



MOUNT NANSEN GROUNDWATER QUALITY EXISTING CONDITIONS REPORT

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Ecological Logistics & Research Ltd.
Whitehorse, YT
Assessment and Abandoned Mines
Energy Mines and Resources
Whitehorse, YT

Submitted by:
Amec Foster Wheeler Environment & Infrastructure
Burnaby, BC

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1.0 INTRODUCTION

Care and maintenance is the term used to describe ongoing activities such as site inspections or water monitoring and treatment done to protect human health, safety and the environment at the Mount Nansen Site (the Site). As part of care and maintenance, dam stability, water quality and site security are closely monitored to ensure there are no adverse effects to human health and safety or the environment until a final remediation plan can be developed and implemented. Ongoing care and maintenance operations at the Site will occur within the boundaries of the Order in Council Reserve area.

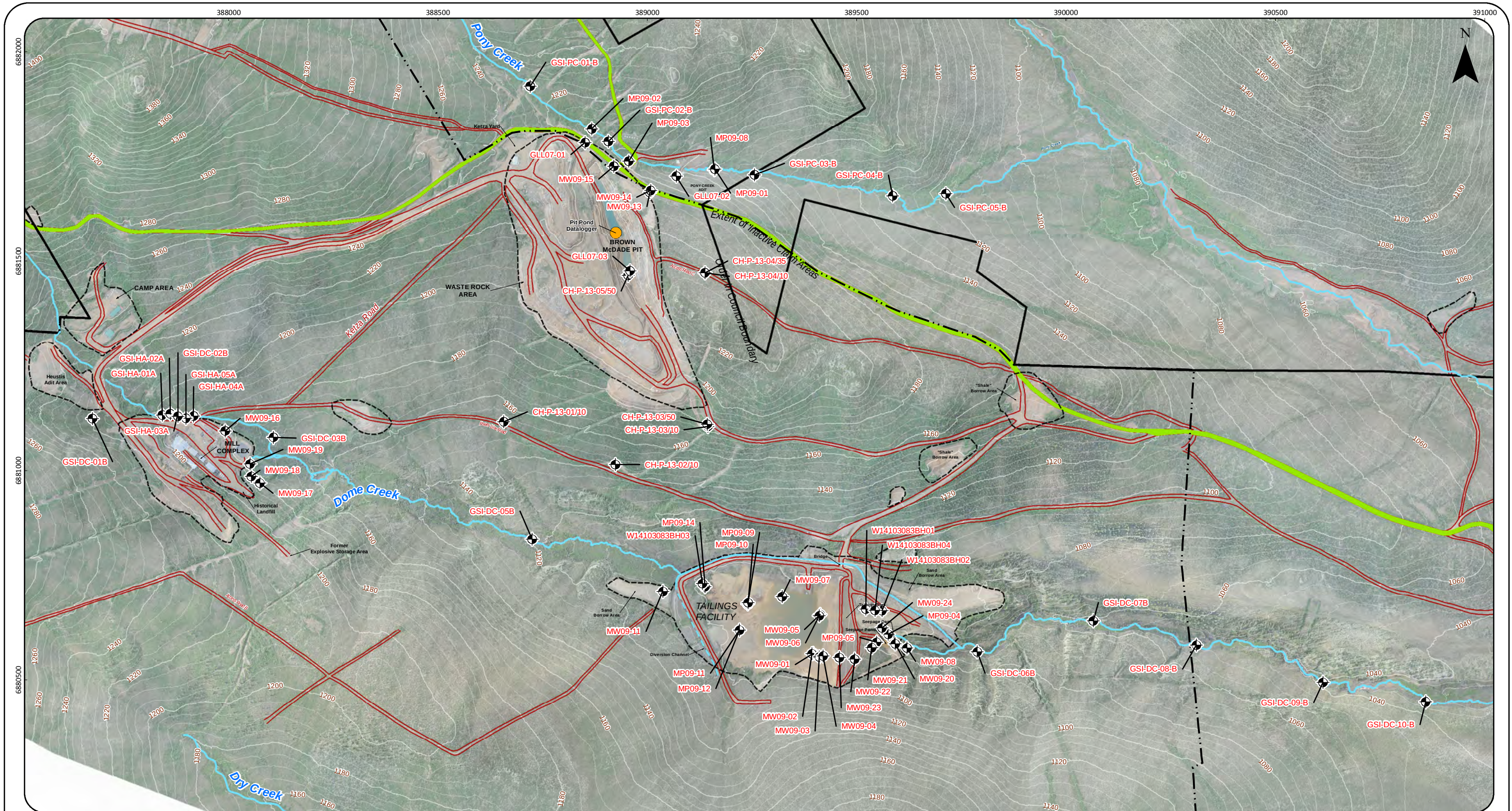
As part of the ongoing care and maintenance activities, Assessment and Abandoned Mines is applying for a water use licence, which is reviewable under the Yukon Environmental and Socio-economic Assessment Act. Proponents for a water use licence under the Act are required to provide specific information with respect to surface water and groundwater quantity (flow) and quality (chemical). This report presents an assessment of groundwater quality in the vicinity of the Site. Our characterization assesses the spatial and temporal variation of groundwater quality parameters of potential concern. The groundwater quality data included in this evaluation spans the period from 2007 to 2016.

This report is structured as follows:

1. Introduction – summarizes report purpose, description of the study area including details of the conceptual groundwater flow, and history of groundwater quality monitoring.
2. Methods – summarizes groundwater quality data sources, provides an overview of general groundwater sampling methodologies and a description of the screening process followed that led to the determination of key groundwater quality parameters of interest.
3. Results – summarizes the results of the groundwater quality assessment, highlighting spatial and temporal trends for key parameters of interest.
4. Summary and Conclusions – highlights key findings of this study.

1.1 Study Area Description

Mount Nansen is an abandoned former gold and silver mine located 60 km west of the Village of Carmacks and within the Traditional Territory of the Little Salmon/Carmacks First Nation. Mount Nansen has been the site of mining exploration activity and/or active mining since the 1940s. A current plan of the Site is provided in Figure 1-1. The most extensive stage of mining occurred between November 1996 and February 1999 in the Brown-McDade Pit. It involved construction of the existing tailings dam and deposition of approximately 300,000 m³ of tailings (Lorax 2011) within the tailings impoundment. A waste rock storage area containing approximately 500,000 m³ of waste rock (Altura 2009, R73) was also created adjacent to the Brown-McDade Pit. Earlier periods of mining contributed to smaller amounts of tailings, some of which are still present near the mill site, and localized zones of waste rock at the mill site and elsewhere on the Site. Other Site infrastructure includes the mill and camp facilities, as well as various ancillary structures, power lines and pipelines.



Data Source:
Roads, trails, streams, waterbodies, watercourses and infrastructure areas digitized using 2008 Quickbird imagery (courtesy of Yukon Geomatics) and spatial data provided by Yukon government.

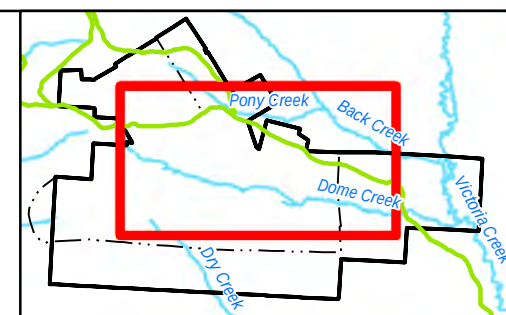
Heli LIDAR Data Survey and Imagery, 2012

Datum: NAD 1983 CSRS UTM Zone 8N

Legend

- Order in Council Boundary
- Extent of Inactive Claim Areas
- Public Road
- Road
- Stream
- Diversion Channel
- Contour (20 m)
- Contour (5 m)

- Groundwater Monitoring Wells
- Dataloggers
- Disturbed Area



**MOUNT NANSEN SITE
FIGURE 1
CARE AND MAINTENANCE
PROJECT PROPOSAL
SITE DISTRIBUTION OF EXISTING
GROUNDWATER MONITORING LOCATIONS**

Scale 1:9,000
Metres
0 190 380
February 28, 2017

Groundwater quality data collection primarily focused around the Site's main mining components: 1) the Mill Complex; 2) the Tailings Management Area (TMA); and 3) the Brown-McDade Pit. Additional investigations were completed around Dome Creek and Pony Creek to understand groundwater-surface water interactions. For the purposes of this report, the study area consists of these aforementioned components where groundwater data exist. To support the evaluation of Mount Nansen groundwater quality, groundwater flow at the Site needs to be described to highlight source to receptor pathways and thereby provide the basis for observed trends in groundwater quality, both spatially and temporally. A brief overview of groundwater flow systems is therefore provided.

Several Site assessment programs, conducted between 2000 and 2009, have involved a component of hydrogeological characterization. Results of these investigations have led to the development of a hydrogeological conceptual model for the Site (AECOM 2010). An updated description of the Site's hydrogeological conceptual model is provided in AMEC (2014).

The hydrogeological conceptual model consists of four main hydrostratigraphic units: overburden, shallow weathered bedrock, competent bedrock, and tailings. Groundwater at Mount Nansen primarily occurs in two flow systems: 1) shallow groundwater system; and 2) deep regional bedrock. The shallow groundwater system primarily occurs during the warmer summer months within the active zone on top of the permafrost, and is highly controlled by topography with localized discharge towards creeks that traverse the Site. Groundwater flow within the deep bedrock system is predominantly northwest to southwest and likely influence by the north-south trending geologic structure.

A detailed summary of the conceptual groundwater flow (AECOM 2010), updated with the 2013 Site investigation findings, is paraphrased below from Section 6 of the 2014 Site Characterization Report (AMEC 2014). Conceptual groundwater flow within the area of the TMA is taken from AECOM 2010.

1. *Pony Creek groundwater exchange:*

- a. The September 2013 creek data suggest that, in its upper reaches, Pony Creek is either a slightly losing or gaining stream, as the amount of groundwater exchanged was very low. The amount of creek bed groundwater exchanged is likely more pronounced when greater hydraulic heads are present during freshet and heavy rainfall. Surface water ponds, created by exploration trenches, may increase infiltration to shallow groundwater.
- b. Pony Creek adjacent to the Brown-McDade Pit is documented as losing stream water to shallow groundwater, some of which reports to the Brown-McDade Pit via the northern pit wall.
- c. In September 2013, the Pony Creek reach upstream of the confluence with Back Creek had the greatest groundwater gains, indicating it is a considerable discharge area for groundwater to surface water.

2. *Brown-McDade Pit geological faulting*: Several faults have been mapped through the Brown-McDade Pit, extending north and south of the Brown-McDade Pit footprint. These features have been described as low conductive, groundwater zones and barriers to flow and may also be directing some water from Pony Creek into the pit. The 2013 vibrating wire piezometer temperature data indicate that permafrost is present east and southeast of the Brown-McDade Pit, as also verified by freeze-back observations of the groundwater monitoring wells constructed in the 2013 coreholes. Permafrost, therefore, currently appears to be the greater constraint against deep groundwater moving east and southeast from the Brown-McDade Pit area.
3. *Brown-McDade Pit rock mass*: The Brown-McDade Pit rock mass has a hydraulic conductivity in the order of 10^{-7} m/s, as quantified by hydraulic packer testing of two coreholes into the Brown-McDade Pit floor and eastern wall. This value agrees with documented analyses of rock mass permeability that used pond level fluctuation and short-duration pumping tests (Gartner Lee Limited 2007, 2008).
4. *Brown-McDade Pit pond groundwater exchange*: The pond was documented as a possible perched water feature. From 2010 to 2013, climatic and pit pond levels and piezometric elevation data for the underlying rock mass show the pond to be a surface water retention feature, with saturated hydraulic connection to the deep groundwater system, i.e., a leaky retention feature. The following three lines of evidence summarize the pit water balance:
 - a. *Brown-McDade Pit climatic water balance*: Using precipitation, runoff, evaporation and pond level change data, the rate of water exchange between the pond and groundwater was calculated and an average seepage rate out of the Brown-McDade Pit was determined to be 0.2 L/s (Gartner Lee Limited 2007).
 - b. *Brown-McDade Pit wintertime pond level recession curves*: The pond level data for August 2010 to June 2013, inclusive, included three wintertime pond level decline curves (2010–2011, 2011–2012 and 2012–2013). These occur when climatic surface water inputs to the pond are not possible and Pony Creek north seepage inputs are negligible. As the pit pond does not freeze to bottom and water continues to leave as groundwater, the latter was quantified in a more selective manner compared to water balance. This method quantified the pond water outflow rate as being in the 0.3 L/s to 0.6 L/s range.
 - c. *Brown-McDade Pit pond relationship to groundwater*: It has been **concluded** that the pond behaves as a leaky surface water retention feature, with a seasonally intermittent saturated hydraulic connection to deep groundwater. Water leaves the pit pond as groundwater at an average rate of 0.4 L/s (rounded), based on the winter recession curve method, all year, applicable to a pond elevation range between 1,181 m and 1,184 m, as recorded by the pond data logger from August 2010 to June 2013, inclusively. The winter recession curve method provides the best estimate for the pit water balance.
5. *Brown-McDade Pit underlying rock piezometric elevation range*: The underlying rock piezometric elevation is a key part of controlling the equilibrium condition between the Brown-McDade Pit pond and the surrounding and underlying deep groundwater; i.e., the long-term groundwater elevation in the Brown-McDade Pit, starting from an empty pit condition, with negligible climatic inputs and negligible Pony Creek water reporting to the

northern pit wall. An upper bound value for the piezometric range within the deeper rock mass underlying the Brown-McDade Pit was derived from pond elevation wintertime minima of five winters, each exhibiting a linear decline. Elevation 1,181 m is currently interpreted as the upper bound value for the piezometric range within the deeper rock mass underlying the Brown-McDade Pit, applicable to the period of minimum pond storage in April-May each year. However, data from VWP CH-P-13-06 reveal that groundwater levels in bedrock beneath the pit fall to about 1,156 m in the month of April and that fractures in bedrock beneath the pit appear to become unsaturated. The regional minima can also be as high as 1,166 m during the months of October-November (observed initially following drilling of CH-P-13-05). The lower bound value for the piezometric range beneath the Brown-McDade Pit ranges from 1,156 m to 1,166 m.

6. *Deep groundwater:*

- a. Deep groundwater in the vicinity of the Brown-McDade Pit appears to be recharging unconsolidated overburden in the central and lower reaches of Dome Creek and, to a lesser extent, the lower reaches of Pony Creek.
- b. Deep groundwater discharging to shallow groundwater within Dome Creek and Pony Creek overburden, ultimately to surface water, is currently influenced by relict permafrost surrounding the Brown-McDade Pit.

7. *Tailings Management Area (from AECOM 2010):*

- a. Regional Context – The TMA is underlain by a thin veneer of organics, which is in turn underlain by a combination of silty aeolian sand and alluvial/colluvial sediments associated with the Dome Creek stream channel and mass wasting processes at work on the valley's side slopes. Permafrost was encountered in every borehole drilled within the TMA just below the base of tailings. Above permafrost, the unfrozen native organics and alluvial/aeolian sediments host the shallow groundwater flow system. Beneath permafrost, the deeper groundwater flow system is inferred to report to the alluvial/aeolian package in deeper parts of the Dome Creek valley. The thickness of permafrost beneath the tailings facility has not yet been determined.
- b. Interaction with Shallow Groundwater System – The shallow aquifer underlying the TMA receives groundwater contributions primarily from the valley bottom aquifer upstream of the TMA and the south-facing slopes of the Dome Creek catchment. Surface water and precipitation also infiltrate through the tailings mass and report to the shallow unfrozen aquifer overlying permafrost. A portion of the groundwater reporting to the valley bottom aquifer upwells into the diversion channel and is conveyed downstream around the TMA. Run-off and snowmelt within the TMA catchment raises the level of water in the tailings pond each spring. Two-dimensional groundwater flow through the tailings dam was conducted as part of the geotechnical investigation (AECOM 2010) to estimate the amount of groundwater seepage through the tailings dam. It is discussed in more detail below.

- c. Interaction with Deep Groundwater Flow System – Low permeability sand to clay size tailings were deposited on top of native materials during mine operations. Groundwater level measurements in nested wells installed in the TMA indicate strong downward vertical groundwater gradients. Relatively permeable materials beneath the tailings are inferred to function as a drain beneath the TMA and transmit groundwater down-valley along a primarily horizontal flow pathway, as the base of the flow system in the upper part of the Dome Creek catchment appears to be limited by fairly extensive permafrost. The overlying tailings are inferred to be tension-saturated to saturated, with dominant vertical drainage. Near the upstream face of the tailings dam, where the underlying dam fill is relatively permeable, the tailings pond is perched above the underlying groundwater flow system. Tailings porewater and water in the tailings pond is anticipated to slowly infiltrate through the tailings and enter the underlying aquifer. It then flows downgradient through the remnant organics and tailings dam fill and reports to the seepage collection pond.

1.2 History of Groundwater Sampling at the Site

Post-operational hydrogeological investigations conducted at the Site date back to 2000; however, groundwater quality data recorded in the groundwater quality database compiled in spreadsheet format by Lorax Environmental Services Ltd. based on the contents of the Assessment and Abandoned Mines Mount Nansen archives date back to only 2007. Baseline groundwater data dating back to pre-mining activities do not exist. A summary of the groundwater monitoring events is provided in Table 1-1 and Table 1-2. The locations of all monitoring wells associated with groundwater quality data listed in Table 1-1 and Table 1-2 are shown on Figure 1-1.

The 2013 hydrogeological field investigation included the expansion of the Site's groundwater monitoring well network. The rationale for the monitoring well network expansion is based on the findings of studies that included groundwater monitoring events in 2007, 2009, 2010, 2011 and 2012. Groundwater quality monitoring events occurred in October 2013; June and October 2014; March, June and September 2015; and May and August 2016. A groundwater quality database was developed, including information from the previous studies in 2007 through to 2016.

Table 1-1: Record of Groundwater Monitoring Events

Area	Well Name	UTM (Zone 08N)		2016 Status ^{1,2}	Monitoring Events (Count per Year)										Total Count
		Easting	Northing		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Brown-McDade Pit	CH-P-13-01/10	388657	6881116	Frozen	-	-	-	-	-	-	-	1	-	-	1
	CH-P-13-03/10	389145	6881105	Not Sampled	-	-	-	-	-	-	-	-	-	-	0
	CH-P-13-03/50	389143	6881110	Direct Sampled ^{4,5}	-	-	-	-	-	-	-	1	-	2	3
	CH-P-13-04/10	389138	6881472	Frozen	-	-	-	-	-	-	-	1	-	-	1
	CH-P-13-04/35	389138	6881472	Frozen	-	-	-	-	-	-	-	-	-	-	0
	CH-P-13-05/50	388954	6881466	Not Accessible	-	-	-	-	-	-	-	2	3	-	5
	GLL07-01	388851	6881783	Frozen	-	-	-	-	-	-	-	-	-	-	0
	GLL07-02	389069	6881703	Dry	-	-	-	-	-	1	-	1	-	-	2
	GLL07-03	388959	6881477	Not Accessible	1	-	1	-	-	-	1	2	1	-	6
	MW09-13	389006	6881664	Frozen	-	-	-	-	-	-	-	-	-	-	0
	MW09-14	389008	6881669	Frozen	-	-	-	-	-	-	-	-	-	-	0
	MW09-15	388920	6881727	Frozen	-	-	-	-	-	-	-	-	-	-	0
Mill Complex	CH-P-13-02/10	388924	6881014	Not Sampled	-	-	-	-	-	-	-	-	-	-	0
	GSI-HA-01A	387842	6881132	Slow Recharge ^{4,5,6}	-	-	2	-	-	-	1	1	3	2	9
	GSI-HA-02A	387861	6881135	Slow Recharge ⁵	-	-	-	-	-	-	1	1	2	1	5
	GSI-HA-03A	387878	6881131	Frozen	-	-	-	-	-	-	1	1	2	1	5
	GSI-HA-04A	387916	65881130	Direct Sampled ^{4,6}	-	-	-	-	-	-	1	1	2	2	6
	GSI-HA-05A	387898	6881125	Slow Recharge ⁵	-	-	-	-	-	-	1	1	2	1	5
	MW09-16	387992	6881094	Good ^{4,5}	-	-	2	1	1	-	1	2	2	2	11
	MW09-17	388075	6880970	Damaged	-	-	2	1	1	1	1	2	2	-	10
Pony Creek	MW09-18	388054	6880986	Good ^{4,5}	-	-	2	1	1	1	1	2	3	2	13
	MW09-19	388051	6881016	Good ⁵	-	-	1	1	1	-	1	2	3	-	9
	GSI-PC-01-B	388720	6881918	Destroyed	-	-	-	-	-	-	1	-	-	-	1
	GSI-PC-02-B	388907	6881786	Destroyed	-	-	-	-	-	-	1	-	-	-	1
	GSI-PC-03-B	389256	6881706	Direct Sampled ^{4,6}	-	-	-	-	-	-	-	1	2	2	5
	GSI-PC-04-B	389586	6881656	Direct Sampled ⁶	-	-	-	-	-	-	-	1	1	1	3
	GSI-PC-05-B	389713	6881661	Dry	-	-	-	-	-	-	1	1	1	-	3
	MP09-01	389161	6881720	Destroyed	-	-	-	-	-	1	-	-	-	-	1
	MP09-02	388867	6881816	Destroyed	-	-	-	-	-	1	-	2	-	-	3
	MP09-03	388956	6881739	Direct Sampled ⁶	-	-	-	-	-	-	-	-	1	1	2
	MP09-08	389160	6881718	Good ^{4,5}	-	-	-	-	-	1	-	-	1	2	4
Notes: 1 Direct sampling was completed at sample stations where insufficient volume had been encountered during the June 2014 groundwater sampling (Hemmera and ELR 2014a). This insufficient volume limited standard purging and sampling methodologies. 2 Groundwater wells previously reported as damaged (MW09-01 and CH-P-13-03/10), dry/damaged (CH-P-13-02/10), or blocked (CH-P-13-04/35) were investigated during the June 2015 sampling event using a down well camera. 3 Destroyed wells are included in the scope of work and are therefore listed above in the summary table. These wells are not further discussed in this report. 4 Sampling completed in May 2016. 5 Sampling completed in August 2016. 6 Direct Sampling completed August 2016.															

Table 1-2: Record of Groundwater Monitoring Events

Area	Well Name	UTM (Zone 08N)		2016 Status ^{1,2}	Monitoring Events (Count per Year)											Total Count
		Easting	Northing		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		
Seepage Dam	W14103083BH01	389522	6880669	Frozen	-	-	-	-	-	-	-	1	-	-	1	
	W14103083BH02	389561	6880665	Frozen	-	-	-	-	-	-	-	1	-	-	1	
	W14103083BH04	389544	6880666	Frozen	-	-	-	-	-	-	-	1	-	-	1	
TMA	MP09-04	389575	6880609	Good ^{4,5}	-	-	1	-	1	1	1	2	1	2	9	
	MP09-05	389548	6880590	Good ^{4,5}	-	-	2	-	1	1	1	2	2	2	11	
	MP09-09	389240	6880681	Good ⁵	-	-	2	-	1	-	1	2	2	1	9	
	MP09-10	389241	6880684	Frozen	-	-	2	-	1	-	2	2	1	-	8	
	MP09-11	389220	6880619	Good ⁵	-	-	2	-	2	-	2	2	2	1	11	
	MP09-12	389220	6880619	Good ⁵	-	-	2	-	1	-	1	2	1	1	8	
	MP09-14	389138	6880722	Direct Sampled ^{4,5,6}	-	-	-	-	-	-	-	2	1	-	3	
	MW09-01	389396	6880563	Not Sampled	-	-	2	-	1	1	1	-	2	-	7	
	MW09-02	389393	6880562	Good ^{4,5}	-	-	2	-	1	1	2	2	3	2	13	
	MW09-03	389411	6880555	Good ^{4,5}	-	-	2	-	1	1	1	2	2	2	11	
	MW09-04	389420	6880557	Good ^{4,5}	-	-	2	-	1	1	1	2	2	2	11	
	MW09-05	389413	6880656	Dry	-	-	-	-	-	-	-	1	-	-	1	
	MW09-06	389411	6880653	Good ^{4,5}	-	-	2	-	-	-	-	1	3	2	8	
	MW09-07	389322	6880699	Dry	-	-	-	-	1	-	1	2	-	-	4	
	MW09-08	389620	6880576	Good ^{4,5}	-	-	2	-	1	-	1	2	2	2	10	
	MW09-11	389037	6880711	Dry	-	-	2	-	1	-	-	-	-	-	3	
	MW09-20	389592	6880586	Frozen	-	-	-	-	-	-	-	-	-	-	0	
	MW09-21	389536	6880577	Good ⁵	-	-	2	-	1	-	1	2	1	1	8	
	MW09-22	389495	6880549	Good ^{4,5}	-	-	2	-	1	1	1	3	2	2	12	
	MW09-23	389459	6880553	Good ^{4,5}	-	-	2	-	1	1	1	3	3	2	13	
	MW09-24	389561	6880624	Good ^{4,5}	-	-	2	-	1	1	2	2	3	2	13	
		W14103083BH03	389132	6880730	Frozen	-	-	-	-	-	-	-	2	-	-	2
Dome Creek	GSI-DC-01B	387675	6881124	Direct Sampled ⁶	-	-	-	-	-	-	1	1	1	1	4	
	GSI-DC-02B	387879	6881129	Slow Recharge ⁵	-	-	-	-	-	-	1	1	2	1	5	
	GSI-DC-03B	388107	6881079	Slow Recharge ⁵	-	-	-	-	-	-	1	1	1	1	4	
	GSI-DC-05B	388725	6880836	Slow Recharge ⁵	-	-	-	-	-	-	1	-	1	1	3	
	GSI-DC-06B	389788	6880567	Good ⁵	-	-	-	-	-	-	1	2	1	1	5	
	GSI-DC-07B	390065	6880641	Good ⁵	-	-	-	-	-	-	1	2	1	1	5	
	GSI-DC-08-B	390311	6880583	Direct Sampled ⁶	-	-	-	-	-	-	-	1	-	1	2	
	GSI-DC-09-B	390614	6880494	Good ⁵	-	-	-	-	-	-	1	2	1	1	5	
	GSI-DC-10-B	390859	6880447	Good ⁵	-	-	-	-	-	-	1	2	1	1	5	
Notes:	1 Direct sampling was completed at sample stations where insufficient volume had been encountered during the June 2014 groundwater sampling (Hemmera and ELR 2014a). This insufficient volume limited standard purging and sampling methodologies. 2 Groundwater wells previously reported as damaged (MW09-01 and CH-P-13-03/10), dry/damaged (CHP-13-02/10), or blocked (CH-P-13-04/35) were investigated during the June 2015 sampling event using a down well camera. 3 Destroyed wells are included in the scope of work and are therefore listed above in the summary table. These wells are not further discussed in this report. 4 Sampling completed in May 2016. 5 Sampling completed in August 2016. 6 Direct Sampling completed August 2016.															

The highest groundwater quality sample population exists for the Mill Complex and the TMA. Groundwater quality monitoring events at the Mill Complex and TMA have occurred fairly consistently since 2009 with about two monitoring events completed annually over this period. Following the 2013 Site Investigation (AMEC 2014), additional groundwater quality monitoring data was generated for all of the study area components. As recorded in Table 1-1 and Table 1-2, site conditions impacted the ability to collect groundwater samples and, therefore, for some study areas groundwater quality data are limited in population. For those locations where sample count is low, the assessment of temporal groundwater quality data is constrained.

2.0 METHODS

2.1 Sources of Information

The preparation of this report relied on information provided in the following reports:

- Gartner Lee Limited, 2008, Hydrogeological Site Characterization at Brown McDade Pit, Mt. Nansen, 12, 20 March 2008;
- AECOM, 2009, Hydrogeological Field Investigation Summary, 3 December 2009;
- Altura Environmental Consulting, Prepared for Lorax Environmental Services Ltd., 2010, Mill Area Geochemical Characterization Summary of 2010 Field Investigations, 19 December 2010;
- Lorax Environmental Services Ltd., 2017, Mount Nansen Care and Maintenance Surface Water Quality Existing Conditions, 30 March 2017.
- Lorax Environmental Services Ltd., 2012, Technical Memorandum – Field Report – Groundwater & Surface Water Sampling-25 Sep.-1 Oct. 2011., 10-15 February 2012;
- EBA Engineering Consultants Ltd., 2012, Groundwater Sampling Methods & Results Report Mount Nansen, Yukon, 8, November 2012;
- AMEC Environment & Infrastructure, 2014, Mount Nansen Remediation Project Site Characterization Report, 231, 16 April 2014;
- Hemmera Envirochem Inc. and Ecological Logistics & Research Ltd., 2014a, Mount Nansen June 2014 Groundwater Monitoring and Sampling, 26, November 2014;
- Hemmera Envirochem Inc. and Ecological Logistics & Research Ltd., 2014b, Mount Nansen October 2014 Groundwater Monitoring and Sampling, 28, January 2015;
- Hemmera Envirochem Inc. and Ecological Logistics & Research Ltd., 2015a, Mount Nansen March 2015 Groundwater Monitoring and Sampling, 26, June 2015;
- Hemmera Envirochem Inc. and Ecological Logistics & Research Ltd., 2015b, Mount Nansen June 2015 Groundwater Monitoring and Sampling, 28, October 2015;
- Hemmera Envirochem Inc. and Ecological Logistics & Research Ltd., 2016a, Mount Nansen May 2016 Groundwater Monitoring and Sampling, 25, September 2016; and
- Hemmera Envirochem Inc. and Ecological Logistics & Research Ltd., 2016b, Mount Nansen August 2016 Groundwater Monitoring and Sampling, 26, November 2016.

2.2 General Sampling Procedures

Table 2-1 summarizes groundwater sampling event details in regards to sampling and groundwater analyses. Sampling methods are consistent with industry standard protocols (AMEC 2014). These methods (Hemmera and ELR 2014a, 2014b; 2015a, 2015b; 2016a, 2016b) were consistent with the protocols of the Environment Yukon's *Protocol No. 7: Groundwater Monitoring Well Installation, Sampling and Decommissioning* (2002). The methods used (Hemmera and ELR 2014a, 2014b; 2015a, 2015b; 2016a, 2016b) were also consistent with the ASTM D4448-01 Standard Guide for Sampling Groundwater Monitoring Wells (ASTM 2013) and

the D6452-99 Guide for Purging Methods for Wells used for Groundwater Quality Investigations (ASTM 2012).

Prior to sampling, groundwater monitoring was conducted measuring the water level and total depth below well casing using a water level meter. Wells were sampled using either a peristaltic pump or a portable bladder pump with appropriate controller and compressor. The bladder pump was used in place of the peristaltic pump for wells with water levels greater than 7 m below the top of the casing, because the bladder pump has more lift capability than the peristaltic pump. The well water level was monitored to ensure a constant water level was maintained. Water was pumped to a flow through cell with a multiparameter probe allowing the measurement of water quality parameters (specific conductance, pH, and dissolved oxygen [DO]). Water samples were collected following stabilization of the water quality parameters. Samples were collected in laboratory-supplied containers, preserved and filtered as required, and shipped to a qualified laboratory under chilled conditions for analysis.

Table 2-1: Groundwater Quality Sampling Event Summary

Year	Month	Sampling Company	Parameters Analyzed
2007	November	Gartner Lee Limited	Physical Tests (no Turbidity or TDS), Bicarbonate, Carbonate, Hydroxide, Alkalinity, Sulphate, Nitrate, Dissolved Metals
2008	No Samples Collected		
2009	July	Lorax ¹	Physical Tests, Anions, Nutrients, Dissolved Metals, PAHs, Hydrocarbons
	September	Lorax ¹	Physical Tests, Anions, Nutrients, Dissolved Metals
2010	July	Lorax	Physical Tests, Anions, Nutrients, Dissolved Metals
2011	September	Lorax	Physical Tests, Anions, Nutrients, Total Metals, Dissolved Metals
2012	August	EBA	Physical Tests, Anions, Nutrients, Total Metals, Dissolved Metals
2013	September	AMEC	Physical Tests, Anions, Nutrients, Dissolved Metals
2014	June	Hemmera and ELR	Physical Tests, Anions, Nutrients, Total Metals, Dissolved Metals
	October	Hemmera and ELR	Physical Tests, Anions, Nutrients, Dissolved Metals, Total Metals (Travel Blanks)
2015	March	Hemmera and ELR	Physical Tests, Anions, Nutrients, Dissolved Metals, Total Metals (Travel Blanks)
	June	Hemmera and ELR	Physical Tests, Anions, Nutrients, Dissolved Metals, Total Metals (Travel Blanks)
	September	Hemmera and ELR	Physical Tests, Anions, Nutrients, Dissolved Metals, Total Metals (Travel Blanks)
2016	February	Hemmera and ELR	Physical Tests, Anions, Nutrients, Dissolved Metals, Total Metals (Travel Blanks)
	May	Hemmera and ELR	Physical Tests, Anions, Nutrients, Dissolved Metals, Total Metals (Travel Blanks)
	August	Hemmera and ELR	Physical Tests, Anions, Nutrients, Dissolved Metals, Total Metals (Travel Blanks)
Notes:			
¹ AECOM collected samples from MW09-23			
Physical Tests pH (field/lab), EC (electrical conductivity) (field/lab), Temp(field), Hardness (as CaCO ₃), Turbidity, TDS (total dissolved solids)			
Ammonia, Bicarbonate, Bromide, Carbonate, Chloride, OH, Alkalinity (As CaCO ₃), Cyanate, Cyanide, Thiocyanate, Total Organic Carbon, Total Inorganic			
Anions and Nutrients Carbon, Fluoride, SO ₄ , Sulphide, Nitrate and Nitrite, PO ₄ -P			
Metals (Dissolved) Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Hg, Mo, Ni, K, Se, Ag, Na, Tl, Sn, Ti, U, V, Zn			
Metals (Total) Al, Sb, As, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, S, Te, Ti, Th, Sn, Ti, U, V, Zn, Zr			
Hydrocarbons EPH ₁₀₋₁₉ (extractable petroleum hydrocarbons), EPH ₁₉₋₃₂ , LEPH (light extractable petroleum hydrocarbons), HEPH (heavy extractable petroleum hydrocarbons)			
PAHs (Polycyclic Aromatic Hydrocarbons) Acenaphthene, Acenaphthylene, Anthracene, Ben(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-c,d)pyrene, 2-Methylaphthalene, Naphthalene, Phenanthrene, Pyrene			

2.3 Screening Groundwater Quality Data for Parameters of Potential Concern

Screening of the analytical data was performed to constrain the Mount Nansen groundwater quality assessment to select parameters of interest that may represent a greater potential environmental risk, i.e., parameters of potential concern (POPCs). The identification of POPCs does not necessarily indicate impacts to aquatic habitat, but defines concentration levels above which anthropogenic impact is probable or is of interest relative to the local system. The identification of parameters of interest was based on the following:

1. Geochemical characterization of the Brown-McDade Pit walls, Waste Rock, Mill and TMA, which are potential sources for mining-related impacts to groundwater quality. The results of these tests do not necessarily conclude that groundwater quality has been impacted, but indicate the potential for impacts to occur under a specific set of environmental conditions consistent with those under which the tests were conducted. Leachable metals identified include antimony (Sb), arsenic (As), bismuth (Bi), cadmium (Cd), copper (Cu), lead (Pb) and zinc (Zn) (AMEC 2014). Sulphur content of the oxide and sulphide zones of the pit wall were as high as 2.4% and 36.2%, respectively; and
2. Comparison of groundwater quality data to water quality guidelines. Groundwater quality data from 2007 and 2016 were compared to Canadian Council Ministers of the Environment (CCME) Water Quality Long-Term Guidelines for the protection of Freshwater Aquatic Life (FAL; CCME 2005) (Table 2-2). Approved British Columbia Ministry of Environment (BC MOE) Water Quality Guidelines (WQGs) for the protection of aquatic life were applicable when no guideline values were provided by CCME. British Columbia Working WQGs were applied when no guideline values were provided by the CCME or BC Approved WQGs. The reported method detection limit replaced non-detected values to perform statistical analysis.

Results of the parameter of interest screening assessment are summarized in Table 2-3 and include a total count (N) of sample populations in comparison to percentage of values above the guideline (% > Guideline). Results of this screening indicate that exceedances of the guidelines occurred repeatedly for total-ammonia ($\text{NH}_4\text{-T}$), nitrate (NO_3^-) and nitrite (NO_2^{2-}), sulphate (SO_4^{2-}), Cyanide (CN)-Free and weak acid dissociable (WAD), aluminum (Al), Sb, As, Cd, cobalt (Co), Cu, iron (Fe), selenium (Se) and Zn.

Leachable metals identified in the geochemical characterization of the Brown-McDade Pit walls, Waste Rock and Mill Complex soils (via metals leaching tests and kinetic tests) include Sb, As, Cd, Cu, Pb and Zn. Tailings porewater is similar in composition to the results of the geochemical characterization and can be differentiated from the underlying native sediments by total sulphur and metal enrichment, including Sb, As, Cu, Fe, Pb, manganese (Mn), silver (Ag) and Zn with depletion in calcium (Ca), magnesium (Mg) and sodium (Na). Tailings can also be differentiated by CN-Total and CN-WAD. As such, the parameters of interest include $\text{NH}_4\text{-T}$, NO_3^- , NO_2^{2-} , SO_4^{2-} , CN-WAD, CN-Free, Al, As, Cd, Co, Cu, Fe, Sb, Se and Zn. Manganese, although not screened, is included in the list of parameters of interest, because discharge limits were specified on the Mount Nansen water use licence.

Parameters of interest are discussed further within sections of the report demarcated by mine facility and/or drainage. Parameters of interest are assessed within the context of the study area, mine facility and drainage to identify impacts related to naturally elevated background and or

mining-related activities. Within each section, a final screening of parameters of interest is conducted. Parameters of interest that exceed WQGs and are deemed attributable to site activities are identified as POPC.

Table 2-2: Applied Water Quality Guidelines

Parameter	Units	CCME FAL ^{1, 2, 3, 4}	BC WQG Working guidelines (in bold)
Physical Tests			
Lab pH	pH units	6.5-9.0 ⁵	-
Field pH	pH units	6.5-9.0 ⁵	6.5-9.0 ²¹
Ammonia, Total (as N)	mg/L	Varies ⁷	Varies ²²
Chloride (Cl)	mg/L	120	150
Fluoride (F)	mg/L	0.12	-
Nitrate (as N)	mg/L	13	3
Nitrite (as N)	mg/L	0.06	Varies ²³
Sulphate (SO ₄)	mg/L	-	Varies ²⁴
Sulphide	mg/L	-	-
Cyanide			
Cyanide, Total	mg/L	-	-
Cyanide, Free	mg/L	0.005	-
Cyanide, Weak Acid Diss	mg/L	-	0.005
Dissolved Metals			
Aluminum (Al)	mg/L	Varies ⁸	Varies ²⁵
Antimony (Sb)	mg/L	-	0.009
Arsenic (As)	mg/L	0.005	0.005
Barium (Ba)	mg/L	-	1
Beryllium (Be)	mg/L	-	0.00013
Boron (B)	mg/L	1.5	1.2
Cadmium (Cd)	mg/L	Varies ⁹	Varies ²⁶
Chromium (Cr) (Cr(VI))	mg/L	0.001	0.00089
Cobalt (Co)	mg/L	-	0.004
Copper (Cu)	mg/L	Varies ¹⁰	Varies ²⁷
Iron (Fe)	mg/L	0.3	-
Lead (Pb)	mg/L	Varies ¹¹	Varies ²⁸
Manganese (Mn) – Total	mg/L	-	Varies ²⁹
Mercury (Hg)	mg/L	0.000026	Varies ³⁰
Molybdenum (Mo)	mg/L	0.073	1
Nickel (Ni)	mg/L	Varies ¹²	-
Selenium (Se)	mg/L	0.001	0.002
Silver (Ag)	mg/L	0.025	Varies ³¹
Thallium (Tl)	mg/L	0.0008	-
Titanium (Ti)	mg/L	-	-
Uranium (U)	mg/L	0.015	-
Zinc (Zn)	mg/L	0.03	Varies ³²
Notes:			
(1)	Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".		
(2)	No standard or not analyzed		
(3)	CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014		
(4)	CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014		
(5)	CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9		
(6)	Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages		
(7)	Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH ₃ versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.		

(8)	Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
	0.005 if pH<6.5
	0.1 if pH≥6.5
	When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.
(9)	Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
	0.00 if H<17
	0.00004 –
	0.00037 if H≥17 and H≤280 as follows;
	CWQG (µg/L) = 10{0.83[log(hardness)] – 2.46
	0.00 if H>280
(10)	Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
	0.002 if H<82
	0.002 –
	0.004 if H≥82 and H≤180 as follows;
	CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
	0.004 if H>180
(11)	Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
	0.001 if H<60
	0.001 –
	0.007 if H≥60 and H≤180 as follows;
	CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
	0.007 if H>180
(12)	Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
	0.025 if H<60
	0.025 - 0.15 if H≥60 and H≤180 as follows;
	CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
	0.15 if H>180
(13)	Due to slow recharge and low well volumes, samples were collected from GSI-HA-03A between August 29 and August 30, 2016. Thiocyanate, Ammonia, and TIC were collected on August 30, 2016. All other parameters were collected on August 29, 2016.
(14)	RPD = Relative Percent Difference. The difference between a sample and its field duplicate over the average of two values. nc = not calculated. RPD is not calculated if either the sample or the field duplicate concentration is less than five times the detection limit.
(15)	Due to slow recharge and low well volumes, samples were collected from GSI-PC-04B between August 31 and September 1, 2016. Dissolved metals, dissolved mercury, and general chemistry were collected on August 31, 2016. Cyanide was collected on September 1, 2016.
(16)	Due to slow recharge and low well volumes, samples were collected from MP09-03 between August 31 and September 1, 2016. Dissolved metals, dissolved mercury, and general chemistry were collected on August 31, 2016. Cyanide was collected on September 1, 2016.
(17)	Due to slow recharge and low well volumes, samples were collected from MP09-14 between August 29 and August 31, 2016. Dissolved metals were collected on August 29, 2016. Dissolved mercury and general chemistry were collected on August 31, 2016.
(18)	AU = Attenuation Units – an alternate unit of turbidity measurement used where turbidity is >500. AU is equivalent to NTU, but is measured using transmitted rather than scattered light.
(19)	Water for TKN analysis taken out of general chemistry bottle due to insufficient water volumes to collect a preserved ammonia sample. Variability in the TKN analysis may occur due to preservation holding time exceedance.
(20)	Ammonia standard could not be calculated, because no pH data were available.
(21)	BC water quality guideline for pH.
(22)	Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.
(23)	Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
	0.02 if Chloride < 2 mg/L
	0.04 if Chloride = 2 to 4 mg/L
	0.06 if Chloride = 4 to 6 mg/L
	0.08 if Chloride = 6 to 8 mg/L
	0.10 if Chloride = 8 to 10 mg/L

		0.20	if	Chloride > 10 mg/L
(24)	Sulphate varies with hardness as follows for BC WQG:			
		128	if	H≤30
		218	if	H≥31 and H≤75
		309	if	H≥76 and H≤180
		429	if	H≥181 and H≤250
		Site specific	if	H>250
(25)	Aluminum varies with pH as follows for BC WQG FA:			
	WQG (µg/L) = $e^{[1.6-3.327(\text{median p.H})+0.402(\text{median Ph})^2]}$		if	pH < 6.5
		0.05	if	pH ≥ 6.5
(26)	Cadmium varies with hardness as follows for BC WQG FA:			
	WQG = $e^{[0.736 \times \ln(\text{hardness}^*) - 4.943]}$			
(27)	Copper varies with hardness as follows for BC WQG FA:			
		≤2	if	H≤50
	WQG ≤ 0.04 (mean hardness*)		if	H>50
(28)	Lead varies with hardness in mg/L as follows for BC WQG:			
	WQG ≤ 3.31 + $e^{[1.273 \ln(\text{hardness}^*) - 4.704]}$		if	H>8
	* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO ₃ .			
(29)	Manganese varies with hardness in mg/L as follows for BC WQG:			
	WQG ≤ 0.0044 hardness* + 0.605		if	H≥ 37 and H≤450
	* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO ₃ .			
(30)	Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:			
	WQG = 0.0001 / (MeHg/total Hg)			
(31)	Silver varies with hardness in mg/L as follows for BC WQG:			
		0.0005	if	H≤100
		0.0015	if	H>100
(32)	Zinc varies with hardness in mg/L as follows for BC WQG:			
		0.075	if	H≤90
	WQG = 7.5 + 0.75 (hardness* - 90)		if	H≥90

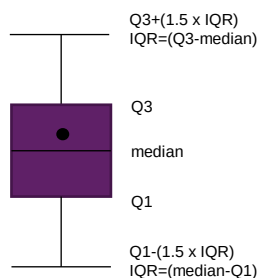
Table 2-3: Groundwater Quality Guideline Parameter Screening Assessment

Year	2009		2010		2011		2012		2013		2014		2015		2016	
	Guideline		Guideline		Guideline		Guideline		Guideline		Guideline		Guideline		Guideline	
Physical Properties	N	% Exceedance	N	% Exceedance	N	% Exceedance	N	% Exceedance	N	% Exceedance	N	% Exceedance	N	% Exceedance	N	% Exceedance
pH (lab)	0	NS	0	0%	0	NS	0	0%	10	21%	1	1%	5	9%	4	7%
Anions and Nutrients																
Ammonia as N	34	69%	0	0%	18	51%	7	37%	13	29%	20	32%	16	29%	13	25%
Bromide (Br)	0	0%	0	0%	0	0%	0	0%	0	NS	0	NS	0	NS	0	NS
Chloride (Cl)	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Fluoride (F)	22	45%	0	0%	9	27%	3	16%	22	46%	16	23%	28	48%	22	39%
Nitrate (as N)	6	12%	0	0%	6	17%	3	16%	2	4%	3	4%	1	2%	1	2%
Nitrite (as N)	1	2%	0	0%	0	0%	19	100%	0	0%	1	1%	1	2%	0	0%
Sulfate (SO4)	1	2%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Cyanides																
Cyanide, Weak Acid Diss	22	48%	0	0%	20	57%	0	NS	6	10%	12	18%	9	16%	4	7%
Cyanide, Total	34	74%	0	0%	21	64%	11	58%	18	30%	24	36%	24	42%	13	24%
Dissolved Metals																
Aluminum (Al)-Dissolved	9	18%	1	25%	4	12%	4	21%	17	19%	28	35%	11	17%	8	14%
Antimony (Sb)-Dissolved	19	39%	1	25%	8	24%	2	11%	14	15%	17	21%	15	23%	11	19%
Arsenic (As)-Dissolved	43	88%	4	100%	26	79%	16	84%	70	77%	57	70%	55	86%	44	75%
Boron (B)-Dissolved	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Cadmium (Cd)-Dissolved	32	65%	1	25%	14	42%	5	26%	43	47%	36	44%	22	34%	19	32%
Chromium (Cr)-Dissolved	2	4%	0	0%	7	21%	4	21%	25	27%	20	25%	10	16%	15	25%
Cobalt (Co)-Dissolved	26	53%	0	0%	15	45%	7	37%	35	38%	34	42%	18	28%	14	24%
Copper (Cu)-Dissolved	14	29%	1	25%	8	24%	2	11%	28	31%	20	25%	14	22%	13	22%
Iron (Fe)-Dissolved	29	59%	1	25%	18	55%	0	NS	63	69%	53	65%	45	70%	35	59%
Lead (Pb)-Dissolved	4	8%	1	25%	2	6%	0	0%	9	10%	0	0%	2	3%	1	2%
Manganese (Mn)-Dissolved	1	2%	0	0%	0	0%	0	NS	2	2%	1	1%	1	2%	1	2%
Mercury (Hg)-Dissolved	0	0%	0	NS	0	NS	0	NS	0	0%	2	2%	2	3%	0	0%
Nickel (Ni)-Dissolved	0	0%	0	0%	0	0%	0	0%	2	2%	1	1%	0	0%	0	0%
Phosphorus (P)-Dissolved	0	0%	0	0%	0	0%	0	NS	0	0%	0	0%	0	0%	0	0%
Selenium (Se)-Dissolved	4	8%	0	0%	1	3%	3	16%	1	1%	8	10%	3	5%	3	5%
Silver (Ag)-Dissolved	3	6%	0	0%	1	3%	0	0%	0	0%	5	6%	2	3%	0	0%
Thallium (Tl)-Dissolved	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	2%	0	0%
Uranium (U)-Dissolved	1	2%	0	0%	0	0%	0	0%	0	0%	0	0%	1	2%	1	2%
Zinc (Zn)-Dissolved	15	31%	1	25%	7	21%	3	16%	40	44%	23	28%	19	30%	13	22%
BOLD	Parameter Exceeds BC WQG															
%	Parameter Exceeds CCME Guidelines															

2.4 Groundwater Quality Trend Evaluation

Groundwater quality data across Mount Nansen were assessed both spatially and temporally. Spatial evaluation of the groundwater quality data was conducted on a source-to-receptor concept along established groundwater flow paths, as presented in the conceptual groundwater flow model (AECOM 2010, AMEC 2014). To the extent possible with the available groundwater quality datasets, up-gradient points were selected, where background groundwater quality was identified, for each area to assess impacts from mining or background sources. Background groundwater quality data were inferred based on relative ion percentages (Piper plots discussed in Section 3.1) where increasing sulphate composition is representative of mine-contact water. Spatial assessment was completed on an area by area basis as follows: 1) Mill Area; 2) Dome Creek; 3) TMA; 4) Brown-McDade Pit; and 5) Pony Creek. Within each area, statistical plots were generated with monitoring wells ordered upgradient-downgradient along the x-axis.

Descriptive statistics, in the form of box plots, were applied to groundwater quality data to evaluate spatial trends in groundwater quality along conceptualized groundwater flow paths. For most groundwater monitoring wells, there exists sufficient sample population to produce the statistical plots showing mean, medians and percentile distributions to assess impacts of mining on groundwater. For the purposes of the assessment, the box represents an interquartile range (IQR). The horizontal line inside the box is the median (50th percentile). The ends of the whisker are set at $1.5 \times \text{IQR}$ above the third quartile (Q3) and $1.5 \times \text{IQR}$ below the first quartile (Q1). Minimum or maximum values outside this range are plotted as outliers. In addition, and for comparative purposes relative to the median, the mean value is plotted as a black circle. Where applicable, monitoring wells were differentiated in the boxplots by colour: green representing overburden, red representing bedrock, and yellow representing tailings. The reported method detection limit replaced non-detected values to perform statistical analysis.



As noted earlier in Section 1.2, the temporal evaluation of water quality trends is constrained by the low sample counts at individual wells, as the majority of groundwater samples were collected following the 2013 site investigation (AMEC 2014). As such, temporal evaluation of groundwater quality data was restricted to monitoring wells that had a sufficient population to visually decipher correlations between parameters and time using scatter plots. Temporal evaluation of groundwater quality data is consistent with the spatial evaluation in terms of parameter and grouping (i.e., per specific mine area). Groundwater quality temporal trends were evaluated for monitoring wells of the specific mine area representing conditions along the source-to-receptor pathway.

Groundwater quality included physiochemical parameters pH, fluid conductivity (electrical conductivity [EC]) and the parameters of interest identified from Table 2-3, specifically, $\text{NH}_4\text{-T}$, NO_3^- , NO_2^{2-} , SO_4^{2-} , CN-WAD, CN-Free, Al, As, Cd, Co, Cu, Fe, Sb, Se and Zn. Parameters of interest specific to the TMA include $\text{NH}_4\text{-T}$, NO_3^- , NO_2^{2-} , CN-Free and CN-WAD.

3.0 RESULTS

3.1 General Features

Relative percent abundance plots (Piper plots) of major ions for the Pony Creek, Brown-McDade Pit, the Mill Area, Dome Creek and the TMA are provided in Figure 3-1 to Figure 3-5. Piper plots allow an assessment of chemical composition of groundwater based on the major ion ratios. Absolute concentrations of the parameters of interest are discussed in later sections. The majority of groundwater at the Site is a calcium-magnesium-sulphate type water. Chloride concentrations across the site are generally quite low (see Appendix A). The calcium-magnesium-sulphate signature is not unexpected, considering the location of the groundwater wells proximal to mining components and the deposit geology, which consists of sulphide-quartz veins hosted within massive feldspar porphyritic dykes nested within igneous-metamorphic rocks, as well as sulphide-rich breccia hosted by metamorphosed carbonate and clastic rocks.

There are notable exceptions to the general groundwater composition within each area (see Figure 3-1 to Figure 3-3) where groundwater composition trends from a calcium-magnesium-sulphate type water to a calcium-magnesium-bicarbonate type water. Several groundwater samples from the TMA and Dome Creek have a calcium-bicarbonate-type water signature, which is indicative of a non-impacted fresh water source. Monitoring wells MP09-05, located within the tailings ponds upgradient of the dam, MW09-24, located adjacent to the seepage pond, and MP09-09, located within the tailings pond near the eastern side, are calcium-magnesium-bicarbonate type water. Along Dome Creek (Figure 3-4), shallow groundwater immediately downslope of the TMA is calcium-magnesium-bicarbonate type water (GS1-DC-06B and -08B). Further downslope groundwater quality grades towards a calcium-magnesium-sulphate type water. Upstream of the TMA and towards the Mill Area, groundwater quality is calcium-magnesium-sulphate type water.

Groundwater quality across the site is generally circumneutral to slightly alkaline, ranging in pH from 6.5 to approximately 9. However, fluid conductivity (EC) varies considerably depending on the Site area. Variations in the physiochemical parameters are discussed in more detail in the following mine-area specific sections.

Reduction oxidation (Redox) conditions across the site can be generally described as being mildly suboxic to oxic depending on location and depth of well. Oxidation reduction potential (ORP) measurements were only conducted consistently on groundwater samples following the 2013 Site Investigation (AMEC 2014). The ORP measurements indicate a relative change in the reduction potential of groundwater systems. The ORP values observed across the Site vary from fairly negative (-150 mV) to fairly positive (+150 mV). The concentrations of dissolved species in groundwater provide a better indication of absolute redox conditions in comparison to ORP measurements. Inspection of the data for DO, NO_3^- , dissolved Fe, and dissolved Mn indicates that groundwater is generally mildly suboxic to oxic (see Appendix A). Concentrations of dissolved Fe in groundwater the site vary from non-detect to as high as 80 mg/L. Elevated dissolved Fe concentrations are generally indicative of Fe(III)-oxide reduction indicating suboxic conditions. The presence of dissolved Fe in groundwater indicates suboxic conditions likely prevail throughout the year. Dissolved Fe concentrations are evaluated further spatially and temporally for each mine area in the following sections. Dissolved Mn concentrations in groundwater ranged from non-detect to a high of about 50 mg/L (MW-09-2 within the TMA). Such values are likely indicative of Mn(IV)-oxide reduction and further support the presence of groundwater suboxia.

The DO data are not consistent with the Fe and Mn values, which show measureable DO values in most wells. This may indicate a sampling artifact associated with the DO measurements. Measured DO levels vary from non-detect to as high as approximately 8 mg/L, and NO₃⁻ levels are generally quite low in concentration (< 1.5 mg/L) with the exception of notable locations within the TMA, which is discussed in more detail in the Tailing Management Area section that follows.

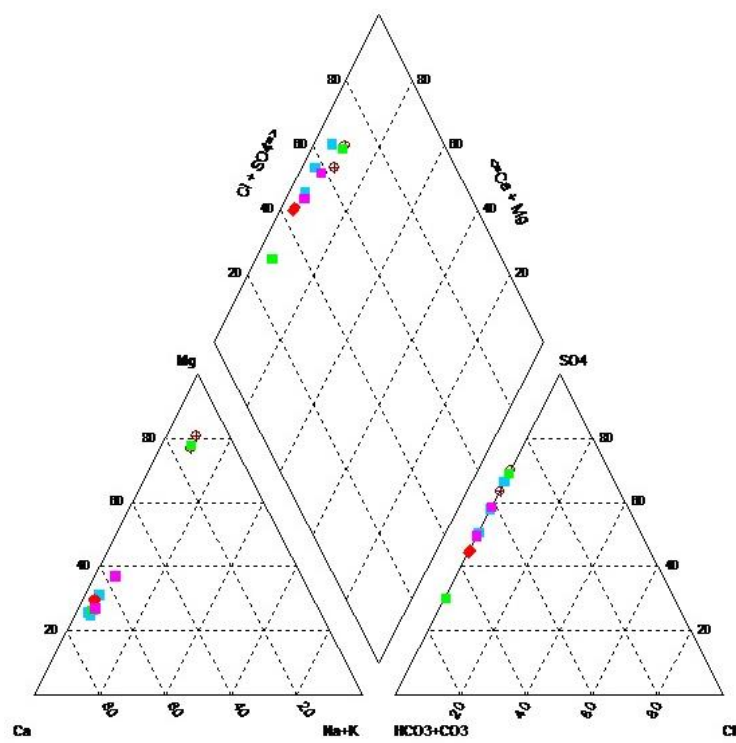


Figure 3-1: Piper Plot - Groundwater Quality - Pony Creek

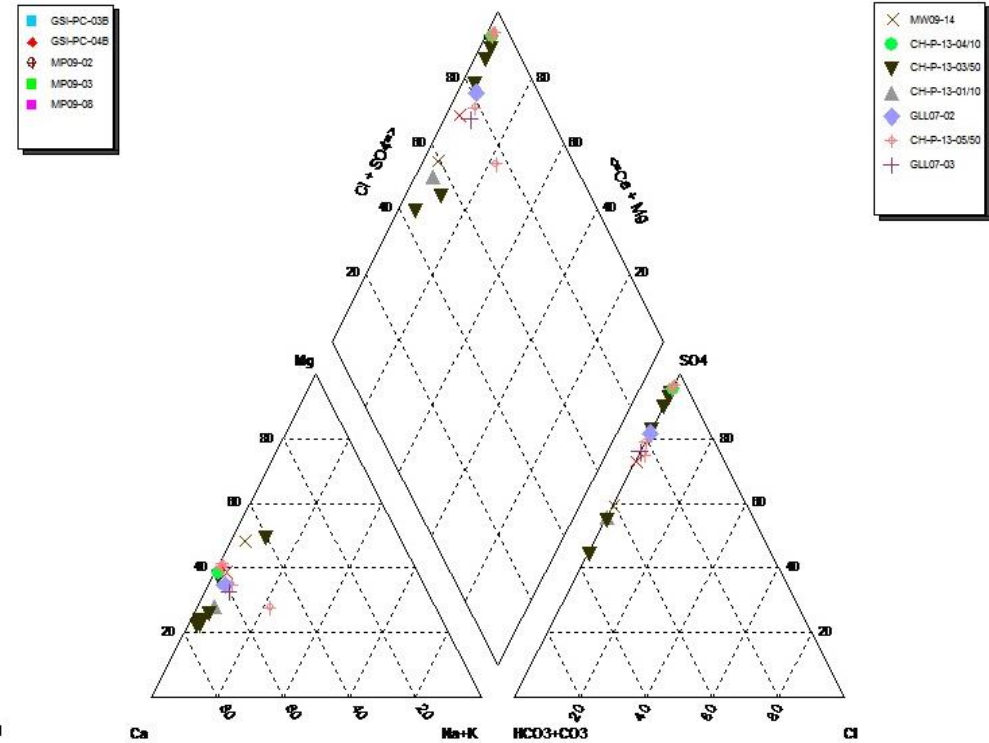


Figure 3-2: Piper Plot - Groundwater Quality - Brown-McDade Pit

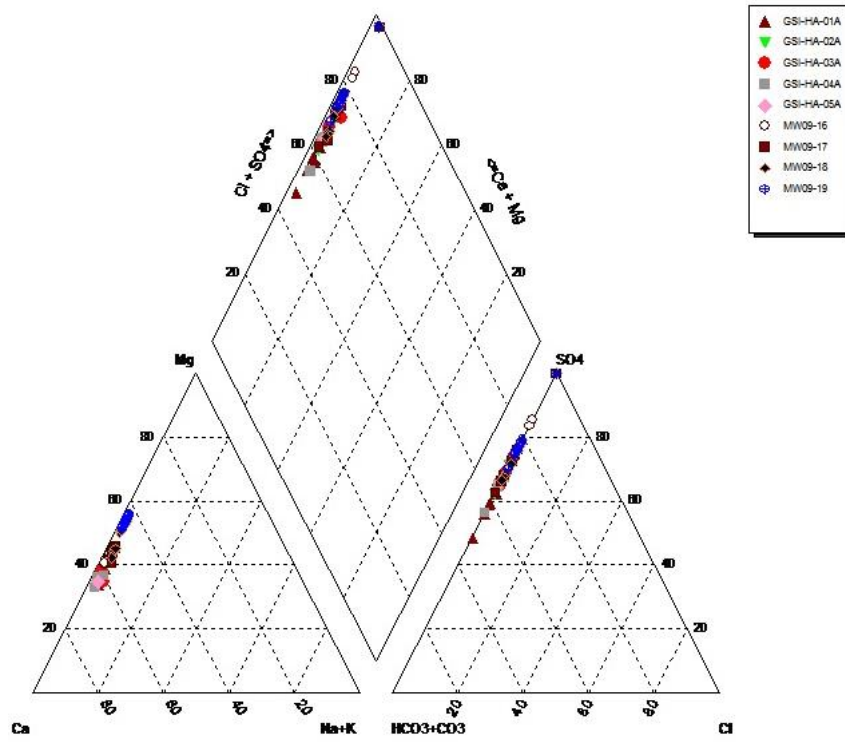


Figure 3-3: Piper Plot - Groundwater Quality - Mill Area

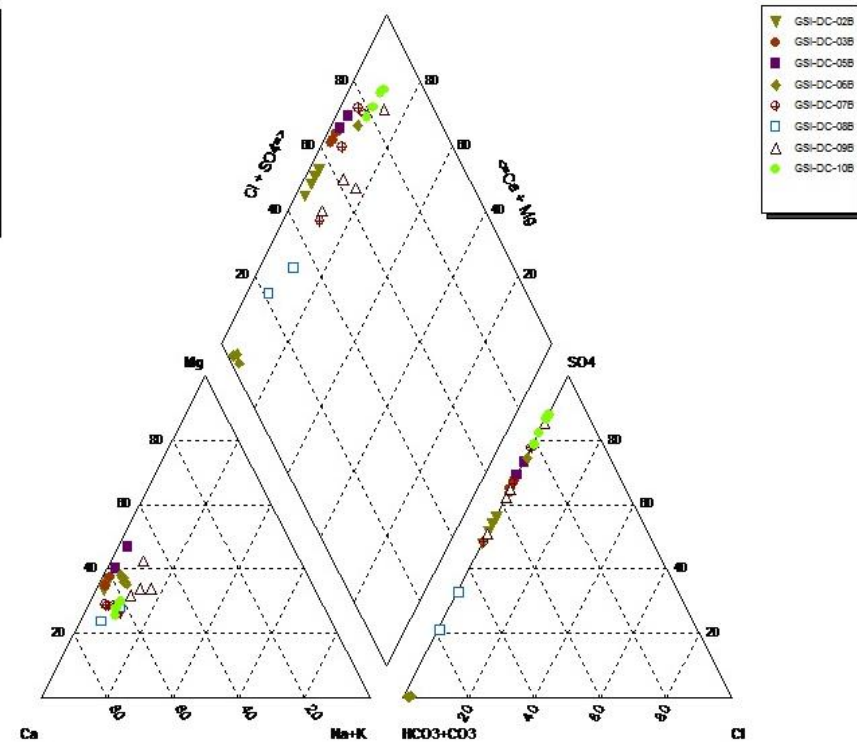


Figure 3-4: Piper Plot - Groundwater Quality - Dome Creek

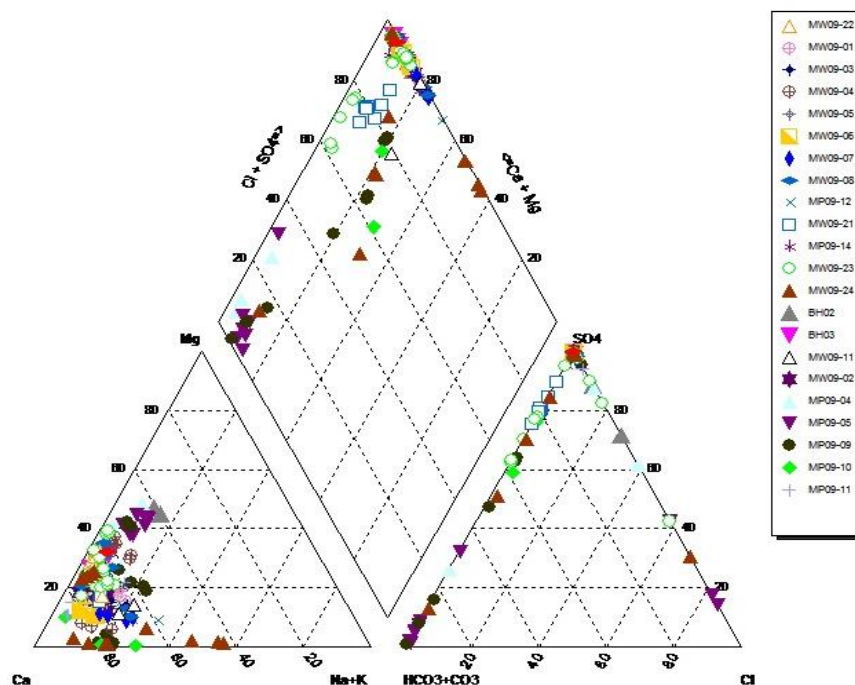


Figure 3-5: Piper Plot - Groundwater Quality - TMA

3.2 Mill Area

Groundwater collected from monitoring wells GS1-HA-01A, -02A, -05A, 004A, MW09-16, -18 and -17 is used to characterize groundwater quality in the Mill Area. Water quality data from these groundwater monitoring wells are provided in Appendix A. Groundwater quality parameters of interest in the Mill Area include SO_4^{2-} , Al, As, Cd, chromium (Cr), Co, Cu, Fe, Mn, Pb, Se, Sb and Zn. Concentrations of these parameters in groundwater are presented in Figure 3-6 through Figure 3-10.

Figure 3-6 and Figure 3-7 present boxplots of groundwater quality for monitoring wells orientated north-south (upgradient-downgradient) along the dominant groundwater flow path (AECOM 2010, AMEC 2014), with monitoring wells GS1-HA-01A and MW09-17 representing the maximum upgradient and downgradient positions, respectively, in the Mill Area. Monitoring wells MW09-18 and MW09-17 are screened with bedrock and the remainder are screened with overburden.

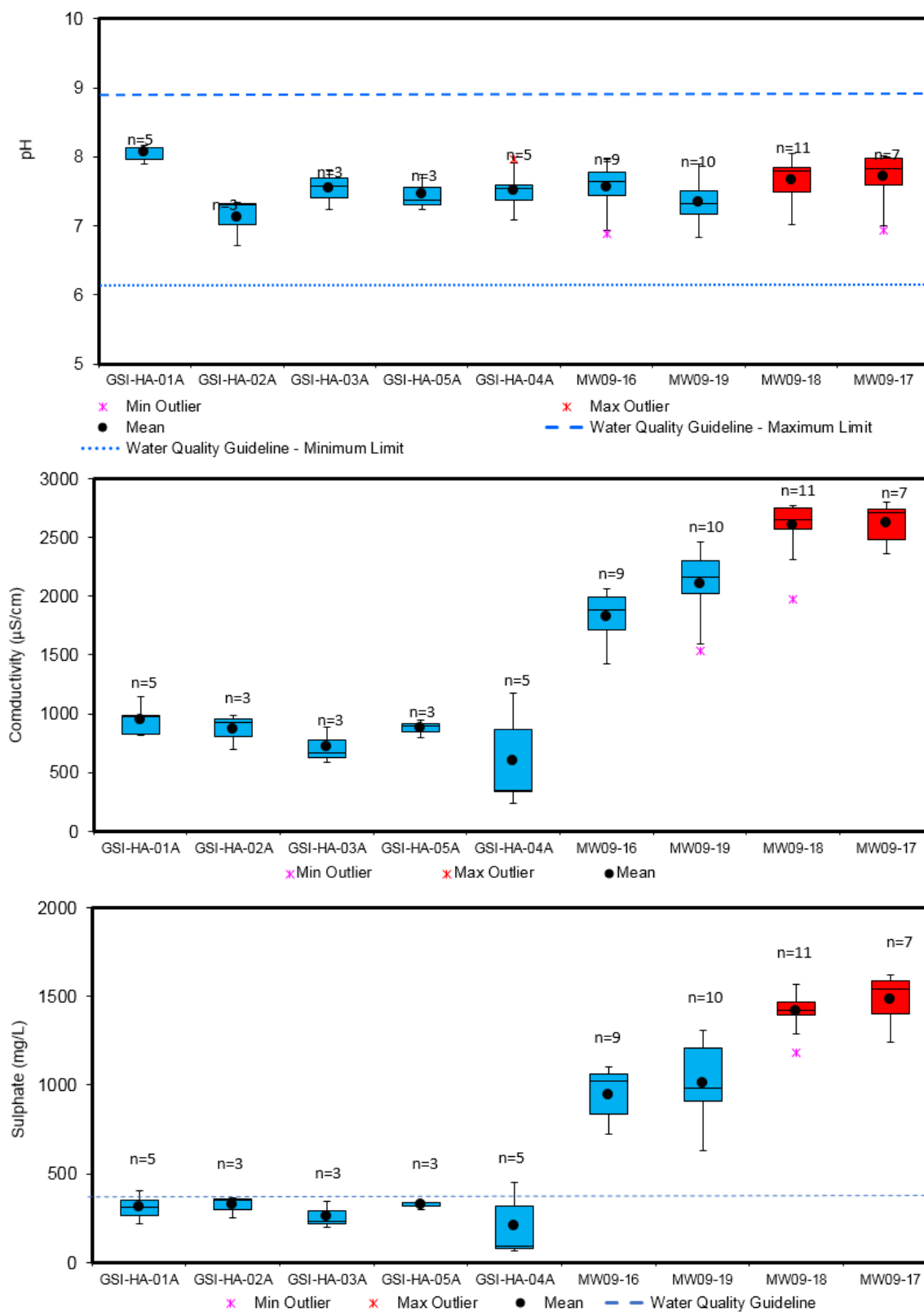


Figure 3-6: Anions Mill Area

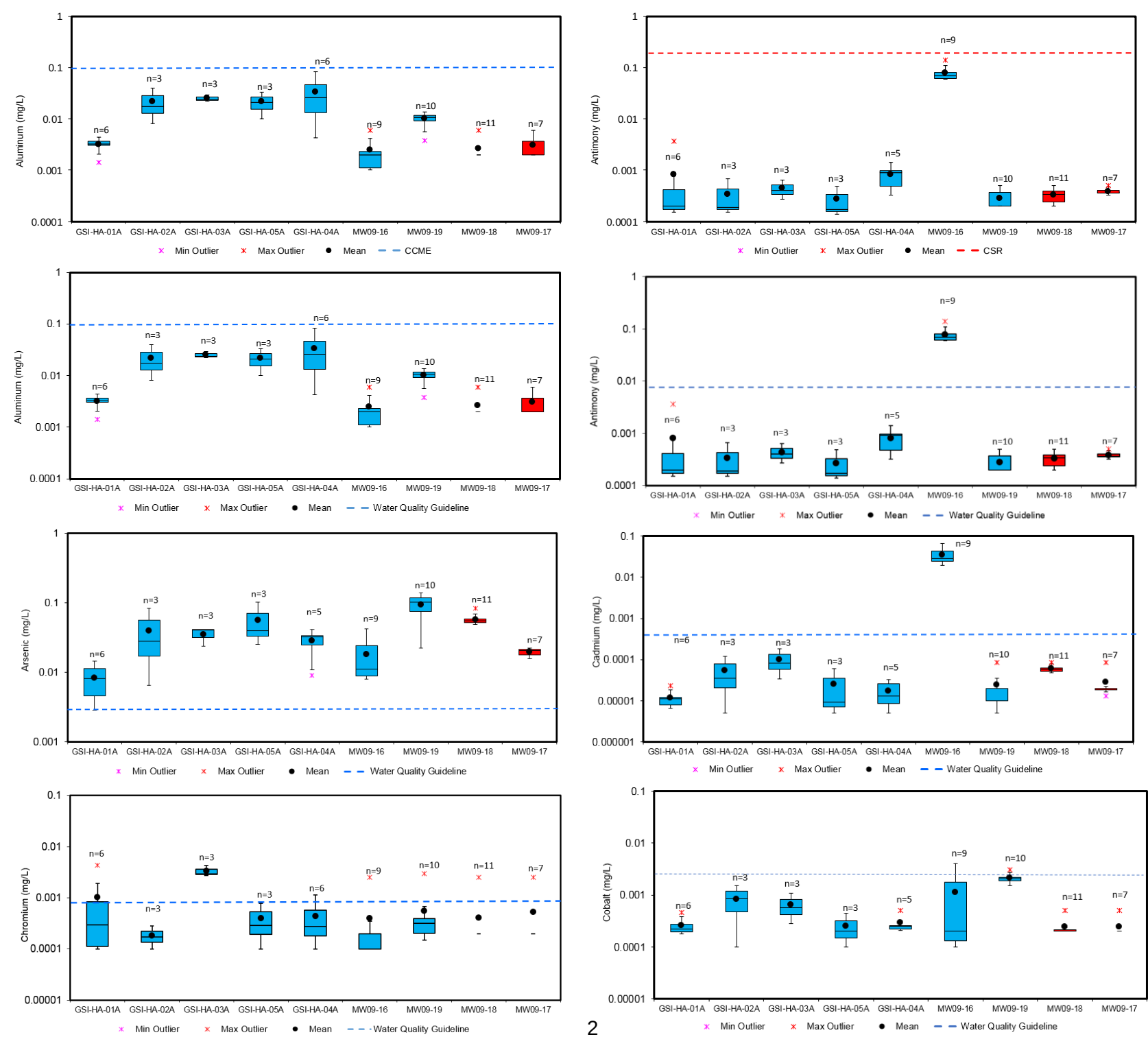


Figure 3-7: Metals - Aluminum, Antimony, Arsenic, Cadmium, Chromium and Cobalt - Mill Area

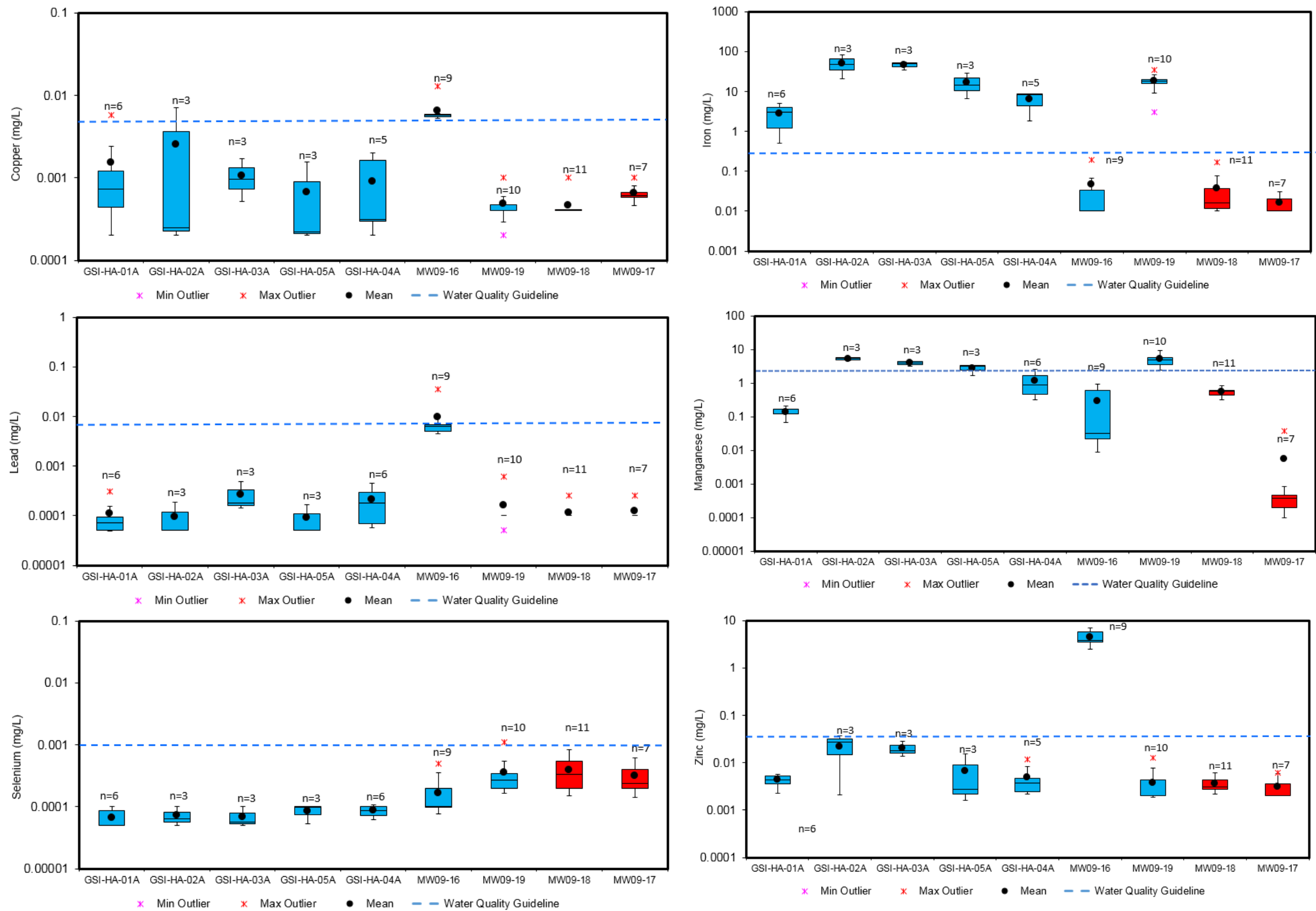


Figure 3-8: Metals - Copper, Iron, Lead, Manganese, Selenium and Zinc - Mill Area

pH in the Mill Area is consistently circumneutral; however, fluid conductivity increases from approximately 750 $\mu\text{S}/\text{cm}$ to approximately 2,500 $\mu\text{S}/\text{cm}$ (Figure 3-6). Sulphate concentrations increase from medians of approximately 204 mg/L to 350 mg/L at GS1-HA-01A through GS1-HA-05A to median concentrations of 984 mg/L to 1,540 mg/L at MW09-16 through MW09-19, exceeding the guideline limits and demarcating effects of mining on water quality along this flow path. The increase in fluid conductivity appears to reflect the increase in SO_4^{2-} concentrations, as dissolved metals (Figure 3-7) do not increase in concentration along this flow path. However, the opposite is true with respect to the correlation between EC and Fe concentrations, as Fe concentrations are high within overburden groundwater and low within bedrock groundwater. With the exception of groundwater quality at MW09-16, metals concentrations (with the exception of Mn) are generally statistically consistent along this flow path. Specific details relating to metal concentrations in groundwater are discussed further.

Aluminum, Cr, Cu, and Pb concentrations are consistently below guideline levels.

The apparent loss of Fe from groundwater in the Mill Area along the groundwater flow could be attributed to oxidation and subsequent precipitation, as ORP levels for the deep wells (MW09-16 to MW09-19) is quite high, with DO concentrations at less than 1 mg/L. The increase in SO_4^{2-} and the apparently oxic redox conditions would preclude losses of Fe due to iron-sulphide (FeS_2) precipitation.

Arsenic concentrations in groundwater generally exceed the guideline and are elevated relative background groundwater (GS1-HA-01A). The highest As concentration in groundwater observed in the Mill Area was at MW09-19 with a mean concentration above 0.05 mg/L.

Manganese (total) concentrations in groundwater exceed guideline at all monitoring wells except GS1-HA-01A (background) and MW09-17 (downgradient bedrock).

Copper, Cd, Sb and Zn are generally consistent across all monitoring wells, with the exception of groundwater at monitoring well MW09-16, where concentrations are consistently higher, often exceeding guidelines. Cadmium and Zn median concentrations in groundwater at MW09-16 exceed guidelines.

Selenium concentrations in groundwater are below the guideline; however, groundwater concentrations downgradient of MW09-16 (through MW09-19, -17 and -18) indicate, statistically, an increase in concentrations. The increase Se correlates positively with SO_4^{2-} , indicating the release mechanism is through oxidation of sulphide minerals.

The large distribution in concentrations displayed in the box plots was further assessed using scatter plots of the parameter of interest over time. The highest distribution is typically associated with metal concentrations within overburden groundwater (see Figure 3-7 and Figure 3-8). A review of the scatter plots (Figure 3-9 and Figure 3-10) indicates that much of the variability is associated with intra-annual variability and likely linked to seasonal fluctuations in groundwater levels related to freshet and winter low levels or permafrost conditions. Metals are typically lower in concentration if samples were collected during freshet and higher during low-flow conditions (late summer/winter).

Arsenic and SO_4^{2-} are screened out as a POPC, because concentrations in groundwater are generally elevated downgradient of the Mill Area and likely persist further downgradient. Metal species Cu, Cd, Sb and Zn are identified as POPCs, because they consistently exceed guidelines

at MW09-16, indicating a source of metal concentrations that may impact surface water quality. Manganese concentrations in shallow groundwater downgradient of the Mill Area are also identified as a POPC, because levels are elevated above the direction in the water use licence.

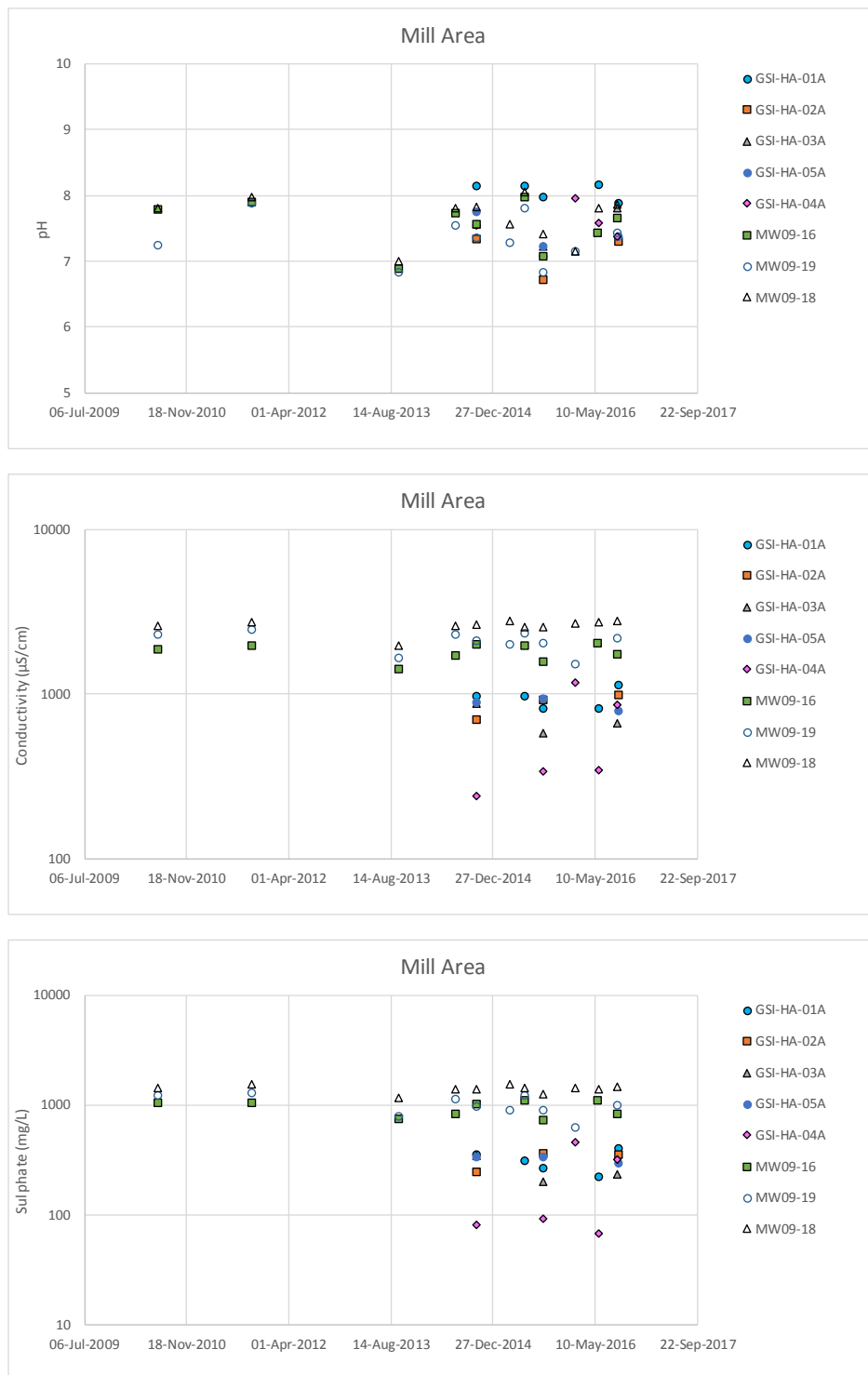


Figure 3-9: Anions - Temporal Variability - Mill Area

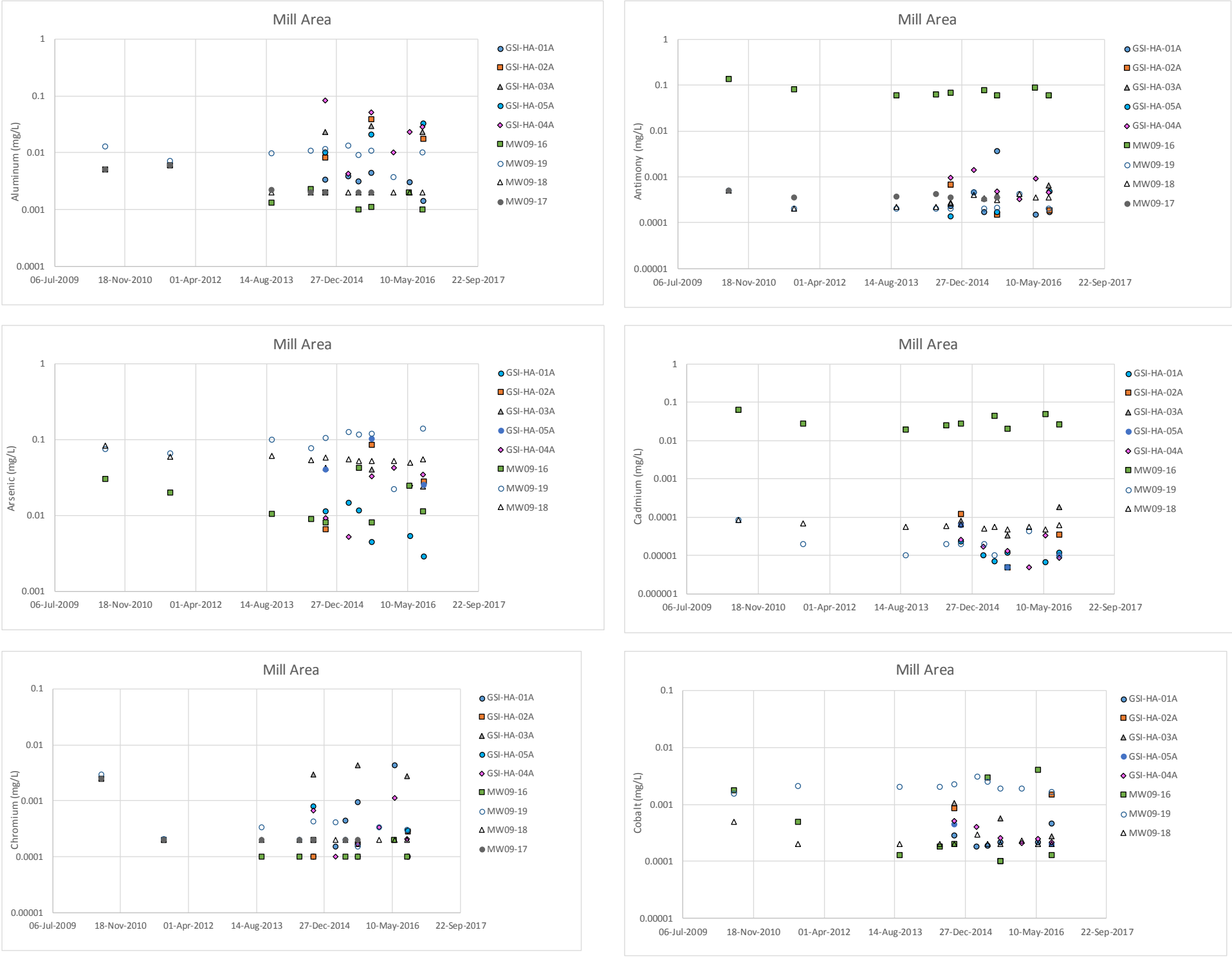


Figure 3-10: Metals - Aluminum, Antimony, Arsenic, Cadmium, Chromium and Cobalt - Temporal Variability - Mill Area

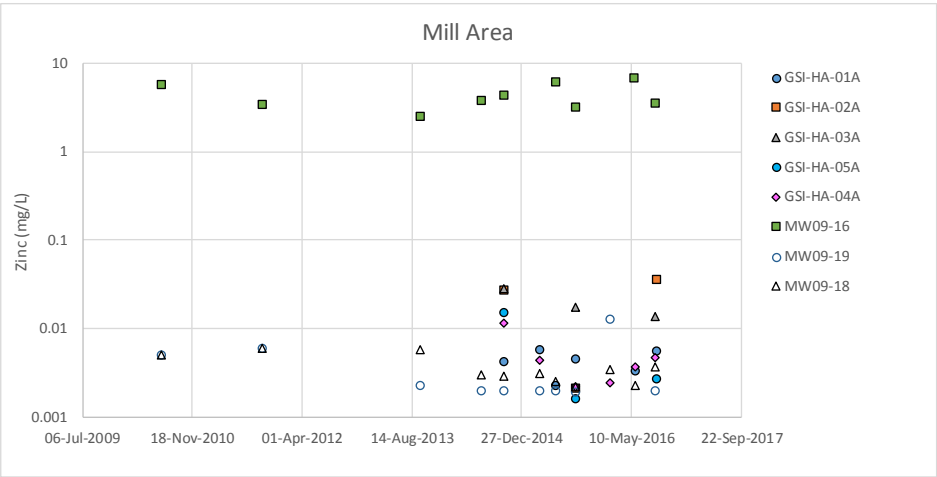
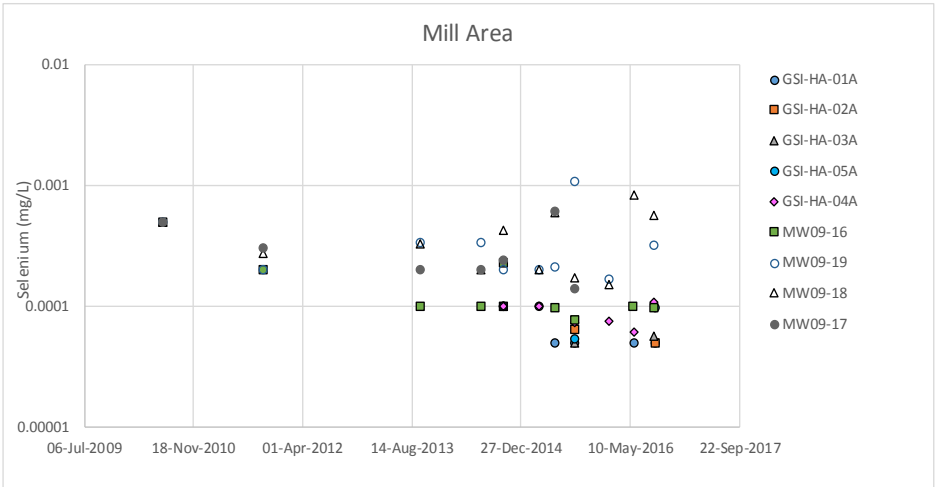
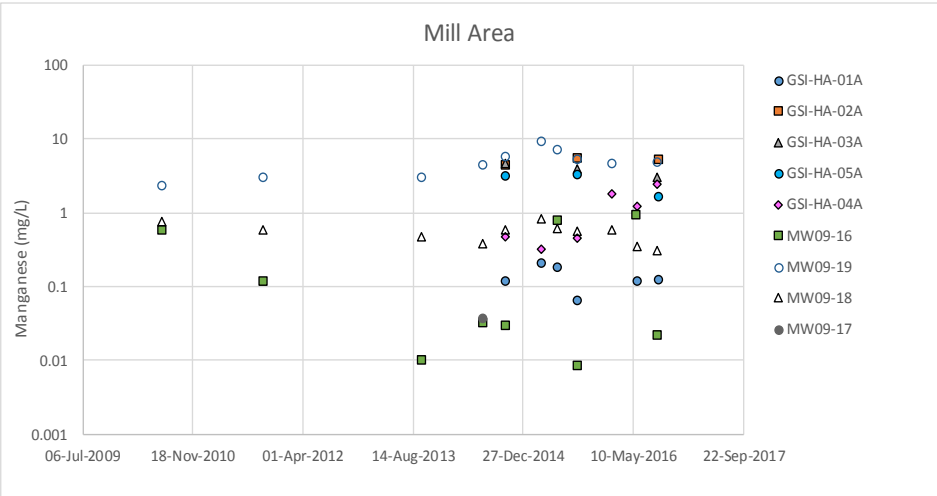
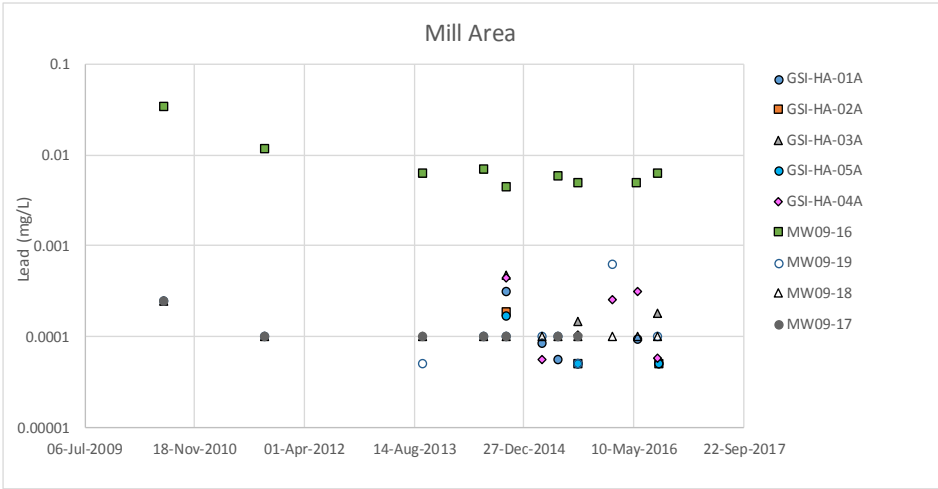
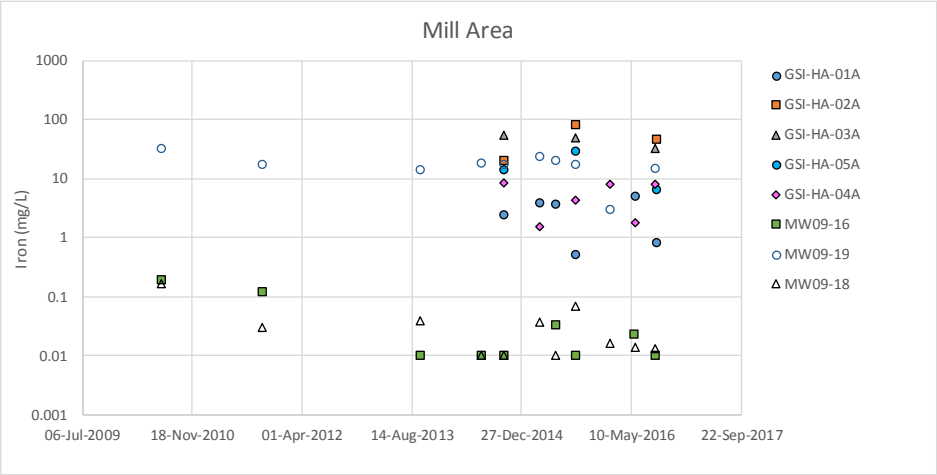
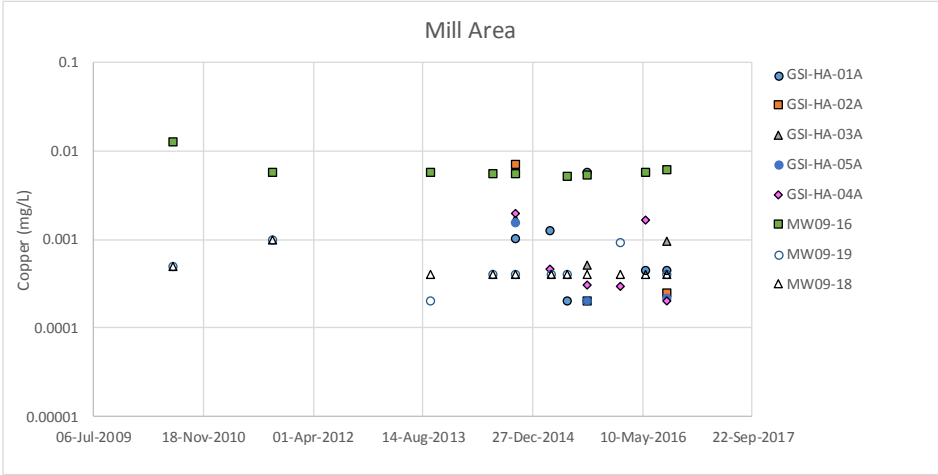


Figure 3-11: Metals - Copper, Iron, Lead, Manganese, Selenium and Zinc -Temporal Variability - Mill Area (continued)

3.3 Dome Creek

Groundwater collected from monitoring wells GS1-DC-01B, -02B, -03B, -04B, -05B, -06B, -07B, -08B, -09B and -10B is used to characterize shallow groundwater quality along Dome Creek, upgradient of the Mill Area, to the TMA, and downgradient of the TMA. All of the Dome Creek wells are shallow installations and screened with overburden or fluvial sediments of the creek bed. Therefore, groundwater quality is representative of the shallow groundwater system more proximal to surface water than to deep groundwater within this area. Locally, groundwater flow is towards Dome Creek, as the creek is considered a groundwater discharge zone (AMEC 2014). However, along Dome Creek, groundwater flow is controlled by topography, and the dominant local flow path is within overburden/fluvial sediments along Dome Creek (essentially east to west). Water quality data from these groundwater monitoring wells are provided in Appendix A. Dome Creek groundwater quality parameters of interest along Dome Creek include SO_4^{2-} , Al, As, Cd, Co, Cr, Cu, Fe, Mn, Sb, Se and Zn. Concentrations of these parameters in groundwater are presented in Figure 3-12 through Figure 3-17. Figure 3-12 through Figure 3-14 present boxplots of groundwater quality of monitoring wells orientated along Dome Creek with monitoring well GS1-DC-01B located upgradient of the Mill Area and GS1-DC-10B located approximately 1 km downslope of the TMA.

Groundwater quality at monitoring wells GSI-DC-06B and GSI-DC-08B are consistently fresh in composition (calcium-magnesium-bicarbonate type water), while elsewhere along Dome Creek sulphate is the dominant anion.

pH along Dome Creek is generally circumneutral; however, pH is statistically lower at GSI-DC-10B, with a value of 6.75 versus 7.5 at the next upgradient well, GSI-DC-9B. Fluid conductivity varies along Dome Creek. Downgradient of the Mill Area, EC statistically increases in from 1,000 $\mu\text{S}/\text{cm}$ at GSI-DC-02B to 1,500 $\mu\text{S}/\text{cm}$ at GSI-DC-05B (see Figure 3-12), and then appears to decrease downgradient of the TMA; the decrease is likely related to the freshwater input. At GSI-DC-10B, EC is consistently at 1,000 $\mu\text{S}/\text{cm}$ with a narrow distribution and is elevated relative to upgradient groundwater.

There exists a strong visual correlation between EC and SO_4^{2-} . Median SO_4^{2-} concentrations increase from 300 mg/L to 640 mg/L at GSI-DC-02B and GSI-DC-05B, respectively. The SO_4^{2-} concentration at GSI-DC-06B is unusually low, with a median value of 3.1 mg/L, the low concentration being reflective of the freshwater input from the seepage pond. Further downgradient SO_4^{2-} concentrations are generally higher than groundwater at GSI-DC-06B. Monitoring wells GSI-DC-07B and -10B appear to contain mine contact water, as median SO_4^{2-} concentrations are 427 mg/L and 508 mg/L, respectively.

Dissolved Fe concentrations increase from a median value of 0.042 mg/L at the upgradient well GSI-DC-01B to 129.5 mg/L at GSI-DC-08B, located downgradient of the TMA. Dissolved Fe concentrations appear to increase in concentrations along the entire flowpath, indicating contributions from both the Mill Area and the TMA. Dissolved Fe is identified as a POPC, because it exceeds CCME guidelines and is persistent in groundwater along the Dome Creek drainage.

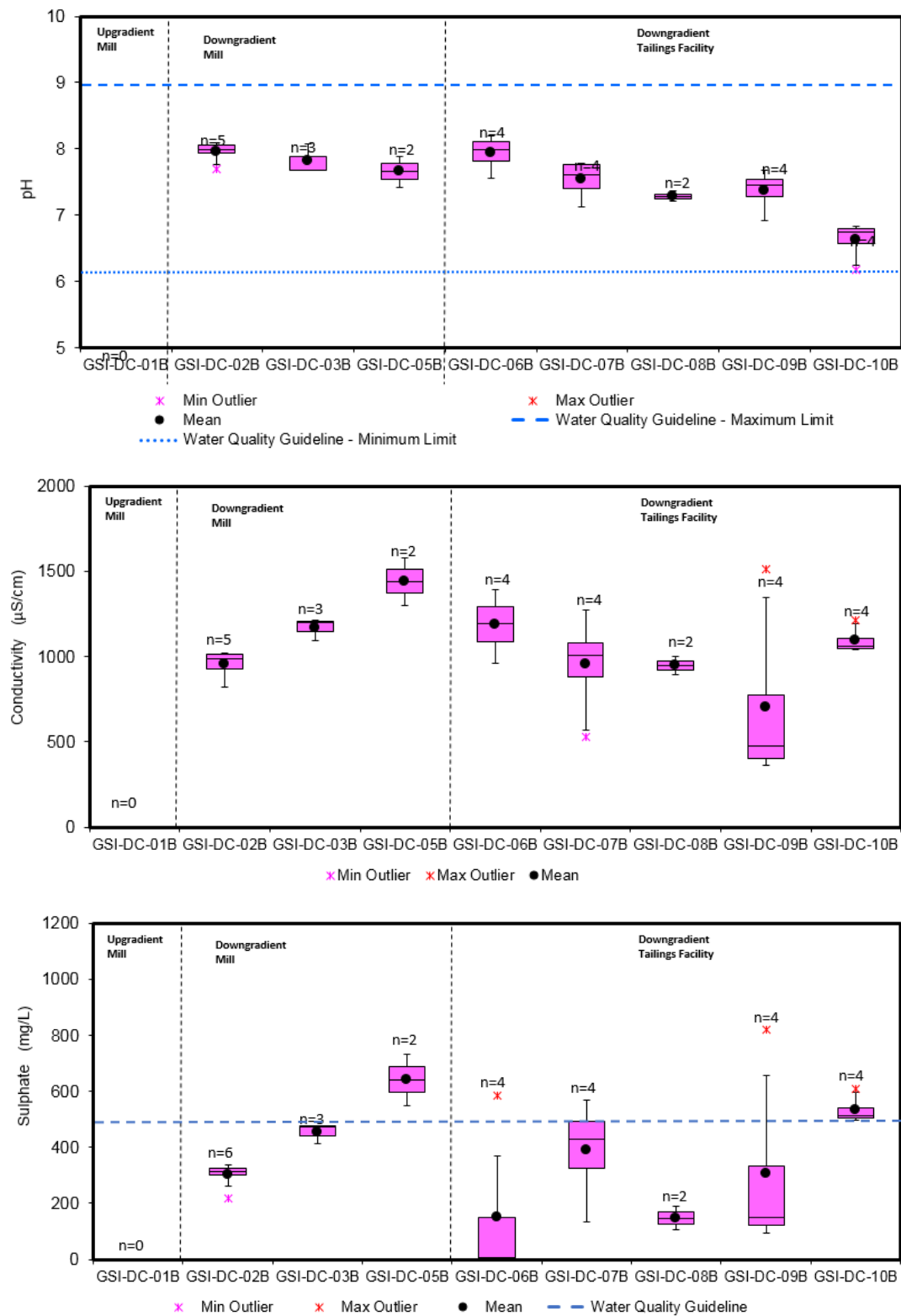


Figure 3-12: Anions - Dome Creek

Box plots of trace elements in groundwater along Dome Creek are presented in Figure 3-13 and Figure 3-14. Arsenic concentrations along the upper portion of Dome Creek are statistically indistinguishable from the upgradient well GSI-DC-01B; however, median As concentrations at GSI-DC-05B are greater than background and guideline levels. Arsenic in groundwater at GSI-DC-06B has a median concentration of 0.342 mg/L, which is above the guideline limits. Arsenic concentrations further downgradient are distinctly higher, with median values ranging from 0.052 mg/L at GSI-DC-09B to 0.342 mg/L at GSI-DC-06B. Arsenic concentrations in groundwater downgradient of the TMA exceed the guideline. Arsenic is identified as a POPC, as concentrations exceed the guideline, and elevated concentrations are persistent within shallow groundwater downgradient of the Mill Area and TMA.

Concentrations of Cu in groundwater indicate a decreasing trend with distance along Dome Creek. The highest Cu concentration in groundwater along Dome Creek is observed at the upgradient well GSI-DC-01B, with a median value of 0.039 mg/L. Cadmium concentrations in groundwater are generally consistent along Dome Creek, with the exception of groundwater at GSI-DC-03B, which has a median value of 0.00066 mg/L, exceeding the guideline. Cadmium concentrations in groundwater below the TMA are below the guideline limits. Zinc concentrations in groundwater along Dome Creek are generally consistent and are below guideline limits, with the exception of groundwater at GSI-DC-03B, which has a median concentration of 0.059 mg/L, slightly above the guideline.

Aluminum concentrations in groundwater downgradient of the TMA exceed CCME guidelines and appear to originate from the TMA. Chromium concentrations in shallow groundwater are indistinguishable along the entire Dome Creek drainage. The concentration of Cr in the monitoring well upgradient of the Mill Area would suggest a background source. Chromium concentrations along Dome Creek generally exceed the guideline, particularly at GSI-DC-08B. Cobalt concentrations appear to increase in concentration along Dome Creek. Concentrations of Co in shallow groundwater are statistically higher than in background groundwater (GSI-DC-01B) and exceed the guideline. Manganese concentrations in shallow groundwater exceed the guideline along the entire Dome Creek drainage downgradient of the Mill Area. The large distributions in concentrations displayed in the box plots were further evaluated using scatter plots of the parameter of interest over time (see Figure 3-15 and Figure 3-16). A review of the scatter plots indicates that much of the distribution observed in the box plots is associated with intra-annual variability and likely linked to seasonal fluctuations in water levels and groundwater flows related to freshet and winter low levels or permafrost conditions. Visually, there appears to be inter-annual correlation with concentration and time.

Parameters of potential concern identified include SO_4^{2-} , Al, As, Cd, Co, Cr, Fe and Mn, and of these, Cr is considered attributed to background-related sources.

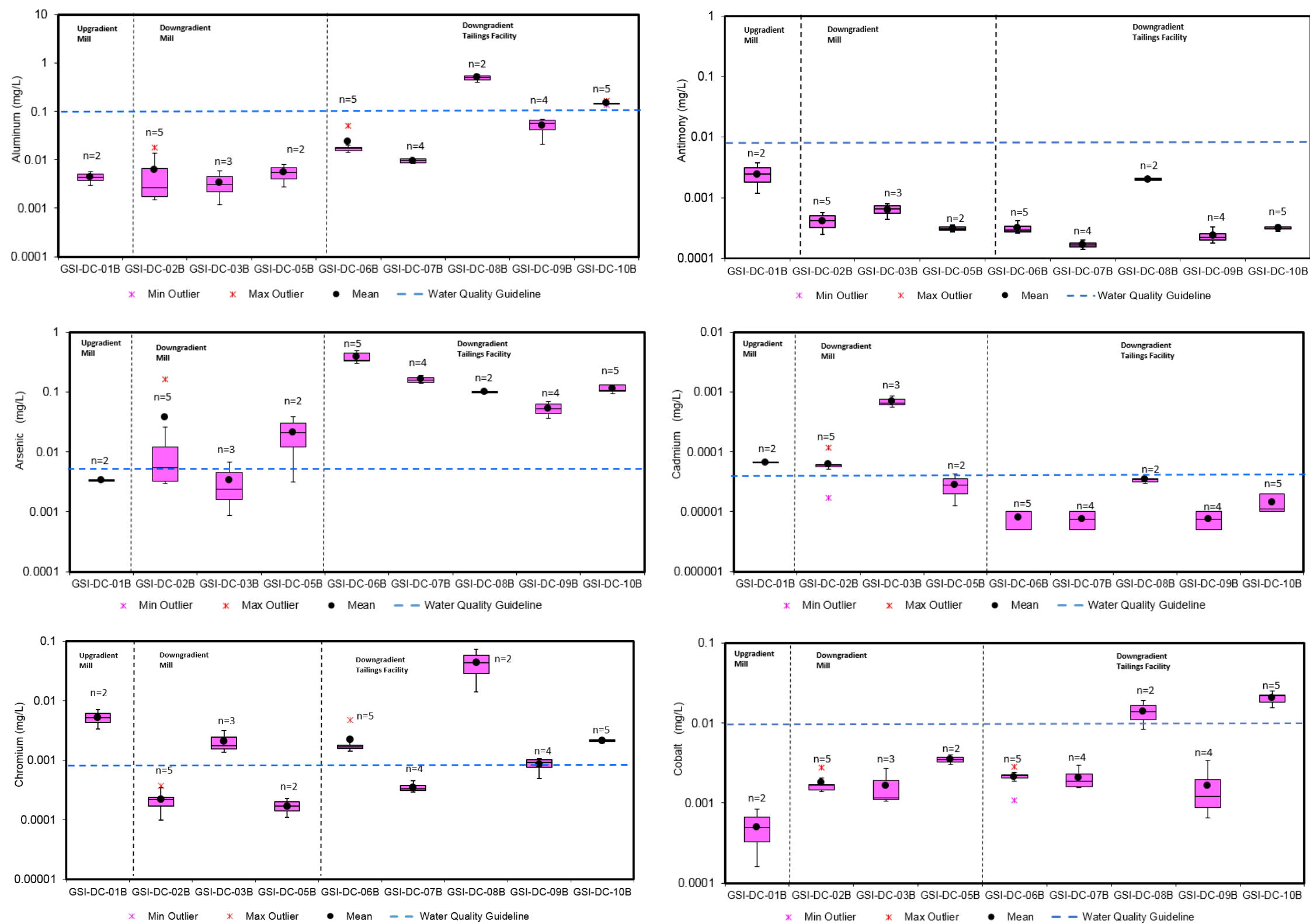


Figure 3-13: Metals - Aluminum, Antimony, Arsenic, Cadmium, Chromium and Cobalt - Dome Creek

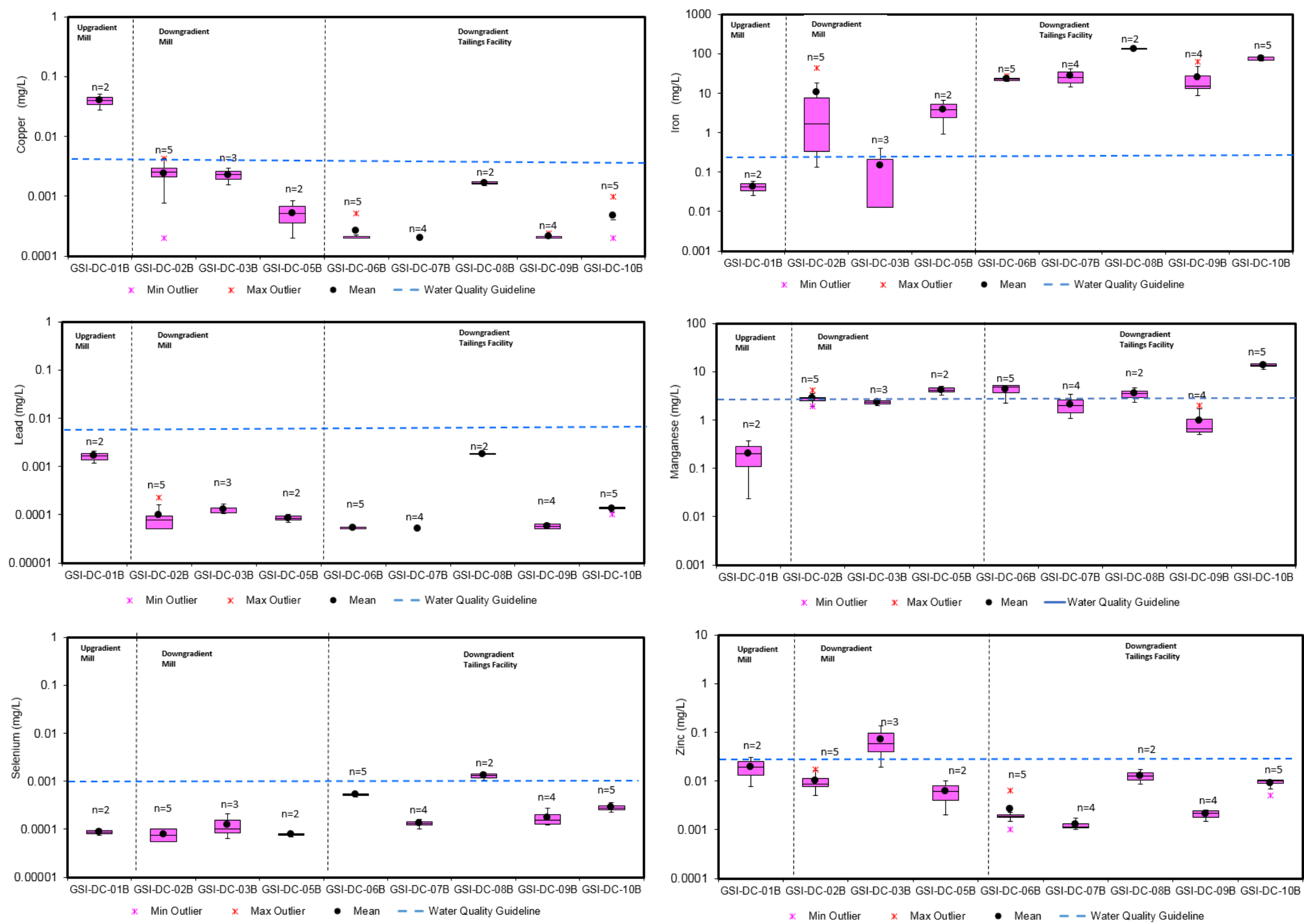


Figure 3-14: Metals - Copper, Iron, Lead, Manganese, Selenium and Zinc - Dome Creek

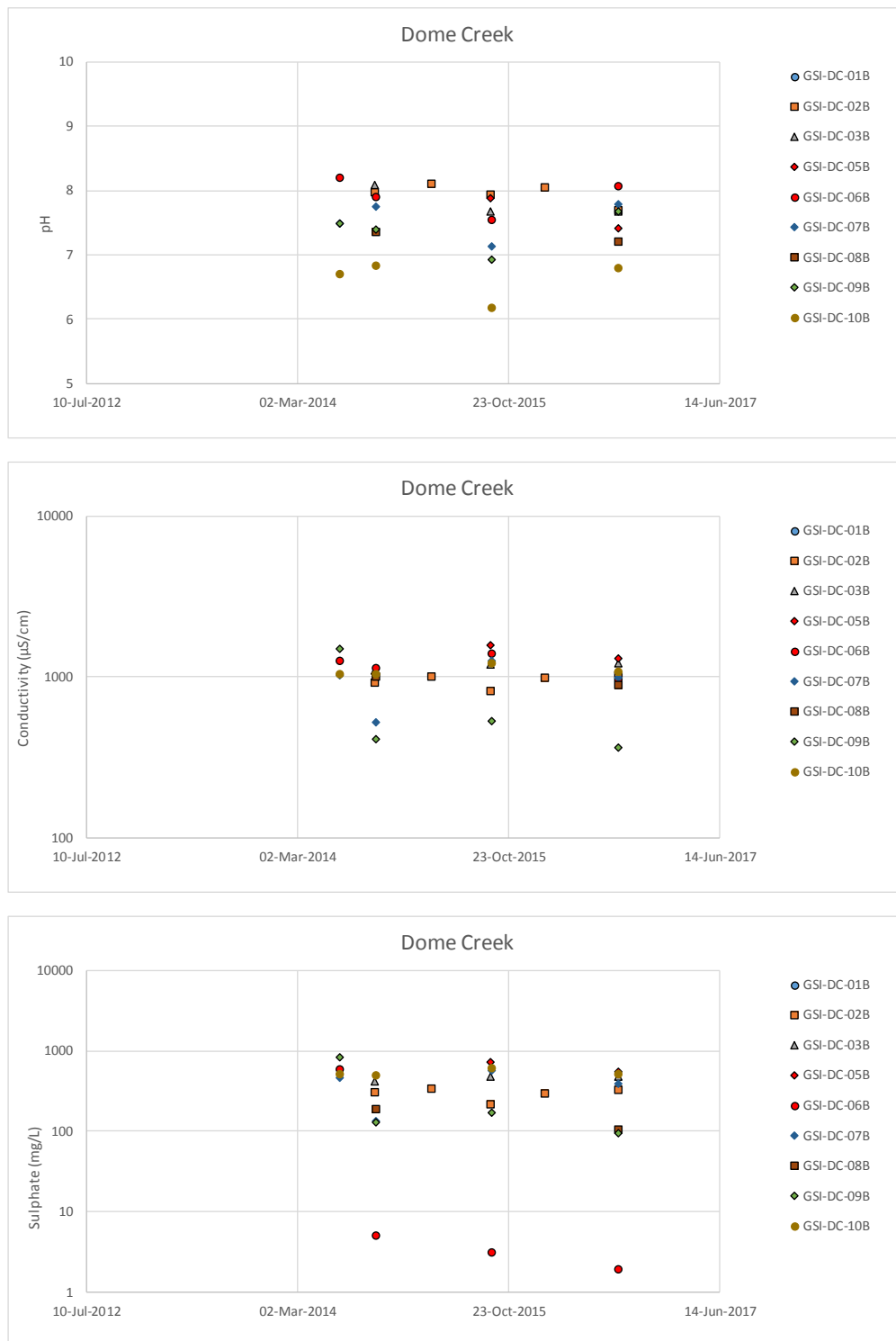


Figure 3-15: Anions - Temporal Variability - Dome Creek

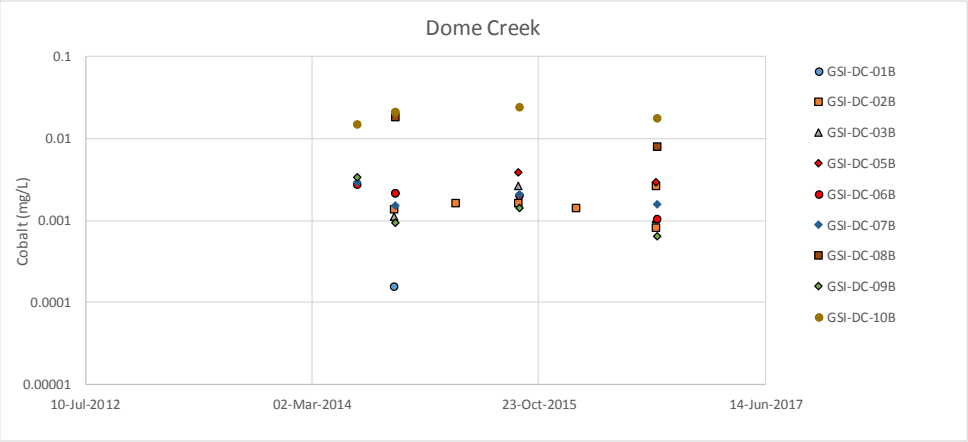
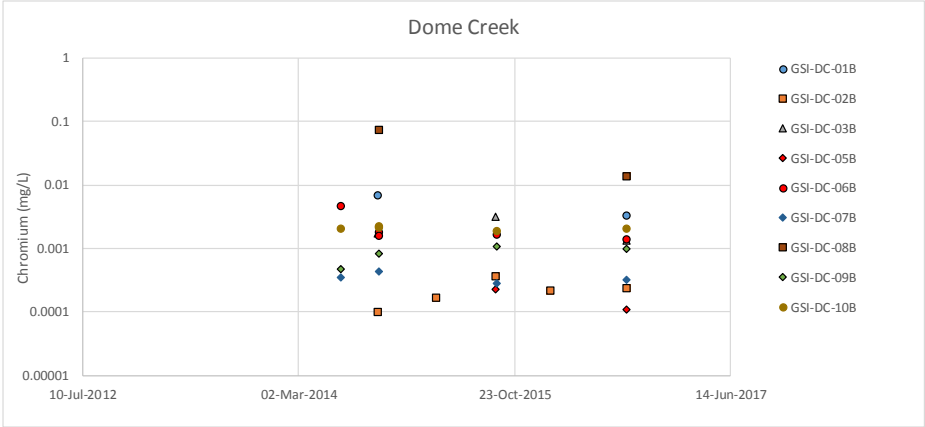
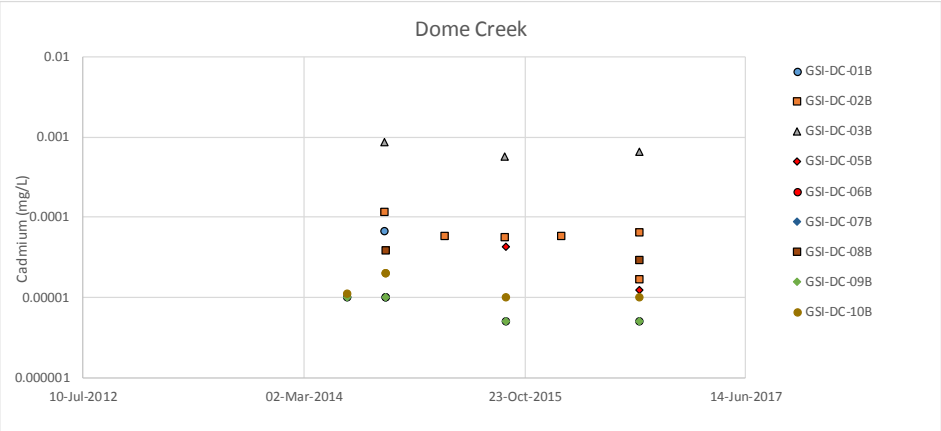
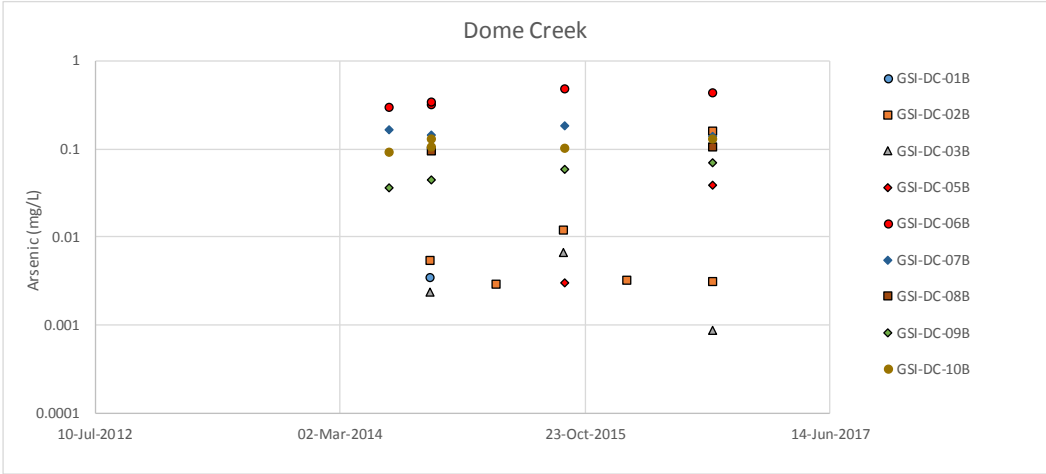
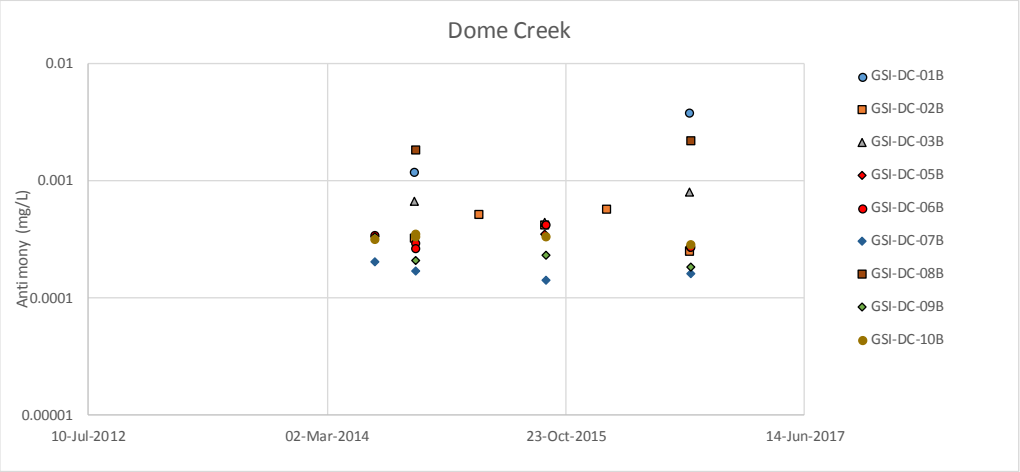
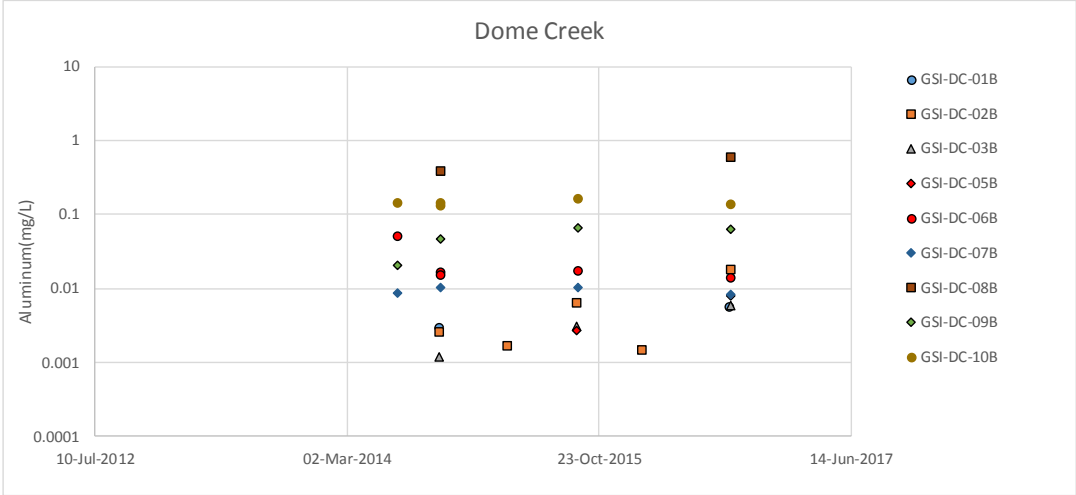


Figure 3-16: Metals - Aluminum, Antimony, Arsenic, Cadmium, Chromium and Cobalt - Temporal Variability - Dome Creek

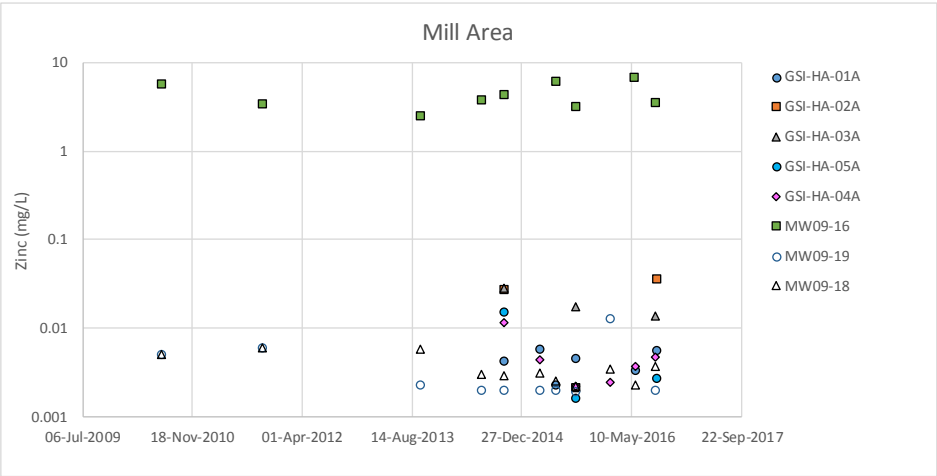
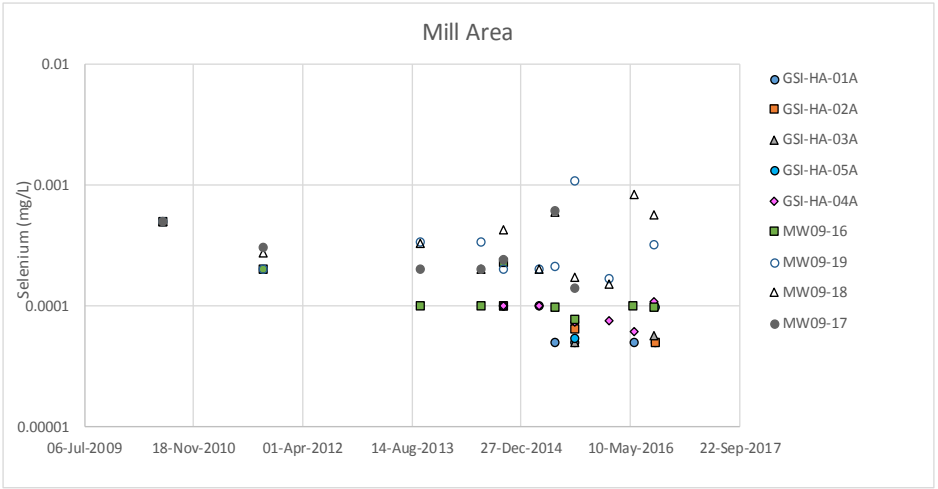
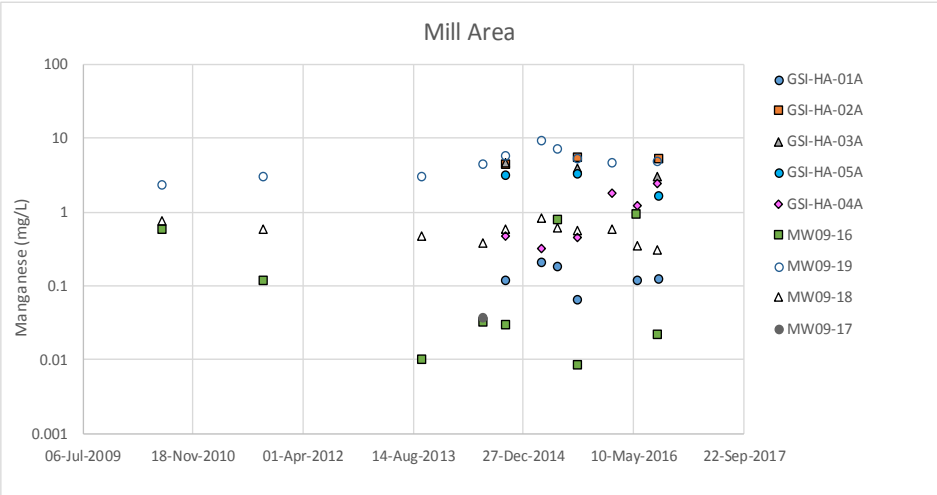
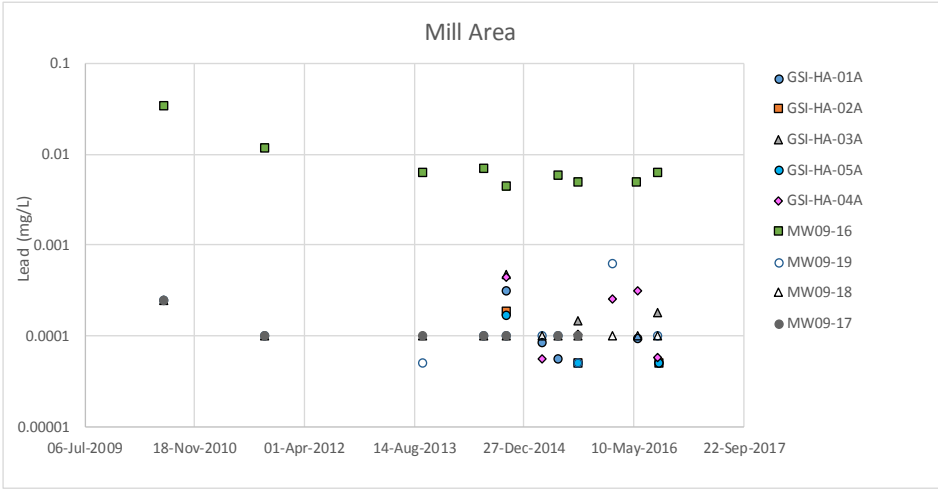
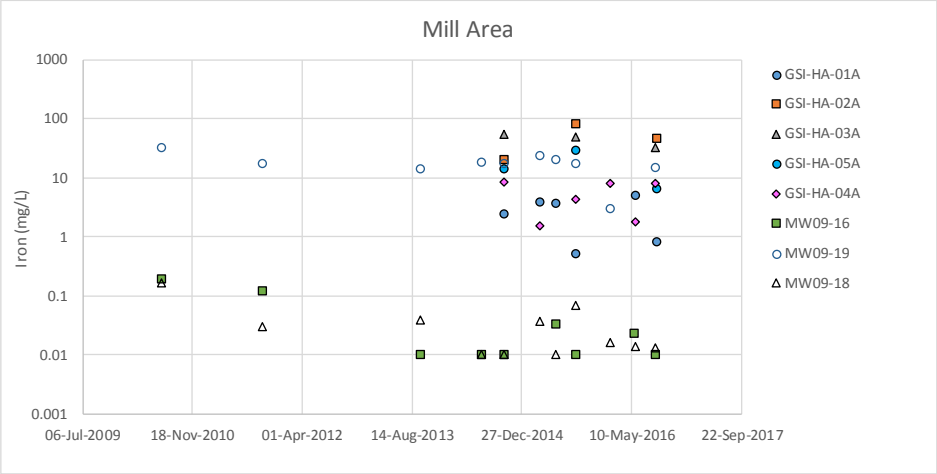
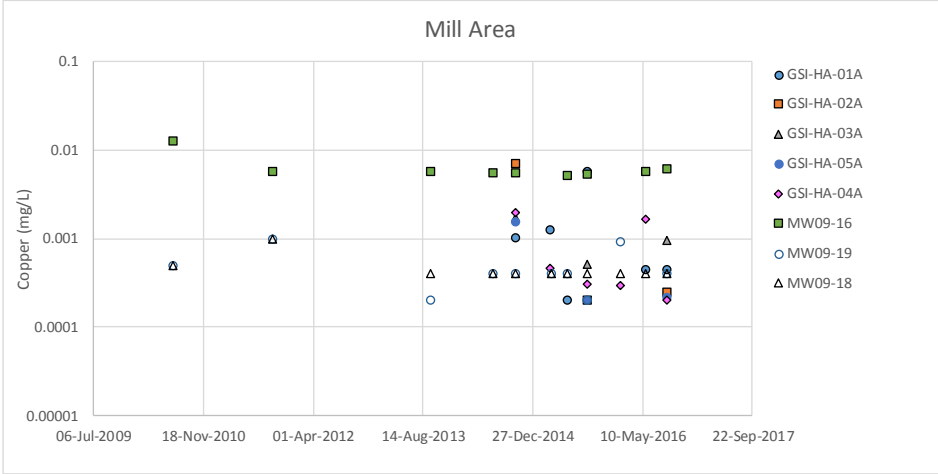


Figure 3-17: Metals - Copper, Iron, Lead, Manganese, Selenium and Zinc - Temporal Variability - Dome Creek

3.4 Tailings Management Area

Groundwater collected from twenty-three (23) monitoring wells located within the TMA area is used to characterize groundwater quality. Water quality data from these groundwater monitoring wells are provided in Appendix A. These monitoring wells are distributed among the main components of the TMA: upgradient of tailings pond, the tailings pond, the tailings dam, and downgradient seepage dam. The location of these monitoring points are shown in Figure 1-1. Groundwater quality parameters of interest for the TMA include SO_4^{2-} , Al, As, Cd, Co, Cr, Cu, Fe, Mn, Pb, Se, Sb, Zn, NO_3^- , ammonia (NH_3^+), CN-WAD and CN-Free. Concentrations of these parameters in groundwater are presented in Figure 3-18 to Figure 3-25. Figure 3-18 to Figure 3-21 present box plots of groundwater concentrations of monitoring wells orientated along the Dome Creek drainage (i.e., oriented upgradient-downgradient through the TMA). Groundwater quality data from MW-09-11 represent upgradient local conditions for the TMA, and MW-09-08, located at the toe of the tailings dam, represents downgradient conditions.

AECOM (2010, Section 4.4) and AMEC (2014, Section 6.4) provide details of conceptual groundwater flow conditions around the TMA. The TMA is underlain by a thin veneer of native sediments consisting of organics, silty aeolian sand and alluvial/colluvial sediments of the Dome Creek drainage. Permafrost conditions were encountered below the base of the tailings but above the unfrozen conditions within and above the native sediments, which represents the hydrostratigraphic unit hosting the shallow groundwater system. Hydraulic connection between the TMA and deeper bedrock unit has not been confirmed. Locally, groundwater flow within the thin veneer of Dome Creek channel is primarily along Dome Creek towards the southeast. As such, the dominant water flow path through the TMA consists of downward seepage through the tailings pond and tailings dam, then lateral seepage through the shallow sediments of Dome Creek, with seepage daylighting at the toe of the dam, which is then diverted to the seepage pond.

All of the TMA monitoring wells are screened within native sediments or TMA material (i.e., sand burrow area at MW09-11; AECOM 2010), native sediments beneath the tailings pond (at MP09-07, 09, -10, -11, -12, -14), within the tailings beach (at MW09-01, -02, -03, -04, -05 [screened in native sediments], -06), tailings dam (at MW09-08 [screened in native sediments], MW09-20, -21, -22, -23), and adjacent to the seepage pond at MW09-24.

Median pH of groundwater in the TMA ranged from 6.7 to 8.7 (see Figure 3-18). The relatively higher pH measured in groundwater from two monitoring wells (MP09-09 to MP09-12) is representative of native sediments. Median pH of MP09-09 and MP09-10 were 8.5 and 8.7, respectively. pH is highly variable beneath the tailings pond, reflecting source material, depositional history of tailings material and subsequent geochemical reactions. pH through and downgradient of the tailings dam is generally more consistent. Groundwater quality within the native sediments is clearly distinguishable from TMA groundwater based on parameters measured. Fluid conductivity within the native sediments is generally around 1,000 $\mu\text{S}/\text{cm}$, whereas within the tailings, EC is on the order of 2,500 $\mu\text{S}/\text{cm}$.

In general, the highest concentrations of anions and metals are observed in monitoring wells screened within the tailings beach at MW09-01, -02, -03, -04, -05 (screened in native sediments), and -06 (tailings dam). Sulphate concentrations within the native sediments have median values ranging from 8.8 mg/L to 136 mg/L, contrasting with concentrations within tailings of 893 mg/L to 1,780 mg/L. The highest CN-Free and CN-WAD observed within the TMA occur within the native sediments underlying the tailings. The high CN concentrations correlate with the higher pH values observed, indicating that the higher pH values are helping to preserve the CN concentrations. Median CN-Free and CN-WAD concentrations at MP09-09 and MP09-10 are above the CCME guideline limits. Free cyanide, CN-WAD and SO_4^{2-} are identified as POPCs.

The redox chemistry within the TMA is a significant geochemical process with implications for redox-sensitive metal species, for example, As, Cr and Fe. The elevated presence of dissolved Fe, NH_4 and SO_4^{2-} indicate suboxic conditions. Ammonia is not only a redox chemistry regulator but can also reduce pH with its presence, thereby affecting metalloid speciation; in addition it is a competitor for surface sorption and competes for cation exchange sites. A detailed discussion on redox chemistry and implications on concentrations for parameters of interest is beyond the scope of this report, and readers are referred to Lorax (2017).

Reduced NO_3^- values and elevated NH_4 are an indication of denitrification under reducing conditions. The presence of the elevated Fe, as an efficient scavenger of oxygen, precludes oxic conditions. Nitrate and NH_4 concentrations appear to be inversely correlated; however, the boxplots (see Figure 3-19) do not strongly support this trend statistically. The general indication based on nitrogen species distribution is that groundwater redox conditions become more oxic downgradient of the tailings dam. The mobility of As is generally controlled by adsorption/desorption reactions and solid-phase precipitation-dissolution reactions, with the former likely being the dominant process. Sorption/desorption is influenced by pH, redox reactions, and presence of competing anions. Arsenate is the dominant form under oxidizing conditions and it strongly sorbs to iron-oxides. The reduction in As through the tailings dam could be related to increasing oxic conditions where As is oxidized, along with Fe, and subsequently sorbed to fresh iron-oxide precipitates.

With the exception of Zn, the concentrations of trace metals As, Sb, Cd, Co and Cu are generally above the guideline limits. Dissolved Fe, Cr and Zn exceed guidelines; however, Cr concentrations in groundwater appear to be related to background sources, as concentrations are similar along Dome Creek and lower than groundwater upgradient of the Mill Area (see Figure 3-13). Copper concentrations within the native sediments (MP09-09 and MP09-10) are above the guideline limit. Zinc concentrations within the tailings are above guideline. Dissolved Fe concentrations are highly variable throughout the TMA and there is no discernable general trend observed.

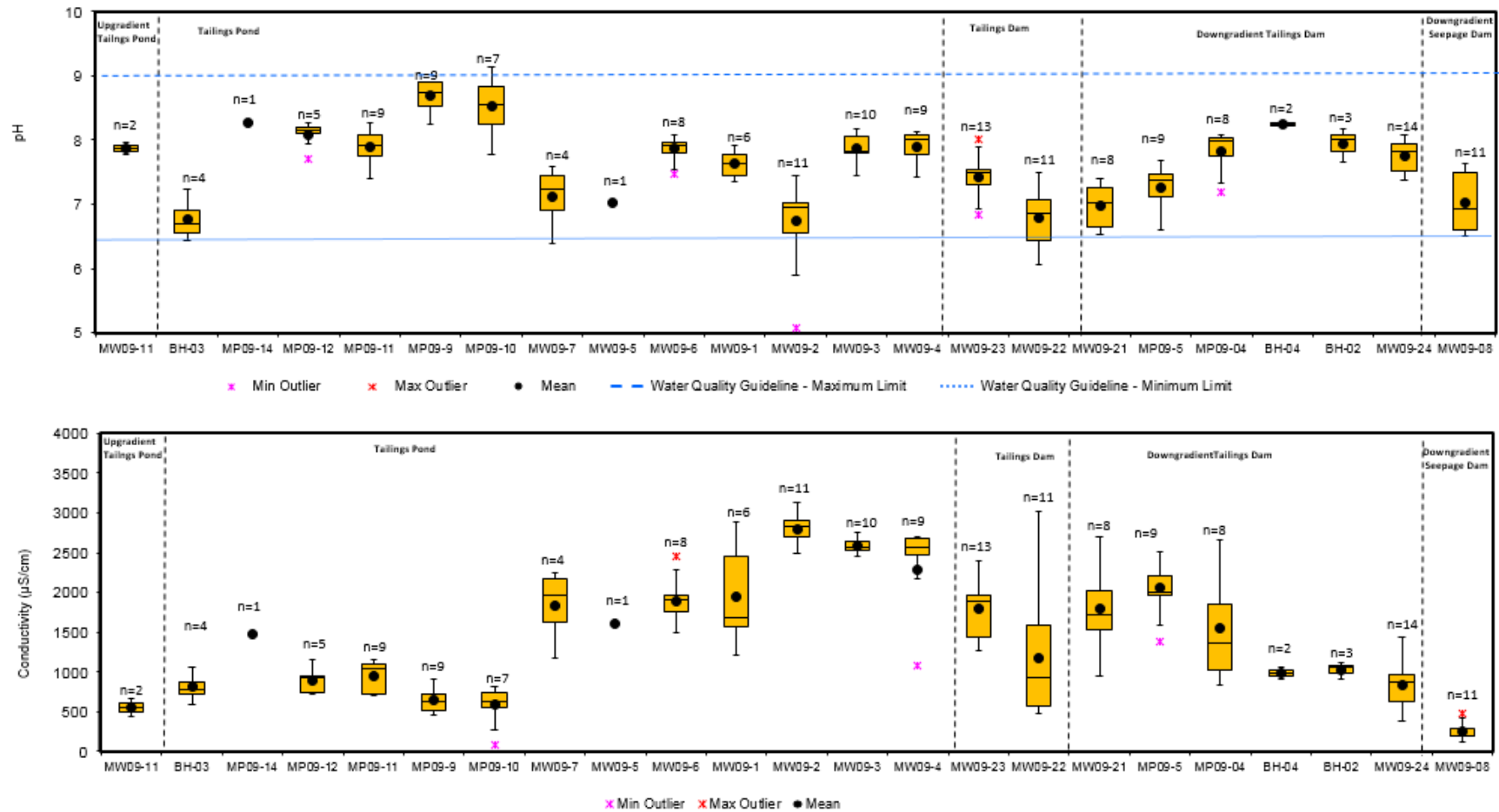


Figure 3-18: pH / Conductivity - TMA

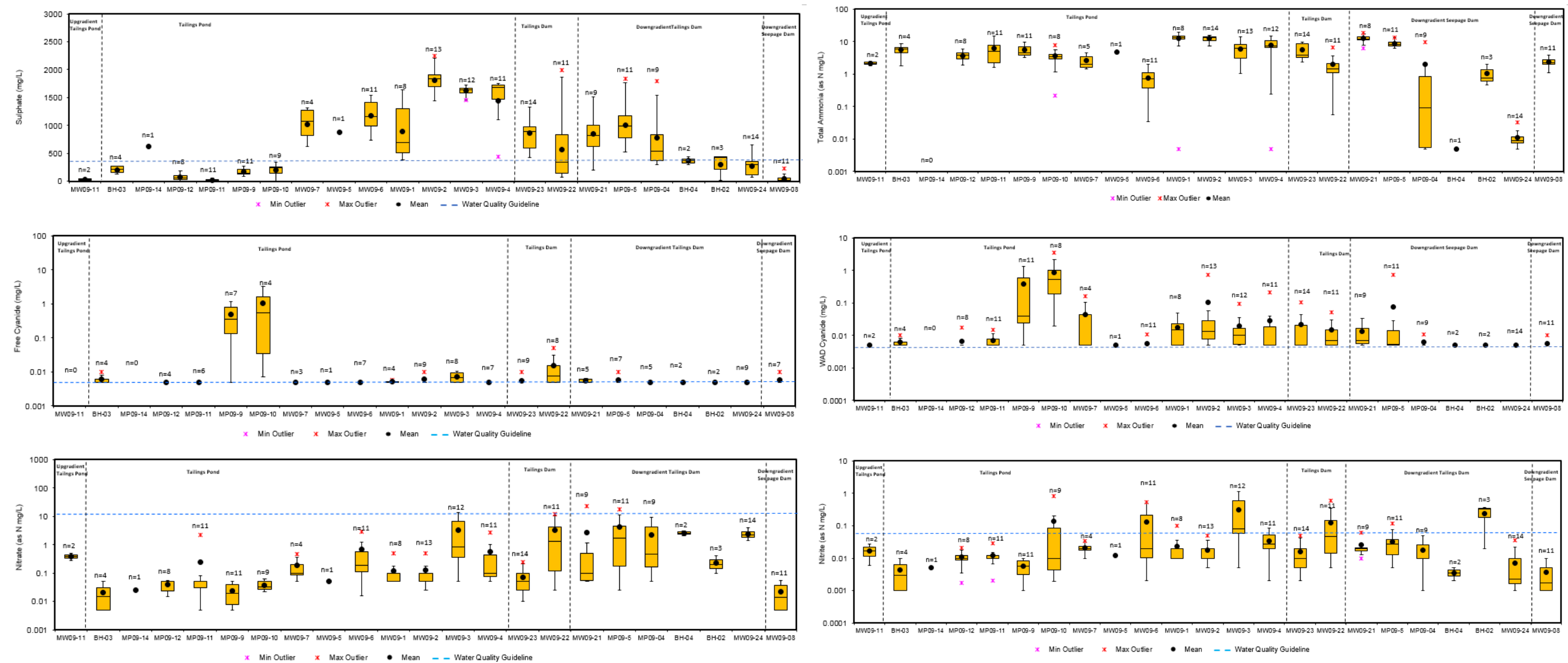


Figure 3-19: Anions / Nutrients - TMA

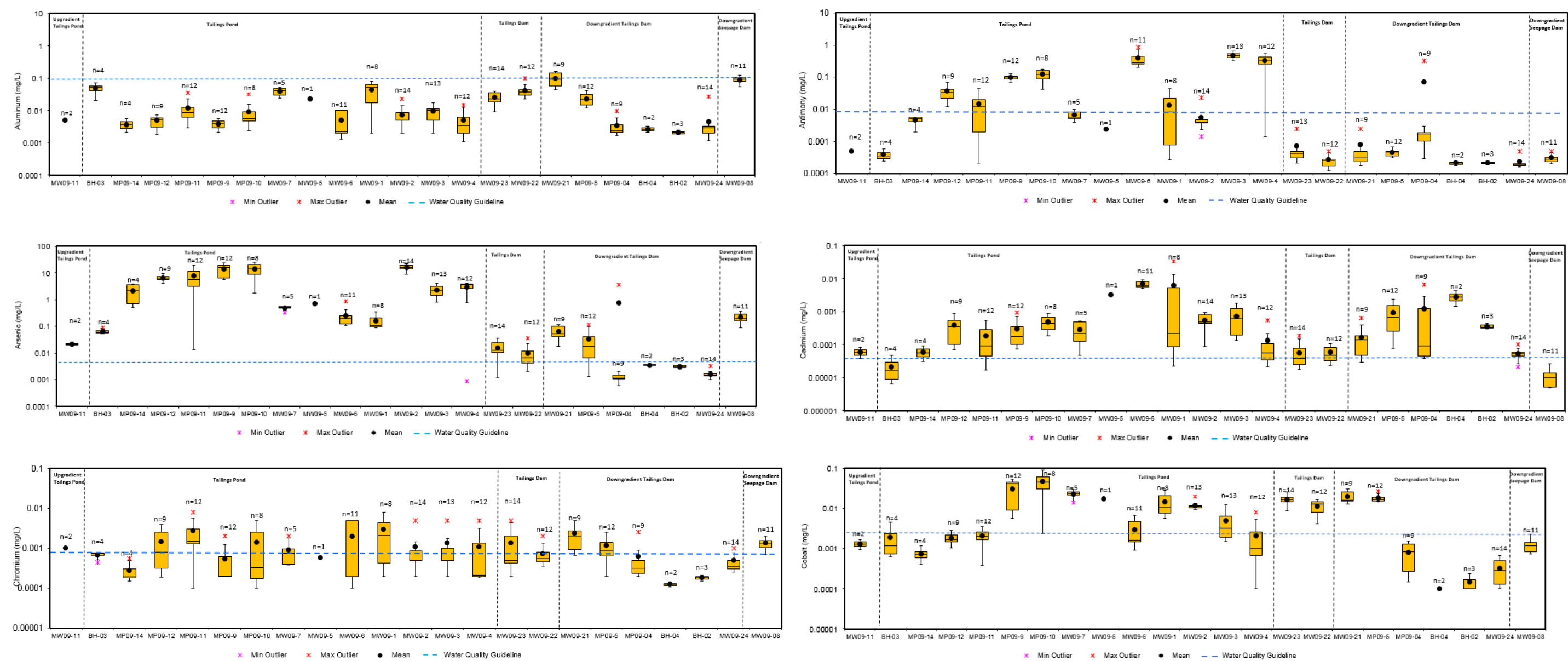


Figure 3-20: Metals - Aluminum, Antimony, Arsenic, Cadmium, Chromium and Cobalt - TMA

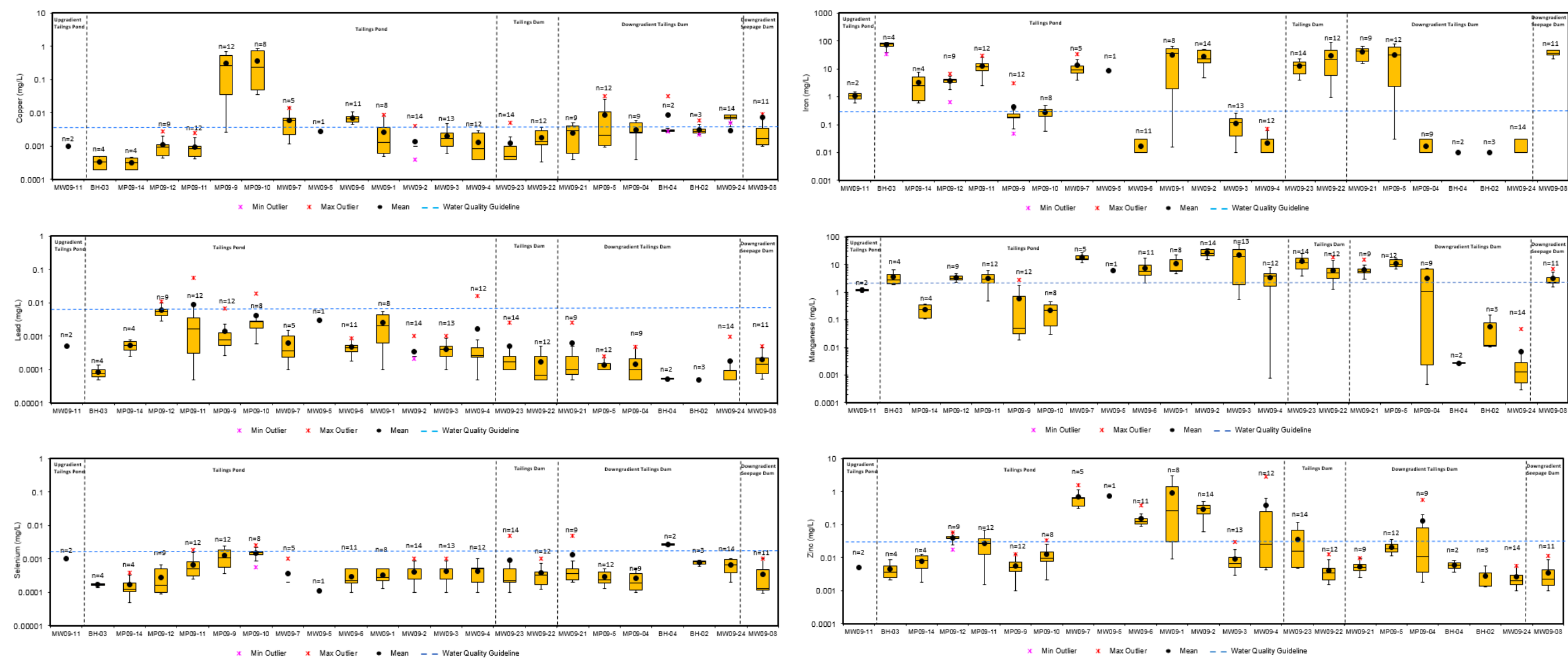


Figure 3-21: Metals - Copper, Iron, Lead, Manganese, Selenium and Zinc - TMA

Time series plots of the parameters of interest for the TMA are presented in Figure 3-22 to Figure 3-25. The figures show groundwater quality conditions beneath the tailings pond (MP09-09), within the tailings dam (MW09-02), and at the toe of the dam (MW09-23). Scatter plots reveal decreasing trends in time with NO_3^- , CN-Free and CN-Total. Among the trace elements, Co and Cd appear to show a decline in concentration over time, particularly within groundwater at the toe of the dam. Increasing trends are visually apparent with As and Mn in monitoring well MW09-23, screened within the tailings dam.

Parameters identified as POPCs include SO_4^{2-} , As, Cd, Co, Cu, Fe, Mn, Sb, Zn, CN-WAD and CN-Free, because concentrations exceed guidelines, are consistently present within the TMA, and will act as a mine-contact water source for downstream surface water.

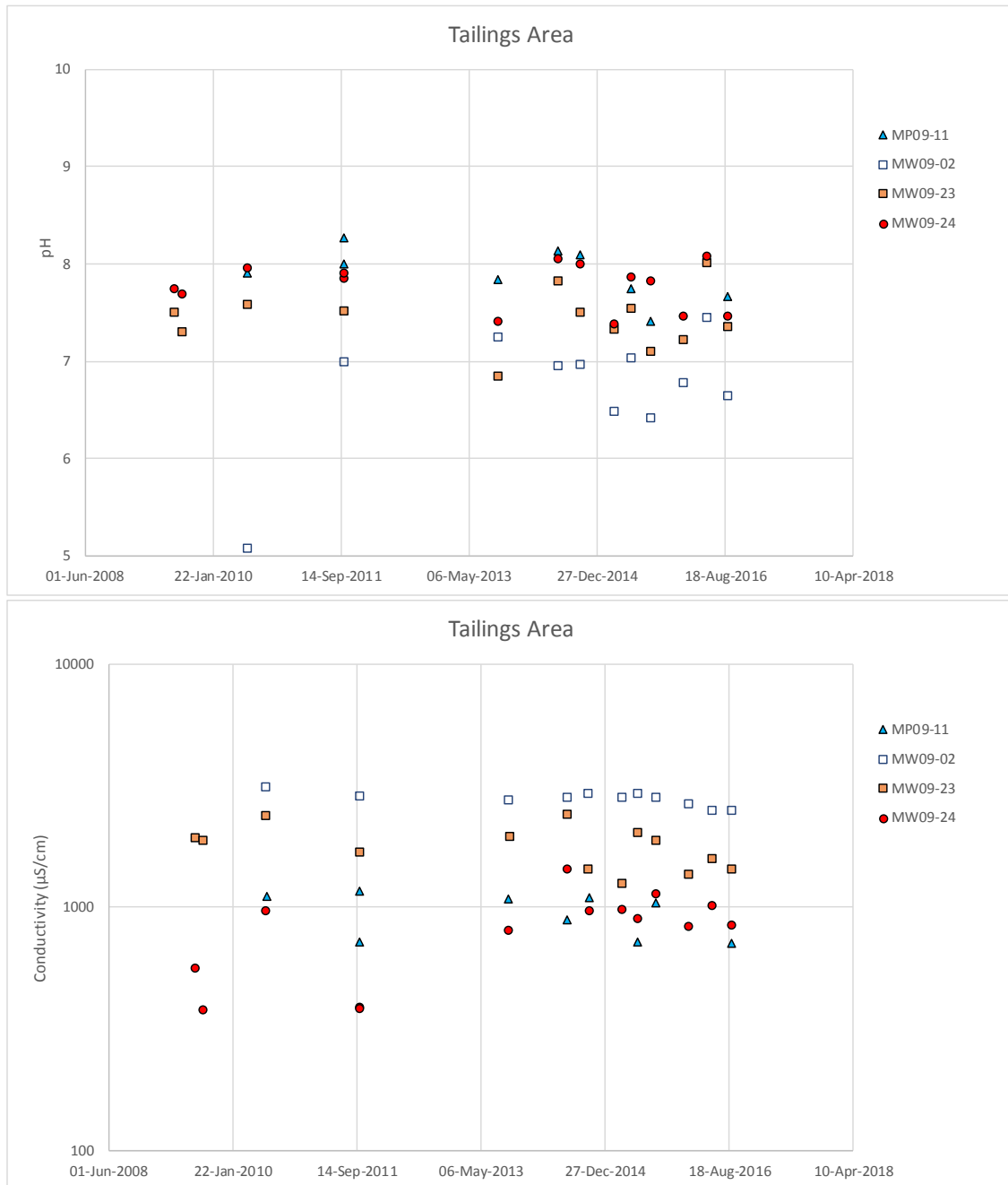


Figure 3-22: pH / Conductivity - Temporal Variability - TMA

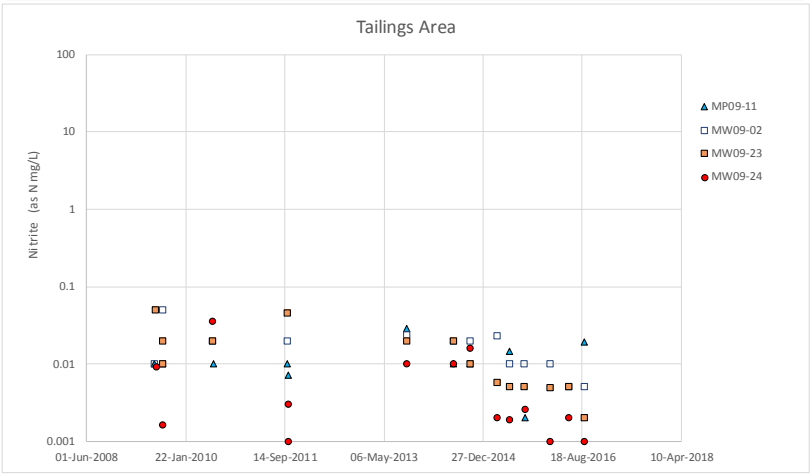
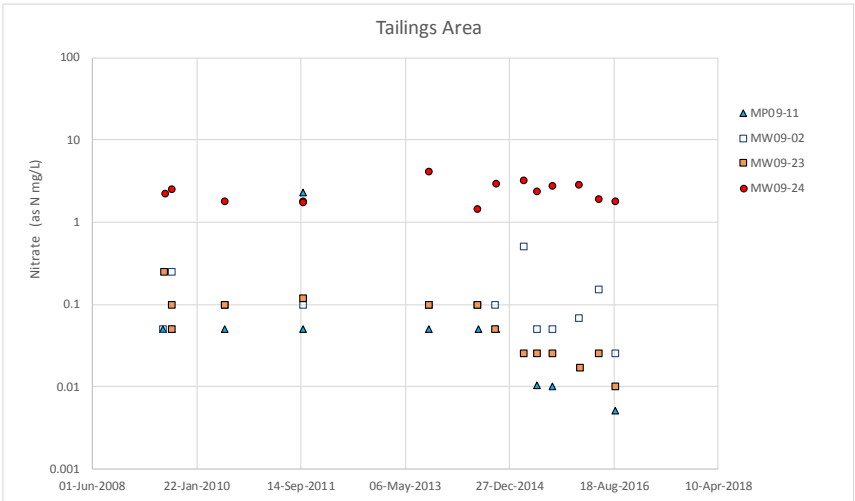
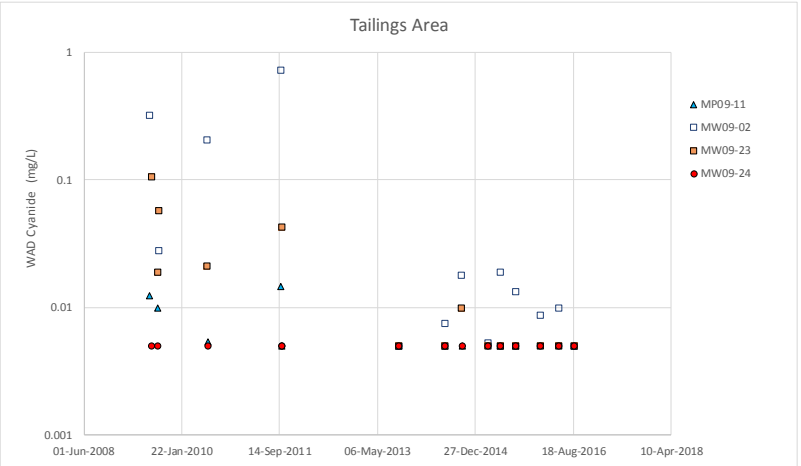
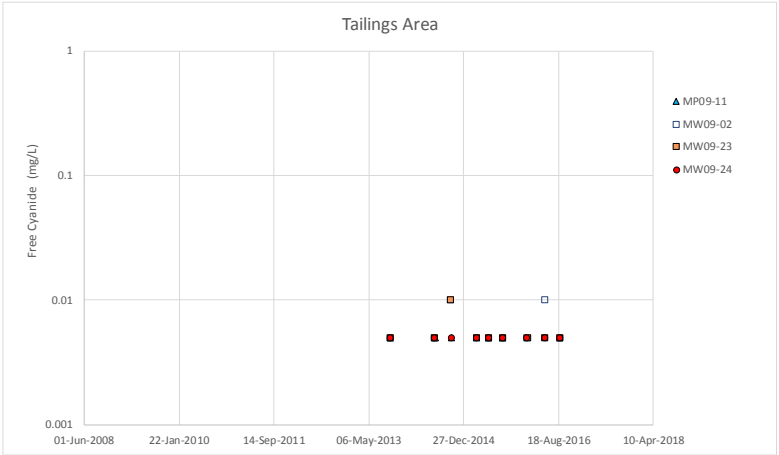
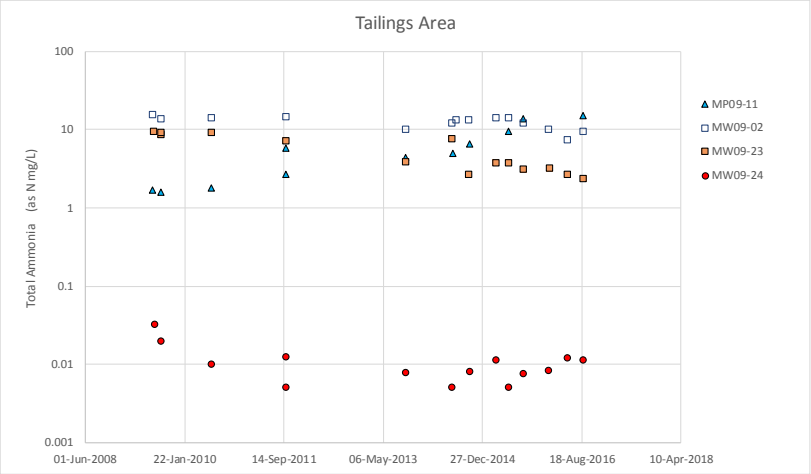
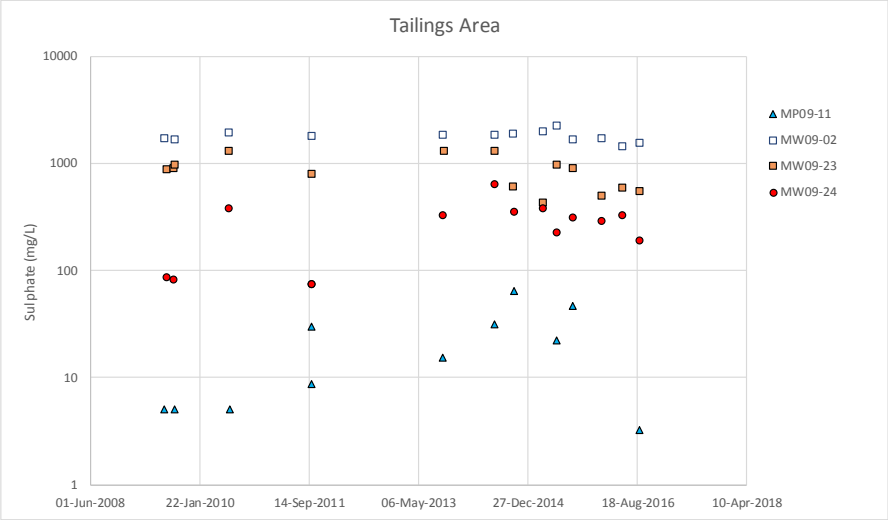


Figure 3-23: Fluid Conductivity - Temporal Variability - TMA

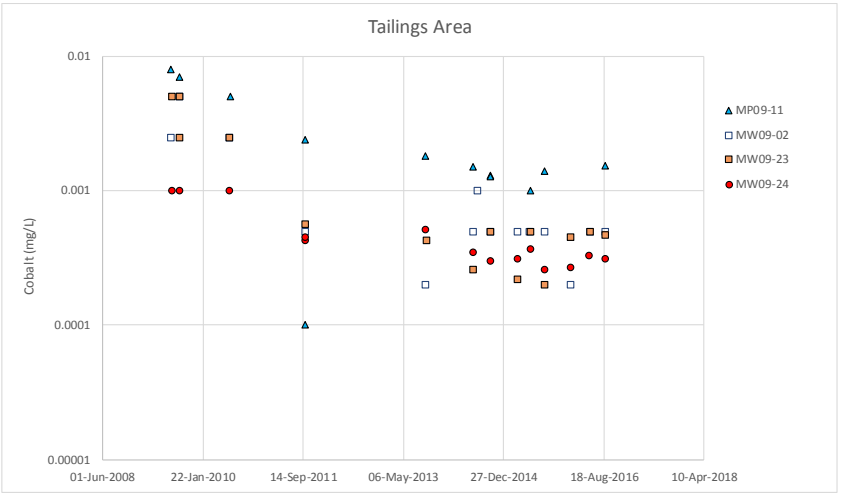
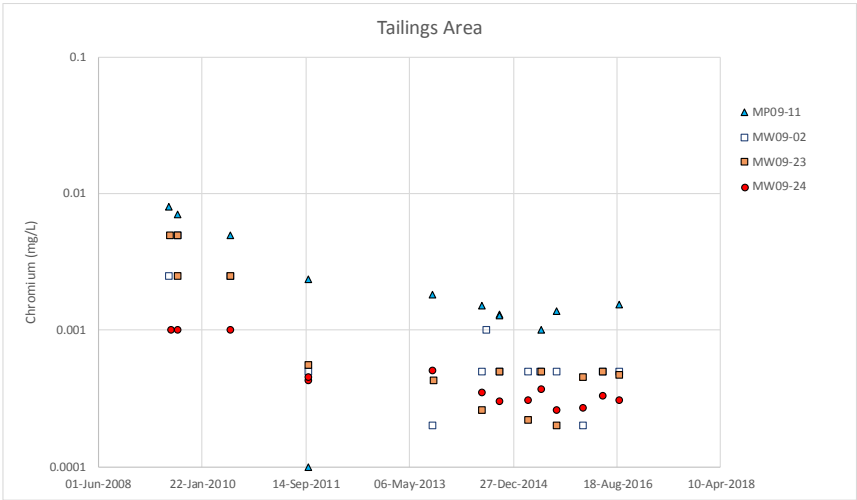
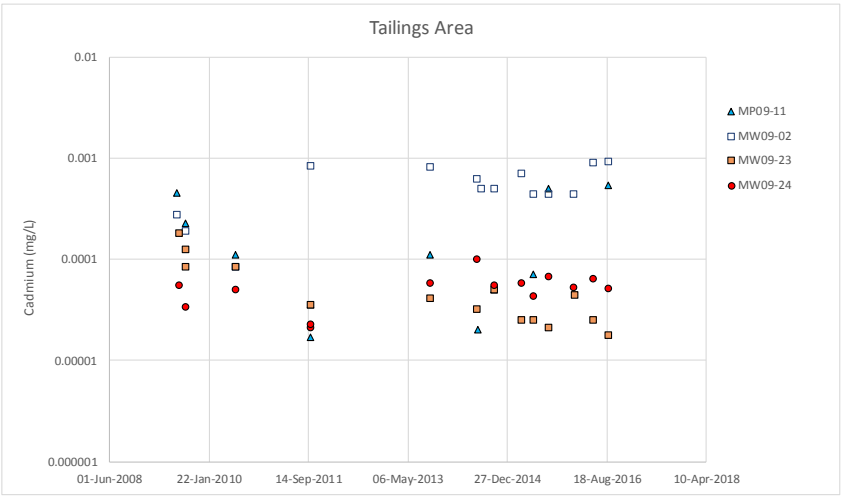
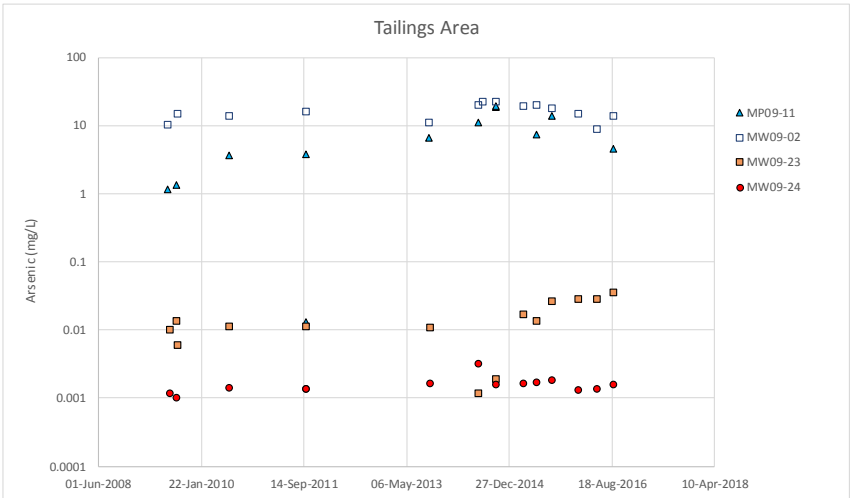
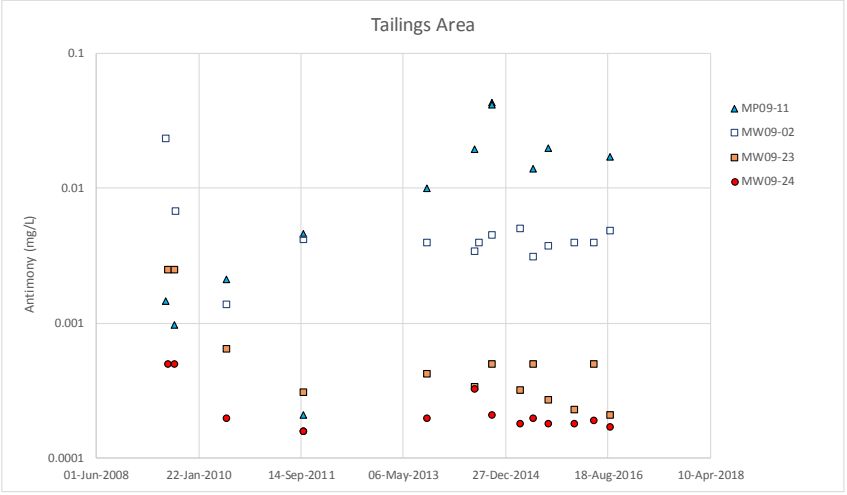
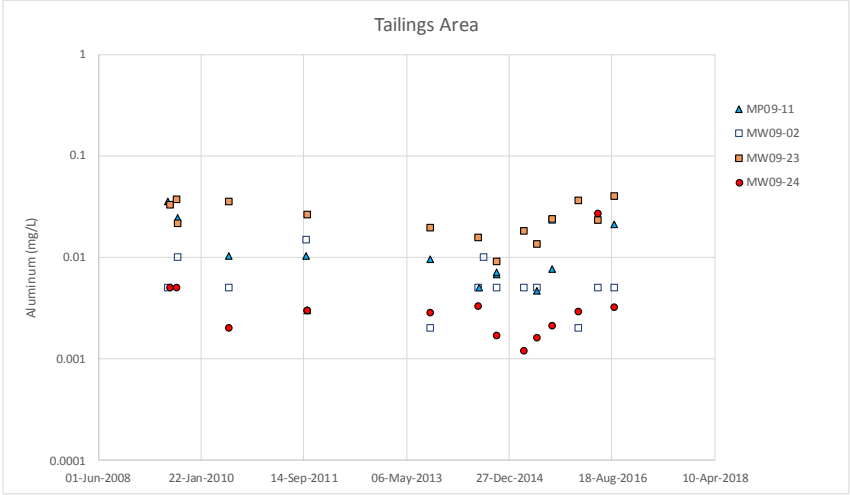


Figure 3-24: Metals - Aluminum, Antimony, Arsenic, Cadmium, Chromium and Cobalt - Temporal Variability - TMA

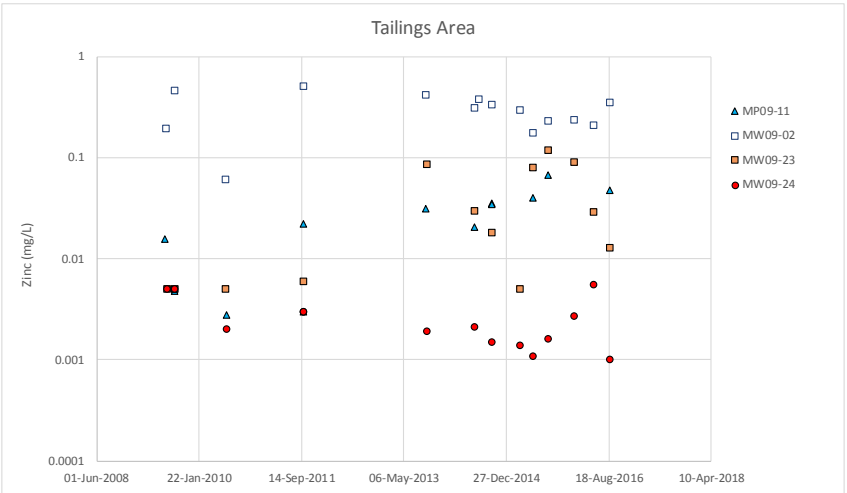
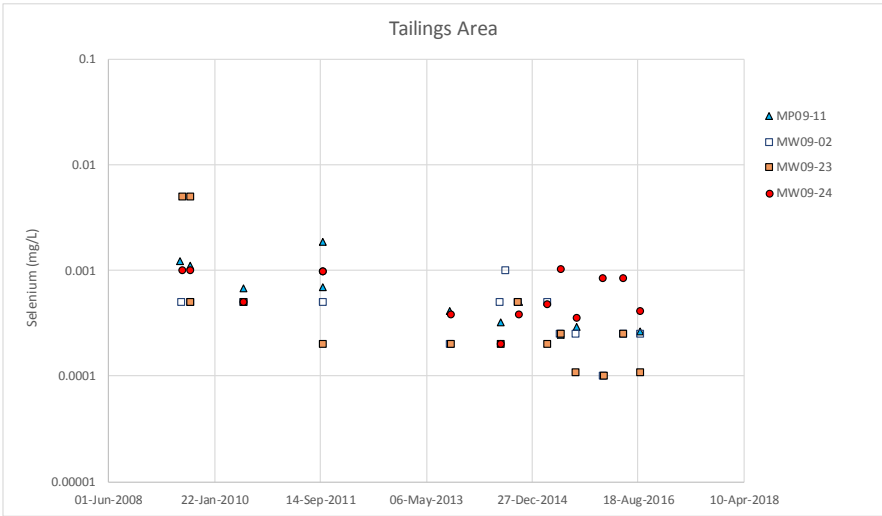
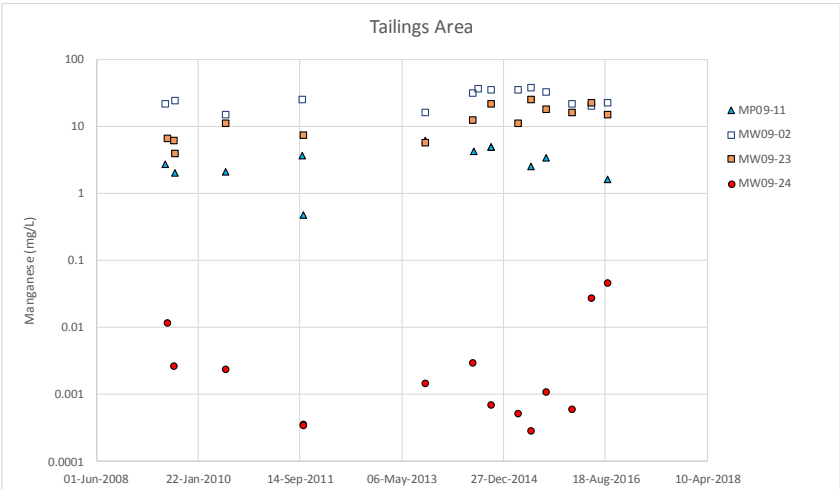
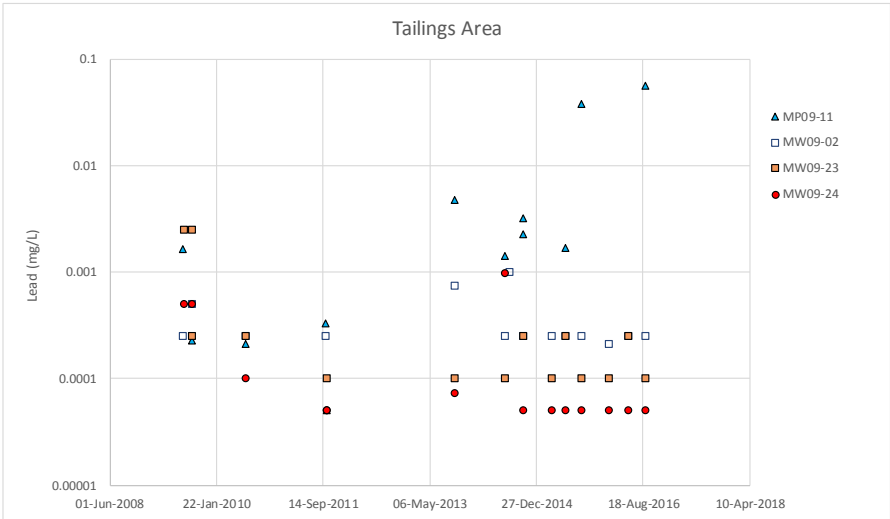
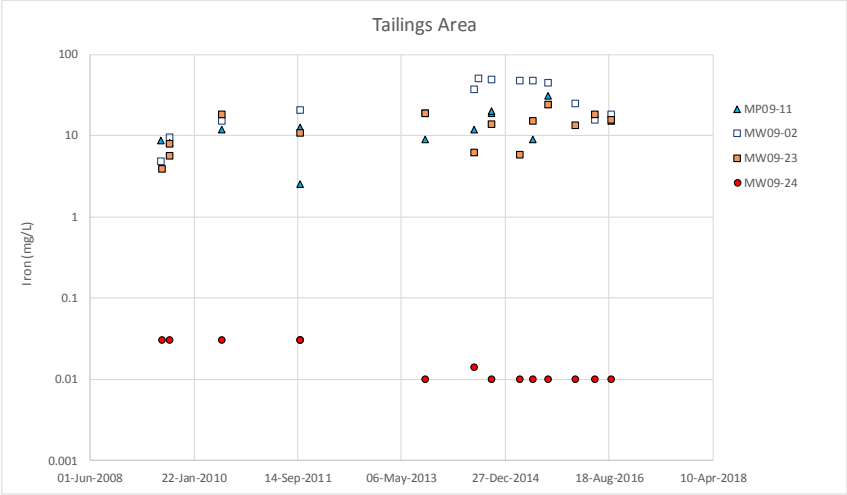
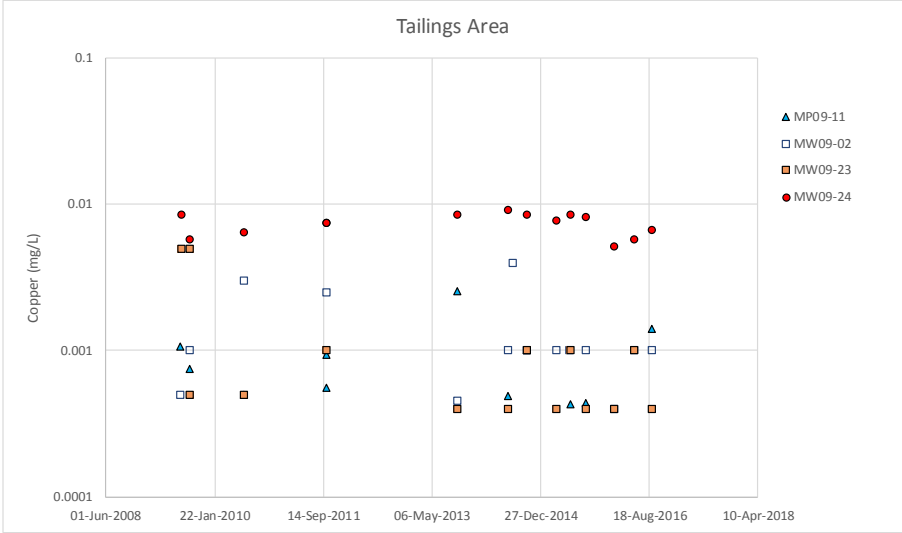


Figure 3-25: Metals - Copper, Iron, Lead, Manganese, Selenium and Zin - Temporal Variability - TMA

3.5 Brown-McDade Pit

Groundwater collected from monitoring wells GLL07-02, -03, MW09-14, CH-P-13-05/50, -03/50, -01/10 and -04/10 is used to characterize groundwater quality in the Brown-McDade Pit area. Water quality data from these groundwater monitoring wells are provided in Appendix A. Brown-McDade Pit groundwater quality parameters of interest include SO_4^{2-} , Al, As, Cd, Co, Cr, Cu, Fe, Mn, Pb, Se, Sb and Zn. Concentrations of these parameters in groundwater are presented in Figure 3-26 through Figure 3-31. Figure 3-26 and Figure 3-28 present boxplots of groundwater quality for monitoring wells along the x-axis ordered from upgradient (north) to downgradient (south) orientation. Monitoring well GLL07-03, situated at the outside of the pit at the northern end, represents upgradient conditions, while monitoring well CH-P-13-01/10 represents groundwater quality downgradient from the pit.

The shallow groundwater system within the overburden deposits is strongly controlled by Pony Creek to the north and by topography. Groundwater flow within the deep bedrock system is generally north-south (AECOM 2010, AMEC 2014) with hydraulic connection between the pit lake and groundwater occurring at the talik that exists beneath the pit lake. Further details of groundwater flow around the pit are provided in AECOM (2010) and AMEC (2014). All of the monitoring wells representing groundwater quality around the pit are screened within bedrock.

Groundwater quality at monitoring wells situated at the north-northwestern end of the pit (GLL07-02, MW09-14 and CH-P-13-04/10) have a calcium-magnesium-sulphate signature. Groundwater quality at CH-P-13-01/10 has a calcium-magnesium-bicarbonate-sulphate signature, while groundwater quality at the downgradient end of the pit (CH-P-13-03/50) grades between calcium-magnesium-sulphate and calcium-magnesium-bicarbonate (see Figure 3-2).

pH around the pit is generally circumneutral with no apparent trend associated with location; however, pH of groundwater at CH-P-13-5/50 appears to be decreasing with time, ranging from 7.05 to 5.98 (see Figure 3-22). Fluid conductivity at CH-P-13-3/50 and -5/50 are distinctly elevated relative to surrounding groundwater.

Spatially, there exists a correlation between pH, EC and SO_4^{2-} concentrations. The lowest pH observed in the pit area, along with the highest EC and SO_4^{2-} concentrations, occurs in groundwater at CH-P-13-5/50, located within the pit floor, and CH-P-13-3/50, located immediately downgradient of the pit. There is no clear, definitive correlation with metals species save Cu and Fe; however, concentrations for Cd, Co, Cu and Zn exceed the guideline limits primarily in groundwater at CH-P-13-04/10 and CH-P-13-05/50. The median Co concentration at GLL07-02 also exceeds guideline. Likewise, Fe, As and Se exceed guidelines. Curiously, Cr concentrations in monitoring wells around the pit are well below the guideline, indicating that bedrock is not a background source for Cr as was observed along Dome Creek. Dissolved Mn concentrations generally exceed the guideline.

Groundwater was sampled from CH-13-05 five times since September 2013 (see Figure 3-24) and all data are similar to the concentration observed in 2013. The analytical data indicate mineralization associated with the periodic oxidation of the orebody beneath the pit floor. The high metal and SO_4^{2-} content of groundwater is characteristically from oxidation of mineralized orebody rock. The elevated metal concentrations observed at GLL07-02, considering proximity of the well to the pit walls/floor, are impacted by oxidation of mineralized orebody rock. Parameters of potential concern associated with groundwater near the pit include SO_4^{2-} , As, Cd, Co, Cu, Fe, Mn and Zn.

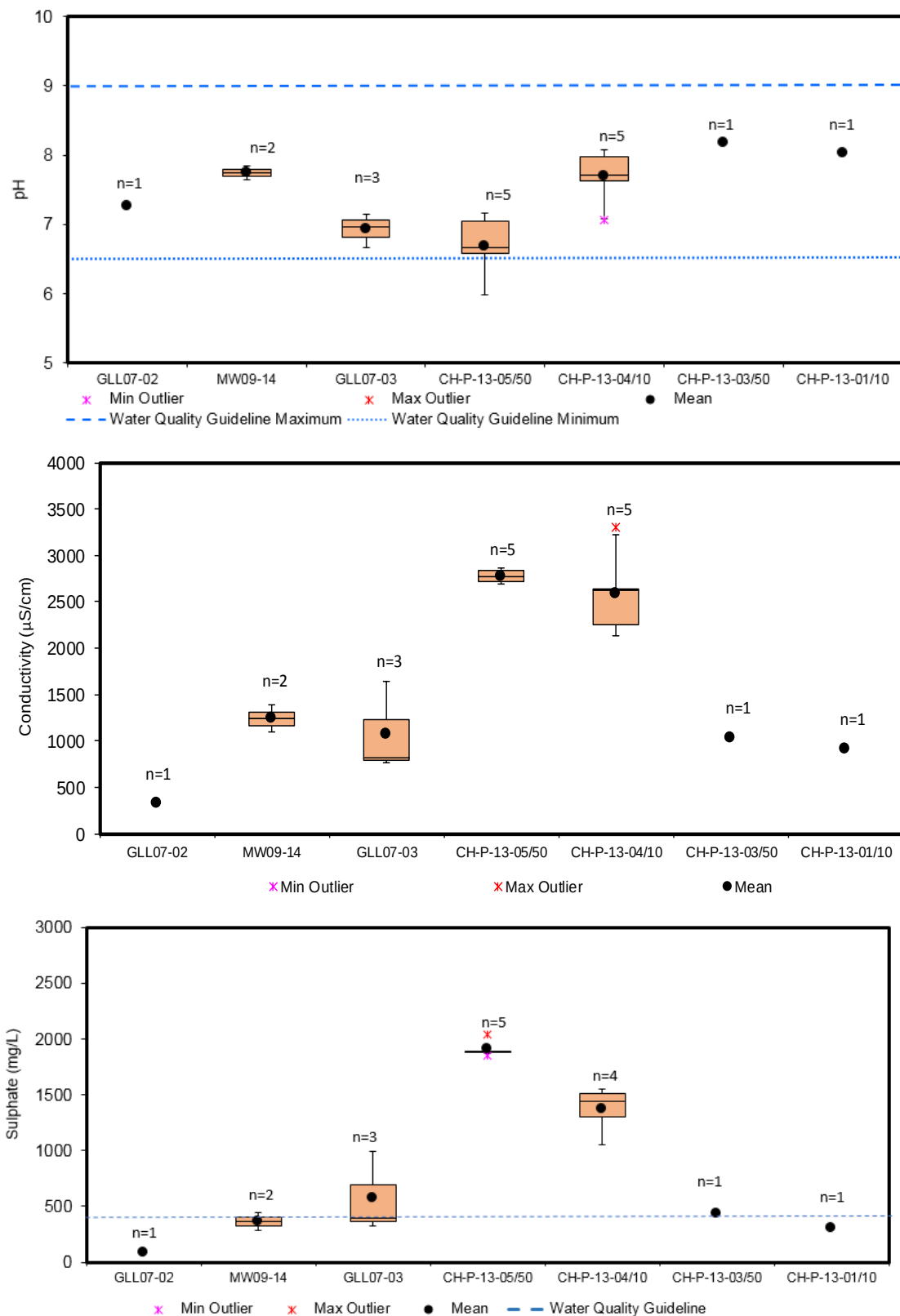


Figure 3-26: Anions - Brown-McDade Pit and Waste Rock Dump Area

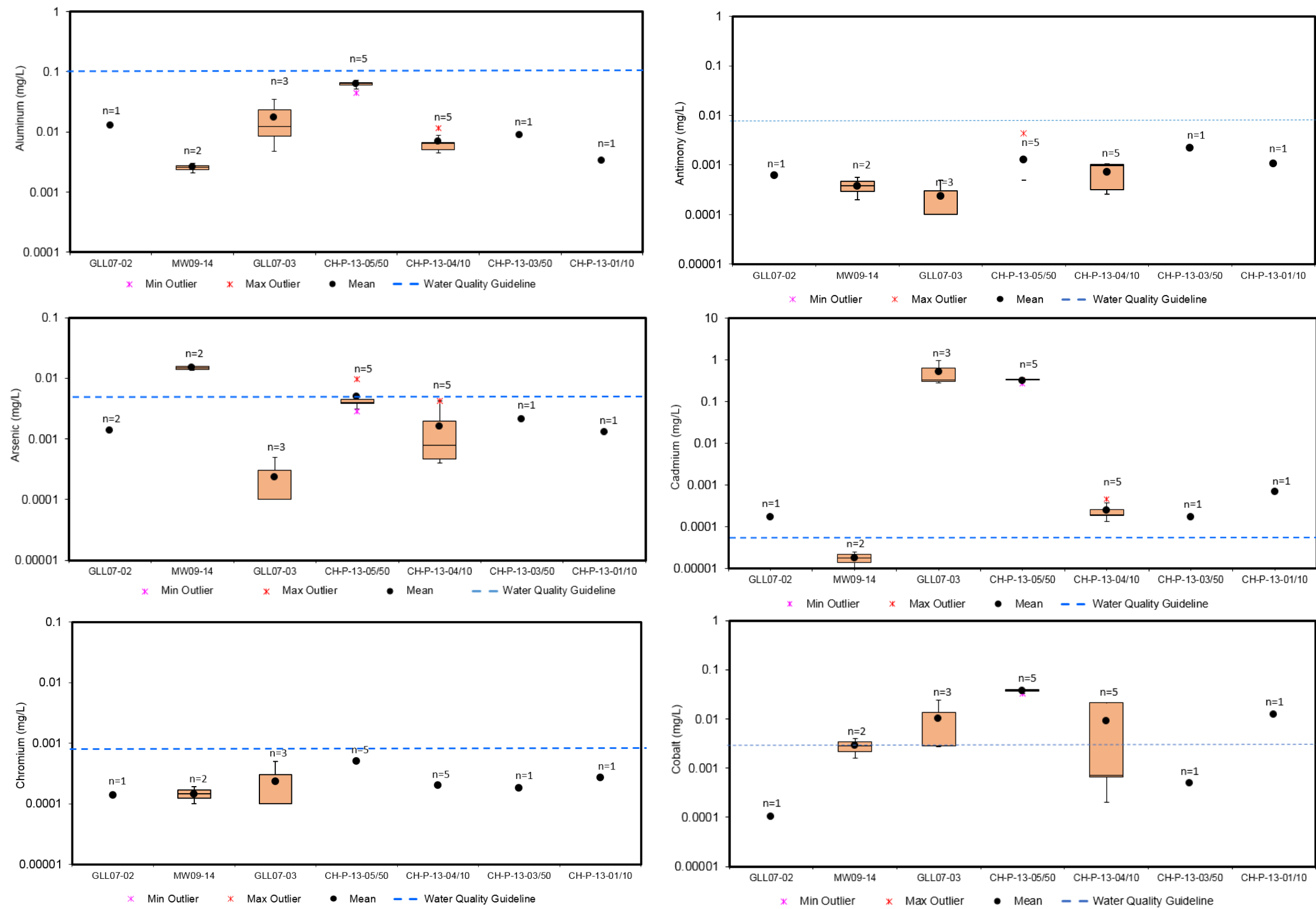


Figure 3-27: Metals - Aluminum, Antimony, Arsenic, Cadmium, Chromium and Cobalt - Brown-McDade Pit and Waste Rock Dump Area

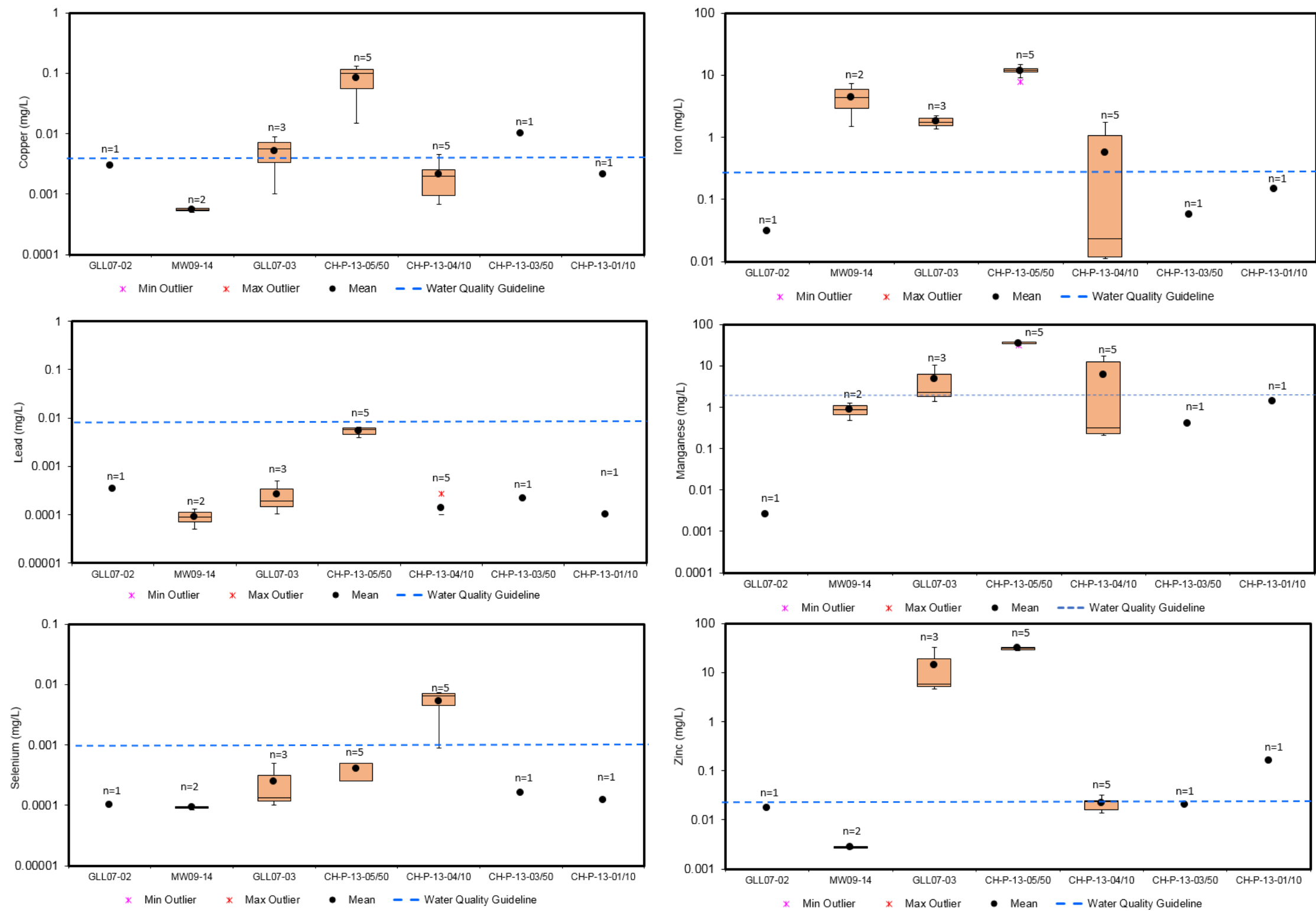


Figure 3-28: Metals - Copper, Iron, Lead, Manganese, Selenium and Zinc - Brown-McDade Pit and Waste Rock Dump Area (continued)

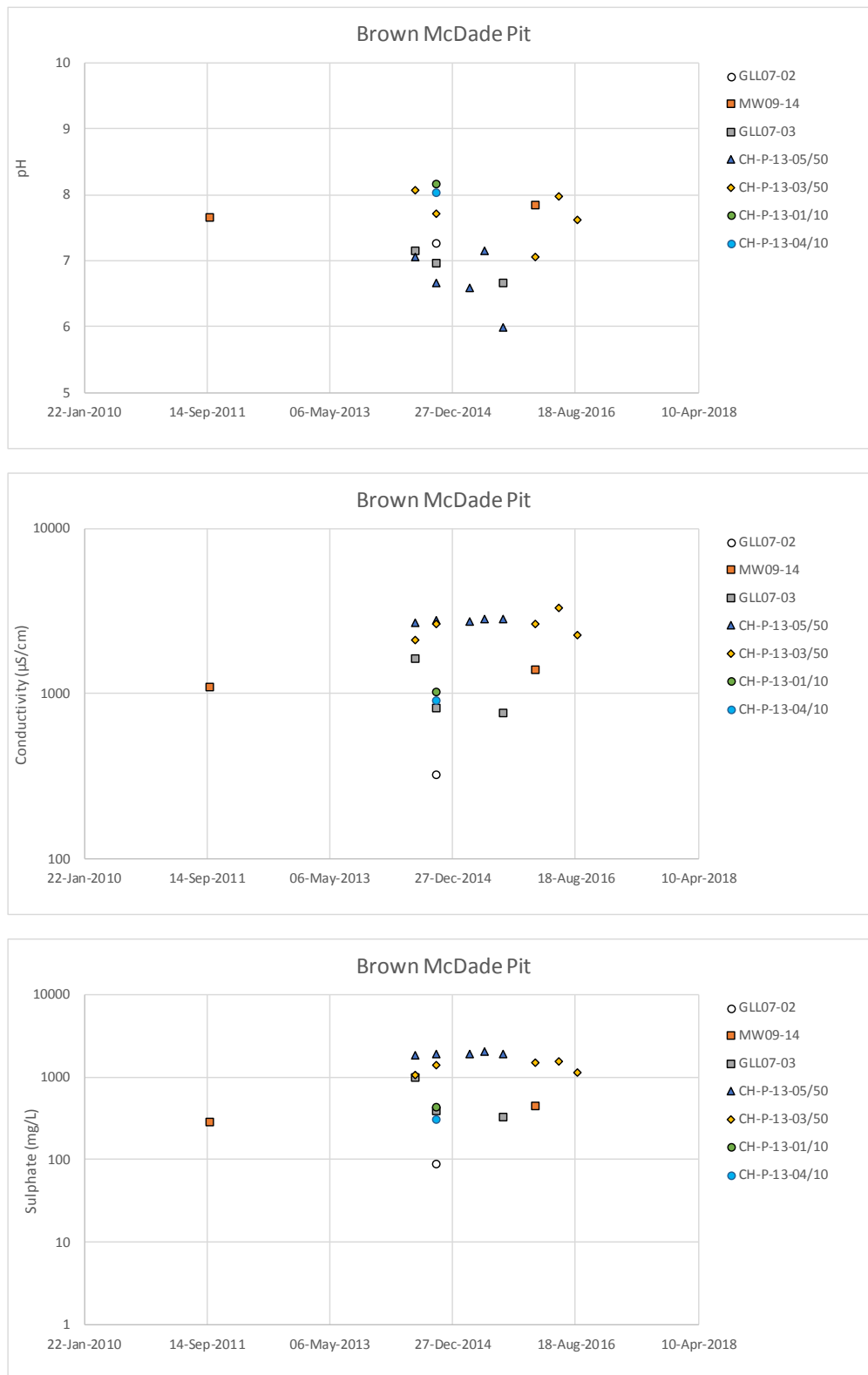
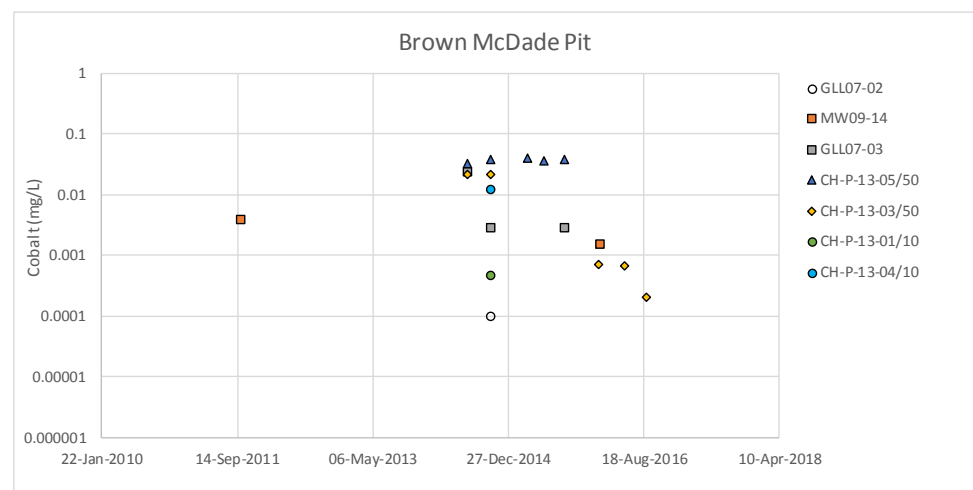
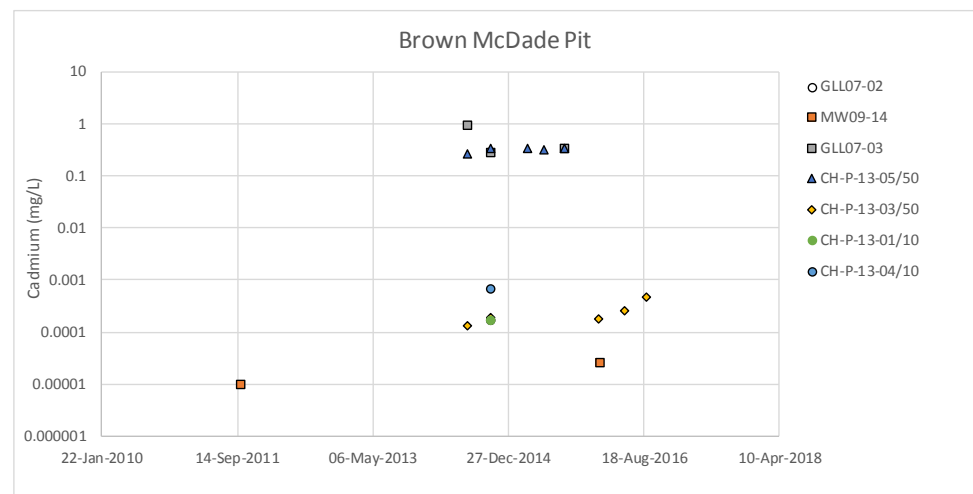
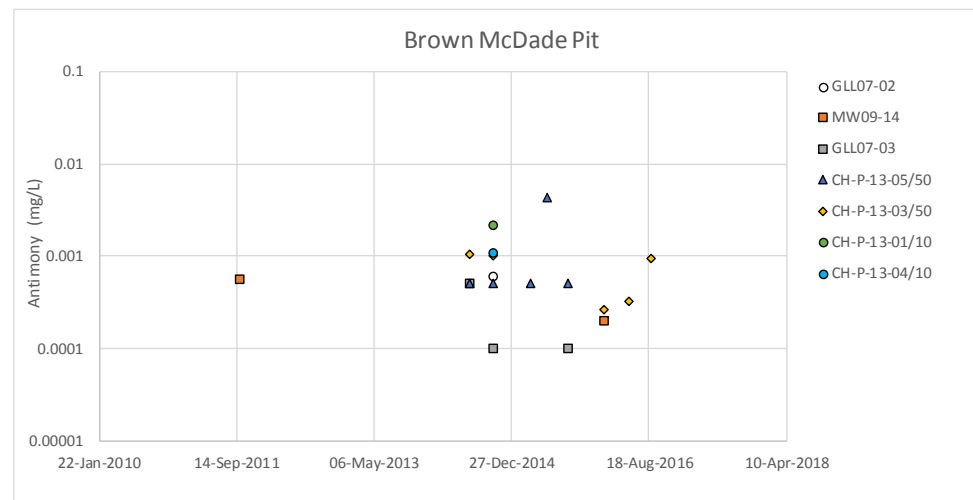


Figure 3-29: Anions - Temporal Variability - Brown-McDade Pit and Waste Rock Dump



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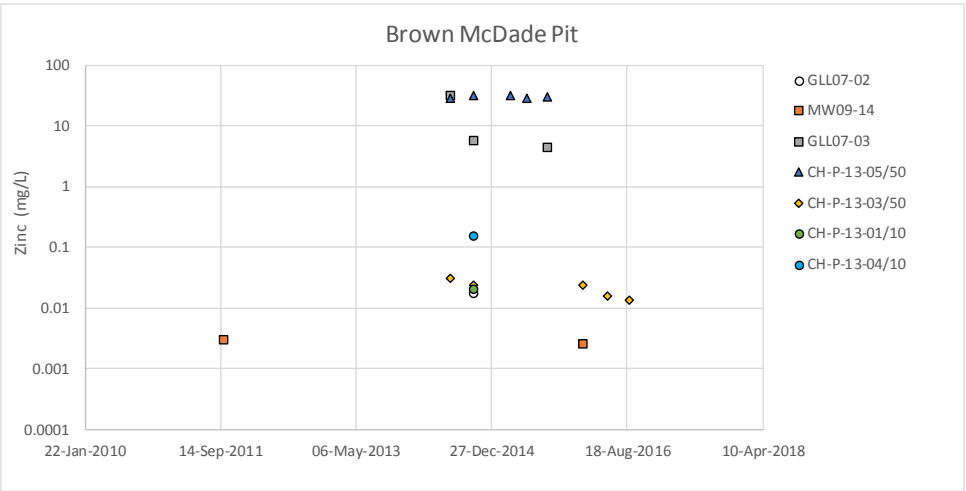
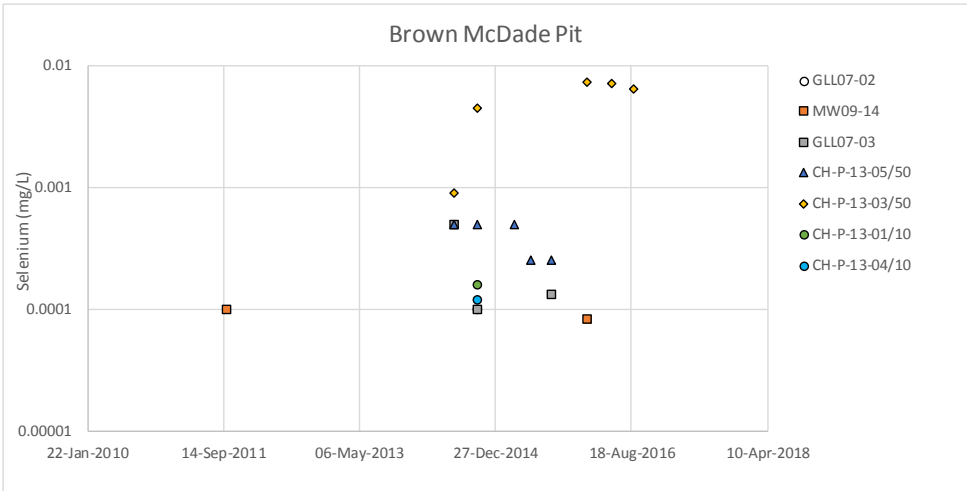
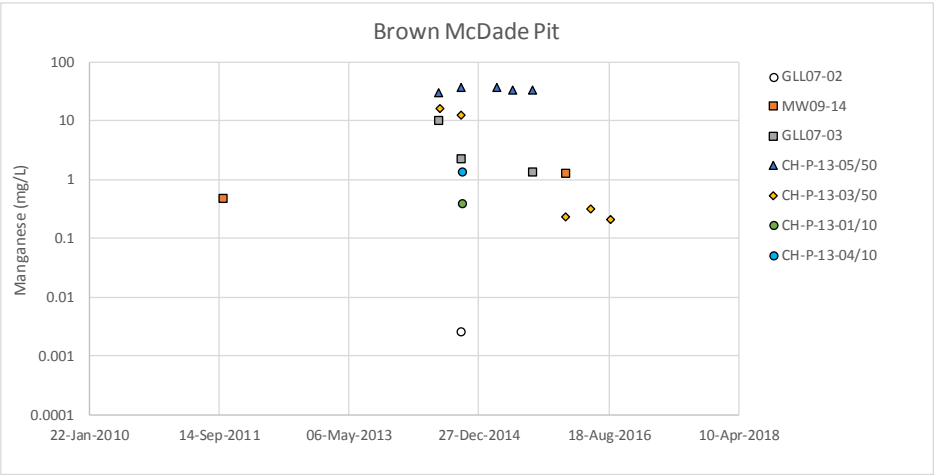
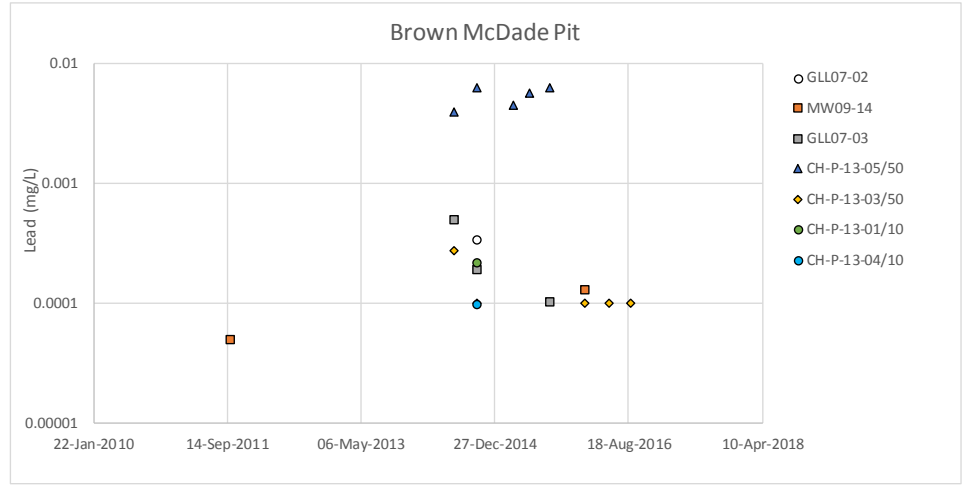
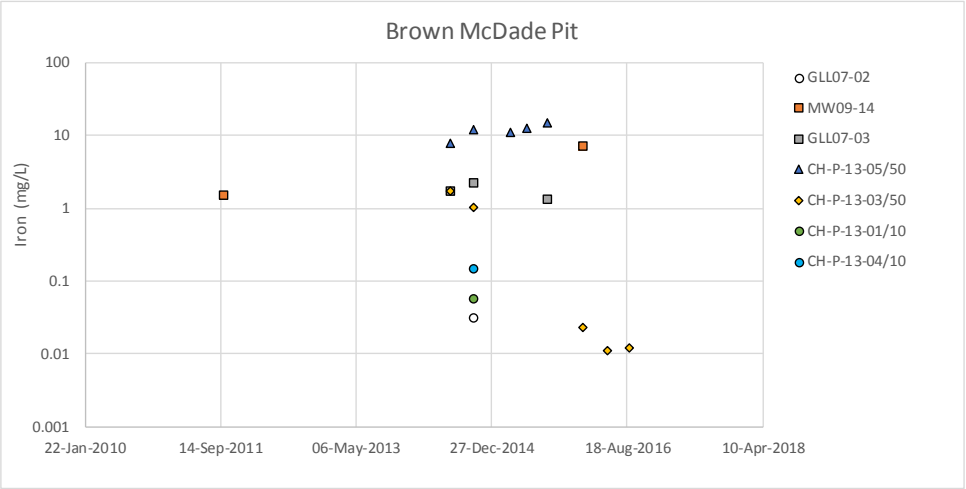
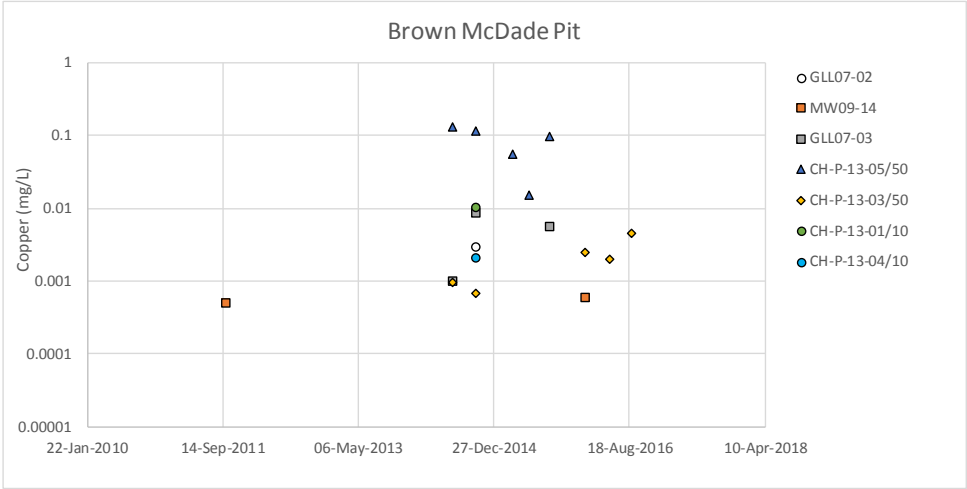


Figure 3-31: Metals - Copper, Iron, Lead, Manganese, Selenium and Zinc - Temporal Variability - Brown-McDade Pit and Waste Rock Dump

3.6 Pony Creek

Groundwater collected from monitoring wells MP02-02, -03 and -08, GIS-PC-03B, -04B and -05B is used to characterize groundwater quality along Pony Creek upgradient of the Brown-McDade Pit. Water quality data from these groundwater monitoring wells are provided in Appendix A. Pony Creek groundwater quality parameters of interest along Dome Creek include SO_4^{2-} , Al, As, Cd, Co, Cr, Cu, Fe, Mn, Pb, Se, Sb and Zn. Concentrations of these parameters in groundwater are presented in Figure 3-32 through Figure 3-37. Figure 3-32 to Figure 3-34 present boxplots of groundwater quality for monitoring wells orientated along Pony Creek, with monitoring well MP02-02 located at the most upgradient point in the area and GIS-PC-05B located approximately 1 km downstream from the pit. The MP09-series wells are screened within bedrock and the GIS-PC wells are screened within overburden or stream sediments. Groundwater flow within close proximity of the pit, whether in bedrock or overburden, is influenced by the pit, with shallow groundwater discharging to the pit and with pit lake water flowing into the bedrock groundwater system. Otherwise, further downstream of the pit, shallow groundwater flow is in the direction of Pony Creek. Considering the elevation and position of the pit to Pony Creek and groundwater flow paths, it is unlikely that the pit affects groundwater quality further downstream along the creek.

Groundwater quality along Pony Creek is generally consistent in composition with a calcium-magnesium-bicarbonate-sulphate type signature.

pH along Pony Creek is circumneutral and consistent along the creek and over time (see Figure 3-35). Fluid conductivity along Pony Creek is generally consistent, ranging from 500 $\mu\text{S}/\text{cm}$ to 1,000 $\mu\text{S}/\text{cm}$. Fluid conductivity at GIS-PC-03B, located approximately 200 m downstream of the pit, has a median EC value of about 3,500 $\mu\text{S}/\text{cm}$. The significantly higher EC value at GIS-PC-3B is associated with a statistically higher SO_4^{2-} concentration (see Figure 3-35). There are no other statistically discernible trends associated with metals in shallow groundwater along Pony Creek. Indeed, there is high distribution of As and Fe concentrations at GIS-PC-03B and of Fe at GIS-PC-04B; however, the temporal data indicate that the distribution is likely related to intra-annual variation as a result of seasonal changes in stream flow and groundwater levels (see Figure 3-36).

Metals concentrations elevated above guidelines in groundwater along the Pony Creek drainage include As, Cd, Cr, Co, Cu, Fe and Se. Sulphate concentrations in groundwater exceed the guideline consistently at GIS-PC-03B. Arsenic, Cd, Cr, Co and Se concentrations in groundwater consistently exceed guidelines. Dissolved Mn concentrations are generally at or below the guideline. Parameters of potential concern identified include SO_4^{2-} , As, Cd, Co, Cr, Cu, Fe, Mn, Se and Zn.

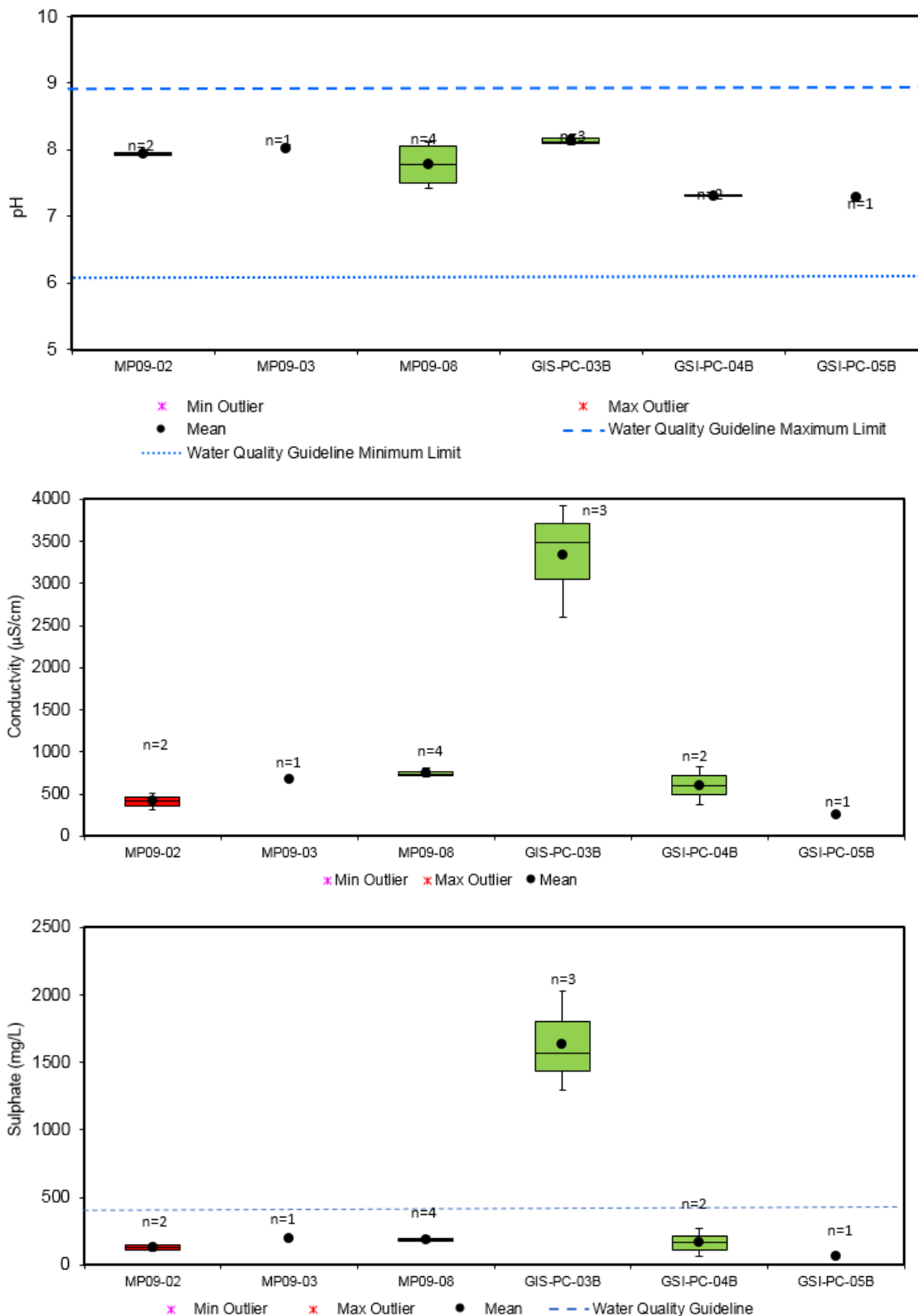


Figure 3-32: Anions - Pony Creek

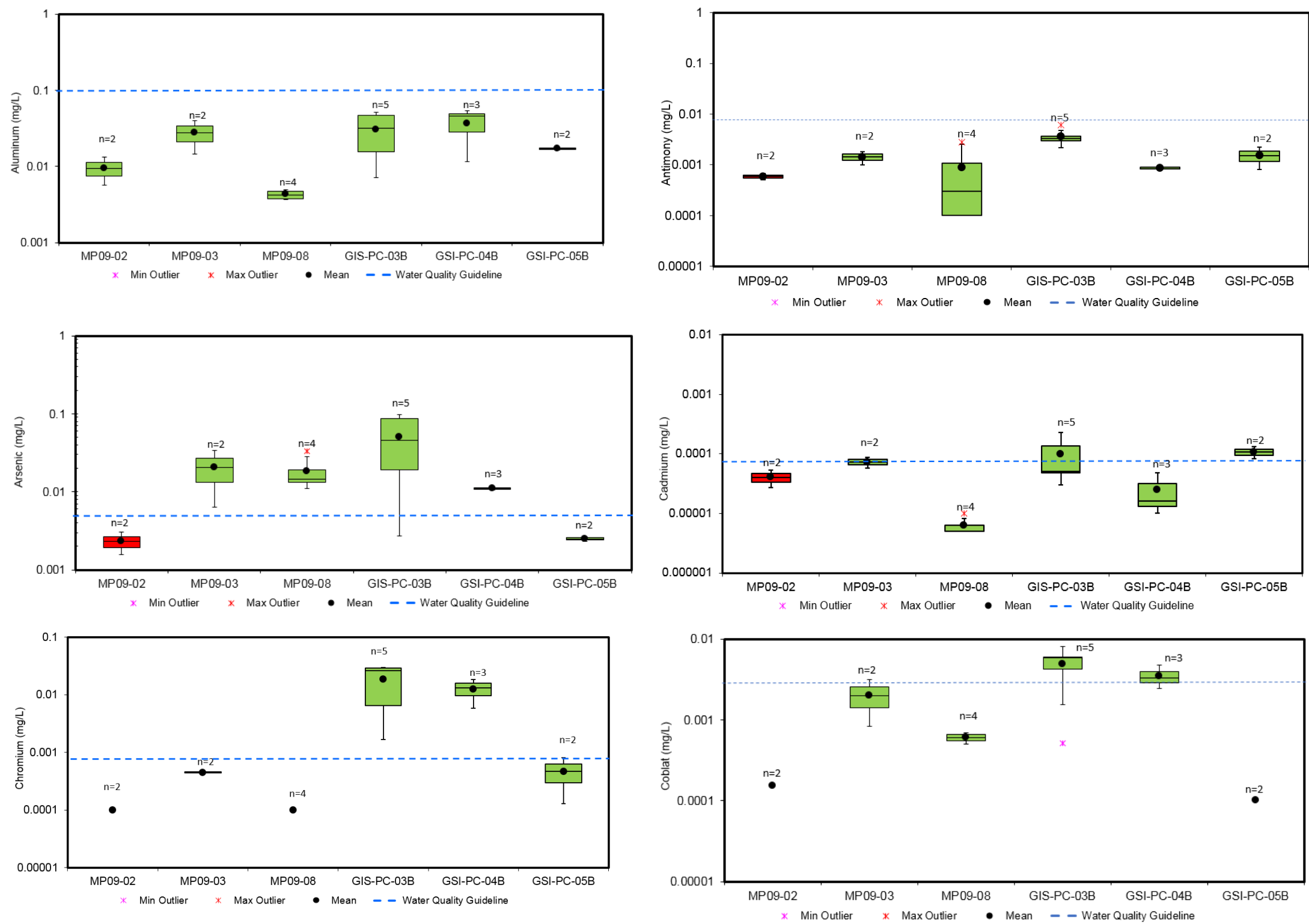


Figure 3-33: Metals - Pony Creek

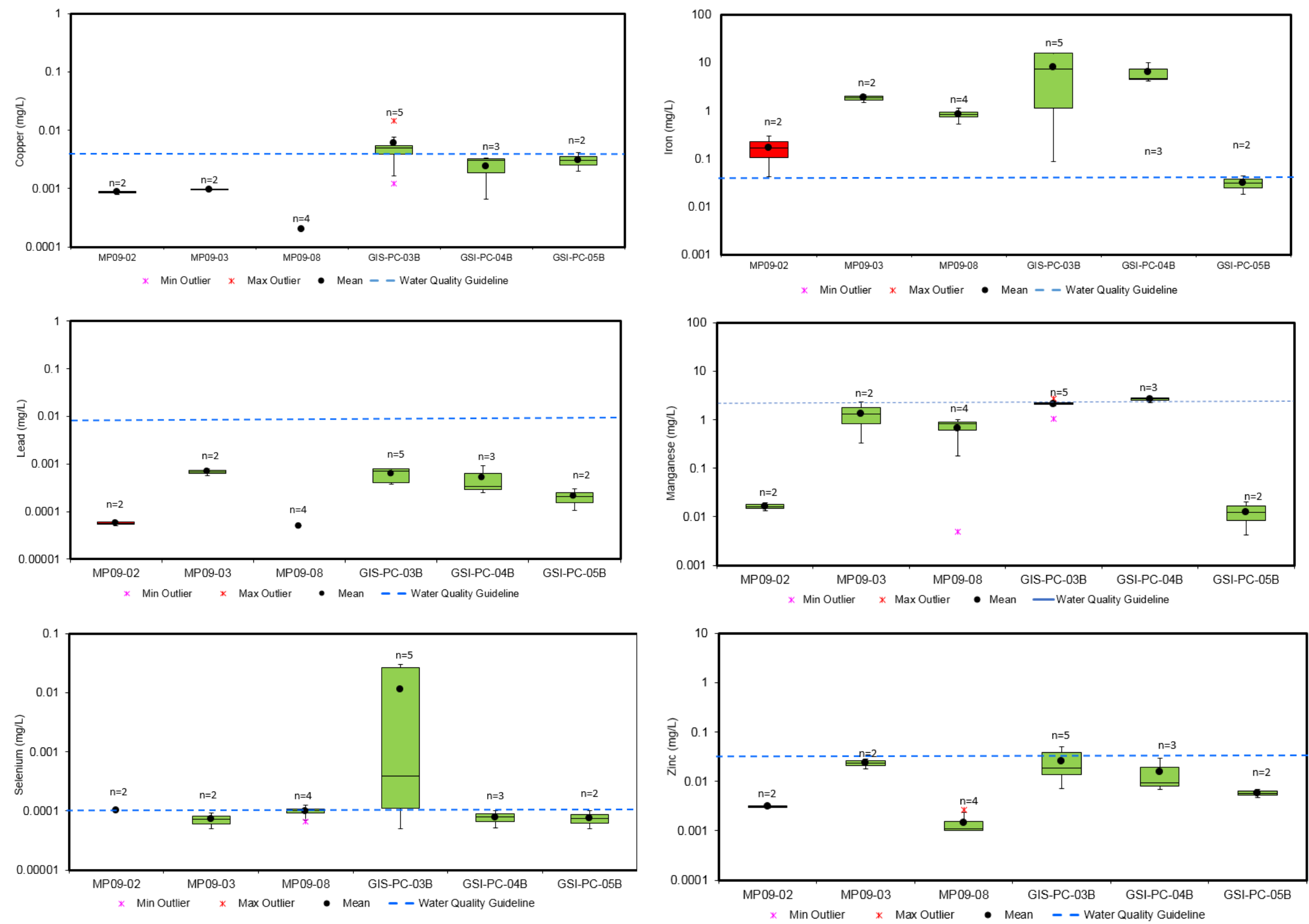


Figure 3-34: Metals - Pony Creek

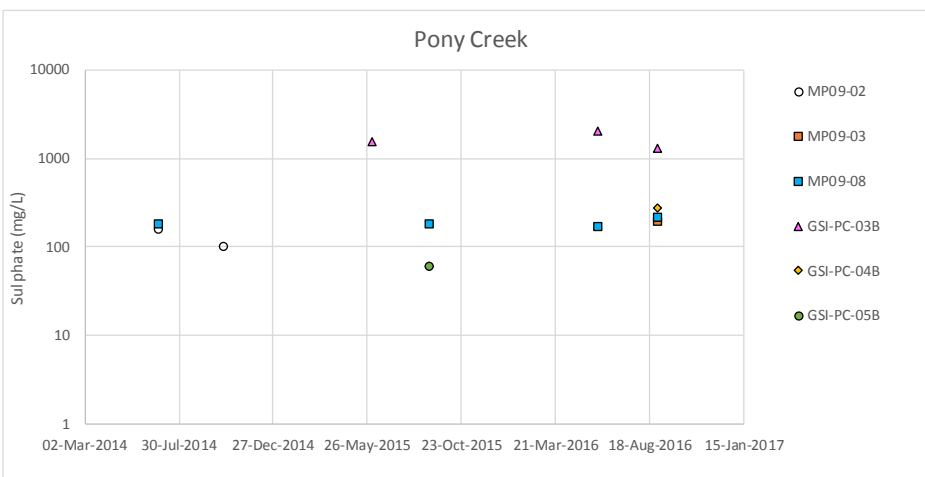
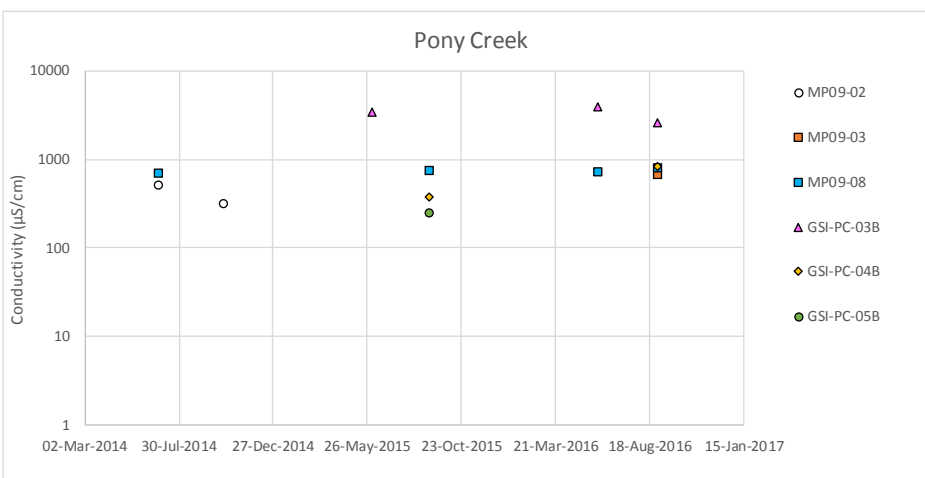
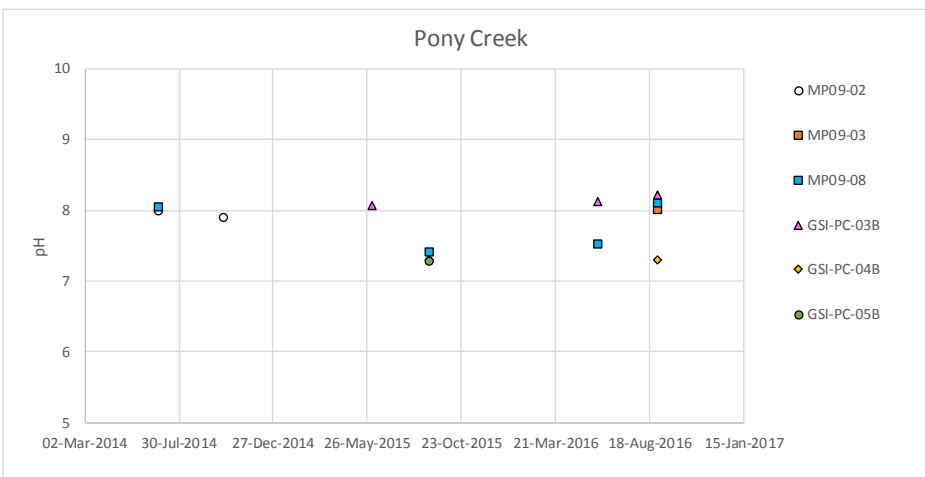


Figure 3-35: Anions - Temporal Variability - Pony Creek

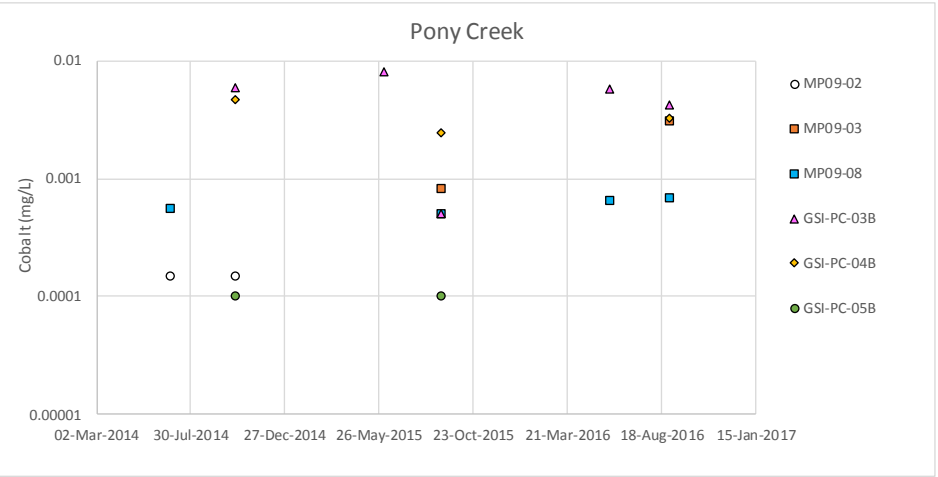
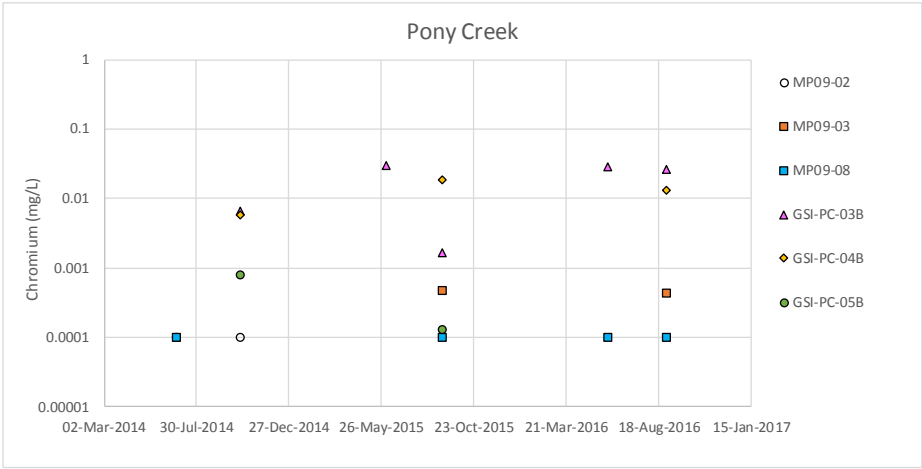
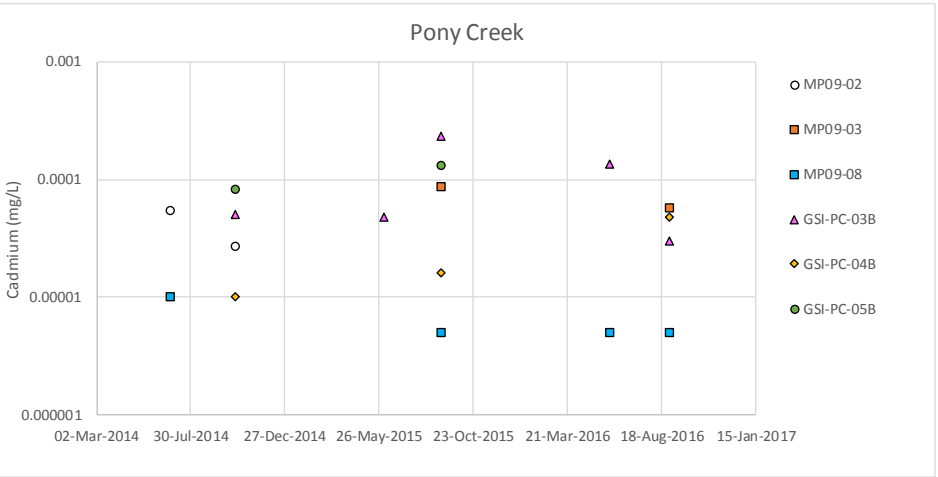
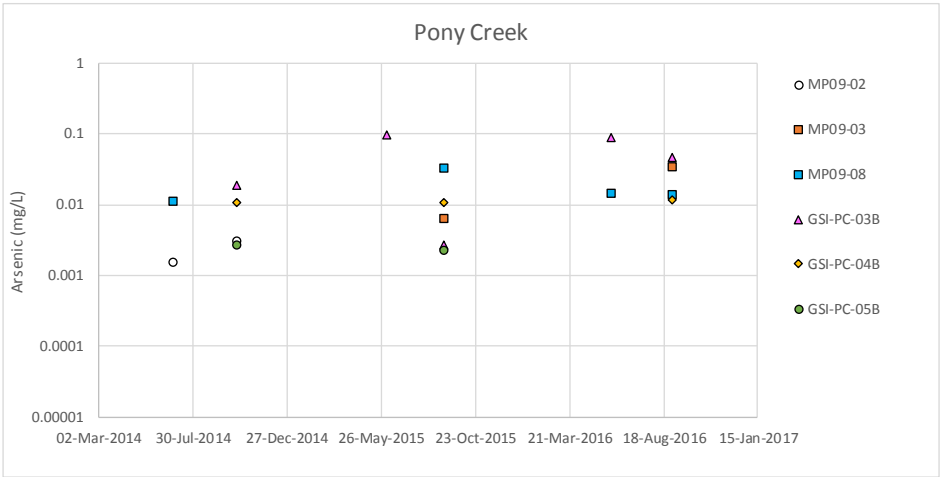
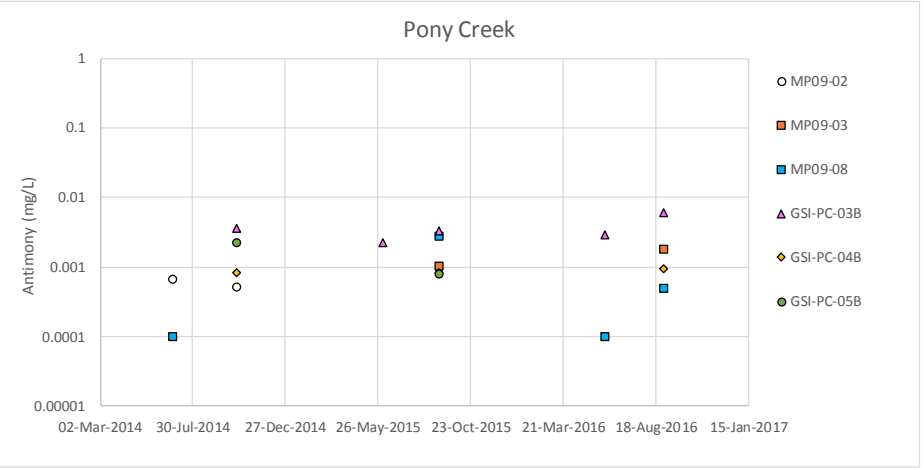
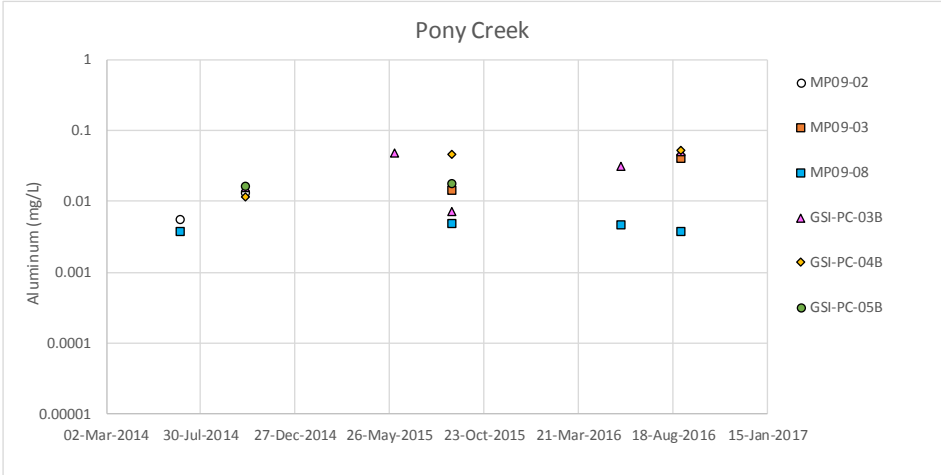


Figure 3-36: Metals - Temporal Variability - Pony Creek

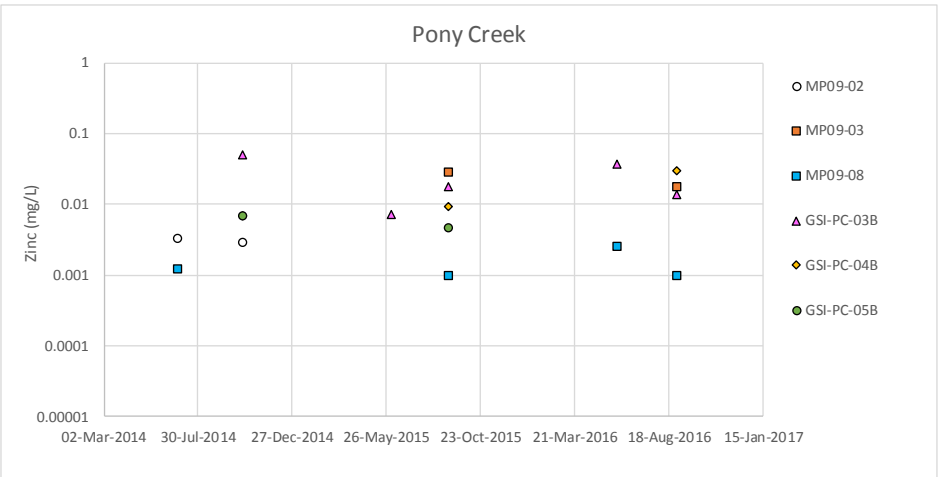
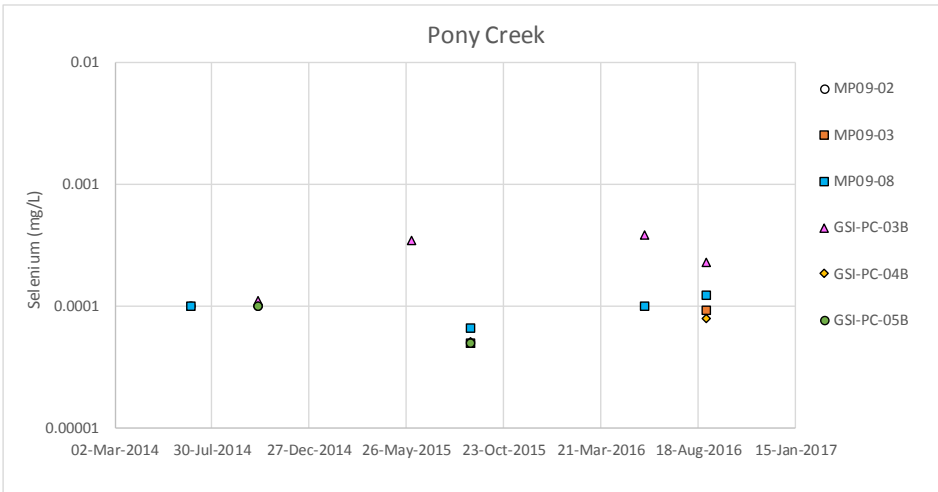
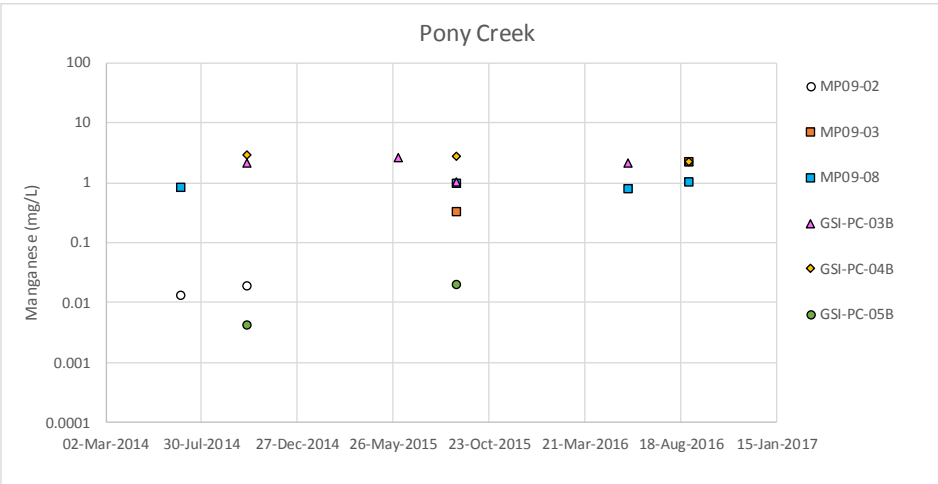
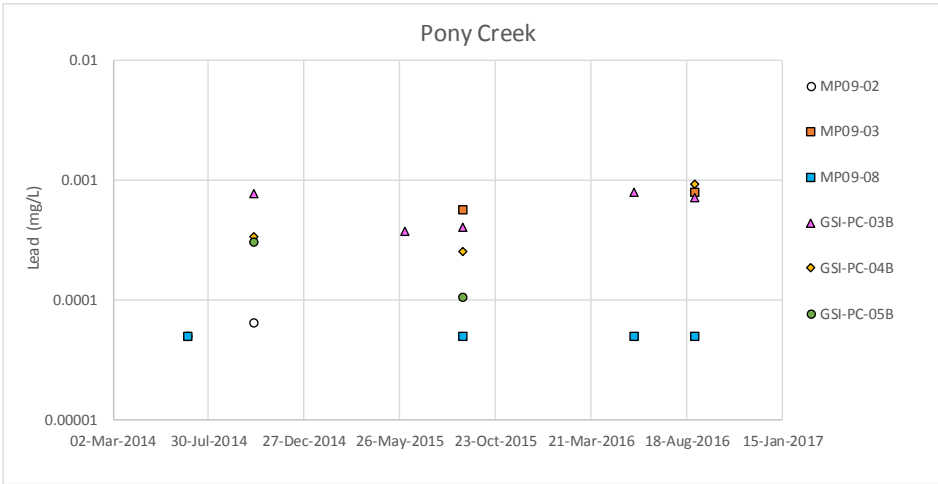
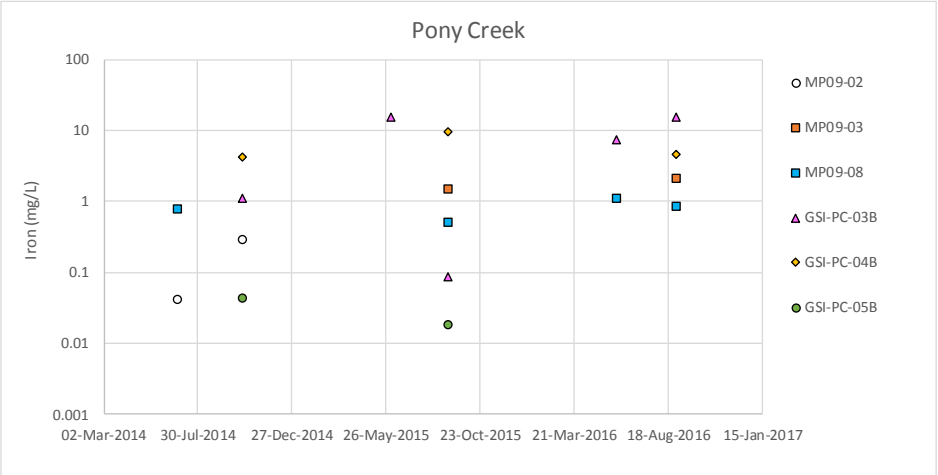
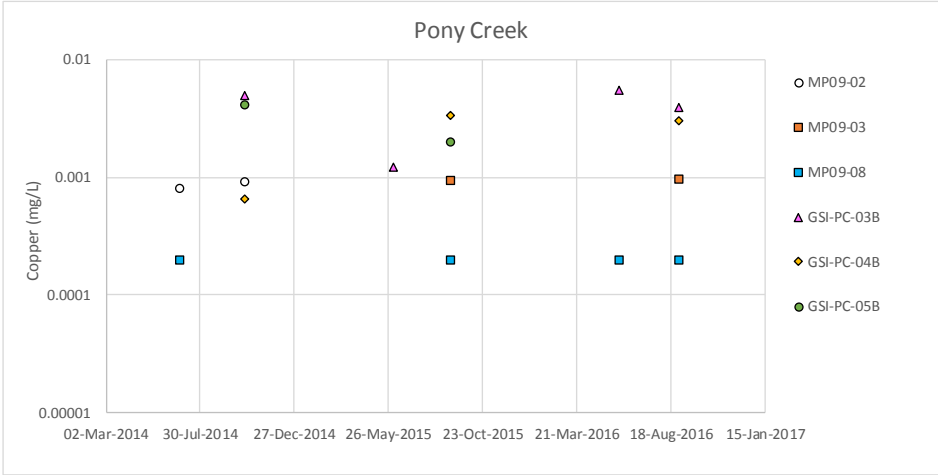


Figure 3-37: Metals - Temporal Variability - Pony Creek

4.0 SUMMARY

- Groundwater quality monitoring at the Site began in 2007; however, routine monitoring did not begin until 2009, with about two samples collected annually over this period. Following the 2013 Site Investigation (AMEC 2014), additional groundwater quality monitoring data were generated for all of the study area components. The highest groundwater sample population density exists for the TMA and the Mill Area.
- Parameters of interest were identified through a screening process based on parameters associated with local and ore deposit geology, and based on a comparison of the observed chemical parameter concentrations to the CCME and BC WQGs. Parameters of interest include SO_4^{2-} , Al, As, Cd, Co, Cr, Cu, Fe, Mn, Pb, Se, Sb and Zn. For the TMA, parameters of interest also include $\text{NH}_4\text{-T}$, CN-WAD, CN-Free, NO_3^- and NO_2^- .
- Groundwater quality data across the Site were assessed both spatially and temporally. Spatial evaluation of the groundwater quality data was conducted on a source-to-receptor (upgradient-downgradient) concept, which is based on groundwater flow paths as presented in the conceptual groundwater flow model (AECOM 2010, AMEC 2014). Descriptive statistical plots (box plots) were prepared to evaluate spatial trends for the following areas: 1) Mill Area; 2) Dome Creek; 3) TMA; 4) Brown-McDade Pit and 5) Pony Creek.
- Temporal evaluation of water quality trends is constrained by the low sample counts at individual wells, as the majority of groundwater samples were collected following the 2013 site investigation (AMEC 2014). As such, temporal evaluation of groundwater quality data was restricted to monitoring wells that had a sufficient population to visually decipher correlations between parameters and time using scatter plots.
- The majority of groundwater at the Site is a calcium-magnesium-sulphate type water. Several groundwater samples from the TMA and Dome Creek have a calcium-bicarbonate type water signature, which is indicative of a non-impacted fresh water source, which in turn is representative of non-impacted water or dilution by recent meteorological inputs.
- Groundwater quality across the Site is generally circumneutral to slightly alkaline, ranging in pH from 6.5 to approximately 9. However, fluid conductivity (EC) varies considerably depending on the Site area.
- Redox conditions across the Site can be generally described as mildly suboxic to oxic, depending on the location and depth of the well.
- Mill Area: SO_4^{2-} concentrations increase in shallow and deep groundwater along the dominant groundwater flowpath. Temporal changes in concentrations fluctuate intra-annually and, therefore, relate to seasonal changes in water flux through the Site. Parameters of potential concern identified include SO_4^{2-} , As, Cd, Cu, Mn, Sb and Zn.
- Dome Creek: dissolved Fe and SO_4^{2-} concentrations in groundwater increase along Dome Creek (upgradient of the TMA to downgradient of the TMA), indicating inputs from the Mill Area, TMA and/or Brown-McDade Pit; however, immediately downgradient of the TMA, SO_4^{2-} concentrations decrease substantially due to freshwater input likely related to the TMA. Temporal changes in concentrations fluctuate intra-annually and, therefore, relate

to seasonal changes in water flux through the Site. Parameters of potential concern identified include SO_4^{2-} , Al, As, Cd, Co, Fe and Mn.

- TMA: SO_4^{2-} concentrations in groundwater were observed to highest beneath the tailings pond, CN concentrations were highest within natural sediments beneath the tailing pond, correlating with the highest pH levels observed. Redox conditions vary across the TMA, from sub-oxic beneath the tailings pond grading into mildly oxic conditions within the tailings dam. The general indication based on nitrogen species distribution is that groundwater redox conditions become more oxic downgradient of the tailings dam; however, elevated dissolved Fe concentrations maintain low DO concentrations. The mobility of As is generally controlled by adsorption/desorption reactions and solid-phase precipitation-dissolution reactions, with the former likely being the dominant process. Scatter plots reveal decreasing trends in time with NO_3^- , CN-Free, CN-Total, Co and Cd. Parameters identified as POPCs include SO_4^{2-} , As, Cd, Co, Cu, Fe, Mn, Sb, Zn, CN-Free and CN-WAD.
- Brown-McDade Pit: Spatially there exists a correlation between pH, EC and SO_4^{2-} concentrations. The lowest pH observed in the pit area, along with the highest EC and sulphate concentrations occurs in groundwater at CH-P-13-5/50 located within the pit floor and CH-P-13-3/50 located immediately downgradient of the pit. The analytical data indicates mineralization associated with the periodic oxidation of the orebody beneath the Pit floor. The high metal and sulphate content of groundwater is characteristically from oxidation of mineralized orebody rock. Parameters of potential concern identified include: SO_4^{2-} , As, Cd, Co, Cu, Fe, Mn, and Zn.
- Pony Creek: Fluid conductivity at GIS-PC-03B, located approximately 200 m downstream of the pit, has a median EC value of about 3,500 $\mu\text{S}/\text{cm}$. The significantly higher EC value at GIS-PC-3B is associated with a statistically higher SO_4^{2-} concentration. There are no other statistically discernible trends associated with metals in shallow groundwater along Pony Creek. Indeed, there is high distribution of As and Fe concentrations at GIS-PC-03B and of Fe at GIS-PC-04B; however, the temporal data indicate that the distribution is likely related to intra-annual variation as a result of seasonal changes in stream flow and groundwater levels. Parameters of potential concern identified include SO_4^{2-} , As, Cd, Co, Cu, Fe, Mn, Se and Zn.

5.0 LIMITATIONS AND CLOSURE

This report was prepared exclusively for Ecological Logistics & Research Ltd. and Assessment and Abandoned Mines, Energy Mines and Resources, Yukon Government by Amec Foster Wheeler Environment & Infrastructure, a wholly owned subsidiary of Amec Foster Wheeler Americas Limited. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Amec Foster Wheeler's services and based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions and qualifications set forth in this report. This report is intended to be used by Ecological Logistics & Research Ltd. and Assessment and Abandoned Mines, Energy Mines and Resources, Yukon Government only, subject to the terms and conditions of the associated contract with Amec Foster Wheeler. Any other use of, or reliance on, this report by any other party is at that party's sole risk.

Yours truly,

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

Reviewed by:



Mario Bianchin, Ph.D., P.Geo.
Senior Associate Hydrogeologist



R. Brian Geddes, P.Eng.
Principal Engineer

MB/RBG/jm

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Appendix A

2009 – 2016 Groundwater Quality Data Summary Tables

2009 Analytical Data

			Sample ID	GLL07-03	MW09-01	MW09-01	MW09-02	MW09-02	MW09-03	MW09-03	MW09-04	MW09-04	MW09-04	MW09-06	MW09-06	MW09-06	MW09-08	MW09-08
			Date Sampled	01/09/2009	12/07/2009	03/09/2009	12/07/2009	03/09/2009	11/07/2009	03/09/2009	11/07/2009	11/07/2009	03/09/2009	13/07/2009	13/07/2009	03/09/2009	08/07/2009	01/09/2009
			Lab ID	L814853-1	L791918-12	L815006-5	L791918-13	L815006-6	L791918-5	L815006-7	L791918-6	L791918-10	L815006-8	L791918-3	L791918-4	L815006-9	L796873-1	L814853-2
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	1740	-	-	-	-	-	-	-	-	-	-	-	-	187	222
Hardness (as CaCO3)	mg/L	-	-	1110	923	943	1390	1440	1470	1510	1410	1420	1480	1480	1490	1550	72.2	99.5
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	5.66	-	-	-	-	-	-	-	-	-	-	-	-	7.5	6.92
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	5.66	-	-	-	-	-	-	-	-	-	-	-	-	7.5	6.92
Total Dissolved Solids	mg/L	-	-	1670	-	-	-	-	-	-	-	-	-	-	-	-	189	233
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-	81.4	-	-	-	-	-	-	-	-	-	-	-	-	13.9	26.6
Alkalinity, Total (as CaCO3)	mg/L	-	-	15.5	-	-	-	-	-	-	-	-	-	-	-	-	91.1	88.3
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.103	13.9	13.5	15.5	14	14.4	10.7	13.6	13.7	14.7	0.47	0.743	1.96	3.27	3.77
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	<0.25	<0.50	<5.0	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<1.0	<0.50	<0.50	<1.0	<0.50	<0.25
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<2.5	5.3	<50	<5.0	<25	<5.0	<10	<5.0	<5.0	<10	<5.0	<5.0	<10	<5.0	<2.5
Fluoride (F)	mg/L	0.12	-	0.15	<0.20	0.076	0.43	0.729	0.57	0.56	0.4	0.53	0.68	<0.20	<0.20	<0.40	<0.20	<0.10
Nitrate (as N)	mg/L	13	3	0.779	<0.050	<0.50	<0.050	<0.25	7.07	7.15	<0.050	<0.050	<0.10	0.401	0.197	<0.10	<0.050	<0.025
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.0544	<0.010	<0.10	<0.010	<0.050	0.694	1.14	0.058	0.085	<0.020	0.335	0.375	<0.020	<0.010	<0.0050
Sulfate (SO4)	mg/L	-	Varies ¹⁶	529	646	531	1730	1690	1700	1570	1680	1650	1610	1400	1430	1450	16	14.9
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	-	0.0261	0.0209	0.326	0.0281	0.0305	0.0107	0.207	0.295	0.0239	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	meq/L	0.005	-	-	0.0401	0.0525	0.547	0.361	0.254	0.298	0.654	0.812	0.0425	0.0083	0.0062	<0.0050	0.0542	0.0104
Cyanate (CNO)	mg/L	-	-	-	<1.8	5.1	3	4.7	<1.8	1.74	<1.8	<1.8	5.9	<0.50	<0.50	<0.50	<1.6	<0.50
Thiocyanate (SCN)	mg/L	-	-	0.82	35	27.1	5.56	3.11	1	1.1	3.05	2.99	1.21	0.69	0.68	0.71	-	5.8
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	1.27	41.4	66.8	7.48	6.23	10.2	8.8	7.67	7.22	5.16	6.05	5.87	6.05	-	23.3
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	1.39	0.0696	0.0812	<0.0050	<0.010	0.0116	<0.010	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	0.118	0.098
Antimony (Sb)-Dissolved	mg/L	-	0.2	<0.0050	0.0124	0.00404	0.0235	0.0068	0.33	0.439	0.434	0.486	0.484	0.72	0.838	0.591	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.005	0.005	<0.0050	0.0923	0.215	10.5	15.3	3.08	3.29	2.99	3.42	4.06	0.274	0.353	0.868	0.178	0.284
Barium (Ba)-Dissolved	mg/L	-	10	<0.020	0.117	0.163	0.0165	0.0138	0.0652	0.0523	0.0105	0.011	0.00834	0.00531	0.00598	0.00564	0.102	0.126
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.010	<0.0025	<0.0025	<0.0025	<0.0050	<0.0025	<0.0050	<0.0025	<0.0025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.20	<0.0025	<0.0025	<0.0025	<0.0050	<0.0025	<0.0050	<0.0025	<0.0025	<0.0050	<0.0050	<0.0050	<0.0050	<0.20	<0.20
Boron (B)-Dissolved	mg/L	1.5	1.2	<0.10	0.055	0.051	<0.050	<0.10	0.231	0.28	0.151	0.152	0.23	0.24	0.28	0.36	<0.10	<0.10
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.436	<0.000085	<0.000085	0.000278	0.00019	0.000194	0.00018	0.000549	0.000364	<0.00017	0.00835	0.00894	0.00827	<0.000017	<0.000017
Calcium (Ca)-Dissolved	mg/L	-	-	336	274	293	487	488	477	493	484	484	489	528	527	548	21.8	30.9
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.010	0.0036	<0.0070	<0.0025	<0.0050	<0.0025	<0.0050	<0.0025	<0.0025	<0.0050	<0.0050	<0.0050	<0.0050	0.0017	<0.0020
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0144	0.011	0.011	0.02	0.0122	0.0123	0.0091	0.00819	0.00875	0.0051	0.0056	0.0057	0.0038	0.00145	0.00147
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.55	0.00164	<0.00050	<0.00050	<0.0010	0.0006	0.0018	0.0006	0.00286	<0.0010	0.0052	0.0055	0.0045	<0.0010	<0.0010
Iron (Fe)-Dissolved	mg/L	0.3	-	11.6	57.1	66.4	4.85	9.46	0.118	0.126	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	31.9	40.7
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.0114	0.00255	0.00044	<0.00025	<0.00050	0.00041	<0.00050	<0.00025	<0.00025	<0.00050	<0.00050	<0.00050	0.00087	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	-	-	<0.050	<0.025	<0.025	<0.025	<0.050	<0.025	<0.050	<0.025	<0.025	<0.050	<0.050	<0.050	<0.050	<0.0050	<0.0050
Magnesium (Mg)-Dissolved	mg/L	-	-	66.4	57.9	51.7	43.3	53.2	68.9	69	50.2	50.6	62.7	38.6	41.4	44	4.3	5.45
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	10.5	6.16	6.05	21.8	23.7	0.555	0.761	4.94	3.31	3.32	12.6	17.1	14	2.09	2.32
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.000020	-	-	-	-	-	-	-	-	-	-	-	-	<0.000020	<0.000020
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	<0.010	0.00292	0.00121	0.0135	0.00974	0.0229	0.0128	0.0122	0.0116	0.0105	0.0075	0.00899	0.00899	<0.0010	<0.0010
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.014	0.0038	0.0033	0.0029	<0.0050	<0.0025	<0.0050	<0.0025	<0.0025	<0.0050	0.006	0.0077	0.0059	<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	-	-	<0.30	<0.30	<0.30	<0.60	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Dissolved	mg/L	-	-	2.1	8.4	9	43.9	51.8	28.5	31	40.6	44	44	10.7	11.2	11.4	<2.0	<2.0
Selenium (Se)-Dissolved	mg/L	0.001	0.002	<0.010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010
Silicon (Si)-Dissolved	mg/L	-	-	4.92	5.79	6.65	5.19	5.36	4.62	5.29	10.2	10.1	9.61	7.58	7.42	7.43	8.28	8.72
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.00020	<0.000050	<0.000050	<0.000050	0.00014	<0.000050	0.00012	<0.000050	0.000071	<0.00010	<0.00010	<0.00010	<0.00010	<0.000020	<0.000020
Sodium (Na)-Dissolved	mg/L	-	-	8	76.2	81.9	183	123	149	72.7	101	109	55.9	24.6	26.9	28.4	4.1	3.8
Strontium (Sr)-Dissolved	mg/L	-	-	0.354	0.968	1.03	0.9	1.08	1.08	1.18	1.03	1.06	1.14	0.847	0.892	1.02	0.106	0.14
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.0020	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<0.00020
Tin (Sn)-Dissolved	mg/L	-	-	<0.0050	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050	<0.0010	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050
Titanium (Ti)-Dissolved	mg/L	-	-	0.014	0.01	<0.010	0.026	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.015	-	<0.0020	0.00209	0.0012	0.000658	0.00048	0.00514	0.00513	0.000486	0.000501	0.00015	0.00489	0.00501	0.00309	<0.00020	<0.00020
Vanadium (V)-Dissolved	mg/L	-	-	<0.010	0.0083	0.0125	<0.0050	<0.010	<0.0050	<0.010	<0.0050	<0.0050	<0.010	<0.010	<0.010	<0.010	0.0059	0.0048
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	23.2	0.0307	0.0094	0.197	0.462	<0.0050	<0.010	<0.0050	<0.0050	<0.010	0.123	0.129	0.121	<0.0050	0.0117
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

2009 Analytical Data

			Sample ID	MW09-11	MW09-11	MW09-15	MW09-15	MW09-16	MW09-16	MW09-17	MW09-17	MW09-18	MW09-18	MW09-18	MW09-19	MW09-21	MW09-21	MW09-21
			Date Sampled	22/07/2009	02/09/2009	14/07/2009	01/09/2009	19/07/2009	01/09/2009	19/07/2009	01/09/2009	19/07/2009	19/07/2009	01/09/2009	01/09/2009	21/07/2009	21/07/2009	01/09/2009
			Lab ID	L796873-2	L814853-3	L796959-1	L814853-4	L796959-2	L814853-5	L796959-3	L814853-6	L796959-4	L796959-5	L814853-7	L814853-9	L796873-3	L796873-7	L814853-10
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	433	659	1010	937	1930	1770	2570	2570	2660	2660	2670	2470	1630	1640	1790
Hardness (as CaCO3)	mg/L	-	-	209	352	581	579	1210	1180	1760	1840	1830	1860	1920	1750	711	710	838
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.96	7.78	7.08	7.28	7.38	7.23	7.74	7.42	7.71	7.71	7.47	7.16	7.1	7.17	6.67
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.96	7.78	7.08	7.28	7.38	7.23	7.74	7.42	7.71	7.71	7.47	7.16	7.1	7.17	6.67
Total Dissolved Solids	mg/L	-	-	262	445	757	682	1650	1540	2380	2430	2490	2440	2560	2370	1230	1280	1420
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-	5.3	10.9	23.3	26.3	35.4	31.2	28.5	39.9	30.3	29.7	31.9	45.7	38.8	31.9	143
Alkalinity, Total (as CaCO3)	mg/L	-	-	227	325	288	276	298	294	435	434	427	425	426	389	266	269	231
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	1.85	2.48	0.331	0.1	0.079	<0.020	0.229	<0.020	0.041	0.066	0.021	2.24	6.3	12.1	17.9
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	<0.050	0.05	<0.050	<0.50	<2.5	<0.50	<2.5	<1.0	<2.5	<2.5	<1.0	<1.0	<2.5	<2.5	<1.0
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	3.23	4.9	<0.50	<5.0	<25	<5.0	<25	<10	<25	<25	<10	<10	<25	<25	<10
Fluoride (F)	mg/L	0.12	-	0.723	0.697	0.07	<0.20	0.152	<0.20	0.144	<0.40	0.143	0.122	<0.40	<0.40	0.057	0.059	<0.40
Nitrate (as N)	mg/L	13	3	0.283	0.495	<0.0050	<0.050	<0.25	0.201	<0.25	0.3	<0.25	<0.25	<0.10	<0.10	1.44	1.37	<0.10
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.0059	0.0277	0.0027	<0.010	<0.050	<0.010	<0.050	<0.020	<0.050	<0.050	<0.020	<0.020	0.058	<0.050	<0.020
Sulfate (SO4)	mg/L	-	Varies ¹⁶	11	50.2	289	271	934	832	1360	1400	1490	1470	1490	1340	617	617	818
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanides	mg/L																	
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	<0.0050	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0331	0.0209	0.0169
Cyanide, Total	meq/L	0.005	-	<0.0050	<0.0050	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0146	0.0504	0.0465	0.0293
Cyanate (CNO)	mg/L	-	-	<1.6	<0.50	-	-	<1.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.75	5	6.9	20.7
Thiocyanate (SCN)	mg/L	-	-	-	1.03	-	0.93	-	1.16	-	1.35	-	-	1.23	1.25	-	-	1.98
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	26.2	-	4.62	-	3.67	-	5.01	-	-	2.89	80.8	-	-	42.5
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	<0.0050	<0.0050	<0.025	<0.010	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.050	<0.025	0.158	0.15	0.152
Antimony (Sb)-Dissolved	mg/L	-	0.2	<0.00050	<0.00050	0.0178	0.0023	0.175	0.102	<0.0025	<0.0025	<0.0025	<0.0025	<0.0050	<0.0025	<0.0025	<0.0025	<0.0025
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0182	0.0239	0.122	0.187	0.0506	0.0391	0.0119	0.0128	0.0382	0.0423	0.0526	0.0834	0.0329	0.0341	0.0443
Barium (Ba)-Dissolved	mg/L	-	10	0.169	0.311	<0.020	<0.020	0.034	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.077	0.3	0.294	0.426
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0010	<0.0010	<0.0050	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Boron (B)-Dissolved	mg/L	1.5	1.2	<0.10	<0.10	<0.10	<0.10	0.27	0.19	0.27	0.16	<0.10	<0.10	<0.10	0.4	<0.10	<0.10	<0.10
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000082	0.000038	0.00754	0.000758	0.0558	0.0419	<0.000085	<0.000085	<0.000085	<0.000085	<0.00017	<0.000085	0.000196	0.000188	0.000162
Calcium (Ca)-Dissolved	mg/L	-	-	39.3	65.5	157	158	276	273	327	350	352	355	375	373	247	247	293
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.0010	<0.0010	<0.0050	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00169	0.00096	<0.0015	0.00076	0.002	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0030	<0.0015	0.0268	0.0272	0.026
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	<0.0010	<0.0010	<0.0050	<0.0020	0.01	0.0105	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
Iron (Fe)-Dissolved	mg/L	0.3	-	0.596	1.52	0.192	1.58	0.389	0.331	<0.030	<0.030	<0.030	<0.030	<0.030	30.4	19	18.7	66.4
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00050	<0.00050	0.0171	0.0059	0.0364	0.0284	<0.0025	<0.0025	<0.0025	<0.0025	<0.0050	<0.0025	<0.0025	<0.0025	<0.0025
Lithium (Li)-Dissolved	mg/L	-	-	<0.0050	<0.0050	<0.025	<0.010	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.050	<0.025	<0.025	<0.025	<0.025
Magnesium (Mg)-Dissolved	mg/L	-	-	26.9	45.8	45.7	44.5	126	120	230	235	231	236	240	200	22.9	22.5	26.1
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	0.987	1.42	0.905	0.681	0.389	0.208	0.0164	0.0096	0.349	0.409	0.427	1.97	7.52	7.66	6.73
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.01	0.0079	<0.0050	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0033	0.0027	<0.0050	<0.0020	0.0071	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
Phosphorus (P)-Dissolved	mg/L	-	-	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.41	<0.30	<0.30	<0.30
Potassium (K)-Dissolved	mg/L	-	-	3.2	4.2	<2.0	<2.0	6.5	6.4	7.2	7.5	6.9	7.1	7.1	4.9	8.2	8.1	9.4
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.001	<0.0010	<0.0050	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)-Dissolved	mg/L	-	-	5.5	6.03	5.85	6.32	5.29	5.28	4.74	4.75	4.8	4.87	4.85	7.6	5.69	5.61	5.69
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000020	<0.000020	<0.00010	<0.000040	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	-	-	15.3	20.1	7.7	6.9	18.9	9	10.8	11	10	10.2	10.5	14	102	99.4	73.1
Strontium (Sr)-Dissolved	mg/L	-	-	0.376	0.637	1.48	1.32	0.67	0.596	0.972	0.99	0.981	1	1.01	1.01	0.927	0.906	1
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.00020	<0.00020	<0.0010	<0.00040	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
Tin (Sn)-Dissolved	mg/L	-	-	<0.00050	<0.00050	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0050	<0.0025	<0.0025	<0.0025	<0.0025
Titanium (Ti)-Dissolved	mg/L	-	-	<0.010	<0.010	0.011	0.011	0.013	0.013	0.014	0.014	0.015	0.014	0.014	0.015	0.019	0.018	0.019
Uranium (U)-Dissolved	mg/L	0.015	-	0.00273	0.00346	0.086	0.0128	0.0037	0.0029	0.007	0.007	0.0068	0.007	0.0075	<0.0010	0.0016	0.0016	0.001
Vanadium (V)-Dissolved	mg/L	-	-	0.0015	0.0018	<0.0050	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	0.0052	0.0051	0.0064
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	<0.0050	<0.0050	0.437	0.233	4.44	3.66	<0.0050	<0.0050	<0.0050	<0.0050	<0				

2009 Analytical Data

			Sample ID	MW09-22	MW09-22	MW09-23	MW09-23	MW09-23	MW09-23	MW09-24	MW09-24	MW09-26	MP09-04	MP09-05	MP09-05	MP09-09	MP09-09	MP09-10	MP09-10
			Date Sampled	22/07/2009	01/09/2009	21/07/2009	01/09/2009	03/09/2009	22/07/2009	01/09/2009	01/09/2009	13/07/2009	13/07/2009	03/09/2009	12/07/2009	02/09/2009	12/07/2009	02/09/2009	
			Lab ID	L796873-4	L814853-11	L796873-5	L814853-12	L815006-10	L796873-6	L814853-13	L814853-14	L791918-1	L791918-2	L815006-11	L791918-11	L815006-1	L791918-9	L815006-2	
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																
Physical Properties																			
Conductivity	uS/cm	-	-	630	543	1930	1890	-	564	378	666	-	-	-	-	-	-	-	-
Hardness (as CaCO3)	mg/L	-	-	248	244	1020	1030	1070	297	197	355	377	684	693	415	382	210	196	
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.12	6.92	7.5	7.3	-	7.75	7.69	7.85	-	-	-	-	-	-	-	-
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.12	6.92	7.5	7.3	-	7.75	7.69	7.85	-	-	-	-	-	-	-	-
Total Dissolved Solids	mg/L	-	-	389	378	1630	1610	-	364	255	434	-	-	-	-	-	-	-	-
Anions and Nutrients																			
Acidity (as CaCO3)	mg/L	-	-	21.1	27.2	21	24.4	-	7.5	5.9	9.1	-	-	-	-	-	-	-	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	176	122	269	247	-	210	107	317	-	-	-	-	-	-	-	-
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	6.65	4.37	9.49	8.73	9.27	0.032	<0.020	2.43	0.843	8.17	8.06	9.6	8.5	2.94	2.65	
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	<0.25	<0.50	<2.5	<0.50	<1.0	<0.050	<0.050	0.05	<0.050	<0.50	<0.50	<0.050	<0.50	<0.050	<0.50	<0.50
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<2.5	<5.0	<25	<5.0	<10	0.76	<0.50	4.96	<0.50	<5.0	6.6	1.96	6.5	1.6	<5.0	
Fluoride (F)	mg/L	0.12	-	0.075	<0.20	0.058	<0.20	<0.40	<0.020	0.032	0.711	<0.020	<0.20	<0.20	0.568	0.64	1.5	1.67	
Nitrate (as N)	mg/L	13	3	4.79	<0.050	<0.25	<0.050	<0.10	2.2	2.52	0.544	9.55	15.2	5.7	<0.0050	<0.050	0.026	<0.050	
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.0996	<0.010	<0.050	<0.010	<0.020	0.0092	0.0016	0.0271	0.0264	0.028	0.119	<0.0010	<0.010	0.0019	<0.010	
Sulfate (SO4)	mg/L	-	Varies ¹⁶	126	156	879	916	976	86.6	81.7	51.4	297	634	530	136	179	263	237	
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanides	mg/L																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	<0.0050	0.107	0.019	0.0583	<0.0050	<0.0050	<0.0050	<0.0050	0.0149	0.0171	<0.0050	0.0335	0.627	0.964	
Cyanide, Total	meq/L	0.005	-	0.0165	0.0102	0.419	0.0324	0.0729	0.012	0.0119	0.0074	<0.0050	0.02	0.0219	<0.0050	0.125	2.69	2.96	
Cyanate (CNO)	mg/L	-	-	<1.6	1.14	3.5	2.34	3	<0.50	<0.50	<0.50	<0.50	0.87	3.42	<0.50	<0.60	2.1	0.54	
Thiocyanate (SCN)	mg/L	-	-	-	1.2	-	3.72	5.86	-	<0.50	1.04	0.5	1.11	1.62	1.6	1.96	3.39	3.2	
Organic / Inorganic Carbon																			
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	13.7	-	18.8	18.1	-	4.18	26.8	5.24	15.2	24.3	32	35.4	49.2	48.5	
Dissolved Metals																			
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0332	0.0982	0.033	0.037	0.039	<0.0050	<0.0050	<0.0050	0.0037	0.015	0.0198	0.0045	0.0023	<0.0050	<0.010	
Antimony (Sb)-Dissolved	mg/L	-	0.2	<0.00050	<0.00050	<0.0025	<0.0025	<0.00050	<0.00050	<0.00050	<0.00050	0.00055	<0.00050	<0.00050	0.108	0.109	0.163	0.178	
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.014	0.0368	0.01	0.0137	0.00912	0.00117	0.00102	0.0235	0.00105	0.00132	0.00355	6.58	5.73	24.9	24.2	
Barium (Ba)-Dissolved	mg/L	-	10	0.157	0.115	0.089	0.064	0.0683	0.077	0.056	0.315	0.0435	0.0441	0.044	0.0137	0.013	0.00475	0.00361	
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0010	<0.0010	<0.0050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0025	<0.0010	<0.0010	<0.0025	<0.0050	
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.20	<0.20	<0.20	<0.20	<0.0025	<0.20	<0.20	<0.20	<0.0010	<0.0025	<0.0025	<0.0010	<0.0010	<0.0025	<0.0050	
Boron (B)-Dissolved	mg/L	1.5	1.2	<0.10	<0.10	0.14	0.14	0.152	<0.10	<0.10	<0.10	0.076	0.073	0.071	<0.020	<0.020	<0.050	<0.10	
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000109	0.000077	0.000184	0.000126	0.000132	0.000055	0.000034	0.000035	0.0028	0.00227	0.00239	0.000134	0.000166	0.000489	0.00089	
Calcium (Ca)-Dissolved	mg/L	-	-	91.6	89.9	327	332	353	88.7	60.4	65.8	121	237	232	122	115	80.6	76	
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.0010	<0.0020	<0.0050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0025	<0.0010	<0.0010	<0.0025	<0.0050	
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0134	0.0123	0.0189	0.0171	0.017	0.00063	0.00063	0.00097	0.00153	0.0214	0.0211	0.00828	0.00954	0.0834	0.0896	
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.0036	0.0015	<0.0050	<0.0050	<0.00050	0.0085	0.0057	<0.0010	0.00513	0.0267	0.0324	0.0152	<0.015	0.732	0.725	
Iron (Fe)-Dissolved	mg/L	0.3	-	3.46	14.6	3.86	7.93	5.55	<0.030	<0.030	1.45	<0.030	<0.030	0.346	0.192	0.16	0.381	0.496	
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00050	<0.00050	<0.0025	<0.0025	<0.00025	<0.00050	<0.00050	<0.00050	<0.00010	<0.00025	<0.00025	0.00104	0.00077	0.00212	0.00311	
Lithium (Li)-Dissolved	mg/L	-	-	<0.0050	<0.0050	<0.025	<0.025	<0.025	<0.0050	<0.0050	<0.0050	<0.010	<0.025	<0.025	<0.010	<0.010	<0.025	<0.050	
Magnesium (Mg)-Dissolved	mg/L	-	-	4.57	4.84	50.1	47.8	47.2	18.4	11.3	46.4	18	22.5	28	26.7	23	2.05	1.49	
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	3.88	3.2	6.69	6.06	6.88	0.0115	0.00267	1.38	5.25	8.6	9.04	0.81	0.679	0.349	0.26	
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.000020	<0.000020	<0.000020	<0.000020	-	<0.000020	<0.000020	<0.000020	-	-	-	-	-	-	-	
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.0017	<0.0010	<0.0050	<0.0050	0.00252	<0.0010	<0.0010	0.0078	0.00035	0.00049	0.00034	0.0148	0.0151	0.0139	0.0123	
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0096	0.0092	<0.0050	<0.0050	<0.0025	<0.0010	<0.0010	0.0028	0.0064	0.0068	0.0097	0.0049	0.0084	0.0413	0.0367	
Phosphorus (P)-Dissolved	mg/L	-	-	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.73	0.68	0.56	0.54	
Potassium (K)-Dissolved	mg/L	-	-	5.7	4.4	15.5	14.4	15.6	<2.0	<2.0	4.3	4.1	7.2	7.4	34.3	32	12.9	12.6	
Selenium (Se)-Dissolved	mg/L	0.001	0.002	<0.0010	<0.0010	<0.0050	<0.0050	<0.00050	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	0.00053	0.0006	0.00191	0.00259	
Silicon (Si)-Dissolved	mg/L	-	-	4.69	5.51	5.35	5.69	5.33	5.74	5.62	6.06	9.19	3.94	5.07	22.8	22.7	16.2	15.9	
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000020	<0.000020	<0.00010	<0.00010	0.00128	<0.000020	<0.000020	<0.000020	<0.000020	<0.000050	<0.000050	0.000166	0.000079	0.0196	0.0285	
Sodium (Na)-Dissolved	mg/L	-	-	25.6	15.4	59.5	56.9	80.9	9.2	8.7	20.3	21.2	92.8	79	34.8	36.8	105	106	
Strontium (Sr)-Dissolved	mg/L	-	-	0.341	0.286	0.736	0.698	0.752	0.467	0.295	0.645	0.299	0.706	0.679	0.766	0.731	0.253	0.233	
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.00020	<0.00020	<0.0010	<0.0010	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00050	<0.0010	
Tin (Sn)-Dissolved	mg/L	-	-	<0.00050	<0.00050	<0.0025	<0.0025	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00050	<0.0010	
Titanium (Ti)-Dissolved	mg/L	-	-	<0.010	0.011	0.015	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Uranium (U)-Dissolved	mg/L	0.015	-	0.00067	0.00071	0.0023	0.0015	0.00157	0.00252	0.00058	0.00341	0.000252	0.00125	0.00133	0.00587	0.00337	0.00111	0.00077	
Vanadium (V)-Dissolved	mg/L	-	-	0.0019	0.0044	<0.0050	<0.0050	<0.0050	<0.0010	<0.0010	0.0017	<0.0020	<0.0050	<0.0050	<0.0020	<0.0020	<0.0050	<0.010	
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	<0.0050	<0.0050	<													

			Sample ID	MP09-11	MP09-11	MP09-12	MP09-12
			Date Sampled	11/07/2009	02/09/2009	12/07/2009	02/09/2009
			Lab ID	L791918-7	L815006-3	L791918-8	L815006-4
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)				
Physical Properties							
Conductivity	uS/cm	-	-	-	-	-	-
Hardness (as CaCO3)	mg/L	-	-	722	607	709	668
Dissolved Oxygen	mg/L	-	-	-	-	-	-
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	-
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	-	-	-
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	-	-	-	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-
Anions and Nutrients							
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	-	-
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	1.7	1.6	1.92	1.98
Bicarbonate	mg/L	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	<0.50	<0.50	<0.50	<0.50
Carbonate	mg/L	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	11.2	8.5	<5.0	6.3
Fluoride (F)	mg/L	0.12	-	0.197	0.218	<0.20	0.2
Nitrate (as N)	mg/L	13	3	<0.050	<0.050	<0.050	<0.050
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.010	<0.010	<0.010	<0.010
Sulfate (SO4)	mg/L	-	Varies ¹⁶	<5.0	<5.0	79	59.9
Sulfide	mg/L	-	-	-	-	-	-
Cyanides	mg/L						
Cyanide, Weak Acid Diss	mg/L	-	0.005	0.0124	0.0099	<0.0050	<0.0050
Cyanide, Total	meq/L	0.005	-	0.0591	0.0747	0.0326	0.0387
Cyanate (CNO)	mg/L	-	-	<0.50	0.54	<0.50	<0.50
Thiocyanate (SCN)	mg/L	-	-	4.3	4.46	2.37	2.89
Organic / Inorganic Carbon							
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	164	142	45.2	55.9
Dissolved Metals							
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0353	0.0244	0.0058	0.0052
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00148	0.00098	0.0653	0.0707
Arsenic (As)-Dissolved	mg/L	0.005	0.005	1.16	1.33	7.56	9.27
Barium (Ba)-Dissolved	mg/L	-	10	0.139	0.158	0.053	0.047
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0010	<0.0010	<0.0025	<0.0025
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0010	<0.0010	<0.0025	<0.0025
Boron (B)-Dissolved	mg/L	1.5	1.2	0.027	0.027	0.119	0.114
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000458	0.000229	0.00091	0.000546
Calcium (Ca)-Dissolved	mg/L	-	-	147	129	195	185
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.0080	<0.0070	<0.0035	<0.0025
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0033	0.00276	0.00215	0.00208
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00107	0.00075	0.00199	0.00102
Iron (Fe)-Dissolved	mg/L	0.3	-	8.55	8.1	0.661	1.03
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.00166	0.00023	0.00285	0.00404
Lithium (Li)-Dissolved	mg/L	-	-	<0.010	<0.010	<0.025	<0.025
Magnesium (Mg)-Dissolved	mg/L	-	-	86.3	69	53.7	50.1
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	2.67	2.03	3.83	3.3
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	-	-	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.0223	0.0246	0.021	0.0235
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0151	0.016	0.0127	0.0133
Phosphorus (P)-Dissolved	mg/L	-	-	0.43	0.41	<0.30	<0.30
Potassium (K)-Dissolved	mg/L	-	-	2.5	2.5	6.3	6.6
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00124	0.00111	<0.00050	0.00065
Silicon (Si)-Dissolved	mg/L	-	-	13.5	12	16.1	16.7
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	0.000061	0.000068	<0.000050	<0.000050
Sodium (Na)-Dissolved	mg/L	-	-	44.6	39.1	41.4	40.1
Strontium (Sr)-Dissolved	mg/L	-	-	0.694	0.582	0.655	0.633
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.00020	<0.00020	<0.00050	<0.00050
Tin (Sn)-Dissolved	mg/L	-	-	<0.00020	<0.00020	<0.00050	<0.00050
Titanium (Ti)-Dissolved	mg/L	-	-	0.014	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.015	-	0.000697	0.000211	0.0042	0.00384
Vanadium (V)-Dissolved	mg/L	-	-	0.0716	0.0507	0.0053	<0.0050
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.0158	0.0048	0.0451	0.038
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-

Notes:

	Exceeds CCME Guidelines
	Exceeds BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)
	Exceeds both CCME Guidelines and BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)

(1) CCME guideline exceedances shaded with light red.
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014

(5) CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(8) Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.00 if H<17
0.00004 – 0.00037 if H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46
0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.002 if H<82
0.002 – 0.004 if H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.001 if H<60
0.001 – 0.007 if H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15 if H>180

(13) BC water quality guideline for pH.

(14) Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(15) Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
0.02 if Chloride < 2 mg/L
0.04 if Chloride = 2 to 4 mg/L
0.06 if Chloride = 4 to 6 mg/L
0.08 if Chloride = 6 to 8 mg/L
0.10 if Chloride = 8 to 10 mg/L
0.20 if Chloride > 10 mg/L

(16) Sulphate varies with hardness as follows for BC WQG:
128 if H<=30
218 if H>=31 and H<=75
309 if H>=76 and H<=180
429 if H>=181 and H<=250
Site specific if H>250

(17) Aluminum varies with pH as follows for BC WQG FA:
WQG (µg/L) = e{1.6-3.327(median p.H)+0.402 (median Ph)^2} if pH < 6.5
0.05 if pH>= 6.5

(18) Cadmium varies with hardness as follows for BC WQG FA:
WQG = e[0.736 × ln(hardness*) – 4.943]

(19) Copper varies with hardness as follows for BC WQG FA:
2 if H≤50
WQG ≤ 0.04 (mean hardness*) if H>50

(20) Lead varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 3.31 + e[1.273 ln (hardness*) - 4.704] if H>8
* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO3.

(21) Manganese varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 0.0044 hardness* + 0.605 if H>= 37 and H<=450
* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO3.

(31) Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:
WQG = 0.0001 / (MeHg/total Hg)

(32) Silver varies with hardness in mg/L as follows for BC WQG:
0.0005 if H≤100
0.0015 if H>100

(33) Zinc varies with hardness in mg/L as follows for BC WQG:
0.075 if H≤90
WQG = 7.5 + 0.75 (hardness* - 90) if H>90

			Sample ID	MW09-16	MW09-17	MW09-18	MW09-19
			Date Sampled	02-JUL-10	02-JUL-10	02-JUL-10	02-JUL-10
			Lab ID	-	-	-	-
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)				
Physical Properties							
Conductivity	uS/cm	-	-	2	2.513	2.691	2.439
Hardness (as CaCO3)	mg/L	-	-	1210	1710	1950	1630
Dissolved Oxygen	mg/L	-	-	1.66	1.02	2.4-4.2	12.15
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	6.73	6.42	6.15	5.73
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.78	7.78	7.8	7.24
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.73	6.42	6.15	5.73
Total Dissolved Solids	mg/L	-	-	1670	2180	2640	2090
Anions and Nutrients							
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	-	-
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.023	<0.010	<0.010	2.45
Bicarbonate	mg/L	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	<0.50	<0.50	<0.50	<0.50
Carbonate	mg/L	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<5.0	<5.0	<5.0	<5.0
Fluoride (F)	mg/L	0.12	-	<0.20	<0.20	<0.20	<0.20
Nitrate (as N)	mg/L	13	3	0.134	0.298	<0.050	<0.050
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.010	<0.010	<0.010	<0.010
Sulfate (SO4)	mg/L	-	Varies ¹⁶	1040	1240	1420	1240
Sulfide	mg/L	-	-	<2	<2	<2	613.2753782
Cyanides	mg/L						
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	meq/L	0.005	-	<0.0050	<0.0050	<0.0050	0.005
Cyanate (CNO)	mg/L	-	-	<0.50	<0.50	<0.50	<0.50
Thiocyanate (SCN)	mg/L	-	-	0.98	1.22	1.23	1.72
Organic / Inorganic Carbon							
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	3.44	2.38	2.56	11.2
Dissolved Metals							
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	<0.0050	<0.0050	<0.0050	0.0129
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.14	<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0307	0.016	0.0842	0.0743
Barium (Ba)-Dissolved	mg/L	-	10	0.0162	0.00878	0.00788	0.0716
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0025	<0.0025	<0.0025	<0.0025
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0025	<0.0025	<0.0025	<0.0025
Boron (B)-Dissolved	mg/L	1.5	1.2	0.195	0.23	<0.050	0.404
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.0656	<0.000085	<0.000085	<0.000085
Calcium (Ca)-Dissolved	mg/L	-	-	284	322	353	349
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.0025	<0.0025	<0.0025	<0.0030
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00177	<0.00050	<0.00050	0.00153
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.0128	0.0006	<0.00050	<0.00050
Iron (Fe)-Dissolved	mg/L	0.3	-	0.194	<0.030	0.164	33.6
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.0346	<0.00025	<0.00025	<0.00025
Lithium (Li)-Dissolved	mg/L	-	-	<0.025	<0.025	<0.025	<0.025
Magnesium (Mg)-Dissolved	mg/L	-	-	123	219	259	185
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	0.592	0.00038	0.767	2.38
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	-	-	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.00027	<0.00025	<0.00025	<0.00025
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0055	<0.0025	<0.0025	<0.0025
Phosphorus (P)-Dissolved	mg/L	-	-	<0.30	<0.30	<0.30	0.46
Potassium (K)-Dissolved	mg/L	-	-	6.6	7.4	7.4	5.7
Selenium (Se)-Dissolved	mg/L	0.001	0.002	<0.00050	<0.00050	<0.00050	<0.00050
Silicon (Si)-Dissolved	mg/L	-	-	4.88	5.29	5.58	8.81
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	0.000127	<0.000050	<0.000050	<0.000050
Sodium (Na)-Dissolved	mg/L	-	-	8.4	11.6	11.5	14.9
Strontium (Sr)-Dissolved	mg/L	-	-	0.619	0.916	0.977	0.985
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.00050	<0.00050	<0.00050	<0.00050
Tin (Sn)-Dissolved	mg/L	-	-	<0.00050	<0.00050	<0.00050	<0.00050
Titanium (Ti)-Dissolved	mg/L	-	-	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.015	-	0.00235	0.00657	0.00737	0.000257
Vanadium (V)-Dissolved	mg/L	-	-	<0.0050	<0.0050	<0.0050	<0.0050
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	5.74	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-

Notes:

	Exceeds CCME Guidelines
	Exceeds BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)
	Exceeds both CCME Guidelines and BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)

(1) CCME guideline exceedances shaded with light red.
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014

(5) CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(8) Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.00 if H<17
0.00004 – 0.00037 if H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46
0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.002 if H<82
0.002 – 0.004 if H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.001 if H<60
0.001 – 0.007 if H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15 if H>180

(13) BC water quality guideline for pH.

(14) Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(15) Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
0.02 if Chloride < 2 mg/L
0.04 if Chloride = 2 to 4 mg/L
0.06 if Chloride = 4 to 6 mg/L
0.08 if Chloride = 6 to 8 mg/L
0.10 if Chloride = 8 to 10 mg/L
0.20 if Chloride > 10 mg/L

(16) Sulphate varies with hardness as follows for BC WQG:
128 if H<=30
218 if H>=31 and H<=75
309 if H>=76 and H<=180
429 if H>=181 and H<=250
Site specific if H>250

(17) Aluminum varies with pH as follows for BC WQG FA:
WQG (µg/L) = e{1.6-3.327(median p.H)+0.402 (median Ph)^2} if pH < 6.5
0.05 if pH>= 6.5

(18) Cadmium varies with hardness as follows for BC WQG FA:
WQG = e[0.736 × ln(hardness*) – 4.943]

(19) Copper varies with hardness as follows for BC WQG FA:
2 if H≤50
WQG ≤ 0.04 (mean hardness*) if H>50

(20) Lead varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 3.31 + e[1.273 ln (hardness*) - 4.704] if H>8
* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO3.

(21) Manganese varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 0.0044 hardness* + 0.605 if H>= 37 and H<=450
* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO3.

(31) Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:
WQG = 0.0001 / (MeHg/total Hg)

(32) Silver varies with hardness in mg/L as follows for BC WQG:
0.0005 if H≤100
0.0015 if H>100

(33) Zinc varies with hardness in mg/L as follows for BC WQG:
0.075 if H≤90
WQG = 7.5 + 0.75 (hardness* - 90) if H>90

2011 Analytical Data

				Sample ID	MW09-01	MW09-02	MW09-03	MW09-04	MW09-07	MW09-08	MW09-11	MW09-21	MW09-22	MW09-23	MW09-24	MP09-04	MP09-05	MP09-09	MP09-10
				Date Sampled	27-SEP-11	27-SEP-11	27-SEP-11	27-SEP-11	28-SEP-11	29-SEP-11	29-SEP-11	28-SEP-11	28-SEP-11	28-SEP-11	29-SEP-11	28-SEP-11	28-SEP-11	27-SEP-11	27-SEP-11
				Lab ID															
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																
Physical Properties																			
Conductivity	uS/cm	-	-	1560	2880	2700	2530	2140	124	720	942	479	1690	385	1020	2210	913	603	
Hardness (as CaCO3)	mg/L	-	-	803	1390	1660	1500	1230	55.6	405	458	249	990	199	621	1060	484	231	
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.54	7	8.17	8.04	7.07	7.07	8	7.24	7.4	7.52	7.85	7.97	7.38	8.46	8.47	
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.54	7	8.17	8.04	7.07	7.07	8	7.24	7.4	7.52	7.85	7.97	7.38	8.46	8.47	
Total Dissolved Solids	mg/L	-	-	1190	2720	2670	2480	1900	165	408	705	319	1350	250	790	1750	668	484	
Anions and Nutrients																			
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Alkalinity, Total (as CaCO3)	mg/L	-	-	563	32.3	165	40.4	224	64.6	379	338	193	278	126	225	290	446	142	
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	10.7	14.6	9.39	10.7	3.45	1.11	2.67	12	0.057	7.3	0.0124	0.0918	13.2	5.84	3.61	
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bromide (Br)	mg/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<0.25	<0.25	<0.50	<0.050	<1.0	<0.050	<0.50	<1.0	<0.50	0.113	
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chloride (Cl)	mg/L	120	150	<10	<10	<10	<10	<10	<2.5	<2.5	<5.0	<0.50	<10	<0.50	<5.0	<10	<5.0	4.42	
Fluoride (F)	mg/L	0.12	-	<0.40	0.72	0.43	0.59	<0.40	0.1	0.34	<0.20	0.078	<0.40	0.044	<0.20	<0.40	0.55	1.44	
Nitrate (as N)	mg/L	13	3	<0.10	<0.10	6.48	0.57	<0.10	<0.025	2.27	<0.050	1.36	0.12	1.79	4.41	<0.10	<0.050	0.0316	
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.020	<0.020	0.553	0.044	<0.020	<0.005	0.0072	<0.010	0.0065	0.046	<0.0010	0.021	<0.020	<0.010	0.0043	
Sulfate (SO4)	mg/L	-	Varies ¹⁶	389	1830	1730	1710	1250	<2.5	30.3	194	70.4	809	74.8	362	1070	83	148	
Sulfide	mg/L	-	-	0.022	<0.020	<0.020	<0.020	<0.020	0.066	<0.020	0.03	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.10	
Cyanides				mg/L															
Cyanide, Weak Acid Diss	mg/L	-	0.005	0.0499	0.732	0.0953	0.0135	0.162	0.0081	<0.0050	0.0127	0.0168	0.0431	<0.0050	0.01	0.736	0.039	0.238	
Cyanide, Total	meq/L	0.005	-	0.0635	0.186	0.136	0.0157	0.112	0.0173	0.006	0.028	0.0185	0.0407	<0.0050	0.0246	0.34	0.153	0.572	
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thiocyanate (SCN)	mg/L	-	-	14	2.87	0.8	0.67	6.14	4	1.28	8.09	1.47	1.2	<0.50	0.73	23.4	1.28	1.26	
Organic / Inorganic Carbon																			
Dissolved Organic Carbon	mg/L	-	-	45	7.32	8.47	5.98	15.6	19.8	8.05	40.1	10.9	14.9	4.28	94.8	50.4	36.4	30.6	
Total Inorganic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dissolved Metals																			
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0627	<0.015	<0.015	<0.015	0.0246	0.122	<0.0030	0.143	0.0349	0.0261	<0.0030	<0.0030	0.0328	<0.0030	<0.0060	
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00027	0.00419	0.572	0.559	0.00515	0.00033	0.00021	0.00022	0.00017	0.00031	0.00016	0.0003	0.00067	0.101	0.166	
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.11	16.1	4.15	4.14	0.332	0.309	0.0132	0.0398	0.00367	0.0114	0.00138	0.00131	0.0227	6.29	18.8	
Barium (Ba)-Dissolved	mg/L	-	10	0.136	0.01	0.0305	0.0054	0.0252	0.071	0.475	0.204	0.0895	0.102	0.0571	0.0351	0.0953	0.018	0.00647	
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00020	<0.00050	<0.00050	<0.00050	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00020	<0.00010	<0.00020	
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0010	<0.0025	<0.0025	<0.0025	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0010	<0.00050	<0.0010	
Boron (B)-Dissolved	mg/L	1.5	1.2	0.074	<0.050	0.252	0.25	0.067	<0.010	0.027	0.016	0.023	0.115	0.011	0.019	0.058	<0.010	<0.020	
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000022	0.000833	0.000134	<0.000050	0.000514	<0.000010	0.000017	0.000139	0.000027	0.000036	0.000021	0.00122	0.000079	0.000102	0.000187	
Calcium (Ca)-Dissolved	mg/L	-	-	263	463	525	477	385	16.7	90.3	159	90.8	328	60.4	170	346	136	84.1	
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00256	<0.00050	<0.00050	<0.00050	0.00038	0.00141	<0.00010	0.00252	0.00055	0.00056	0.00043	0.00043	0.00105	0.00021	<0.00020	
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00618	0.0116	0.00618	0.00202	0.0143	0.00075	0.00039	0.0156	0.00534	0.0157	0.00029	0.00083	0.0271	0.00692	0.0266	
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	<0.0010	<0.0025	<0.0025	<0.0025	0.0012	<0.00050	0.00093	0.00296	0.00334	<0.0010	0.00741	0.00594	<0.0010	0.0416	0.262	
Iron (Fe)-Dissolved	mg/L	0.3	-	44.3	20.3	0.053	<0.030	12.7	23.1	2.5	31.3	6.46	10.7	<0.030	<0.030	76.5	0.185	0.108	
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00010	<0.00025	<0.00025	<0.00025	0.00037	0.000269	<0.00050	<0.00050	<0.00050	<0.00010	<0.00050	<0.00050	<0.00010	0.00686	0.0027	
Lithium (Li)-Dissolved	mg/L	-	-	<0.0010	0.0146	<0.0025	<0.0025	0.0017	0.00053	0.00207	<0.00050	<0.00050	<0.0010	0.00067	0.00117	<0.0010	0.00468	0.0012	
Magnesium (Mg)-Dissolved	mg/L	-	-	35.6	57.3	85.3	73.7	66.1	3.37	43.5	14.7	5.47	41.8	11.6	47.7	47.4	35.1	5.03	
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	4.82	25.4	7.22	1.8	11.6	1.54	0.474	3.05	1.28	7.24	0.000352	1.05	16.2	2.81	0.445	
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.00091	0.00659	0.00811	0.00869	0.00175	0.000112	0.00723	0.000367	0.000457	0.00392	0.000279	0.000167	0.00054	0.0157	0.0191	
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0023	0.0047	<0.0025	<0.0025	0.0146	<0.00050	0.0012	0.00254	0.00144	0.0014	<0.00050	0.00196	0.0084	0.00512	0.0216	
Phosphorus (P)-Dissolved	mg/L	-	-	0.34	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.37	0.52	
Potassium (K)-Dissolved	mg/L	-	-	7.9	80.2	31	42.9	12.6	<2.0	3.7	7.5	2.5	13.2	<2.0	2.7	8.4	23.9	13.6	
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.0003	<0.00050	<0.00050	<0.00050	<0.00020	0.00013	0.00185	0.00037	0.00017	<0.00020	0.00097	0.00037	0.00037	0.00037	0.00094	
Silicon (Si)-Dissolved	mg/L	-	-	8.74	5.56	9.28	9.73	10.5	8.61	4.37	6.07	4.53	6.08	5.4	5.67	7.37	24.2	18.1	
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000020	<0.000050	0.000106	<0.000050	0.000037	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	<0.000010	<0.000010	<0.000020	0.000031	0.000978	
Sodium (Na)-Dissolved	mg/L	-	-	76.7	118	66.1	56.3	65.7	<2.0	9.6	29.5	11.6	24.4	8.8	11.7	138	17.2	38.2	
Strontium (Sr)-Dissolved	mg/L	-	-	0.816	1.1	1.45	1.25	1.07	0.0804	0.642	0.51	0.291	0.861	0.259	0.412	1.09	0.653	0.286	
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.000020	0.000188	<0.000050	0.000059	0.000087	<0.000010	<0.000010	0.000031	<0.000010	<0.000020	<0.000010	<0.000010	<0.000020	0.000022	0.00005	
Tin (Sn)-Dissolved	mg/L	-	-	<0.00020	<0.00050	<0.00050	<0.00050	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00020	<0.00010	<0.00020	
Titanium (Ti)-Dissolved	mg/L	-	-	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Uranium (U)-Dissolved	mg/L	0.015	-	0.000885	0.000346	0.00379	0.000105	0.00219	0.000119	0.00391	0.000497	0.0012	0.00253	0.00122	0.00218	0.00175	0.00146	0.00123	
Vanadium (V)-Dissolved	mg/L	-	-	0.0121	<0.0050	<0.0050	<0.0050	<0.0020	0.0059	<0.0010	0.0066	<0.0010	0.0025	<0.0010	<0.0010	0.0027	<0.0010	<0.0020	
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.0446	0.511	<0.015	<0.015	0.675	<0.0030	<0.0030	0.0062	<0.0030	<0.0060	<0.0030	0.0143	0.029	0.0074	<0.0060	
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

			Sample ID	SEEP POND	SEEP POND DUP	WQ BLNK	TAILS POND	SEEP POND
			Date Sampled	29-SEP-11	29-SEP-11	29-SEP-11	29-SEP-11	29-SEP-11
			Lab ID					
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)					
Physical Properties								
Conductivity	uS/cm	-	-	1480	1480	<2.0	1520	1480
Hardness (as CaCO3)	mg/L	-	-	817	820	<0.50	821	766
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.74	7.72	5.87	7.86	7.04
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	-	-	-	-
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.74	7.72	5.87	7.86	7.04
Total Dissolved Solids	mg/L	-	-	1180	1220	<10	1150	1110
Anions and Nutrients								
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	243	245	<2.0	108	246
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	4.16	4.89	<0.0050	<0.01	3.23
Bicarbonate	mg/L	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	<1.0	<1.0	<0.050	-	-
Carbonate	mg/L	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<10	<10	<0.50	<0.5	<0.5
Fluoride (F)	mg/L	0.12	-	<0.40	<0.40	<0.020	-	-
Nitrate (as N)	mg/L	13	3	3.64	3.71	<0.0050	<0.1	3.92
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.076	0.078	<0.0010	<0.1	<0.1
Sulfate (SO4)	mg/L	-	Varies ¹⁶	641	640	<0.50	627	559
Sulfide	mg/L	-	-	-	-	-	-	-
Cyanides	mg/L							
Cyanide, Weak Acid Diss	mg/L	-	0.005	0.117	0.119	<0.0050	0.002	0.01
Cyanide, Total	meq/L	0.005	-	0.105	0.0994	<0.0050	-	-
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	6.97	6.96	<0.50	<0.1	3.8
Organic / Inorganic Carbon								
Dissolved Organic Carbon	mg/L	-	-	17.8	18.3	0.52	-	-
Total Inorganic Carbon	mg/L	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	-
Dissolved Metals								
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0095	0.0102	<0.0030	0.008	0.012
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00059	0.00057	<0.00010	0.0868	0.0005
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0232	0.0232	<0.00010	0.108	0.0237
Barium (Ba)-Dissolved	mg/L	-	10	0.0595	0.059	<0.000050	0.014	0.06
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00020	<0.00020	<0.00010	<0.00004	0.00007
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0010	<0.0010	<0.00050	<0.001	<0.001
Boron (B)-Dissolved	mg/L	1.5	1.2	0.06	0.061	<0.010	0.108	0.061
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000932	0.000984	<0.000010	0.00127	0.00094
Calcium (Ca)-Dissolved	mg/L	-	-	252	253	<0.050	243	238
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00037	0.00038	<0.00010	<0.0004	0.0014
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0084	0.0086	<0.00010	0.00132	0.00744
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.0032	0.0035	<0.00050	0.024	0.004
Iron (Fe)-Dissolved	mg/L	0.3	-	6.63	6.67	<0.030	0.046	6.5
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00010	<0.00010	<0.000050	0.001	<0.0001
Lithium (Li)-Dissolved	mg/L	-	-	<0.0010	<0.0010	<0.00050	0.009	0.001
Magnesium (Mg)-Dissolved	mg/L	-	-	45.5	45.7	<0.10	52.3	41.4
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	6.07	6.08	<0.000050	0.702	6.45
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	-	-	-	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.00104	0.00103	<0.000050	0.002	0.0009
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0032	0.0033	<0.00050	<0.001	<0.001
Phosphorus (P)-Dissolved	mg/L	-	-	<0.30	<0.30	<0.30	0.01	0.01
Potassium (K)-Dissolved	mg/L	-	-	6.1	6.1	<2.0	13.9	6
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00026	0.00024	<0.00010	<0.0006	<0.0006
Silicon (Si)-Dissolved	mg/L	-	-	7.05	7.06	<0.050	2.07	5.77
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000020	<0.000020	<0.000010	0.00004	<0.00001
Sodium (Na)-Dissolved	mg/L	-	-	45	45.3	<2.0	24.3	45.6
Strontium (Sr)-Dissolved	mg/L	-	-	0.75	0.751	<0.00010	0.562	0.683
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.000020	<0.000020	<0.000010	0.0002	0.00001
Tin (Sn)-Dissolved	mg/L	-	-	<0.000020	<0.000020	<0.000010	0.0002	0.0008
Titanium (Ti)-Dissolved	mg/L	-	-	<0.010	<0.010	<0.010	0.013	0.0102
Uranium (U)-Dissolved	mg/L	0.015	-	0.00234	0.00237	<0.000010	0.0013	0.0022
Vanadium (V)-Dissolved	mg/L	-	-	<0.0020	<0.0020	<0.0010	0.0002	0.0014
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.0096	0.0097	<0.0030	0.092	0.011
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-	-

Notes:

	Exceeds CCME Guidelines
	Exceeds BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)
	Exceeds both CCME Guidelines and BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)

(1) CCME guideline exceedances shaded with light red.
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014

(5) CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(8) Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.00 if H<17
0.00004 – 0.00037 if H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46
0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.002 if H<82
0.002 – 0.004 if H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.001 if H<60
0.001 – 0.007 if H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15 if H>180

(13) BC water quality guideline for pH.

(14) Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(15) Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
0.02 if Chloride < 2 mg/L
0.04 if Chloride = 2 to 4 mg/L
0.06 if Chloride = 4 to 6 mg/L
0.08 if Chloride = 6 to 8 mg/L
0.10 if Chloride = 8 to 10 mg/L
0.20 if Chloride > 10 mg/L

(16) Sulphate varies with hardness as follows for BC WQG:
128 if H<=30
218 if H>=31 and H<=75
309 if H>=76 and H<=180
429 if H>=181 and H<=250
Site specific if H>250

(17) Aluminum varies with pH as follows for BC WQG FA:
WQG (µg/L) = e{1.6-3.327(median p.H)+0.402 (median Ph)^2} if pH < 6.5
0.05 if pH>= 6.5

(18) Cadmium varies with hardness as follows for BC WQG FA:
WQG = e[0.736 × ln(hardness*) – 4.943]

(19) Copper varies with hardness as follows for BC WQG FA:
2 if H≤50
WQG ≤ 0.04 (mean hardness*) if H>50

(20) Lead varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 3.31 + e[1.273 ln (hardness*) - 4.704] if H>8
* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO3.

(21) Manganese varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 0.0044 hardness* + 0.605 if H>= 37 and H<=450
* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO3.

(31) Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:
WQG = 0.0001 / (MeHg/total Hg)

(32) Silver varies with hardness in mg/L as follows for BC WQG:
0.0005 if H≤100
0.0015 if H>100

(33) Zinc varies with hardness in mg/L as follows for BC WQG:
0.075 if H≤90
WQG = 7.5 + 0.75 (hardness* - 90) if H>90

2012 Analytical Data

			Sample ID	MP09-01	MP09-01 (DUP2)	MP09-02	MP09-04	MP09-05	MP09-08	MW09-01	MW09-02	MW09-03	MW09-04	MW09-17	MW09-18	MW09-18 (SP1)	MW09-22	MW09-22 (DUP1)
			Date Sampled	5-Jun-12	5-Jun-12	6-Jun-12	3-Jun-12	3-Jun-12	5-Jun-12	3-Jun-12	2-Jun-12	2-Jun-12	2-Jun-12	1-Jun-12	1-Jun-12	1-Jun-12	4-Jun-12	4-Jun-12
			Lab ID															
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	102	102	277	1253	2155	1005	1994	2849	2533	2533	2192	2160	2160	692	692
Hardness (as CaCO3)	mg/L	-	-	57	47	181	724	1080	652	1010	1420	1490	1510	1380	1390	1550	312	329
Dissolved Oxygen	mg/L	-	-	7.6	7.6	2.85	5.26	1.63	10.1	3.18	4.21	3.36	2.8	3.27	1.54	1.54	3.12	3.12
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	6.77	6.77	7.15	6.97	6.85	8.2	7.16	7.12	9.04	9.06	7.02	6.98	6.98	6.35	6.35
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7	7	7.54	7.59	7.19	8.09	7.53	6.98	8.06	8.15	7.68	7.7	7.74	7.04	7.18
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.77	6.77	7.15	6.97	6.85	8.2	7.16	7.12	9.04	9.06	7.02	6.98	6.98	6.35	6.35
Total Dissolved Solids	mg/L	-	-	80	71	210	999	1680	769	1490	2460	2300	2330	1790	1770	1840	401	404
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	17	14	87	192	415	273	492	48	44	48	428	396	388	161	158
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.09	0.01	0.01	0.06	10.7	0.05	8.5	12.3	9.6	8.3	0.05	0.01	0.05	1.02	0.83
Bicarbonate	mg/L	-	-	21	17	106	235	505	332	600	58	53	58	522	483	473	196	192
Bromide (Br)	mg/L	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Carbonate	mg/L	-	-	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Chloride (Cl)	mg/L	120	150	1	0.7	0.5	0.5	6.2	0.8	6.6	4	1.9	2	1.4	0.8	0.8	0.5	0.8
Fluoride (F)	mg/L	0.12	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.47	0.39	0.45	0.1	0.1	0.1	0.1	0.1
Nitrate (as N)	mg/L	13	3	0.1	0.1	0.1	0.65	0.23	0.1	0.1	0.1	0.1	0.1	1.69	0.48	0.37	6.12	6.13
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.1	0.1	0.1	0.27	0.34	0.1	0.49	0.1	0.1	0.1	0.55	0.4	0.54	0.1	0.1
Sulfate (SO4)	mg/L	-	Varies ¹⁶	31	30	68	589	894	345	707	1670	1590	1620	1070	1070	1080	123	120
Sulfide	mg/L	-	-	0.005	0.005	0.005	0.005	0.008	0.005	0.014	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide, Total	meq/L	0.005	-	0.002	0.002	0.002	0.028	3	0.002	4.9	0.5	0.17	0.13	0.002	0.002	0.002	0.018	0.015
Cyanate (CNO)	mg/L	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.5
Thiocyanate (SCN)	mg/L	-	-	0.7	0.3	0.4	0.4	11	0.3	31	3.3	0.4	0.4	0.5	0.3	0.3	0.3	0.3
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	10.7	11	13	5.9	31	4.8	31.9	5.8	5.4	5.8	3.4	3.2	3	11	11.4
Total Inorganic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.07	0.071	0.024	0.005	0.028	0.005	0.024	0.005	0.005	0.005	0.005	0.005	0.005	0.055	0.057
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.0017	0.0017	0.0005	0.0014	0.0005	0.0002	0.0002	0.0032	0.702	0.42	0.0012	0.0005	0.0002	0.0004	0.0002
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.006	0.0054	0.0157	0.0029	0.0183	0.0096	0.0468	15.1	3.61	3.6	0.0208	0.0577	0.0547	0.0156	0.0133
Barium (Ba)-Dissolved	mg/L	-	10	0.041	0.042	0.043	0.152	0.068	0.081	0.109	0.008	0.009	0.005	0.008	0.007	0.007	0.104	0.105
Beryllium (Be)-Dissolved	mg/L	-	0.053	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Bismuth (Bi)-Dissolved	mg/L	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Boron (B)-Dissolved	mg/L	1.5	1.2	0.01	0.004	0.008	0.032	0.08	0.008	0.11	0.051	0.166	0.234	0.537	0.034	0.019	0.033	0.025
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.00011	0.00011	0.00004	0.00009	0.00006	0.00001	0.00001	0.00056	0.00001	0.00001	0.00001	0.00006	0.00004	0.00005	0.00003
Calcium (Ca)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.0004	0.0004	0.0004	0.0008	0.002	0.0004	0.0023	0.0004	0.0004	0.0004	0.0008	0.0007	0.0005	0.0015	0.0014
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00097	0.00097	0.00093	0.00075	0.021	0.00065	0.00814	0.0123	0.00182	0.00187	0.00034	0.00043	0.00041	0.00762	0.0079
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.002	0.003	0.001	0.003	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Iron (Fe)-Dissolved	mg/L	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.0003	0.0003	0.0002	0.0001	0.0001	0.0001	0.0001	0.0008	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001
Lithium (Li)-Dissolved	mg/L	-	-	0.001	0.001	0.001	0.001	0.001	0.007	0.001	0.025	0.002	0.003	0.023	0.02	0.021	0.001	0.001
Magnesium (Mg)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.0003	0.0001	0.0001	0.0001	0.0003	0.0002	0.0009	0.005	0.0087	0.0071	0.0001	0.0001	0.0001	0.0001	0.0001
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.001	0.001	0.001	0.003	0.008	0.002	0.004	0.008	0.005	0.005	0.003	0.004	0.004	0.009	0.009
Phosphorus (P)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium (K)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.0006	0.0006	0.0006	0.0006	0.0009	0.0006	0.0006	0.0006	0.0006	0.0006	0.0016	0.0014	0.0013	0.0006	0.0006
Silicon (Si)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	0.00008	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Sodium (Na)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.076	0.076	0.308	0.809	1.16	2.07	1.1	1.18	1.61	1.42	0.948	0.946	0.942	0.397	0.41
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	0.00003	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00022	0.00001	0.00006	0.00012	0.00022	0.00023	0.00001	0.00001
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	0.01	0.01	0.01	0.01	0.012	0.01	0.01	0.01	0.01	0.01	0.01	0.025	0.01	0.011
Uranium (U)-Dissolved	mg/L	0.015	-	0.0004	0.0004	0.0004	0.0044	0.0014	0.0062	0.0009	0.0004	0.0004	0.0004	0.0056	0.0054	0.0056	0.0006	0.0006
Vanadium (V)-Dissolved	mg/L	-	-	0.0018	0.0016	0.0007	0.0002	0.0031	0.0002	0.0038	0.0001	0.0002	0.0002	0.0004	0.0002	0.0002	0.0019	0.002
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.022	0.022	0.005	0.005	0.025	0.002	0.002	0.414	0.003	0.124	0.002	0.003	0.003	0.005	0.004
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0002	0.0002	0.0001	0.0001	0.0011	0.0001	0.0015	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0006	0.0006

			Sample ID	MW09-23	MW09-24	Seepage Discharge	Seepage Pond
			Date Sampled	2-Jun-12	6-Jun-12	3-Jun-12	3-Jun-12
			Lab ID				
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)				
Physical Properties							
Conductivity	uS/cm	-	-	1944	1018	1367	1767
Hardness (as CaCO3)	mg/L	-	-	1250	578	793	333
Dissolved Oxygen	mg/L	-	-	0.8	5.12	9.3	1
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.07	7.18	7.19	7.12
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.52	7.65	7.6	7.68
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.07	7.18	7.19	7.12
Total Dissolved Solids	mg/L	-	-	1710	769	1100	400
Anions and Nutrients							
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	290	171	214	111
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	7.4	0.05	4.41	1
Bicarbonate	mg/L	-	-	354	209	261	135
Bromide (Br)	mg/L	-	-	0.2	0.2	0.2	0.2
Carbonate	mg/L	-	-	6	6	6	6
Chloride (Cl)	mg/L	120	150	0.8	0.6	1.3	0.7
Fluoride (F)	mg/L	0.12	-	0.1	0.1	0.1	0.1
Nitrate (as N)	mg/L	13	3	0.4	4.92	2.58	1.36
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.1	0.1	0.1	0.1
Sulfate (SO4)	mg/L	-	Varies ¹⁶	1010	403	604	181
Sulfide	mg/L	-	-	0.008	0.005	0.005	0.005
Cyanides	mg/L						
Cyanide, Weak Acid Diss	mg/L	-	0.005	-	-	-	-
Cyanide, Total	meq/L	0.005	-	0.052	0.004	0.58	0.067
Cyanate (CNO)	mg/L	-	-	1.1	0.2	0.3	0.2
Thiocyanate (SCN)	mg/L	-	-	0.3	0.3	3.7	0.6
Organic / Inorganic Carbon							
Dissolved Organic Carbon	mg/L	-	-	10.8	5.7	14.5	7.5
Total Inorganic Carbon	mg/L	-	-	-	-	-	-
Total Organic Carbon	mg/L	-	-	-	-	-	-
Dissolved Metals							
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.011	0.005	0.005	0.005
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.0003	0.0002	0.0004	0.0003
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.007	0.0036	0.0236	0.0027
Barium (Ba)-Dissolved	mg/L	-	10	0.128	0.135	0.061	0.052
Beryllium (Be)-Dissolved	mg/L	-	0.053	0.00004	0.00004	0.00004	0.00004
Bismuth (Bi)-Dissolved	mg/L	-	-	0.001	0.001	0.001	0.001
Boron (B)-Dissolved	mg/L	1.5	1.2	0.11	0.024	0.078	0.028
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.00005	0.00006	0.00042	0.00027
Calcium (Ca)-Dissolved	mg/L	-	-	-	-	-	-
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.0008	0.0007	0.0006	0.0004
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0172	0.00092	0.00835	0.003
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.001	0.007	0.003	0.004
Iron (Fe)-Dissolved	mg/L	0.3	-	-	-	-	-
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.0001	0.0001	0.0001	0.0001
Lithium (Li)-Dissolved	mg/L	-	-	0.001	0.002	0.001	0.001
Magnesium (Mg)-Dissolved	mg/L	-	-	-	-	-	-
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	-	-	-	-
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	-	-	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.0037	0.0001	0.0007	0.0003
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.005	0.002	0.004	0.002
Phosphorus (P)-Dissolved	mg/L	-	-	-	-	-	-
Potassium (K)-Dissolved	mg/L	-	-	-	-	-	-
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.0006	0.0006	0.0006	0.0006
Silicon (Si)-Dissolved	mg/L	-	-	-	-	-	-
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	0.00001	0.00001	0.00001	0.00001
Sodium (Na)-Dissolved	mg/L	-	-	-	-	-	-
Strontium (Sr)-Dissolved	mg/L	-	-	1.03	0.835	0.735	0.313
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	0.00001	0.00001	0.00001	0.00001
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	0.0001	0.0001	0.0001
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	0.01	0.014	0.01
Uranium (U)-Dissolved	mg/L	0.015	-	0.0022	0.0035	0.0021	0.0016
Vanadium (V)-Dissolved	mg/L	-	-	0.0014	0.0003	0.001	0.0001
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.471	0.012	0.006	0.004
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0006	0.0001	0.0004	0.0001

Notes:

	Exceeds CCME Guidelines
	Exceeds BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)
	Exceeds both CCME Guidelines and BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)

(1) CCME guideline exceedances shaded with light red.
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014

(5) CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(8) Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.00 if H<17
0.00004 – 0.00037 if H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46
0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.002 if H<82
0.002 – 0.004 if H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.001 if H<60
0.001 – 0.007 if H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15 if H>180

(13) BC water quality guideline for pH.

(14) Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(15) Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
0.02 if Chloride < 2 mg/L
0.04 if Chloride = 2 to 4 mg/L
0.06 if Chloride = 4 to 6 mg/L
0.08 if Chloride = 6 to 8 mg/L
0.10 if Chloride = 8 to 10 mg/L
0.20 if Chloride > 10 mg/L

(16) Sulphate varies with hardness as follows for BC WQG:
128 if H<=30
218 if H>=31 and H<=75
309 if H>=76 and H<=180
429 if H>=181 and H<=250
Site specific if H>250

(17) Aluminum varies with pH as follows for BC WQG FA:
WQG (µg/L) = e{1.6-3.327(median p.H)+0.402 (median Ph)^2} if pH < 6.5
0.05 if pH>= 6.5

(18) Cadmium varies with hardness as follows for BC WQG FA:
WQG = e[0.736 × ln(hardness*) – 4.943]

(19) Copper varies with hardness as follows for BC WQG FA:
2 if H≤50
WQG ≤ 0.04 (mean hardness*) if H>50

(20) Lead varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 3.31 + e[1.273 ln (hardness*) - 4.704] if H>8
* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO3.

(21) Manganese varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 0.0044 hardness* + 0.605 if H>= 37 and H<=450
* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO3.

(31) Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:
WQG = 0.0001 / (MeHg/total Hg)

(32) Silver varies with hardness in mg/L as follows for BC WQG:
0.0005 if H≤100
0.0015 if H>100

(33) Zinc varies with hardness in mg/L as follows for BC WQG:
0.075 if H≤90
WQG = 7.5 + 0.75 (hardness* - 90) if H>90

2013 Analytical Data

				Sample ID	MP09-04 Standard Preservation	MP09-04 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MP09-05 STANDARD PRESERVATI ON	MP09-05 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MP09-09 STANDARD PRESERVATI ON	MP09-09 ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)	MP09-09 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MP09-10 STANDARD PRESERVATI ON	MP09-11 STANDARD PRESERVATI ON	FIELD DUP A STANDARD PRESERVATI ON	MP09-11 ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)	FIELD DUP A ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)	MP09-11 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	FIELD DUP A ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MP09-12 STANDARD PRESERVATI ON	MP09-12 ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)	MP09-12 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)
			Date Sampled	18/09/2013	18/09/2013	18/09/2013	18/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013
			Lab ID	BC WQG (Yukon CSR in bold)																	
	Units	CCME-FAL ^{1, 2, 3, 4}																			
Physical Properties																					
Conductivity	uS/cm	-	-	1500	-	1950	-	457	-	-	495	1080	1120	-	-	-	-	929	-	-	
Hardness (as CaCO3)	mg/L	-	-	1160	1140	1290	1340	200	-	203	-	642	630	-	-	705	665	602	-	585	
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.19	-	6.59	-	8.54	-	-	9.15	7.84	7.78	-	-	-	-	7.71	-	-	
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.19	-	6.59	-	8.54	-	-	9.15	7.84	7.78	-	-	-	-	7.71	-	-	
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Anions and Nutrients																					
Acidity (as CaCO3)	mg/L	-	-																		
Alkalinity, Total (as CaCO3)	mg/L	-	-	341	-	226	-	124	-	-	141	686	709	-	-	-	-	430	-	-	
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.0102	-	9.41	-	3.21	-	-	3.23	4.4	4.02	-	-	-	-	4.67	-	-	
Bicarbonate	mg/L	-	-	341	-	226	-	113	-	-	90.9	686	709	-	-	-	-	430	-	-	
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbonate	mg/L	-	-	<1.0	-	<1.0	-	11.2	-	-	49.9	<1.0	<1.0	-	-	-	-	<1.0	-	-	
Chloride (Cl)	mg/L	120	150	<5.0	-	<10	-	2.26	-	-	2.79	<5.0	<5.0	-	-	-	-	<5.0	-	-	
Fluoride (F)	mg/L	0.12	-	<0.20	-	<0.40	-	1.45	-	-	1.62	0.5	0.57	-	-	-	-	0.35	-	-	
Nitrate (as N)	mg/L	13	3	0.166	-	0.26	-	0.0096	-	-	0.033	<0.050	<0.050	-	-	-	-	0.056	-	-	
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.010	-	0.041	-	0.0066	-	-	0.0053	0.029	0.012	-	-	-	-	0.019	-	-	
Sulfate (SO4)	mg/L	-	Varies ¹⁶	783	-	1220	-	101	-	-	108	15.4	15.9	-	-	-	-	145	-	-	
Sulfide	mg/L	-	-	-	-	-	-	<0.20	-	-	-	-	-	-	-	-	-	-	-	-	
Cyanides	mg/L																				
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	-	<0.0050	-	0.0058	0.32	-	0.0196	<0.0050	<0.0050	<0.0050	<0.0050	-	-	<0.0050	<0.0050	-	
Cyanide, Total	meq/L	0.005	-	0.0109	-	0.0915	-	2.37	0.324	-	2.07	0.901	0.909	<0.0050	<0.0050	-	-	0.158	<0.0050	-	
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thiocyanate (SCN)	mg/L	-	-	<0.50	-	2.87	-	0.99	<0.50	-	-	1.18	0.7	<0.50	<0.50	-	-	0.7	<0.50	-	
Organic / Inorganic Carbon																					
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Inorganic Carbon	mg/L	-	-	78.2	-	48.6	-	21.1	-	-	37.3	146	158	-	-	-	-	81	-	-	
Total Organic Carbon	mg/L	-	-	2.17	-	104	-	28.5	-	-	52.5	62.8	61.1	-	-	-	-	19.6	-	-	
Dissolved Metals																					
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0023	<0.0010	0.0409	0.0286	0.0021	-	<0.0020	-	0.0094	0.0082	-	-	0.007	0.0061	0.0031	-	0.0029	
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00183	0.00184	0.00052	0.00052	0.127	-	0.13	-	0.0101	0.0104	-	-	0.0132	0.0129	0.022	-	0.0269	
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.00144	0.00144	0.118	0.0728	16	-	17.7	-	6.65	5.86	-	-	9.75	6.2	3.98	-	4.15	
Barium (Ba)-Dissolved	mg/L	-	10	0.0922	0.0954	0.115	0.11	0.00381	-	0.00371	-	0.145	0.136	-	-	0.155	0.123	0.208	-	0.195	
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00020	<0.00010	<0.00020	<0.00020	<0.00020	-	<0.00020	-	<0.00010	<0.00010	-	-	<0.00010	<0.00010	<0.00010	-	<0.00010	
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	-	<0.0010	-	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050	-	<0.00050	
Boron (B)-Dissolved	mg/L	1.5	1.2	<0.020	0.016	0.106	0.095	<0.020	-	<0.020	-	0.054	0.045	-	-	0.056	0.048	0.036	-	0.044	
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000104	0.000114	0.000381	0.000315	0.000072	-	0.000077	-	0.000112	0.000098	-	-	0.000085	0.000061	0.000629	-	0.000634	
Calcium (Ca)-Dissolved	mg/L	-	-	310	295	428	451	75.9	-	77.2	-	132	129	-	-	146	135	132	-	125	
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.0005	0.00048	0.00092	0.0006	<0.00020	-	<0.00020	-	0.00182	0.00191	-	-	0.00186	0.00173	0.0008	-	0.00074	
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00028	0.00036	0.0152	0.0154	0.0153	-	0.0181	-	0.0035	0.00356	-	-	0.00355	0.00374	0.00147	-	0.00142	
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00298	0.0032	0.00165	0.0015	0.171	-	0.285	-	0.00255	0.00214	-	-	0.00162	0.00172	0.00273	-	0.00448	
Iron (Fe)-Dissolved	mg/L	0.3	-	<0.010	<0.010	56.1	53.4	0.048	-	0.067	-	8.81	7.75	-	-	4.75	6.47	3.49	-	2.69	
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00010	<0.000050	0.00012	0.00013	0.00252	-	0.00215	-	0.0048	0.00286	-	-	0.00276	0.00241	0.0105	-	0.0111	
Lithium (Li)-Dissolved	mg/L	-	-	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	-	<0.0010	-	0.00504	0.00447	-	-	0.00445	0.00455	0.00206	-	0.00248	
Magnesium (Mg)-Dissolved	mg/L	-	-	93.6	99	54.2	52.6	2.51	-	2.39	-	76.1	74.5	-	-	82.6	79.7	66.3	-	66.4	
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	0.00233	0.00243	10.7	12.1	0.39	-	0.408	-	6.02	6.18	-	-	6.56	5.54	3.23	-	3.1	
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-	<0.000010	-	<0.000010	<0.000010	-	-	<0.000010	<0.000010	<0.000010	-	<0.000010	
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.00034	0.000358	0.00073	0.00073	0.0145	-	0.0134	-	0.00996	0.0094	-	-	0.0109	0.0108	0.00217	-	0.0026	
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	<0.0010	0.00059	0.0063	0.0052	0.0098	-	0.012	-	0.0154	0.0157	-	-	0.0146	0.0164	0.00547	-	0.00569	
Phosphorus (P)-Dissolved	mg/L	-	-	<0.050	<0.050	<0.050	<0.25	0.43	-	0.449	-	0.086	0.082	-	-	0.072	0.063	0.097	-	0.083	
Potassium (K)-Dissolved	mg/L	-	-	2.65	2.6	8.5	8.4	11.2	-	10.2	-	8.71	8.61	-	-	9.11	9.99	5.94	-	5.88	
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00031	0.00023	0.00027	0.00034	0.00057	-	0.00067	-	0.00041	0.00038	-	-	0.00071	0.00049	0.00016	-	0.00027	
Silicon (Si)-Dissolved	mg/L	-	-	5.08	5.02	6.38	6.3	14.9	-	16.2	-	10	9.85	-	-	10.8	10.5	10.1	-	9.67	
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000020	<0.000010	<0.000020	0.000023	0.000056	-	0.000083	-	0.000019	0.00002	-	-	0.000028	0.000015	<0.000010	-	0.000021	
Sodium (Na)-Dissolved	mg/L	-	-	8.9	9.11	76.1	78	15.8	-	17.2	-	21.4	21.8	-	-	22.5	22.7	10.8	-	9.91	
Strontium (Sr)-Dissolved	mg/L	-	-	0.969	0.979	1.09	1.14	0.234	-	0.226	-	0.836	0.789	-	-	0.907	0.854	0.8	-	0.92	
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.000020	<0.000010	0.000036	0.000037	<0.000020	-	<0.000020	-	<0.000010	<0.000010	-	-	0.000011	<0.000010	0.000108	-	0.000125	
Tin (Sn)-Dissolved	mg/L	-	-	<0.00020	<0.00010	<0.00020	<0.00020	<0.00020	-	<0.00020	-	0.00041	0.00019	-	-	0.00017	0.00013	<0.00010	-	<0.00010	
Titanium (Ti)-Dissolved	mg/L	-	-	<0.020	<0.010	<0.020	<0.020	<0.020	-	<0.020	-	<0.010	<0.010	-	-	<0.010	<0.010	<0.010	-	<0.010	
Uranium (U)-Dissolved	mg/L	0.015	-	0.0131	0.0128	0.00133	0.00126	0.00194	-	0.00215	-	0.00076	0.00075	-	-	0.000904	0.000865	0.00067	-	0.000764	
Vanadium (V)-Dissolved	mg/L	-	-	<0.0020	<0.0010	0.0026	<0.0020	<0.0020	-	<0.0020	-	0.0074	0.0071	-	-	0.0074	0.006	0.0029	-	0.0025	
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.006	0.0073	0.0187	0.0151	0.0052	-	0.0035	-	0.0313	0.026	-	-	0.0258	0.0188	0.0585	-	0.0614	
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

2013 Analytical Data

			Sample ID	MW09-01	MW09-01	MW09-01	MW09-02	FIELD DUP B	MW09-02	FIELD DUP B	MW09-02	FIELD DUP B	MW09-03	MW09-03	MW09-03	MW09-04	MW09-04	MW09-07	MW09-07	
				STANDARD	ALTERNATE	ALTERNATE	STANDARD	STANDARD	ALTERNATE	ALTERNATE	ALTERNATE	ALTERNATE	STANDARD	ALTERNATE	ALTERNATE	STANDARD	ALTERNATE	ALTERNATE	STANDARD	ALTERNATE
				PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI	PRESERVATI
			Date Sampled	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	17/09/2013	18/09/2013	18/09/2013	
			Lab ID	BC WQG																
	Units	CCME-FAL ^{1, 2, 3, 4}	(Yukon CSR in bold)																	
Physical Properties																				
Conductivity	uS/cm	-	-	1740	-	-	2750	2790	-	-	-	-	2490	-	-	2480	-	-	1180	-
Hardness (as CaCO3)	mg/L	-	-	858	-	882	1860	1860	-	-	1930	1930	1520	-	1600	1610	-	1670	787	-
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.42	-	-	7.25	7.33	-	-	-	-	7.45	-	-	7.77	-	-	6.38	-
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.42	-	-	7.25	7.33	-	-	-	-	7.45	-	-	7.77	-	-	6.38	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																				
Acidity (as CaCO3)	mg/L	-	-																	
Alkalinity, Total (as CaCO3)	mg/L	-	-	341	-	-	97.4	97.9	-	-	-	-	41.7	-	-	40	-	-	172	-
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	12.8	-	-	10.3	9.86	-	-	-	-	7.72	-	-	8.75	-	-	1.48	-
Bicarbonate	mg/L	-	-	341	-	-	97.4	97.9	-	-	-	-	41.7	-	-	40	-	-	172	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	<1.0	-	-	<1.0	<1.0	-	-	-	-	<1.0	-	-	<1.0	-	-	<1.0	-
Chloride (Cl)	mg/L	120	150	<5.0	-	-	<10	<10	-	-	-	-	<10	-	-	<10	-	-	<5.0	-
Fluoride (F)	mg/L	0.12	-	<0.20	-	-	0.75	0.73	-	-	-	-	0.64	-	-	0.66	-	-	<0.20	-
Nitrate (as N)	mg/L	13	3	<0.050	-	-	<0.10	0.16	-	-	-	-	2.68	-	-	<0.10	-	-	0.477	-
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.010	-	-	0.024	0.031	-	-	-	-	0.098	-	-	<0.020	-	-	0.034	-
Sulfate (SO4)	mg/L	-	Varies ¹⁶	753	-	-	1860	1890	-	-	-	-	1660	-	-	1660	-	-	624	-
Sulfide	mg/L	-	-	0.272	-	-	<0.020	-	-	-	-	-	-	-	-	-	-	-	0.026	-
Cyanides	mg/L																			
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	0.01	-	<0.0050	<0.0050	0.006	<0.0050	-	-	<0.0050	<0.0050	-	<0.0050	<0.0050	-	<0.0050	<0.0050
Cyanide, Total	meq/L	0.005	-	0.506	0.512	-	<0.0050	0.0072	0.02	0.0093	-	-	0.0066	<0.0050	-	<0.0050	<0.0050	-	<0.0050	<0.0050
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	7.11	8.99	-	<0.50	<0.50	<0.50	<0.50	-	-	0.57	<0.50	-	0.56	<0.50	-	0.61	<0.50
Organic / Inorganic Carbon																				
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	76.3	-	-	17.2	17.6	-	-	-	-	7.94	-	-	7.4	-	-	31.1	-
Total Organic Carbon	mg/L	-	-	76	-	-	6.31	6.35	-	-	-	-	11.9	-	-	5.92	-	-	31.4	-
Dissolved Metals																				
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0422	-	0.0311	<0.0020	0.0024	-	-	<0.0020	<0.0020	<0.0020	-	<0.0020	0.0031	-	<0.0020	0.0414	-
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00081	-	0.00071	0.00397	0.00429	-	-	0.0044	0.00462	0.654	-	0.777	0.222	-	0.268	0.00394	-
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.087	-	0.0671	11	10.2	-	-	9.15	11.7	3.55	-	3.78	1.42	-	1.04	0.512	-
Barium (Ba)-Dissolved	mg/L	-	10	0.116	-	0.11	0.00676	0.00687	-	-	0.00671	0.00697	0.00998	-	0.0106	0.00705	-	0.00644	0.0236	-
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00010	-	<0.00010	<0.00020	<0.00020	-	-	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00050	-	<0.00050	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Boron (B)-Dissolved	mg/L	1.5	1.2	0.101	-	0.102	0.095	0.102	-	-	0.101	0.098	0.152	-	0.183	0.251	-	0.255	0.062	-
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000328	-	0.000319	0.000825	0.000948	-	-	0.00094	0.000908	0.000318	-	0.000333	0.00005	-	0.000051	0.000127	-
Calcium (Ca)-Dissolved	mg/L	-	-	257	-	269	476	463	-	-	495	492	487	-	515	479	-	507	247	-
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00168	-	0.00131	<0.00020	<0.00020	-	-	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	-	<0.00020	0.00075	-
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00582	-	0.00579	0.0119	0.0124	-	-	0.0122	0.0125	0.00155	-	0.00165	0.00119	-	0.00126	0.0218	-
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00064	-	0.00091	0.00045	<0.00040	-	-	<0.00040	0.00057	0.00369	-	0.0038	0.00079	-	<0.00040	0.00693	-
Iron (Fe)-Dissolved	mg/L	0.3	-	27.9	-	28.3	18.6	17.1	-	-	15	1.1	<0.010	-	<0.010	<0.010	-	<0.010	3.98	-
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.000696	-	0.000562	0.00075	0.00092	-	-	0.00064	0.00075	0.00066	-	0.00073	0.0162	-	0.00152	0.00147	-
Lithium (Li)-Dissolved	mg/L	-	-	0.00141	-	0.00106	0.014	0.013	-	-	0.0131	0.0134	<0.0010	-	0.0014	0.0034	-	0.0033	0.0017	-
Magnesium (Mg)-Dissolved	mg/L	-	-	52.6	-	50.9	164	171	-	-	169	171	73.7	-	77.1	102	-	97	41.4	-
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	5.84	-	5.98	16.3	16	-	-	15.9	16.5	1.21	-	1.26	2.77	-	2.62	15.6	-
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.000010	-	<0.000010	<0.000010	<0.000010	-	-	<0.000010	<0.000010	<0.000010	-	<0.000010	<0.000010	-	<0.000010	<0.000010	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.00123	-	0.00133	0.00767	0.00825	-	-	0.00836	0.00811	0.00768	-	0.00889	0.00708	-	0.00722	0.00066	-
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.00289	-	0.00308	0.004	0.0041	-	-	0.0041	0.0042	0.0014	-	0.0014	<0.0010	-	<0.0010	0.0218	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.119	-	<0.25	<0.050	<0.050	-	-	<0.10	<0.050	0.066	-	0.069	<0.050	-	<0.050	<0.050	-
Potassium (K)-Dissolved	mg/L	-	-	10.4	-	10.5	29	28.1	-	-	25.5	30	39.5	-	41.8	41.2	-	41.3	11.4	-
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00024	-	0.00049	<0.00020	<0.00020	-	-	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Silicon (Si)-Dissolved	mg/L	-	-	7.04	-	7.08	7.99	8.16	-	-	8.12	7.76	9.95	-	10.3	8.21	-	7.16	10.1	-
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	0.00001	-	0.000015	<0.000020	<0.000020	-	-	<0.000020	<0.000020	0.000021	-	0.00003	<0.000020	-	<0.000020	0.00019	-
Sodium (Na)-Dissolved	mg/L	-	-	69.9	-	69.1	32.3	31.6	-	-	31.4	33	60.6	-	63.9	51.1	-	56.7	48.3	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.744	-	0.742	0.872	0.894	-	-	0.91	0.905	1.19	-	1.41	1.24	-	1.26	0.614	-
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.000010	-	<0.000010	0.000381	0.000402	-	-	0.000408	0.000399	<0.000020	-	<0.000020	<0.000020	-	<0.000020	<0.000020	-
Tin (Sn)-Dissolved	mg/L	-	-	<0.00010	-	<0.00010	<0.00020	<0.00020	-	-	<0.00020	<0.00020	0.00046	-	0.00042	<0.00020	-	<0.00020	<0.00020	-
Titanium (Ti)-Dissolved	mg/L	-	-	<0.010	-	<0.010	<0.020	<0.020	-	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	-	<0.020	<0.020	-
Uranium (U)-Dissolved	mg/L	0.015	-	0.000804	-	0.000812	0.00101	0.00106	-	-	0.00106	0.00103	0.000395	-	0.000456	0.000143	-	0.000121	0.000718	-
Vanadium (V)-Dissolved	mg/L	-	-	0.0085	-	0.0064	<0.0020	<0.0020	-	-	<0.0020	<0.0020	<0.0020	-	<0.0020	<0.0020	-	<0.0020	<0.0020	-
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.469	-	0.422	0.417	0.454	-	-	0.435	0.44	0.03	-	0.0313	2.78	-	3.78	0.316	-
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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			Sample ID	MW09-07 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-08 STANDARD PRESERVATI ON	FIELD DUP C STANDARD PRESERVATI ON	MW09-08 ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)	FIELD DUP C ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)	MW09-08 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	FIELD DUP C ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-16 STANDARD PRESERVATI ON	MW09-16 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-17 STANDARD PRESERVATI ON	MW09-17 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-18 STANDARD PRESERVATI ON	MW09-18 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-19 STANDARD PRESERVATI ON	FIELP DUP D STANDARD PRESERVATI ON	MW09-19 ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)	FIELP DUP D ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)			
				Date Sampled	18/09/2013	18/09/2013	18/09/2013	18/09/2013	18/09/2013	18/09/2013	18/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013
				Lab ID																			
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																				
Physical Properties																							
Conductivity	uS/cm	-	-	-	193	194	-	-	-	-	1420	-	2390	-	1970	-	1650	1560	-	-			
Hardness (as CaCO3)	mg/L	-	-	718	95	89.2	-	-	81.1	87.5	1050	1090	2010	2080	1890	1980	1410	1430	-	-			
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	6.51	6.49	-	-	-	-	6.89	-	6.94	-	7.01	-	6.84	6.83	-	-			
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	-	6.51	6.49	-	-	-	-	6.89	-	6.94	-	7.01	-	6.84	6.83	-	-			
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Anions and Nutrients																							
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	113	112	-	-	-	-	319	-	503	-	402	-	493	491	-	-			
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	-	1.97	2.02	-	-	-	-	<0.005	-	<0.005	-	0.0166	-	2.76	3.03	-	-			
Bicarbonate	mg/L	-	-	-	113	112	-	-	-	-	319	-	503	-	402	-	493	491	-	-			
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Carbonate	mg/L	-	-	-	<1.0	<1.0	-	-	-	-	<1.0	-	<1.0	-	<1.0	-	<1.0	<1.0	-	-			
Chloride (Cl)	mg/L	120	150	-	<0.500	<0.500	-	-	-	-	<5.0	-	<10	-	<10	-	<5.0	<5.0	-	-			
Fluoride (F)	mg/L	0.12	-	-	0.17	0.181	-	-	-	-	0.2	-	<0.40	-	<0.40	-	<0.20	0.21	-	-			
Nitrate (as N)	mg/L	13	3	-	0.0138	<0.0050	-	-	-	-	0.2	-	0.11	-	0.23	-	0.146	0.139	-	-			
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	-	0.0028	0.0011	-	-	-	-	<0.010	-	<0.020	-	<0.020	-	<0.010	<0.010	-	-			
Sulfate (SO4)	mg/L	-	Varies ¹⁶	-	<0.50	<0.50	-	-	-	-	747	-	1580	-	1180	-	794	797	-	-			
Sulfide	mg/L	-	-	-	0.074	0.069	-	-	-	-	-	-	-	-	-	-	0.184	-	-	-			
Cyanides	mg/L																						
Cyanide, Weak Acid Diss	mg/L	-	0.005	-	<0.0050	<0.0050	<0.0050	<0.0050	-	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050			
Cyanide, Total	meq/L	0.005	-	-	<0.0050	<0.0050	<0.0050	<0.0050	-	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050			
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Thiocyanate (SCN)	mg/L	-	-	-	<0.50	<0.50	<0.50	<0.50	-	-	<0.50	-	<0.50	-	<0.50	-	0.51	<0.50	<0.50	<0.50			
Organic / Inorganic Carbon																							
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Total Inorganic Carbon	mg/L	-	-	-	24.1	23.6	-	-	-	-	78.7	-	59.7	-	80.6	-	115	116	-	-			
Total Organic Carbon	mg/L	-	-	-	24.5	28.4	-	-	-	-	6.08	-	5.7	-	5.75	-	35.2	37.6	-	-			
Dissolved Metals																							
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.031	0.0938	0.0904	-	-	0.09	0.0923	0.0013	<0.0010	0.0022	<0.0020	<0.0020	<0.0020	0.0097	0.0105	-	-			
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00522	0.00026	0.00026	-	-	0.00028	0.00026	0.061	0.0591	0.00037	0.0004	0.00022	0.00021	0.0002	0.00021	-	-			
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.418	0.377	0.362	-	-	0.369	0.386	0.0106	0.0106	0.0225	0.0243	0.0613	0.0649	0.0994	0.0867	-	-			
Barium (Ba)-Dissolved	mg/L	-	10	0.0205	0.107	0.107	-	-	0.106	0.109	0.0127	0.0123	0.00781	0.0086	0.00885	0.00919	0.0518	0.0541	-	-			
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00020	<0.00010	<0.00010	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00010	<0.00010	-	-			
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0010	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	-	-			
Boron (B)-Dissolved	mg/L	1.5	1.2	0.057	<0.010	<0.010	-	-	<0.010	<0.010	0.085	0.082	0.043	0.044	<0.020	<0.020	0.324	0.344	-	-			
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000208	<0.000010	<0.000010	-	-	<0.000010	0.000016	0.0194	0.0192	<0.000020	<0.000020	0.000055	0.000053	<0.000010	<0.000010	-	-			
Calcium (Ca)-Dissolved	mg/L	-	-	220	29.1	26.8	-	-	24.4	26.3	249	249	365	378	366	374	306	309	-	-			
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00072	0.00119	0.00121	-	-	0.00114	0.00122	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00020	0.00034	0.00037	-	-			
Cobalt (Co)-Dissolved	mg/L																						

2013 Analytical Data

			Sample ID	MW09-19 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	FIELP DUP D ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-21 STANDARD PRESERVATI ON	MW09-21 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-22 STANDARD PRESERVATI ON	MW09-22 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-23 STANDARD PRESERVATI ON	MW09-23 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	MW09-24 STANDARD PRESERVATI ON	MW09-24 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	GLL07-02 STANDARD PRESERVATI ON	GLL07-02 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	GLL07-03 ALTERNATE PRESERVATI ON #1 (SCN WITH HNO3)	GLL07-03 ALTERNATE PRESERVATI ON #2 (SULPHIDE REMOVED)	GLL07-03 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)	W1410383- BH02 STANDARD PRESERVATI ON	W1410383- BH02 ALTERNATE PRESERVATI ON #3 (UNPRESERV ED)		
				Date Sampled	19/09/2013	19/09/2013	19/09/2013	19/09/2013	18/09/2013	18/09/2013	19/09/2013	18/09/2013	19/09/2013	18/09/2013	18/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	19/09/2013	18/09/2013	18/09/2013
				Lab ID																		
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																			
Physical Properties																						
Conductivity	uS/cm	-	-	-	-	1240	-	1030	-	1960	-	808	-	329	-	-	-	-	920	-		
Hardness (as CaCO3)	mg/L	-	-	1460	1460	786	832	637	650	1540	1530	590	612	179	168	-	-	731	501	511		
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	-	6.52	-	6.05	-	6.84	-	7.41	-	6.55	-	-	-	-	7.65	-		
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	-	-	6.52	-	6.05	-	6.84	-	7.41	-	6.55	-	-	-	-	7.65	-		
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Anions and Nutrients																						
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	-	319	-	61.4	-	256	-	201	-	83.9	-	-	-	-	-	-		
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	-	-	12.4	-	1.34	-	3.86	-	0.0079	-	6.8	-	-	-	-	0.0224	-		
Bicarbonate	mg/L	-	-	-	-	319	-	61.4	-	256	-	201	-	83.9	-	-	-	-	264	-		
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Carbonate	mg/L	-	-	-	-	<1.0	-	<1.0	-	<1.0	-	<1.0	-	<1.0	-	-	-	-	-	-		
Chloride (Cl)	mg/L	120	150	-	-	<5.0	-	<5.0	-	<10	-	<5.0	-	<0.50	-	-	-	-	<5.0	-		
Fluoride (F)	mg/L	0.12	-	-	-	<0.20	-	<0.20	-	<0.40	-	<0.20	-	0.053	-	-	-	-	<0.20	-		
Nitrate (as N)	mg/L	13	3	-	-	<0.050	-	3.67	-	<0.10	-	4.1	-	0.697	-	-	-	-	0.808	-		
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	-	-	<0.010	-	0.601	-	<0.020	-	<0.010	-	<0.0010	-	-	-	-	<0.010	-		
Sulfate (SO4)	mg/L	-	Varies ¹⁶	-	-	538	-	569	-	1330	-	327	-	98.3	-	-	-	-	368	-		
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Cyanides	mg/L																					
Cyanide, Weak Acid Diss	mg/L	-	0.005	-	-	<0.0050	-	0.0529	-	<0.0050	-	<0.0050	-	<0.0050	-	-	<0.0050	-	<0.0050	-		
Cyanide, Total	meq/L	0.005	-	-	-	0.008	-	0.178	-	0.0081	-	0.027	-	<0.0050	-	-	<0.0050	-	<0.0050	-		
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Thiocyanate (SCN)	mg/L	-	-	-	-	1.11	-	0.57	-	<0.50	-	0.51	-	0.59	-	<0.50	<0.50	-	0.53	-		
Organic / Inorganic Carbon																						
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total Inorganic Carbon	mg/L	-	-	-	-	78.8	-	8.5	-	52.6	-	46.7	-	19.1	-	-	-	-	63.6	-		
Total Organic Carbon	mg/L	-	-	-	-	90.9	-	28	-	22.2	-	8.59	-	11.6	-	-	-	-	9.74	-		
Dissolved Metals																						
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.01	0.0074	0.128	0.0877	0.0421	0.0235	0.0194	0.0162	0.0028	0.0014	0.0109	0.0113	-	-	<0.0010	0.0025	<0.0010		
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00023	0.00022	0.00018	0.00019	0.00017	0.00012	0.00042	0.00042	0.0002	0.00019	0.00058	0.00058	-	-	<0.00010	0.00021	0.00022		
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0955	0.0687	0.104	0.0837	0.00727	0.00393	0.0108	0.0104	0.00163	0.00152	0.00127	0.00121	-	-	<0.00010	0.00243	0.00278		
Barium (Ba)-Dissolved	mg/L	-	10	0.053	0.0516	0.166	0.148	0.132	0.126	0.0958	0.0976	0.0451	0.0463	0.0269	0.0264	-	-	0.00939	0.124	0.127		
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00020	<0.00010	<0.00010	<0.00010	<0.00010	-	-	<0.00010	<0.00010	<0.00010		
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050		
Boron (B)-Dissolved	mg/L	1.5	1.2	0.364	0.346	0.022	0.022	0.02	0.019	0.127	0.125	0.015	0.014	<0.010	<0.010	-	-	<0.010	0.015	0.015		
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	<0.000020	<0.000010	0.000048	0.000057	0.000034	0.000023	0.000041	0.000066	0.000058	0.000057	0.000205	0.00017	-	-	0.00448	0.000445	0.000395		
Calcium (Ca)-Dissolved	mg/L	-	-	325	308	251	270	208	215	454	459	172	172	52	48.6	-	-	220	132	127		
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00032	0.00032	0.00205	0.00157	0.00063	0.00036	0.00043	0.00046	0.00051	0.00049	0.00016	0.00013	-	-	<0.00010	0.00015	0.00016		
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00204	0.00188	0.0135	0.0135	0.0117	0.0102	0.0199	0.0205	0.00068	0.00064	<0.00010	<0.00010	-	-	0.00695	0.00024	0.00014		
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	<0.00040	<0.00020	0.0004	0.00043	0.00151	0.00107	<0.00040	0.00063	0.00844	0.00708	0.00331	0.00287							

2013 Analytical Data

			Sample ID	W1410383	W1410383	DC-01	DC-02	DC-02	DC-03	DC-03	DC-05	DC-05	DC-06	DUP_01	DC-06	DUP_01	DC-07	DC-07	DC-09	DC-09	
				BH03	BH03			(UNPRESERV		(UNPRESERV		(UNPRESERV			(UNPRESERV	(UNPRESERV					
				STANDARD	ALTERNATE			ED)		ED)		ED)			ED)	ED)					
			Date Sampled	20/09/2013	20/09/2013	28/09/2013	27/09/2013	28/09/2013	30/09/2013	30/09/2013	30/09/2013	30/09/2013	28/09/2013	28/09/2013	28/09/2013	28/09/2013	28/09/2013	28/09/2013	28/09/2013	28/09/2013	28/09/2013
			Lab ID																		
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																		
Physical Properties																					
Conductivity	uS/cm	-	-	807	-	456	838	-	924	-	1280	-	1090	1090	-	-	474	-	459	-	
Hardness (as CaCO3)	mg/L	-	-	423	457	-	586	599	667	676	759	680	795	788	781	777	222	196	272	257	
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	6.44	-	7.79	6.99	-	7.68	-	7.27	-	7.35	7.35	-	-	7.05	-	6.33	-	
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.44	-	7.79	6.99	-	7.68	-	7.27	-	7.35	7.35	-	-	7.05	-	6.33	-	
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Anions and Nutrients																					
Acidity (as CaCO3)	mg/L	-	-																		
Alkalinity, Total (as CaCO3)	mg/L	-	-	200	-	86.7	300	-	251	-	250	-	785	789	-	-	137	-	51.6	-	
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	8.53	-	-	1.96	-	0.505	-	0.419	-	2.41	2.27	-	-	1.56	-	4.7	-	
Bicarbonate	mg/L	-	-	200	-	86.7	300	-	251	-	250	-	785	789	-	-	137	-	51.6	-	
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbonate	mg/L	-	-	<1.0	-	<1.0	<1.0	-	<1.0	-	<1.0	-	<1.0	<1.0	-	-	<1.0	-	<1.0	-	
Chloride (Cl)	mg/L	120	150	<5.0	-	1.76	<5.0	-	<5.0	-	<5.0	-	7.8	7.8	-	-	1.5	-	0.51	-	
Fluoride (F)	mg/L	0.12	-	<0.20	-	0.091	<0.20	-	0.25	-	0.2	-	0.51	0.42	-	-	0.145	-	0.041	-	
Nitrate (as N)	mg/L	13	3	<0.050	-	0.207	0.053	-	<0.050	-	<0.050	-	<0.050	<0.050	-	-	0.0306	-	0.0209	-	
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.010	-	0.0016	<0.010	-	<0.010	-	<0.010	-	<0.010	<0.010	-	-	0.0046	-	0.0018	-	
Sulfate (SO4)	mg/L	-	Varies ¹⁶	269	-	175	257	-	404	-	681	-	<5.0	<5.0	-	-	132	-	191	-	
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cyanides																					
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	-	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	<0.0050	-	-	<0.0050	-	<0.0050	-	
Cyanide, Total	meq/L	0.005	-	<0.0050	-	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	<0.0050	-	-	<0.0050	-	<0.0050	-	
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thiocyanate (SCN)	mg/L	-	-	0.72	-	-	<0.50	-	<0.50	-	<0.50	-	<0.50	<0.50	-	-	<0.50	-	<0.50	-	
Organic / Inorganic Carbon																					
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Inorganic Carbon	mg/L	-	-	33.9	-	-	71.4	-	58.9	-	-	-	174	183	-	-	30.9	-	12.4	-	
Total Organic Carbon	mg/L	-	-	88.2	-	-	127	-	220	-	19.1	-	128	131	-	-	42.8	-	64.7	-	
Dissolved Metals																					
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0487	0.0303	-	0.0167	<0.0010	0.0041	0.0019	0.0068	<0.0010	0.0254	0.0262	0.021	0.021	0.0194	0.015	0.0554	0.0498	
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00041	0.00037	-	0.00065	0.00033	0.00386	0.00393	0.00292	0.00151	0.00065	0.00056	0.00085	0.00082	0.00174	0.00129	0.00081	0.00086	
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0914	0.0724	-	0.186	0.0135	0.00648	0.00647	0.0438	0.0143	0.225	0.223	0.225	0.222	0.131	0.136	0.103	0.0936	
Barium (Ba)-Dissolved	mg/L	-	10	0.296	0.252	-	0.211	0.147	0.0357	0.0348	0.071	0.0578	0.332	0.329	0.331	0.322	0.0933	0.0899	0.082	0.0802	
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Boron (B)-Dissolved	mg/L	1.5	1.2	0.017	0.017	-	0.026	0.019	0.55	0.564	0.194	0.255	0.093	0.077	0.379	0.32	0.302	0.172	0.749	0.766	
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000022	0.00002	-	0.000086	<0.000010	0.0017	0.00142	0.000164	0.000268	<0.000010	0.000015	0.000018	<0.000010	0.000122	0.000011	0.000029	0.000014	
Calcium (Ca)-Dissolved	mg/L	-	-	118	128	-	150	147	171	167	179	155	199	197	194	193	63.1	55.4	74	69.8	
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00077	0.00056	-	0.00027	<0.00010	0.00071	0.00065	0.0006	0.0003	0.00181	0.00182	0.00239	0.00223	0.00094	0.00061	0.00216	0.00178	
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00159	0.00175	-	0.00234	0.00167	0.0043	0.00427	0.0108	0.0121	0.00444	0.00431	0.00469	0.00475	0.0032	0.00299	0.00435	0.00388	
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00048	0.00028	-	0.00052	<0.00020	0.0995	0.074	0.00232	0.00476	0.00063	0.00032	0.0012	0.00124	0.00529	0.00209	0.0153	0.0112	
Iron (Fe)-Dissolved	mg/L	0.3	-	82.7	72.8	-	34.8	5.93	0.042	0.044	6.86	3.14	18.2	17.7	9.08	6.24	11.5	11.4	21	19.3	
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.000138	0.000058	-	0.000277	<0.000050	0.000477	0.00051	0.000548	0.000246	0.00007	0.000059	0.000176	0.000165	0.0014	0.000398	0.00194	0.00142	
Lithium (Li)-Dissolved	mg/L	-	-	<0.00050	0.00072	-	<0.00050	<0.00050	0.00456	0.0066	0.00355	0.0045	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00123	<0.00050	0.00149	
Magnesium (Mg)-Dissolved	mg/L	-	-	31.1	33	-	51.4	56.6	58.4	62.7	75.9	71.1	72.4	71.6	72.3	71.4	15.6	13.9	21.2	20.1	
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	3.53	4.68	-	4.2	3.97	3.47	3.45	4.57	4.32	5.77	5.48	5.73	5.63	1.18	1.08	1.8	1.81	
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.000010	<0.000010	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.000553	0.000552	-	0.0043														

2013 Analytical Data

			Sample ID	DC-10	DC-10 (UNPRESERVED)	PC-01	PC-01 (UNPRESERVED)	PC-02	PC-05	PC-05 (UNPRESERVED)	HA-01	HA-01 (UNPRESERVED)	HA-02	HA-02 (UNPRESERVED)	HA-03	HA-03 (UNPRESERVED)	HA-04	HA-04 (UNPRESERVED)	HA-05	HA-05 (UNPRESERVED)	
			Date Sampled	29/09/2013	29/09/2013	30/09/2013	30/09/2013	27/09/2013	30/09/2013	30/09/2013	29/09/2013	29/09/2013	29/09/2013	29/09/2013	29/09/2013	29/09/2013	29/09/2013	29/09/2013	29/09/2013	29/09/2013	29/09/2013
			Lab ID																		
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																		
Physical Properties																					
Conductivity	uS/cm	-	-	666	-	362	-	334	285	-	865	-	774	-	761	-	238	-	803	-	
Hardness (as CaCO3)	mg/L	-	-	382	345	167	89.6	-	156	143	631	667	529	530	530	536	122	104	558	570	
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	6.32	-	6.99	-	7.9	7.25	-	7.22	-	6.41	-	6.59	-	6.05	-	6.87	-	
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.32	-	6.99	-	7.9	7.25	-	7.22	-	6.41	-	6.59	-	6.05	-	6.87	-	
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Anions and Nutrients																					
Acidity (as CaCO3)	mg/L	-	-																		
Alkalinity, Total (as CaCO3)	mg/L	-	-	127	-	142	-	69.9	79.6	-	223	-	128	-	135	-	25.6	-	192	-	
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	1.84	-	-	-	-	0.0146	-	0.468	-	1.25	-	0.92	-	3.31	-	0.81	-	
Bicarbonate	mg/L	-	-	127	-	142	-	69.9	79.6	-	223	-	128	-	135	-	25.6	-	192	-	
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbonate	mg/L	-	-	<1.0	-	<1.0	-	<1.0	<1.0	-	<1.0	-	<1.0	-	<1.0	-	<1.0	-	<1.0	-	
Chloride (Cl)	mg/L	120	150	2.04	-	1.98	-	0.67	0.54	-	<5.0	-	<5.0	-	<5.0	-	<5.0	-	<5.0	-	
Fluoride (F)	mg/L	0.12	-	0.155	-	0.216	-	0.172	0.073	-	0.29	-	<0.20	-	<0.20	-	0.042	-	<0.20	-	
Nitrate (as N)	mg/L	13	3	0.065	-	0.0738	-	0.0468	0.0668	-	0.175	-	<0.050	-	<0.050	-	0.0276	-	<0.050	-	
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.0047	-	0.0064	-	0.0032	0.0015	-	0.021	-	<0.010	-	<0.010	-	0.0014	-	<0.010	-	
Sulfate (SO4)	mg/L	-	Varies ¹⁶	277	-	51.4	-	92.4	75.8	-	383	-	365	-	384	-	85.5	-	365	-	
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cyanides	mg/L																				
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	-	<0.0050	-	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	-	
Cyanide, Total	meq/L	0.005	-	<0.0050	-	<0.0050	-	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	-	
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thiocyanate (SCN)	mg/L	-	-	0.66	-	<0.50	-	-	<0.50	-	<0.50	-	<0.50	-	<0.50	-	0.61	-	<0.50	-	
Organic / Inorganic Carbon																					
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Inorganic Carbon	mg/L	-	-	25.8	-	-	-	-	20.4	-	56	-	32.5	-	29.4	-	5.41	-	44.4	-	
Total Organic Carbon	mg/L	-	-	73.2	-	-	-	-	18.5	-	145	-	93.9	-	396	-	124	-	71.5	-	
Dissolved Metals																					
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.237	0.212	0.107	0.0419	-	0.0179	0.0098	0.0049	0.0047	0.0355	<0.0010	0.0132	<0.0010	0.0592	0.0413	0.0159	0.0049	
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00252	0.0018	0.00094	0.00066	-	0.00113	0.00135	0.00097	0.00134	0.00055	0.00011	0.00105	0.00037	0.00067	0.00052	0.00068	0.00076	
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0652	0.0425	0.0126	0.00352	-	0.00252	0.0021	0.0246	0.0214	0.0258	0.00125	0.0134	0.00156	0.0109	0.00767	0.0905	0.0367	
Barium (Ba)-Dissolved	mg/L	-	10	0.362	0.308	0.129	0.0555	-	0.0338	0.0303	0.198	0.185	0.0651	0.0714	0.079	0.0696	0.106	0.0982	0.161	0.142	
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Boron (B)-Dissolved	mg/L	1.5	1.2	0.655	0.682	0.373	0.08	-	0.023	0.02	0.155	0.18	0.284	0.113	0.722	0.337	0.159	0.1	0.053	0.057	
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000281	0.000276	0.0003	0.000152	-	0.000251	0.000137	<0.000010	<0.000010	0.000022	<0.000010	0.000296	0.00002	<0.000010	0.00001	0.000021	0.000028	
Calcium (Ca)-Dissolved	mg/L	-	-	112	101	49.6	25.7	-	44.6	40.5	163	166	129	119	135	129	36.4	31.1	148	143	
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00976	0.0064	0.0117	0.00291	-	0.00045	<0.00010	0.00019	0.00015	0.00014	<0.00010	0.00084	<0.00010	0.00091	0.00081	0.00021	<0.00010	
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0268	0.0242	0.00312	0.00104	-	0.00031	0.00014	0.0006	0.00081	0.00753	0.00435	0.00776	0.00387	0.00099	0.00063	0.00133	0.00143	
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.0429	0.0343																

2013 Analytical Data

			Sample ID	DUP_02	DUP_02 (UNPRESERV ED)	CH-13-03	CH-13-03 (UNPRESERV ED)	CH-13-04	CH-13-04 (UNPRESERV ED)	CH-13-05	CH-13-05 (UNPRESERV ED)
			Date Sampled	29/09/2013	29/09/2013	30/09/2013	30/09/2013	30/09/2013	30/09/2013	30/09/2013	30/09/2013
			Lab ID								
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)								
Physical Properties											
Conductivity	uS/cm	-	-	795	-	948	-	505	-	1820	-
Hardness (as CaCO3)	mg/L	-	-	561	573	690	725	310	314	1460	1530
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	-	-	-	-	-
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	6.82	-	7.45	-	7.53	-	6.06	-
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.82	-	7.45	-	7.53	-	6.06	-
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients											
Acidity (as CaCO3)	mg/L	-	-								
Alkalinity, Total (as CaCO3)	mg/L	-	-	197	-	192	-	134	-	44.1	-
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.78	-	0.113	-	0.024	-	0.073	-
Bicarbonate	mg/L	-	-	197	-	192	-	134	-	44.1	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	<1.0	-	<1.0	-	<1.0	-	<1.0	-
Chloride (Cl)	mg/L	120	150	<5.0	-	<5.0	-	2.66	-	<10	-
Fluoride (F)	mg/L	0.12	-	<0.20	-	<0.20	-	0.079	-	<0.40	-
Nitrate (as N)	mg/L	13	3	<0.050	-	0.311	-	0.163	-	2.72	-
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.010	-	<0.010	-	0.0072	-	0.029	-
Sulfate (SO4)	mg/L	-	Varies ¹⁶	359	-	491	-	169	-	1430	-
Sulfide	mg/L	-	-	-	-	-	-	-	-	-	-
Cyanides											
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	-
Cyanide, Total	meq/L	0.005	-	<0.0050	-	<0.0050	-	<0.0050	-	<0.0050	-
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.50	-	<0.50	-	<0.50	-	<0.50	-
Organic / Inorganic Carbon											
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	45.3	-	44.1	-	31.6	-	8.59	-
Total Organic Carbon	mg/L	-	-	16.2	-	26.3	-	14.1	-	7.53	-
Dissolved Metals											
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0142	0.0095	0.0085	0.0054	0.0079	0.0037	0.462	0.35
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00084	0.00067	0.00242	0.00224	0.0009	0.00094	0.0004	0.00043
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0876	0.0603	0.00272	0.00277	0.00109	0.00123	0.00073	0.00066
Barium (Ba)-Dissolved	mg/L	-	10	0.162	0.143	0.0476	0.0481	0.0341	0.0364	0.0175	0.0183
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00022	0.00021
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	1.5	1.2	0.039	0.067	0.021	0.02	<0.010	0.011	<0.020	<0.020
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000013	0.000027	0.00108	0.000967	0.00058	0.000579	0.145	0.15
Calcium (Ca)-Dissolved	mg/L	-	-	148	144	164	167	71.2	66	428	444
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.00010	<0.00010	0.00057	0.00054	0.00028	0.00025	0.00026	0.000

Notes:

	Exceeds CCME Guidelines
	Exceeds BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)
	Exceeds both CCME Guidelines and BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)

(1) CCME guideline exceedances shaded with light red.
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014

(5) CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(8) Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.00 if H<17
0.00004 – 0.00037 if H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46
0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.002 if H<82
0.002 – 0.004 if H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.001 if H<60
0.001 – 0.007 if H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15 if H>180

(13) BC water quality guideline for pH.

(14) Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(15) Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
0.02 if Chloride < 2 mg/L
0.04 if Chloride = 2 to 4 mg/L
0.06 if Chloride = 4 to 6 mg/L
0.08 if Chloride = 6 to 8 mg/L
0.10 if Chloride = 8 to 10 mg/L
0.20 if Chloride > 10 mg/L

(16) Sulphate varies with hardness as follows for BC WQG:
128 if H<=30
218 if H>=31 and H<=75
309 if H>=76 and H<=180
429 if H>=181 and H<=250
Site specific if H>250

(17) Aluminum varies with pH as follows for BC WQG FA:
WQG (µg/L) = e{1.6-3.327(median p.H)+0.402 (median Ph)^2} if pH < 6.5
0.05 if pH>= 6.5

(18) Cadmium varies with hardness as follows for BC WQG FA:
WQG = e[0.736 × ln(hardness*) – 4.943]

(19) Copper varies with hardness as follows for BC WQG FA:
2 if H≤50
WQG ≤ 0.04 (mean hardness*) if H>50

(20) Lead varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 3.31 + e[1.273 ln (hardness*) - 4.704] if H>8
* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO3.

(21) Manganese varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 0.0044 hardness* + 0.605 if H>= 37 and H<=450
* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO3.

(31) Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:
WQG = 0.0001 / (MeHg/total Hg)

(32) Silver varies with hardness in mg/L as follows for BC WQG:
0.0005 if H≤100
0.0015 if H>100

(33) Zinc varies with hardness in mg/L as follows for BC WQG:
0.075 if H≤90
WQG = 7.5 + 0.75 (hardness* - 90) if H>90

2014 Analytical Data

			Sample ID	GSI-DC-06-B	GSI-DC-07-B	GSI-DC-09-B	GSI-DC-10-B	MW09-16	MW09-17	MW09-18	MW09-19	CH-P-13-03/50	CH-P-13-05/50	GLL07-03	MP09-02	MP09-08	MP09-04	MP09-05
			Date Sampled	6/29/2014	6/29/2014	6/29/2014	6/29/2014	6/26/2014	6/29/2014	6/26/2014	6/26/2014	6/28/2014	6/27/2014	6/27/2014	6/27/2014	6/27/2014	6/28/2014	6/28/2014
			Lab ID	L1478849-16	L1478849-15	L1478849-11	L1478849-12	:L1478694-8	L1478849-19	L1478694-10	L1478694-6	L1478849-3	L1478694-1	L1478694-5	L1478694-4	L1478694-3	L1478849-4	L1478849-2
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	250	628	1151	709	1040	1594	2590	1285	-	1640	1014	304.9	416.6	959	1723
Hardness (as CaCO3)	mg/L	-	-	587	554	816	513	1130	2010	1860	1530	1040	1810	974	276	408	1070	1360
Dissolved Oxygen	mg/L	-	-	0.66	0.42	0.23	0.1	3.62	0.08	0.8	2.19	-	2.53	5.32	5.4	1.64	4.09	4.1
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.1	7.03	6.6	6.6	6.67	6.8	7.01	6.76	-	6.27	6.19	7.22	7.12	7.04	6.75
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	8.2	7.48	7.49	6.71	7.74	7.94	7.81	7.54	8.07	7.05	7.15	7.99	8.05	7.92	7.68
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.1	7.03	6.6	6.6	6.67	6.8	7.01	6.76	8.07	6.27	6.19	7.22	7.12	7.04	6.75
Total Dissolved Solids	mg/L	-	-	587	554	816	513	1130	2010	1860	1530	1040	1810	974	276	408	1070	1360
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-															
Alkalinity, Total (as CaCO3)	mg/L	-	-	204	131	145	72.1	312	451	464	443	338	116	74.8	121	226	243	330
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	2.92	1.81	3.03	2.32	<0.005	<0.005	0.0231	2.05	0.153	0.0349	0.185	0.0055	0.0309	0.0056	8.16
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<5.000	<5.000	<5.000	<5.000	<5.000	<10.000	<10.000	<10.000	21	<10.000	<5.000	<0.500	<0.500	<5.000	<10.000
Fluoride (F)	mg/L	0.12	-	<0.200	<0.200	<0.200	<0.200	<0.200	<0.400	<0.400	<0.400	<0.400	<0.400	<0.200	0.061	0.078	<0.200	<0.400
Nitrate (as N)	mg/L	13	3	0.277	<0.050	<0.050	<0.050	0.247	0.11	<0.100	<0.100	<0.100	0.42	<0.050	0.0717	<0.005	0.478	1.66
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.02	<0.010	<0.010	<0.010	<0.010	<0.020	<0.020	<0.020	<0.020	<0.020	<0.010	<0.001	<0.001	<0.010	0.035
Sulfate (SO4)	mg/L	-	Varies ¹⁶	583	466	820	519	835	1590	1410	1130	1050	1850	991	159	180	835	1310
Sulfide	mg/L	-	-	<0.020	<0.020	0.024	<0.020	<0.020	<0.020	<0.020	0.195	0.027	<0.020	0.384	<0.020	0.108	<0.020	<0.020
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0054
Cyanide, Total	meq/L	0.005	-	<0.005	<0.005	0.0099	<0.005	<0.005	<0.005	<0.005	<0.005	0.0088	<0.005	<0.005	<0.005	<0.005	0.0078	0.0366
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.5	<0.5	0.52	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.5
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	74.3	13	29.5	29.6	2.96	2.49	2.57	13.1	28.9	2.05	3.6	6.39	5.01	5.48	24.1
Total Organic Carbon	mg/L	-	-	19.7	17.2	29.9	13.6	63.9	108	102	98.1	78.4	16.5	9.95	25.3	49.5	52.3	70.4
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0507	0.0087	0.0205	0.142	0.0023	<0.002	<0.002	0.0109	0.0115	0.0444	0.0344	0.0056	0.0038	0.0017	0.0224
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00034	0.0002	0.00033	0.00031	0.0634	0.00043	0.00022	<0.0002	0.00105	<0.0005	<0.0005	0.00067	<0.0001	0.00185	0.0004
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.303	0.167	0.0361	0.0931	0.00902	0.0207	0.0537	0.0779	0.00422	0.00284	<0.0005	0.00156	0.0111	0.00097	0.0276
Barium (Ba)-Dissolved	mg/L	-	10	0.22	0.158	0.0702	0.443	0.0137	0.00842	0.0083	0.0488	0.0447	0.0111	0.00967	0.0553	0.043	0.0807	0.0811
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0001	<0.0001	<0.0001	<0.0002
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0025	<0.0025	<0.0005	<0.0005	<0.0005	<0.001
Boron (B)-Dissolved	mg/L	1.5	1.2	0.014	0.012	0.015	<0.01	0.131	0.096	<0.02	0.437	0.04	<0.05	<0.05	<0.01	<0.01	0.017	0.122
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	<0.00001	<0.00001	<0.00001	0.000011	0.0249	<0.00002	0.000058	<0.00002	0.000134	0.271	0.945	0.000054	<0.00001	0.00009	0.000961
Calcium (Ca)-Dissolved	mg/L	-	-	143	153	199	147	262	367	357	326	268	449	294	81.3	113	260	449
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00472	0.00035	0.00049	0.00207	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0001	<0.0001	0.00027	0.00079
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00282	0.00298	0.0034	0.0153	0.00018	<0.0002	<0.0002	0.00204	0.0212	0.0322	0.0238	0.00015	0.00056	0.00022	0.0157
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	<0.0002	<0.0002	0.00024	<0.0002	0.00558	0.00056	<0.0004	<0.0004	0.00095	0.131	<0.001	0.0008	<0.0002	0.00267	0.00378
Iron (Fe)-Dissolved	mg/L	0.3	-	20.5	31.5	61.7	82.4	<0.01	<0.01	<0.01	18.5	1.72	7.72	1.75	0.041	0.795	<0.01	21.5
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.000055	<0.00005	<0.00005	0.000139	0.0069	<0.0001	<0.0001	<0.0001	0.00027	0.00396	0.00049	<0.00005	<0.00005	<0.00005	<0.0001
Lithium (Li)-Dissolved	mg/L	-	-	<0.0005	0.00167	0.00059	0.00054	0.0086	0.0201	0.0202	0.0108	0.0035	0.0319	0.0245	0.00091	0.00395	0.00079	<0.001
Magnesium (Mg)-Dissolved	mg/L	-	-	55.5	41.5	77.7	35.5	115	266	235	174	90.7	167	58.4	17.8	30.9	102	57.4
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	4.87	2.41	1.97	11	0.0321	0.0369	0.375	4.54	16.7	30.4	10.4	0.013	0.852	0.0034	10.6
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.0096	0.000363	0.000346	0.000565	0.000089	<0.0001	<0.0001	0.00012	0.00404	0.00076	0.00043	0.000126	0.000477	0.000162	0.00053
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0194	0.00103	0.00176	0.00386	0.00328	<0.001	<0.001	<0.001	0.0339	0.0136	0.0499	<0.0005	<0.0005	<0.0005	0.0036
Phosphorus (P)-Dissolved	mg/L	-	-	0.159	0.061	0.142	<0.050	<0.050	<0.050	<0.050	0.234	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	3.53	3.25	3.9	3.58	5.95	7.58	7.29	7.38	8.84	5.18	2.45	0.86	1.16	2.72	9.57
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00051	<0.0001	0.00027	0.00023	<0.0001	<0.0002	<0.0002	0.00034	0.00089	<0.0005	<0.0005	<0.0001	<0.0001	0.00012	<0.0002
Silicon (Si)-Dissolved	mg/L	-	-	10.1	6.95	6.51	8.18	4.78	5	4.85	9.3	7.15	6.6	3.32	5.48	7	6.69	5.68
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00002	<0.00002	<0.00002	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00002
Sodium (Na)-Dissolved	mg/L	-	-	19.7	20	54.4	24.3	7.08	11.7	10.7	14.7	131	11	11	4.55	6.16	12.8	80.6
Strontium (Sr)-Dissolved	mg/L	-	-	0.726	0.474	0.633	0.555	0.586	1.1	1.08	1.16	0.777	0.647	0.334	0.652	1.29	0.927	1.13
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.00001	<0.00001	<0.00001	0.000016	0.00025	0.000103	0.00028	<0.00002	0.000029	0.000458	0.000391	<0.00001	<0.00001	<0.00001	0.000045
Tin (Sn)-Dissolved	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	0.00107	<0.0005	<0.0005	<0.0001	<0.0001	<0.0001	<0.0002
Titanium (Ti)-Dissolved	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.01	<0.01	<0.01	<0.02
Uranium (U)-Dissolved	mg/L	0.015	-	0.000084	0.000067	0.000157	0.000294	0.00304	0.00794	0.00781	0.00056	0.00809	0.000931	0.000117	0.00134	0.00316	0.00247	0.00205
Vanadium (V)-Dissolved	mg/L	-	-	0.0131	0.0013	0.0017	0.0107	<0.001	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<			

2014 Analytical Data

			Sample ID	MP09-09	MP09-10	MP09-11	MP09-12	MW09-02	MW09-03	MW09-04	MW09-07	MW09-08	MW09-21	MW09-22	MW09-23	MW09-24	GSI-DC-01B	GSI-DC-02B
			Date Sampled	6/29/2014	6/29/2014	6/29/2014	6/29/2014	6/27/2014	6/27/2014	6/27/2014	6/29/2014	6/28/2014	6/28/2014	6/27/2014	6/28/2014	6/28/2014	10/7/2014	10/7/2014
			Lab ID	L1478849-17	L1478849-21	L1478849-18	L1478849-14	L1478694-12	L1478694-14	L1478694-11	L1478849-13	L1478849-7	L1478849-1	L1478694-15	L1478849-6	L1478849-5	L1531123	L1531123
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	174.3	283	498.7	333.9	1670	1492	154.3	1542	216.7	1430	1684	1468	761	-	-
Hardness (as CaCO3)	mg/L	-	-	197	280	485	444	1580	1560	1720	1300	139	1600	1700	1350	907	320	544
Dissolved Oxygen	mg/L	-	-	0.25	7.04	0.37	5.93	0.14	0.76	0.28	3.1	1.41	1.91	2.58	4.32	5.77	-	-
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	9.66	9.21	7.54	7.46	7.13	7.22	8.64	6.8	6.82	6.82	5.82	7.12	7.34	-	-
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	8.74	9.07	8.14	8.16	6.96	7.84	7.96	7.6	7.49	7.4	6.52	7.83	8.06	-	7.98
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	9.66	9.21	7.54	7.46	7.13	7.22	8.64	6.8	6.82	6.82	5.82	7.12	7.34	-	7.98
Total Dissolved Solids	mg/L	-	-	197	280	485	444	1580	1560	1720	1300	139	1600	1700	1350	907	-	-
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-															
Alkalinity, Total (as CaCO3)	mg/L	-	-	80.2	108	581	429	34.5	155	97.6	225	147	359	35.7	326	272	-	244
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	4.12	7.74	5.03	3.91	12.1	2.37	6.82	4.6	2.01	11.6	2.27	7.77	<0.005	-	-
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	2.5	2.84	<5.000	<0.500	<10.000	<10.000	<10.000	<10.000	<0.500	<10.000	<10.000	<10.000	<5.000	-	<2.500
Fluoride (F)	mg/L	0.12	-	1.65	1.63	0.49	0.356	0.47	<0.400	<0.400	<0.400	0.077	<0.400	<0.400	<0.400	<0.200	-	<0.100
Nitrate (as N)	mg/L	13	3	0.0191	0.0306	<0.050	0.0218	<0.100	<0.100	0.31	<0.100	<0.005	<0.100	11.9	<0.100	1.45	-	0.298
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.0063	0.0023	<0.010	0.0017	<0.020	<0.020	0.059	<0.020	0.0017	<0.020	0.326	<0.020	<0.010	-	0.0104
Sulfate (SO4)	mg/L	-	Varies ¹⁶	136	253	31.2	48.5	1860	1640	1750	1320	12.9	1410	1990	1300	645	-	301
Sulfide	mg/L	-	-	<0.100	<0.020	0.03	<0.020	<0.020	<0.020	<0.020	0.097	0.069	<0.020	0.023	<0.020	<0.020	-	-
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	0.0319	3.49	<0.005	<0.005	0.0076	0.0129	<0.005	<0.005	<0.005	0.007	0.0132	<0.005	<0.005	-	<0.005
Cyanide, Total	meq/L	0.005	-	0.292	49.9	0.0323	0.0367	0.0557	0.0437	<0.005	<0.005	<0.005	0.0107	0.0225	0.0097	<0.005	-	<0.005
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.5	0.85	0.62	<0.5	1.36	<0.5	<0.5	<0.5	<0.5	0.58	<0.5	<0.5	<0.5	-	-
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	28.3	45.6	48.4	13.8	5.82	6.7	5.88	20.3	18.3	23.8	10.8	14	6.44	-	-
Total Organic Carbon	mg/L	-	-	9.2	66.4	89.1	89.8	8.2	27.9	14.4	46	33.2	73.3	4.9	67	59.7	-	-
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0048	0.0088	0.005	0.0018	<0.005	<0.005	<0.002	0.0306	0.0686	0.0588	0.0396	0.0154	0.0033	0.003	0.0026
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.0897	0.0907	0.0195	0.0331	0.00345	0.503	0.342	0.0085	0.00024	0.00031	0.00027	0.00034	0.00033	0.00117	0.00032
Arsenic (As)-Dissolved	mg/L	0.005	0.005	18.7	9.72	11.3	5.41	20.3	1.28	3.83	0.564	0.198	0.0576	0.00666	0.00119	0.00319	0.00353	0.00537
Barium (Ba)-Dissolved	mg/L	-	10	0.00127	0.00083	0.0884	0.0532	0.00688	0.0364	0.006	0.027	0.128	0.147	0.0554	0.0649	0.0607	0.0246	0.115
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0002	<0.0002	<0.0002	<0.0001	<0.0005	<0.0005	<0.0002	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.001	<0.001	<0.001	<0.0005	<0.0025	<0.0025	<0.001	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005
Boron (B)-Dissolved	mg/L	1.5	1.2	0.299	0.342	0.037	0.052	0.058	0.126	0.247	0.089	<0.01	0.11	0.024	0.18	0.014	0.058	<0.01
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000102	0.000658	<0.00002	0.000313	0.000627	0.000895	0.000037	0.000049	<0.00001	0.000029	0.000094	0.000032	0.0001	0.000067	0.000115
Calcium (Ca)-Dissolved	mg/L	-	-	77.6	111	112	103	473	477	487	396	41.6	474	587	355	241	89.5	141
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.0002	<0.0002	0.00152	0.00029	<0.0005	<0.0005	<0.0002	0.0004	0.00093	0.00087	0.00034	0.00026	0.00035	0.00708	<0.0001
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0402	0.0468	0.00189	0.00169	0.0115	0.00422	0.001	0.0243	0.00124	0.016	0.0153	0.0258	0.00014	0.00016	0.00138
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.383	0.0349	0.00049	0.00052	<0.001	<0.001	<0.0004	0.00224	<0.0002	<0.0004	0.00112	<0.0004	0.00911	0.0512	0.0043
Iron (Fe)-Dissolved	mg/L	0.3	-	0.401	0.229	11.7	3.89	37	0.218	<0.01	34.2	47.7	45	87.4	6.21	0.014	0.026	1.64
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.00185	0.0028	0.00144	0.00631	<0.00025	<0.00025	0.00022	0.00024	0.000052	<0.0001	0.0002	<0.0001	0.000974	0.00209	0.000223
Lithium (Li)-Dissolved	mg/L	-	-	<0.001	<0.001	0.0031	0.00208	0.0192	<0.0025	0.0056	0.0082	<0.0005	<0.001	<0.001	<0.001	0.00096	0.00066	0.00167
Magnesium (Mg)-Dissolved	mg/L	-	-	0.81	0.88	49.8	45.6	96.6	90.5	121	76.6	8.43	101	57.5	113	74.1	23.4	46.6
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	0.0591	0.0291	4.15	2.7	30.7	50.2	4.25	15.4	3.52	14.9	17.9	12.2	0.00292	0.0239	2.89
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	0.000036	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.013	0.0142	0.00818	0.00255	0.00564	0.00371	0.00758	0.00343	0.000071	0.00043	0.00012	0.00611	0.000305	0.00818	0.000958
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0143	0.0146	0.0093	0.00521	0.0035	<0.0025	<0.001	0.0231	<0.0005	0.0016	0.0031	0.002	<0.0005	0.026	0.0111
Phosphorus (P)-Dissolved	mg/L	-	-	0.179	0.199	0.083	0.097	<0.050	0.06	0.072	<0.050	0.104	<0.050	<0.050	<0.050	<0.050	<0.05	<0.05
Potassium (K)-Dissolved	mg/L	-	-	8.18	10.5	8.22	5.23	67	20.6	39.5	22.1	1.45	12.9	5.92	15.7	1.85	4.4	3.09
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00183	0.0015	0.00032	<0.0001	<0.0005	<0.0005	<0.0002	<0.0002	0.00011	<0.0002	0.00039	<0.0002	0.0002	<0.0001	<0.0001
Silicon (Si)-Dissolved	mg/L	-	-	8.71	6.67	10.8	9.61	7	15.4	11.8	10.1	9.3	4.91	4.68	5.35	5.48	3.76	6.97
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	0.00189	0.00891	<0.00002	<0.00001	<0.00005	<0.00005	<0.00002	0.000113	<0.00001	<0.00002	0.000045	<0.00002	<0.00001	0.000011	<0.00001
Sodium (Na)-Dissolved	mg/L	-	-	22.7	28.1	21	3.5	64.1	26.2	43.5	59.5	1.44	26.3	82	89.7	8.3	4.16	4.94
Strontium (Sr)-Dissolved	mg/L	-	-	0.146	0.18	0.596	0.468	0.915	1.59	1.45	0.915	0.182	1.29	1.31	0.873	0.632	0.24	0.305
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.00002	0.000046	<0.00002	0.000084	0.000254	<0.00005	0.000082	<0.00002	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	0.000019	<0.00001
Tin (Sn)-Dissolved	mg/L	-	-	<0.0002	<0.0002	<0.0002	<0.0001	<0.0005	<0.0005	<0.0002	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	0.00399	0.00025
Titanium (Ti)-Dissolved	mg/L	-	-	<0.02	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01
Uranium (U)-Dissolved	mg/L	0.015	-	0.000542	0.000975	0.000762	0.000713	0.000678	0.00143	0.000227	0.00315	0.000077	0.00193	0.000229	0.00311	0.00584	0.000415	0.000397
Vanadium (V)-Dissolved	mg/L	-	-	<0.002	<0.002	0.0056	<0.001	<0.005	<0.005	<0.002	<0.002	0.003	0.0039	<0.002	<0.002	<0.001	<0.001	<0.001
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.009	0.0082	0.0206	0.0403	0.312	0.0065	0.953	1.61	0.0017	0.0025	0.0047	0.0299	0.0021	0.0305	0

2014 Analytical Data

			Sample ID	GS1-DC-03B	GS1-DC-06B	GS1-DC-06B	GS1-DC-07B	GS1-DC-08B	GS1-DC-09B	GS1-DC-10B	GS1-DC-10B	GS1-HA-01A	GS1-HA-02A	GS1-HA-03A	GS1-HA-04A	GS1-HA-05A	MW09-16	MW09-17		
			Date Sampled	10/7/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/7/2014	10/7/2014	10/7/2014	10/7/2014	10/7/2014	10/7/2014	10/7/2014	10/7/2014
			Lab ID	L1531123	L1531711	L1531711	L1531711	L1531711	L1531711	L1531711	L1531711	L1531711	L1531711	L1531123	L1531123	L1531123	L1531123	L1531123	L1531123	L1531123
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																	
Physical Properties																				
Conductivity	uS/cm	-	-	-	-	-	579	-	94.9	234.7	-	-	-	-	-	-	2154	2914		
Hardness (as CaCO3)	mg/L	-	-	685	734	749	261	560	194	548	555	566	372	512	104	502	1330	1880		
Dissolved Oxygen	mg/L	-	-	-	-	-	1.38	-	0.49	0.66	-	-	-	-	-	-	5.38	2.14		
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	-	6.9	-	6.01	6.15	-	-	-	-	-	-	6.55	6.7		
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	8.08	7.9	-	7.75	7.36	7.4	6.83	-	8.14	7.33	7.57	7.54	7.75	7.56	7.83		
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	8.08	7.9	-	6.9	7.36	6.01	6.15	-	8.14	7.33	7.57	7.54	7.75	6.55	6.7		
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Anions and Nutrients																				
Acidity (as CaCO3)	mg/L	-	-																	
Alkalinity, Total (as CaCO3)	mg/L	-	-	242	702	-	149	403	81	138	-	218	121	161	29.6	170	337	638		
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.129	2.9*	-	1.39	-	1.74	1.61	-	-	-	-	-	-	<0.005	<0.005		
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chloride (Cl)	mg/L	120	150	<5.000	10.3	-	0.56	3.2	<0.500	<5.000	-	<5.000	0.56	<2.500	<0.500	<2.500	<5.000	<10.000		
Fluoride (F)	mg/L	0.12	-	<0.200	0.33	-	0.081	0.14	0.054	<0.200	-	<0.200	0.142	<0.100	0.029	<0.100	<0.200	<0.400		
Nitrate (as N)	mg/L	13	3	<0.050	<0.050	-	<0.005	<0.025	<0.005	<0.050	-	<0.050	0.0126	<0.025	<0.005	0.054	0.14	0.17		
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.010	<0.010	-	<0.001	0.02	<0.001	<0.010	-	<0.010	0.0027	<0.005	<0.001	<0.005	<0.010	<0.020		
Sulfate (SO4)	mg/L	-	Varies ¹⁶	411	5	-	135	190	128	496	-	351	249	343	80.5	340	1020	1440		
Sulfide	mg/L	-	-	<0.020	0.02	-	0.024	-	<0.020	0.024	-	-	-	-	-	-	<0.020	<0.020		
Cyanides			mg/L																	
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	-	<0.005	-	-	-	<0.005	<0.005	<0.005		
Cyanide, Total	meq/L	0.005	-	<0.005	<0.005	-	<0.005	-	<0.005	<0.005	-	<0.005	-	-	-	<0.005	<0.005	<0.005		
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Thiocyanate (SCN)	mg/L	-	-	-	<0.5	-	<0.5	-	<0.5	<0.5	-	-	-	-	-	-	<0.5	<0.5		
Organic / Inorganic Carbon																				
Dissolved Organic Carbon	mg/L	-	-																	
Total Inorganic Carbon	mg/L	-	-	5.56	79.6	-	18.1	-	21.2	35.2	-	-	-	-	-	-	3.14	2.71		
Total Organic Carbon	mg/L	-	-	51.7	105	-	30.2	-	16.1	25.4	-	-	-	-	-	-	66.4	111		
Dissolved Metals																				
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0169	0.0012	0.0155**	0.0103	0.394	0.0477	0.142	0.134**	0.0033	0.0081	0.0234	0.0823	0.01	<0.002	<0.002		
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00066	0.00029	0.00026	0.00017	0.00185	0.00021	0.00035	0.00033	0.00023	0.00067	0.00027	0.00097	0.00014	0.069	0.00036		
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.00235	0.326	0.342	0.144	0.0945	0.0453	0.13	0.107	0.0112	0.00651	0.042	0.00917	0.0404	0.00808	0.0225		
Barium (Ba)-Dissolved	mg/L	-	10	0.0243	0.24	0.232	0.0715	0.18	0.0341	0.424	0.408	0.103	0.101	0.0848	0.042	0.116	0.0155	0.00778		
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002		
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001		
Boron (B)-Dissolved	mg/L	1.5	1.2	<0.01	<0.01	<0.01	0.011	0.11	0.012	<0.02	<0.02	<0.01	0.022	<0.01	<0.01	<0.01	0.112	0.079		
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000846	<0.00001	<0.00001	<0.00001	0.000038	<0.00001	<0.00002	<0.00002	0.000023	0.000122	0.000081	0.000026	0.000061	0.0286	<0.00002		
Calcium (Ca)-Dissolved	mg/L	-	-	177	177	181	73.7	154	49.7	152	154	136	94.6	125	26.4	133	307	346		
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00176	0.00181	0.00158	0.00045	0.0737	0.00086	0.00231	0.00221	0.0001	0.0001	0.00294	0.00066	0.00079	<0.0002	<0.0002		
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00115	0.0022	0.00219	0.00155	0.019	0.00096	0.0215	0.0218	0.00029	0.00085	0.00107	0.00051	0.00044	<0.0002	<0.0002		
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00227	0.00052	0.0002	<0.0002	0.00179	<0.0002	0.00097	<0.0004	0.00103	0.00704	0.00171	0.00198	0.00157	0.00553	0.00046		
Iron (Fe)-Dissolved	mg/L	0.3	-	0.013	23.2	22.4	14.3	125	14.2	68.7	66.7	2.43	20.3	55	8.36	14.6	<0.01	<0.01		
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.000165	0.000059	<0.00005	<0.00005	0.0018	<0.00005	0.00014	0.00014	0.000312	0.000186	0.000479	0.000449	0.000166	0.00451	<0.0001		
Lithium (Li)-Dissolved	mg/L	-	-	0.00684	<0.0005	<0.0005	0.0011	0.00129	<0.0005	<0.001	<0.001	0.00769	0.00209	0.00063	0.00116	0.00177	0.0115	0.0216		
Magnesium (Mg)-Dissolved	mg/L	-	-	59.3	71	71.7	18.8	42.6	16.9	40.7	41.1	55.1	33	48.3	9.12	41.1	137	247		
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	1.95	5.07	5.19	1.06	4.58	0.51	13	13.4	0.12	4.48	4.71	0.477	3.17	0.0297	<0.0001		
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001		
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.00236	0.0038	0.00368	0.000378	0.011	0.00021	0.0006	0.00057	0.00154	0.00235	0.00329	0.00114	0.00029	0.00011	<0.0001		
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.00892	0.00368	0.00362	0.00054	0.19	0.00059	0.0045	0.0046	0.00488	0.0142	0.0257	0.00466	0.00846	0.0046	<0.001		
Phosphorus (P)-Dissolved	mg/L	-	-	<0.05	0.251	0.244	0.083	0.218	0.164	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.088	<0.05	<0.05		
Potassium (K)-Dissolved	mg/L	-	-	2.94	3.95	3.94	2.37	6.82	2.22	2.22	2.23	3.69	3.25	2.16	0.24	1.85	5.81	6.96		
Selenium (Se)-Dissolved	mg/L	0.001	0.002	<0.0001	0.00054	0.00057	0.00016	0.00105	0.00013	0.00036	0.00031	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	0.00023	0.00024		
Silicon (Si)-Dissolved	mg/L	-	-	7.03	8	8	7.1	10.6	8.13	7.77	7.81	5.96	4.24	7.31	9.04	6.59	4.77	5.05		
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.00001	<0.00001	<0.00001	<0.00001	0.00002	<0.00001	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00002		
Sodium (Na)-Dissolved	mg/L	-	-	5.2	20.3	19.4	13.2	25.1	10.2	23.7	23.1	4.85	3.33	5	2.12	5.4	8.59	12.4		
Strontium (Sr)-Dissolved	mg/L	-	-	0.439	0.897	0.869	0.239	0.585	0.159	0.579	0.56	0.37	0.272	0.407	0.0959	0.307	0.688	1.08		
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	0.000024	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00002	0.000014	0.000014	<0.00001	<0.00001	0.000011	0.000258	0.000107		
Tin (Sn)-Dissolved	mg/L	-	-	0.00058	<0.0001	<0.0001	<0.0001	0.0005	<0.0001	<0.0002	<0.0002	0.00012	0.00017	0.00046	0.00016	0.00025	<0.0002	<0.0002		
Titanium (Ti)-Dissolved	mg/L	-	-	<0.01	<0.01	<0.01	<0.01	0.028	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02		
Uranium (U)-Dissolved	mg/L	0.015	-	0.00233	0.000155	0.00016	0.000034	0.00205	0.000109	0.0003	0.000306	0.00135	0.00036	0.000117	0.000043	0.000039	0.00411	0.00833		
Vanadium (V)-Dissolved	mg/L	-	-	<0.001	0.0085	0.0079	0.002	0.0816	0.0046	0.0113	0.0102	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002		
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.136	0.0018	0.002	0.0017	0.017	0.0015	0.0101	0.0099	0.0042	0.0271	0.0282	0.0115	0.0154	4.4	<0.002		
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

2014 Analytical Data

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			Sample ID	MP09-05	MP09-05	MP09-09	MP09-05	MP09-09	MP09-11	MP09-11	MP09-12	MW09-02	MW09-03	MW09-04	MW09-05	MW09-06	MW09-07	MW09-08
			Date Sampled	10/9/2014	10/9/2014	10/10/2014	10/10/2014	10/10/2014	10/9/2014	10/9/2014	10/9/2014	10/8/2014	10/8/2014	10/8/2014	10/8/2014	10/8/2014	10/10/2014	10/9/2014
			Lab ID	L1531123	L1531123	L1531711	L1531711	L1531711	L1531123	L1531123	L1531123	L1531123	L1531123	L1531123	L1531123	L1531123	L1531123	L1531711
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	356.3	-	546	-	290	-	9.43	642	3194	2681	2870	1907	1819	-	59.6
Hardness (as CaCO3)	mg/L	-	-	1460	1480	216	213	261	656	626	434	1570	1580	1670	888	1080	971	101
Dissolved Oxygen	mg/L	-	-	0.66	-	4.08	-	7.04	-	2.69	5.3	1.34	0.92	0.99	0.99	0.84	-	0.35
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	6.68	-	8.9	-	8.86	-	7.17	6.99	6.97	6.99	8.38	6.12	7.4	-	6.56
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.12	-	8.9	-	8.59	-	8.09	8.21	6.97	7.82	8.02	7.03	7.98	7.4	7.63
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.68	-	8.9	-	8.86	-	7.17	6.99	6.97	6.99	8.38	6.12	7.4	7.4	6.56
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-															
Alkalinity, Total (as CaCO3)	mg/L	-	-	224	-	82.6	-	90.5	-	695	421	44.3	178	96.8	88.7	127	212	112
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	12.1	-	3.71	-	5.21	-	6.49	4.49	13.6	1.06	7.28	4.77	1.22	2*	2.05
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<10.000	-	2.47	-	2.63	-	<5.000	<0.500	<10.000	<10.000	<10.000	<5.000	<5.000	<5.000	<5.000
Fluoride (F)	mg/L	0.12	-	<0.400	-	1.77	-	1.54	-	0.36	0.328	0.49	<0.400	<0.400	<0.200	0.26	<0.200	0.217
Nitrate (as N)	mg/L	13	3	0.35	-	0.0124	-	0.027	-	<0.050	0.0149	<0.100	<0.100	<0.100	<0.050	<0.050	<0.050	0.0536
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.027	-	0.0058	-	0.0841	-	<0.010	0.0207	<0.020	<0.020	<0.020	0.012	<0.010	<0.010	<0.001
Sulfate (SO4)	mg/L	-	Varies ¹⁶	1840	-	148	-	212	-	64.2	27.8	1900	1530	1730	876	989	893	234
Sulfide	mg/L	-	-	0.021	-	<2.000	-	<0.020	-	0.029	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.54	0.065
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.010	-	0.602	-	1.11	-	<0.005	<0.005	0.018	<0.010	<0.005	<0.005	<0.005	<0.005	<0.010
Cyanide, Total	meq/L	0.005	-	0.244	-	1.98	-	11.1	-	0.0117	0.0093	0.227	0.043	<0.005	<0.005	<0.005	<0.005	<0.010
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	2.5	-	<0.5	-	<0.5	-	<0.5	<0.5	1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	28.9	-	33.3	-	46.6	-	53.9	19.4	6.84	6.18	6.8	12.2	6.68	29.8	21.9
Total Organic Carbon	mg/L	-	-	43.3	-	8.8	-	28	-	134	89.4	<1.000	35.6	14.4	14.7	20.7	42.2	22.7
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0354	0.0307**	0.0041	0.0051**	0.0037	0.0071**	0.0068	0.0026	<0.005	<0.01	0.0038	0.0235	<0.002	0.0491	0.0901
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00048	0.00045	0.101	0.0987	0.0951	0.0421	0.0434	0.0417	0.00453	0.547	0.341	0.00237	0.254	0.00568	0.00028
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0963	0.0838	20.6	20.7	9.93	19.3	18.8	5.66	22.8	0.838	3.76	0.695	0.106	0.556	0.136
Barium (Ba)-Dissolved	mg/L	-	10	0.122	0.121	0.00174	0.00146	0.000633	0.119	0.119	0.0434	0.00785	0.0474	0.00712	0.0312	0.00685	0.022	0.101
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0002	<0.0002	<0.0002	<0.0005	<0.0001	<0.0005	<0.0005	<0.0001	<0.0005	<0.001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0001
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.001	<0.001	<0.001	<0.0025	<0.0005	<0.0025	<0.0025	<0.0005	<0.0025	<0.005	<0.001	<0.0005	<0.001	<0.001	<0.0005
Boron (B)-Dissolved	mg/L	1.5	1.2	0.085	0.087	0.306	0.313	0.307	<0.05	<0.05	0.064	0.059	0.1	0.297	0.093	0.158	0.058	<0.01
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000295	0.000265	0.000322	0.000318	0.000287	<0.00005	<0.00005	0.000352	0.000497	0.00123	0.000021	0.0032	0.00621	0.000223	<0.00001
Calcium (Ca)-Dissolved	mg/L	-	-	471	477	85.8	84.7	103	151	145	102	477	509	487	281	342	297	30.5
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00094	0.00078	<0.0002	<0.0005	<0.0001	0.00127	0.0013	0.00037	<0.0005	<0.001	<0.0002	0.00058	<0.0002	0.00096	0.00117
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.016	0.0156	0.0458	0.0469	0.0447	0.00207	0.0021	0.00165	0.0118	0.0064	0.00104	0.0178	0.00123	0.0264	0.0008
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00115	0.00106	0.714	0.657	0.215	<0.001	<0.001	0.00093	<0.001	<0.002	<0.0004	0.00283	0.00644	0.00606	<0.0002
Iron (Fe)-Dissolved	mg/L	0.3	-	69.1	68.2	0.214	0.322	0.279	19.6	18.4	4.19	48.7	0.254	<0.01	8.64	<0.01	9.16	34.4
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.0001	<0.0001	0.00099	0.0008	0.000806	0.00226	0.00322	0.00651	<0.00025	<0.0005	0.00028	0.00309	0.00034	<0.0001	0.000144
Lithium (Li)-Dissolved	mg/L	-	-	<0.001	<0.001	<0.001	<0.0025	<0.0005	0.0034	0.0031	0.00252	0.0294	<0.005	0.0055	0.00269	0.0096	0.0029	<0.0005
Magnesium (Mg)-Dissolved	mg/L	-	-	68.9	70.8	0.41	0.4	0.76	67.5	64.1	43.5	92.2	74.6	110	45.1	55.4	55.7	6.12
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	15.3	14.8	0.0409	0.0385	0.03	4.96	4.84	2.66	34.7	55.2	4.64	6.24	5.64	20.5	2.58
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.00001	<0.00001	0.000021	0.000021	0.000028	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000013	0.000011	<0.00001	<0.00001
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.00055	0.00057	0.0146	0.0146	0.0148	0.00913	0.00864	0.00294	0.0056	0.00336	0.00739	0.000646	0.00425	0.00156	<0.00005
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0052	0.0049	0.0184	0.0197	0.0124	0.0097	0.0096	0.00534	0.0033	<0.005	<0.001	0.0103	0.0016	0.0207	<0.0005
Phosphorus (P)-Dissolved	mg/L	-	-	<0.05	<0.05	0.168	0.154	0.22	0.128	0.18	0.127	<0.05	0.057	0.081	<0.05	<0.05	<0.05	0.116
Potassium (K)-Dissolved	mg/L	-	-	8.75	8.94	8.78	8.58	9.44	11.2	10.3	5.34	83.7	16.6	40.8	15.5	20.5	12	1.32
Selenium (Se)-Dissolved	mg/L	0.001	0.002	<0.0002	<0.0002	0.00233	0.00238	0.00161	<0.0005	<0.0005	0.00011	<0.0005	<0.001	<0.0002	0.00011	<0.0002	0.0002	0.0001
Silicon (Si)-Dissolved	mg/L	-	-	6.63	6.71	9.6	9.47	6.09	13.5	13.6	10.5	6.87	16	12	7.1	7.46	9.98	10.1
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.00002	<0.00002	0.0299	0.028	0.0533	<0.00005	<0.00005	<0.00001	<0.00005	<0.0001	<0.00002	0.000045	<0.00002	0.000168	<0.00001
Sodium (Na)-Dissolved	mg/L	-	-	83.8	80.2	24.5	24.6	27.6	25.1	24.1	3.84	86.9	24.1	52.3	37.2	23.7	33.5	1.3
Strontium (Sr)-Dissolved	mg/L	-	-	1.25	1.25	0.158	0.16	0.162	0.844	0.723	0.591	1.07	1.47	1.37	0.592	0.706	0.706	0.131
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	0.000021	<0.00002	0.00004	0.000066	0.000051	<0.00005	<0.00005	0.000109	0.000256	<0.0001	0.000109	0.000208	0.000358	<0.00002	<0.00001
Tin (Sn)-Dissolved	mg/L	-	-	<0.0002	<0.0002	<0.0002	<0.0005	<0.0001	<0.0005	<0.0005	<0.0001	<0.0005	<0.001	0.00064	0.00032	<0.0002	<0.0002	<0.0001
Titanium (Ti)-Dissolved	mg/L	-	-	<0.02	<0.02	<0.02	<0.05	<0.01	<0.05	<0.05	<0.01	<0.05	<0.1	<0.02	<0.01	<0.02	<0.02	<0.01
Uranium (U)-Dissolved	mg/L	0.015	-	0.00161	0.00161	0.000514	0.00054	0.00138	0.0011	0.00104	0.000644	0.000528	0.00285	0.000238	0.000455	0.00128	0.00117	0.000088
Vanadium (V)-Dissolved	mg/L	-	-	0.003	0.0025	<0.002	<0.005	<0.001	<0.005	<0.005	<0.001	<0.005	<0.01	<0.002	<0.001	<0.002	0.0026	0.004
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.0147	0.0142	0.0045	<0.005	0.0021	0.0347	0.0358	0.0367	0.333	<0.01	0.132	0.732	0.104	0.36	0.0012
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

2014 Analytical Data

			Sample ID	MW09-21	MW09-22	MW09-22	MW09-22	MW09-23	MW09-24	W14103083B H03
			Date Sampled	10/9/2014	10/8/2014	10/9/2014	10/9/2014	10/8/2014	10/9/2014	10/8/2014
			Lab ID	L1531123	L1531123	L1531123	L1531123	L1531123	L1531123	L1531123
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)							
Physical Properties										
Conductivity	uS/cm	-	-	349.6	1600	-	-	2592	188.5	185.8
Hardness (as CaCO3)	mg/L	-	-	1010	-	900	915	784	574	390
Dissolved Oxygen	mg/L	-	-	0.9	1.51	-	-	2.37	8.6	1.17
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	6.61	6.06	-	-	6.54	7.19	6.35
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.29	6.69	-	-	7.51	8	6.8
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.61	6.06	-	-	6.54	7.19	6.35
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-
Anions and Nutrients										
Acidity (as CaCO3)	mg/L	-	-							
Alkalinity, Total (as CaCO3)	mg/L	-	-	336	148	-	-	268	201	260
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	10.7	1.92	-	-	2.71	0.008	6.13
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<5.000	<5.000	-	-	<5.000	<5.000	<2.500
Fluoride (F)	mg/L	0.12	-	<0.200	<0.200	-	-	<0.200	<0.200	<0.100
Nitrate (as N)	mg/L	13	3	0.498	11	-	-	<0.050	2.94	<0.025
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.019	0.198	-	-	<0.010	0.016	<0.005
Sulfate (SO4)	mg/L	-	Varies ¹⁶	688	1040	-	-	614	355	160
Sulfide	mg/L	-	-	0.044	0.03	-	-	0.038	<0.020	0.136
Cyanides										
Cyanide, Weak Acid Diss	mg/L	-	0.005	0.0058	0.0351	-	-	<0.010	<0.005	<0.010
Cyanide, Total	meq/L	0.005	-	0.014	0.0786	-	-	0.016	0.0235	<0.010
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5
Organic / Inorganic Carbon										
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	30	12.8	-	-	17.4	9.02	30.6
Total Organic Carbon	mg/L	-	-	62.4	22.7	-	-	57.1	42.3	55.5
Dissolved Metals										
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0965	-	0.025**	0.0229**	0.009	0.0017	0.0529
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00024	-	0.00027	0.00026	<0.0005	0.00021	0.00025
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.117	-	0.00486	0.00433	0.00194	0.00157	0.0605
Barium (Ba)-Dissolved	mg/L	-	10	0.0892	-	0.0437	0.0433	0.0408	0.0538	0.354
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0002	-	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.001	-	<0.0005	<0.0005	<0.0025	<0.0005	<0.0005
Boron (B)-Dissolved	mg/L	1.5	1.2	0.037	-	0.074	0.078	0.143	0.013	<0.01
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000095	-	0.00004	0.000037	<0.00005	0.000055	<0.00001
Calcium (Ca)-Dissolved	mg/L	-	-	318	-	294	300	206	152	104
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00158	-	0.00047	0.00042	<0.0005	0.0003	0.00074
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0128	-	0.0171	0.0168	0.0196	0.00042	0.00062
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00061	-	0.00115	0.00097	<0.001	0.00852	<

Notes:

	Exceeds CCME Guidelines
	Exceeds BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)
	Exceeds both CCME Guidelines and BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)

(1) CCME guideline exceedances shaded with light red.
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014

(5) CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(8) Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.00 if H<17
0.00004 – 0.00037 if H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46
0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.002 if H<82
0.002 – 0.004 if H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.001 if H<60
0.001 – 0.007 if H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15 if H>180

(13) BC water quality guideline for pH.

(14) Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(15) Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
0.02 if Chloride < 2 mg/L
0.04 if Chloride = 2 to 4 mg/L
0.06 if Chloride = 4 to 6 mg/L
0.08 if Chloride = 6 to 8 mg/L
0.10 if Chloride = 8 to 10 mg/L
0.20 if Chloride > 10 mg/L

(16) Sulphate varies with hardness as follows for BC WQG:
128 if H<=30
218 if H>=31 and H<=75
309 if H>=76 and H<=180
429 if H>=181 and H<=250
Site specific if H>250

(17) Aluminum varies with pH as follows for BC WQG FA:
WQG (µg/L) = e{1.6-3.327(median p.H)+0.402 (median Ph)^2} if pH < 6.5
0.05 if pH>= 6.5

(18) Cadmium varies with hardness as follows for BC WQG FA:
WQG = e[0.736 × ln(hardness*) – 4.943]

(19) Copper varies with hardness as follows for BC WQG FA:
2 if H≤50
WQG ≤ 0.04 (mean hardness*) if H>50

(20) Lead varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 3.31 + e[1.273 ln (hardness*) - 4.704] if H>8
* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO3.

(21) Manganese varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 0.0044 hardness* + 0.605 if H>= 37 and H<=450
* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO3.

(31) Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:
WQG = 0.0001 / (MeHg/total Hg)

(32) Silver varies with hardness in mg/L as follows for BC WQG:
0.0005 if H≤100
0.0015 if H>100

(33) Zinc varies with hardness in mg/L as follows for BC WQG:
0.075 if H≤90
WQG = 7.5 + 0.75 (hardness* - 90) if H>90

2015 Analytical Data

			Sample ID	GSI-HA-01A	MW09-16	MW09-17	MW09-18	MW09-19	CH-P-13-05/50	GSI-PC-03B	MP09-05	MP09-09	MP09-11	MP09-14	MW09-01	MW09-02	MW09-03	MW09-04
			Date Sampled	02/06/2015	01/06/2015	02/06/2015	02/06/2015	02/06/2015	02/06/2015	04/06/2015	03/06/2015	04/06/2015	04/06/2015	02/06/2015	03/06/2015	02/06/2015	02/06/2015	02/06/2015
			Lab ID	L1620902	L1620902	L1620902	L1620902	L1620902	L1620902	L1622366	L1622366	L1622366	L1622366	L1620902	L1622366	L1620902	L1620902	L1620902
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	688	1257	1572	1495	1344	1682	-	1361	388	454	-	1731	1753	1557	1640
Hardness (as CaCO3)	mg/L	-	-	593	1260	1950	1780	1460	1940	2440	1270	288	383	372	1490	1410	1600	1630
Dissolved Oxygen	mg/L	-	-	-	0.05	0.86	0.52	1.14	3.17	-	0.07	0.79	3.14	-	1.78	0.48	0.22	0.29
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.15	6.75	6.92	6.94	6.77	6.19	-	6.66	9.31	7.65	-	7.13	7.18	7.21	8.03
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	8.14	7.97	8.02	8.05	7.8	7.16	8.07	6.95	8.9	7.75	-	7.91	7.03	8.01	8.09
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.15	6.75	6.92	6.94	6.77	6.19	8.07	6.66	9.31	7.65	-	7.13	7.18	7.21	8.03
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-															
Alkalinity, Total (as CaCO3)	mg/L	-	-	257	224	425	396	403	76.8	935	280	63.9	386	-	255	26.6	137	100
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.0669	0.0331	<0.0050	0.0284	3.23	0.0395	-	10.1	3.88	9.49	-	17.8	14.2	3.06	6.27
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<0.50	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<2.5	2.59	0.58	-	<5.0	<5.0	<5.0	<5.0
Fluoride (F)	mg/L	0.12	-	0.118	0.47	<0.20	<0.20	0.28	0.25	<0.60	0.14	1.62	0.491	-	0.33	0.82	0.58	0.64
Nitrate (as N)	mg/L	13	3	0.0059	<0.050	0.391	<0.050	<0.050	<0.050	0.17	<0.025	0.0273	0.0103	-	0.053	<0.050	0.534	0.269
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.0010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.0050	0.004	0.0143	-	<0.010	<0.010	0.072	0.04
Sulfate (SO4)	mg/L	-	Varies ¹⁶	312	1100	1540	1440	1230	2040	1570	1120	234	22.1	-	1640	2240	1610	1550
Sulfide	mg/L	-	-	0.133	<0.020	<0.020	<0.020	0.123	<0.020	-	<0.020	<1.0	<0.020	-	<0.020	<0.020	<0.020	<0.020
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.278	<0.0050	-	0.0091	0.0192	0.0118	<0.0050
Cyanide, Total	meq/L	0.005	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0108	1.36	0.0254	-	0.0881	0.132	0.0363	<0.0050
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	-	0.78	0.98	0.56	-	4.84	1.34	<0.50	<0.50
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	51.4	52.2	95.1	95.6	96.4	12	-	61.3	8.43	85.7	-	56.9	2.3	27.8	18.7
Total Organic Carbon	mg/L	-	-	4.27	3.57	2.49	2.63	12.6	5.34	-	25.4	31.4	34.3	-	17.8	5.87	6.6	6.29
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0031	<0.0010	<0.0020	<0.0020	0.009	0.0599	0.0472	0.0218	0.003	0.0046	0.0041	<0.0020	<0.0050	<0.0050	<0.0020
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00017	0.0801	0.00032	0.00034	<0.00020	0.00436	0.0022	0.00033	0.0776	0.014	0.00586	0.0442	0.00314	0.467	0.285
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0115	0.0426	0.0208	0.0518	0.117	0.00966	0.0969	0.00755	15.3	7.35	3.44	0.206	20.2	1.47	3.84
Barium (Ba)-Dissolved	mg/L	-	10	0.161	0.0144	0.00749	0.00768	0.046	0.00604	0.108	0.0321	0.00053	0.145	0.145	0.0217	0.00683	0.0316	0.00758
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.000020	<0.000020	<0.000040	<0.000040	<0.000040	0.00015	<0.000040	<0.000040	<0.000040	<0.000020	<0.000020	<0.000040	<0.00010	<0.00010	<0.000040
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.000050	<0.000050	<0.00010	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.000050	<0.000050	<0.00010	<0.00025	<0.00025	<0.00010
Boron (B)-Dissolved	mg/L	1.5	1.2	<0.010	0.062	0.083	<0.020	0.19	<0.050	0.057	0.074	0.254	0.033	0.025	0.098	<0.050	0.155	0.307
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.0000071	0.044	0.000017	0.000056	<0.00010	0.329	0.000048	0.00141	0.000438	0.0000719	0.0000311	0.0332	0.000447	0.000608	0.000029
Calcium (Ca)-Dissolved	mg/L	-	-	153	297	337	323	313	455	149	382	114	86.2	121	502	438	493	469
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00044	<0.00010	<0.00020	<0.00020	<0.00020	<0.00050	0.0296	0.00669	<0.00020	0.00101	0.00019	<0.00020	<0.00050	<0.00050	<0.00020
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00019	0.00295	<0.00020	<0.00020	0.00251	0.0365	0.00802	0.0183	0.0424	0.00128	0.00068	0.0192	0.0104	0.00325	0.00089
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.0002	0.00526	0.00061	<0.00040	<0.00040	0.015	0.00122	0.00096	0.526	0.00043	<0.00020	0.00361	<0.0010	<0.0010	<0.00040
Iron (Fe)-Dissolved	mg/L	0.3	-	3.71	0.033	<0.010	<0.010	20.5	12.8	15.4	42.3	0.171	8.87	7.72	1.75	46.4	0.167	0.011
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	0.000056	0.00583	<0.00010	<0.00010	<0.00010	0.00573	0.00038	<0.00010	0.00027	0.00171	0.000798	0.0043	<0.00025	<0.00025	0.00052
Lithium (Li)-Dissolved	mg/L	-	-	0.0068	0.0097	0.0199	0.0212	0.0106	0.0394	0.0526	<0.0020	<0.0020	0.0022	0.0063	0.0054	0.0239	<0.0050	0.0093
Magnesium (Mg)-Dissolved	mg/L	-	-	51.1	127	269	237	165	194	502	75.6	1.1	40.8	16.7	56.9	75.7	89.8	112
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	0.185	0.803	<0.00020	0.611	7.05	34.3	2.67	15	0.0239	2.48	0.363	20.5	38.2	35.1	6.47
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.0000050	0.0000175	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000661	<0.0000050	0.0000067	0.0000103	0.0000051	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.000406	0.000222	<0.00010	<0.00010	0.00018	0.0004	0.0155	0.00085	0.0219	0.0035	0.00146	0.0026	0.00491	0.00511	0.00573
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.00251	0.00535	<0.0010	<0.0010	<0.0010	0.0129	0.0845	0.0083	0.0195	0.00654	0.00146	0.0066	0.0027	<0.0025	<0.0010
Phosphorus (P)-Dissolved	mg/L	-	-	<0.050	<0.050	<0.050	<0.050	0.145	<0.050	<0.050	<0.050	0.205	<0.050	<0.050	<0.050	<0.050	0.051	0.078
Potassium (K)-Dissolved	mg/L	-	-	3.38	6.32	7.11	6.99	6.76	5.01	25.1	8.48	9.37	8.36	31.5	14.8	82.7	22.1	35
Selenium (Se)-Dissolved	mg/L	0.001	0.002	<0.000050	0.000097	0.00061	0.00059	0.00021	<0.00025	0.00035	0.00027	0.00188	0.000246	0.000128	0.00013	<0.00025	<0.00025	<0.00010
Silicon (Si)-Dissolved	mg/L	-	-	6.38	4.53	5.1	4.96	8.46	7.5	8.59	5.85	6.22	9.06	2.9	6.55	5.81	13.9	13.4
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000010	0.000097	<0.000020	<0.000020	<0.000020	<0.000050	<0.000020	<0.000020	0.0244	0.000012	<0.000010	0.000076	<0.000050	<0.000050	<0.000020
Sodium (Na)-Dissolved	mg/L	-	-	5.08	7.32	12.7	11.1	16.8	7.72	103	46.2	25.3	11	17.7	93.2	73.5	27.6	30.8
Strontium (Sr)-Dissolved	mg/L	-	-	0.341	0.665	1.01	0.929	1.07	0.584	2.84	1.08	0.168	0.667	0.442	1.1	0.933	1.27	1.34
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.000010	0.000459	0.000094	0.000261	<0.000020	0.000564	<0.000020	0.000024	0.000042	0.000012	<0.000010	0.00086	0.000216	0.000055	0.000107
Tin (Sn)-Dissolved	mg/L	-	-	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00050	0.00043	<0.00020	<0.00020	<0.00010	<0.00010	<0.00020	<0.00050	<0.00050	<0.00020
Titanium (Ti)-Dissolved	mg/L	-	-	<0.00030	<0.00030	<0.00060	<0.00060	0.00079	<0.0015	0.00257	0.00113	<0.00060	0.00123	<0.00030	<0.00060	<0.0015	<0.0015	<0.00060
Uranium (U)-Dissolved	mg/L	0.015	-	0.00003	0.00301	0.00753	0.00652	0.000755	0.000749	0.0164	0.00217	0.000861	0.000281	0.000355	0.00189	0.000535	0.00149	0.000346
Vanadium (V)-Dissolved	mg/L	-	-	<0.00050	<0.00050	<0.0010	<0.0010	<0.0010	<0.0025	0.0029	0.0017	<0.0010	0.00354	<0.00050	<0.0010	<0.0025	<0.0025	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²															

2015 Analytical Data

			Sample ID	MW09-06	MW09-08	MW09-22	MW09-23	MW09-24	W14103083B H03	GSI-DC-02B	GSI-HA-01A	GSI-HA-04A	MW09-18	MW09-19	CH-P-13-05- /50	MW09-02	MW09-06	MW09-23
			Date Sampled	03/06/2015	04/06/2015	04/06/2015	04/06/2015	04/06/2015	03/06/2015	3/18/2015	3/18/2015	3/18/2015	3/20/2015	3/20/2015	3/20/2015	3/19/2015	3/19/2015	3/19/2015
			Lab ID	L1622366	L1622366	L1622366	L1622366	L1622366	L1622366	L1589940	L1589940	L1589940	L1590448	L1590448	L1590448	L1589940	L1589940	L1589940
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	1354	197	991	1180	499	683	-	-	-	1530	1158	1566	1732	1105	800
Hardness (as CaCO3)	mg/L	-	-	1230	201	924	1270	550	657	632	657	647	2060	1300	1910	1580	1310	618
Dissolved Oxygen	mg/L	-	-	0.05	0.06	0.26	2.47	8.27	5.15	-	-	-	1.97	1.12	2.36	0.9	2.6	3.8
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.44	6.67	6.25	6.9	7.03	6.88	-	-	-	6.89	6.59	6.54	7.29	7.51	7.4
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.9	6.66	6.33	7.54	7.86	7.23	8.1	-	-	7.57	7.29	6.58	6.49	7.81	7.33
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.44	6.67	6.25	6.9	7.03	6.88	8.1	-	-	6.89	6.59	6.54	7.29	7.51	7.4
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-															
Alkalinity, Total (as CaCO3)	mg/L	-	-	182	125	70.6	336	280	378	295	-	-	491	483	94.7	40.9	119	365
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	1.15	2.15	1.47	3.8	<0.0050	1.76	-	-	-	0.0339	6.88	0.0381	14.4	0.733	3.79
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<2.5	<0.50	<2.5	<2.5	1.1	<0.50	<1.000	-	-	<5.000	<5.000	<5.000	<10.000	<2.500	<2.500
Fluoride (F)	mg/L	0.12	-	0.41	<0.20	0.1	0.18	0.038	<0.20	0.066	-	-	<0.200	<0.200	<0.200	0.75	0.26	0.16
Nitrate (as N)	mg/L	13	3	2.54	<0.0050	0.039	<0.025	2.37	<0.0050	0.778	-	-	<0.050	<0.050	<0.050	0.5	0.192	<0.025
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.0919	<0.0010	0.0205	<0.0050	0.0019	<0.0010	0.0102	-	-	<0.010	<0.010	<0.010	0.023	0.0138	0.0058
Sulfate (SO4)	mg/L	-	Varies ¹⁶	1160	75.9	809	979	226	265	337	-	-	1570	909	1880	2020	1190	428
Sulfide	mg/L	-	-	<0.020	0.058	<0.020	<0.020	<0.020	<0.020	-	-	-	<0.020	0.134	<0.020	<0.020	<0.020	0.023
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	<0.005	<0.005	<0.005	0.0053	<0.005	<0.005
Cyanide, Total	meq/L	0.005	-	<0.0050	0.0069	0.0124	0.0093	<0.0050	<0.0050	-	-	-	<0.005	<0.005	<0.005	0.169	<0.005	0.0376
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.50	0.62	<0.50	0.51	<0.50	0.53	-	-	-	<0.5	0.68	<0.5	1.28	<0.5	<0.5
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	40.1	28	15.6	77.7	66.9	83.2	-	-	-	104	103	14.8	3.81	21.6	76.6
Total Organic Carbon	mg/L	-	-	9.74	15.4	14.6	14.9	7.74	19	-	-	-	2.62	22.2	2.37	5.71	7.27	25.6
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	<0.0020	0.0553	0.0475	0.0133	0.0016	0.0208	0.0017	0.0038	0.0042	<0.002	0.0134	0.0649	<0.005	0.002	0.0182
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.259	0.00021	0.00019	<0.00050	0.0002	0.0006	0.00051	0.00047	0.00141	0.00041	0.00046	<0.0005	0.00508	0.213	0.00032
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.122	0.189	0.0131	0.0136	0.00169	0.0541	0.00298	0.0147	0.00517	0.0556	0.125	0.00444	19.2	0.197	0.0168
Barium (Ba)-Dissolved	mg/L	-	10	0.00611	0.191	0.202	0.0734	0.0996	0.101	0.103	0.175	0.116	0.0094	0.052	0.00627	0.00896	0.00762	0.0375
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.000040	<0.000020	<0.000020	<0.00010	<0.000020	<0.000020	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00010	<0.000050	<0.000050	<0.00025	<0.000050	<0.000050	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0025	<0.0025	<0.001	<0.001
Boron (B)-Dissolved	mg/L	1.5	1.2	0.116	<0.010	0.028	0.148	0.013	0.028	<0.01	<0.01	<0.01	<0.02	0.13	<0.05	0.058	0.116	0.169
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.00623	<0.000050	0.0000778	<0.000025	0.0000435	0.0000064	0.000059	<0.00001	0.000017	0.00005	<0.00002	0.33	0.000707	0.00557	0.000025
Calcium (Ca)-Dissolved	mg/L	-	-	380	61.3	320	308	151	190	166	172	166	369	302	453	487	443	159
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.00020	0.00082	0.00079	<0.00050	0.00037	0.00045	0.00017	0.00015	<0.0001	<0.0002	0.00041	<0.0005	<0.0005	<0.0002	0.00022
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00151	0.00119	0.0144	0.0215	<0.00010	0.00467	0.00169	0.00018	0.0004	0.0003	0.00306	0.0398	0.0115	0.00151	0.0192
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.0107	&													

2015 Analytical Data

			Sample ID	MW09-24	GSI-DC-02B ¹⁴	GSI-DC-03B	GSI-DC-05B	GSI-DC-06B	GSI-DC-07B	GSI-DC-09B	GSI-DC-10B	GSI-HA-01A ¹⁵	GSI-HA-02A	GSI-HA-03A ¹⁶	GSI-HA-04A	GSI-HA-05A	MW09-16	MW09-17
			Date Sampled	3/19/2015	31/08/2015	31/08/2015	01/09/2015	03/09/2015	03/09/2015	03/09/2015	03/09/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015	31/08/2015
			Lab ID	L1589940	L1667552	L1667552	L1667552	L1668494	L1668494	L1668494	L1668494	L1667552	L1667552	L1667552	L1667552	L1667552	L1667552	L1667552
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	420	-	-	620	845	782	332.1	745	-	547	-	187.1	516	977	1230
Hardness (as CaCO3)	mg/L	-	-	620	557	761	1040	844	733	236	642	454	530	498	179	552	1020	1850
Dissolved Oxygen	mg/L	-	-	7.98	-	-	5.77	0.16	0.12	0.24	6.27	-	10.83	-	6.33	12.1	2.5	1.52
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.13	-	-	7.37	7.4	6.84	6.89	6.6	-	6.88	-	6.78	6.75	6.54	6.85
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.38	7.94	7.68	7.89	7.55	7.13	6.92	6.17	7.97	6.72	7.23	7.08	7.23	7.08	7.4
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.13	7.94	7.68	7.37	7.4	6.84	6.89	6.6	7.97	6.88	7.23	6.78	6.75	6.54	6.85
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-															
Alkalinity, Total (as CaCO3)	mg/L	-	-	189	246	239	276	868	169	98.3	96.7	192	155	108	74.3	194	284	446
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.0113	0.828	0.165	0.664	2.78	2.09	1.79	1.79	0.0363	1.09	0.501	0.132	0.748	<0.0050	<0.0050
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<1.000	0.52	<1.0	<2.5	7.3	1.3	<0.50	1.2	<0.50	<1.0	<0.50	<0.50	<1.0	<2.5	<5.0
Fluoride (F)	mg/L	0.12	-	<0.040	0.12	0.141	<0.10	0.254	0.046	0.087	0.057	0.132	<0.040	0.07	0.079	0.067	0.14	<0.20
Nitrate (as N)	mg/L	13	3	3.28	0.417	0.011	<0.025	<0.010	0.018	<0.0050	<0.010	0.0081	<0.010	0.0405	<0.0050	<0.010	0.148	0.395
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.002	0.0281	<0.0020	<0.0050	<0.0020	<0.0020	<0.0010	<0.0020	0.0011	<0.0020	0.0013	<0.0010	<0.0020	<0.0050	<0.010
Sulfate (SO4)	mg/L	-	Varies ¹⁶	387	218	475	731	3.07	567	173	608	264	366	199	92.4	340	724	1360
Sulfide	mg/L	-	-	<0.020	<0.020	<0.020	<0.020	0.036	<0.020	0.118	<0.020	<0.020	0.063	0.031	0.04	0.057	<0.020	<0.020
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	meq/L	0.005	-	0.0117	<0.0050	0.0062	<0.0050	<0.0050	0.0074	0.0101	0.011	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.5	<0.50	<0.50	<0.50	0.58	<0.50	0.67	0.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	37.1	60.9	-	53.3	186	35.9	19.8	15.7	41	32.3	39.5	16.4	44.2	62.1	104
Total Organic Carbon	mg/L	-	-	8.74	11.7	8.87	15	66.5	15.3	28.3	35.8	9.28	10.9	10.2	26.9	8.04	3.55	2.83
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0012	0.0065	0.0031	0.0027	0.0174	0.0103	0.067	0.166	0.0044	0.0392	0.0294	0.0516	0.021	0.0011	<0.0020
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00018	0.00042	0.00044	0.00035	0.00042	0.00014	0.00023	0.00033	0.00367	0.00015	0.0004	0.00048	0.00017	0.061	0.00035
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.00165	0.0122	0.00677	0.00308	0.492	0.188	0.0595	0.102	0.00444	0.0844	0.0406	0.0328	0.103	0.00802	0.0193
Barium (Ba)-Dissolved	mg/L	-	10	0.205	0.093	0.0259	0.0341	0.177	0.235	0.0235	0.391	0.0854	0.243	0.0771	0.0516	0.0703	0.0132	0.00752
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.0001	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000033	<0.000040	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000040
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010
Boron (B)-Dissolved	mg/L	1.5	1.2	0.015	<0.010	<0.010	0.017	0.012	0.023	0.014	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	0.169	0.093
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000058	0.0000555	0.000561	0.0000427	<0.000050	<0.000050	<0.000050	<0.00010	0.000012	<0.000050	0.0000335	0.0000133	<0.000050	0.021	0.000013
Calcium (Ca)-Dissolved	mg/L	-	-	169	144	188	215	202	204	56	172	118	127	123	44.5	145	235	323
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00031	0.00037	0.00315	0.00023	0.0017	0.00029	0.00107	0.00194	0.00096	0.00017	0.00426	0.00017	<0.00010	<0.00010	<0.00020
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00053	0.00168	0.0027	0.00395	0.00206	0.00209	0.00147	0.0248	0.00022	<0.00010	0.00057	0.00026	<0.00010	<0.00010	<0.00020
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00769	0.00252	0.00156	0.00084	0.00021	<0.00020	<0.00020	<0.00040	0.00574	<0.00020	0.00052	0.00031	<0.00020	0.00547	0.00064
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	7.57	0.404	0.903	27.4	41.7	15.2	90.8	0.51	83.4	49.5	4.28	29.1	<0.010	<0.010
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00005	<0.000050	0.000108	0.0001	<0.000050	<0.000050	0.000067	0.00013	<0.000050	<0.000050	0.000144	0.000102	<0.000050	0.00503	<0.00010
Lithium (Li)-Dissolved	mg/L	-	-	0.0012	0.0028	0.0059	0.0035	<0.0010	0.0018	<0.0010	<0.0020	0.005	<0.0010	<0.0010	0.0014	0.0029	0.0098	0.0187
Magnesium (Mg)-Dissolved	mg/L	-	-	48.3	48.1	70.7	122	82.7	54.5	23.4	51.7	38.6	51.7	46.4	16.6	46.3	106	253
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	0.000515	1.9	2.66	4.98	3.72	3.33	0.706	15.5	0.0657	5.56	3.86	0.452	3.3	0.00857	<0.00020
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.00001	<0.0000050	<0.0000050	<0.0000050	0.0000117	0.0000094	0.0000166	0.0000131	0.0000087	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.000203	0.00249	0.00654	0.00181	0.00249	0.000309	0.000296	0.001	0.000765	<0.000050	0.0019	0.000235	0.000113	0.000073	<0.00010
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	<0.0005	0.0114	0.0348	0.0169	0.00385	0.00081	0.00083	0.0065	0.00449	<0.00050	0.0115	<0.00050	<0.00050	0.00329	<0.0010
Phosphorus (P)-Dissolved	mg/L	-	-	<0.050	<0.050	<0.050	<0.050	0.301	0.095	0.175	<0.050	<0.050	<0.050	0.067	<0.050	0.168	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	1.98	3.6	3.32	3.9	4.26	3.68	2.17	3.19	4.87	3.46	1.95	0.95	2.57	5.97	7.12
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00048	0.000054	0.000064	0.000086	0.000532	0.000131	0.000174	0.00025	<0.000050	0.000064	<0.000050	0.000072	0.000053	0.000076	0.00014
Silicon (Si)-Dissolved	mg/L	-	-	6.12	7.47	7.82	8.75	8.89	8.85	7.48	8.04	5.64	8.54	7.92	8.45	8.07	5.65	5.32
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000013	<0.000020
Sodium (Na)-Dissolved	mg/L	-	-	9.09	4.41	5.76	13.1	19.4	15.7	20.4	28.6	4.2	5.11	4.72	2.52	5.47	7.91	11.9
Strontium (Sr)-Dissolved	mg/L	-	-	0.686	0.293	0.427	0.706	0.988	0.667	0.175	0.639	0.245	0.39	0.354	0.116	0.368	0.501	0.969
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.00001	<0.000010	0.000013	0.000014	<0.000010	<0.000010	<0.000010	<0.000020	0.000022	<0.000010	<0.000010	<0.000010	<0.000010	0.000239	0.000088
Tin (Sn)-Dissolved	mg/L	-	-	<0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	<0.000010	<0.000010	0.00015	<0.000010	<0.000010	<0.000010	<0.000020
Titanium (Ti)-Dissolved	mg/L	-	-	<0.01	<0.00030	<0.00030	<0.00030	0.00298	<0.0012	0.00429	0.00194	<0.00030	0.0015	0.00124	0.00143	0.00084	<0.00030	<0.00060
Uranium (U)-Dissolved	mg/L	0.015	-	0.00324	0.00141	0.00129	0.00314	0.000199	0.000051	0.000172	0.000574	0.000969	0.000016	0.000036	0.000048	0.000043	0.00222	0.00676
Vanadium (V)-Dissolved	mg/L	-	-	<0.001	<													

2015 Analytical Data

			Sample ID	MW09-18	MW09-19	MP09-03	W14103083B H02	MP09-10	MP09-11	MP09-12	MP09-14	MW09-01	MW09-02	MW09-03	MW09-04	MW09-06	MW09-08	MW09-21
			Date Sampled	31/08/2015	31/08/2015	03/09/2015	02/09/2015	02/09/2015	02/09/2015	02/09/2015	02/09/2015	01/09/2015	01/09/2015	01/09/2015	01/09/2015	02/09/2015	01/09/2015	01/09/2015
			Lab ID	L1667552	L1667552	L1668494	L1668494	L1668494	L1668494	L1668494	L1668494	L1667552	L1667552	L1667552	L1667552	L1668494	L1667552	L1667552
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	1200	1044	-	-	-	694	166.7	-	1668	1636	1480	1578	969	209.9	1410
Hardness (as CaCO3)	mg/L	-	-	1810	1370	56.2	738	35.9	557	534	493	1540	1480	1660	662	1040	137	1640
Dissolved Oxygen	mg/L	-	-	0.41	0.53	-	-	-	0.18	5.14	-	0.32	0.12	0.14	0.13	2.22	0.3	0.29
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	6.89	6.73	-	-	-	7.33	7.52	-	7	7.16	8.11	8.39	7.49	6.72	6.82
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.42	6.84	-	8.17	8.02	7.41	-	-	7.75	6.42	7.78	7.6	7.92	6.53	6.62
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.89	6.73	-	8.17	8.02	7.33	7.52	-	7	7.16	8.11	8.39	7.49	6.72	6.82
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-															
Alkalinity, Total (as CaCO3)	mg/L	-	-	458	438	-	216	37.4	564	-	-	320	35.7	113	181	147	119	221
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	0.0237	4.04	-	<0.0050	0.222	13.7	-	-	19.1	12.3	3.46	<0.0050	1.04	2.34	11.5
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<5.0	<2.5	-	<1.0	<0.50	1.7	-	-	<5.0	<5.0	<5.0	<1.0	<2.5	<0.50	<5.0
Fluoride (F)	mg/L	0.12	-	<0.20	0.14	-	0.254	0.169	0.467	-	-	0.26	0.53	0.34	0.049	0.33	<0.20	<0.20
Nitrate (as N)	mg/L	13	3	<0.050	<0.025	-	0.708	0.0219	<0.010	-	-	<0.050	<0.050	0.822	2.74	0.128	<0.0050	0.071
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.011	<0.0050	-	<0.0020	0.33	<0.0020	-	-	0.01	<0.010	0.089	0.0293	0.011	<0.0010	0.017
Sulfate (SO4)	mg/L	-	Varies ¹⁶	1270	910	-	445	5.56	46.8	-	-	1540	1700	1650	435	939	28.7	1510
Sulfide	mg/L	-	-	<0.020	0.176	-	<0.020	-	<0.020	-	-	0.044	<0.020	<0.020	<0.020	<0.020	0.08	0.032
Cyanides																		
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	<0.0050	-	<0.0050	0.051	<0.0050	-	-	<0.0050	0.0135	<0.0050	<0.0050	<0.0050	<0.0050	0.0053
Cyanide, Total	meq/L	0.005	-	<0.0050	<0.0050	-	<0.0050	1.89	<0.0050	-	-	0.0279	0.0977	0.0127	0.0057	<0.0050	<0.0050	0.0109
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.50	0.57	-	<0.50	<0.50	0.74	-	-	18.8	0.89	<2.5	<0.50	<0.50	0.58	0.66
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	105	102	-	46	-	118	-	-	66.5	8.05	25.2	44.7	31.2	25.7	44.4
Total Organic Carbon	mg/L	-	-	2.98	24.8	-	5.29	7.39	42.4	-	-	20.5	6.14	7.23	6.66	6.26	22.6	26.5
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	<0.0020	0.011	0.0146	0.0021	0.0317	0.0076	0.0061	0.0031	0.0178	0.023	0.0168	0.0017	0.0046	0.0921	0.0774
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00031	0.00021	0.00101	0.00019	0.0424	0.0202	0.0427	0.00553	0.0217	0.00377	0.42	0.00146	0.299	0.0002	0.00039
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0517	0.121	0.00631	0.00361	1.82	13.9	6.62	3.94	0.343	18	2.11	0.00087	0.131	0.0869	0.105
Barium (Ba)-Dissolved	mg/L	-	10	0.00843	0.045	0.0323	0.117	0.00466	0.286	0.0217	0.117	0.0202	0.00664	0.0224	0.0747	0.00694	0.143	0.215
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.000040	<0.000020	<0.000020	<0.000020	<0.000020	<0.000040	<0.000020	<0.000020	<0.00010	<0.00010	<0.000040	<0.000020	<0.000040	0.00002	<0.000040
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00010	<0.000050	<0.000050	<0.000050	0.000113	<0.00010	<0.000050	<0.000050	<0.00025	<0.00025	<0.00010	<0.000050	<0.00010	<0.000050	<0.00010
Boron (B)-Dissolved	mg/L	1.5	1.2	<0.020	0.15	<0.010	0.02	0.045	0.036	0.131	0.065	0.094	0.057	0.2	0.013	0.137	<0.010	0.059
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000049	<0.000050	0.0000873	0.000345	0.000386	0.000506	0.000489	0.0000896	0.00316	0.000439	0.000932	0.000063	0.00581	<0.000050	0.000035
Calcium (Ca)-Dissolved	mg/L	-	-	335	299	15.6	193	13.9	124	137	160	513	469	491	160	333	40.7	497
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.00020	0.00015	0.00047	0.00021	0.00047	0.00139	0.00019	0.00056	<0.00050	<0.00050	<0.00020	0.00023	<0.00020	0.00137	0.00068
Cobalt (Co)-Dissolved	mg/L	-	0.004	<0.00020	0.00189	0.00082	<0.00010	0.00241	0.00177	0.00253	0.00118	0.0278	0.011	0.00192	0.00018	0.00148	0.0014	0.0252
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	<0.00040	<0.00020	0.00093	0.0022	0.0507	0.00044	0.00045	0.00047	0.0041	<0.0010	0.0007	0.00277	0.00689	<0.00020	0.00076
Iron (Fe)-Dissolved	mg/L	0.3	-	0.068	17.6	1.48	<0.010	0.328	30.6	4.19	4.12	1.99	44.2	0.039	<0.010	<0.010	47.5	66
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00010	<0.000050	0.000576	<0.000050	0.0192	0.0379	0.00408	0.000441	0.00541	<0.00025	0.00015	<0.000050	0.00018	0.000055	<0.00010
Lithium (Li)-Dissolved	mg/L	-	-	0.0185	0.0115	<0.0010	0.0012	<0.0010	0.003	0.0043	0.0124	0.008	0.0247	0.0022	<0.0010	0.0111	<0.0010	<0.0020
Magnesium (Mg)-Dissolved	mg/L	-	-	237	152	4.23	62	0.28	59.9	46.9	22.8	63.6	74.4	105	63.8	50.1	8.65	96.5
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	0.575	5.4	0.325	0.011	0.0691	3.44	4.38	0.344	22.2	32.5	17.9	0.00146	4.34	3.42	6.91
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.000050	<0.000050	<0.000050	<0.000050	0.0000293	0.0000122	0.0000105	0.0000092	0.0000059	<0.000050	<0.000050	<0.000050	0.0000095	<0.000050	<0.000050
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	<0.00010	0.000143	0.000392	0.00125	0.00084	0.00408	0.0069	0.00876	0.00301	0.00461	0.00518	0.000165	0.00518	<0.000050	0.00043
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	<0.0010	0.00162	0.00414	0.00064	0.00238	0.0054	0.00774	0.0169	0.0087	0.0029	<0.0010	<0.00050	0.0027	<0.00050	0.0022
Phosphorus (P)-Dissolved	mg/L	-	-	<0.050	0.172	<0.050	<0.050	0.171	0.116	0.054	<0.050	<0.050	<0.050	0.076	<0.050	<0.050	0.109	<0.050
Potassium (K)-Dissolved	mg/L	-	-	7.05	8.45	1.43	3.69	0.99	13.3	7.15	48.9	15.6	78.8	28.2	1.77	18.5	1.51	15.1
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00017	0.00108	<0.000050	0.00083	0.000558	0.00029	0.000096	0.000122	<0.00025	<0.00025	<0.00010	0.000692	<0.00010	0.000435	0.00024
Silicon (Si)-Dissolved	mg/L	-	-	5.15	10	1.19	5.3	2.28	10.6	13.2	3.03	7.29	6.97	12.3	6.37	8.11	10	5.99
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000020	<0.000010	<0.000010	<0.000010	0.000491	<0.000020	<0.000010	<0.000010	0.000093	<0.000050	<0.000020	<0.000010	0.000043	<0.000010	<0.000020
Sodium (Na)-Dissolved	mg/L	-	-	11	14.5	1.68	8.91	1.32	16.4	3.93	22.6	110	61.1	29.6	9.05	24.1	2.43	67.4
Strontium (Sr)-Dissolved	mg/L	-	-	0.889	1.01	0.0928	0.776	0.0242	1.04	0.517	0.664	1.1	0.924	1.31	0.527	0.698	0.172	1.39
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	0.000248	<0.000010	<0.000010	<0.000010	0.000019	0.000289	0.000182	<0.000010	0.000364	0.000196	0.000034	<0.000010	0.000333	<0.000010	<0.000020
Tin (Sn)-Dissolved	mg/L	-	-	<0.00020	<0.000010	0.00012	<0.000010	0.00026	<0.00020	<0.000010	0.00013	<0.000050	<0.000050	<0.000020	<0.000010	<0.000020	<0.000010	<0.000020
Titanium (Ti)-Dissolved	mg/L	-	-	<0.00060	<0.0018	0.00067	<0.00030	<0.00030	0.00174	0.00031	<0.00030	<0.0015	<0.0015	<0.00060	<0.00030	<0.00060	0.00437	<0.0045
Uranium (U)-Dissolved	mg/L	0.015	-	0.00628	0.000523	0.000044	0.00513	0.000164	0.000424	0.00127	0.000247	0.00241	0.000573	0.00129	0.00152	0.00162	0.000093	0.000748
Vanadium (V)-Dissolved	mg/L	-	-	<0.0010	0.0009	<0.00050	0.00093	<0.00050	0.0063	0.00064	<0.00050	<0.0025	<0.0025	<0.0010	<0.00050	<0.0010	0.00406	0.005
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.0022	0.0019	0.0285	0.0013	0.0124	0.067	0.0472	0.0126	2.67	0.23	0.0029	0.0042	0.11	<0.0010	0.0054

			Sample ID	MW09-22	MW09-23	MW09-24	W14103083B H03
			Date Sampled	01/09/2015	01/09/2015	02/09/2015	02/09/2015
			Lab ID	L1667552	L1667552	L1668494	L1668494
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)				
Physical Properties							
Conductivity	uS/cm	-	-	807	1051	543	448
Hardness (as CaCO3)	mg/L	-	-	874	1150	747	280
Dissolved Oxygen	mg/L	-	-	0.78	2.51	5.56	0.19
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	6.21	6.94	7.19	6.53
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	6.26	7.1	7.82	6.58
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.21	6.94	7.19	6.53
Total Dissolved Solids	mg/L	-	-	-	-	-	-
Anions and Nutrients							
Acidity (as CaCO3)	mg/L	-	-				
Alkalinity, Total (as CaCO3)	mg/L	-	-	131	297	353	193
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	1.6	3.17	0.0075	5.53
Bicarbonate	mg/L	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<2.5	<2.5	<1.0	0.81
Fluoride (F)	mg/L	0.12	-	<0.10	0.16	<0.040	<0.40
Nitrate (as N)	mg/L	13	3	<0.025	<0.025	2.74	<0.0050
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.0050	<0.0050	0.0026	<0.0010
Sulfate (SO4)	mg/L	-	Varies ¹⁶	847	905	310	124
Sulfide	mg/L	-	-	0.03	0.038	<0.020	0.097
Cyanides	mg/L						
Cyanide, Weak Acid Diss	mg/L	-	0.005	0.0068	<0.0050	<0.0050	<0.0050
Cyanide, Total	meq/L	0.005	-	0.0171	0.0756	<0.0050	<0.0050
Cyanate (CNO)	mg/L	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.50	<0.50	<0.50	0.53
Organic / Inorganic Carbon							
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	20.7	67.3	75.7	41
Total Organic Carbon	mg/L	-	-	14.5	19	11.1	29.2
Dissolved Metals							
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0421	0.0238	0.0021	0.0727
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00016	0.00027	0.00018	0.00031
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.00674	0.0261	0.00183	0.0576
Barium (Ba)-Dissolved	mg/L	-	10	0.0488	0.0556	0.0938	0.28
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.000020	<0.000040	<0.000020	0.000025
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.000050	<0.00010	<0.000050	<0.000050
Boron (B)-Dissolved	mg/L	1.5	1.2	0.028	0.07	0.012	0.011
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.0000964	0.000021	0.0000683	0.000049
Calcium (Ca)-Dissolved	mg/L	-	-	303	291	209	74.6
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00045	<0.00020	0.00026	0.00076
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0138	0.0149	<0.00010	0.00077
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00108	<0.00040	0.00811	<0.00020
Iron (Fe)-Dissolved	mg/L	0.3	-	46.2	23.5	<0.010	77.3
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.000050	<0.00010	<0.000050	0.000064
Lithium (Li)-Dissolved	mg/L	-	-	0.0014	<0.0020	0.0012	<0.0010
Magnesium (Mg)-Dissolved	mg/L	-	-	28.8	103	54.7	22.7
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	8.22	17.9	0.00108	2.03
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.0000050	<0.0000050	0.0000102	0.000079
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.000174	0.0023	0.000377	0.000135
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.00276	0.0017	0.00055	0.00064
Phosphorus (P)-Dissolved	mg/L	-	-	<0.050	<0.050	<0.050	0.242
Potassium (K)-Dissolved	mg/L	-	-	4.47	8.09	1.66	1.52
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.000323	0.00011	0.000354	0.000196
Silicon (Si)-Dissolved	mg/L	-	-	4.96	6.99	6.18	10.8
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	0.000016	<0.000020	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	39	31.3	7.87	8.4
Strontium (Sr)-Dissolved	mg/L	-	-	0.885	0.784	0.681	0.268
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	<0.000010	<0.000020	<0.000010	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	<0.000010	<0.000020	<0.000010	<0.000010
Titanium (Ti)-Dissolved	mg/L	-	-	<0.0018	<0.0015	<0.00030	0.00249
Uranium (U)-Dissolved	mg/L	0.015	-	0.000592	0.00193	0.0079	0.000116
Vanadium (V)-Dissolved	mg/L	-	-	0.00125	0.0021	<0.00050	0.00212
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.0022	0.118	0.0016	0.0047
Zirconium (Zr)-Dissolved	mg/L	-	-	0.00047	0.00078	<0.00030	0.00047

Notes:

	Exceeds CCME Guidelines
	Exceeds BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)
	Exceeds both CCME Guidelines and BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)

(1) CCME guideline exceedances shaded with light red.
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014

(5) CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(8) Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.00 if H<17
0.00004 – 0.00037 if H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46
0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.002 if H<82
0.002 – 0.004 if H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.001 if H<60
0.001 – 0.007 if H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15 if H>180

(13) BC water quality guideline for pH.

(14) Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(15) Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
0.02 if Chloride < 2 mg/L
0.04 if Chloride = 2 to 4 mg/L
0.06 if Chloride = 4 to 6 mg/L
0.08 if Chloride = 6 to 8 mg/L
0.10 if Chloride = 8 to 10 mg/L
0.20 if Chloride > 10 mg/L

(16) Sulphate varies with hardness as follows for BC WQG:
128 if H<=30
218 if H>=31 and H<=75
309 if H>=76 and H<=180
429 if H>=181 and H<=250
Site specific if H>250

(17) Aluminum varies with pH as follows for BC WQG FA:
WQG (µg/L) = e{1.6-3.327(median p.H)+0.402 (median Ph)^2} if pH < 6.5
0.05 if pH>= 6.5

(18) Cadmium varies with hardness as follows for BC WQG FA:
WQG = e[0.736 × ln(hardness*) – 4.943]

(19) Copper varies with hardness as follows for BC WQG FA:
2 if H≤50
WQG ≤ 0.04 (mean hardness*) if H>50

(20) Lead varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 3.31 + e[1.273 ln (hardness*) - 4.704] if H>8
* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO3.

(21) Manganese varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 0.0044 hardness* + 0.605 if H>= 37 and H<=450
* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO3.

(31) Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:
WQG = 0.0001 / (MeHg/total Hg)

(32) Silver varies with hardness in mg/L as follows for BC WQG:
0.0005 if H≤100
0.0015 if H>100

(33) Zinc varies with hardness in mg/L as follows for BC WQG:
0.075 if H≤90
WQG = 7.5 + 0.75 (hardness* - 90) if H>90

2016 Analytical Data

			Sample ID	GSI-DC-01B	GSI-DC-02B	GSI-DC-03B	GSI-DC-05B	GSI-DC-06B	GSI-DC-07B	GSI-DC-08B	GSI-DC-09B	GSI-DC-10B	GSI-HA-01A	GSI-HA-02A	GSI-HA-03A ¹³	GSI-HA-04A	GSI-HA-05A	FB-1	
			Date Sampled	8/29/2016	8/30/2016	8/30/2016	8/30/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/30/2016	8/30/2016	8/29/2016	8/29/2016	8/30/2016	8/29/2016
			Lab ID	L1823304	L1822156	L1822156	L1822156	L1823304	L1823304	L1823304	L1823304	L1823304	L1823304	L1822156	L1822156	L1822156	L1822156	L1822156	L1822156
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																
Physical Properties																			
Conductivity	uS/cm	-	-	-	612	556	770	570	590	839	219	696	664	680	-	525	686	1086	
Hardness (as CaCO3)	mg/L	-	-	119	608	737	796	578	572	429	174	568	691	568	364	487	456	<0.50	
Dissolved Oxygen	mg/L	-	-	-	5.6	5.63	2.39	0.69	0.96	2.48	-	0.26	5.12	2.57	-	7.7	6.53	2.26	
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	7.57	7.28	7.23	7.5	6.96	6.6	7.12	6.65	7.07	6.89	-	6.66	7.15	6.63	
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	-	7.69	7.68	7.42	8.07	7.78	7.21	7.68	6.79	7.89	7.3	7.81	7.38	7.37	5.32	
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	-	7.57	7.28	7.23	7.5	6.96	6.6	7.12	6.65	7.07	6.89	7.81	6.66	7.15	6.63	
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Anions and Nutrients																			
Acidity (as CaCO3)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	289	265	255	595	201	406	95.3	113	291	222	131	170	158	<1.0	
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	-	1.12	0.277	0.899	3.39	2.38	11.6	1.51	1.54	0.048	1	0.392	0.184	0.291	<0.0050	
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chloride (Cl)	mg/L	120	150	-	<1.0	<1.0	<1.0	8.1	<2.5	3.2	<0.50	<2.5	<1.0	<1.0	0.74	<0.50	<0.50	<0.50	
Fluoride (F)	mg/L	0.12	-	-	0.062	0.123	0.074	0.35	<0.10	0.16	0.086	<0.10	0.137	0.052	0.05	0.058	0.059	<0.020	
Nitrate (as N)	mg/L	13	3	-	<0.010	0.044	<0.010	<0.025	<0.025	0.049	0.0196	<0.025	0.011	0.044	0.0193	<0.0050	0.0238	<0.0050	
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	-	<0.0020	<0.0020	<0.0020	<0.0050	<0.0050	0.0168	0.0017	<0.0050	<0.0020	<0.0020	<0.0010	<0.0010	0.0064	<0.0010	
Sulfate (SO4)	mg/L	-	Varies ¹⁶	-	326	474	550	1.9	388	105	94.7	508	405	350	234	316	296	<0.30	
Sulfide	mg/L	-	-	-	0.11	0.25	0.8	0.06	0.05	0.8	-	0.02	-	-	-	0.06	0.15	0.01	
Cyanides																			
Cyanide, Weak Acid Diss	mg/L	-	0.005	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.0050	<0.0050	<0.0050	
Cyanide, Total	meq/L	0.005	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.0050	<0.0050	<0.0050	
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thiocyanate (SCN)	mg/L	-	-	-	<0.50	<0.50	<0.50	0.54	<0.50	2.93	<0.50	0.61	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Organic / Inorganic Carbon																			
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Inorganic Carbon	mg/L	-	-	-	77.1	65.7	64.7	142	59.3	128	29.3	38.4	71.2	55.3	49.3	45.9	38.1	<0.50	
Total Organic Carbon	mg/L	-	-	-	11.8	7.47	12.5	52.6	15.9	451	23.3	35	4.95	14.9	7.8	15.7	146	<0.50	
Dissolved Metals																			
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0057	0.018	0.0058	0.0081	0.0139	0.0084	0.589	0.0642	0.14	0.0014	0.0175	0.0229	0.0284	0.0329	<0.0010	
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00374	0.00025	0.0008	0.00027	0.00027	0.00016	0.00217	0.00018	0.00028	0.00017	0.00019	0.00064	0.00047	0.00049	<0.00010	
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.00314	0.162	0.00087	0.0385	0.444	0.14	0.106	0.0696	0.132	0.00287	0.0283	0.0238	0.0342	0.0256	<0.00010	
Barium (Ba)-Dissolved	mg/L	-	10	0.011	0.227	0.0253	0.0379	0.0812	0.175	0.305	0.0356	0.389	0.147	0.161	0.0532	0.144	0.133	<0.000050	
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000109	0.000024	<0.000040	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B)-Dissolved	mg/L	1.5	1.2	0.022	<0.010	<0.010	0.013	<0.010	0.021	<0.010	0.013	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000064	0.0000168	0.000656	0.0000124	<0.000050	<0.000050	0.0000295	<0.000050	<0.000010	0.000012	0.0000357	0.000184	0.0000085	0.0000094	<0.000050	
Calcium (Ca)-Dissolved	mg/L	-	-	39.1	155	190	187	142	159	128	36.8	153	180	142	92.3	125	116	<0.050	
Chromium (Cr)-Dissolved	mg/L	-	0.01	0.00334	0.00024	0.00136	0.00011	0.00144	0.00032	0.014	0.001	0.00211	<0.00010	0.00028	0.00274	0.00021	0.00029	<0.00010	
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00083	0.00275	0.00106	0.00303	0.00108	0.00162	0.00829	0.00065	0.0183	0.00046	0.00152	0.00028	0.00022	0.0002	<0.00010	
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.0276	<0.00020	0.00294	<0.00020	<0.00020	<0.00020	0.00152	<0.00020	<0.00040	0.00044	0.00025	0.00095	<0.00020	0.0		

2016 Analytical Data

			Sample ID	Dup-1	MW09-16	MW09-18	MW09-19	CH-P-13-03/50	GSI-PC-03B	GSI-PC-04B ¹⁵	FB-3	MP09-08	MP09-04	MP09-05	MP09-11	FB-4	MP09-12	MP09-14 ¹⁷	
			Date Sampled	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/29/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/31/2016	8/30/2016	8/30/2016	8/30/2016	9/1/2016	9/1/2016	8/29/2016
			Lab ID	L1822156	L1822156	L1822156	L1822156	L1822156	L1822156	L1823304	L1823304	L1823304	L1823304	L1822156	L1822156	L1822156	L1823304	L1823304	L1823304
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)																
Physical Properties																			
Conductivity	uS/cm	-	-	1086	1086	1591	1360		-	-	457	457	659	1221	473	460	460	-	
Hardness (as CaCO3)	mg/L	-	-	1100	1120	1890	1440	1400	1710	457	<0.50	482	1490	1080	350	<0.50	524	535	
Dissolved Oxygen	mg/L	-	-	2.26	2.26	0.18	0.24	-	-	-	0.24	0.24	1.96	1.55	0.8	11.3	11.3	-	
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	6.63	6.63	6.91	6.77	-	-	-	7.14	7.14	6.96	6.69	7.79	8.04	8.04	-	
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.77	7.65	7.87	7.44	7.62	8.22	7.3	5.37	8.11	8.04	7.27	7.66	5.01	8.1	8.27	
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	6.63	6.63	6.91	6.77	7.62	8.22	7.3	7.14	7.14	6.96	6.69	7.79	8.04	8.04	8.27	
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Anions and Nutrients																			
Acidity (as CaCO3)	mg/L	-	-																
Alkalinity, Total (as CaCO3)	mg/L	-	-	330	327	529	524	376	610	201	<1.0	270	91	307	414	<1.0	386	295	
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	<0.0050	<0.0050	<0.0050	3.42	0.0151	-	-	<0.0050	0.0222	9.48	6.35	15.1	<0.0050	5.96	-	
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chloride (Cl)	mg/L	120	150	<2.5	<2.5	<2.5	<2.5	<2.5	<10	<2.5	<0.50	<2.5	<2.5	<2.5	<0.50	<0.50	<2.5	<2.5	
Fluoride (F)	mg/L	0.12	-	0.15	0.15	0.11	0.1	0.16	<0.40	<0.10	<0.020	<0.10	0.42	<0.10	0.625	<0.020	0.3	0.24	
Nitrate (as N)	mg/L	13	3	0.182	0.174	0.046	<0.025	2.72	0.21	<0.025	<0.0050	<0.025	0.331	3.66	<0.0050	<0.0050	<0.025	<0.025	
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.055	<0.0050	<0.0010	<0.0050	0.0502	<0.0050	0.0193	<0.0010	<0.0050	<0.0050	
Sulfate (SO4)	mg/L	-	Varies ¹⁶	825	835	1490	1000	1140	1300	272	<0.30	213	1640	908	3.26	<0.30	178	620	
Sulfide	mg/L	-	-	0.01	0.01	0.01	0.15	0.09	-	-	0.05	0.05	0.01	0.03	-	0.8	0.8	-	
Cyanides																			
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	
Cyanide, Total	meq/L	0.005	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050	0.0083	0.015	<0.0050	0.422	-	
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thiocyanate (SCN)	mg/L	-	-	<0.50	<0.50	<0.50	0.55	<0.50	-	-	<0.50	<0.50	<0.50	<0.50	0.55	<0.50	<0.50	-	
Organic / Inorganic Carbon																			
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Inorganic Carbon	mg/L	-	-	83.8	86.1	137	139	90.5	-	-	<0.50	67.3	53.4	80.5	102	<0.50	98.2	-	
Total Organic Carbon	mg/L	-	-	3.23	3.35	3.36	24.1	30.2	-	-	<0.50	12.8	7.11	17.4	33.1	<0.50	18.6	-	
Dissolved Metals																			
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0022	0.001	<0.0020	0.0101	0.0066	0.0512	0.0532	<0.0010	0.0037	0.0021	0.0148	0.0207	<0.0010	0.0074	0.0057	
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.0605	0.0602	0.00036	<0.00020	0.00096	0.00607	0.00095	<0.00010	0.0005	0.291	0.00037	0.0172	<0.00010	0.0215	0.00198	
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.0121	0.0113	0.0554	0.14	0.00046	0.0458	0.0115	<0.00010	0.014	3.52	0.0128	4.58	<0.00010	7.4	0.502	
Barium (Ba)-Dissolved	mg/L	-	10	0.0149	0.0145	0.00893	0.0496	0.0275	0.102	0.102	<0.000050	0.0518	0.0111	0.0578	0.235	<0.000050	0.0458	0.0917	
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.000020	<0.000020	<0.000040	<0.000040	<0.000040	<0.000040	<0.000020	<0.000020	<0.000040	<0.000040	<0.000040	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.000050	<0.000050	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.000050	<0.000050	<0.00010	<0.00010	0.000159	<0.000050	<0.000050	<0.000050	
Boron (B)-Dissolved	mg/L	1.5	1.2	0.097	0.099	<0.020	0.336	<0.020	0.039	<0.010	<0.010	<0.010	0.236	0.155	0.032	<0.010	0.104	0.05	
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.0271	0.027	0.000063	<0.000010	0.000463	0.00003	0.0000475	0.00002	<0.000050	0.000046	0.00129	0.000541	<0.000050	0.000103	0.000067	
Calcium (Ca)-Dissolved	mg/L	-	-	254	259	349	308	364	98.5	111	<0.050	133	462	332	76.8	<0.050	144	149	
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.00010	<0.00010	<0.00020	0.0003	<0.00020	0.0262	0.0133	<0.00010	<0.00010	<0.00020	0.0004	0.00155	<0.00010	0.00032	0.00022	
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00013	0.00013	<0.00020	0.00164	<0.00020	0.0042	0.00325	<0.00010	0.00069	0.00117	0.017					

2016 Analytical Data

			Sample ID	MW09-02	MW09-03	MW09-04	MW09-06	MW09-08	MW09-21	MW09-22	MW09-23	FB-2	Dup-2	MW09-24	GSI-HA-01A	GSI-HA-04A ¹³	MW09-16	MW09-18
			Date Sampled	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	8/29/2016	8/30/2016	8/30/2016	8/30/2016	8/30/2016	5/25/2016	5/25/2016	5/24/2016	5/25/2016
			Lab ID	L1822156	L1822156	L1822156	L1822156	L1822156	L1822156	L1822156	L1822156	L1822156	L1822156	L1822156	L1774699	L1775300	L1774699	L1774699
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)															
Physical Properties																		
Conductivity	uS/cm	-	-	1499	1544	1602	1034	160	1135	395	776	455	455	455	-	-	1257	1465
Hardness (as CaCO3)	mg/L	-	-	1390	1530	708	852	87.1	1060	287	857	<0.50	514	503	528	262	1390	1870
Dissolved Oxygen	mg/L	-	-	0.05	0.07	0.08	1.2	2	1.25	0.59	2.18	5.07	5.07	5.07	-	-	0.97	2.27
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	7.16	8.25	8.41	7.39	6.71	6.81	6.44	7.18	7.23	7.23	7.23	-	-	6.7	6.77
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	6.64	7.82	7.43	7.48	6.55	6.93	7.5	7.35	5.53	7.46	7.46	8.16	7.59	7.44	7.8
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.16	8.25	8.41	7.39	6.71	6.81	6.44	7.18	7.23	7.23	7.23	8.16	7.59	6.7	6.77
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																		
Acidity (as CaCO3)	mg/L	-	-															
Alkalinity, Total (as CaCO3)	mg/L	-	-	65.1	111	263	162	105	287	138	329	<1.0	303	311	243	136	195	423
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	9.51	6.59	<0.0050	0.142	2.23		1.09	2.41	<0.0050	0.0109	0.0112	0.0384	0.0641	0.0267	0.0118
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	<2.5	<2.5	<1.0	<1.0	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	0.97	<0.50	<2.5	<5.0
Fluoride (F)	mg/L	0.12	-	0.55	0.32	<0.040	0.261	0.147	<0.10	0.088	0.105	<0.020	0.048	0.047	0.133	0.097	0.13	<0.20
Nitrate (as N)	mg/L	13	3	<0.025	0.906	2.26	0.016	<0.0050	0.054	0.187	<0.010	<0.0050	1.79	1.82	0.0123	0.0059	<0.025	0.077
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	<0.0050	<0.0050	<0.0020	<0.0020	<0.0010	0.0198	0.0646	<0.0020	<0.0010	0.0052	<0.0010	0.0036	<0.0010	<0.0050	<0.010
Sulfate (SO4)	mg/L	-	Varies ¹⁶	1580	1590	446	739	<0.30	887	182	551	<0.30	188	190	220	68.3	1100	1390
Sulfide	mg/L	-	-	0.02	0	0	0.01	0.04	0.06	0.08	0.05	0.09	0.09	0.09	0.06	-	0	0.02
Cyanides	mg/L																	
Cyanide, Weak Acid Diss	mg/L	-	0.005	<0.0050	0.0101	<0.0050	<0.0050	<0.0050	0.0057	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	meq/L	0.005	-	0.0258	0.0175	<0.0050	<0.0050	<0.0050	0.011	0.0102	0.0236	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Organic / Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	17.2	27.5	68.7	39.5	30.5	70.9	39.4	84.9	<0.50	79.7	78.8	60.4	30.8	53.2	118
Total Organic Carbon	mg/L	-	-	5.92	6.73	6.77	5.54	27.5	23.1	14.3	17.5	<0.50	10.8	10.8	13.6	18	3.78	3.2
Dissolved Metals																		
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	<0.0050	0.0172	0.0011	0.0013	0.105	0.0431	0.0481	0.0401	<0.0010	0.0035	0.0032	0.003	0.0232	<0.0020	<0.0020
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00486	0.378	0.00155	0.287	0.00028	0.00028	0.00012	0.00021	<0.00010	0.00018	0.00017	0.00015	0.0009	0.0891	0.00035
Arsenic (As)-Dissolved	mg/L	0.005	0.005	13.8	2.26	0.00096	0.124	0.11	0.0535	0.0111	0.0353	<0.00010	0.00151	0.00158	0.00534	0.0249	0.0244	0.049
Barium (Ba)-Dissolved	mg/L	-	10	0.00512	0.0228	0.0699	0.00632	0.107	0.143	0.0654	0.0466	<0.000050	0.0708	0.0707	0.126	0.0531	0.0149	0.00851
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.00010	<0.000040	<0.000020	<0.000020	0.000026	<0.000020	<0.000020	<0.000040	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000040	<0.000040
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00025	<0.00010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010	<0.00010
Boron (B)-Dissolved	mg/L	1.5	1.2	0.083	0.224	0.012	0.131	<0.010	0.115	0.029	0.07	<0.010	<0.010	<0.010	<0.010	<0.010	0.051	<0.020
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000933	0.000364	0.000069	0.00553	<0.000050	0.000186	0.000024	0.000018	<0.000050	0.0000518	0.0000511	0.0000066	0.000033	0.0503	0.000048
Calcium (Ca)-Dissolved	mg/L	-	-	457	465	187	275	25.5	298	101	216	<0.050	141	138	136	67	320	332
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.00050	<0.00020	0.00018	<0.00010	0.00134	0.00093	0.00089	0.00047	<0.00010	0.00031	0.00031	0.00438	0.00114	<0.00020	<0.00020
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.0115	0.00188	0.00017	0.00091	0.00078	0.0156	0.00533	0.0107	<0.00010	0.00013	0.00013	0.00022	0.00025	0.00402	<0.00020
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	<0.0010	0.0015	0.00273	0.00509	<0.00020	0.00315	0.00123	<0.00040	<0.00020	0.00679	0.00666	0.00044	0.00164	0.00575	<0.00040
Iron (Fe)-Dissolved	mg/L	0.3	-	18.1	0.017	<0.010	<0.010	31.8	15.3	15.2	15.7	<0.010	<0.010	<0.010	5.07	1.8	0.023	0.014
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00025	<0.00010	<0.000050	0.000282	0.00019	<0.000050	0.000059	<0.00010	<0.000050	<0.000050	<0.000050	0.000095	0.000315	0.00502	<0.00010
Lithium (Li)-Dissolved	mg/L	-	-	0.0157	<0.0020	<0.0010	0.0123	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	0.0061	0.002	0.0099	0.0228
Magnesium (Mg)-Dissolved	mg/L	-	-	60.5	91	58.2	40.2	5.69	77.2	8.41	77.2	<0.10	39.2	38.6	45.9	23.1	143	254
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	22.1	19.1	0.00077	2.15	2.3	5.51	2.88	14.7	<0.00010	0.0436	0.0463	0.118	1.24	0.943	0.352
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.0000050	<0.0000050	<0.0000050	0.0000062	<0.0000050	<0.0000050	0.000006	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000053	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.0074	0.00574	0.000204	0.00317	<0.000050	0.000448	0.000454	0.00142	<0.000050	0.000324	0.000339	0.000456	0.00077	0.00024	<0.00010
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0101	0.001	<0.00050	0.00174	<0.00050	0.0017	0.00112	0.0012	<0.00050	<0.00050	<0.00050	0.0036	0.00172	0.0061	<0.0010
Phosphorus (P)-Dissolved	mg/L	-	-	<0.050	<0.050	<0.050	<0.050	0.12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	29	28.7	1.8	15.1	1.16	11	3.22	5.67	<0.10	1.93	1.84	3.53	2.24	6.59	7.81
Selenium (Se)-Dissolved	mg/L	0.001	0.002	<0.00025	<0.00010	0.000737	0.000259	0.000139	0.000222	0.000221	0.00011	<0.000050	0.000478	0.000415	<0.000050	0.000061	<0.00010	0.00084
Silicon (Si)-Dissolved	mg/L	-	-	7.11	12.1	5.9	8.57	10.2	5.82	4.68	6.62	<0.050	6.67	6.48	6.24	4.66	4.34	4.65
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000050	<0.000020	<0.000010	0.000041	<0.000010	0.000011	0.000028	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000064	<0.000020
Sodium (Na)-Dissolved	mg/L	-	-	24	28.1	9.21	14.6	1.5	46.1	17.8	17.4	<0.050	6.94	6.97	4.53	2.79	7.08	11.4
Strontium (Sr)-Dissolved	mg/L	-	-	1.13	1.37	0.47	0.626	0.117	0.824	0.34	0.536	<0.00020	0.412	0.434	0.315	0.165	0.706	1.03
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	0.000278	0.000027	<0.000010	0.000296	<0.000010	0.000015	<0.000010	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000423	0.00029
Tin (Sn)-Dissolved	mg/L	-	-	<0.000050	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000020	<0.000020
Titanium (Ti)-Dissolved	mg/L	-	-	<0.0015	<0.00060	<0.00030	<0.00030	0.00593	0.00208	0.00182	0.00106	<0.00030	<0.00030	<0.00030	0.00034	0.00095	<0.00060	<0.00060
Uranium (U)-Dissolved	mg/L	0.015	-	0.00109	0.00108	0.00454	0.00126	0.000095	0.000815	0.000187	0.00128	<0.000010	0.00314	0.00331	0.000043	0.000367	0.00261	0.00702
Vanadium (V)-Dissolved	mg/L	-	-	<														

2016 Analytical Data

			Sample ID	CH-P-13-03/50	GSI-PC-03B	MP09-08	MP09-04	MP09-05	MP09-14	MW09-02	MW09-03	MW09-04	MW09-06	MW09-08	MW09-22	MW09-23	MW09-24
			Date Sampled	5/25/2016	5/27/2016	5/27/2016	5/26/2016	5/26/2016	5/26/2016	5/26/2016	5/26/2016	5/26/2016	5/26/2016	5/26/2016	5/27/2016	5/26/2016	5/25/2016
			Lab ID	L1774699	L1775300	L1775300	L1774699	L1774699	L1775300	L1774699	L1774699	L1774699	L1774699	L1774699	L1775300	L1774699	L1774699
	Units	CCME-FAL ^{1, 2, 3, 4}	BC WQG (Yukon CSR in bold)														
Physical Properties																	
Conductivity	uS/cm	-	-	-	-	405	691	1169	-	1387	1519	1479	1144	373	-	865	572
Hardness (as CaCO3)	mg/L	-	-	1760	2790	413	755	1150	144	1520	1650	1600	1220	245	471	955	661
Dissolved Oxygen	mg/L	-	-	-	-	5.06	4.89	0.83	-	0.39	0.32	0.18	0.52	0.51	-	2.72	4.33
pH (field)	pH units	6.5-9.0 ⁵	6.5-9.0 ¹³	-	-	6.89	6.93	6.79	-	7.22	8.5	8.32	7.11	6.65	-	6.98	7.41
pH (lab)	pH units	6.5-9.0 ⁵	6.5-9.0	7.98	8.12	7.53	8.06	7.51	-	7.45	8.08	8.13	8.08	6.77	7.03	8.02	8.08
pH (priority field then lab)	pH units	6.5-9.0	6.5-9.0	7.98	8.12	6.89	6.93	6.79	-	7.22	8.5	8.32	7.11	6.65	7.03	6.98	7.41
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																	
Acidity (as CaCO3)	mg/L	-	-														
Alkalinity, Total (as CaCO3)	mg/L	-	-	374	900	225	167	252	-	70.1	111	116	189	171	165	395	239
Ammonia as N	mg/L	Varies ⁷	Varies ¹⁴	-	-	0.0318	<0.0050	8.39	-	7.35	6.18	7.04	0.3	2.64	0.702	2.69	0.0119
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromide (Br)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride (Cl)	mg/L	120	150	30.2	<10	<0.50	<1.0	<2.5	-	<2.5	<5.0	<5.0	<2.5	<0.50	<1.0	<2.5	<1.0
Fluoride (F)	mg/L	0.12	-	<0.20	<0.40	0.077	<0.040	<0.10	-	0.54	0.3	0.32	0.23	0.124	0.046	0.12	<0.040
Nitrate (as N)	mg/L	13	3	0.964	<0.10	<0.0050	0.797	0.05	-	0.153	0.452	0.05	0.703	<0.0050	0.33	<0.025	1.91
Nitrite (as N)	mg/L	0.06	Varies ¹⁵	0.016	<0.020	<0.0010	<0.0020	<0.0050	-	<0.0050	0.075	0.027	0.0496	<0.0010	0.0188	<0.0050	0.002
Sulfate (SO4)	mg/L	-	Varies ¹⁶	1550	2030	172	541	949	-	1440	1450	1340	996	91.9	343	592	331
Sulfide	mg/L	-	-	-	-	0.14	0.01	0.01	-	0.05	0.02	0	0.07	0.11	-	-	0.14
Cyanides																	
Cyanide, Weak Acid Diss	mg/L	-	0.005	-	<0.0050	<0.0050	<0.0050	0.0051	-	<0.010	0.0054	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	meq/L	0.005	-	-	<0.0050	<0.0050	0.0084	0.0078	-	<0.020	0.0142	<0.0050	<0.0050	<0.0050	0.0177	0.114	<0.0050
Cyanate (CNO)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thiocyanate (SCN)	mg/L	-	-	-	-	<0.50	<0.50	0.7	-	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	0.54	<0.50
Organic / Inorganic Carbon																	
Dissolved Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inorganic Carbon	mg/L	-	-	-	-	60.4	42.5	72.1	-	17.6	23.4	24.6	47.2	59.9	59.2	101	59.6
Total Organic Carbon	mg/L	-	-	-	-	5.99	5.83	22.4	-	6.42	6.41	5.95	6.12	18.3	18.5	19.7	8.88
Dissolved Metals																	
Aluminum (Al)-Dissolved	mg/L	Varies ⁸	Varies ¹⁷	0.0051	0.0315	0.0046	0.0024	0.0243	0.0021	<0.0050	<0.0050	0.0027	<0.0020	0.0607	0.0275	0.023	0.0271
Antimony (Sb)-Dissolved	mg/L	-	0.2	0.00032	0.00296	<0.00010	0.00138	0.00031	0.00481	0.00401	0.401	0.339	0.201	0.00024	0.00031	<0.00050	0.00019
Arsenic (As)-Dissolved	mg/L	0.005	0.005	0.00079	0.0874	0.0148	0.00061	0.023	0.809	8.95	2.08	3.55	0.108	0.208	0.00206	0.0283	0.00135
Barium (Ba)-Dissolved	mg/L	-	10	0.0443	0.126	0.0446	0.0735	0.041	0.0237	0.00462	0.0176	0.00857	0.00531	0.238	0.0829	0.049	0.0928
Beryllium (Be)-Dissolved	mg/L	-	0.053	<0.000040	<0.000040	<0.000020	<0.000020	<0.000040	<0.000020	<0.00010	<0.00010	<0.000040	<0.000040	0.000021	<0.000020	<0.00010	<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	-	<0.00010	<0.00010	<0.000050	<0.000050	<0.00010	<0.000050	<0.00025	<0.00025	<0.00010	<0.00010	<0.000050	<0.000050	<0.00025	<0.000050
Boron (B)-Dissolved	mg/L	1.5	1.2	0.026	0.036	<0.010	0.012	0.052	0.02	0.058	0.172	0.204	0.1	<0.010	0.029	0.062	0.014
Cadmium (Cd)-Dissolved	mg/L	0.00009	Varies ¹⁸	0.000256	0.000135	<0.000050	0.0000462	0.000149	0.0000467	0.000917	0.00181	0.000023	0.0072	0.000053	0.000055	<0.000025	0.0000653
Calcium (Ca)-Dissolved	mg/L	-	-	438	125	114	180	330	44.7	477	493	482	389	73.7	167	252	194
Chromium (Cr)-Dissolved	mg/L	-	0.01	<0.00020	0.029	<0.00010	0.00024	0.00048	0.00015	<0.00050	<0.00050	<0.00020	<0.00020	0.0007	0.00047	<0.00050	0.00033
Cobalt (Co)-Dissolved	mg/L	-	0.004	0.00067	0.00579	0.00065	0.00043	0.0153	0.0004	0.00995	0.00156	0.00086	0.00191	0.00161	0.00884	0.013	0.00012
Copper (Cu)-Dissolved	mg/L	Varies ¹⁰	Varies ¹⁹	0.00197	0.00541	<0.00020	0.0025	0.00099	0.00043	<0.0010	0.0047	<0.00040	0.0104	<0.00020	0.00348	<0.0010	0.00579
Iron (Fe)-Dissolved	mg/L	0.3	-	0.011	7.28	1.11	<0.010	50.9	0.6	15.4	0.036	<0.010	<0.010	80	0.936	18	<0.010
Lead (Pb)-Dissolved	mg/L	Varies ¹¹	Varies ²⁰	<0.00010	0.0008	<0.000050	<0.000050	<0.00010	0.00065	<0.00025	0.00061	0.00045	0.00036	0.000086	0.000081	<0.00025	<0.000050
Lithium (Li)-Dissolved	mg/L	-	-	0.0029	0.0469	0.0036	<0.0010	<0.0020	0.0022	0.012	<0.0050	0.012	0.0123	<0.0010	<0.0010	<0.0050	0.0011
Magnesium (Mg)-Dissolved	mg/L	-	-	163	603	30.9	74.1	78.1	7.83	79	101	95.6	59	14.7	13	79.2	42.9
Manganese (Mn)-Dissolved	mg/L	-	Varies ²¹	0.318	2.1	0.804	0.00046	10.1	0.115	19.8	19.5	7.76	3.04	6.89	3.49	22.4	0.0275
Mercury (Hg)-Dissolved	mg/L	0.000026	Varies ²²	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	<0.000050	<0.000050	0.0000167	<0.000050	<0.000050	<0.000050	<0.000050
Molybdenum (Mo)-Dissolved	mg/L	0.073	1	0.00069	0.0153	0.000406	0.000212	0.00067	0.000727	0.00684	0.00554	0.00384	0.00163	0.000107	0.000195	0.00221	0.00027
Nickel (Ni)-Dissolved	mg/L	Varies ¹²	-	0.0199	0.0743	<0.00050	<0.00050	0.0052	0.00523	<0.0025	<0.0025	<0.0010	0.0033	<0.00050	0.00127	<0.0025	<0.00050
Phosphorus (P)-Dissolved	mg/L	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.06	0.082	<0.050	0.11	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	11.8	24.6	1.12	1.89	8.7	9.49	32.4	29.6	42.2	19.3	1.92	3.01	6.83	1.9
Selenium (Se)-Dissolved	mg/L	0.001	0.002	0.00717	0.00039	0.0001	0.000181	0.00017	<0.000050	<0.00025	<0.00025	<0.00010	0.00022	0.000096	0.000148	<0.00025	0.00084
Silicon (Si)-Dissolved	mg/L	-	-	6.1	8.84	7.39	5.68	5.49	0.932	7.24	12.8	15.6	8.35	10.7	4.35	6.56	7.38
Silver (Ag)-Dissolved	mg/L	0.00025	Varies ²³	<0.000020	<0.000020	<0.000010	<0.000010	<0.000020	<0.000010	<0.000050	<0.000050	0.000054	0.00012	<0.000010	0.000019	<0.000050	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	203	117	6.32	8.02	41.2	4.8	27.3	24.8	24.3	18.6	2.36	22.5	11.5	7.63
Strontium (Sr)-Dissolved	mg/L	-	-	1.24	2.18	1.15	0.594	1.01	0.158	0.848	1.35	1.23	0.88	0.319	0.448	0.621	0.623
Thallium (Tl)-Dissolved	mg/L	0.0008	0.003	0.000087	<0.000020	<0.000010	<0.000010	<0.000020	<0.000010	0.000199	0.000085	0.000116	0.000024	<0.000010	<0.000010	<0.000050	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.00281	0.00025	<0.00010	<0.00010	<0.000020	<0.00010	<0.000050	<0.000050	<0.000020	<0.000020	<0.00010	<0.00010	<0.000050	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	<0.00060	0.00336	<0.00030	<0.00030	0.00094	<0.00030	<0.0015	<0.0015	<0.00060	<0.00060	0.00275	0.00069	<0.0015	<0.00030
Uranium (U)-Dissolved	mg/L	0.015	-	0.0124	0.0239	0.00246	0.00214	0.00167	0.000129	0.00109	0.00127	0.000303	0.00176	0.000067	0.000684	0.00285	0.00259
Vanadium (V)-Dissolved	mg/L	-	-	<0.0010	0.0033	<0.000050	<0.000050	0.0017	<0.000050	<0.0025	<0.0025	<0.0010	<0.0010	0.00238	0.00053	<0.0025	<0.000050
Zinc (Zn)-Dissolved	mg/L	0.03	Varies ²⁴	0.0159	0.0376	0.0026	0.0024	0.0156	0.0059	0.213	0.0062	0.63	0.383	0.0038	0.002	0.0289	0.0055
Zirconium (Zr)-Dissolved	mg/L	-	-	<0.00060	0.00114	<0.00030	<0.00030	0.00079	<0.00030	<0.0015	<0.0015	<0.00060	<0.00060	0.00064	0.00031	<0.0015	<0.00030

Notes:

	Exceeds CCME Guidelines
	Exceeds BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)
	Exceeds both CCME Guidelines and BC Water Quality Guidelines or Yukon CSR (Sb, Ba, Be, Cr and Ti)

(1) CCME guideline exceedances shaded with light red.
Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to November 2014

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to November 2014

(5) CCME FAL, Federal Interim GW Quality Guidelines - PL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N, and other usage guidelines. CCME values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(8) Aluminum varies with pH as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.005 if pH<6.5
0.1 if pH>=6.5
when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.00 if H<17
0.00004 – 0.00037 if H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46
0.00 if H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.002 if H<82
0.002 – 0.004 if H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004 if H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.001 if H<60
0.001 – 0.007 if H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007 if H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL and Federal Interim GW Quality Guidelines - PL:
0.025 if H<60
0.025 - 0.15 if H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15 if H>180

(13) BC water quality guideline for pH.

(14) Ammonia varies with pH and temperature for BC WQG; see BC WQG table 26C for details regarding the applicable criteria and usage guidelines. BC WQG values listed in the table are expressed as ammonia (N). When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used. If field temperature is not available ammonia standards cannot be calculated.

(15) Nitrite varies with Chloride concentration in mg/L as follows for BC WQG:
0.02 if Chloride < 2 mg/L
0.04 if Chloride = 2 to 4 mg/L
0.06 if Chloride = 4 to 6 mg/L
0.08 if Chloride = 6 to 8 mg/L
0.10 if Chloride = 8 to 10 mg/L
0.20 if Chloride > 10 mg/L

(16) Sulphate varies with hardness as follows for BC WQG:
128 if H<=30
218 if H>=31 and H<=75
309 if H>=76 and H<=180
429 if H>=181 and H<=250
Site specific if H>250

(17) Aluminum varies with pH as follows for BC WQG FA:
WQG (µg/L) = e{1.6-3.327(median p.H)+0.402 (median Ph)^2} if pH < 6.5
0.05 if pH>= 6.5

(18) Cadmium varies with hardness as follows for BC WQG FA:
WQG = e[0.736 × ln(hardness*) – 4.943]

(19) Copper varies with hardness as follows for BC WQG FA:
2 if H≤50
WQG ≤ 0.04 (mean hardness*) if H>50

(20) Lead varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 3.31 + e[1.273 ln (hardness*) - 4.704] if H>8
* long-term average and short-term maximum WQGs both apply to water hardnesses between 8 – 360 mg/L CaCO3.

(21) Manganese varies with hardness in mg/L as follows for BC WQG:
WQG ≤ 0.0044 hardness* + 0.605 if H>= 37 and H<=450
* long-term average and short-term maximum WQGs both apply to water hardnesses between 37 – 450 mg/L CaCO3.

(31) Mercury varies with methyl mercury (MeHg) and total mercury in mg/L as follows for BC WQG:
WQG = 0.0001 / (MeHg/total Hg)

(32) Silver varies with hardness in mg/L as follows for BC WQG:
0.0005 if H≤100
0.0015 if H>100

(33) Zinc varies with hardness in mg/L as follows for BC WQG:
0.075 if H≤90
WQG = 7.5 + 0.75 (hardness* - 90) if H>90