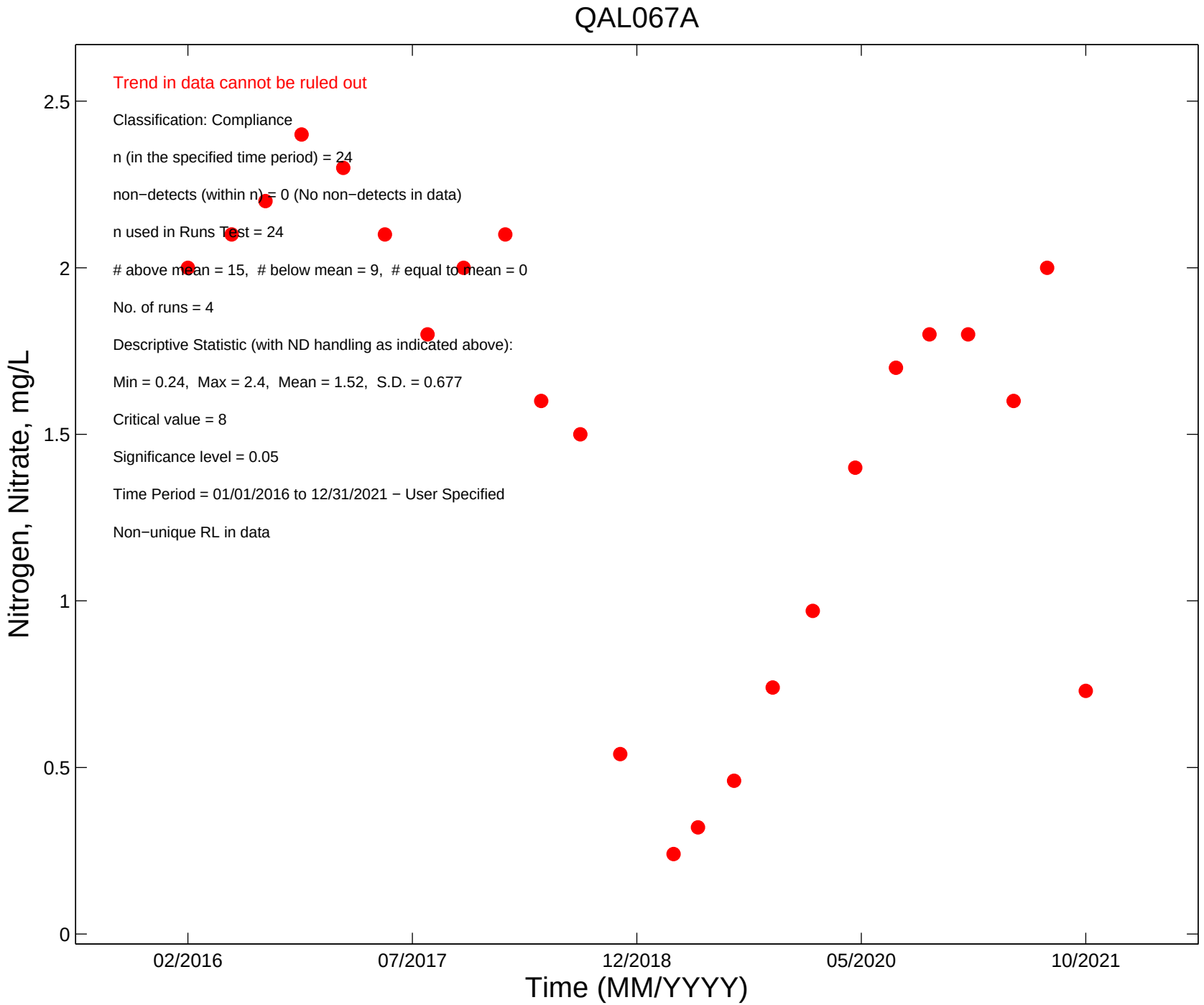

QAL063A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 11, # below mean = 13, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 1, Max = 53.9, Mean = 21.7, S.D. = 18.2
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sodium, mg/L
0
10
20
30
40
50
60
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

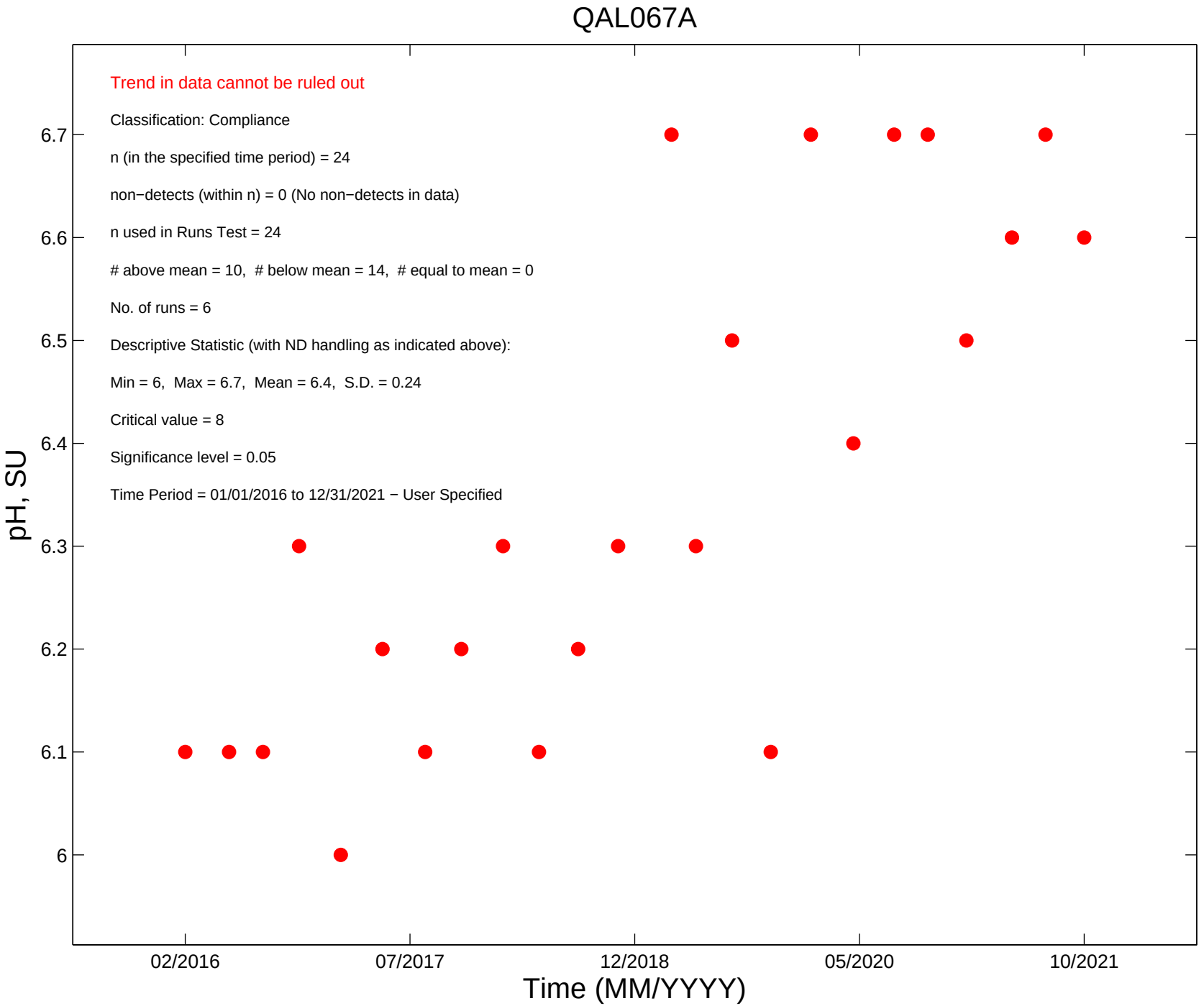

QAL066D
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 6 (Included in data analysis as equal to RL)
n used in Runs Test = 24
above mean = 12, # below mean = 12, # equal to mean = 0
No. of runs = 7
Descriptive Statistic (with ND handling as indicated above):
Min = 20, Max = 1300, Mean = 416.8, S.D. = 362.4
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data (NDs included in Runs Test as equal to RL)
Iron, ug/L
1400
1200
1000
800
600
400
200
0
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

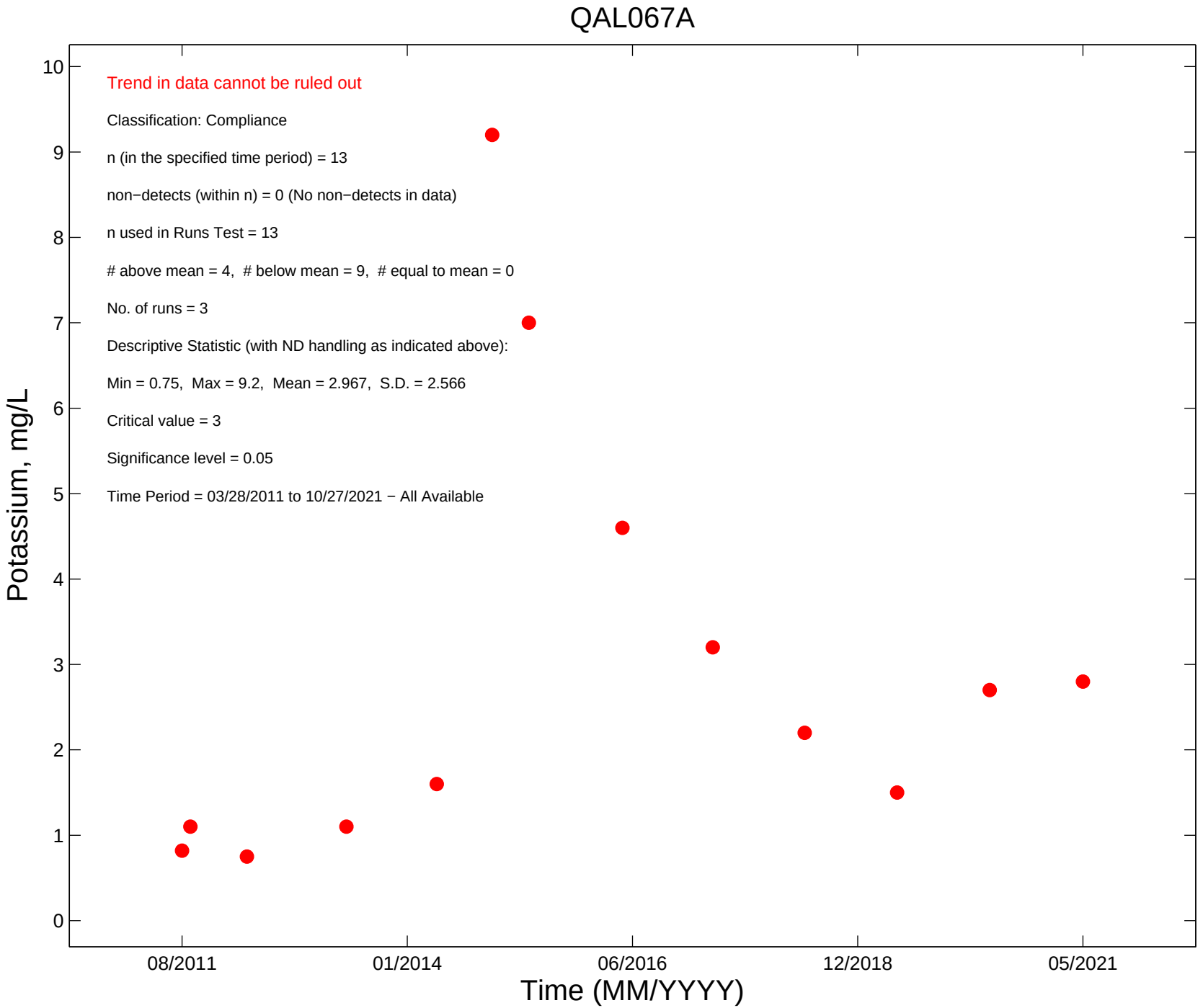

QAL066D
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 12, # below mean = 12, # equal to mean = 0
No. of runs = 6
Descriptive Statistic (with ND handling as indicated above):
Min = 9.6, Max = 23.5, Mean = 18.3, S.D. = 3.82
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sodium, mg/L
24
22
20
18
16
14
12
10
8
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

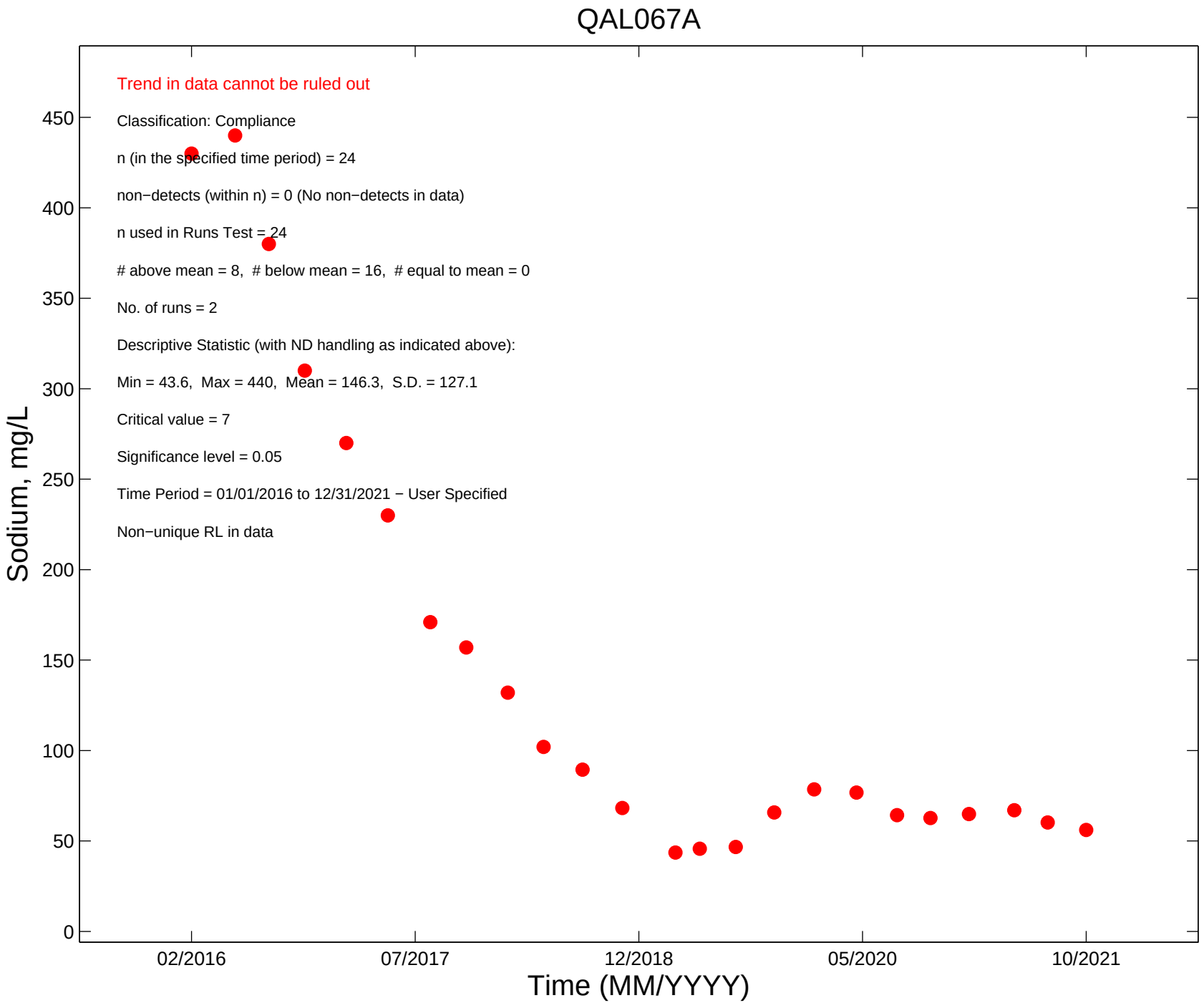

QAL067A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 9, # below mean = 15, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 48, Max = 101, Mean = 66.22, S.D. = 16.27
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Alkalinity, Bicarbonate, mg/L
100
90
80
70
60
50
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

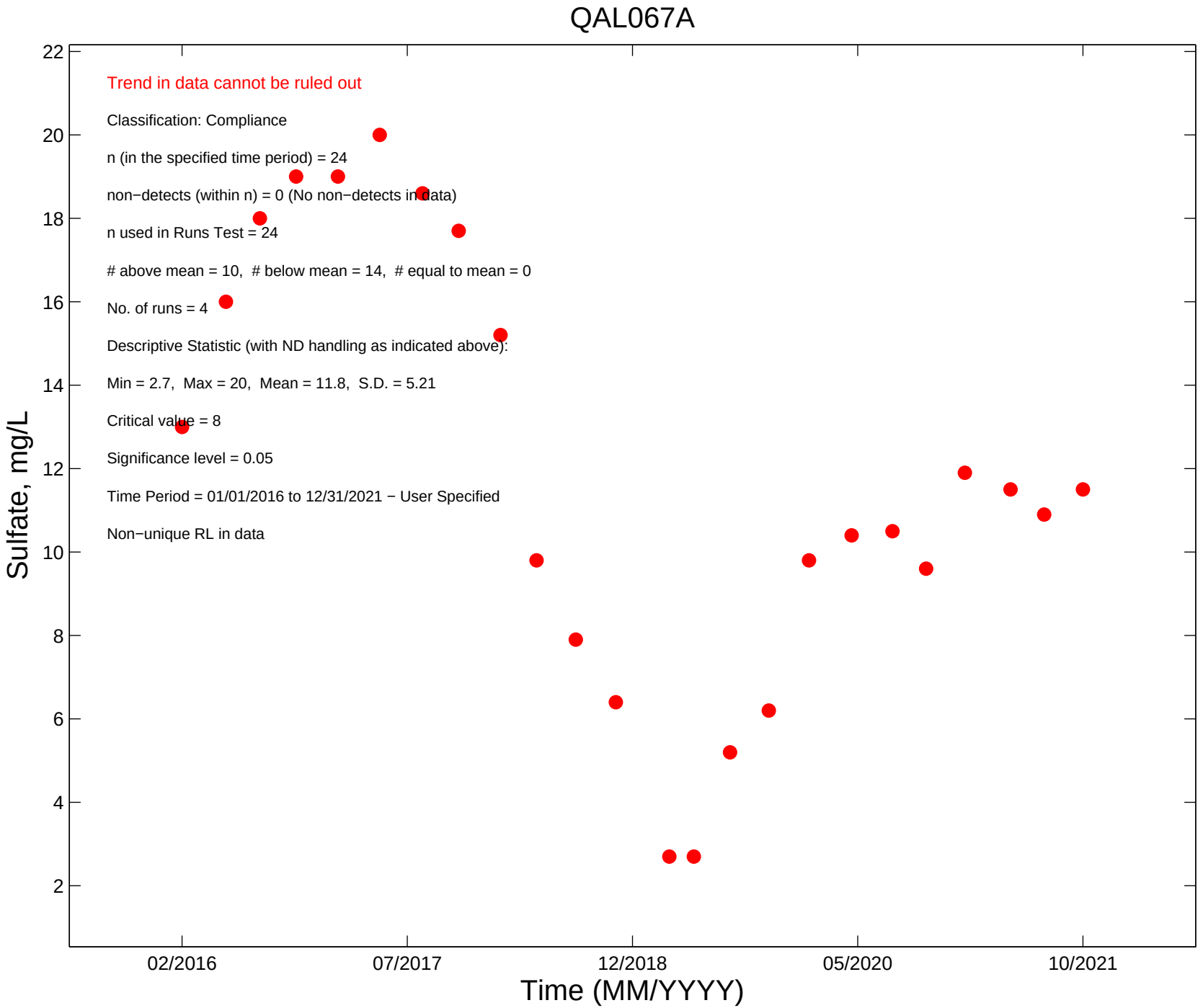

QAL067A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 8, # below mean = 16, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 41.8, Max = 730, Mean = 235.2, S.D. = 207.1
Critical value = 7
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Chloride, mg/L
800
700
600
500
400
300
200
100
0
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

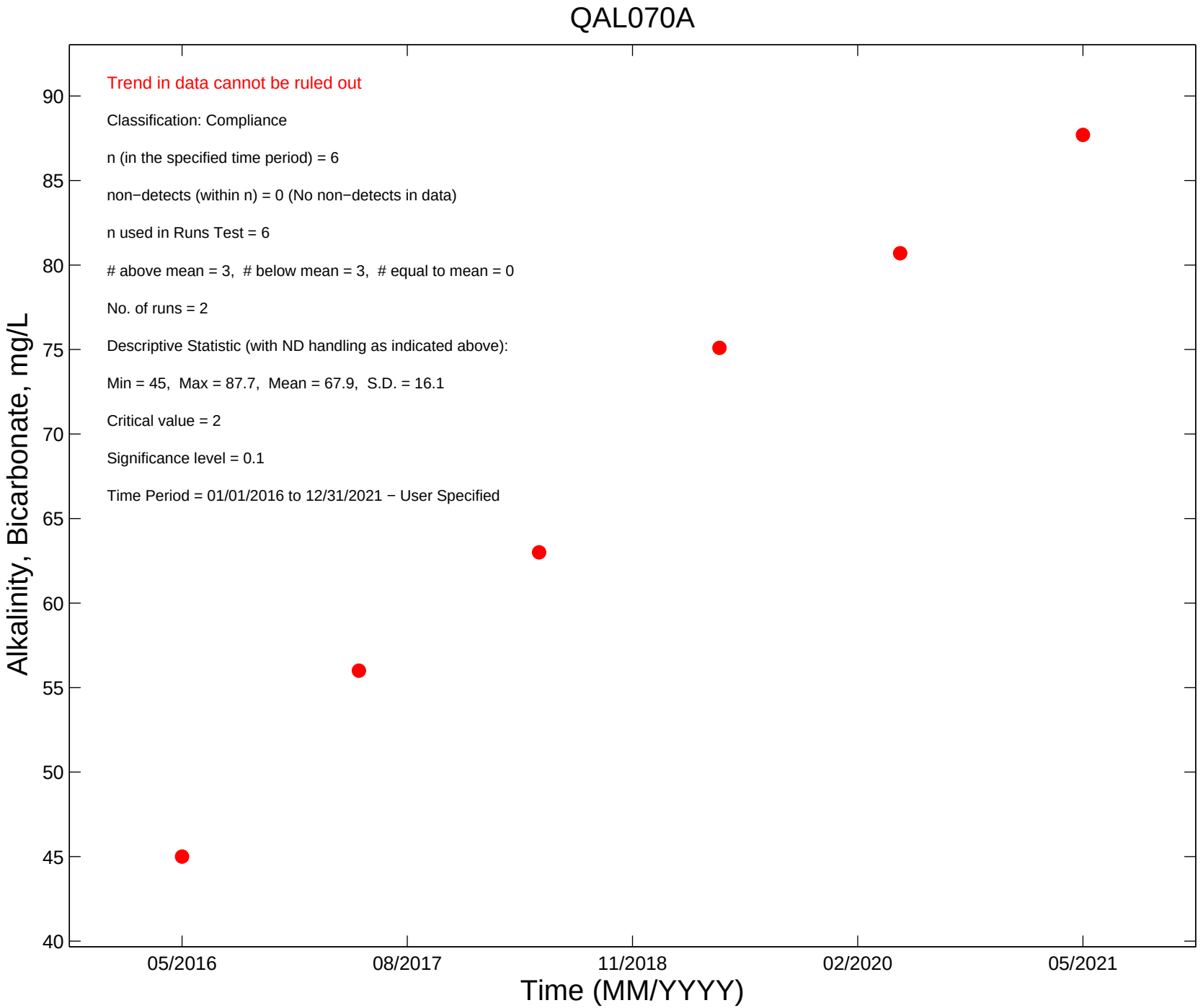

QAL067A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 15, # below mean = 9, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 0.24, Max = 2.4, Mean = 1.52, S.D. = 0.677
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Nitrogen, Nitrate, mg/L
0
0.5
1
1.5
2
2.5
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

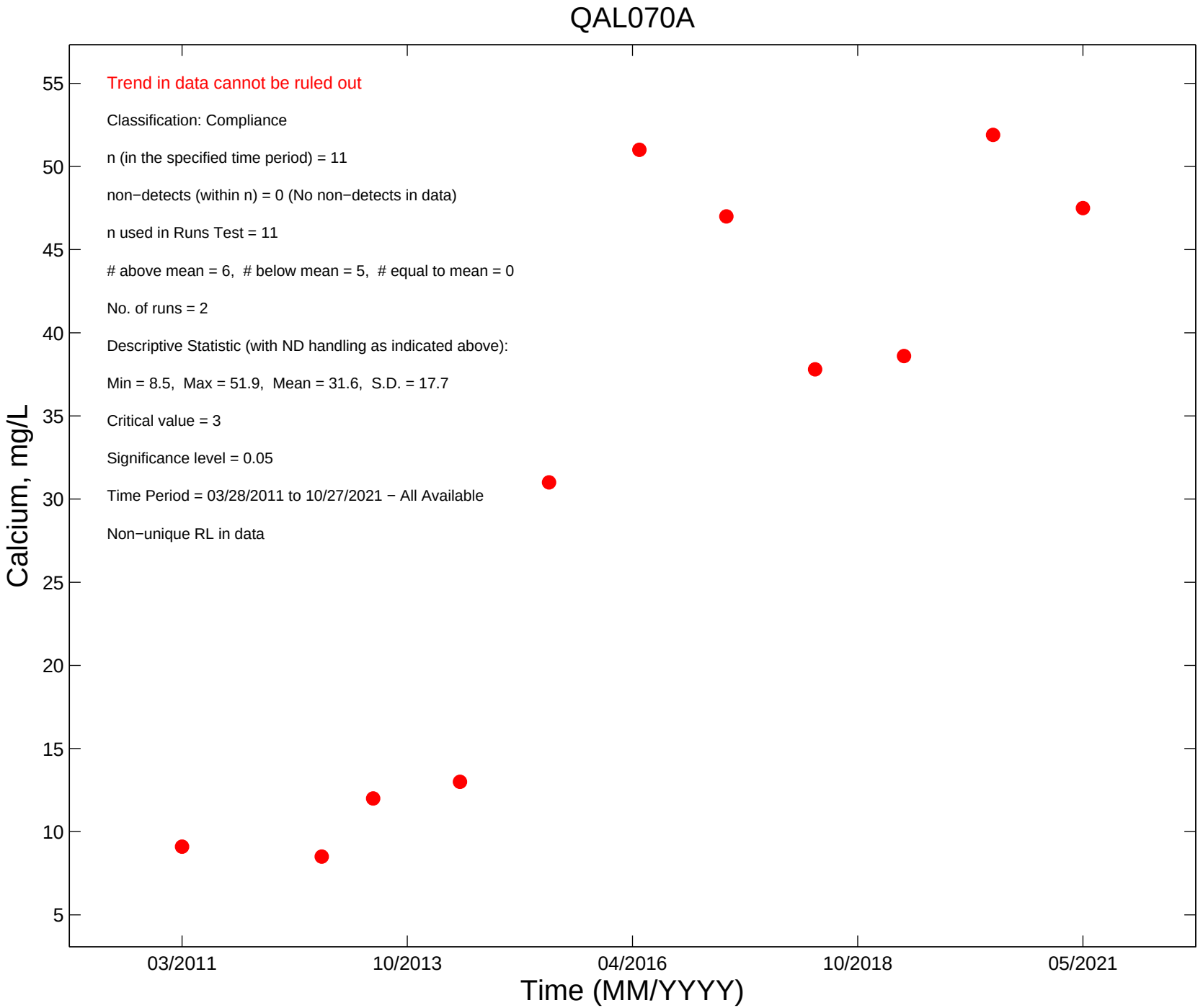

QAL067A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 10, # below mean = 14, # equal to mean = 0
No. of runs = 6
Descriptive Statistic (with ND handling as indicated above):
Min = 6, Max = 6.7, Mean = 6.4, S.D. = 0.24
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
pH, SU
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

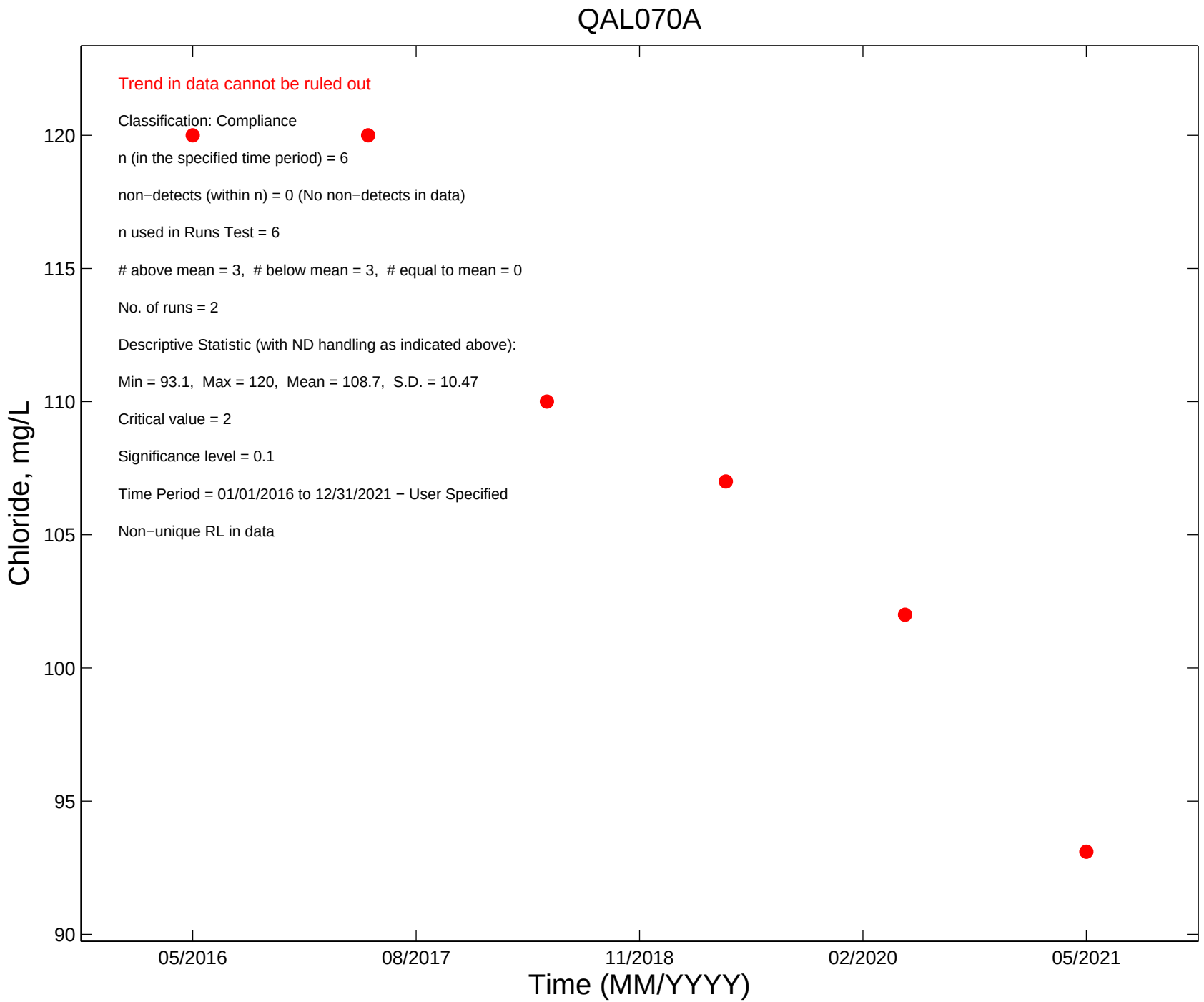

QAL067A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 13
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 13
above mean = 4, # below mean = 9, # equal to mean = 0
No. of runs = 3
Descriptive Statistic (with ND handling as indicated above):
Min = 0.75, Max = 9.2, Mean = 2.967, S.D. = 2.566
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Potassium, mg/L
0
1
2
3
4
5
6
7
8
9
10
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)

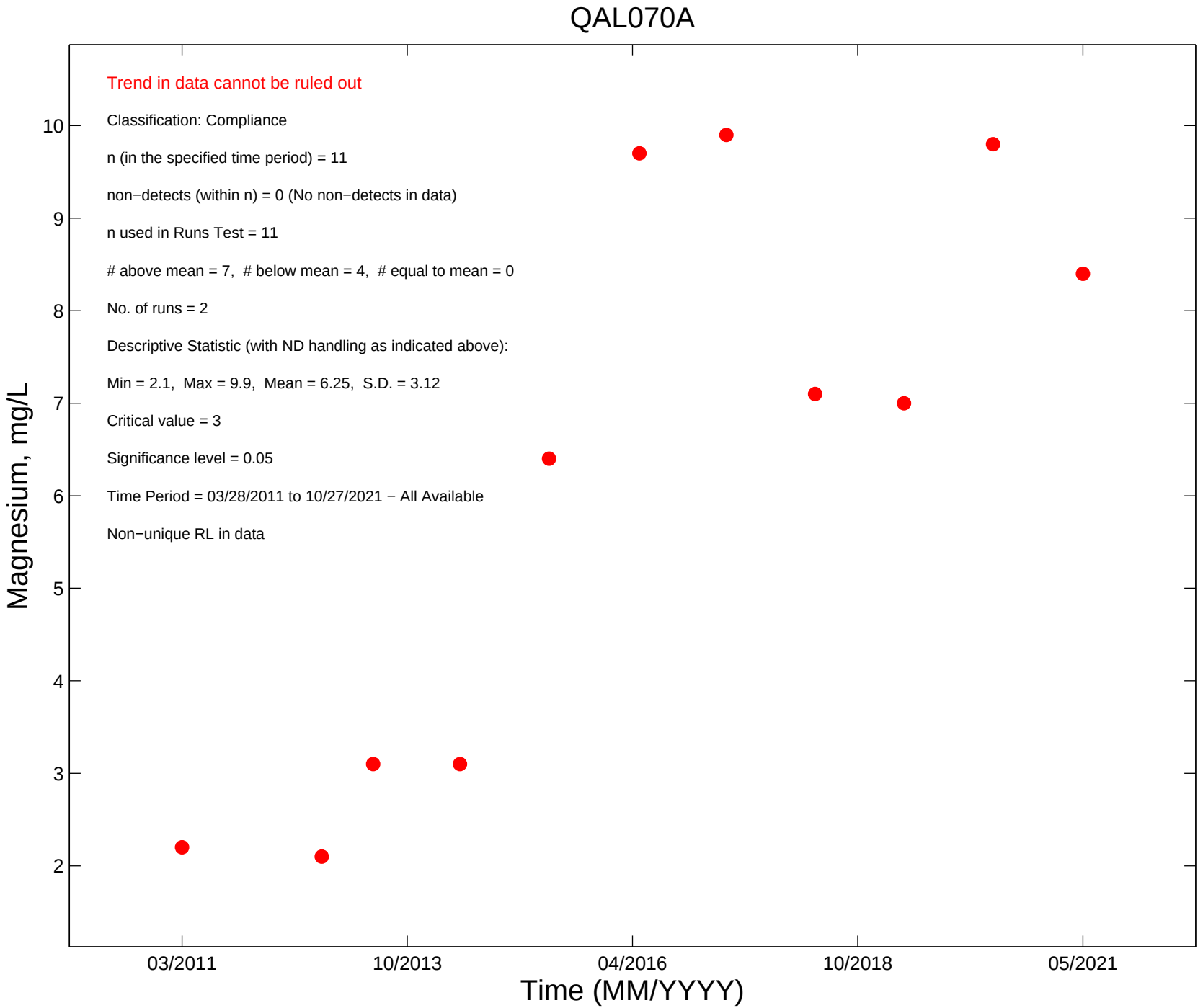

QAL067A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 8, # below mean = 16, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 43.6, Max = 440, Mean = 146.3, S.D. = 127.1
Critical value = 7
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sodium, mg/L
0
50
100
150
200
250
300
350
400
450
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

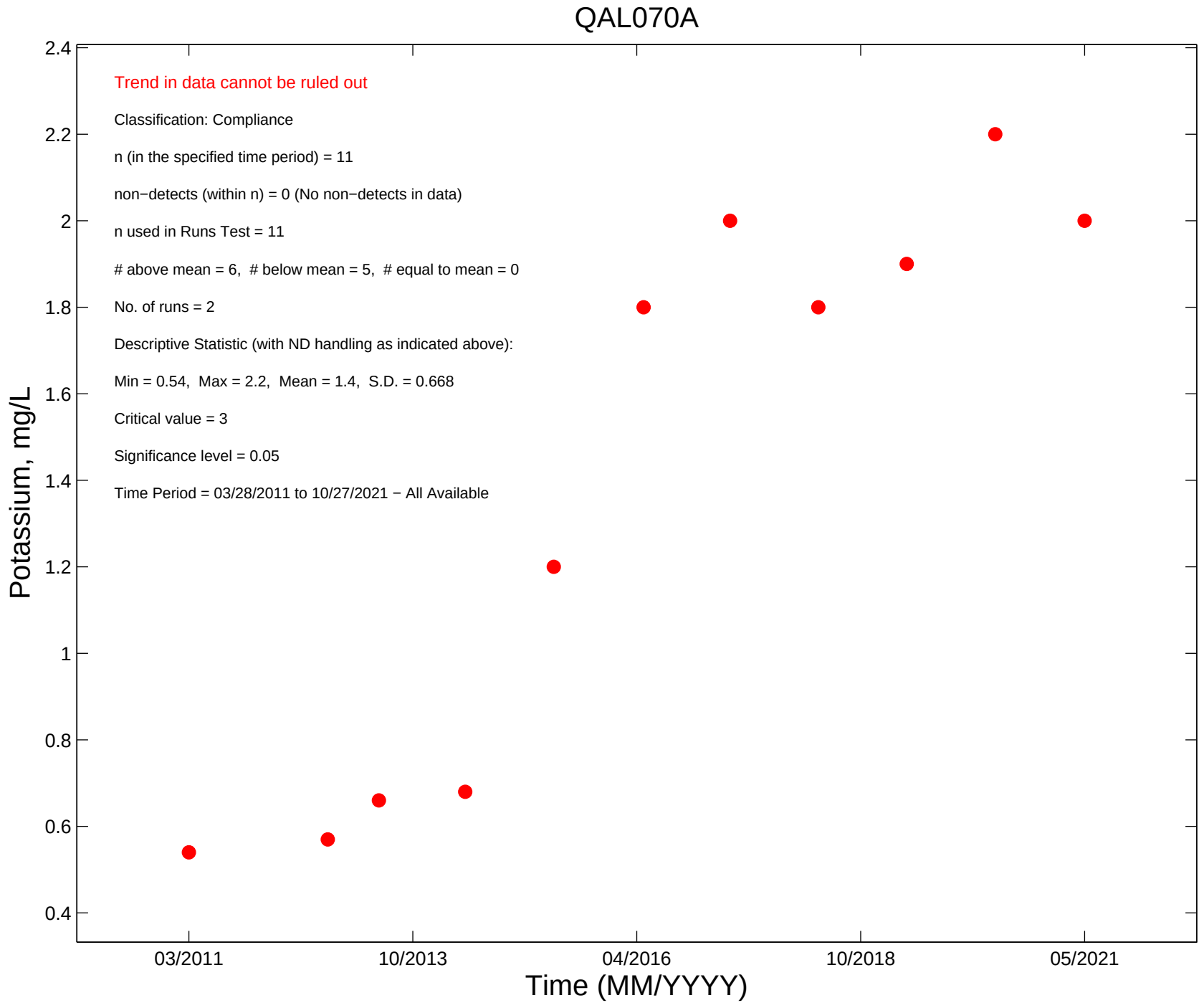

QAL067A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 10, # below mean = 14, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 2.7, Max = 20, Mean = 11.8, S.D. = 5.21
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sulfate, mg/L
22
20
18
16
14
12
10
8
6
4
2
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

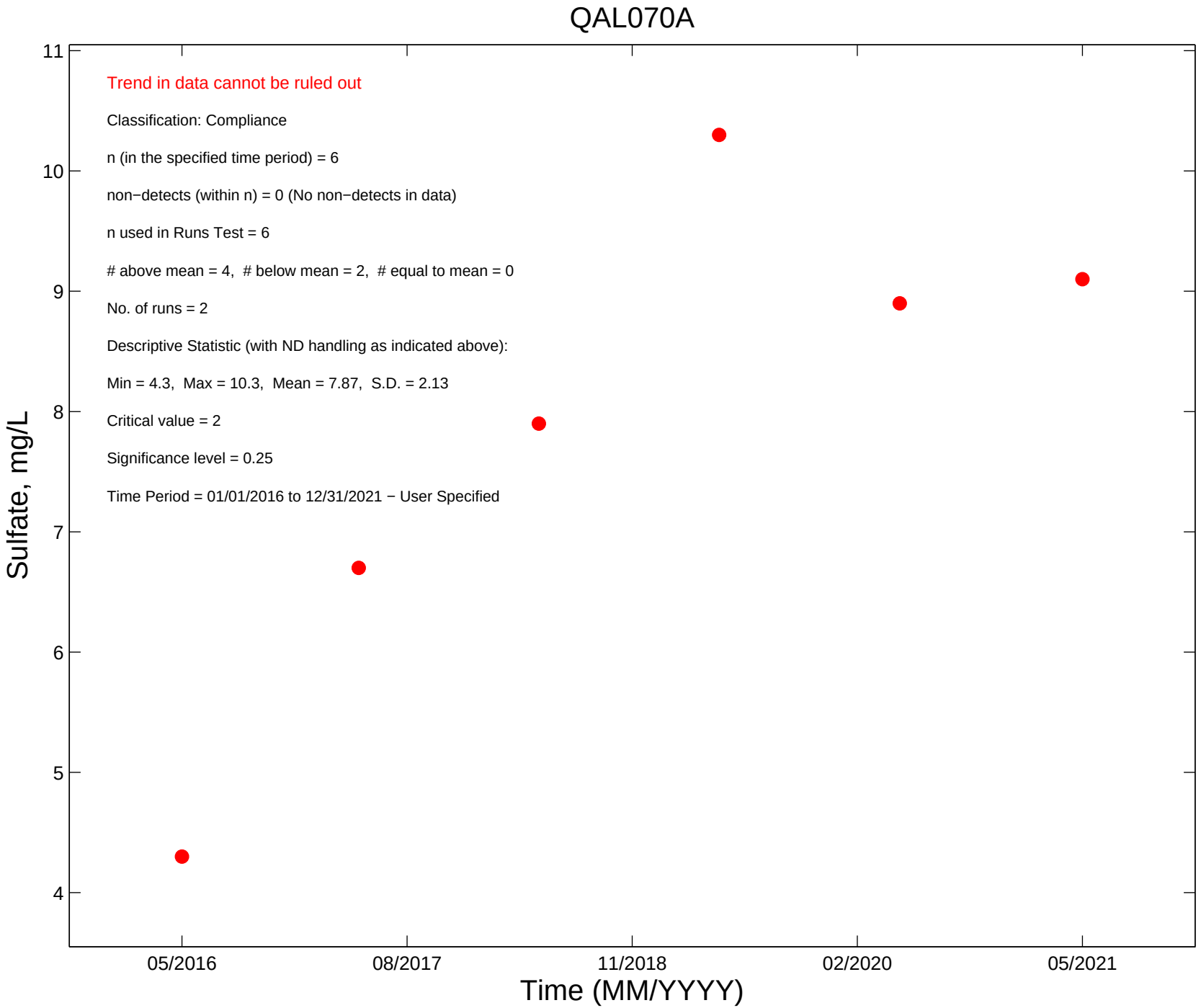

QAL070A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 6
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 6
above mean = 3, # below mean = 3, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 45, Max = 87.7, Mean = 67.9, S.D. = 16.1
Critical value = 2
Significance level = 0.1
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Alkalinity, Bicarbonate, mg/L
90
85
80
75
70
65
60
55
50
45
40
05/2016
08/2017
11/2018
02/2020
05/2021
Time (MM/YYYY)

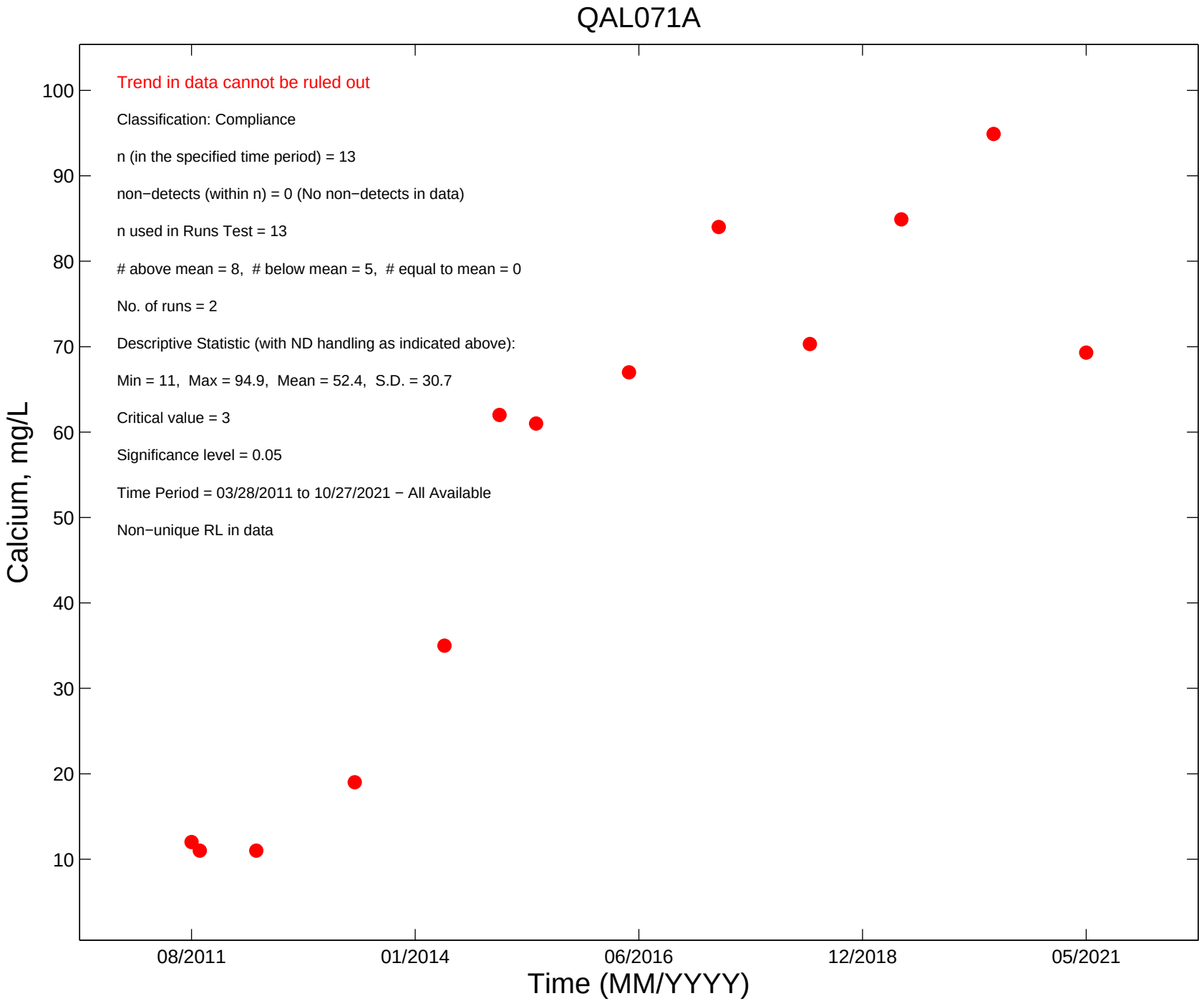

QAL070A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 11
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 11
above mean = 6, # below mean = 5, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 8.5, Max = 51.9, Mean = 31.6, S.D. = 17.7
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Calcium, mg/L
55
50
45
40
35
30
25
20
15
10
5
03/2011
10/2013
04/2016
10/2018
05/2021
Time (MM/YYYY)

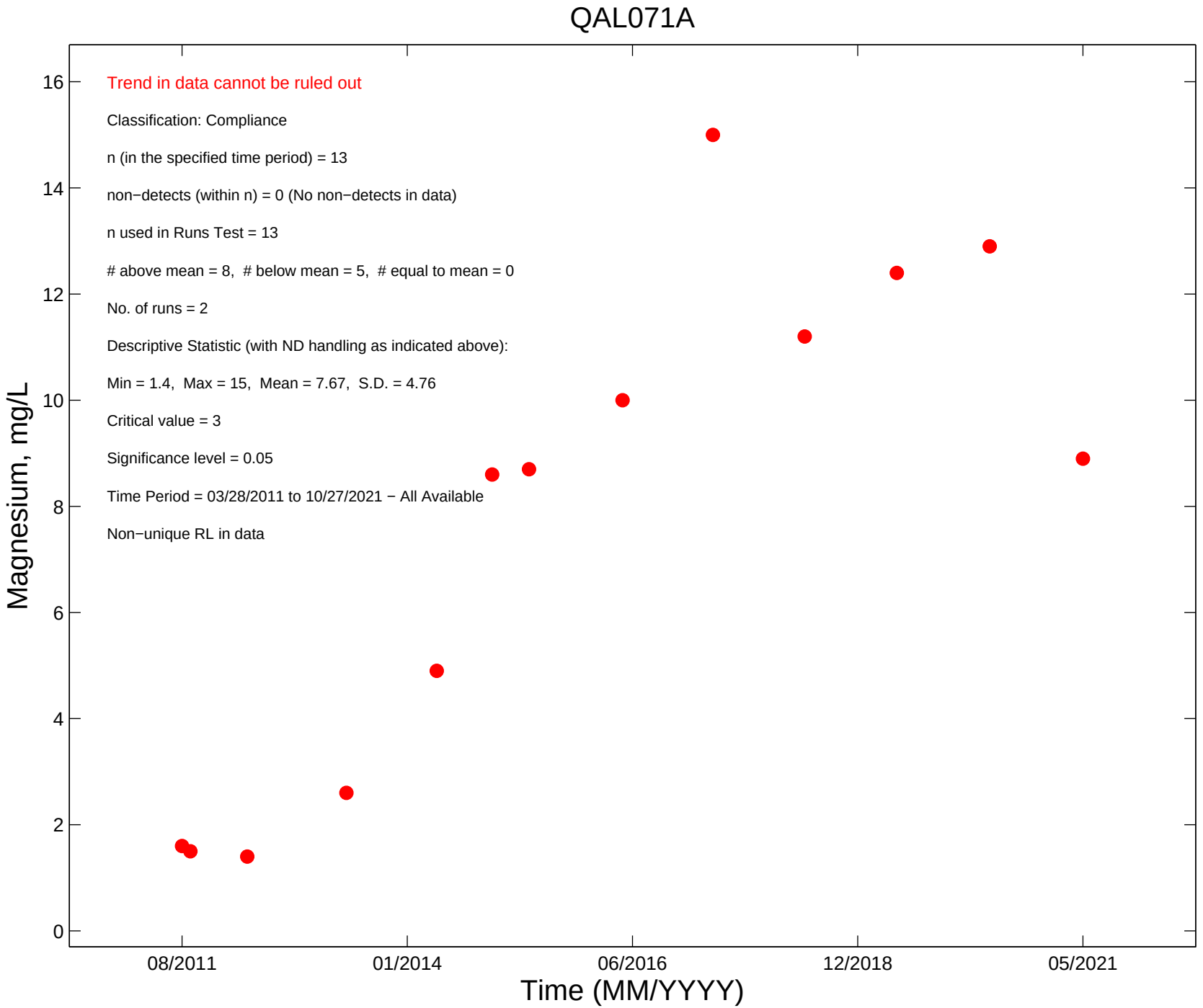

QAL070A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 6
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 6
above mean = 3, # below mean = 3, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 93.1, Max = 120, Mean = 108.7, S.D. = 10.47
Critical value = 2
Significance level = 0.1
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Chloride, mg/L
120
115
110
105
100
95
90
05/2016
08/2017
11/2018
02/2020
05/2021
Time (MM/YYYY)

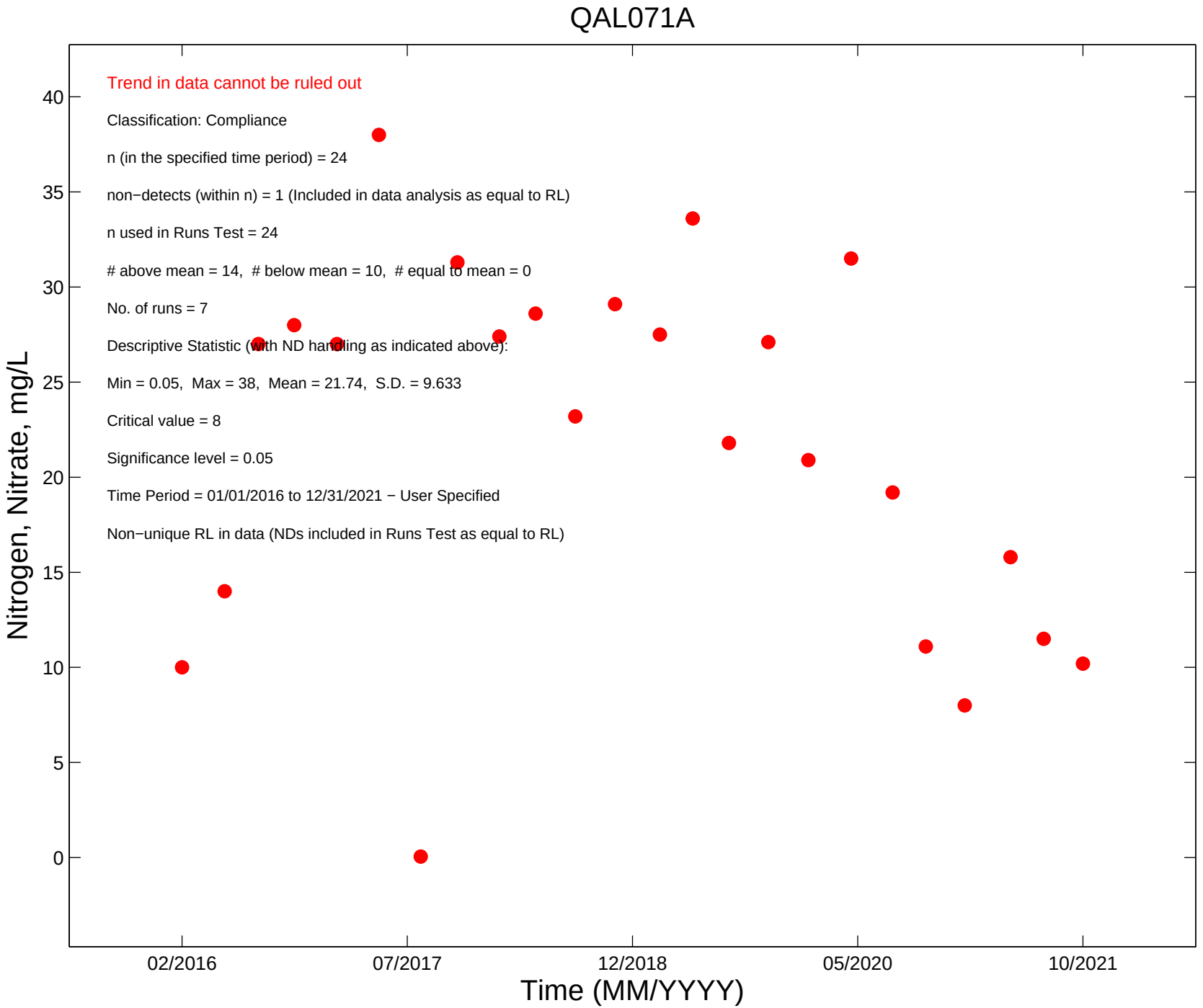

QAL070A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 11
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 11
above mean = 7, # below mean = 4, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 2.1, Max = 9.9, Mean = 6.25, S.D. = 3.12
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Magnesium, mg/L
10
9
8
7
6
5
4
3
2
03/2011
10/2013
04/2016
10/2018
05/2021
Time (MM/YYYY)

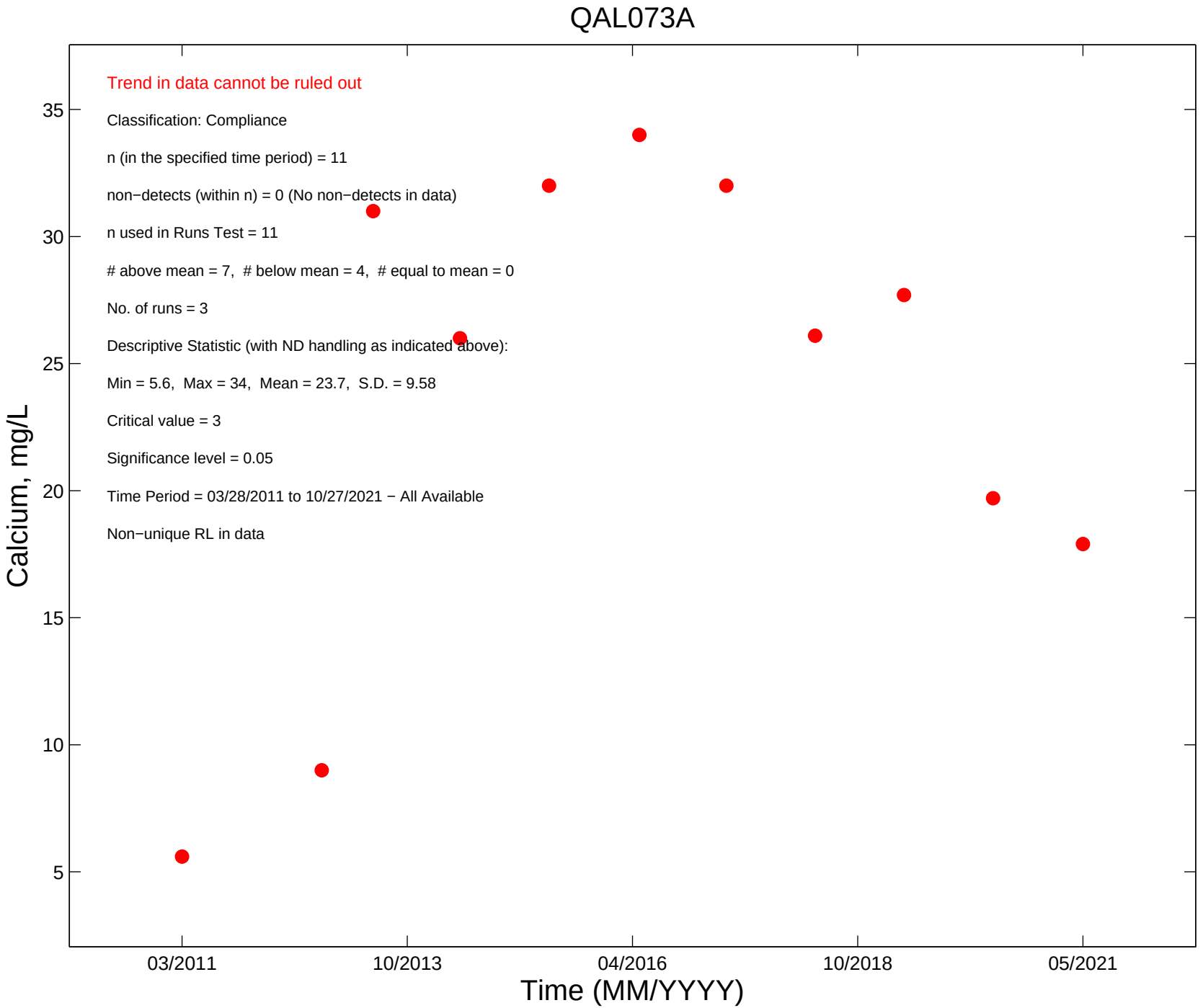

QAL070A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 11
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 11
above mean = 6, # below mean = 5, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 0.54, Max = 2.2, Mean = 1.4, S.D. = 0.668
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Potassium, mg/L
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
03/2011
10/2013
04/2016
10/2018
05/2021
Time (MM/YYYY)

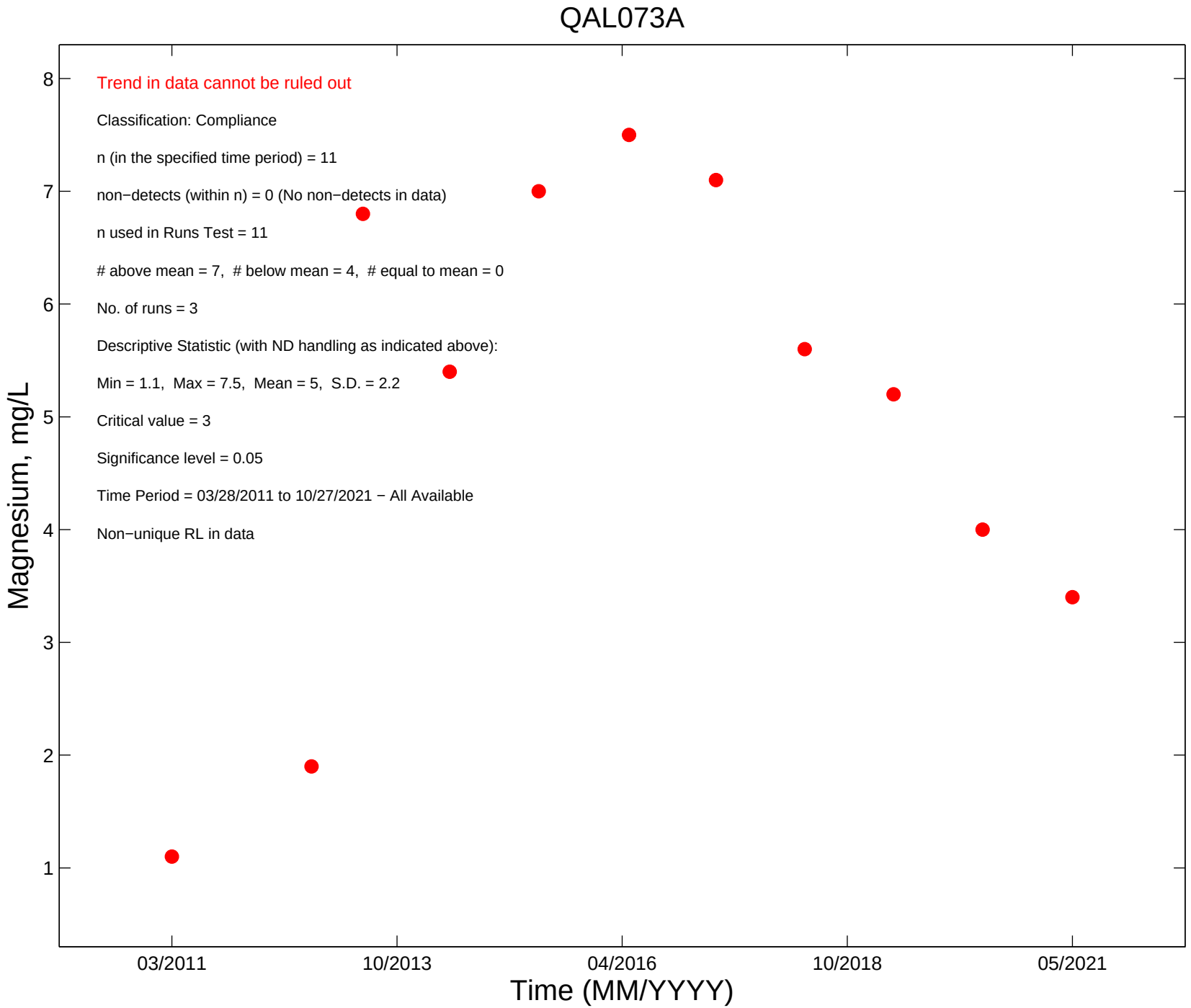

QAL070A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 6
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 6
above mean = 4, # below mean = 2, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 4.3, Max = 10.3, Mean = 7.87, S.D. = 2.13
Critical value = 2
Significance level = 0.25
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Sulfate, mg/L
11
10
9
8
7
6
5
4
05/2016
08/2017
11/2018
02/2020
05/2021
Time (MM/YYYY)

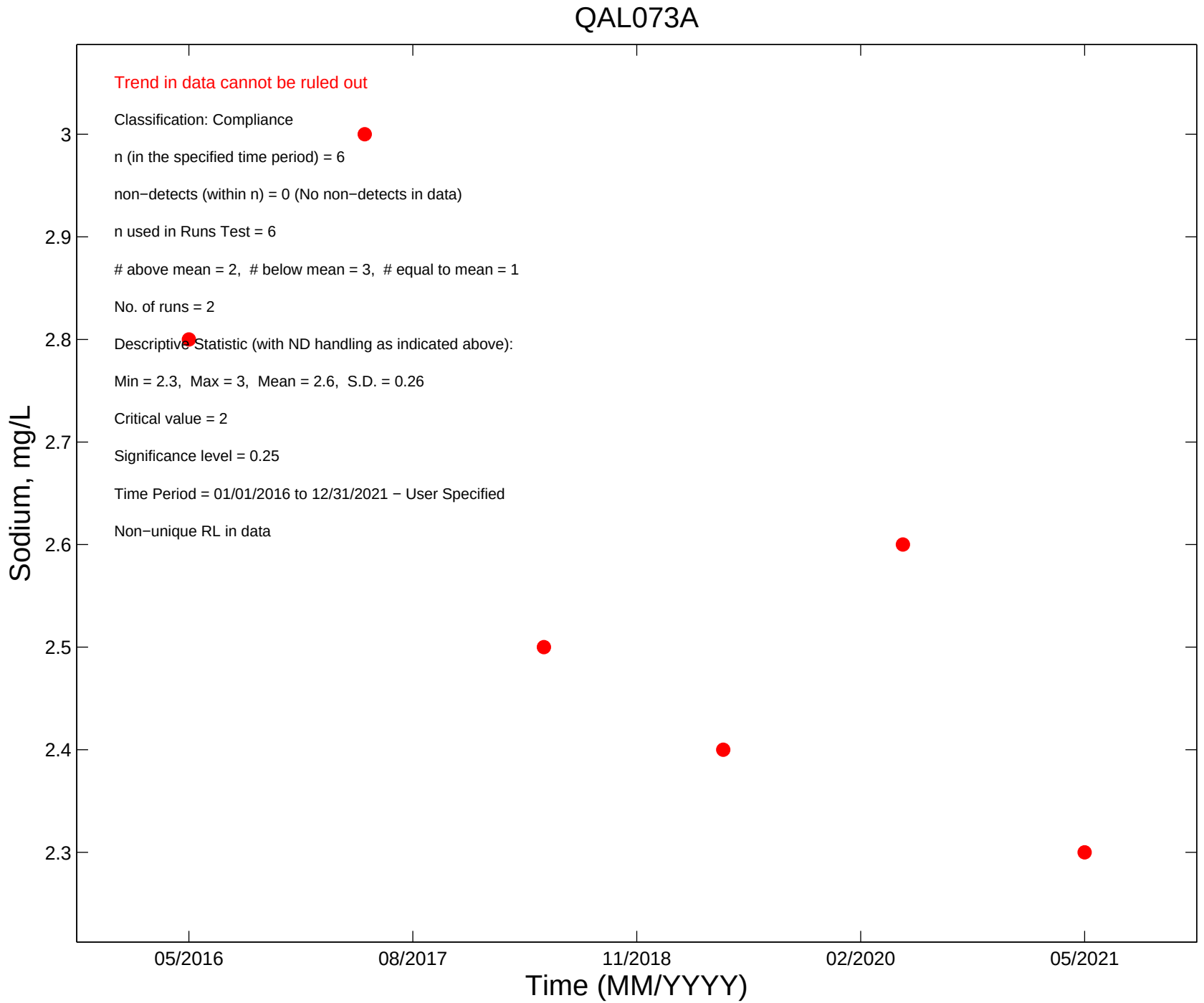

QAL071A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 13
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 13
above mean = 8, # below mean = 5, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 11, Max = 94.9, Mean = 52.4, S.D. = 30.7
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Calcium, mg/L
100
90
80
70
60
50
40
30
20
10
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)

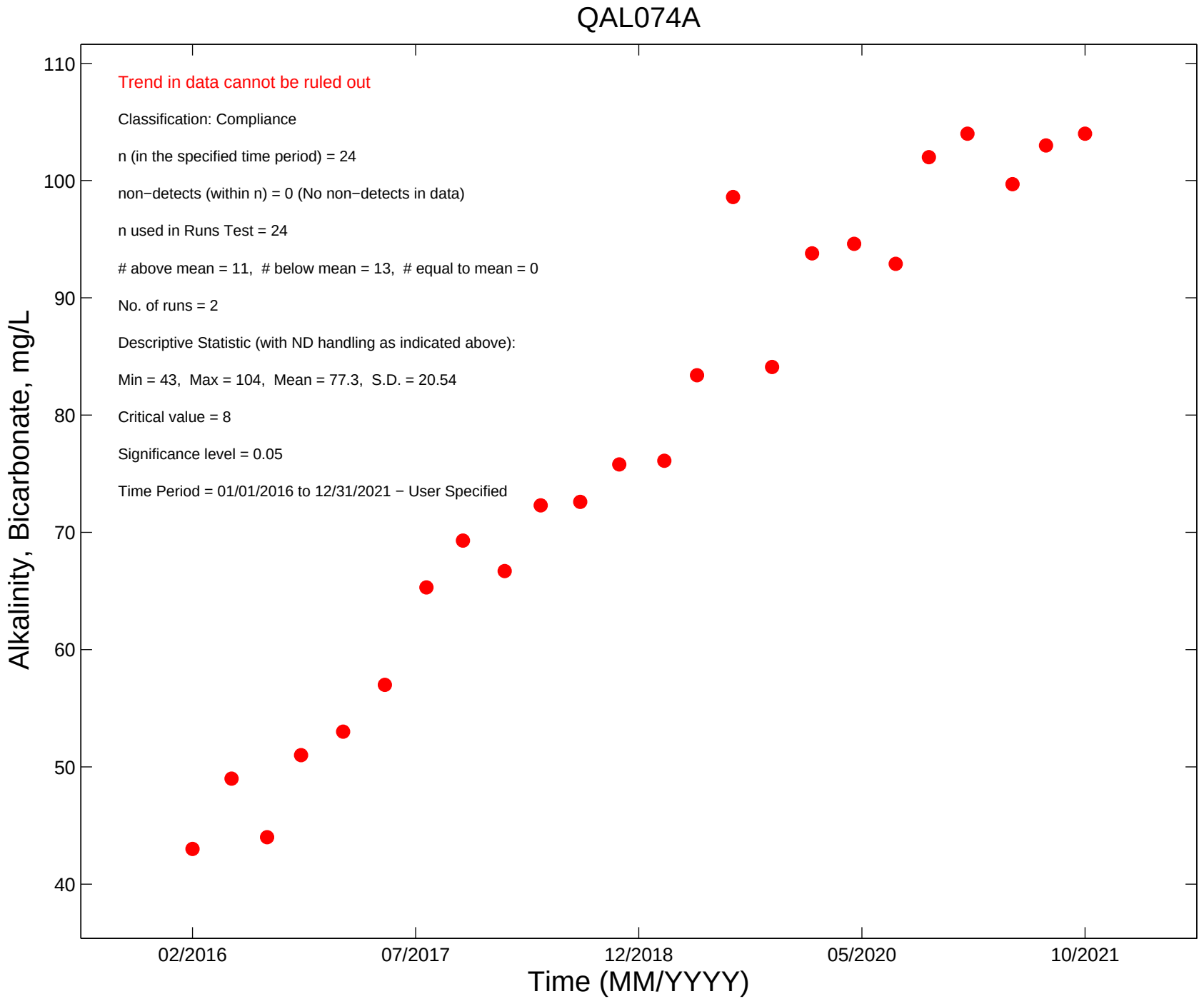

QAL071A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 13
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 13
above mean = 8, # below mean = 5, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 1.4, Max = 15, Mean = 7.67, S.D. = 4.76
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Magnesium, mg/L
0
2
4
6
8
10
12
14
16
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)

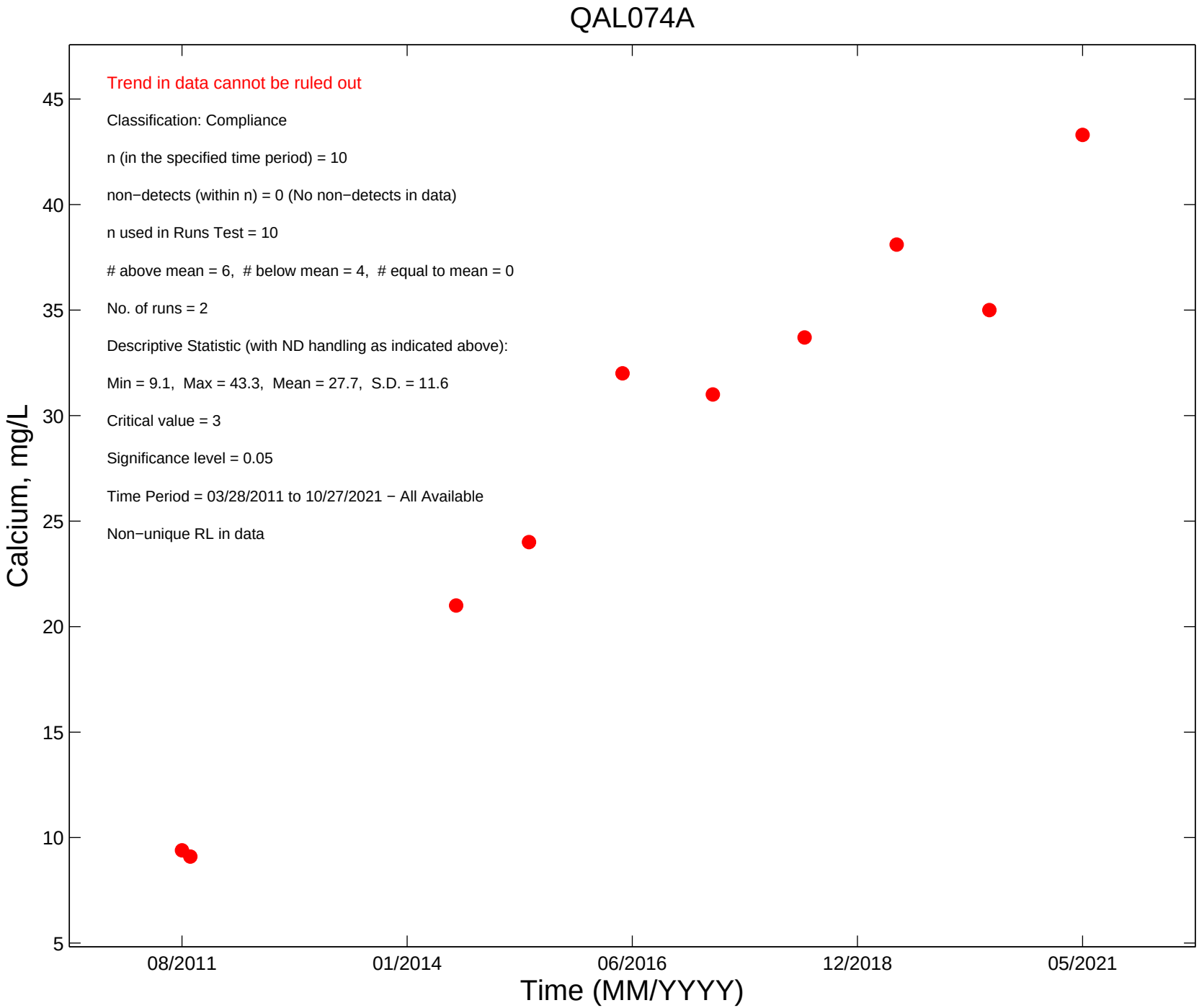

QAL071A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 1 (Included in data analysis as equal to RL)
n used in Runs Test = 24
above mean = 14, # below mean = 10, # equal to mean = 0
No. of runs = 7
Descriptive Statistic (with ND handling as indicated above):
Min = 0.05, Max = 38, Mean = 21.74, S.D. = 9.633
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data (NDs included in Runs Test as equal to RL)
Nitrogen, Nitrate, mg/L
0
5
10
15
20
25
30
35
40
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

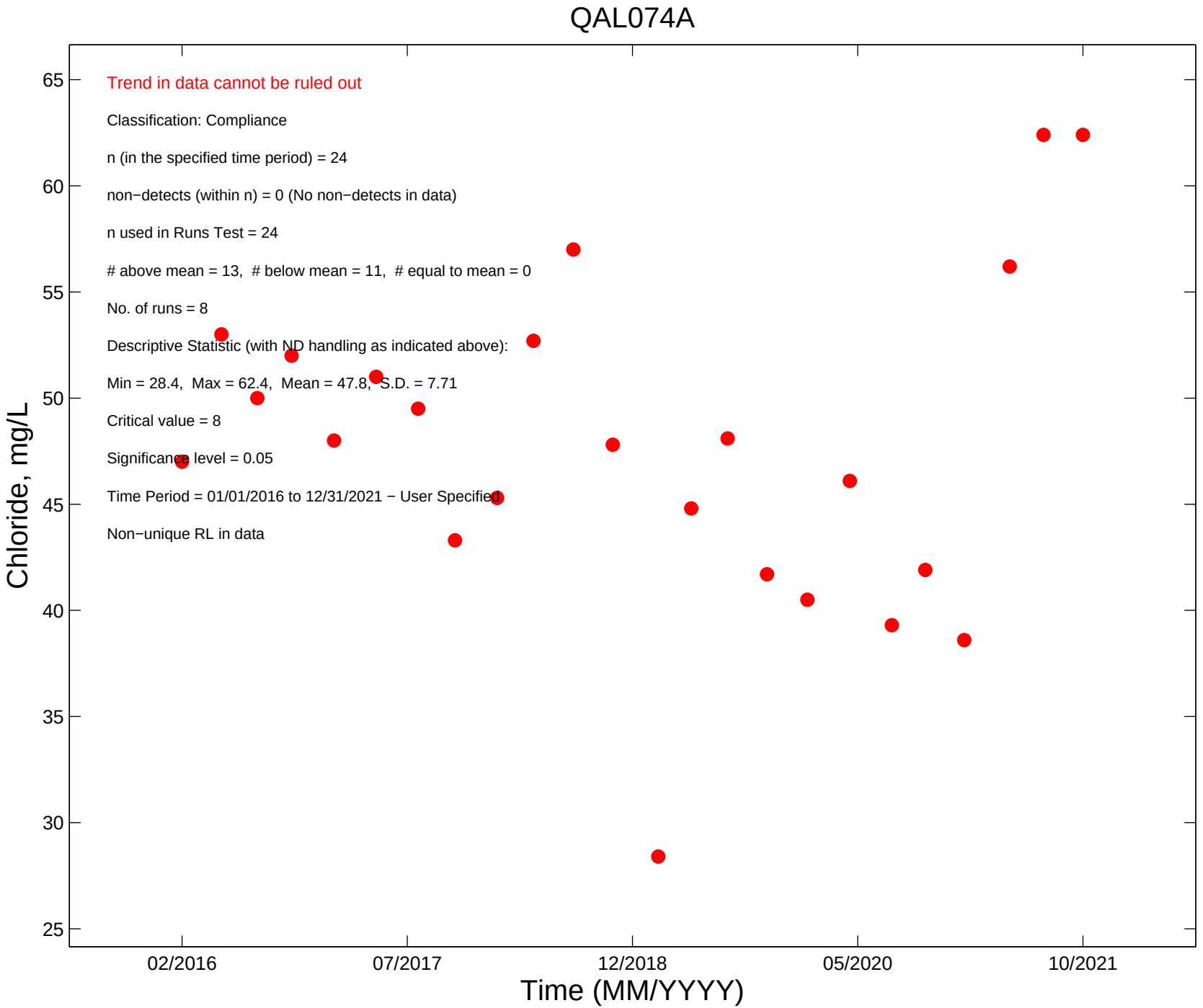

QAL073A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 11
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 11
above mean = 7, # below mean = 4, # equal to mean = 0
No. of runs = 3
Descriptive Statistic (with ND handling as indicated above):
Min = 5.6, Max = 34, Mean = 23.7, S.D. = 9.58
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Calcium, mg/L
35
30
25
20
15
10
5
03/2011
10/2013
04/2016
10/2018
05/2021
Time (MM/YYYY)

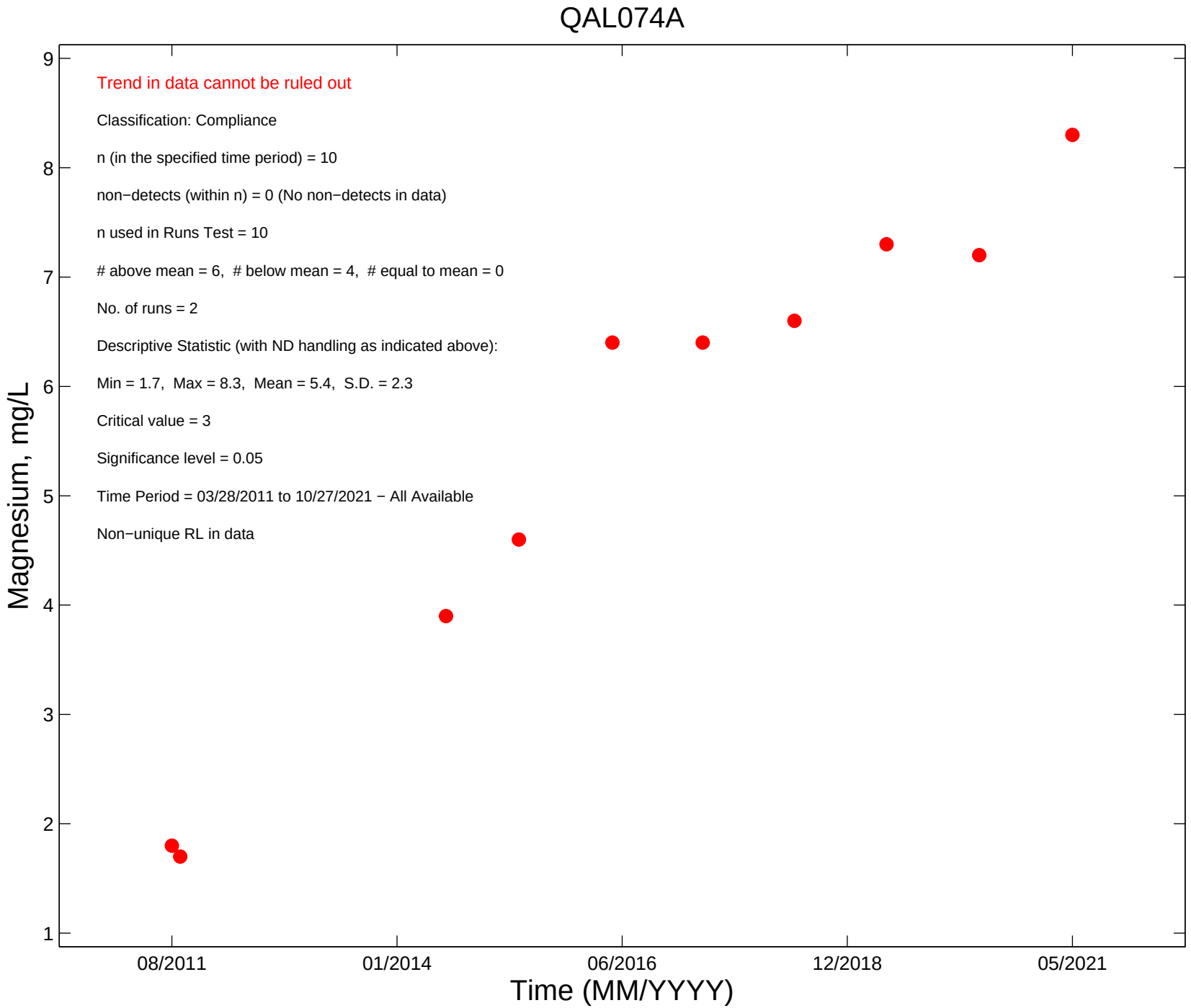

QAL073A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 11
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 11
above mean = 7, # below mean = 4, # equal to mean = 0
No. of runs = 3
Descriptive Statistic (with ND handling as indicated above):
Min = 1.1, Max = 7.5, Mean = 5, S.D. = 2.2
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Magnesium, mg/L
8
7
6
5
4
3
2
1
03/2011
10/2013
04/2016
10/2018
05/2021
Time (MM/YYYY)

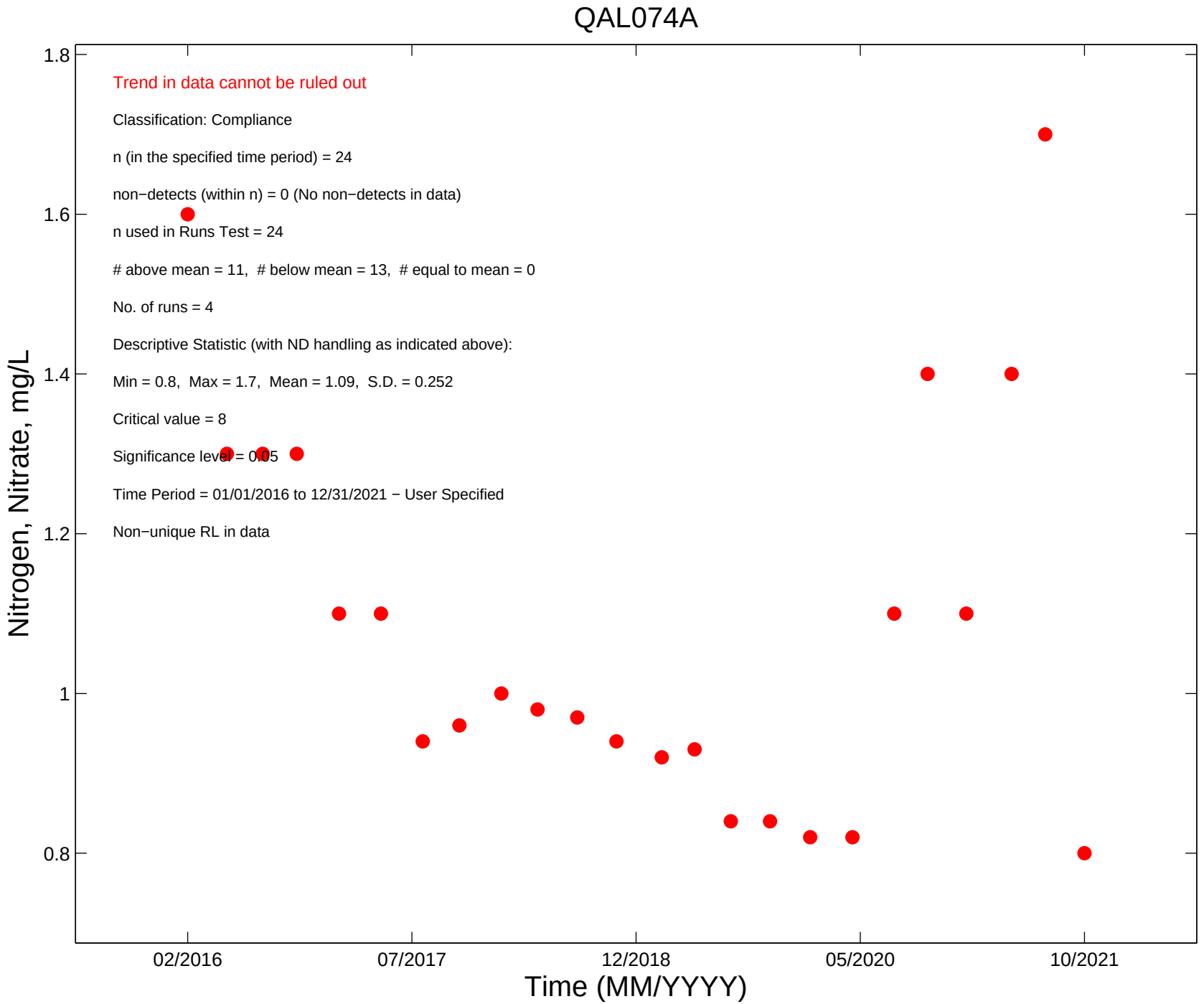

QAL073A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 6
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 6
above mean = 2, # below mean = 3, # equal to mean = 1
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 2.3, Max = 3, Mean = 2.6, S.D. = 0.26
Critical value = 2
Significance level = 0.25
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sodium, mg/L
3
2.9
2.8
2.7
2.6
2.5
2.4
2.3
05/2016
08/2017
11/2018
02/2020
05/2021
Time (MM/YYYY)

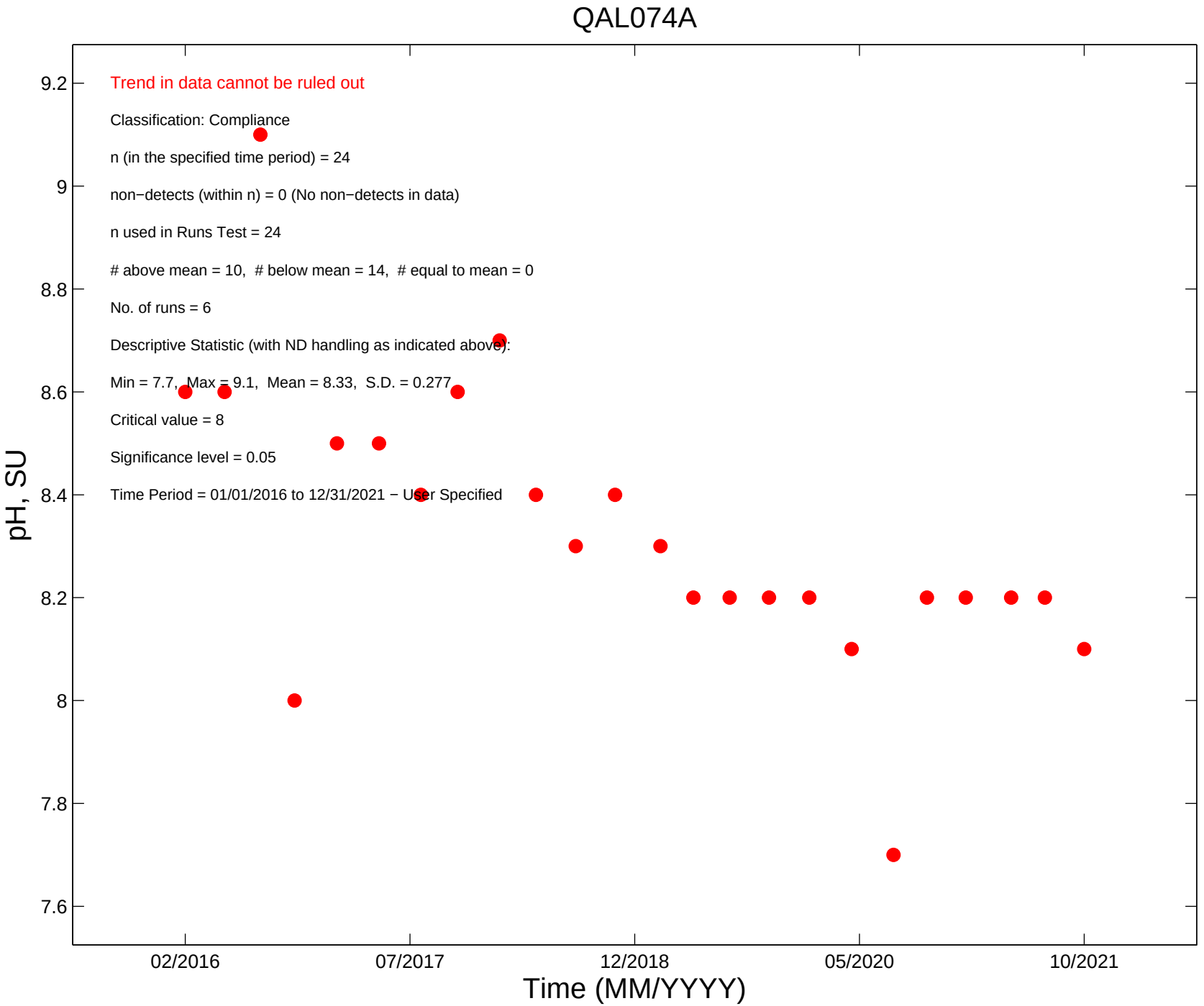

QAL074A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 11, # below mean = 13, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 43, Max = 104, Mean = 77.3, S.D. = 20.54
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Alkalinity, Bicarbonate, mg/L
110
100
90
80
70
60
50
40
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

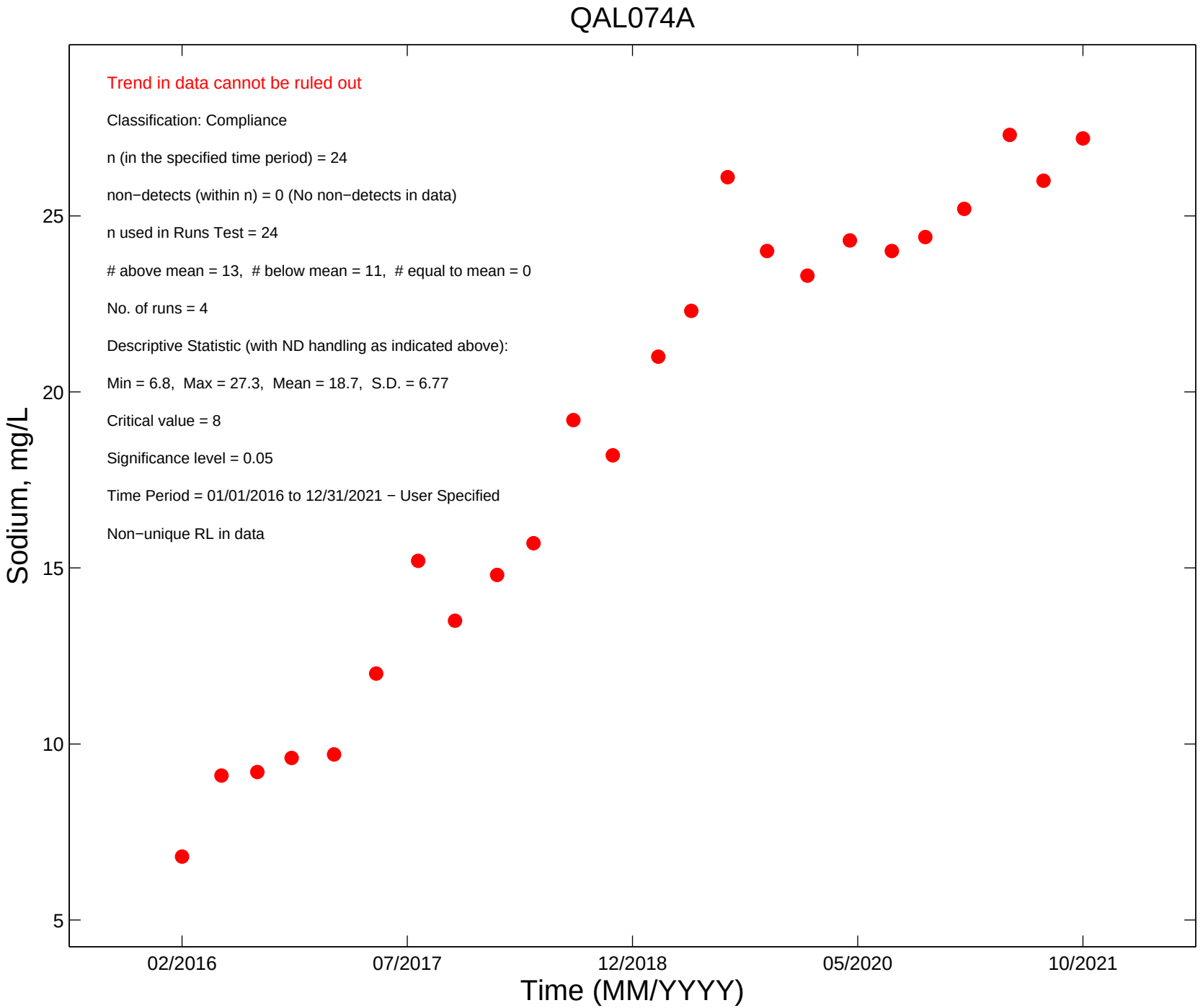

QAL074A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 10
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 10
above mean = 6, # below mean = 4, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 9.1, Max = 43.3, Mean = 27.7, S.D. = 11.6
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Calcium, mg/L
45
40
35
30
25
20
15
10
5
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)


QAL074A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 13, # below mean = 11, # equal to mean = 0
No. of runs = 8
Descriptive Statistic (with ND handling as indicated above):
Min = 28.4, Max = 62.4, Mean = 47.8, S.D. = 7.71
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Chloride, mg/L
65
60
55
50
45
40
35
30
25
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)


QAL074A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 10
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 10
above mean = 6, # below mean = 4, # equal to mean = 0
No. of runs = 2
Descriptive Statistic (with ND handling as indicated above):
Min = 1.7, Max = 8.3, Mean = 5.4, S.D. = 2.3
Critical value = 3
Significance level = 0.05
Time Period = 03/28/2011 to 10/27/2021 − All Available
Non−unique RL in data
Magnesium, mg/L
9
8
7
6
5
4
3
2
1
08/2011
01/2014
06/2016
12/2018
05/2021
Time (MM/YYYY)


QAL074A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 11, # below mean = 13, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 0.8, Max = 1.7, Mean = 1.09, S.D. = 0.252
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Nitrogen, Nitrate, mg/L
1.8
1.6
1.4
1.2
1
0.8
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)


QAL074A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 10, # below mean = 14, # equal to mean = 0
No. of runs = 6
Descriptive Statistic (with ND handling as indicated above):
Min = 7.7, Max = 9.1, Mean = 8.33, S.D. = 0.277
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
pH, SU
9.2
9
8.8
8.6
8.4
8.2
8
7.8
7.6
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)


QAL074A
Trend in data cannot be ruled out
Classification: Compliance
n (in the specified time period) = 24
non−detects (within n) = 0 (No non−detects in data)
n used in Runs Test = 24
above mean = 13, # below mean = 11, # equal to mean = 0
No. of runs = 4
Descriptive Statistic (with ND handling as indicated above):
Min = 6.8, Max = 27.3, Mean = 18.7, S.D. = 6.77
Critical value = 8
Significance level = 0.05
Time Period = 01/01/2016 to 12/31/2021 − User Specified
Non−unique RL in data
Sodium, mg/L
25
20
15
10
5
02/2016
07/2017
12/2018
05/2020
10/2021
Time (MM/YYYY)

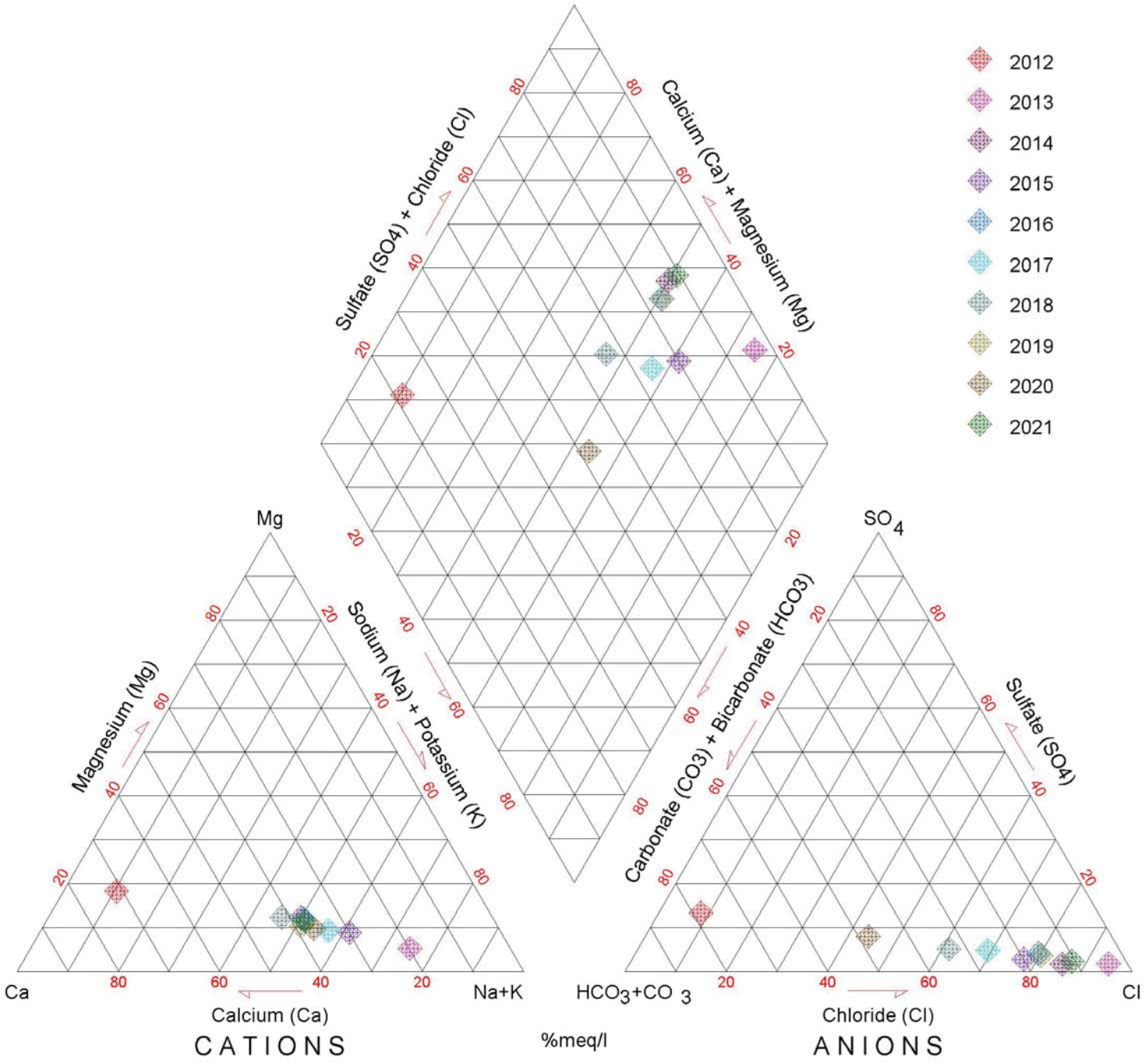
Appendix H

Eagle Mine

Groundwater Piper Diagrams

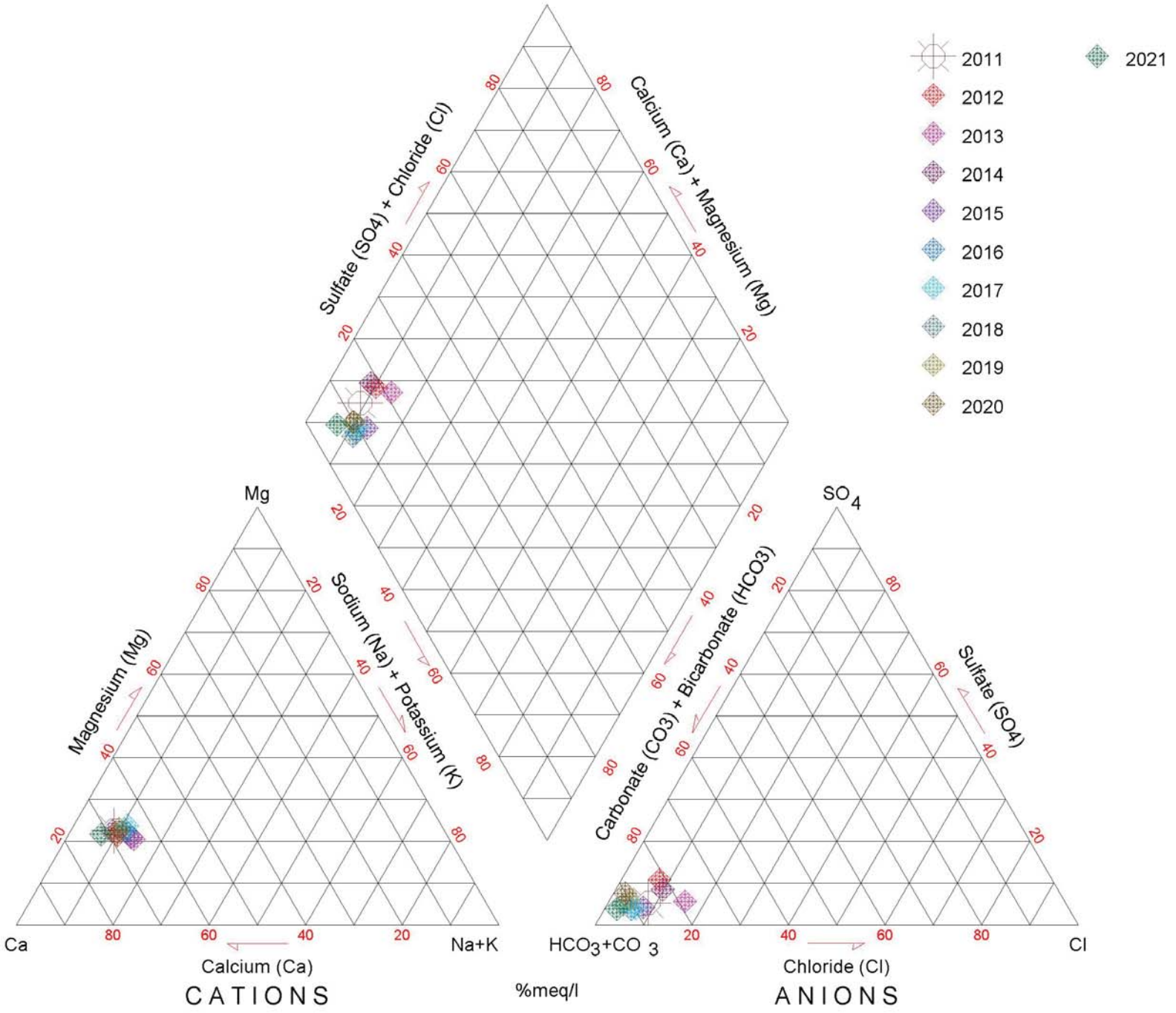
WELL QAL024A

2021 Piper Diagram



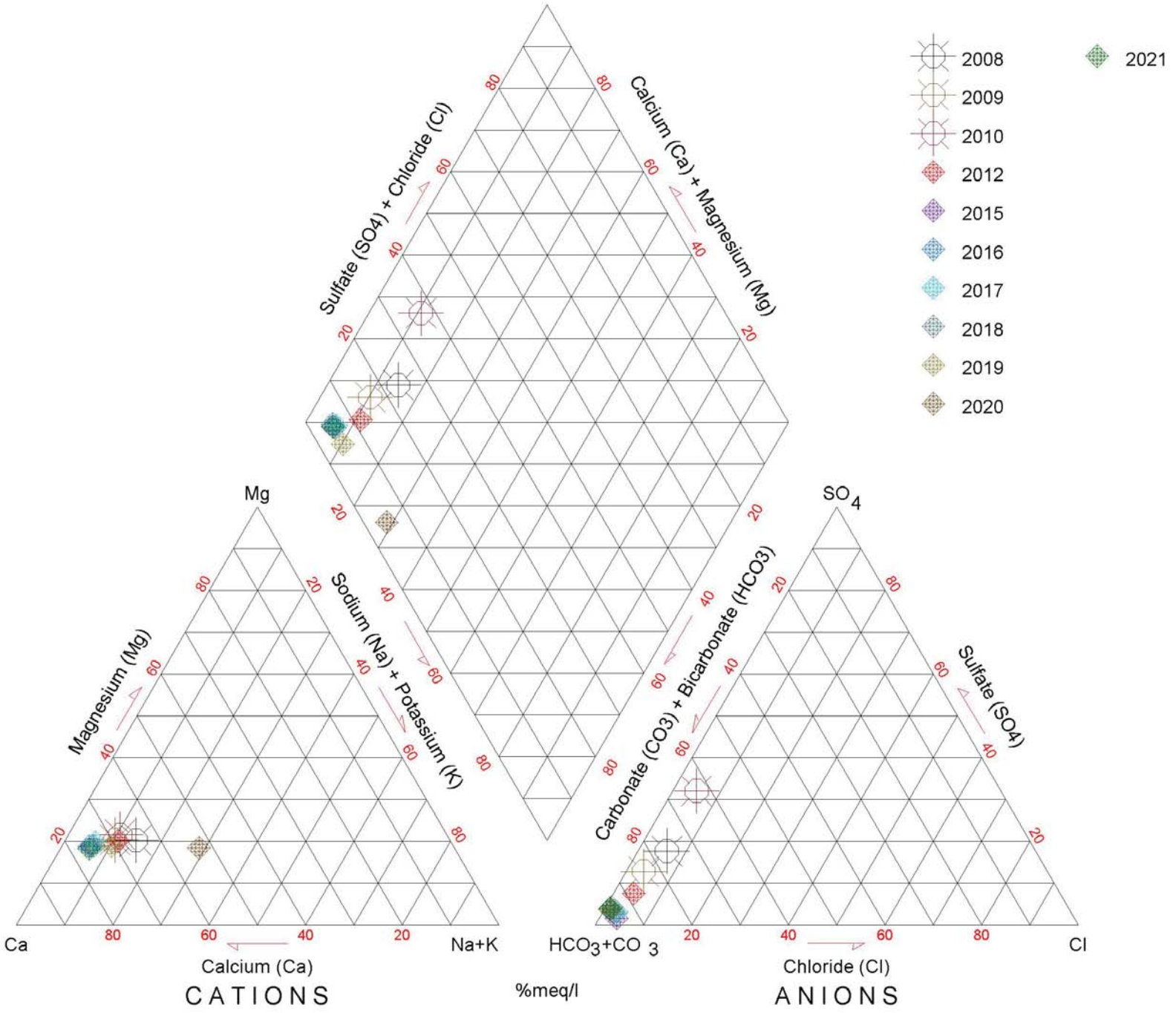
WELL QAL025A

2021 Piper Diagram



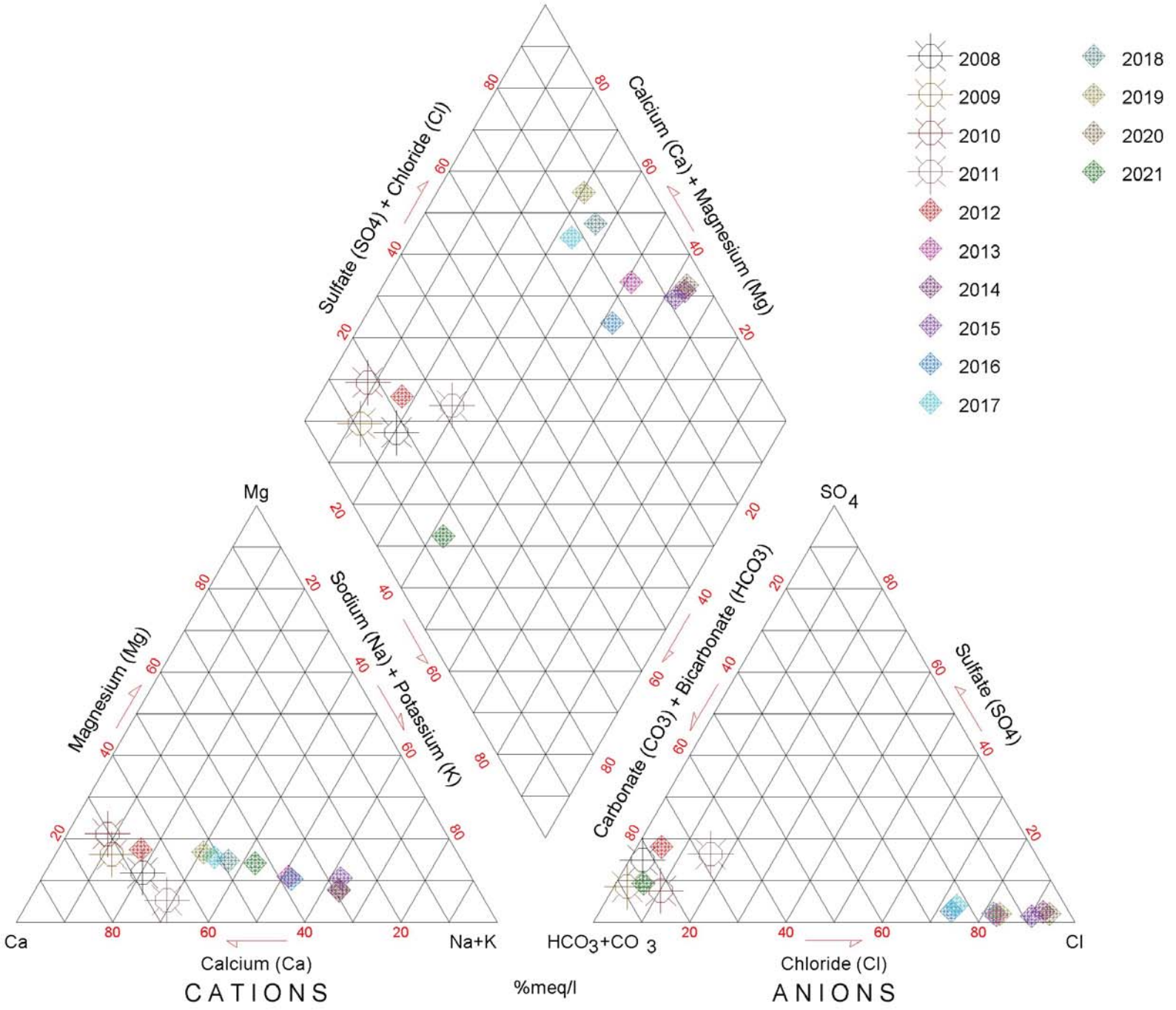
WELL QAL026A

2021 Piper Diagram



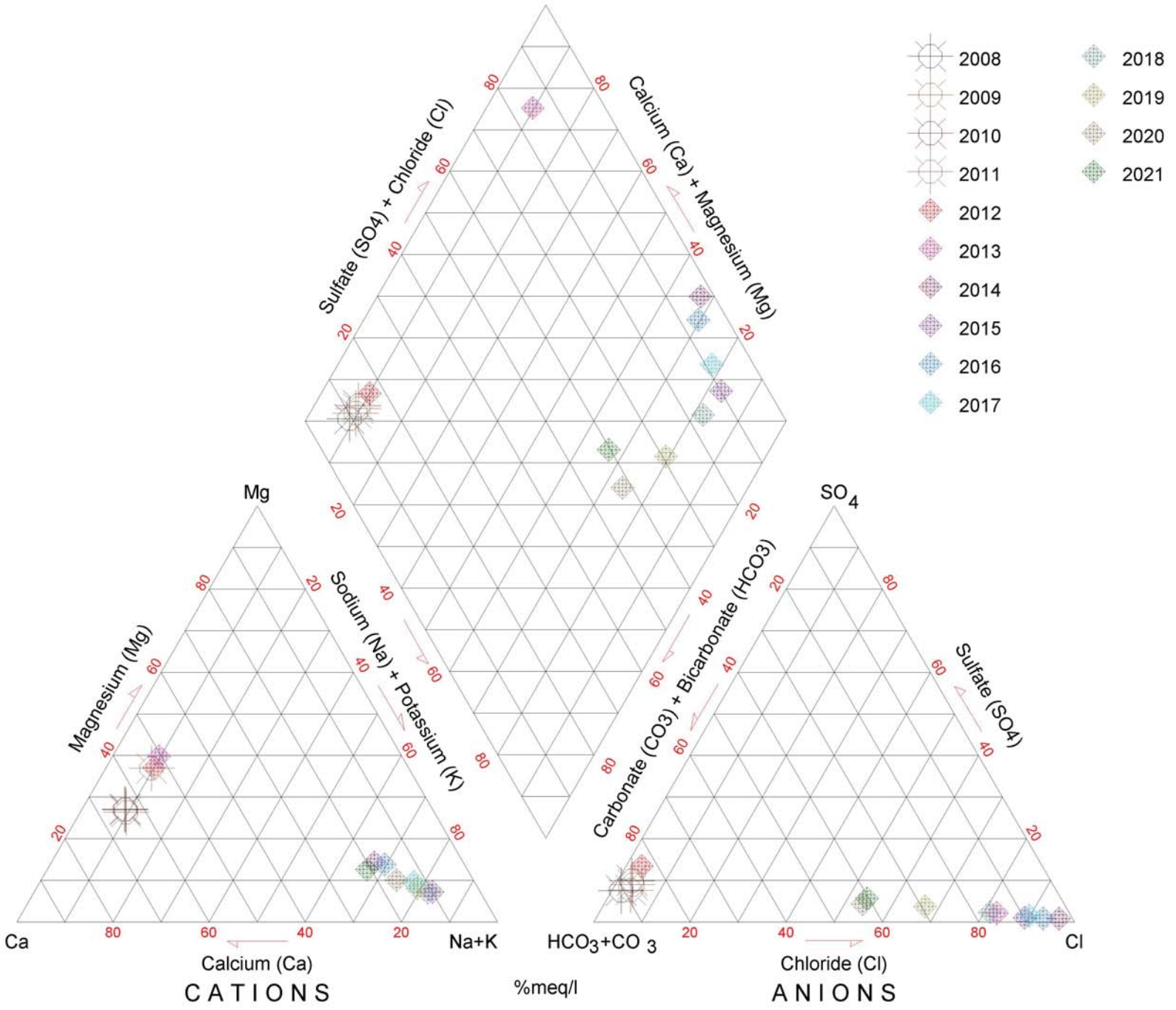
WELL QAL029A

2021 Piper Diagram



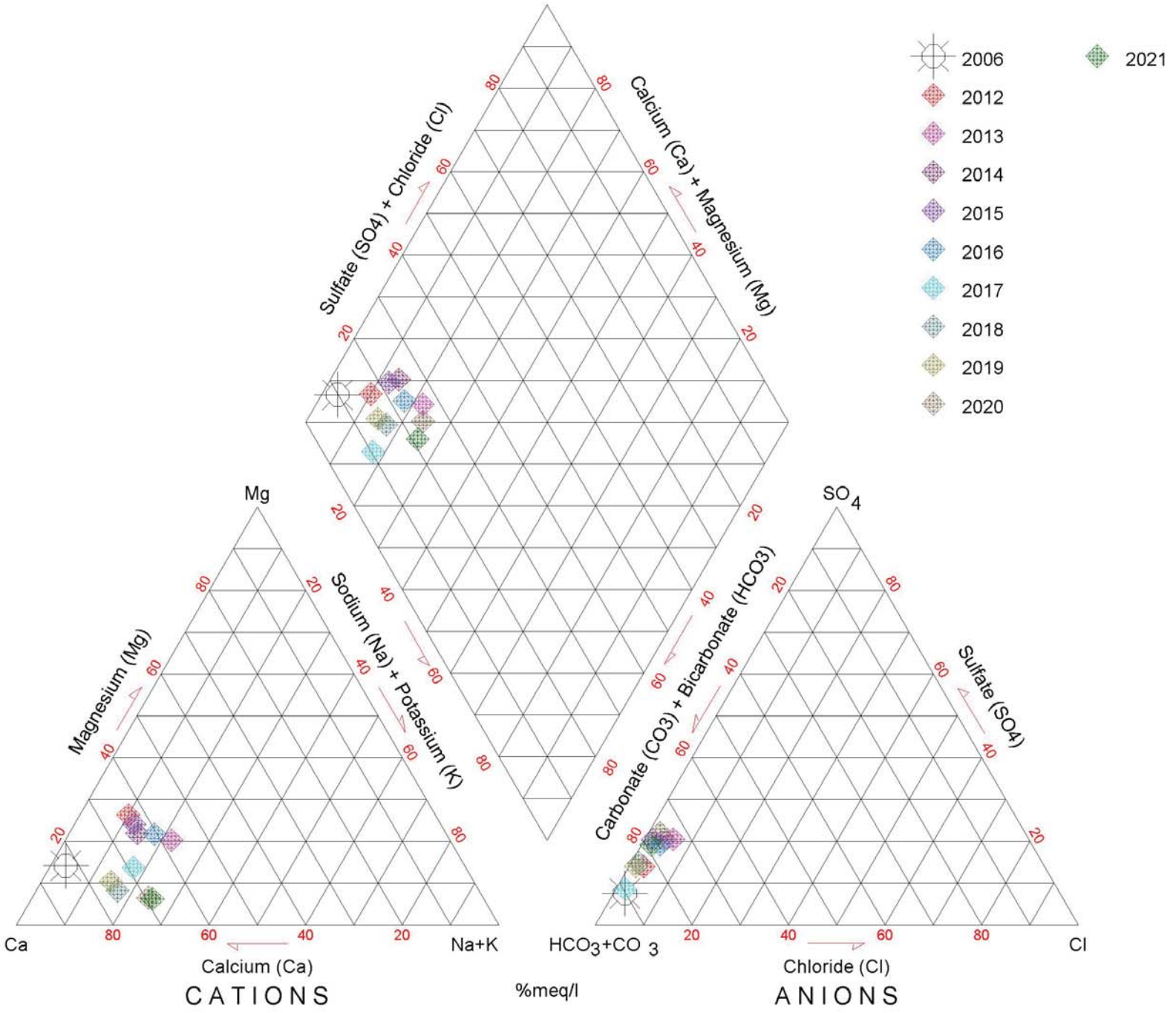
WELL QAL029D

2021 Piper Diagram



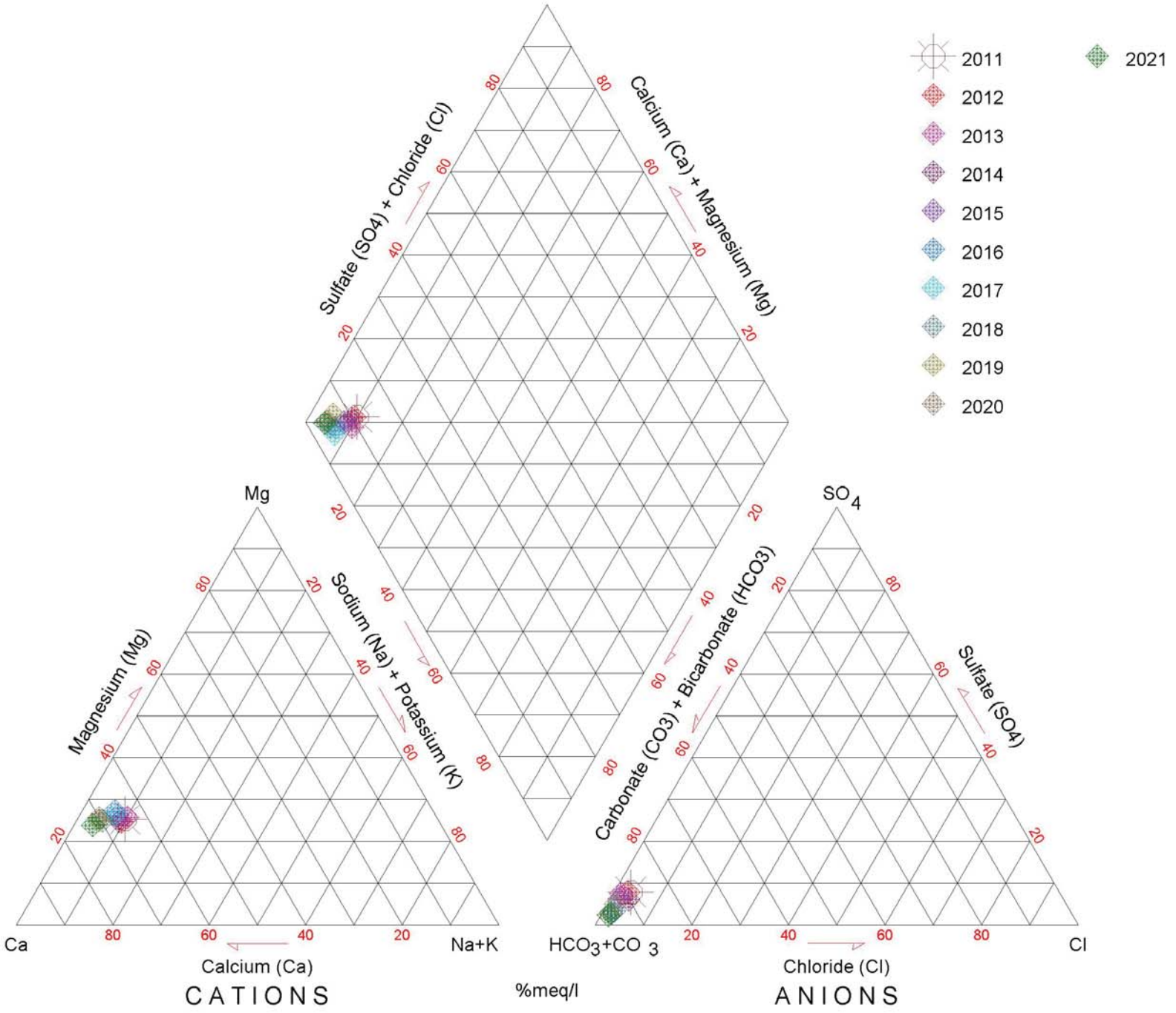
WELL QAL044B

2021 Piper Diagram



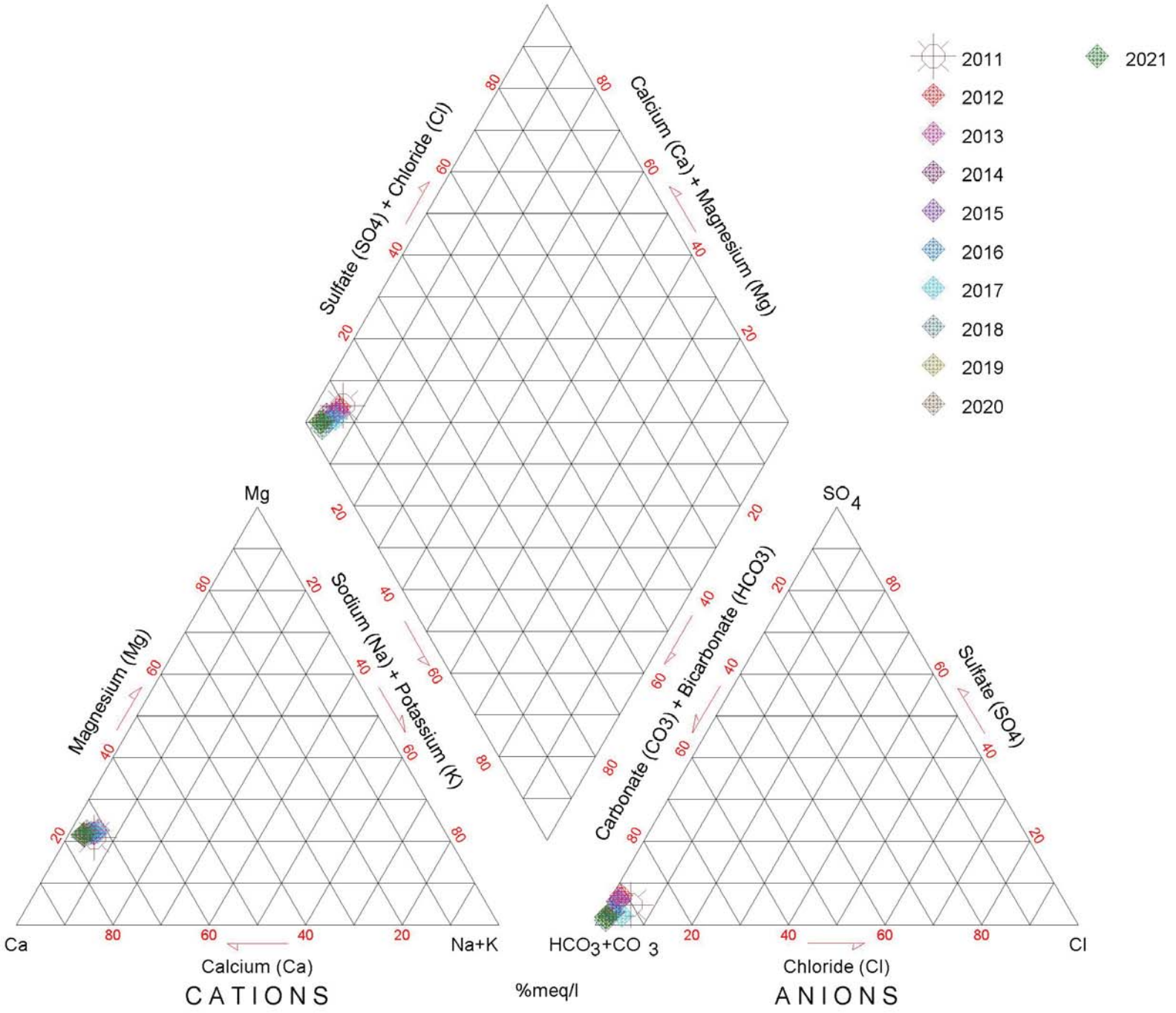
WELL QAL060A

2021 Piper Diagram



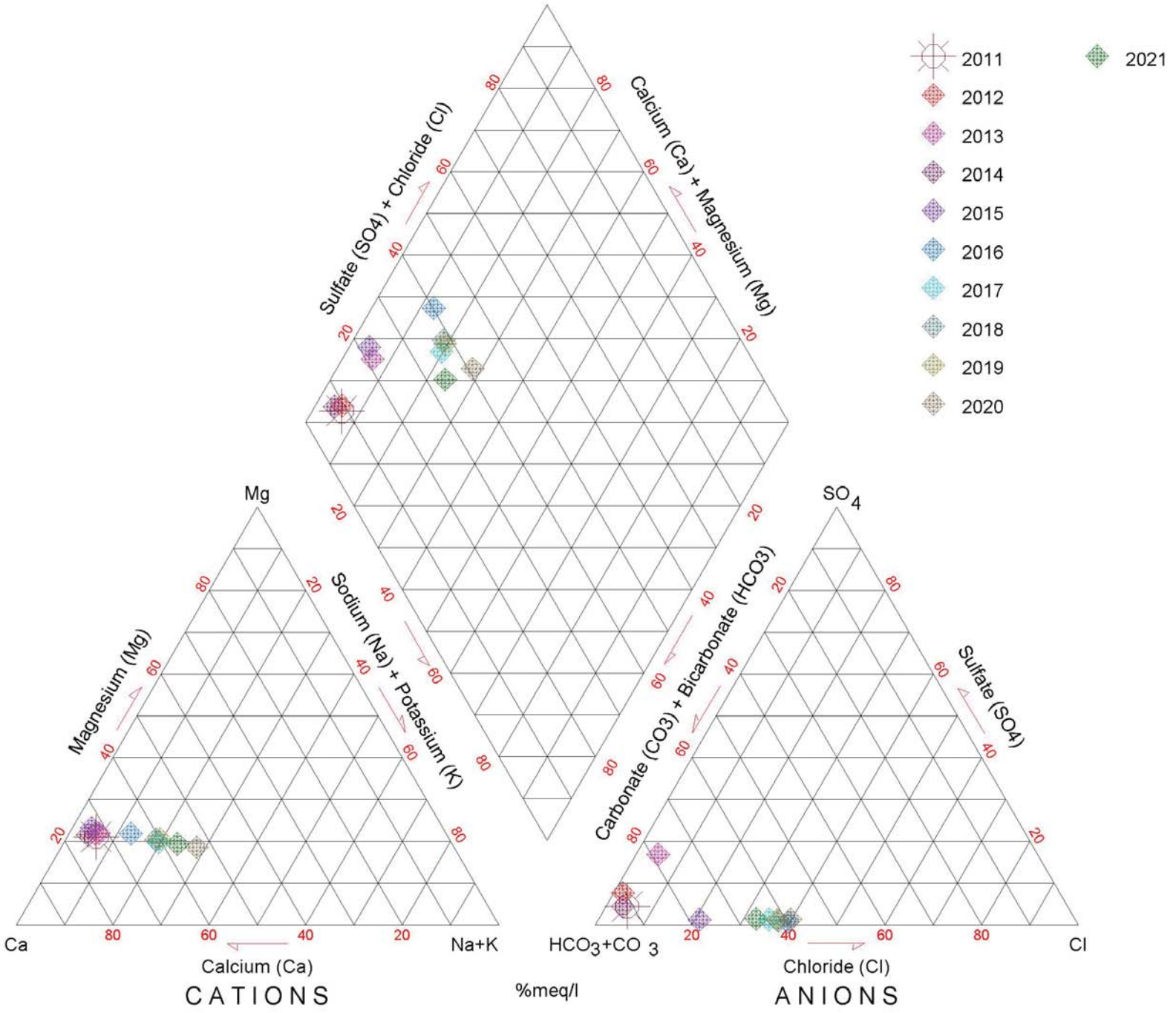
WELL QAL061A

2021 Piper Diagram



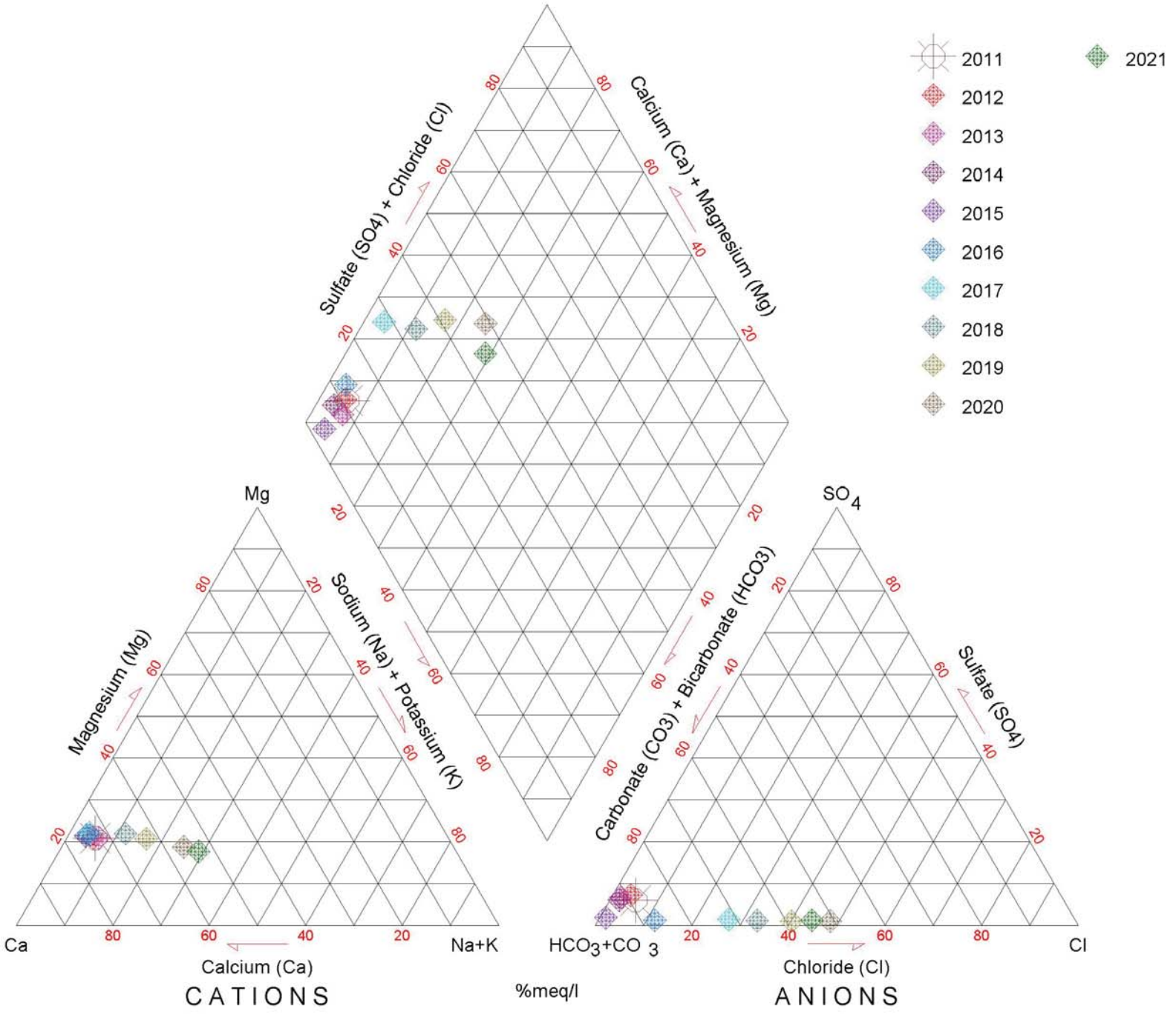
WELL QAL062A

2021 Piper Diagram



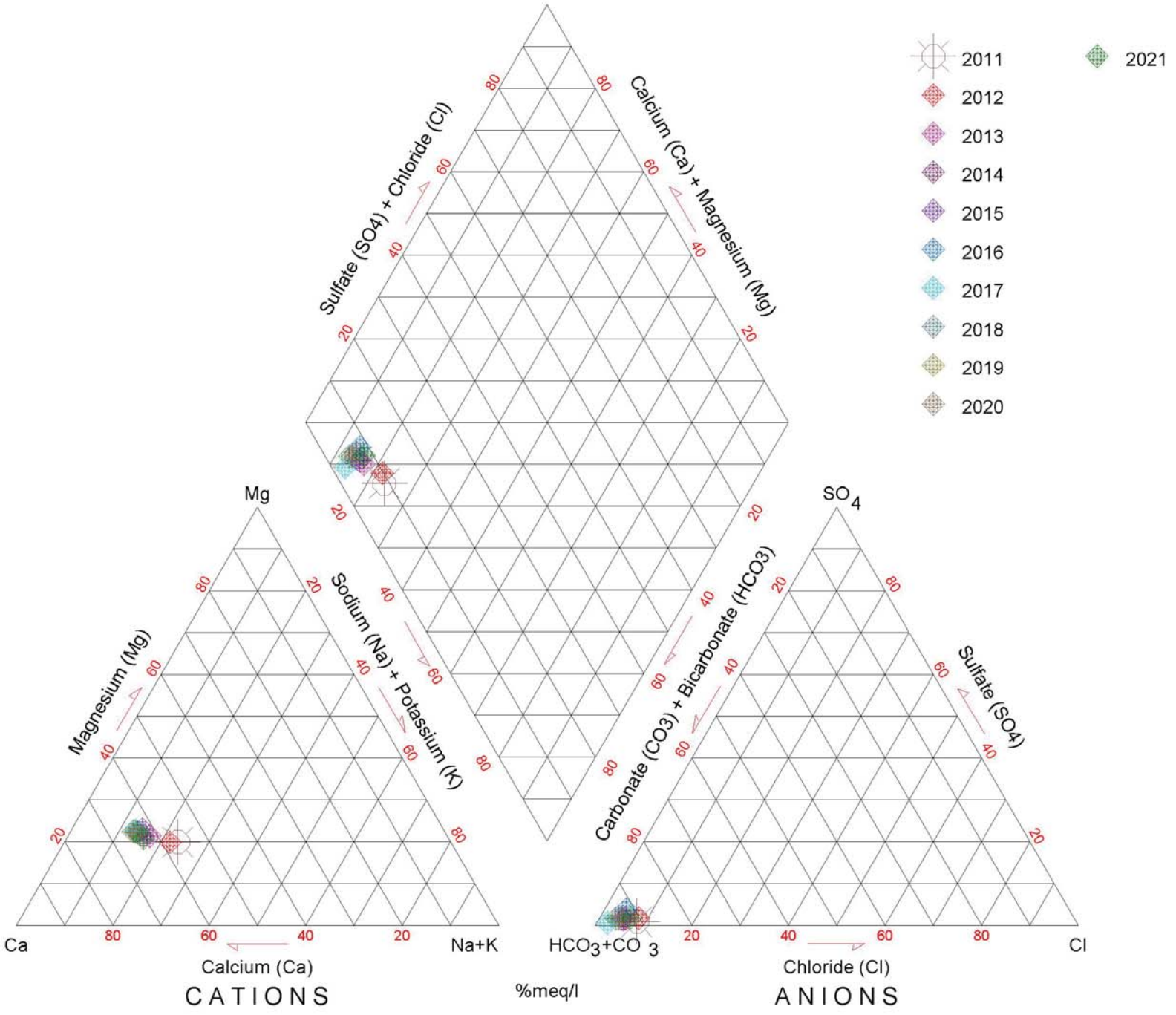
WELL QAL063A

2021 Piper Diagram



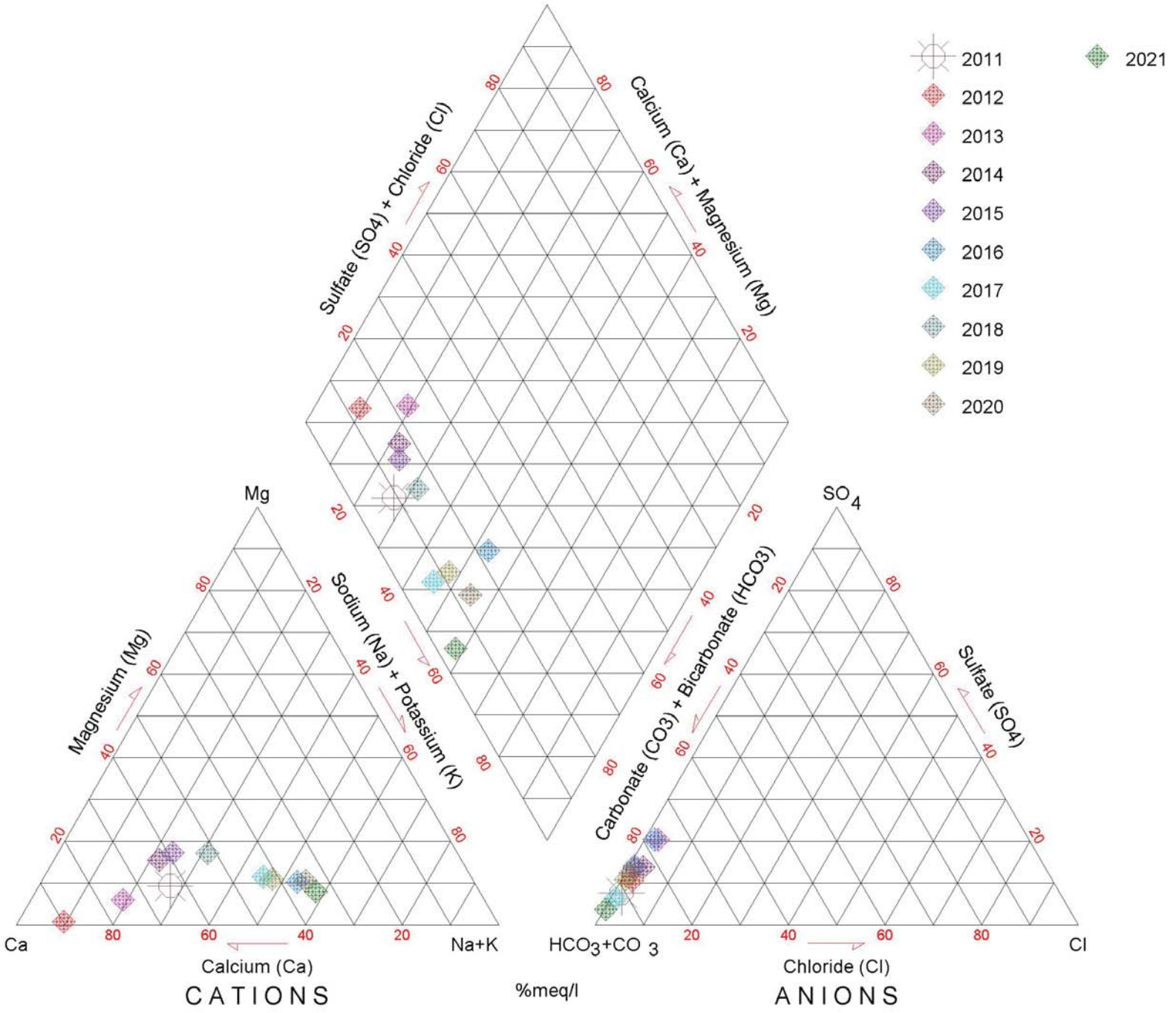
WELL QAL064D

2021 Piper Diagram



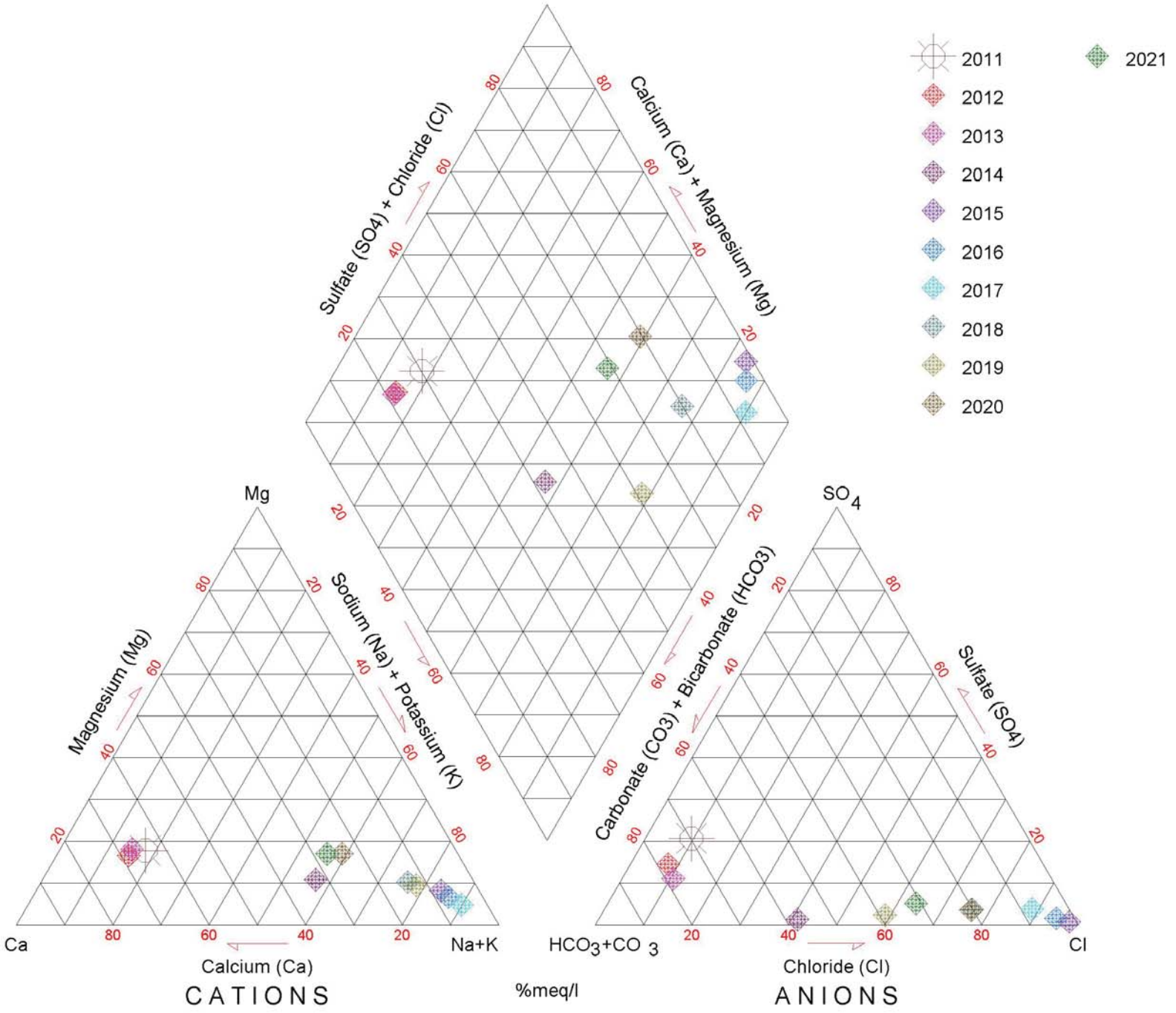
WELL QAL066D

2021 Piper Diagram



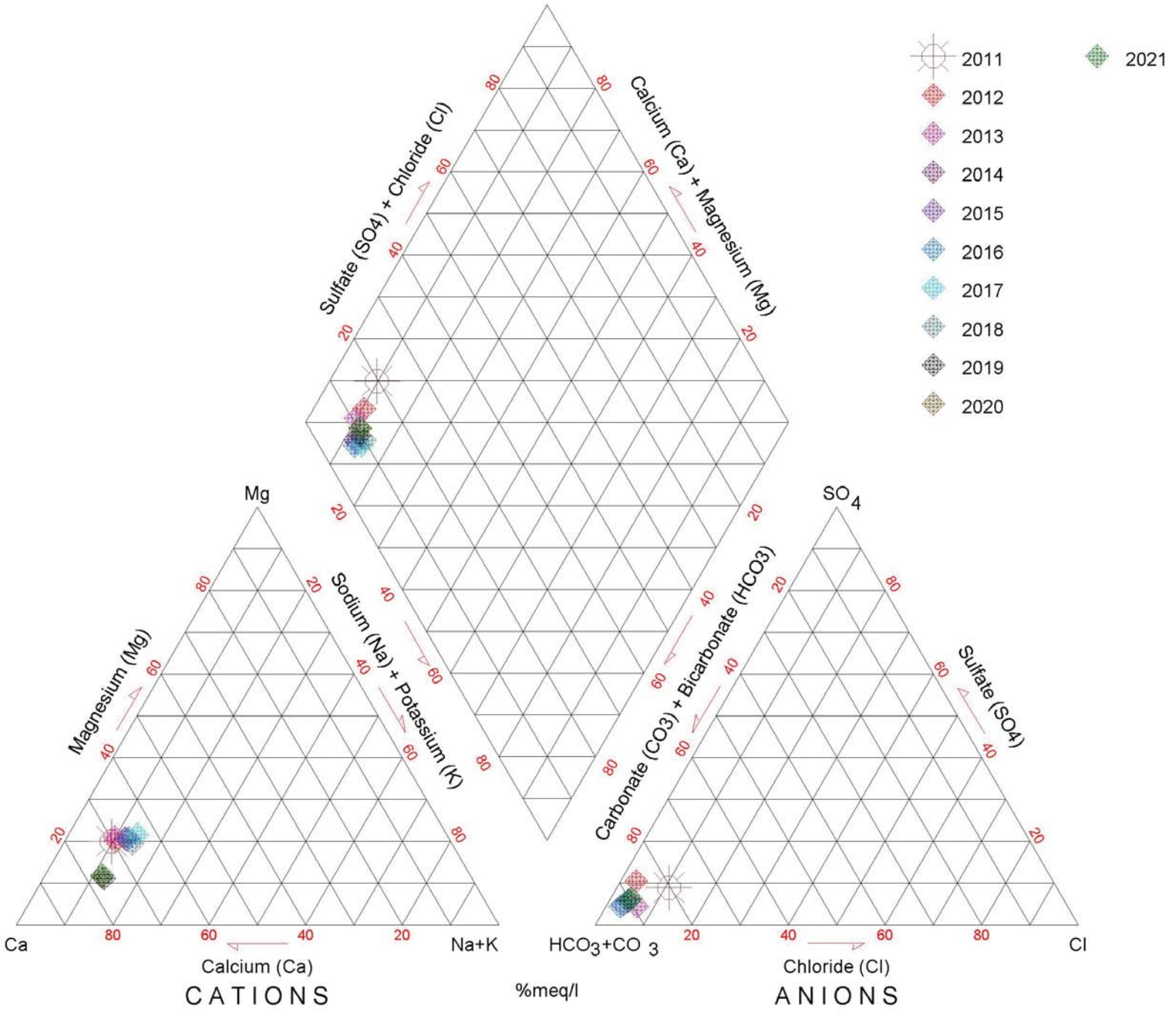
WELL QAL067A

2021 Piper Diagram



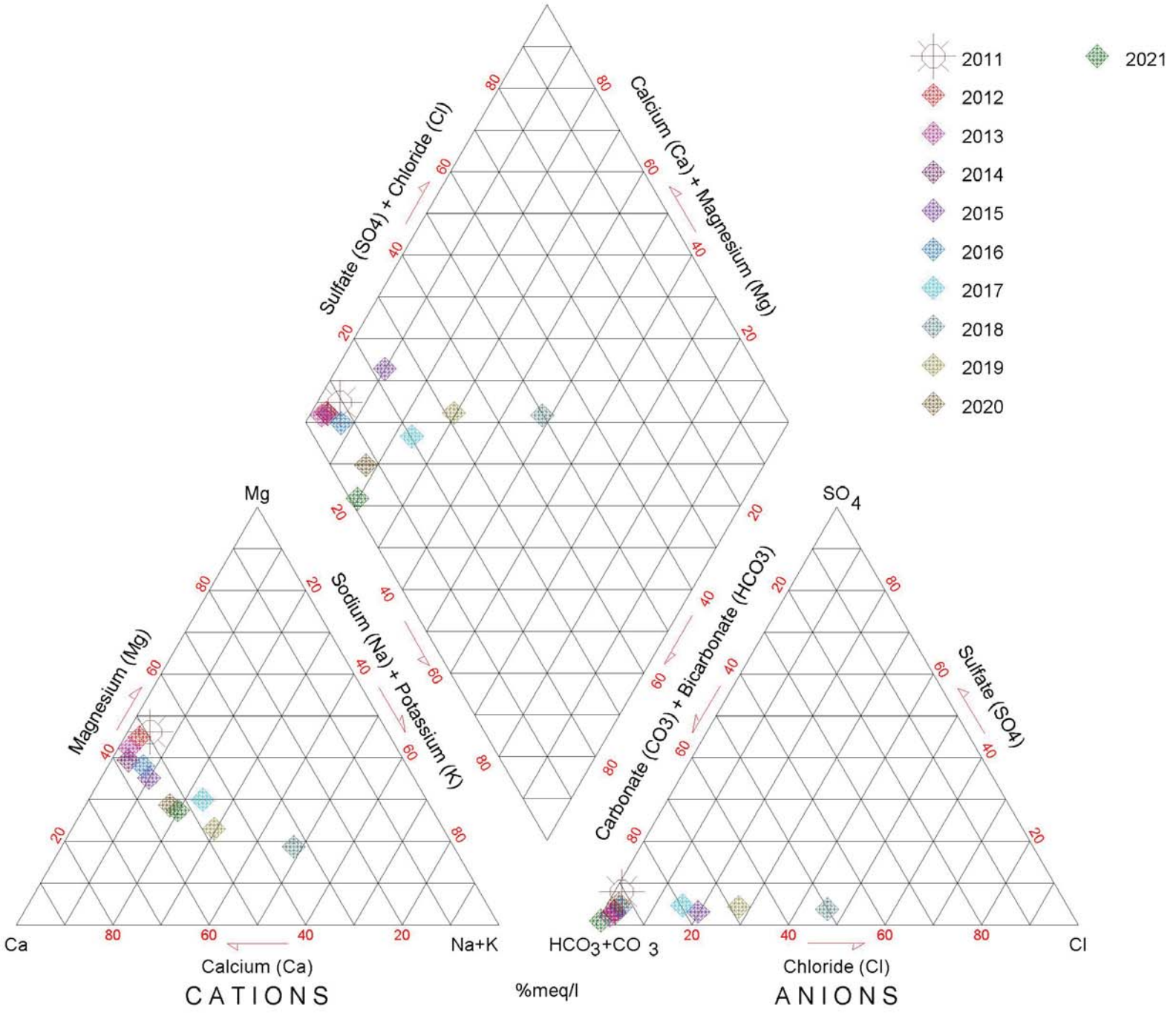
WELL QAL068A

2021 Piper Diagram



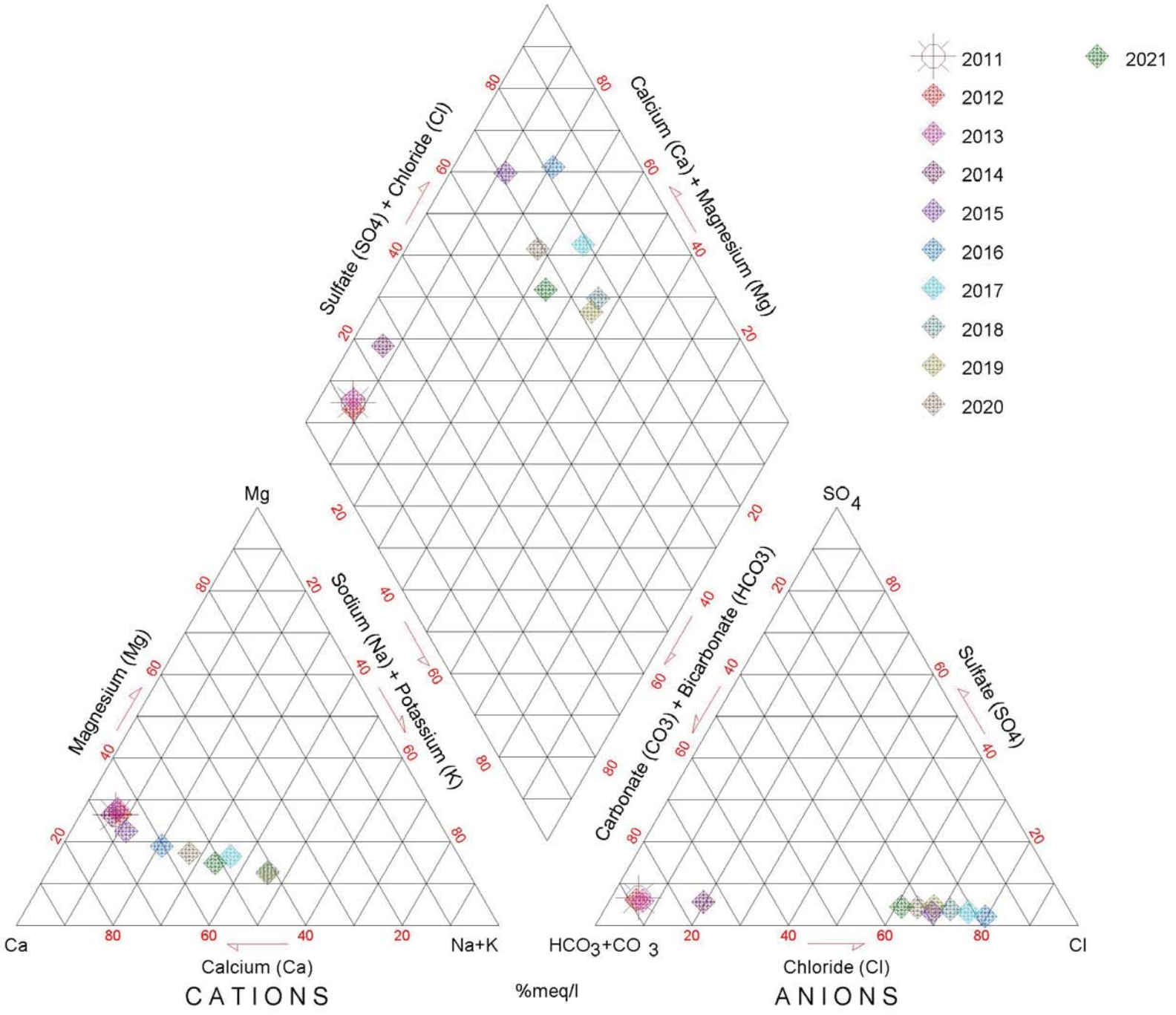
WELL QAL069A

2021 Piper Diagram



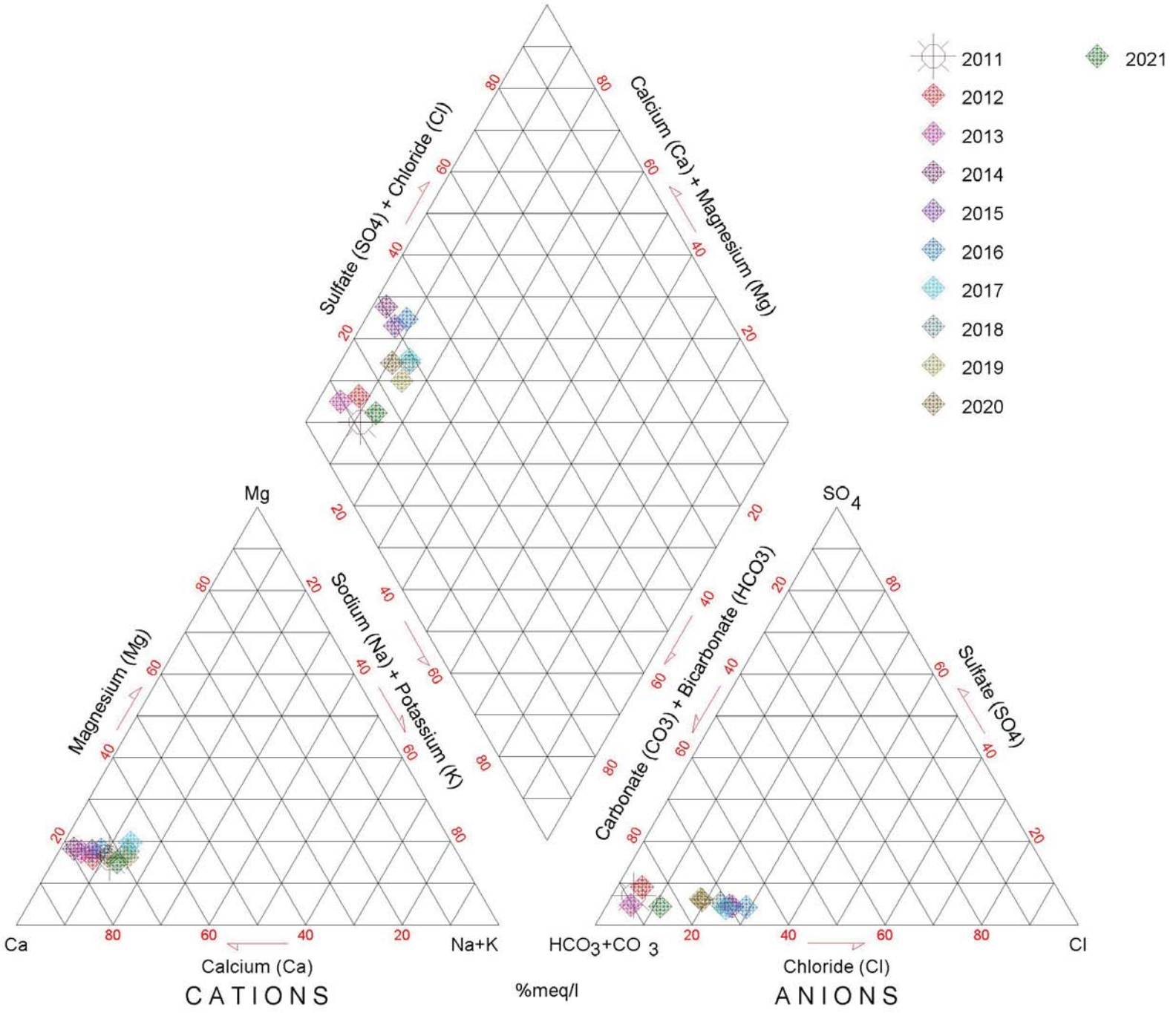
WELL QAL070A

2021 Piper Diagram



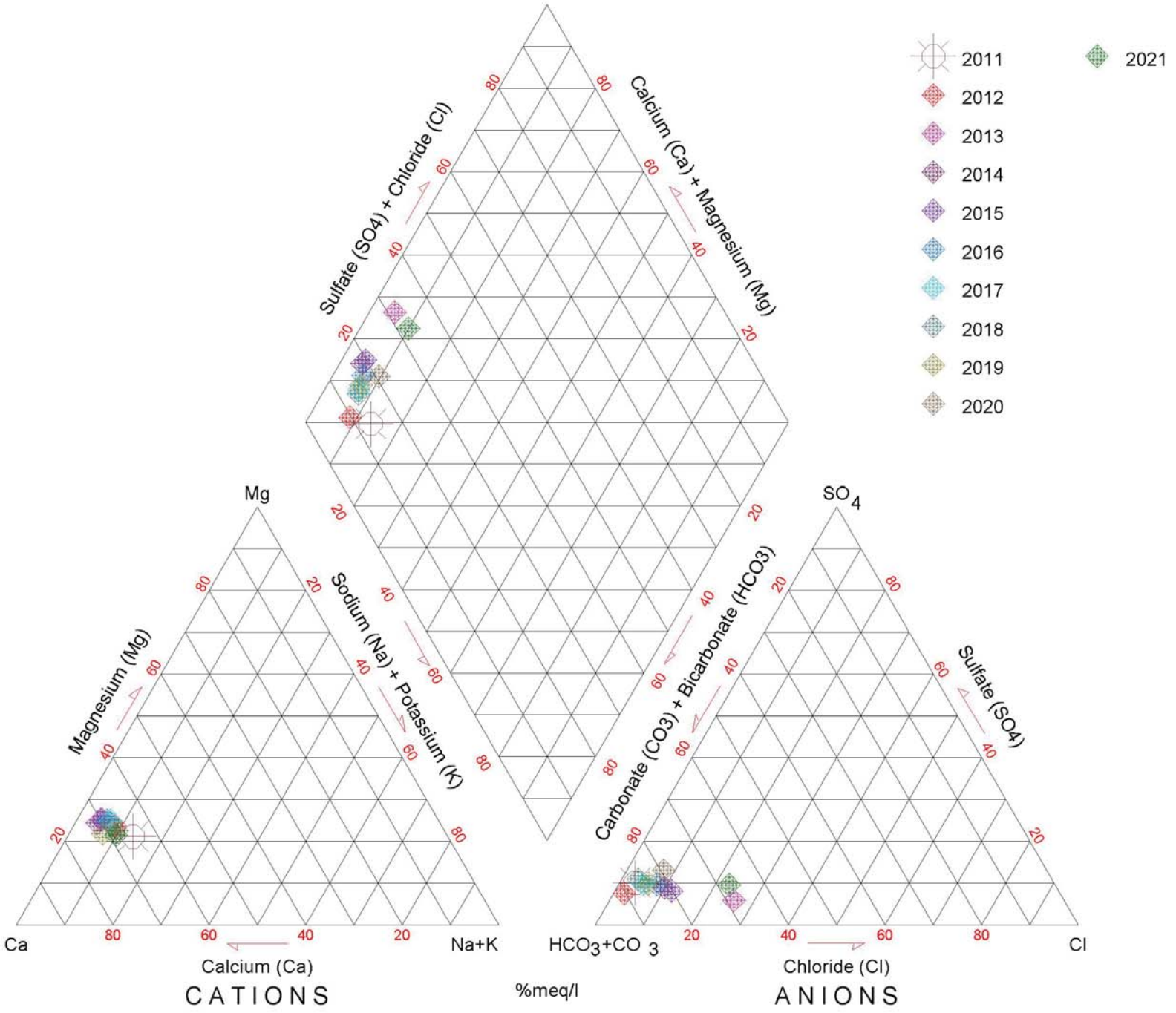
WELL QAL071A

2021 Piper Diagram



WELL QAL073A

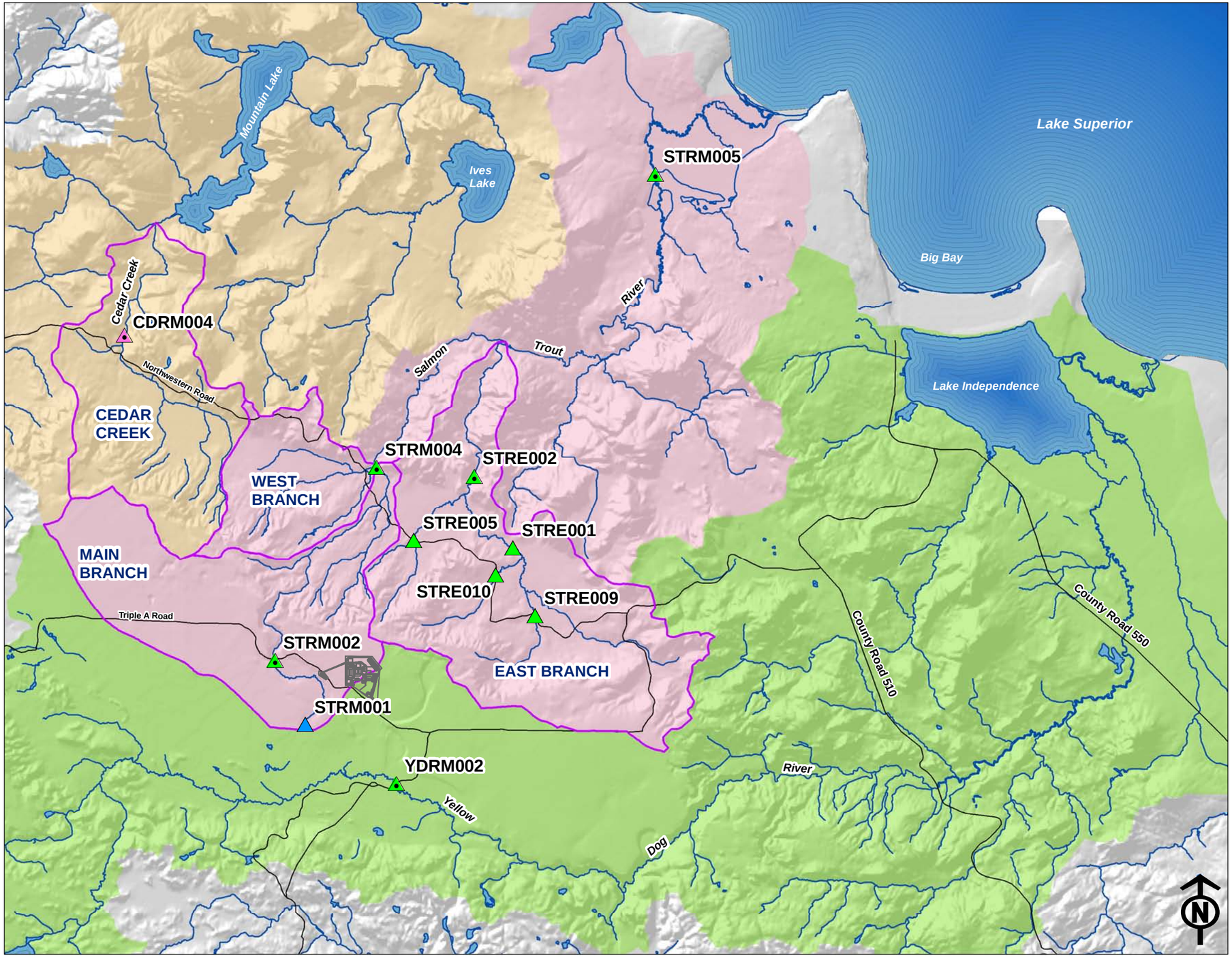
2021 Piper Diagram



Appendix I

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

0 1 2 Miles

Scale: 1:90,000

Eagle Mine
a subsidiary of lundin mining

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Appendix J

Eagle Mine

Surface Water Results

and

Benchmark Summary Table

2021
Mine Permit Surface Water Quality Monitoring Data
Benchmark Summary Table

Location	Location Classifcation	Q1	Q2	Q3	Q4
STRM001	Background	pH		**Mercury**	Iron, Manganese
STRM002	Compliance	pH			
STRM004	Compliance				
STRM005	Compliance		Manganese	**pH**, Iron	**Iron**
STRE001	Compliance	Iron		**Iron**	
STRE002	Compliance				Iron
STRE005	Compliance	pH	**Calcium, Magnesium, Hardness**	**Manganese**	
STRE009	Compliance	**Iron**	Calcium, Hardness		Iron
STRE010	Compliance		**Calcium, Magnesium, Hardness**		Iron
YDRM002	Compliance				
CDRM004	Reference				Iron, Mercury

Parameters listed in this table had values reported that were equal to or greater than a site-specific benchmark. Parameters in BOLD are instances in which the Department was notified because benchmarks deviations were identified at compliance monitoring locations for two consecutive seasonal (e.g. Q1 2013 and Q1 2014) sampling events. If the location is classified as background or reference, Department notification is not required for an exceedance.

2021
Mine Permit Surface Water Quality Monitoring Data
STRM001 (Background)
Eagle Mine

Parameter	Unit	Permit RL	STRM001 Seasonal Benchmark				STRM001 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/17/21		4/7/21		8/9/21		10/14/21	
Field														
D.O.	ppm	--	--	--	--	--	**5.9**		**6.7**		**1.9**		**4.0**	
Flow	cfs	--	--	--	--	--	**0.30**		<0.10		**0.20**		**0.30**	
pH	SU	--	6.2-7.2	6.2-7.2	6.2-7.2	6.0-7.0	**8.1**		**7.1**		**6.5**		**6.5**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**5.0**		**43**		**76**		**49**	
Temperature	°C	--	--	--	--	--	**0.0**		**10**		**19**		**14**	
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		<1.0		<1.0		<1.0	
Barium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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		**1.2**		<1.0	
Iron	ug/L	20	875	1,616	6,195	675	**518**		**324**	e	**3,030**		**1000**	e
Lead	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Lithium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Manganese	ug/L	10.0	44	179	392	40	**34**		<10.0		**164**		**47**	
Mercury	ng/L	0.50	2.0	3.6	2.9	2.0	**0.71**		**1.5**		**3.0**		**1.2**	
Molybdenum	ug/L	10	--	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	e	<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	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	40	--	--	--		**10.6**		--		--	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	7.3	--	--	--		<1.0		--		--	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		<0.05		--		--	
Sulfate	mg/L	1.0	4.0	10.0	4.0	4.0	**1.4**		**1.0**	e	<1.0		<1.0	e
Major Cations														
Calcium	mg/L	0.50	--	11	--	--	--		**3.8**	e	--		--	
Magnesium	mg/L	0.50	--	2.4	--	--	--		<1.0		--		--	
Potassium	mg/L	0.50	--	2.0	--	--	--		<0.50	e	--		--	
Sodium	mg/L	0.50	--	2.0	--	--	--		<1.0	e	--		--	
General														
Hardness	mg/L	3.0	--	36	--	--	--		<3.0		--		--	
TDS	mg/L	50	200	200	200	200	<50.0	e	<50.0	e	<50.0		**51**	e

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

2021
Mine Permit Surface Water Quality Monitoring Data
STRM002 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	STRM002 Seasonal Benchmark				STRM002 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/17/21		4/6/21		8/9/21		10/12/21	
Field														
D.O.	ppm	--	--	--	--	--	**11**		**10**		**7.9**		**8.3**	
Flow	cfs	--	--	--	--	--	**1.4**		**5.3**		**1.6**		**2.1**	
pH	SU	--	6.8-7.8	6.5-7.5	6.3-7.3	6.5-7.5	**6.5**		**6.8**		**7.2**		**7.2**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**70**		**46**		**76**		**71**	
Temperature	°C	--	--	--	--	--	**0.10**		**7.8**		**17**		**14**	
Metals														
Aluminum	ug/L	50	--	200	--	--	--		**108**		--		**--**	
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	--	--	--		<10.0		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	304	651	703	504	**241**		**401**	e	**235**		**275**	e
Lead	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Lithium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Manganese	ug/L	10.0	40	58	40	40	<10.0		**18**		<10.0		<10.0	
Mercury	ng/L	0.50	2.0	5.8	2.4	2.8	**0.72**		**3.4**		**1.5**		**1.3**	
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	e	<2.0		<2.0		<2.0	
Silver	ug/L	0.20	--	0.80	--	--	--		<0.20		--		--	
Zinc	ug/L	10.0	250	40	40	40	<10.0	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	34	--	--	--		**21**		--		**--**	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		**--**	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.07**		--		--	
Sulfate	mg/L	1.0	4.0	6.2	4.0	4.0	**2.1**		**1.7**	e	**1.4**		**1.6**	e
Major Cations														
Calcium	mg/L	0.50	--	10	--	--	--		**6.6**	e	--		**--**	
Magnesium	mg/L	0.50	--	2.0	--	--	--		**1.3**		--		**--**	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.60**	e	--		**--**	
Sodium	mg/L	0.50	--	2.0	--	--	--		<1.0	e	--		--	
General														
Hardness	mg/L	3.0	--	32	--	--	--		**22**		--		**--**	
TDS	mg/L	50	200	200	200	200	<50.0	e	<50.0	e	<50.0		<50.0	e

2021
Mine Permit Surface Water Quality Monitoring Data
STRM005 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	STRM005 Seasonal Benchmark				STRM005 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/23/21		4/6/21		8/9/21		10/12/21	
Field														
D.O.	ppm	--	--	--	--	--	**13**		**11**		**8.4**		**8.9**	
Flow	cfs	--	--	--	--	--	**40**		**82**		**34**		**35**	
pH	SU	--	7.1-8.1	6.6-7.6	6.6-7.6	7.2-8.2	**7.4**		**7.4**		**7.9**		**8.1**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**143**		**105**		**150**		**141**	
Temperature	°C	--	--	--	--	--	**0.0**		**8.7**		**16**		**14**	
Metals														
Aluminum	ug/L	50	--	568	--	--	--		**115**		--		**--**	
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**		**1.1**	
Barium	ug/L	10.0	--	40	--	--	--		**11**		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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		2.7		<1.0		<1.0	
Iron	ug/L	20	166	470	201	309	**158**		**198**	e	**263**		**400**	e
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	**12**		**56**		**14**		**22**	
Mercury	ng/L	0.50	2.0	11	2.0	2.5	**0.67**		**2.2**		**1.8**		**0.82**	
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	e	<2.0		<2.0		<2.0	
Silver	ug/L	0.20	--	0.80	--	--	--		<0.20		--		--	
Zinc	ug/L	10.0	40	89	40	40	<10.0	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	66	--	--	--		**47**		--		**--**	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		**--**	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.05**		--		**--**	
Sulfate	mg/L	1.0	6.6	4.0	4.0	4.0	**3.7**		**2.7**	e	**3.0**		**3.0**	e
Major Cations														
Calcium	mg/L	0.50	--	19	--	--	--		**15**	e	--		**--**	
Magnesium	mg/L	0.50	--	3.9	--	--	--		**2.8**		--		**--**	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.70**	e	--		**--**	
Sodium	mg/L	0.50	--	2.0	--	--	--		**1.2**	e	--		--	
General														
Hardness	mg/L	3.0	--	65	--	--	--		**49**		--		**--**	
TDS	mg/L	50	200	200	200	200	**68**	e	<50.0	e	**72**		**56**	e

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

2021
Mine Permit Surface Water Quality Monitoring Data
STRM004 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	STRM004 Seasonal Benchmark				STRM004 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/22/21		4/20/21		8/9/21		10/13/21	
Field														
D.O.	ppm	--	--	--	--	--	**13**		**14**		**8.9**		**9.5**	
Flow	cfs	--	--	--	--	--	**4.8**		**8.0**		**5.0**		**7.9**	
pH	SU	--	7.0-8.0	7.3-8.3	7.2-8.2	7.2-8.2	**7.6**		**7.3**		**7.6**		**7.5**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**106**		**93**		**111**		**107**	
Temperature	°C	--	--	--	--	--	**0.0**		**1.3**		**15**		**13**	
Metals														
Aluminum	ug/L	50	--	993	--	--	--		**107**		--		**--**	
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		**1.4**		1.3	
Barium	ug/L	10.0	--	40	--	--	--		<10.0		--		**--**	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	312	984	500	406	**283**		**192**	e	**202**		**268**	e
Lead	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Lithium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Manganese	ug/L	10.0	40	61	40	40	**22**		**15**		**18**		**23**	
Mercury	ng/L	0.50	2.5	14	3.5	2.9	**1.0**		**2.0**		**2.2**		**2.2**	
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	e	<2.0		<2.0		<2.0	
Silver	ug/L	0.20	--	0.80	--	--	--		<0.20		--		--	
Zinc	ug/L	10	40	40	40	40	<10.0	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	52	--	--	--		**42**		--		**--**	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		**--**	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.06**		--		**--**	
Sulfate	mg/L	1.0	4.5	4.0	4.0	4.0	**2.5**		**2.2**	e	**2.0**		**2.5**	e
Major Cations														
Calcium	mg/L	0.50	--	16	--	--	--		**14**	e	--		**--**	
Magnesium	mg/L	0.50	--	3.0	--	--	--		**2.7**		--		**--**	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.65**	e	--		**--**	
Sodium	mg/L	0.50	--	2.0	--	--	--		**1.0**	e	--		**--**	
General														
Hardness	mg/L	3.0	--	54	--	--	--		**45**		--		**--**	
TDS	mg/L	50	200	200	200	200	<50.0	e	**56**	e	<50.0		**57**	e

2021
Mine Permit Surface Water Quality Monitoring Data
STRE001 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	STRE001 Seasonal Benchmark				STRE001 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/18/21		4/20/21		8/10/21		10/14/21	
Field														
D.O.	ppm	--	--	--	--	--	**13**		**13**		**8.4**		**9.5**	
Flow	cfs	--	--	--	--	--	**8.8**		**17**		**13**		**14**	
pH	SU	--	7.3-8.3	7.0-8.0	7.1-8.1	7.2-8.2	**8.1**		**7.4**		**8.0**		**7.5**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**109**		**126**		**146**		**135**	
Temperature	°C	--	--	--	--	--	**0.0**		**3.7**		**12**		**11**	
Metals														
Aluminum	ug/L	50	--	339	--	--	--		**77**		--		--	
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		**1.3**		**1.2**	
Barium	ug/L	10.0	--	40	--	--	--		**10**		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	96	327	109	160	**108**		**127**	e	**177**		**104**	**e**
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	94	**13**		**16**		**24**		**12**	
Mercury	ng/L	0.50	2.0	8.6	2.0	2.2	**0.58**		**1.8**		**1.2**		**1.1**	
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	e	<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	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	81	--	--	--		**57**		--		--	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.06**		--		--	
Sulfate	mg/L	1.0	6.1	4.0	4.0	4.0	**3.6**		**3.1**	e	**3.1**		**3.6**	e
Major Cations														
Calcium	mg/L	0.50	--	24	--	--	--		**19**	e	--		--	
Magnesium	mg/L	0.50	--	4.6	--	--	--		**3.8**		--		--	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.70**	e	--		--	
Sodium	mg/L	0.50	--	2.0	--	--	--		**1.2**	e	--		--	
General														
Hardness	mg/L	3.0	--	78	--	--	--		**64**		--		--	
TDS	mg/L	50	200	200	200	200	**58**	e	**57**	e	**66**		**90**	e

2021
Mine Permit Surface Water Quality Monitoring Data
STRE002 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	STRE002 Seasonal Benchmark				STRE002 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/18/21		4/20/21		8/10/21		10/13/21	
Field														
D.O.	ppm	--	--	--	--	--	**14**		**13**		**9.7**		**9.9**	
Flow	cfs	--	--	--	--	--	**9.1**		**22**		**15**		**22**	
pH	SU	--	7.3-8.3	7.6-8.6	7.4-8.4	7.2-8.2	**7.3**		**7.6**		**7.8**		**7.6**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**147**		**121**		**149**		**137**	
Temperature	°C	--	--	--	--	--	**0.0**		**2.0**		**13**		**12**	
Metals														
Aluminum	ug/L	50	--	200	--	--	--		**60**		--		--	
Antimony	ug/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Arsenic	ug/L	1.0	4.0	4.0	4.0	4.0	**1.1**		<1.0		**1.4**		**1.2**	
Barium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	**103**		**118**	e	**133**		**201**	e
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	**12**		**12**		**26**		**24**	
Mercury	ng/L	0.50	2.0	4.8	2.0	2.0	**0.71**		**1.5**		**0.65**		**1.9**	
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	e	<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	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	81	--	--	--		**55**		--		--	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.06**		--		--	
Sulfate	mg/L	1.0	5.7	4.0	4.0	4.0	**3.7**		**3.0**	e	**3.1**		**3.3**	e
Major Cations														
Calcium	mg/L	0.50	--	24	--	--	--		**19**	e	--		--	
Magnesium	mg/L	0.50	--	4.7	--	--	--		**3.6**		--		--	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.79**	e	--		--	
Sodium	mg/L	0.50	--	2.0	--	--	--		**1.3**	e	--		--	
General														
Hardness	mg/L	3.0	--	80	--	--	--		**61**		--		--	
TDS	mg/L	50	200	200	200	200	**57**	e	**54**	e	**55**		**62**	e

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

2021
Mine Permit Surface Water Quality Monitoring Data
STRE005 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	STRE005 Seasonal Benchmark				STRE005 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/18/21		4/20/21		8/10/21		10/13/21	
Field														
D.O.	ppm	--	--	--	--	--	**14**		**13**		**8.7**		**9.1**	
Flow	cfs	--	--	--	--	--	**0.50**		**1.1**		**0.50**		**1.4**	
pH	SU	--	7.1-8.1	6.8-7.8	7.3-8.3	7.0-8.0	**8.2**		**7.5**		**7.8**		**7.6**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**63**		**115**		**165**		**142**	
Temperature	°C	--	--	--	--	--	**0.0**		**1.9**		**17**		**14**	
Metals														
Aluminum	ug/L	50	--	1,722	--	--	--		<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	--	--	--		<10.0		--		**--**	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	489	1,218	501	259	**203**		**129**	e	**215**		**141**	e
Lead	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Lithium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Manganese	ug/L	10.0	66	93	40	40	**31**		**24**		**56**		**21**	
Mercury	ng/L	0.50	2.0	17	2.0	2.0	**0.84**		**1.3**		**0.68**		**1.9**	
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	e	<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	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	60	--	--	--		**54**		--		**--**	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		**--**	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.08**		--		**--**	
Sulfate	mg/L	1.0	6.1	4.0	4.0	6.4	**3.0**		**2.2**	e	**1.2**		**2.8**	e
Major Cations														
Calcium	mg/L	0.50	--	17	--	--	--		**18**	e	--		**--**	
Magnesium	mg/L	0.50	--	3.0	--	--	--		**3.3**		--		**--**	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.96**	e	--		**--**	
Sodium	mg/L	0.50	--	2.0	--	--	--		**1.1**	e	--		--	
General														
Hardness	mg/L	3.0	--	55	--	--	--		**60**		--		**--**	
TDS	mg/L	50	200	200	200	200	**66**	e	**61**	e	**75**		**63**	e

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

2021
Mine Permit Surface Water Quality Monitoring Data
STRE009 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	STRE009 Seasonal Benchmark				STRE009 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/23/21		4/21/21		8/10/21		10/12/21	
Field														
D.O.	ppm	--	--	--	--	--	**12**		**13**		**9.8**		**10**	
Flow	cfs	--	--	--	--	--	**3.9**		**4.5**		**4.3**		**4.7**	
pH	SU	--	7.3-8.3	6.9-7.9	7.2-8.2	6.8-7.8	**7.4**		**7.6**		**7.6**		**7.7**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**125**		**113**		**128**		**121**	
Temperature	°C	--	--	--	--	--	**2.4**		**3.2**		**15**		**11**	
Metals														
Aluminum	ug/L	50	--	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		<1.0		**1.1**		**1.0**	
Barium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	400	224	114	**103**		**72**	e	**119**		**114**	e
Lead	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Lithium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Manganese	ug/L	10.0	40	40	36	40	**12**		<10.0		**15**		**14**	
Mercury	ng/L	0.50	2.0	6.6	2.9	2.0	<0.50		**0.75**		**0.63**		**0.61**	
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	e	<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	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	57	--	--	--		**56**		--		**--**	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		**--**	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		<0.05		--		**--**	
Sulfate	mg/L	1.0	5.7	4.0	4.0	10	**3.5**		**3.1**	e	**2.8**		**2.8**	e
Major Cations														
Calcium	mg/L	0.50	--	17	--	--	--		**17**	e	--		**--**	
Magnesium	mg/L	0.50	--	3.3	--	--	--		**3.2**		--		**--**	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.60**	e	--		**--**	
Sodium	mg/L	0.50	--	2.0	--	--	--		**1.0**	e	--		**--**	
General														
Hardness	mg/L	3.0	--	56	--	--	--		**56**		--		**--**	
TDS	mg/L	50	200	200	200	200	**60**	e	**53**	e	**54**		**50**	e

2021
Mine Permit Surface Water Quality Monitoring Data
STRE010 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	STRE010 Seasonal Benchmark				STRE010 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/18/21		4/20/21		8/10/21		10/12/21	
Field														
D.O.	ppm	--	--	--	--	--	**13**		**13**		**10**		**10**	
Flow	cfs	--	--	--	--	--	**3.3**		**3.6**		**3.1**		**4.1**	
pH	SU	--	7.3-8.3	6.9-7.9	7.2-8.2	7.0-8.0	**7.6**		**7.5**		**7.9**		**7.7**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**124**		**120**		**135**		**127**	
Temperature	°C	--	--	--	--	--	**1.2**		**4.4**		**11**		**11**	
Metals														
Aluminum	ug/L	50	--	431	--	--	--		**65**		--		**--**	
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	--	--	--		<10.0		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	514	135	97	**171**		**130**	e	**95**		**136**	e
Lead	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Lithium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Manganese	ug/L	10.0	40	43	40	40	**20**		**12.6**		**13.7**		**17.6**	
Mercury	ng/L	0.50	2.0	9.7	2.0	2.0	**0.96**		**1.3**		**0.54**		**0.73**	
Molybdenum	ug/L	10	--	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	e	<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	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	55	--	--	--		**54**		--		**--**	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		**--**	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.10**		--		**--**	
Sulfate	mg/L	1.0	5.7	4.0	4.0	4.0	**2.9**		**2.6**	e	**2.4**		**2.5**	e
Major Cations														
Calcium	mg/L	0.50	--	16	--	--	--		**18**	e	--		**--**	
Magnesium	mg/L	0.50	--	3.0	--	--	--		**3.2**		--		**--**	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.68**	e	--		**--**	
Sodium	mg/L	0.50	--	2.0	--	--	--		<1.0	e	--		**--**	
General														
Hardness	mg/L	3.0	--	52	--	--	--		**59**		--		**--**	
TDS	mg/L	50	200	200	200	200	**54**	e	<50.0	e	**55**		**52**	e

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

2021
Mine Permit Surface Water Quality Monitoring Data
YDRM002 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	YDRM002 Seasonal Benchmark				YDRM002 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/17/21		4/7/21		8/9/21		10/12/21	
Field														
D.O.	ppm	--	--	--	--	--	**11**		**9.6**		**7.5**		**7.8**	
Flow	cfs	--	--	--	--	--	**11**		**76**		**7.6**		**9.5**	
pH	SU	--	7.3-8.3	6.1-7.1	6.6-7.6	6.6-7.6	**7.3**		**6.3**		**7.3**		**7.4**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**27**		**50**		**95**		**83**	
Temperature	°C	--	--	--	--	--	**0.0**		**8.2**		**19**		**15**	
Metals														
Aluminum	ug/L	50	--	200	--	--	--		**139**		--		**--**	
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		**1.1**	
Barium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	6.8	4.0	4.0	<1.0		<1.0		<1.0		<1.0	
Iron	ug/L	20	165	1,192	1,270	1,207	**608**		**522**	e	**934**		**916**	e
Lead	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Lithium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Manganese	ug/L	10.0	40	50	40	40	**28**		**27**		**23**		**28**	
Mercury	ng/L	0.50	2.0	8.1	3.1	6.0	**1.2**		**3.9**		**2.2**		**1.2**	
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	e	<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	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	30	--	--	--		**9.0**		--		**--**	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		**--**	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.08**		--		**--**	
Sulfate	mg/L	1.0	5.7	10	4.0	24	**3.4**		**1.5**	e	**3.9**		**3.7**	e
Major Cations														
Calcium	mg/L	0.50	--	10	--	--	--		**4.2**	e	--		**--**	
Magnesium	mg/L	0.50	--	2.1	--	--	--		<1.0		--		**--**	
Potassium	mg/L	0.50	--	2.0	--	--	--		<0.50	e	--		--	
Sodium	mg/L	0.50	--	2.0	--	--	--		<1.0	e	--		--	
General														
Hardness	mg/L	3.0	--	32	--	--	--		<3.0		--		**--**	
TDS	mg/L	50	200	200	200	200	<50.0	e	<50.0	e	<50.0		<50.0	e

2021
Mine Permit Surface Water Quality Monitoring Data
CDRM004 (Compliance)
Eagle Mine

Parameter	Unit	Permit RL	CDRM004 Seasonal Benchmark				CDRM004 Data (Q1-Q4 2021)							
			Q1	Q2	Q3	Q4	Q1 2021		Q2 2021		Q3 2021		Q4 2021	
			Winter Baseflow	Spring Snowmelt & Runoff	Summer Baseflow	Fall Rain	Winter Baseflow		Spring Snowmelt & Runof		Summer Baseflow		Fall Rain	
							2/22/21		4/21/21		8/9/21		10/14/21	
Field														
D.O.	ppm	--	--	--	--	--	**14**		**13**		**10**		**10**	
Flow	cfs	--	--	--	--	--	**13**		**15**		**10**		**16**	
pH	SU	--	7.3-8.3	7.2-8.2	7.2-8.2	7.2-8.2	**7.9**		**7.7**		**7.8**		**7.8**	
Specific Conductance	µS/cm @ 25°C	--	--	--	--	--	**144**		**121**		**159**		**144**	
Temperature	°C	--	--	--	--	--	**0.80**		**2.3**		**12**		**12**	
Metals														
Aluminum	ug/L	50	--	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	**1.3**		**1.2**		**2.6**		**2.2**	
Barium	ug/L	10.0	--	40	--	--	--		<10.0		--		--	
Beryllium	ug/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Boron	ug/L	50	200	200	200	200	<50.0	e	<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	358	309	195	**96**		**93**	e	**147**		**278**	e
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	**13**		**12**		**17**		**37**	
Mercury	ng/L	0.50	2.0	8.1	2.0	2.0	<0.50		**1.1**		**1.0**		**2.0**	
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	e	<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	e	<10.0	e	<10.0		<10.0	
Major Anions														
Alkalinity, Bicarbonate	mg/L	2.0	--	85	--	--	--		**57**		--		--	
Alkalinity, Carbonate	mg/L	2.0	--	8.0	--	--	--		<2.0		--		--	
Chloride	mg/L	1.0	--	4.0	--	--	--		<1.0		--		--	
Fluoride	mg/L	0.10	--	0.40	--	--	--		<0.10	e	--		--	
Nitrogen, Nitrate	mg/L	0.05	--	0.20	--	--	--		**0.07**		--		--	
Sulfate	mg/L	1.0	5.7	4.0	4.0	4.0	**2.6**		**2.2**	e	**1.6**		**2.8**	e
Major Cations														
Calcium	mg/L	0.50	--	25	--	--	--		**18**	e	--		--	
Magnesium	mg/L	0.50	--	4.0	--	--	--		**3.0**		--		--	
Potassium	mg/L	0.50	--	2.0	--	--	--		**0.62**	e	--		--	
Sodium	mg/L	0.50	--	2.0	--	--	--		**1.1**	e	--		--	
General														
Hardness	mg/L	3.0	--	80	--	--	--		**58**		--		--	
TDS	mg/L	50	200	200	200	200	**77**	e	**57**	e	**63**		**94**	e

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

2021
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 K

Eagle Mine

Surface Water Monitoring

Trend Analysis Summary & Trending Charts

2021 Mine Permit Surface Water
Trend Analysis Summary
Eagle Mine

Location	Quarter	Classification	Parameter	Unit	# Samples	# NDs	Non-detects handling	# used in Runs Test	Min	Max	Mean	St. Dev.	# Above Mean	# Below Mean	# Equal Mean	# Runs	Criti- cal value	Sig Level	Trend Present	Remarks
STRE005	1	Compliance	Sulfate	mg/L	10	2	Included as RL	10	1.0	5.5	2.9	1.50	5	5	0	3	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE009	1	Compliance	Sulfate	mg/L	10	0	No NDs	10	3.2	4.6	3.9	0.50	6	4	0	2	3	0.05	Y	Non-unique RL in data
STRE010	1	Compliance	Sulfate	mg/L	10	0	No NDs	10	2.2	4.2	3.1	0.56	4	6	0	3	3	0.05	Y	
CDRM004	2	Reference	Sodium	mg/L	14	1	Included as RL	14	0.6	1.2	0.944	0.16	9	5	0	4	4	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
CDRM004	2	Reference	Sulfate	mg/L	14	11	Included as RL	14	1.00	5	1.80	1.40	5	9	0	3	4	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE001	2	Compliance	Potassium	mg/L	14	4	Included as RL	14	0.50	0.7	0.57	0.07	5	9	0	4	4	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE001	2	Compliance	Sodium	mg/L	14	0	No NDs	14	0.58	1.4	0.96	0.23	8	6	0	4	4	0.05	Y	Non-unique RL in data
STRE001	2	Compliance	Sulfate	mg/L	14	10	Included as RL	14	1.0	5.0	2	1.50	5	9	0	3	4	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE002	2	Compliance	Sulfate	mg/L	13	9	Included as RL	13	1.0	5	1.8	1.30	4	9	0	3	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE005	2	Compliance	Sodium	mg/L	10	3	Included as RL	10	0.50	1.2	0.86	0.22	4	6	0	2	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE005	2	Compliance	Sulfate	mg/L	10	7	Included as RL	10	1.0	2.2	1.3	0.48	3	7	0	2	2	0.05	Y	
STRE009	2	Compliance	Sulfate	mg/L	10	7	Included as RL	10	1.00	3.1	1.6	0.92	3	7	0	2	2	0.05	Y	
STRE010	2	Compliance	Sodium	mg/L	10	2	Included as RL	10	0.7	1.1	0.876	0.14	4	6	0	2	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE010	2	Compliance	Sulfate	mg/L	10	7	Included as RL	10	1	2.6	1.5	0.74	3	7	0	2	2	0.05	Y	
STRM002	2	Compliance	Chloride	mg/L	16	7	Included as RL	16	1.0	1.7	1.2	0.25	9	7	0	5	5	0.05	Y	
STRM002	2	Compliance	Mercury	ng/L	16	0	No NDs	16	1.6	5.54	3.47	1.11	8	8	0	3	5	0.05	Y	Non-unique RL in data
STRM002	2	Compliance	Potassium	mg/L	16	4	Included as RL	16	0.42	0.68	0.552	0.07	7	9	0	5	5	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRM004	2	Compliance	Sulfate	mg/L	13	10	Included as RL	13	1.0	5.0	1.5	1.10	4	9	0	3	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRM004	2	Compliance	TDS	mg/L	13	4	Included as RL	13	48	124	65.2	23.30	4	9	0	3	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRM005	2	Compliance	Sulfate	mg/L	12	9	Included as RL	12	1	2.7	1.4	0.70	3	9	0	2	2	0.05	Y	
YDRM002	2	Compliance	Chloride	mg/L	16	5	Included as RL	16	1.0	1.5	1.2	0.18	9	7	0	5	5	0.05	Y	
CDRM004	3	Reference	Arsenic	ug/L	12	0	No NDs	12	1.9	3.3	2.6	0.49	5	5	2	3	3	0.05	Y	
CDRM004	3	Reference	Sulfate	mg/L	12	9	Included as RL	12	1.0	5	1.8	1.50	2	10	0	2	2	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE002	3	Compliance	Mercury	ng/L	11	1	Included as RL	11	0.5	2.09	0.988	0.42	5	6	0	3	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE005	3	Compliance	TDS	mg/L	10	2	Included as RL	10	50	154	90	37.20	4	6	0	3	3	0.05	Y	
STRE010	3	Compliance	Sulfate	mg/L	10	6	Included as RL	10	1.0	2.8	1.5	0.74	4	6	0	2	3	0.05	Y	
STRM001	3	Background	Iron	ug/L	12	0	No NDs	12	651.0	5860.0	2167	1547.00	6	6	0	3	3	0.05	Y	Non-unique RL in data
STRM002	3	Compliance	Manganese	ug/L	12	6	Included as RL	12	10	23	12	4.62	2	10	0	2	2	0.05	Y	
STRM002	3	Compliance	Sulfate	mg/L	12	9	Included as RL	12	1	5	1.8	1.50	2	10	0	2	2	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRM004	3	Compliance	Sulfate	mg/L	11	8	Included as RL	11	1.0	5.0	1.6	1.20	4	7	0	3	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
CDRM004	4	Reference	TDS	mg/L	16	2	Included as RL	16	50.0	100.0	81.3	16.60	10	6	0	5	5	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)
STRE001	4	Compliance	Mercury	ng/L	13	0	No NDs	13	0.5	6.0	1.606	1.44	4	9	0	3	3	0.05	Y	Non-unique RL in data
STRE010	4	Compliance	Sulfate	mg/L	11	7	Included as RL	11	1.0	2.9	1.6	0.80	4	7	0	3	3	0.05	Y	Non-unique RL in data (NDs included in Runs Test as equal to RL)

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.

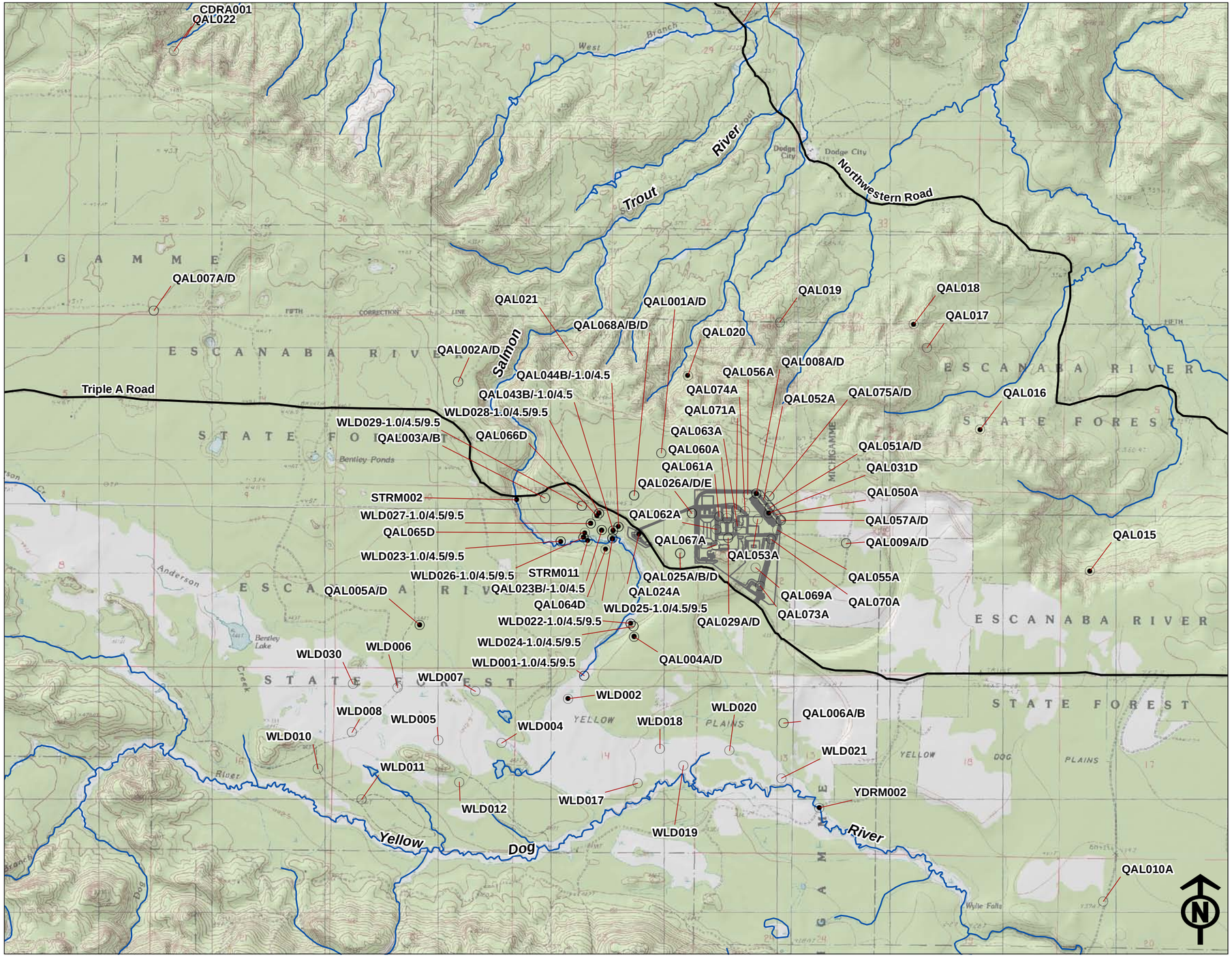
Note: Sulfate trend analysis period is 2005-2021 to eliminate effect of high previous RL. No Y* cases were identified in 2021.

Appendix L

Eagle Mine

Water Level Monitoring Location Map

MINE PERMIT WATER LEVEL MONITORING LOCATION MAP



Reference

Data provided by: Eagle Mine and North Jackson Company

Projection & Datum: UTM NAD 83 Zone 16N

0 — 1 Miles

Scale: 1:36,000

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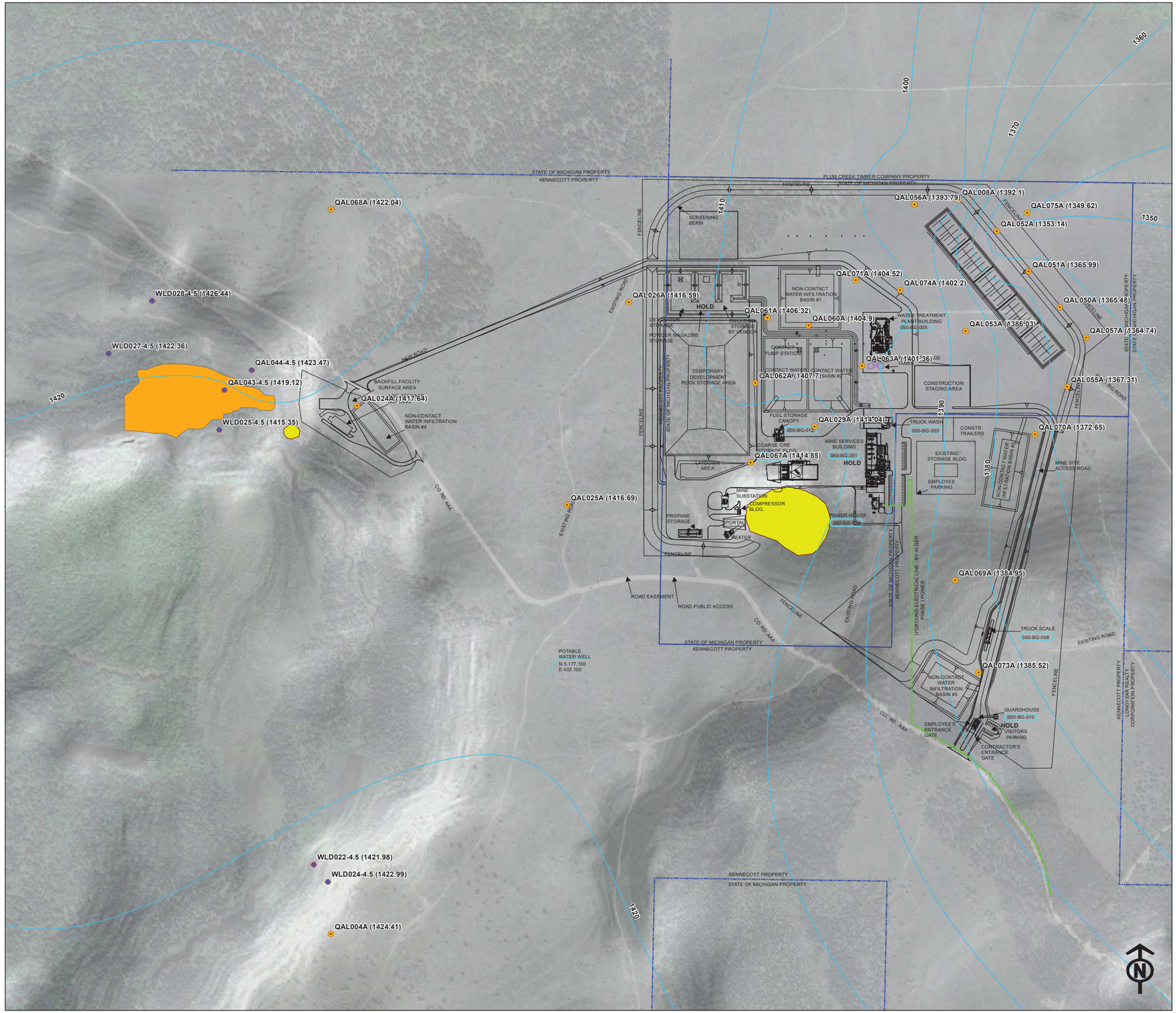
Appendix M

Eagle Mine

Groundwater Contour Maps



A-ZONE GROUNDWATER ELEVATION CONTOURS
WINTER BASEFLOW FEBRUARY-MARCH 2021

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

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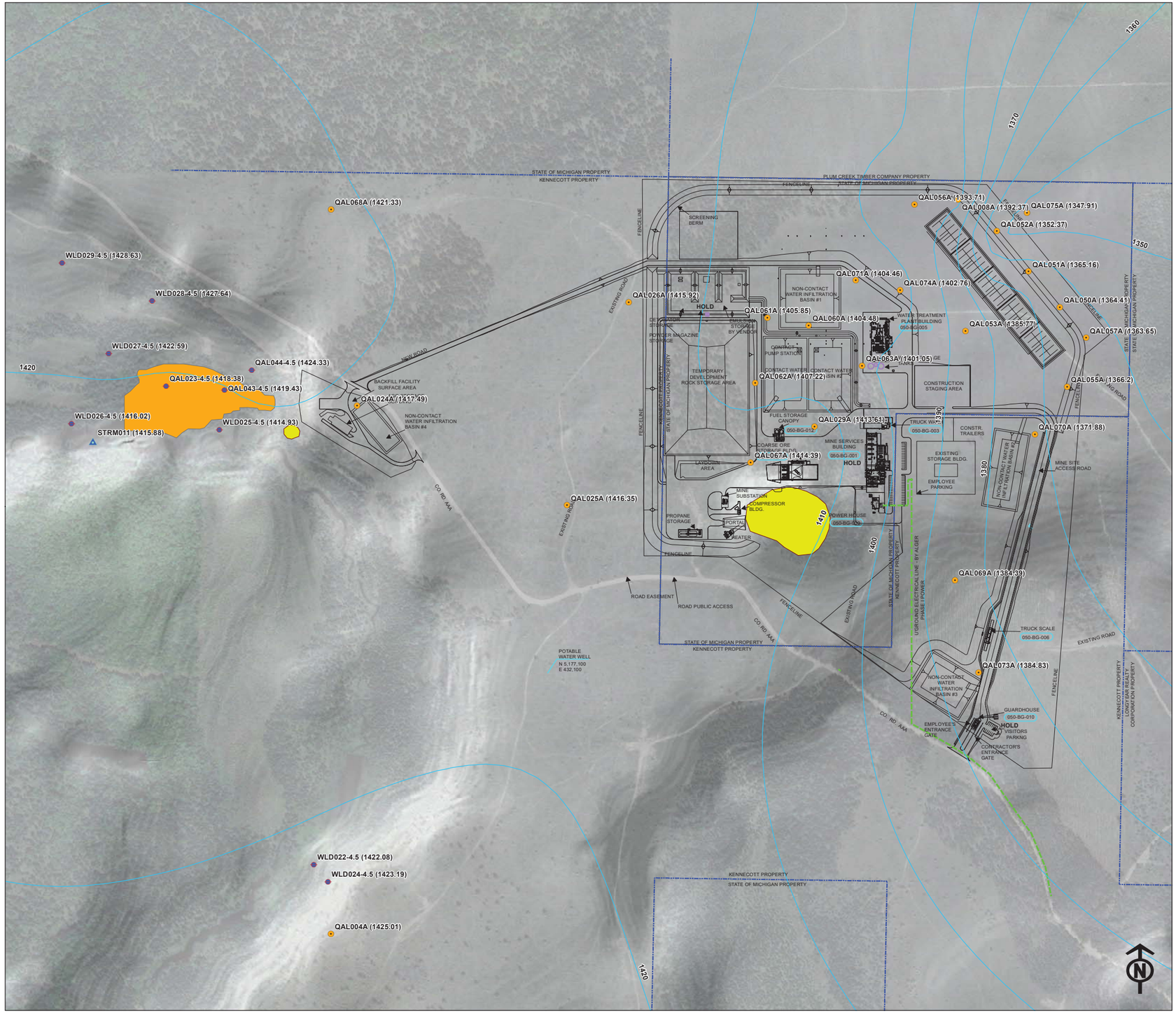
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1



A-ZONE GROUNDWATER ELEVATION CONTOURS SPRING RUNOFF, APR-MAY 2021

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
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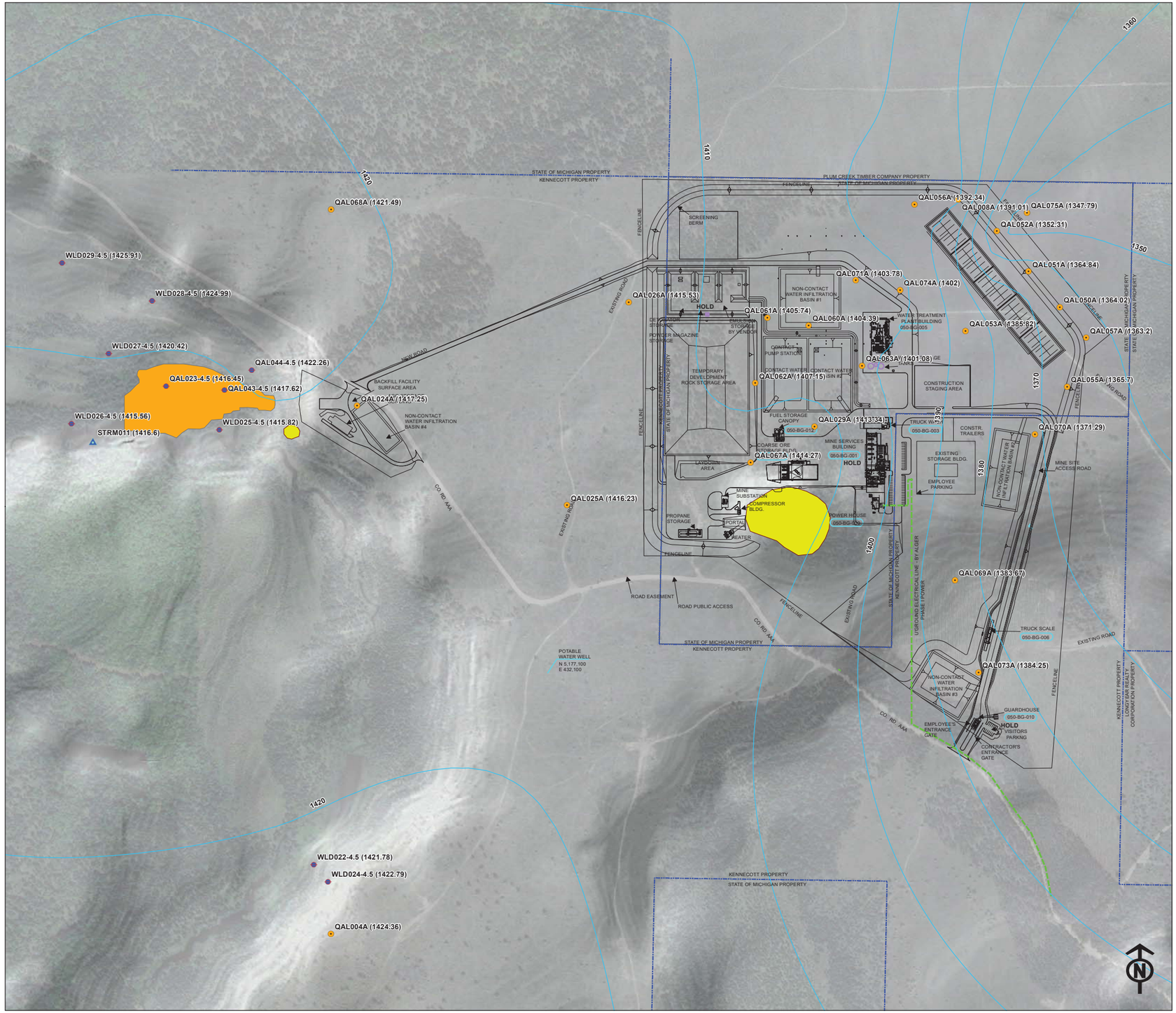
North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1



A-ZONE GROUNDWATER ELEVATION CONTOURS SUMMER BASEFLOW, AUGUST 2021

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

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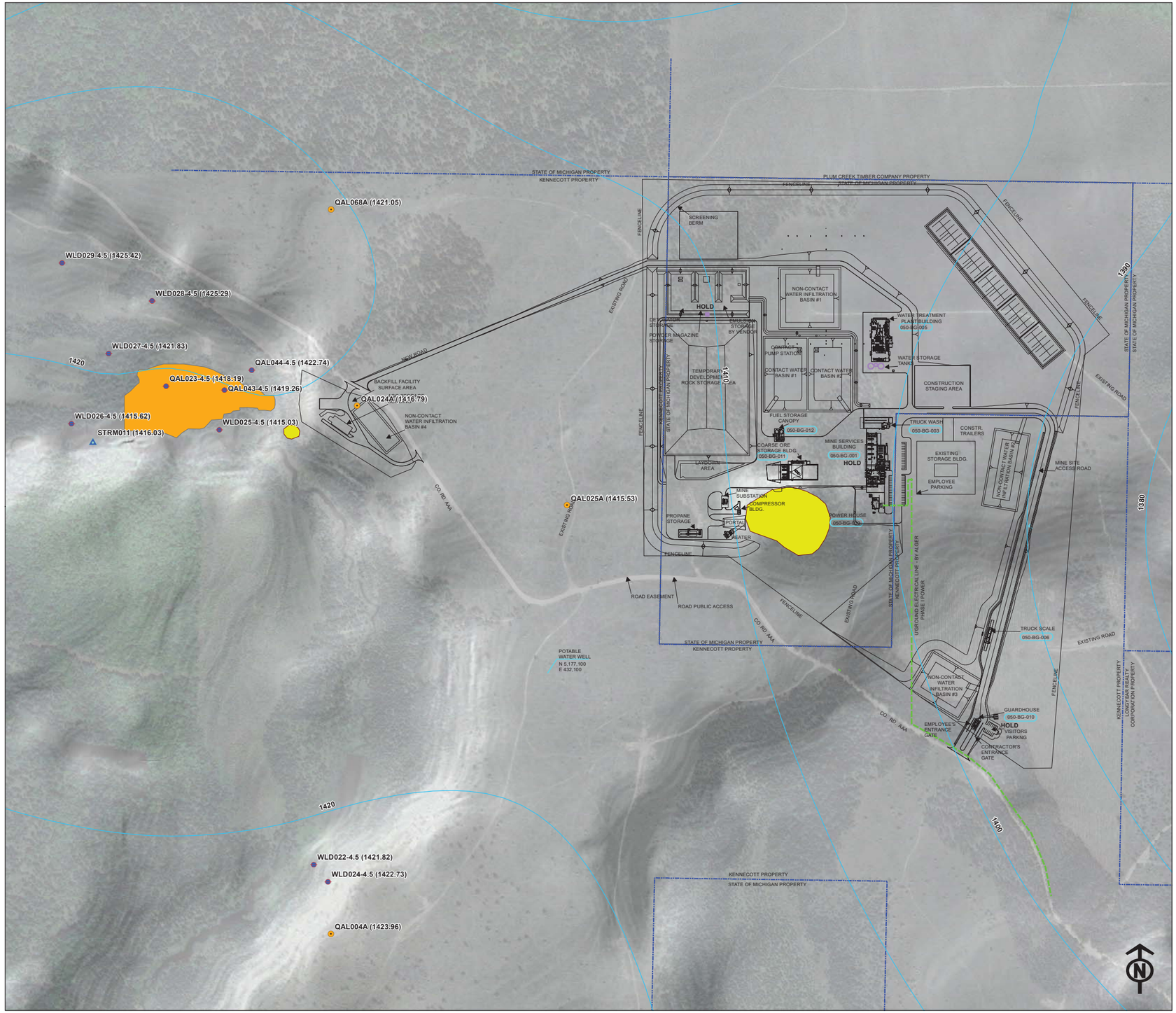
Figure: 1

A-ZONE GROUNDWATER ELEVATION CONTOURS
FALL RAIN RUNOFF, OCT-NOV 2021



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

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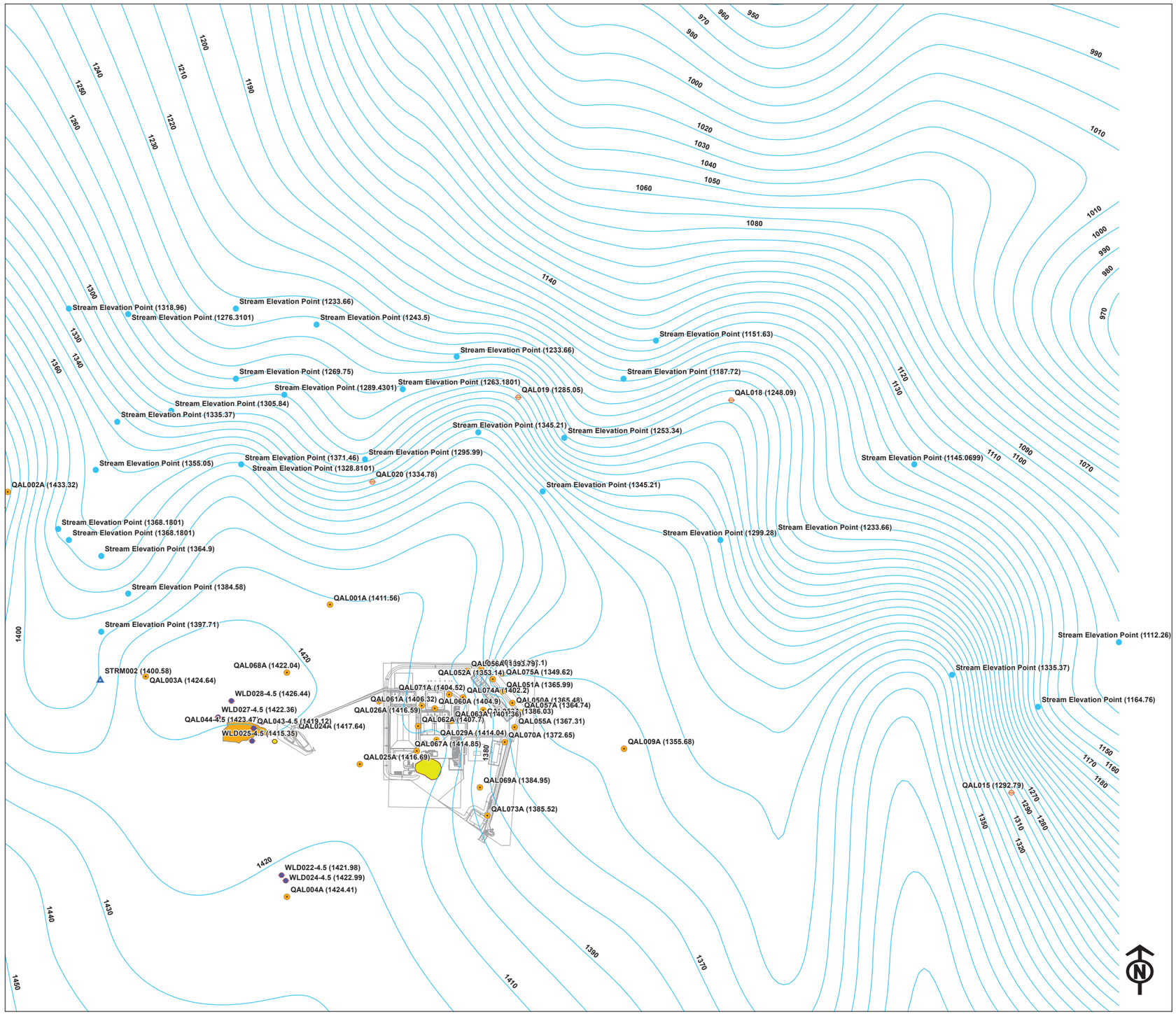
Figure: 1



A-ZONE GROUNDWATER ELEVATION CONTOURS
WINTER BASEFLOW, FEBRUARY-MARCH 2021

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 1,450 2,900 Feet

1:11,634

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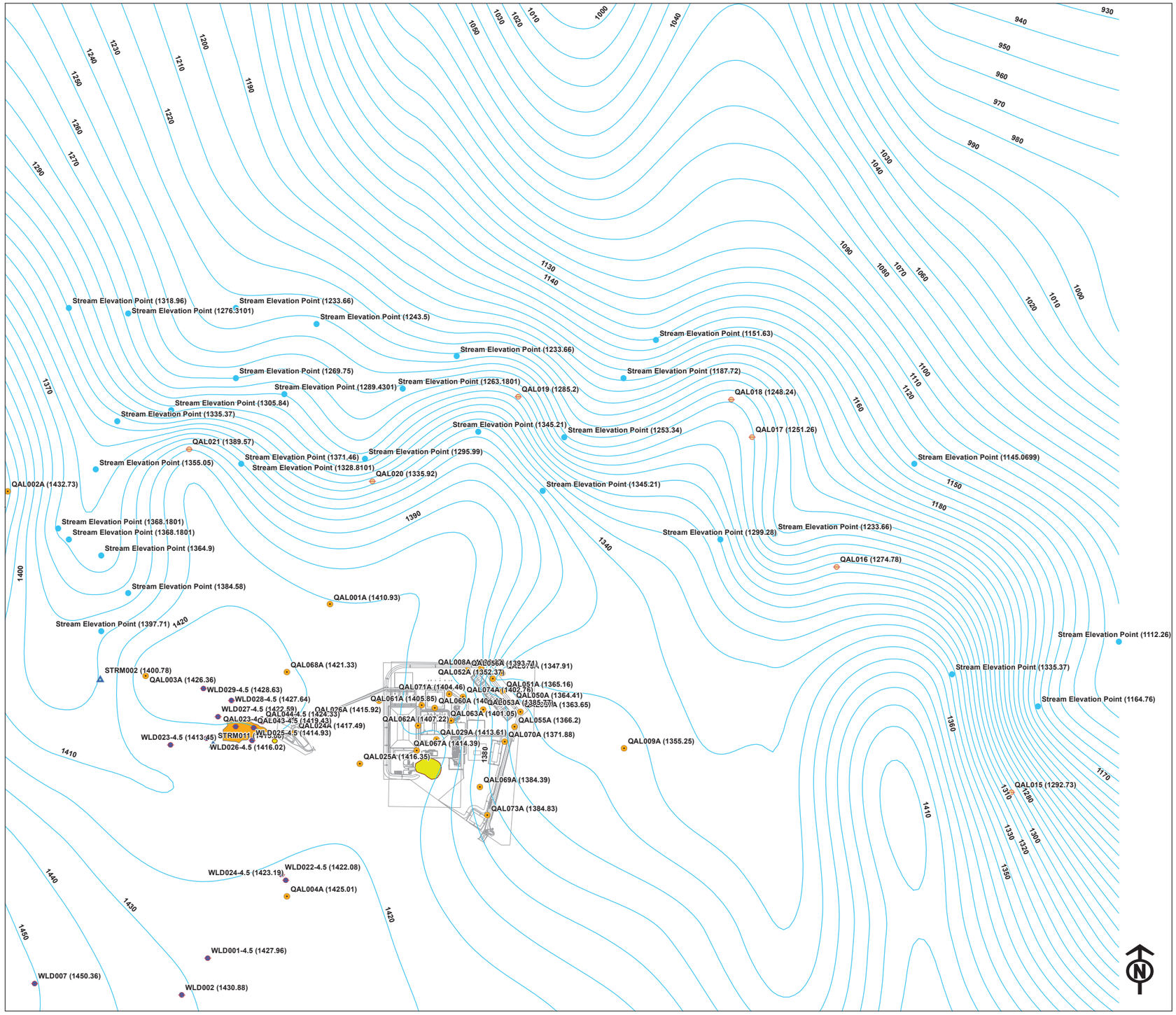
Figure: 1

A-ZONE GROUNDWATER ELEVATION CONTOURS
SPRING RUNOFF, APR-MAY 2021



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 1,450 2,900 Feet

1:11,634

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Figure: 1

A-ZONE GROUNDWATER ELEVATION CONTOURS SUMMER BASEFLOW, AUGUST 2021

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 1,400 2,800 Feet

1:11,634

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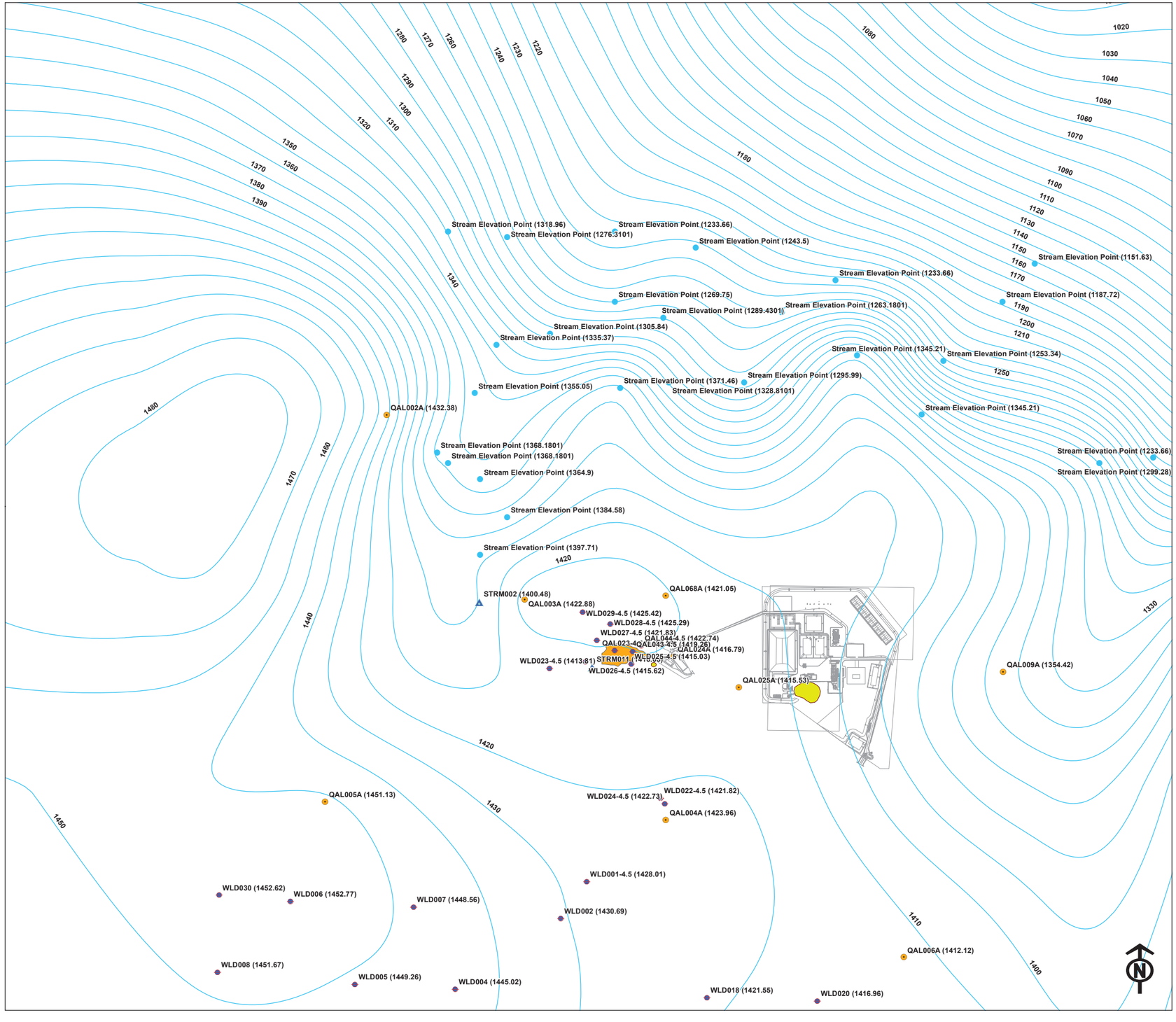
Figure: 1

A-ZONE GROUNDWATER ELEVATION CONTOURS
FALL RAIN RUNOFF, OCT-NOV 2021



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 1,450 2,900 Feet

1:11,634

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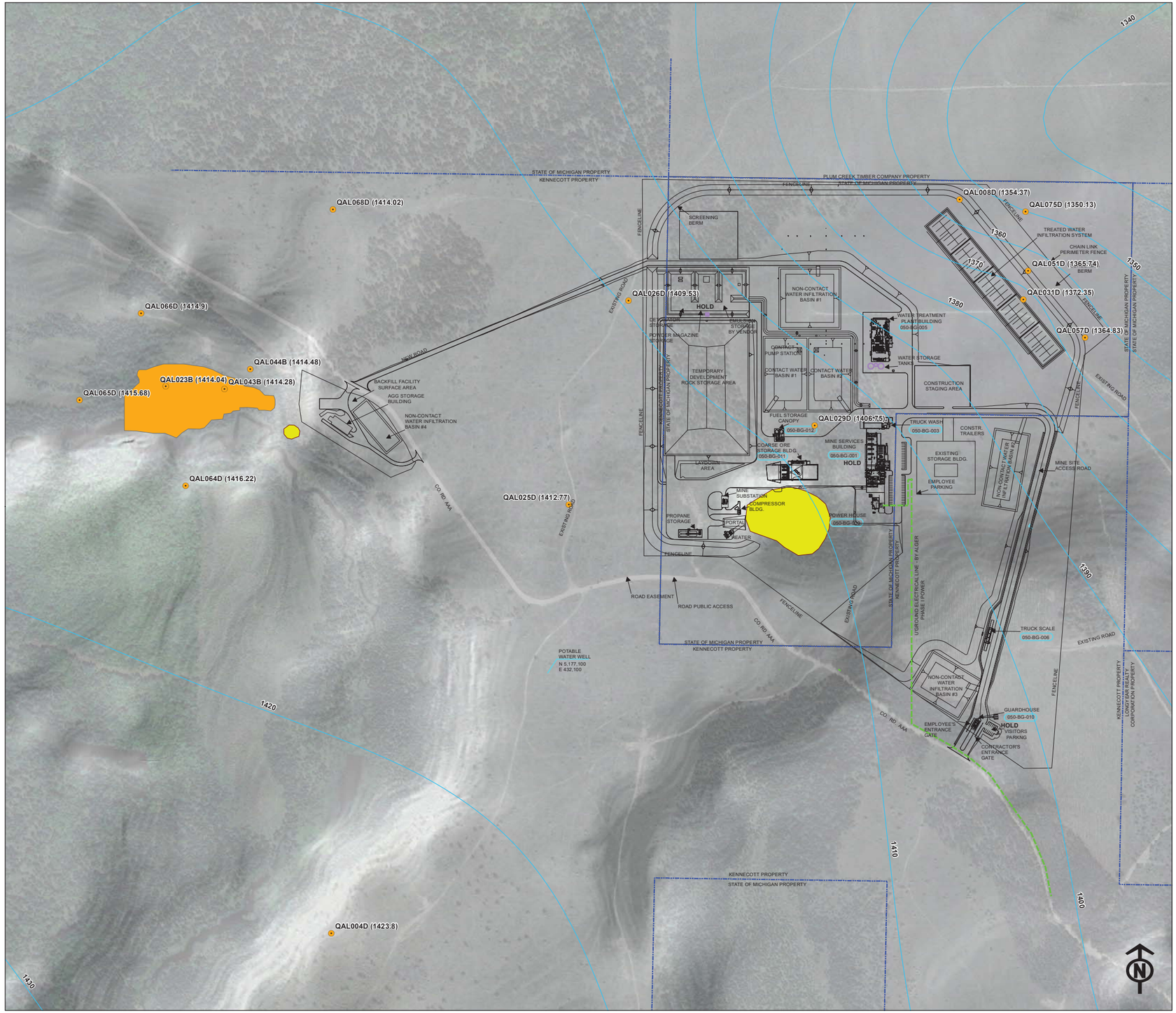
Figure: 1

D-ZONE GROUNDWATER ELEVATION CONTOURS
WINTER BASEFLOW, FEBRUARY-MARCH 2021
HS VIEW



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

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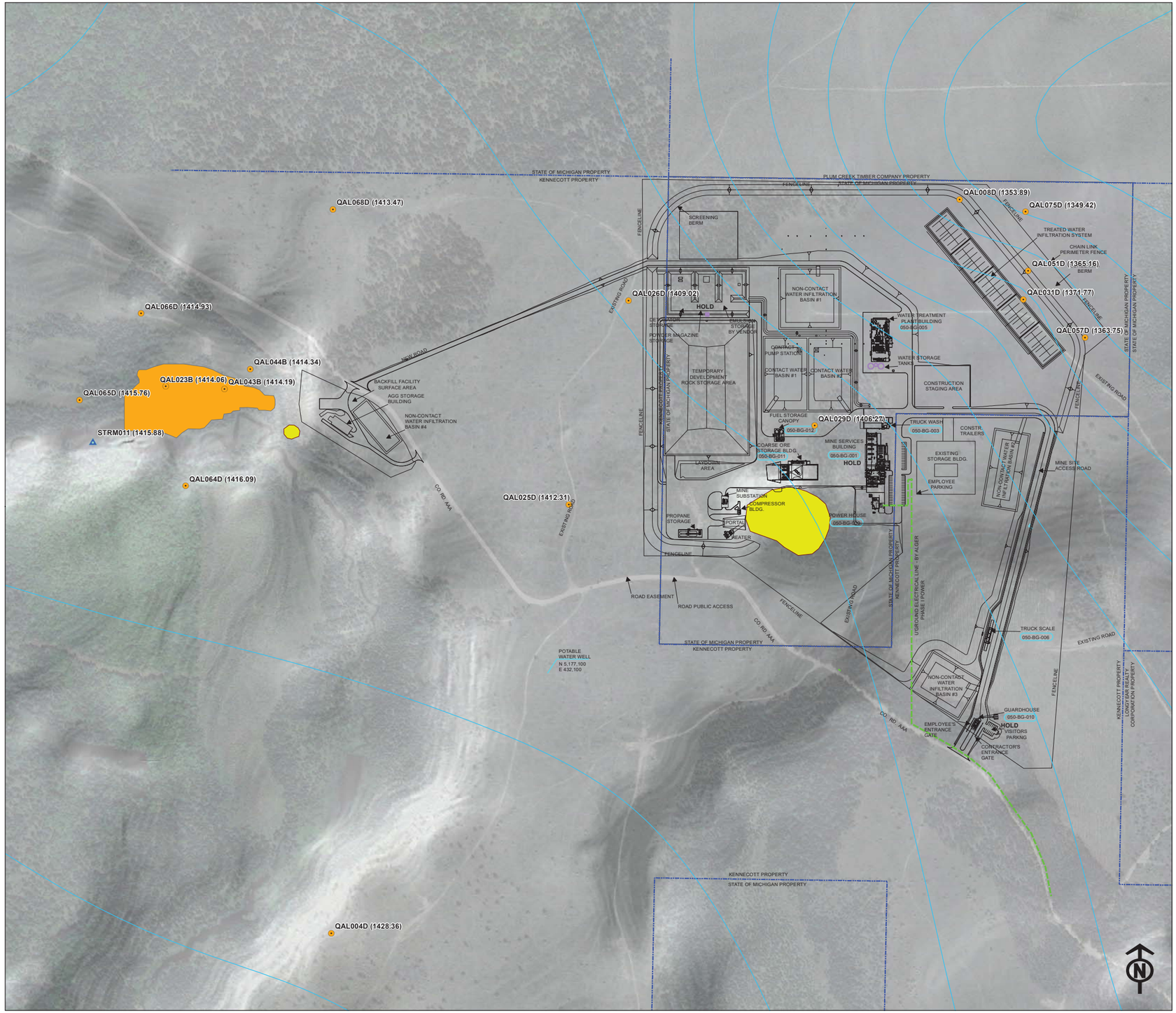
Figure: 1



D-ZONE GROUNDWATER ELEVATION CONTOURS
SPRING RUNOFF, APR-MAY 2021
HS VIEW

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
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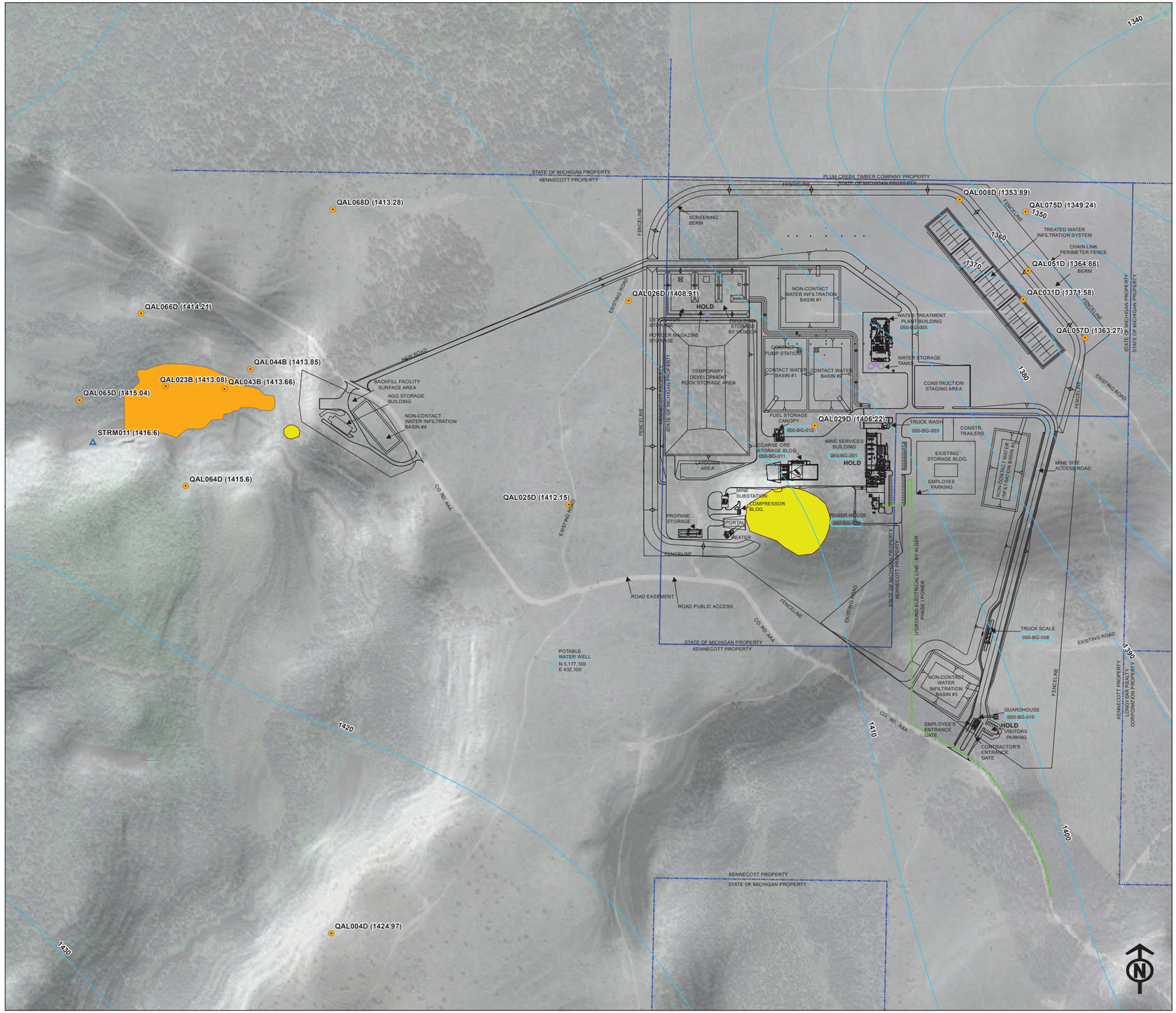
North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1

D-ZONE GROUNDWATER ELEVATION CONTOURS
SUMMER BASEFLOW, AUGUST 2021
HS VIEW



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

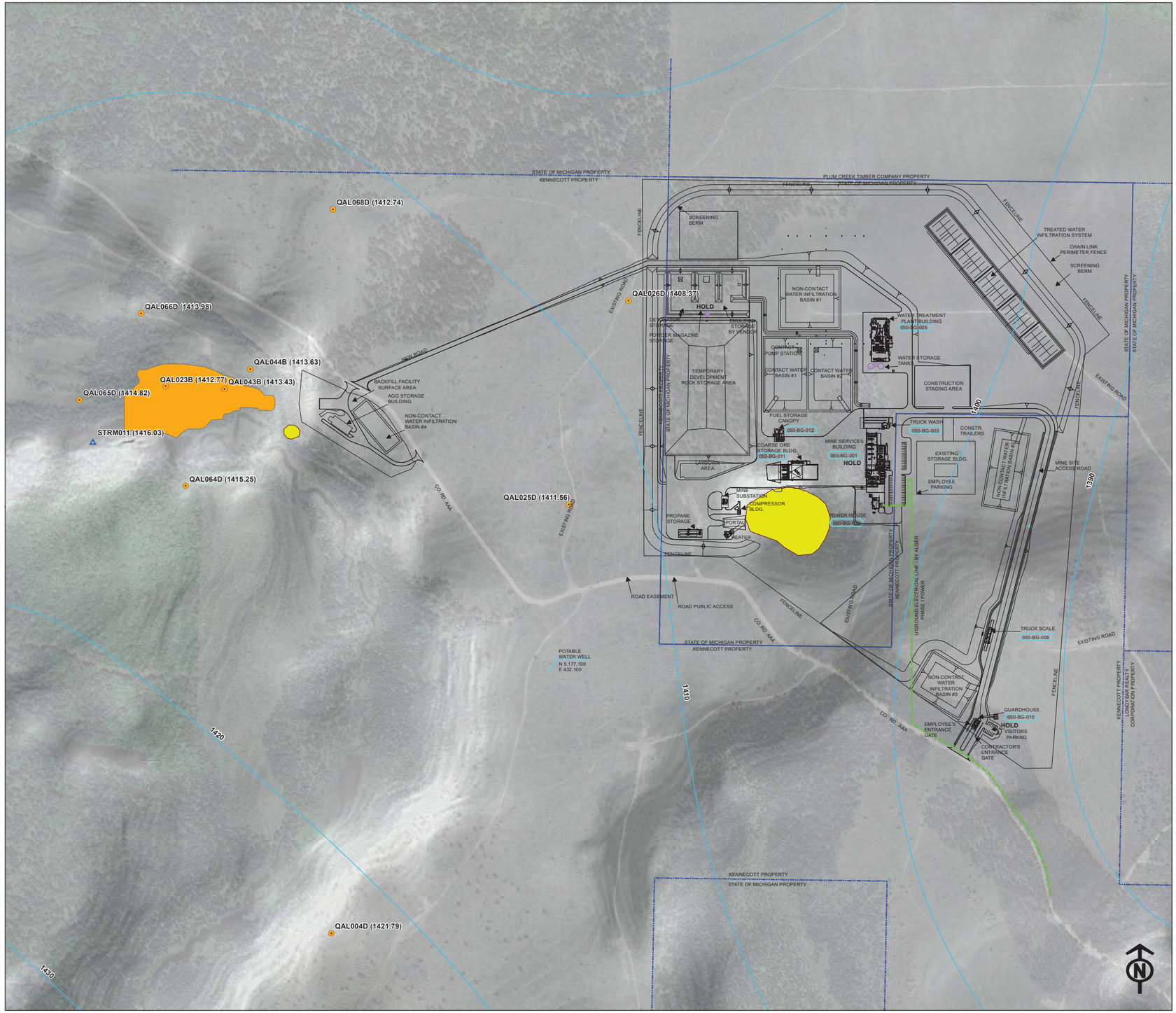
1:3,600

Eagle Mine
a subsidiary of hudbay mining

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1

D-ZONE GROUNDWATER ELEVATION CONTOURS
FALL RAIN RUNOFF, OCT-NOV 2021
HS VIEW



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

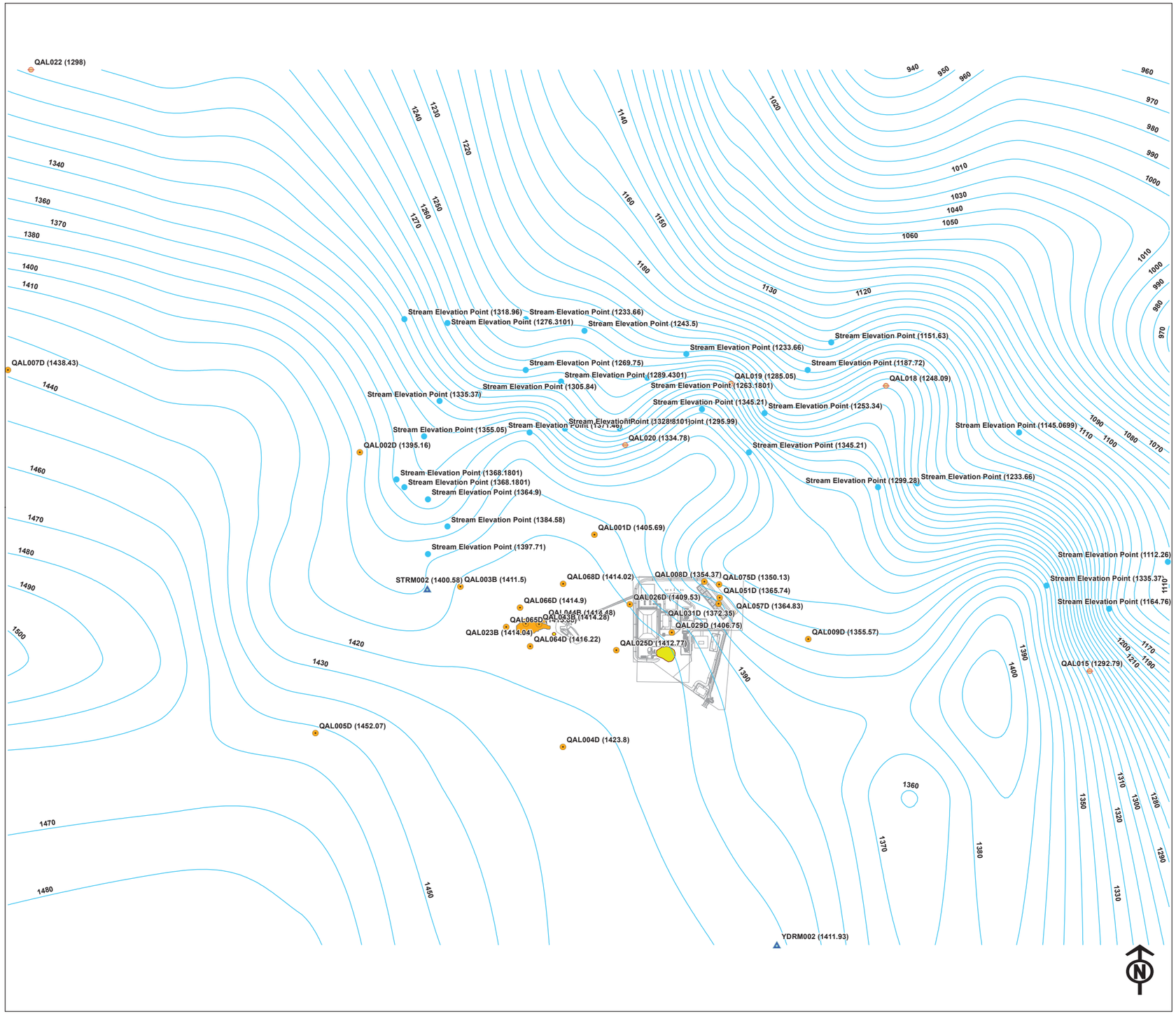
1:3,600

Eagle Mine
a subsidiary of kmdia mining

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1

D-ZONE GROUNDWATER ELEVATION CONTOURS
WINTER BASEFLOW, FEBRUARY-MARCH 2021



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 2,000 4,000 Feet

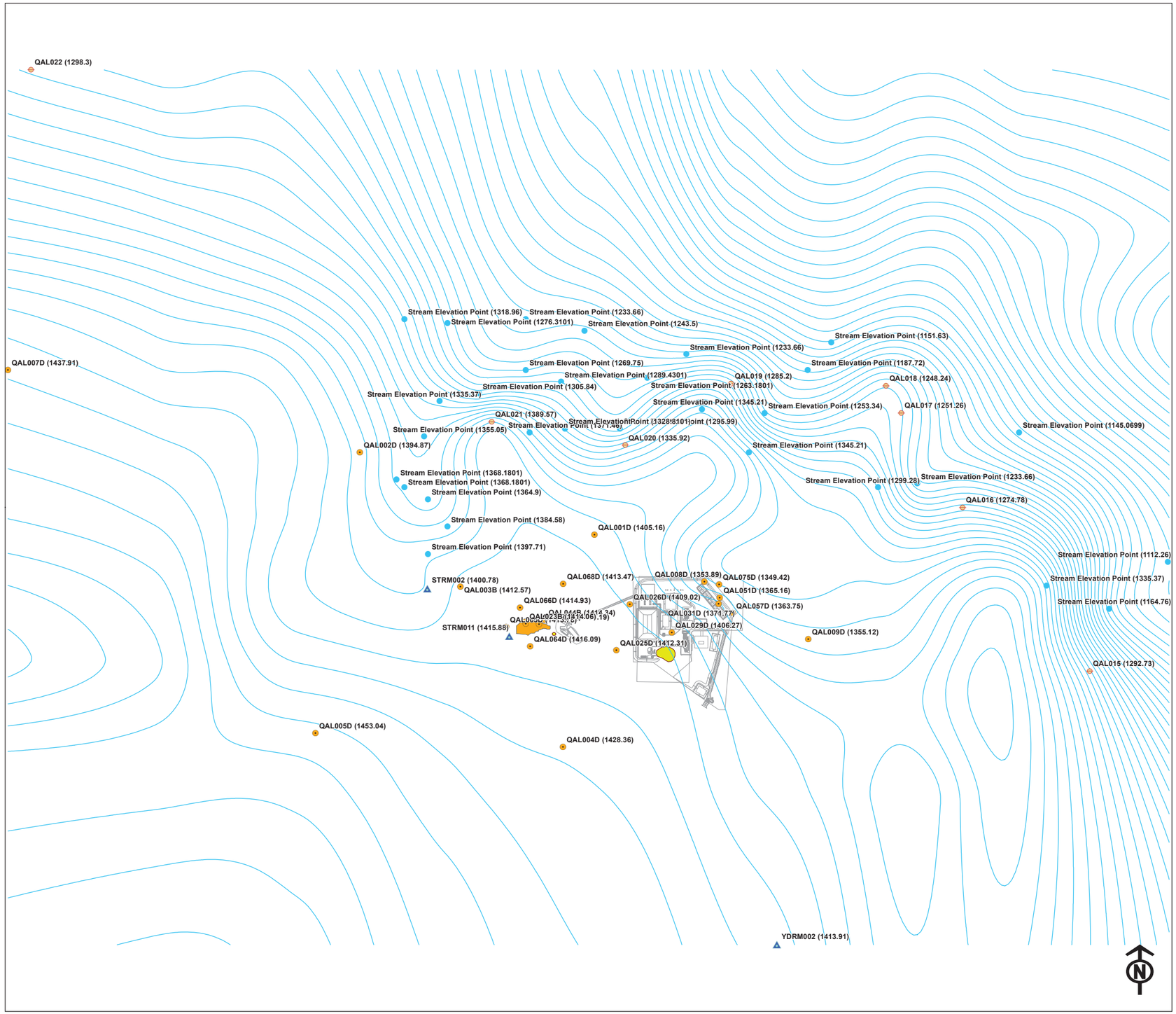
1:16,000

Eagle Mine
a subsidiary of hudbay mining

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1

D-ZONE GROUNDWATER ELEVATION CONTOURS
SPRING RUNOFF, APR-MAY 2021



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 2,000 4,000 Feet

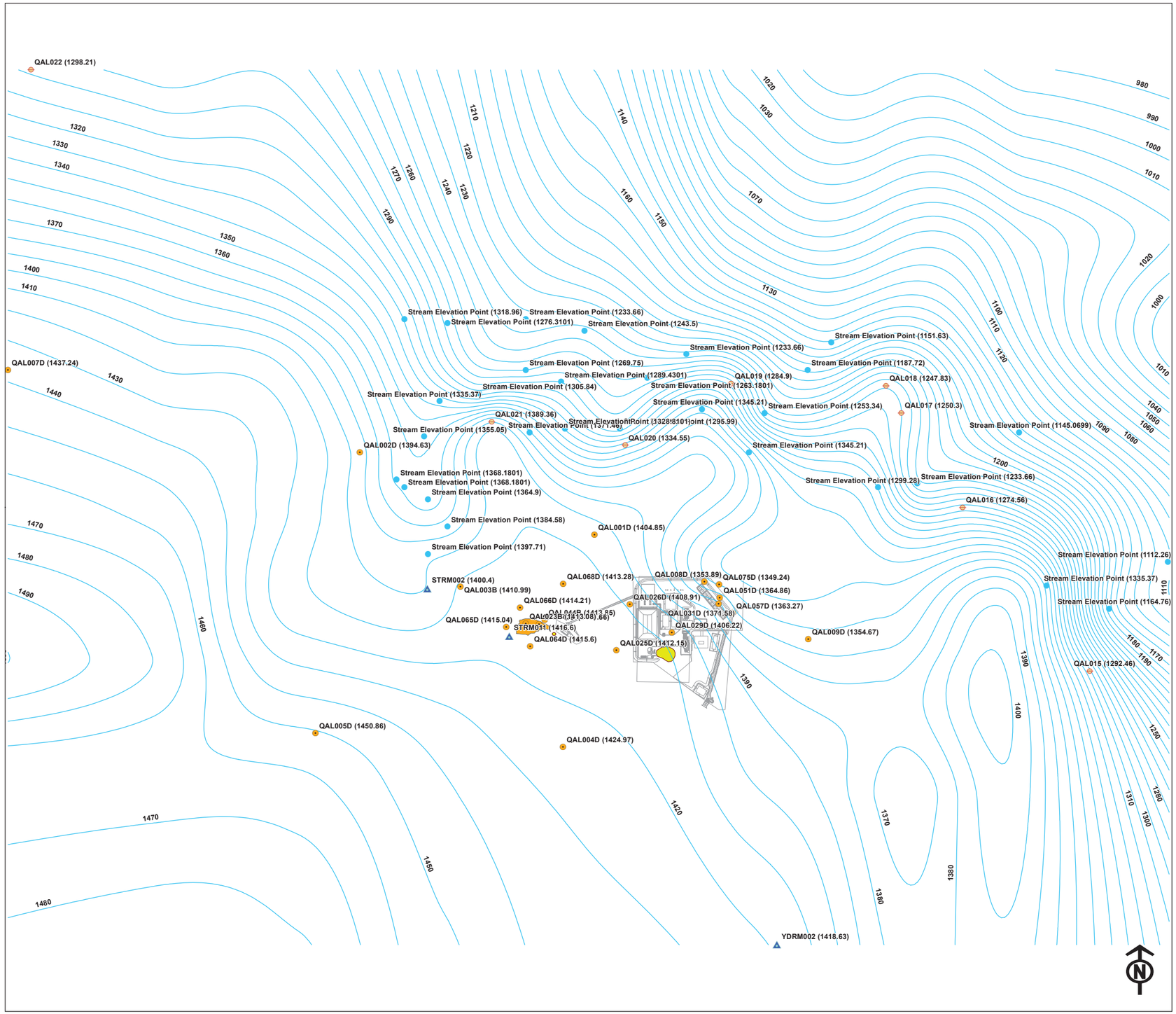
1:16,000

Eagle Mine
a subsidiary of hudbay mining

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1

D-ZONE GROUNDWATER ELEVATION CONTOURS
SUMMER BASEFLOW, AUGUST 2021



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 2,000 4,000 Feet

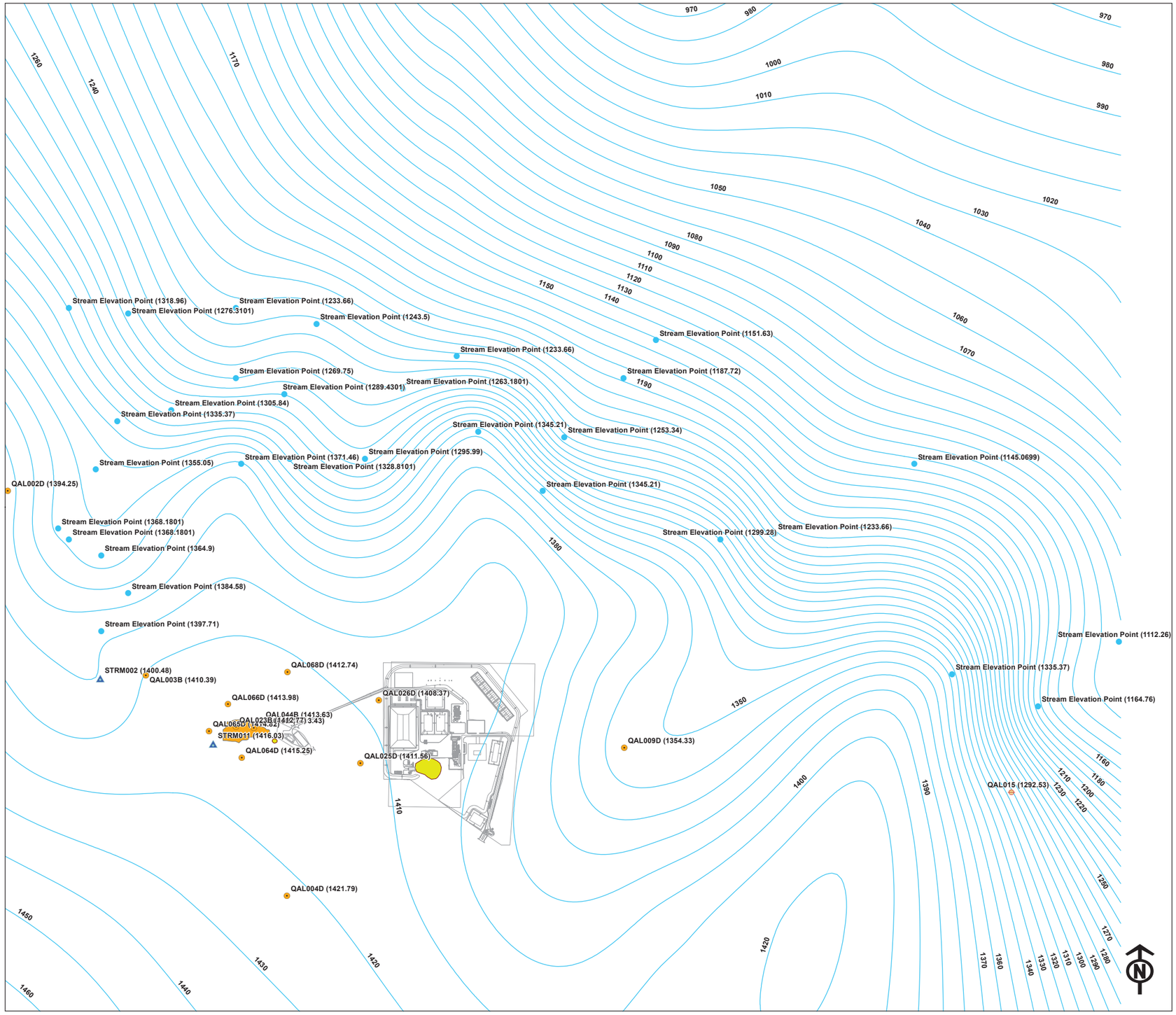
1:16,000

Eagle Mine
a subsidiary of hudbay mining

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1

D-ZONE GROUNDWATER ELEVATION CONTOURS
FALL RAIN RUNOFF, OCT-NOV 2021



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 1,450 2,900 Feet

1:11,634

Eagle Mine
a subsidiary of Lundin Mining

North Jackson Company
ENVIRONMENTAL SCIENCE & ENGINEERING

Figure: 1

Appendix N

Eagle Mine

Continuous Groundwater Level Results

2021 Water Year
Continuous Monitoring Results
Monitoring Well Locations
Eagle Mine

	QAL023B	QAL024A	QAL044B	QAL064D	QAL065D	QAL066D
Background						
Mean	1416.9	1417.8	1416.2	1418.7	1417.1	1416.9
Standard Dev.	0.4	0.4	0.4	0.7	0.4	0.3
Minimum	1415.7	1417.2	1414.9	1415.7	1416.1	1416.1
Maximum	1417.6	1418.5	1416.9	1419.6	1417.8	1417.5
Oct-20						
Mean	1414.8	1418.3	1415.3	1416.7	1416.1	1415.7
Minimum	1414.7	1418.3	1415.2	1416.5	1416.0	1415.6
Maximum	1414.9	1418.5	1415.4	1416.9	1416.3	1415.8
Nov-20						
Mean	1414.8	1418.1	1415.3	1416.6	1416.2	1415.7
Minimum	1414.6	1418.1	1415.1	1416.3	1416.1	1415.5
Maximum	1414.9	1418.2	1415.4	1416.8	1416.3	1415.9
Dec-20						
Mean	1414.6	1418.0	1415.1	1416.5	1416.1	1415.5
Minimum	1414.5	1417.9	1415.0	1416.2	1416.0	1415.4
Maximum	1414.7	1418.1	1415.2	1416.6	1416.2	1415.6
Jan-21						
Mean	1414.4	1417.8	1414.8	1416.3	1415.9	1415.3
Minimum	1414.3	1417.7	1414.7	1416.0	1415.8	1415.1
Maximum	1414.6	1417.9	1415.0	1416.5	1416.1	1415.5
Feb-21						
Mean	1414.1	1417.5	1414.6	1416.1	1415.7	1415.0
Minimum	1413.9	1417.5	1414.3	1415.5	1415.6	1414.9
Maximum	1414.3	1417.7	1414.7	1416.2	1415.8	1415.1
Mar-21						
Mean	1414.2	1417.3	1414.6	1416.2	1415.7	1415.0
Minimum	1414.1	1417.3	1414.4	1415.9	1415.6	1414.9
Maximum	1414.4	1417.4	1414.7	1416.4	1415.9	1415.1
Apr-21						
Mean	1414.3	1417.3	1414.5	1416.3	1415.9	1415.1
Minimum	1414.2	1417.2	1414.5	1416.2	1415.9	1415.0
Maximum	1414.4	1417.3	1414.6	1416.5	1416.0	1415.2
May-21						
Mean	1414.0	1417.3	1414.3	1416.0	1415.7	1414.9
Minimum	1413.9	1417.3	1414.2	1415.8	1415.5	1414.7
Maximum	1414.3	1417.4	1414.5	1416.4	1416.0	1415.1
Jun-21						
Mean	NM	1417.3	1414.2	1415.9	1415.4	1414.6
Minimum	NM	1417.3	1414.0	1415.6	1415.3	1414.5
Maximum	NM	1417.4	1414.2	1416.1	1415.5	1414.7

2021 Water Year
Continuous Monitoring Results
Monitoring Well Locations
Eagle Mine

	QAL023B	QAL024A	QAL044B	QAL064D	QAL065D	QAL066D
Background						
Mean	1416.9	1417.8	1416.2	1418.7	1417.1	1416.9
Standard Dev.	0.4	0.4	0.4	0.7	0.4	0.3
Minimum	1415.7	1417.2	1414.9	1415.7	1416.1	1416.1
Maximum	1417.6	1418.5	1416.9	1419.6	1417.8	1417.5
Jul-21						
Mean	NM	1417.2	1413.9	1415.5	1415.1	1414.3
Minimum	NM	1417.2	1413.8	1415.3	1414.8	1414.2
Maximum	NM	1417.3	1414.1	1415.8	1415.5	1414.6
Aug-21						
Mean	NM	1417.1	1413.9	1415.6	1415.0	1414.2
Minimum	NM	1417.0	1413.8	1415.3	1414.9	1414.1
Maximum	NM	1417.2	1414.0	1415.9	1415.2	1414.3
Sep-21						
Mean	NM	1416.9	1413.8	1415.4	1415.0	1414.1
Minimum	NM	1416.9	1413.7	1415.2	1414.9	1414.0
Maximum	NM	1417.0	1413.9	1415.6	1415.1	1414.2

Source: North Jackson Company, REACH System

* All results are calculated based on mean daily values from continuous monitoring.

NM = Not measured.

Results in red indicate mean monthly values are outside of the background range.

2021 Water Year
Continuous Monitoring Results
Wetland Monitoring Locations
Eagle Mine

	WLD022-4.5	WLD023-4.5	WLD025-4.5	WLD025-9.5	WLD026-4.5	WLD026-9.5	WLD027-4.5	WLD027-9.5	WLD028-4.5	WLD028-9.5
Background										
Mean	1422.6	1413.5	1415.5	1415.9	1416.3	1416.2	1422.1	1422.2	1427.2	1427.0
Standard Dev.	0.2	0.5	0.3	0.2	0.3	0.3	0.7	0.7	0.5	0.5
6" limit	1421.6	1411.4	1414.3	1414.6	1415.3	1415.3	1419.8	1419.8	1424.5	1424.7
Minimum	1422.1	1411.9	1414.8	1415.1	1415.8	1415.8	1420.3	1420.3	1425.0	1425.2
Maximum	1422.9	1414.7	1416.5	1416.7	1417.0	1416.7	1423.1	1423.1	1428.3	1428.3
Oct-20										
Mean	1422.2	1413.4	1415.5	1415.5	1416.4	1416.5	1422.6	1422.6	1427.6	1427.4
Minimum	1422.2	1413.4	1415.2	1415.3	1416.3	1416.2	1422.5	1422.5	1427.4	1427.2
Maximum	1422.3	1413.5	1415.6	1415.7	1416.6	1416.8	1422.9	1422.8	1427.9	1427.6
Nov-20										
Mean	1422.1	1413.5	1415.5	1415.6	1416.5	1416.6	1422.6	1422.6	1427.9	1427.5
Minimum	1422.1	1413.5	1415.5	1415.5	1416.5	1416.6	1422.6	1422.6	1427.8	1427.3
Maximum	1422.2	1413.5	1415.6	1415.6	1416.6	1416.7	1422.8	1422.8	1428.0	1427.6
Dec-20										
Mean	1422.0	1413.5	1415.5	1415.5	1416.4	1416.5	1422.5	1422.5	1427.5	1427.1
Minimum	1422.0	1413.5	1415.4	1415.4	1416.4	1416.5	1422.5	1422.5	1427.4	1427.0
Maximum	1422.1	1413.5	1415.5	1415.6	1416.4	1416.5	1422.5	1422.5	1427.7	1427.3
Jan-21										
Mean	1422.0	1413.5	1415.5	1415.4	NM	NM	1422.4	1422.4	1427.1	1426.9
Minimum	1422.0	1413.5	1415.4	1415.3	NM	NM	1422.4	1422.4	1426.9	1426.8
Maximum	1422.0	1413.5	1415.5	1415.5	NM	NM	1422.5	1422.5	1427.4	1427.0
Feb-21										
Mean	1422.0	NM	NM	1415.2	1416.3	1416.2	1422.3	1422.3	1426.6	1426.5
Minimum	1422.0	NM	NM	1415.1	1416.3	1416.2	1422.3	1422.3	1426.5	1426.4
Maximum	1422.0	NM	NM	1415.3	1416.3	1416.2	1422.4	1422.4	1426.9	1426.7
Mar-21										
Mean	1422.0	1413.5	1415.4	1415.3	1416.5	1416.6	1422.6	1422.6	1427.4	1427.0
Minimum	1422.0	1413.5	1415.4	1415.2	1416.5	1416.5	1422.3	1422.3	1426.5	1426.4
Maximum	1422.1	1413.5	1415.5	1415.5	1416.7	1416.7	1422.9	1422.9	1428.0	1427.7
Apr-21										
Mean	1422.1	1413.5	1415.4	1415.4	1416.6	1416.7	1422.7	1422.7	1427.9	1427.5
Minimum	1422.0	1413.5	1415.4	1415.4	1416.5	1416.6	1422.6	1422.6	1427.8	1427.4
Maximum	1422.1	1413.6	1415.5	1415.5	1416.7	1416.9	1422.9	1422.9	1428.1	1427.7
May-21										
Mean	1422.0	1413.4	1415.1	1415.1	1416.3	1416.3	1422.4	1422.4	1427.5	1427.0
Minimum	1422.0	1413.4	1414.9	1415.0	1416.2	1416.1	1422.2	1422.2	1427.0	1426.6
Maximum	1422.1	1413.5	1415.4	1415.4	1416.5	1416.6	1422.6	1422.6	1427.9	1427.3
Jun-21										
Mean	1421.9	1413.2	1414.9	1415.0	1416.0	1415.9	1421.8	1421.8	1426.5	1426.2
Minimum	1421.9	1412.9	1414.8	1414.8	1415.8	1415.8	1421.2	1421.2	1425.9	1425.9
Maximum	1422.1	1413.4	1415.2	1415.2	1416.3	1416.2	1422.4	1422.4	1427.1	1426.6

2021 Water Year
Continuous Monitoring Results
Wetland Monitoring Locations
Eagle Mine

	WLD022-4.5	WLD023-4.5	WLD025-4.5	WLD025-9.5	WLD026-4.5	WLD026-9.5	WLD027-4.5	WLD027-9.5	WLD028-4.5	WLD028-9.5
Background										
Mean	1422.6	1413.5	1415.5	1415.9	1416.3	1416.2	1422.1	1422.2	1427.2	1427.0
Standard Dev.	0.2	0.5	0.3	0.2	0.3	0.3	0.7	0.7	0.5	0.5
6" limit	1421.6	1411.4	1414.3	1414.6	1415.3	1415.3	1419.8	1419.8	1424.5	1424.7
Minimum	1422.1	1411.9	1414.8	1415.1	1415.8	1415.8	1420.3	1420.3	1425.0	1425.2
Maximum	1422.9	1414.7	1416.5	1416.7	1417.0	1416.7	1423.1	1423.1	1428.3	1428.3
Jul-21										
Mean	1421.8	1412.7	1414.9	1414.9	1415.8	1415.7	1421.3	1421.3	1425.8	1425.7
Minimum	1421.8	1412.2	1414.7	1414.7	1415.5	1415.6	1420.7	1420.7	1425.4	1425.4
Maximum	1422.0	1413.3	1415.3	1415.5	1416.2	1416.1	1422.4	1422.4	1426.9	1426.5
Aug-21										
Mean	1421.7	1412.3	1415.7	1415.8	1415.9	1416.0	1420.4	1420.4	1425.1	1425.1
Minimum	1421.7	1411.7	1415.6	1415.7	1415.8	1415.9	1420.1	1420.1	1424.8	1424.9
Maximum	1421.9	1413.1	1415.8	1415.8	1416.0	1416.1	1421.0	1421.1	1425.5	1425.5
Sep-21										
Mean	1421.8	1413.0	1415.7	1415.6	1416.0	1416.0	1420.7	1420.7	1425.1	1425.1
Minimum	1421.8	1412.3	1415.5	1415.3	1415.9	1416.0	1420.1	1420.2	1424.8	1424.9
Maximum	1421.9	1413.6	1415.8	1415.8	1416.2	1416.2	1421.4	1421.3	1425.5	1425.4

Source: North Jackson Company, REACH System

* All results are calculated based on mean daily values from continuous monitoring.

NM = Not measured.

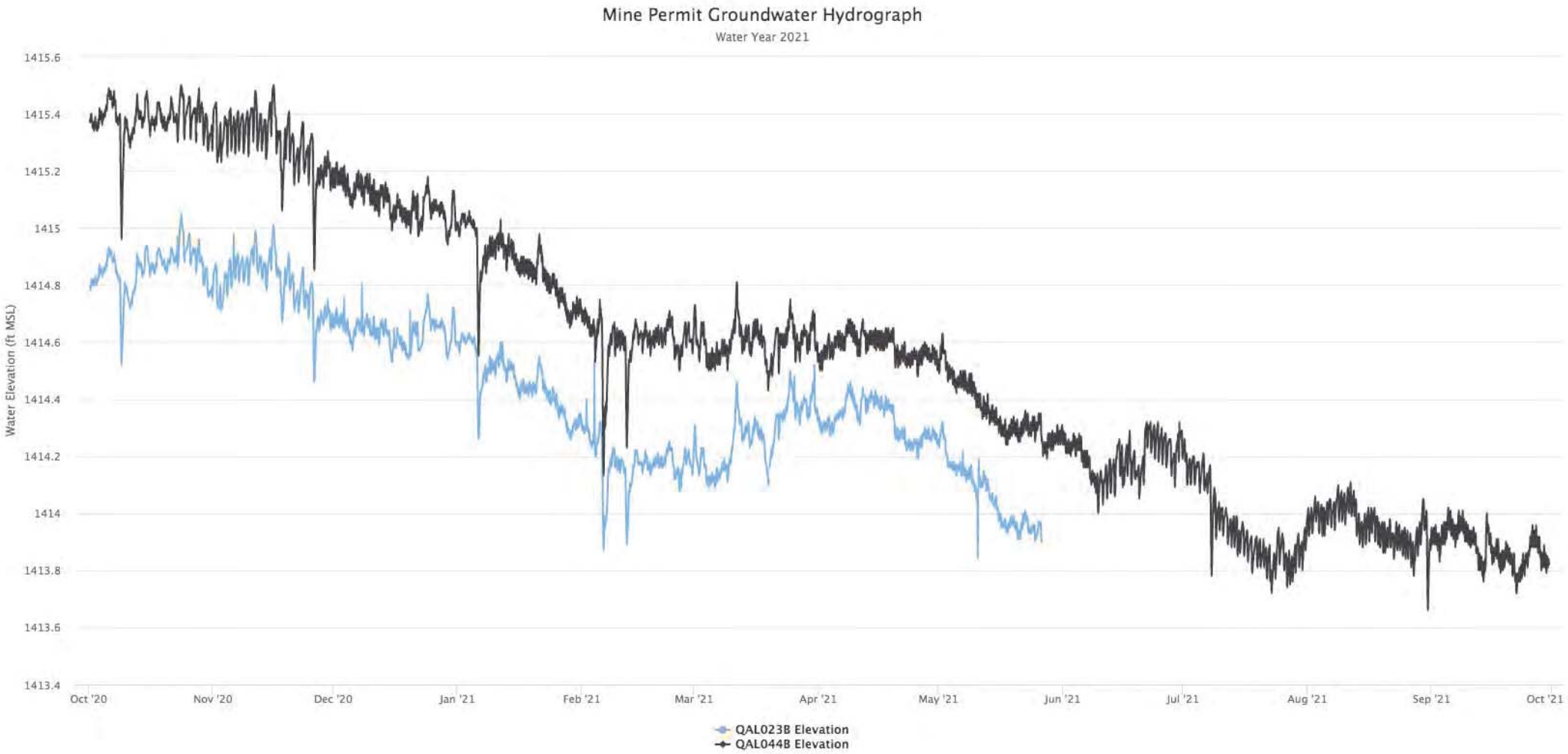
Results in red indicate mean monthly values are outside of the background range.

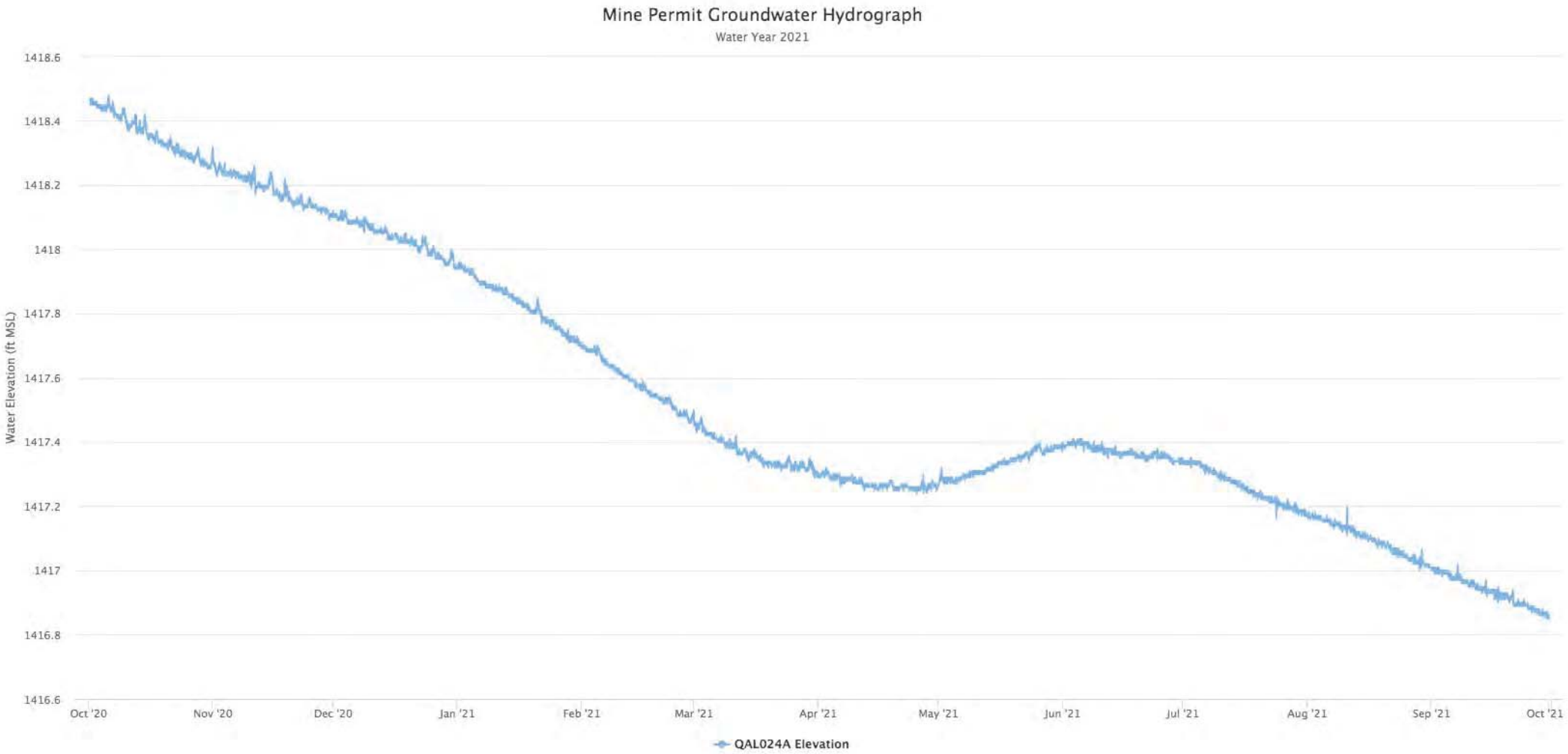
Appendix O

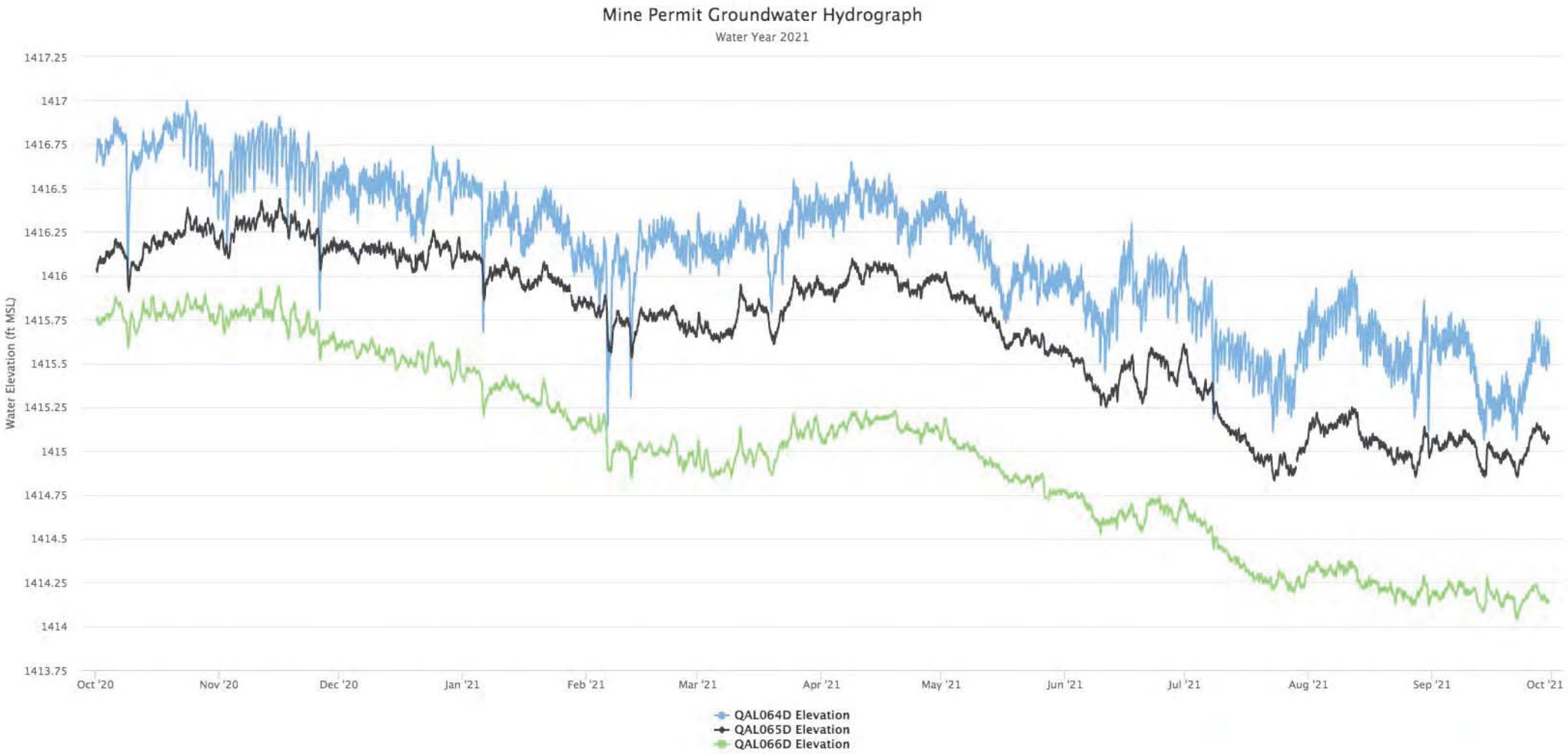
Eagle Mine

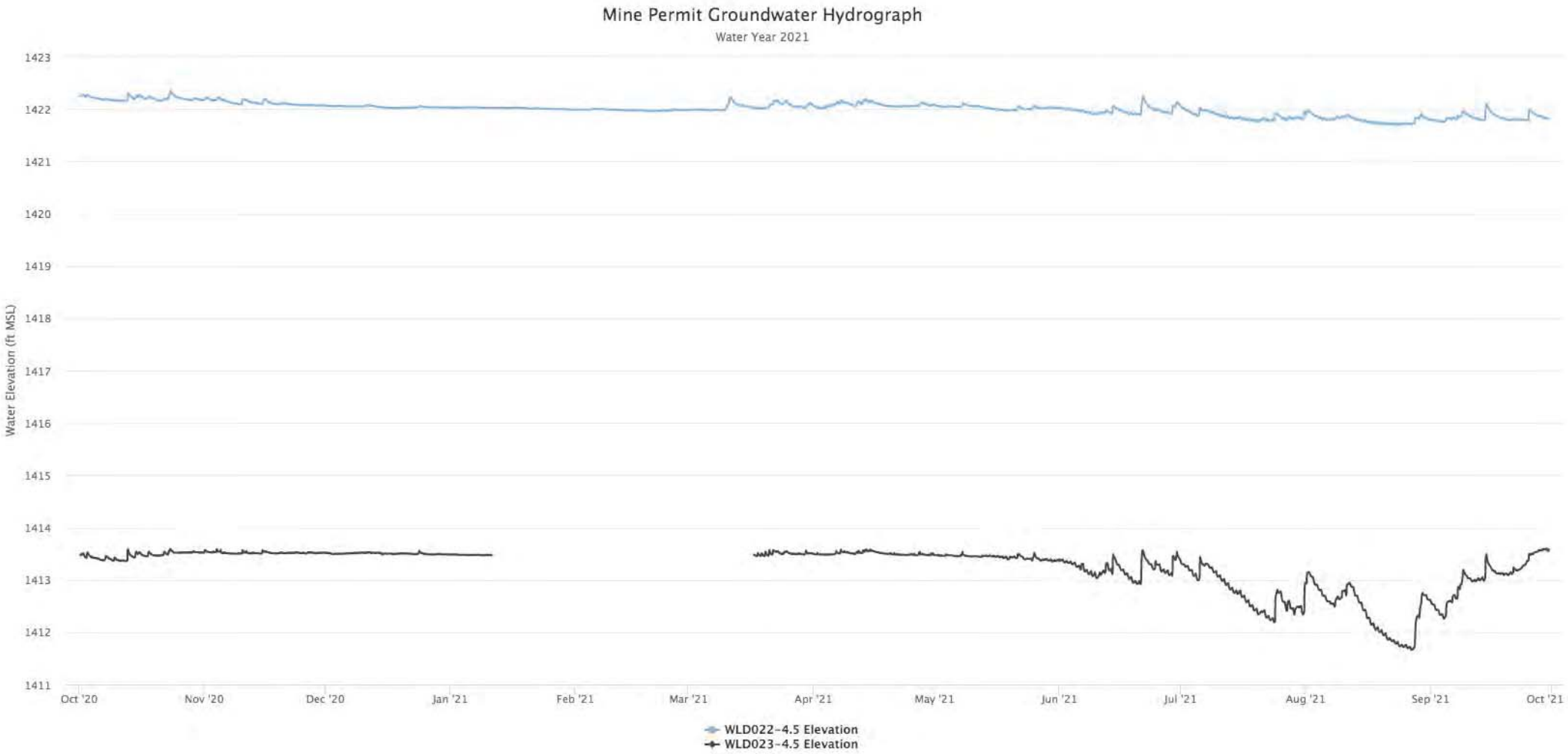
Groundwater and Wetland

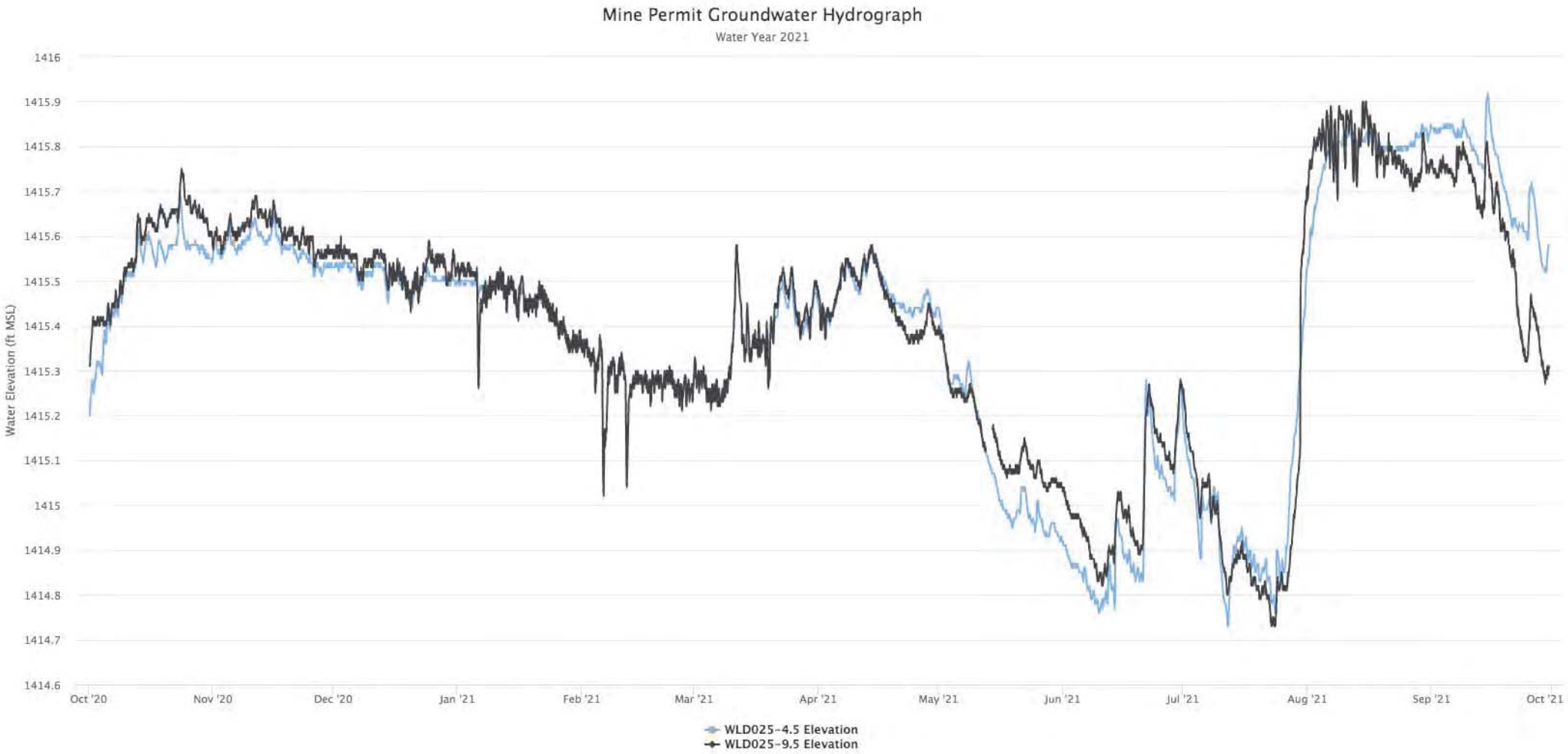
Hydrographs

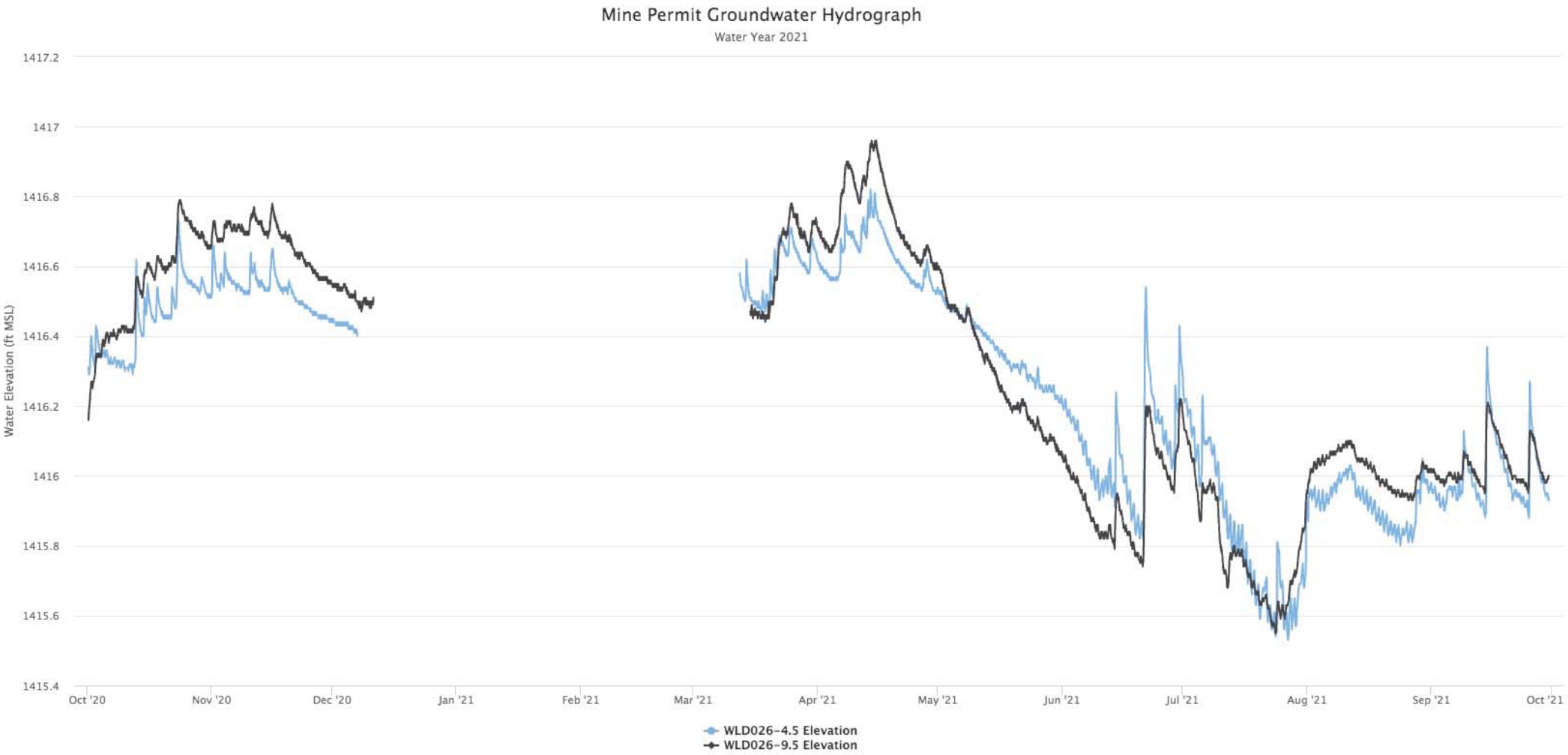

Mine Permit Groundwater Hydrograph
Water Year 2021
Water Elevation (ft MSL)
1415.6
1415.4
1415.2
1415
1414.8
1414.6
1414.4
1414.2
1414
1413.8
1413.6
1413.4
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
QAL023B Elevation
QAL044B Elevation

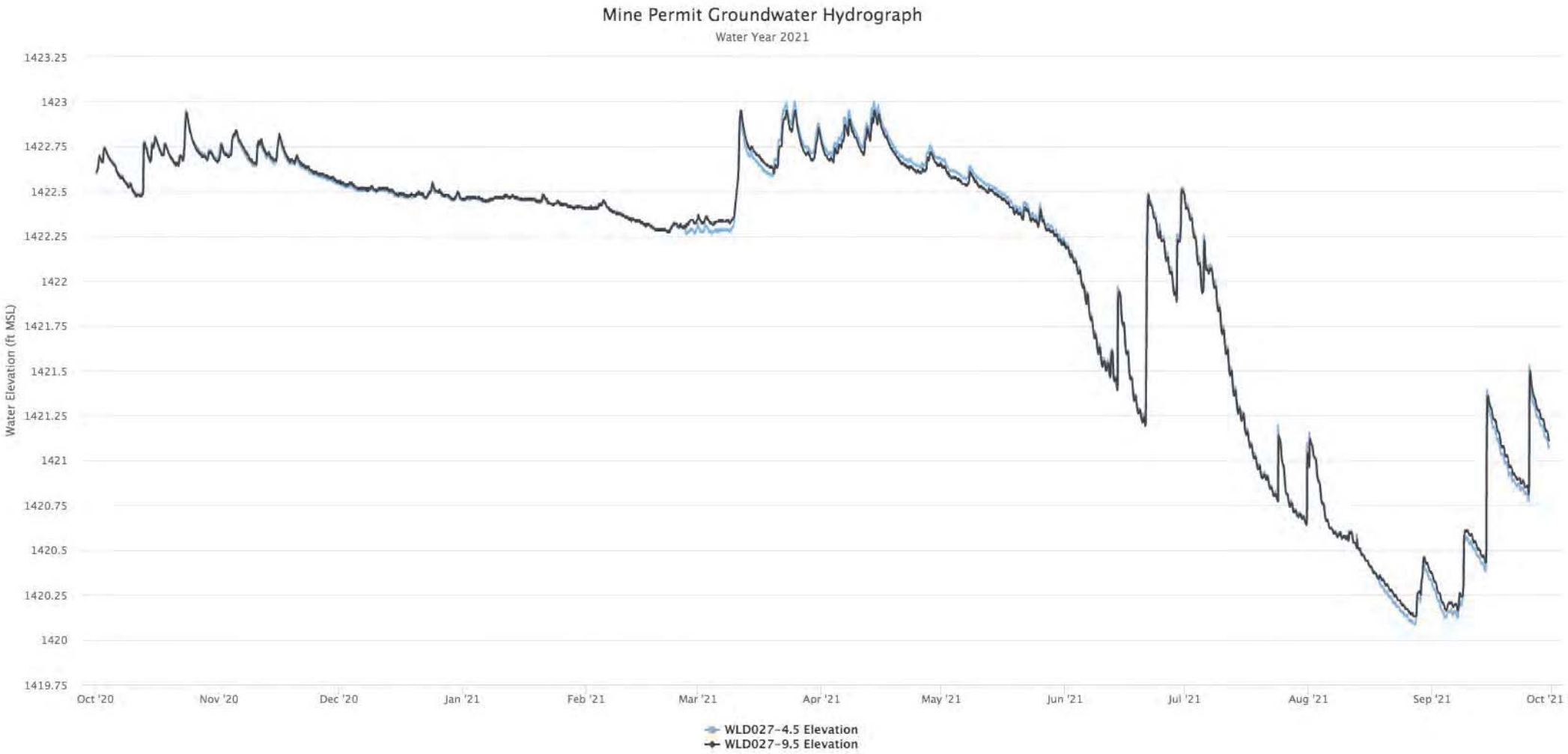

Mine Permit Groundwater Hydrograph
Water Year 2021
Water Elevation (ft MSL)
1418.6
1418.4
1418.2
1418
1417.8
1417.6
1417.4
1417.2
1417
1416.8
1416.6
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
QAL024A Elevation

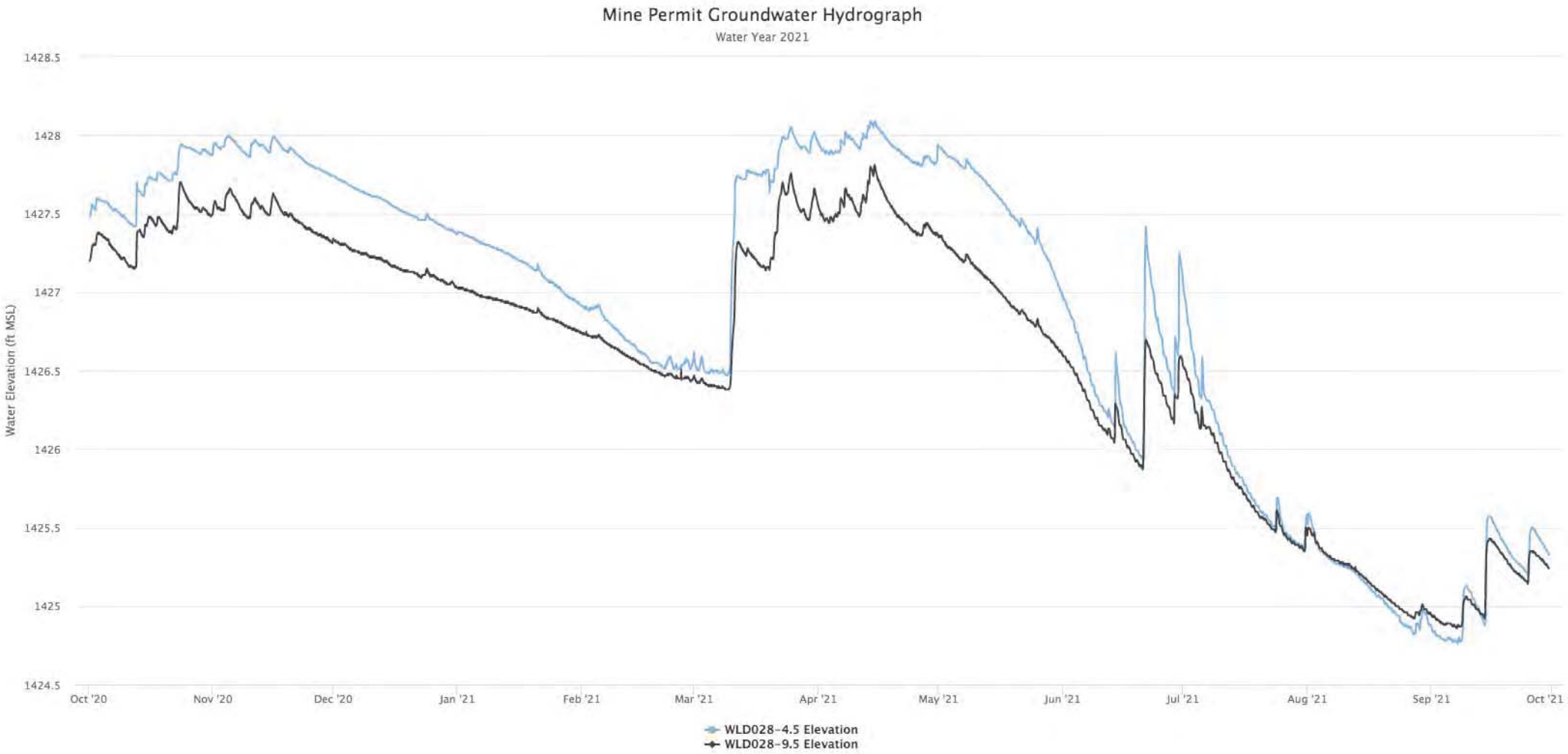

Mine Permit Groundwater Hydrograph
Water Year 2021
Water Elevation (ft MSL)
1417.25
1417
1416.75
1416.5
1416.25
1416
1415.75
1415.5
1415.25
1415
1414.75
1414.5
1414.25
1414
1413.75
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
QAL064D Elevation
QAL065D Elevation
QAL066D Elevation


Mine Permit Groundwater Hydrograph
Water Year 2021
Water Elevation (ft MSL)
1423
1422
1421
1420
1419
1418
1417
1416
1415
1414
1413
1412
1411
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
WLD022-4.5 Elevation
WLD023-4.5 Elevation


Mine Permit Groundwater Hydrograph
Water Year 2021
Water Elevation (ft MSL)
1416
1415.9
1415.8
1415.7
1415.6
1415.5
1415.4
1415.3
1415.2
1415.1
1415
1414.9
1414.8
1414.7
1414.6
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
WLD025-4.5 Elevation
WLD025-9.5 Elevation


Mine Permit Groundwater Hydrograph
Water Year 2021
Water Elevation (ft MSL)
1417.2
1417
1416.8
1416.6
1416.4
1416.2
1416
1415.8
1415.6
1415.4
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
WLD026-4.5 Elevation
WLD026-9.5 Elevation


Mine Permit Groundwater Hydrograph
Water Year 2021
Water Elevation (ft MSL)
1423.25
1423
1422.75
1422.5
1422.25
1422
1421.75
1421.5
1421.25
1421
1420.75
1420.5
1420.25
1420
1419.75
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
WLD027-4.5 Elevation
WLD027-9.5 Elevation


Mine Permit Groundwater Hydrograph
Water Year 2021
Water Elevation (ft MSL)
1428.5
1428
1427.5
1427
1426.5
1426
1425.5
1425
1424.5
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
WLD028-4.5 Elevation
WLD028-9.5 Elevation

Appendix P

Eagle Mine

Discrete Groundwater Elevations

Mine Permit Water Elevation Data
2021 Full Network Quarterly Discrete Measurements
Eagle Project

Location	1st Qtr 2021		2nd Qtr 2021		3rd Qtr 2021		4th Qtr 2021	
	Elev. (ft MSL)	Meas. Date	Elev. (ft MSL)	Meas. Date	Elev. (ft MSL)	Meas. Date	Elev. (ft MSL)	Meas. Date
QAL001A	1411.56	02/24/21	1410.93	05/13/21	1410.35	08/17/21	NM	11/08/21
QAL001D	1405.69	02/24/21	1405.16	05/13/21	1404.85	08/17/21	NM	11/08/21
QAL002A	1433.32	02/24/21	1432.73	05/11/21	1431.77	08/17/21	1432.38	11/08/21
QAL002D	1395.16	02/24/21	1394.87	05/11/21	1394.63	08/17/21	1394.25	11/08/21
QAL003A	1424.64	02/24/21	1426.36	05/12/21	1424.04	08/17/21	1422.88	11/08/21
QAL003B	1411.50	02/24/21	1412.57	05/12/21	1410.99	08/17/21	1410.39	11/08/21
QAL004A	1424.41	02/24/21	1425.01	05/11/21	1424.36	08/17/21	1423.96	11/08/21
QAL004D	1423.80	02/24/21	1428.36	05/11/21	1424.97	08/17/21	1421.79	11/08/21
QAL005A	1453.22	02/24/21	1454.71	05/12/21	1452.15	08/17/21	1451.13	11/08/21
QAL005D	1452.07	02/24/21	1453.04	05/12/21	1450.86	08/17/21	1450.24	11/08/21
QAL006A	1413.74	02/25/21	1415.21	05/14/21	1412.97	08/17/21	1412.12	11/08/21
QAL006B	1400.83	02/25/21	1401.13	05/14/21	1400.11	08/17/21	1399.01	11/08/21
QAL007A	NM	03/01/21	1429.33	05/14/21	1429.23	08/17/21	1428.55	11/08/21
QAL007D	NM	02/25/21	1437.91	05/14/21	1437.24	08/17/21	1436.28	11/08/21
QAL008A	1392.10	02/24/21	1392.37	05/11/21	1391.01	08/17/21	NM	11/08/21
QAL008D	1354.37	02/24/21	1353.89	05/11/21	1353.89	08/17/21	NM	11/08/21
QAL009A	1355.68	02/24/21	1355.25	05/11/21	1354.81	08/17/21	1354.42	11/08/21
QAL009D	1355.57	02/24/21	1355.12	05/11/21	1354.67	08/17/21	1354.33	11/08/21
QAL010A	1422.56	02/25/21	1423.10	05/12/21	1422.11	08/18/21	1420.94	11/08/21
QAL015	1292.79	02/25/21	1292.73	05/12/21	1292.46	08/18/21	1292.53	11/08/21
QAL016	F	02/24/21	1274.78	05/13/21	1274.56	08/19/21	NM	11/08/21
QAL017	F	02/24/21	1251.26	05/13/21	1250.30	08/19/21	NM	11/08/21
QAL018	1248.09	02/24/21	1248.24	05/13/21	1247.83	08/19/21	NM	11/08/21
QAL019	1285.05	02/24/21	1285.20	05/13/21	1284.90	08/19/21	NM	11/08/21
QAL020	1334.78	02/24/21	1335.92	05/13/21	1334.55	08/19/21	NM	11/08/21
QAL021	F	02/24/21	1389.57	05/13/21	1389.36	08/19/21	NM	11/08/21
QAL022	NM	02/25/21	1298.30	05/14/21	1298.21	08/17/21	1298.31	11/08/21
QAL023-1.0	F	02/25/21	1418.40	05/12/21	D	08/18/21	1418.22	11/08/21
QAL023-4.5	F	02/25/21	1418.38	05/12/21	1416.45	08/18/21	1418.19	11/08/21
QAL023B	1414.04	02/25/21	1414.06	05/12/21	1413.08	08/18/21	1412.77	11/08/21
QAL024A	1417.64	02/25/21	1417.49	05/11/21	1417.25	08/18/21	1416.79	11/08/21
QAL025A	1416.69	02/24/21	1416.35	05/11/21	1416.23	08/17/21	1415.53	11/08/21
QAL025B	1416.62	02/24/21	1416.25	05/11/21	1416.13	08/17/21	1415.51	11/08/21
QAL025D	1412.77	02/24/21	1412.31	05/11/21	1412.15	08/17/21	1411.56	11/08/21
QAL026A	1416.59	02/24/21	1415.92	05/11/21	1415.53	08/17/21	<1415.4	11/08/21
QAL026D	1409.53	02/24/21	1409.02	05/11/21	1408.91	08/17/21	1408.37	11/08/21
QAL026E	1409.50	02/24/21	1408.98	05/11/21	1408.83	08/17/21	1408.28	11/08/21
QAL029A	1414.04	02/25/21	1413.61	05/11/21	1413.34	08/17/21	NM	11/08/21
QAL029D	1406.75	02/25/21	1406.27	05/11/21	1406.22	08/17/21	NM	11/08/21
QAL031D	1372.35	02/24/21	1371.77	05/11/21	1371.58	08/17/21	NM	11/08/21
QAL043-1.0	1419.12	02/25/21	1419.41	05/12/21	D	08/17/21	1419.26	11/08/21
QAL043-4.5	1419.12	02/25/21	1419.43	05/12/21	1417.62	08/17/21	1419.26	11/08/21
QAL043B	1414.28	02/25/21	1414.19	05/12/21	1413.66	08/17/21	1413.43	11/08/21
QAL044-1.0	1423.84	02/25/21	1424.28	05/12/21	D	08/17/21	D	11/08/21
QAL044-4.5	1423.47	02/25/21	1424.33	05/12/21	1422.26	08/17/21	1422.74	11/08/21
QAL044B	1414.48	02/25/21	1414.34	05/12/21	1413.85	08/17/21	1413.63	11/08/21
QAL050A	1365.48	02/01/21	1364.41	05/11/21	1364.02	08/17/21	NM	11/08/21
QAL051A	1365.99	02/01/21	1365.16	05/11/21	1364.84	08/17/21	NM	11/08/21
QAL051D	1365.74	02/01/21	1365.16	05/11/21	1364.86	08/17/21	NM	11/08/21
QAL052A	1353.14	02/01/21	1352.37	05/11/21	1352.31	08/17/21	NM	11/08/21
QAL053A	1386.03	02/25/21	1385.77	05/11/21	1385.82	08/17/21	NM	11/08/21
QAL055A	1367.31	02/01/21	1366.20	05/11/21	1365.70	08/17/21	NM	11/08/21
QAL056A	1393.79	02/01/21	1393.71	05/11/21	1392.34	08/17/21	NM	11/08/21
QAL057A	1364.74	02/01/21	1363.65	05/11/21	1363.20	08/17/21	NM	11/08/21
QAL057D	1364.83	02/01/21	1363.75	05/11/21	1363.27	08/17/21	NM	11/08/21
QAL060A	1404.90	02/25/21	1404.48	05/11/21	1404.39	08/17/21	NM	11/08/21
QAL061A	1406.32	02/25/21	1405.85	05/11/21	1405.74	08/17/21	NM	11/08/21
QAL062A	1407.70	02/25/21	1407.22	05/11/21	1407.15	08/17/21	NM	11/08/21
QAL063A	1401.36	02/25/21	1401.05	05/11/21	1401.08	08/17/21	NM	11/08/21

Footnotes at the end of table.

Mine Permit Water Elevation Data
2021 Full Network Quarterly Discrete Measurements
Eagle Project

Location	1st Qtr 2021		2nd Qtr 2021		3rd Qtr 2021		4th Qtr 2021	
	Elev. (ft MSL)	Meas. Date	Elev. (ft MSL)	Meas. Date	Elev. (ft MSL)	Meas. Date	Elev. (ft MSL)	Meas. Date
QAL064D	1416.22	02/24/21	1416.09	05/12/21	1415.60	08/18/21	1415.25	11/08/21
QAL065D	1415.68	02/25/21	1415.76	05/12/21	1415.04	08/18/21	1414.82	11/08/21
QAL066D	1414.90	02/25/21	1414.93	05/12/21	1414.21	08/18/21	1413.98	11/08/21
QAL067A	1414.85	02/25/21	1414.39	05/11/21	1414.27	08/17/21	NM	11/08/21
QAL068A	1422.04	02/24/21	1421.33	05/11/21	1421.49	08/17/21	1421.05	11/08/21
QAL068B	1413.39	02/24/21	1413.39	05/11/21	1413.17	08/17/21	1412.66	11/08/21
QAL068D	1414.02	02/24/21	1413.47	05/11/21	1413.28	08/17/21	1412.74	11/08/21
QAL069A	1384.95	02/25/21	1384.39	05/06/21	1383.67	08/17/21	NM	11/08/21
QAL070A	1372.65	02/25/21	1371.88	05/11/21	1371.29	08/17/21	NM	11/08/21
QAL071A	1404.52	02/25/21	1404.46	05/11/21	1403.78	08/17/21	NM	11/08/21
QAL073A	1385.52	02/25/21	1384.83	05/11/21	1384.25	08/17/21	NM	11/08/21
QAL074A	1402.20	02/25/21	1402.76	05/11/21	1402.00	08/17/21	NM	11/08/21
QAL075A	1349.62	02/24/21	1347.91	05/11/21	1347.79	08/17/21	NM	11/08/21
QAL075D	1350.13	02/24/21	1349.42	05/11/21	1349.24	08/17/21	NM	11/08/21
QAL076E	NM	03/01/21	1313.81	05/12/21	1313.33	08/18/21	1313.23	11/08/21
QAL077E	NM	03/01/21	1234.71	05/12/21	1234.68	08/18/21	1234.68	11/08/21
STRM002	1400.58	02/17/21	1400.78	04/06/21	1400.40	08/09/21	1400.48	10/12/21
STRM011	F	02/24/21	1415.88	05/12/21	1416.60	08/18/21	1416.03	11/08/21
WLD001-1.0	NM	02/25/21	1428.93	05/13/21	1428.78	08/17/21	1428.95	11/08/21
WLD001-4.5	NM	02/25/21	1427.96	05/13/21	1427.86	08/17/21	1428.01	11/08/21
WLD001-9.5	NM	02/25/21	1429.37	05/13/21	1429.05	08/17/21	1429.12	11/08/21
WLD002	NM	03/01/21	1430.88	05/13/21	1430.19	08/17/21	1430.69	11/08/21
WLD004	NM	03/01/21	1446.28	05/14/21	1444.75	08/17/21	1445.02	11/08/21
WLD005	NM	03/01/21	1450.99	05/14/21	1449.00	08/17/21	1449.26	11/08/21
WLD006	NM	03/01/21	1455.37	05/14/21	1452.96	08/17/21	1452.77	11/08/21
WLD007	NM	03/01/21	1450.36	05/14/21	1448.31	08/17/21	1448.56	11/08/21
WLD008	NM	03/01/21	1453.39	05/14/21	1451.27	08/17/21	1451.67	11/08/21
WLD010	NM	03/01/21	1447.41	05/14/21	1445.14	08/17/21	1445.84	11/08/21
WLD011	NM	03/01/21	1446.57	05/14/21	1444.41	08/17/21	1444.66	11/08/21
WLD012	NM	03/01/21	1446.04	05/14/21	1444.30	08/17/21	1444.66	11/08/21
WLD017	NM	03/01/21	1423.07	05/14/21	1420.87	08/17/21	1421.40	11/08/21
WLD018	NM	03/01/21	1422.66	05/14/21	1420.78	08/17/21	1421.55	11/08/21
WLD019	NM	03/01/21	1420.08	05/14/21	1418.15	08/17/21	1418.42	11/08/21
WLD020	NM	03/01/21	1419.32	05/14/21	1416.73	08/17/21	1416.96	11/08/21
WLD021	NM	03/01/21	1415.30	05/14/21	1413.90	08/17/21	1414.75	11/08/21
WLD022-1.0	1421.96	02/24/21	1422.03	05/11/21	1421.63	08/17/21	1421.93	11/08/21
WLD022-4.5	1421.98	02/24/21	1422.08	05/11/21	1421.78	08/17/21	1421.82	11/08/21
WLD022-9.5	1422.24	02/24/21	1422.34	05/11/21	1422.20	08/17/21	1422.94	11/08/21
WLD023-1.0	NM	02/25/21	1413.69	05/12/21	D	08/18/21	1414.07	11/08/21
WLD023-4.5	NM	02/25/21	1413.45	05/12/21	1412.10	08/18/21	1413.81	11/08/21
WLD023-9.5	NM	03/05/21	1415.39	05/12/21	1414.31	08/18/21	1414.92	11/08/21
WLD024-1.0	F	02/24/21	1422.98	05/11/21	1422.52	08/17/21	1422.59	11/08/21
WLD024-4.5	1422.99	02/24/21	1423.19	05/11/21	1422.79	08/17/21	1422.73	11/08/21
WLD024-9.5	F	02/24/21	1423.38	05/11/21	1423.01	08/17/21	1423.21	11/08/21
WLD025-1.0	F	02/25/21	1414.91	05/12/21	1415.71	08/18/21	1415.54	11/08/21
WLD025-4.5	1415.35	02/25/21	1414.93	05/12/21	1415.82	08/18/21	1415.03	11/08/21
WLD025-9.5	1415.35	02/25/21	1414.91	05/12/21	1415.53	08/18/21	1414.75	11/08/21
WLD026-1.0	1415.45	02/25/21	1415.48	05/12/21	1415.61	08/18/21	1416.24	11/08/21
WLD026-4.5	F	02/25/21	1416.02	05/12/21	1415.56	08/18/21	1415.62	11/08/21
WLD026-9.5	F	02/25/21	1416.02	05/12/21	1415.70	08/18/21	1415.63	11/08/21
WLD027-1.0	F	02/25/21	1422.98	05/12/21	D	08/18/21	D	11/08/21
WLD027-4.5	1422.36	02/25/21	1422.59	05/12/21	1420.42	08/18/21	1421.83	11/08/21
WLD027-9.5	1422.33	02/25/21	1422.55	05/12/21	1420.40	08/18/21	1421.83	11/08/21
WLD028-1.0	F	02/25/21	1427.68	05/12/21	D	08/18/21	D	11/03/21
WLD028-4.5	1426.44	02/25/21	1427.64	05/12/21	1424.99	08/18/21	1425.29	11/03/21
WLD028-9.5	1426.24	02/25/21	1427.16	04/30/21	1424.94	08/18/21	1425.08	11/03/21
WLD029-1.0	NM	03/01/21	D	05/12/21	D	08/18/21	D	11/08/21
WLD029-4.5	NM	03/01/21	1428.63	05/12/21	1425.91	08/18/21	1425.42	11/08/21
WLD029-9.5	NM	03/01/21	1428.71	05/12/21	1426.38	08/18/21	1425.89	11/08/21
WLD030	NM	03/01/21	1454.82	05/14/21	1452.64	08/17/21	1452.62	11/08/21
YDRM002	1411.93	02/17/21	1413.91	04/07/21	1418.63	08/09/21	1418.63	10/12/21

2021 Mine Permit Water Elevation Data
Footnote Explanation
Eagle Project

Footnote	Explanation
BP	Below pump. Maximum water elevation is shown.
D	Dry.
F	Frozen.
NM	Not measured.
R	Measured value was rejected based on quality control procedures.

Appendix Q

Eagle Mine

Continuous Surface Water Monitoring Results

2021 Water Year
Continuous Monitoring Results
Surface Water Location STRE002
Eagle Mine

STRE002								
Parameter	**Month**	**Background MEAN**	**Background Min**	**Background MAX**	**Background SD**	**Water Year MEAN**	**Water Year MIN**	**Water Year MAX**
Temperature (°C)	2020/10	7.5	3.2	14.6	1.5	5.5	1.7	9.5
	2020/11	3.4	-0.1	9.3	0.5	3.7	1.2	10.3
	2020/12	0.8	-0.2	3.2	0.4	1.4	-0.1	3.0
	2021/01	0.6	-0.2	0.8	0.5	1.0	-0.1	2.5
	2021/02	0.5	-0.2	2.4	0.2	0.5	-0.1	2.2
	2021/03	1.5	-0.2	4.7	0.3	1.9	0.5	3.8
	2021/04	4.2	-0.1	10.8	1.6	5.9	1.9	9.3
	2021/05	9.7	1.3	17.8	1.0	10.2	6.3	15.6
	2021/06	13.0	8.1	17.0	0.7	14.1	11.3	17.7
	2021/07	14.1	10.6	18.2	1.0	14.2	11.8	17.4
	2021/08	13.5	10.0	17.6	0.7	14.2	12.2	16.0
	2021/09	11.4	7.0	16.6	0.8	11.5	9.0	14.8
Flow (cfs)	2020/10	22.9	12.0	119.0	7.1	23.8	14.2	54.1
	2020/11	18.5	12.4	37.8	3.1	22.6	16.0	34.8
	2020/12	17.8	12.1	58.8	4.1	NA	NA	NA
	2021/01	18.1	12.0	45.0	3.5	NA	NA	NA
	2021/02	17.3	12.0	50.0	5.6	22.6	22.6	22.6
	2021/03	23.3	12.0	110.9	5.7	35.8	21.6	65.5
	2021/04	37.0	12.0	131.5	10.3	33.3	21.2	66.9
	2021/05	22.2	11.8	160.6	6.3	15.3	12.5	20.3
	2021/06	18.0	12.0	90.1	3.5	14.0	11.8	38.8
	2021/07	14.0	11.8	33.0	1.5	12.4	11.9	17.1
	2021/08	14.5	11.8	74.4	2.3	12.3	11.7	17.5
	2021/09	16.9	11.7	69.8	3.2	14.0	11.9	33.4
Specific Conductivity (uS/cm@25°C)	2020/10	127.8	70.0	146.0	14.4	119.9	105.9	125.8
	2020/11	130.2	80.0	148.0	9.2	100.6	97.9	103.4
	2020/12	132.9	89.0	153.0	6.7	NA	NA	NA
	2021/01	133.3	115.0	145.0	3.9	NA	NA	NA
	2021/02	133.2	111.0	144.0	3.1	99.0	99.0	99.0
	2021/03	122.0	54.0	148.0	13.6	98.9	94.0	104.0
	2021/04	95.6	50.0	146.0	18.2	113.3	104.1	120.3
	2021/05	122.0	37.0	149.0	9.3	88.4	78.0	103.7
	2021/06	129.1	94.0	169.0	6.4	119.3	104.0	132.0
	2021/07	146.4	119.0	165.0	7.4	140.2	132.2	145.3
	2021/08	146.1	107.0	163.0	6.5	145.1	141.0	149.0
	2021/09	138.2	80.0	149.0	6.0	136.7	132.0	141.0

2021 Water Year
Continuous Monitoring Results
Surface Water Location STRM004
Eagle Mine

STRM004								
Parameter	Month	Background MEAN	Background Min	Background MAX	Background SD	Water Year MEAN	Water Year MIN	Water Year MAX
Temperature (°C)	2020/10	7.5	2.3	15.2	1.6	6.0	2.3	9.8
	2020/11	3.0	0.0	9.6	0.5	3.7	1.7	8.7
	2020/12	0.3	-0.1	2.5	0.2	1.3	0.7	2.6
	2021/01	0.2	-0.1	1.9	0.3	1.0	0.4	1.6
	2021/02	0.1	0.0	1.3	0.1	0.4	0.3	0.8
	2021/03	0.9	-0.1	5.0	0.4	1.3	0.1	3.0
	2021/04	4.2	-0.1	11.3	1.9	5.2	1.2	8.0
	2021/05	10.1	1.9	18.2	1.0	9.2	5.9	14.5
	2021/06	13.8	7.9	18.6	1.2	13.8	10.3	16.4
	2021/07	14.8	11.0	19.0	1.3	14.3	12.2	16.5
	2021/08	14.2	10.4	18.1	0.7	14.9	12.9	16.6
	2021/09	11.8	7.3	17.3	4.5	12.0	9.6	14.3
Flow (cfs)	2020/10	7.7	3.9	41.1	2.2	8.1	6.4	16.1
	2020/11	6.8	4.2	23.1	2.5	7.2	5.8	9.6
	2020/12	6.7	4.6	18.9	1.6	NA	NA	NA
	2021/01	5.6	3.5	13.2	1.8	NA	NA	NA
	2021/02	5.7	2.8	15.5	1.8	6.7	6.7	6.7
	2021/03	8.2	3.1	56.7	3.0	8.9	5.4	20.3
	2021/04	14.9	5.2	44.5	2.5	6.4	4.6	11.0
	2021/05	8.3	4.4	59.9	2.5	5.9	5.0	7.3
	2021/06	5.7	3.0	27.4	1.1	5.3	4.5	12.3
	2021/07	4.6	2.8	9.9	0.4	5.2	4.7	6.2
	2021/08	4.8	2.8	28.0	1.1	5.2	4.9	6.3
	2021/09	5.2	2.8	24.0	2.2	5.3	4.5	9.6
Specific Conductivity (uS/cm@25°C)	2020/10	87.3	56.0	140.0	9.2	93.0	88.6	95.0
	2020/11	87.1	59.0	96.0	4.2	87.9	84.0	94.9
	2020/12	84.7	61.0	95.0	11.6	93.7	79.4	148.7
	2021/01	91.3	67.0	97.0	1.6	108.3	90.0	139.0
	2021/02	94.5	58.0	103.0	3.5	106.6	72.0	136.8
	2021/03	88.6	44.0	105.0	8.1	67.1	56.7	75.8
	2021/04	69.5	33.0	105.0	12.6	65.8	62.6	72.5
	2021/05	85.6	37.0	114.0	9.2	83.4	77.0	94.1
	2021/06	88.5	57.0	116.0	14.3	94.3	91.0	96.8
	2021/07	97.1	82.0	114.0	6.2	94.1	91.0	106.7
	2021/08	100.6	70.0	119.0	9.2	112.1	104.0	130.0
	2021/09	81.3	57.0	130.0	48.8	127.4	118.0	142.7

2021 Water Year
Continuous Monitoring Results
Surface Water Location STRM005
Eagle Mine

STRM005								
Parameter	**Month**	**Background MEAN**	**Background Min**	**Background MAX**	**Background SD**	**Water Year MEAN**	**Water Year MIN**	**Water Year MAX**
Temperature (°C)	2020/10	7.9	2.6	15.5	2.4	5.7	1.5	9.8
	2020/11	3.1	0.0	7.6	0.2	3.6	0.9	10.6
	2020/12	0.3	-0.1	2.2	0.2	0.9	0.2	2.8
	2021/01	0.3	-0.1	2.6	0.2	0.5	0.2	1.5
	2021/02	0.0	-0.1	1.4	0.1	0.2	0.1	0.2
	2021/03	0.5	-0.1	3.7	0.3	1.3	0.1	3.4
	2021/04	4.2	0.1	11.1	1.4	5.7	1.7	9.0
	2021/05	10.4	2.1	17.5	1.0	10.6	7.2	15.7
	2021/06	15.4	9.2	20.5	1.0	15.5	12.1	18.8
	2021/07	17.2	11.9	21.3	1.1	16.4	14.3	19.4
	2021/08	16.6	12.7	21.1	0.4	16.6	15.0	18.7
	2021/09	13.1	9.2	18.7	1.1	13.1	10.8	15.8
Flow (cfs)	2020/10	64.2	29.2	346.6	29.2	64.0	46.0	121.0
	2020/11	52.8	29.2	188.7	24.1	66.1	52.0	104.2
	2020/12	55.7	33.6	131.3	17.6	50.8	50.8	50.8
	2021/01	44.9	38.0	83.3	2.7	NA	NA	NA
	2021/02	59.6	40.7	119.3	0.0	86.7	86.7	86.7
	2021/03	126.0	36.0	456.2	115.0	123.2	70.9	380.1
	2021/04	126.8	41.7	459.4	21.5	97.3	65.8	257.0
	2021/05	67.2	32.5	781.5	28.7	52.8	44.1	66.7
	2021/06	40.5	26.3	164.1	9.9	43.9	38.7	77.8
	2021/07	29.8	24.0	52.0	22.0	39.0	37.3	42.9
	2021/08	28.8	23.2	82.0	4.0	37.8	35.5	45.7
	2021/09	38.6	21.8	155.5	14.2	42.2	37.0	61.5
Specific Conductivity (uS/cm@25°C)	2020/10	112.0	29.0	147.0	26.8	102.6	79.9	130.6
	2020/11	123.5	65.0	143.0	15.9	114.4	64.1	158.8
	2020/12	126.6	79.0	145.0	8.4	NA	NA	NA
	2021/01	129.3	99.0	145.0	4.7	NA	NA	NA
	2021/02	128.1	91.0	143.0	5.3	79.9	76.6	84.0
	2021/03	119.1	55.0	141.0	9.4	81.4	57.8	111.3
	2021/04	77.5	36.0	121.0	11.3	92.4	41.0	115.3
	2021/05	112.5	30.0	141.0	8.1	127.4	108.0	139.6
	2021/06	130.9	78.0	149.0	4.2	142.7	126.3	147.0
	2021/07	142.9	111.0	161.0	8.4	146.7	141.0	153.8
	2021/08	145.0	101.0	163.0	11.4	138.5	114.6	155.7
	2021/09	133.3	90.0	150.0	15.7	122.4	99.0	137.8

2021 Water Year
Continuous Monitoring Results
Surface Water Location YDRM002
Eagle Mine

YDRM002								
Parameter	**Month**	**Background MEAN**	**Background Min**	**Background MAX**	**Background SD**	**Water Year MEAN**	**Water Year MIN**	**Water Year MAX**
Temperature (°C)	2020/10	8.5	2.7	17.2	1.9	5.2	0.8	10.2
	2020/11	2.4	0.0	9.3	0.5	2.2	0.0	9.3
	2020/12	0.1	0.0	1.4	0.0	0.1	-0.1	1.2
	2021/01	0.0	-0.1	1.0	0.1	-0.1	-0.1	0.0
	2021/02	0.0	0.0	0.2	0.0	0.0	-0.1	-0.1
	2021/03	0.4	-0.1	4.9	0.3	0.6	-0.1	2.5
	2021/04	4.3	0.0	11.4	2.1	4.6	0.8	8.9
	2021/05	11.5	0.8	21.6	1.4	11.9	7.5	18.6
	2021/06	16.5	9.8	22.2	1.2	17.6	12.7	21.7
	2021/07	18.6	12.4	23.6	1.4	18.4	15.9	21.7
	2021/08	17.9	11.7	23.2	0.9	NA	NA	NA
	2021/09	14.3	8.5	21.0	0.7	NA	NA	NA
Flow (cfs)	2020/10	34.6	7.1	214.9	25.4	40.3	25.8	77.2
	2020/11	26.8	10.0	94.0	9.9	43.5	35.8	56.7
	2020/12	21.1	10.6	74.0	6.9	NA	NA	NA
	2021/01	18.4	10.0	41.1	4.1	NA	NA	NA
	2021/02	16.8	12.2	29.7	2.9	29.3	29.3	29.3
	2021/03	25.7	11.4	173.1	11.1	57.1	28.0	112.5
	2021/04	91.8	14.9	306.2	29.0	52.7	41.7	73.8
	2021/05	47.2	8.1	204.3	22.2	24.3	16.2	33.6
	2021/06	21.2	8.0	61.2	8.6	14.1	9.1	26.9
	2021/07	11.6	6.2	32.6	1.9	8.7	6.3	14.8
	2021/08	9.0	4.3	45.6	2.7	NA	NA	NA
	2021/09	13.1	5.5	68.5	5.9	NA	NA	NA
Specific Conductivity (uS/cm@25°C)	2020/10	61.3	30.0	102.0	18.8	43.8	33.0	61.5
	2020/11	53.1	32.0	74.0	7.6	39.7	34.6	48.2
	2020/12	62.0	32.0	91.0	9.0	55.1	49.9	58.9
	2021/01	64.6	52.0	76.0	5.8	NA	NA	NA
	2021/02	69.6	55.0	79.0	5.6	NA	NA	NA
	2021/03	57.0	28.0	75.0	12.4	60.0	46.5	76.3
	2021/04	35.2	19.0	72.0	7.1	52.0	50.0	53.5
	2021/05	45.9	20.0	92.0	11.7	57.4	42.3	73.9
	2021/06	67.1	44.0	94.0	4.6	74.3	59.3	81.7
	2021/07	81.6	53.0	105.0	7.7	90.6	74.5	106.5
	2021/08	87.4	47.0	107.0	10.2	NA	NA	NA
	2021/09	80.3	42.0	103.0	11.0	NA	NA	NA

Source: North Jackson Company, REACH System (mean daily values)

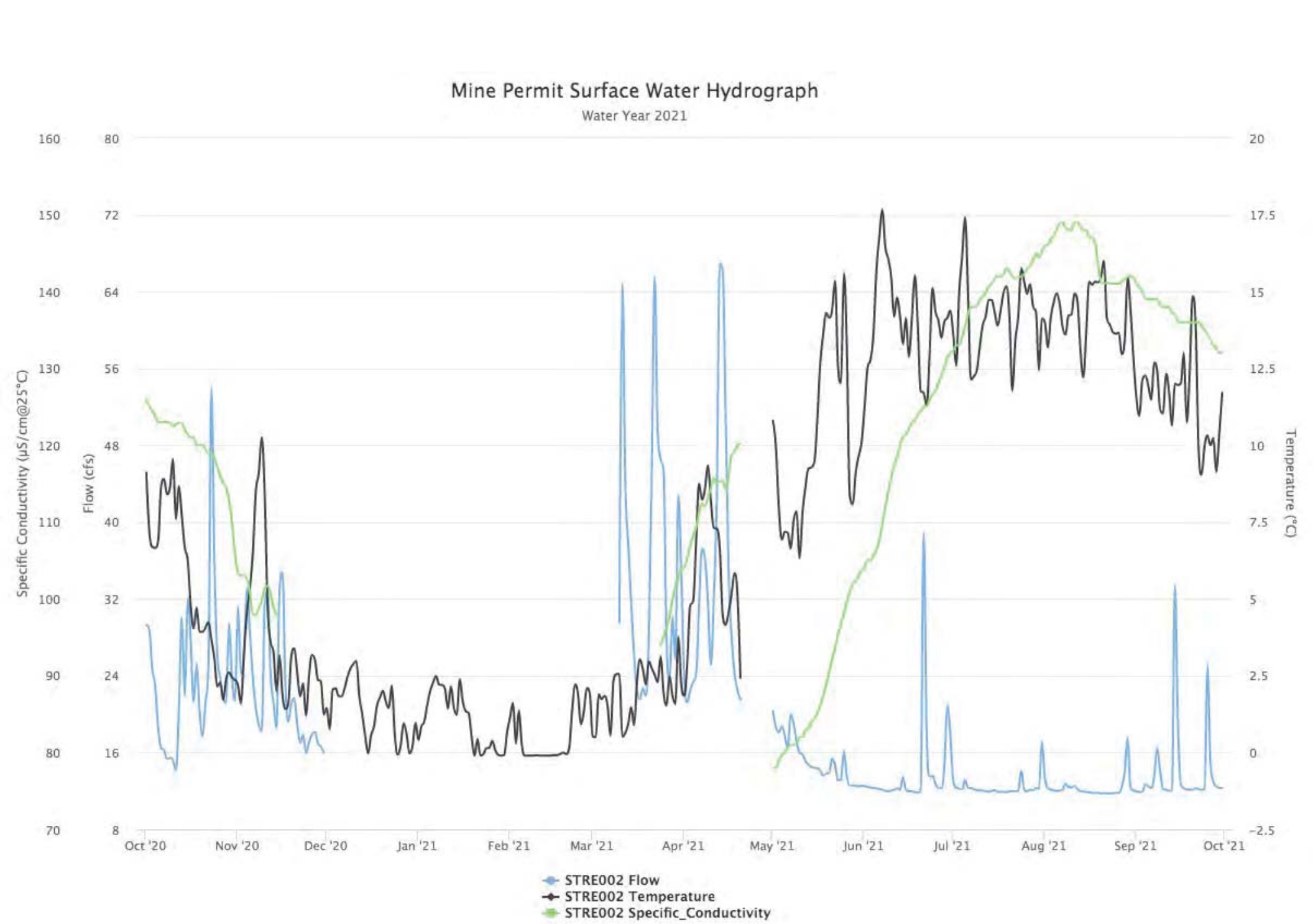
NA =Continuous record suppressed where >50% of values missing or data failed to meet quality control measures (e.g., due to ice or beaver activity).

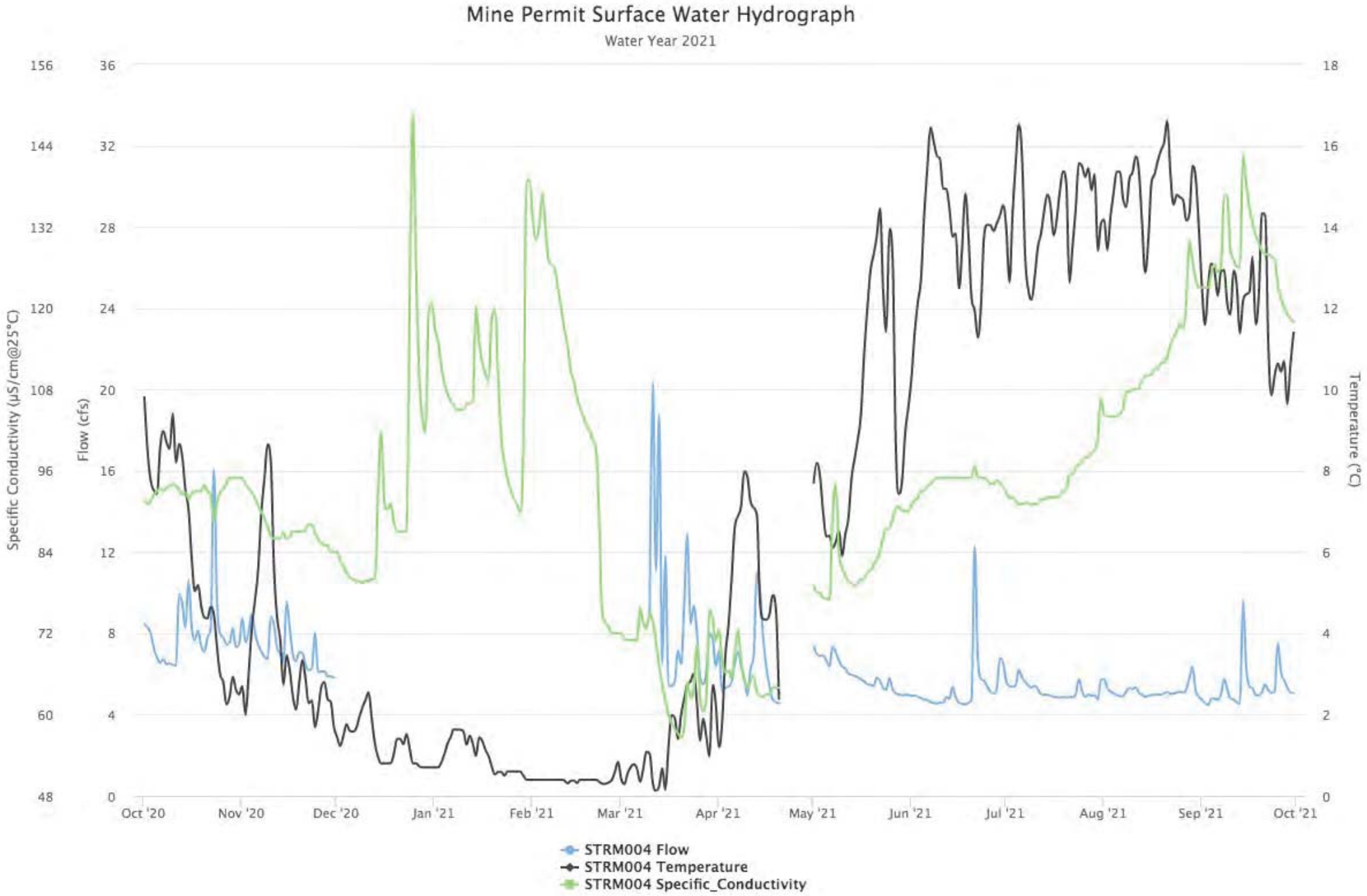
Results in red indicate mean monthly value is outside background range.

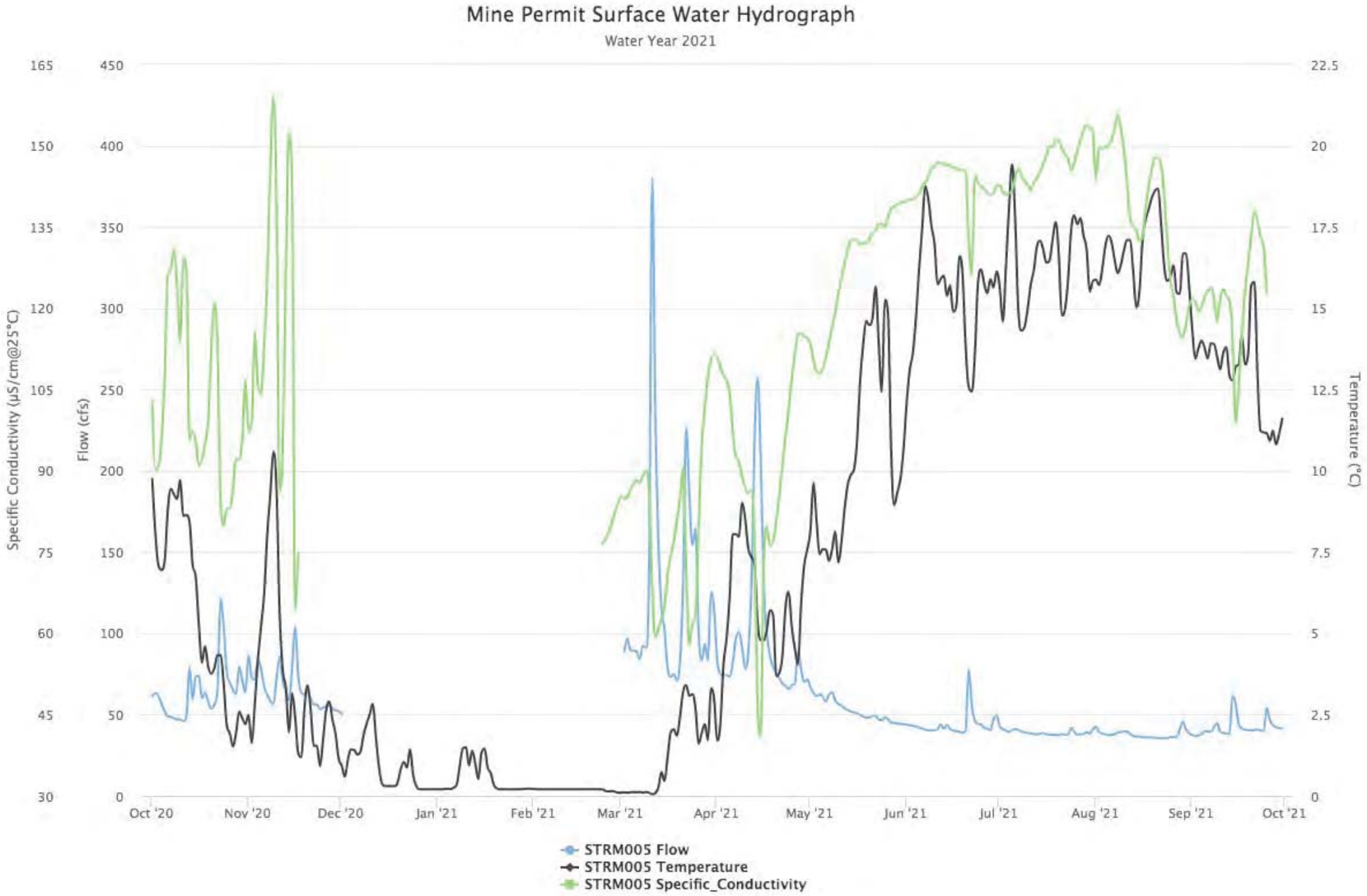
Appendix R

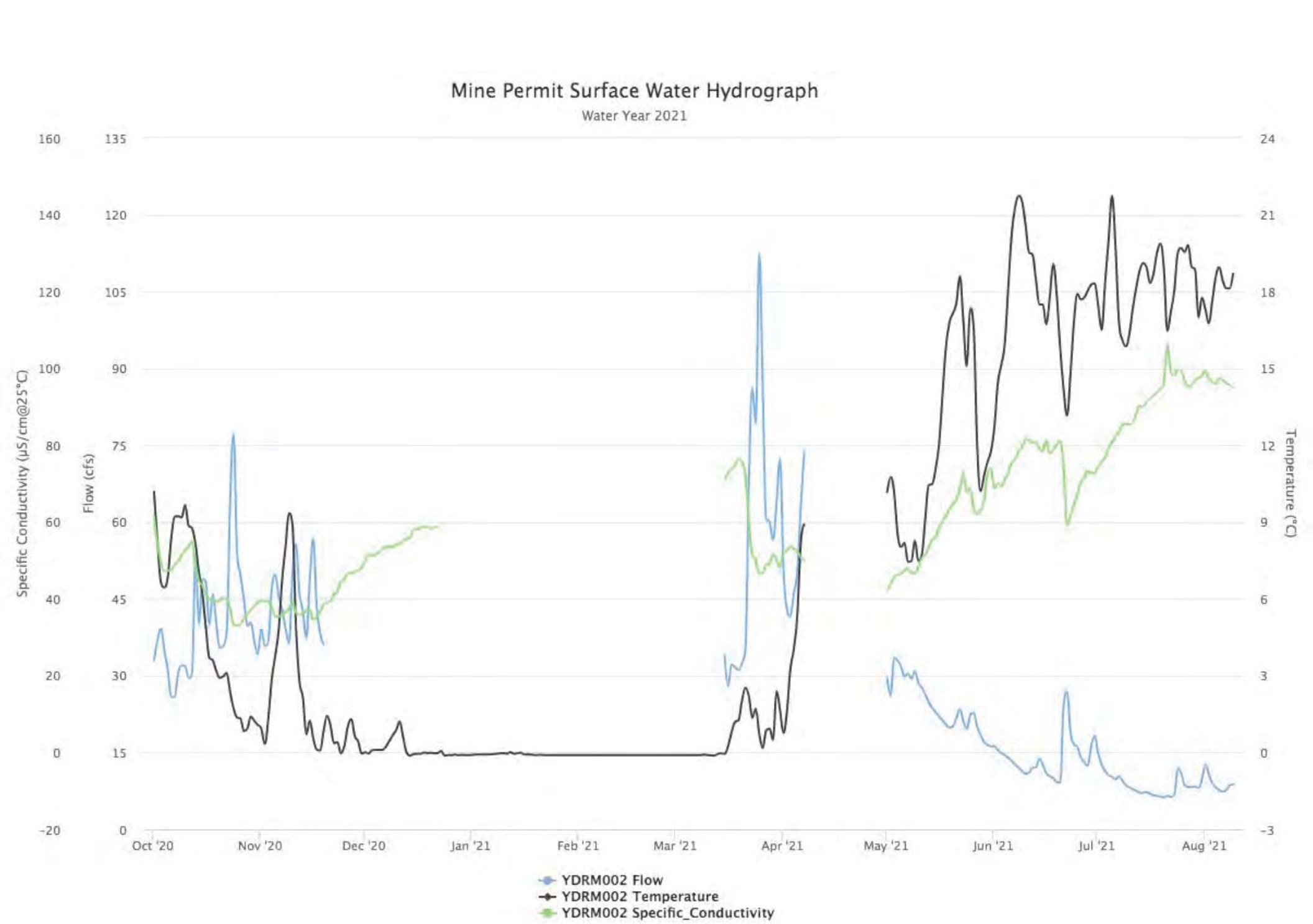
Eagle Mine

Surface Water Hydrographs


Mine Permit Surface Water Hydrograph
Water Year 2021
Specific Conductivity (µS/cm@25°C)
Flow (cfs)
Temperature (°C)
160
150
140
130
120
110
100
90
80
70
80
72
64
56
48
40
32
24
16
8
20
17.5
15
12.5
10
7.5
5
2.5
0
-2.5
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
STRE002 Flow
STRE002 Temperature
STRE002 Specific_Conductivity


Mine Permit Surface Water Hydrograph
Water Year 2021
Specific Conductivity (µS/cm@25°C)
Flow (cfs)
Temperature (°C)
156
144
132
120
108
96
84
72
60
48
36
32
28
24
20
16
12
8
4
0
18
16
14
12
10
8
6
4
2
0
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
STRM004 Flow
STRM004 Temperature
STRM004 Specific_Conductivity


Mine Permit Surface Water Hydrograph
Water Year 2021
Specific Conductivity (µS/cm@25°C)
Flow (cfs)
Temperature (°C)
165
150
135
120
105
90
75
60
45
30
450
400
350
300
250
200
150
100
50
0
22.5
20
17.5
15
12.5
10
7.5
5
2.5
0
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
Sep '21
Oct '21
STRM005 Flow
STRM005 Temperature
STRM005 Specific_Conductivity


Mine Permit Surface Water Hydrograph
Water Year 2021
Specific Conductivity (µS/cm@25°C)
Flow (cfs)
Temperature (°C)
160
140
120
100
80
60
40
20
0
-20
135
120
105
90
75
60
45
30
15
0
24
21
18
15
12
9
6
3
0
-3
Oct '20
Nov '20
Dec '20
Jan '21
Feb '21
Mar '21
Apr '21
May '21
Jun '21
Jul '21
Aug '21
YDRM002 Flow
YDRM002 Temperature
YDRM002 Specific_Conductivity

Appendix S

Eagle Mine

Flora & Fauna Survey Location Map

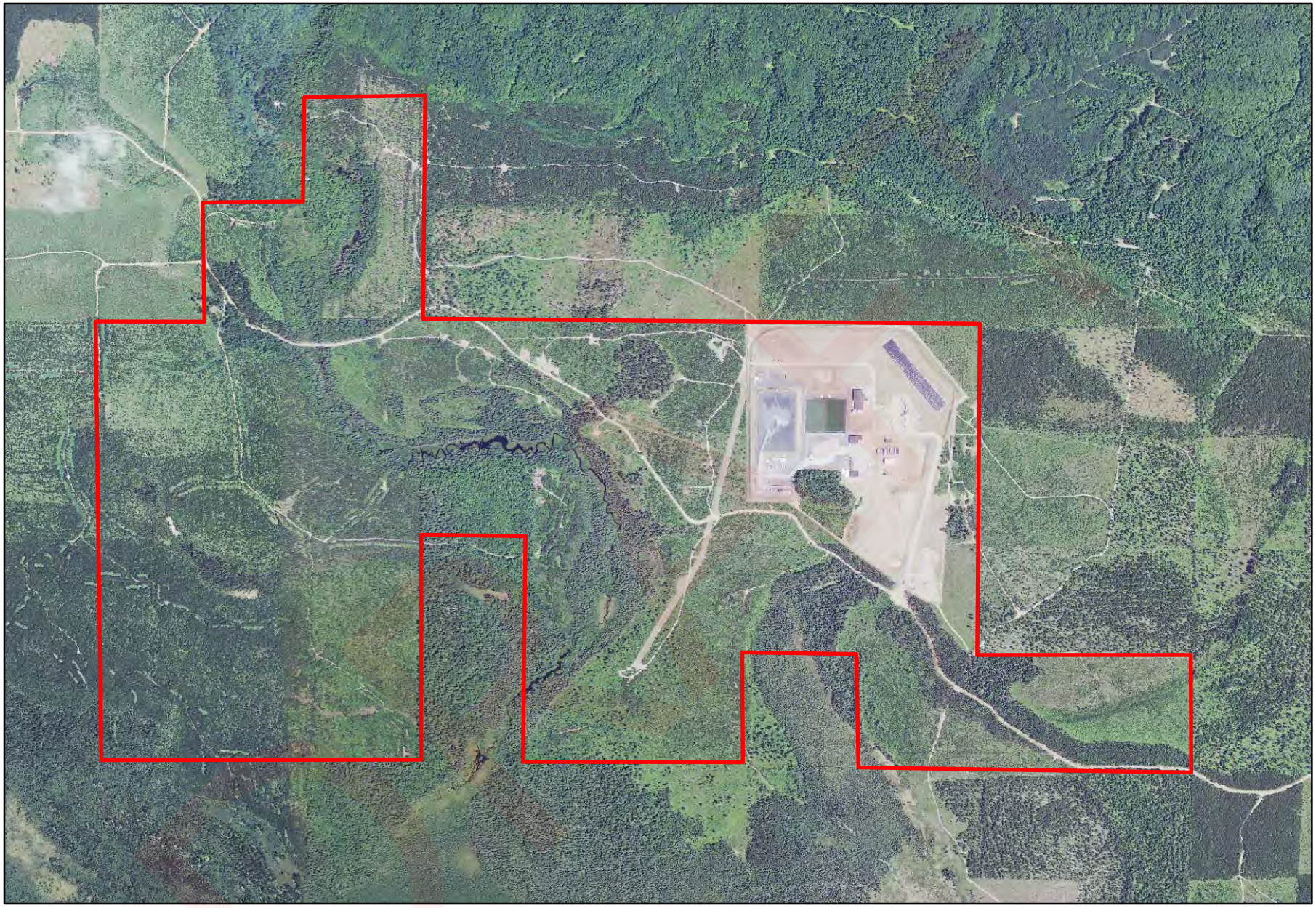


Figure 1-2. Study Area

BARR

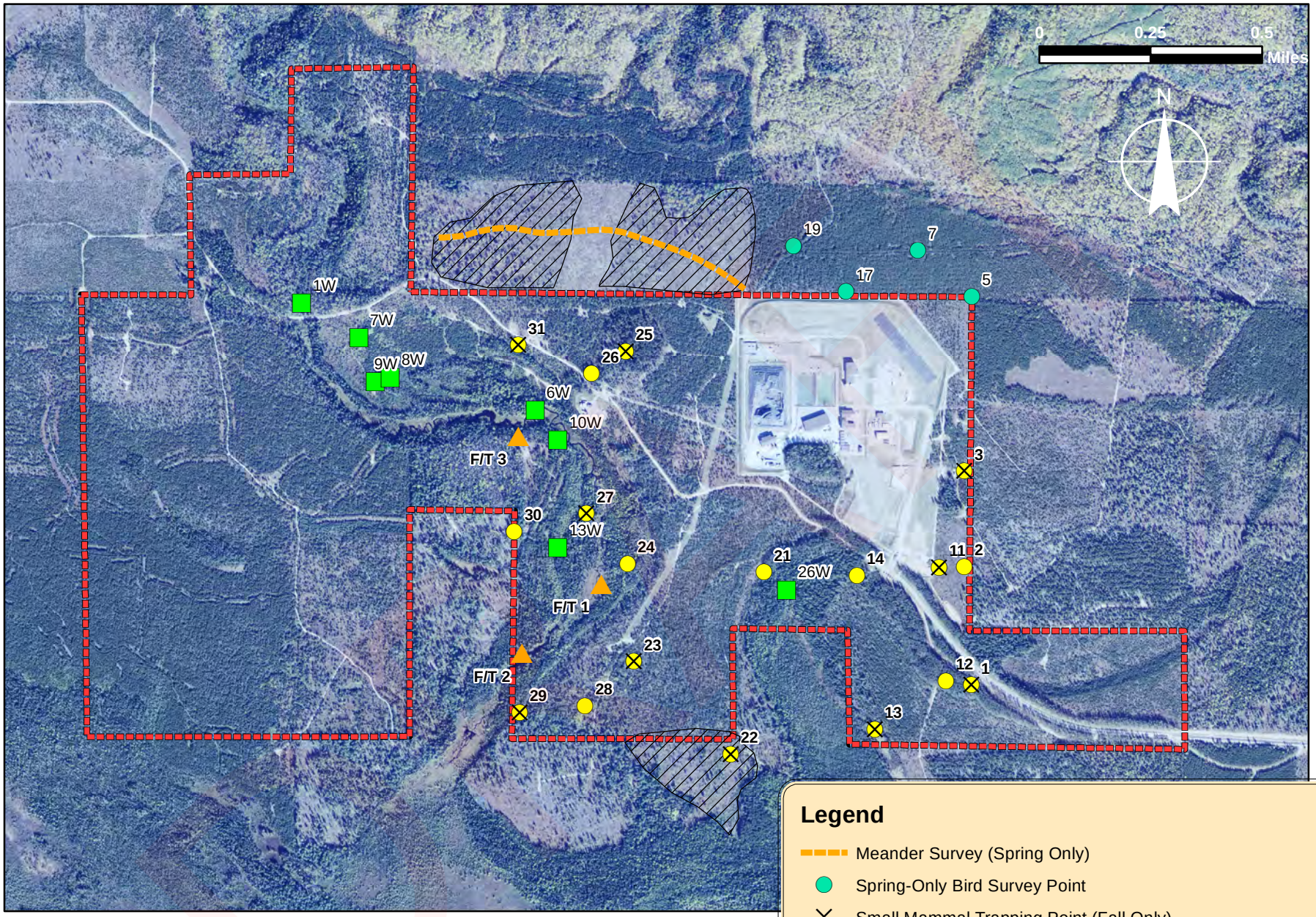


Figure 1-3. Biological and Wetland Survey Areas

BARR

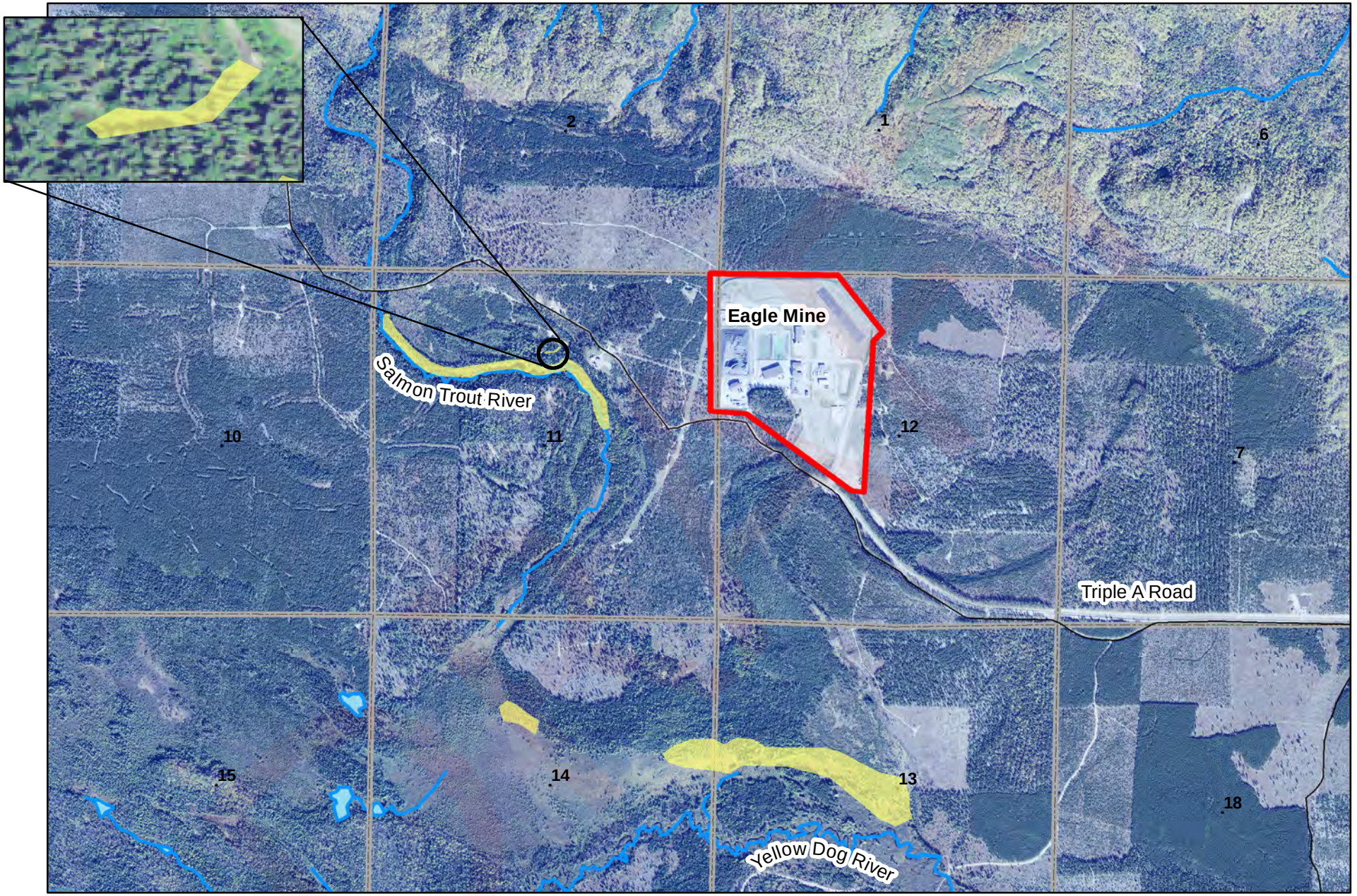


Figure 5-1. Narrow-leaved Gentian Survey (2018)

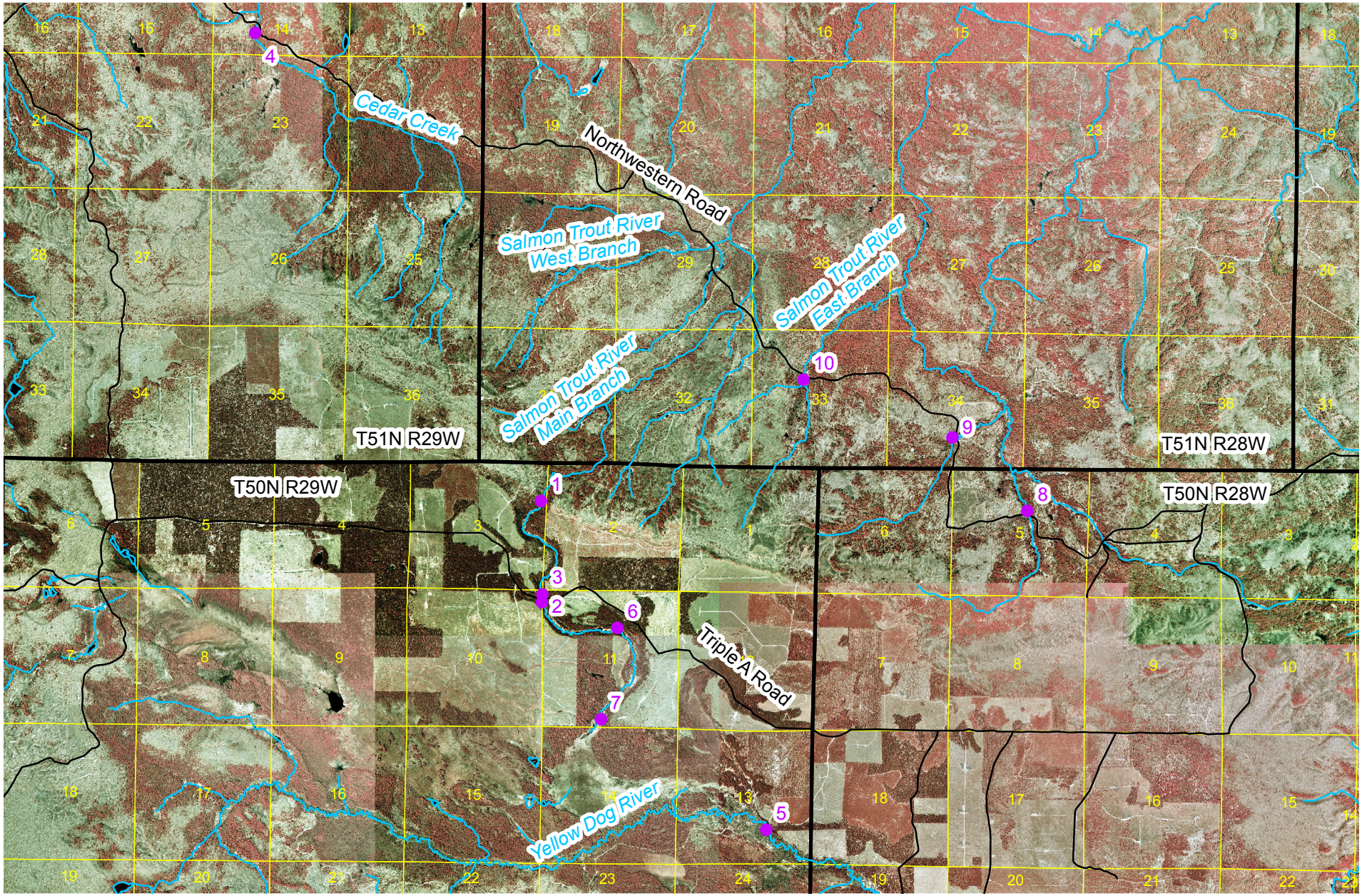
BARR

Figure 5-3. Kirtland's Warbler Habitat - US Fish & Wildlife Service

Appendix T

Eagle Mine

Aquatic Survey Location Map



Legend

- Survey Stations
- Rivers
- Township/Range
- Sections

N

0 0.375 0.75 1.5 2.25 3 Miles

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PROJECT	Eagle Mine
TITLE	Aquatic Sampling Locations
FIGURE	1-2

Appendix U

Eagle Mine

Updated Contingency Plan

Eagle Mine
a subsidiary of lundin mining

1. Contingency Plan – Eagle Mine Site

This contingency plan addresses requirements defined in R 425.205. This includes a qualitative assessment of the risk to public health and safety or the environment (HSE risks) associated with potential accidents or failures involving activities at the Eagle Mine. Engineering or operational controls to protect human health and the environment are discussed in Section 4 and Section 5 of this document. The focus of this contingency plan is on possible HSE risks and contingency measures. Possible HSE risks to on-site workers will be addressed by Eagle Mine through HSE procedures in accordance with Occupational Safety and Health Administration (OSHA) and Mine Safety and Health Administration (MSHA) requirements.

Processes undertaken at the Eagle Mine Site includes mining ore, as well as storing and treating by-products of that process. Eagle Mine's mining, storage, and treatment facilities have been designed, constructed, and operated in a manner that is protective of the environment through the use of proven technologies and engineering practices.

1.1 Contingency Items

This contingency plan addresses the items listed below in this Section in accordance with R 425.205 (1)(a)(i) - (xii).

- Release or threat of release of toxic or acid-forming materials
- Storage, transportation and handling of explosives
- Fuel storage and distribution
- Fires
- Wastewater collection and treatment system
- Air emissions
- Spills of hazardous substances
- Other natural risks defined in the EIA
- Power disruption
- Unplanned subsidence
- Leaks from containment systems for stockpiles or disposal and storage facilities, and
- Basin berm failures.

For each contingency item, a description of the risk is provided, followed by a qualitative assessment of the risk(s) to the environment or public health and safety. Next, the response measures to be taken in the event of an accident or failure are described.

1.1.1 Release of Toxic or Acid-Forming Materials

Potentially reactive materials generated as a result of mining operations include the ore and development rock. Both the development rock and ore have the potential to leach mining related constituents when exposed to air and water. As described in the following sub-sections, handling and temporary storage of

both the ore and development rock have been carefully considered in the design of the Eagle Mine so as to prevent the uncontrolled release of acid rock drainage (ARD). Since secondary processing will occur at an off-site mill, the only chemical reagents used on-site are associated with the water treatment plant (WTP).

1.1.1.1 Coarse Ore Storage Area (COSA)

Coarse ore from the underground mine is trucked to the surface and placed in the COSA. The COSA is a steel sided building with a full roof that is used for temporary storage of stockpiled coarse ore. The COSA has a concrete floor that is sloped to a floor drain that collects any contact water associated with the ore. This contact water is collected in an epoxy lined sump in the COSA and pumped into the composite lined contact water basins (CWB) where it is stored until treatment at the water treatment plant. Contingency measures associated with the CWB liner systems are discussed in Section 1.1.12. Also, in accordance with Air Permit (No. 50-06B) all overhead doors must be closed during loading or unloading of ore and a fugitive dust management plan, which includes sweeping and watering, is in place to minimize the generation of dust.

1.1.1.2 Temporary Development Rock Storage Area (TDRSA)

Development of the mine began with excavation of surrounding rock to provide access to the ore body through portals, raises and ramps. This rock is known as "development rock" and upon excavation is transported to the surface and temporarily stored in the TDRSA. The development rock stored in the TDRSA is returned underground as backfill in areas where ore has been removed.

Most of the development rock is classified as inert while stored on the surface, posing no threat to the environment. Ongoing tests show some of this rock has the potential to oxidize when exposed to air and water over longer periods of time. Therefore, Eagle Mine handles the development rock in a way to minimize the potential formation of ARD, and if formed, prevent it from being released into the environment.

Accordingly, Eagle Mine has designed and constructed a state-of-the-art TDRSA to contain the development rock. The TDRSA is constructed of the following components to minimize the potential generation of ARD, and if formed, prevent it from being released to the environment:

- A composite liner system comprised of a geo-membrane liner underlain by a GCL.
- A water collection system over the composite liner to collect precipitation that comes in contact with development rock. The collection system also helps protect the geo-membrane from damage by the development rock. The collection system consists of a geo-composite drainage fabric overlain by a 12-in thick granular drainage layer sloping towards the collection sump.
- A leak detection system for early detection and collection of potential percolation through the composite liner system. The leak detection system includes a collection sump, and a sump pump for liquid removal.
- A geo-membrane cover system placed over the development rock if development stops for an extended period of time.

In accordance with MP 01 2007, condition F4 and the Limestone Addition Plan (January 2017), when development rock is placed in the TDRSA and stored for greater than one year, it is amended with high-calcium limestone at a rate of two percent. This is added as an additional contingency measure to offset

the formation of ARD. Moreover, if development or mining is suspended for an extended period of time the development rock will be covered with a HDPE geo-membrane to further limit the generation of ARD by minimizing contact with precipitation. As an added measure, the time in which development rock will be stored in the TDRSA has been modified. Development rock was originally scheduled for storage on the TDRSA for approximately seven years before being returned underground. Eagle Mine has chosen to immediately return the rock underground as cemented rock fill or gob fill in order to further reduce the risk of ARD generation. The short-term nature of this project significantly reduces the potential for release of toxic and acid-forming materials.

If the event that the water that comes in contact with the development rock become acidic, it will not be exposed to the environment due to the design of the TDRSA. All contact water from the TDRSA is collected in the contact water basins and treated at the WTP. The contingency actions that address potential failure of the liner contact water collection system are discussed in Section 1.1.12.

1.1.1.3 Ore Transportation

The ore will be loaded from the Coarse Ore Storage Area (COSA) building into tractor-trailer combinations utilizing front end-loaders and transported to the Humboldt Mill. All loaded ore trucks will be covered and have the tires washed at the on-site truck wash prior to leaving the Contact Area at the Mine site.

The following sixty-six mile route is being utilized for moving the ore from the Eagle Mine site to the Humboldt Mill on existing roadways:

- East on Triple A Road, 9.0 miles to CR 510.
- East on CR 510, 3.0 miles to CR 550
- South on CR 550 approximately 20 miles to Sugarloaf Avenue
- South on Sugarloaf to Wright Street
- Wright Street to US-41 West
- US-41 West to M-95
- M-95 South to CR 601
- CR 601 East to the Humboldt Mill entrance.

Eagle Mine, in cooperation with the Marquette County Road Commission (MCRC), upgraded the portions of the sixty-six mile route that were not currently “all season” status. These upgrades included widening of roadways and addition of passing lanes all of which add a level of safety for all drivers on the road.

The trucks are covered side-dump units with a length limit of approximately 80 ft. They consist of a tractor, a trailer, and second trailer (pup). The truck carries approximately 45 metric tons per load on average. All loads are weighed prior to departure from the COSA to ensure that they do not exceed roadway weight limits.

Safety is stressed with the ore truck drivers. Tracking devices are mounted on the tractors to monitor and record speed, location and braking effort. Excessive speeds or erratic driving are not tolerated. In addition, Eagle Mine will work with the MCRC to maintain a safe road surface for employees, vendors and ore shipment.

Potential truck accidents are possible while transporting ore from the Mine to the Mill. In the event of a truck roll over, ore could be spilled onto the road and adjacent areas. Since the coarse ore is run of mine rock and not crushed, it will be relatively easy to pick the material up with conventional earthmoving equipment and place the ore back into a truck. If such an event should occur, removal action would take place as soon as possible. Although geochemical testing of the ore has shown that ARD will not occur in this short of a time period, it is important to respond appropriately to any spills. If an accident results in spillage of ore into a water body, specialized equipment and procedures may be required. Items such as temporary dams/cofferdams and large backhoes may be required to remove the material from the water. Eagle Mine has an emergency response contractor on call to immediately respond to environmental incidents, assist with clean-up efforts, and conduct environmental monitoring associated with any spills. In addition, a transportation spill response standard operating procedure has been developed.

The Mill Coarse Ore Facility is designed such that all unloading of ore will occur in an enclosed building with a concrete floor. These features will prevent release of dust and prevent precipitation from contacting the ore. After the ore is unloaded into the Coarse Ore Facility, it is crushed and transferred, with loading and transfer points featuring dust control in accordance with the Air Permit to Install (50-06B).

1.1.2 Storage, Transportation and Handling of Explosives

Blasting agents or explosives are required for blasting operations in the development and operation of the mine. The bulk explosives selected for use at the Eagle Mine are comprised of ammonium nitrate and small percentages of sodium and calcium nitrate, and diesel fuel. Although uncommon, accidental detonation of explosives could result from impact, shock, fire, or electrical discharge.

The entire surface operations are located within a fenced area. Vehicular access to Eagle Mine is controlled by a gate house and fence system. To further mitigate concerns related to explosives, with the exception of the bulk emulsion, all explosives components are stored in a locked explosives magazine located underground.

The storage, transportation, and use of explosives comply with applicable MSHA and/or ATF standards. Caps, primers, and detonating cord are stored in a locked magazine underground while the bulk emulsion is stored in locked storage tanks on the surface. Explosives are transported by a clearly marked truck.

The main impacts of an uncontrolled explosion on the surface would be in the immediate area of the explosion and would include direct injury from the blast zone, falling debris, fire, and the release of combustion products. Combustion products expected from the explosives are carbon monoxide and nitrogen oxides. Neither of these products is expected to be generated in high enough concentrations for significant above ground or off-site exposures to occur. Dust could also be generated but would likely settle to the ground before migrating beyond the Eagle Mine site. Uncontrolled underground explosions have not been considered since the environmental effects would not be different from controlled explosions in normal mine operations. In the event of a surface explosion, the Emergency Procedure will be followed, as discussed in Section 1.2.

1.1.3 Fuel Storage and Distribution

The fuel storage area is located within the contact area of the Eagle Mine Site. The entire surface operations are located within a fenced area and controlled by a gate house and fence system. The fuel

storage area contains two off-road diesel fuel storage tanks with a capacity of 20,000 gallons each and one smaller 570-gallon tank for on-road diesel. An additional 1,700-gallon diesel fuel storage tank is located in the non-contact area near the powerhouse generator (with a 500-gallon backup tank) and a 500-gallon diesel tank associated with the fire water system is located inside the water treatment plant. All fuel tanks are made of double-walled construction for added protection against leaks. In addition, the mine site currently has a propane storage capacity of approximately 93,600 gallons. All propane tanks, currently on site, are located adjacent to the buildings that require the fuel for heating purposes.

In general, fuel spills and leaks will be minimized by the following measures:

- A Spill Prevention Control and Countermeasures Plan (SPCC) has been written and implemented.
- Training of personnel responsible for handling fuel in proper procedures and emergency response;
- Regular equipment inspections and documentation of findings;
- Double-walled construction of all above ground tanks and/or additional secondary containment, and
- Staging of on-site emergency response equipment to quickly respond to unanticipated spills or leaks.

Specific procedures have been prepared as part of the project's SPCC Plan. In addition, a Pollution Incident Prevention Plan (PIPP) has been prepared which addresses potential spillage of fuels and other polluting materials.

Diesel fuel and propane (fuels) are transported to the Eagle Mine by tanker truck from local petroleum distributors. The probability of an accidental release during transportation will be dependent on the location of the supplier(s) and the frequency of shipment. A fuel release resulting from a vehicular accident during transportation is judged to be a low probability event. Transport of fuel in tanker trucks does not pose an unusual risk to the region since tanker trucks currently travel to the region on a regular basis to deliver fuels to gasoline stations located in the communities surrounding the Eagle Mine.

Three potential release events associated with the surface-stored fuels are a bulk tank failure, mishandling/leaking hoses, and a construction/reclamation phase release.

Bulk Tank Failure – A tank failure could potentially result from unusual thermal, mechanical, or chemical stresses. Chemical stresses are not anticipated as the storage tanks will be constructed of materials compatible with the fuels. Mechanical stress is also not anticipated since the tanks will be located within an area offering protection from vehicles. Contingency measures required to mitigate a fuel spill are included in the SPCC and PIPP. All fuel tanks are double-walled and visually inspected at regular frequencies to verify that the storage tanks are not leaking.

Mishandling/Leaking Hoses – A release might result from leaking hoses or valves, or from operator mishandling. This type of release is likely to be small in volume and is judged to be a low probability event given that operators will be trained to manage these types of potential releases. These small spills will be cleaned up by using on-site spill response equipment such as absorbent materials and/or removing impacted soils.

Construction/Reclamation Phase Release – A major fuel spill during the construction or reclamation phases could occur from a mobile storage tank failure or mishandling of fuels. Such a release is also considered to be a low probability event given that operators will be trained to manage these types of potential releases and all tanks are required to have secondary containment. As with mishandling or leaking hoses, these small spills will be cleaned up by using on-site spill response equipment such as absorbent materials and/or removing impacted soils.

Absorptive materials may be used initially to contain a potential spill. After the initial response, soil impacted with residual fuel would be addressed. Remedial efforts could include, if necessary, the removal of soil to preclude migration of fuel to groundwater or surface water. The project's PIPP and SPCC plans addresses fueling operations, fuel spill prevention measures, inspections, training, security, spill reporting, and equipment needs. In addition, standard operating procedures have been developed which cover fueling operations and spill response activities. All responses to a fuel spill, both large and small, will follow the guidelines dictated by the spill response plan and be reported internally. The tanks will be inspected regularly, and records of spills will be kept and reported to EGLE and other agencies as required.

In the event of a release in the contact area, fuels would be routed (due to site grading) to the contact water basins where they would cleaned-up using absorbent pads/booms or other fuel absorbing products. Any fuel not absorbed would be routed to the WTP and treated prior to release to the environment. In the event of a release in the non-contact area, fuels would be absorbed by soil, retarding their migration. Exposures to contaminated groundwater are not expected because of regulatory requirements for timely and effective response actions which will dictate soil or source removal before migration to groundwater takes place. A transportation-related fuel spill resulting from a non-traffic accident is considered a low probability event. Therefore, the risk of a fuel spill from a non-traffic accident is judged to be minor.

Contingency plans for responding to fuel spills from tanker trucks are required of all mobile transport owners as dictated by Department of Transportation (DOT) regulation 49 CFR 130. These response plans require appropriate personnel training and the development of procedures for timely response to spills. The plan must identify who will respond to the spill and describe the response actions to potential releases, including the complete loss of cargo. The plan must also list the names and addresses of regulatory contacts to be notified in the event of a release.

1.1.4 Fires

This section discusses contingency measures to be taken in the event of either an underground mine fire or surface fires.

1.1.4.1 Mine Fire

One potential source of combustion could occur during the handling of combustible minerals in the Eagle Mine ore body. The ore body contains certain quantities of pyrrhotite, which is an iron sulfide mineral. Iron sulfide is considered to be a phyrophoric material that oxidizes exothermically when exposed to air. Due to the exothermic reaction, ignition can occur, especially if the surface area is increased with the occurrence of finely divided material. This situation is often encountered in a petroleum refinery, where finely divided iron sulfide scales form in refinery units in oxygen deficient atmospheres. When subsequently exposed to air, these crystals of iron sulfide oxidize rapidly back to iron oxide. While this condition can also occur in underground mines, this problem should be adequately controlled through proper mine ventilation.

In the event that a mine fire develops it would be expected to be localized, short lived, and would not pose a threat to the workers or the environment. Off-site populations would not be exposed to agents resulting in adverse effects. Events that do not result in exposure cannot result in health effects and do not pose a risk. Mine fires, therefore, pose a negligible risk to the environment.

Appropriate preventative and contingency measures will be exercised as required by MSHA. These measures include housekeeping, the installation of fire suppression systems on mobile equipment, the widespread distribution of fire extinguishers throughout the mine, employee safety training programs, and the use of a mine rescue team trained in firefighting techniques. Mine evacuation procedures, as discussed in Section 1.2, may be invoked, depending on the nature and extent of an underground fire.

1.1.4.2 Surface Fire

Surface fires can be started by a variety of causes including vehicular accidents, accidental ignition of fuels or flammable chemical reagents, and lightning strikes. Smoking is only allowed in designated areas on the site. Contingency measures include having the required safety equipment, appropriate personnel training and standard operating procedures. Given these measures, uncontrolled or large surface fires are considered a low probability event with negligible risk.

Because the Eagle Mine is situated in a forested region, forest fires started off-site could potentially impact the mine site. The cleared area in the vicinity of the surface facilities and excess soil berms will serve as a fire break to protect surface facilities. At Eagle Mine Wildfire Response Guideline has been developed in conjunction with Michigan DNR Fire Division to ensure the best possible response. Contingency measures discussed below can be implemented in the event of an off-site forest fire.

In order to minimize the risk of a fire on-site, stringent safety standards are being followed during both the construction and operation phases of surface facilities. All vehicles/equipment are required to be equipped with fire extinguishers and all personnel trained in their use. In addition, all personnel are required to complete a “hot work” permit whenever work is being performed where an ignition source is present. Water pipelines and network of fire hydrants have been installed throughout the site and additional fire extinguishers are also located in high risk areas. On-site firefighting equipment includes:

- An above ground water storage tank and distribution system for fire suppression.
- Stocked and maintained fire hose stations/cabinets.
- Multiple dry chemical fire extinguishers located throughout the facility.
- An alarm system which automatically notifies security of any onsite alarm.

1.1.5 Wastewater Collection and Treatment

The major sources of water requiring treatment are groundwater inflow to the mine, water used in support of underground operations, contact water from the TDRSA, and precipitation and storm water runoff from the operations area. All water is routed to CWBs No.1 and No.2. These basins provide wastewater storage and equalization capacity. Water from the basins is conveyed to the WTP which is comprised of several unit processes, including: metals precipitation, multi-media filtration, weak acid ion exchange, and double pass reverse osmosis. The final product water is pH adjusted prior to subsurface discharge via a Treated Water Infiltration System (TWIS). This discharge is authorized by the State of Michigan under a Groundwater Discharge Permit.

The water treatment system is designed to handle various process upset conditions such as power disruption (Section 1.1.10) or maintenance of the various process units. The effluent is continually monitored for key indicator parameters to verify the proper operation. Effluent not meeting treatment requirements is pumped back to the CWBs for re-treatment. The CWBs are designed to hold approximately 14,000,000 gallons of water. This storage capacity allows sufficient time to correct the process upset condition. Potential hazards and chemical reagents associated with the WTP are discussed in Section 1.1.8.

1.1.5.1 Contact Water Basins

The CWBs were very conservatively designed to handle a combined 50-year peak snow melt and rain event. The CWBs have also been designed with the following contingencies which are further addressed in the Eagle Mine Site Water Management Plan:

- The CWBs are designed to hold approximately 14,00,000 gallons of water allowing sufficient time for maintenance of WTP equipment.
- In the unlikely event that a runoff event exceeds capacity of the CWBs the following actions will be taken:
  - By-pass CWBs and divert underground mine water directly to the WTP.
  - Transfer water from CWBs to the TDRSA (during a true emergency, more than one foot of head can be stored on the TDRSA with consent from the EGLE).
- Water can be pumped into vacant underground mine workings for additional temporary storage of water.

Potential release events associated with breach of the composite liner and overtopping of the berms are discussed in Section 1.1.6 and the Eagle Mine Site Water Management Plan. Potential leakage of the liner system is discussed in Section 1.1.12.

1.1.5.2 Non-Contact Storm Water

Storm water runoff from the non-contact areas will be directed to one of four NCWIBs. The NCWIBs allows runoff from non-contact areas to infiltrate through the on-site sandy soils. In general, the NCWIBs have been designed such that no runoff is expected to leave the disturbed areas of the site. The NCWIBs are very conservatively sized to accommodate the same runoff event as the CWBs.

As an additional conservative design measure, the NCWIBs have been sized assuming the ground is frozen six months out of the year with no infiltration during this time period. In the event that the infiltration capacity of the NCWIB soils is reduced over time by the presence of silt, the solids will be removed to restore the infiltration capacity.

1.1.5.3 Treated Water Infiltration System

Treated water is piped from the WTP to the TWIS in a buried pipeline. The treated water is discharged to the on-site sandy soils through the TWIS. The TWIS is located in highly permeable soil. The treated effluent is applied evenly within individual infiltration cells and discharged to groundwater. The treated effluent is applied to the TWIS through five separate infiltration cells. This design allows at least one cell to be out of service for resting and/or maintenance while the other cells are being used.

Potential failure mechanisms of the TWIS include reduced infiltration capacity, pipe breakage and frost damage. The infiltration capacity of the TWIS is designed with a capacity that is greater than the capacity of the WTP. In the unlikely event that the infiltration capacity becomes reduced over time, additional capacity could be constructed adjacent to the proposed footprint. If pipe breakage occurs, the damaged sections will be removed and replaced. Frost is not expected to be a problem. As a contingency against frost damage, styrofoam insulation was incorporated into the design, which keeps the natural temperature of the earth above 32 degrees. Furthermore, since the material below the TWIS is free draining, water should not freeze in the interstitial space.

1.1.6 Berm Failures

This section discusses contingency actions to be taken in the event of berm failures at the CWBs and TDRSA. Liner failures are discussed in Section 1.1.12.

Embankment failure of the CWBs or the TDRSA is not likely due to the very small height of the embankments, and the flat slopes and the stable nature of the onsite foundation soils at the site. All construction was under strict QA/QC procedures to verify good construction of the embankments. In addition, the berms are inspected on a monthly basis or after a rain event that exceeds 0.5 inches in a 24-hour period, as required by permit condition L-31& L-32 of the mining permit. These inspections identify preventative maintenance required in order to maintain stability of the berms and embankments. All identified issues are immediately reported to onsite maintenance staff for repair.

Overtopping of the CWBs is also very unlikely due to the requirement to maintain two feet of freeboard above an already very conservative design. In addition, in the event of a catastrophic flood event, the TDRSA and underground workings will be used for excess water storage.

Erosion on the external berm slopes could be caused by unusually high precipitation. Erosion control contingency measures will be to quickly repair potential rutting or other soil instability with conventional earth moving equipment.

1.1.7 Air Emissions

The construction, operation and reclamation phases of the project will be performed in a manner to minimize the potential for accidents or failures that could result in off-site air quality impacts. All phases of the project will incorporate a combination of operating and work practices, maintenance practices, emission controls and engineering design to minimize potential accidents or failures. Below is a description of identified areas of risk and associated contingency measures that may be required. As part of a comprehensive environmental control plan, these contingency measures will assist in minimizing air impacts to the surrounding area.

1.1.7.1 Air Emissions during Operations

During operation of the mine, potential emissions from the facility will be controlled as detailed in the project's current Michigan Air Use Permit (No. 50-06B). These controls include paving of the site access road and parking areas, implementation of an on-site roadway sweeping and watering program, use of building enclosures or flexible membrane covers on storage areas, installation of dust collection or suppression systems where necessary, or enclosed structures to control dust during ore transfer operations, and following prescribed preventive maintenance procedures for the facility. Ore that is

moved off-site will be transported in covered trucks to minimize dust emissions. Below is a more detailed discussion of potential airborne risks associated with proposed operations at the facility.

During facility operations, Eagle Mine will utilize certain pieces of mobile equipment to move ore about the site. Equipment includes ore production trucks, front end loaders, product haul trucks and miscellaneous delivery trucks. Although the movement of most vehicles across the site is on asphalt surfaces, a comprehensive on-site watering and sweeping program has been developed to control potential fugitive sources of dust. While the watering program is closely monitored, if excessive dust emissions should occur, the facility will take appropriate corrective action, which may include intensifying and/or adjusting the watering program to properly address the problem.

To minimize dust emissions from development rock and coarse ore storage areas, such areas will either be fully or partially enclosed. Materials will be moved to and from these areas during the course of operations. Given the relatively large size and moisture content of these materials, it is anticipated that the risk of excessive fugitive dust emissions from these activities is low. Any development rock crushed in preparation for use in backfill will be watered prior to crushing and conveyors will be equipped with water sprays to minimize dust emissions. The TDRSA will also be temporary in nature, in that development rock will be moved back underground to fill stopes that have been mined.

The coarse ore storage building is designed as an enclosed structure to control fugitive emissions from ore transfer between underground production vehicles and offsite haul trucks. No crushing will occur in the COSA, so the risk of fugitive dust emissions from this activity is low due to the enclosed nature of the building and moisture content of the ore. If necessary, water sprays are used to control dust within the building and best housekeeping practices apply to ensure cleanliness of the building (i.e. sweeping and washing down of floors). Although the risk of fugitive dust during transport of coarse ore material off-site is considered to be low due to its large size, this risk is further reduced as all trucks will be equipped with covers. Trucks undergo a tire wash prior to exiting the facility to reduce the potential for ore dust migration from the property.

Portland cement is being incorporated as a binder for aggregate material used in backfilling primary stope areas underground. The cement is unloaded at the surface and stored in silos at the surface backfill facilities. Controls have been incorporated to minimize fugitive dust emissions during this process and include the use of a truck mounted pneumatic conveying system, vent fabric collectors and enclosed screw conveyors. While it is anticipated the risk of accidental emissions from these operations is moderate, Eagle Mine will be prepared to take appropriate corrective action if an upset condition should occur. All cemented rock fill generating activities will occur under emissions control such as fabric filters until the material is wet and transferred back to the underground.

1.1.7.2 Air Emissions During Reclamation

Once underground mining and ore transfer activities are completed at the site, reclamation will commence in accordance with R 425.204. Similar to construction activities, there is a moderate risk fugitive dust emissions could be released during certain re-vegetation activities and during temporary storage of materials in stockpiles. Similar to controls employed during the construction phase, areas that are reclaimed will be re-vegetated to stabilize soil and reduce dust emissions. If severe wind or an excessive rain event reduces the effectiveness of these protective measures, appropriate action will take place as soon as possible to restore vegetated areas to their previous effectiveness and replace covers as

necessary.

To the extent necessary, areas being reclaimed will be kept in a wet state by continuing the watering program. It is anticipated this program should minimize the possibility of excessive dust associated with mobile equipment. In the event fugitive dust is identified as an issue, corrective action will determine the cause of the problem and appropriate action will occur.

1.1.8 Spills of Hazardous Substances

Since secondary mineral processing is not planned on-site, the primary chemical reagents used are associated with the WTP. Table 1-1 includes a list of reagents used at WTP along with the storage volumes and physical state of each chemical.

Table 1-1 – Chemical Reagents Used at the Water Treatment Plant

Item No.	Chemical Name	CAS No.	Storage Volume (Gallons)	Storage Volumes (pounds)	Delivery State
1	Sodium Hydroxide (50%)	1310-73-2	5,000 gallons	63,308 lbs.	Liquid
2	Sodium Hydroxide (Euco-Fill 25 & Eucon Retarder 100)	1310-73-2	2,000 gallons	18,659 lbs.	Liquid
3	Sodium Hypochlorite (12.5%)	7681-52-9	55 gallons	573 lbs.	Liquid
4	Sodium Carbonate (Soda Ash)	497-19-8	-	34,000 lbs.	Solid
5	Ferric Chloride (35%)	7705-08-0	900 gallons	10,499 lbs.	Liquid
6	Hydrochloric Acid (32%)	7647-01-0	5,000 gallons	15,744 lbs.	Liquid
7	Suppressor 1615 (Antifoam)	N/A	330 gallons	2,708 lbs.	Liquid
8	Nitric Acid (30%)	7697-37-2	600 gallons	1,773 lbs.	Liquid
9	Sulfuric Acid (93%)	7664-93-9	660 gallons	10,116 lbs.	Liquid
10	Sodium Metabisulfite	7681-57-4	-	50 lbs.	Solid
11	PC-191-T (Antiscalant)	20592-85-2	520 gallons	11,078 lbs.	Liquid
12	POL-EZ 83904 Polymer	64742-47-8	110 gallons	999 lbs.	Liquid
13	Nalco Enact 7880 Polymer	10043-52-4	110 gallons	1,191 lbs.	Liquid
14	Citric Acid	77-92-9	-	2,000 lbs.	Liquid
15	Carbon Dioxide Gas	124-38-9	-	800 lbs.	Gas
16	Propane (on site)	74-98-6	4 cylinders at WTP; 5 tanks	390,200 lbs.	Gas
17	High pH RO Cleaner	-	-	800 lbs.	Liquid

Chemical storage and delivery systems follow current standards that are designed to prevent and to contain spills. All use areas and indoor storage areas were designed, constructed and/or protected to prevent run-on and run-off to surface or groundwater. This includes development of secondary

containment areas for liquids. The secondary containment area is constructed of materials that are compatible with and impervious to the liquids that are being stored. In addition, the truck off-loading area for bulk chemicals is an enclosed facility curbed with a sloped pad, such that spills are directed and contained within the secondary containment area. A release in the WTP from the associated piping would be contained within the curbed and contained plant area and neutralized. Absorbent materials are available to contain acid or caustic spills. Eagle Mine has an emergency response contractor on call to immediately respond to environmental incidents, assist with clean-up efforts, and conduct environmental monitoring associated with any spills.

Spill containment measures for chemical storage and handling will reduce the risk of a spill from impacting the environment. Due to the low volatility of these chemicals, fugitive emissions from the WTP to the atmosphere during a spill incident are likely to be negligible. Off-site exposures are not expected. It is therefore anticipated that management and handling of WTP reagents will not pose a significant risk to human health or the environment.

1.1.9 Other Natural Risks

Earthquakes – The Upper Peninsula of Michigan is in a seismically stable area. The USGS seismic impact zone maps show the maximum horizontal acceleration to be less than 0.1 g in 250 years at 90% probability. Therefore, the mine site is not located in a seismic impact zone and the risk of an earthquake is minimal. Therefore, no contingency measures are discussed in this section.

Floods – High precipitation events have been discussed previously in sections that describe the CWBs, NCWIBs and the TDRSA. High precipitation could also lead to the failure of erosion control structures. The impacts of such an event would be localized erosion. Contingency measures to control erosion include sandbag sediment barriers and temporary diversion berms. Long term or off-site impacts would not be expected. Failed erosion control structures would be repaired or rebuilt. Impacts from high precipitation are reversible and off-site impacts are not expected to occur. Given the considerable planning and engineering efforts to manage high precipitation events, the risk posed by high precipitation is considered negligible.

Severe Thunderstorms or Tornadoes – Severe thunderstorms or tornadoes are addressed in the emergency procedures developed for the mine site. Certain buildings are designated shelters in the event of severe weather. Evacuation procedures are part of the on-site training of all employees.

Blizzard – The mine site is designed to accommodate the winter conditions anticipated for the Upper Peninsula. Triple A Road has been upgraded to accommodate the increased vehicle traffic which allows access to the mine during the worst of winter weather. Eagle Mine and the MCRC have an arrangement for maintenance of the County Roads during winter conditions. If road conditions deteriorate beyond the capability of the maintenance equipment, Eagle Mine will have arrangements to keep workers on-site for extended periods.

Forest Fires – Forest fires were discussed in Section 1.1.4.

1.1.10 Power Disruption

Facility electric power is provided by Alger-Delta Electric Cooperative, as well as, a backup generator capable of delivering 2,000 kW of power. The electrical distribution system provides power to the main

surface facilities, the backfill surface facilities, the potable well, and underground facilities. In the event of a power outage, the backup generator automatically starts and provides power to the surface facilities and underground ventilation system. A second portable generator can be utilized to power the potable water system, if necessary. During the outage, Eagle Mine would have to reduce operations so as to keep critical equipment in operation with the reduced power.

In the event the WTP would need to be temporarily shut down during power disruptions, the CWBs were designed with significantly larger capacity than required in daily operations. The CWBs can hold approximately 14,000,000 gallons of mine inflow water which would be sufficient enough in size to store water for an extended period of time if necessary.

1.1.11 Unplanned Subsidence

The blast hole mining method being used at Eagle Mine consists of primary and secondary stopes. This method requires that prior to mining a secondary stope, the primary stopes on both sides and on the level above be backfilled with cemented rock fill. Mining will start with a small number of stopes near the middle elevation of the ore body and then proceed to the lower parts of the ore body and progress vertically to the top of the deposit over the life of the mine. This mining method and sequence will minimize the potential for surface subsidence to occur.

The primary stopes are backfilled using an engineered cemented development rock or aggregate fill. A Portland cement binder is used to prepare the backfill. The quantity of binder required is estimated at approximately four percent by weight. The secondary stopes are backfilled with either limestone amended development rock from the TDRSA or local uncemented fill material obtained from off-site sources. Backfilling the primary and secondary stopes as proposed above is designed to mitigate surface subsidence and the subsidence is predicted to be immeasurable at the ground surface.

A comprehensive evaluation of the stability of the crown pillar and surface subsidence was completed as part of the mine design. The conclusion of the stability assessment was that the pillar is predicted to be stable with the typical rock mass classification values obtained prior to the start of mining. The crown pillar assessment also predicted the vertical displacement of the crown pillar. The modeling results predicted vertical displacement at the top of bedrock less than 2 cm (<1 in). Given that the bedrock is covered by overburden, this displacement of the crown pillar and this subsidence will be imperceptible at the ground surface. As a contingency, a Crown Pillar Management Plan has been developed that includes subsidence monitoring measured both through surface and underground extensometers as well as five survey monuments that detect vertical subsidence and progressive ground movement. The surface extensometer is downloaded and survey completed on a monthly basis. The underground extensometers are continually monitored and tied into a telemetry system for on-demand data retrieval. In the event of unanticipated subsidence, the mining sequence and backfill methods as described above and in Section 4, will be evaluated and adjusted to reduce the subsidence. Adjustments to the stope sequence, backfill methods, crown pillar thickness, and backfill mix would be adjusted as needed to minimize subsidence. In addition, ground support inspections are completed on a daily basis by onsite staff to ensure safe working conditions for miners.

1.1.12 Containment System Leaks

Details of the containment systems for the CWBs and TDRSA were previously discussed. These containment facilities are both designed with composite liner systems to minimize the potential for

release. In addition, QA/QC measures required by the mining permit assure proper construction of the containment structures. As an additional preventative measure to minimize the potential for leaks from these facilities, leak location surveys were completed during construction of the TDRSA and CWBs and will continue to be completed periodically for the CWBs to identify potential leaks that occur during operations. The TDRSA is equipped with a leak detection system and therefore a leak detection survey is not necessary.

1.2 Emergency Procedures

This section includes the emergency notification procedures and contacts for the Eagle Mine. In accordance with R 425.205(2), a copy of this contingency plan will be provided to each emergency management coordinator having jurisdiction over the affected area at the time the application is submitted to the EGLE.

Emergency Notification Procedures – An emergency will be defined as any unusual event or circumstance that endangers life, health, property or the environment. If an incident were to occur, all employees are instructed to contact Security via radio or phone. Security then makes the proper notifications to the facility managers and activates the Eagle Mine Emergency Response Guideline as needed. If personnel on site need to be notified of such an event an emergency toned broadcast via radio will be made with instructions.

Eagle Mine has adopted an emergency response structure that allows key individuals to take immediate responsibility and control of the situation and ensures appropriate public authorities, safety agencies and the general public are notified, depending on the nature of the emergency. A brief description of the key individuals is as follows:

- Health & Safety Officer: The facility H&S manager and H&S staff are responsible for monitoring activities in response to any emergencies. During an emergency, H&S representatives will manage special situations that expose responders to hazards, coordinate emergency response personnel, mine rescue teams, fire response, and ensure relevant emergency equipment is available for emergency service. This individual will also ensure appropriate personnel are made available to respond to the situation.

- Environmental Officer: The facility environmental manager will be responsible for managing any environmental aspects of an emergency situation. This individual will coordinate with personnel to ensure environmental impact is minimized, determine the type of response that is needed and act as a liaison between environmental agencies and mine site personnel.

- Public Relations Officer: The facility external relations manager will be responsible for managing all contacts with the public and will coordinate with the safety and environmental officers to provide appropriate information to the general public.

In addition to the emergency response structure cited above, a Crisis Management Team (CMT) has also been established for situations that may result in injuries, loss of life, environmental damage, property or asset loss, or business interruption. If a situation is deemed a “crisis” the CMT immediately convenes to actively manage the situation. The following is a description of the core members and their roles:

Crisis Management Team – Core Members and Roles

Core Members	Role
Team Leader	Responsible for strategy and decision making by the CMT during a crisis and maintaining a strategic overview.
Coordinator	Ensures a plan is followed and all logistical/administrative support required is provided.
Administrator	Records key decisions and actions and provides appropriate administrative supports to the CMT.
Information Lead	Gathers, shares, and updates facts on a regular basis.
Emergency Services and Security	Liaises with external response agencies and oversees requests for resources. Maintains a link between the ERT and CMT and oversees and necessary evacuations.
Communications Coordinator	Develops and implements the communications plan with support from an external resource.
Spokesperson	Conducts media interviews and stakeholder briefings.

Evacuation Procedures – While the immediate surrounding area is sparsely populated, if it is necessary to evacuate the general public, this activity will be handled in conjunction with emergency response agencies. The Public Relations Officer will be responsible for this notification and will work with other site personnel, including the safety and environmental officers.

In the event evacuation of mine personnel is required, Eagle Mine has developed emergency response procedures for underground facilities as well as surface facilities. All evacuation procedures were developed in compliance with MSHA regulations and practiced on a regular basis. A surface muster point has been established and an Escape and Evacuation Plan developed and practiced for underground operations. The escape and evacuation plan details the locations of the eight (12-person) and four (4-person) Mine Arc refuge chambers as well as the locations of escapeway ladders and Alimak elevator all of which may be utilized during an emergency based on employee location and type of incident.

In addition, in accordance with MSHA, Eagle Mine is required to have a Mine Rescue team that is routinely and adequately trained to respond to underground emergency situations. Training is conducted on a monthly basis and provides the opportunity for the team to practice their skills both in the classroom and field. Training may include exploration in smoke (theatrical), basic first aid & CPR, firefighting, rope rescue hoisting, and operation and maintenance of both the BG4 closed-circuit breathing apparatus (CCBA) and MX6 gas instruments.

Security personnel are EMTs and paramedics who are trained in accordance with state and federal regulations. Eagle Mine also maintains a state licensed ALS ambulance onsite for immediate response to emergency situations.

COVID-19 –

In order to reduce the risk of onsite spread of Covid-19, several policies, procedures, and onsite controls are in place which include daily health screening, required mask use, quarantine requirements, occupancy limits in shared spaces, and vaccine incentives to increase participation. A Covid-19 Trigger Action Response Plan (TARP) and risk register are also in place to help determine when additional action may be necessary to further reduce risk.

Emergency Equipment – Emergency equipment includes but is not limited to the following:

- ABC Rechargeable fire extinguishers
- Telephone mine communication system
- Radios
- First aid kits, stretchers, backboards, and appropriate medical supplies with a licensed transporting advance life support ambulance on site properly staffed at all times.
- BG-4 Self Contained Breathing Apparatus
- Gas detection monitors that detect 5 gases and LEL.
- Cap lamps
- Self-rescuers
- Underground refuge stations
- Mine elevator
- Spill kits (hydrocarbon and chemical)
- High expansion foam machines
- Portable drift seal.

This equipment is located both underground and at the surface facilities. Fire extinguishers are located at appropriate locations throughout the facility, in accordance with MSHA requirements. Mine and surface facility personnel are also equipped with radios for general communications and emergencies. Other emergency response equipment is located at appropriate and convenient locations for easy access for response personnel. In addition, the Eagle Mine has an Advanced Life Support (ALS) ambulance and certified EMTs and paramedics onsite at all times to respond in the event of an emergency.

Emergency Telephone Numbers – Emergency telephone numbers are included for site and emergency response agencies, as required by R 425.205(1)(c). They are as follows:

- Mine Security: (906) 339-7018
- Local Ambulance Services: Mine ALS Ambulance Service provided by G4S Security they can be contacted at Extension 7018, or on the radio system using the Security, Emergency, or UG out Channels.
- Hospitals: UP Health System Marquette – (906) 449-3000
    - Bell Hospital – (906) 486-4431
- Local Fire Departments: Powell Township – 911
- Local Police: Marquette County Central Dispatch – 911
    - Marquette County Sheriff Department – (906) 225-8435
    - Michigan State Police – (906) 475-9922
- Trimedia 24-hr emergency spill response: 866-866-5125
- EGLE Marquette Office: (906) 228-4853
- Michigan Pollution Emergency Alerting System: (800) 292-4706
- Federal Agencies: EPA Region 5 Environmental Hotline – (800) 621-8431
    - EPA National Response Center – (800) 424-8802
    - MSHA North Central District – (218) 720-5448

- MDNR Marquette Field Office: (906) 228-6561
- Michigamme Township Supervisor: William Seppanen, (906) 323-6608
- MSHA: 1-800-746-1553

1.3 Testing of Contingency Plan

During the course of each year, the facility will test the effectiveness of the Contingency Plan. Conducting an effective test will be comprised of two components. The first component will include participation in adequate training programs on emergency response procedures for those individuals that will be involved in responding to emergencies and the second component is completion of a mock field or desktop exercise.

Training will include participation of the Incident Commander, Safety Officer, Environmental Officer, Public Relations Officer and other individuals designated to respond to emergencies including the Mill ERT. Individuals will receive appropriate training and information with respect to their specific roles, including emergency response procedures and use of applicable emergency response equipment.

The second component of an effective Contingency Plan is to conduct desktop exercises or mock field tests. At least one desktop exercise or mock field test will be performed each year. The Safety Officer will work with the Environmental Officer and Emergency Response Coordinator to first define the situation that will be tested. The types of test situations may include responding to a release of a hazardous substance, fire or natural disaster such as a tornado. A list of objectives will be developed for planning and evaluating each identified test situation. A date and time will then be established to carry out the test. Local emergency response officials may be involved, depending on the type of situation selected.

Once the test is completed, members of the crisis management team and emergency response team will evaluate the effectiveness of the response and make recommendations to improve the system. These recommendations will then be incorporated into a revision of the facility Contingency Plan.

Appendix V

Eagle Mine

Organizational Information Update

Eagle Mine
4547 County Road 601
Champion, MI 49814, USA
Phone: (906) 339-7000
Fax: (906) 339-7005
www.eaglemine.com

Organizational Information

Eagle Mine LLC

January 03, 2022

Registered Address:	Eagle Mine, LLC 1209 Orange Street Wilmington, DE 19801	**Business Address:**	Eagle Mine, LLC 4547 County Road 601 Champion, MI 49814

Board of Directors

Darby Stacey	4547 County Road 601 Champion, MI 49814
Peter Richardson	4547 County Road 601 Champion, MI 49814
Scott Manninen, CFO	4547 County Road 601 Champion, MI 49814

Eagle Mine
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Officers

Jinhee Magie	Treasurer	4547 County Road 601 Champion, MI 49814
Annie Laurenson	Secretary	4547 County Road 601 Champion, MI 49814
Darby Stacey	President/Managing Director	4547 County Road 601 Champion, MI 49814
Scott Manninen	CFO	4547 County Road 601 Champion, MI 49814