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Technical Report Overview

Report: 2019 Coal Mountain Operation Local Aquatic Effects Monitoring Program (LAEMP) Report

Overview: This report presents the 2019 results of the local aquatic effects monitoring program developed for Teck's Coal Mountain Operations. The report presents data and evaluates the magnitude and extent of influence of mine operations on water quality, calcite, and benthic invertebrate communities downstream of Coal Mountain Operations.

This report was prepared for Teck by Golder Associates Ltd.

For More Information

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Future studies will be made available at **teck.com/elkvalley**

REPORT

2019 Coal Mountain Operation Local Aquatic Effects Monitoring Program (LAEMP) Report

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EXECUTIVE SUMMARY

Teck Coal Limited (Teck) owns the Coal Mountain Operation (CMO) in the Elk River watershed. CMO discharges mine-influenced water from sedimentation ponds into Corbin Creek, which flows into Michel Creek and then to the Elk River. This discharge is authorized by the British Columbia Ministry of Environment and Climate Change Strategy (ENV) through Permit 107517 pursuant to the *Environmental Management Act*.

Teck evaluates potential effects on aquatic life associated with operation of its mines via a regional aquatic effects monitoring program (RAEMP), which provides comprehensive routine monitoring and assessment of potential mine-related effects on the aquatic environment every three years. In addition, Teck conducts local aquatic effects monitoring programs (LAEMPs) to address uncertainties related to potential local-scale effects.

A LAEMP was initiated for CMO in 2018 "*to assess the magnitude and extent of influence from CMO on water quality, calcite, and benthic invertebrate communities downstream of CMO, and to assess what factors are contributing to the observed effects*" (per 25 August 2018 and 4 April 2019 amendments to Permit 107517). Additional sites were added to the routine RAEMP field program to support development of the CMO LAEMP study design and sampling began in September 2018. Sampling was conducted again in September 2019 following finalization of the 2019 study design.

The CMO LAEMP study questions and key findings presented herein are:

Study Question 1. What are the magnitude and spatial extent of influence from CMO on water quality, calcite, sediment quality, and benthic invertebrate communities in Michel Creek downstream of CMO, how are these conditions changing over time, and are the conditions expected?

Concentrations of most water quality constituents were similar at reference stations and at the upstream Michel Creek station (MIUCO), 0.82 km upstream of the confluence of Corbin Creek. The highest concentrations of mine-influenced water quality and sediment quality constituents and calcite were observed in Corbin Creek (CORCK), followed by the first station downstream of CMO on Michel Creek (MIDCO, 0.83 km downstream), with a declining gradient of concentrations further downstream in Michel Creek. Concentrations of nitrate, nitrite, cobalt, and nickel had returned to concentrations observed at MIUCO within approximately 3.8 km, downstream of Andy Good Creek at MIDAG. Concentrations of sulphate, selenium, and uranium were greater than those at MIUCO at the furthest downstream station, approximately 12.9 km downstream of CMO (MI5).

Concentrations greater than British Columbia Water Quality Guidelines occurred at MIDCO for selenium (2018 and 2019) and sulphate, nitrate, and cobalt (2018 only). Selenium concentrations were less than the lowest level 1 benchmark at all stations in both years. Sulphate and nitrate concentrations were greater than the lowest level 1 benchmark at MIDCO in 2018 only. Nickel and cobalt were greater than interim screening values at MIDCO (nickel in both years; cobalt in 2018 only) and nickel was greater than the interim screening value at MIDAG in 2018 only.

Within the period of record (2012 through 2019), peak concentrations of sulphate, nitrate, nitrite, total cobalt, total nickel, and total selenium occurred in 2018 during a period of relatively high pit dewatering activity. Most of these constituents subsequently decreased in concentration between 2018 and 2019, reflecting differences in mine water management between years. The decrease in mine-related constituent concentrations was expected based on water quality projections developed by SRK (2019) that reflected temporal changes in mine water management. Overall, concentrations of sulphate, nitrate, nitrite, nickel, cobalt, and selenium were either lower than or similar to the SRK projections for all years except 2018 (sulphate, nitrate, nitrite, and nickel), when concentrations were higher than expected.

Sediment selenium and PAH concentrations were found in higher concentrations in the sediment at mine-influenced stations in the CMO area compared to reference stations and were above sediment quality guidelines at mine-influenced stations in 2018 and 2019. Cadmium, manganese, nickel, and zinc concentrations were higher at CORCK and MIDCO compared to downstream and reference stations in 2018 and 2019, whereas sediment metals concentrations downstream of MIDCO were generally similar to reference stations, with the exception of selenium.

Calcite indices were generally low and within the reference normal range in Michel Creek (calcite index <1), with a decrease in calcite index observed from historical values (2012 to 2018) to 2019. Calcite has been consistently present at CORCK, and calcite index values have consistently been higher at CORCK relative to stations in Michel Creek and have increased between 2016 and 2019, with the highest values observed in 2019.

Benthic invertebrate richness and abundance were generally similar among mine-influenced and reference stations and were within or above the regional normal range between 2012 to 2019. Benthic invertebrate communities (BIC) at reference stations were generally dominated by Ephemeroptera. Ephemeroptera also dominated at mine-influenced stations in Michel Creek, except MIDCO which was dominated by Diptera. Multidimensional scaling indicated that community composition based on a family-level comparison was similar between reference and mine-influenced stations in Michel Creek but differed significantly from CORCK.

Abundance of EPT taxa and Ephemeroptera were similar among reference and mine-influence stations in Michel Creek between 2012 and 2019. Abundance of EPT taxa and Ephemeroptera were within or above the regional normal range at reference and mine-influenced stations between 2012 to 2019, except for Ephemeroptera abundance at MIDCO in 2018, which was below the normal range.

Percent EPT (%EPT) was within or above the regional normal range at the three reference stations (all years) and MIUCO (all years except 2019), below the normal range at MIDCO in all years, and had returned to within the normal range by MIDAG (all years except 2019). Percent Ephemeroptera (%E) exhibited a similar pattern: %E was within or above the regional normal range at reference stations (except MI25 in 2012), below the normal range at MIDCO (all years except 2012), and had returned to within the normal range by MIDAG.

Benthic invertebrate tissue selenium concentrations were generally within the regional normal range at reference and mine-influenced stations between 2012 and 2019, with the exception of MIULE (9.8 km downstream) in 2018 and MIDAG (0.83 km downstream) in 2019, which exceeded the upper bound of the regional normal range. All benthic invertebrate tissue selenium concentrations recorded in Michel Creek were less than the lowest level 1 benchmark. Benthic invertebrate tissue cobalt and nickel concentrations were higher at mine-influenced stations downstream of CMO compared to reference stations and were lower in 2019 compared to in 2018.

Study Question 2. How do spatial and temporal patterns in the benthic invertebrate communities correspond to water quality, calcite, sediment quality, and other potential stressors, and what does this tell us about what factors are causing observed effects?

Spatial and temporal patterns in BIC endpoints corresponded more closely with mine-influenced water quality than with sediment quality or calcite, suggesting that observed patterns in BIC are attributable to one or more water quality constituents. Spatial and temporal patterns in concentrations greater than WQGs or interim screening values support previous assessments that have implicated nickel as the likely cause of observed effects in BIC. This interpretation is also supported by analyses conducted by the regional chronic toxicity monitoring program.

There are no recommended changes to the field sampling program for the CMO LAEMP 2020 study design.

ABBREVIATIONS AND UNITS OF MEASURE

Abbreviation	Definition
%	Percent
<	less than
>	greater than
µm	Micrometre
BC	British Columbia
CABIN	Canadian Aquatic Biomonitoring Network
cm	Centimetre
CMO	Coal Mountain Operations
ECCC	Environment and Climate Change Canada
EMC	Elk Valley Environmental Monitoring Committee
ENV	British Columbia Ministry of Environment and Climate Change Strategy
EPT	Ephemeroptera, Plecoptera, and Trichoptera
EVWQP	Elk Valley Water Quality Plan
Golder	Golder Associates Ltd.
GPS	Global Positioning System
LAEMP	local aquatic effects monitoring program
mm	Millimetre
QA	quality assurance
QC	quality control
RAEMP	regional aquatic effects monitoring program
SRK	SRK Consulting Inc.
Teck	Teck Coal Limited
UTM	Universal Transverse Mercator

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) is pleased to provide Teck Coal Limited (Teck) with the following report on the 2019 local aquatic effects monitoring program (LAEMP) for Teck's Coal Mountain Operation (CMO) in the Elk Valley. This study represents the first year of monitoring under the approved study design (Golder 2019a) to satisfy requirements under permits and associated regulatory approvals.

1.1 Background

Teck operates five steelmaking coal mines in the Elk River watershed, which are the Fording River Operation (FRO), Greenhills Operation (GHO), Line Creek Operation (LCO), Elkview Operation (EVO), and CMO (Figure 1.1-1). Discharges from the mines are authorized by the British Columbia Ministry of Environment and Climate Change Strategy (ENV) through Permit 107517, issued under the provisions of the *Environmental Management Act*.

Permit 107517 requires that Teck evaluate potential effects on aquatic life associated with operation of the mines via a regional aquatic effects monitoring program (RAEMP). The RAEMP (Minnow 2015a, 2018a,b) and its predecessor programs (Minnow et al. 2007, 2011, 2012, Minnow 2014) provide comprehensive routine monitoring and assessment of potential mine-related effects on the aquatic environment downstream from Teck's coal mines in the Elk Valley every three years.

In addition to regional monitoring, Teck conducts local aquatic effects monitoring programs (LAEMPs) to address local-scale uncertainties associated with potential mine-related aquatic effects. The study questions addressed by the LAEMPs are unique to each program and distinct from those of the RAEMP, but the ultimate objective of all LAEMPs is to reduce uncertainty and thereby support effective environmental management decisions. Investigations undertaken in the LAEMPs can also inform refinement of the RAEMP, for example by developing refined interpretive tools or identifying locations of interest for ongoing inclusion in RAEMP monitoring. As a LAEMP's study questions are answered and uncertainty is reduced, the intent is that the scope of the LAEMP will be progressively reduced. All LAEMPs are intended to eventually be discontinued.

The CMO LAEMP was initiated by Teck in response to findings from regional biological monitoring conducted between 2015 and 2017 (Minnow 2018a,b), the routine chronic toxicity monitoring program (Golder 2018), and an aquatic health assessment conducted to support planning for care and maintenance at CMO (Golder 2017). Specifically, the results of RAEMP monitoring between 2015 and 2017 indicated alteration of the benthic invertebrate community (BIC) in Corbin Creek and in Michel Creek immediately downstream of Corbin Creek relative to stations upstream in Michel Creek, local reference creeks, and the regional normal range. At the same time, the chronic toxicity monitoring program reported effects to the invertebrate test species *Hyalella azteca* and *Ceriodaphnia dubia* in water from the compliance monitoring point in Michel Creek downstream of Corbin Creek. Follow-up testing attributed the observed chronic toxicity test responses to nickel (Nautilus Environmental 2018) and an evaluation of published toxicity data for nickel supported the interpretation that nickel could also be the cause of observed changes to the BIC (Golder 2017).

The objective of the CMO LAEMP was specified in amendments to Permit 107517 that were issued by ENV on 25 August 2018 and 4 April 2019. Specifically, the CMO LAEMP was required to "*assess the magnitude and extent of influence from CMO on water quality, calcite, and benthic invertebrate communities downstream of CMO, and to assess what factors are contributing to the observed effects*". The 2019 CMO LAEMP study design (Golder 2019a) was developed to address this permit requirement. Sampling began in September 2018 under a preliminary study design and was conducted again in September 2019 following finalization of the 2019 study design.

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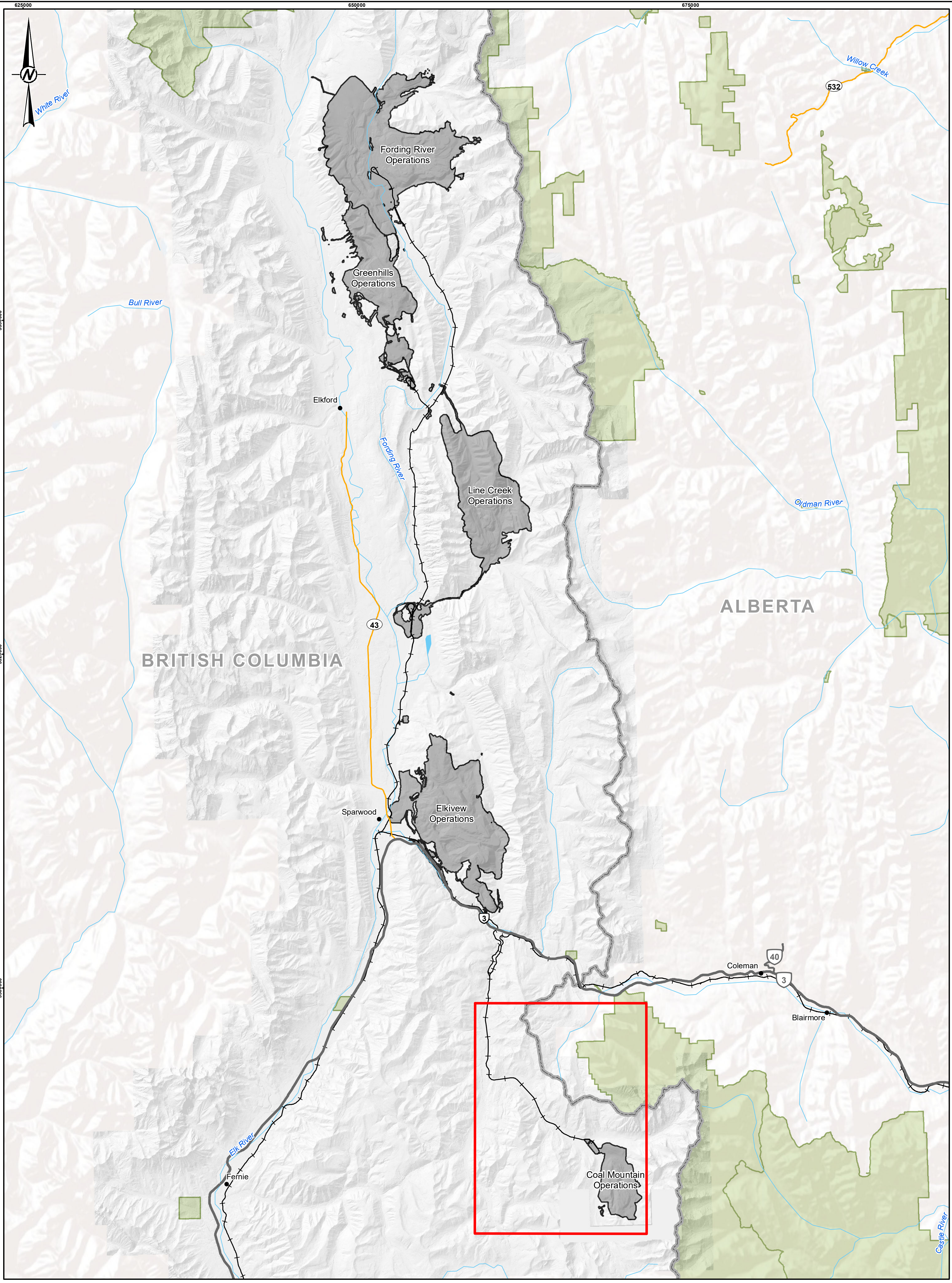

LEGEND

- CITY / TOWN / COMMUNITY
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILROAD
- WATERCOURSE
- BRITISH COLUMBIA-ALBERTA BOUNDARY
- COAL MINING OPERATION
- PARK / PROTECTED AREA
- PROJECT LOCATION
- WATERBODY

0 5 10
1:275,000 KILOMETRES

REFERENCE(S)
BASE DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
TECK COAL LIMITED

PROJECT
COAL MOUNTAIN OPERATION (CMO) LOCAL AQUATIC ENVIRONMENTAL MONITORING PROGRAM (LAEMP)

TITLE
CMO LAEMP PROJECT LOCATION

CONSULTANT
GOLDER

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DESIGNED	KH
PREPARED	DR
REVIEWED	KH
APPROVED	SH

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1.2 Study Questions and Scope

The CMO LAEMP study questions were developed in consultation with the Elk Valley Environmental Monitoring Committee (EMC) to meet the objective specified in the 25 August 2018 and 4 April 2019 amendments to Permit 107517. The study questions define the scope of the CMO LAEMP by explicitly defining the intended use of the data. The CMO LAEMP study questions are:

1) What are the magnitude and spatial extent of influence from CMO on water quality, calcite, sediment quality, and benthic invertebrate communities in Michel Creek downstream of CMO, how are these conditions changing over time, and are the conditions expected?

2) How do spatial and temporal patterns in the benthic invertebrate communities correspond to water quality, calcite, sediment quality, and other potential stressors, and what does this tell us about what factors are causing observed effects?

The study questions are intended to address uncertainties and information gaps identified by the EMC and the CMO care and maintenance aquatic health assessment (Golder 2017). The study questions address the nature, extent, and cause(s) of observed effects on biota in Michel Creek and are intended to inform decisions regarding water quality management at CMO.

In addition to addressing the study questions, this report integrates information from other relevant monitoring studies in the Michel Creek watershed to help characterize and understand potential effects of activities at CMO on fish and aquatic-dependent wildlife.

1.3 Linkages to Adaptive Management

As discussed in Section 1.1, the CMO LAEMP was initiated in response to findings of the RAEMP and other investigations that indicated unexpected biological conditions in Michel Creek. The decision to initiate a LAEMP was made under the response framework of the Water Quality Adaptive Management Plan for Teck Coal in the Elk Valley (hereafter, ‘AMP’ [Teck 2018]). Teck (2018) provides detailed information on the adaptive management framework, a series of Management Questions and associated Key Uncertainties, the response framework, continuous improvement procedures, linkages between the AMP and other EVWQP programs, and AMP reporting. The AMP was developed by Teck to support implementation of the Elk Valley Water Quality Plan (EVWQP) to achieve water quality and calcite targets, to protect human health and the environment, and where necessary, restored, and to facilitate continual improvement of water quality management in the Elk Valley.

In addition to addressing the CMO LAEMP study questions on an annual basis, monitoring data from the CMO LAEMP will contribute to the full monitoring dataset assessed every three years within the RAEMP. Combined data from the RAEMP and the LAEMPs inform the AMP to address the following questions:

- AMP Management Question #2: Will aquatic ecosystem health be protected by meeting the long-term site performance objectives?
- AMP Management Question #5: does monitoring indicate that mine-related changes in aquatic ecosystem conditions are consistent with expectations?

Following the adaptive management framework, data collected as part of the CMO LAEMP in 2018 and 2019 will be used to inform understanding of conditions in Michel Creek, interpretation of information collected under routine chronic toxicity monitoring and other programs, decisions on environmental management at CMO, and potential adjustments to the 2020 CMO LAEMP study design.

1.4 Site Activities and Water Management at CMO

Mining activity at Coal Mountain began around 1908 with small underground mines and has continued intermittently for over a century. Open pit operations began in 1975 and mining progressed under various owners until Teck took ownership of CMO in 2008 (Teck 2017). Mine operations ceased in 2018, at which point the mine moved into care and maintenance (C&M), initially set in the CMO Closure Plan (Teck 2016) as a 10-year period from 2018 to 2028 (Figure 1.4-1). Following C&M, closure (2028 to 2036) and post closure (2036 and beyond) activities will be carried out at CMO, which will include decommissioning of infrastructure, remediation, and revegetation, as appropriate.

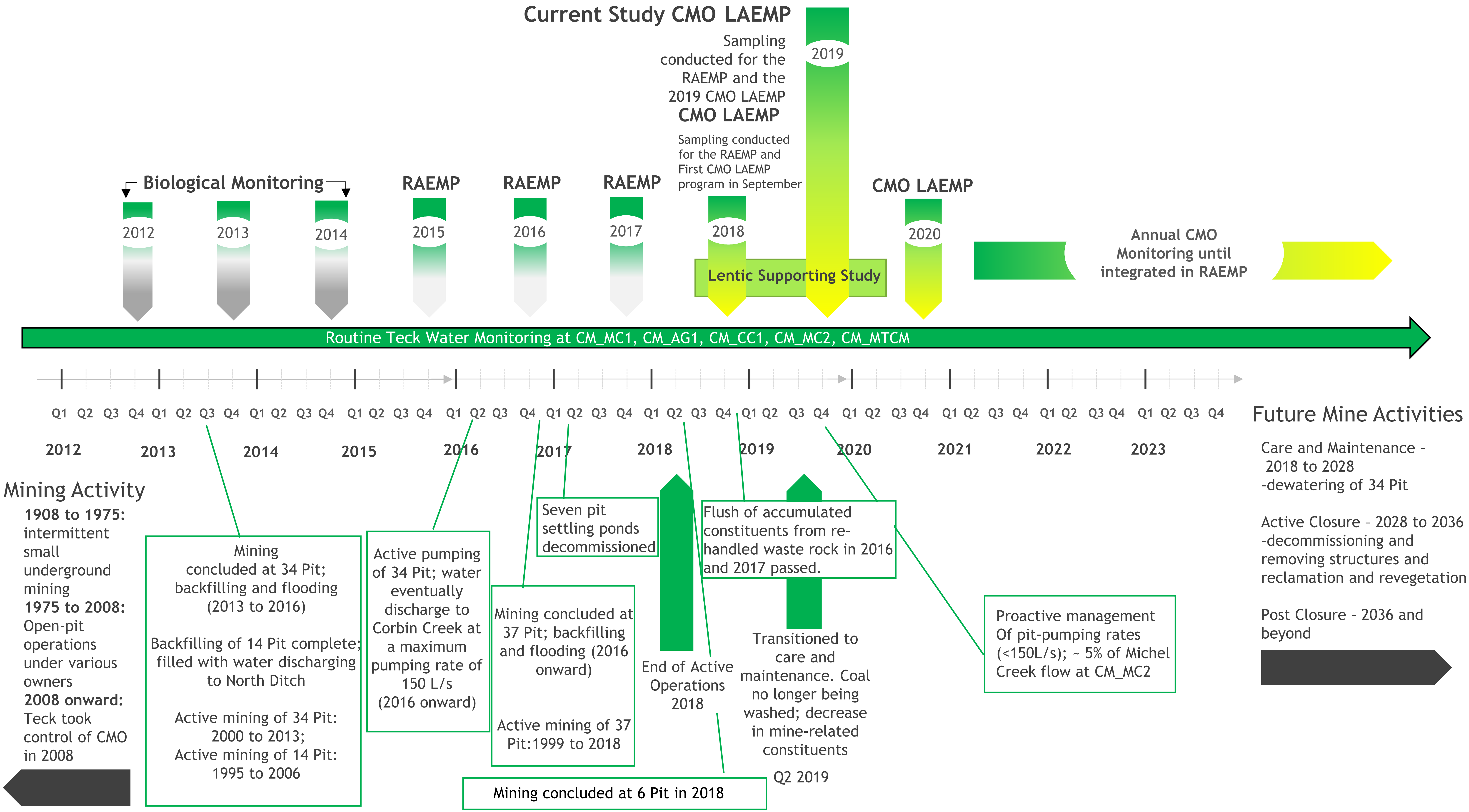
Between 2008 and 2018 during operations, CMO consisted of four pits: 6 Pit, 14 Pit, 34 Pit, and 37 Pit (Teck 2017). Mining in 14 Pit concluded in 2006, 34 Pit in 2013, 37 Pit and 6 Pit in 2018. The 14 Pit, 34 Pit, and 37 Pit have been fully (14 Pit) and partially (34 Pit and 37 Pit) backfilled with waste rock and refuse. Water storage capacity of the pits have been maximized. Pit pumping is required for geotechnical safety. Current pit dewatering practices at CMO direct water to backfilled and dormant pits or to established and permitted mining contact water collection systems, which eventually discharge to Corbin Creek. The Seven Pit Settling Pond system was successfully decommissioned in 2017.

The surface water management system at CMO is designed to capture all mine contact surface water. The water management system includes: a three-pond system for settling out total suspended solids (Corbin Creek Dam and the west and east Main Interceptor Sedimentation Ponds); clean water diversions to move clean water around mine disturbed areas; North and West Ditches to convey contact water to the ponds; rock drains utilized in creeks where there is spoiling of waste rock; and infiltration sumps used to collect additional runoff from other structures. Water quality is monitored at CMO as required under Permits 4750 and 107517 and is required to maintain water quality that meets these permit limits and must not cause greater than 50% mortality in 96-hour rainbow trout (*Oncorhynchus mykiss*) single concentration toxicity tests (EPS 1/RM/13 2nd edition, December 2000) or greater than 50% mortality in 48 hour *Daphnia magna* single concentration toxicity tests (EPS 1/RM/14 2nd edition, December 2000). Maximum TSS concentration permitted in the discharge is 50 mg/L.

Between 2016 and 2018, concentrations of several constituents were identified as increasing in water discharged from Corbin Dam at monitoring station CM_CCPD and at the Main Interceptor Sedimentation Ponds (CM_SPD) (Teck 2019). The constituents were associated with the flush of blasting residues (nitrate, ammonia and nitrite) and with metal leaching (sulphate, boron, calcium, cobalt, lithium, magnesium, manganese, molybdenum, nickel, potassium, selenium, sodium, and hardness).

Between 2018 and 2019, a decrease in mining-related constituents (i.e., nitrate, cobalt, sulphate, and TDS) was measured at CM_CCPD and at CM_SPD, both of which affect water quality in Corbin Creek and Michel Creek downstream of CMO (Teck 2019). The decrease was in part attributed to completion of the flush of accumulated constituents resulting from re-handled waste rock in 2016 and 2017. It was suspected that re-handling of waste rock disturbed constituents that had accumulated in the rock and caused a flush of constituents downstream of CMO when the waste rock was being disturbed. In addition, coal was no longer being washed as CMO transitioned to C&M in May 2019; therefore, plant wash-down discharge to the North Ditch or Main Interceptor Sedimentation Ponds had ceased.

Figure 1.4-1: Timeline of Mining, Water Management, and Monitoring in the CMO Area



Proactive management of pit pumping rates for 34 Pit and 6 Pit in relation to Permit 107517 limits at CM_MC2 was interpreted to be responsible for reduced loading of cobalt and nickel. An evaluation of cobalt data from 2016 to 2018 indicated that cobalt was highest when 34 Pit made up a greater proportion of flow at CM_MC2 (Teck 2019). This condition occurs at the end of freshet when pumping remains high and in-stream flows are low. Therefore, the updated pumping plan for 34 Pit recommended the synchronization of the pump rate with seasonal flow variation at CM_MC2; the target was approximately 5% of flow at CM_MC2 up to the maximum allowable rate (150 L/s). In 2019, pumping rates from 34 Pit were below maximum authorized rates (150 L/s) and no pumping from 6 Pit occurred in 2019; 6 Pit filled natural in 2019 but did not decant. Water storage was maximized in 2019.

Following the cessation of mining activities in 2018 and as CMO moves further into C&M, water quality will continue to improve. However, Teck is committed to taking further actions to address the increased trend in mine-related constituents that was observed between 2016 and 2018 in Corbin Creek and will continue to develop toxicological information for nickel, as well as to evaluate commercially available treatment options for nickel and cobalt at CMO.

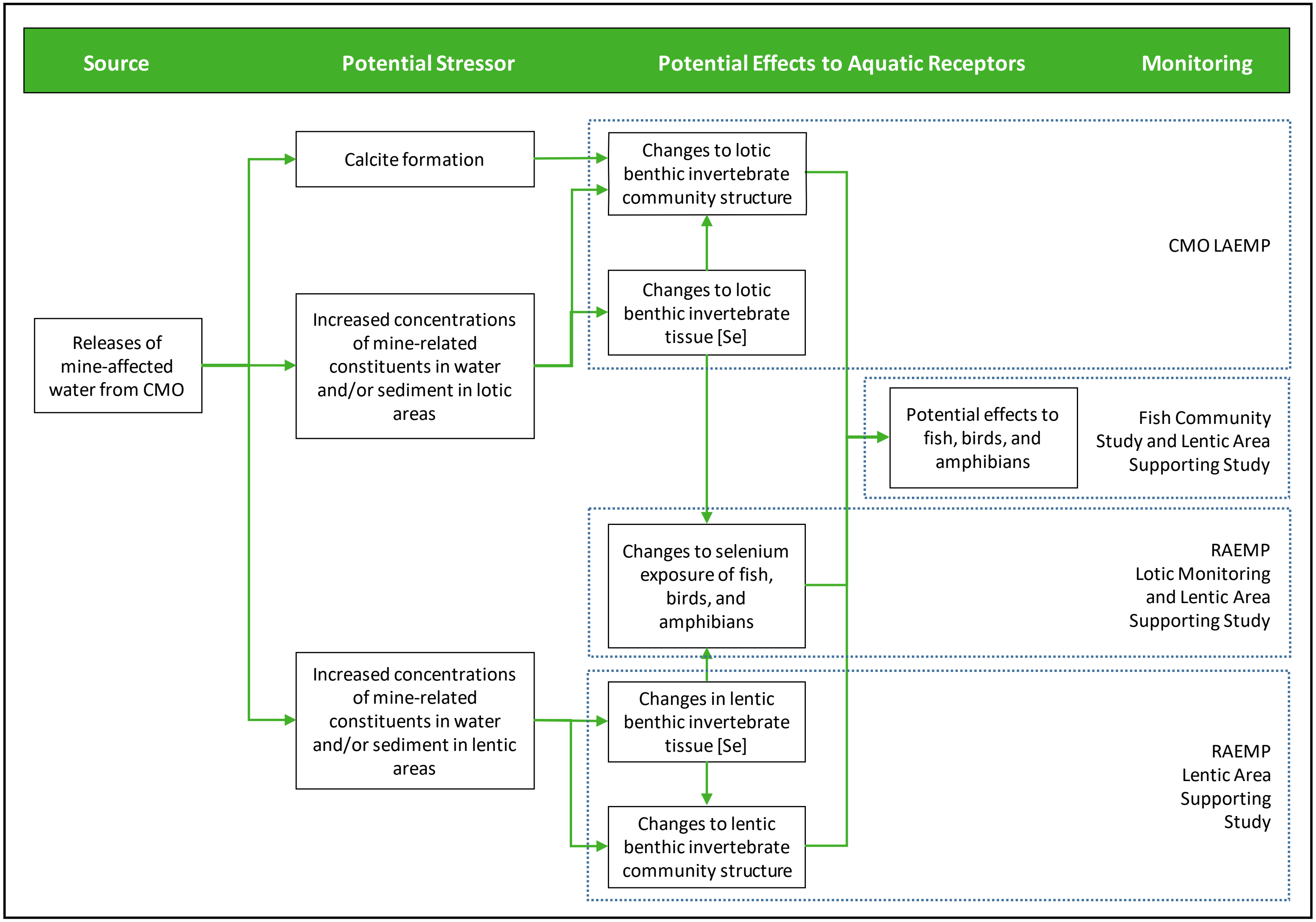
1.5 Conceptual Site Model

A conceptual site model for the CMO LAEMP is shown in Figure 1.5-1, providing an illustrative depiction of the relationships between activities at CMO and the ways in which those activities might alter the environment and affect biological receptors. The conceptual model for the CMO LAEMP illustrates potential stressors, pathways, and receptors for potential effects of CMO on water quality and aquatic biota in Michel Creek. Figure 1.3-1 also summarizes existing and planned monitoring under the CMO LAEMP and the RAEMP to evaluate potential effects aquatic biota.

The CMO LAEMP evaluates pathways related to the study questions by monitoring the following:

- **Supporting Environmental Variables:** to provide information on water quality, calcite, sediment quality, and physical habitat characteristics to aid in interpretation of biological data.
- **Benthic Invertebrate Community**: to characterize potential effects of CMO on the BIC resulting from changes in water and sediment quality or other mine-related stressors.
- **Benthic Invertebrate Tissue Chemistry**: to provide a measure of selenium exposure to aquatic biota over time, relative to historical conditions, relative to reference areas, and relative to benchmarks for potential effects.

Figure 1.5-1: Coal Mountain Operations Local Aquatic Effects Monitoring Program Conceptual Site Model



Note: CMO = Coal Mountain Operations; LAEMP = local aquatic effects monitoring program; RAEMP = regional aquatic effects monitoring program; [Se] = selenium concentration

2.0 METHODS

2.1 Overview

Biological monitoring areas included in the CMO LAEMP and corresponding monitoring stations are listed in Tables 2.1-1 and 2.1-2 and shown on Figure 2.1-1. Monitoring areas were selected to delineate the spatial extent of observed effects to physical and biological conditions and to provide a basis for evaluating potential future changes, including those related to water quality mitigation. Areas monitored in previous years were retained to provide temporal consistency. Stations were added on Michel Creek downstream of Andy Good Creek (MIDAG) and upstream of Leach Creek (MIULE) to help delineate how far downstream from Corbin Creek effects are observed. Reference locations on Andy Goode Creek (AGCK) and Leach Creek (LE1) were included, in addition to MI25 on Michel Creek upstream of mine operations, to characterize local reference conditions.

Components monitored under the CMO LAEMP in 2019 were:

- water quality
- sediment quality
- calcite index
- benthic invertebrate community
- benthic invertebrate tissue

These components were used to answer the study questions (Section 1.2). The spatial distribution of the stations along Michel Creek was used to determine the spatial extent of downstream influence from CMO on the monitoring components (Study Question #1). The inclusion of reference stations was used to characterize local reference conditions and helped characterize the magnitude of mine-related changes to monitoring components (Study Question #1). Historical data from the RAEMP and previous studies within the CMO area were used to assess how conditions have changed over time (Study Question #1). The CMO water and load balance report (SRK 2016) and update (2019) were used to assess whether these water quality conditions were expected (Study Question #1) and the aquatic health assessment (Golder 2017) was used to assess if the effects to the BIC were expected based on the water quality conditions.

Information gathered for Study Question # 1 was integrated together with the BIC data to answer how spatial and temporal patterns correspond and to suggest which factors are causing observed effects in the BIC (Study Question #2).

Sampling was conducted by Minnow Environmental Inc. (Minnow) in September 2018 under a preliminary study design and again in September 2019 following the 2019 CMO LAEMP Study Design (Golder 2019a). Sample collection, laboratory analysis, and data analysis methods for each component are consistent with methods developed for the RAEMP (Minnow 2018b) and are presented in Sections 2.2 to 2.6. To be consistent with previous monitoring and RAEMP methods, BIC sampling was conducted in September.

Teck conducts a variety of additional programs to monitor, evaluate, and/or manage the aquatic effects of mining operations within the CMO area. The results of studies of fish and aquatic-dependent wildlife in the Michel Creek watershed are summarized herein to contribute to the data evaluation and interpretation (Table 2.1-2; Section 4.0). The relevant studies incorporated into the CMO LAEMP interpretation are:

- RAEMP – regional lotic aquatic effects monitoring results. Finalized results and interpretation for the 2018 to 2020 RAEMP monitoring cycle will be available for incorporation into the 2020 CMO LAEMP and will be used to evaluate selenium exposure and potential effects to fish. Water quality results associated with the 2015 to 2017 cycle of the RAEMP were incorporated into Section 3.1.
- Lentic Area Supporting Study – regional lentic aquatic effects results. This study was initiated in 2018 to support the RAEMP and provides information regarding use of lentic areas by fish and aquatic-dependent wildlife and evaluates amphibian use, amphibian egg tissue chemistry, bird use, bird egg tissue chemistry, fish use, fish abundance, and fish tissue chemistry, benthic invertebrate tissue chemistry, habitat features, water quality, and sediment chemistry. Several lentic areas along Michel Creek and in reference areas are included in the Lentic Area Supporting Study (Figure 2.2-1); results of the Lentic Area Supporting Study will be incorporated into the 2020 CMO LAEMP.
- Environmental Flow Needs (EFN) Study - An EFN study of Corbin Creek occurred in 2019 (Teck 2018). The EFN study included reconnaissance electrofishing to assess distribution of fish species and life stages, spring spawner surveys, fish abundance and biomass density measurements, and Fisheries Habitat Assessment Procedure mapping and an instream flow study. The fish community survey component of the EFN study is summarized in Section 4.4. The Fisheries Habitat Assessment Procedure and instream flow study reports are in progress. The finalized results and interpretation of these studies will be available for incorporation into the 2020 CMO LAEMP.

The CMO LAEMP integrates information from these, routine monitoring and the chronic toxicity testing study to characterize and understand potential effects of CMO on fish and aquatic-dependent wildlife in the Michel Creek watershed. Summaries of relevant reports are provided in Section 4.0, while sample collection, laboratory and data analysis methods are presented in the cited monitoring reports.

Table 2.1-1: Monitoring Locations and Replication of Sampling Components for the Coal Mountain Operations in the Local Aquatic Effects Monitoring Program

Watercourse	Biological Monitoring Areas	Teck Water Monitoring Code[a]	Location Description	Distance Downstream of Corbin Creek Confluence (km)	UTM Coordinates		Replication of Sampling Components				
							Water Chemistry	Calcite Index	Sediment Chemistry	Benthic Invertebrate	
					Easting	Northing				Community	Tissue Chemistry
Michel Creek	MI25	CM_MC1	reference location, u/s of CMO	-4.61	668226	5482795	1	3	3	3	3
Andy Goode Creek	AGCK	CM_AG1	reference location, outside of CMO	-	667551	5488669	1	3	3	3	3
Leach Creek	LE1	-	reference location, u/s of Michel Creek	-	659512	5493527	1	3	3	3	3
Michel Creek	MIUCO	-	u/s of Corbin Creek confluence	-0.82	668203	5486653	1	3	5	3	3
Corbin Creek	CORCK	CM_CC1	Corbin Creek u/s of Michel Creek	-	668563	5487395	1	3	5	3	3
Michel Creek	MIDCO	CM_MC2[b]	d/s of Corbin Creek confluence	+0.83	667757	5487611	1	5	5	5	5
Michel Creek	MIDAG	CM_MCTM	d/s of Corbin Creek and Andy Goode	+3.83	665212	5489264	1	3	5	3	3
Michel Creek	MIULE	-	d/s of Corbin Creek and Andy Goode	+9.84	660503	5493048	1	3	5	3	3
Michel Creek	MI5	-	d/s of Leach Creek confluence	+12.9	659497	5496573	1	3	5	3	3

a) Teck Water Monitoring stations that are in the proximity of the biological monitoring areas are listed; UTM coordinates represent coordinates for the biological monitoring areas not the water monitoring stations.

b) Compliance Point.

u/s = upstream; d/s = downstream; CMO = Coal Mountain Operations

Table 2.1-2: Monitoring Conducted Under the CMO LAEMP and Other Relevant Programs in 2019

<table>
<tr><th rowspan="2">Type</th><th rowspan="2">Creek Name</th><th rowspan="2">Biological Monitoring Area</th><th rowspan="2">Teck Water Monitoring Code</th><th rowspan="2">Water Chemistry[a]</th><th rowspan="2">Calcite Index</th><th rowspan="2">Sediment Chemistry</th><th colspan="2">Benthic Invertebrates</th><th colspan="2">Fish</th><th colspan="2">Amphibians</th><th colspan="2">Birds</th></tr>
<tr><th>Community</th><th>Tissue Chemistry</th><th>Survey</th><th>Tissue Chemistry</th><th>Survey</th><th>Egg Chemistry</th><th>Survey</th><th>Egg Chemistry</th></tr>
<tr><td rowspan="3">Reference</td><td>Michel Creek</td><td>MI25</td><td>CM_MC1</td><td>Routine / Concurrent[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>n/a</td><td>n/a</td><td rowspan="9">n/a</td><td rowspan="9">n/a</td><td rowspan="9">n/a</td><td rowspan="9">n/a</td></tr>
<tr><td>Andy Goode Creek</td><td>AGCK</td><td>CM_AG1</td><td>Routine / Concurrent[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>n/a</td><td>n/a</td></tr>
<tr><td>Leach Creek</td><td>LE1</td><td>-</td><td>Concurrent</td><td>Annual</td><td>Annual</td><td>Annual</td><td>Annual</td><td>n/a</td><td>n/a</td></tr>
<tr><td rowspan="7">Mine- Influenced</td><td>Michel Creek</td><td>MIUCO</td><td>-</td><td>Concurrent[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>n/a</td><td>n/a</td></tr>
<tr><td>Corbin Creek</td><td>CORCK</td><td>CM_CC1</td><td>Routine / Concurrent</td><td>Annual</td><td>Annual</td><td>Annual</td><td>Annual</td><td>✓</td><td>n/a</td></tr>
<tr><td rowspan="5">Michel Creek</td><td>MIDCO</td><td>CM_MC2</td><td>Routine / Concurrent[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>n/a</td><td>✓[b]</td></tr>
<tr><td>MIDAG</td><td>CM_MCTM</td><td>Quarterly / Concurrent[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>n/a</td><td>n/a</td></tr>
<tr><td>MIULE</td><td>-</td><td>Concurrent</td><td>Annual</td><td>Annual</td><td>Annual</td><td>Annual</td><td>n/a</td><td>n/a</td></tr>
<tr><td>MI5</td><td>-</td><td>Concurrent[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>Annual[b]</td><td>n/a</td><td>n/a</td></tr>
<tr><td>Lentic Areas[c]</td><td>-</td><td>Concurrent</td><td>n/a</td><td>✓</td><td>n/a</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table>

Sampling conducted for and reported under the CMO LAEMP.

Sampling conducted for and reported under the RAEMP Lentic Area Supporting Study. Relevant data also reported and interpreted under the CMO LAEMP.

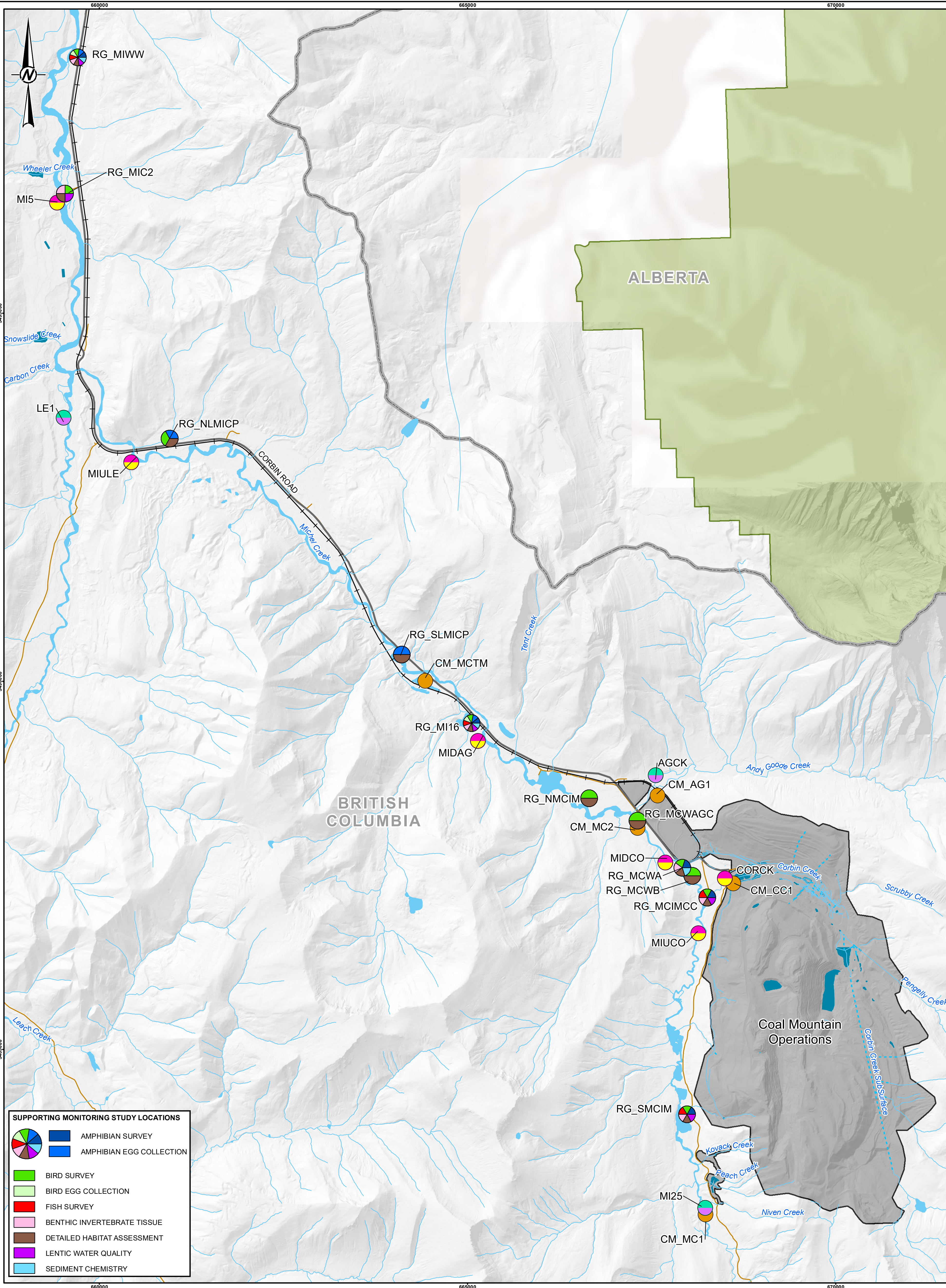
Sampling conducted for and reported under the EFN Study. Relevant data also reported and interpreted under the CMO LAEMP.

(a) Concurrent - water chemistry sampling will be conducted with sediment and biological sampling. Routine - water chemistry sampling is conducted weekly or monthly through Permit 107517 and Permit 6428.

(b) Sampling conducted for and reported under the RAEMP. Relevant data also reported and interpreted under the CMO LAEMP.

(c) Areas surveyed for the Lentic Areas Supporting Study are RG_SMCIM, RG_MCIMCC, RG_MI16, RG_MCWB, RG_MCWA, RG_MCWAGC, RG_NMCIM, RG_NLMICP, RG_MIC2, RG_SLMICP, and RG_MIWW.

- = not sampled in 2019; n/a = not applicable; ✓ = sampled in 2019



LEGEND

- WATER QUALITY STATION

CMO LAEMP STATIONS

- MINE-EXPOSED
- REFERENCE

RAEMP

- MINE-EXPOSED
- REFERENCE

- ROAD - PAVED
- ROAD - UNPAVED
- RAILROAD
- SURFACE FLOW WATERCOURSE
- SUBSURFACE FLOW WATERCOURSE
- BRITISH COLUMBIA-ALBERTA BOUNDARY
- CMO C-84 PERMIT BOUNDARY
- PARK / PROTECTED AREA
- WASTE WATER/SEDIMENT POND
- WATERBODY

0 1 2

1:50,000 KILOMETRES

REFERENCE(S)

BASE DATA OBTAINED TECK COAL LIMITED AND FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
DATUM: NAD 83 PROJECTION: UTM ZONE 11

CLIENT
TECK COAL LIMITED

PROJECT
COAL MOUNTAIN OPERATION (CMO) LOCAL AQUATIC ENVIRONMENTAL MONITORING PROGRAM (LAEMP)

TITLE
SAMPLING LOCATIONS FOR CMO LAEMP

CONSULTANT
GOLDER

YYYY-MM-DD	2020-06-26
DESIGNED	KH
PREPARED	DR
REVIEWED	KH
APPROVED	SH

PROJECT NO.	CONTROL	REV.	FIGURE
18101951	8000	0	2.1-1

2.2 Water Quality

Water quality is routinely monitored by Teck at stations within the CMO LAEMP, as required by Permit 107517 and to support management decisions (Table 2.1-2; Figure 2.1-1), and data are reported annually and incorporated into the annual CMO LAEMP where appropriate. Water quality samples are also collected in lentic areas as part of the RAEMP and at benthic invertebrate sampling stations to support the biological data as part of the CMO LAEMP. Methods for sampling and laboratory analysis of water quality samples are described in Section 7.0 of the RAEMP (Minnow 2018b) and are provided in brief below.

2.2.1 Sample Collection

In 2018 and 2019, water quality samples were collected from mine-influenced and reference areas during biological monitoring in September, following the 2019 CMO LAEMP study design (Golder 2019a). One sample was collected from each area in September. Following RAEMP methods, water samples were collected far enough upstream or downstream of tributaries or discharges to avoid areas of incomplete lateral or vertical mixing and upstream from bridges or other structures to avoid potential associated contamination.

Temperature, pH, dissolved oxygen, and specific conductance or conductivity were measured at each sampling area using a calibrated water quality meter. Water chemistry samples were collected by wading into a mid-channel area, moving from downstream to upstream, to avoid disturbing the substrate. Clean sample bottles provided by the laboratory were filled to minimize the amount of air in the container, consistent with the *British Columbia Field Sampling Manual* (BC MoE 2013). Water samples for analysis of dissolved organic carbon and dissolved metals were field filtered with a 0.45 micrometer (µm) membrane and preserved according to laboratory specifications. Samples were kept cool until being shipped to a qualified laboratory for analysis.

2.2.2 Laboratory Analysis

Samples were shipped to ALS Environmental (ALS; Burnaby BC) for analysis of the analytes listed in Permit 107517. Analysis methods were consistent with the *British Columbia Environmental Laboratory Manual* (BC MoE 2016).

2.2.3 Data Analysis

Water quality data collected in 2018 and 2019 were screened against Compliance Limits and Site Performance Objectives (SPOs) specified in Permit 107517, EVWQP benchmarks (Teck 2014), and BC water quality guidelines for protection of freshwater aquatic life (ENV 2017, 2019a,b), as applicable. EVWQP benchmarks and screening values applicable to the CMO LAEMP are summarized in Table 2.2-1. Nickel and cobalt were screened against interim screening values (Teck 2017), as these were previously identified as potential contributors to effects in Corbin and Michel creeks (Golder 2017). Water quality data collected between 2015 and 2017 and reported in the RAEMP (Minnow 2018b) were included in the screening tables for comparison.

Water quality data from 2018 and 2019 and RAEMP data from 2012 to 2017 (Minnow 2018b) were plotted for comparison between reference and mine-influenced sites and to visualize spatial variation. Additional water quality data collected by Teck during monthly or weekly routine monitoring at CORCK (water quality monitoring location CM_CC1), MIDCO (compliance point CM_MC2), and MI25 (water quality monitoring location CM_MC1) were plotted for visual assessment of temporal trends and comparison to the 2013 to 2019 SRK projected concentrations (SRK 2019). These projections were used to determine if the water quality conditions in 2018 and 2019 were expected.

Table 2.2-1: Benchmarks and Interim Screening Values

Receptor and Parameter	Unit	Benchmark or Interim Screening Value[a]		
		Level 1	Level 2	Level 3
Invertebrates				
Sulphate	mg/L	625	729	1,315
Nitrate	mg/L	$=10^{(1.0003*(Log(hardness))-b)}$		
		b = 1.82	b = 1.60	b = 0.98
Dissolved Cadmium	µg/L	$=(010^{(0.83*Log(hardness)-b)}$		
		b = 2.53	b = 2.24	b = 1.28
Total Cobalt	µg/L	$= exp^{(0.414*(ln(hardness)) – b)}$		
		b = 0.99	b = 0.3	b = -0.29
Total Nickel	µg/L	5.3	15	22
Total Selenium	µg/L	104	-	-
Fish				
Sulphate	mg/L	499	674	1,173
Nitrate	mg/L	$=10^{(1.0003*(Log(hardness))-b)}$		
		b = 1.35	b = 1.22	b = 0.87
Dissolved Cadmium	µg/L	$=10^{(0.83*Log(hardness)-b)}$		
		b = 2.02	b = 1.37	b = 1.31
Total Cobalt	µg/L	$= exp^{(0.414*(ln(hardness)) – b)}$		
		b = -3.92	-	-
Total Nickel	µg/L	$10^{(log(b)- 0.763\times(log(103)-log(hardness)) - 0.073\times(log(0.5)-log(DOC))+0.242\times(7.4-pH))}$		
		b = 88	b = 134	b = 278
Total Selenium	µg/L	19	74	-
Amphibians				
Sulphate	mg/L	481	822	1,545
Nitrate	µg/L	$=10^{(1.0003)(Log (hardness))-b}$		
		b = 1.04	b = -0.05	b = -0.65
Dissolved Cadmium	µg/L	$=10^{(0.83*Log(hardness)-b)}$		
		b = -0.914	-	-
Juvenile Birds				
Total Selenium	µg/L	203	-	-
Bird Reproduction				
Total Selenium	µg/L	394	-	-

a) Values for sulphate, nitrate, cadmium, selenium are EVWQP benchmarks; values for cobalt and nickel are interim screening values.

"-" = not derived; mg/L = milligrams per litre; µg/L = micrograms per litre.

2.3 Calcite Index

Methods for monitoring calcite are described in Section 9.0 of the RAEMP (Minnow 2018b) and summarized in brief below. Methods for characterizing calcite are consistent with those used to monitor calcite as part of the regional calcite monitoring program (Lotic and Teck 2016), but data are collected at a localized scale relevant to the biological sampling area.

2.3.1 Sample Collection

Calcite was measured at areas where benthic invertebrate samples were collected in 2018 and 2019. Three measurements of calcite were collected from each mine-influenced and reference area, except at MIDCO where five measurements were collected.

Calcite was measured in association BIC sampling, which involved measurement of 100 “pebbles” in the vicinity of each BIC sample (Environment Canada 2012a). The same methods for calcite measurement were applied as for the regional calcite monitoring program (Lotic and Teck 2016), except that calcite monitoring under the RAEMP and LAEMPs is conducted in riffle habitats within approximately 10 m of where each invertebrate replicate sample is collected, whereas the regional calcite monitoring program involves calcite measurement in 100 m long areas that include glide and cascade habitats.

For calcite characterization, the presence (score = 1) or absence (score = 0) of calcite was recorded for each of the 100 particles. Degree of concretion was assessed by determining if the particle could be removed with negligible resistance (not concreted; score = 0), noticeable resistance but removable (partially concreted; score = 1), or immovable (fully concreted; score = 2). The calcite index was calculated as the sum of the calcite presence score (number of particles with calcite divided by the number of particles counted) and calcite concretion score (sum of particle concretion scores divided by the number of particles counted).

2.3.2 Spatial Trends

Calcite data were compared between reference and mine-influenced areas and plotted relative to previous results and reference area normal ranges defined in the most current RAEMP (Minnow 2018b).

2.4 Sediment Quality

Methods for sampling and laboratory analysis of sediment samples are described in Section 10.0 of the RAEMP (Minnow 2018b) and are summarized in brief below.

2.4.1 Sample Collection

Sediment samples were collected from mine-influenced and reference areas where BIC samples were collected in 2018 and 2019. Five samples were collected from each mine-influenced area and three samples were collected from each reference area.

Sediment samples were collected using a spoon from deposits of sand and/or fines amongst the cobbles. When no such deposits were found but if there was evidence of fine deposits on rock surfaces, then the sediments were gently brushed off the rocks into sample containers. Details pertaining to the samples such as depth, substrate characteristics, colour, texture, and presence of aquatic vegetation were recorded. Sediment samples were stored in a cooler with ice or ice packs and then transferred to a refrigerator at the end of the day.

2.4.2 Laboratory Analysis

Samples were shipped to ALS for analysis of moisture content, particle size, pH, total organic carbon, and metals (<2 mm fractions). The laboratory homogenized each sediment sample before analysis according to standard laboratory protocols. Analysis methods were consistent with the *British Columbia Environmental Laboratory Manual* (BC MoE 2016).

2.4.3 Data Analysis

Sediment quality data were compared to BC sediment quality guidelines for the protection of freshwater aquatic life (ENV 2017), reference area concentrations, and sediment quality previously observed in the same areas. In addition, sediment quality data were plotted for visual examination of spatial and temporal variability. Data from 2018 and 2019 were plotted for all parameters for which a Working Sediment Quality Guideline (WSQG) was available and visually assessed for temporal changes.

2.5 Benthic Invertebrate Community

Benthic invertebrates are excellent biomonitors for assessing potential effects of physical and chemical habitat changes in aquatic systems because of their relatively sessile nature, known chemical tolerances, ease of sampling, and resulting from their direct and indirect source of food for fish and aquatic dependent wildlife (e.g., amphibians, birds; Barbour et al. 1999, Feltmate and Fraser 1999, Beatty et al. 2006). Within the CMO LAEMP, potential mine-related effects on aquatic biota were evaluated by comparing BIC endpoints at mine-influenced stations to reference stations and to the regional normal ranges.

Methods for sampling and laboratory analysis of BIC samples are described in Section 3.2 of the RAEMP (Minnow 2018b) and are summarized in brief below.

2.5.1 Sample Collection

Three BIC samples were collected from each mine-influenced and reference area except for MIDCO, the compliance station, where five samples were collected. Each sample was collected from a separate riffle at each stream area or from 50 m apart if the sampling area was one long riffle.

Collection methods were consistent with the *CABIN Field Manual: Wadeable Streams* (Environment Canada 2012). A 400-µm mesh kick net was used to collect a time-integrated sample. The reach sampled was traversed from bank to bank in an upstream direction for a collection time of three minutes. The kick net was held downstream of the sampler while the substrate in the top 5 to 10 cm was disturbed and rocks were overturned to dislodge invertebrates clinging to interstitial spaces and allow them to drift into the kick net. The collected material was transferred to labelled containers and preserved with 10% phosphate-buffered formalin.

Supporting habitat information was collected concurrent with benthic sampling, including stream habitat characteristics and calcite presence and substrate concretion scores.

2.5.2 Laboratory Analysis

BIC samples were sent to Cordillera Consulting, Summerland, BC for sorting and taxonomic identification. Organisms were identified to the lowest practical level of taxonomy (typically genus or species) using up-to-date taxonomic keys. Analysis methods were consistent with the *CABIN Laboratory Methods: Processing, Taxonomy, and Quality Control of Benthic Macroinvertebrate Samples* (Environment Canada 2014). Sorting efficiency and sub-sampling accuracy and precision were quantified using methods specified by Environment Canada (2014).

2.5.3 Data Analysis

The community endpoints that were evaluated at mine-influenced and reference stations were those used in the RAEMP: abundance, as the number of organisms per 3 min kick; richness; Ephemeroptera-Plecoptera-Trichoptera (EPT) abundance and proportion (% EPT); and Ephemeroptera abundance and proportion (%E).

EPT taxa are particularly sensitive to poor water quality conditions in rivers and streams (Rosenberg and Resh 1993); therefore, EPT taxa are useful biological indicators in determining water quality in rivers and streams. Active anthropogenic activities near rivers can affect the abundance and diversity of EPT and often the presence of EPT taxa in a river or stream indicates that it is within the tolerance limit for a number environmental factors (e.g., water temperature, dissolved oxygen, nutrients, toxic chemicals and heavy metals; Dudgeon 1984). Ephemeroptera (mayflies) are also good bioindicators of freshwater quality because they are only able to survive in rivers or streams that have good water quality (Chapman 1996).

These community endpoints were compared between mine-influenced stations and reference stations, and to historical BIC endpoints observed in the same areas under the RAEMP from 2012 to 2017. As well, BIC endpoints were plotted for visual examination of spatial and temporal variability and comparison to the regional normal range (Section 2.5.3.1).

Statistical analysis were conducted on the 2018 and 2019 CMO LAEMP data to compare mine-influenced stations to reference stations, providing a direct indication of localized spatial differences (Section 2.5.3.2). Temporal changes were also evaluated to compare the current year’s data (2019) to previous years for each station by assessing changes over time. Multivariate analysis was used to evaluate spatial trends in 2018 and 2019 and temporal trends (Section 2.5.3.3).

2.5.3.1 Regional Normal Ranges

The BIC data collected as part of the CMO LAEMP were compared to the regional normal range for each community endpoint. Regional normal ranges were developed for the RAEMP using pooled reference area data from 2012 and 2015 (Table 2.5-1; Minnow 2018b). Site-specific regional normal ranges are currently being developed and will be incorporated into the CMO LAEMP in the future; however, these updated normal ranges were not available for incorporation into the 2019 CMO LAEMP annual report.

Table 2.5-1: Benthic Invertebrate Community Regional Normal Ranges

Variable	Unit	Normal Range	
		Lower Limit	Upper Limit
Benthic invertebrate taxonomic richness (lowest practical level)	no. of taxa per sample	20	38
Benthic invertebrate abundance	no. of organisms per sample (per 3 min kick)	1,005	13,221
Percent Ephemeroptera, Plecoptera, Tricoptera	%	63	97
Ephemeroptera, Plecoptera, Tricoptera abundance	no. of organisms per sample (per 3 min kick)	878	12,165
Percent Ephemeroptera	%	23	69
Ephemeroptera Abundance	no. of organisms per sample (per 3 min kick)	348	9,480

Source: RAEMP Study Design, 2018 to 2020 (Minnow 2018b)

2.5.3.2 Univariate Statistical Analysis

Statistical analysis of BIC endpoints followed the approach described in the RAEMP (Minnow 2018b, Section 3.2.6), with the exception that LAEMP data were not amenable to temporal trend analysis using repeated measures analysis of variance (ANOVA) and therefore a *Year x Station* model ANOVA was used to compare the current year's data (2019) to previous years for each station. Statistical analyses were conducted in SYSTAT version 13.2 (SYSTAT 2017).

Spatial Evaluation

The BIC endpoints were evaluated at each of the mine-influenced stations and compared to reference stations using an ANOVA and contrasts to detect which mine-influenced stations differed from the reference stations in the 2018 and 2019. An overall ANOVA model was fit as:

$$Y = CI + Station(CI) + \epsilon$$

Equation 2.5-1

where: *Y* = response variable; *CI* = a fixed factor for station type with two levels (control = reference and impact = mine influenced); *Station(CI)* = a fixed factor for area, (nested in *CI* because each area can only be assigned to one level of *CI*); and ϵ = the error term.

The best transformation for each endpoint was chosen as the transformation for which a Shapiro-Wilk's test on the residuals gave the highest *P*-value (i.e., most parameters were normally distributed). The BIC endpoints with significant ANOVA results were compared among years using Tukey's honestly significant difference (HSD) multiple comparison method (Zar 2010).

When a statistically significant difference was detected, the magnitude of the difference was calculated as the average percent change in the station differences according to the following equation:

$$Magnitude\ (\%) = (Station\ A - Reference\ mean) / Reference\ mean) \times 100$$

Equation 2.5-2

where: *Station A* = mine-influenced station.

The mean value at each mine-influenced area was compared to the mean of the three reference areas using a post-hoc contrast. The arithmetic mean was used when the 2018 or 2019 data were determined to be normally distributed based on significance of the Shapiro-Wilk test, the geometric mean was used to estimate the reference station mean when normality could be achieved by log-transformation, and the median was used to provide an estimate of central tendency in cases where normality could not be achieved by data transformation.

Temporal Evaluation

Temporal changes in BIC endpoints were evaluated for data collected between 2012 to 2019. For some (but not all) years there were replicate data for a given area within a year. Thus, for each endpoint, an overall ANOVA with factors *Year*, *Station* and *Year* × *Station* was fit. The best transformation for each endpoint was chosen as the transformation for which a Shapiro-Wilk's test on the residuals gave the highest *P*-value. If there was a significant *Year* term, the variability within years and areas from the full model was used to test for significant differences between each year and the current year (2019) using pairwise comparisons. This test assumes the variability to be consistent among areas and years but allows for comparisons between years without replicates. Significance of the pairwise comparisons was assessed with an α of 0.05 in a Tukey's HSD (Zar 1999). For each year, a magnitude of difference from 2019 was calculated following Equation 2.5-2.

2.5.3.3 Multivariate Statistical Analysis

Spatial and temporal patterns of BIC structure were evaluated further using the non-parametric ordination method of multidimensional scaling (MDS) (Clarke 1993; Clark and Gorley 2016). Taxon abundances were square root transformed to improve the separation of data among stations on the MDS plots and to reduce weighting of the analysis by the most abundant taxa. A Bray-Curtis resemblance matrix was generated and the MDS procedure was applied to this matrix. Using rank order information, MDS determined the relative positions of stations in two dimensions based on similarities. Goodness-of-fit was determined by examining Shepard diagrams and stress values calculated from the deviations in the Shepard diagrams. Stress values less than 0.20 are considered acceptable, although lower stress values (i.e., less than 0.10) indicate greater goodness-of-fit (Clarke 1993).

Metric and non-metric MDS was used to assess broad patterns in the BIC data. In metric MDS (mMDS) the similarity differences have meaning on the ordination plots and differences or distances between points can be interpreted based on the scales. In non-metric MDS (nMDS), the differences are just a representation of the rankings and differences or distances between points and can not be interpreted; therefore, nMDS does not have scaled axes. When stress is less than 0.20 in a mMDS ordination plot, mMDS can be used. For the spatial comparison of the 2018 and 2019 data, the stress value was 0.20 for the mMDS; therefore, mMDS was used. When a stress value less than 0.20 cannot be achieved with mMDS, nMDS is used. For the temporal comparison of the 2012 to 2019 data, a higher stress value was observed; therefore, an nMDS ordination plot was used. Points that fall close together on the MDS ordination plot represent samples with similar community composition, whereas points that are far apart from each other represent samples with dissimilar community composition. A similarity profile (SIMPROF) test was carried out on the ordination data to identify meaningful clusters of taxa that behave in a coherent manner across areas and to prevent over-interpretation of the nMDS plot (Clarke et al. 2014). These SIMPROF clusters were superimposed on the nMDS plots. A one-way analysis of similarities (ANOSIM) test was carried out on the Bray-Curtis resemblance matrix to test whether differences in community composition observed in the MDS ordination plots were significant.

2.6 Benthic Invertebrate Tissue

Methods for sampling and laboratory analysis of benthic invertebrate tissue are described in Section 3.4 of the RAEMP (Minnow 2018b) and summarized in brief below.

2.6.1 Sample Collection

Benthic invertebrate tissue samples were collected as taxonomic composites from mine-influenced and reference areas where benthic invertebrate community samples were collected. Three samples were collected from each area except for MIDCO where five samples were collected.

Benthic invertebrate tissue samples were collected using a kick net as described for BIC samples (Section 2.5.1). Representative taxa were combined, and invertebrates were picked free of debris in the field until at least 2 grams of wet tissue was obtained. Invertebrate tissue samples were kept cool until shipment to the analytical laboratory.

2.6.2 Laboratory Analysis

Samples were shipped to Saskatchewan Research Council (SRC) Environmental Analytical Laboratories, Saskatoon, SK, for analysis of metals including selenium. Analysis methods were consistent with the *British Columbia Environmental Laboratory Manual* (BC MoE 2016). Results were reported on a dry weight basis.

2.6.3 Data Analysis

Benthic invertebrate selenium concentrations were compared to available EVWQP benchmarks (Teck 2014) and BC tissue guidelines (ENV 2019a). Benthic invertebrate tissue data for cobalt, nickel, and selenium were plotted relative to previous results and reference area normal ranges defined in the most current RAEMP and evaluated for spatial and temporal variability.

2.7 Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) methods were consistent with methods developed for the RAEMP (Minnow 2018b, Section 11.0). Because CMO LAEMP data were collected by Minnow as part of data collection for the RAEMP, QA/QC procedures and samples for the RAEMP relate to the CMO LAEMP as well. Detailed QA/QC procedures and results are presented in the RAEMP (in preparation). The data quality review indicated that the data quality objectives were met, and that the data are appropriate for the purposes of this assessment (Minnow 2020, in preparation).

3.0 RESULTS

3.1 Water Quality

Water quality screening and spatial and temporal trends are summarized in Sections 3.1.1 to 3.1.3. Supplementary plots and tabulated data are provided in Appendices A and B.

3.1.1 Water Quality Screening

Water quality results screened against BC WQGs, Compliance Limits, benchmarks, and interim screening values are provided in Appendix B, Table B-1. Appendix B provides September water quality data collected with biological monitoring; routine weekly water quality monitoring data is screened in Section 3.1.3. A summary of constituents with concentrations greater than one or more of these values is provided in Table 3.1-1.

The highest concentrations of mine-influenced constituents were observed at CORCK, followed by MIDCO, with a declining gradient of concentrations further downstream in Michel Creek. Key spatial and temporal patterns in screening results were:

- Concentrations greater than BC WQGs occurred at CORCK (sulphate, nitrate, cobalt, and selenium in both years; nitrite and uranium in 2018 only) and MIDCO (selenium in both years; sulphate, nitrate, and cobalt in 2018 only). Selenium concentrations were greater than or equal to the BC WQG at all stations in both years.
- Sulphate and nitrate concentrations were greater than the lowest level 1 benchmark only at CORCK (both years) and MIDCO (2018 only). Selenium was less than the lowest level 1 benchmark at all stations in both years.
- Nickel and cobalt were greater than interim screening values at CORCK (both years) and MIDCO (nickel in both years; cobalt in 2018 only). Nickel was also greater than the interim screening value at MIDAG (2018 only).

Table 3.1-1: Summary of Water Quality Screening at Stations Downstream of CMO, September 2018 and 2019

Parameter	Compliance Limit	BC Long-Term WQG	Lowest Level 1 Benchmark or Interim Screening Value	Parameter Concentration									
				CORCK		MIDCO		MIDAG		MIULE		MI5	
				2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
Sulphate (mg/L)	500	309 - 429[a]	499	**836**	**679**	***531***	373	265	69	192	123	133	86
Nitrate (mg/L)	5	3	2 – 15[a]	**8.7**	**5.9**	***5.4***	2.9	2.4	0.6	1.6	0.7	0.002	0.4
Nitrite (µg/L)	-	20 - 80[b]	-	**100**	10	**60**	5	8	<1	3.2	1	10	2
Total Cobalt (µg/L)	-	4	3 – 10[a]	**30**	**4**	**8**	1	0.8	2	0.2	<0.1	<0.1	<0.1
Total Nickel (µg/L)	-	98 - 150[a]	5.3[(c)]	100	60	70	20	10	3	4	2	2	0.9
Total Selenium (µg/L)	19	2	19	**10**	**18**	**7**	**9**	**5**	**2**	**3**	**3**	**3**	2
Total Uranium (µg/L)	-	8.5	-	**9**	6	5	3	2	1	2	1	1	1

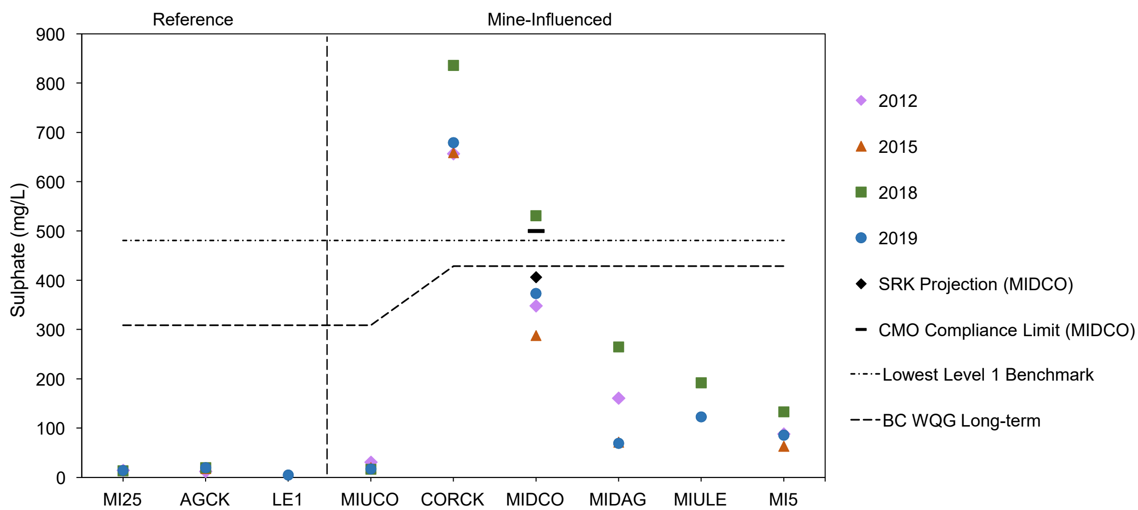
Notes: Stations are ordered from upstream to downstream. Only constituents greater than the BC WQGs, Compliance Limits, benchmarks, or interim screening values are shown for the mine-influenced stations.
a. Hardness dependent.
b. Chloride dependent.
c. Lowest level 1 Benchmark for benthic invertebrates shown.
Italicized values exceed the Permit 107517 CMO Compliance Limit at MIDCO.
Bolded values exceed the BC Long-term WQG (ENV 2017, 2019a).
Shaded values exceed an EVWQP benchmark or interim screening value.
"-" = no data available; µg/L = micrograms per litre; mg/L = milligrams per litre; WQG = Water Quality Guideline.

3.1.2 Spatial Trends

Water quality data collected in September 2012, 2015, 2018, and 2019 to support the biological programs were plotted and visually assessed for spatial trends. Constituents identified in the screening step (Section 3.1.1) are plotted in Figures 3.1-1 to 3.1-7. Plots for all other monitored constituents are provided in Appendix A.

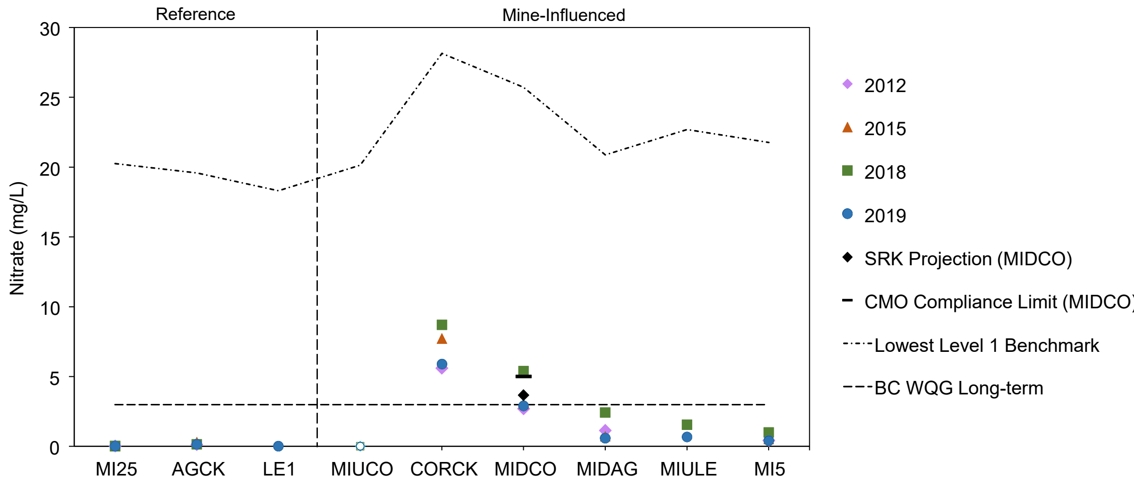
The prevailing spatial pattern was that concentrations of mine-influenced constituents were highest at CORCK, with a gradient of declining concentrations downstream of CMO in Michel Creek (Figures 3.1-1 to 3.1-7). Concentrations at MIUCO were similar to those observed at the reference stations MI25, AGCK, and LE1. Similar spatial trends were observed for other metals (antimony, cadmium, lithium, molybdenum, and strontium), major ions (calcium, potassium, sodium, and magnesium), and related composite parameters (TDS, conductivity, hardness, alkalinity) (Appendix A).

Figure 3.1-1: Spatial and Temporal Variation in Sulphate Concentrations Collected in the CMO LAEMP Study Area in September, 2012 to 2019



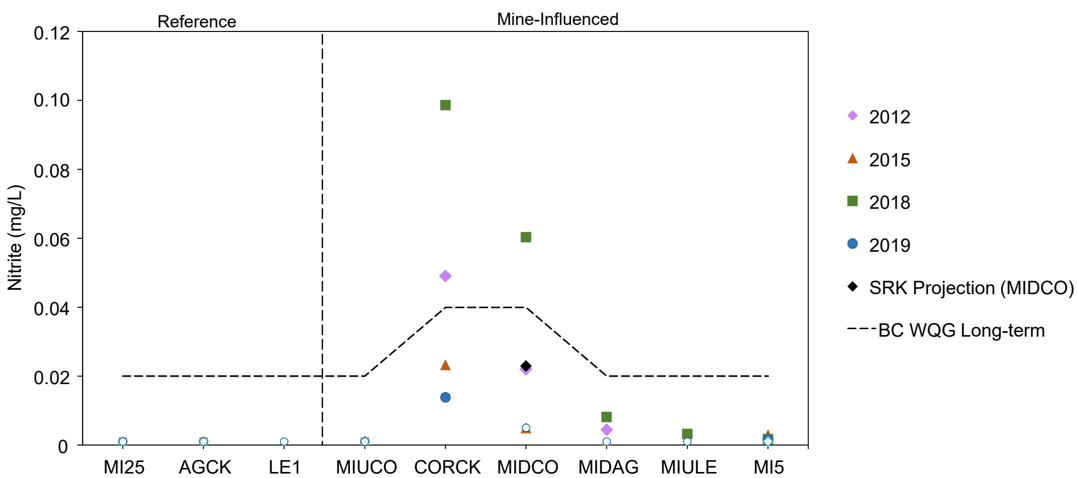
Notes: Sulphate WQG guideline is hardness-dependent and calculated based on 2019 hardness. SRK projection is for 2019.
CMO = Coal Mountain Operations; mg/L = milligrams per litre; WQG = water quality guideline.

Figure 3.1-2: Spatial and Temporal Variation in Nitrate Concentrations Collected in the CMO LAEMP Study Area in September, 2012 to 2019



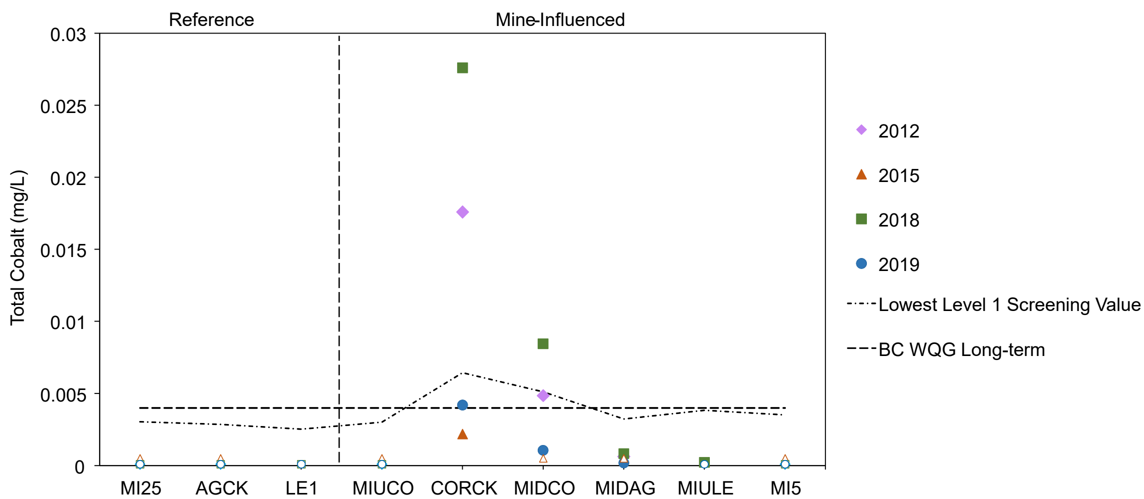
Notes: Lowest level 1 benchmark is hardness-dependent and calculated based on 2019 hardness.
Open symbols indicate non-detects. CMO = Coal Mountain Operations; mg/L = milligrams per litre; WQG = water quality guideline.

Figure 3.1-3: Spatial and Temporal Variation in Nitrite Concentrations Collected in the CMO LAEMP Study Area in September, 2012 to 2019



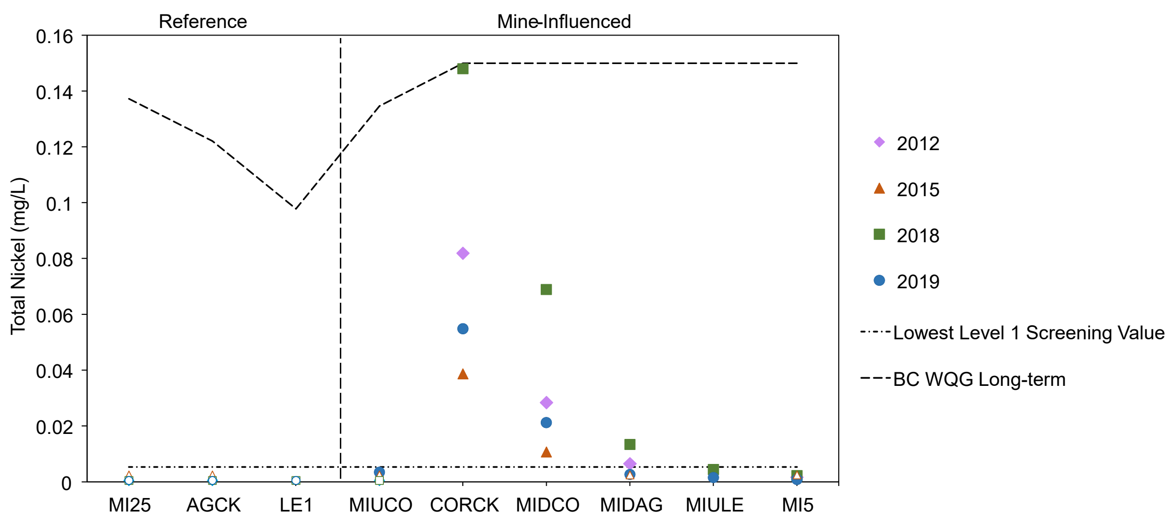
Notes: Nitrite WQG is chloride-dependent and calculated based on 2019 hardness.
Open symbols indicate non-detects. mg/L = milligrams per litre; WQG = water quality guideline.

Figure 3.1-4: Spatial and Temporal Variation in Total Cobalt Concentrations Collected in the CMO LAEMP Study Area in September, 2012 to 2019



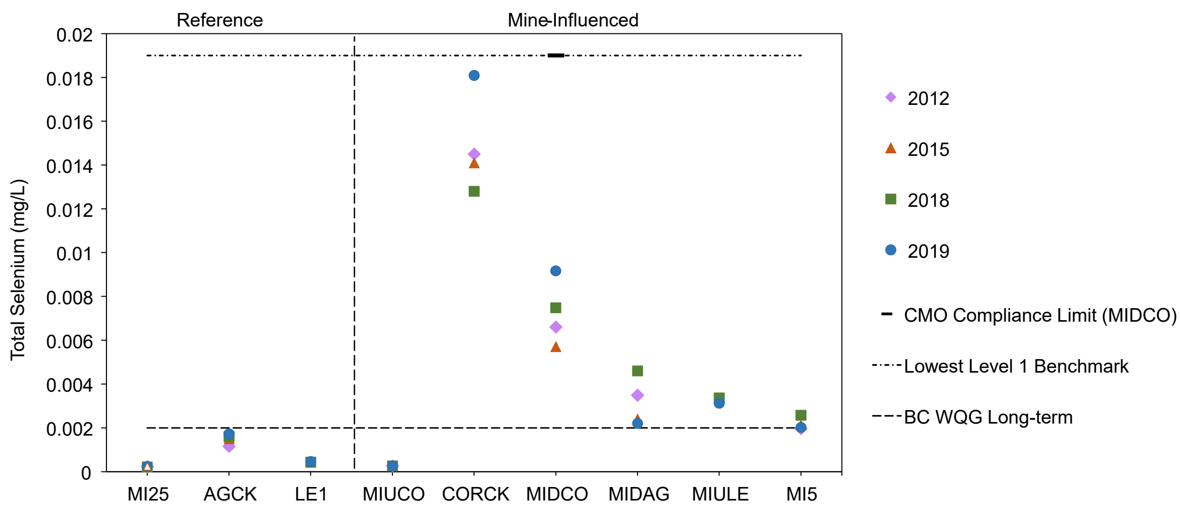
Notes: BC WQG short-term (0.11 mg/L) not shown. Interim screening value is hardness-dependent and calculated based on 2019 hardness. Open symbols indicate non-detects. mg/L = milligrams per litre; WQG = water quality guideline.

Figure 3.1-5: Spatial and Temporal Variation in Total Nickel Concentrations Collected in the CMO LAEMP Study Area in September, 2012 to 2019



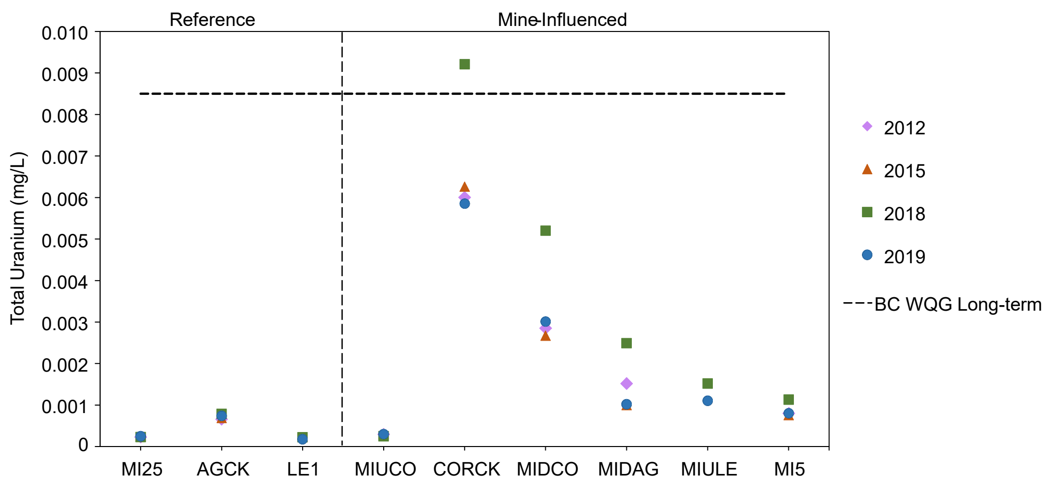
Notes: Nickel WQG is hardness-dependent and calculated based on 2019 hardness.
Open symbols indicate non-detects. mg/L = milligrams per litre; WQG = water quality guideline.

Figure 3.1-6: Spatial and Temporal Variation in Total Selenium Concentrations Collected in the CMO LAEMP Study Area in September, 2012 to 2019



Open symbols indicate non-detects. mg/L = milligrams per litre; WQG = water quality guideline.

Figure 3.1-7: Spatial and Temporal Variation in Total Uranium Concentrations Collected in the CMO LAEMP Study Area in September, 2012 to 2019



mg/L = milligrams per litre; WQG = water quality guideline.

3.1.3 Temporal Trends at CMO LAEMP Stations

Available water quality data from regular and permitted Teck monitoring between 2012 and 2019 were plotted for MI25 (CM_MC1; reference station), MIDCO (CM_MC2; compliance point), and CORCK (CM_CC1) and were visually assessed for temporal trends for those parameters that exceeded guidelines, benchmarks, or interim screening values or parameters that showed a potential mine influence (sulphate, nitrate, nitrite, total cobalt, total nickel, total selenium, and total uranium). Constituents identified in the screening step (Section 3.1.1) are plotted in Figures 3.1-8 to 3.1-14. Plots for all other monitored constituents are provided in Appendix A.

Concentrations of constituents at the reference station on Michel Creek (MI25; CM_MC1) were relatively consistent over the period of record compared to CORCK(CM_CC1) and MIDCO (CM_MC2, with no apparent long-term trends. Key temporal patterns at CORCK (CM_CC1) and MIDCO (CM_MC2) were:

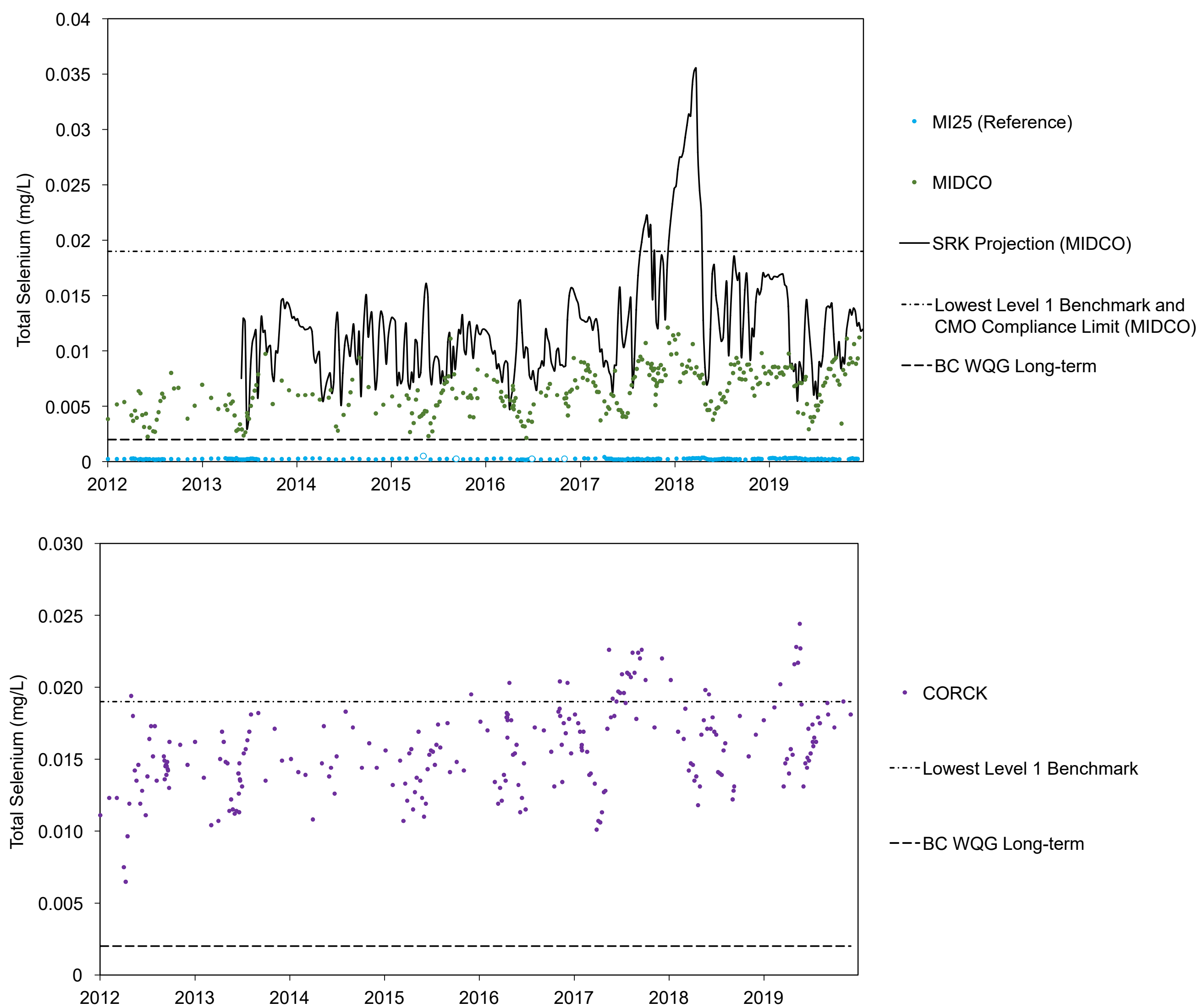
- Concentrations of selenium (Figure 3.1-8) and sulphate (Figure 3.1-9) exhibited a shallow but consistent increasing trend between 2012 and 2018 and appear to have stabilized between 2018 and 2019:
  - Concentrations of selenium (Figure 3.1-8) were below the lowest level 1 benchmark at MIDCO but there were occurrences between 2016 and 2019 when concentrations were greater than the lowest level 1 benchmark at CORCK.
  - Concentrations of sulphate were greater than the lowest level 1 benchmark at MIDCO on three occurrences in 2018 and once in 2019, and were consistently greater than the lowest level 1 benchmark at CORCK between 2012 and 2019.
- Concentrations of nitrite, nitrate, cobalt, nickel, and uranium increased after 2012, peaking in 2017 or 2018 and declining through 2019 (Figures 3.1-10 to 3.1-14):
  - Concentrations of nitrite were greater than the BC WQG (long-term) twice in 2016 at MIDCO and at CORCK between 2013 and 2019. Concentrations of nitrate were greater than the BC WQG (long-term) at MIDCO between 2015 and 2019 and at CORCK between 2012 and 2019.
  - Concentrations of cobalt were greater than the level 1 interim screening value at MIDCO in 2016, 2017 and 2018, and were greater than the level 1 interim screening value at CORCK in 2012, 2013, and 2016 to 2019.
  - Concentrations of nickel were greater than the level 1 interim screening value at MIDCO and CORCK between 2012 and 2019.
  - Concentrations of uranium were greater than the BC WQG (long-term) at CORCK in 2018.
- At both stations, concentrations were generally lowest in May and June and highest between August and October for nitrate, nitrite, sulphate, total alkalinity, TDS, hardness, ions (chloride, calcium, magnesium, potassium, sodium, phosphorus), and some total metals (antimony, barium, boron, nickel, selenium, uranium). Conversely, concentrations were highest in May and June for DOC and some total metals (aluminum, arsenic, cadmium, chromium, iron, lead, manganese, mercury, silver, zinc).

3.1.4 Comparison to Projections

Figures 3.1-8 to 3.1-14 also show projected concentrations at MIDCO obtained from SRK (2019). Plots for all other monitored constituents are provided in Appendix A. Key findings of the comparison to projected water quality were:

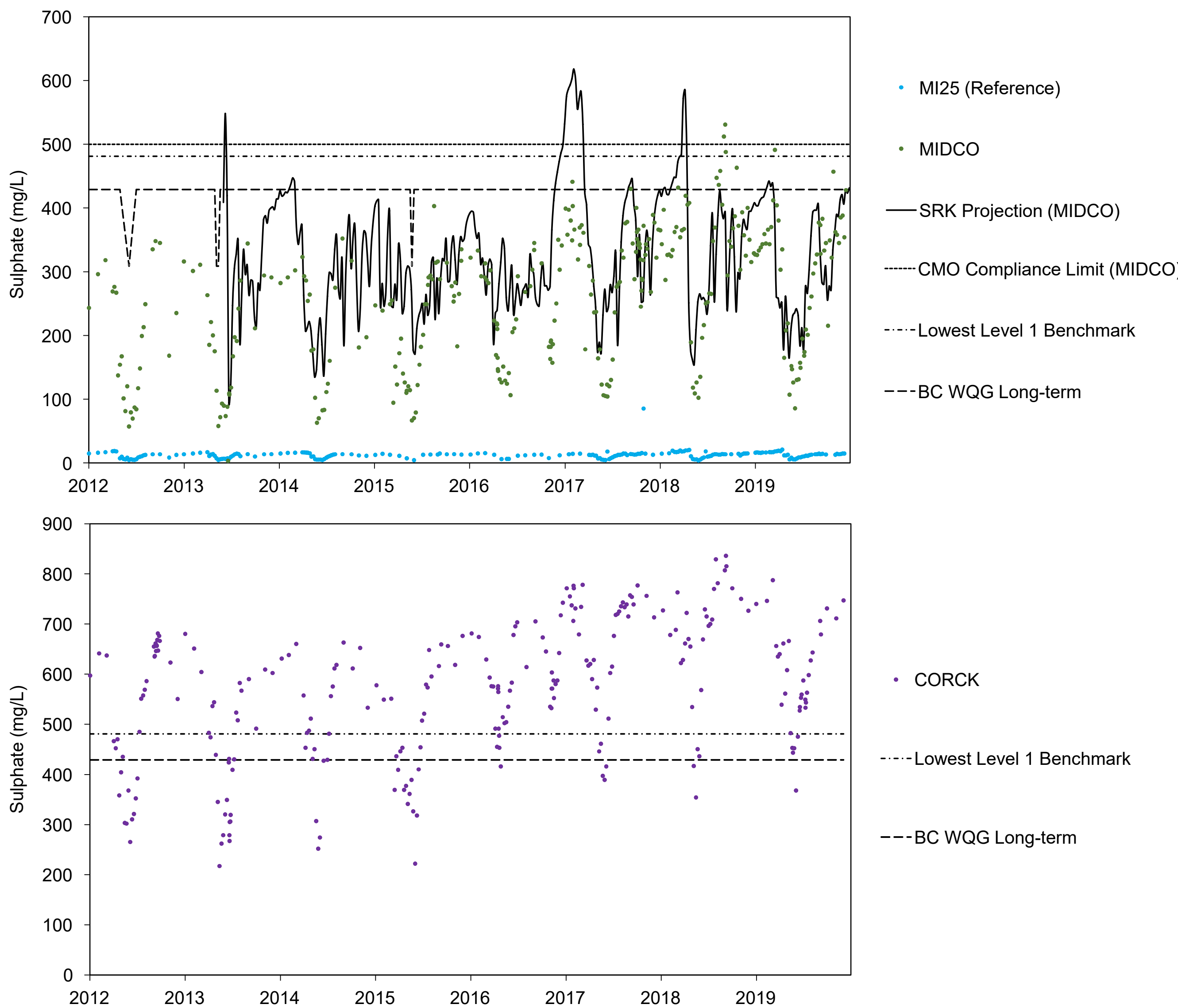
- Concentrations of sulphate, nitrate, nitrite, and nickel were either lower than or similar to projections for all years except 2018, when concentrations were higher than projected for sulphate, nitrate, and nickel.
- Concentrations of total selenium and cobalt were either lower than or similar to projections for dissolved selenium and cobalt for all years.
- Concentrations of total uranium were similar to projected concentrations for dissolved uranium until 2017, when measured concentrations were higher than projected.

Figure 3.1-8: Total Selenium Concentrations at MIDCO and MI25 (top panel), and CORCK (bottom panel)



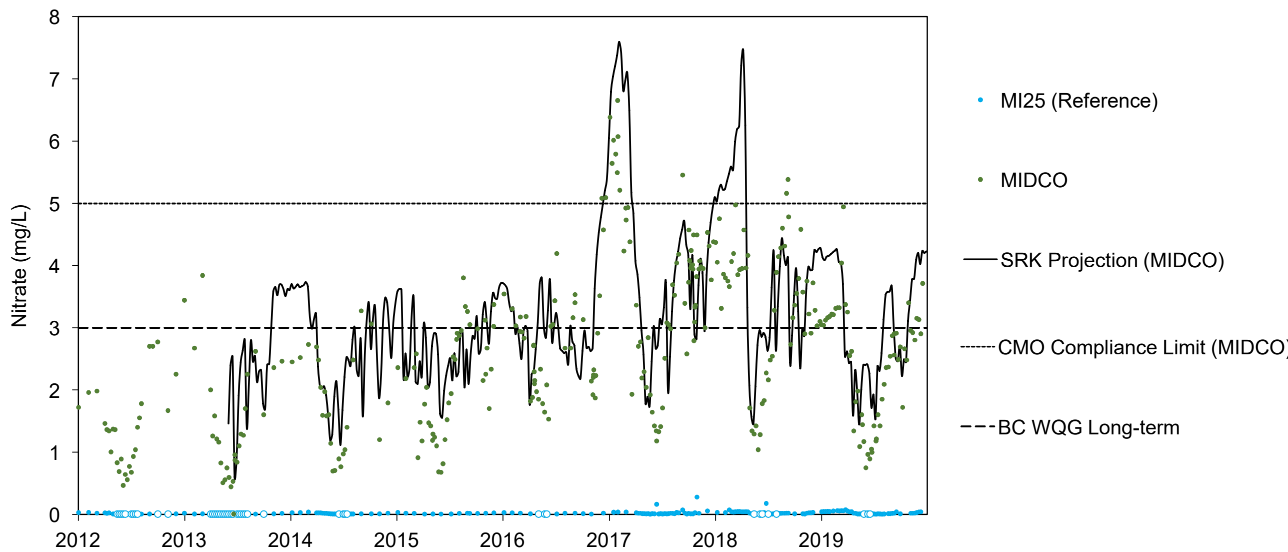
Notes: SRK modelled projections for dissolved selenium (SRK 2019). These projections were included for comparisons to total selenium. Open symbols indicate non-detects. CMO = Coal Mountain Operations; mg/L = milligrams per litre; WQG = water quality guideline.

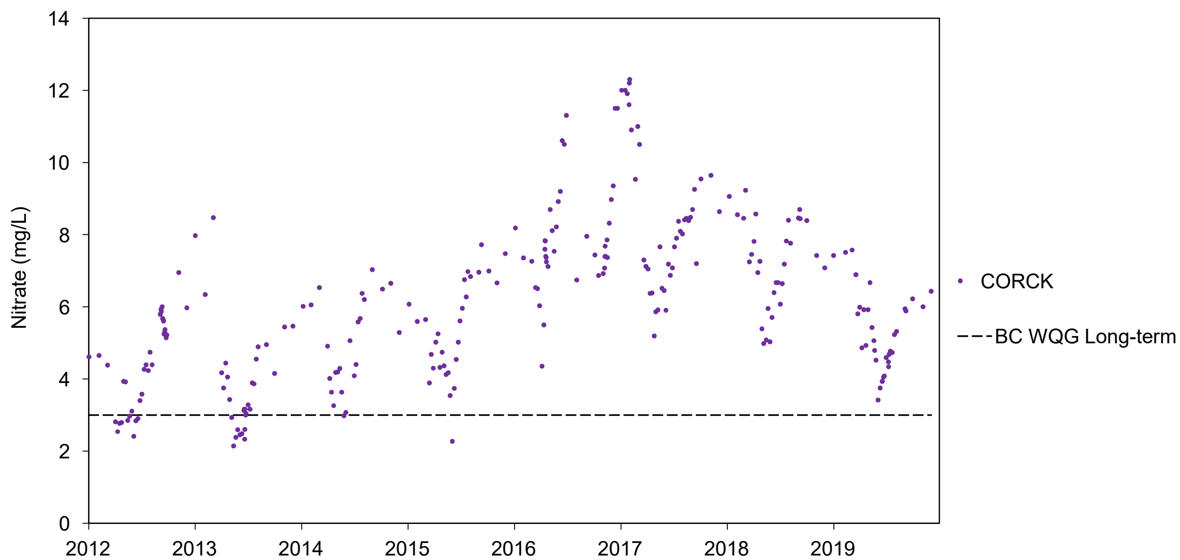
Figure 3.1-9: Total Sulphate Concentrations at MIDCO and MI25 (top panel), and CORCK (bottom panel)



CMO = Coal Mountain Operations; mg/L = milligrams per litre; WQG = water quality guideline.

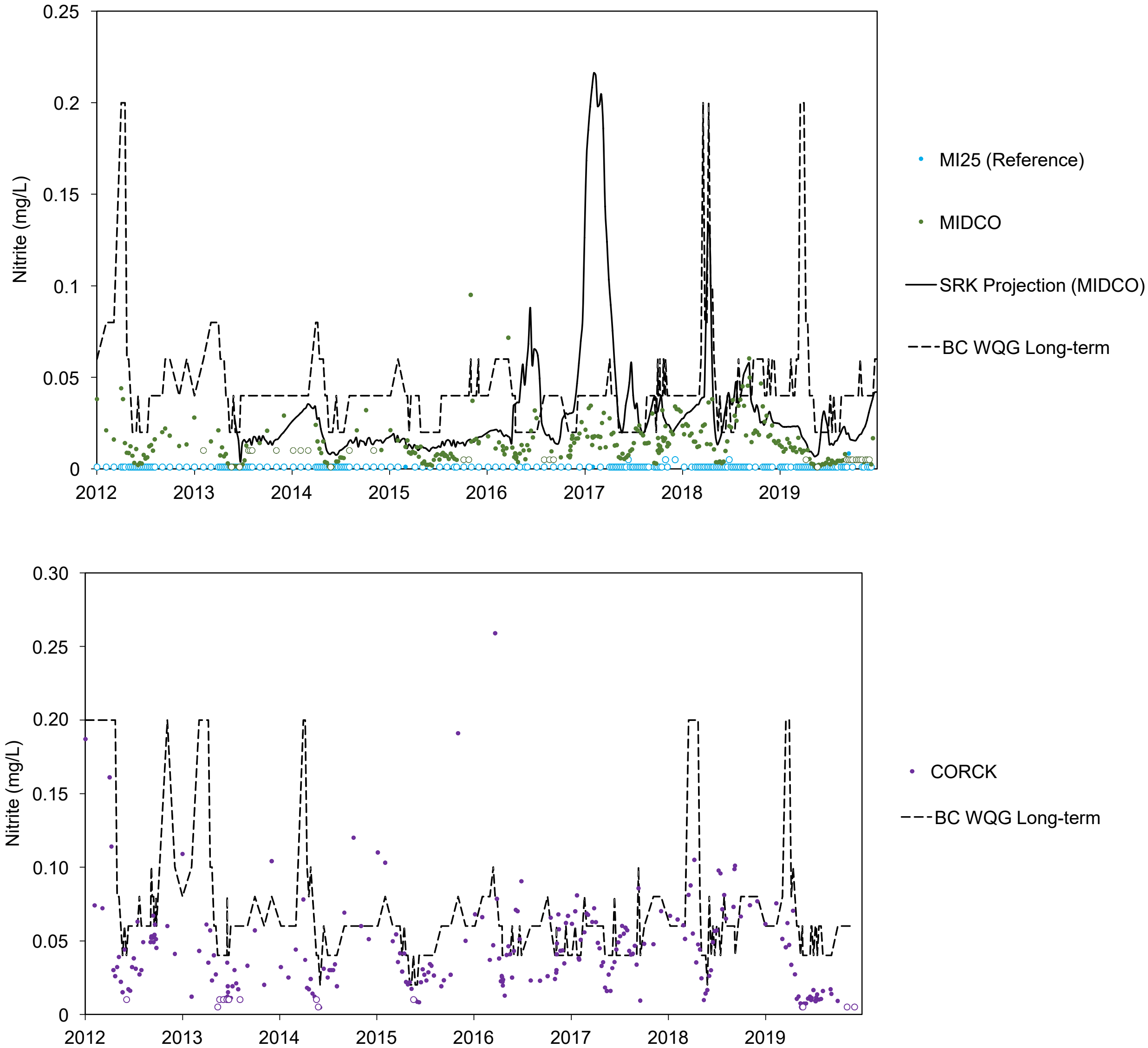
Figure 3.1-10: Total Nitrate Concentrations at MIDCO and MI25 (top panel), and CORCK (bottom panel)





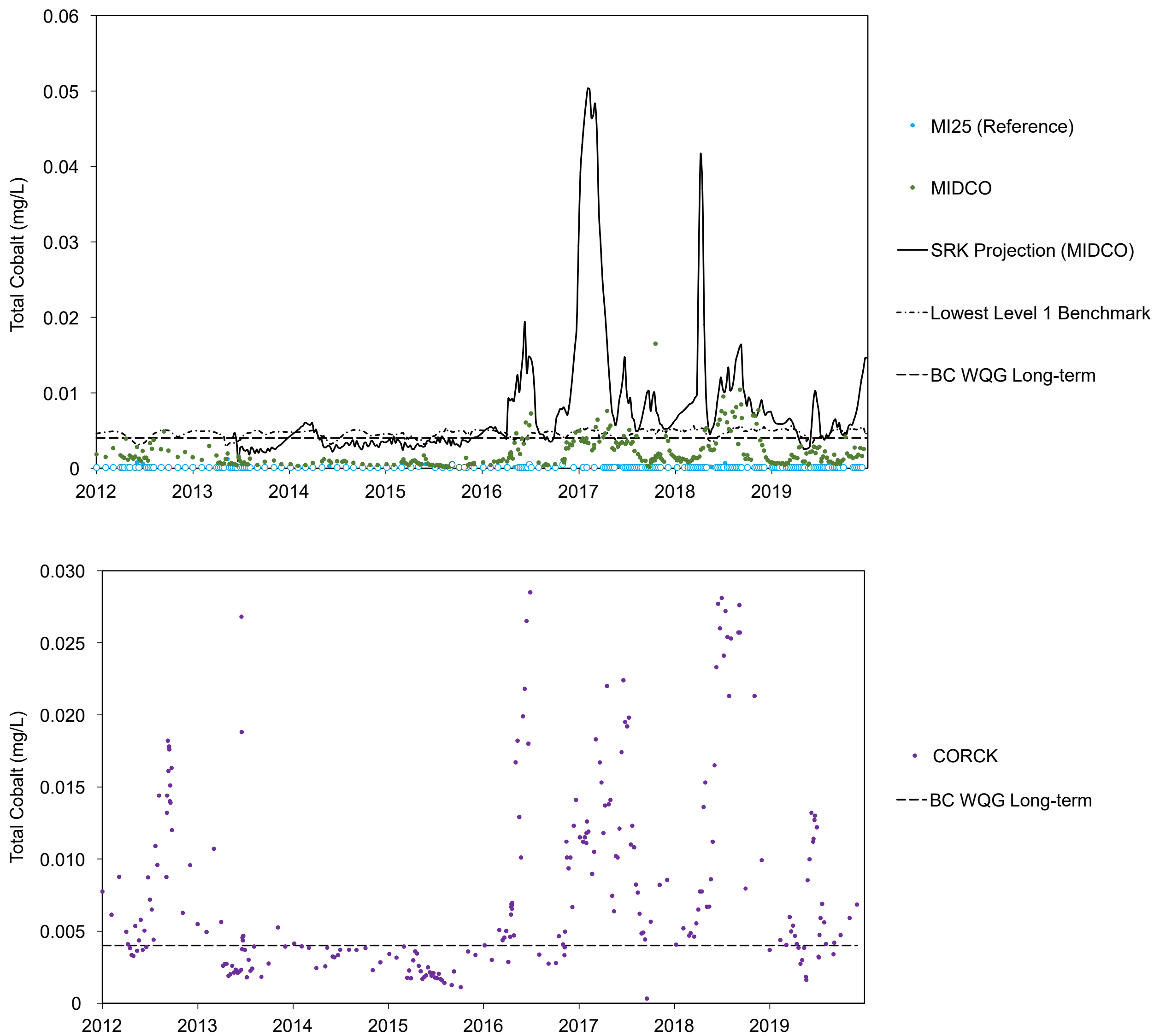
Notes: Lowest Level 1 Benchmark (hardness-dependent; 19 to 27 mg/L) not shown.
Open symbols indicate non-detects. CMO = Coal Mountain Operations; mg/L = milligrams per litre; WQG = water quality guideline.

Figure 3.1-11: Total Nitrite Concentrations at MIDCO and MI25 (top panel), and CORCK (bottom panel)



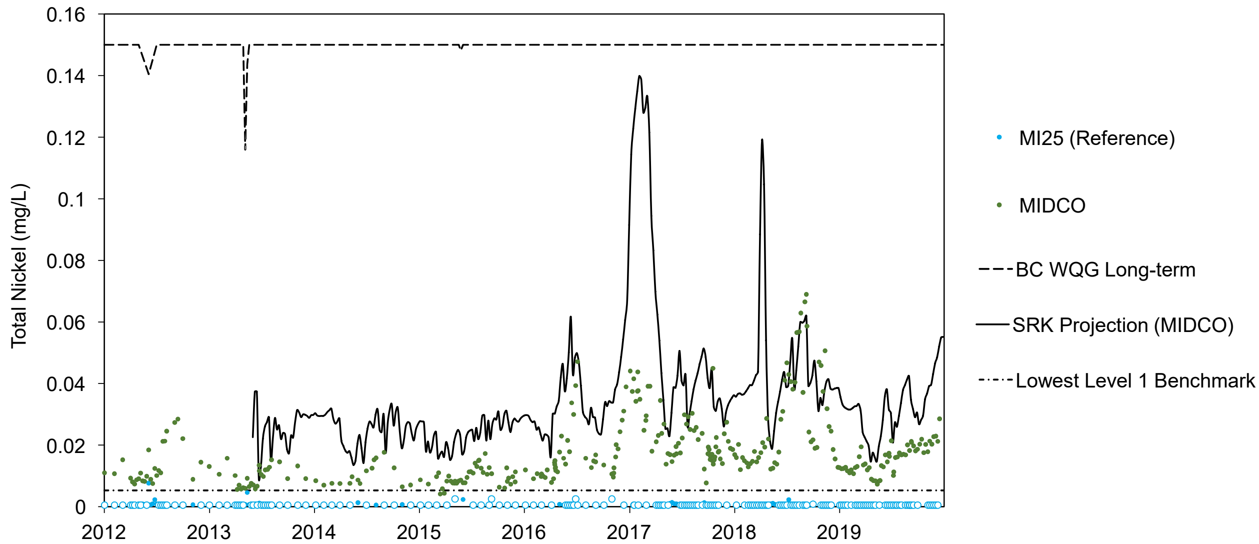
Open symbols indicate non-detects. mg/L = milligrams per litre; WQG = water quality guideline.

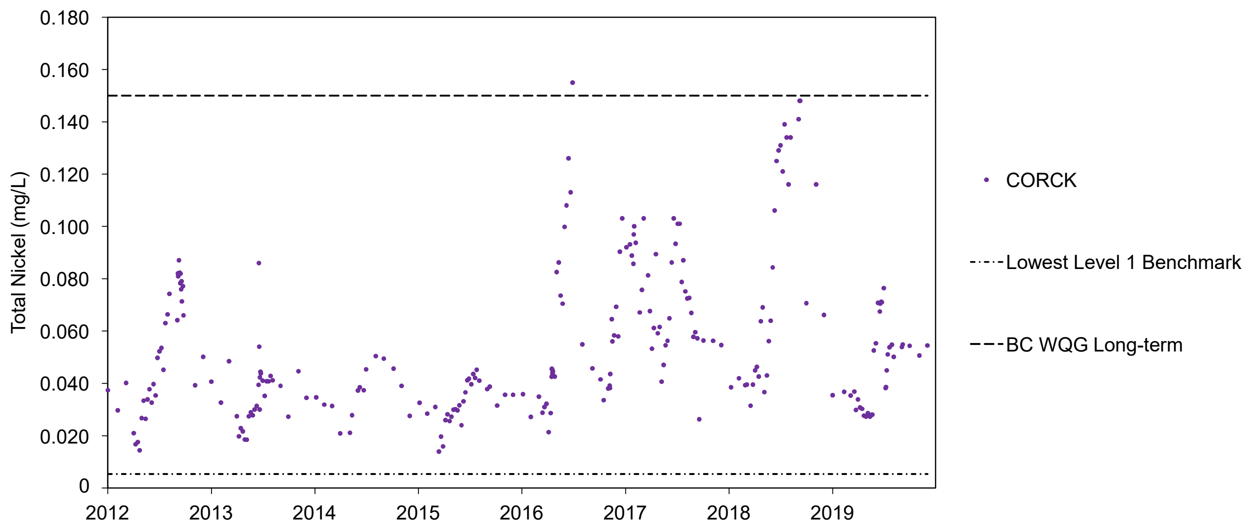
Figure 3.1-12: Total Cobalt Concentrations at MIDCO and MI25 (top panel), and CORCK (bottom panel)



Notes: SRK modelled projections for dissolved cobalt (SRK 2019). These projections were included for comparisons to total cobalt. Open symbols indicate non-detects. mg/L = milligrams per litre; WQG = water quality guideline.

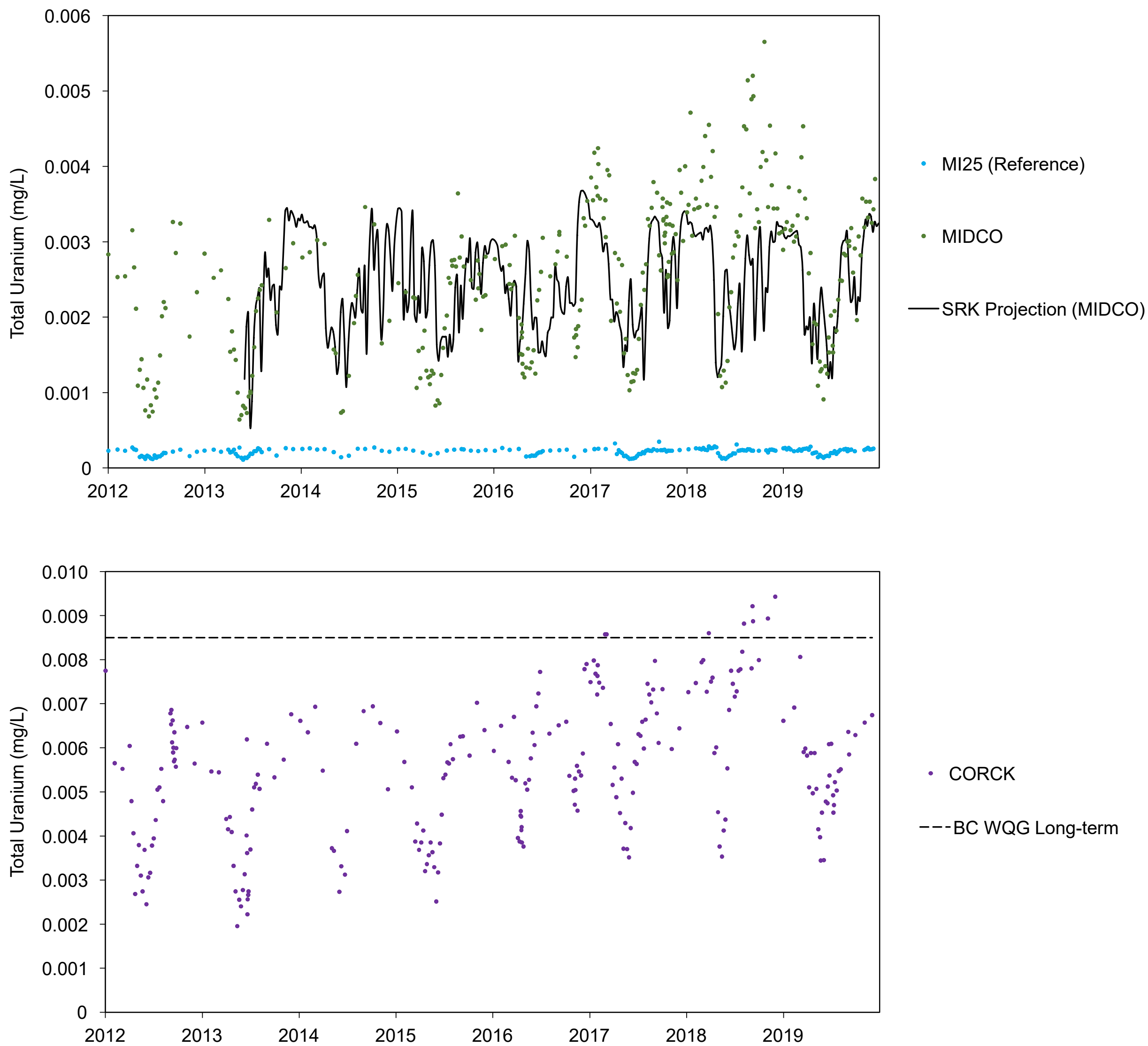
Figure 3.1-13: Total Nickel Concentrations at MIDCO and MI25 (top panel), and CORCK (bottom panel)





Notes: SRK modelled projections for dissolved nickel (SRK 2019). These projections were included for comparisons to total nickel. BC Long-term WQG (hardness-dependent; 0.12 – 0.15 mg/L) not shown in upper panel.
Open symbols indicate non-detects. mg/L = milligrams per litre; WQG = water quality guideline.

Figure 3.1-14: Total Uranium Concentrations at MIDCO and MI25 (top panel), and CORCK (bottom panel)



Notes: SRK modelled projections for dissolved uranium (SRK 2019). These projections were included for comparisons to total uranium. BC Long-term WQG (0.0085 mg/L) not shown in upper panel.
Open symbols indicate non-detects. mg/L = milligrams per litre; WQG = water quality guideline.

3.2 Sediment Quality

Sediment quality results screened against the BC WSQG for the protection of aquatic life (ENV 2017) are provided in Appendix Table C-1. A summary of metal and polycyclic aromatic hydrocarbon (PAH) parameters with concentrations greater than BC WSQGs is provided in Table 3.2-1 and Table 3.2-2. Substrate composition, sediment texture, grain size and sediment total organic carbon (TOC) content are provided in Section 3.4.

The highest concentrations of mine-influenced constituents were observed at CORCK, followed by MIDCO, with a declining gradient of concentrations further downstream in Michel Creek, except for arsenic, chromium, copper, iron, and selenium (Figures 3.2-1 to 3.2-10). Concentrations of arsenic and iron were relatively low at CORCK and higher at MIDCO but declined with increasing distance downstream of MIDCO. Key spatial and temporal patterns in the sediment quality results were:

- Metals and PAH concentrations above the lower BC WSQGs were observed at both reference and mine-influenced stations in 2018 and 2019. Metals and PAH concentrations that were above the lower BC WSQGs at mine-influenced stations were also above at one or more reference stations in 2018 and 2019.
- Metals concentrations greater than the upper BC WSQGs occurred at CORCK (cadmium, manganese, nickel, and zinc in both years) and MIDCO (manganese and nickel in both years).
- Downstream of MIDCO, metals concentrations were similar to or lower than concentrations at reference stations, except for selenium in 2018 and 2019, which had higher concentrations at downstream stations compared to reference stations.
- Concentrations of selenium were above the lower BC WSQGs at AGCK, MIDAG, MIDCO, and MIULE in 2018, CORCK in 2019, and MI5 in both years. The highest concentrations of selenium at Michel Creek stations (i.e., aside from CORCK) were observed at MI5 (Section 3.5). Sediment selenium concentrations at MI5 were also highly variable across replicates. The reason for the relatively high variability and mean concentration at this station is unknown.
- PAHs greater than the upper BC WSQGs occurred at CORCK (fluorene, 2-methylnaphthalene, naphthalene, and phenanthrene in both years), MIDCO (2-methylnaphthalene and phenanthrene in 2018), MIDAG (2-methylnaphthalene in both years and phenanthrene in 2018), and MIULE (2-methylnaphthalene in both years). PAHs are slow to degrade and tend to accumulate in habitats where they are found in association with fine sediments, higher TOC content and detritus (Newman and Unger 2003); however, the substrate composition at both reference and mine-influenced stations was mostly composed of cobble (>50%) and TOC content was <10% (Section 3.4).

Table 3.2-1: Summary of Sediment Quality Screening for Metals at CMO in 2018 and 2019

Parameter	BC Lower WSQG (mg/kg dw)	Maximum Concentration (mg/kg dw)[(a)]																	
		Reference Stations						Mine-influenced Stations											
		MI25		AGCK		LEI		MIUCO		CORCK		MIDCO		MIDAG		MIULE		MI5	
		2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
Arsenic	5.9	**11**	**17**	**7.1**	**6.8**	-	**9.3**	**8.8**	**9.9**	2.7	2.9	**8.2**	**12**	**7.4**	**9.1**	5.6	**9.3**	**7.3**	**8.4**
Cadmium	0.6	**1.5**	**2**	**0.77**	0.51	-	**2**	**0.91**	**0.97**	**7.9**	**12**	**1.8**	**1.5**	**1.1**	**0.95**	**1.5**	**1.1**	**1.6**	**2**
Chromium	37	17	33	**60**	12	-	17	22	21	3.6	5.4	21	22	13	16	10	13	14	17
Copper	36	27	**39**	6	5.1	-	16	21	22	5.7	8.9	18	24	12	15	12	15	12	14
Iron	21,200	**21,500**	**42,300**	6,890	6,460	-	20,900	**26,800**	**32,500**	3,790	3,980	**23,100**	**33,900**	16,500	**22,300**	12,800	19,200	16,400	**21,300**
Manganese	460	**636**	**1,060**	400	135	-	393	**716**	**786**	**2,440**	**3,220**	**1,910**	**1,270**	**502**	**562**	356	450	258	278
Nickel	16	**32**	**55**	**28**	13	-	**30**	**27**	**32**	**272**	**365**	**235**	**92**	**70**	**59**	**50**	**48**	**36**	**43**
Selenium	1.9	1.2	1.3	**2.2**	0.68	-	0.77	0.92	1	1.7	**5.5**	**4.7**	1.7	**2.4**	1.1	**3.3**	1.7	**3.4**	**5.2**
Zinc	123	**136**	**211**	**148**	67	-	**126**	104	120	**760**	**1,210**	**176**	**180**	120	**130**	120	**170**	101	**136**

Note: Stations are ordered upstream to downstream.

a. Concentrations shown are the maximum of the five replicate samples at each station.

Bolded values exceed the lower BC WSQG for the protection of aquatic life (ENV 2017).

Shaded values exceed the upper BC WSQG for the protection of aquatic life (ENV 2017).

"-" = no data available or values below detection limit; mg/kg dw = milligram per kilogram dry weight; WSQG = working sediment quality guideline.

Table 3.2-2: Summary of Sediment Quality Screening for Polycyclic Aromatic Hydrocarbons at CMO in 2018 and 2019

Parameter	BC Lower WSQG (mg/kg dw)	Maximum Concentration (mg/kg dw)[(a)]																	
		Reference Stations						Mine-influenced Stations											
		MI25		AGCK		LEI		MIUCO		CORCK		MIDCO		MIDAG		MIULE		MI5	
		2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
Acenaphthylene	0.0067	-	-	-	-	-	-	-	-	-	0.016	-	-	0.011	-	-	-	-	-
Benz(a)anthracene	0.032	-	0.026	-	-	-	-	-	-	**0.063**	**0.091**	**0.057**	-	**0.074**	0.017	**0.036**	0.019	-	-
Benzo(a)pyrene	0.032	-	0.027	-	-	-	-	-	-	**0.05**	**0.068**	-	-	**0.053**	0.014	-	-	-	-
Chrysene	0.057	-	0.033	**0.12**	0.017	-	0.014	0.042	0.047	**0.31**	**0.4**	**0.27**	0.042	**0.21**	**0.098**	**0.13**	**0.096**	0.056	0.047
Fluoranthene	0.111	-	0.042	-	-	-	-	-	-	0.06	0.085	0.047	-	**0.2**	0.036	0.053	0.035	-	-
Fluorene	0.021	-	-	-	-	-	-	-	0.02	**0.15**	**0.24**	**0.11**	0.018	**0.12**	**0.039**	**0.046**	**0.025**	-	-
2-Methylnaphthalene	0.02	-	-	**0.44**	**0.041**	-	0.018	**0.1**	**0.3**	**1.7**	**2.4**	**1.1**	**0.2**	**0.87**	**0.38**	**0.44**	**0.32**	**0.16**	**0.11**
Naphthalene	0.035	-	-	**0.1**	0.013	-	0	**0.041**	**0.12**	**0.54**	**0.81**	**0.36**	**0.072**	**0.26**	**0.16**	**0.17**	**0.16**	**0.048**	0.027
Phenanthrene	0.042	-	0.021	**0.23**	0.036	-	0.038	**0.086**	**0.13**	**0.83**	**1.2**	**0.73**	**0.11**	**0.63**	**0.3**	**0.38**	**0.32**	**0.15**	**0.12**
Pyrene	0.053	-	0.038	-	-	-	-	-	0.013	**0.098**	**0.15**	**0.079**	0.013	**0.16**	0.037	**0.061**	0.045	-	0.012

Note: Stations are ordered upstream to downstream.

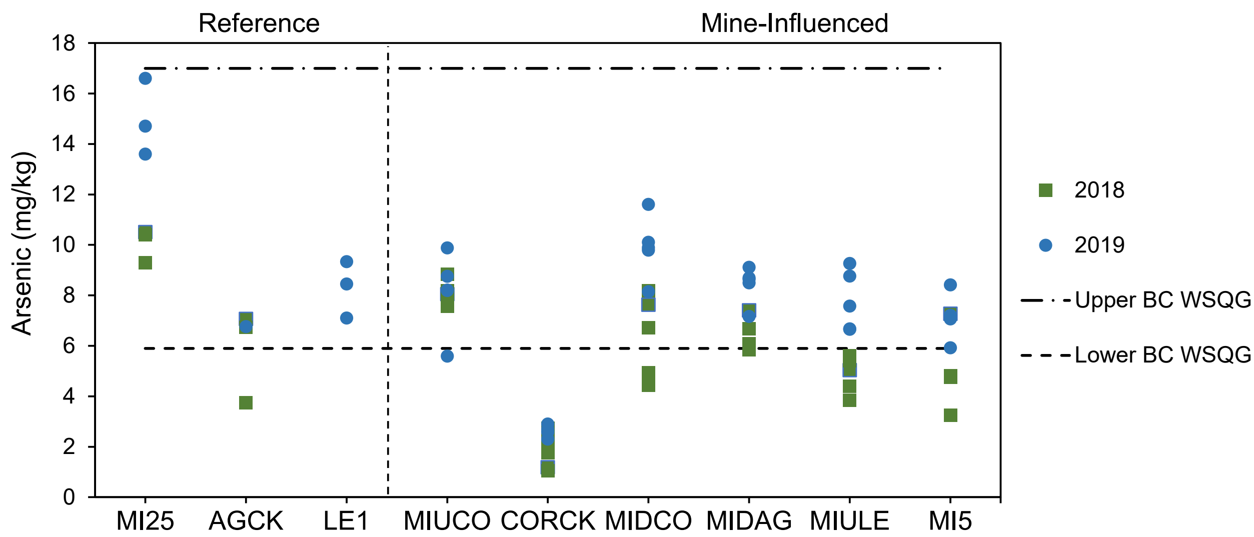
a) Concentrations shown are the maximum of the five replicate samples at each station.

Bolded values exceed the lower BC WSQG for the protection of aquatic life (ENV 2017).

Shaded values exceed the upper BC WSQG for the protection of aquatic life (ENV 2017).

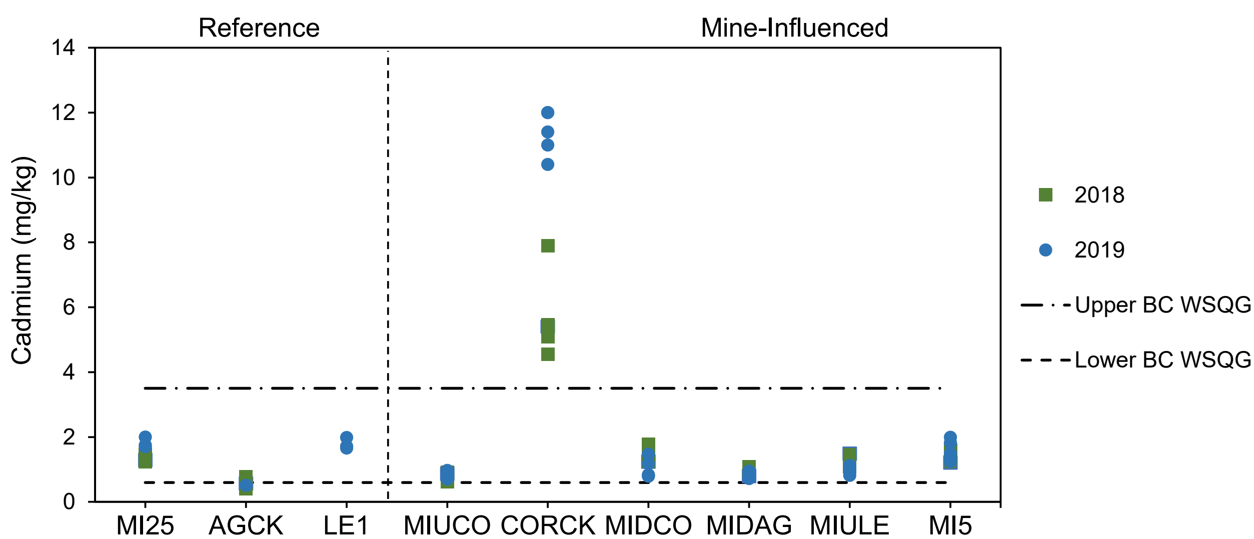
"-" = values below detection limit; mg/kg dw = milligram per kilogram dry weight; WSQG = working sediment quality guidelines.

Figure 3.2-1: Spatial Variation in Sediment Arsenic Concentrations in the CMO LAEMP Study Area



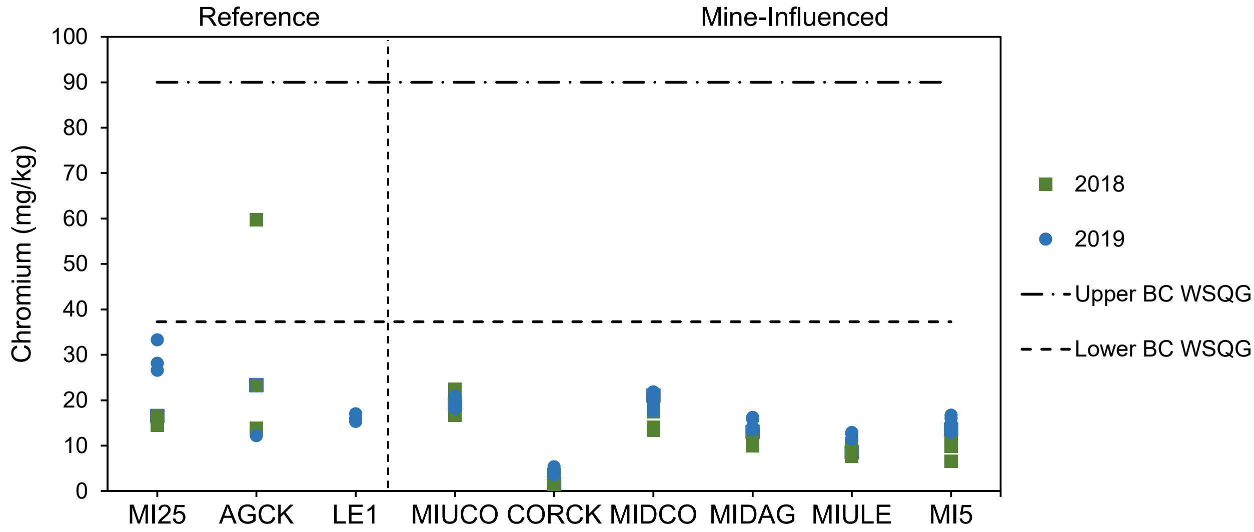
WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-2: Spatial Variation in Sediment Cadmium Concentrations in the CMO LAEMP Study Area



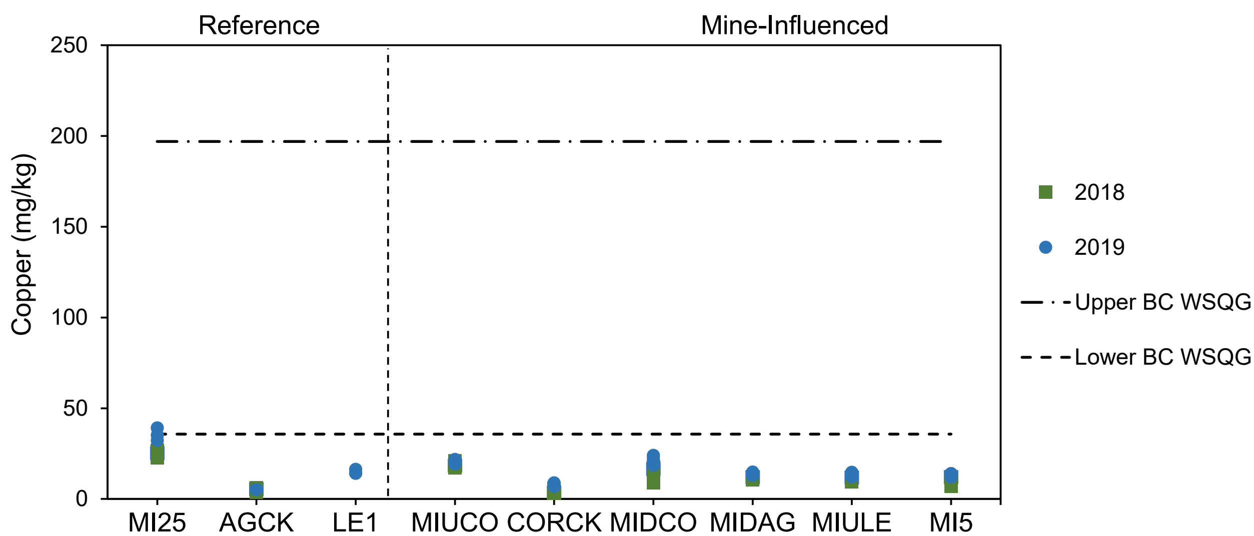
WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-3: Spatial Variation in Sediment Chromium Concentrations in the CMO LAEMP Study Area



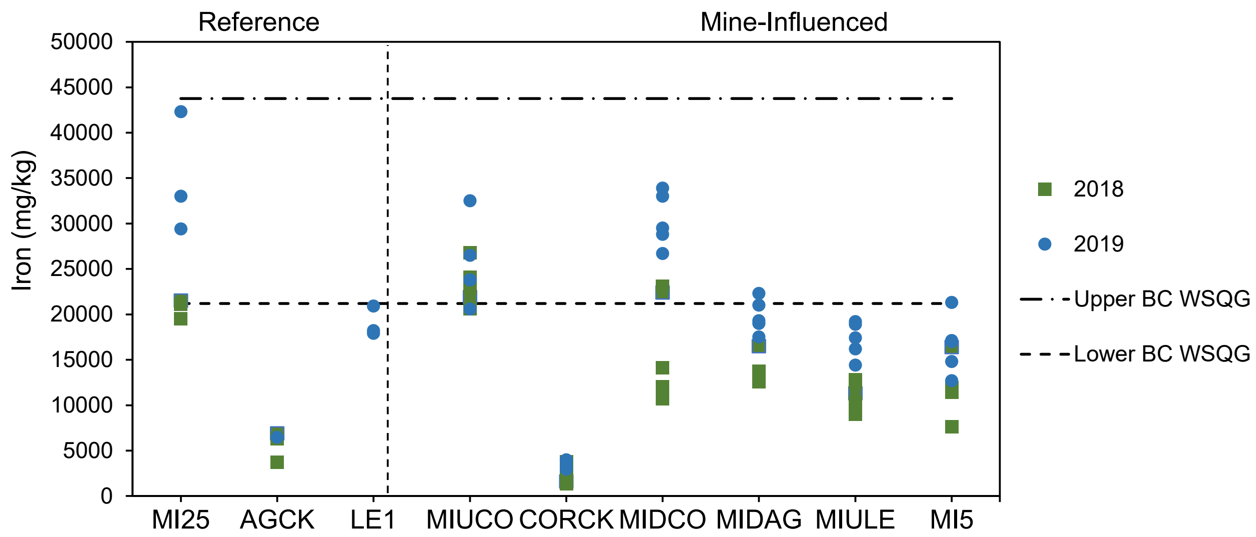
WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-4: Spatial Variation in Sediment Copper Concentrations in the CMO LAEMP Study Area



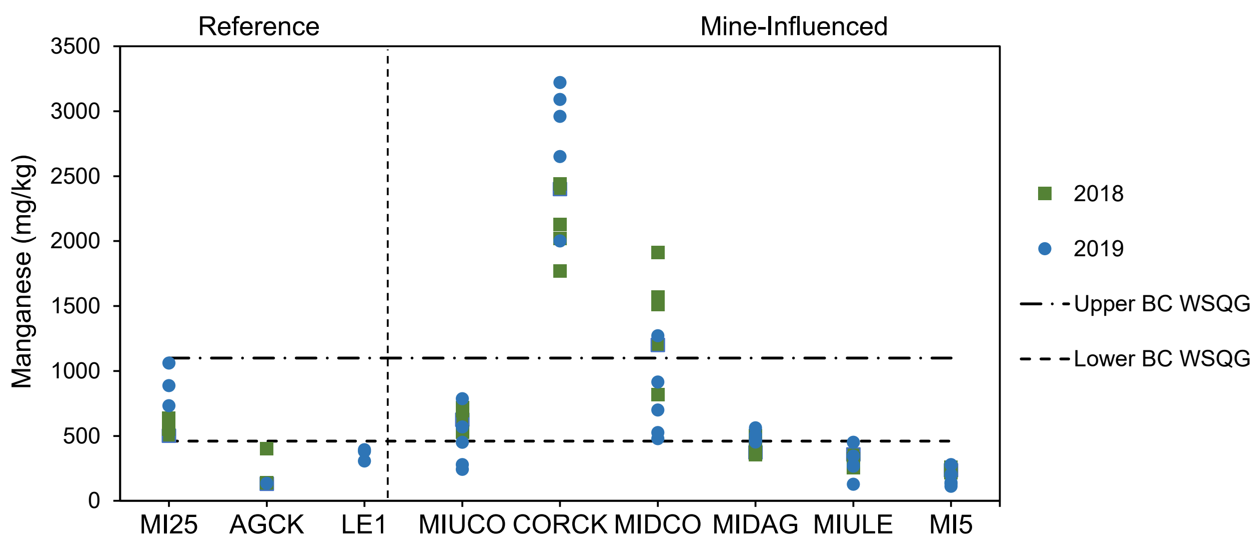
WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-5: Spatial Variation in Sediment Iron Concentrations in the CMO LAEMP Study Area



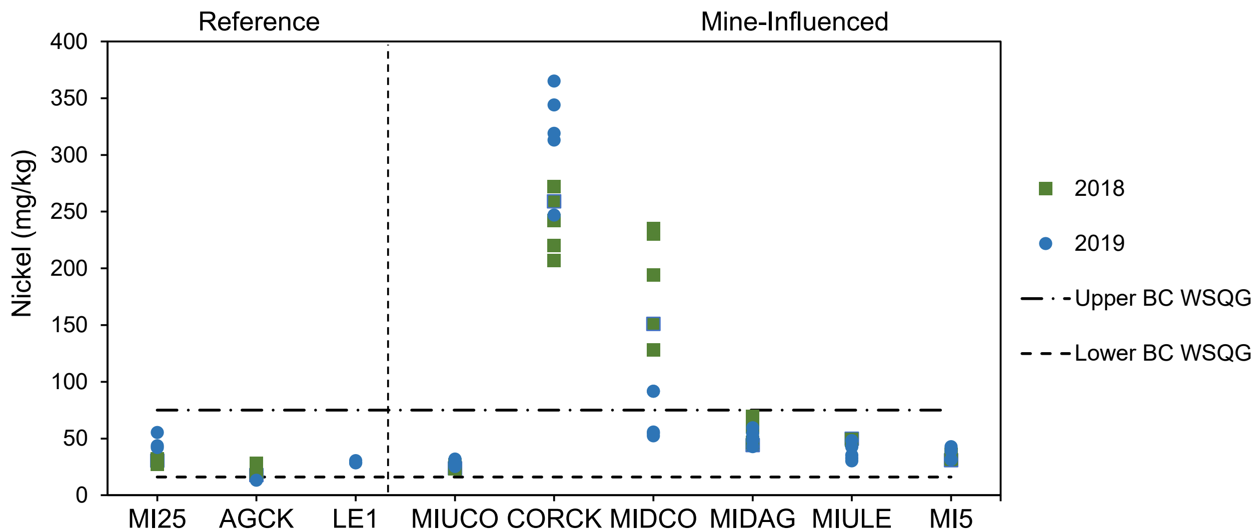
WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-6: Spatial Variation in Sediment Manganese Concentrations in the CMO LAEMP Study Area



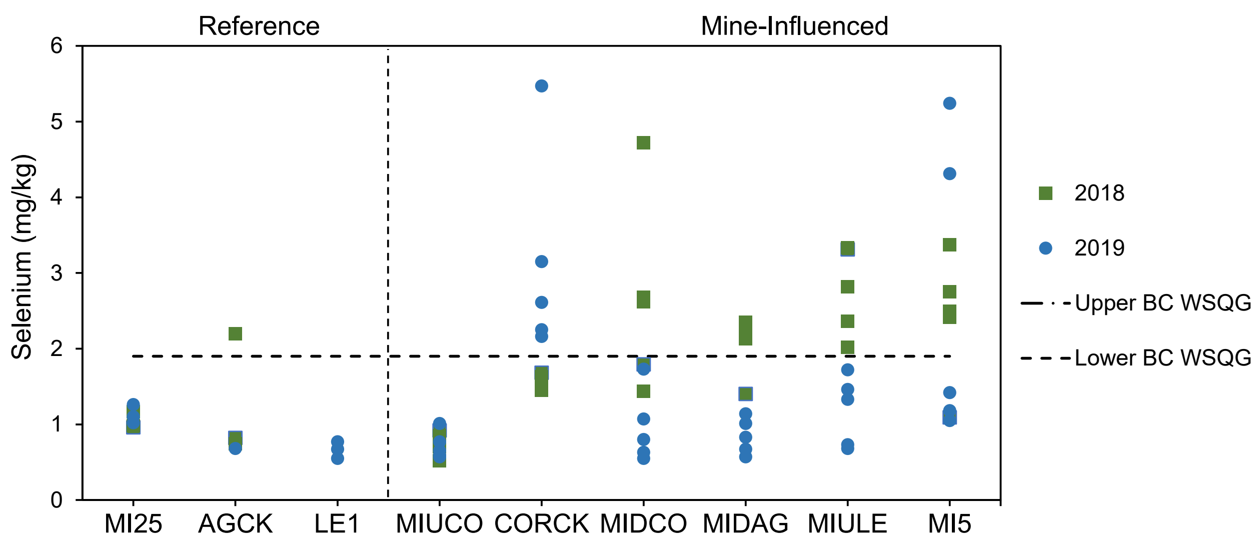
WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-7: Spatial Variation in Sediment Nickel Concentrations in the CMO LAEMP Study Area



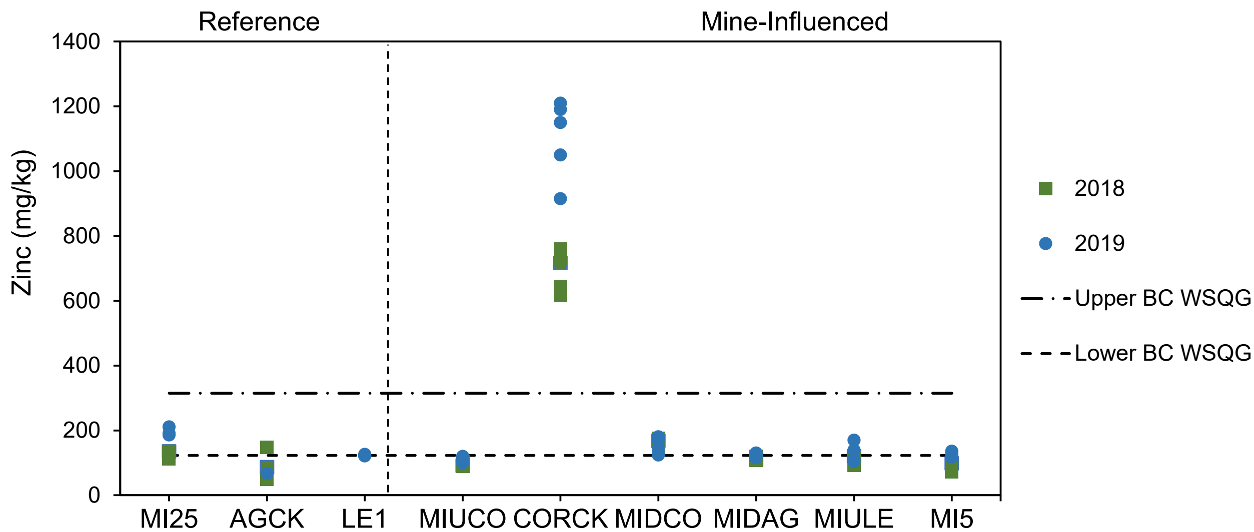
WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-8: Spatial Variation in Sediment Selenium Concentrations in the CMO LAEMP Study Area



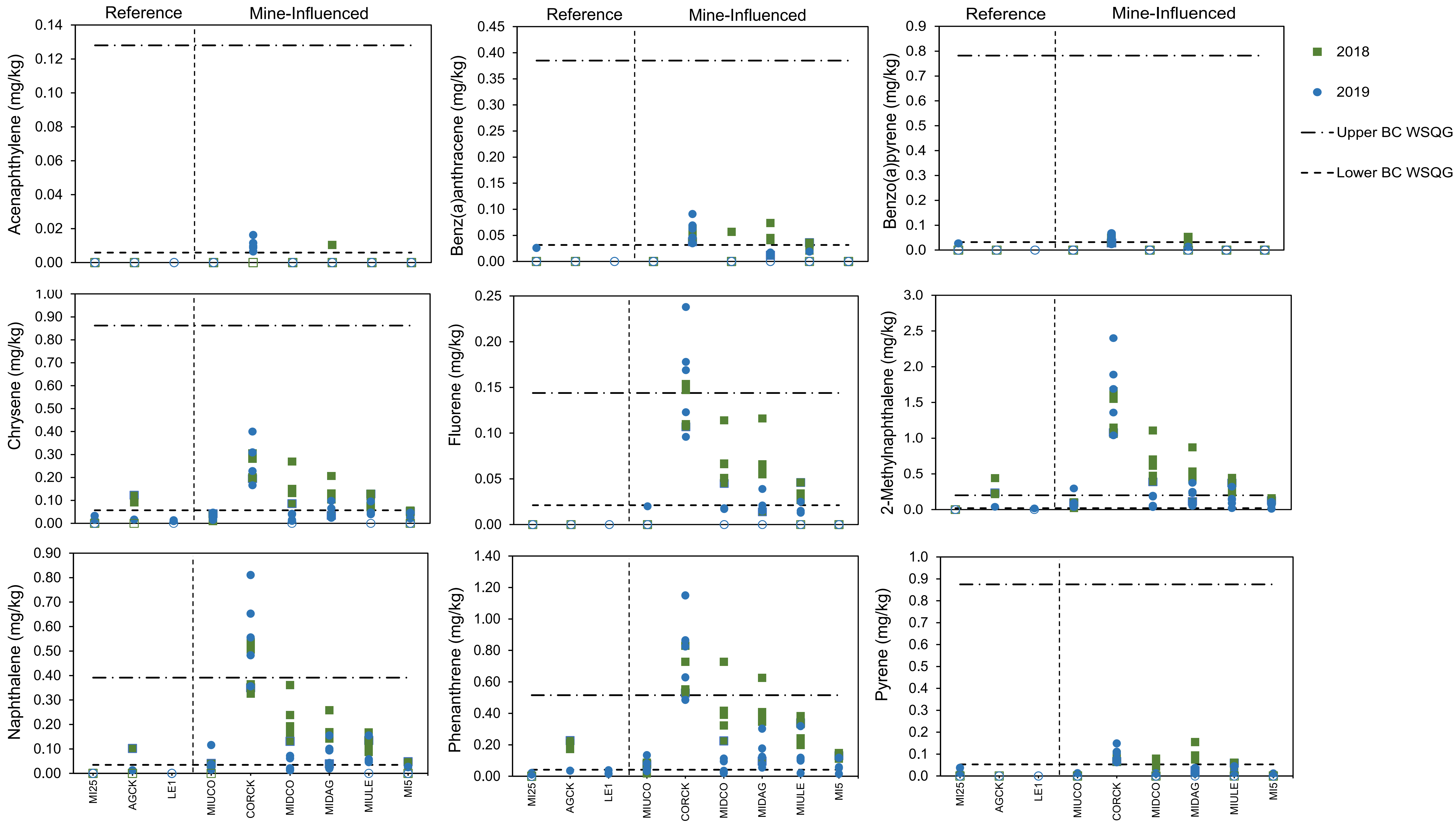
WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-9: Spatial Variation in Sediment Zinc Concentrations in the CMO LAEMP Study Area



WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

Figure 3.2-10: Spatial Variation in Sediment Polycyclic Aromatic Hydrocarbon Concentrations in the CMO LAEMP Study Area



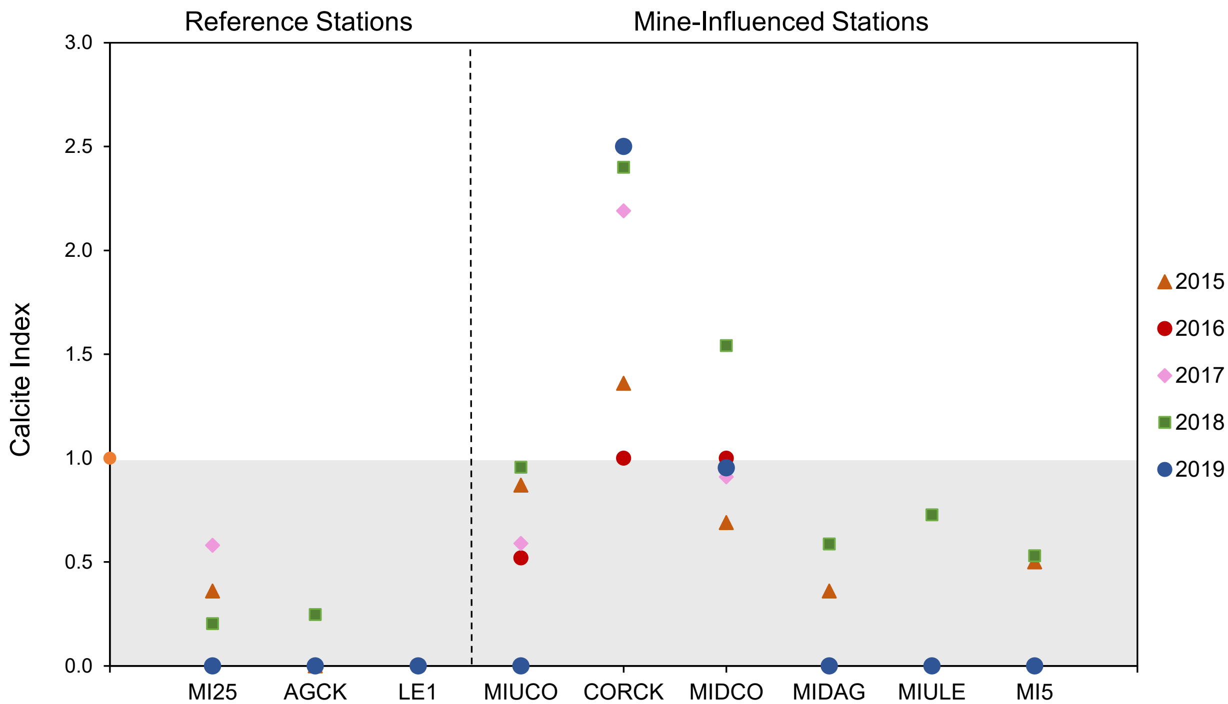
Open symbols represent non-detects. WSQG = working sediment quality guideline; mg/kg = milligrams per kilogram dry weight.

3.3 Calcite Index

In 2013, Teck initiated a regional calcite monitoring program to document calcite deposition in tributary and main stem areas of the Elk River watershed (Robinson and Atherton 2016). Calcite monitoring was also conducted as part of the RAEMP and the CMO LAEMP in 2019 to continue evaluation of calcite formation.

Calcite measurements near CMO were within the reference normal range of 0 to 1 at reference stations and MIUCO, MIDAG, MIULE, and MI5 (Figure 3.3-1; Appendix D). Index values above the reference normal range were observed at CORCK in 2015, 2018 and 2019 and at MIDCO in 2018. Calcite index values at MIDCO have been near the upper end of the reference normal range since 2016. Calcite index values at CORCK have consistently been higher relative to stations in Michel Creek and have increased since 2016, with the highest values observed in 2019.

Figure 3.3-1: Spatial Variation in Calcite Index in the CMO LAEMP Study Area



Notes: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the RAEMP (Minnow 2018b).

3.4 Physical Habitat

Variation in physical habitat attributes such as water depth, velocity, sediment particle size, and TOC can influence BIC structure in streams (Rosenberg and Resh 1992). Water depth ranged between 0.13 m and 0.25 m among sampling stations in 2018 and 2019 and stations were chosen in areas with a stream velocity between 0.19 and 0.49 m/s (Table 3.4-1).

Field water quality measurements taken at the benthic invertebrate sampling stations in Michel Creek in 2018 and 2019 indicated that pH was neutral to slightly basic (8.1 to 8.4), well oxygenated (9.0 to 11.4 mg/L of DO) and similar among stations in each year (Table 3.4-1; Appendix B). Specific conductivity was lower at the reference stations and at stations upstream of CMO (190 to 311 µS/cm), higher at CORCK and MIDCO, and decreased with increasing distance from CMO (Table 3.4-1). Water temperature was relatively similar among stations.

Substrate composition at both reference and mine-influenced stations, based on visual examination of the area, was mostly (>50%) composed of cobble (Table 3.4-1; Appendix D). Sediment texture, based on the sediment samples collected near BIC stations was sandy, silty loam, and particle size generally consisted of sand (coarse and fine fractions) and silt, with low proportions of gravel (Table 3.4-1; Appendix C; Appendix D). Sediment TOC content was similar among stations, <5% at each station within each year, with the exceptions of AGCK (2018), CORCK (2018 and 2019), MIDCO (2019) and MIULE (2018), which had higher sediment TOC content, ranging from 5.9 to 7.1%.

Overall, the benthic invertebrate habitat variables were similar between reference and mine-influenced stations and there was similar substrate composition and sediment particle size between stations (Section 3.4; Table 3.4-1; Appendix A, Figures 4.0-1 and 4.0-2). The comparison between percent fines, sand, gravel, cobble, and boulder and %EPT and %E demonstrated that it is unlikely, based on the visual evaluation, that differences in habitat characteristics caused the differences observed in BIC downstream of CMO in Michel Creek (Appendix A, Figures 4.0-1 and 4.0-2).

Table 3.4-1: Habitat Characteristics at Benthic Invertebrate Sampling Stations within the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2018 and 2019

Parameter	Units	Reference Stations						Mine-Influenced Stations											
		MI25		AGCK		LEI		MIUCO		CORCK		MIDCO		MIDAG		MIULE		MI5	
		2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
Field Parameters																			
Sample water depth	m	0.13	0.14	0.15	0.19	0.15	0.17	0.16	0.18	0.16	0.15	0.17	0.18	0.25	0.20	0.24	0.23	0.21	0.22
Velocity	m/s	0.29	0.19	0.31	0.27	0.35	0.31	0.33	0.30	0.36	0.38	0.36	0.31	0.41	0.48	0.48	0.32	0.49	0.29
Water temperature	°C	7.3	9.7	7.1	7.2	9.6	13.6	9.3	9.2	11.3	11.2	12.1	11.2	9.4	6.2	10.0	10.7	8.0	10.1
Dissolved oxygen	mg/L	11.3	9.9	10.5	11.0	9.7	9.7	11.5	10.5	9.0	9.2	11.5	9.6	11.8	11.2	11.4	10.0	12.3	10.2
Specific conductivity	µS/cm	190	311	256	281	196	210	210	266	1,710	1,461	934	926	571	333	487	587	371	454
pH	-	8.1	8.2	8.0	8.3	7.4	8.3	8.4	8.4	8.1	8.1	8.4	8.3	8.2	8.1	8.4	8.4	8.3	8.4
Organic Carbon																			
Total organic carbon	%	4.3	2.2	7.1	3.1	-	1.4	1.2	4.7	6.3	9.5	5.9	1.9	4.7	2.9	6.8	3.5	4.1	4.9
Sediment Particle Size																			
Clay (<0.004 mm)	%	<1.0	3.9	1.4	14.1	-	13.1	14.9	10.7	7.3	<1.0	4.6	23.0	5.7	1.5	6.5	13.5	11.0	13.0
Silt (0.0004 to 0.06 mm)	%	20.0	26.4	19.3	51.7	-	65.0	49.9	25.8	12.1	10.6	7.2	49.7	37.5	61.3	9.1	24.0	35.0	32.3
Fine sand (0.06 to 0.25 mm)	%	20.0	20.3	21.3	20.0	-	16.4	9.9	19.2	19.5	13.8	10.5	10.3	12.5	13.3	15.8	36.2	13.4	26.4
Coarse sand (0.25 to 2.0 mm)	%	52.2	47.0	53.5	12.5	-	8.3	23.2	40.1	57.4	69.4	70.2	15.0	40.3	22.0	63.5	24.2	37.5	25.6
Gravel (>2.0 mm)	%	7.5	2.6	5.2	1.6	-	2.1	2.1	4.4	3.9	6.0	7.7	2.0	3.9	1.9	5.6	2.1	3.2	2.7
Substrate Composition																			
Bedrock	%	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0
Boulder	%	5	0	5	5	5	0	5	10	10	5	5	5	20	10	15	15	5	2
Cobble	%	50	40	60	70	65	90	75	75	65	60	80	60	60	80	60	75	65	85
Gravel	%	30	40	30	25	15	5	5	8	10	20	5	20	10	5	15	10	20	10
Sand	%	10	10	5	<1	10	3	5	5	0	0	5	5	10	5	5	0	5	1
Finer	%	5	10	0	0	5	2	0	2	20	15	5	5	0	0	5	0	5	2

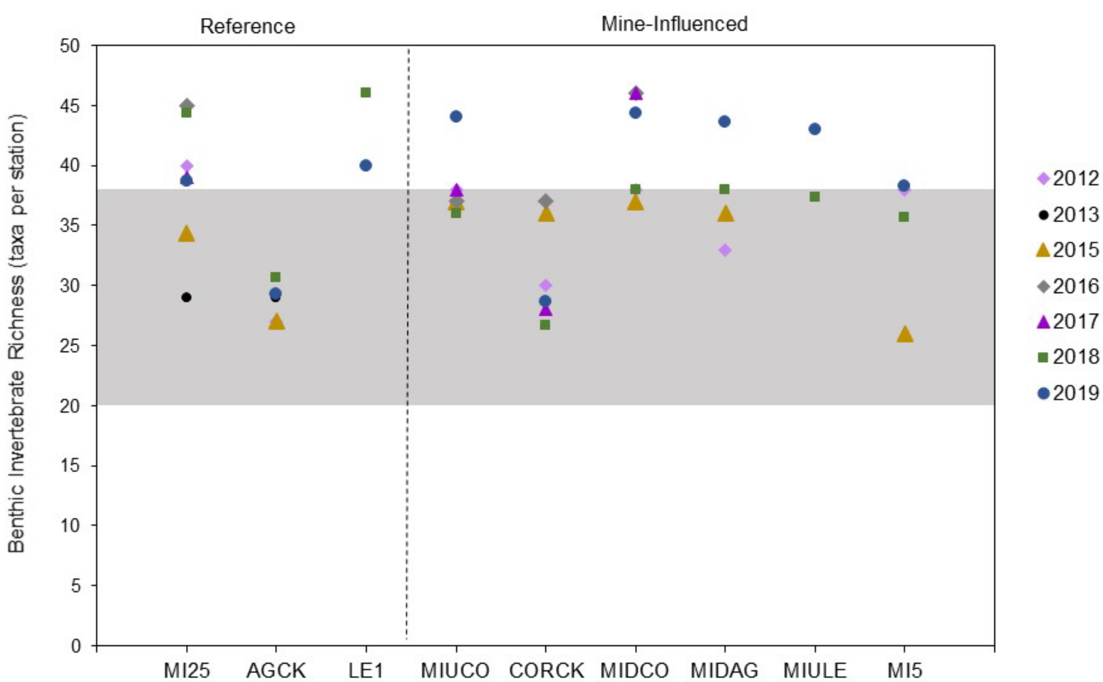
m = metre; m/s = metre per second; °C = degrees Celsius; mg/L = milligrams per litre; µS/cm = microsiemens per square centimetre; % = percent; - = no data

3.5 Benthic Invertebrate Community

Benthic invertebrate richness was similar among stations between 2012 and 2019 (Figure 3.5-1), showing no statistical difference between the mean of the reference stations and each mine-influenced station in 2018 or 2019 (Appendix F, Table F-2). Richness was either within or above the upper bound the regional normal range at reference and mine-influenced stations between 2012 to 2019 and no statistical difference was observed between the current year (2019) and previous years (Appendix F, Table F-3).

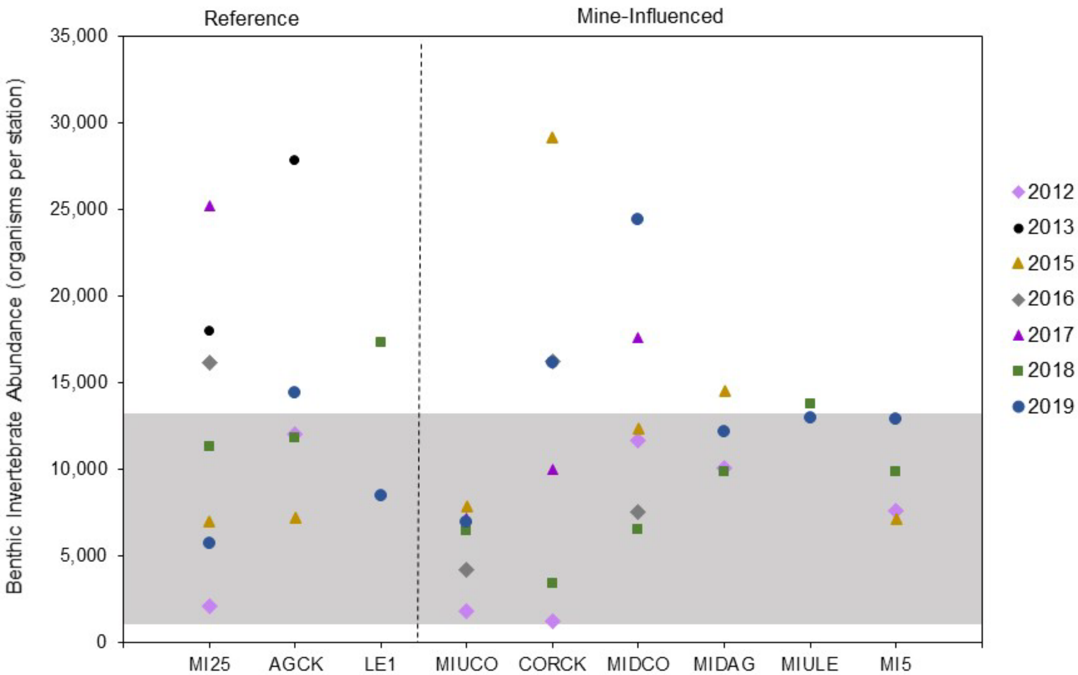
Benthic invertebrate abundance was within or above the upper bound of the regional normal range at reference and mine-influenced stations between 2012 to 2019 (Figure 3.5-2). Abundance in 2012 was near the lower bound of the normal range at AGCK, MIUCO and CORCK, but within or above the normal range in 2013 and 2015. Spatially, a statistical difference was observed between the mean of the reference stations and CORCK in 2018 (73% lower at CORCK in 2018 compared to the mean of the reference stations; $p = 0.024$; Appendix F, Table F-2), but not in 2019. There were no statistical differences between the mean of reference stations and the other mine-influenced stations in 2018 or 2019. Benthic invertebrate abundance was lower at reference station AGCK in 2019 compared to 2013 (48% lower in 2019; $p = 0.016$;) and significantly higher at MIDCO in 2019 compared to 2018 (251% higher in 2019; $p = 0.002$; Appendix F, Table F-3).

Figure 3.5-1: Benthic Invertebrate Taxonomic Richness in the CMO LAEMP Study Area



Notes: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the RAEMP (Minnow 2018b).

Figure 3.5-2: Benthic Invertebrate Abundance in the CMO LAEMP Study Area



Notes: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the RAEMP (Minnow 2018b).

The BIC at the reference stations was dominated by Ephemeroptera in all years with few exceptions: at MI25 in 2012 and 2013 the BIC was dominated by Plecoptera and at LEI in 2019 was co-dominated by Trichoptera and Ephemeroptera (Figure 3.5-3). The proportions of the other major groups Trichoptera, Plecoptera, Oligochaeta, Chironomidae, and other Diptera differed among stations and years within the reference stations, but Acari abundance was low at the reference stations in all years. Ephemeroptera also dominated at most mine-influenced stations in Michel Creek (MIUCO, MIDAG, and MIULE), except at MIDCO, which was dominated by Diptera, and at MI5 which was dominated by Ephemeroptera in 2012 and 2018 and Trichoptera in 2015 and 2019 (Figure 3.5-4). The BIC at CORCK was dominated by Diptera. Higher proportions of Oligochaeta were observed at CORCK and MIDCO, with the highest proportions observed at MIDCO in 2019.

A decrease in the proportion of Ephemeroptera and an increase in the proportion of Diptera was observed at MIUCO and MIDAG between 2012 and 2019 (Figure 3.5-4).

A two-dimensional mMDS configuration for BIC abundance in 2018 and 2019 had an overall stress value of 0.20, indicating a reasonable level of fit to the original dataset (Figure 3.5-5). A two-dimensional nMDS configuration for BIC abundance from 2012 to 2019 had an overall stress value of 0.14, indicating a good level of fit to the original dataset (Figure 3.5-6). SIMPROF tests (*p*-value <0.05) indicated that the level of interpretation of the clusters was acceptable and global ANOSIM tests (R = 0.717 for the mMDS and 0.898 for the nMDS, *p*-value = 0.001) indicate that statistical interpretation of the MDS structures is valid.

The MDS ordination plots showed a weak mine-influenced pattern in both the spatial (mMDS; Figure 3.5-5) and temporal (nMDS; Figure 3.5-6) plots, with CORCK on one side of the plots and MIDCO next to CORCK, followed by the other Michel Creek stations downstream of CMO and reference stations grouped together.

The mMDS ordination plot indicated separation between CORCK and stations in Michel Creek downstream of CMO and between stations in Michel Creek and reference stations MI25 and AGCK (Figure 3.5-5). The BIC at CORCK in 2018 and 2019 were 50% similar and differed from the remaining stations, while reference stations (MI25 and AGCK) and stations in Michel Creek downstream of CMO were 50% similar. Reference stations MI25, upstream of CMO on Michel Creek, and AGCK were 60% similar, and differed from the other stations, while the stations downstream of CMO on Michel Creek and reference station LEI on Leach Creek were 60% similar.

The nMDS ordination plot indicated separation among the station and year groupings in Corbin Creek, Michel Creek downstream of CMO and the reference stations in terms of BIC composition between 2012 and 2019 (Figure 3.5-6). BIC at CORCK between 2015 and 2019 were 50% similar. BIC at CORCK in 2012 differed from other years and stations. The reference BIC at AGCK between 2012 and 2019 was 60% similar among years and was 50% similar to stations on Michel Creek between 2012 and 2019. Between 2012 and 2019 stations on Michel Creek, both upstream and downstream of CMO were 60% similar to communities at LEI, with the exception of MIUCO and MI25 in 2012 which differed from the rest of the Michel Creek stations.

Figure 3.5-3: Benthic Invertebrate Community Composition in the Reference Stations in the CMO LAEMP Study Area

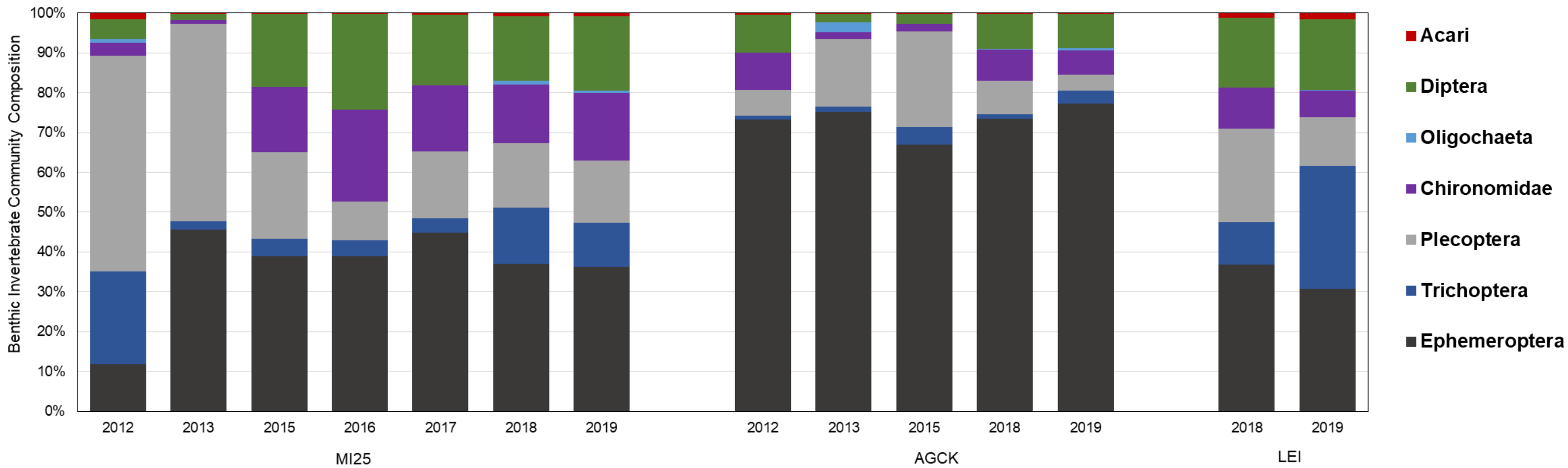


Figure 3.5-4: Benthic Invertebrate Community Composition in Mine-influenced Stations in the CMO LAEMP Study Area

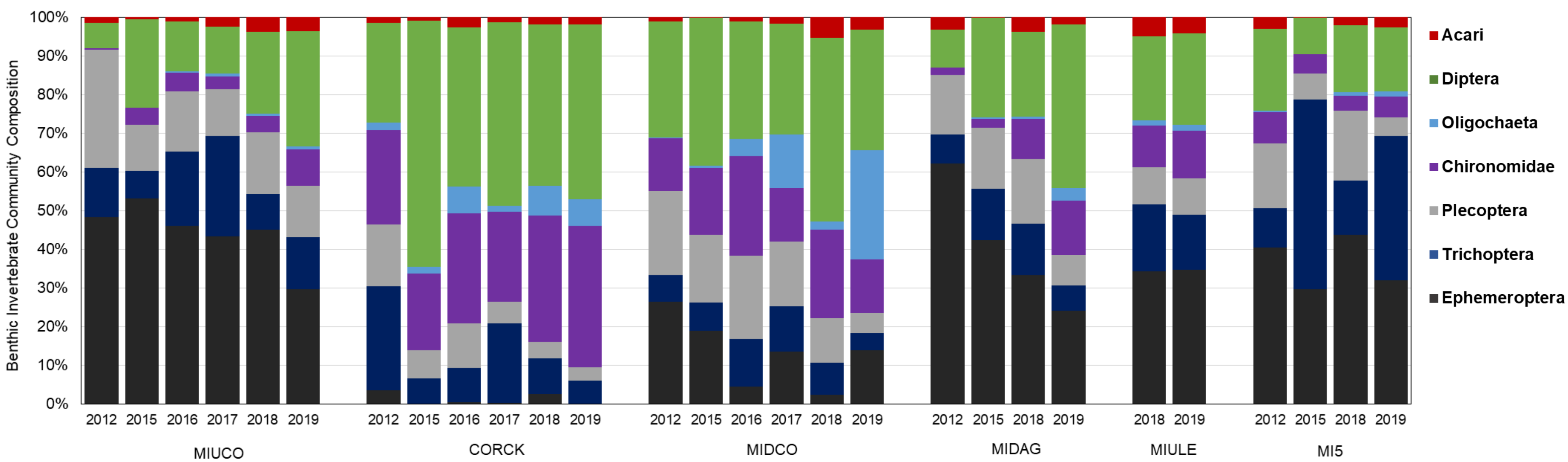


Figure 3.5-5: Metric Multidimensional Scaling of the Benthic Invertebrate Community at Stations in in the CMO LAEMP Study Area

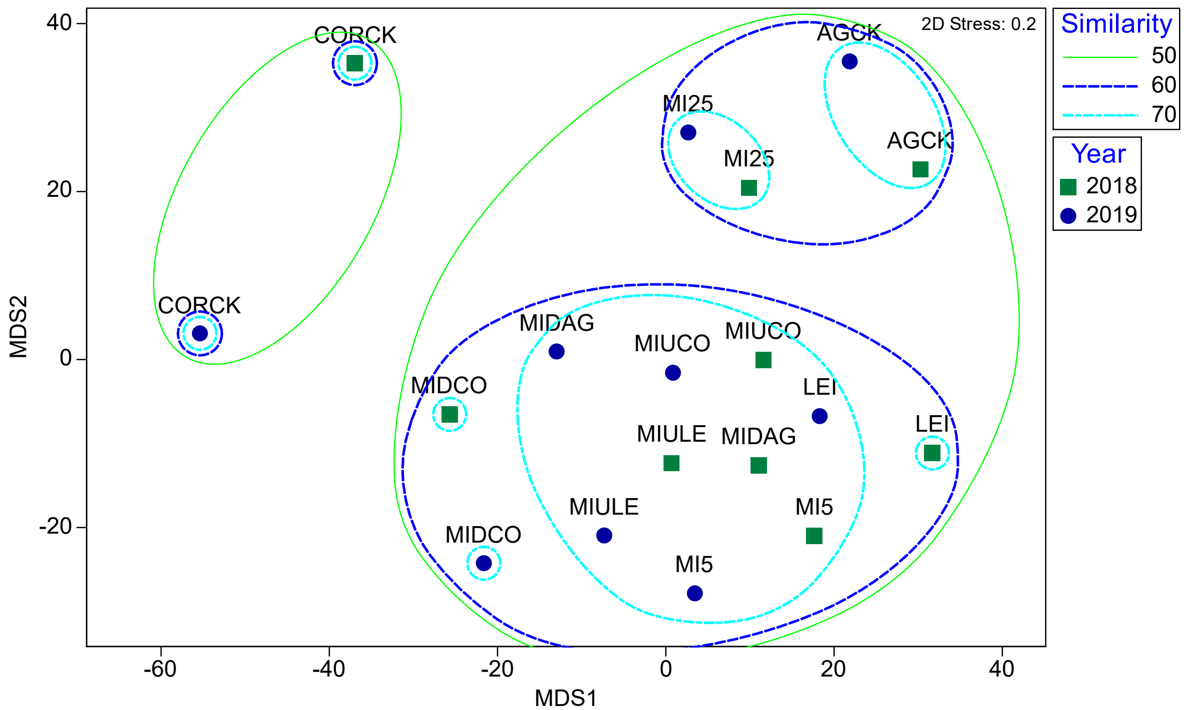
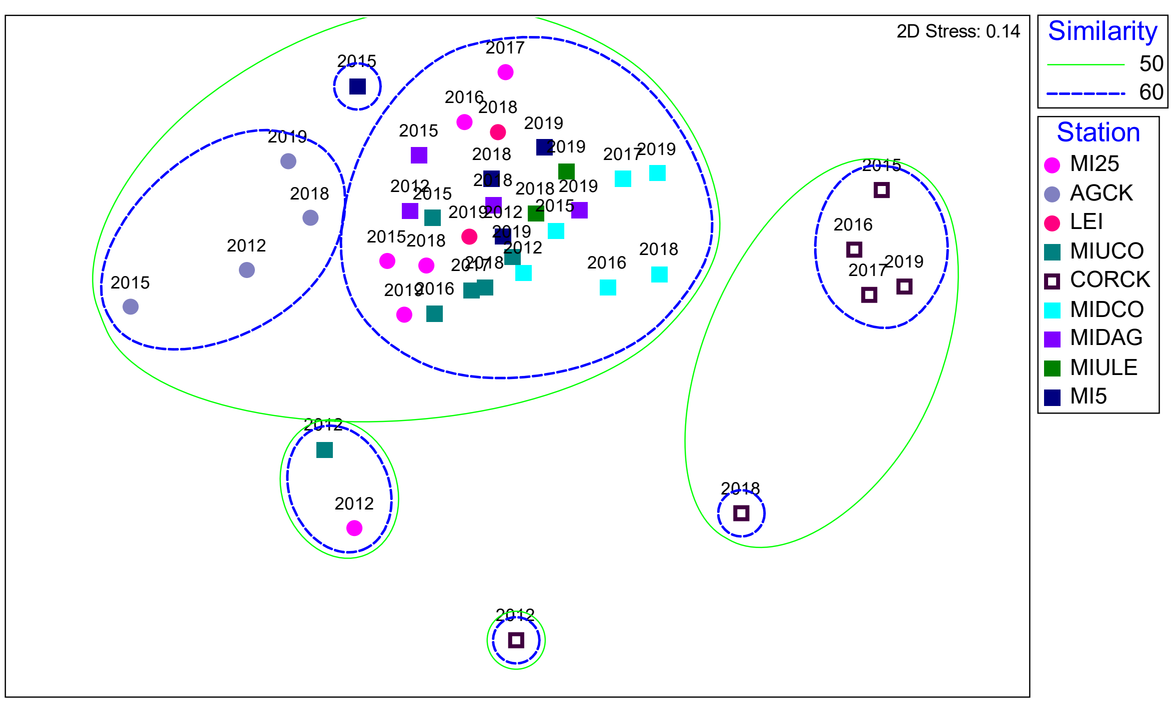


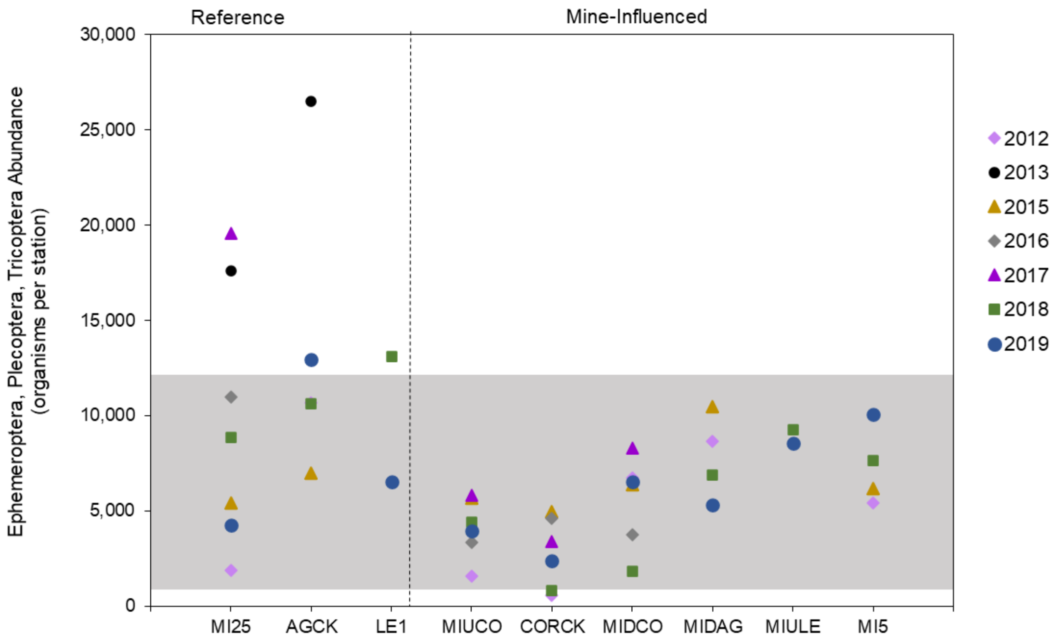
Figure 3.5-6: Non-metric Multidimensional Scaling of the Benthic Invertebrate Community in the CMO LAEMP Study Area



Key spatial and temporal patterns in the abundance and proportion of EPT taxa (%EPT) were:

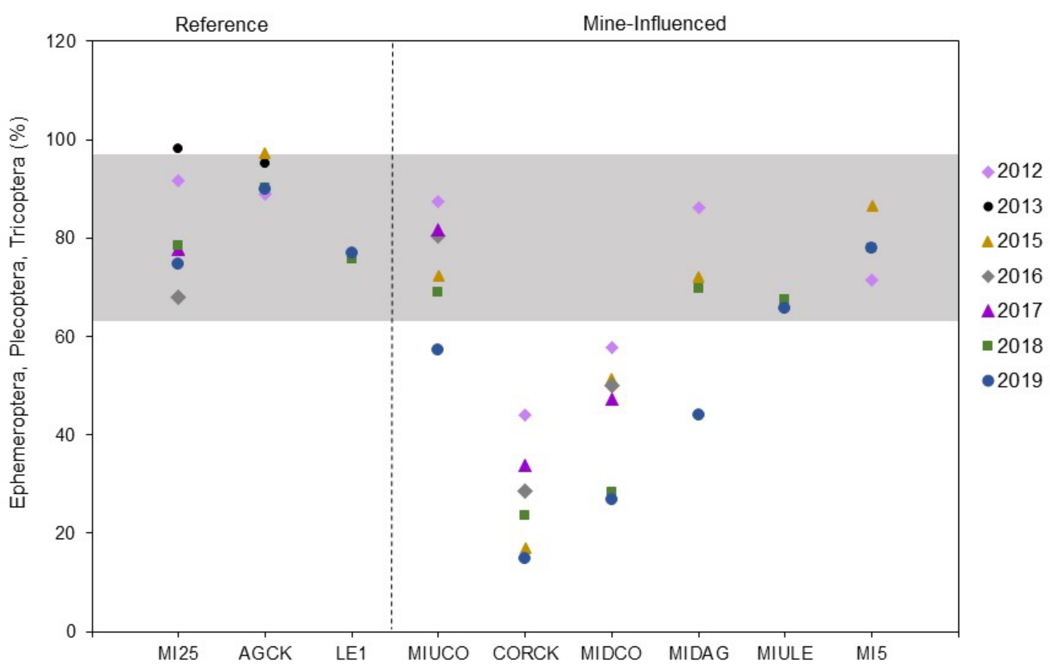
- EPT abundance in Michel Creek was within or above the upper bound the regional normal range at reference and mine-influenced stations between 2012 to 2019 (Figure 3.5-7). EPT abundance was near the lower bound of the regional normal range at MI25 and MIUCO in 2012 but increased thereafter. EPT abundance at CORCK was below the lower boundary of the regional normal range in 2012 and 2018 and was significantly lower than the mean of the reference stations (Appendix F, Table F-2).
- EPT abundance at MIDCO was significantly higher in 2019 compared to in 2018 (magnitude = +218%; $p = 0.034$; Appendix F, Table F-3), driven by an increase in Ephemeroptera in 2019. EPT abundance at MIDCO was significantly lower than the mean of the reference areas in 2018 (magnitude = -15%; $p<0.001$) and 2019 (magnitude = -54%; $p<0.001$; Appendix F, Table F-2).
- %EPT at reference stations and at mine-influenced stations further downstream of CMO (i.e., MIULE and MI5) was within or above the upper bound the regional normal range between 2012 to 2019 (Figure 3.5-8). There were no significant spatial differences in %EPT between the reference stations and MIDAG, MIULE and MI5 in 2018 and 2019. %EPT was below the regional normal range at CORCK and MIDCO between 2012 and 2019.
- %EPT at MIUCO and MIDAG was within the regional normal range between 2012 and 2018 and below the lower boundary of the regional normal range in 2019. %EPT was significantly lower at MIUCO in 2019 compared to 2012 (magnitude = -34%; $p = 0.006$), 2016 (magnitude = -29%; $p = 0.016$), and 2017 (magnitude = -30%; $p = 0.013$; Appendix F, Table F-3).
- %EPT at CORCK was significantly lower than the mean of the reference areas in 2018 (magnitude = -74%; $p<0.01$) and 2019 (magnitude = -81%; $p<0.01$; Appendix F, Table F-2). %EPT at CORCK was significantly lower in 2019 compared to 2015 but the difference was relatively small (magnitude = -12%; $p = 0.034$; Appendix F, Table F-3).

Figure 3.5-7: Ephemeroptera, Plecoptera, Trichoptera Abundance in the CMO LAEMP Study Area



Notes: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the RAEMP (Minnow 2018b).

Figure 3.5-8: Ephemeroptera, Plecoptera, Trichoptera Proportion in the CMO LAEMP Study Area

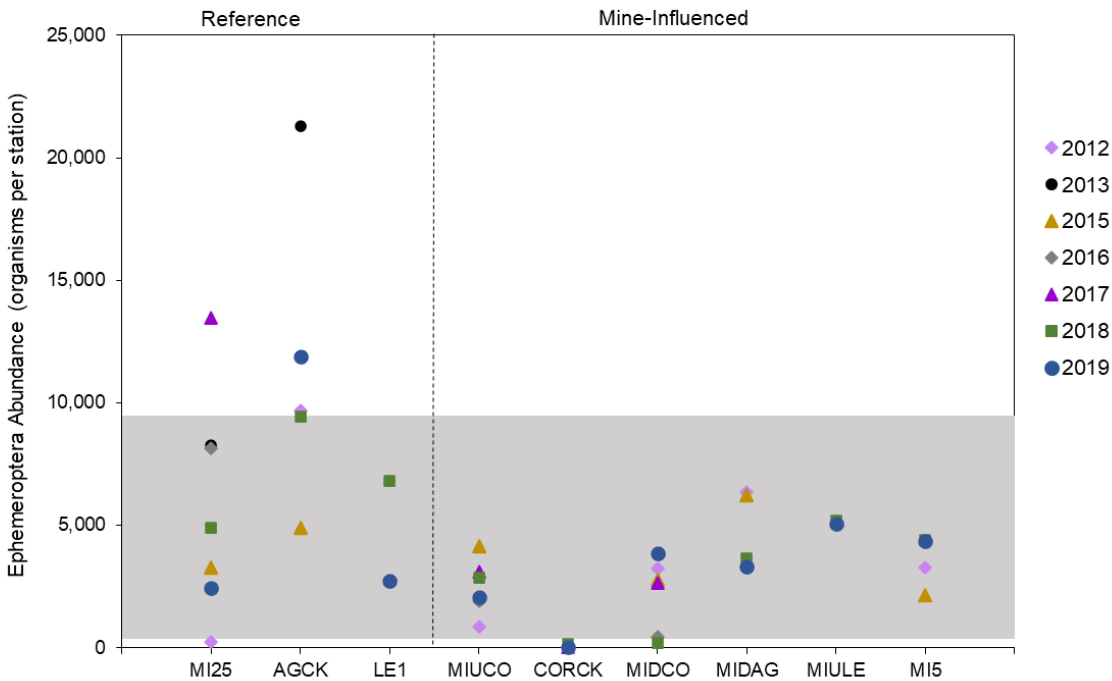


Notes: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the RAEMP (Minnow 2018b).

Key spatial and temporal patterns in the abundance and proportion of Ephemeroptera taxa were:

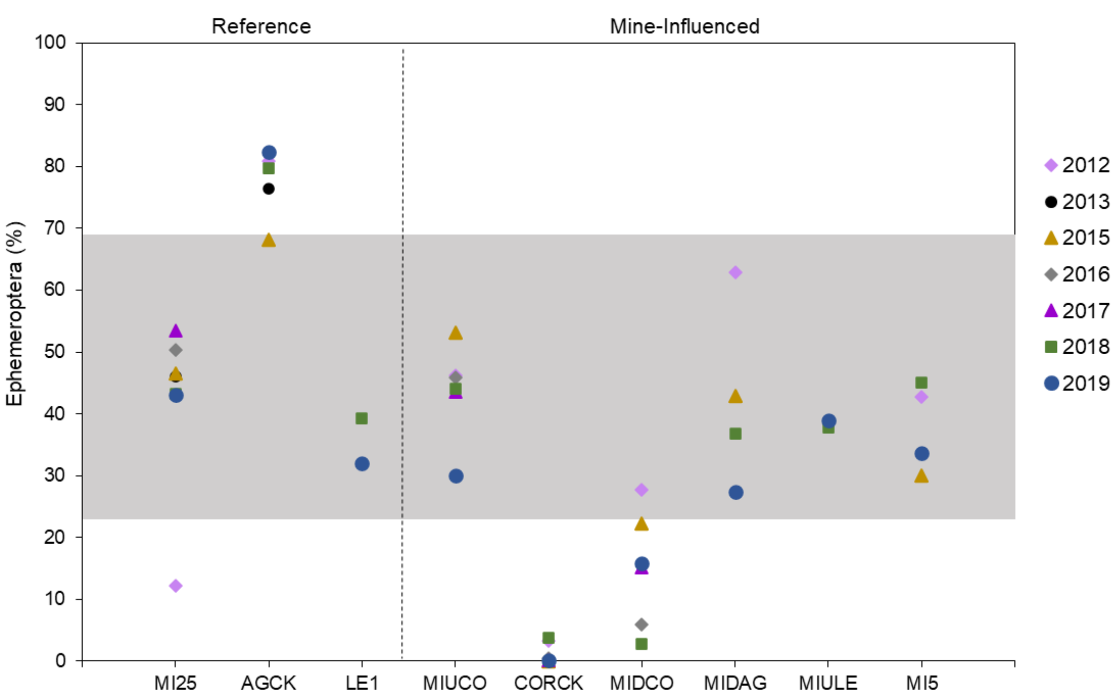
- There were no significant spatial differences in Ephemeroptera abundance between the reference stations and the mine-influenced stations in Michel Creek in 2019.
- Ephemeroptera abundance was within or above the upper bound the regional normal range at reference and mine-influenced stations between 2012 to 2019, except for samples collected at CORCK (2012 and 2019), MI25 (2012), and MIDCO (2018), which were below the lower boundary (Figure 3.5-9).
- Ephemeroptera abundance at CORCK was significantly lower than the mean of the reference stations in 2018 (magnitude = -99%; $p<0.05$; Appendix F, Table F-2), but there were no significant spatial differences between the mean of the reference stations and mine-influenced stations in Michel Creek.
- Ephemeroptera abundance was low at MIDCO in 2016, near the lower bound of the normal range, but increased to well within or above the normal range in 2017 before falling below the normal range again in 2018. It was also significantly higher in 2019 compared to 2016 (magnitude = +617%; $p = 0.049$) and 2018 (magnitude = +1,698%; $p = 0.001$; Appendix F, Table F-3) but significantly lower at AGCK in 2019 compared to in 2013 (magnitude = -44%; $p = 0.040$; Appendix F, Table F-3).
- There were no significant spatial differences in proportion of Ephemeroptera taxa (%E) between the reference stations and MIDAG, MIULE, MI5 in 2018 or 2019.
- %E was within or above the upper bound the regional normal range at reference stations and mine-influenced stations between 2012 to 2019, except for at MI25 in 2012, CORCK in 2012 to 2019, and MIDCO 2015 to 2019, which were at or below the lower boundary (Figure 3.5-10).
- %E was significantly lower at CORCK than the mean of the reference stations in 2018 (magnitude = -100%; $p<0.01$) and 2019 (magnitude =-100%; $p<0.01$; Appendix F, Table F-2) and at MIDCO in 2018 (magnitude = -40%; $p<0.01$) and 2019 (magnitude = -48%; $p<0.05$). It was significantly lower at MIDAG in 2019 compared to in 2012 (magnitude = -56%; $p = 0.033$; Appendix F, Table F-3) and significantly lower at MI5 in 2019 compared to in 2018 (magnitude = -25%; $p = 0.013$; Appendix F, Table F-3).

Figure 3.5-9: Ephemeroptera Abundance in the CMO LAEMP Study Area



Notes: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the RAEMP (Minnow 2018b).

Figure 3.5-10: Ephemeroptera Proportion in the CMO LAEMP Study Area



Notes: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the RAEMP (Minnow 2018b).

Overall, BIC abundance, richness, and overall community composition were similar at mine-influenced stations and reference stations and followed similar spatial patterns in each year. Benthic invertebrate richness and abundance were within or above the upper bound the regional normal range between 2012 to 2019. Ephemeroptera dominated at reference and most mine-influenced stations, except for at MIDCO and CORCK, which were dominated by Diptera.

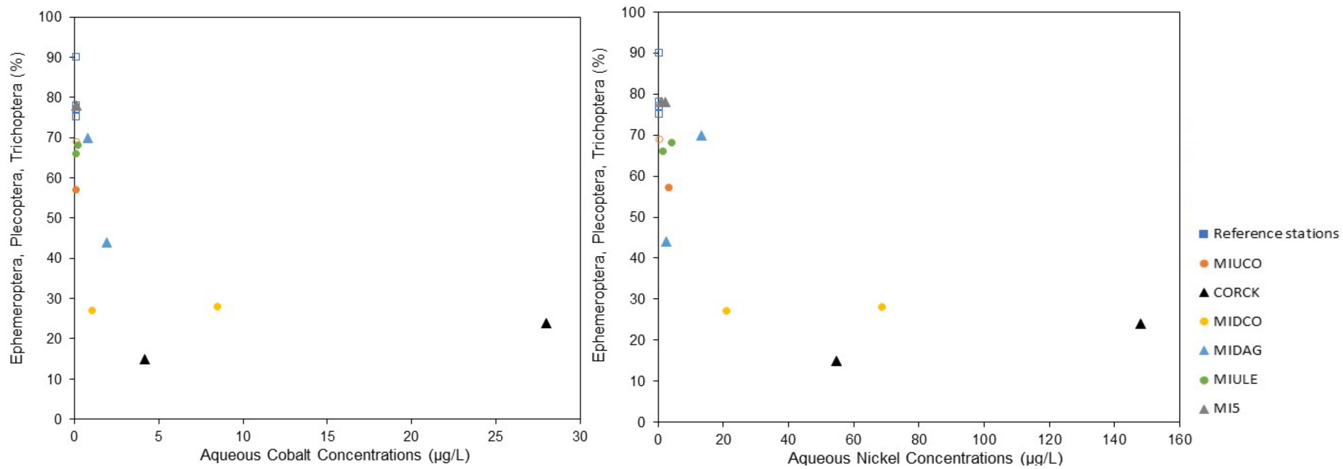
Despite total abundances being similar among stations, EPT abundance, %EPT, Ephemeroptera abundance and %E differed among stations and years. EPT abundance was near the lower boundary of the normal range at CORCK in 2012 and 2018. Ephemeroptera abundance was near or below the lower boundary of the normal range at CORCK in all years and at MIDCO in 2016 and 2018. %EPT was below the lower boundary of normal range at CORCK in all years, at MIDCO between 2012 and 2019, and at MIUCO and MIDAG in 2019. %E was near or below the lower boundary of the regional normal range at CORCK and MIDCO in all years. These patterns indicate that the mine-related influence on some EPT taxa occurs immediately downstream of CMO.

The relationship of %EPT and %E with aqueous nickel and cobalt concentrations and sediment selenium, nickel, and cobalt concentrations was examined to further evaluate potential cause(s) of lower proportions of %EPT and %E. These constituents were chosen for follow-up comparisons because of results from early chronic toxicity testing linking nickel and possibly cobalt to BIC changes (Golder 2017) and concerns associated with selenium concentrations in the Elk Valley (Minnow 2018a,b). In addition, the relationship between %EPT and %E and sediment particle size, which is used as a habitat indicator, was examined to see if habitat differences could be related to spatial differences in %EPT and %E downstream of CMO (Section 3.4).

There was a relationship between %EPT and %E and aqueous cobalt and nickel based on the 2018 and 2019 data (Figure 3.5-11 and 3.5-12). There was also relationship between %EPT and %E and sediment cobalt and nickel concentrations (Figure 3.5-13 and 3.5-14). However, there was no relationship between %EPT or %E and sediment selenium concentrations.

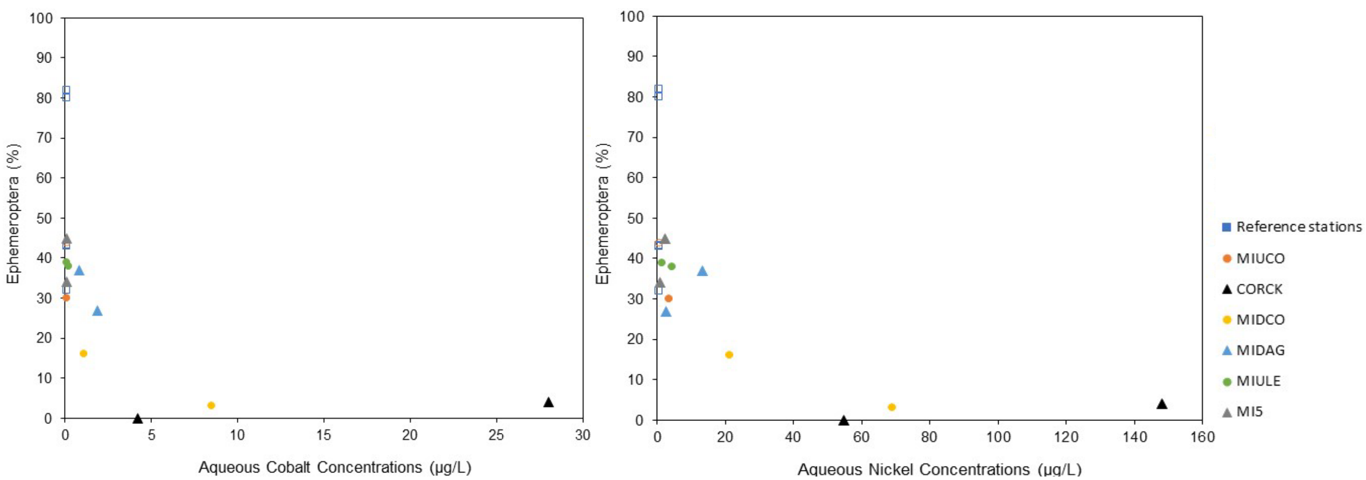
Based on the visual evaluation of spatial patterns, aqueous and sediment concentrations of cobalt and/or nickel appear to be potentially responsible for patterns in %EPT and %E in the CMO area. However, intercorrelations among these potential stressors make it challenging to identify the cause(s) of the observed BIC changes downstream of CMO.

Figure 3.5-11: Proportion of Ephemeroptera, Plecoptera, and Trichoptera versus Aqueous Cobalt (left panel) and Nickel (right panel) Concentrations from the CMO LAEMP Study Area, 2018 and 2019



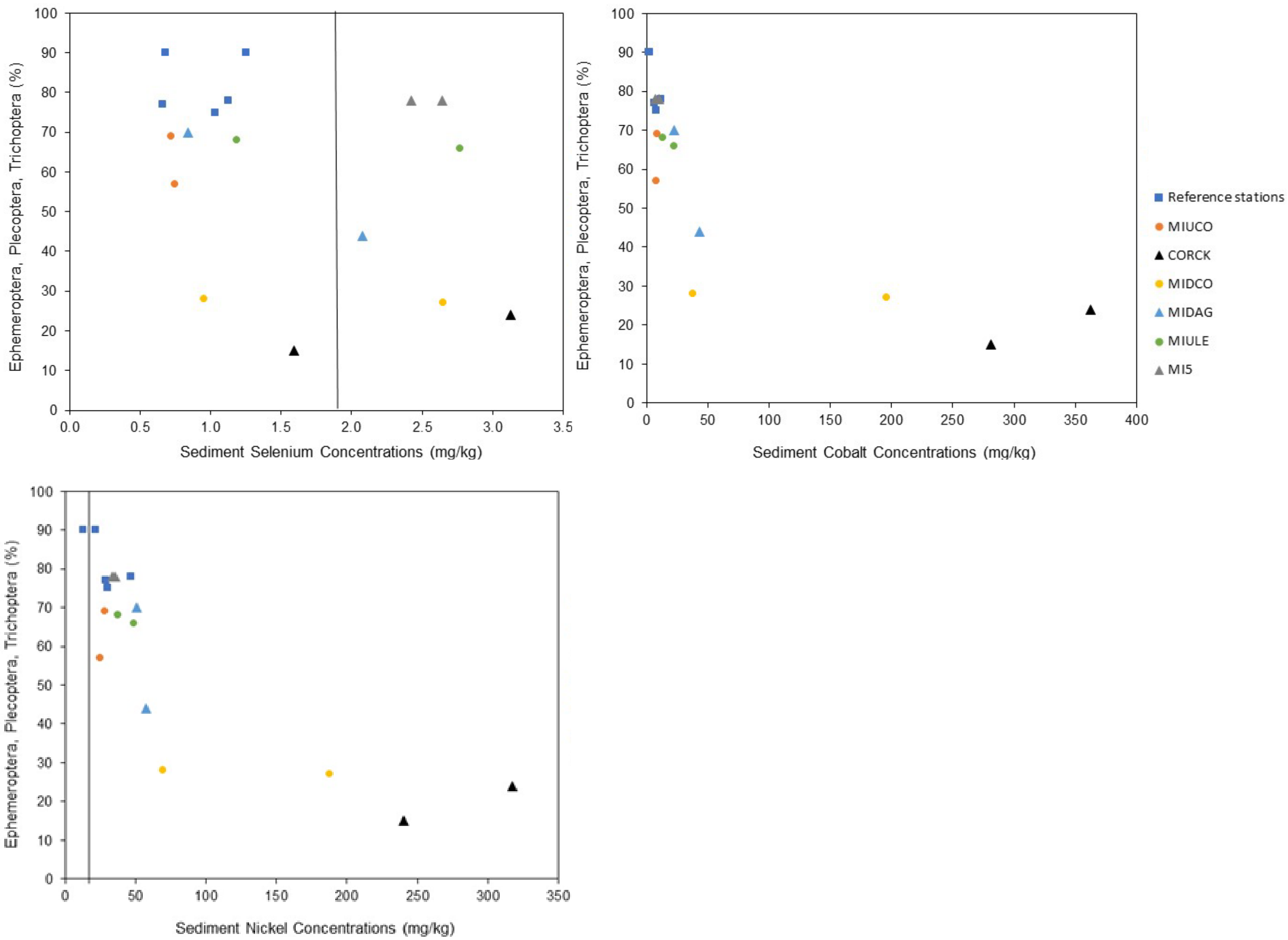
Note: Open symbols indicate non-detects. µg/L = micrograms per litre.

Figure 3.5-12: Proportion of Ephemeroptera versus Aqueous Cobalt (left panel) and Nickel (right panel) Concentrations from the CMO LAEMP Study Area, 2018 and 2019



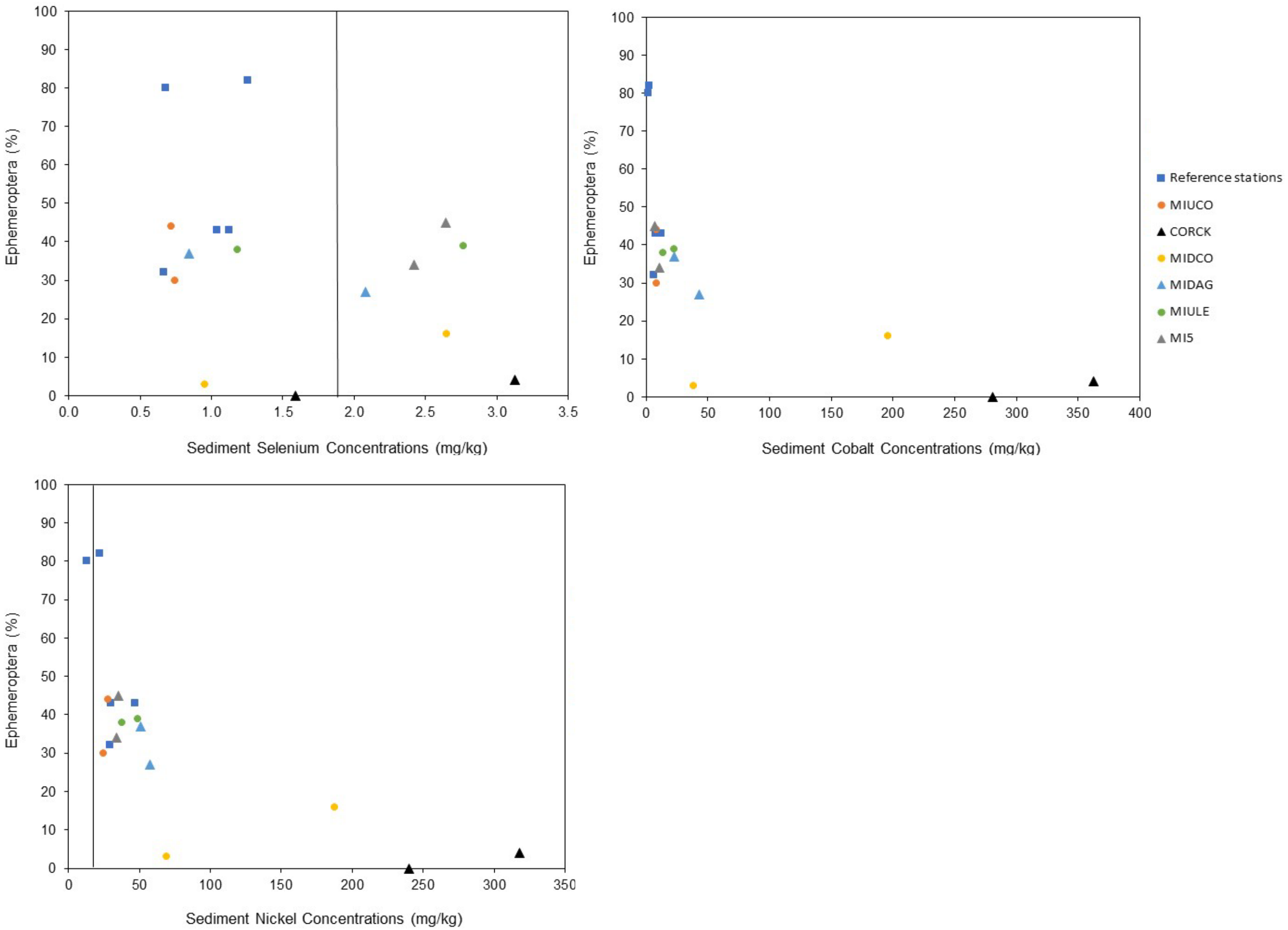
Note: Open symbols indicate non-detects. µg/L = micrograms per litre.

Figure 3.5-13: Proportion of Ephemeroptera, Plecoptera, and Trichoptera versus Sediment Selenium (top left), Cobalt (top right) and Nickel (bottom left) Concentrations from the CMO LAEMP Study Area



Note: Vertical lines represent the BC WSQG; sediment and tissue datasets includes replicate data (n =3 for reference stations; n = 5 for mine-influenced stations) collected from 2018 and 2019.mg/kg = milligrams per kilogram.

Figure 3.5-14: Proportion of Ephemeroptera versus Sediment Selenium (top left), Cobalt (top right) and Nickel (bottom left) Concentrations from the CMO LAEMP Study Area



Note: Vertical lines represent the BC WSQG; sediment and tissue datasets includes replicate data (n =3 for reference stations; n = 5 for mine-influenced stations) collected from 2018 and 2019. mg/kg = milligrams per kilogram.

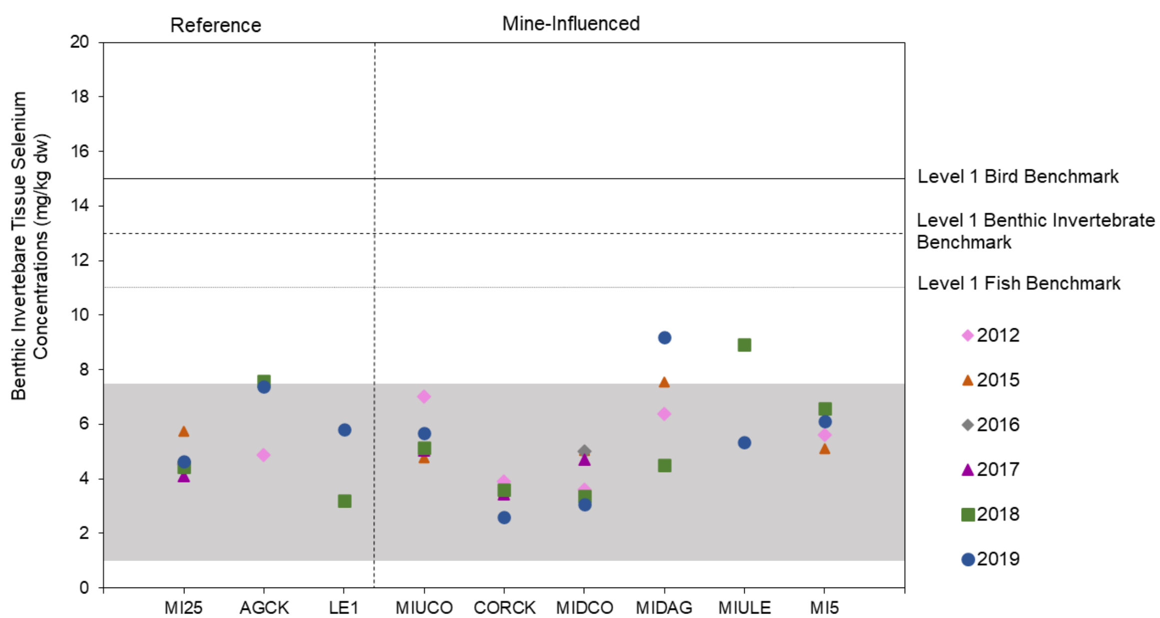
3.6 Benthic Invertebrate Tissue Chemistry

Benthic invertebrate tissue data for cobalt, nickel, and selenium are plotted relative to previous results and reference normal ranges where available (as discussed in the CMO LAEMP Study Design). This information is used to help interpret results of water quality and BIC monitoring by providing an indication of the bioavailability of observed aqueous selenium, cobalt, and nickel concentrations (Section 3.7). Composite benthic invertebrate tissue chemistry results for other parameters are provided in Appendix G.

Benthic invertebrate tissue selenium concentrations were within or near the upper bound of the regional normal range at reference and mine-influenced stations between 2012 and 2019, with the exception of MIULE in 2018 and MIDAG in 2019, which were above the upper bound of the regional normal range (Figure 3.6-1). Tissue selenium concentrations at all sampling areas in all years were less than the lowest level 1 benchmark (Figure 3.6-1; Appendix G, Table G-1). Although most tissue selenium concentrations at mine-influenced stations were within the normal range (with the noted exceptions), a spatial gradient was observed. The lowest tissue selenium concentrations were observed at CORCK, with an increase in tissue selenium concentrations observed with increasing distance downstream in Michel Creek.

Benthic invertebrate tissue cobalt and nickel concentrations were higher at mine-influenced stations near CMO (i.e., CORCK, MIDCO, MIDAG, MIULE, and MI5) compared to the reference stations and higher in 2018 compared to in 2019 (Figures 3.6-2 and 3.6-3; Appendix G, Table G-1), except at MIDAG, where nickel concentrations were higher in 2019 compared to 2018. Tissue cobalt concentrations were highest at CORCK, showing a declining gradient further downstream in Michel Creek. For tissue nickel concentrations, concentrations declined in a similar pattern downstream in 2018, but in 2019 concentrations were higher at MIDAG than at CORCK and MIDCO. A downstream decline in tissue nickel concentrations was observed after MIDAG.

Figure 3.6-1: Composite Benthic Invertebrate Tissue Selenium Concentrations from the CMO LAEMP Study Area



Notes: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the RAEMP (Minnow 2018b).

Figure 3.6-2: Composite Benthic Invertebrate Tissue Cobalt Concentrations from the CMO LAEMP Study Area

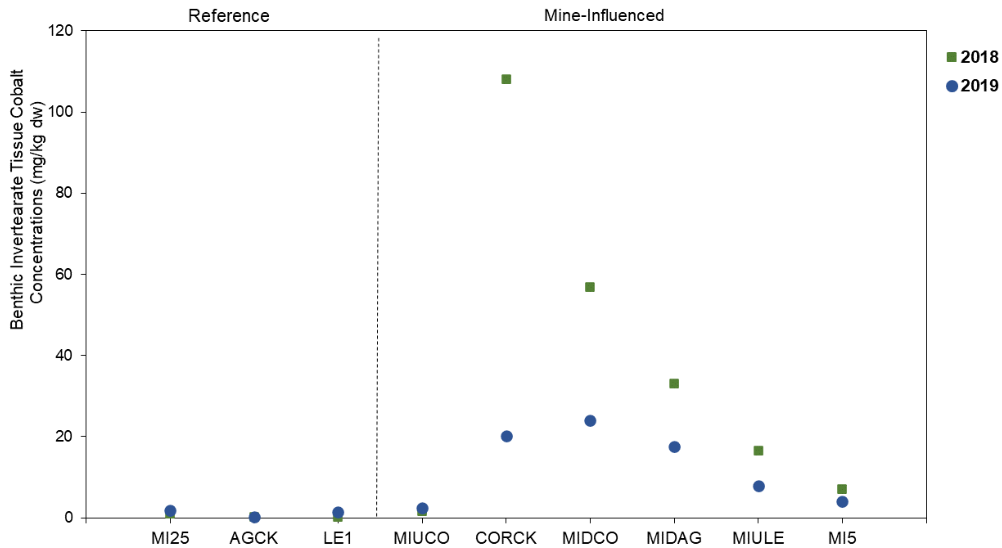
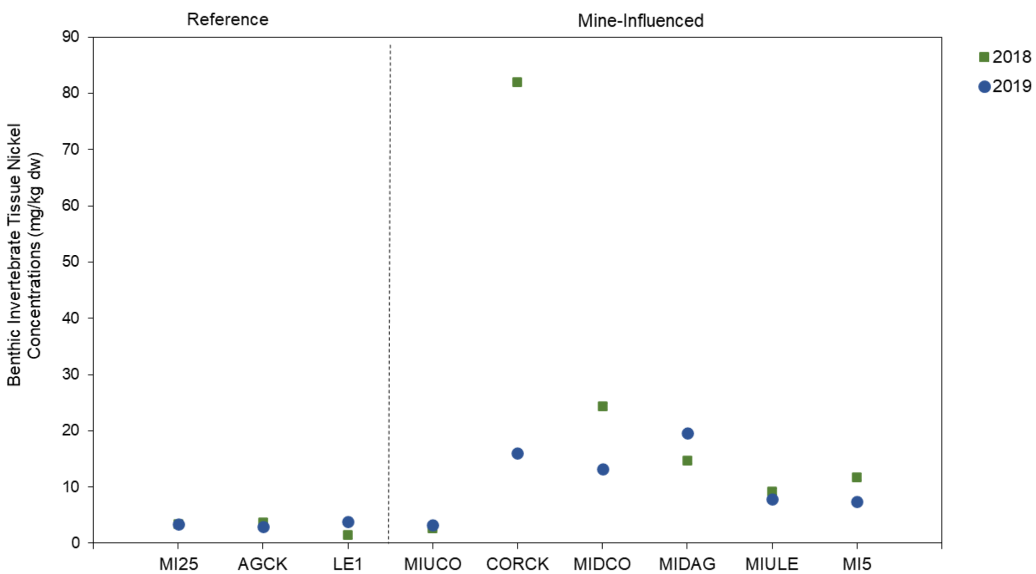
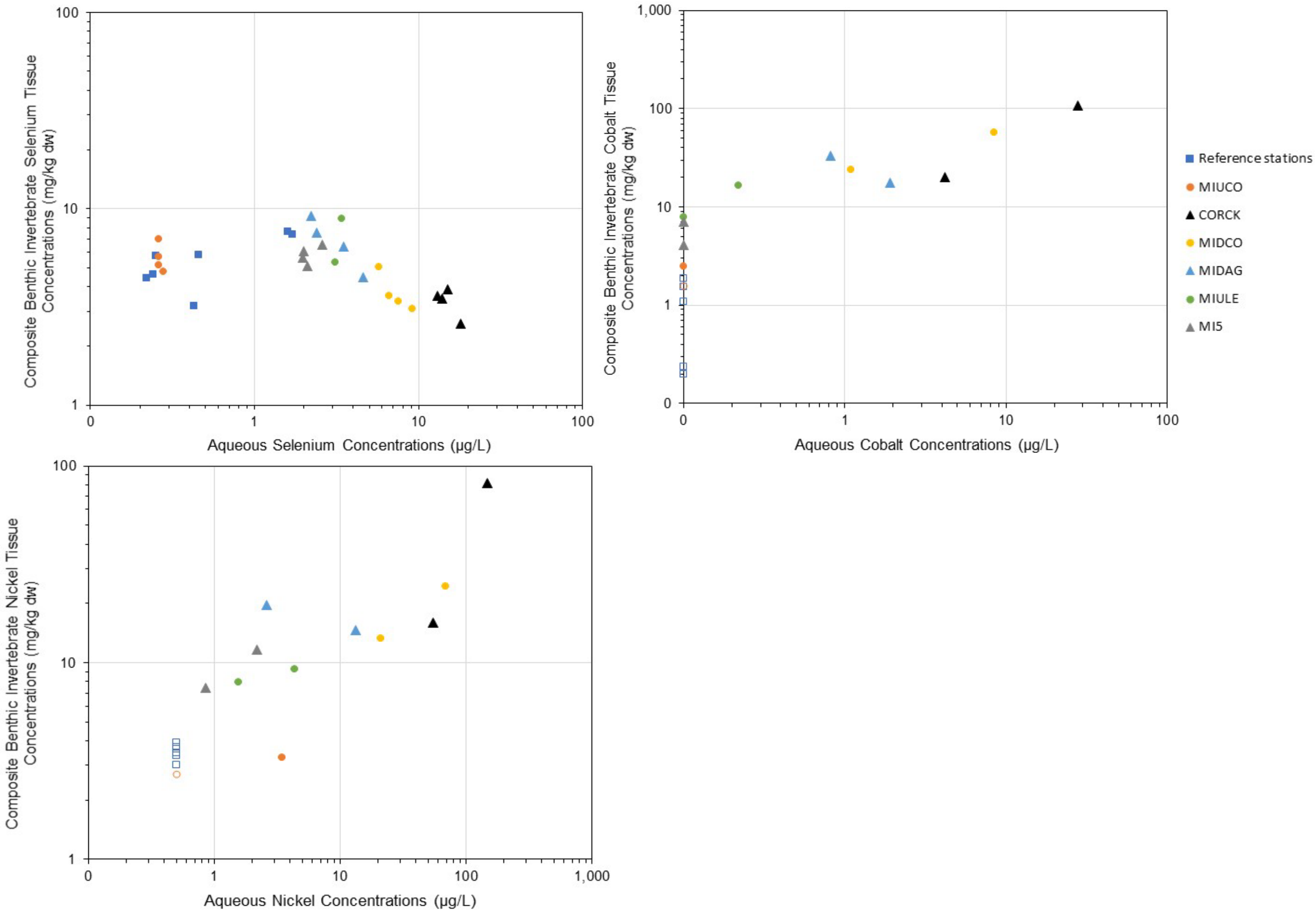


Figure 3.6-3: Composite Benthic Invertebrate Tissue Nickel Concentrations from the CMO LAEMP Study Area



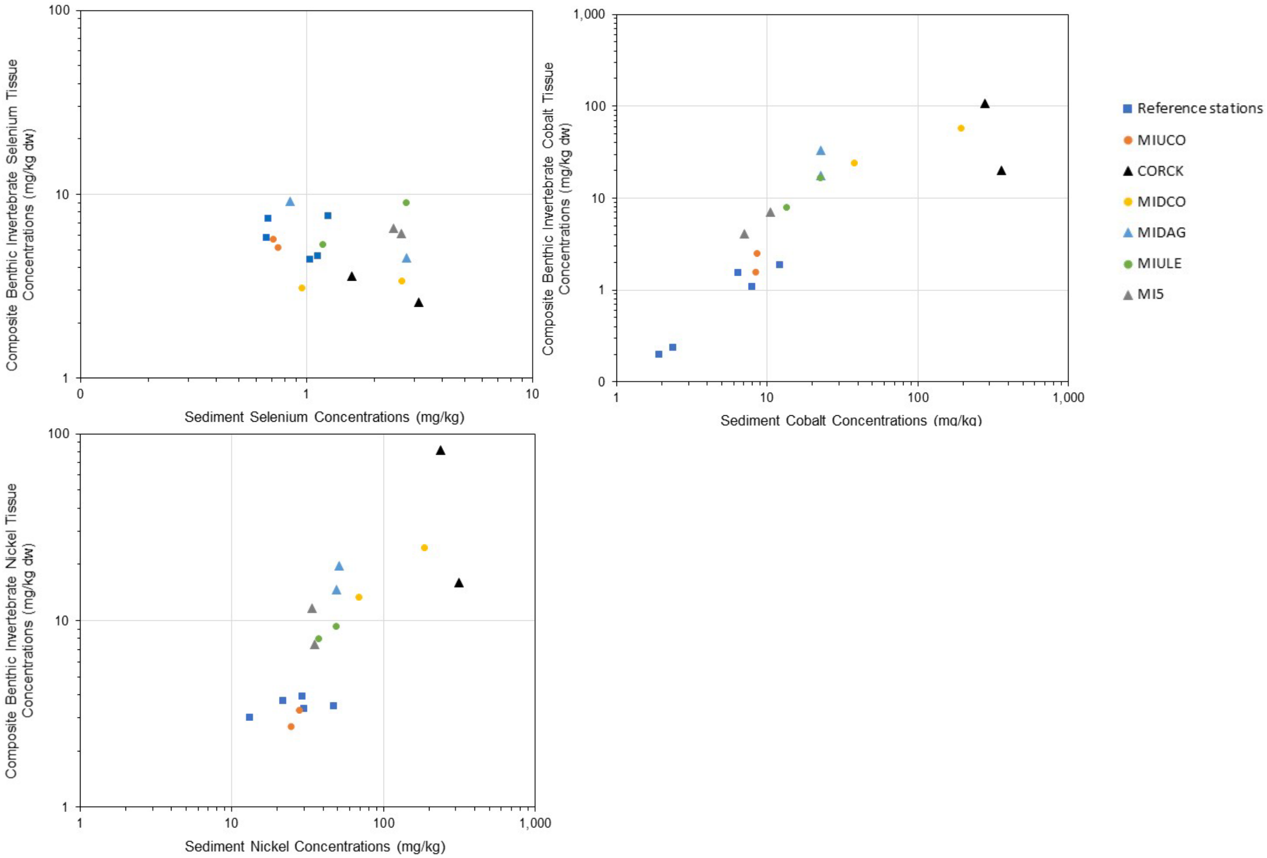
The relationship of composite benthic invertebrate tissue concentrations with aqueous selenium, nickel, and cobalt concentrations and sediment selenium, nickel and cobalt concentrations was also examined. There was an inverse relationship between composite benthic invertebrate tissue selenium concentrations and aqueous selenium (Figure 3.6-4), as aqueous selenium concentrations increased composite benthic invertebrate tissue selenium concentrations decreased. There was no relationship between composite benthic invertebrate tissue selenium concentrations and sediment selenium concentrations, based on 2018 and 2019 data (Figure 3.6-5). There was also a relationship between benthic invertebrate tissue cobalt and nickel concentrations and aqueous cobalt and nickel (Figure 3.6-4) and sediment cobalt and nickel concentrations (Figure 3.6-5). Composite benthic invertebrate tissue cobalt and nickel concentrations increased with increasing aqueous and sediment cobalt and nickel concentrations.

Figure 3.6-4: Composite Benthic Invertebrate Tissue Concentrations versus Aqueous Selenium (top left), Cobalt (top right) and Nickel (bottom left) Concentrations from the CMO LAEMP Study Area



Note: Open symbols indicate non-detects. The selenium dataset includes data from 2012 to 2019; the cobalt and nickel datasets include data from 2018 and 2019.
µg/L = micrograms per litre.

Figure 3.6-5: Composite Benthic Invertebrate Tissue Concentrations versus Sediment Selenium (top left), Cobalt (top right) and Nickel (bottom left) Concentrations from the CMO LAEMP Study Area



Note: Sediment and tissue datasets includes data collected from 2018 and 2019.
mg/kg = milligrams per kilogram.

4.0 SUMMARY OF RELATED AQUATIC PROGRAMS

The following summary of related aquatic programs in the Michel Creek watershed is provided to supplement the CMO LAEMP and provide linkages across studies. The information summarized in this section provides content relevant to answering the study questions outlined in Section 1.2.

4.1 Regional Aquatic Effects Monitoring Program

Teck's RAEMP provides spatially comprehensive monitoring and assessment of potential mine related effects on the aquatic environment downstream from Teck's coal mines in the Elk Valley. The RAEMP reporting encompasses monitoring data for the six management units associated with Teck's five coal mines (Minnow 2018b). Management Unit 4 applies to the CMO area and the EVO areas.

The general objective of the RAEMP is to monitor, assess, and interpret indicators of aquatic ecosystem condition related to mine operations, and to inform adaptive management relative to expectations established in approved plans for mine development and in Permit 107517 (Minnow 2018b). Another objective of the RAEMP is to determine if conditions in the aquatic environment are consistent with expectations outlined in Environmental Assessments (EAs) supporting approved mine development applications. Thus, the RAEMP informs adaptive management by iteratively evaluating aquatic ecosystem conditions within the watershed relative to expectations established in approved plans for mine development and in Permit 1075177, consistent with the framework described by Somers et al. (2018).

The aquatic receptors that could be influenced by mining activities examined in the RAEMP and the *Lentic Area Supporting Study* (Section 4.8.2) that apply to the CMO LAEMP include benthic macroinvertebrates, fish (e.g., westslope cutthroat trout [*Oncorhynchus clarkii lewisi*], longnose sucker [*Catostomus catostomus*] and mountain whitefish [*Prosopium williamsoni*]), amphibians, and aquatic-dependent wildlife (e.g., birds; Minnow 2018b).

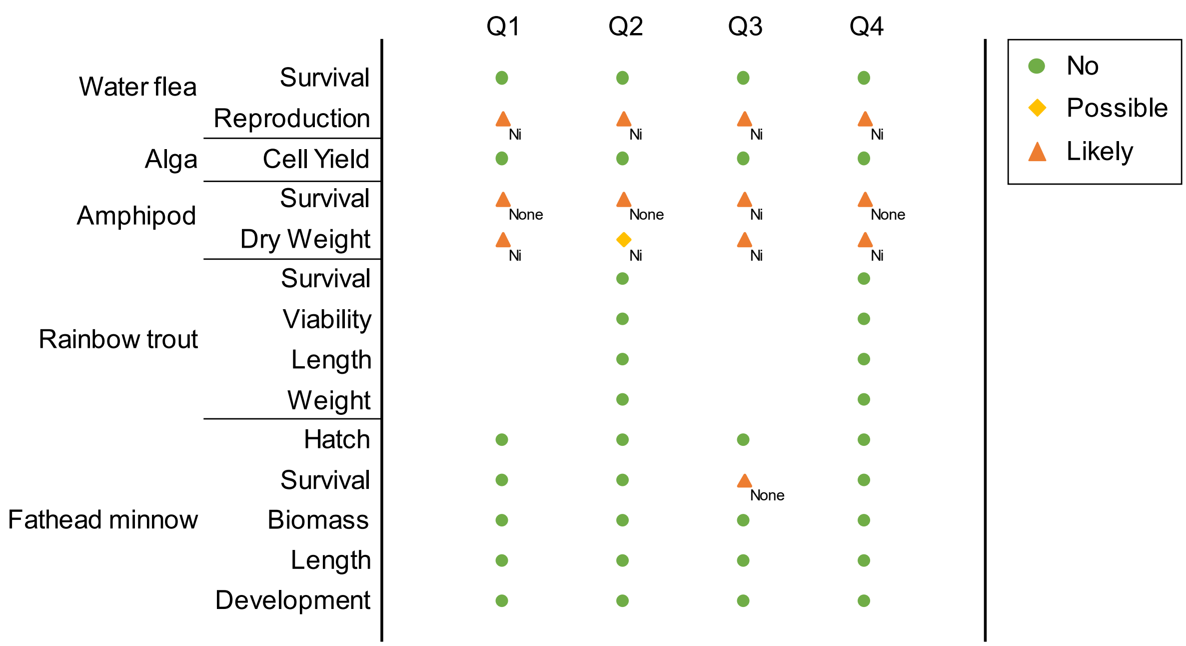
Finalized results and interpretation for the 2018 to 2020 RAEMP monitoring cycle were not available for incorporation into the 2019 CMO LAEMP. However, water quality results associated with the 2015 to 2017 cycle of the RAEMP were incorporated into Section 3.1.

4.2 Chronic Toxicity Testing Program

The chronic toxicity testing program supports AMP Management Question #2 and #5 (Section 1.3). The program reviews data quality to confirm that results met acceptability criteria, standardizes the data to help discern toxicological responses from other sources of variability in data, considers the size of response in each test and how that compares to responses in tests of reference waters (not influenced by mining) to categorize each result as "no", "possible", or "likely" adverse response and evaluated the correspondence between test responses and indicators of mine-related water quality. This evaluation includes statistical assessment of patterns and specialized laboratory tests (called "toxicity identification evaluations") designed to identify causes of toxicity.

Test results for CM_MC2 (MIDCO) are summarized in Figure 4.2-1 (2018) and Figure 4.2-2 (2019) and test results for RG_MIDAG (MIDAG) are summarized in Figure 4.2-3 (2019). The evaluation of constituents with the potential to cause toxicity is presented in Table 4.2-1. For CM_MC2, likely adverse responses were observed in all quarters in 2018 for water flea reproduction and amphipod survival and growth, and many of these responses could be attributed to nickel. A likely adverse response for fathead minnow survival was observed in Q3 of 2018 only, but no water quality constituent was identified as potentially contributing to the observed response in this test. In 2019, likely adverse responses were observed in water flea reproduction in Q1 and algal cell yield in Q3, these responses were also attributed to nickel. No adverse responses were observed at RG_MIDAG in 2019, indicating that potential nickel response may be localized, and the spatial extent of effects does not extend to RG_MIDAG (3 km downstream).

Figure 4.2-1: Summary of test results by category at CM_MC2, 2018

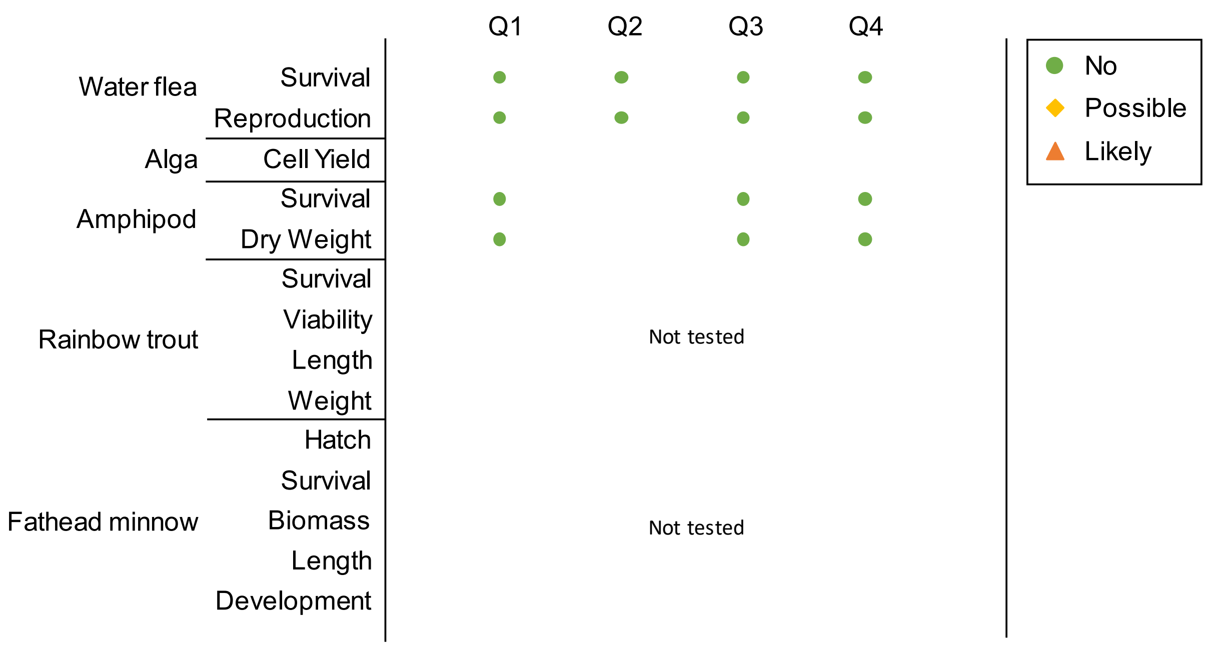


Note: Test results are categorized in Section 3.3.1 of the chronic toxicity report (Golder 2019b). Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. Ni = nickel; None = no water quality constituent associated with observed responses was identified.

Figure 4.2-2: Summary of test results by category at CM_MC2, 2019.

Note: Test results are categorized in Section 3.3.1 of the chronic toxicity report (Golder 2020). Possible and likely symbols are annotated with constituent(s) identified as potentially contributing to observed response. Ni = nickel; None = no water quality constituent associated with observed responses was identified. Toxicity Identification Evaluations were conducted to support the causation assessment for water flea and amphipod tests.

Figure 4.2-3: Summary of test results by category at RG_MIDAG, 2019.



Note: Test results are categorized in Section 3.3.1 of the chronic toxicity report (Golder 2020). Not tested = no testing conducted for rainbow trout or fathead minnow, as station is not currently part of Permit requirements. Station was assessed for sensitive invertebrate species to characterize spatial extent of effects.

Table 4.2-1: Summary of Constituents Identified as Potentially Contributing to Observed Responses at CM_MC2

Quarter	Organism	Endpoint	CM_MC2		RG_MIDAG
			2018	2019	2019
Q1	Water flea	Reproduction	Ni	Ni[(a)]	-
	Amphipod	Dry Weight	Ni	-	-
		Survival	None	-	-
Q2	Water flea	Reproduction	Ni	-	-
	Amphipod	Dry Weight	Ni	-	-
		Survival	None	-	-
Q3	Water flea	Reproduction	Ni	-	-
	Alga	Cell yield	-	None	-
	Amphipod	Dry Weight	Ni	Ni[(a)]	-
		Survival	Ni	-	-
	Fathead minnow	Biomass	-	Microbes	-
		Survival	None	Microbes	-
Q4	Water flea	Reproduction	Ni	-	-
	Amphipod	Dry Weight	Ni	Ni[(a)]	-
		Survival	None	None	-
	Rainbow trout	Viability	-	None	-

a) Causation assessment supported by Toxicity Identification Evaluations.
Note: Species and endpoint shown if one or more tests identified as likely or possible for that quarter.
'-' = test was categorized as no adverse response; Q = quarter of chronic toxicity testing; Ni = nickel; None = no water quality constituent was identified.

4.3 Lentic Area Supporting Study

Only a small proportion of aquatic habitat in the Elk River watershed is classified as lentic (Minnow 2018b), including off-channel habitats such as oxbows, wetlands, marshes, ponds, and small lakes that have standing or minimally flowing water and an accumulation of fine sediments (Armantrout 1998; IRCL 2008). In the Michel Creek watershed, lentic areas are located in off-channel wetlands, ponds and marshes along the Michel Creek (Figure 2.1-1).

The Lentic Area Supporting Study was initiated in 2018 to support the RAEMP and provide information regarding use of lentic areas by fish and aquatic-dependent wildlife and evaluate potential effects to fish and aquatic-dependent wildlife from mine-related constituents. The Lentic Area Supporting Study includes sampling of amphibian use and amphibian egg tissue chemistry, bird use and bird egg tissue chemistry, fish use, fish abundance, and fish tissue chemistry, benthic invertebrate tissue chemistry, habitat features, water quality, and sediment chemistry. Several lentic areas along Michel Creek (Table 4.3-1; Figure 2.1-1) and in reference areas are included in the Lentic Area Supporting Study. Components included in the Lentic Area Supporting Study are listed in Table 4.3-2.

Finalized results and interpretation for the 2018 to 2020 Lentic Area Supporting Study will be available for incorporation into the 2020 CMO LAEMP.

Historical information on lentic habitat for fish and aquatic-dependent wildlife was summarized in the Lentic Area Study Design (Minnow 2018b) as follows:

- Amphibians: Historical information regarding amphibians in the Elk River watershed is limited, and there is no historical information associated with the CMO area. Five amphibian survey sites and egg collection sites are planned as part of the 2018 to 2020 Lentic Area Supporting Study, which will target the Columbian spotted frog (*Heleioporus albopunctatus*), western toad (*Anaxyrus boreas*), and long-toed salamander (*Ambystoma macrodactylum*), all known to be present in the CMO area (Table 4.3-2).

- Aquatic-dependent birds: red-winged blackbird (*Agelaius phoeniceus*), mallard (*Anas playrhynchos),* marsh wren (*Cistothorus palustris*) and spotted sandpiper (*Actitis macularius*) have been observed historically within the ten bird survey sites within the CMO LAEMP area (Figure 2.1-1; Table 4.3-1; Minnow 2018a). Red-winged blackbird and spotted sandpiper eggs were sampled from lotic and lentic areas within the Elk River watershed and at two egg collection sites (Figure 2.1-1; Tables 4.3-1 and 4.3-2) between 2002 and 2014 (Harding et al. 2005; Minnow 2014, 2016, 2018a). Data collected in 2013 and 2014 indicated no apparent selenium-related effects on spotted sandpiper egg hatchability, % nest success, and clutch size among nests monitored in the Elk River watershed or within the CMO area (Minnow 2016).
- Fish: A total of 12 fish species have been observed in lentic habitats in the Elk River watershed (Minnow 2018c). Of these, bull trout (*Salvelinus confluentus*) and westslope cutthroat trout (*Oncorhynchus clarkia lewisi*) are the only species with special conservation status in the Kootenay Region of BC. Both species are blue-listed provincially (Pearson and Healey 2012). Westslope cutthroat trout are also listed as threatened by COSEWIC and as Special Concern under SARA (COSEWIC 2016; Government of Canada 2018). Within the CMO area only longnose sucker (*Catostomus catostomus*), westslope cutthroat trout, and redside shiner (*Richardsonius balteatus*) have been observed in lentic areas (Minnow 2018b).

Table 4.3-1: Lentic Sampling Areas near CMO

Lentic Area ID	Area Description	UTM Coordinates (NAD83, Zone 11U)	
		Easting	Northing
RG_SMCIM	Southern Michel Creek impoundment	667979	5484119
RG_MCIMCC	Michel Creek impoundment at Corbin Creek	668254	5487064
RG_MCWB	Michel Creek Wetlands	668051	5487358
RG_MCWA	Michel Creek Beaver Pond	667917	5487467
RG_MCWAGC	Michel Creek Wetland at Andy Goode Creek	667308	5488107
RG_NMCIM	Northern Michel Creek Impoundment	666651	5488412
RG_MI16	Michel Creek/Corbin Road Wetland	665055	5489432
RG_SLMICP	Southern Lower Michel Creek Pond	664106	5490363
RG_NLMICP	Northern Lower Michel Creek Pond	660955	5493299
RG_MIC2	Michel Creek Oxbow #2	659533	5496626
RG_MIWW	Lower Michel Wetland d/s Wheeler Creek	659707	5498474

Note: The Lentic Area Supporting Study report will be submitted 30 November 2020, as part of the RAEMP.

Table 4.3-2: Lentic Sampling Components near CMO, 2018 and 2019

Lentic Area ID	Amphibian Survey [a]				Amphibian Egg Collections			Bird Surveys[b]	Bird Egg Collections[c]	Fish Survey	Fish Meristics[d]	Fish Tissue	Benthic Invertebrate Composite Tissue
	Egg Survey	Tadpole/ Larvae Survey	Adult Survey 1	Adult Survey 2	Columbia Spotted Frog	Western Toad	Long-toed Salamander						
RG_SMCIM	2018, 2019	2018, 2019	2018, 2019	2019	2019	2019	-	2018, 2019	-	2018	-	-	2018, 2019
RG_MCIMCC	2018, 2019	2018, 2019	2018, 2019	2019	-	2019	-	2018, 2019	-	2018	2019	2019[e]	2019
RG_MCWB	-	-	-	-	-	-	-	2018, 2019	-	-	-	-	-
RG_MCWA	2018, 2019	2018, 2019	2018, 2019	2019	-	-	-	2018, 2019	-	-	-	-	2019
RG_MCWAGC	-	-	-	-	-	-		2018, 2019	-	-	-	-	-
RG_NMCIM	-	-	-	-	-	-	-	2018, 2019	-	-	-	-	-
RG_MI16	2018, 2019	2018, 2019	2018, 2019	2019	2018	-	-	2018, 2019	2019	2018	-	-	2018, 2019
RG_SLMICP	-	-	-	-	-	-	2018	-	-	-	-	-	2018
RG_NLMICP	-	-	-	-	-	2018	-	2018	-	-	-	-	-
RG_MIC2	-	-	-	-	-	-	-	2018, 2019	-	-	2019	-	2019
RG_MIWW	2018, 2019	2018, 2019	2018, 2019	2019	2018	-	-	2018, 2019	2019	2018	2019	2019[f]	2018, 2019

a) Amphibian occurrence and distribution surveys were completed by VAST Resource Solutions.
b) Surveys focused on aquatic and aquatic-dependent bird species.
c) Red-winged blackbird and spotted sandpiper.
d) Targeted eight female longnose sucker for tissue in May 2019 and 100 young-of-year and 100 non young-of-year for non-lethal measurements in September 2019.
e) Muscle and aging structures.
f) Muscle, ovary, and aging structures.
g) Three samples were collected per lentic area per sampling event, concurrent with fish surveys in 2019 and amphibian egg, bird egg, or fish tissue chemistry sampling in 2018 and 2019.

4.4 Environmental Flow Needs Study – Fish Community Survey

An EFN study of Corbin Creek occurred in 2019 (Teck 2018). A component of the associated EFN study is a fish community survey, summarized in this section. The other two EFN study components, the Fisheries Habitat Assessment Procedure (FHAP) (Regehr et al. 2020, in draft) and the instream flow study (IFS) are in progress. The finalized results and interpretation of the FHAP and IFS will be available for incorporation into the 2020 CMO LAEMP.

Existing information on fish species documented in Corbin Creek and surrounding area was reviewed. Fish species documented in Corbin Creek were Eastern brook trout (*Salvelinus fontinalis*)[1], mountain whitefish (*Prosopium williamsoni*), and westslope cutthroat trout (MOE 2019a). Downstream in Michel Creek, Bull Trout[2], mountain whitefish, westslope cutthroat trout and longnose sucker (Golder 2015, MOE 2019b). Westslope cutthroat trout was consistently the most common species observed in these two streams (Golder 2015, MOE 2019b). Tributaries such as Corbin Creek provide spawning, juvenile rearing, and high flow velocity refuge habitats that are limited in the frequently confined mainstem of Michel Creek (Golder 2015).

The fish community survey involved determining fish presence, distribution, and abundance in Corbin Creek during the growing season, as well as fish use of Corbin Creek for spawning and overwintering. The spawning assessment was conducted by Ecofish in June 2019, targeting westslope cutthroat trout, the fish community survey was completed from September 7 to 11, 2019, and the overwintering assessment was conducted in November 2019 and February 2020.

Electrofishing captures included mostly westslope cutthroat trout (81%, 96%, and 91% of captures for open-site electrofishing, closed-site electrofishing, and minnow trapping, respectively), although a few longnose sucker and eastern brook trout were also captured. Analysis of density and biomass by age class, as determined from closed-site electrofishing results, indicated that fry (0+), parr (1+), parr (2+), and sub-adult (3+) age classes were present in Corbin Creek; adults (≥4+) were not captured.

No spawners or redds were recorded during either survey suggesting that spawning is not common in Corbin Creek; however, fry were present in the sampling area during the growing season, indicating that spawning occurs somewhere in the vicinity.

Westslope cutthroat trout were present in Corbin Creek during the winter (95% of fish observed during the overwintering assessment were westslope cutthroat trout) (Regehr et al. 2020, in draft). A comparison of numbers of fish observed and habitat characteristics by sub-site (defined as a section of stream that had similar habitat characteristics within an overwintering site) suggested that sub-sites with cover tended to have higher numbers of fish and that fish presence was associated with the presence of cover (Regehr et al. 2020, in draft).

[1] Eastern Brook Trout is an introduced species.

[2] Numerous FIDQ records note the presence of Dolly Varden in Michel Creek; however, based on known provincial Dolly Varden distribution, Golder (2015) assumed that these records referred to incorrectly identified Bull Trout.

Opportunistic fish tissue sampling was completed in 2019 in Corbin Creek at CM_CC1 (CORCK) and CM_CC2 (upstream of CORCK; Table 4.4-1). Two fish tissue samples were collected during the September EFN electrofishing survey by Ecofish as muscle. The two fish captured were westslope cutthroat trout. Fish tissue concentrations were below the detection limit for all constituents, except mercury, selenium, strontium, thallium and zinc (Table 4.4-1). The selenium tissue concentration was 4.2 milligrams per kilogram dry weight (mg/kg dw) in both samples and was below the lowest level 1 benchmark for fish (11 mg/kg dw). Fish tissue cobalt and nickel concentrations were below the detection limit 5 mg/kg dw for both.

Table 4.4-1: Fish Tissue Concentrations, September 2019

Species	Location	UTM Coordinates (NAD83, Zone 11U)		Mercury (mg/kg dw)	Selenium (mg/kg dw)	Strontium (mg/kg dw)	Thallium (mg/kg dw)	Zinc (mg/kg dw)
		Easting	Northing	DL = 0.02	DL = 0.5	DL = 1.0	DL = 0.1	DL = 50
Westslope cutthroat trout	CM_CC1	668551	5487380	0.02	4.2	2.0	0.2	70
Westslope cutthroat trout	CM_CC2	669552	5487406	0.03	4.2	2.0	0.1	<50

Note: All other constituents were below detection limits.
DL = detection limit; mg/kg dw = milligrams per kilograms dry weight.

5.0 STUDY QUESTIONS

An integrated evaluation of CMO LAEMP data is presented below to address each study question.

5.1 Study Question 1

What are the magnitude and spatial extent of influence from CMO on water quality, calcite, sediment quality, and benthic invertebrate communities in Michel Creek downstream of CMO, how are these conditions changing over time, and are the conditions expected?

The highest concentrations of mine-influenced water quality constituents were observed at CORCK, followed by the first station downstream of CMO on Michel Creek (MIDCO, 0.83 km downstream), with a declining gradient of concentrations further downstream in Michel Creek. This was expected as Corbin Creek receives discharges of mine-influenced water before entering Michel Creek. Concentrations of most water quality parameters were similar between the reference stations and MIUCO, which is 0.82 km upstream of CORCK and 1.65 km from MIDCO. Within Michel Creek downstream of CMO, concentrations of nitrate, nitrite, cobalt, and nickel returned to concentrations observed at MIUCO by MIDAG (3.83 km downstream). Concentrations of sulphate, selenium, and uranium remained elevated at the furthest downstream of CMO station (MI5).

Concentrations greater than BC WQGs occurred at MIDCO for selenium (2018 and 2019) and sulphate, nitrate, and cobalt (2018 only). Selenium concentrations were below the lowest level 1 benchmark at all stations in both years. Sulphate and nitrate concentrations were greater than the lowest level 1 benchmark at MIDCO (2018 only). Nickel and cobalt were greater than interim screening values at MIDCO (nickel in both years; cobalt in 2018 only) and nickel was greater than the interim screening value at MIDAG (2018 only).

Peak concentrations of sulphate, nitrate, nitrite, total cobalt, total nickel, and total selenium were observed at MIDCO in 2018. Most of these parameters decreased in concentration between 2018 and 2019 except for selenium. The decrease in these mine-related constituents was expected based on the SRK projections, which projected a decrease between 2017 and 2019 based on changes over time in mine water management. Overall, concentrations of sulphate, nitrate, nitrite, and nickel were either lower than or similar to the SRK projections for all years except 2018. Concentrations of total selenium and cobalt were either lower than or similar to projections for dissolved selenium and cobalt for all years, while concentrations of total uranium were higher than projected concentrations for dissolved uranium (2017 onward) and sulphate, nitrate and nickel in 2018.

The decrease in mining-related constituents between 2018 and 2019 at CORCK and in Michel Creek downstream of CMO was attributed to completion of the flush of accumulated constituents resulting from re-handled waste rock in 2016 and 2017, coal no longer being washed, and proactive management of pit-pumping rates for 34 Pit and 6 Pit (Teck 2019c). Continued improvement in water quality is expected to occur as CMO moves further into care and maintenance and as Teck continues to take actions to address the elevated concentrations in mine-related constituents in Corbin Creek compared to reference stations, including the development of science-based benchmarks for nickel toxicity and the evaluation of commercially available treatment options for nickel and cobalt.

As expected based on the 2015 to 2016 RAEMP results, sediment selenium and PAH concentrations were found in higher concentrations in the sediment at mine-influenced stations in the CMO area compared to reference stations and were above sediment quality guidelines at mine-influenced stations in 2018 and 2019. Cadmium, manganese, nickel, and zinc concentrations were higher at CORCK and MIDCO compared to downstream and reference stations in 2018 and 2019, while sediment metal concentrations downstream of MIDCO were generally similar to reference stations, with the exception of selenium.

Calcite presence was high in Corbin Creek but generally low in Michel Creek (calcite index <1), with a decrease in calcite index observed from historical values (i.e., 2012 to 2018) to 2019. The calcite index values were lower than expected, if calcite were an influencing factor in BIC affects in Michel Creek (Minnow 2018b). The calcite index values remained within the reference normal range in Michel Creek throughout the time series, with the exception of MIDCO in 2018.

Benthic invertebrate richness and abundance were generally similar among mine-influenced and reference stations and were within or above the regional normal range between 2012 to 2019. The BIC at reference stations was generally dominated by Ephemeroptera. Ephemeroptera also dominated at mine-influenced stations in Michel Creek, except for at MIDCO, which was dominated by Diptera. Diptera dominated the BIC at CORCK. MDS ordination plots indicated that community composition based on a family-level comparison was similar between the reference and mine-influenced stations in Michel Creek but differed significantly from community composition at CORCK.

Abundance of EPT taxa and Ephemeroptera were similar among reference and mine-influence stations in Michel Creek. Abundance of EPT taxa and Ephemeroptera was within or above the regional normal range at reference and mine-influenced stations between 2012 to 2019, except for Ephemeroptera at MIDCO in 2018, which was below the normal range.

Percent EPT was within or above the regional normal range at the three reference stations (all years) and MIUCO (all years except 2019), but below the normal range at CORCK and MIDCO in all years, and had returned to within the normal range by MIDAG (all years except 2019). %E exhibited a similar pattern: %E was within or above the regional normal range at reference stations (except MI25 in 2012), below the normal range at MIDCO (all years except 2012), and had returned to within the normal range by MIDAG.

Benthic invertebrate tissue selenium concentrations were within the regional normal range at reference and mine-influenced stations between 2012 and 2019, with the exception of MIULE (9.8 km downstream) in 2018 and MIDAG (0.83 km downstream) in 2019, which exceeded the upper bound of the regional normal range. Benthic invertebrate tissue selenium concentrations recorded in Michel Creek were less than the lowest level 1 benchmark. Benthic invertebrate tissue cobalt and nickel concentrations were higher at mine-influenced stations downstream of CMO compared to reference stations and were lower in 2019 compared to in 2018, consistent with observed changes in water quality between years related to mine water management. The findings from the chronic toxicity testing (Golder 2017, 2019b, 2020), nickel is likely responsible for the BIC changes.

Fish tissue results show that tissue concentrations of nickel and cobalt are below the detection limit. Fish tissue selenium concentrations were detectable but below the lowest level 1 benchmark and the toxicity results indicate no clear adverse effects on fish.The lower proportions of BIC endpoints will continue to be investigated through on-going monitoring within the CMO LAEMP and the RAEMP.

5.2 Study Question 2

How do spatial and temporal patterns in the benthic invertebrate communities correspond to water quality, calcite, sediment quality, and other potential stressors, and what does this tell us about what factors are causing observed effects?

Benthic invertebrate habitat variables were generally similar between reference and mine-influenced stations and it is unlikely that differences in habitat caused the differences observed in the proportion of EPT and Ephemeroptera taxa at the stations downstream of CMO in Michel Creek. Similarly, it is unlikely that calcite presence and concretion in Michel Creek was a factor in the lower proportions of EPT and Ephemeroptera taxa at MIDCO and MIDAG, because calcite index values were generally low between 2012 and 2019 and within the reference normal range in Michel Creek. However, calcite presence may have been a factor at CORCK.

Comparisons across stations indicated correlations of %EPT and %E with aqueous, sediment, and tissue concentrations of nickel and cobalt, and intercorrelations among these potential stressors. The was an inverse relationship between aqueous selenium concentrations and tissue selenium concentrations, as aqueous selenium concentrations increased composite benthic invertebrate tissue selenium concentrations decreased. Therefore, this relationship was not considered meaningful and both aqueous selenium and tissue selenium concentrations were below guidelines and the lowest level 1 benchmark.

The intercorrelations between constituents makes it challenging to identify the cause(s) of the observed BIC changes downstream of CMO. However, the findings discussed herein, in particular the comparison to interim screening values and the interpretation of chronic toxicity data (Golder 2019b, 2020), support previous interpretations (Golder 2017) that nickel is the most likely cause.

6.0 RECOMMENDATIONS

The current study design is effective at collecting sufficient data to address the study questions; therefore, there are no recommended changes to the CMO LAEMP 2020 study design. The CMO LAEMP will continue to assess relevant site-specific issues, as required, until sufficient data have been collected, concerns no longer exist, or monitoring can be incorporated into the RAEMP. The next CMO LAEMP field program is planned for September 2020.

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1.0 WATER QUALITY

1.1 Spatial Trends

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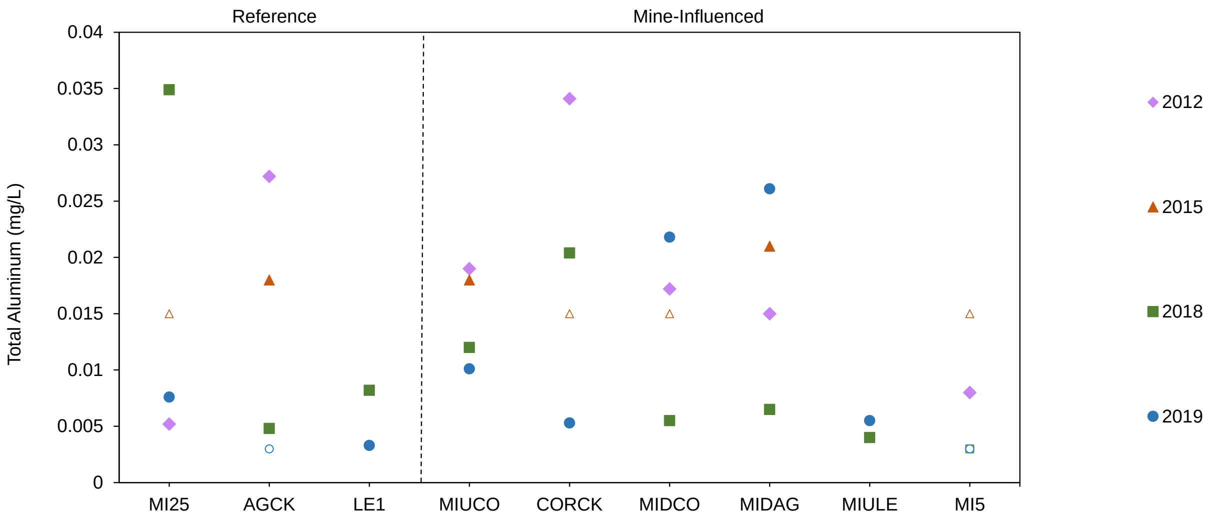
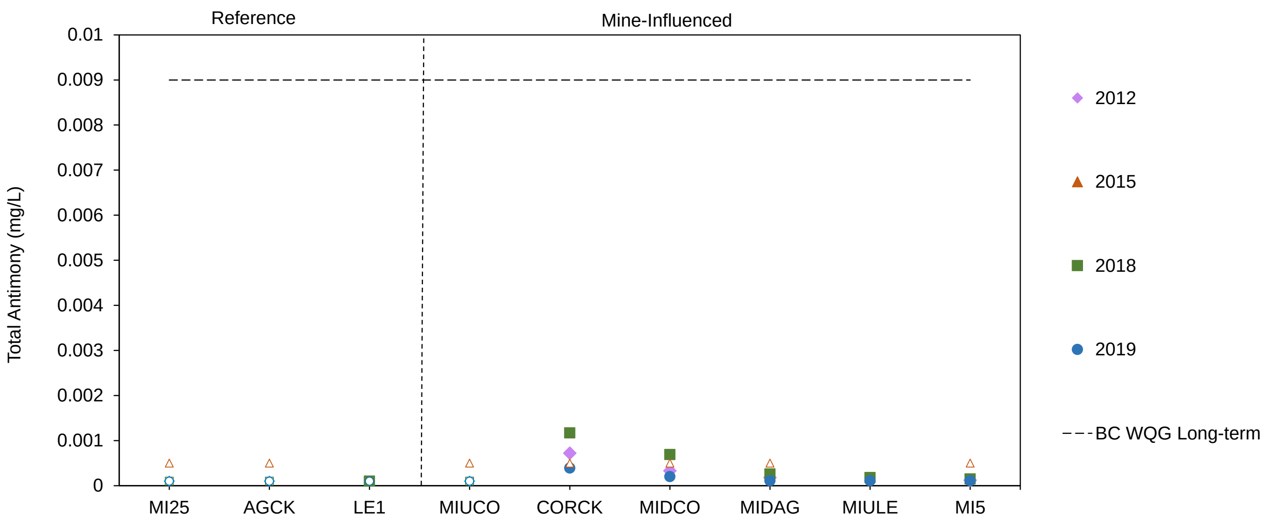


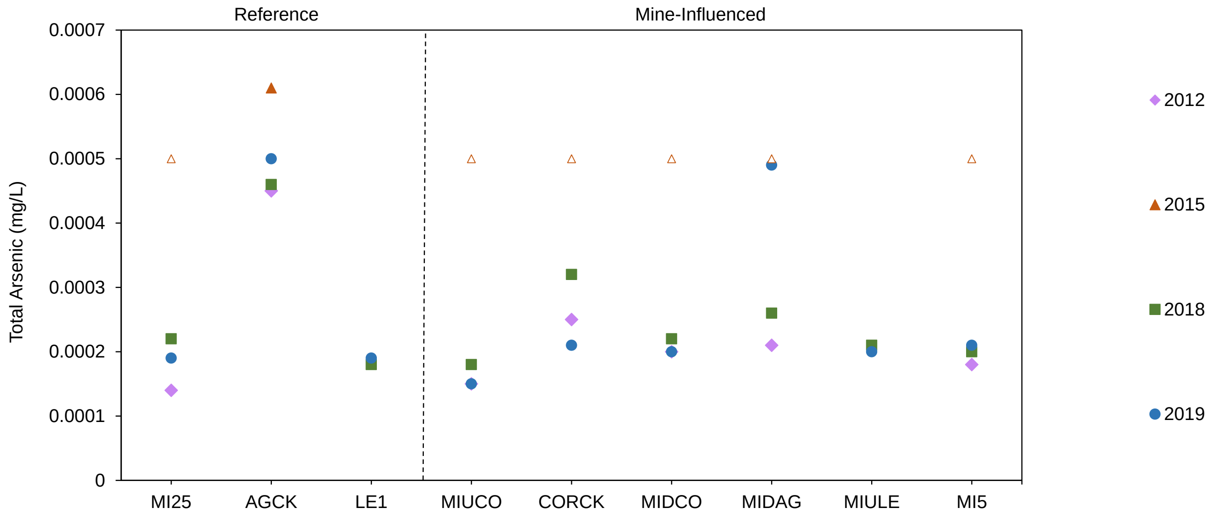
Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-2: Spatial Variation in Aqueous Antimony Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



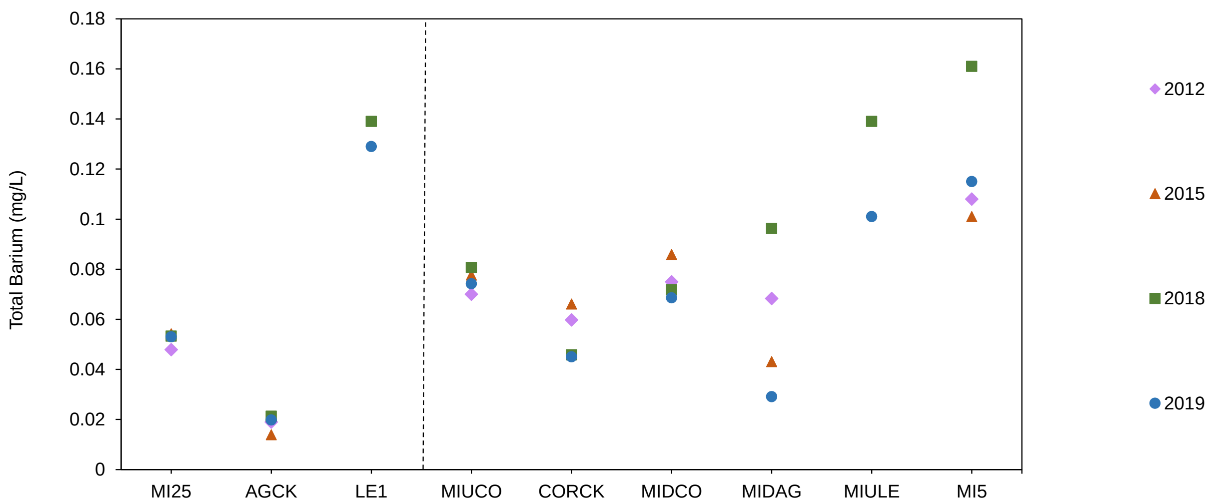
Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-3: Spatial Variation in Aqueous Arsenic Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



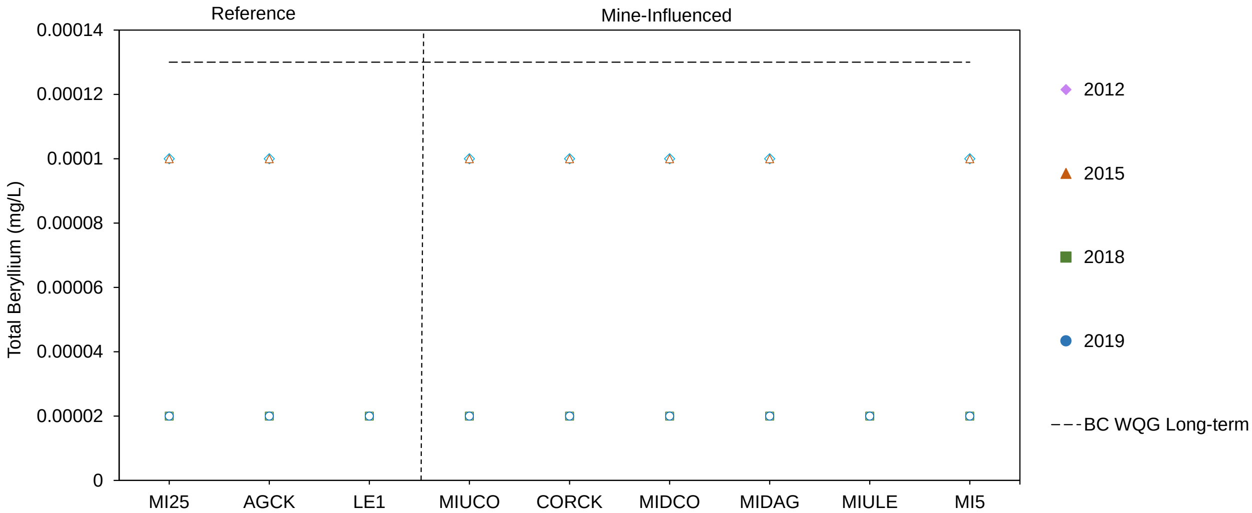
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-4: Spatial Variation in Aqueous Barium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



Note: Long-term BC WQG (1.0 mg/L) not shown.
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-5: Spatial Variation in Aqueous Beryllium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline.

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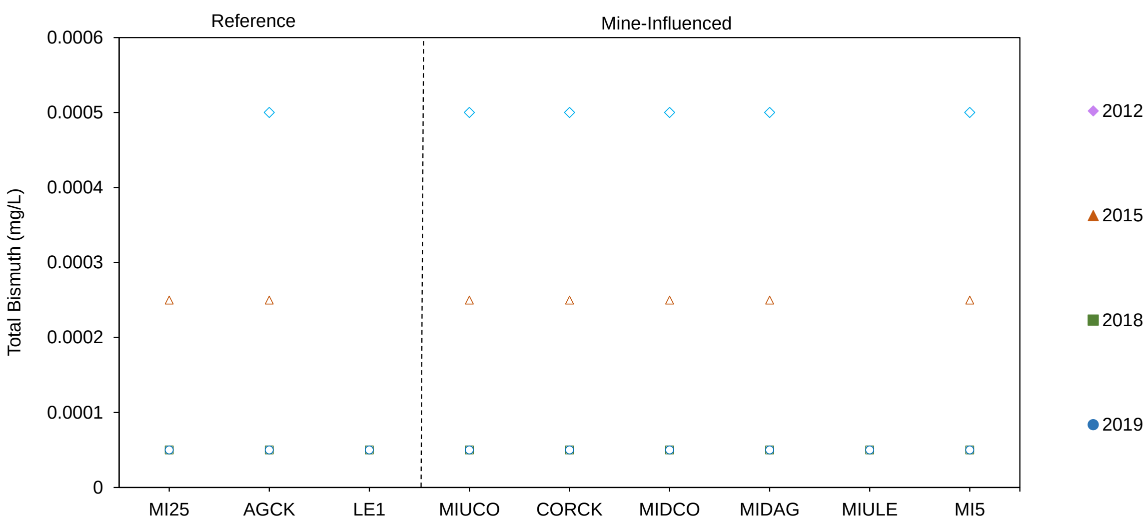

Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline

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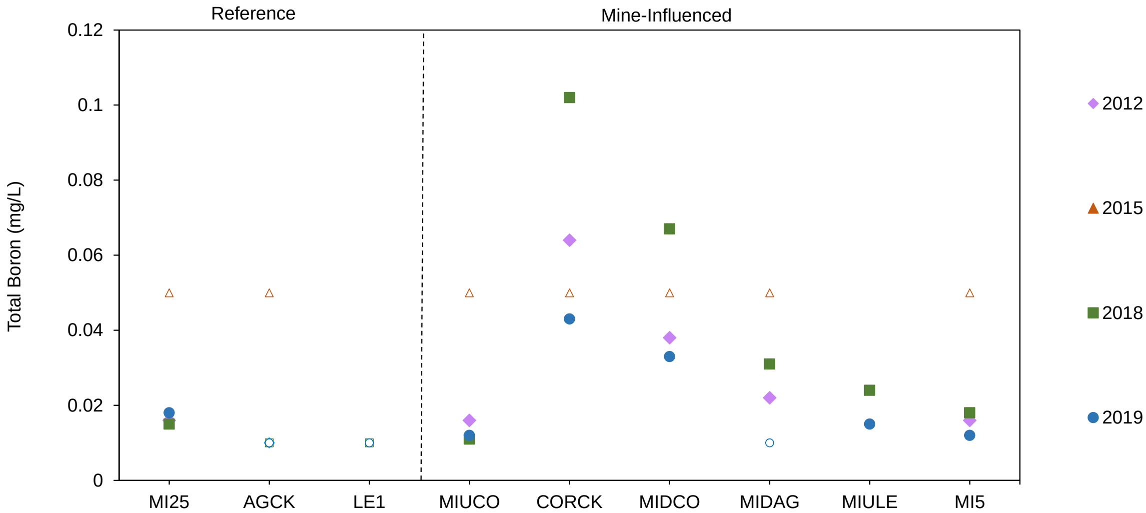
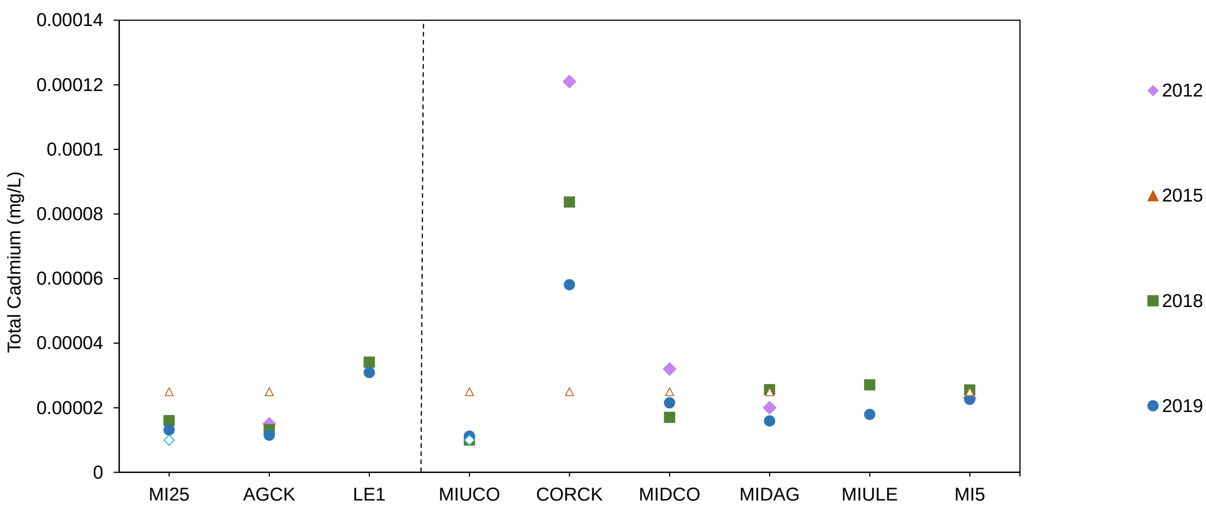


Note: Open symbols represent non-detects. Long-term BC WQG not shown (1.2 mg/L).
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-8: **Spatial Variation in Aqueous Cadmium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline

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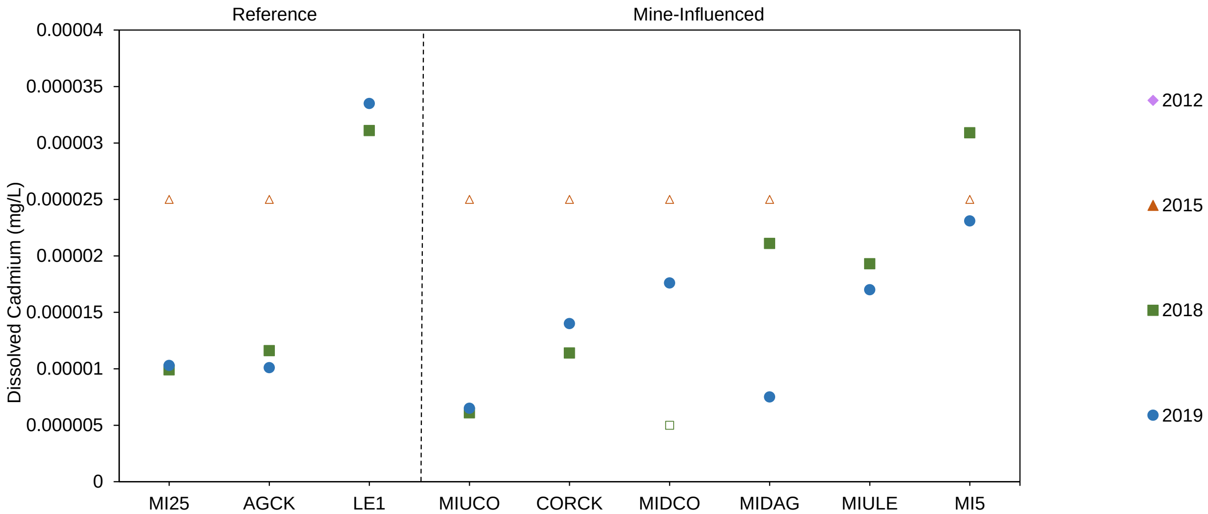
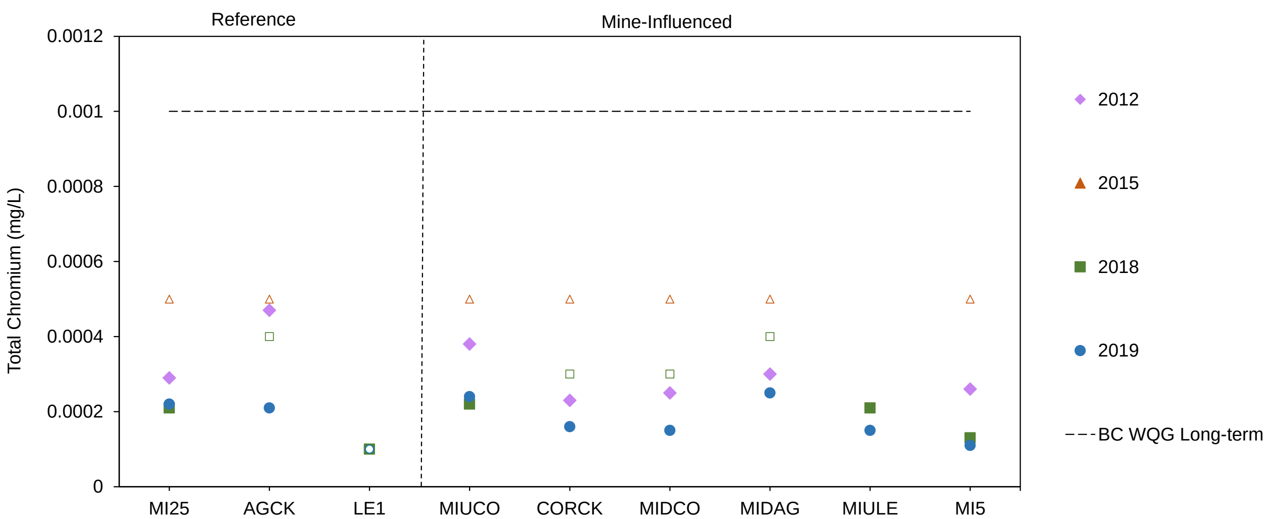


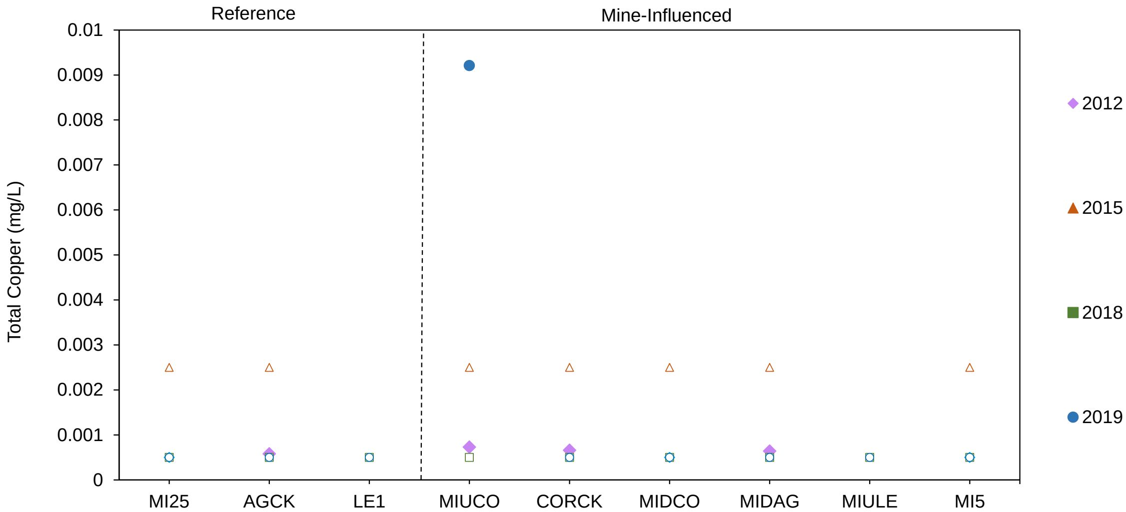
Note: Open symbols represent non-detects. Long-term BC WQG not shown (hardness dependent).
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-10: Spatial Variation in Aqueous Chromium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



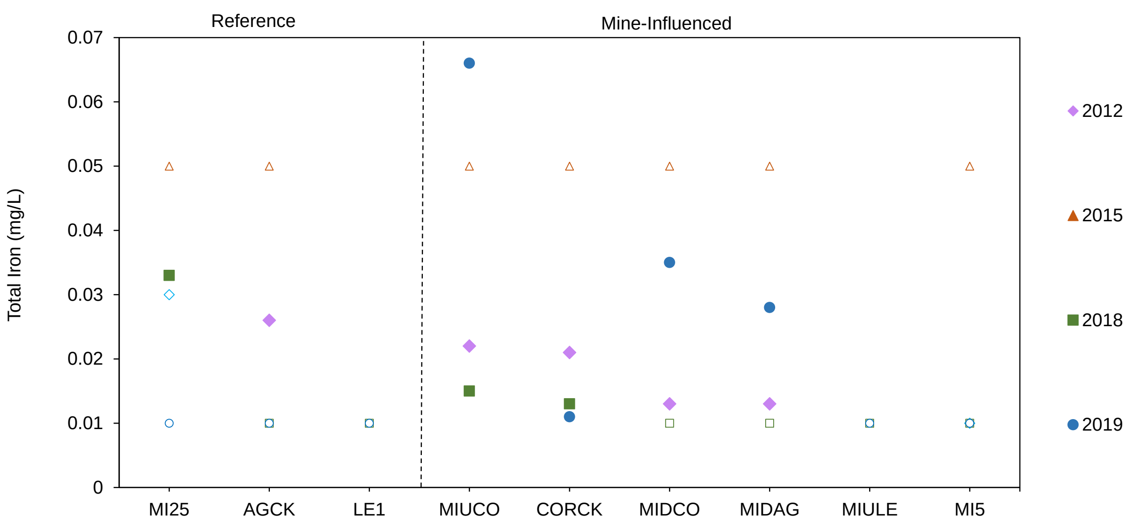
Note: Open symbols represent non-detects. Long-term WQG not shown (0.001 mg/L).
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-11: Spatial Variation in Aqueous Copper Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



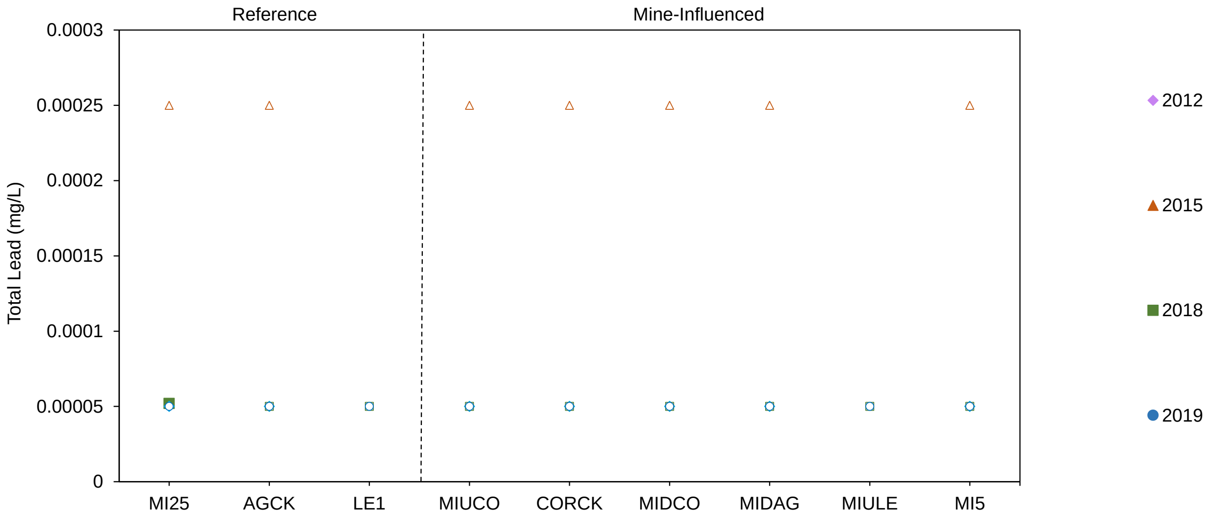
Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-12: Spatial Variation in Aqueous Iron Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



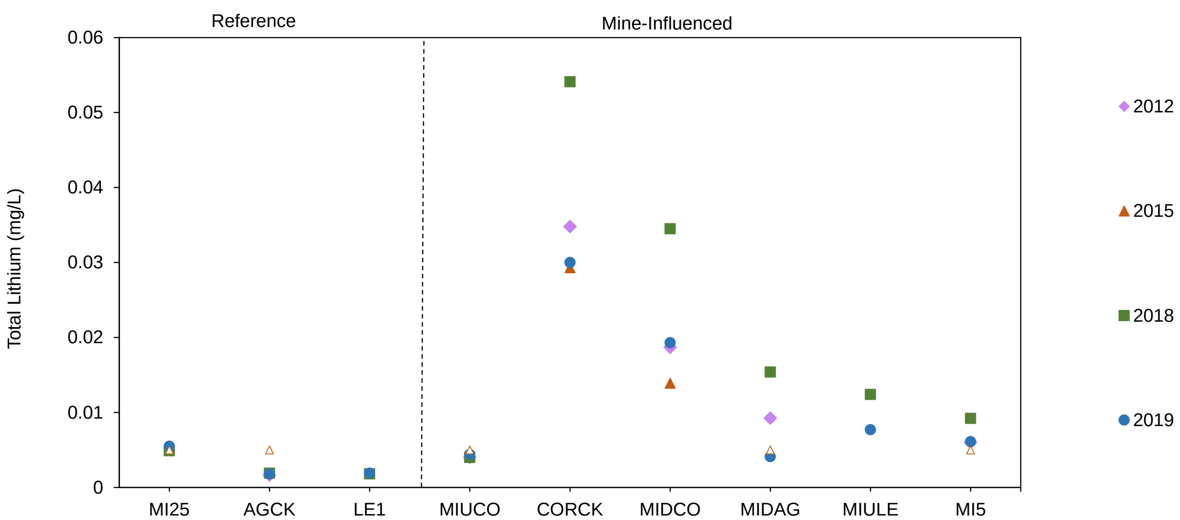
Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-13: Spatial Variation in Aqueous Lead Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



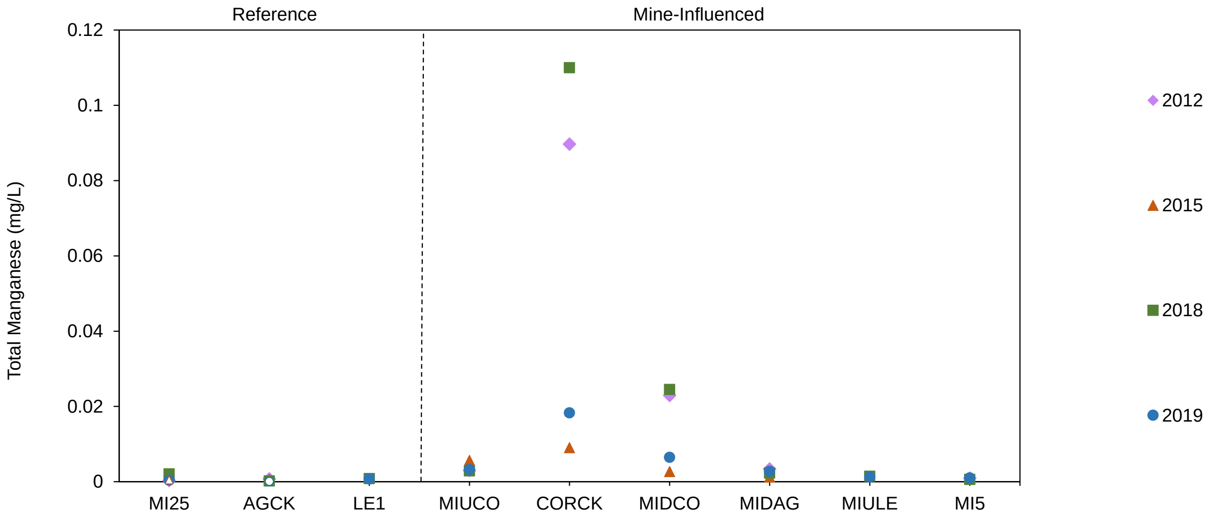
Note: Open symbols represent non-detects. Long-term BC WQG not shown (hardness dependent; 0.007 – 0.04 mg/L).
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-14: Spatial Variation in Aqueous Lithium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



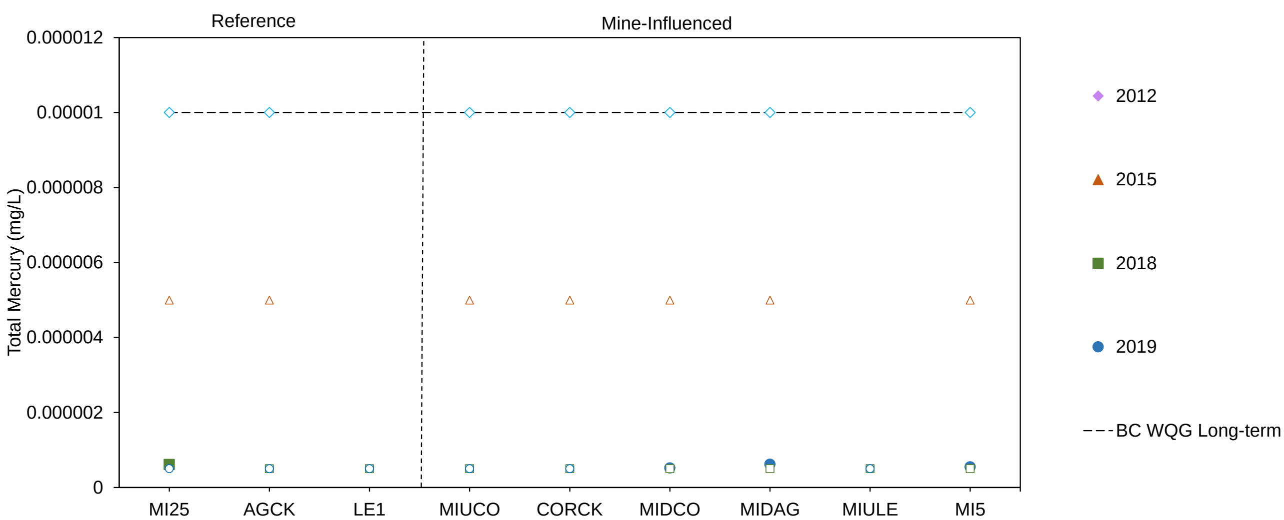
Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-15: Spatial Variation in Aqueous Manganese Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



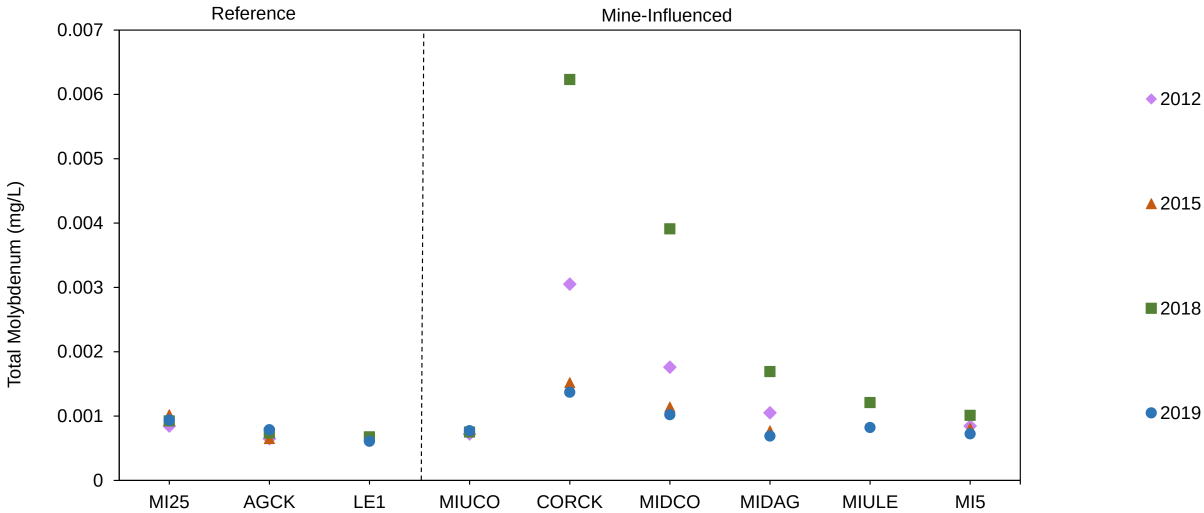
Note: Open symbols represent non-detects. Long-term BC WQG not shown (hardness dependent; 1.2 – 3.8 mg/L).
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-16: Spatial Variation in Aqueous Mercury Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



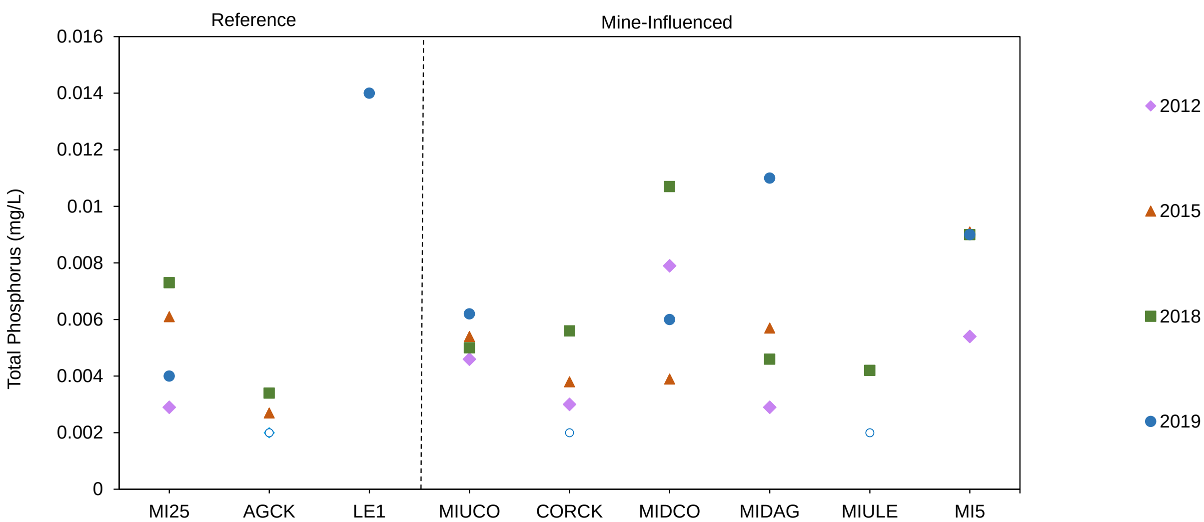
Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-17: Spatial Variation in Aqueous Molybdenum Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



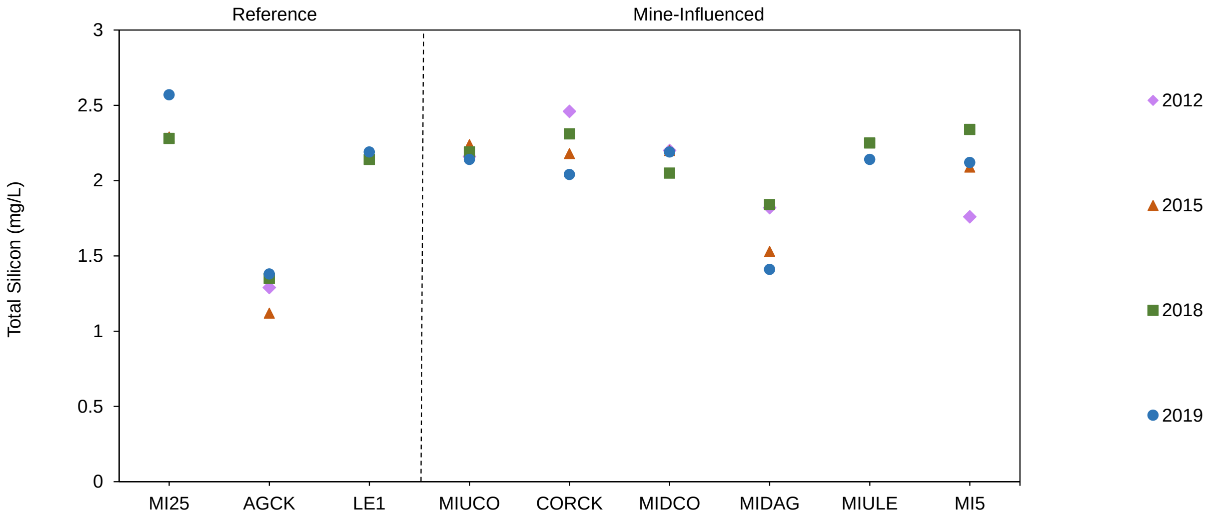
Notes: Open symbols represent non-detects. BC long-term WQG not shown (1.0 mg/L).
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-18: Spatial Variation in Aqueous Phosphorus Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



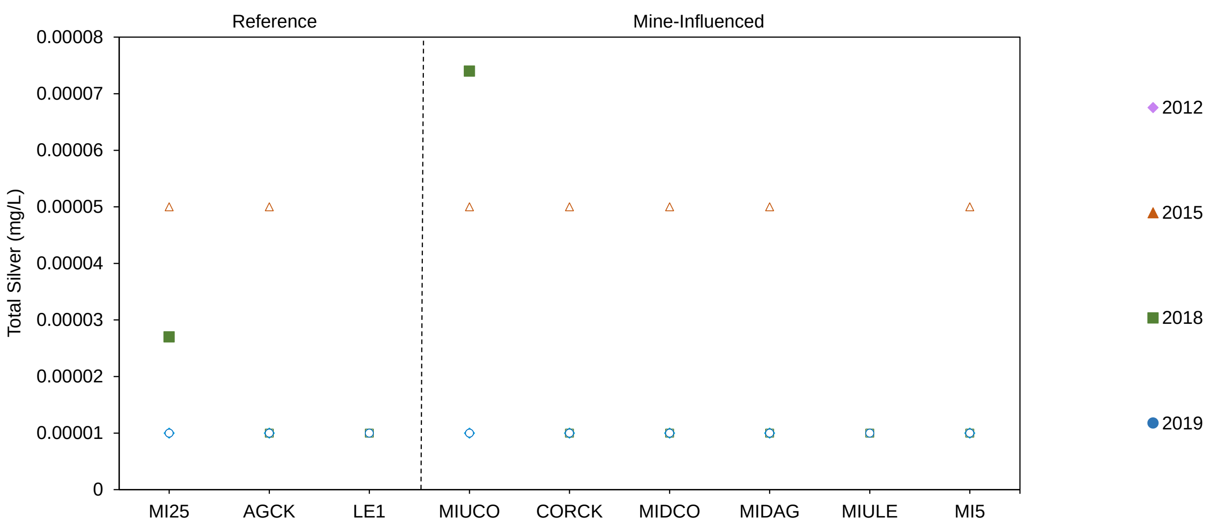
Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-19: Spatial Variation in Aqueous Silicon Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



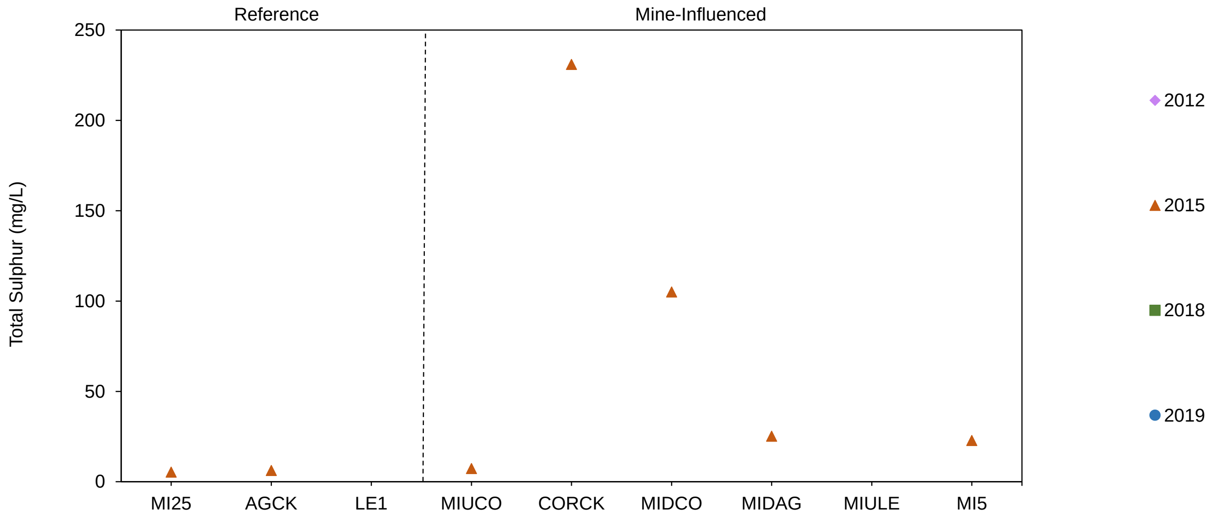
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-20: Spatial Variation in Aqueous Silver Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



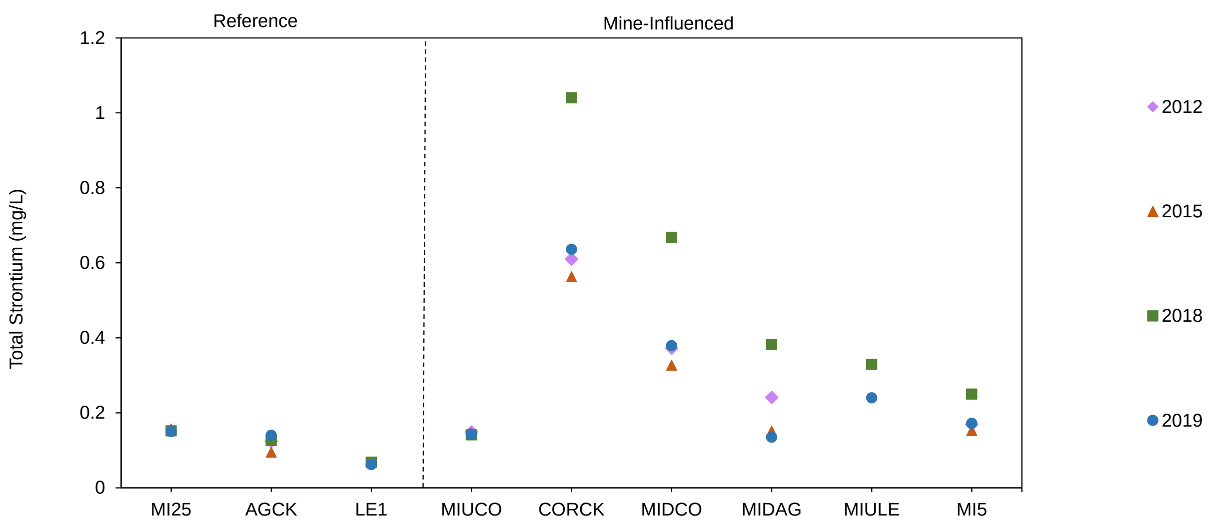
Note: Open symbols represent non-detects. Long-term BC WQG not shown (0.0015 mg/L).
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-21: Spatial Variation in Aqueous Sulphur Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



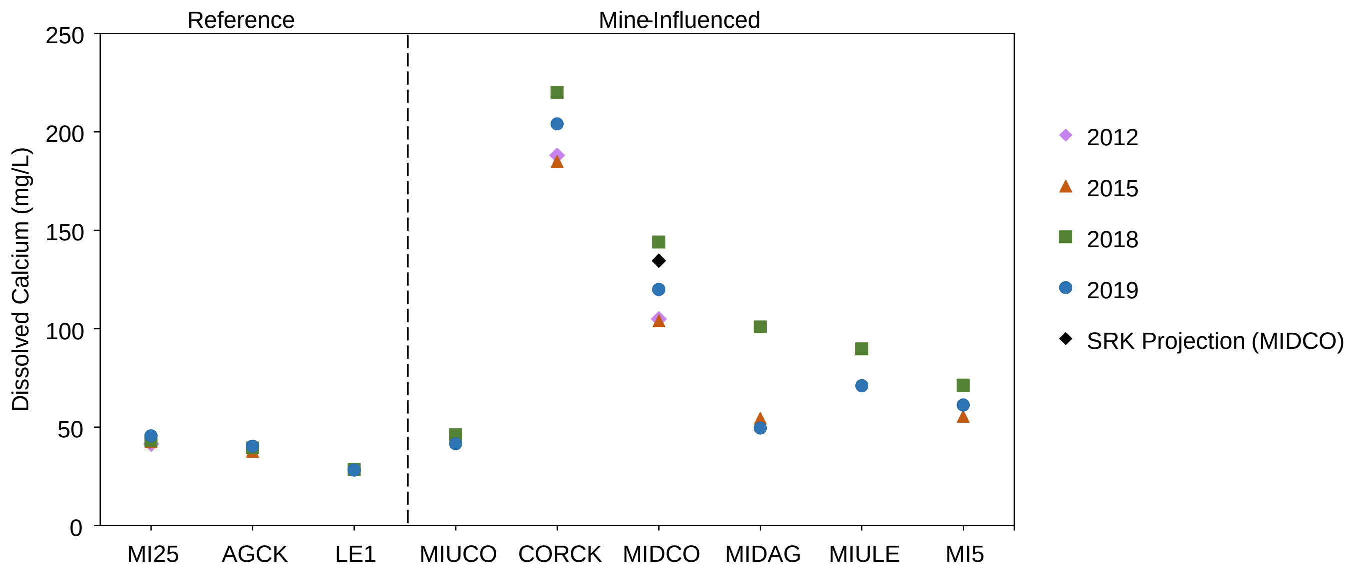
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-22: Spatial Variation in Aqueous Strontium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



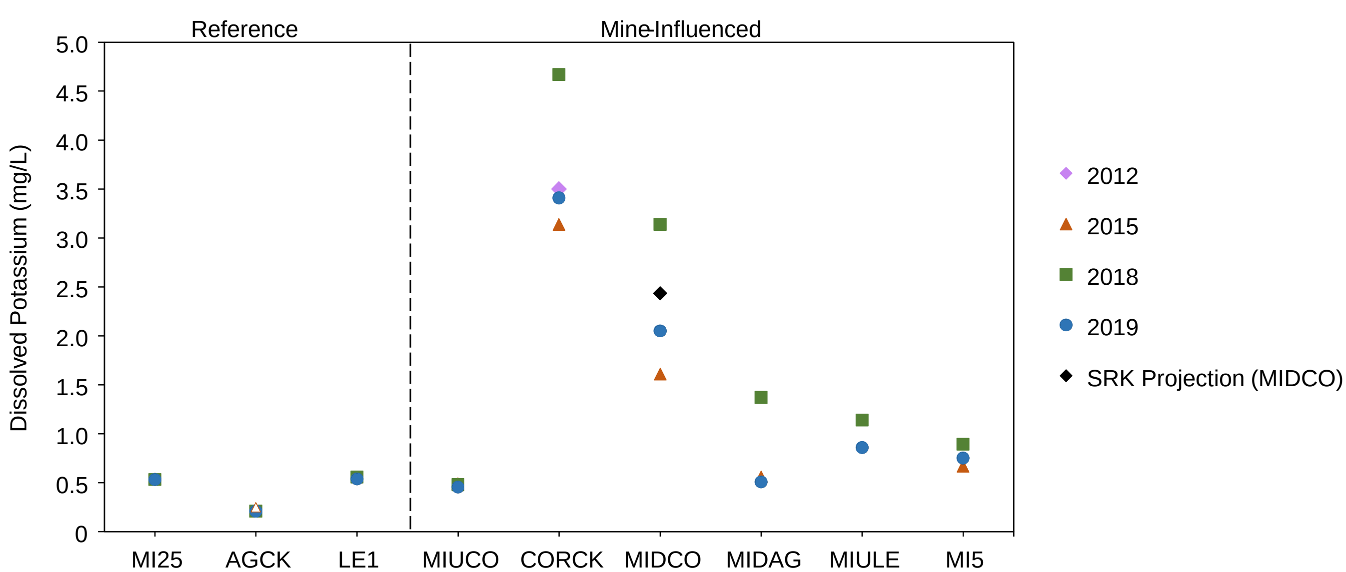
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-23: Spatial Variation in Aqueous Calcium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



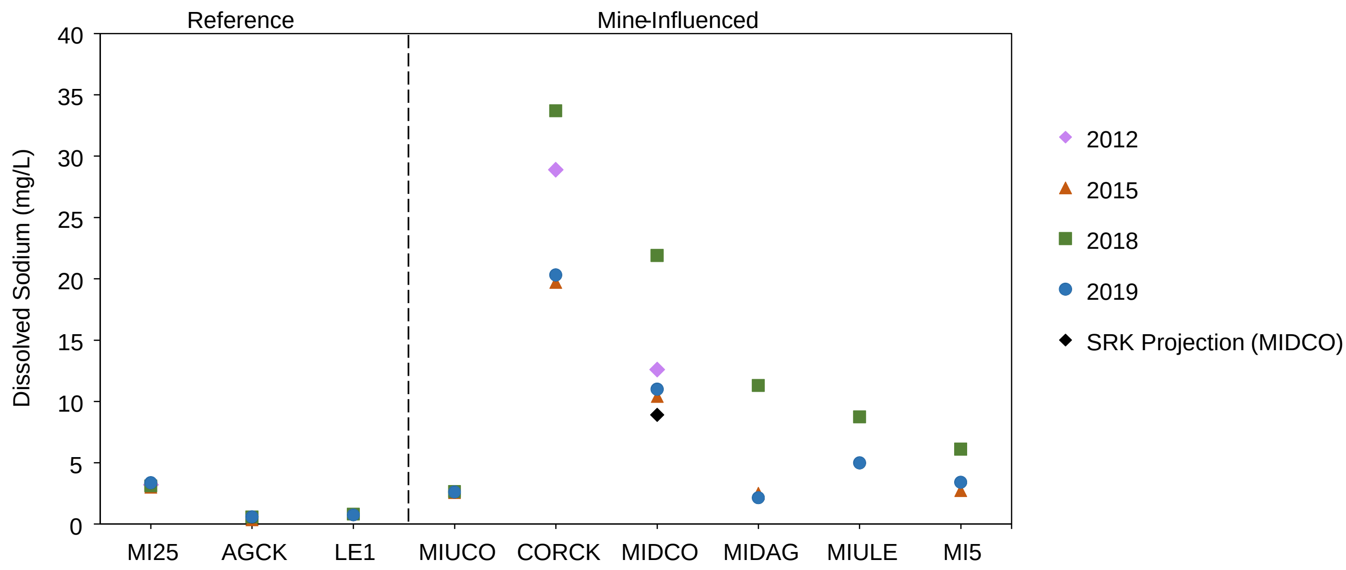
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-24: Spatial Variation in Aqueous Potassium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



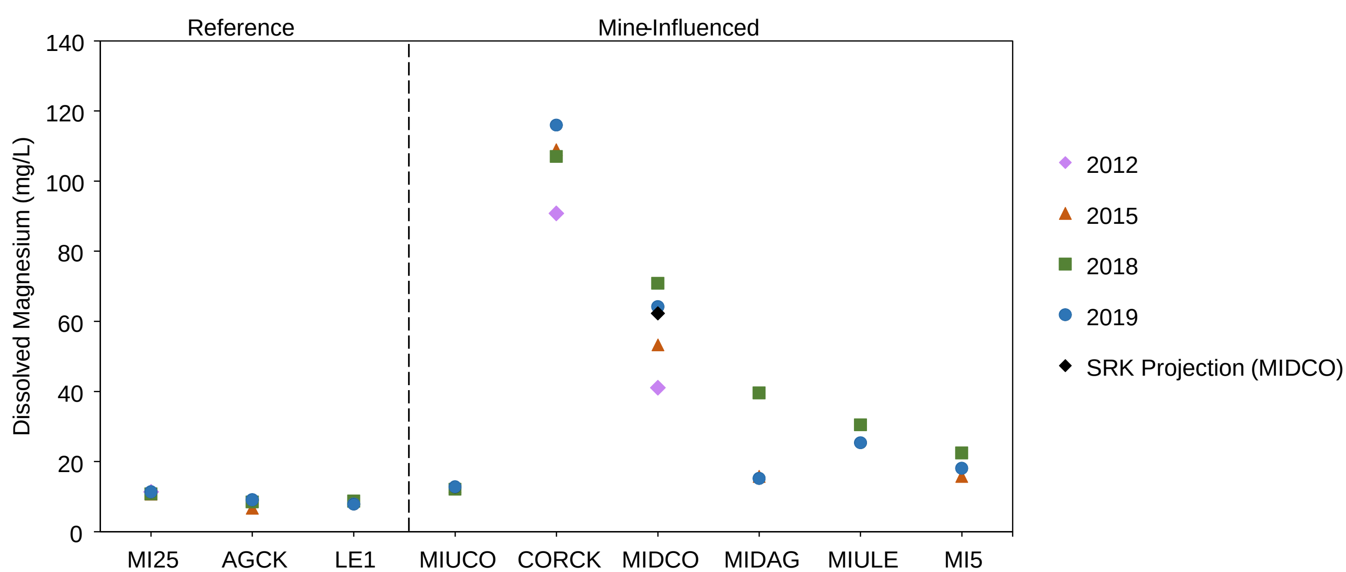
Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline.

Figure 1.1-25: Spatial Variation in Aqueous Sodium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



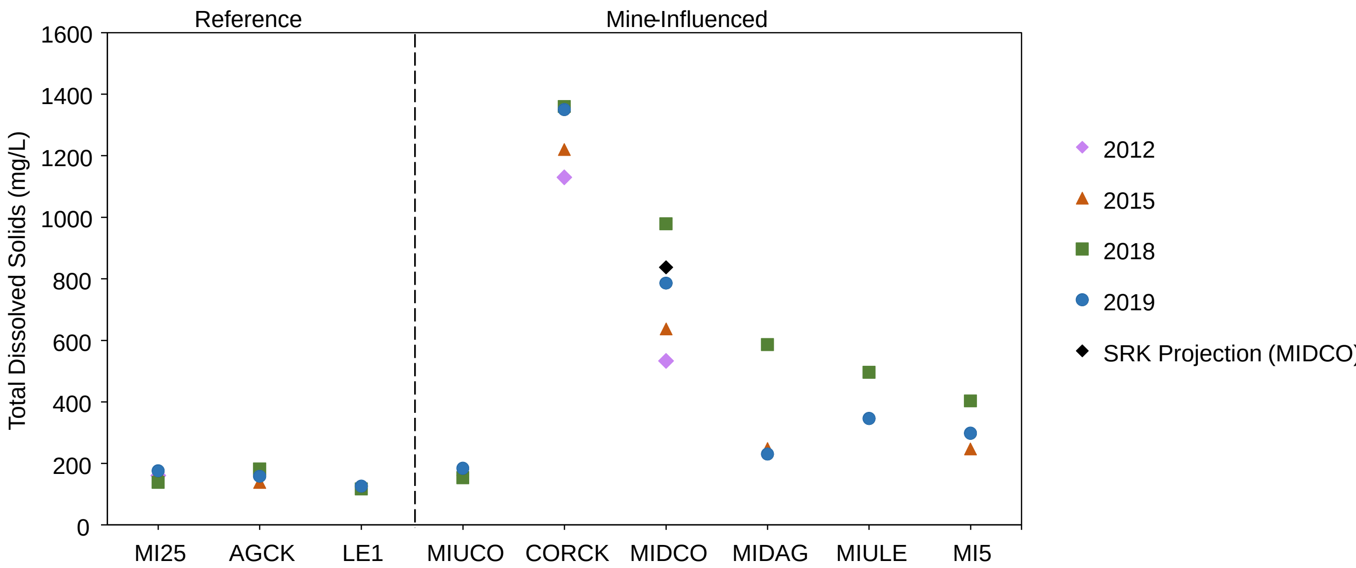
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-26: Spatial Variation in Aqueous Magnesium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



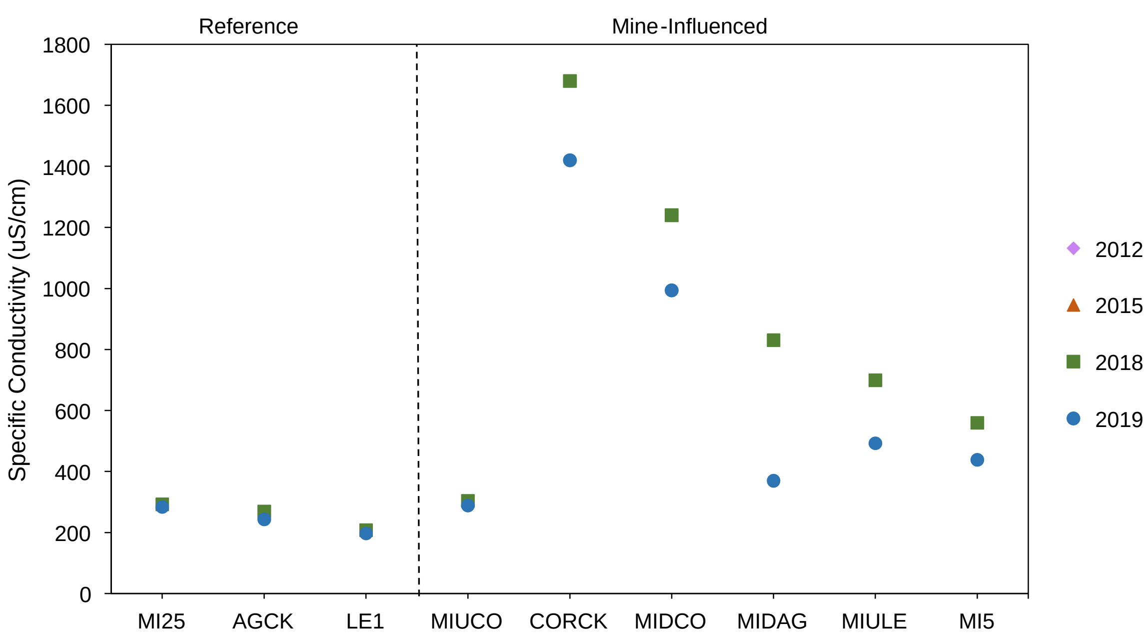
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-27: Spatial Variation in Total Dissolved Solids Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



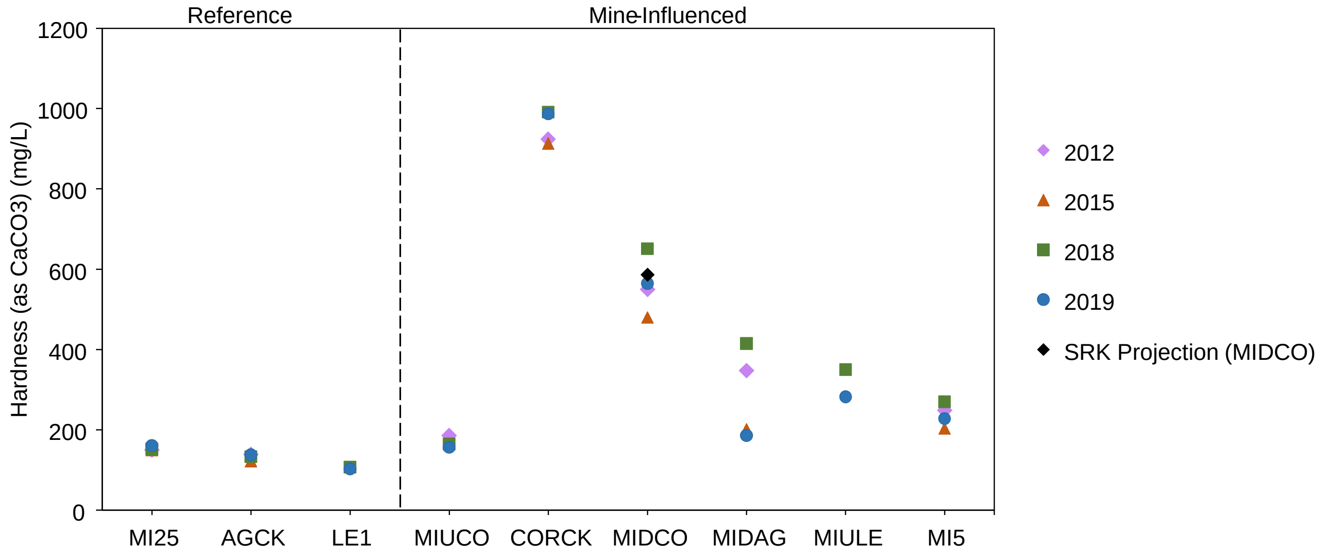
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-28: Spatial Variation in Specific Conductivity in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



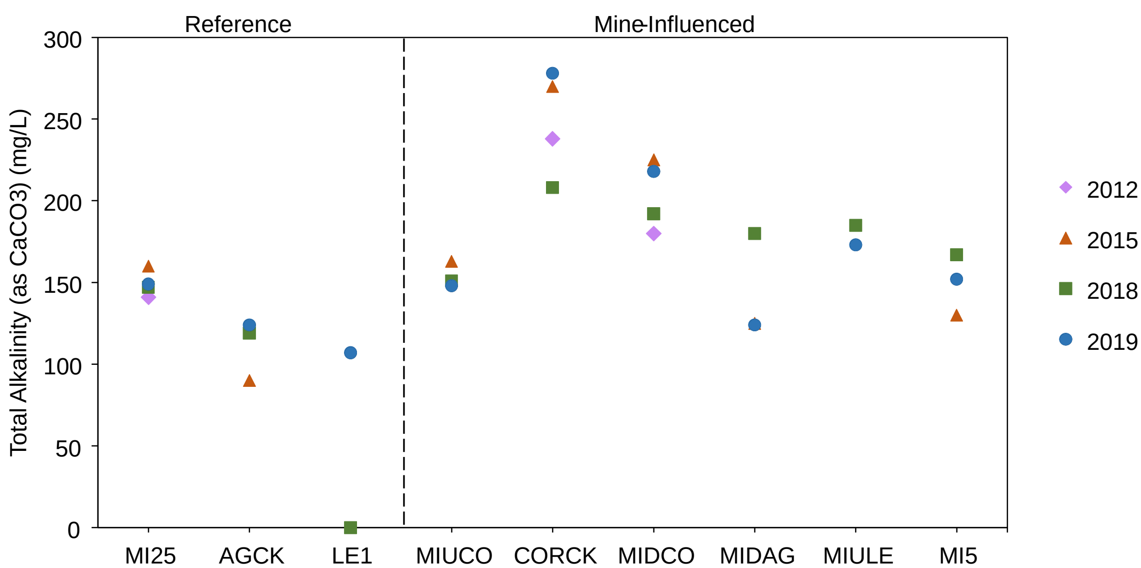
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-29: Spatial Variation in Hardness in samples collected from the coal mountain operations local aquatic effects monitoring program, 2012 to 2019



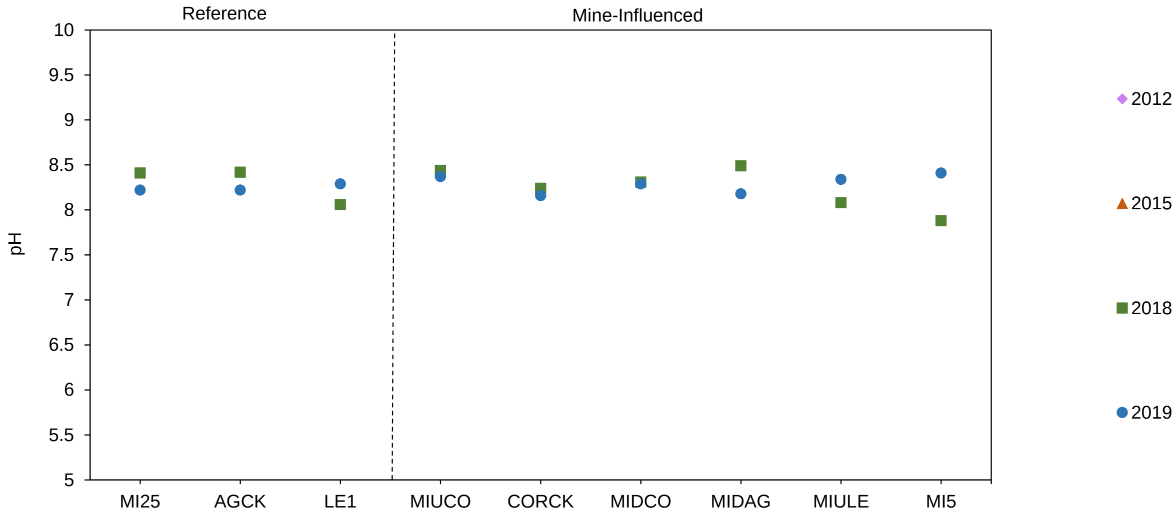
mg/L = milligrams per litre; WQG = water quality guideline

Figure 1.1-30: Spatial Variation in Alkalinity in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



mg/L = milligrams per litre; WQG = water quality guideline

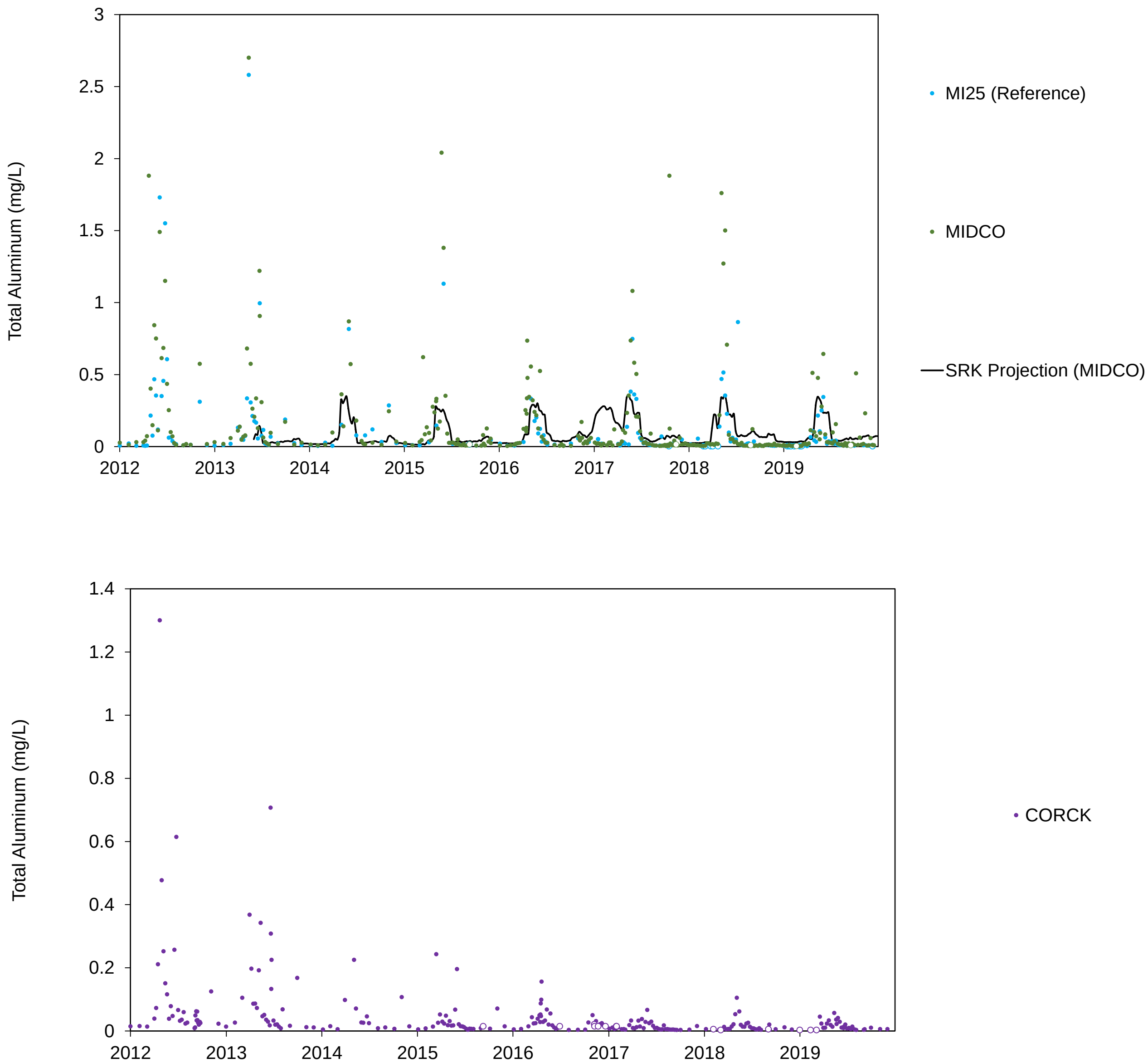
Figure 1.1-31: Spatial Variation in Aqueous pH in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



Note: Open symbols represent non-detects.
mg/L = milligrams per litre; WQG = water quality guideline

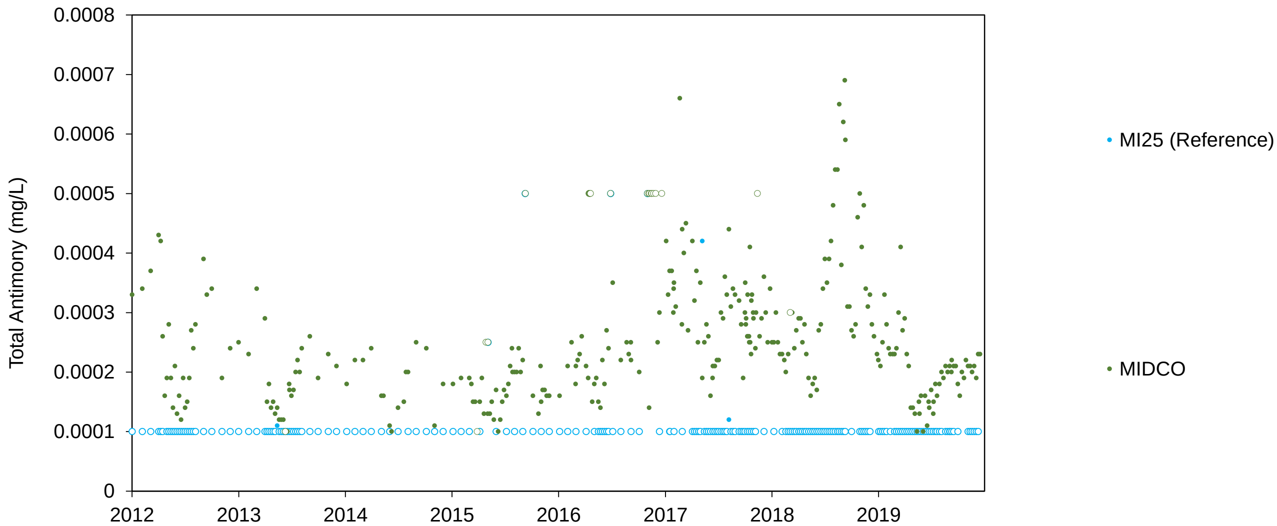
1.2 Temporal Trends

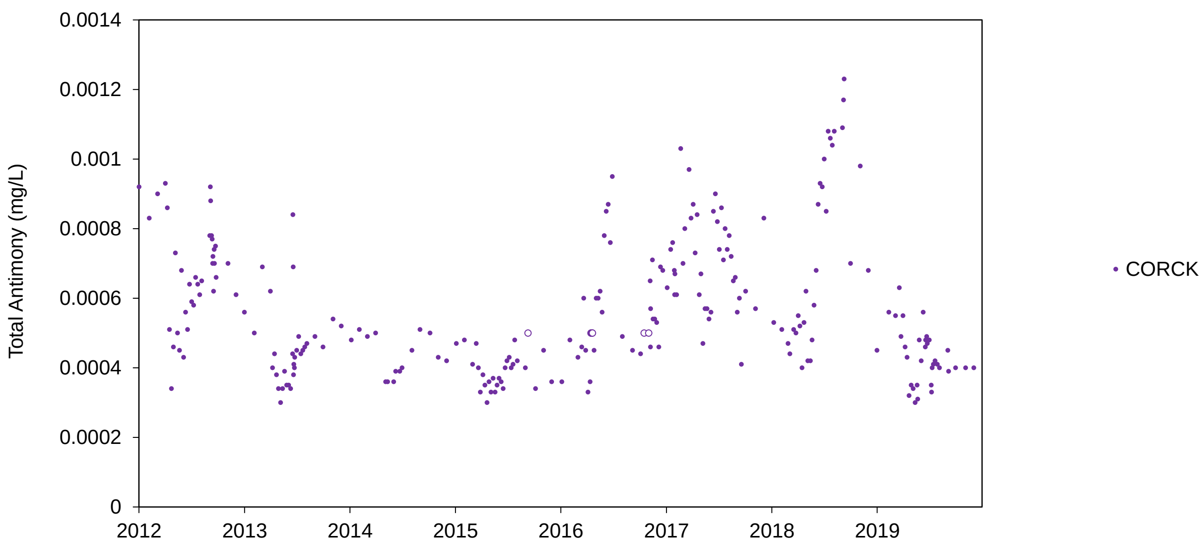
Figure 1.2-1: Temporal Variation in Aqueous Aluminum Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



Note: Open symbols represent non-detects. SRK modelled projections for dissolved aluminum and are included for comparison (SRK 2019). Two points not shown in the bottom panel (6.3 and 15.2 mg/L in June 2013).
mg/L = milligrams per litre; WQG = water quality guideline

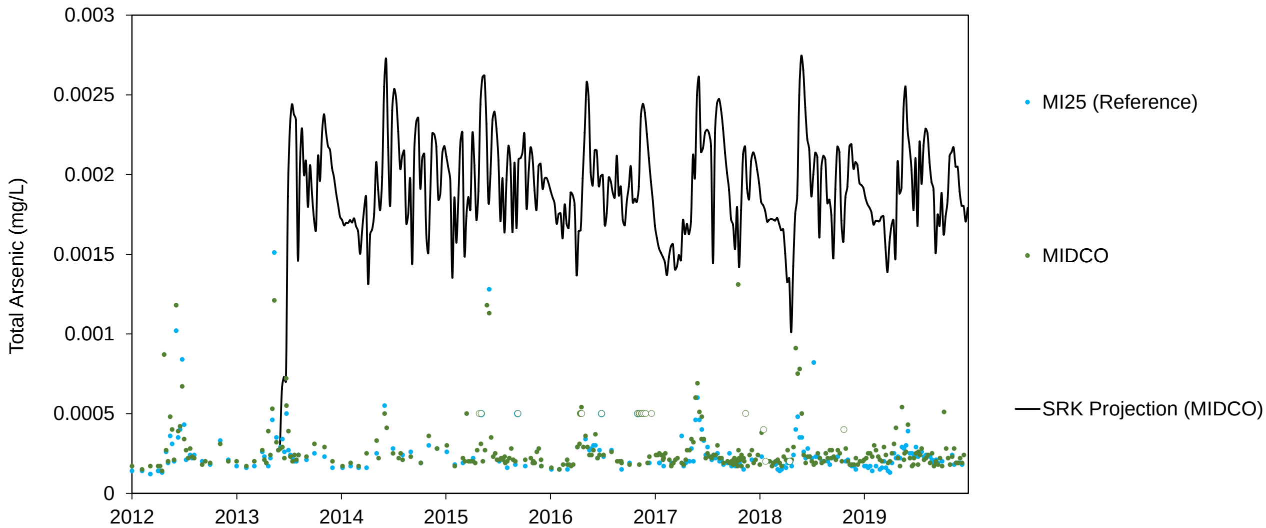
Figure 1.2-2: Temporal Variation in Aqueous Antimony Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

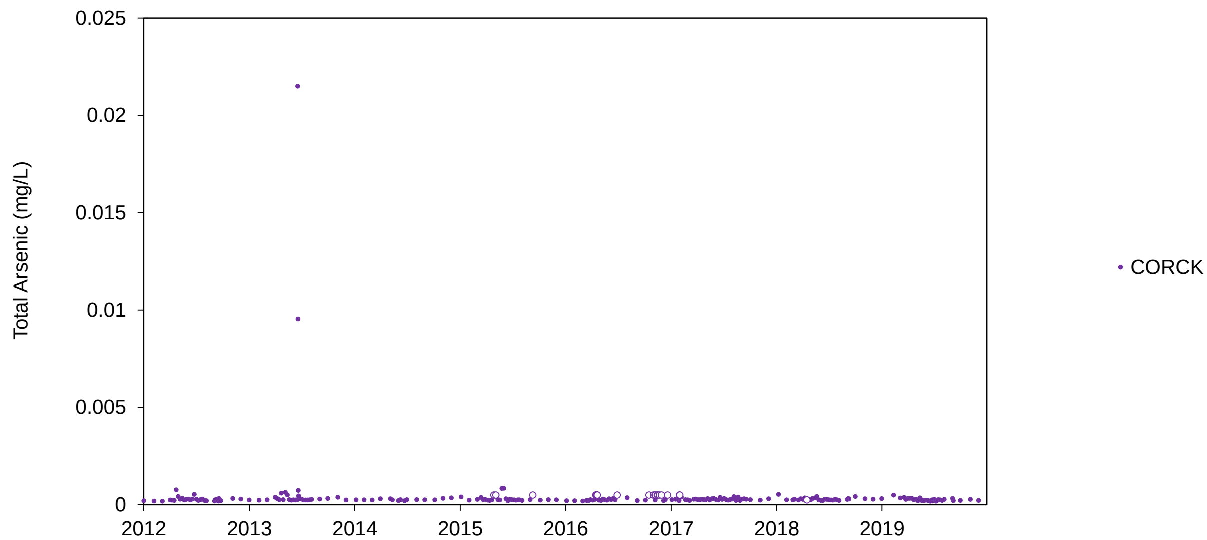




Note: Open symbols represent non-detects. For comparison, SRK modelled projections for dissolved antimony at MIDCO ranged from 0.14 – 25 mg/L (SRK 2019). Long-term BC WQG not shown (0.009 mg/L).
mg/L = milligrams per litre.

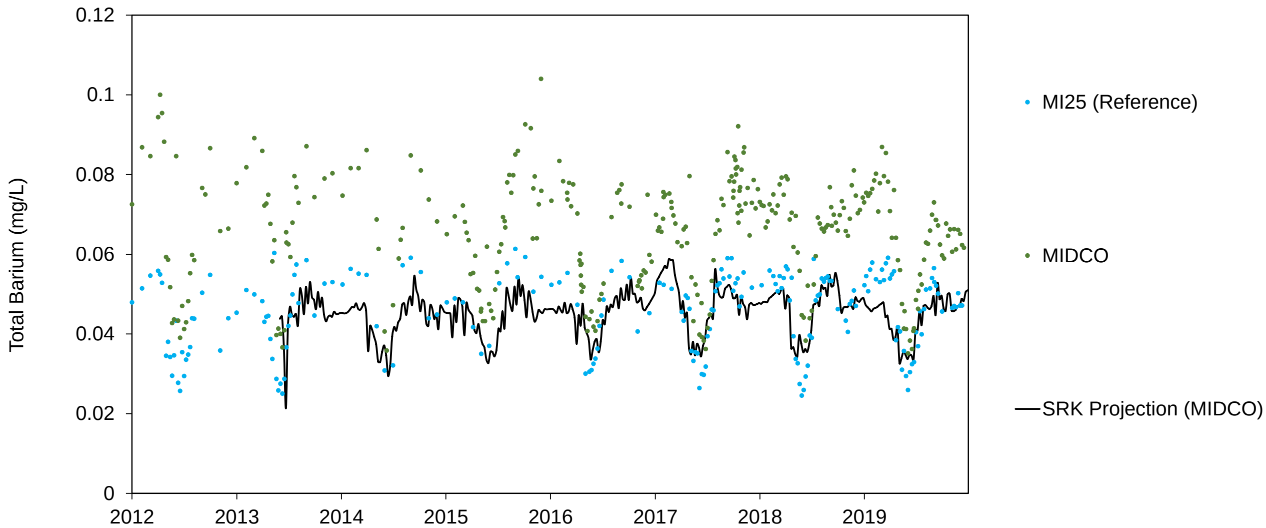
Figure 1.2-3: Temporal Variation in Aqueous Arsenic Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

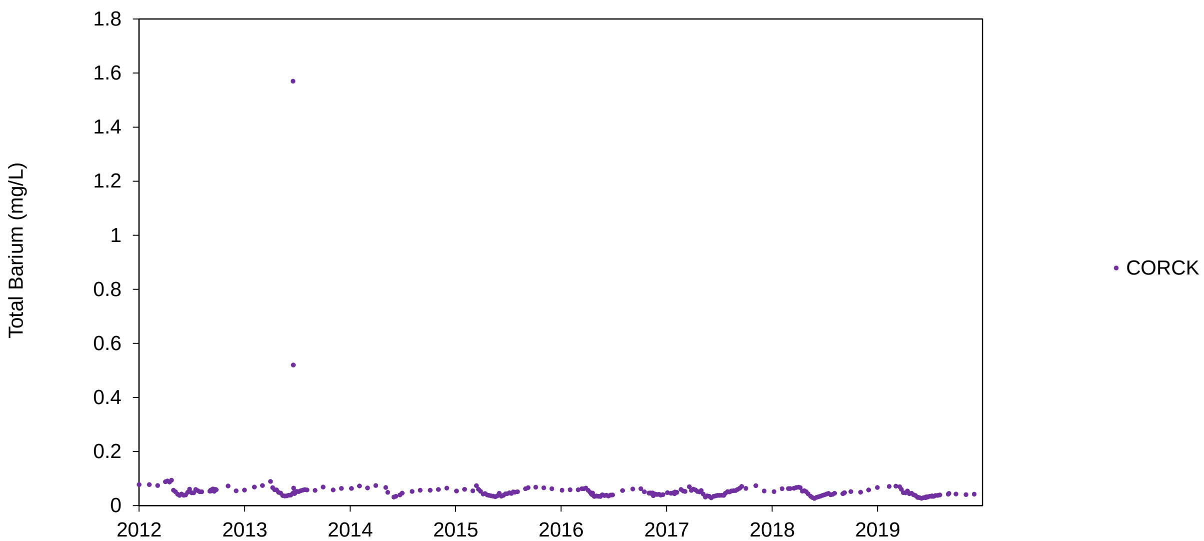




Note: Open symbols represent non-detects. SRK modelled projections for dissolved arsenic and are included for comparison (SRK 2019). mg/L = milligrams per litre; WQG = water quality guideline.

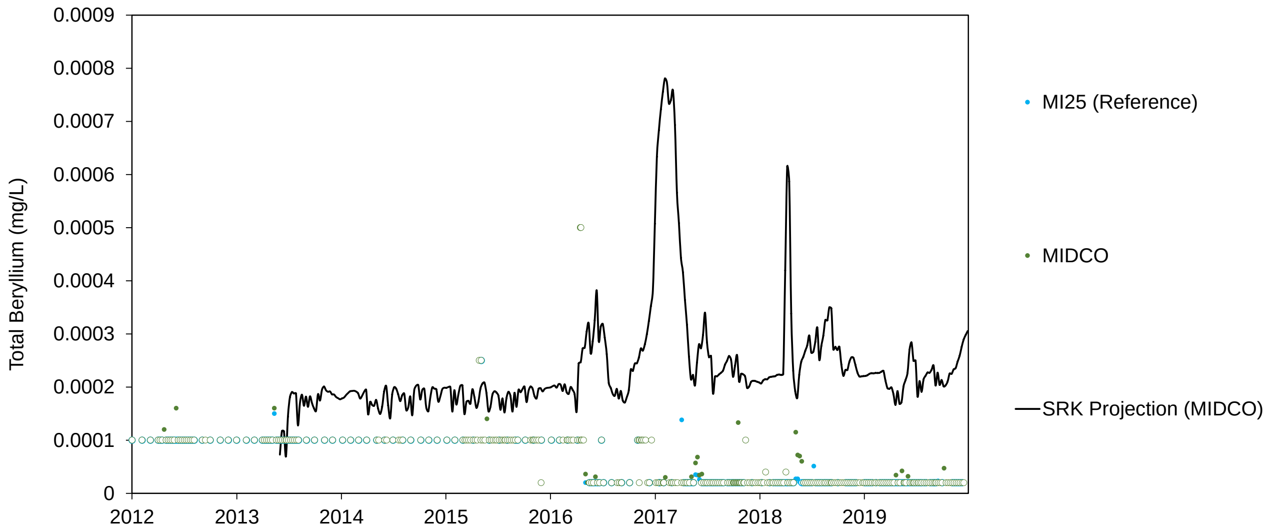
Figure 1.2-4: Temporal Variation in Aqueous Barium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

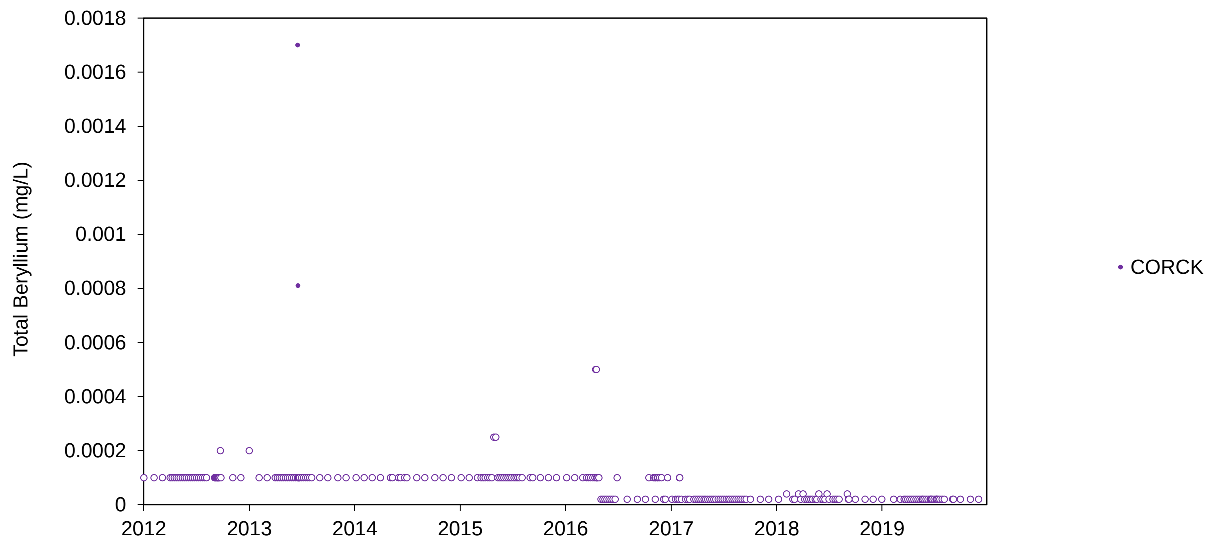




Note: Open symbols represent non-detects. SRK modelled projections for dissolved barium and are included for comparison (SRK 2019).
mg/L = milligrams per litre; WQG = water quality guideline.

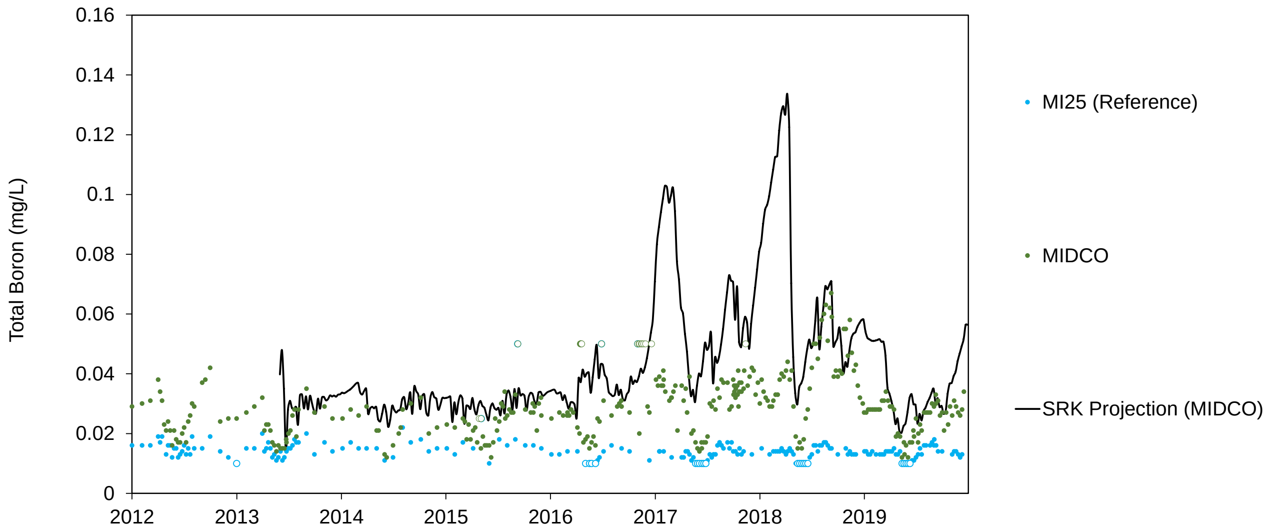
Figure 1.2-5: Temporal Variation in Aqueous Beryllium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

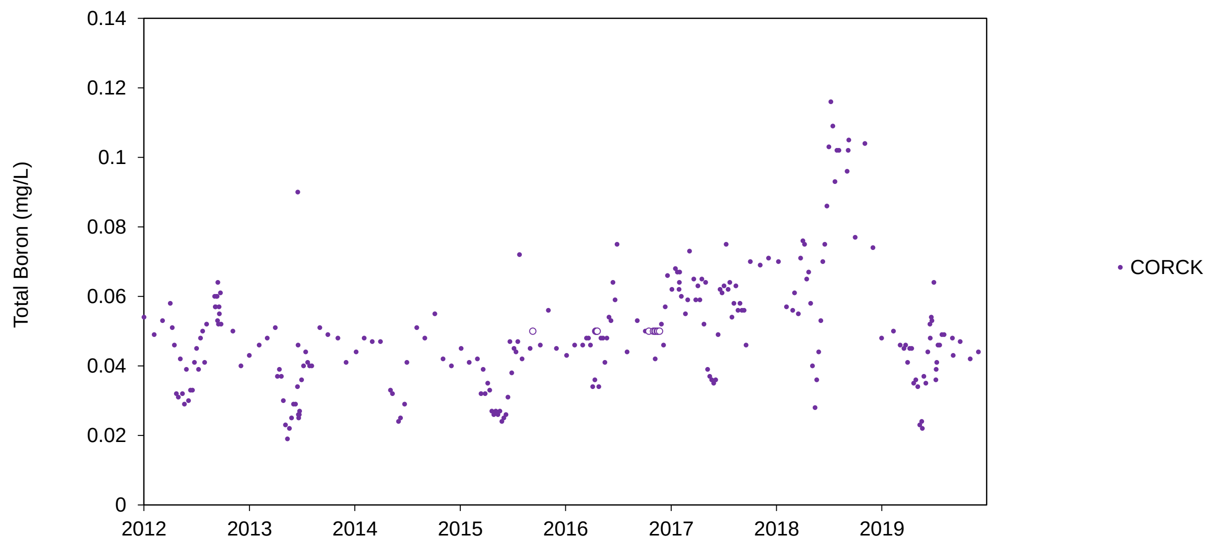




Note: Open symbols represent non-detects. SRK modelled projections for dissolved beryllium and are included for comparison (SRK 2019). mg/L = milligrams per litre; WQG = water quality guideline.

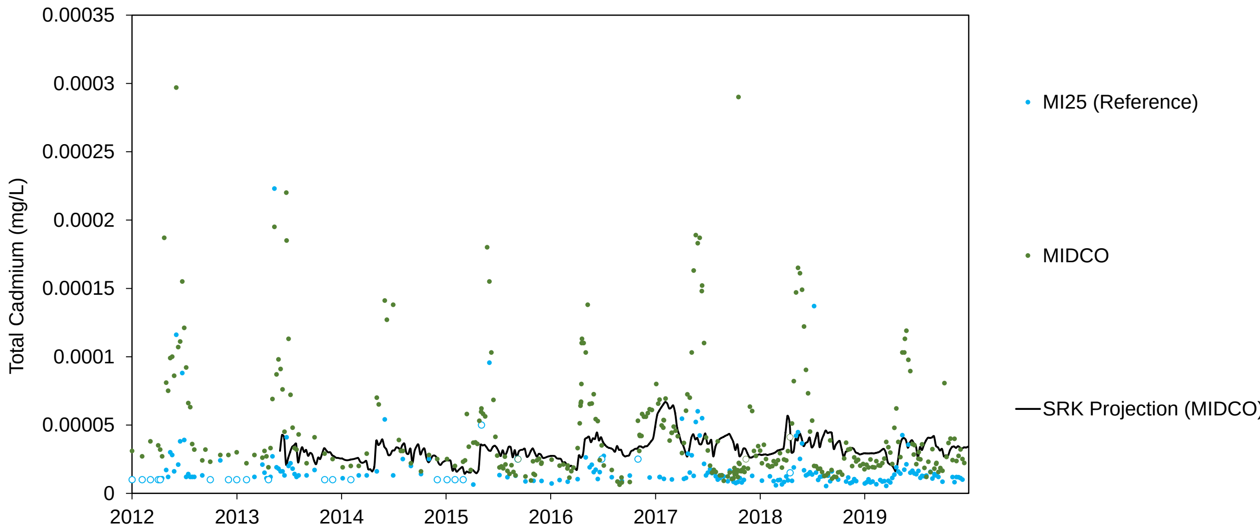
Figure 1.2-6: Temporal Variation in Aqueous Boron Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

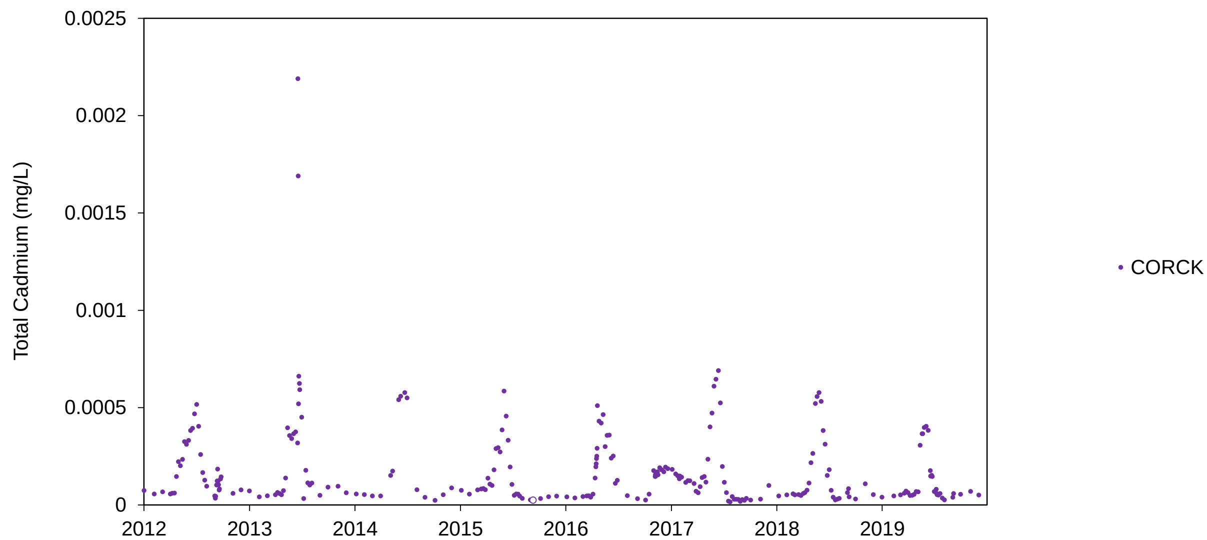




Note: Open symbols represent non-detects. SRK modelled projections for dissolved boron and are included for comparison (SRK 2019).
mg/L = milligrams per litre; WQG = water quality guideline.

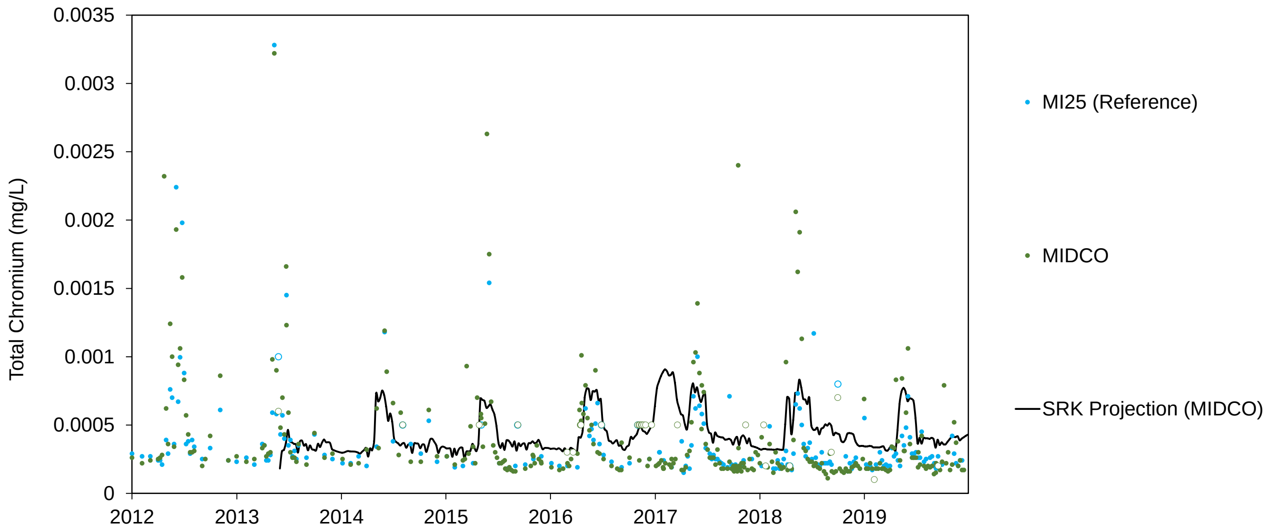
Figure 1.2-7: Temporal Variation in Aqueous Cadmium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

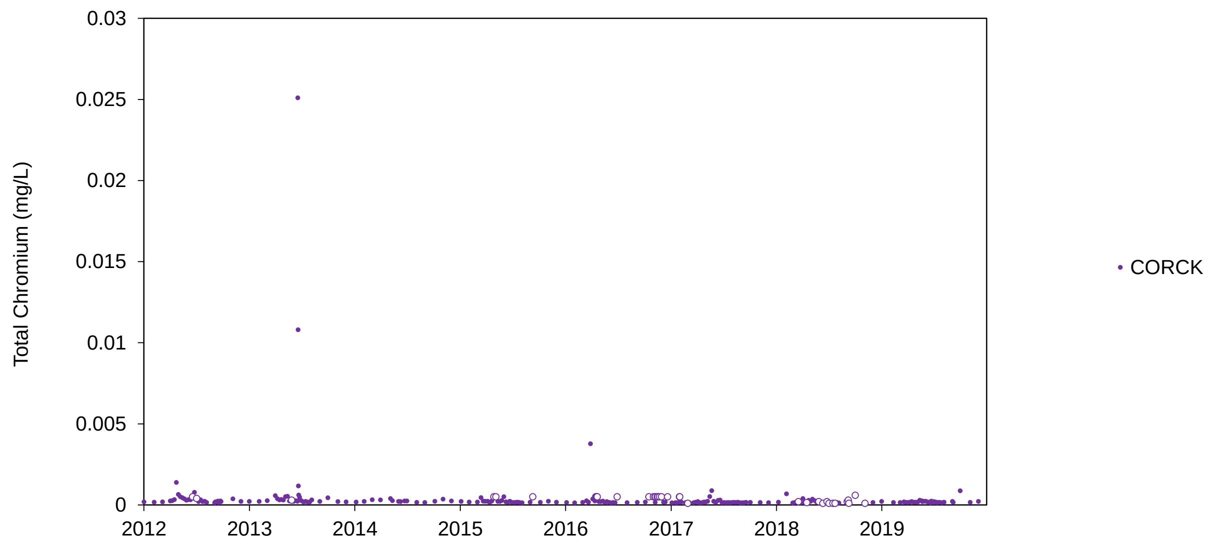




Note: Open symbols represent non-detects. SRK modelled projections for dissolved cadmium and are included for comparison (SRK 2019). mg/L = milligrams per litre; WQG = water quality guideline.

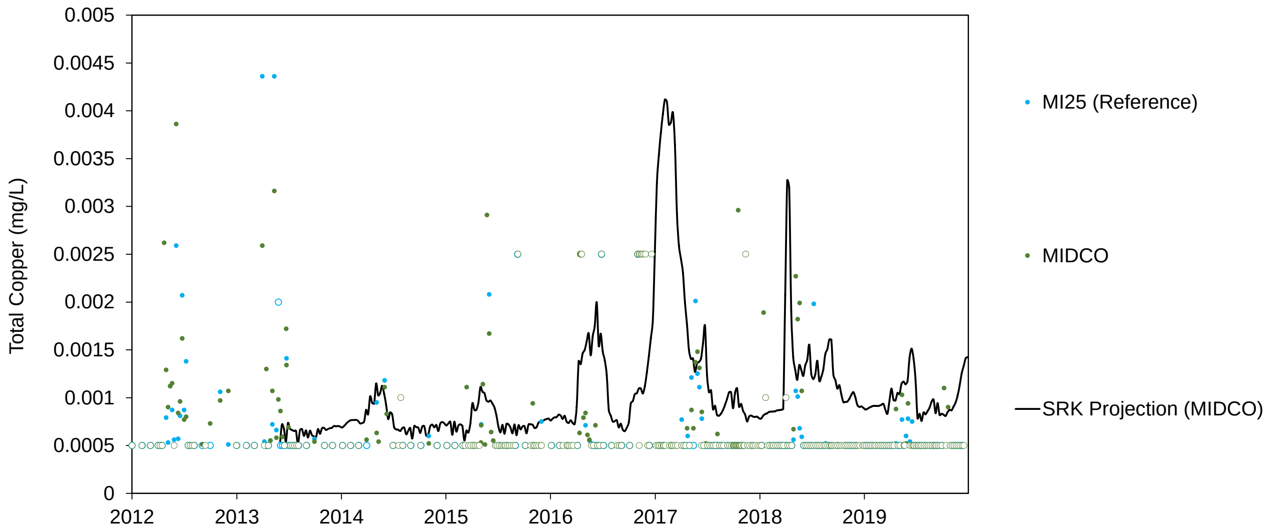
Figure 1.2-8: Temporal Variation in Aqueous Chromium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

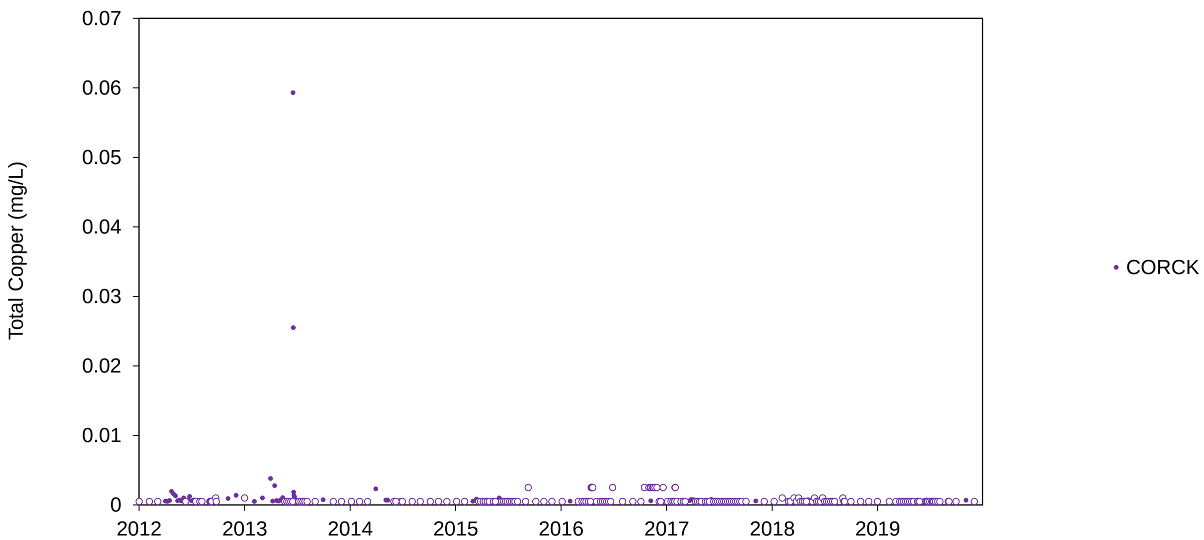




Note: Open symbols represent non-detects. SRK modelled projections for dissolved chromium and are included for comparison (SRK 2019).
mg/L = milligrams per litre; WQG = water quality guideline.

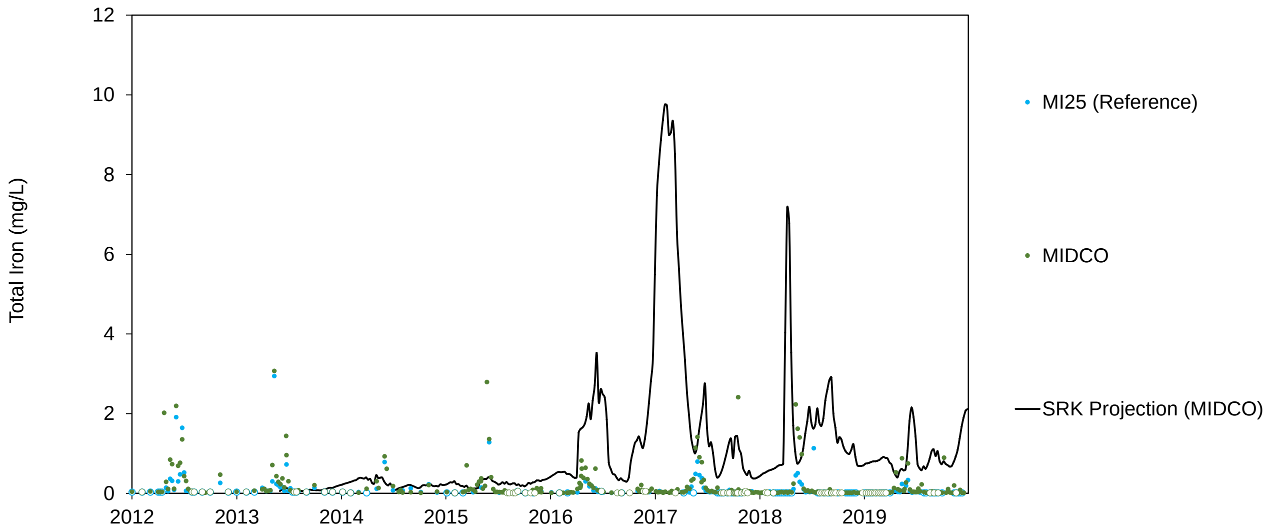
Figure 1.2-9: Temporal Variation in Aqueous Copper Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

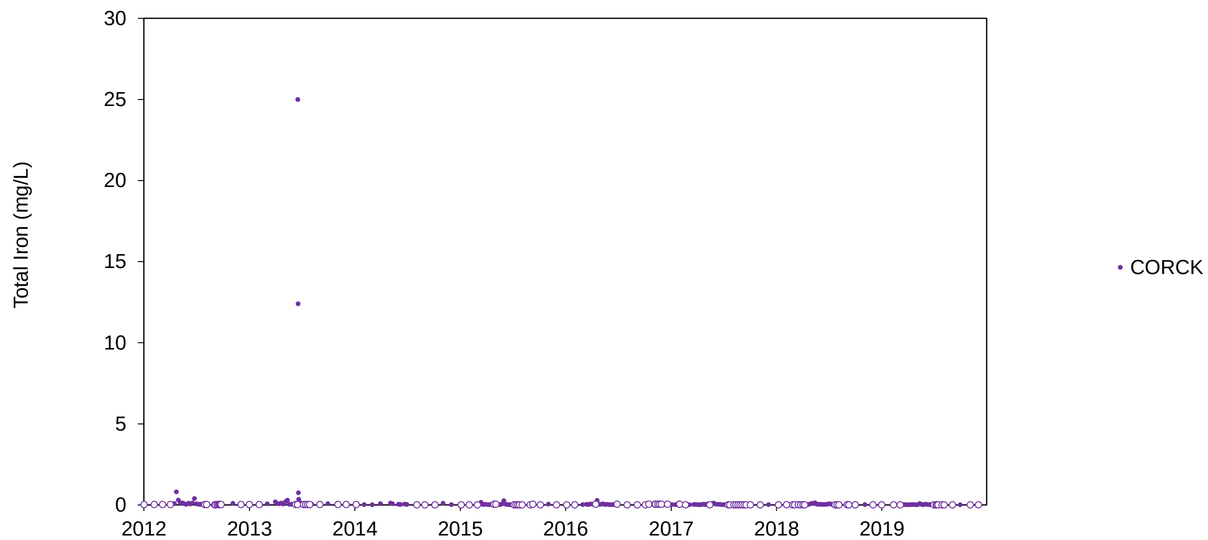




Note: Open symbols represent non-detects. SRK modelled projections for dissolved copper and are included for comparison (SRK 2019). mg/L = milligrams per litre; WQG = water quality guideline.

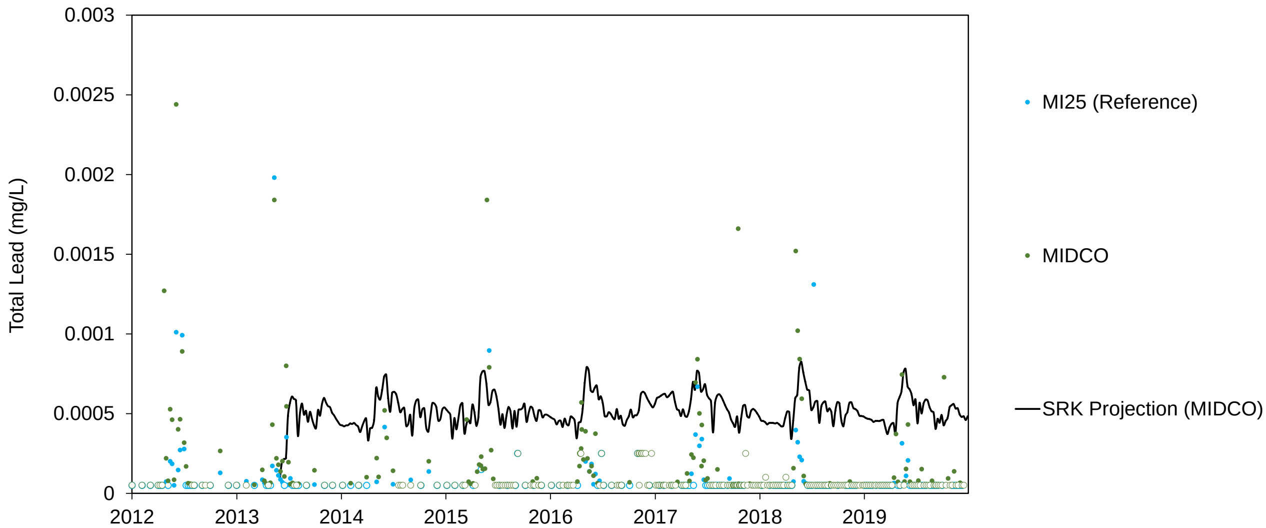
Figure 1.2-10: Temporal Variation in Aqueous Iron Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

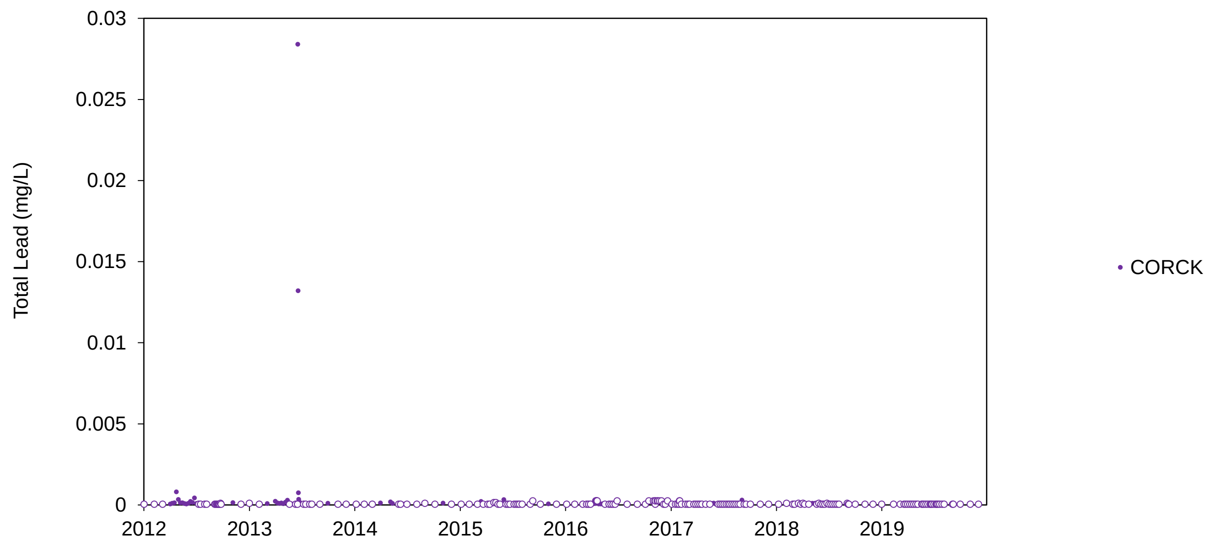




Note: Open symbols represent non-detects. SRK modelled projections for dissolved iron and are included for comparison (SRK 2019).
mg/L = milligrams per litre; WQG = water quality guideline.

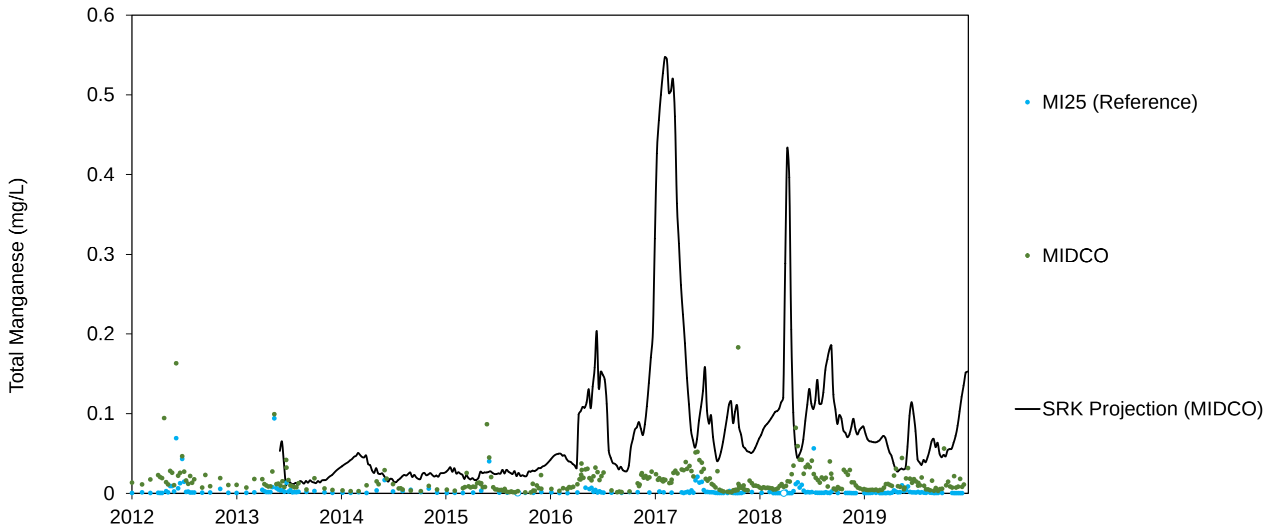
Figure 1.2-11: Temporal Variation in Aqueous Lead Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

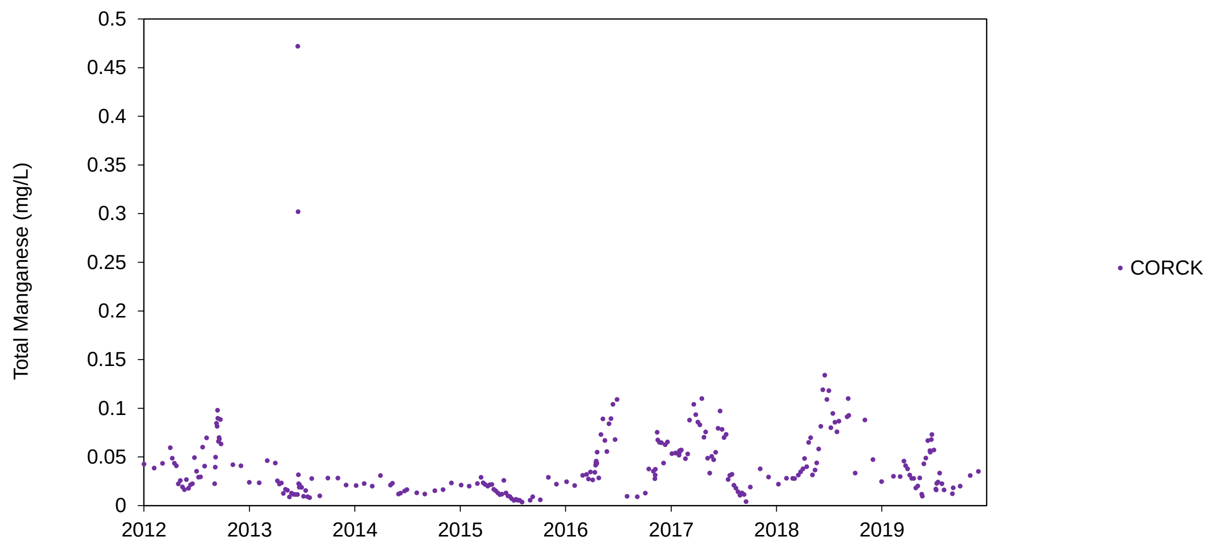




Note: Open symbols represent non-detects. SRK modelled projections for dissolved lead and are included for comparison (SRK 2019).
mg/L = milligrams per litre; WQG = water quality guideline.

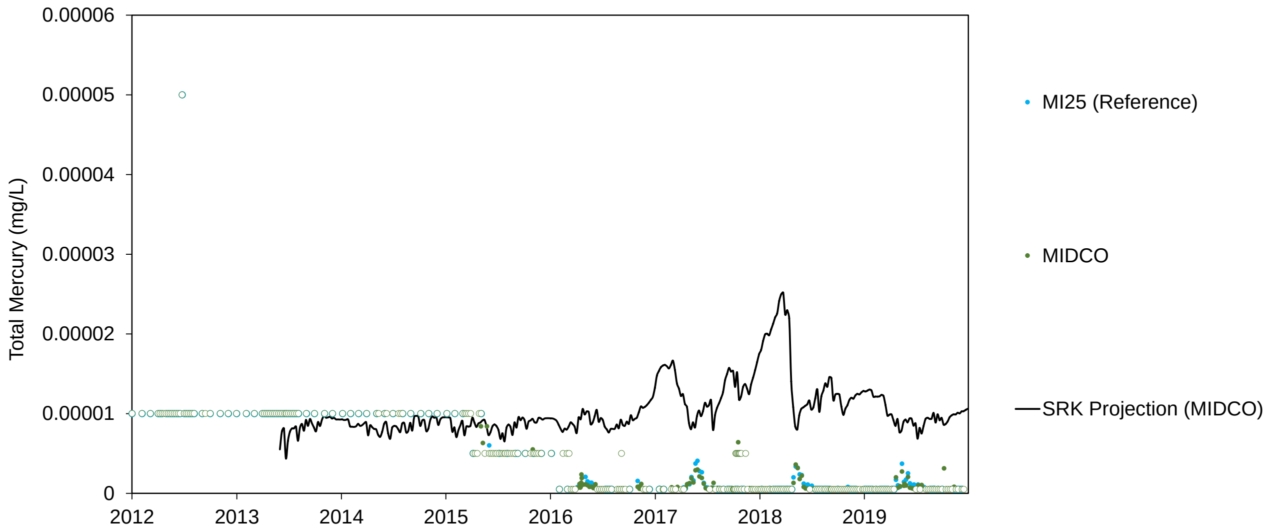
Figure 1.2-12: Temporal Variation in Aqueous Manganese Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

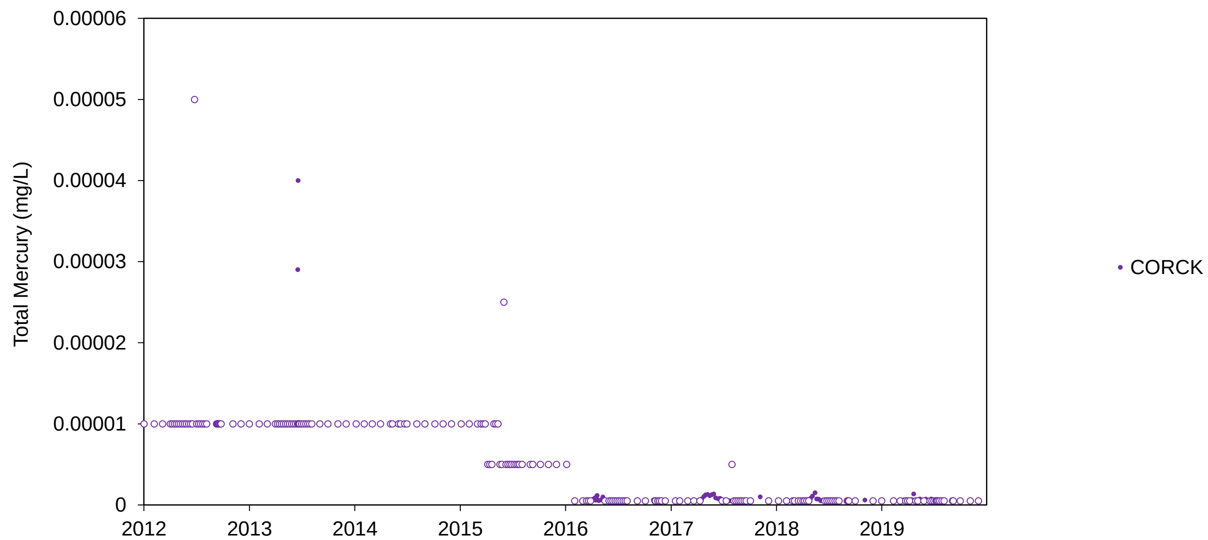




Note: Open symbols represent non-detects. SRK modelled projections for dissolved manganese and are included for comparison (SRK 2019). mg/L = milligrams per litre; WQG = water quality guideline.

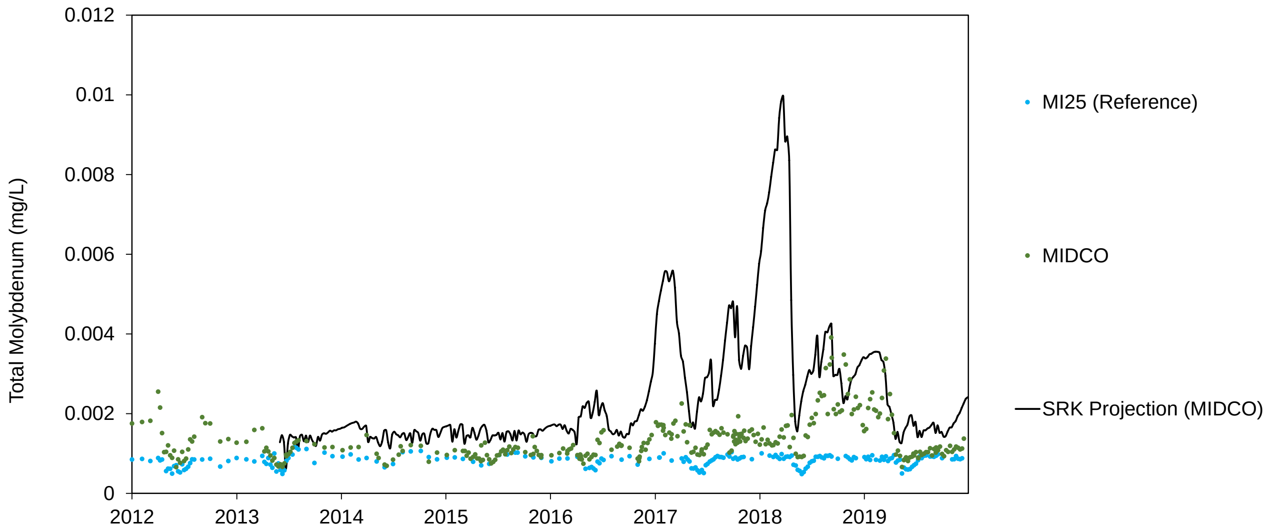
Figure 1.2-13: Temporal Variation in Aqueous Mercury Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

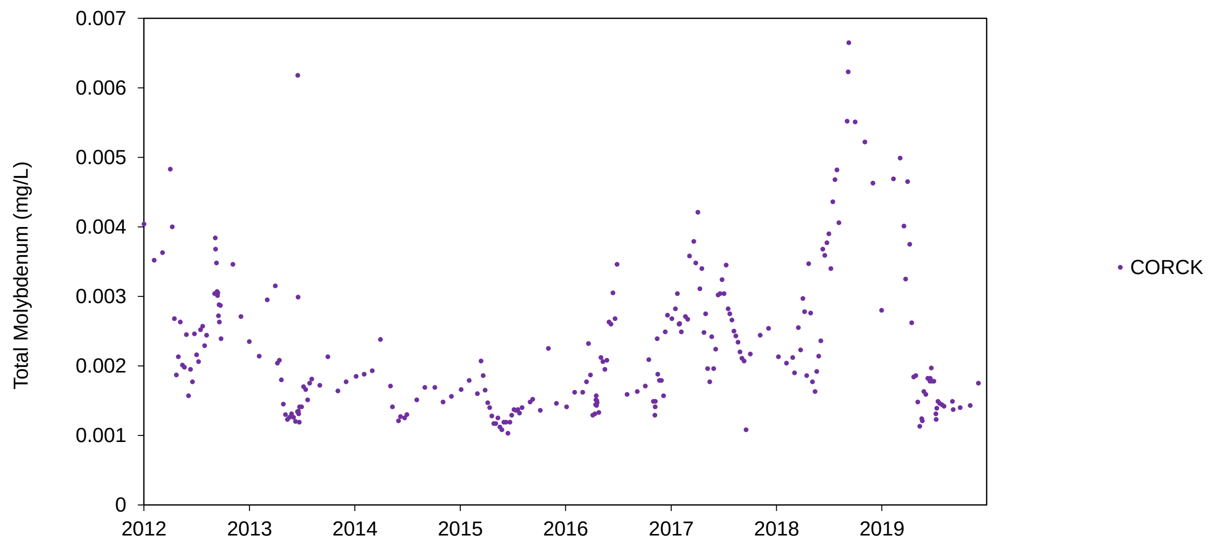




Note: Open symbols represent non-detects. SRK modelled projections for dissolved mercury and are included for comparison (SRK 2019).
mg/L = milligrams per litre; WQG = water quality guideline.

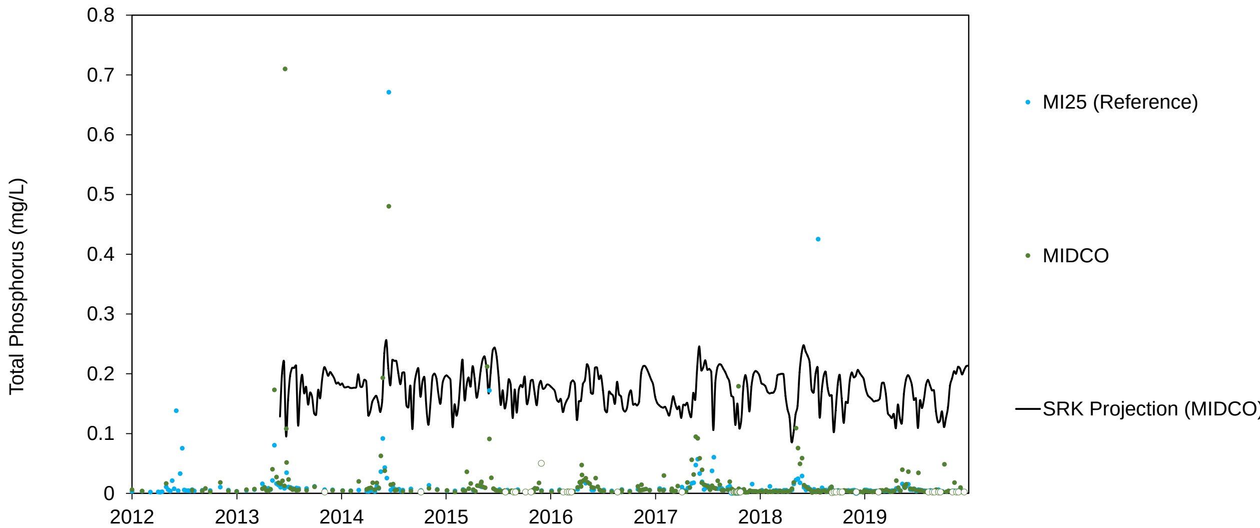
Figure 1.2-14: Temporal Variation in Aqueous Molybdenum Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

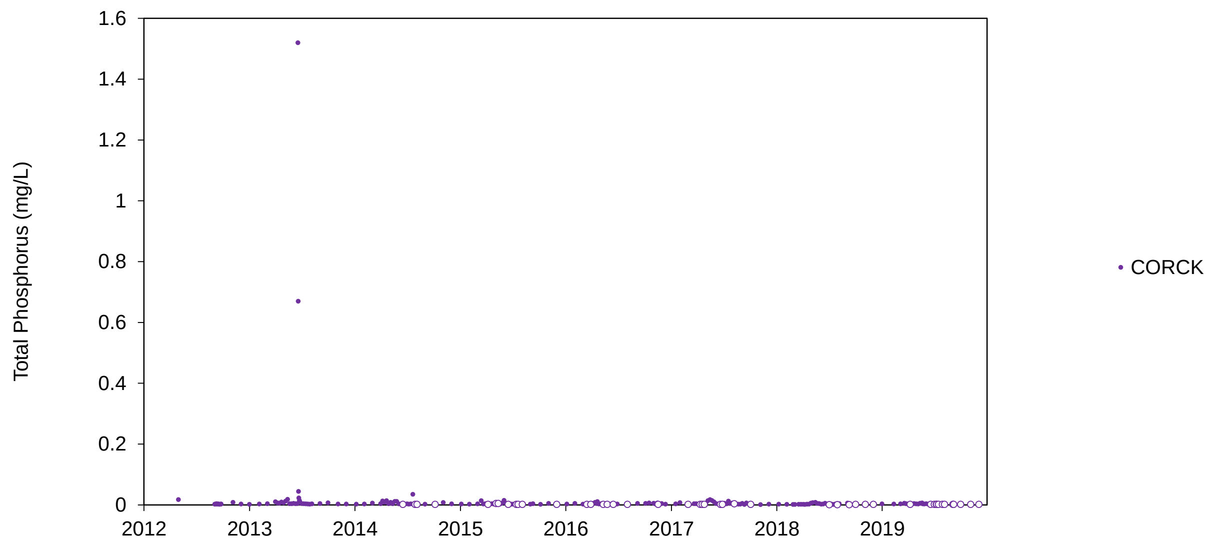




Note: Open symbols represent non-detects. SRK modelled projections for dissolved molybdenum mercury and are included for comparison (SRK 2019).
mg/L = milligrams per litre; WQG = water quality guideline.

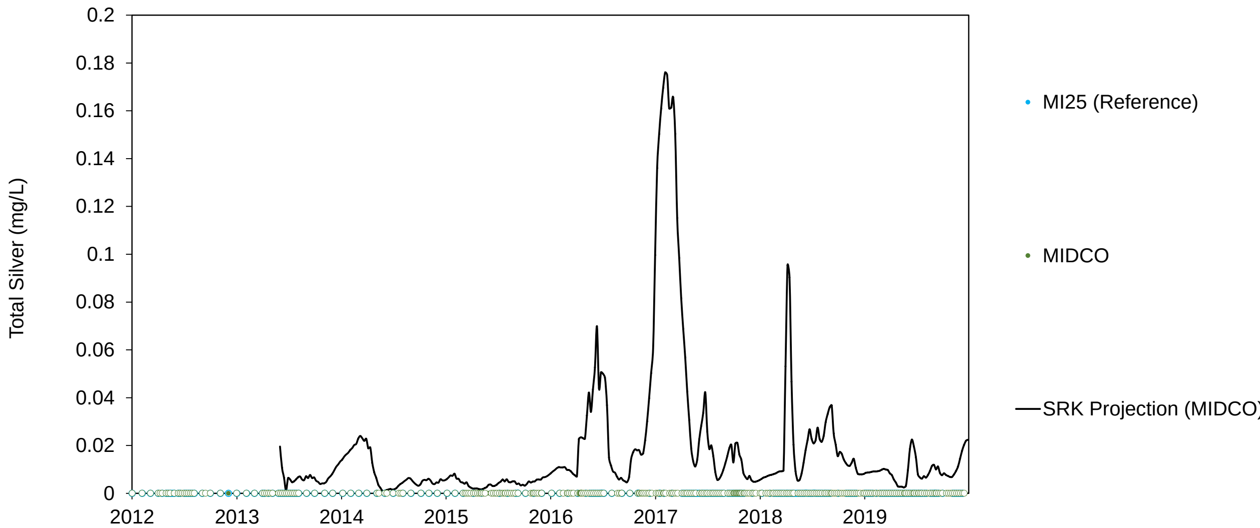
Figure 1.2-15: Temporal Variation in Aqueous Phosphorus Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

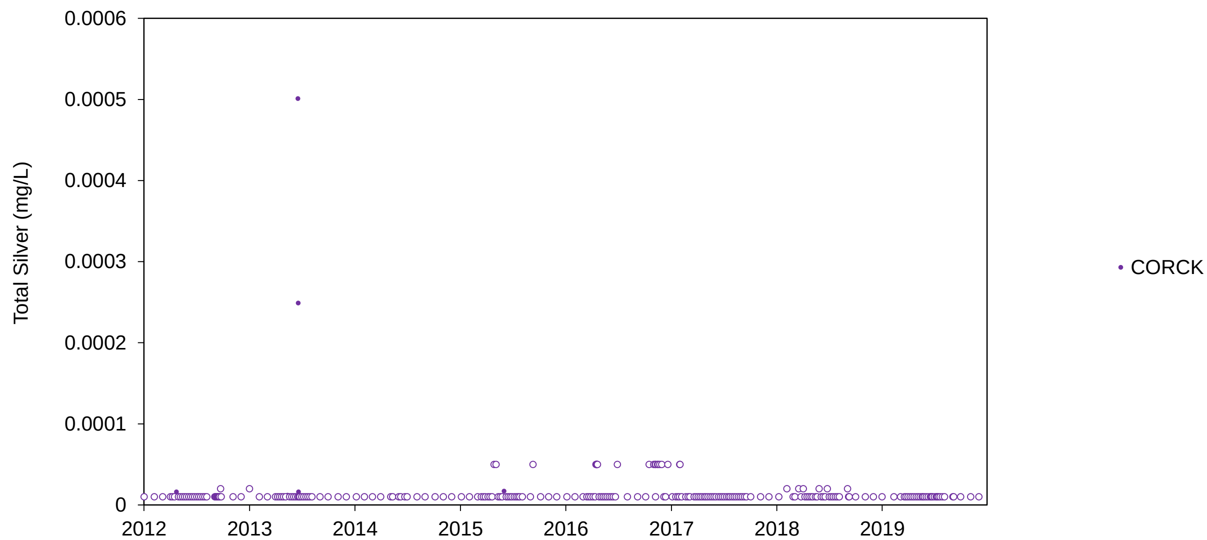




Note: Open symbols represent non-detects. SRK modelled projections for dissolved phosphorus mercury and are included for comparison (SRK 2019).
mg/L = milligrams per litre; WQG = water quality guideline.

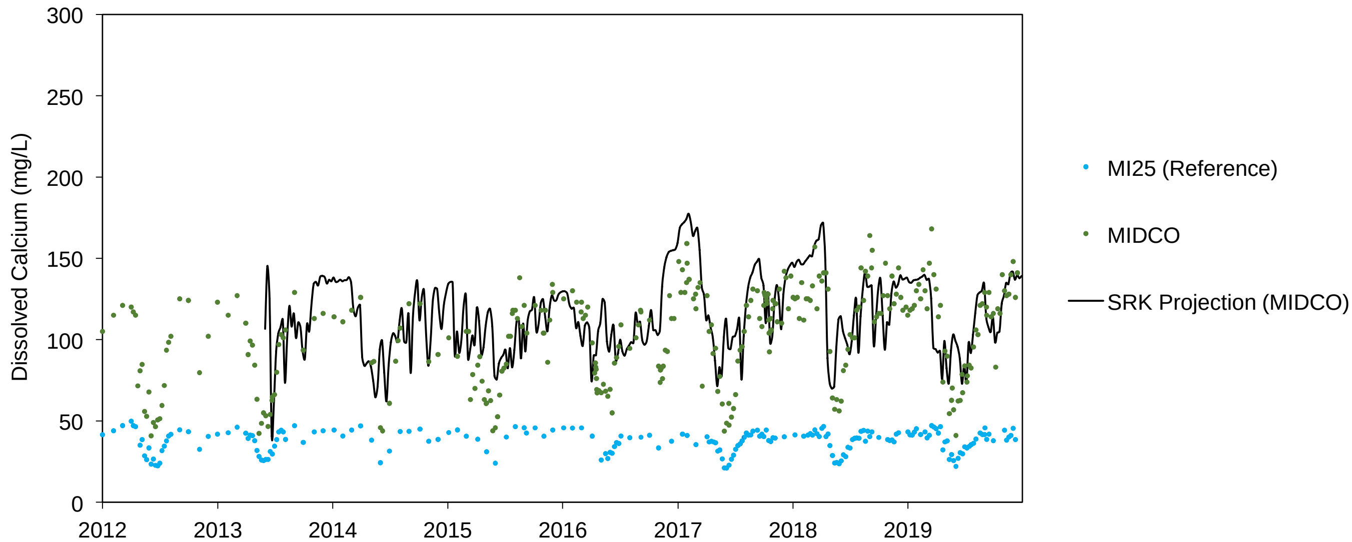
Figure 1.2-16: Temporal Variation in Aqueous Silver Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

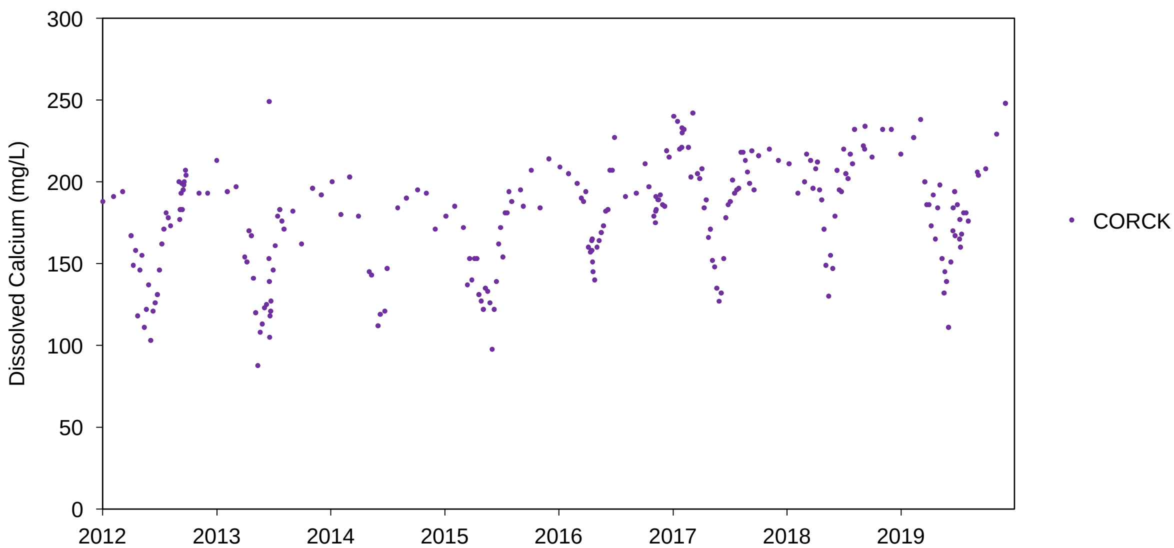




Note: Open symbols represent non-detects. SRK modelled projections for dissolved silver mercury and are included for comparison (SRK 2019).
mg/L = milligrams per litre.

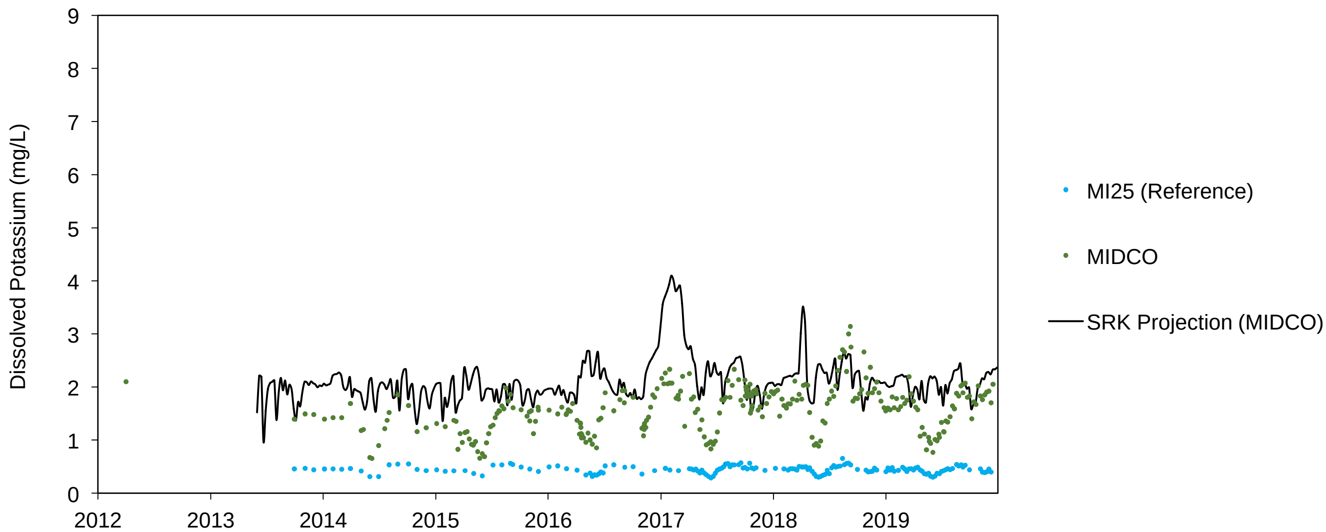
Figure 1.2-17: Temporal Variation in Aqueous Calcium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

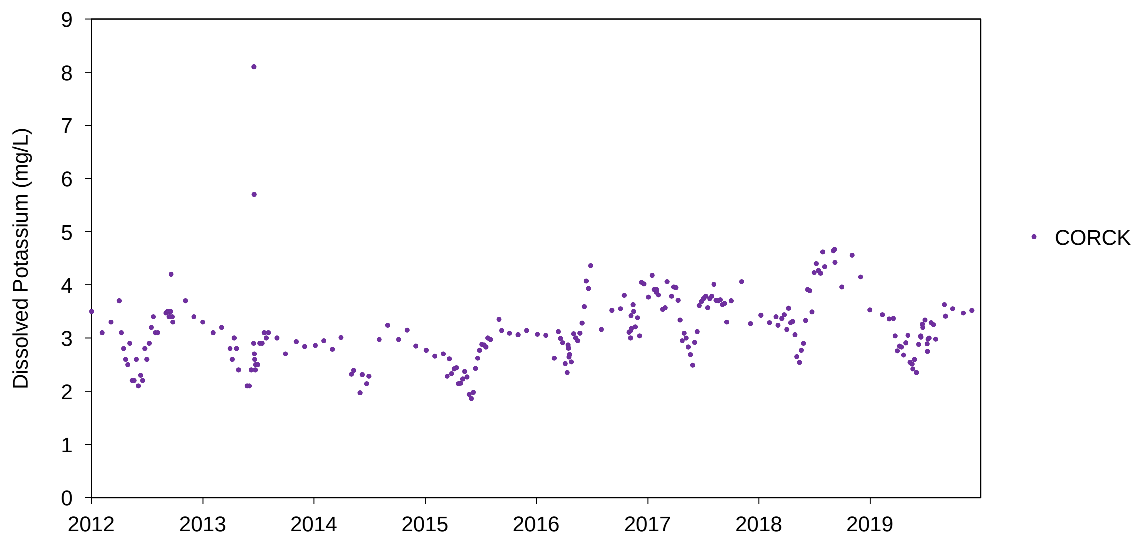




Note: Open symbols represent non-detects. SRK modelled projections for dissolved silver mercury and are included for comparison (SRK 2019).
mg/L = milligrams per litre

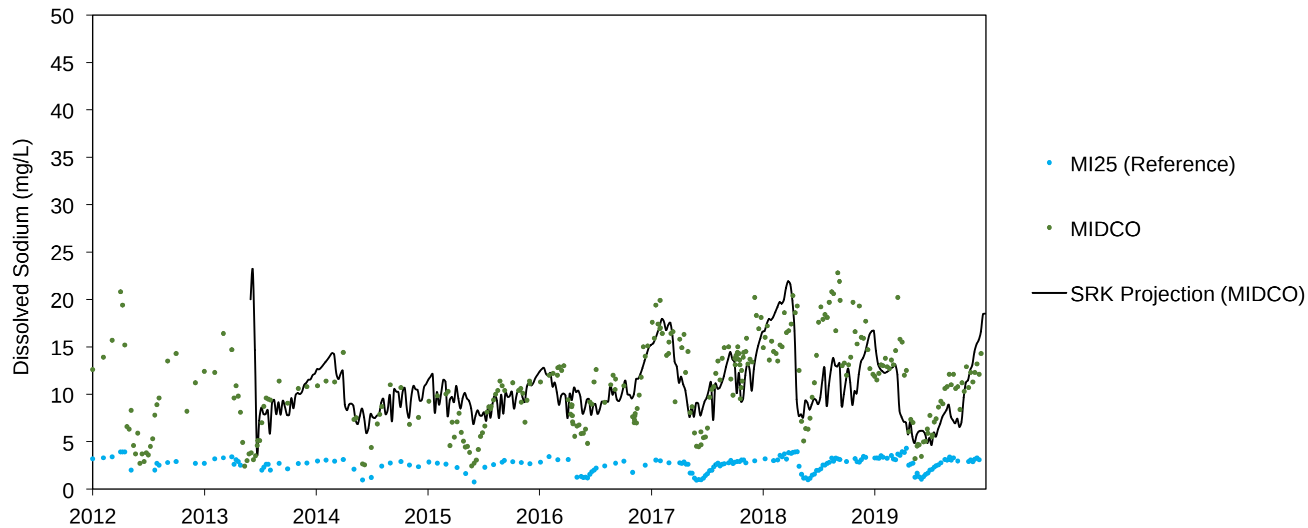
Figure 1.2-18: **Temporal Variation in Aqueous Potassium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**

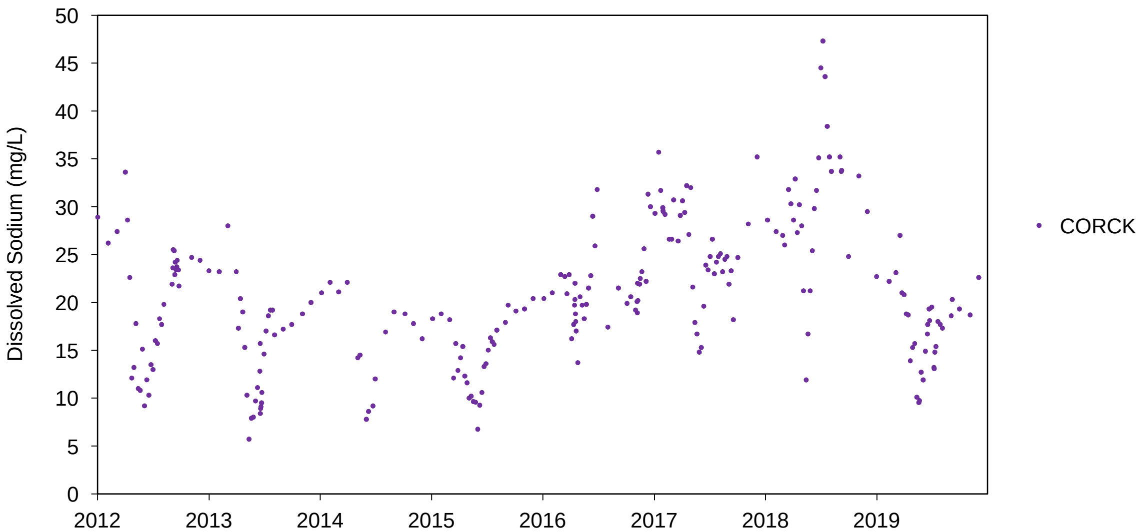




Note: Open symbols represent non-detects. SRK modelled projections for dissolved silver mercury and are included for comparison (SRK 2019).
mg/L = milligrams per litre

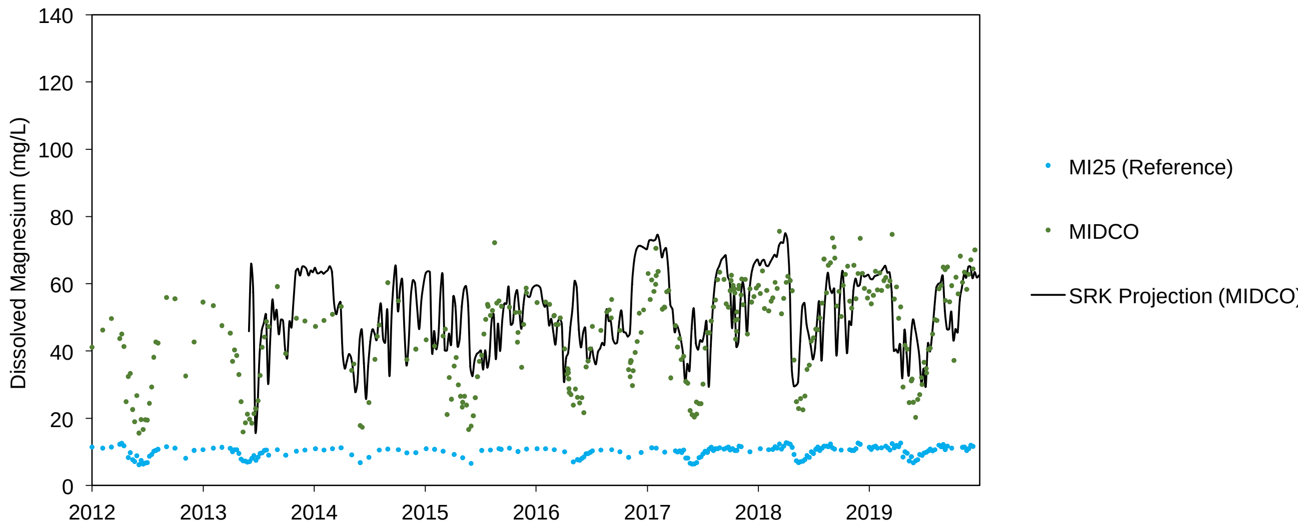
Figure 1.2-19: Temporal Variation in Aqueous Sodium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

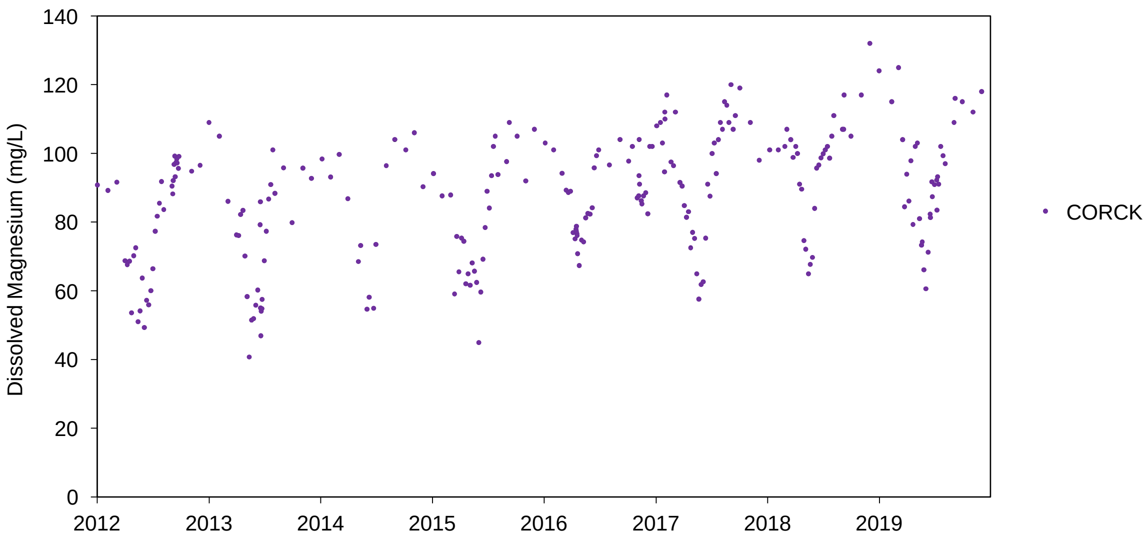




Note: Open symbols represent non-detects. SRK modelled projections for dissolved silver mercury and are included for comparison (SRK 2019).
mg/L = milligrams per litre.

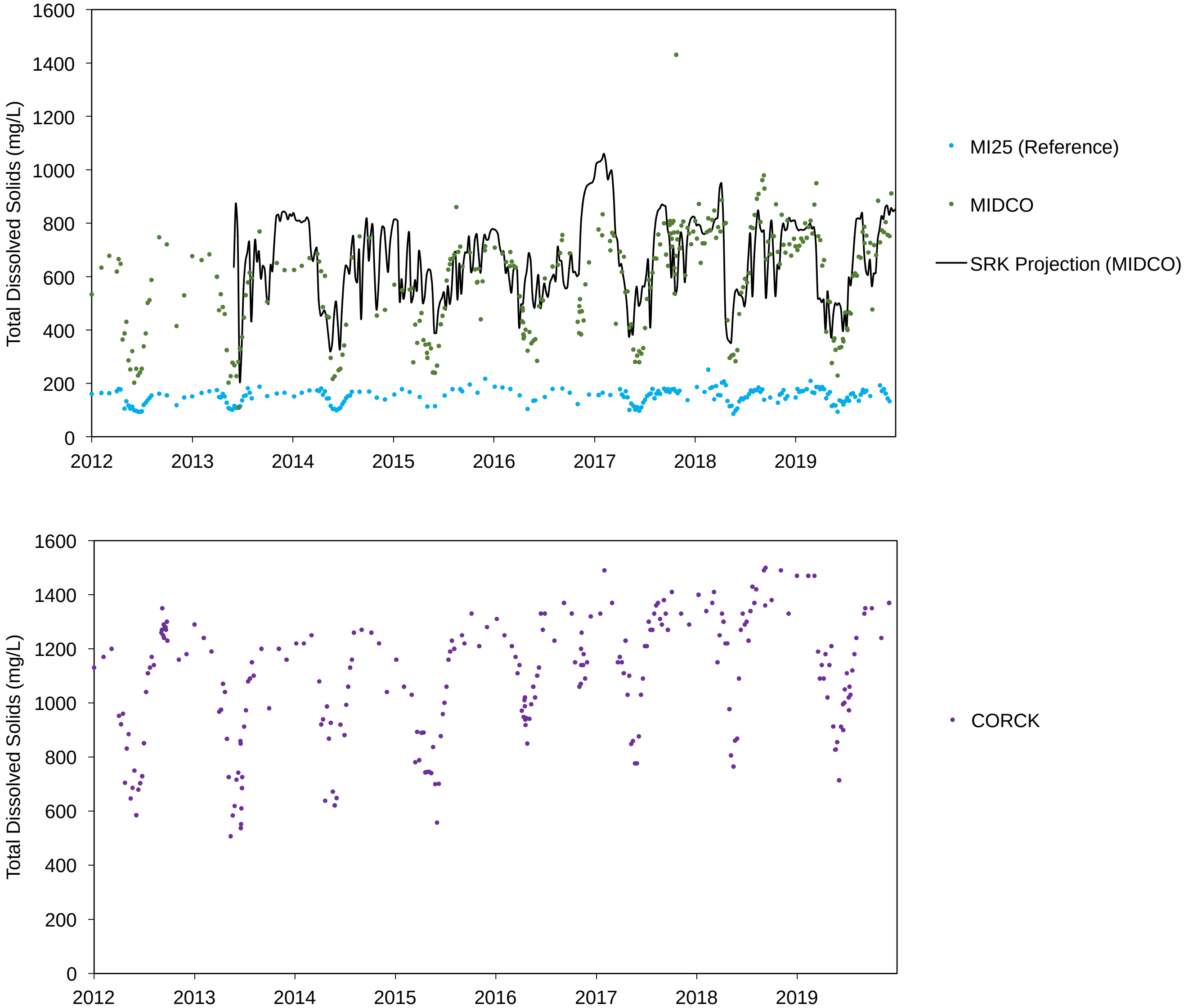
Figure 1.2-20: Temporal Variation in Aqueous Magnesium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019





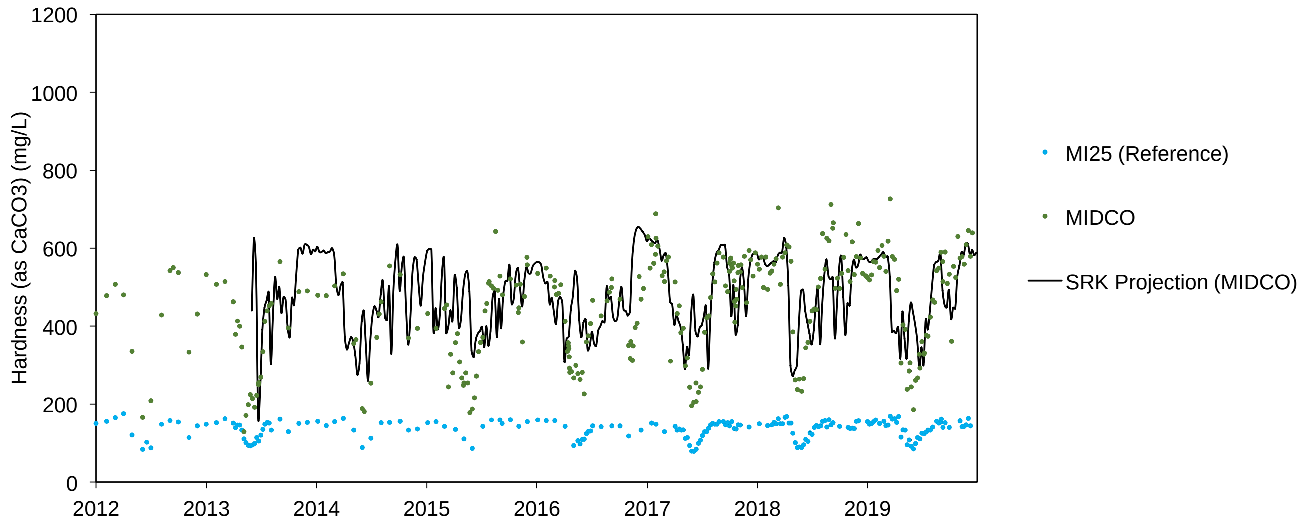
Note: Open symbols represent non-detects. SRK modelled projections for dissolved silver mercury and are included for comparison (SRK 2019).
mg/L = milligrams per litre.

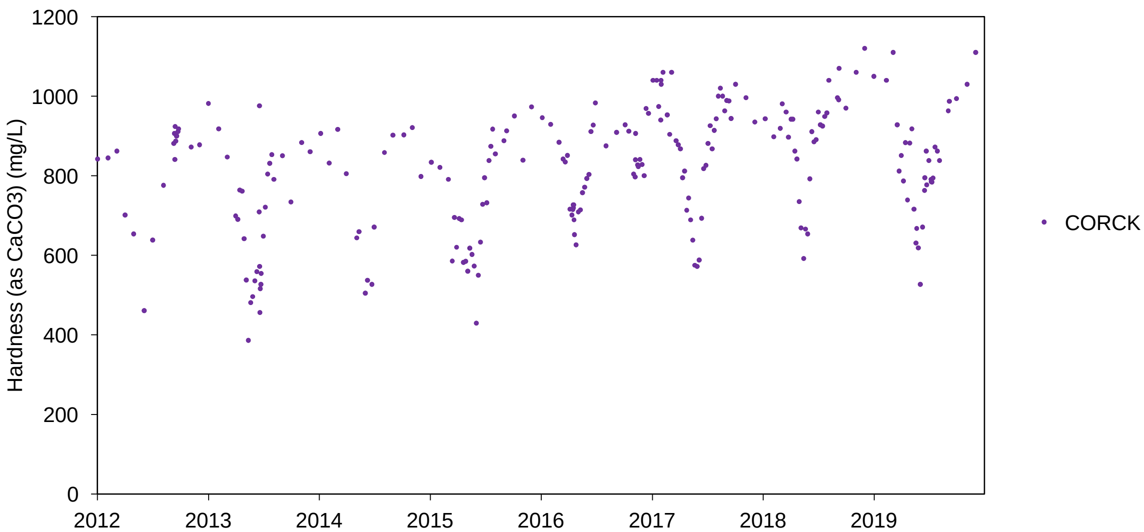
Figure 1.2-21: Temporal Variation in Total Dissolved Solids Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



mg/L = milligrams per litre.

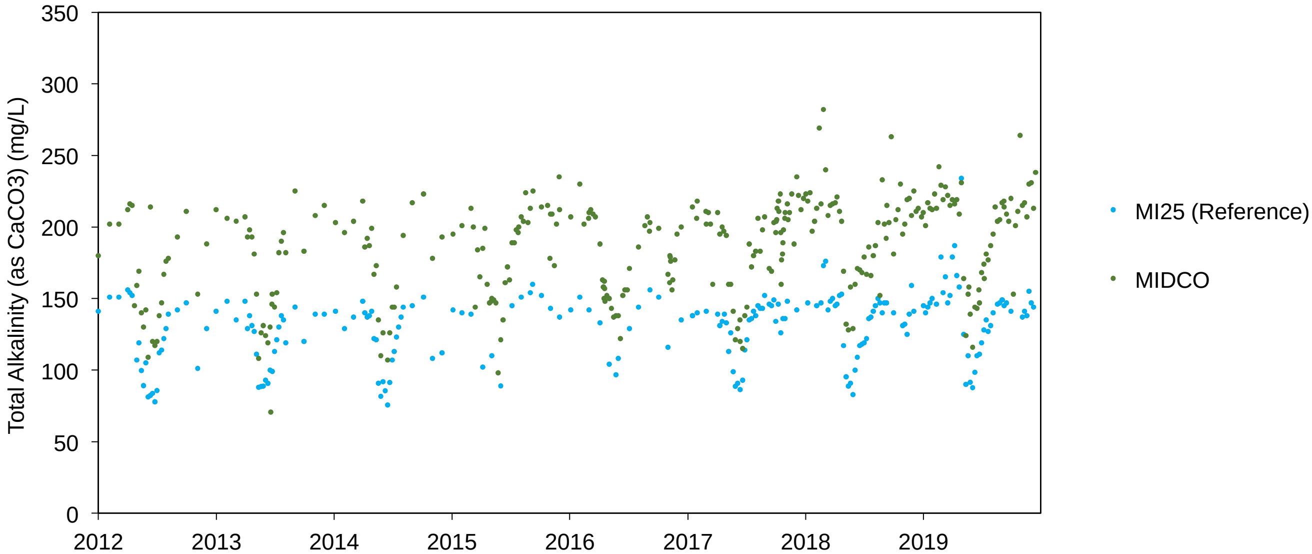
Figure 1.2-22: Temporal Variation in Hardness in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

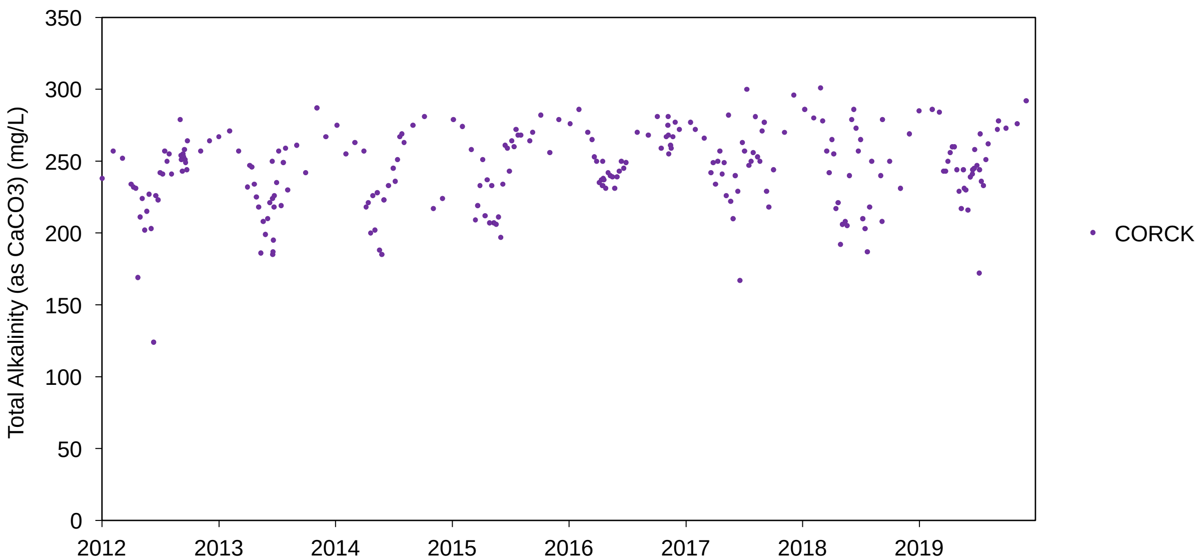




mg/L = milligrams per litre.

Figure 1.2-23: Temporal Variation in Alkalinity in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019

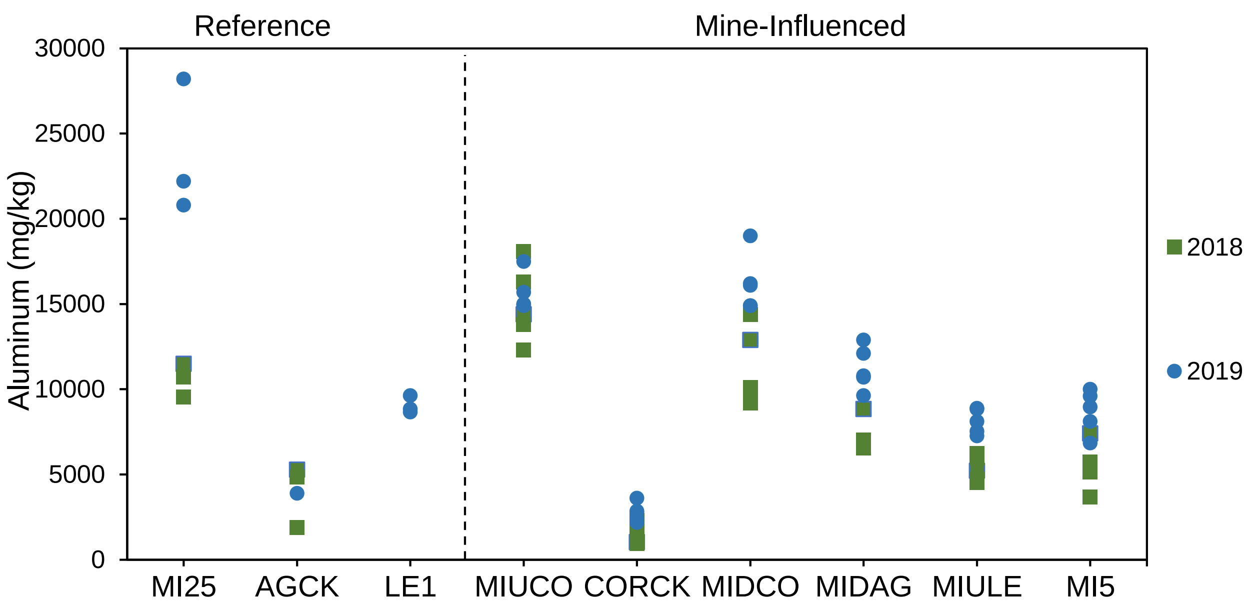




mg/L = milligrams per litre.

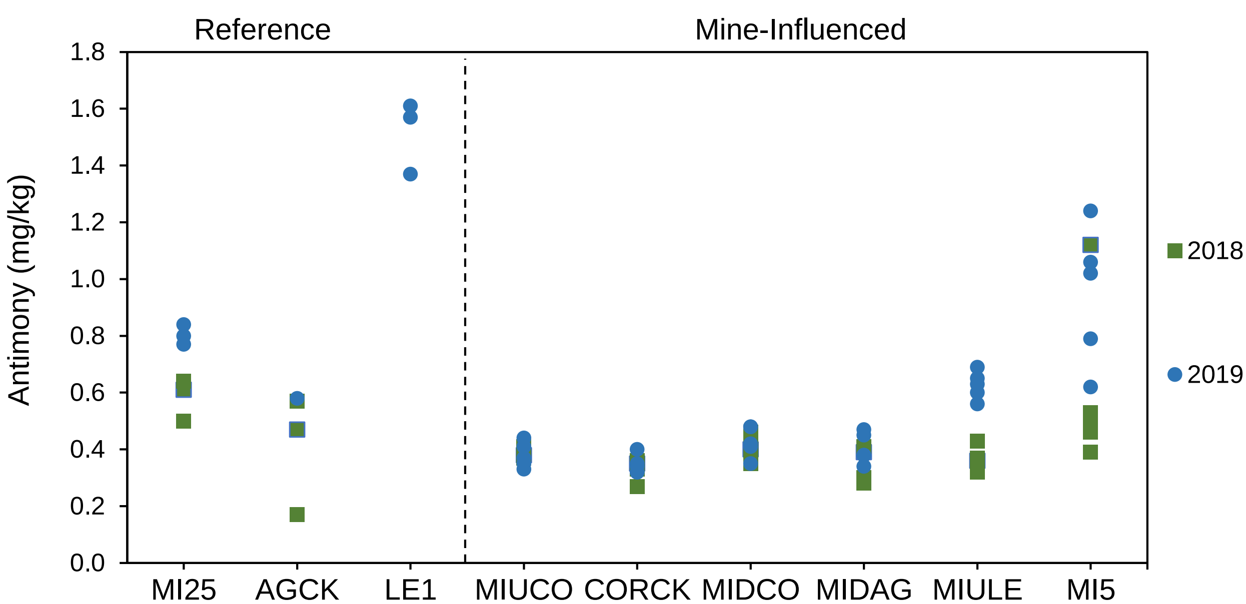
2.0 SEDIMENT QUALITY

Figure 2.0-1: Spatial Variation in Sediment Aluminum Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



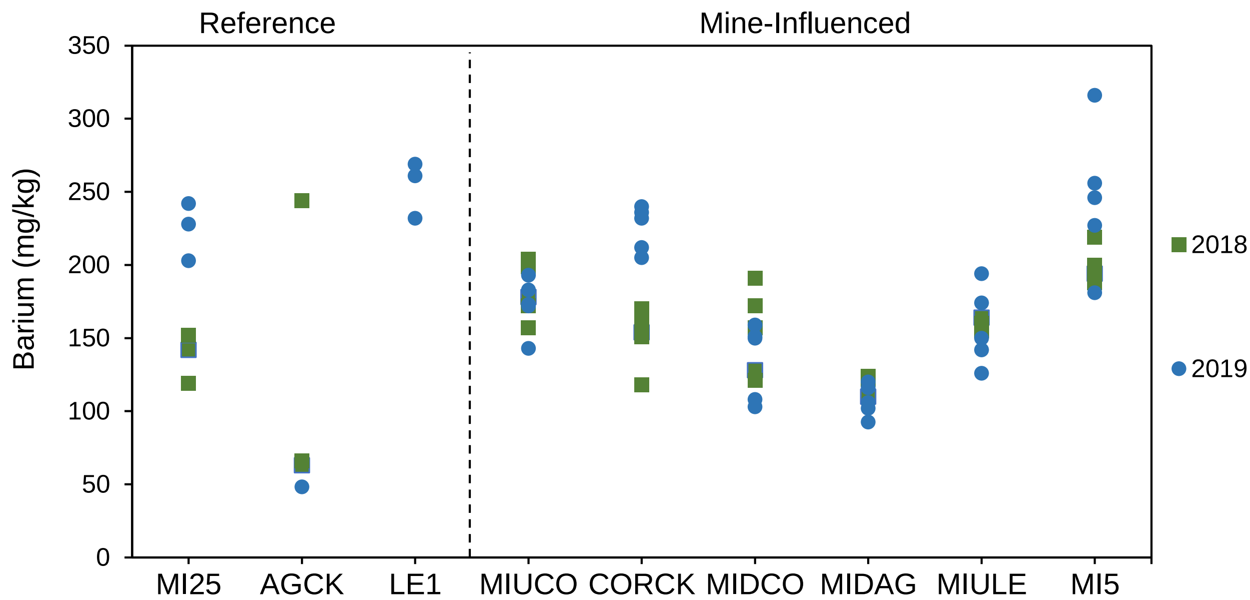
mg/kg = milligrams per kilogram.

Figure 2.0-2: Spatial Variation in Sediment Antimony Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



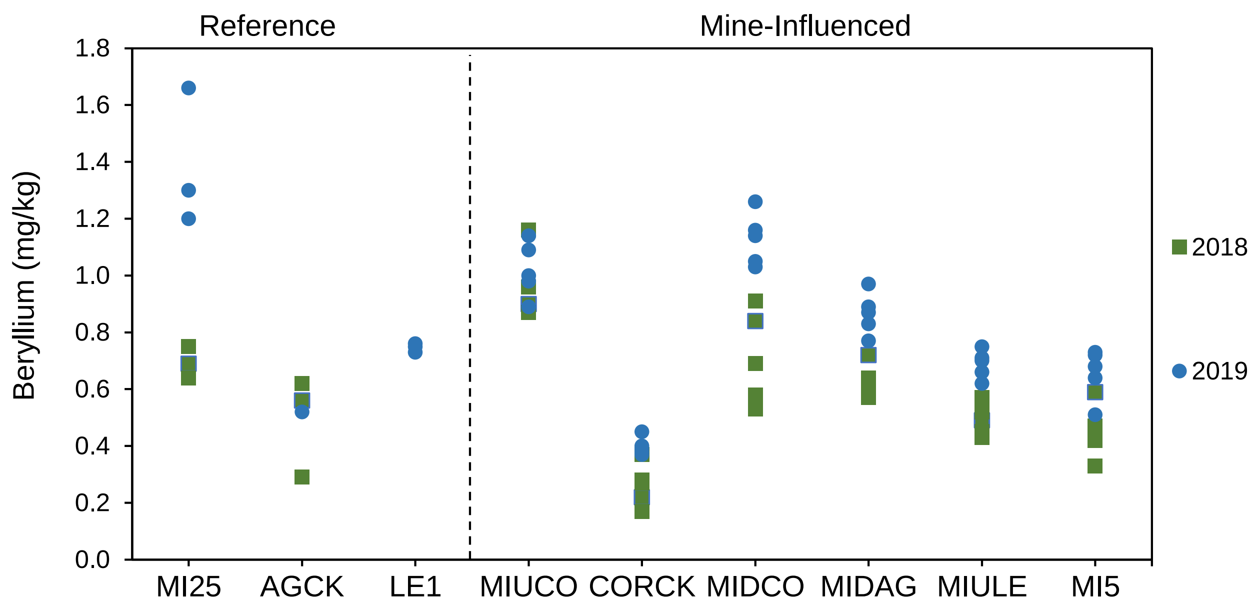
mg/kg = milligrams per kilogram.

Figure 2.0-3: Spatial Variation in Sediment Barium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



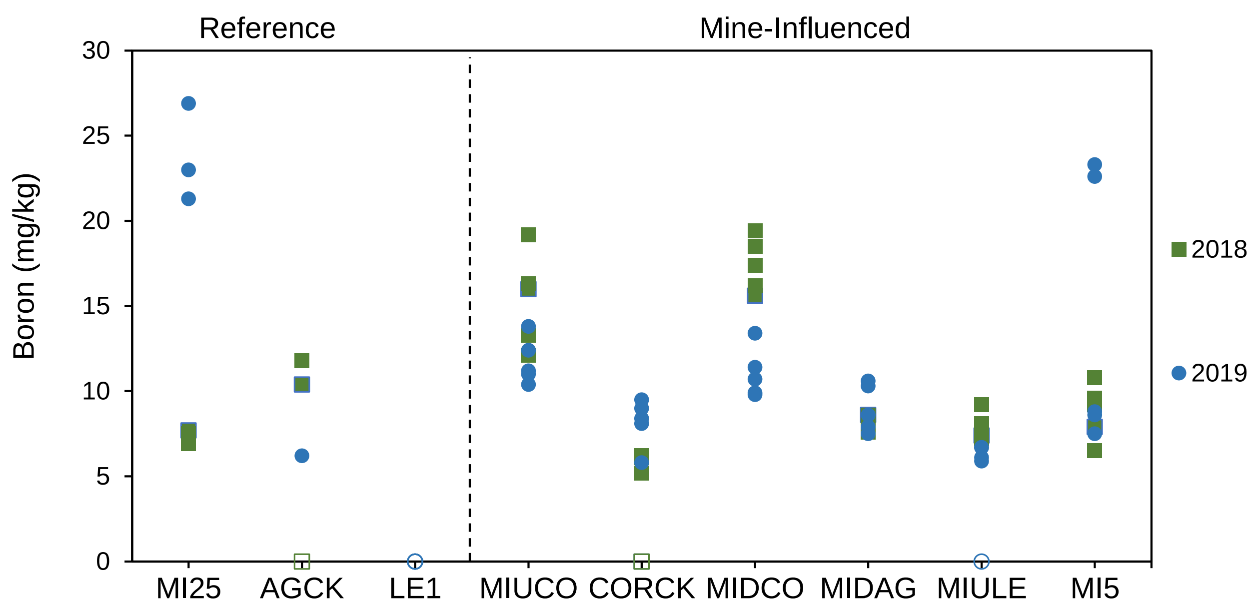
mg/kg = milligrams per kilogram.

Figure 2.0-4: Spatial Variation in Sediment Beryllium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



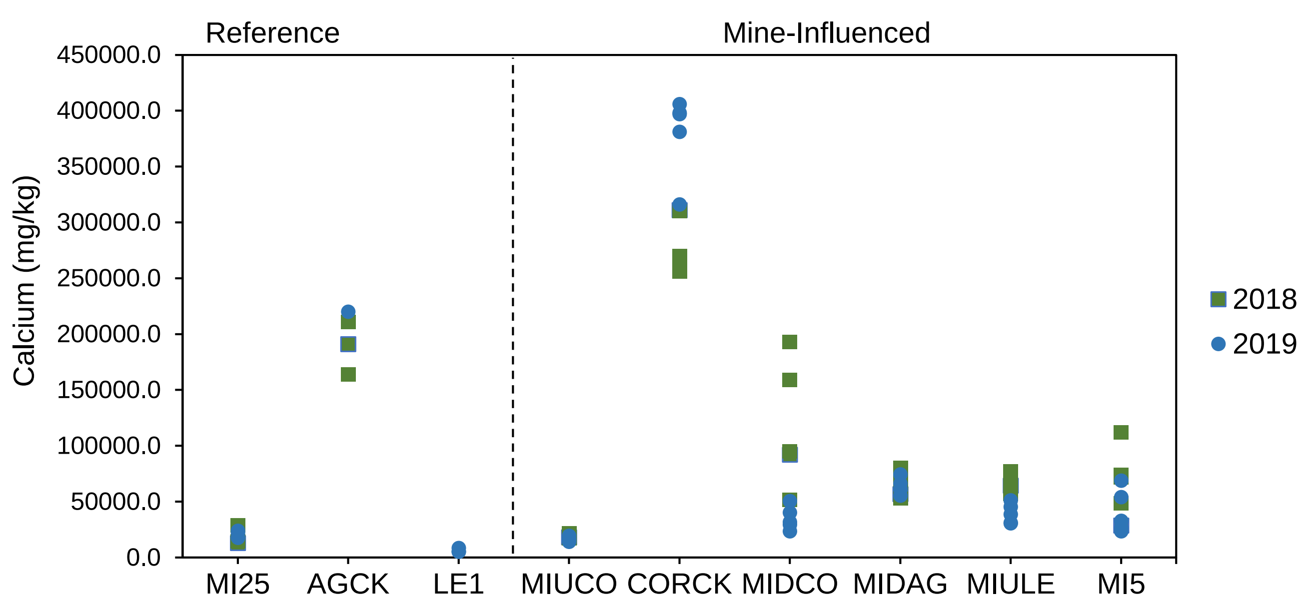
mg/kg = milligrams per kilogram.

Figure 2.0-5: Spatial Variation in Sediment Boron Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



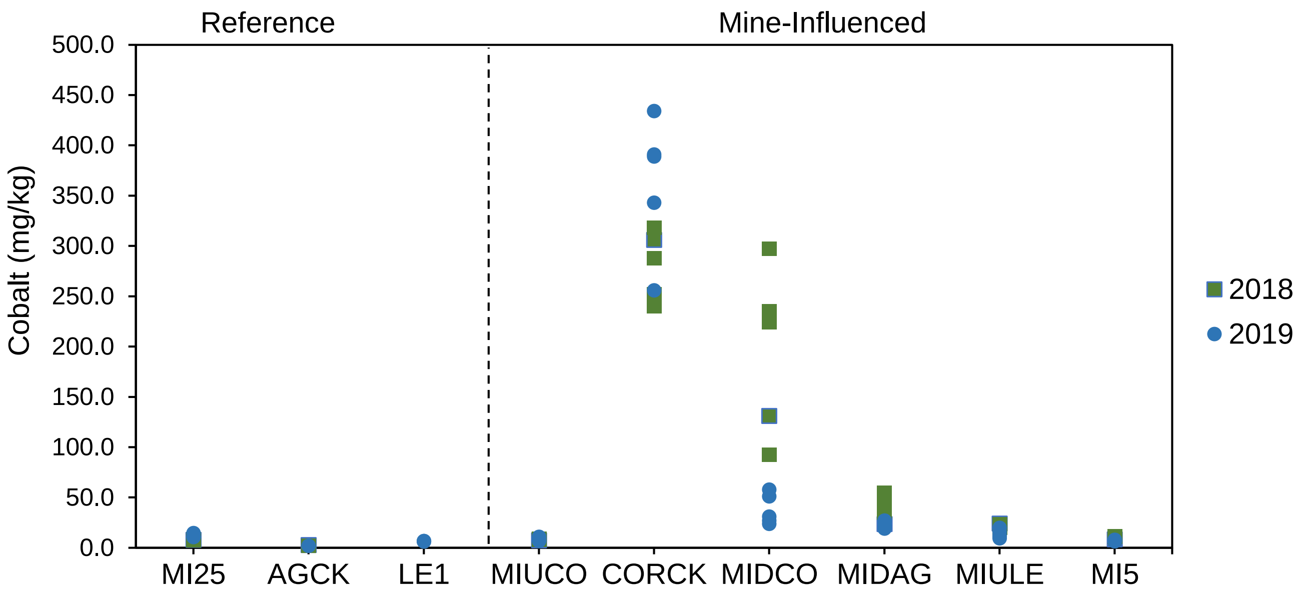
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-6: Spatial Variation in Sediment Calcium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



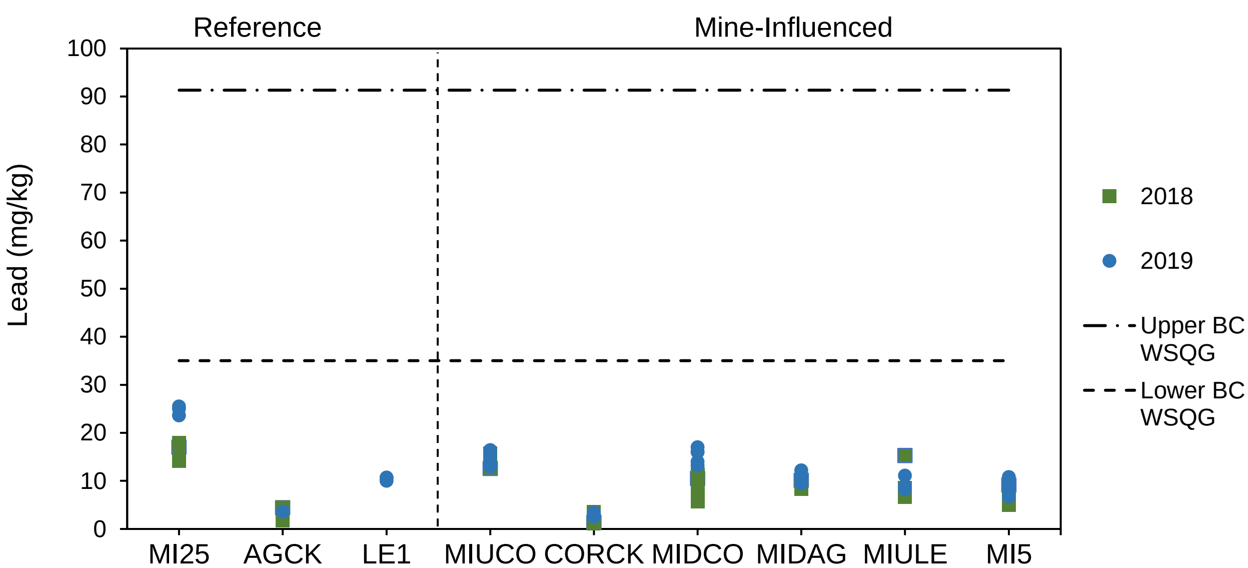
mg/kg = milligrams per kilogram

Figure 2.0-7: **Spatial Variation in Sediment Cobalt Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



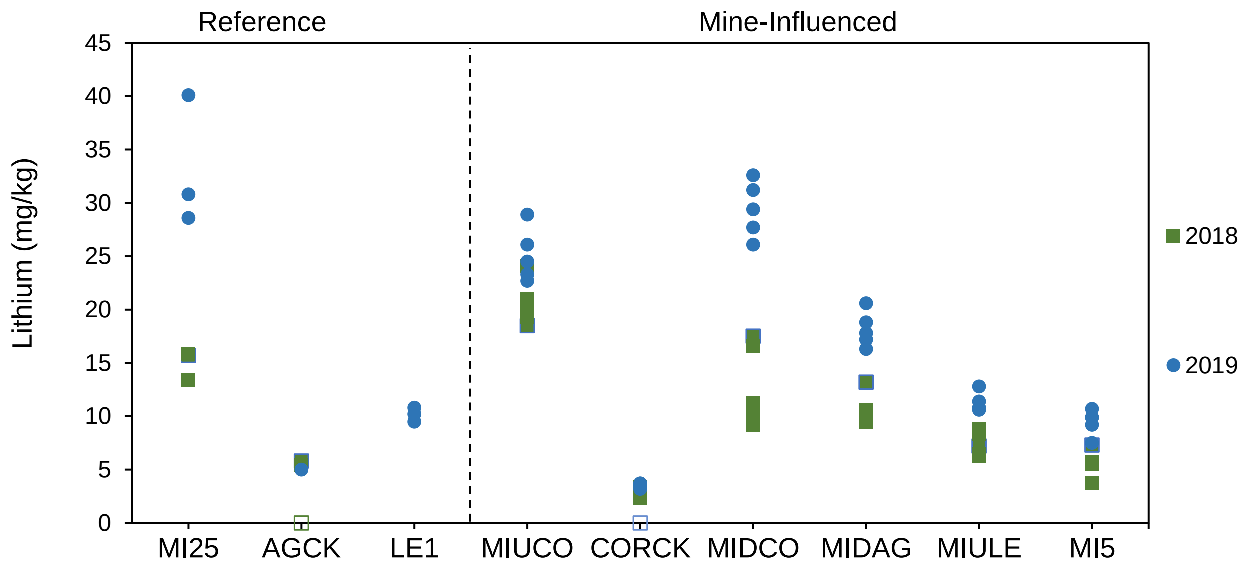
mg/kg = milligrams per kilogram

Figure 2.0-8: **Spatial Variation in Sediment Lead Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



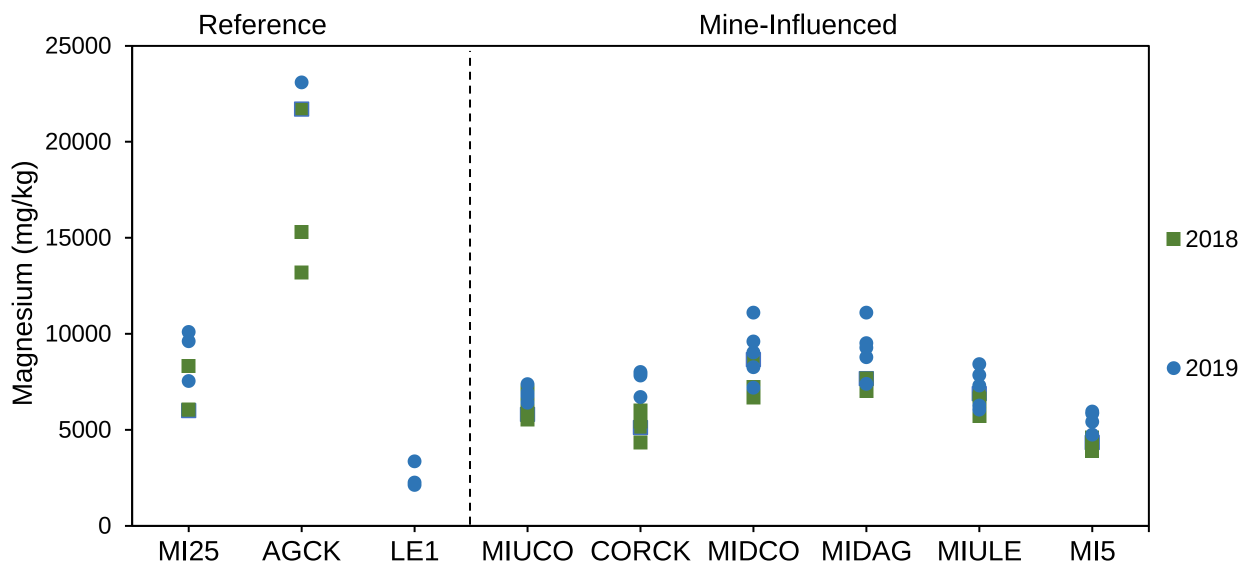
mg/kg = milligrams per kilogram.

Figure 2.0-9: Spatial Variation in Sediment Lithium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



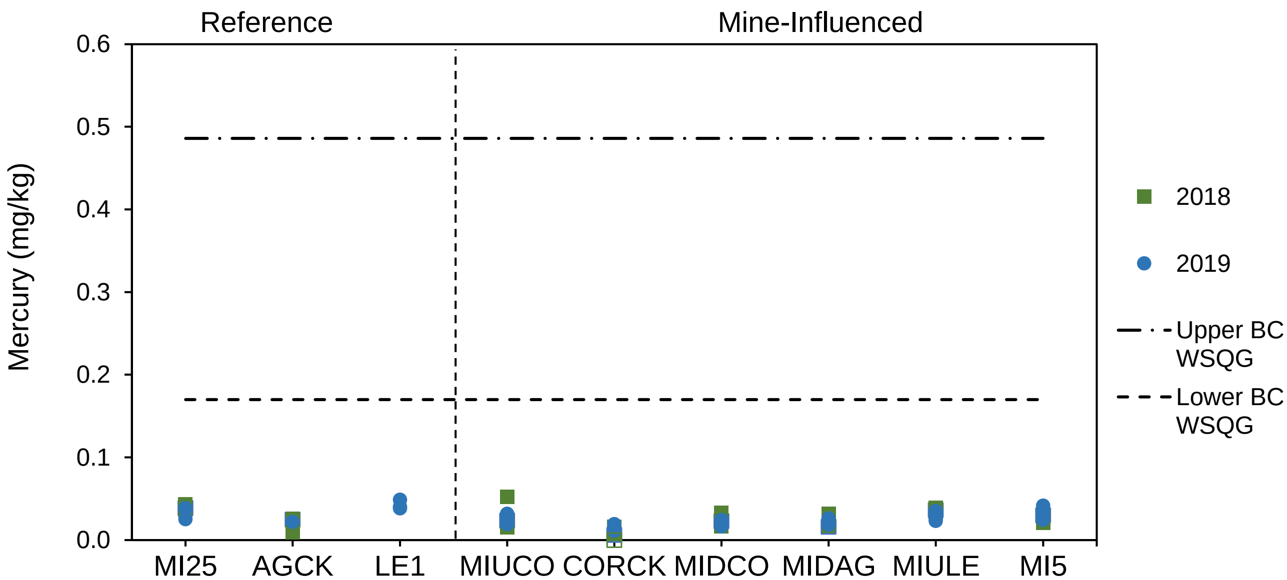
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-10: Spatial Variation in Sediment Magnesium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



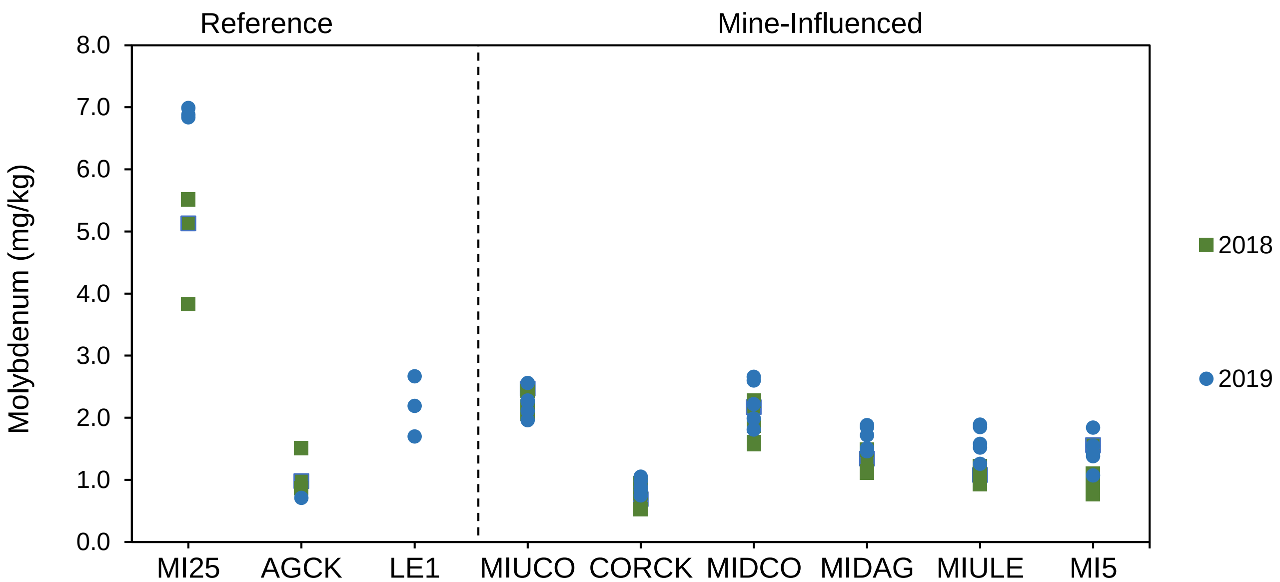
mg/kg = milligrams per kilogram.

Figure 2.0-11: **Spatial Variation in Sediment Mercury Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



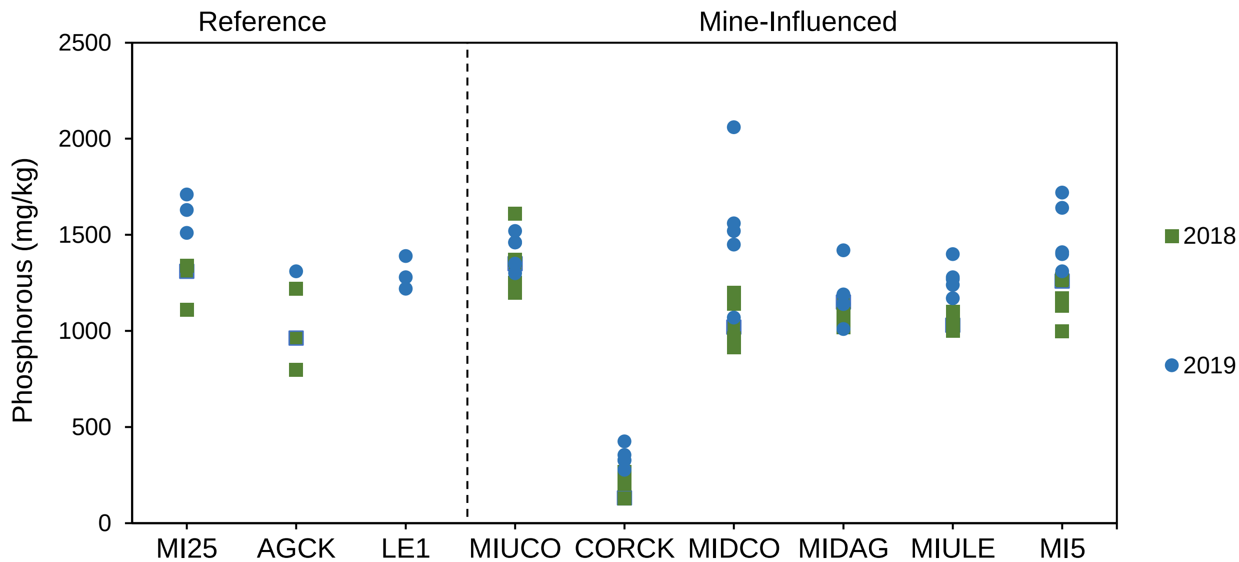
mg/kg = milligrams per kilogram.

Figure 2.0-12: **Spatial Variation in Sediment Molybdenum Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



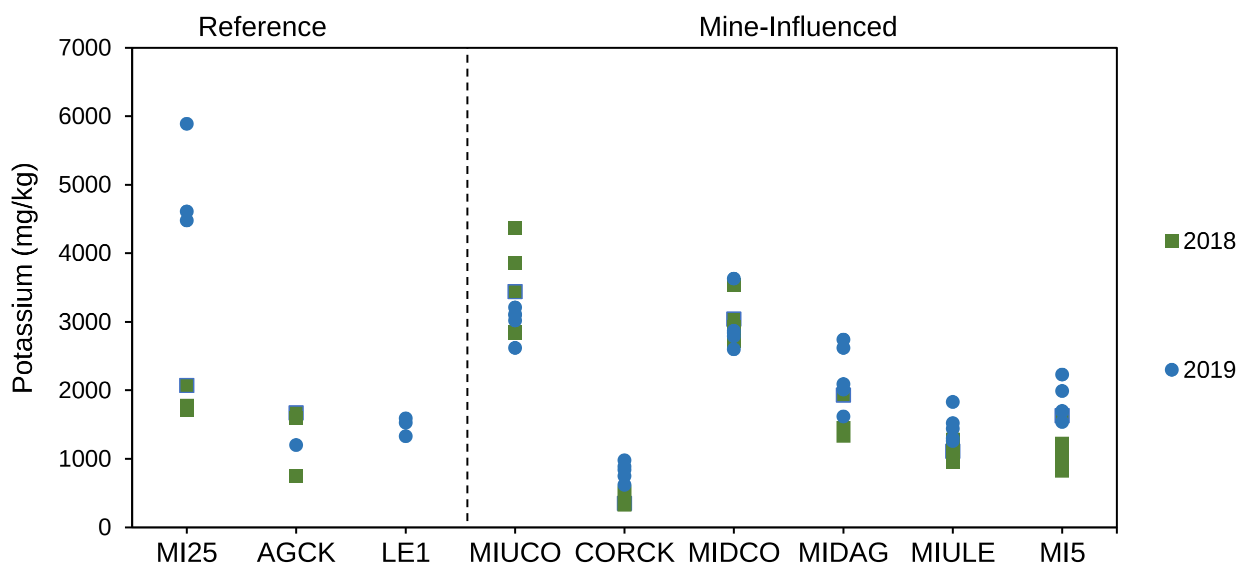
mg/kg = milligrams per kilogram.

Figure 2.0-13: Spatial Variation in Sediment Phosphorus Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



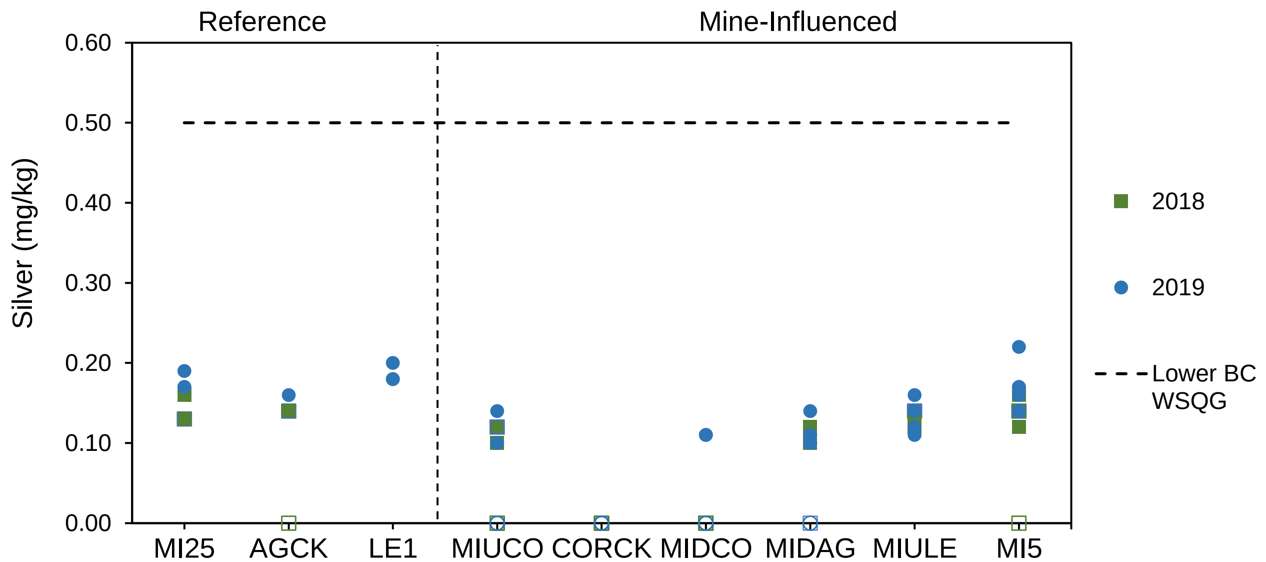
mg/kg = milligrams per kilogram.

Figure 2.0-14: Spatial Variation in Sediment Potassium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



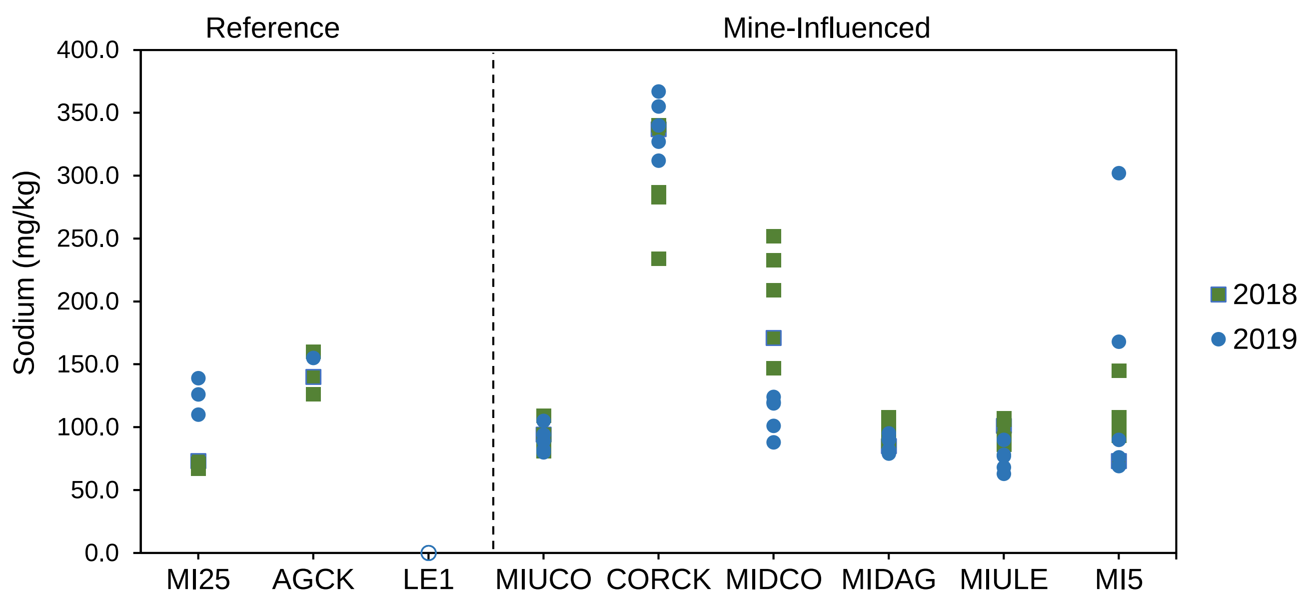
mg/kg = milligrams per kilogram.

Figure 2.0-15: Spatial Variation in Sediment Silver Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



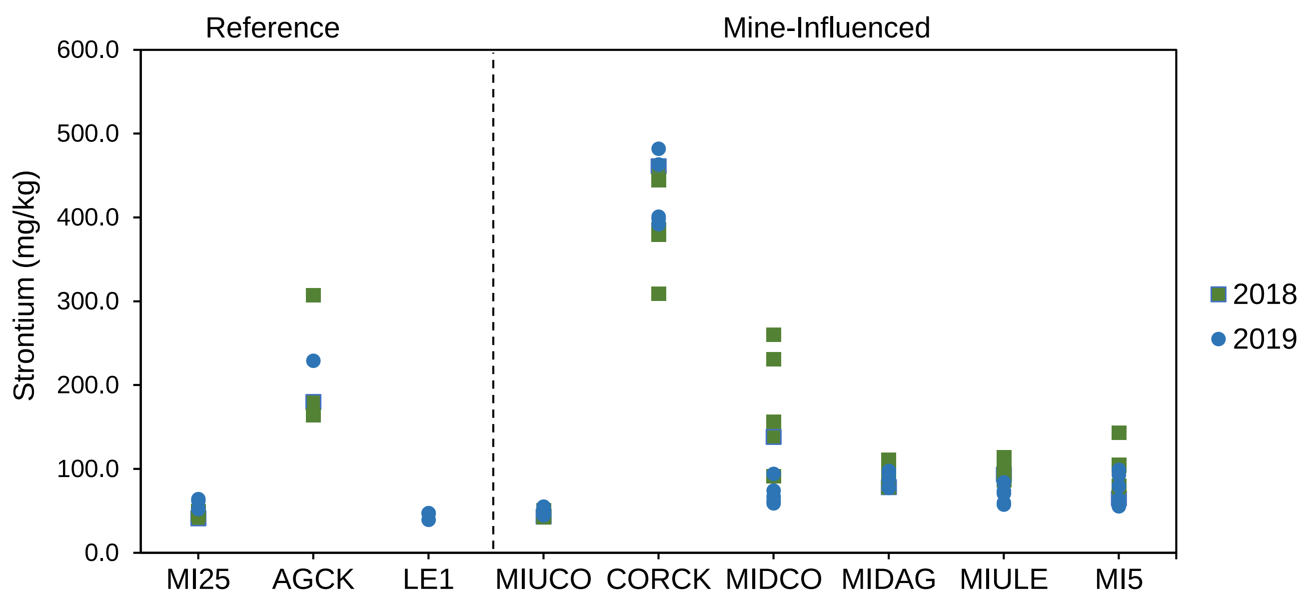
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-16: Spatial Variation in Sediment Sodium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



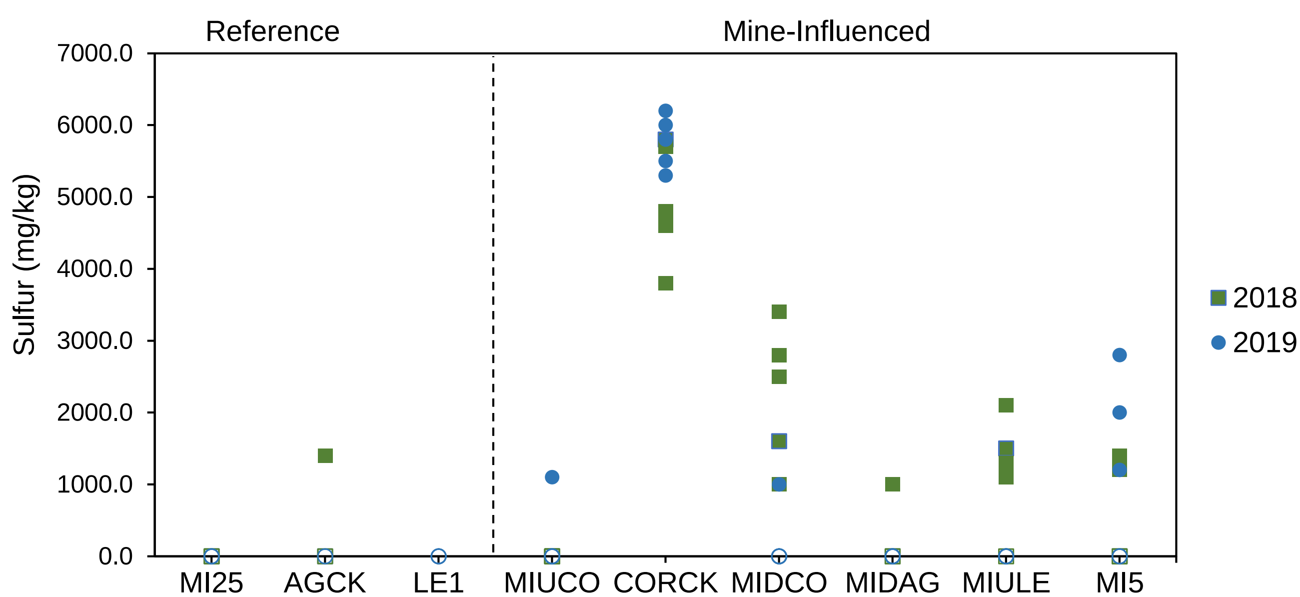
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram

Figure 2.0-17: Spatial Variation in Sediment Strontium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



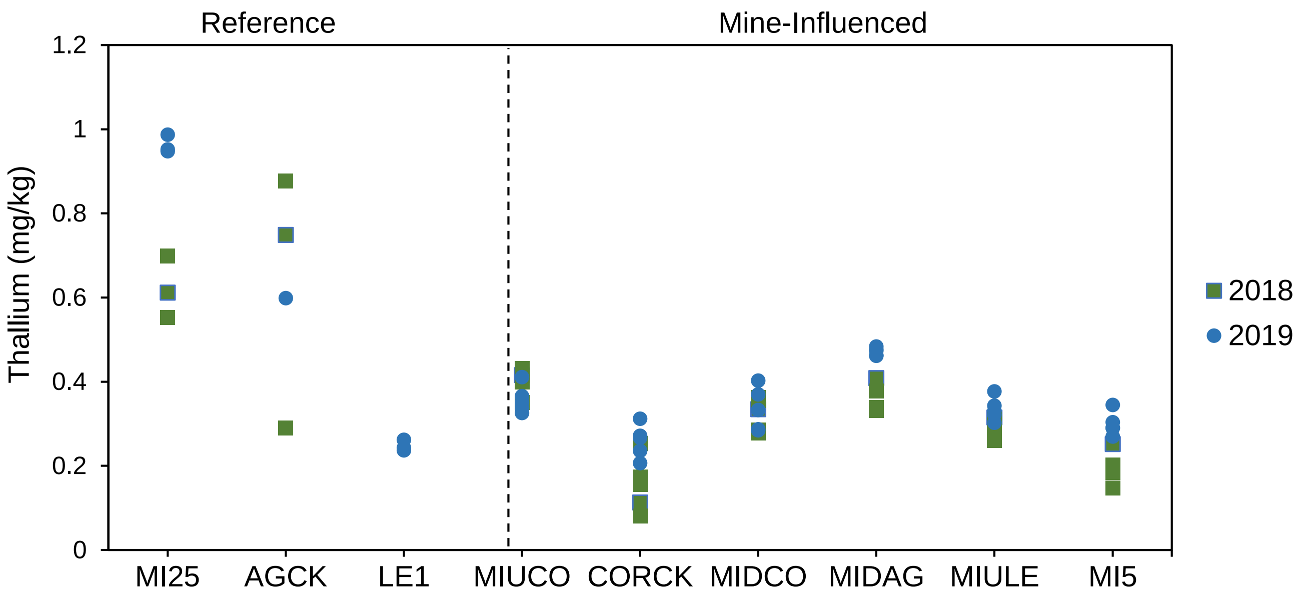
mg/kg = milligrams per kilogram

Figure 2.0-18: Spatial Variation in Sediment Sulfur Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



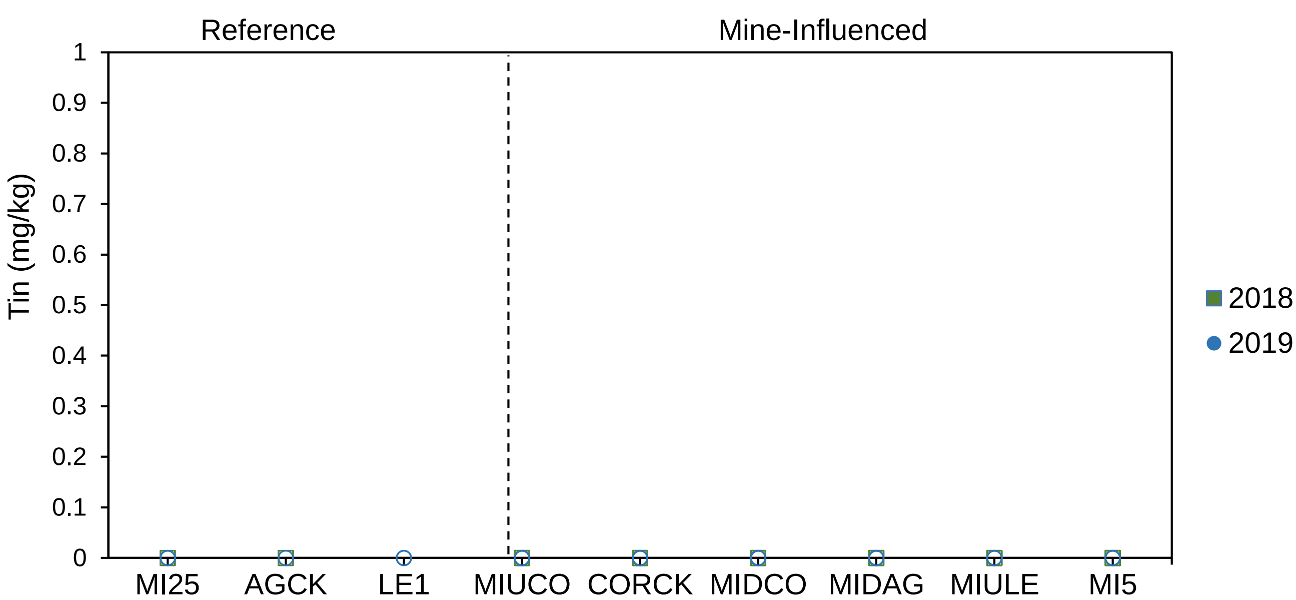
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram

Figure 2.0-19: **Spatial Variation in Sediment Thallium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



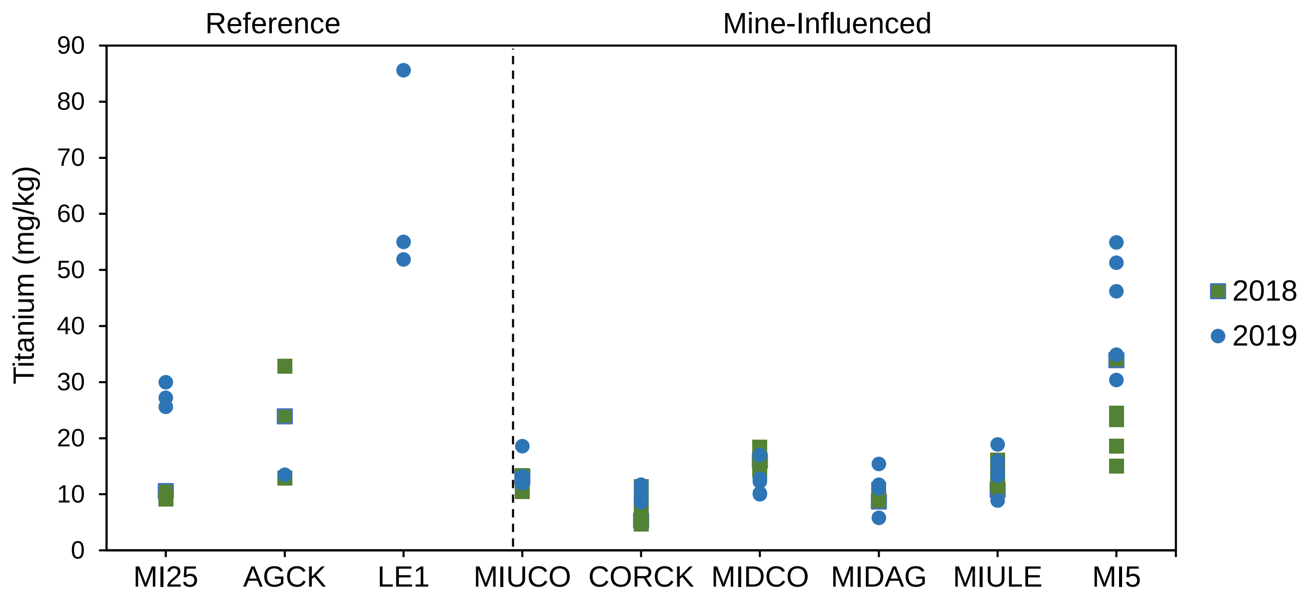
mg/kg = milligrams per kilogram.

Figure 2.0-20: **Spatial Variation in Sediment Tin Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



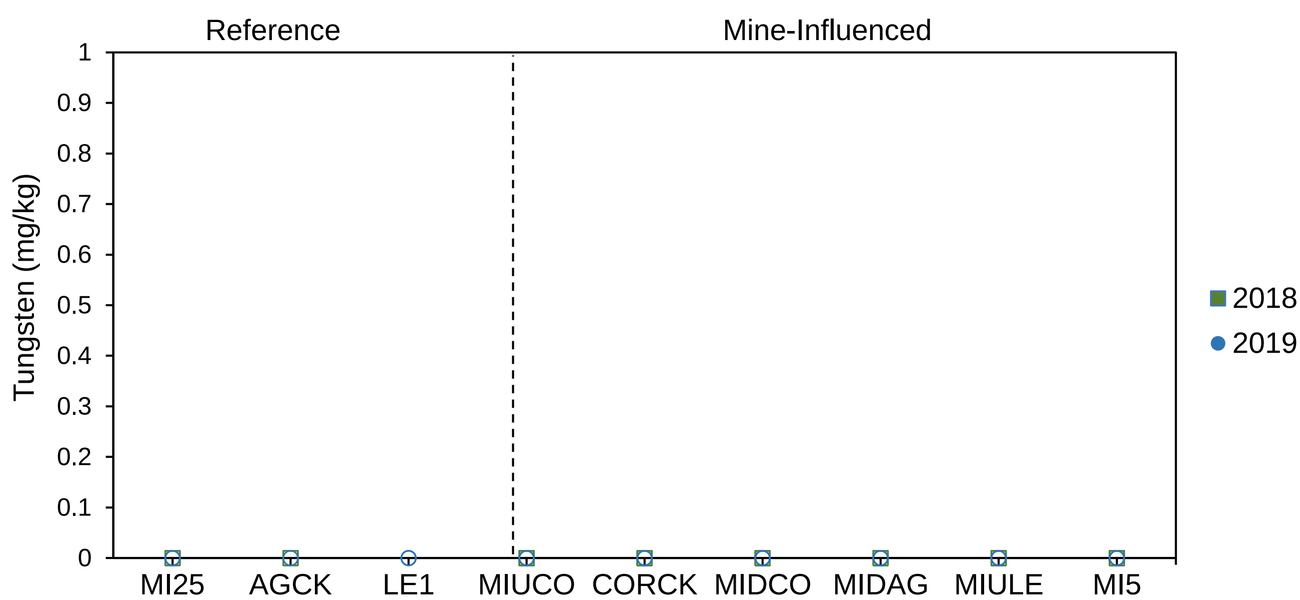
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-21: Spatial Variation in Sediment Titanium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



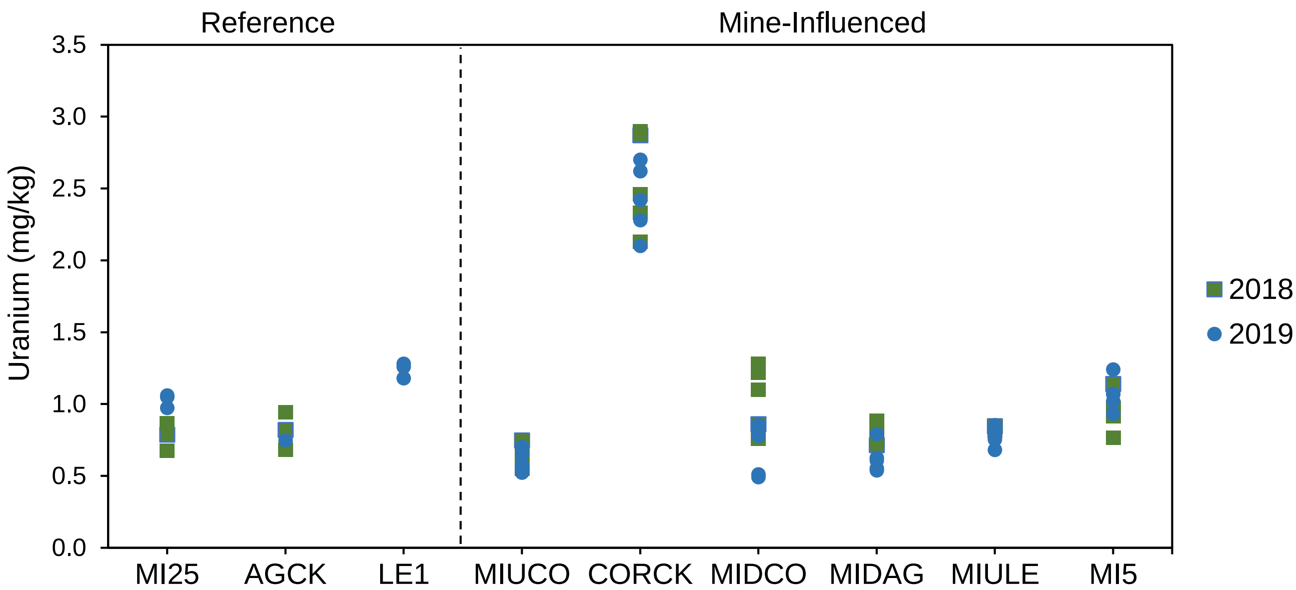
mg/kg = milligrams per kilogram.

Figure 2.0-22: Spatial Variation in Sediment Tungsten Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



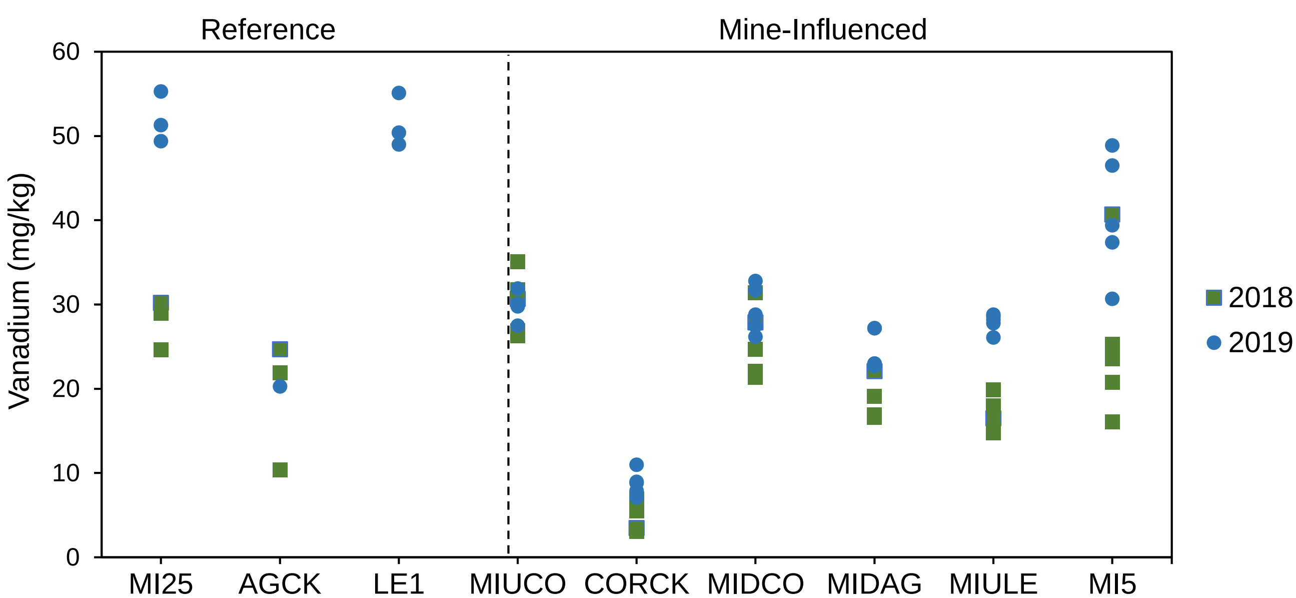
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-23: **Spatial Variation in Sediment Uranium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



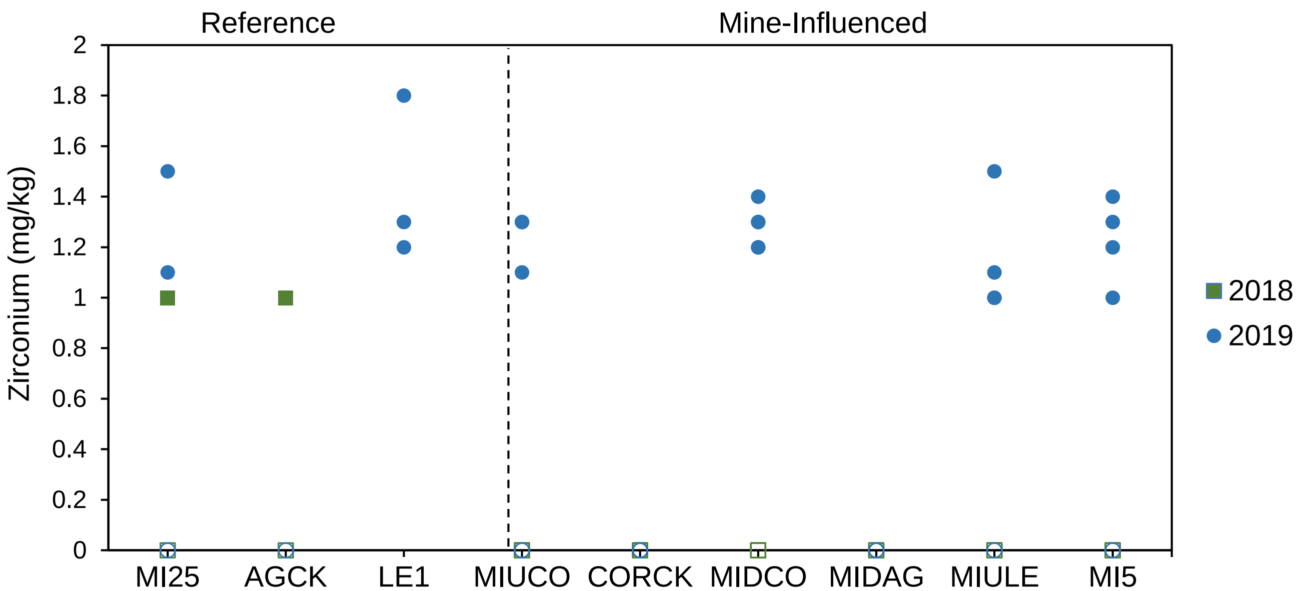
mg/kg = milligrams per kilogram

Figure 2.0-24: **Spatial Variation in Sediment Vanadium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019**



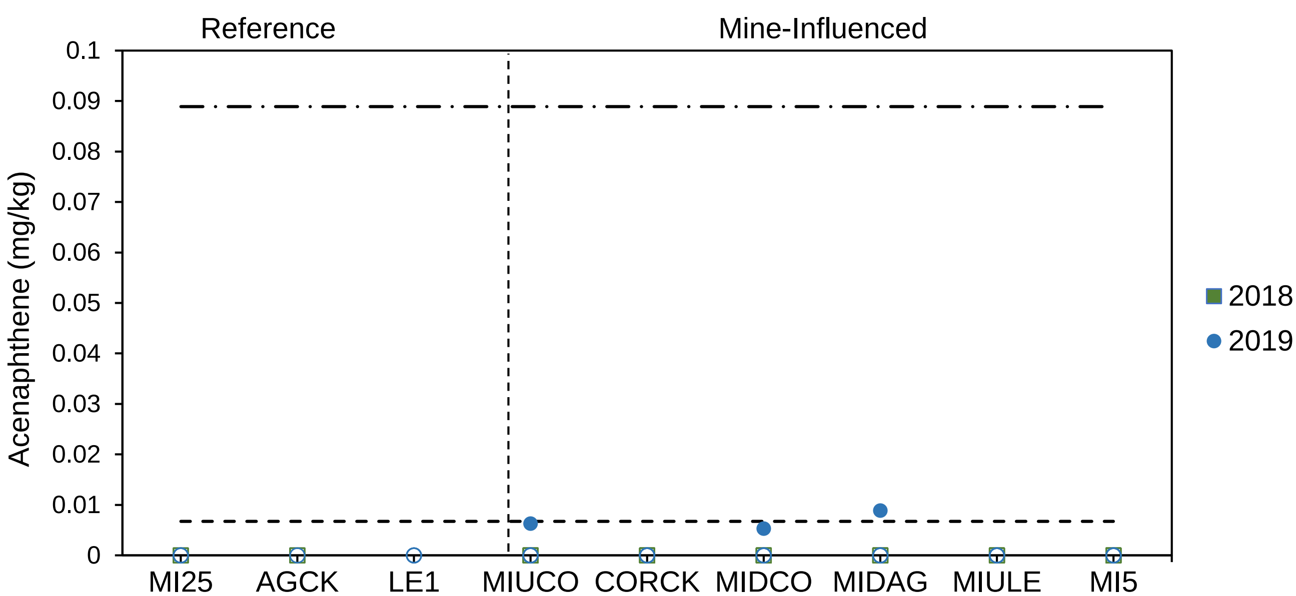
mg/kg = milligrams per kilogram.

Figure 2.0-25: Spatial Variation in Sediment Zirconium Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



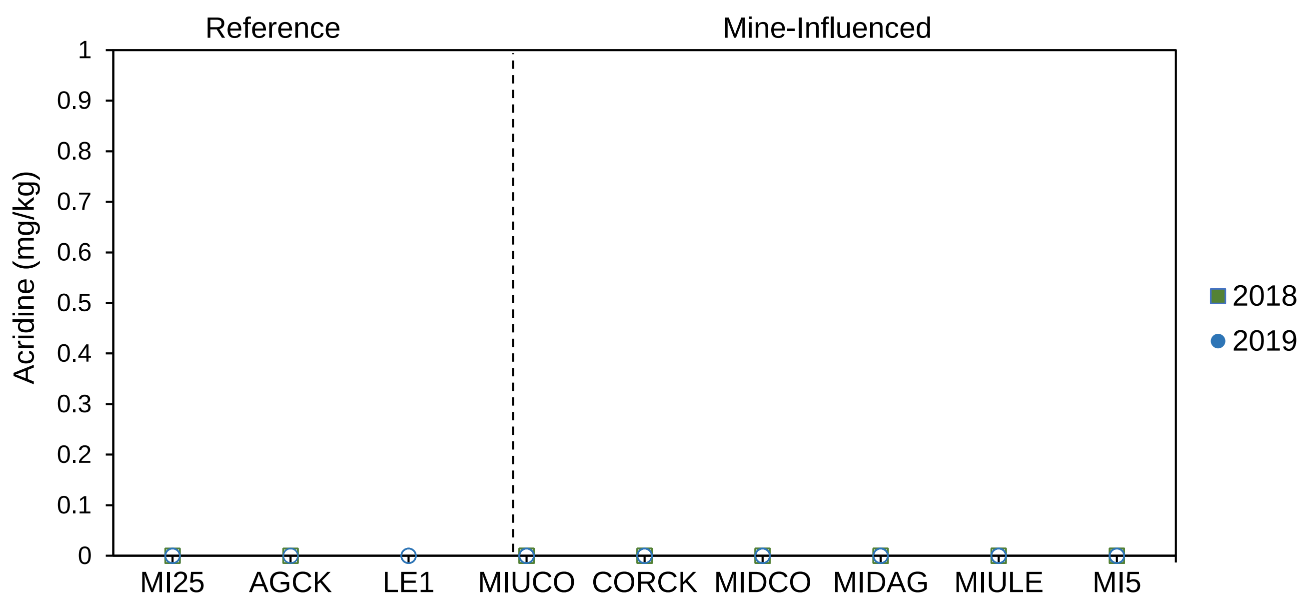
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-26: Spatial Variation in Sediment Acenaphthene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



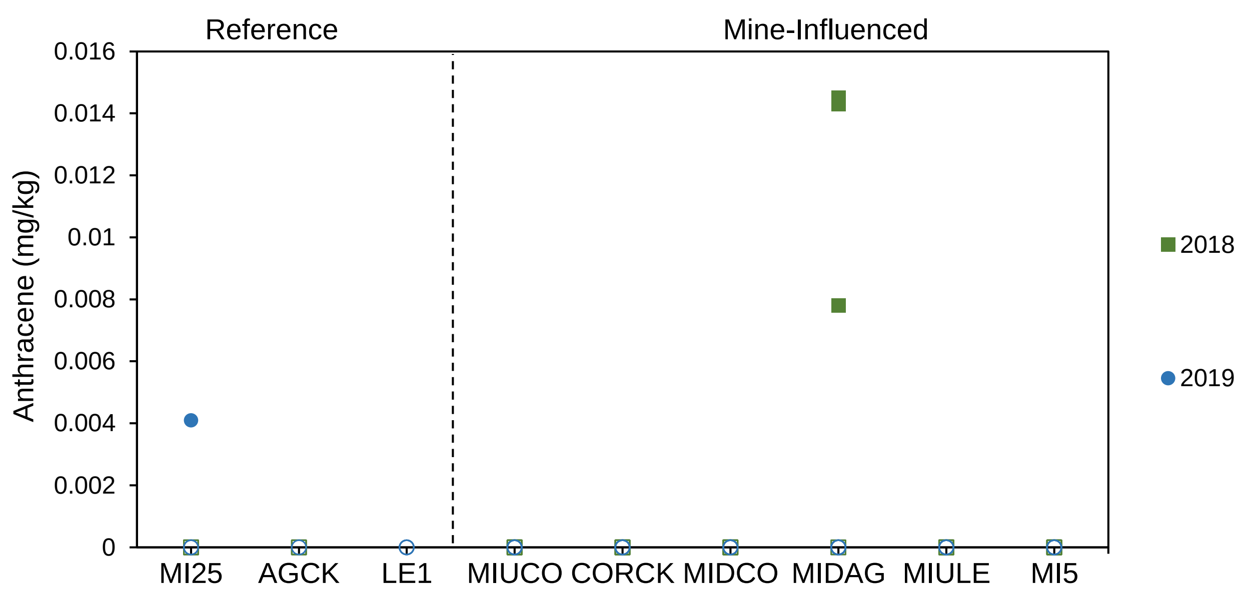
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-27: Spatial Variation in Sediment Acridine Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



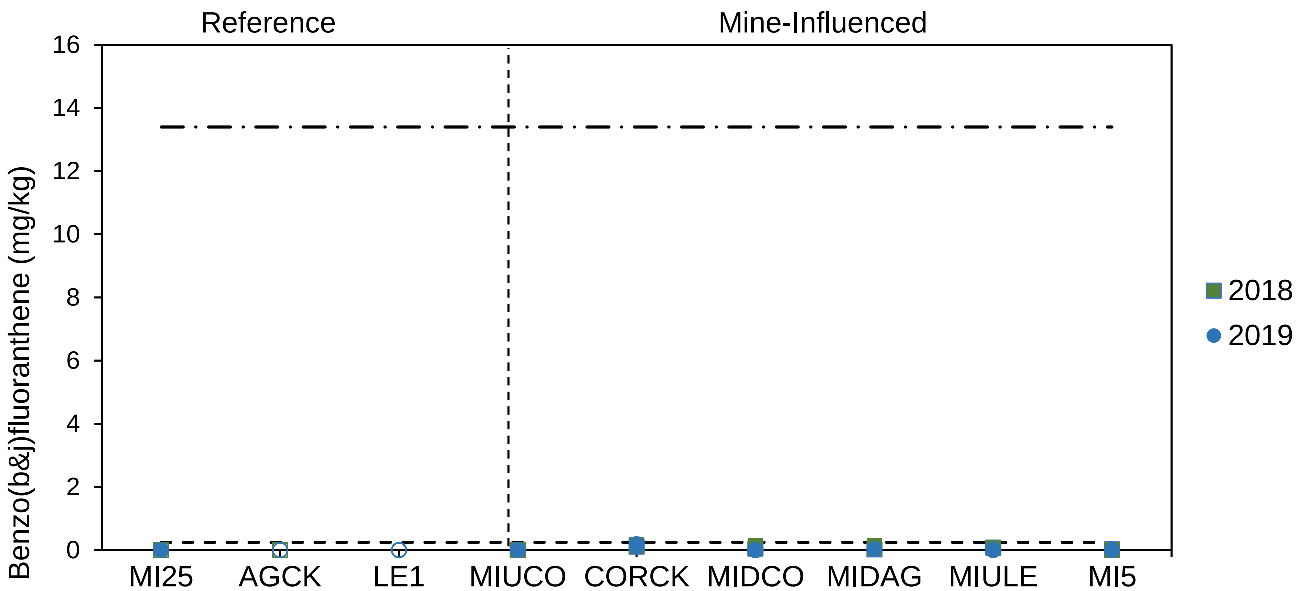
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-28: Spatial Variation in Sediment Anthracene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



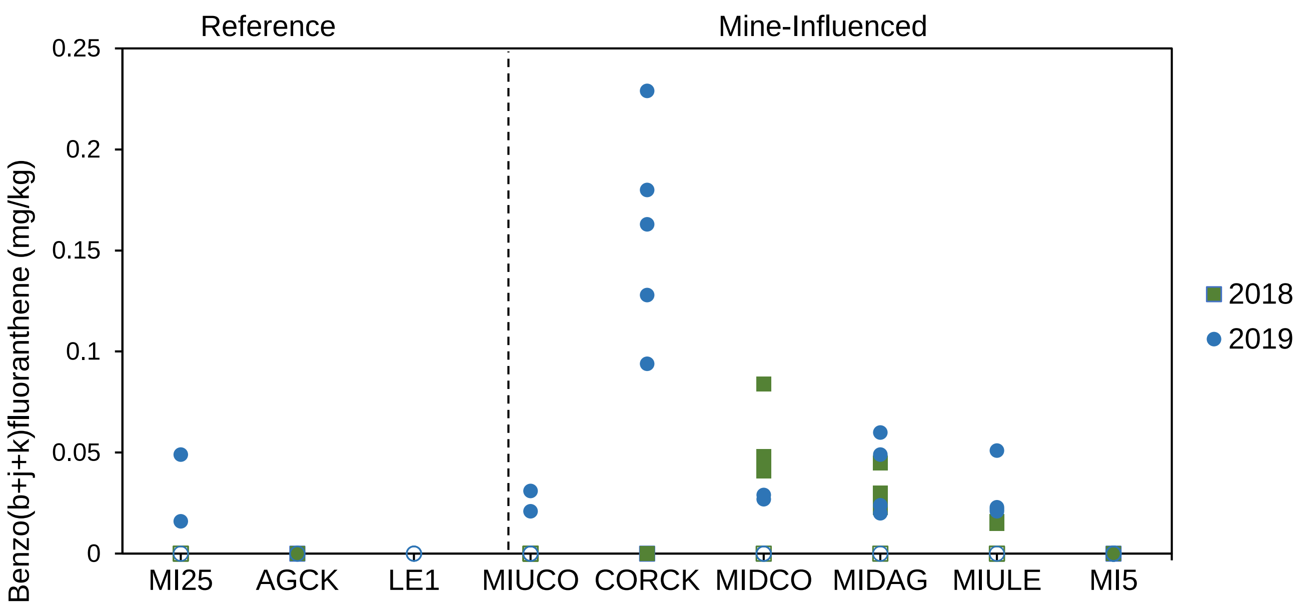
Note: Open symbols represent non-detects. Lower BC WQG (0.0469) and Upper BC WQG (0.245) not shown.
mg/kg = milligrams per kilogram.

Figure 2.0-29: Spatial Variation in Sediment Benzo(b,j)fluoranthene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



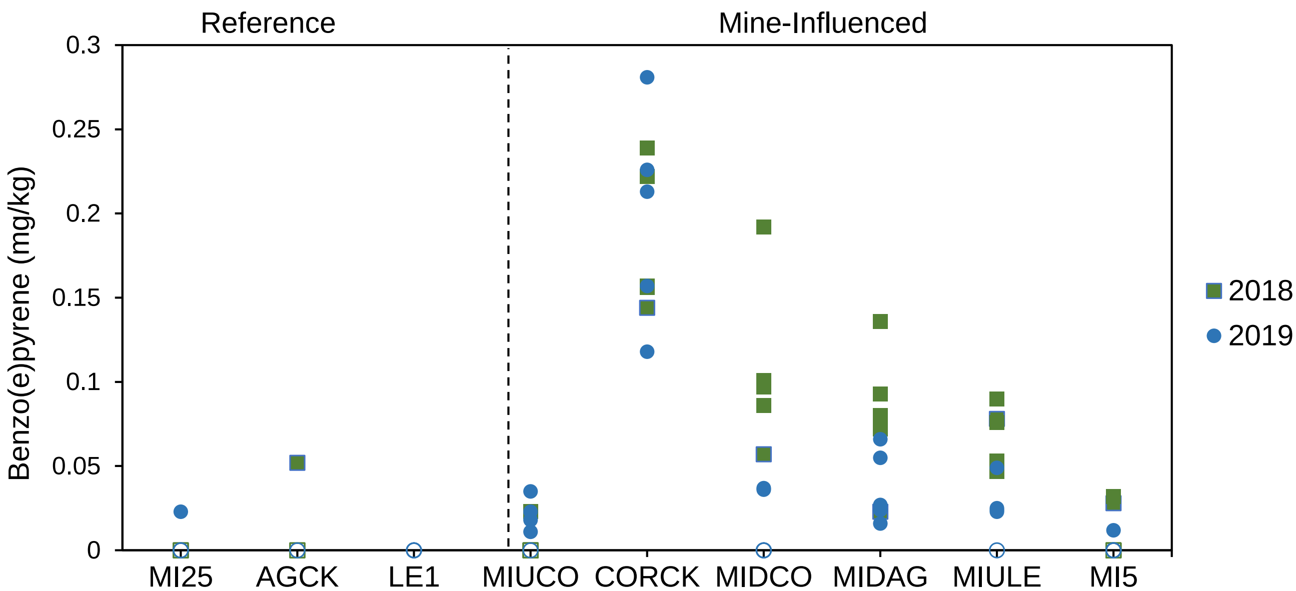
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-30: Spatial Variation in Sediment Benzo(b,j,k)fluoranthene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



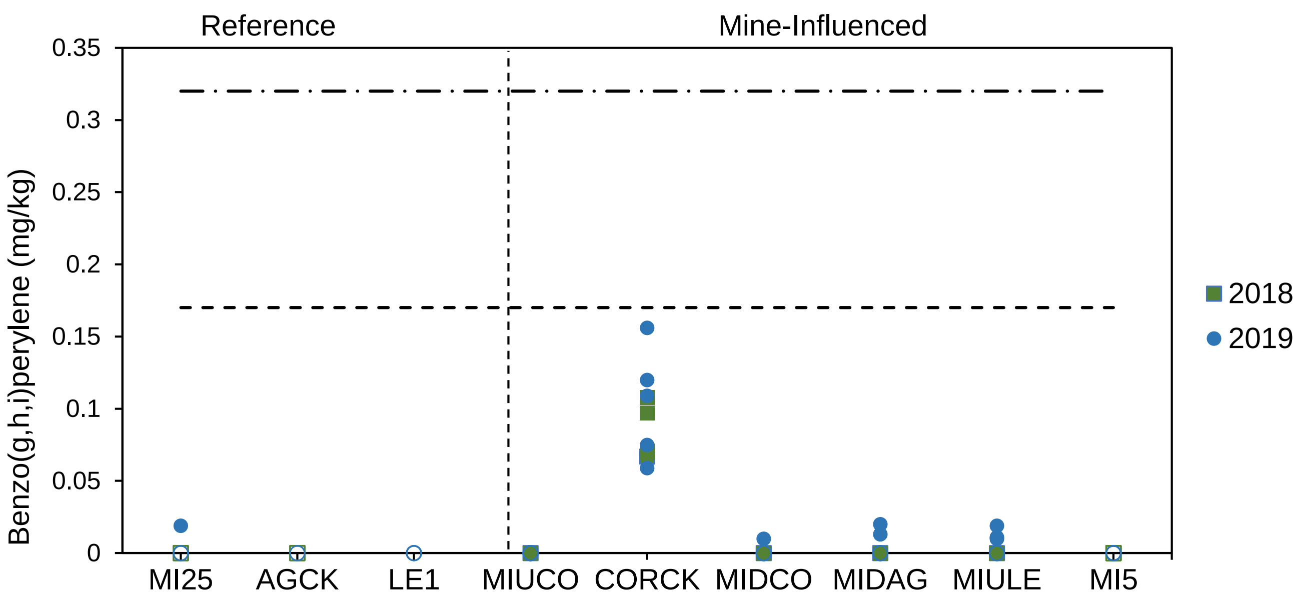
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-31: Spatial Variation in Sediment Benzo(e)pyrene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



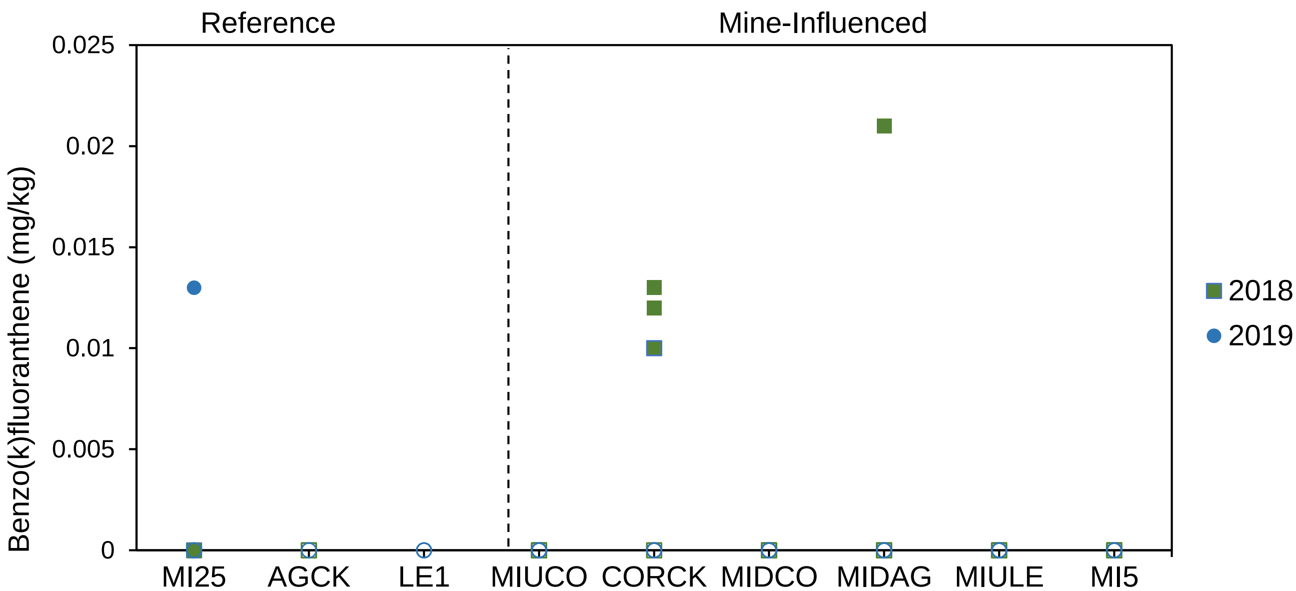
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-32: Spatial Variation in Sediment Benzo(g,h,i)perylene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



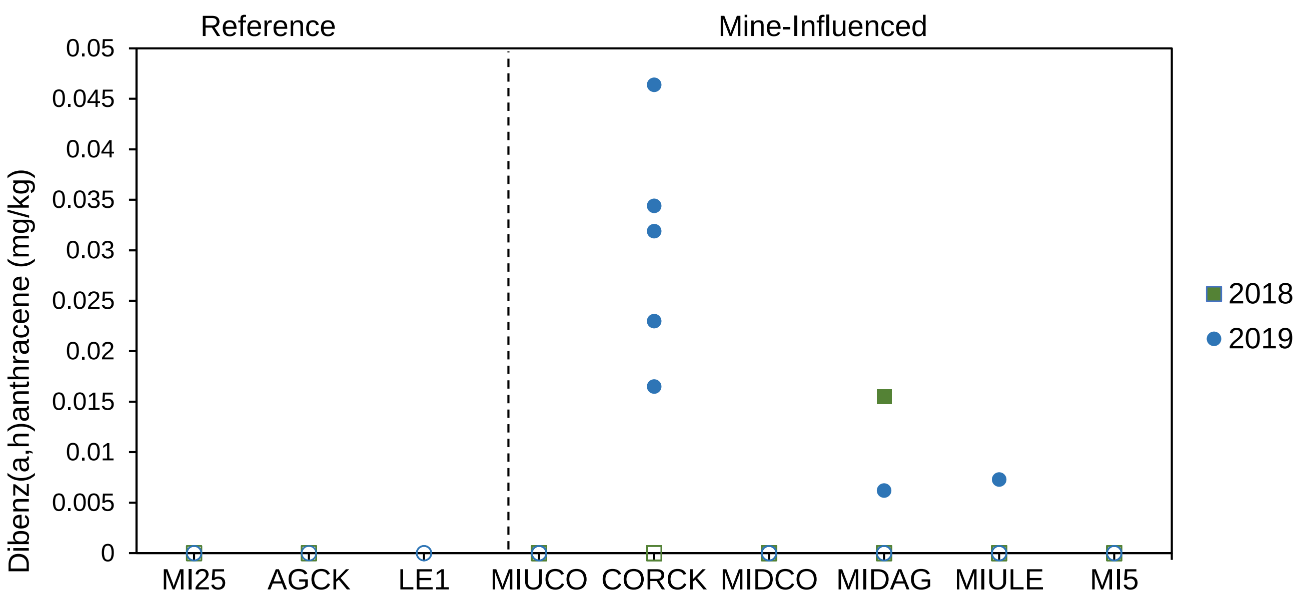
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-33: Spatial Variation in Sediment Benzo(k)fluoranthene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



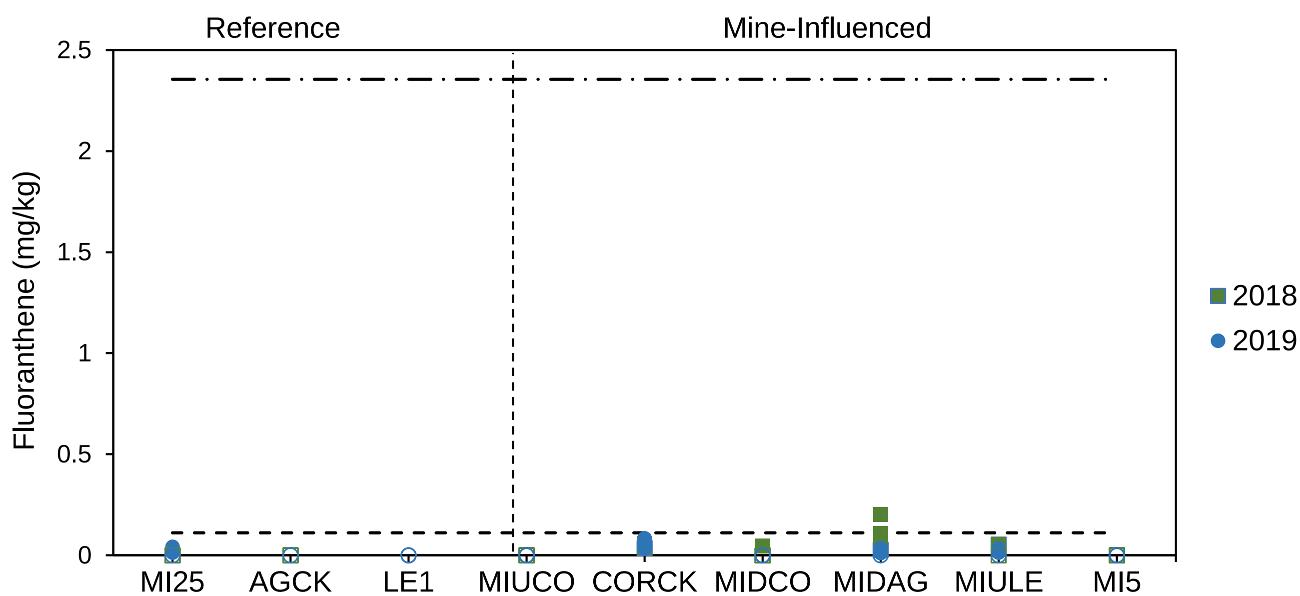
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.
Concentrations below Lower BC WSQG

Figure 2.0-34: Spatial Variation in Sediment Dibenzo(a,h)anthracene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



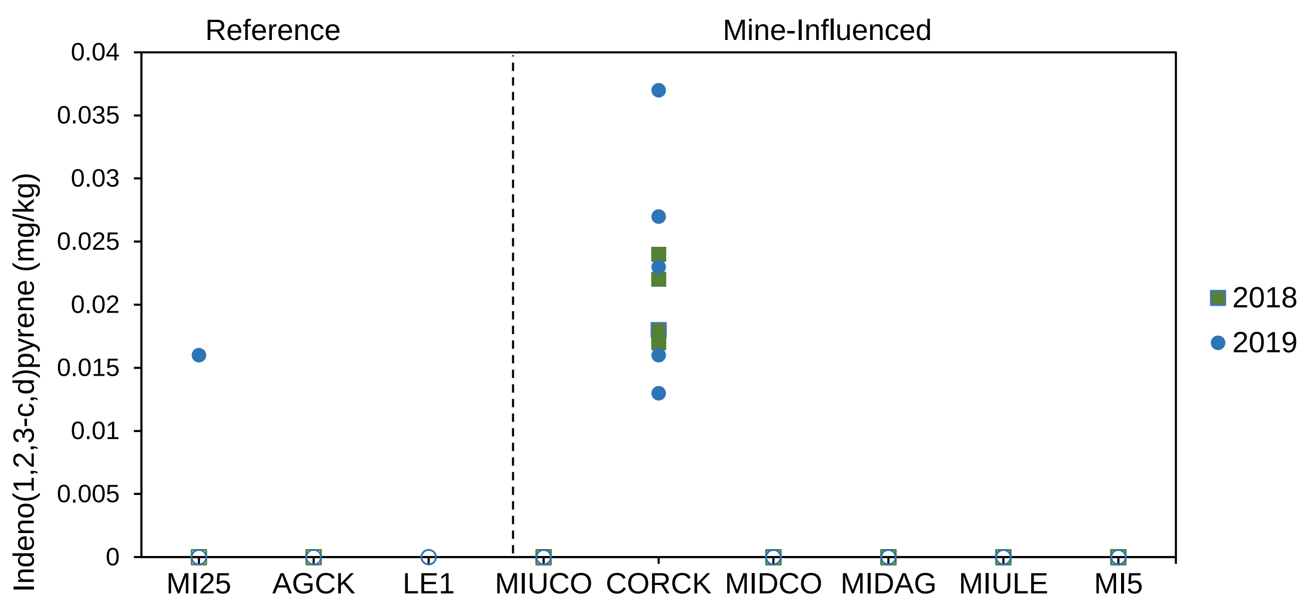
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-35: Spatial Variation in Sediment Fluoranthene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



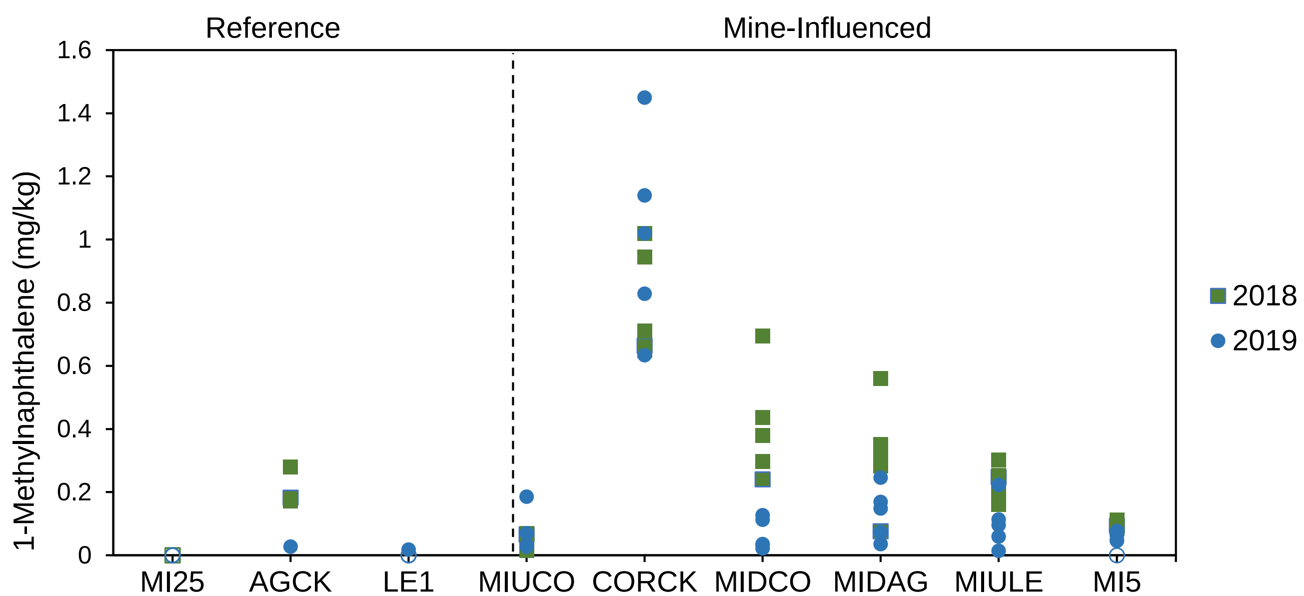
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-36: Spatial Variation in Sediment Ideno(1,2,3-c,d)pyrene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



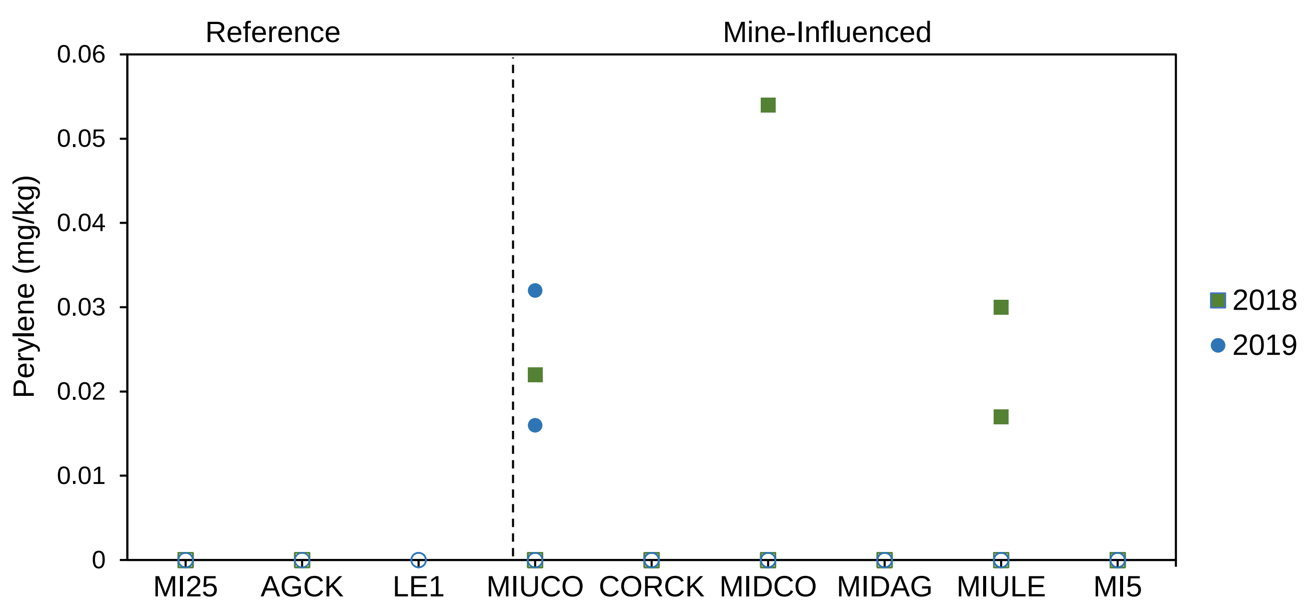
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.
Concentrations below Upper and Lower BC WSQG

Figure 2.0-37: Spatial Variation in Sediment 1-Methtylnaphthalene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



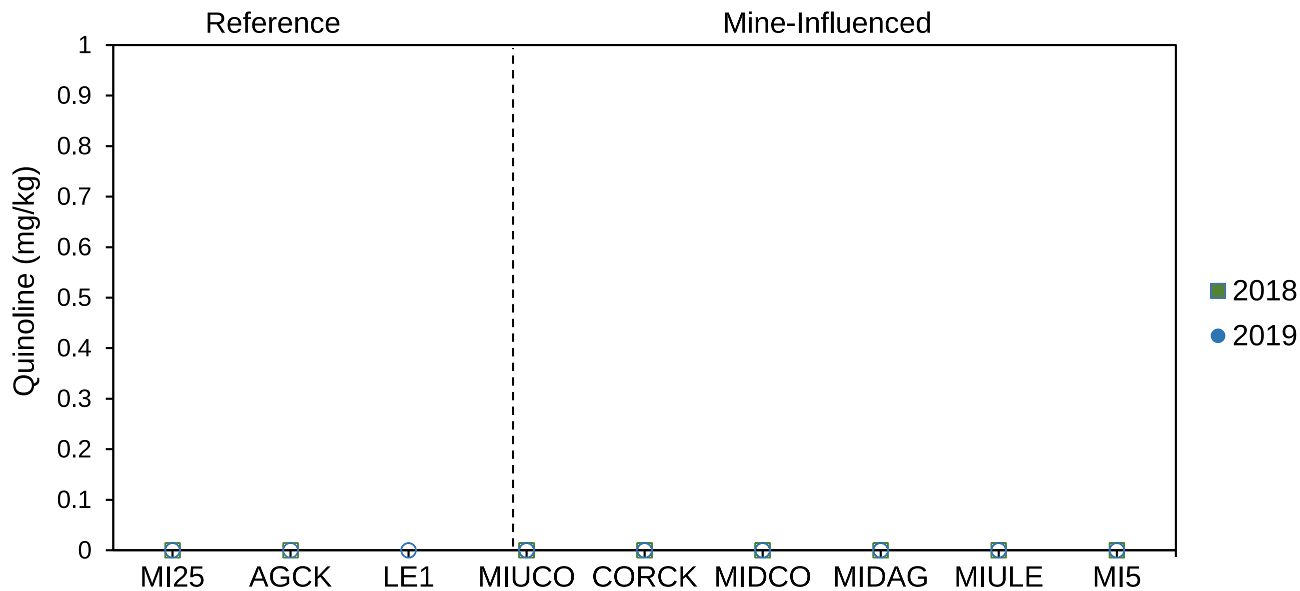
Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

Figure 2.0-38: Spatial Variation in Sediment Perylene Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

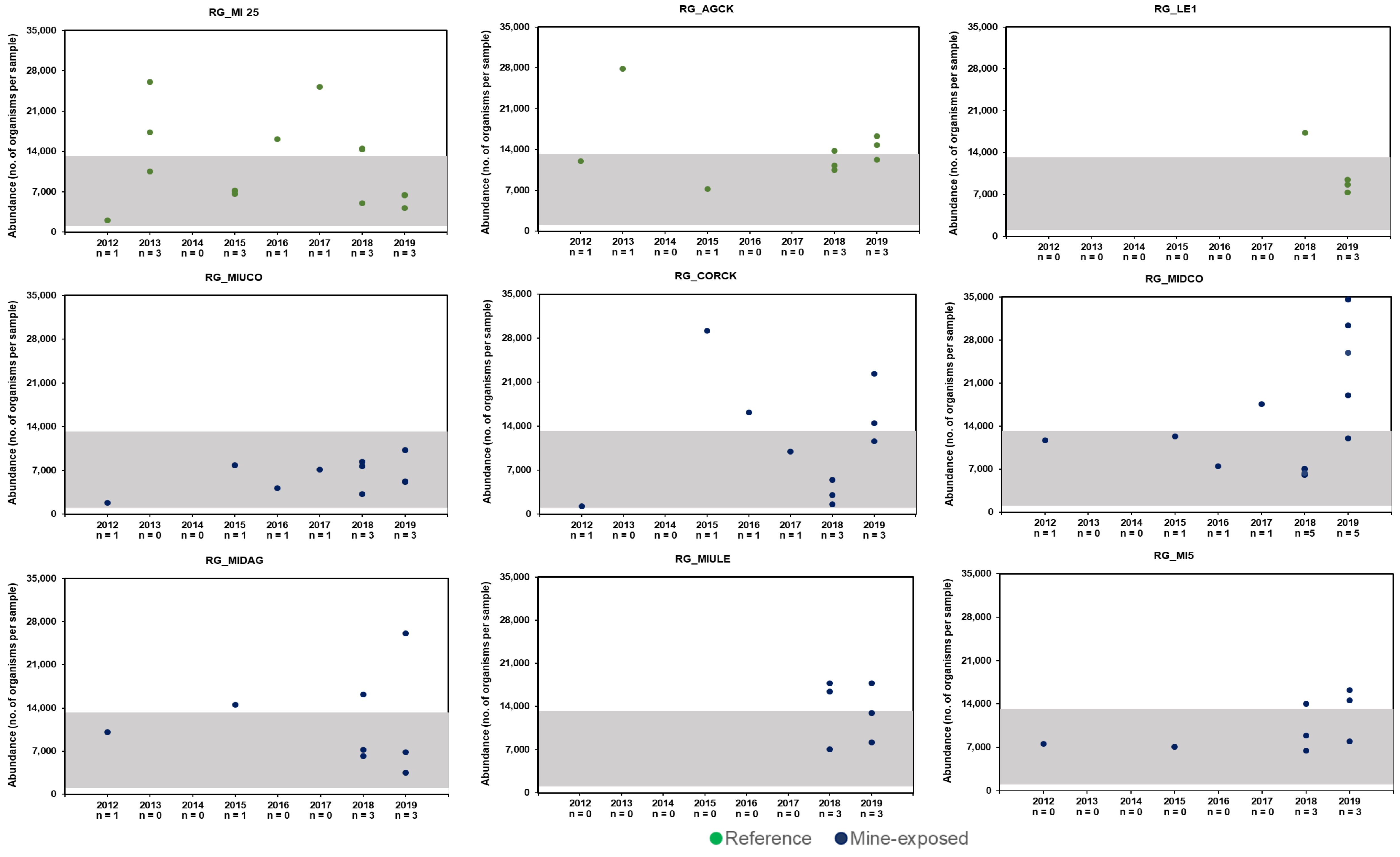
Figure 2.0-39: Spatial Variation in Sediment Quinoline Concentrations in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



Note: Open symbols represent non-detects.
mg/kg = milligrams per kilogram.

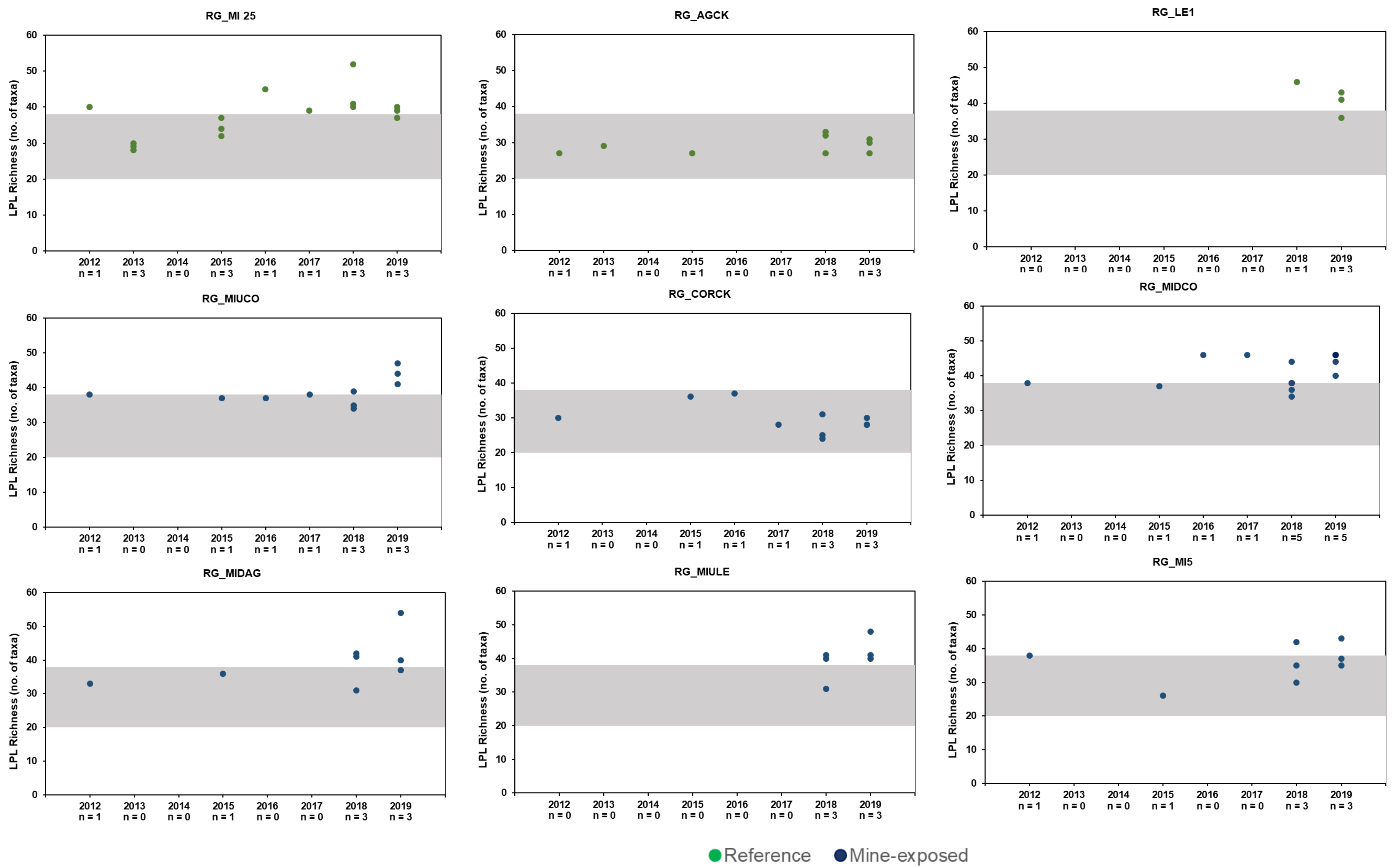
3.0 BENTHIC INVERTEBRATE COMMUNITY

Figure 3.0-1: Benthic Invertebrate Abundance in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



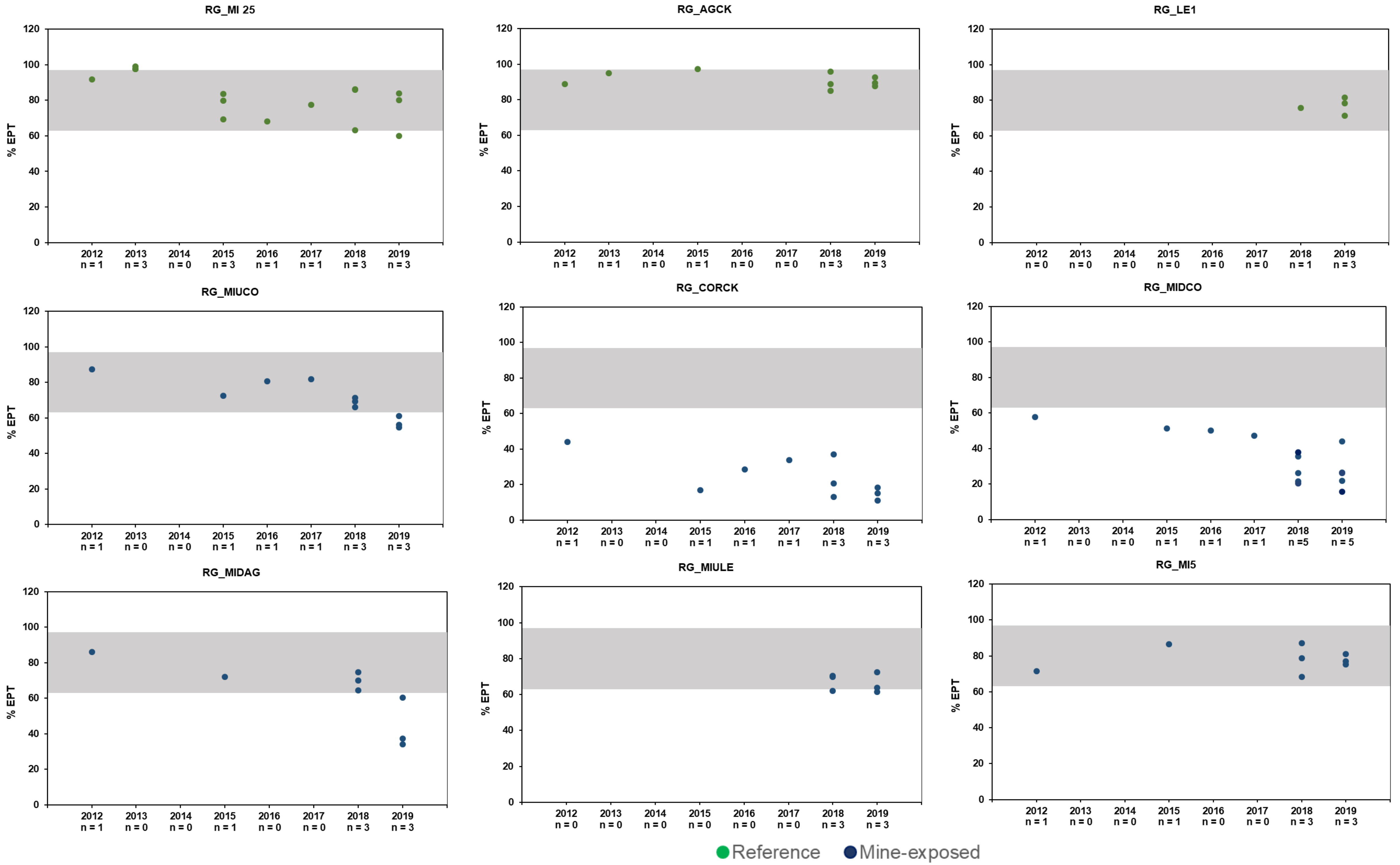
Note: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the Regional Aquatic Environmental Monitoring Program (RAEMP).
n = sample size

Figure 3.0-2: Benthic Invertebrate Taxonomic Richness (lowest possible level) in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



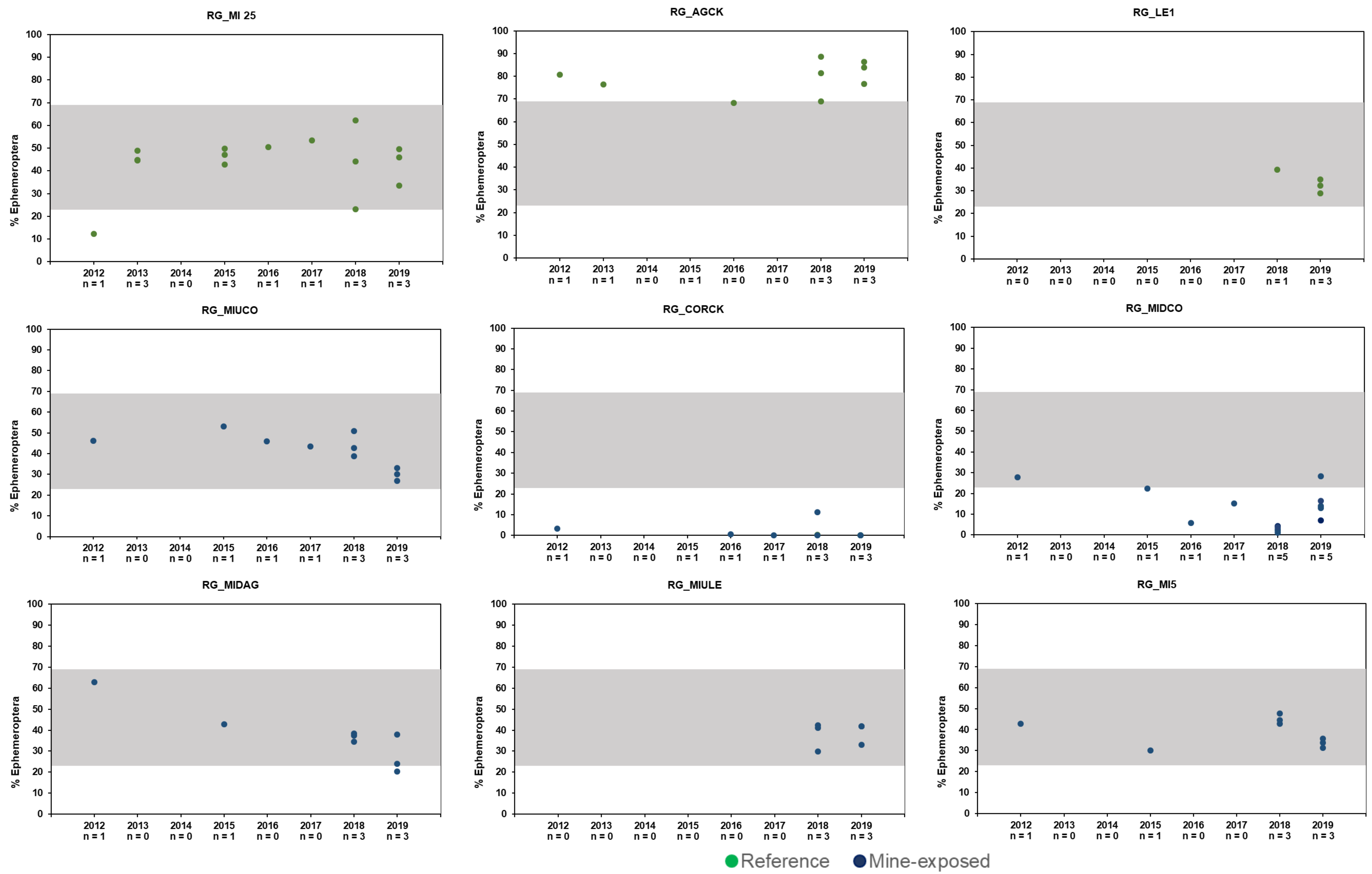
Note: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the Regional Aquatic Environmental Monitoring Program (RAEMP).
LPL = lowest possible level; n = sample size

Figure 3.0-3: Percent Ephemeroptera, Plecoptera, Tricoptera in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



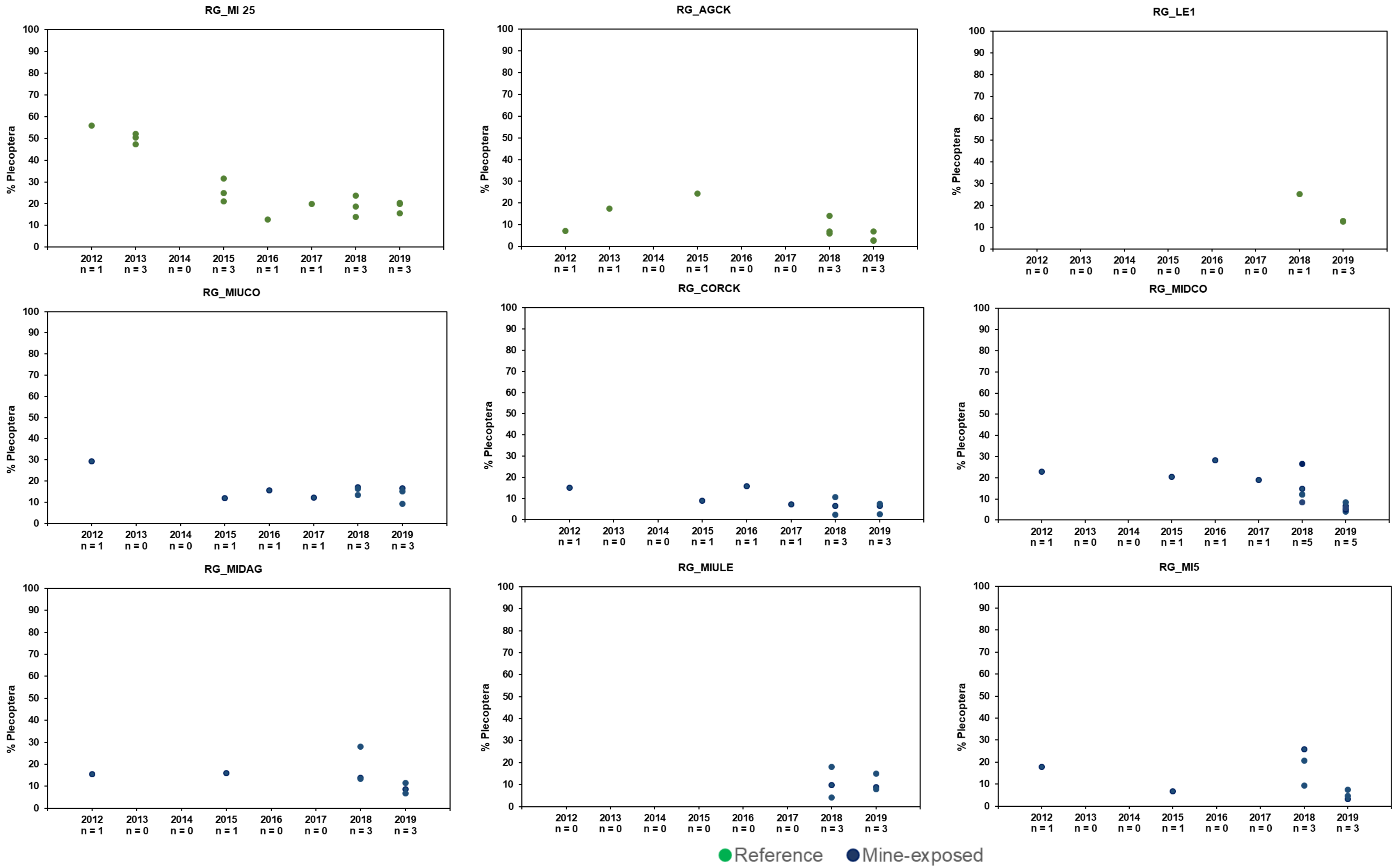
Note: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the Regional Aquatic Environmental Monitoring Program (RAEMP).
% = percent; n = sample size

Figure 3.0-4: Percent Ephemeroptera in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



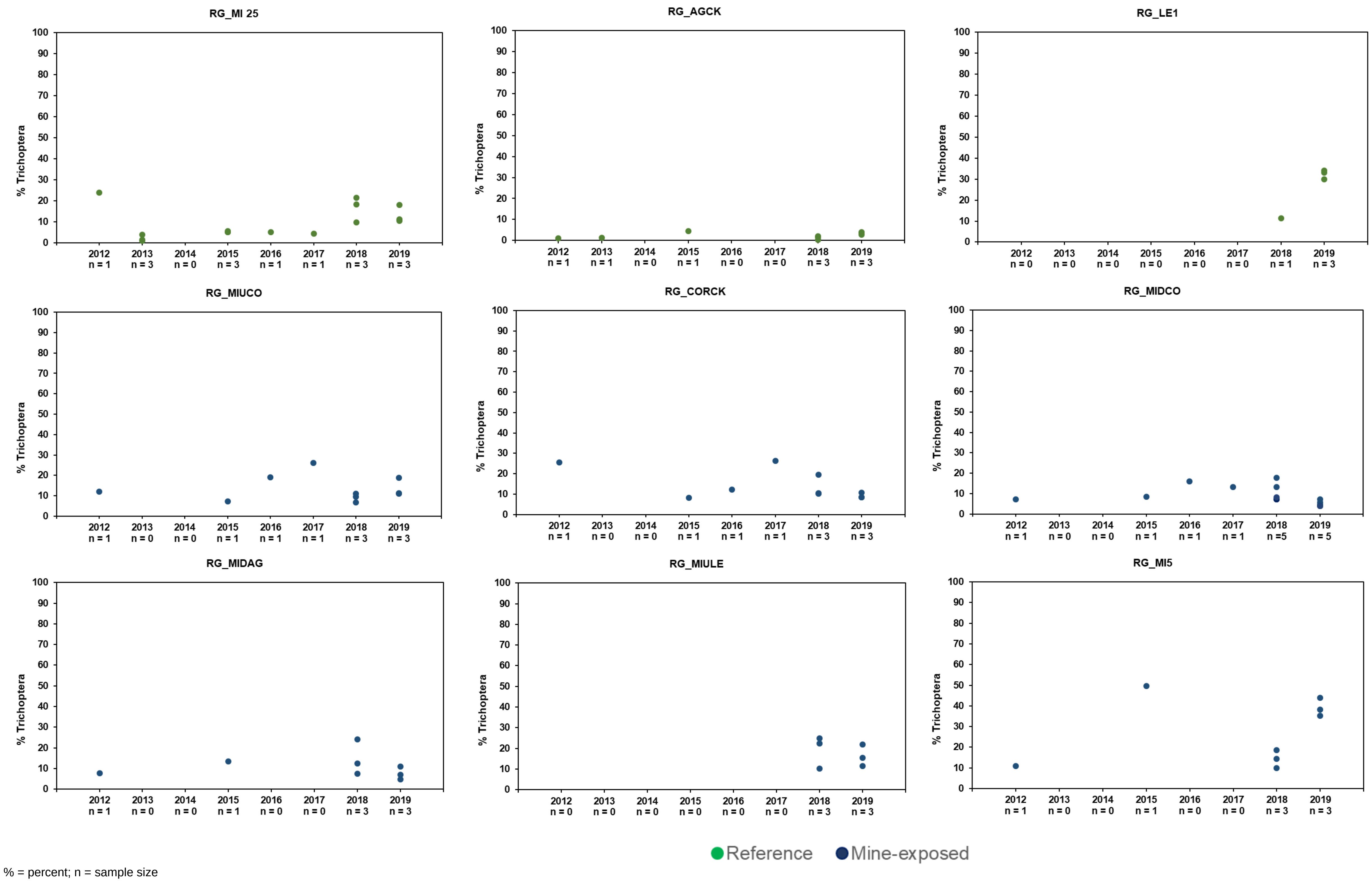
Note: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the Regional Aquatic Environmental Monitoring Program (RAEMP).
% = percent; n = sample size

Figure 3.0-5: Percent Plecoptera in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



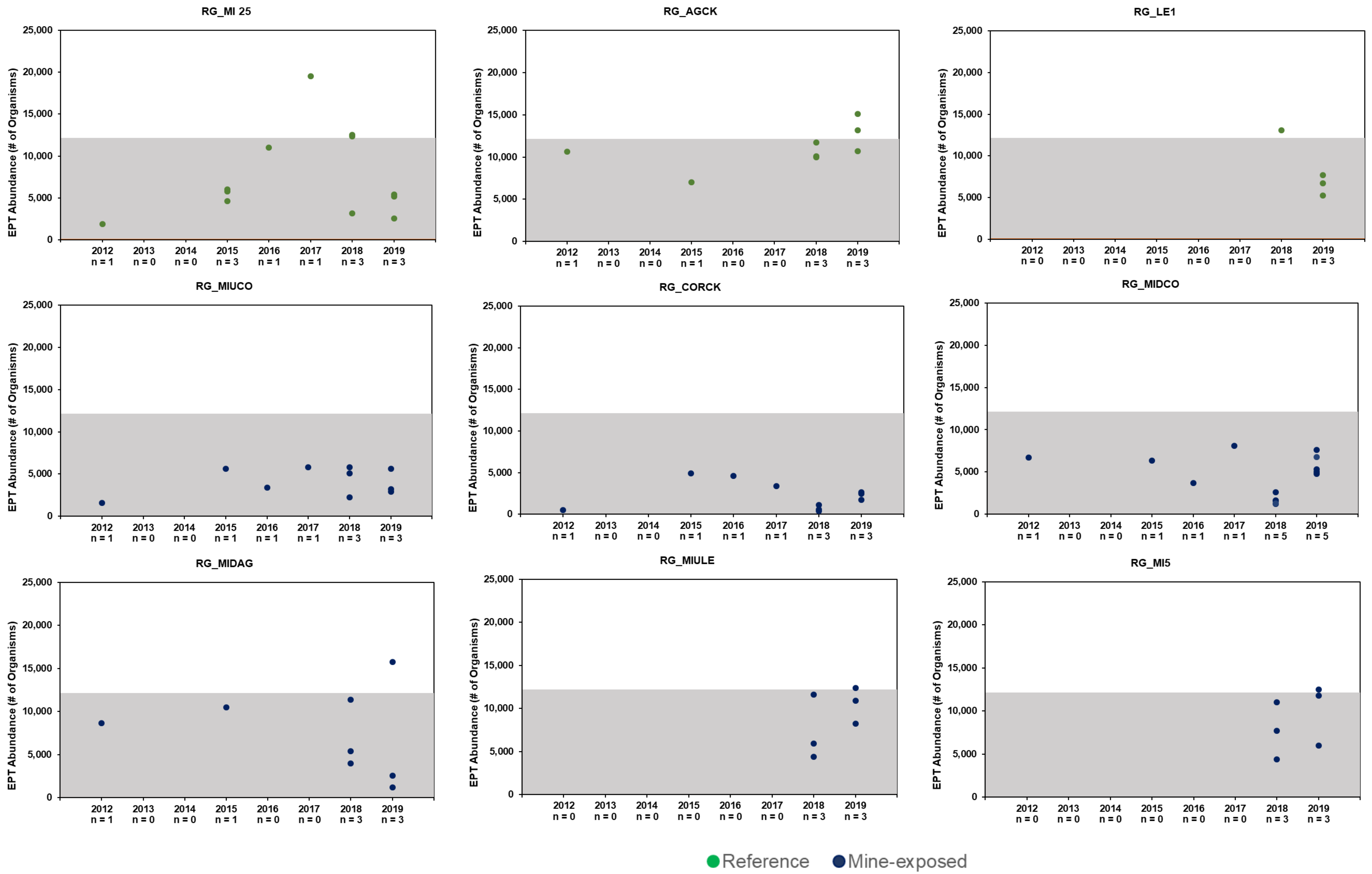
% = percent; n = sample size

Figure 3.0-6: Percent Trichoptera in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



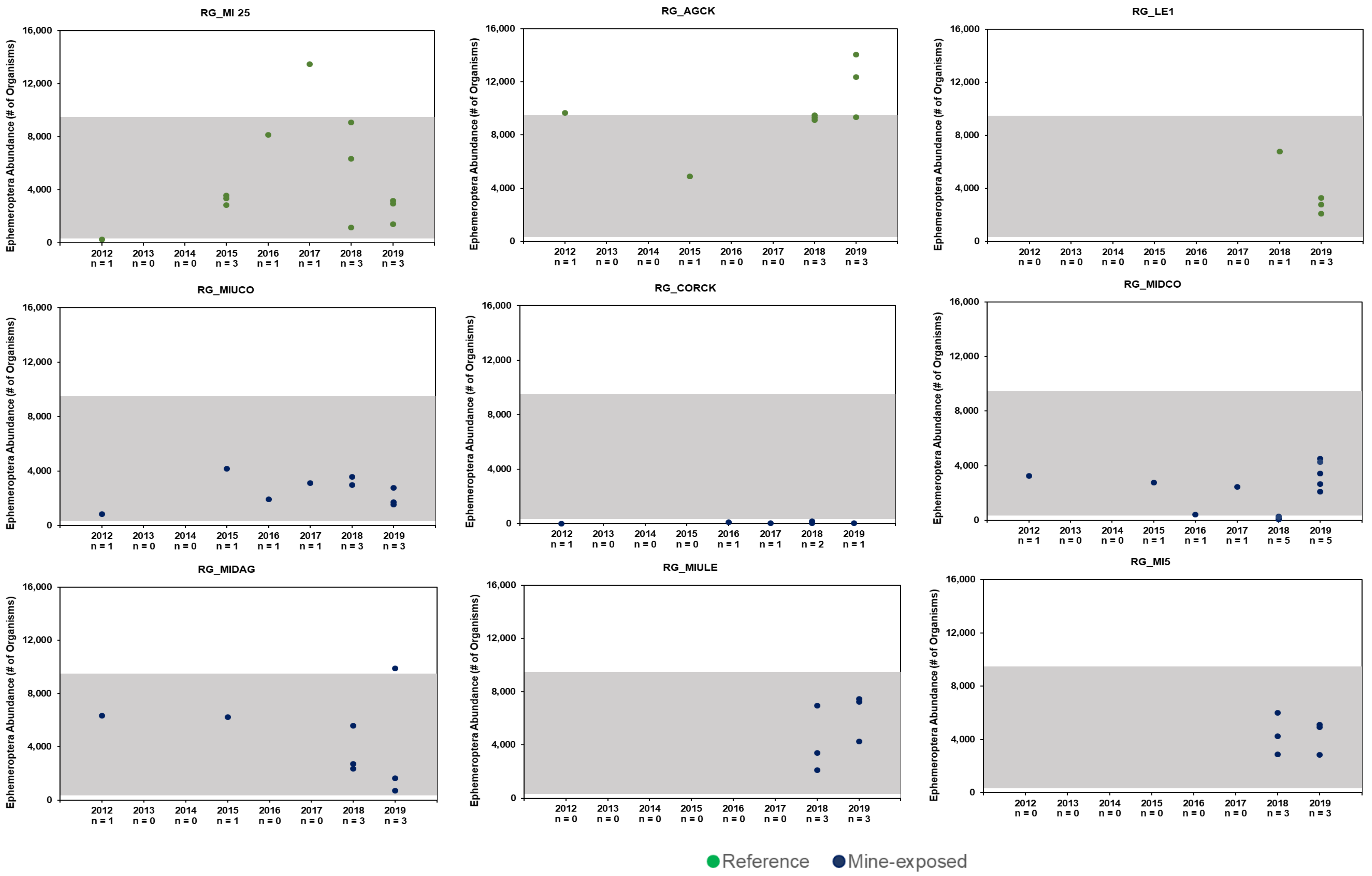
% = percent; n = sample size

Figure 3.0-7: Ephemeroptera, Plecoptera, Trichoptera Abundance in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



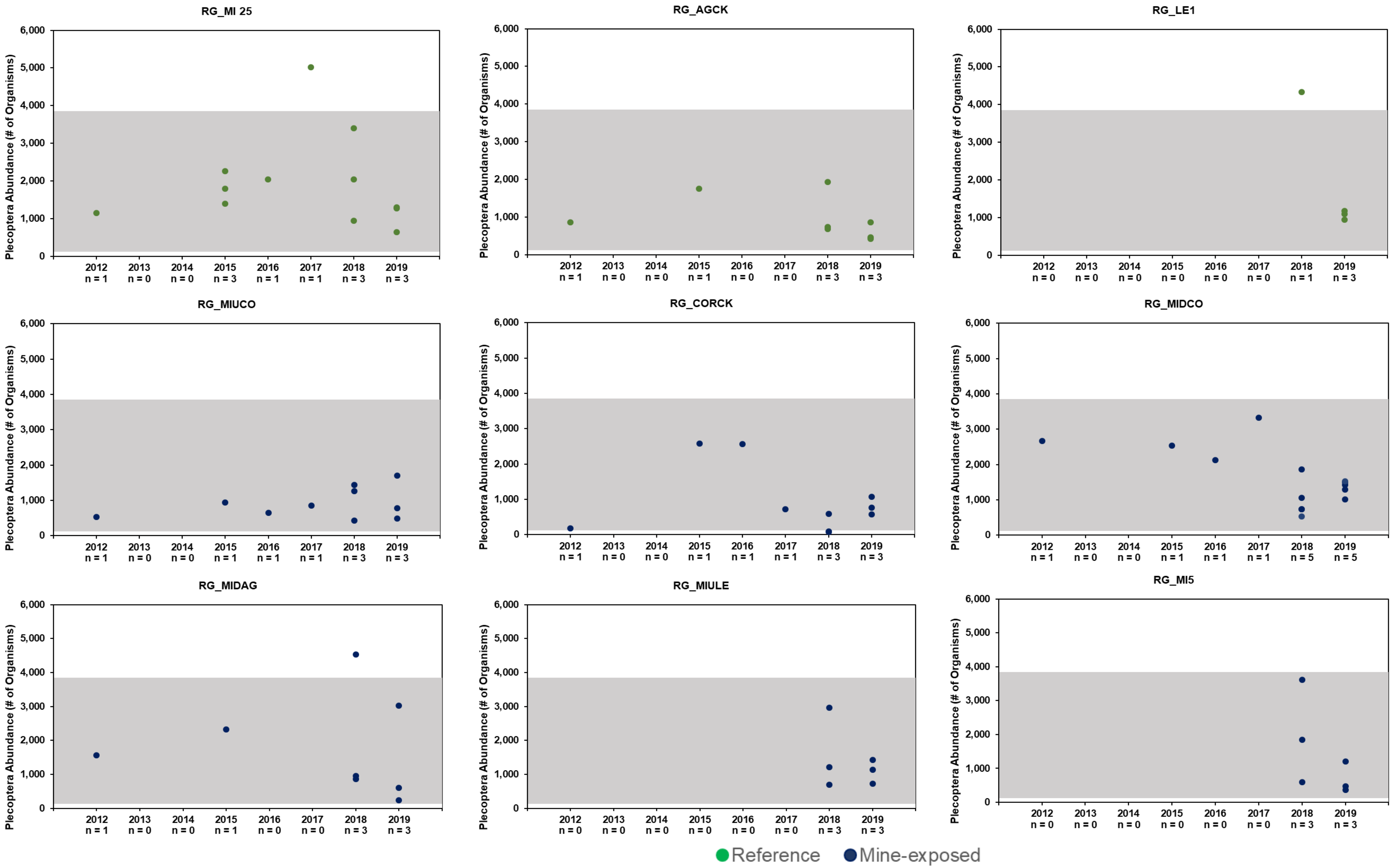
Note: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the Regional Aquatic Environmental Monitoring Program (RAEMP).
EPT = ephemoptera, plecopteran, trichopteran; n = sample size

Figure 3.0-8: Ephemeroptera Abundance in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



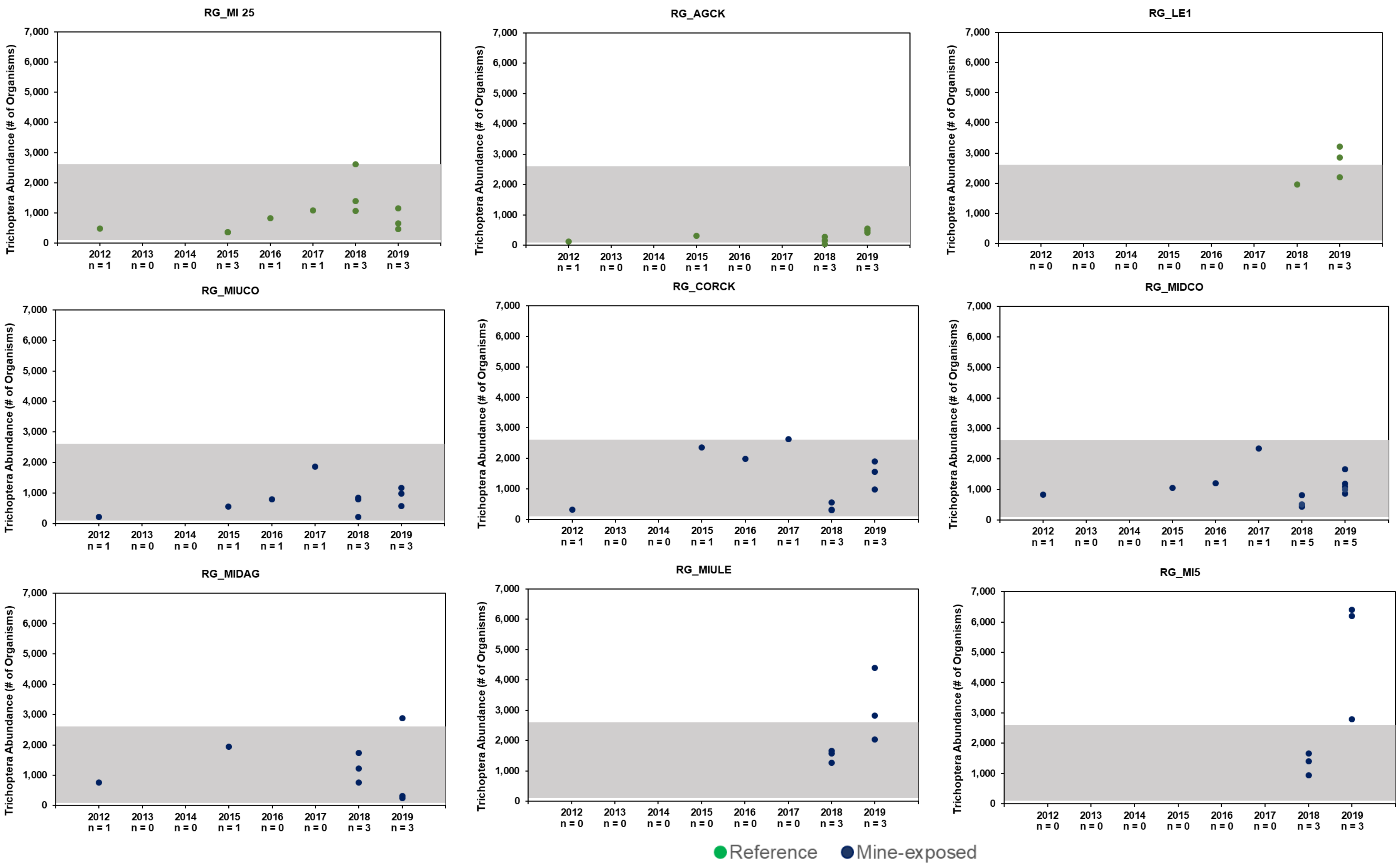
Note: Grey hading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the Regional Aquatic Environmental Monitoring Program (RAEMP).
n = sample size

Figure 3.0-9: Plecoptera Abundance in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



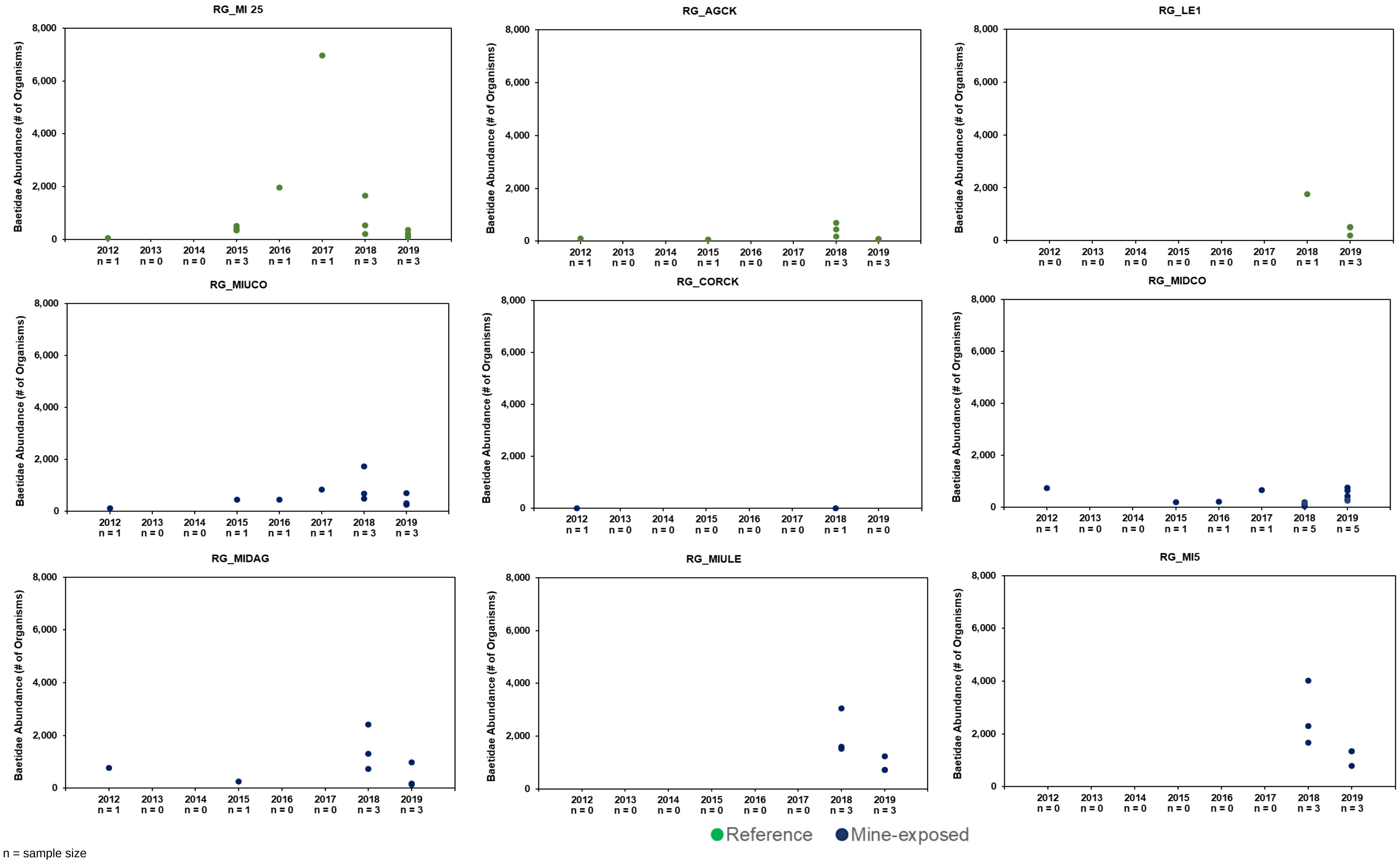
Note: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the Regional Aquatic Environmental Monitoring Program (RAEMP).
n = sample size

Figure 3.0-10: Trichoptera Abundance in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



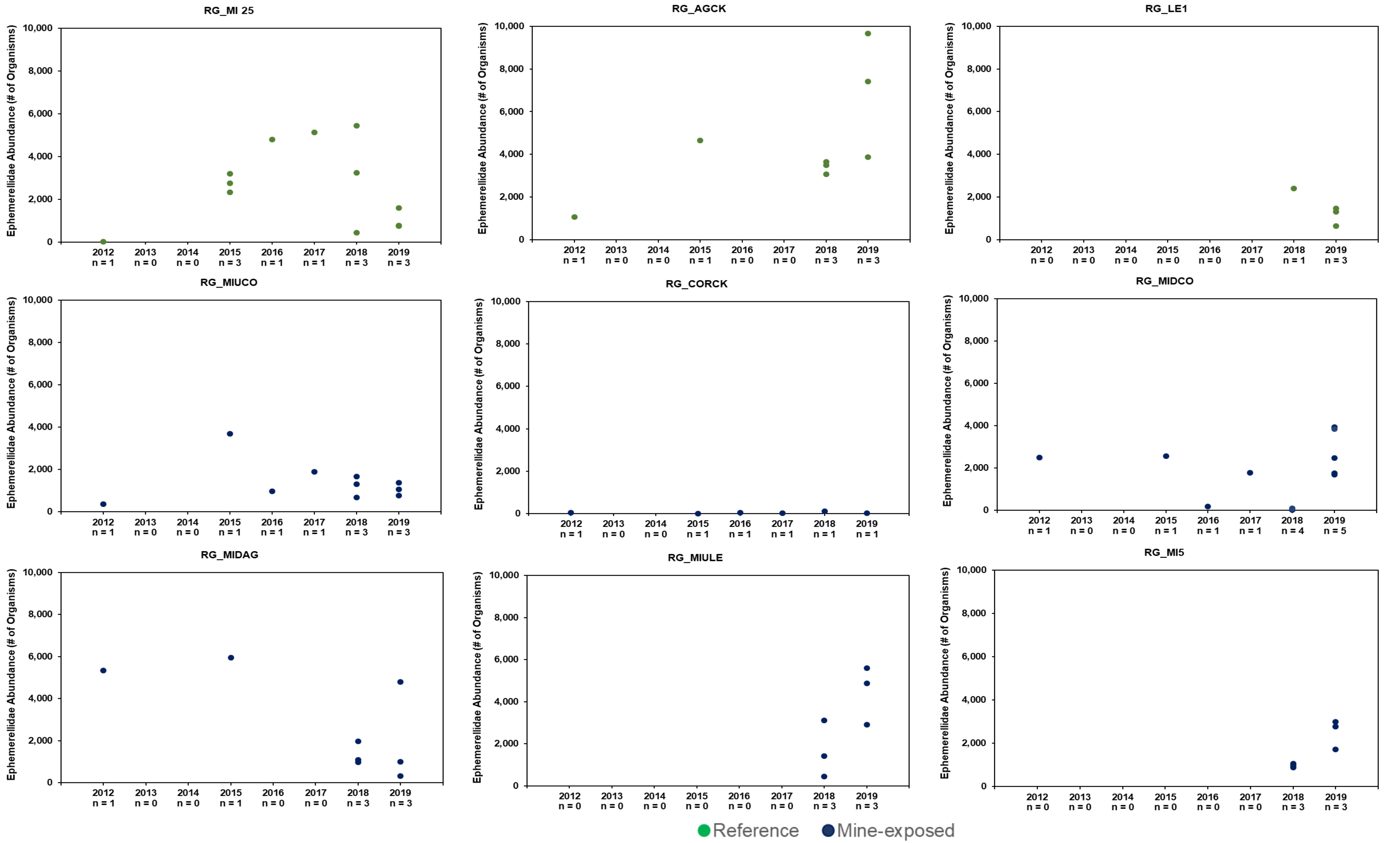
Note: Grey shading represents the normal range defined as the 2.5th and 97.5th percentiles of the 2012 and 2015 reference area data from the Regional Aquatic Environmental Monitoring Program (RAEMP).
n = sample size

Figure 3.0-11: Baetidae Abundance in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



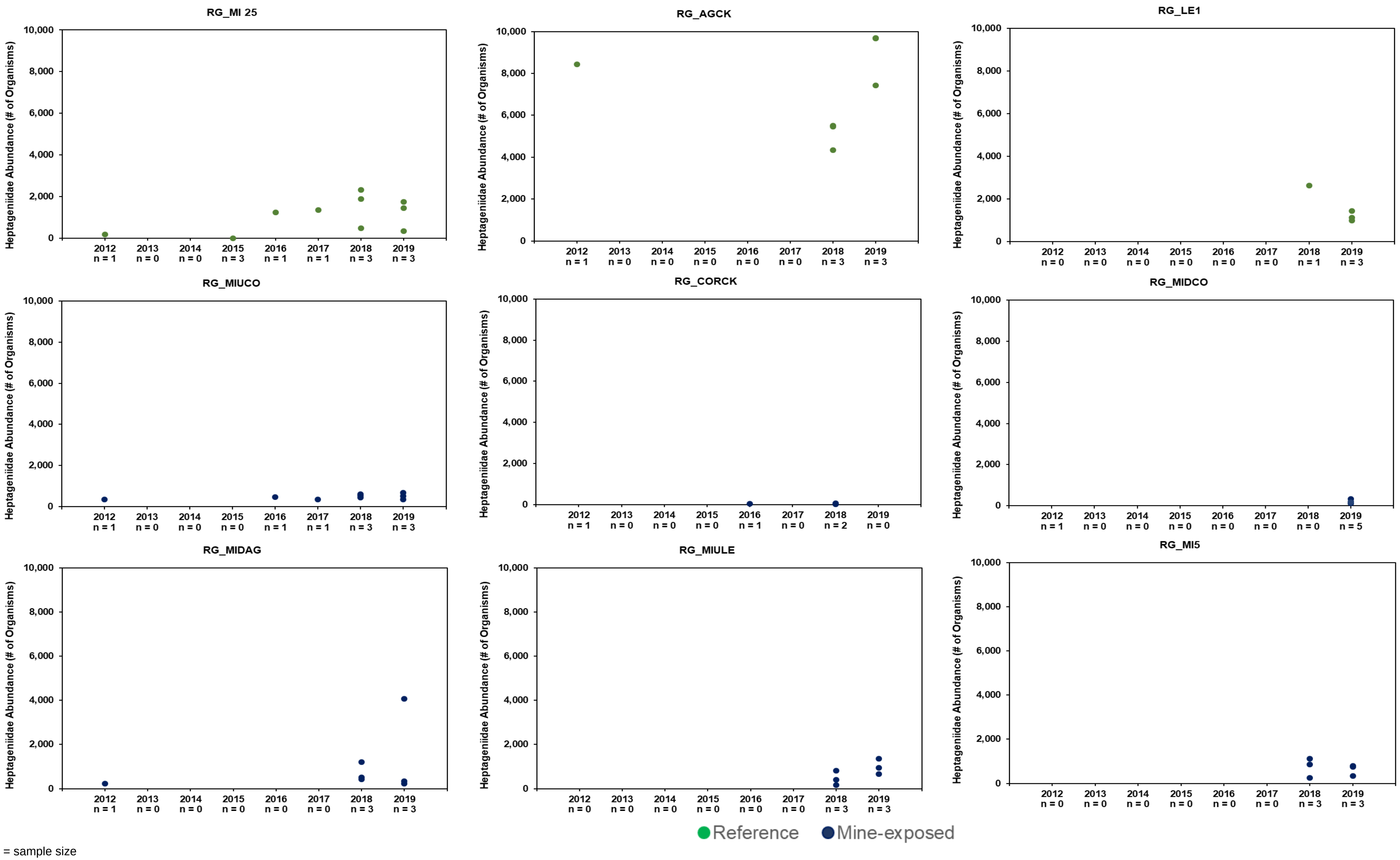
n = sample size

Figure 3.0-12: Ephemerillidae Abundance in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



n = sample size

Figure 3.0-13: Heptageniidae Abundance in Samples Collected from the Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2012 to 2019



n = sample size

4.0 HABITAT COMPARISON

Figure 4.0-1: Proportion of Ephemeroptera, Plecoptera, and Trichoptera versus Substrate Composition in the CMO LAEMP Study Area, 2018 and 2019

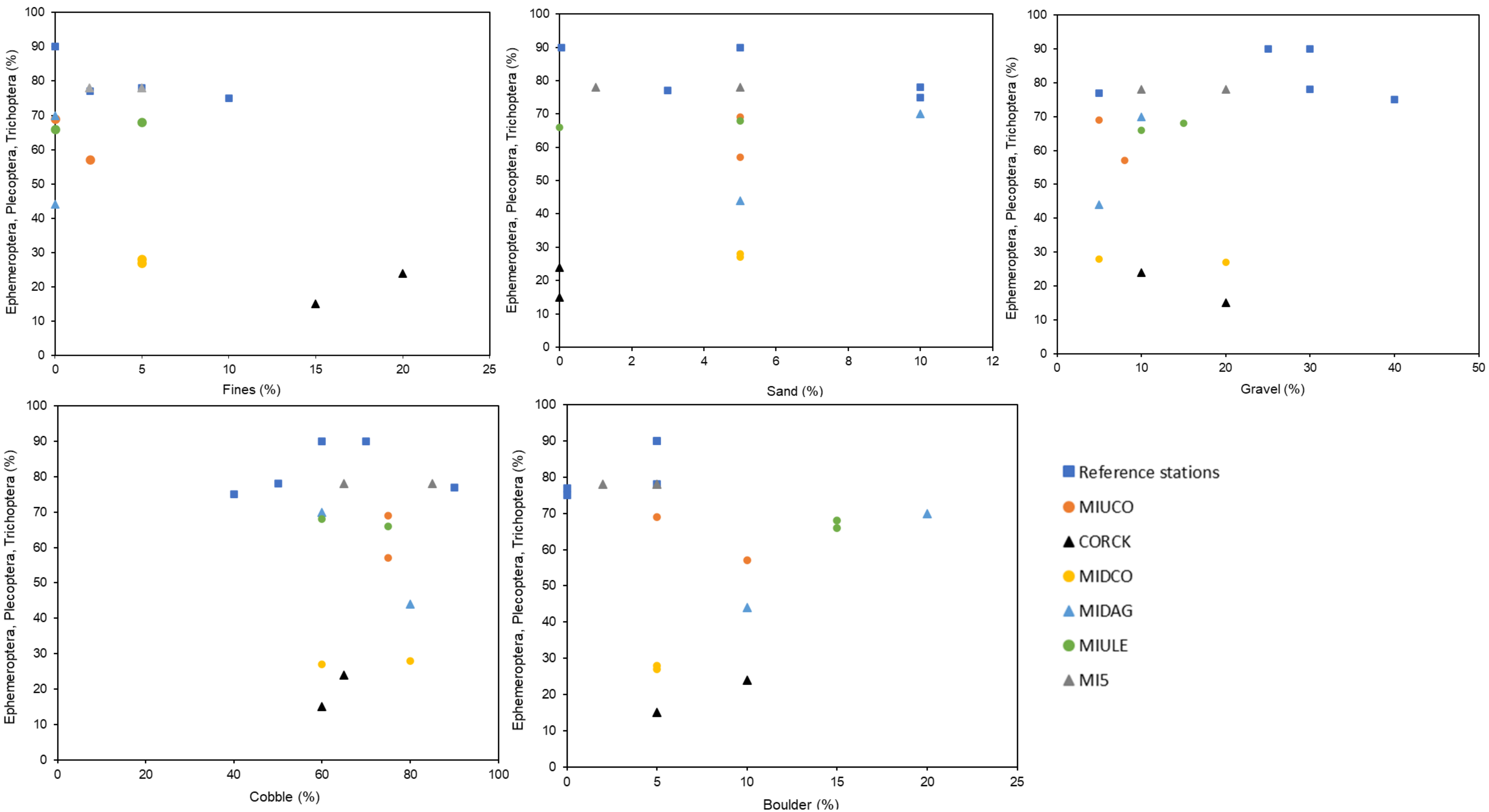
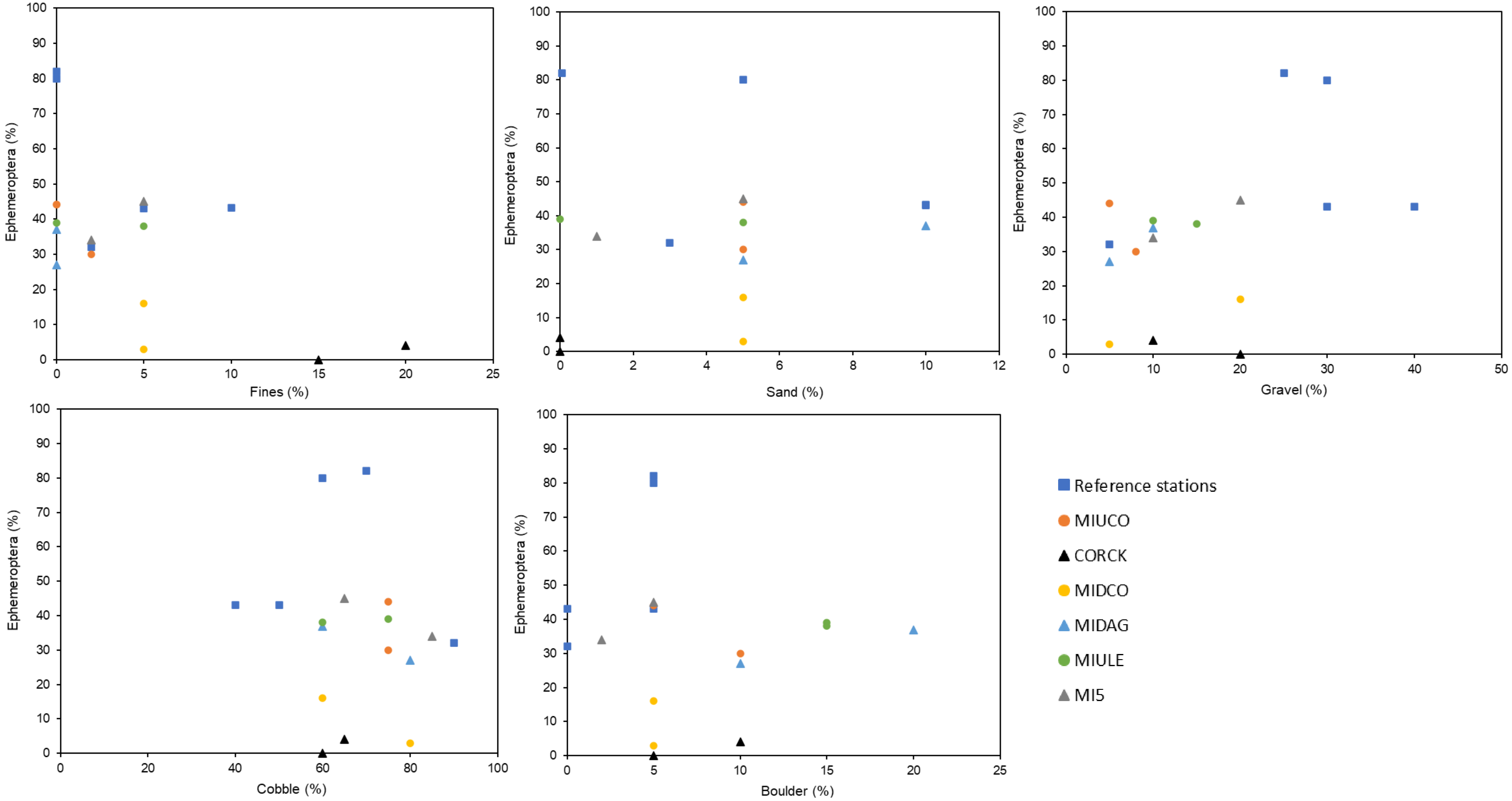


Figure 4.0-2: Proportion of Ephemeroptera versus Substrate Composition in the CMO LAEMP Study Area, 2018 and 2019



APPENDIX B

Water Quality Screening

Table B-1: Screening of Water Quality Samples Collected from the Teck Coal Mountain Opertions Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Location / Watercourse / Station ID / Date	Unit	BC WQ Guidelines for the Protection of Aquatic Life		CMO Compliance Limit or SPO(h) (Permit 107517)	EVWQP Benchmarks or Screening Values(i)										
		Long-term (30-day mean)	Short-term (Maximum)		Fish			Invertebrates (water fleas)			Amphibians			Juvenile Birds	Adult Birds
					Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 1
Parameter															
pH	-	6.5 to 9.0		-	-	-	-	-	-	-	-	-	-	-	-
Temperature	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved oxygen	mg/L	8.0	5.0	-	-	-	-	-	-	-	-	-	-	-	-
Specific conductivity	µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conventional Parameters															
pH	-	6.5 to 9.0		-	-	-	-	-	-	-	-	-	-	-	-
Specific conductivity	µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness, as $CaCO_3$	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total alkalinity, as $CaCO_3$	mg/L	20(a)	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydroxide	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total dissolved solids (calculated)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total suspended solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total organic carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved organic carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Major Ions															
Bicarbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbonate	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	150	600	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride	mg/L	-	1.3 to 2.3(b)	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Magnesium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Potassium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Sodium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate	mg/L	309 to 429(b, c)	-	500	499	674	1,173	625	729	1,315	481	822	1,545	-	-
Nutrients and Biological Indicators															
Nitrate	mg-N/L	3	33	5	5 to 44	6 to 60	14 to 134	2 to 15	3 to 25	11 to 104	9 to 91	116 to 1114	461 to 4436	-	-
Nitrite	mg-N/L	0.020 to 0.080(d)	0.060 to 0.24(d)	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate + nitrite	mg-N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total ammonia	mg-N/L	0.46 to 1.1(e)	2.4 to 5.9(e)	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl nitrogen	mg-N/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total nitrogen (calculated)	mg-N/L	-	-											-	-
Total phosphorus	mg-P/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Orthophosphate	mg-P/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Metals															
Aluminum	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	mg/L	0.0090	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	-	0.0050	-	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/L	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/L	0.00013	-	-	-	-	-	-	-	-	-	-	-	-	-
Bismuth	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron	mg/L	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	-	-	0.001 to 0.002	-	-	-	-	-	-	-	-	-	-	-
Chromium	mg/L	0.0010(f)	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	mg/L	0.0040	0.11	-	0.3 to 0.9	-	-	0.003 to 0.01	0.01 to 0.01	0.01 to 0.02	-	-	-	-	-
Copper	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	mg/L	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/L	0.0066 to 0.020(b)	0.085 to 0.42(b)	-	-	-	-	-	-	-	-	-	-	-	-
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/L	1.1 to 2.6(b)	1.7 to 3.4(b)	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	0.000010	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	mg/L	1.0	2.0	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/L	0.098 to 0.15(b)	-	-	0.088	0.134	278	0.0053	0.015	0.022	-	-	-	-	-
Selenium	mg/L	0.0020	-	0.019	0.019	0.074	-	0.104		-	-	-	-	0.20	0.39
Silicon	mg/L	-	-	-		-	-	-	-	-	-	-	-	-	-
Silver	mg/L	0.0015(b)	0.0030(b)	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/L	0.00080	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	mg/L	0.0085	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	0.017 to 0.19	0.043 to 0.34	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Metals															
Aluminum	mg/L	0.050(f)	0.10(f)	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bismuth	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	0.00022 to 0.00046(b)	0.00061 to 0.0028(b)	-	0.0004 to 0.003	0.002 to 0.01	0.002 to 0.02	0.0001 to 0.001	0.0003 to 0.002	0.002 to 0.02	0.4 to 2.5	-	-	-	-
Chromium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/L	0.3 to 1.3(g)	1.8 to 7.6(g)	-	-	-	-	-	-	-	-	-	-	-	-
Iron	mg/L	-	0.35	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Location	Unit	Reference Stations									Mine-influenced Stations											
Watercourse		Michel Creek			Andy Good Creek				Leach Creek		Michel Creek				Corbin Creek				Michel Creek			
Station ID		RG MI25			RG AGCK				RG LE1		RG MIUCO				RG CORCK				RG MIDCO			
Date		10-Sep-15	10-Sep-18	4-Sep-19	16-Sep-12	12-Sep-15	8-Sep-18	6-Sep-19	13-Sep-18	5-Sep-19	15-Sep-12	10-Sep-15	10-Sep-18	9-Sep-19	15-Sep-12	11-Sep-15	9-Sep-18	7-Sep-19	15-Sep-12	11-Sep-15	9-Sep-18	9-Sep-19
Parameter																						
pH	-	8.2	8.1	8.2	8.2	8.2	8.0	8.3	7.4	8.3	8.4	8.4	8.4	8.4	8.1	8.1	8.1	8.1	8.3	8.3	8.4	8.3
Temperature	°C	8.5	7.3	9.7	8.4	8.4	9.6	7.2	9.6	14	9.3	9.3	9.3	9.2	11	11	11	11	12	12	12	11
Dissolved oxygen	mg/L	11	11	9.9	11	11	11	11	10	9.7	11	11	12	11	9.1	9.1	9.0	9.2	11	11	12	9.6
Specific conductivity	µS/cm	251	190	311	268	268	256	281	196	210	238	238	210	266	1,586	1,586	1,710	1,461	930	930	934	926
Conventional Parameters																						
pH	-	-	8.4	8.2	-	-	8.4	8.2	8.1	8.3	-	-	8.4	8.4	-	-	8.2	8.2	-	-	8.3	8.3
Specific conductivity	µS/cm	-	293	284	-	-	270	244	208	197	-	-	304	289	-	-	1,680	1,420	-	-	1,240	994
Hardness, as $CaCO_3$	mg/L	150	152	161	139	122	133	138	107	103	186	164	165	157	924	913	991	987	550	480	651	565
Total alkalinity, as $CaCO_3$	mg/L	160	147	149	-	90	119	124	0	107	-	163	151	148	-	270	208	278	-	225	192	218
Hydroxide	mg/L	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	0.0	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0
Total dissolved solids (calculated)	mg/L	170	138	176	-	138	181	158	117	126	-	180	154	184	-	1,220	1,360	1,350	-	637	979	786
Total suspended solids	mg/L	<1.0	1.3	<1.0	<3.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0	1.0	0.79	1.7	2.6	<3.0	1.4	2.1	3.3
Total organic carbon	mg/L	0.78	138	<0.5	0.52	0.57	0.94	0.59	1.02	1.1	0.69	-	0.94	0.68	<3.0	1.0	1.3	0.83	1.1	0.74	1.7	0.73
Dissolved organic carbon	mg/L	0.81	0.86	<0.5	0.65	<0.5	0.93	0.52	1.02	1.1	0.74	0.62	0.90	0.63	1.1	0.74	1.4	0.79	1.2	0.71	1.4	0.58
Major Ions																						
Bicarbonate	mg/L	160	144	149	-	90	117	124	0	107	-	163	147	145	-	270	208	278	-	225	191	218
Carbonate	mg/L	<1.0	3.6	<1.0	-	<1.0	2.0	<1.0	0.0	<1.0	-	<1.0	4.4	3.2	-	<1.0	<1.0	<1.0	-	<1.0	1.8	<1.0
Calcium	mg/L	43	43	46	43	38	39	40	29	28	51	45	46	42	-	185	220	204	132	104	144	120
Chloride	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	6.5	5.7	4.2	3.0	<0.5	3.2	3.2	<2.5
Fluoride	mg/L	0.059	0.072	0.078	0.30	0.22	0.32	0.32	-	0.064	0.088	0.069	0.089	0.074	0.20	0.13	0.26	0.12	<0.2	0.11	0.18	0.12
Magnesium	mg/L	11	11	12	7.8	6.7	8.4	9.1	9.1	8.5	14	14	12	13	96	111	109	121	54	56	72	69
Dissolved Magnesium	mg/L	11	11	11	7.8	6.7	8.5	9.1	8.7	7.9	14	13	12	13	-	109	107	116	54	53	71	64
Potassium	mg/L	0.54	0.53	0.53	0.22	<0.25	0.21	0.21	0.59	0.54	0.49	0.49	0.48	0.46	-	3.1	4.7	3.4	2.0	1.6	3.1	2.1
Dissolved Potassium	mg/L	0.52	0.51	0.53	0.22	<0.25	0.23	0.18	0.56	0.55	0.49	0.49	0.45	0.48	3.6	3.3	4.5	3.6	2.0	1.7	2.9	2.0
Sodium	mg/L	3.0	3.1	3.4	0.50	0.34	0.58	0.59	0.81	0.75	2.9	2.6	2.7	2.6	-	20	34	20	14	10	22	11
Dissolved Sodium	mg/L	3.0	2.8	3.2	0.50	0.33	0.64	0.57	0.81	0.77	2.9	2.6	2.4	2.7	25	21	34	20	14	11	23	12
Sulphate	mg/L	15	14	14	12	18	20	20	-	4.9	31	20	16	17	**657**(Mn)	**659**(Mn)	**836**(Mn)	**679**(Mn)	348	288	***531***(Mn)	373
Nutrients and Biological Indicators																						
Nitrate	mg-N/L	0.015	0.020	0.015	0.122	0.291	0.140	0.152	-	0.008	<0.005	<0.005	<0.005	<0.005	**5.6**(Mn)	**7.7**(Mn)	**8.7**(Mn)	**5.9**(Mn)	2.7	**3.1**(Mn)	***5.4***(Mn)	2.9
Nitrite	mg-N/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	0.0012	<0.001	<0.001	0.049	0.023	**0.099**(Mn)	0.014	**0.022**(Mn)	0.0049	**0.060**(Mn)	<0.005
Nitrate + nitrite	mg-N/L	-	-	0.015	0.12	0.29	0.14	0.15	-	0.0081	0.0050	0.0050	0.0050	0.0050	5.6	7.7	8.7	5.9	2.7	3.1	5.4	2.9
Total ammonia	mg-N/L	<0.005	<0.005	0.0064	<0.005	<0.005	-	<0.005	-	0.0081	<0.005	0.0059	<0.005	<0.005	0.14	0.015	0.30	0.025	0.0092	<0.005	0.11	0.0095
Total Kjeldahl nitrogen	mg-N/L	0.056	0.58	0.055	<0.05	0.17	<0.05	<0.05	<0.050	0.056	<0.05	<0.05	0.052	0.088	0.086	0.22	0.32	<0.05	<0.05	0.21	0.28	0.37
Total nitrogen (calculated)	mg-N/L	-	-	0.070	0.15	0.46	0.17	0.18	-	0.064	0.030	0.030	0.057	0.093	5.7	7.9	9.0	5.9	2.7	3.3	5.7	3.3
Total phosphorus	mg-P/L	0.0061	0.0073	0.0040	<0.05	0.0027	0.0034	<0.002	-	0.014	0.0046	0.0054	0.0050	0.0062	0.0030	0.0038	0.0056	<0.002	0.0079	0.0039	0.011	0.0060
Orthophosphate	mg-P/L	0.0056	0.0045	0.0045	-	0.0015	0.0019	<0.001	0.021	0.013	-	0.0032	0.0024	0.0025	-	0.0011	0.0020	<0.001	-	0.0018	<0.001	<0.001
Total Metals																						
Aluminum	mg/L	<0.015	0.035	0.0076	0.027	0.018	0.0048	<0.003	0.008	0.0033	0.019	0.018	0.012	0.010	0.034	<0.015	0.020	0.0053	0.017	<0.015	0.0055	0.022
Antimony	mg/L	<0.0005	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	0.00072	<0.0005	0.0012	0.00039	0.00033	<0.0005	0.00069	0.00020
Arsenic	mg/L	<0.0005	0.00022	0.00019	0.00045	0.00061	0.00046	0.00050	0.00018	0.00019	0.00015	<0.0005	0.00018	0.00015	0.00025	<0.0005	0.00032	0.00021	0.00020	<0.0005	0.00022	0.00020
Barium	mg/L	0.054	0.053	0.053	0.019	0.014	0.021	0.020	0.139	0.13	0.070	0.078	0.081	0.074	0.060	0.066	0.046	0.045	0.075	0.086	0.072	0.069
Beryllium	mg/L	<0.0001	<0.00002	<0.00002	<0.0001	<0.0001	<0.00002	<0.00002	<0.000020	<0.00002	<0.0001	<0.0001	<0.00002	<0.00002	<0.0001	<0.0001	<0.00002	<0.00002	<0.0001	<0.0001	<0.00002	<0.00002
Bismuth	mg/L	<0.00025	<0.00005	<0.00005	<0.0005	<0.00025	<0.00005	<0.00005	<0.000050	<0.00005	<0.0005	<0.00025	<0.00005	<0.00005	<0.0005	<0.00025	<0.00005	<0.00005	<0.0005	<0.00025	<0.00005	<0.00005
Boron	mg/L	<0.05	0.015	0.018	<0.01	<0.05	<0.01	<0.01	<0.010	<0.01	0.016	<0.05	0.011	0.012	0.064	<0.05	0.10	0.043	0.038	<0.05	0.067	0.033
Cadmium	mg/L	<0.000025	0.000016	0.00001	0.00002	<0.00003	0.00001	0.00012	0.00003	0.00031	<0.00001	<0.00003	0.00001	0.00011	0.00012	<0.00003	0.00008	0.00058	0.00003	<0.00003	0.00002	0.00022
Chromium	mg/L	<0.0005	0.00021	0.00022	0.00047	<0.0005	<0.0004	0.00021	0.00010	<0.0001	0.00038	<0.0005	0.00022	0.00024	0.00023	<0.0005	<0.0003	0.00016	0.00025	<0.0005	<0.0003	0.00015
Cobalt	mg/L	<0.0005	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	<0.10	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	**0.018**(Mn)	0.0022	**0.028**(Mn)	**0.0042**(Mn)	**0.0049**(Mn)	<0.0005	**0.0085**(Mn)	0.0011
Copper	mg/L	<0.0025	<0.0005	<0.0005	0.00058	<0.0025	<0.0005	<0.0005	<0.00050	<0.0005	0.00073	<0.0025	<0.0005	0.0092	0.00066	<0.0025	<0.0005	<0.0005	<0.0005	<0.0025	<0.0005	<0.0005
Iron	mg/L	<0.05	0.033	<0.01	0.026	<0.05	<0.01	<0.01	<0.010	<0.01	0.022	<0.05	0.015	0.066	0.021	<0.05	0.013	0.011	0.013	<0.05	<0.01	0.035
Lead	mg/L	<0.00025	0.000052	<0.00005	<0.00005	<0.00025	<0.00005	<0.00005	<0.000050	<0.00005	<0.00005	<0.00025	<0.00005	<0.00005	<0.00005	<0.00025	<0.00005	<0.00005	<0.00005	<0.00025	<0.00005	<0.00005
Lithium	mg/L	<0.005	0.0049	0.0055	0.0017	<0.005	0.0019	0.0018	0.0018	0.0019	0.0040	<0.005	0.0040	0.0044	0.035	0.029	0.054	0.030	0.019	0.014	0.035	0.019
Manganese	mg/L	<0.0005	0.0021	0.00041	0.00075	0.00060	0.00021	<0.0001	0.0008	0.00074	0.0030	0.0057	0.0029	0.0032	0.090	0.0091	0.11	0.018	0.023	0.0027	0.025	0.0065
Mercury	mg/L	<0.000005	0.00000061	<0.000005	<0.00001	<0.000005	<0.000005	<0.000005	<0.00050	<0.000005	<0.00001	<0.000005	<0.000005	<0.000005	<0.00001	<0.000005	<0.000005	<0.000005	<0.00001	<0.000005	<0.000005	0.0000052
Molybdenum	mg/L	0.0010	0.00092	0.00094	0.00065	0.00065	0.00074	0.00079	0.00068	0.00061	0.00072	0.00077	0.00075	0.00077	0.0031	0.0015	0.0062	0.0014	0.0018	0.0011	0.0039	0.0010
Nickel	mg/L	<0.0025	<0.0005	<0.0005	<0.0005	<0.0025	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0025	<0.0005	0.0035	0.082	0.039	0.15	0.055	0.028	0.011	0.069	0.021
Selenium	mg/L	<0.00025	0.00022	0.00024	0.0012	0.0015	0.0016	0.0017	0.00043	0.00046	0.00026	0.00028	0.00026	0.00026	**0.015**(Mn)	**0.014**(Mn)	**0.013**(Mn)	**0.018**(Mn)	**0.0066**(Mn)	**0.0057**(Mn)	**0.0075**(Mn)	**0.0092**(Mn)
Silicon	mg/L	2.3	2.3	2.6	1.3	1.1	1.4	1.4	2.1	2.2	2.2	2.2	2.2	2.1	2.5	2.2	2.3	2.0	2.2	2.2	2.1	2.2
Silver	mg/L	<0.00005	0.000027	<0.00001	<0.00001	<0.00005	<0.00001	<0.00001	<0.000010	<0.00001	<0.00001	<0.00005	0.000074	<0.00001	<0.00001	<0.00005	<0.00001	<0.00001	<0.00001	<0.00005	<0.00001	<0.00001
Strontium	mg/L	0.16	0.15	0.15	0.12	0.095	0.13	0.14	0.07	0.062	0.15	0.15	0.14	0.14	0.61	0.56	1.0	0.64	0.37	0.33	0.67	0.38
Thallium	mg/L	<0.00005	<0.00001	<0.00001	0.000045	0.000063	0.000043	0.000045	<0.000010	<0.00001	<0.00001	<0.00005	<0.00001	<0.00001	0.000050	<0.00005	0.000072	0.000039	0.000021	<0.00005	0.000035	0.000019
Tin	mg/L	<0.0005	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0005	<0.0001	0.00013	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001
Titanium	mg/L	<0.0015	<0.01	<0.01	<0.01	<0.0015	<0.01	<0.01	<0.010	<0.01	<0.01	<0.0015	<0.01	<0.01	<0.01	<0.0015	<0.01	<0.01	<0.01	<0.0015	<0.01	<0.01
Uranium	mg/L	0.00024	0.00023	0.00025	0.00066	0.00069	0.00079	0.00074	0.00022	0.00018	0.00030	0.00030	0.00025	0.00030	0.0060	0.0063	**0.0092**(Mn)	0.0059	0.0029	0.0027	0.0052	0.0030
Vanadium	mg/L	<0.0025	<0.0005	<0.0005	<0.001	<0.0025	<0.0005	<0.0005	<0.00050	<0.0005	<0.001	<0.0025	<0.0005	<0.0005	<0.001	<0.0025	<0.0005	<0.0005	<0.001	<0.0025	<0.0005	<0.0005
Zinc	mg/L	<0.015	<0.003	<0.003	0.0035	<0.015	0.0034	<0.003	<0.0030	<0.003	0.0031	<0.015	<0.003	<0.003	0.022	<0.015	0.016	0.0050	0.0054	<0.015	<0.003	<0.003
Dissolved Metals																						
Aluminum	mg/L	<0.005	<0.003	<0.003	-	0.0052	<0.003	<0.003	<0.0030	<0.003	-	0.0061	<0.003	<0.003	-	<0.005	<0.003	<0.003	-	0.0053	<0.003	<0.003
Antimony	mg/L	<0.0005	<0.0001	<0.0001	-	<0.0005	<0.0001	<0.0001	<0.00010	<0.0001	-	<0.0005	<0.0001	<0.0001	-	<0.0005	0.0012	0.00038	-	<0.0005	0.00069	0.00022
Arsenic	mg/L	<0.0005	0.00019	0.00020	-	0.00062	0.00044	0.00050	0.00018	0.00018	-	<0.0005	0.00015	0.00015	-	<0.0005	0.00027	0.00022	-	<0.0005	0.00020	0.00015
Barium	mg/L	0.055	0.053	0.055	-	0.014	0.021	0.021	0.140	0.13	-	0.078	0.074	0.072	-	0.064	0.045	0.044	-	0.086	0.068	0.067
Beryllium	mg/L	<0.0001	<0.00002	<0.00002	-	<0.0001	<0.00002	<0.00002	<0.000020	<0.00002	-	<0.0001	<0.00002	<0.00002	-	<0.0001	<0.00002	<0.00002	-	<0.0001	<0.00002	<0.00002
Bismuth	mg/L	<0.00025	<0.00005	<0.00005	-	<0.00025	<0.00005	<0.00005	<0.000050	<0.00005	-	<0.00025	<0.00005	<0.00005	-	<0.00025	<0.00005	<0.00005	-	<0.00025	<0.00005	<0.00005
Boron	mg/L	<0.05	0.015	0.017	-	<0.05	<0.01	<0.01	<0.010	<0.01	-	<0.05	0.011	0.011	-	<0.05	0.096	0.048	-	<0.05	0.062	0.029
Cadmium	mg/L	<0.000025	0.000010	0.000010	-	<0.000025	0.000012	0.000010	0.000031	0.000034	-	<0.000025	0.000006	0.000065	-	<0.000025	0.000010	0.000140	-	<0.000025	<0.000005	0.000180
Chromium	mg/L	<0.0005	0.00017	0.00020	-	<0.0005	0.00024	0.00030	<0.00010	<0.0001	-	<0.0005	0.00021	0.00021	-	<0.0005	<0.0001	<0.0001	-	<0.0005	0.00010	0.00016
Cobalt	mg/L	<0.0005	<0.0001	<0.0001	-	<0.0005	<0.0001	<0.0001	<0.10	<0.0001	-	<0.0005	<0.0001	<0.0001	-	0.0020	0.021	0.0026	-	<0.0005	0.0065	0.0051
Copper	mg/L	<0.001	<0.0005	<0.0005	-	<0.001	<0.0005	<0.0005	<0.00050	<0.0005	-	<0.001	<0.0005	<0.0005	-	<0.001	<0.0005	<0.0005	-	<0.001	<0.0005	<0.0005
Iron	mg/L	<0.05	<0.01	<0.01	-	<0.05	<0.01	<0.01	<0.010	<0.01	-	<0.05	<0.01	<0.01	-	<0.05	<0.01	<0.01	-	<0.05	<0.01	<0.01
Lead	mg/L	<0.00025	<0.00005	<0.00005	-	<0.00025	<0.00005	<0.00005	<0.000050	<0.00005	-	<0.00025	<0.00005	<0.00005	-	<0.00025	<0.00005	<0.00005	-	<0.00025	<0.00005	<0.00005
Lithium	mg/L	<0.005	0.0050	0.0049	-	<0.005	0.0018	0.0018	0.0016	0.0016	-	<0.005	0.0040	0.0040	-	0.028	0.054	0.033	-	0.013	0.033	0.017
Manganese	mg/L	<0.0005	0.00034	0.00019	-	<0.0005	<0.0001	<0.0001	0.0004	0.00032	-	0.0039	0.0017	0.00018	-	0.0059	0.066	0.0066	-	0.0021	0.013	0.0011
Mercury	mg/L	<0.000005	<0.000005	<0.000005	-	<0.000005	<0.000005	<0.000005	<0.0000050	<0.000005	-	<0.000005	<0.000005	<0.000005	-	<0.000005	<0.000005	<0.000005	-	<0.000005	<0.000005	<0.000005
Molybdenum	mg/L	0.0010	0.00098	0.00092	-	0.00066	0.00080	0.00078	0.00064	0.00060	-	0.00074	0.00073	0.00073	-	0.0015	0.0068	0.0014	-	0.0012	0.0043	0.0011
Nickel	mg/L	<0.0025	<0.0005	<0.0005	-	<0.0025	<0.0005	<0.0005	<0.00050	<0.0005	-	<0.0025	<0.0005	<0.0005	-	0.038	0.14	0.052	-	0.011	0.063	0.021
Selenium	mg/L	<0.00025	0.0002	0.0002	-	0.0016	0.0018	0.0023	0.0005	0.0005	-	<0.0003	0.0003	0.0003	-	0.0135	0.0168	0.0025	-	0.0056	0.0093	0.0100
Silicon	mg/L	2.2	2.1	2.3	-	1.2	1.3	1.5	2.1	2.1	-	2.1	2.1	2.1	-	2.1	2.3	2.2	-	2.1	2.0	2.0
Silver	mg/L	<0.00005	<0.00001	<0.00001	-	<0.00005	<0.00001	<0.00001	<0.000010	<0.00001	-	<0.00005	<0.00001	<0.00001	-	<0.00005	<0.00001	<0.00001	-	<0.00005	<0.00001	<0.00001
Strontium	mg/L	0.16	0.17	0.16	-	0.097	0.14	0.14	0.06	0.062	-	0.14	0.15	0.14	-	0.54	1.1	0.63	-	0.32	0.74	0.40
Thallium	mg/L	<0.00005	<0.00001	<0.00001	-	0.000059	0.000041	0.000048	<0.000010	<0.00001	-	<0.00005	<0.00001	<0.00001	-	<0.00005	0.000062	0.000039	-	<0.00005	0.000035	0.000019
Tin	mg/L	<0.00050	<0.00010	<0.00010	-	<0.00050	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00050	<0.00010	<0.00010	-	<0.00050	<0.00010	<0.00010	-	<0.00050	<0.00010	<0.00010
Titanium	mg/L	<0.0015	<0.010	<0.010	-	<0.0015	<0.010	<0.010	<0.010	<0.010	-	<0.0015	<0.010	<0.010	-	<0.0015	<0.010	<0.010	-	<0.0015	<0.010	<0.010
Uranium	mg/L	0.00024	0.00024	0.00022	-	0.00072	0.00075	0.00076	0.00023	0.00016	-	0.00029	0.00028	0.00027	-	0.00590	0.00803	0.00590	-	0.00255	0.00490	0.00330
Vanadium	mg/L	<0.0025	<0.00050	<0.00050	-	<0.0025	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.0025	<0.00050	<0.00050	-	<0.0025	<0.00050	<0.00050	-	<0.0025	<0.00050	<0.00050
Zinc	mg/L	<0.0050	<0.0010	<0.0010	-	0.00730	0.00170	0.00240	<0.0010	<0.0010	-	<0.0050	<0.0010	<0.0010	-	<0.0050	0.00180	0.00130	-	<0.0050	<0.0010	<0.0010

Notes:
(a) = Guideline value is the minimum value, unless the background concentration is lower.
(b) = Guideline value is hardness dependent and calculated based on the individual hardness value for each sample.
(c) = For some samples, water hardness was greater than 250 mg/L. At this hardness, no BC ENV water quality guideline has been established for sulphate; however, the observed data were screened against the guideline for very hard water (i.e., 429 mg/L) for comparative purposes.
(d) = Guideline value is chloride dependent and is calculated based on the individual chloride concentration in each sample.
(e) = Ammonia guideline is pH and temperature dependent and is calculated based on the individual field pH and temperature measurements for each sample.
(f) = Guideline value is pH dependent and is calculated based on the individual pH of each sample.
(g) = Guideline value was calculated using the botic ligand model (ENV 2019a).
(h) = Dissolved cadmium is compared against the Site Performance Objective (SPO).
(i) = Selenium, nitrate, cadmium, and sulphate are compared to the Elk Valley Water Quality Program (EVWQP) benchmarks; nickel and cobalt are compared to against screening values.
(Mn) = Concentration is higher than the 30-day mean BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
(Mx) = Concentration is higher than the maximum BC ENV guideline or outside the recommended pH, DO or total alkalinity range.
Bolded concentrations are higher than the British Columbia Approved and Working Water Quality Guidelines (BC WQG) for the protection of aquatic life (ENV 2017; 2019a,b).
Italicized cells are higher than Coal Mountain Operation (CMO) Compliance Limit.
Shaded cells are higher than a Elk Valley Water Quality Program (EVWQP) benchmark.
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision after comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.
Half of the detection limit value was used for total Kjeldahl nitrogen to calculate total nitrogen concentrations.
\- = no guideline or data; < = less than; BC WQ = British Columbia Water Quality; CMO = Coal Mountain Operations; SPO = Site Performance Objective; EVWQP = Elk Valley Water Quality Program; mg/L = milligrams per litre; mg-N/L = milligrams nitrogen per litre; mg-P/L = milligrams phosphorus per litre; °C = degrees celsius; µS/cm = microsiemens per centimeter.

Table B-1: Screening of Water Quality Samples Collected from the Teck Coal Mountain Opertions Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

	Unit	Mine-influenced Stations									
Location		**Michel Creek**				**Michel Creek**		**Michael Creek**			
Watercourse		**RG MIDAG**				**RG MIULE**		**RG MI5**			
Station ID / **Date**		**16-Sep-12**	**12-Sep-15**	**9-Sep-18**	**10-Sep-19**	**11-Sep-18**	**6-Sep-19**	**16-Sep-12**	**13-Sep-15**	**11-Sep-18**	**5-Sep-19**
pH	-	8.1	8.1	8.2	8.1	8.4	8.4	8.3	8.3	8.3	8.4
Temperature	°C	7.8	7.8	9.4	6.2	10	11	9.1	9.1	8.0	10
Dissolved oxygen	mg/L	12	12	12	11	11	10	11	11	12	10
Specific conductivity	µS/cm	452	452	571	333	487	587	412	412	371	454
pH	-	-	-	8.5	8.2	8.1	8.3	-	-	7.9	8.4
Specific conductivity	µS/cm	-	-	831	370	699	493	-	-	560	439
Hardness, as $CaCO_3$	mg/L	348	201	415	186	350	282	249	204	270	228
Total alkalinity, as $CaCO_3$	mg/L	-	125	180	124	185	173	-	130	167	152
Hydroxide	mg/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0
Total dissolved solids (calculated)	mg/L	-	248	586	230	496	346	-	247	403	298
Total suspended solids	mg/L	-	<1.0	1.9	4.2	<1.0	<1.0	1.2	0.59	<1.0	<1.0
Total organic carbon	mg/L	0.83	0.53	1.3	<0.5	1.0	1.0	<3.0	<1.0	1.3	1.2
Dissolved organic carbon	mg/L	0.89	0.50	1.2	<0.5	1.0	1.1	1.1	0.58	1.2	1.0
Bicarbonate	mg/L	-	125	170	124	182	170	-	130	167	148
Carbonate	mg/L	-	<1.0	9.8	<1.0	3.0	2.6	<1.0	<1.0	<1.0	4.4
Calcium	mg/L	91	55	101	50	90	71	68	56	71	61
Chloride	mg/L	2.0	0.69	1.8	0.58	2.0	1.4	1.5	0.84	1.5	1.1
Fluoride	mg/L	0.19	0.18	0.21	0.22	0.17	0.14	0.14	0.12	0.14	0.13
Magnesium	mg/L	30	16	41	15	33	27	20	16	26	20
Dissolved Magnesium	mg/L	30	16	40	15	31	25	20	16	23	18
Potassium	mg/L	1.1	0.56	1.4	0.51	1.1	0.86	0.77	0.67	0.89	0.75
Dissolved Potassium	mg/L	1.1	0.55	1.4	0.46	1.1	0.91	0.77	<0.25	0.93	0.76
Sodium	mg/L	7.0	2.5	11	2.2	8.7	5.0	4.1	2.7	6.1	3.4
Dissolved Sodium	mg/L	7.0	2.5	12	2.1	9.4	5.0	4.1	2.8	6.9	3.6
Sulphate	mg/L	161	72	265	69	192	123	88	64	133	86
Nutrients and Biological Indicators											
Nitrate	mg-N/L	1.1	0.72	2.4	0.59	1.6	0.67	0.42	0.53	0.0017	0.42
Nitrite	mg-N/L	0.0044	<0.001	0.0081	<0.001	0.0032	<0.001	<0.001	0.0029	0.0099	0.0016
Nitrate + nitrite	mg-N/L	1.1	0.72	2.4	0.59	1.6	0.67	0.42	0.53	0.0090	0.42
Total ammonia	mg-N/L	<0.005	<0.005	0.0081	0.0089	0.018	0.014	0.0055	<0.005	<0.05	0.011
Total Kjeldahl nitrogen	mg-N/L	0.10	0.19	0.21	0.23	0.12	0.37	0.092	0.17	0.24	0.19
Total nitrogen (calculated)	mg-N/L	1.2	0.90	2.6	0.82	1.7	1.0	0.51	0.70	0.25	0.61
Total phosphorus	mg-P/L	0.0029	0.0057	0.0046	0.011	0.0042	<0.002	0.0054	0.0091	0.0090	0.0090
Orthophosphate	mg-P/L	-	0.0013	0.0010	0.0019	0.0026	<0.001	-	0.0063	0.0099	0.0048
Total Metals											
Aluminum	mg/L	0.015	0.021	0.0065	0.026	0.0040	0.0055	0.0080	<0.015	<0.003	<0.003
Antimony	mg/L	0.00018	<0.0005	0.00026	0.00011	0.00018	0.00011	0.00012	<0.0005	0.00015	0.00011
Arsenic	mg/L	0.00021	<0.0005	0.00026	0.00049	0.00021	0.00020	0.00018	<0.0005	0.00020	0.00021
Barium	mg/L	0.068	0.043	0.096	0.029	0.14	0.10	0.11	0.10	0.16	0.12
Beryllium	mg/L	<0.0001	<0.0001	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.00002	<0.00002
Bismuth	mg/L	<0.0005	<0.00025	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00025	<0.00005	<0.00005
Boron	mg/L	0.022	<0.05	0.031	<0.01	0.024	0.015	0.016	<0.05	0.018	0.012
Cadmium	mg/L	0.00002	<0.00003	0.00003	0.00016	0.00003	0.00018	0.00002	<0.00003	0.00003	0.00023
Chromium	mg/L	0.00030	<0.0005	<0.0004	0.00025	0.00021	0.00015	0.00026	<0.0005	0.00013	0.00011
Cobalt	mg/L	0.00063	<0.0005	0.00082	0.0019	0.00022	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001
Copper	mg/L	0.00064	<0.0025	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025	<0.0005	<0.0005
Iron	mg/L	0.013	<0.05	<0.01	0.028	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
Lead	mg/L	<0.00005	<0.00025	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00025	<0.00005	<0.00005
Lithium	mg/L	0.0092	<0.005	0.015	0.0041	0.012	0.0077	0.0060	<0.005	0.0092	0.0061
Manganese	mg/L	0.0034	0.0012	0.0023	0.0028	0.0014	0.0013	0.00094	0.00078	0.00059	0.0010
Mercury	mg/L	<0.00001	<0.000005	<0.000005	0.0000062	<0.000005	<0.000005	<0.00001	<0.000005	<0.000005	0.0000055
Molybdenum	mg/L	0.0011	0.00077	0.0017	0.00069	0.0012	0.00082	0.00085	0.00081	0.0010	0.00072
Nickel	mg/L	0.0065	<0.0025	0.013	0.0026	0.0044	0.0016	0.0017	<0.0025	0.0022	0.0009
Selenium	mg/L	**0.0035**$^{(Mn)}$	**0.0024**$^{(Mn)}$	**0.0046**$^{(Mn)}$	**0.0022**$^{(Mn)}$	**0.0034**$^{(Mn)}$	**0.0031**$^{(Mn)}$	0.0020	**0.0021**$^{(Mn)}$	**0.0026**$^{(Mn)}$	0.0020
Silicon	mg/L	1.8	1.5	1.8	1.4	2.3	2.1	1.8	2.1	2.3	2.1
Silver	mg/L	<0.00001	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00005	<0.00001	<0.00001
Strontium	mg/L	0.24	0.15	0.38	0.14	0.33	0.24	0.17	0.15	0.25	0.17
Thallium	mg/L	0.000017	<0.00005	0.000020	0.000043	0.000011	<0.00001	<0.00001	<0.00005	<0.00001	<0.00001
Tin	mg/L	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001
Titanium	mg/L	<0.01	<0.0015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0015	<0.01	<0.01
Uranium	mg/L	0.0015	0.0010	0.0025	0.0010	0.0015	0.0011	0.00080	0.00076	0.00113	0.00080
Vanadium	mg/L	<0.001	<0.0025	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.0025	<0.0005	<0.0005
Zinc	mg/L	0.0034	<0.015	<0.003	<0.003	<0.003	<0.003	<0.003	<0.015	<0.003	<0.003
Dissolved Metals											
Aluminum	mg/L	-	<0.005	<0.003	<0.003	<0.003	<0.003	-	0.0058	<0.003	<0.003
Antimony	mg/L	-	<0.0005	0.00026	0.00013	0.00016	0.00010	-	<0.0005	0.00014	0.00011
Arsenic	mg/L	-	<0.0005	0.00023	0.00045	0.00017	0.00020	-	<0.0005	0.00016	0.00017
Barium	mg/L	-	0.044	0.098	0.030	0.13	0.11	-	0.10	0.13	0.12
Beryllium	mg/L	-	<0.0001	<0.00002	<0.00002	<0.00002	<0.00002	-	<0.0001	<0.00002	<0.00002
Bismuth	mg/L	-	<0.00025	<0.00005	<0.00005	<0.00005	<0.00005	-	<0.00025	<0.00005	<0.00005
Boron	mg/L	-	<0.05	0.029	<0.01	0.023	0.015	-	<0.05	0.016	0.011
Cadmium	mg/L	-	<0.000025	0.000021	0.000075	0.000019	0.000017	-	<0.000025	0.000031	0.000023
Chromium	mg/L	-	<0.0005	0.00014	0.00029	0.00011	0.00013	-	<0.0005	0.00011	<0.0001
Cobalt	mg/L	-	<0.0005	0.00068	<0.0001	0.00014	<0.0001	-	<0.0005	0.00012	<0.0001
Copper	mg/L	-	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	-	<0.001	<0.0005	<0.0005
Iron	mg/L	-	<0.05	<0.01	<0.01	<0.01	<0.01	-	<0.05	<0.01	<0.01
Lead	mg/L	-	<0.00025	<0.00005	<0.00005	<0.00005	<0.00005	-	<0.00025	<0.00005	<0.00005
Lithium	mg/L	-	<0.005	0.015	0.0041	0.012	0.0080	-	<0.005	0.0088	0.0060
Manganese	mg/L	-	0.00055	0.0013	0.00023	0.00044	0.00026	-	<0.0005	0.0011	0.00016
Mercury	mg/L	-	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005	-	<0.000005	<0.000005	<0.000005
Molybdenum	mg/L	-	0.00077	0.0017	0.00077	0.0012	0.00087	-	0.00076	0.00092	0.00076
Nickel	mg/L	-	<0.0025	0.013	0.0026	0.0041	0.0015	-	<0.0025	0.0023	0.00080
Selenium	mg/L	-	0.0024	0.0055	0.0027	0.0036	0.0038	-	0.0021	0.0023	0.0022
Silicon	mg/L	-	1.5	1.8	1.4	2.1	2.2	-	2.1	2.1	2.1
Silver	mg/L	-	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00005	<0.00001	<0.00001
Strontium	mg/L	-	0.15	0.40	0.16	0.30	0.24	-	0.15	0.24	0.17
Thallium	mg/L	-	<0.00005	0.000020	0.000041	0.000011	<0.00001	-	<0.00005	<0.00001	<0.00001
Tin	mg/L	-	<0.00050	<0.00010	<0.00010	0.00030	<0.00010	-	<0.00050	<0.00010	<0.00010
Titanium	mg/L	-	<0.0015	<0.010	<0.010	<0.010	<0.010	-	<0.0015	<0.010	<0.010
Uranium	mg/L	-	0.00098	0.00238	0.00112	0.00176	0.00109	-	0.00075	0.00118	0.00077
Vanadium	mg/L	-	<0.0025	<0.00050	<0.00050	<0.00050	<0.00050	-	<0.0025	<0.00050	<0.00050
Zinc	mg/L	-	<0.0050	<0.0010	0.00130	<0.0010	<0.0010	-	<0.0050	0.00100	<0.0010

APPENDIX C

Sediment Quality Screening

Table C-1: Sediment Quality Guideline Comparisons within the Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2018 and 2019

Location		Lowest Detection Limit	Guidelines for the protection of Freshwater Aquatic Life		Reference Sites													Mine-influenced Stations									
Watercourse					Michel Creek						Andy Good Creek				Leach Creek			Michel Creek									
Station			BC WSQG[a]		MI25						AGCK[b]				LE1			MIUCO									
Date			Lower WSQG (mg/g dw)	Upper WSQG (mg/g dw)	10-Sep-18			4-Sep-19			8-Sep-18			6-Sep-19	5-Sep-19			10-Sep-18					9-Sep-19				
Replicate					Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3	Rep 1	Rep 1	Rep 2	Rep 3	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Parameter	**Units**																										
Physical Tests																											
Moisture Content	%	0.25	-	-	83	88	77	54	36	42	92	96	95	37	35	25	21	89	81	52	87	77	42	50	44	71	40
pH (1:2; soil to water)	pH	0.1	-	-	7.1	7.4	7.4	8.2	8.3	8.1	7.3	7.1	7.0	8.4	8.0	8.5	8.4	8.1	8.0	7.9	7.9	7.9	7.3	7.2	6.9	7.5	7.2
Texture	-	-	-	-	Sandy loam	Silt loam	Silt loam	Sandy loam	Sandy loam	Silt loam	Loamy sand	-	Silt	Loamy sand	Sand	Loamy sand	Sand	Sandy loam	Sandy loam	Loamy sand	Loamy sand	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Silt loam	Sandy loam
Particle Size Distribution																											
% Gravel (>2mm)	%	1.0	-	-	<1.0	<1.0	<1.0	2.5	8.6	<1.0	2.3	-	<1.0	14	<1.0	4.6	22	13	21	11	12	17	5.1	22	2.7	<1.0	23
% Sand (2.00mm to 1.00mm)	%	1.0	-	-	3.5	5.7	<1.0	5.1	5.7	<1.0	2.4	-	<1.0	7.8	1.6	4.2	15	23	21	20	25	20	7.4	4.8	15	<1.0	7.3
% Sand (1.00mm to 0.50mm)	%	1.0	-	-	6.8	8.8	<1.0	12	14	3.0	7.0	-	<1.0	19	28	11	28	17	14	24	19	12	13	12	5.3	<1.0	6.9
% Sand (0.50mm to 0.25mm)	%	1.0	-	-	15	12	7.3	13	15	10	27	-	1.3	25	50	33	25	12	9.7	14	12	7.7	21	18	5.1	<1.0	13
% Sand (0.25mm to 0.125mm)	%	1.0	-	-	15	5.2	19	8.9	8.3	15	27	-	2.1	14	9.2	22	5.8	6.0	4.4	6.0	5.0	7.6	13	12	8.3	2.4	14
% Sand (0.125mm to 0.063mm	%	1.0	-	-	6.1	2.0	12	8.3	6.9	14	12	-	1.8	6.0	2.7	8.5	1.2	3.7	3.2	3.7	3.3	6.8	8.2	7.0	13	9.8	8.2
% Silt (0.063mm to 0.0312mm)	%	1.0	-	-	19	24	27	23	19	27	10	-	42	5.7	3.1	6.7	1.7	11	12	8.9	10	13	14	11	21	32	13
% Silt (0.0312mm to 0.004mm)	%	1.0	-	-	26	33	29	24	20	28	10	-	45	6.8	4.0	7.4	2.1	12	13	10	11	14	16	12	25	45	13
% Clay (<4µm)	%	1.0	-	-	8.2	8.9	5.4	2.6	1.9	3.2	2.6	-	7.7	1.6	1.5	2.6	<1.0	2.1	1.6	2.2	1.9	2.6	2.6	2.5	4.9	9.8	2.3
Organic Carbon																											
Total Organic Carbon	%	0.05	-	-	4.4	6.3	2.4	2.1	2.0	2.5	4.0	-	10	3.10	1.4	1.4	1.5	1.1	1.3	1.0	1.1	1.4	2.0	2.1	2.3	4.1	13
Total Metals (<2mm fractions)																											
Aluminum	mg/kg	50	-	-	11,500	9,550	10,700	22,200	28,200	20,800	5,280	1,890	4,850	3,900	8,850	9,630	8,670	14,400	16,300	18,100	12,300	13,800	17,500	15,700	14,900	15,000	15,000
Antimony	mg/kg	0.1	-	-	0.61	0.5	0.64	0.84	0.77	0.8	0.47	0.17	0.57	0.58	1.4	1.6	1.6	0.38	0.37	0.41	0.41	0.38	0.41	0.37	0.33	0.35	0.44
Arsenic	mg/kg	0.1	5.9	17	**11**	**9.3**	**10**	**15**	**17**	**14**	**7.1**	3.7	**6.7**	**6.8**	**7.1**	**9.3**	**8.5**	**8.1**	**8.2**	**8.8**	**7.6**	**8.1**	**9.9**	**8.2**	**8.2**	5.6	**8.8**
Barium	mg/kg	0.5	-	-	142	119	152	242	228	203	63	244	66	48	261	269	232	178	204	199	172	157	193	183	143	173	172
Beryllium	mg/kg	0.1	-	-	0.69	0.64	0.75	1.3	1.7	1.2	0.56	0.29	0.62	0.52	0.76	0.73	0.75	0.9	0.96	1.2	0.87	0.87	1.1	1.0	0.98	0.89	1.1
Bismuth	mg/kg	0.2	-	-	<0.20	<0.20	0.22	0.31	0.37	0.27	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.21	0.23	0.26	0.21	0.22	0.27	0.21	0.21	0.2	0.23
Boron	mg/kg	5.0	-	-	7.7	6.9	7.5	23	27	21	10	<5.0	12	6.2	<5.0	<5.0	<5.0	16	16	19	13	12	11	12	11	14	10
Cadmium	mg/kg	0.02	0.6	3.5	**1.3**	**1.2**	**1.5**	**1.8**	**2.0**	**1.7**	0.56	0.4	**0.77**	0.51	**2.0**	**1.7**	**1.7**	**0.87**	**0.91**	**0.83**	**0.83**	**0.62**	**0.84**	**0.84**	**0.7**	**0.97**	**0.79**
Calcium	mg/kg	50	-	-	13,000	28,800	14,500	23,900	21,800	17,500	191,000	211,000	164,000	220,000	5,180	8,400	5,350	18,100	17,800	20,700	21,800	17,200	16,800	14,100	19,400	16,300	15,400
Chromium	mg/kg	0.5	37	90	17	14	16	28	33	27	23	**60**	14	12	16	17	15	19	20	22	17	17	21	19	18	20	18
Cobalt	mg/kg	0.1	-	-	8.0	7.4	8.5	11	15	11	2.6	2.3	2.3	1.9	6.6	6.6	6.2	7.5	9.1	9.2	7.9	8.2	11	8.7	7.2	6.8	9.4
Copper	mg/kg	0.5	36	197	25	23	27	35	**39**	32	5.4	3.7	6.0	5.1	16	14	14	18	19	21	21	17	22	19	20	20	21
Iron	mg/kg	50	21200	43766	**21,500**	19,500	21,100	**33,000**	**42,300**	**29,400**	6,890	3,740	6,310	6,460	17,900	20,900	18,200	**21,900**	**24,100**	**26,800**	20,600	**22,900**	**32,500**	**23,800**	**23,800**	20,600	**26,500**
Lead	mg/kg	0.5	35	91	17	14	18	24	26	25	4.4	1.8	4.5	3.6	10	11	11	13	14	16	13	13	16	14	13	13	15
Lithium	mg/kg	2.0	-	-	16	13	16	31	40	29	5.8	<2.0	5.4	5.0	9.5	10	11	19	21	24	19	21	29	23	25	23	26
Magnesium	mg/kg	20	-	-	6,010	8,330	6,050	9,620	10,100	7,540	21,700	13,200	15,300	23,100	2,130	3,360	2,250	5,800	6,520	7,060	5,550	5,850	7,380	6,410	6,790	6,940	6,770
Manganese	mg/kg	1.0	460	1100	**501**	**636**	**554**	**887**	**1060**	**733**	131	400	138	135	382	393	306	**624**	**695**	**716**	**701**	**527**	**786**	**568**	279	243	450
Mercury	mg/kg	0.005	0.17	0.49	0.039	0.036	0.043	0.039	0.025	0.037	0.025	0.0091	0.025	0.022	0.038	0.049	0.04	0.024	0.021	0.053	0.025	0.015	0.019	0.025	0.024	0.032	0.027
Molybdenum	mg/kg	0.1	-	-	5.1	3.8	5.5	7.0	6.9	6.8	0.98	1.5	0.87	0.71	1.7	2.7	2.2	2.5	2.1	2.4	2.2	2.1	2.6	2.3	2.1	2.0	2.3
Nickel	mg/kg	0.5	16	75	**31**	**27**	**32**	**44**	**55**	**42**	**18**	**28**	**20**	13	**29**	**30**	**28**	**24**	**26**	**27**	**23**	**23**	**32**	**28**	**25**	**27**	**29**
Phosphorous	mg/kg	50	-	-	1,310	1,110	1,340	1,710	1,630	1,510	963	796	1,220	1,310	1,220	1,390	1,280	1,350	1,370	1,610	1,250	1,200	1,460	1,460	1,300	1,520	1,350
Potassium	mg/kg	100	-	-	2,070	1,710	1,780	4,610	5,890	4,480	1,670	750	1,590	1,200	1,530	1,590	1,330	3,440	3,860	4,370	2,850	2,830	3,100	3,210	3,020	3,110	2,620
Selenium	mg/kg	0.2	1.9	-	0.96	0.98	1.2	1.3	1.0	1.1	0.82	0.74	**2.2**	0.68	0.67	0.77	0.55	0.92	0.7	0.74	0.85	0.52	0.59	0.77	0.65	1.0	0.57
Silver	mg/kg	0.1	0.5	-	0.13	0.13	0.16	0.19	0.17	0.17	0.14	<0.10	0.14	0.16	0.18	0.2	0.18	0.12	<0.10	<0.10	0.1	<0.10	<0.10	0.1	<0.10	0.14	<0.10
Sodium	mg/kg	50	-	-	73	71	67	126	139	110	140	126	160	155	<50	<50	<50	94	94	109	81	86	82	80	105	89	94
Strontium	mg/kg	0.5	-	-	41	50	46	62	64	52	180	307	164	229	47	39	47	43	43	51	50	42	55	45	46	51	50
Sulfur	mg/kg	1000	-	-	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	1,400	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	1,100	<1000
Thallium	mg/kg	0.05	-	-	0.61	0.55	0.7	0.95	0.99	0.95	0.75	0.29	0.88	0.6	0.24	0.26	0.24	0.42	0.4	0.43	0.41	0.35	0.37	0.35	0.34	0.41	0.33
Tin	mg/kg	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	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium	mg/kg	1.0	-	-	11	9.5	9.1	30	26	27	24	13	33	14	52	86	55	13	12	12	13	11	12	13	13	19	13
Tungsten	mg/kg	0.5	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	mg/kg	0.05	-	-	0.79	0.68	0.87	1.1	1.1	0.97	0.82	0.68	0.94	0.75	1.2	1.3	1.3	0.75	0.64	0.73	0.65	0.55	0.54	0.65	0.52	0.7	0.58
Vanadium	mg/kg	0.2	-	-	30	25	29	51	55	49	25	10	22	20	50	55	49	31	32	35	27	26	32	30	28	30	30
Zinc	mg/kg	2.0	123	315	**135**	113	**136**	**191**	**211**	**186**	86	49	**148**	67	**126**	121	122	91	99	104	92	90	120	102	100	105	112
Zirconium	mg/kg	1.0	-	-	<1.0	<1.0	1.0	1.1	1.5	<1.0	<1.0	<1.0	1.0	<1.0	1.3	1.2	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	1.1	<1.0	<1.0	1.3
Polycyclic Aromatic Hydrocarbons																											
Acenaphthene	mg/kg	0.005	0.0067	0.089	<0.014	<0.019	<0.010	< 0.0050	<0.0050	<0.0050	<0.025	<0.060	<0.045	<0.0050	<0.0050	<0.0050	<0.0050	<0.020	<0.012	<0.0050	<0.017	<0.010	<0.0050	<0.0050	<0.0050	<0.0085	0.0063
Acenaphthylene	mg/kg	0.005	0.0059	0.13	<0.014	<0.019	<0.010	<0.0050	<0.0050	<0.0050	<0.025	<0.060	<0.045	<0.0050	<0.0050	<0.0050	<0.0050	<0.020	<0.012	<0.0050	<0.017	<0.010	<0.0050	<0.0050	<0.0050	<0.0085	<0.0050
Acridine	mg/kg	0.01	-	-	<0.027	<0.038	<0.020	<0.010	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	<0.012
Anthracene	mg/kg	0.004	0.047	0.25	<0.011	<0.015	<0.0080	0.0041	<0.0040	<0.0040	<0.020	<0.048	<0.036	<0.0040	<0.0040	<0.0040	<0.0040	<0.016	<0.0096	<0.0040	<0.014	<0.0080	<0.0040	<0.0040	<0.0040	<0.0068	<0.0040
Benz(a)anthracene	mg/kg	0.01	0.032	0.39	<0.027	<0.038	<0.020	0.026	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	<0.010
Benzo(a)pyrene	mg/kg	0.01	0.032	0.78	<0.027	<0.038	<0.020	0.027	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	<0.010
Benzo(b&j)fluoranthene	mg/kg	0.01	0.24	13	<0.027	<0.038	<0.020	0.036	<0.010	0.012	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	0.02	<0.010	0.019	<0.010	<0.017	0.029
Benzo(b+j+k)fluoranthene	mg/kg	0.015	-	-	<0.027	<0.038	<0.020	0.049	<0.015	0.016	-	-	-	<0.015	<0.015	<0.015	<0.015	<0.040	<0.024	<0.010	<0.034	<0.020	<0.015	0.021	<0.015	<0.025	0.031
Benzo(e)pyrene	mg/kg	0.01	-	-	<0.027	<0.038	<0.020	0.023	<0.010	<0.010	0.052	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	0.023	<0.010	0.023	0.011	0.018	0.035
Benzo(g,h,i)perylene	mg/kg	0.01	0.17	0.32	<0.027	<0.038	<0.020	0.019	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-	<0.010	<0.010	<0.010	<0.017	<0.010
Benzo(k)fluoranthene	mg/kg	0.01	0.3	-	-	-	-	0.013	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	<0.010
Chrysene	mg/kg	0.01	0.057	0.86	<0.027	<0.038	<0.020	0.033	<0.010	0.016	**0.12**	<0.12	**0.091**	0.017	0.014	<0.010	0.01	0.042	0.037	0.01	0.038	0.035	0.015	0.036	0.017	0.027	0.047
Dibenz(a,h)anthracene	mg/kg	0.005	-	-	<0.014	<0.019	<0.010	<0.0050	<0.0050	<0.0050	<0.025	<0.060	<0.045	<0.0050	<0.0050	<0.0050	<0.0050	<0.020	<0.012	<0.0050	<0.017	<0.010	<0.0050	<0.0050	<0.0050	<0.0085	<0.0050
Fluoranthene	mg/kg	0.01	0.11	2.4	<0.027	<0.038	<0.020	0.042	<0.010	0.014	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	<0.010
Fluorene	mg/kg	0.01	0.021	0.14	<0.027	<0.038	<0.020	<0.010	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	0.02
Indeno(1,2,3-c,d)pyrene	mg/kg	0.01	0.2	3.2	<0.027	<0.038	<0.020	0.016	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	<0.010
1-Methylnaphthalene	mg/kg	0.01	-	-	<0.027	<0.038	<0.020	<0.010	<0.010	<0.010	0.18	0.28	0.17	0.028	0.018	<0.010	<0.010	0.066	0.057	0.016	0.069	0.061	0.028	0.07	0.028	0.031	0.19
2-Methylnaphthalene	mg/kg	0.01	0.02	0.2	<0.027	<0.038	<0.020	<0.010	<0.010	<0.010	**0.24**	**0.44**	**0.22**	**0.041**	0.018	<0.010	<0.010	**0.097**	**0.086**	**0.024**	**0.1**	**0.089**	**0.039**	**0.095**	**0.039**	**0.041**	**0.3**
Naphthalene	mg/kg	0.01	0.035	0.39	<0.027	<0.038	<0.020	<0.010	<0.010	<0.010	**0.1**	<0.12	<0.090	0.013	<0.010	<0.010	<0.010	**0.041**	0.033	<0.010	**0.038**	**0.036**	0.016	**0.038**	0.016	0.022	**0.12**
Perylene	mg/kg	0.01	-	-	<0.027	<0.038	<0.020	<0.010	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	0.022	<0.010	0.016	<0.010	0.032	<0.010
Phenanthrene	mg/kg	0.01	0.042	0.52	<0.027	<0.038	<0.020	0.021	<0.010	0.012	**0.23**	**0.21**	**0.17**	0.036	0.038	0.018	0.016	**0.076**	**0.07**	0.019	**0.086**	**0.078**	0.033	**0.081**	0.034	**0.045**	**0.13**
Pyrene	mg/kg	0.01	0.053	0.88	<0.027	<0.038	<0.020	0.038	<0.010	0.014	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	0.013
Quinoline	mg/kg	0.01	-	-	<0.027	<0.038	<0.020	<0.010	<0.010	<0.010	<0.050	<0.12	<0.090	<0.010	<0.010	<0.010	<0.010	<0.040	<0.024	<0.010	<0.034	<0.020	<0.010	<0.010	<0.010	<0.017	<0.010
d10-Acenaphthene	%	-	-	-	72	71	66	83	87	87	91	80	85	73	79	77	80	66	62	69	66	62	79	86	83	82	87
d12-Chrysene	%	-	-	-	88	86	87	92	95	98	104	96	100	85	98	108	104	97	89	97	93	86	91	98	99	98	93
d8-Naphthalene	%	-	-	-	72	71	67	85	88	88	81	70	77	75	79	73	80	64	62	68	63	62	73	85	73	75	80
d10-Phenanthrene	%	-	-	-	81	76	76	88	89	90	94	82	86	80	89	94	92	86	80	88	89	80	80	89	86	85	86
B(a)P Total Potency Equivalent	mg/kg	0.02	-	-	<0.026	<0.036	<0.020	0.039	<0.020	<0.020	0.049	<0.12	0.087	<0.020	<0.020	<0.020	<0.020	0.039	0.023	<0.020	<0.033	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
IACR (CCME)	-	0.15	-	-	<0.29	<0.41	<0.21	0.49	<0.15	0.16	0.58	<1.3	0.98	<0.15	<0.15	<0.15	<0.15	0.44	0.27	<0.15	0.37	0.29	<0.15	0.21	<0.15	0.19	0.28

Notes:

[a] BC Sediment quality guidelines for the protection of freshwater aquatic life (ENV 2017)

[b] As a result of high cobble composition of the substrate at LEI in 2019 only one replicate sediment sample was collected.

Bold shaded font indicates concentrations are higher than the Lower Sediment Water Quality Guideline (ENV 2017).

Underlined shaded font indicates concentrations are higher than the Upper Sediment Water Quality Guideline (ENV 2017).

Sediment quality data and guidelines shown in this table were rounded after comparisons to guidelines. Concentrations equal to the guideline values were not identified as exceedances.

\- = no guideline or no data; $CaCO^3$ = calcium carbonate; % = percent; mg/kg = milligrams per kilograms; dw = dry weight; < = less than; > = greater than; mm = millimetres; WSQG = working sediment quality guidelines; CCME = Canadian Council of the Minsters of the Environment.

Table C-1: Sediment Quality Guideline Comparisons within the Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2018 and 2019

Location		Mine-influenced Stations																													
Watercourse		Corbin Creek										Michel Creek																			
Station		CORCK										MIDCO										MIDAG									
Date		10-Sep-18					7-Sep-19					9-Sep-19					9-Sep-19					10-Sep-18					10-Sep-19				
Replicate		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Parameter	**Units**																														
Physical Tests																															
Moisture Content	%	58	59	61	61	63	0.25	0.25	0.25	0.25	0.25	87	88	90	90	88	53	34	28	56	31	44	83	79	72	77	39	43	42	34	61
pH (1:2; soil to water)	pH	8.5	8.3	8.1	8.3	8.3	0.1	0.1	0.1	0.1	0.1	7.6	7.7	7.6	7.4	7.7	7.2	7.5	7.3	7.1	7.6	8.1	8.0	7.9	7.9	7.9	7.3	7.3	7.1	7.3	7.4
Texture	-	Silt loam	Sandy loam	Silt loam	Silt loam	Silt loam	Silt loam	Silt loam	Silt	Silt loam	Silt loam	Silt	Silt loam	Silt loam	Silt loam	Silt loam	Loamy sand	Loamy sand	Loamy sand	Loamy sand	Loamy sand	Sandy loam	Sandy loam	Silt loam	Silt loam	Sandy loam	d / Loamy s	Loamy sand	Sandy loam	Loamy sand	Loamy sanc
Particle Size Distribution																															
% Gravel (>2mm)	%	<1.0	12	1.1	23	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	1.3	<1.0	19	20	31	26	24	14	1.2	11	12	1.9	3.0	1.2	1.2	3.9	<1.0	<1.0
% Sand (2.00mm to 1.00mm)	%	<1.0	9.0	1.6	6.5	<1.0	2.3	1.6	<1.0	2.6	<1.0	3.2	2.7	<1.0	<1.0	2.8	25	14	18	32	6.8	3.6	16	17	4.4	10	8.1	5.7	14	5.5	<1.0
% Sand (1.00mm to 0.50mm)	%	<1.0	13	2.1	3.6	1.2	5.1	3.8	1.1	5.0	1.7	1.7	2.4	1.2	<1.0	3.5	21	20	26	22	14	22	21	13	7.7	19	39	27	30	29	14
% Sand (0.50mm to 0.25mm)	%	2.0	13	1.7	3.3	2.5	10	5.4	2.2	6.6	4.5	2.0	4.1	3.4	2.4	4.9	6.7	9.9	10	3.8	20	26	8.9	3.2	4.5	11	26	24	13	26	46
% Sand (0.25mm to 0.125mm)	%	7.9	9.7	4.9	5.6	8.7	11	6.4	5.1	9.7	11	2.8	5.0	5.8	3.6	5.6	5.1	5.5	3.6	1.3	14	11	3.6	2.7	5.8	6.3	6.8	11	5.1	9.0	11
% Sand (0.125mm to 0.063mm	%	14	9.2	11	10	16	4.7	3.3	3.8	6.6	7.6	3.8	5.7	7.9	5.0	7.1	5.0	3.9	2.5	1.2	8.9	6.5	4.1	5.2	10	7.3	3.4	6.2	5.2	4.7	4.1
% Silt (0.063mm to 0.0312mm)	%	31	14	34	21	30	25	32	33	28	29	39	35	27	35	23	6.4	6.4	5.7	5.1	9.8	13	16	20	28	18	6.5	11	12	11	11
% Silt (0.0312mm to 0.004mm)	%	39	18	40	25	36	35	42	47	37	39	43	39	38	43	28	8.9	7.4	7.0	7.8	10	14	18	23	32	20	7.4	13	14	13	12
% Clay (<4µm)	%	4.8	3.2	4.1	3.1	4.5	5.8	5.4	6.6	5.1	7.3	4.2	4.9	14	9.4	6.1	2.5	1.5	1.3	2.1	2.6	2.3	3.1	4.2	5.9	4.2	1.1	2.0	2.9	2.1	1.4
Organic Carbon																															
Total Organic Carbon	%	6.0	6.5	6.0	6.5	6.5	8.70	9.9	9.30	9.30	10	5.4	5.5	7.9	6.1	4.7	1.9	2.4	1.80	1.8	1.6	2.5	3.9	4.9	6.1	6.0	2.65	2.60	4.4	2.95	2.08
Total Metals (<2mm fractions)																															
Aluminum	mg/kg	1,040	2,300	1,670	1,860	965	2,430	2,180	2,780	3,610	2,860	12,900	9,250	10,100	9,200	14,400	16,200	14,900	19,000	16,100	14,900	8,850	6,770	6,810	6,560	7,020	10,800	9,630	10,700	12,900	12,100
Antimony	mg/kg	0.35	0.36	0.36	0.33	0.27	0.35	0.32	0.32	0.4	0.34	0.4	0.35	0.46	0.39	0.44	0.48	0.35	0.41	0.48	0.42	0.39	0.3	0.28	0.3	0.41	0.45	0.47	0.34	0.38	0.38
Arsenic	mg/kg	1.2	2.7	1.8	2.2	1.0	2.9	2.3	2.6	2.7	2.6	7.6	4.9	6.7	4.4	8.2	10	8.1	9.9	12	9.8	7.4	6.1	5.9	5.9	6.7	9.1	8.7	7.2	8.6	8.5
Barium	mg/kg	154	170	160	151	118	240	205	212	236	232	128	157	191	172	121	159	108	103	150	151	110	122	123	124	123	102	120	93	106	116
Beryllium	mg/kg	0.22	0.37	0.27	0.28	0.17	0.4	0.37	0.39	0.45	0.38	0.84	0.58	0.69	0.53	0.91	1.1	1.0	1.3	1.2	1.1	0.72	0.57	0.61	0.57	0.64	0.89	0.83	0.77	0.97	0.87
Bismuth	mg/kg	<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	0.25	0.23	0.29	0.28	0.23	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Boron	mg/kg	<5.0	5.2	6.2	6.1	<5.0	5.8	9.0	8.1	9.5	8.4	16	17	19	19	16	11	11	13	9.9	9.8	8.6	8.3	8.6	7.6	7.8	7.9	7.5	8.6	10	11
Cadmium	mg/kg	5.4	7.9	5.5	5.1	4.6	11	10	11	12	12	1.2	1.5	1.8	1.7	1.3	1.5	0.79	0.84	1.2	0.82	0.79	0.98	1.1	1.0	1.0	0.75	0.95	0.72	0.73	0.88
Calcium	mg/kg	311,000	257,000	310,000	270,000	256,000	398,000	381,000	397,000	316,000	406,000	91,900	159,000	94,900	193,000	51,500	40,200	29,500	23,400	50,500	31,600	56,800	80,400	75,800	66,300	53,100	60,700	74,300	61,700	66,100	55,300
Chromium	mg/kg	1.6	3.6	2.7	3.1	1.5	3.8	3.6	4.1	5.4	4.2	21	13	18	14	20	20	18	22	20	18	13	10	10	10.0	11	13	14	14	16	16
Cobalt	mg/kg	306	252	318	288	240	434	343	391	256	389	131	235	224	297	92	51	24	31	58	27	24	55	49	54	35	20	26	22	19	27
Copper	mg/kg	3.5	5.7	4.3	4.8	3.0	7.5	7.2	7.8	8.9	6.9	17	9.6	13	9.0	18	21	19	24	23	19	12	11	11	11	12	15	14	13	15	14
Iron	mg/kg	1,600	3,790	2,180	2,950	1,320	3,980	2,950	3,330	3,860	3,300	22,400	12,000	14,100	10,700	23,100	29,500	26,700	33,900	33,000	28,800	16,500	13,300	13,700	12,600	12,900	21,000	19,000	17,500	22,300	19,300
Lead	mg/kg	1.4	3.6	1.9	2.7	1.2	3.2	2.6	2.9	3.4	2.8	11	6.7	8.6	5.7	11	16	13	16	17	14	10	8.7	8.9	8.3	9.1	12	11	9.5	11	11
Lithium	mg/kg	<2.0	3.4	3.1	3.2	2.3	3.7	3.2	3.6	3.7	3.4	18	10	11	9.2	17	29	28	33	31	26	13	10	10	9.5	11	19	16	18	21	17
Magnesium	mg/kg	5,120	6,010	5,710	5,450	4,330	7,830	7,940	8,010	6,710	7,940	8,660	6,670	7,230	7,070	7,230	9,610	7,190	9,030	11,100	8,260	7,670	7,670	7,460	7,280	7,020	7,390	11,100	9,280	9,520	8,790
Manganese	mg/kg	2400	1770	2440	2130	2020	3220	2650	2960	2000	3090	1200	1510	1570	1910	817	1270	479	700	915	525	372	502	448	498	353	453	507	469	469	562
Mercury	mg/kg	0.0063	0.016	0.013	0.015	<0.0050	0.011	0.014	0.013	0.019	0.012	0.023	0.022	0.033	0.016	0.017	0.021	0.017	0.017	0.024	0.017	0.016	0.021	0.024	0.031	0.031	0.02	0.026	0.021	0.018	0.025
Molybdenum	mg/kg	0.69	0.95	0.8	0.79	0.53	0.98	0.83	0.89	0.75	1.1	2.2	1.6	1.9	1.6	2.3	2.6	1.8	2.2	2.7	2.0	1.3	1.1	1.1	1.1	1.5	1.9	1.7	1.5	1.9	1.5
Nickel	mg/kg	259	207	272	242	220	365	319	313	247	344	151	194	235	230	128	92	52	56	92	55	44	70	60	67	47	43	54	51	48	59
Phosphorous	mg/kg	131	265	209	204	128	328	426	326	355	278	1,020	962	1,140	916	1,200	1,560	1,070	1,450	1,520	2,060	1,150	1,060	1,030	1,020	1,090	1,190	1,420	1,010	1,140	1,140
Potassium	mg/kg	350	520	500	510	330	620	750	840	980	890	3,040	2,720	2,760	2,930	3,530	2,790	2,870	3,630	2,600	2,840	1,930	1,420	1,450	1,340	1,450	2,010	1,620	2,090	2,620	2,740
Selenium	mg/kg	1.7	1.6	1.6	1.6	1.5	2.3	3.2	2.2	5.5	2.6	1.8	2.6	4.7	2.7	1.4	1.1	0.8	0.55	1.7	0.63	1.4	2.1	2.4	2.4	2.2	0.67	1.0	0.83	0.57	1.1
Silver	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	<0.10	<0.10	0.11	<0.10	<0.10	0.1	0.11	0.11	0.12	0.11	0.14	0.1	<0.10	0.1
Sodium	mg/kg	337	234	340	287	283	340	355	327	312	367	171	233	209	252	147	120	88	101	119	124	85	108	97	98	89	79	90	82	91	95
Strontium	mg/kg	461	309	444	386	379	482	401	398	392	463	138	231	156	260	91	74	62	59	94	67	78	111	105	94	78	95	98	77	88	78
Sulfur	mg/kg	5,800	3,800	5,700	4,800	4,600	5,500	6,000	5,800	5,300	6,200	1,600	2,800	2,500	3,400	1,000	<1,000	<1,000	<1,000	1,000	<1,000	<1,000	1,000	1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
Thallium	mg/kg	0.11	0.25	0.16	0.17	0.081	0.31	0.24	0.27	0.21	0.27	0.34	0.28	0.36	0.29	0.36	0.4	0.29	0.33	0.37	0.29	0.41	0.34	0.33	0.33	0.38	0.48	0.47	0.46	0.46	0.48
Tin	mg/kg	<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	<2.0	<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	<2.0
Titanium	mg/kg	5.3	9.3	7.6	11	4.7	9.3	8.6	10	12	12	16	18	14	18	16	17	10	13	12	10	8.7	11	9.8	9.2	10	5.8	15	12	11	11
Tungsten	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	mg/kg	2.9	2.1	2.9	2.5	2.3	2.7	2.3	2.1	2.4	2.6	0.86	1.1	1.3	1.2	0.76	0.86	0.49	0.51	0.81	0.78	0.71	0.88	0.76	0.79	0.85	0.63	0.79	0.54	0.55	0.61
Vanadium	mg/kg	3.5	7.0	5.5	5.9	3.1	7.9	7.1	8.9	11	9.0	28	21	25	22	31	32	26	33	29	28	22	17	17	17	19	23	23	23	27	27
Zinc	mg/kg	717	760	727	643	617	1150	915	1050	1210	1190	168	159	176	171	152	180	124	145	169	129	110	116	119	120	108	121	129	115	119	130
Zirconium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	1.2	1.3	1.2	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Polycyclic Aromatic Hydrocarbons																															
Acenaphthene	mg/kg	<0.032	<0.041	<0.032	<0.046	<0.031	<0.033	<0.060	<0.056	<0.073	<0.045	<0.020	<0.024	<0.039	<0.024	<0.019	0.0053	<0.0050	<0.0050	<0.0050	<0.0050	<0.0060	<0.021	<0.022	<0.024	<0.036	<0.0070	<0.020	<0.0050	<0.0050	0.0089
Acenaphthylene	mg/kg	<0.0070	<0.011	<0.0070	<0.010	<0.0070	0.0066	0.0097	0.012	0.016	0.0088	<0.020	<0.019	<0.022	<0.024	<0.019	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.014	<0.012	<0.0085	0.011	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.055	<0.10	<0.10	<0.14	<0.075	<0.039	<0.038	<0.044	<0.047	<0.038	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.027	<0.023	<0.017	<0.060	<0.010	<0.020	<0.010	<0.010	<0.012
Anthracene	mg/kg	<0.013	<0.015	<0.013	<0.016	<0.013	<0.0090	<0.0064	<0.014	<0.021	<0.012	<0.016	<0.015	<0.018	<0.019	<0.015	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.011	0.015	0.0078	0.014	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Benz(a)anthracene	mg/kg	0.038	0.055	0.043	0.063	0.041	0.035	0.069	0.063	0.091	0.046	<0.039	<0.038	0.057	<0.047	<0.038	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.045	0.043	0.041	0.074	<0.010	0.017	<0.010	<0.010	0.012
Benzo(a)pyrene	mg/kg	0.029	0.045	0.033	0.05	0.032	0.024	0.054	0.043	0.068	0.036	<0.039	<0.038	<0.044	<0.047	<0.038	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.027	0.031	0.025	0.053	<0.010	0.014	<0.010	<0.010	0.013
Benzo(b&j)fluoranthene	mg/kg	0.11	0.17	0.12	0.19	0.12	0.091	0.17	0.16	0.22	0.12	0.047	0.081	0.15	0.079	0.068	0.028	<0.010	<0.010	0.026	<0.010	0.024	0.084	0.1	0.077	0.16	0.023	0.056	0.019	0.012	0.045
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	-	-	0.094	0.18	0.16	0.23	0.13	<0.039	0.048	0.084	<0.047	0.041	0.029	<0.015	<0.015	0.027	<0.015	<0.010	<0.027	0.03	0.023	0.045	0.024	0.06	0.02	<0.015	0.049
Benzo(e)pyrene	mg/kg	0.14	0.22	0.16	0.24	0.16	0.12	0.23	0.21	0.28	0.16	0.057	0.1	0.19	0.097	0.086	0.037	<0.010	<0.010	0.036	<0.010	0.023	0.08	0.093	0.072	0.14	0.027	0.066	0.024	0.016	0.055
Benzo(g,h,i)perylene	mg/kg	0.067	0.097	0.071	0.11	0.07	0.059	0.12	0.11	0.16	0.075	-	-	-	-	-	0.01	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-	<0.010	0.02	<0.010	<0.010	0.013
Benzo(k)fluoranthene	mg/kg	0.01	0.012	<0.010	0.013	<0.010	<0.010	<0.016	<0.014	<0.018	<0.010	<0.039	<0.038	<0.044	<0.047	<0.038	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.027	<0.023	<0.017	0.021	<0.010	<0.010	<0.010	<0.010	<0.010
Chrysene	mg/kg	0.2	0.28	0.2	0.31	0.2	0.17	0.31	0.31	0.4	0.23	0.086	0.15	0.27	0.14	0.13	0.042	0.011	<0.010	0.039	0.015	0.035	0.12	0.13	0.1	0.21	0.037	0.098	0.031	0.024	0.066
Dibenz(a,h)anthracene	mg/kg	<0.022	<0.030	<0.021	<0.033	<0.022	0.017	0.034	0.032	0.046	0.023	<0.020	<0.019	<0.022	<0.024	<0.019	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.014	<0.012	<0.0085	0.016	<0.0050	0.0062	<0.0050	<0.0050	<0.0050
Fluoranthene	mg/kg	0.036	0.054	0.041	0.06	0.041	0.035	0.068	0.061	0.085	0.046	<0.039	<0.038	0.047	<0.047	<0.038	<0.010	<0.010	<0.010	<0.010	<0.010	0.028	0.086	0.11	0.095	0.2	0.014	0.036	0.011	<0.010	0.019
Fluorene	mg/kg	0.11	0.15	0.11	0.15	0.11	0.096	0.18	0.17	0.24	0.12	0.045	0.067	0.11	0.066	0.051	0.017	<0.010	<0.010	0.018	<0.010	0.014	0.055	0.066	0.059	0.12	0.015	0.039	<0.010	<0.010	0.021
Indeno(1,2,3-c,d)pyrene	mg/kg	0.018	0.022	0.017	0.024	0.017	0.013	0.027	0.023	0.037	0.016	<0.039	<0.038	<0.044	<0.047	<0.038	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.027	<0.023	<0.017	<0.019	<0.010	<0.010	<0.010	<0.010	<0.010
1-Methylnaphthalene	mg/kg	0.66	0.95	0.71	1.0	0.65	0.63	1.1	1.0	1.5	0.83	0.24	0.44	0.69	0.38	0.3	0.13	0.033	0.022	0.11	0.036	0.076	0.31	0.35	0.28	0.56	0.15	0.25	0.073	0.036	0.17
2-Methylnaphthalene	mg/kg	1.1	1.6	1.2	1.7	1.1	1.0	1.9	1.7	2.4	1.4	0.39	0.7	1.1	0.61	0.48	0.2	0.049	0.037	0.18	0.057	0.12	0.47	0.54	0.43	0.87	0.23	0.38	0.11	0.053	0.25
Naphthalene	mg/kg	0.35	0.51	0.37	0.54	0.33	0.36	0.65	0.56	0.81	0.48	0.13	0.24	0.36	0.19	0.17	0.072	0.016	0.013	0.062	0.021	0.039	0.15	0.17	0.14	0.26	0.094	0.16	0.043	0.02	0.1
Perylene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.016	<0.014	<0.018	<0.010	<0.039	<0.038	0.054	<0.047	<0.038	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.027	<0.023	<0.017	<0.019	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	mg/kg	0.53	0.73	0.55	0.83	0.55	0.49	0.87	0.83	1.2	0.63	0.23	0.42	0.73	0.39	0.32	0.11	0.029	0.021	0.095	0.035	0.096	0.35	0.41	0.36	0.63	0.12	0.3	0.076	0.056	0.18
Pyrene	mg/kg	0.066	0.088	0.064	0.098	0.07	0.063	0.11	0.11	0.15	0.079	<0.039	0.042	0.079	<0.047	<0.038	0.013	<0.010	<0.010	0.011	<0.010	0.025	0.075	0.094	0.081	0.16	0.016	0.037	0.011	<0.010	0.021
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.016	<0.014	<0.018	<0.010	<0.039	<0.038	<0.044	<0.047	<0.038	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.027	<0.023	<0.017	<0.019	<0.010	<0.010	<0.010	<0.010	<0.010
d10-Acenaphthene	%	84	90	79	83	73	78	84	77	80	77	67	65	62	61	61	87	83	83	85	80	64	69	68	63	62	85	98	84	82	88
d12-Chrysene	%	100	104	93	100	93	88	96	91	95	90	80	79	76	73	80	108	95	93	100	92	88	97	93	89	90	93	115	98	97	107
d8-Naphthalene	%	77	80	71	73	65	76	81	72	74	76	61	59	55	51	55	80	80	83	79	73	61	67	65	58	55	79	90	78	74	81
d10-Phenanthrene	%	95	97	87	93	85	82	87	83	86	81	80	79	75	74	78	92	89	87	87	85	83	93	89	85	85	87	106	87	91	92
B(a)P Total Potency Equivalent	mg/kg	0.061	0.089	0.065	0.099	0.065	0.057	0.12	0.1	0.16	0.08	0.041	0.044	0.062	0.052	0.043	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.037	0.055	0.044	0.098	<0.020	0.03	<0.020	<0.020	0.023
IACR (CCME)	-	1.1	1.6	1.2	1.8	1.2	0.93	1.8	1.6	2.3	1.2	0.62	0.86	1.5	0.91	0.77	0.27	<0.15	<0.15	0.25	<0.15	0.26	0.88	1.0	0.8	1.7	0.23	0.55	0.21	0.16	0.43

Table C-1: Sediment Quality Guideline Comparisons within the Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2018 and 2019

Location		Mine-influenced Stations																			
Watercourse		Michel Creek																			
Station		MIULE										MI5									
Date		10-Oct-18					6-Sep-19					10-Oct-18					5-Sep-19				
Replicate		Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
Parameter	**Units**																				
Physical Tests																					
Moisture Content	%	87	93	69	68	84	53	58	35	41	48	80	93	80	92	80	56	90	47	66	89
pH (1:2; soil to water)	pH	7.8	7.9	7.8	7.9	7.9	7.6	7.7	7.9	7.9	7.6	8.0	7.8	7.8	7.7	8.1	7.8	7.7	7.1	7.2	7.5
Texture	-	Silt loam	Silt loam	Silt loam	Silt loam	Silt	Sandy loam	Sandy loam	Loamy sand	Loamy sand	Loamy sand	Loamy sand	Sandy loam	Silt loam	Sandy loam	Silt loam	Sandy loam	Loamy sand	Loamy sand	loam / Loam	Silt loam
Particle Size Distribution																					
% Gravel (>2mm)	%	21	<1.0	<1.0	10	<1.0	12	51	<1.0	3.7	<1.0	8.5	14	<1.0	29	3.7	3.3	8.7	11	<1.0	41
% Sand (2.00mm to 1.00mm)	%	11	<1.0	<1.0	3.5	<1.0	<1.0	3.5	2.3	1.2	<1.0	3.7	14	1.4	17	12	<1.0	2.1	35	<1.0	4.6
% Sand (1.00mm to 0.50mm)	%	7.9	<1.0	<1.0	3.4	1.7	4.1	2.1	15	3.7	1.4	9.5	15	1.6	19	13	1.3	12	27	1.1	3.5
% Sand (0.50mm to 0.25mm)	%	5.4	<1.0	2.8	6.4	<1.0	21	4.4	28	23	9.5	31	16	5.9	7.3	8.7	12	25	8.1	28	2.2
% Sand (0.25mm to 0.125mm)	%	3.8	4.5	12	11	1.8	20	8.2	21	30	33	22	5.2	11	2.8	4.4	37	22	3.3	29	1.7
% Sand (0.125mm to 0.063mm	%	5.0	7.7	14	11	8.3	12	7.6	11	15	23	7.0	2.6	5.4	2.0	4.4	14	9.8	1.9	12	2.2
% Silt (0.063mm to 0.0312mm)	%	20	39	30	24	39	13	11	10	12	17	8.6	15	33	10	25	15	9.5	6.0	15	18
% Silt (0.0312mm to 0.004mm)	%	22	41	34	26	42	15	11	9.4	10	13	8.4	16	36	11	25	14	9.2	6.8	14	21
% Clay (<4µm)	%	4.1	6.6	6.4	4.5	6.5	3.0	1.7	2.2	1.5	2.3	1.6	2.8	5.8	1.7	3.9	2.6	1.4	1.6	2.0	6.0
Organic Carbon																					
Total Organic Carbon	%	5.7	9.4	5.9	4.7	8.4	5.0	3.8	2.13	3.0	3.4	2.4	4.3	5.7	3.4	4.5	4.9	3.8	2.5	3.9	9.6
Total Metals (<2mm fractions)																					
Aluminum	mg/kg	5,220	4,540	5,960	6,230	4,750	8,890	7,270	8,120	8,850	7,530	7,410	5,150	5,320	3,670	5,730	10,000	9,600	8,960	8,110	6,850
Antimony	mg/kg	0.36	0.32	0.37	0.43	0.34	0.65	0.56	0.6	0.63	0.69	1.1	0.53	0.46	0.39	0.51	1.0	0.79	1.2	1.1	0.62
Arsenic	mg/kg	5.0	3.8	5.4	5.6	4.4	**9.3**	**6.7**	**6.7**	**7.6**	**8.8**	**7.3**	4.8	4.8	3.3	4.8	**7.1**	**5.9**	**8.4**	**7.2**	**7.2**
Barium	mg/kg	164	159	159	160	155	194	174	150	142	126	194	200	188	219	195	227	256	316	181	246
Beryllium	mg/kg	0.49	0.43	0.52	0.57	0.45	0.75	0.62	0.71	0.7	0.66	0.59	0.42	0.44	0.33	0.47	0.73	0.64	0.68	0.72	0.51
Bismuth	mg/kg	<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	<0.20	<0.20	<0.20	<0.20	<0.20
Boron	mg/kg	7.4	9.2	7.2	8.1	7.7	6.1	5.9	6.7	6.7	<5.0	7.9	9.2	6.5	11	9.6	8.8	23	7.5	8.6	23
Cadmium	mg/kg	**1.5**	**1.3**	**1.2**	**1.1**	**1.3**	**1.1**	**1.1**	**1.0**	**0.82**	**0.93**	**1.2**	**1.5**	**1.5**	**1.4**	**1.6**	**1.3**	**1.8**	**1.5**	**1.4**	**2.0**
Calcium	mg/kg	64,200	77,300	59,300	57,100	67,000	51,000	45,400	30,500	31,100	38,600	28,500	71,900	48,500	112,000	74,100	26,200	54,100	32,700	23,500	68,800
Chromium	mg/kg	8.5	7.7	9.6	10.0	7.9	13	12	13	13	11	14	9.9	11	6.6	10	17	15	16	14	13
Cobalt	mg/kg	24	20	23	23	24	20	16	9.3	12	11	8.4	11	11	11	11	7.5	7.9	7.0	6.5	6.4
Copper	mg/kg	12	9.4	11	11	10	15	12	13	12	12	12	9.9	11	6.9	9.9	14	14	14	14	12
Iron	mg/kg	11,300	8,960	12,500	12,800	10,300	19,200	16,200	14,400	17,400	18,900	16,400	11,500	11,400	7,600	11,900	17,100	14,800	**21,300**	17,000	12,700
Lead	mg/kg	15	6.6	8.5	8.4	7.4	11	9.0	8.2	8.7	8.6	9.1	6.8	7.5	5.0	7.9	9.3	8.2	8.9	11	6.7
Lithium	mg/kg	7.2	6.3	8.3	8.8	6.5	13	11	11	11	11	7.3	5.6	5.5	3.7	5.7	11	9.9	9.2	9.9	7.5
Magnesium	mg/kg	6,880	5,720	6,630	6,350	6,360	8,420	7,860	7,310	6,270	6,050	4,340	4,130	4,610	3,910	4,260	5,880	5,860	5,960	4,750	5,420
Manganese	mg/kg	356	256	273	314	326	450	274	127	266	345	236	248	218	258	227	203	131	278	111	141
Mercury	mg/kg	0.036	0.035	0.033	0.034	0.039	0.027	0.029	0.023	0.032	0.035	0.03	0.027	0.026	0.021	0.029	0.031	0.042	0.025	0.036	0.032
Molybdenum	mg/kg	1.1	0.93	1.1	1.2	0.98	1.9	1.5	1.3	1.6	1.9	1.6	1.1	0.93	0.77	0.98	1.6	1.4	1.8	1.4	1.1
Nickel	mg/kg	**50**	**49**	**48**	**48**	**49**	**48**	**43**	**30**	**33**	**35**	**31**	**36**	**36**	**32**	**34**	**32**	**43**	**32**	**31**	**39**
Phosphorous	mg/kg	1,030	1,010	1,100	1,080	1,000	1,400	1,240	1,170	1,270	1,280	1,260	1,170	1,130	998	1,270	1,400	1,640	1,410	1,310	1,720
Potassium	mg/kg	1,110	1,120	1,120	1,280	950	1,440	1,260	1,520	1,830	1,300	1,630	1,020	910	830	1,220	1,990	2,230	1,690	1,540	1,700
Selenium	mg/kg	**3.3**	**3.3**	**2.4**	**2.0**	**2.8**	1.3	1.7	1.5	0.73	0.68	1.1	**2.4**	**2.5**	**2.8**	**3.4**	1.2	**4.3**	1.1	1.4	**5.2**
Silver	mg/kg	0.14	0.12	0.13	0.12	0.13	0.14	0.14	0.16	0.11	0.12	0.14	0.12	0.16	<0.10	0.14	0.17	0.22	0.14	0.17	0.16
Sodium	mg/kg	101	106	86	91	107	90	78	77	68	63	73	93	103	108	145	76	168	69	90	302
Strontium	mg/kg	94	114	86	88	98	84	70	59	57	74	65	104	80	143	105	64	93	80	55	99
Sulfur	mg/kg	1,500	2,100	1,100	<1,000	1,300	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	1,400	1,200	<1,000	2,800	<1,000	1,200	2,000
Thallium	mg/kg	0.32	0.26	0.29	0.31	0.27	0.38	0.34	0.32	0.33	0.3	0.25	0.19	0.19	0.15	0.2	0.3	0.35	0.27	0.29	0.29
Tin	mg/kg	<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	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium	mg/kg	11	12	16	14	12	13	19	16	14	8.9	34	23	15	19	25	55	46	51	35	30
Tungsten	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	mg/kg	0.85	0.84	0.83	0.85	0.81	0.79	0.85	0.8	0.68	0.75	1.1	0.97	0.91	0.76	0.95	1.1	1.2	1.1	1.0	0.93
Vanadium	mg/kg	17	15	18	20	15	28	26	29	29	28	41	24	21	16	25	47	37	49	39	31
Zinc	mg/kg	120	92	113	109	98	**139**	**170**	104	109	113	98	90	99	73	101	118	**136**	**125**	119	**132**
Zirconium	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	1.5	1.1	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1.3	1.2	1.4	<1.0
Polycyclic Aromatic Hydrocarbons																					
Acenaphthene	mg/kg	<0.018	<0.033	<0.012	<0.011	<0.015	<0.0065	<0.0070	<0.0050	<0.0050	<0.015	<0.013	<0.033	<0.012	<0.028	<0.012	<0.0050	<0.020	<0.0050	<0.0070	<0.023
Acenaphthylene	mg/kg	<0.018	<0.033	<0.0075	<0.0070	<0.014	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.013	<0.033	<0.012	<0.028	<0.012	<0.0050	<0.020	<0.0050	<0.0070	<0.023
Acridine	mg/kg	<0.036	<0.065	<0.015	<0.014	<0.027	<0.010	<0.010	<0.010	<0.010	<0.017	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
Anthracene	mg/kg	<0.014	<0.026	<0.0060	<0.0056	<0.011	<0.0040	<0.0040	<0.0040	<0.0040	<0.0052	<0.010	<0.026	<0.0096	<0.022	<0.0096	<0.0040	<0.016	<0.0040	<0.0056	<0.018
Benz(a)anthracene	mg/kg	**0.036**	<0.065	0.023	0.021	**0.036**	<0.010	<0.010	<0.010	<0.010	0.019	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
Benzo(a)pyrene	mg/kg	<0.036	<0.065	<0.015	<0.014	<0.027	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
Benzo(b&j)fluoranthene	mg/kg	0.081	0.094	0.055	0.048	0.08	0.02	0.02	<0.010	0.022	0.047	0.027	<0.066	0.025	<0.055	0.033	0.011	<0.040	<0.010	<0.014	<0.045
Benzo(b+j+k)fluoranthene	mg/kg	<0.036	<0.065	0.016	0.015	<0.027	0.022	0.021	<0.015	0.023	0.051	-	-	-	-	-	<0.015	<0.060	<0.015	<0.020	<0.060
Benzo(e)pyrene	mg/kg	0.078	0.09	0.053	0.047	0.076	0.024	0.023	<0.010	0.025	0.049	0.028	<0.066	<0.024	<0.055	0.032	0.012	<0.040	<0.010	<0.014	<0.045
Benzo(g,h,i)perylene	mg/kg	-	-	-	-	-	0.011	0.01	<0.010	<0.010	0.019	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
Benzo(k)fluoranthene	mg/kg	<0.036	<0.065	<0.015	<0.014	<0.027	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
Chrysene	mg/kg	**0.13**	**0.13**	**0.079**	**0.07**	**0.12**	0.042	0.04	<0.010	0.048	**0.096**	0.052	<0.066	0.039	0.056	0.051	0.023	0.047	<0.010	0.021	<0.045
Dibenz(a,h)anthracene	mg/kg	<0.018	<0.033	<0.0075	<0.0070	<0.014	<0.0050	<0.0050	<0.0050	<0.0050	0.0073	<0.013	<0.033	<0.012	<0.028	<0.012	<0.0050	<0.020	<0.0050	<0.014	<0.023
Fluoranthene	mg/kg	0.053	<0.065	0.039	0.03	0.053	0.018	0.018	<0.010	0.014	0.035	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
Fluorene	mg/kg	**0.046**	<0.065	**0.034**	**0.027**	**0.046**	0.013	0.015	<0.010	<0.010	**0.025**	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.036	<0.065	<0.015	<0.014	<0.027	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
1-Methylnaphthalene	mg/kg	0.25	0.3	0.2	0.16	0.25	0.11	0.096	0.014	0.06	0.22	0.094	0.1	0.085	0.11	0.09	0.048	0.077	<0.010	0.046	0.063
2-Methylnaphthalene	mg/kg	**0.37**	**0.44**	**0.31**	**0.24**	**0.38**	**0.15**	**0.14**	**0.021**	**0.091**	**0.32**	**0.13**	**0.15**	**0.12**	**0.16**	**0.13**	**0.064**	**0.11**	0.013	**0.067**	**0.094**
Naphthalene	mg/kg	**0.14**	**0.17**	**0.11**	**0.088**	**0.14**	**0.058**	**0.052**	<0.010	**0.046**	**0.16**	**0.048**	<0.066	**0.041**	<0.055	**0.042**	0.025	<0.040	<0.010	0.027	<0.045
Perylene	mg/kg	<0.036	<0.065	0.017	<0.014	0.03	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
Phenanthrene	mg/kg	**0.34**	**0.38**	**0.24**	**0.2**	**0.33**	**0.12**	**0.11**	0.02	**0.1**	**0.32**	**0.13**	**0.15**	**0.11**	**0.15**	**0.13**	**0.058**	**0.12**	0.016	**0.053**	**0.12**
Pyrene	mg/kg	**0.059**	<0.065	0.039	0.032	**0.061**	0.018	0.019	<0.010	0.014	0.045	<0.025	<0.066	<0.024	<0.055	<0.024	0.012	<0.040	<0.010	<0.014	<0.045
Quinoline	mg/kg	<0.036	<0.065	<0.015	<0.014	<0.027	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025	<0.066	<0.024	<0.055	<0.024	<0.010	<0.040	<0.010	<0.014	<0.045
d10-Acenaphthene	%	62	65	67	64	62	86	94	86	79	79	71	67	70	67	69	79	85	89	89	81
d12-Chrysene	%	93	94	97	96	92	110	108	105	99	98	92	93	96	87	99	98	110	114	107	105
d8-Naphthalene	%	58	62	64	61	58	78	91	85	79	75	65	63	66	65	65	76	76	82	86	76
d10-Phenanthrene	%	87	87	90	88	84	100	104	98	90	94	89	88	93	84	92	94	100	104	100	94
B(a)P Total Potency Equivalent	mg/kg	0.044	0.07	0.021	<0.020	0.036	<0.020	<0.020	<0.020	<0.020	0.021	0.026	<0.063	0.025	0.053	0.026	<0.020	0.039	<0.020	<0.020	<0.043
IACR (CCME)	-	0.89	1.1	0.54	0.48	0.82	0.22	0.22	<0.15	0.23	0.48	0.38	<0.71	0.35	0.6	0.41	0.15	0.44	<0.15	0.17	<0.48

APPENDIX D

Calcite

Table D-1: Calcite Data from the Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2015 to 2019

Station			Location (UTMs)[a]		Replicate	Calcite Presence					Calcite Concretion					Calcite Index				
			Easting	Northing		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Reference Stations	Michel Creek	MI25	668186	5482838	1	0.36	0.00	0.58	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.58	0.35	0.00
					2	0.36	-	-	0.24	0.00	0.00	-	-	0.00	0.00	0.36	-	-	0.24	0.00
					3	0.36	-	-	0.02	0.00	0.00	-	-	0.00	0.00	0.36	-	-	0.02	0.00
	Andy Good Creek	AGCK	667555	5488644	1	0.00	-	-	0.31	0.00	0.00	-	-	0.00	0.00	0.00	-	-	0.31	0.00
					2	-	-	-	0.21	0.00	-	-	-	0.00	0.00	-	-	-	0.21	0.00
					3	-	-	-	0.22	0.00	-	-	-	0.00	0.00	-	-	-	0.22	0.00
	Leach Creek	LE1	659632	5494112	1	-	-	-	0.00	0.00	-	-	-	0.00	0.00	-	-	-	0.00	0.00
					2	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
					3	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
Mine-influenced Stations	Michel Creek	MIUCO	668134	5486767	1	0.73	0.52	0.59	0.88	0.00	0.15	0.00	0.00	0.53	0.00	0.87	0.52	0.59	1.41	0.00
					2	-	-	-	0.71	0.00	-	-	-	0.01	0.00	-	-	-	0.72	0.00
					3	-	-	-	0.74	0.00	-	-	-	0.00	0.00	-	-	-	0.74	0.00
	Corbin Creek	CORCK	668556	5487388	1	0.98	1.00	1.00	0.99	1.00	0.38	0.00	1.19	1.76	1.30	1.36	1.00	2.19	2.74	2.30
					2	-	-	-	0.99	1.00	-	-	-	0.99	1.30	-	-	-	1.98	2.30
					3	-	-	-	0.99	1.00	-	-	-	1.49	1.90	-	-	-	2.48	2.90
	Michel Creek	MIDCO	667711	5487625	1	0.69	1.00	0.91	0.99	0.90	0.00	0.00	0.00	0.64	0.00	0.69	1.00	0.91	1.63	0.90
					2	-	-	-	1.00	0.99	-	-	-	0.78	0.00	-	-	-	1.78	0.99
					3	-	-	-	0.98	0.97	-	-	-	0.49	0.00	-	-	-	1.47	0.97
					4	-	-	-	1.00	0.98	-	-	-	0.53	0.00	-	-	-	1.53	0.98
					5	-	-	-	0.91	0.93	-	-	-	0.39	0.00	-	-	-	1.30	0.93
		MIDAG	665258	5489417	1	0.27	-	-	0.66	0.00	0.00	-	-	0.00	0.00	0.36	-	-	0.66	0.00
					2	-	-	-	0.55	0.00	-	-	-	0.00	0.00	-	-	-	0.55	0.00
					3	-	-	-	0.55	0.00	-	-	-	0.00	0.00	-	-	-	0.55	0.00
		MIULE	660502	5493059	1	-	-	-	1.00	0.00	-	-	-	0.02	0.00	-	-	-	1.02	0.00
					2	-	-	-	0.56	0.00	-	-	-	0.00	0.00	-	-	-	0.56	0.00
					3	-	-	-	0.60	0.00	-	-	-	0.00	0.00	-	-	-	0.6	0.00
		MI5	659387	5496818	1	0.50	-	-	0.42	0.00	0.00	-	-	0.00	0.00	0.5	-	-	0.42	0.00
					2	-	-	-	0.37	0.00	-	-	-	0.00	0.00	-	-	-	0.37	0.00
					3	-	-	-	0.79	0.00	-	-	-	0.01	0.00	-	-	-	0.80	0.00

Notes: Stations are ordered from upstream to downstream.

a. UTM coordinates provided are from 2019 sampling program.

- = data not available or data not recorded.

APPENDIX E

Field and Habitat Data

Table E-1: Supporting Habitat Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2018 and 20

Station ID	Reference						Mine-influenced											
	MI25		AGCK		LE1		MIUCO		CORCK		MIDCO		MIDAG		MIULE		MI5	
Watercourse	Michel Creek		Andy Good Creek		Leach Creek		Michel Creek		Corbin Creek		Michel Creek							
Date Sampled	10-Sep-18	4-Sep-19	8-Sep-18	6-Sep-19	13-Sep-18	5-Sep-19	10-Sep-18	4-Sep-19	8-Sep-18	7-Sep-19	9-Sep-18	9-Sep-19	8-Sep-18	10-Sep-19	11-Sep-18	6-Sep-19	11-Sep-18	5-Sep-19
Zone 11 UTMs - Easting	668184	668186	667557	667555	659635	659632	668135	668134	668539	668556	667616	667711	665220	665258	660503	660502	659496	659387
Zone 11 UTMs - Northing	5482818	5482838	5488648	5488644	5494108	5494112	5486767	5486767	5487366	5487388	5487621	5487625	5489324	5489417	5493048	5493059	5496774	5496818
Elevation	1,597	1,568	1,492	1,475	1,347	1,347	1,509	1,500	-	1,511	1,491	1,467	1,454	1,440	1,368	1,363	-	1,318
Samplers' Initials	CR, PSC	SW, PS	JC, CR, MC	SW, PS	JT, DS	SW, PS	CR, PSC	SW, PS	CR, MC, JC	SW, PW	CR, JC	SW, PS	CR, MC, JC	SW, PS	CR, PSC	SW, PS	CR, PSC	SW, PS
Habitat Characteristics																		
Site Access Description	Corbin Creek Road	-	Road north of rail line go west, stay right to stream	Turn left onto small dirt road beside gas line before crossing AG creek on Corbin road	drive along Corbin Rd hwy to Hayes bridge. Park and walk to mouth, upstream of confluence with Michel	Park at brdige (Hayres) and walk in	Corbin Creek Rd, to ATV trail then walk NW	Park on FSR, walk in	park at bridge at Corbin Creek Road	Park near CMO access	logging road, walked, walked in from hwy may be better	From Corbin Road	Coal Mt. Road at bridge	Park at Grady Bridge on Corbin Road	Coal Mountain Rd at woodland bridge	Park at woodland bridge and walk upstream of rail bridge	Road off coal road, park at bridge	Park at brdige over creek
Surrounding Land Use	Logging	Forest	Logging, active in area	Forest, Logging	Forest, hwy and railway	Forest	Logging, Mining, CMO	Forest, Logging, Mining	Forest, Logging, Mining, Roads, Parking Lot	Residential, Mining	Mining	Forest, Logging, Mining	Mining	Forest, Logging	Forest, Logging, Mining	Forest, Logging	Logging, Mining, Coal Mt. Operation, upstream	Forest, Logging, Mining
Anthropogenic Influences	-	-	-	People driving across river, train bridge downstream	-	None	-	-	Mine	-	CMO upstream	-	Coal Mountain upstream	Road Bridge upstream of sites 1 and 3	CMO upstream	-	-	Mining, bridge/road upstream
Length of Reach Assessed (m)	50	30	30	-	50	50	50	30	50 - 100	30	50 to 100	-	50	-	200	50	~150	50
Substrate: % Bedrock	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0
% Boulder	5	0	5	5	5	0	5	10	10	5	5	5	20	10	15	15	5	2
% Cobble	50	40	60	70	65	90	75	75	65	60	80	60	60	80	60	75	65	85
% Gravel	30	40	30	25	15	5	5	8	10	20	5	20	10	5	15	10	20	10
% Sand	10	10	5	<1	10	3	5	5	0	0	5	5	10	5	5	0	5	1
% Finer	5	10	0	0	5	2	0	2	20	15	5	5	0	0	5	0	5	2
Bank Stability	moderate	moderate	moderate	moderate	unstable, substantial erosion	moderate	unstable, substantial erosion	moderate	stable, no erosion	moderate	unstable, substantial erosion	moderate	unstable, substantial erosion	moderate	unstable, substantial erosion	unstable, substantial erosion	moderate	-
Water Colour & Clarity	clear	colourless, clear	clear	colourless, clear	none, clear	colourless, clear	clear	colourless, clear	none, clear	colourless, clear	brownish, clear	colourless, clear	clear	colourless, clear	clear	colourless, clear	clear	colourless, clear
Channel Measurements																		
Bankfull Width (m)	12	9	20	18	20	40	38	20	7	5	23	15	18	15	48	50	37	25
Wetted Width (m)	5	5	15	17	13	12	7	5	6	3	6	7	9	10 to 12	10	12	17	10
Bankfull-Wetted Depth (cm)	100	45	1,800	30	80	35	150	100	50	50	320	50	150	150	250	-	200	35

Note: Stations are ordered upstream to downstream.
"-" = data not available or data not recorded; % = percent; cm = centimetre; m = metre

Table E-2: Kick and Sweep Net Data for Samples Collected at Coal Mountain Operations Local Aquatic Effects Monitoring Program Stations, 2018 and 2019

Field Parameters	Reference Stations						Mine-influenced Stations											
	Michel Creek		Andy Good Creek		Leach Creek		Michel Creek		Corbin Creek		Michel Creek							
	MI25		AGCK		LE1		MIUCO		CORCK		MIDCO		MIDAG		MIULE		MI5	
Easting	668184	668186	667557	667555	659635	659632	668135	668134	668539	668556	667716	667711	665267	665258	660503	660502	659406	659387
Northing	5482818	5482838	5488648	5488644	5494108	5494112	5486767	5486767	5487366	5487388	5487621	5487625	5489410	5489417	5493048	5493059	5496774	5496818
Date	10-Sep-18	4-Sep-19	8-Sep-18	6-Sep-19	13-Sep-18	5-Sep-19	10-Sep-18	9-Sep-19	8-Sep-18	7-Sep-19	9-Sep-18	7-Sep-19	8-Sep-18	10-Sep-19	11-Sep-18	6-Sep-19	11-Sep-18	5-Sep-19
Samplers' Initials	PSC	SW	CR	SW	JT	SW	PSC	PS	CR	SW	CR	PS	CR	PS	PSC	SW	PSC	SW
Number of Jars	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total Kick Distance (m)	12	16	14	17	17	15	11.0	-	18	-	11	-	12	-	13.0	15.0	15	20
Full Transect (Yes / No)	Yes	Yes	No	Yes	Yes	Yes	Yes	-	Yes	-	Yes	Yes	Yes	No	Yes	No	Yes	No
Number of Transects	3	4	2 at 3/4 width	1	1	2.5	3	-	3	-	2	2.5	1.75	-	2	-	2	-
Easting	668217	668212	667578	667582	-	659591	668184	668170	668576	668575	667785	667786	665220	665221	660548	660559	659485	659486
Northing	5482778	5482784	5488700	5488699	-	5494042	5486712	5486709	5487424	5487428	5487580	5487579	5489324	5489318	5492993	5492979	5496703	5496720
Date	10-Sep-18	4-Sep-19	8-Sep-18	6-Sep-19	-	5-Sep-19	10-Sep-18	9-Sep-19	8-Sep-18	7-Sep-09	9-Sep-18	7-Sep-19	8-Sep-18	10-Sep-19	11-Sep-18	6-Sep-19	11-Sep-18	5-Sep-19
Samplers' Initials	PSC	SW	CR	SW	-	SW	PSC	SW	CR	SW	CR	SW	CR	PS	PSC	SW	PSC	SW
Number of Jars	1	1	1	1	-	1	1	1	1	2	1	1	1	1	1	1	1	1
Total Kick Distance (m)	10	20	16	15	-	15	12	-	12	-	11	-	15	-	10	15	14	15
Full Transect (Yes / No)	Yes	Yes	Yes	No	-	Yes	Yes	-	Yes	-	Yes	-	Yes	No	Yes	No	Yes	No
Number of Transects	5	6	2.0	-	-	1.5	2.00	-	4	-	1.75	-	4.5	-	1.00	-	1.00	-
Easting	668238	668228	667613	667633	-	659624	668204	668197	668477	668487	667843	667839	665241	665213	660632	660639	659496	659508
Northing	5482722	5482714	5488719	5488731	-	5493968	5486679	5486669	5487346	5487353	5487550	5487544	5489481	5489496	5493026	5493026	5496623	5496610
Date	10-Sep-18	4-Sep-19	8-Sep-18	6-Sep-19	-	5-Sep-19	10-Sep-18	9-Sep-19	8-Sep-18	7-Sep-09	9-Sep-18	7-Sep-19	8-Sep-18	10-Sep-19	11-Sep-18	6-Sep-19	11-Sep-18	5-Sep-19
Samplers' Initials	PSC	SW	CR	SW	-	SW	PSC	-	CR	SW	CR	SW	CR	SW	PSC	SW	PSC	SW
Number of Jars	1	1	1	1	-	1	1	1	1	2	1	1	1	1	1	1	1	1
Total Kick Distance (m)	12	15	14	15	-	15	12	-	12	-	10	-	12	-	11	-	16	17
Full Transect (Yes / No)	Yes	Yes	Yes	Yes	-	Yes	Yes	-	Yes	-	Yes	-	Yes	No	Yes	No	Yes	No
Number of Transects	6	4	2.0	1.5	-	1	3.00	-	4.5	-	2	-	3.75	-	1.00	-	1.20	-
Easting	-	-	-	-	-	-	-	-	-	-	667675	667672	-	-	-	-	-	-
Northing	-	-	-	-	-	-	-	-	-	-	5487639	5487636	-	-	-	-	-	-
Date	-	-	-	-	-	-	-	-	-	-	9-Sep-18	7-Sep-19	-	-	-	-	-	-
Samplers' Initials	-	-	-	-	-	-	-	-	-	-	CR	SW	-	-	-	-	-	-
Number of Jars	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
Total Kick Distance (m)	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-
Full Transect (Yes / No)	-	-	-	-	-	-	-	-	-	-	Yes	Yes	-	-	-	-	-	-
Number of Transects	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Easting	-	-	-	-	-	-	-	-	-	-	667647	667646	-	-	-	-	-	-
Northing	-	-	-	-	-	-	-	-	-	-	5487700	5487698	-	-	-	-	-	-
Date	-	-	-	-	-	-	-	-	-	-	9-Sep-18	7-Sep-19	-	-	-	-	-	-
Samplers' Initials	-	-	-	-	-	-	-	-	-	-	CR	SW	-	-	-	-	-	-
Number of Jars	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
Total Kick Distance (m)	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-
Full Transect (Yes / No)	-	-	-	-	-	-	-	-	-	-	1.33	-	-	-	-	-	-	-
Number of Transects	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Stations are ordered upstream to downstream.
"-" = data not available or data not recorded; m = metre

Table E-3: Channel Measurements of Sampling Stations at Coal Mountain Operations Local Aquatic Effects Monitoring Program, 2018 and 2019

	Year		Location (UTMs)[a]		2018						2019					
	Replicate		Easting	Northing	A	B	C	D	E	Mean	A	B	C	D	E	Mean
Reference Stations		MI25	668186	5482838												
	1	Depth (cm)			12.00	11.00	13.00	8.00	14.00	11.60	12.00	10.00	7.00	10.00	10.00	9.80
		Velocity (m/s)			0.08	0.27	0.46	0.31	0.51	0.33	0.10	0.13	0.18	0.12	0.17	0.14
	2	Depth (cm)			15.00	12.00	13.00	12.00	10.00	12.40	10.00	14.00	14.00	22.00	14.00	14.80
		Velocity (m/s)			0.36	0.22	0.20	0.06	0.19	0.21	0.07	0.40	0.21	0.13	0.29	0.22
	3	Depth (cm)			17.00	16.00	14.00	12.00	10.00	13.80	14.00	16.00	18.00	18.00	20.00	17.20
		Velocity (m/s)			0.25	0.34	0.36	0.48	0.22	0.33	0.14	0.06	0.21	0.22	0.43	0.21
		AGCK	667555	5488644												
	1	Depth (cm)			10.00	11.00	13.00	13.00	12.00	11.80	21.00	16.50	18.50	17.50	10.00	16.70
		Velocity (m/s)			0.30	0.35	0.57	0.23	0.31	0.35	0.36	0.33	0.27	0.19	0.17	0.26
	2	Depth (cm)			8.00	13.00	26.00	21.00	25.00	18.60	18.00	25.00	18.50	22.50	24.50	21.70
		Velocity (m/s)			0.24	0.12	0.09	0.43	0.22	0.22	0.22	0.21	0.24	0.34	0.25	0.25
	3	Depth (cm)			10.00	20.00	17.00	15.00	14.00	15.20	15.00	19.00	19.00	14.00	19.00	17.20
		Velocity (m/s)			0.51	0.60	0.19	0.38	0.10	0.36	0.22	0.19	0.49	0.27	0.38	0.31
		LE1	659632	5494112												
	1	Depth (cm)			9.00	16.50	18.00	18.00	15.50	15.40	13.00	16.00	14.00	18.00	15.00	15.20
		Velocity (m/s)			0.08	0.28	0.56	0.48	0.32	0.35	0.32	0.32	0.31	0.21	0.54	0.34
	2	Depth (cm)			-	-	-	-	-	-	18.00	20.00	12.00	18.00	17.00	17.00
		Velocity (m/s)			-	-	-	-	-	-	0.18	0.44	0.26	0.43	0.25	0.31
	3	Depth (cm)			-	-	-	-	-	-	16.00	17.00	22.00	19.00	23.00	19.40
		Velocity (m/s)			-	-	-	-	-	-	0.19	0.23	0.24	0.33	0.46	0.29
Mine-influenced Stations		MIUCO	668134	5486767												
	1	Depth (cm)			15.00	17.00	17.00	15.00	20.00	16.80	15.00	15.00	19.00	23.00	20.00	18.40
		Velocity (m/s)			0.44	0.49	0.28	0.41	0.24	0.37	0.24	0.26	0.30	0.39	0.19	0.28
	2	Depth (cm)			13.00	13.00	16.00	25.00	17.00	16.80	16.00	18.00	17.00	20.00	21.00	18.40
		Velocity (m/s)			0.24	0.26	0.28	0.13	0.27	0.24	0.34	0.19	0.16	0.34	0.38	0.28
	3	Depth (cm)			14.00	20.00	14.00	12.00	15.00	15.00	20.50	16.50	23.00	20.00	11.50	18.30
		Velocity (m/s)			0.28	0.22	0.42	0.52	0.44	0.38	0.36	0.23	0.35	0.49	0.21	0.33
		CORCK	668556	5487388												
	1	Depth (cm)			14.00	17.00	19.00	15.00	20.00	17.00	12.00	13.00	20.00	16.00	12.00	14.60
		Velocity (m/s)			0.14	0.15	0.40	0.29	0.39	0.27	0.35	0.38	0.38	0.35	0.48	0.39
	2	Depth (cm)			12.00	7.00	12.00	23.00	18.00	14.40	12.00	22.00	16.00	12.50	9.50	14.40
		Velocity (m/s)			0.64	0.35	0.20	0.49	0.27	0.39	0.16	0.17	0.38	0.43	0.29	0.29
	3	Depth (cm)			15.00	16.00	13.00	20.00	12.00	15.20	26.00	12.00	9.50	18.00	18.00	16.70
		Velocity (m/s)			0.50	0.77	0.33	0.22	0.24	0.41	0.74	0.48	0.28	0.40	0.48	0.47
		MIDCO	667711	5487625												
	1	Depth (cm)			10.00	21.00	25.00	16.00	23.00	19.00	17.00	15.00	12.00	24.00	26.00	18.80
		Velocity (m/s)			0.13	0.43	0.39	0.61	0.57	0.43	0.34	0.50	0.26	0.21	0.31	0.32
	2	Depth (cm)			10.00	23.00	15.00	12.00	18.00	15.60	18.00	16.00	16.00	17.00	21.00	17.60
		Velocity (m/s)			0.44	0.40	0.44	0.47	0.23	0.40	0.36	0.18	0.43	0.44	0.37	0.36
	3	Depth (cm)			26.00	18.00	14.00	11.00	16.00	17.00	13.50	19.50	21.00	13.00	20.00	17.40
		Velocity (m/s)			0.49	0.46	0.20	0.19	0.58	0.38	0.37	0.47	0.27	0.20	0.38	0.34
	4	Depth (cm)			10.00	7.00	14.00	25.00	31.00	17.40	16.00	16.00	17.00	19.00	19.00	17.40
		Velocity (m/s)			0.31	0.49	0.15	0.13	0.21	0.26	0.23	0.38	0.14	0.24	0.25	0.25
	5	Depth (cm)			12.00	17.00	18.00	22.00	15.00	16.80	14.00	11.00	15.00	24.00	21.00	17.00
		Velocity (m/s)			0.23	0.34	0.25	0.31	0.51	0.33	0.34	0.32	0.25	0.26	0.30	0.29
		MIDAG	665258	5489417												
	1	Depth (cm)			24.00	30.00	36.00	19.00	30.00	27.80	17.00	29.00	18.00	31.00	31.00	25.20
		Velocity (m/s)			0.10	0.25	0.28	0.15	0.18	0.19	0.32	0.26	0.35	0.28	0.39	0.32
	2	Depth (cm)			14.00	15.00	34.00	28.00	24.00	23.00	14.00	17.00	17.00	16.00	15.00	15.80
		Velocity (m/s)			0.48	0.88	0.63	0.45	0.63	0.61	0.87	0.86	0.63	0.53	1.00	0.78
	3	Depth (cm)			21.00	23.00	23.00	32.00	29.00	25.60	16.00	26.00	15.00	17.00	27.00	20.20
		Velocity (m/s)			0.44	0.26	0.39	0.64	0.38	0.42	0.36	0.37	0.25	0.40	0.34	0.34
		MIULE	660502	5493059												
	1	Depth (cm)			14.00	22.00	21.00	32.00	32.00	24.20	12.00	22.00	31.00	35.00	23.00	24.60
		Velocity (m/s)			0.32	0.44	0.73	0.75	0.58	0.56	0.18	0.38	0.25	0.39	0.60	0.36
	2	Depth (cm)			17.00	19.00	32.00	20.00	19.00	21.40	22.00	23.00	31.00	28.00	22.00	25.20
		Velocity (m/s)			0.56	0.28	0.44	0.69	0.36	0.47	0.26	0.40	0.34	0.34	0.42	0.35
	3	Depth (cm)			16.00	17.00	25.00	44.00	26.00	25.60	21.00	25.00	19.00	23.00	15.00	20.60
		Velocity (m/s)			0.35	0.38	0.51	0.49	0.25	0.40	0.28	0.30	0.26	0.27	0.21	0.26
		MI5	659387	5496818												
	1	Depth (cm)			16.00	20.00	26.00	27.00	19.00	21.60	20.00	42.00	37.00	19.00	14.00	26.40
		Velocity (m/s)			0.72	0.76	0.75	0.63	0.50	0.67	0.25	0.29	0.35	0.53	0.34	0.35
	2	Depth (cm)			16.00	23.00	27.00	20.00	30.00	23.20	18.00	19.00	17.00	15.00	24.00	18.60
		Velocity (m/s)			0.27	0.45	0.28	0.44	0.55	0.40	0.12	0.30	0.16	0.14	0.23	0.19
	3	Depth (cm)			12.00	21.00	22.00	27.00	14.00	19.20	23.00	25.00	25.00	16.00	23.00	22.40
		Velocity (m/s)			0.25	0.22	0.44	0.46	0.67	0.41	0.44	0.22	0.39	0.36	0.18	0.32

Notes: Stations are ordered upstream to downstream. Velocity measurements were taken at five randomly chosen locations throughout the kick sample area. Velocity was measured at the bottom of the water column.

a. UTM coordinates provided are from 2019 sampling program.

"-" = data not available or data not recorded; % = percent; cm = centimetre; m = metre

APPENDIX F

Benthic Invertebrate Community Data

Table F-1: Benthic Invertebrate Community Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Sample	Richness (# of taxa)	Abundance (# of individuals)	Percent Dominance	Simpson's Diversity	Shannon's Diversity	Simpson's Dominance	Simpson's Eveness	EPT Richness	% EPT	Ephemeroptera Richness
			Easting	Northing													
Michel Creek	MI25	Reference	668186	5482838	2012	1	RG_MI25_BIC-1_2012-09-15	40	2050	0.2	0.9	3.0	1.1	0.3	29.0	91.8	9
Michel Creek	MI25	Reference	668186	5482838	2013	1	RG_MI25_BIC-1_2013-09-15	28	26100	0.4	0.7	1.6	1.5	0.1	20.0	97.6	7
Michel Creek	MI25	Reference	668186	5482838	2015	1	RG_MI25_BIC-1_2015-09-10	37	7140	0.2	0.9	2.7	1.1	0.3	23.0	83.8	8
Michel Creek	MI25	Reference	668186	5482838	2016	1	RG_MI25_BIC-1_2016-09-13	45	16160	0.3	0.9	2.6	1.2	0.2	26.0	68.1	7
Michel Creek	MI25	Reference	668186	5482838	2017	1	RG_MI25_BIC-1_2017-09-14	39	25200	0.3	0.9	2.4	1.2	0.2	22.0	77.6	7
Michel Creek	MI25	Reference	668184	5482818	2018	1	RG_MI25_BIC-1_2018-09-10	41	14560	0.4	0.8	2.4	1.2	0.1	23.0	85.9	7
Michel Creek	MI25	Reference	668186	5482838	2019	1	RG_MI25_BIC-1_2019-09-04	37	6420	0.2	0.9	2.5	1.2	0.2	27.0	80.1	8
Michel Creek	MI25	Reference	668186	5482838	2013	2	RG_MI25_BIC-2_2013-09-15	30	10500	0.4	0.8	2.0	1.3	0.2	25.0	99.0	8
Michel Creek	MI25	Reference	668186	5482838	2015	2	RG_MI25_BIC-2_2015-09-10	32	7200	0.2	0.9	2.6	1.1	0.3	19.0	79.7	8
Michel Creek	MI25	Reference	668184	5482818	2018	2	RG_MI25_BIC-2_2018-09-10	40	5014	0.2	0.9	3.0	1.1	0.3	22.0	63.2	7
Michel Creek	MI25	Reference	668186	5482838	2019	2	RG_MI25_BIC-2_2019-09-04	39	4200	0.2	0.9	2.8	1.1	0.2	20.0	60.1	7
Michel Creek	MI25	Reference	668186	5482838	2013	3	RG_MI25_BIC-3_2013-09-15	29	17300	0.5	0.7	1.7	1.4	0.1	20.0	97.6	8
Michel Creek	MI25	Reference	668186	5482838	2015	3	RG_MI25_BIC-3_2015-09-10	34	6640	0.2	0.9	2.7	1.1	0.3	23.0	69.3	8
Michel Creek	MI25	Reference	668184	5482818	2018	3	RG_MI25_BIC-3_2018-09-10	52	14340	0.2	0.9	3.0	1.1	0.2	28.0	86.2	10
Michel Creek	MI25	Reference	668186	5482838	2019	3	RG_MI25_BIC-3_2019-09-04	40	6440	0.3	0.9	2.8	1.1	0.2	23.0	83.9	8
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	AGCK_BIC-1_2012-09-16	27	11980	0.7	0.5	1.5	1.8	0.1	18.0	89.0	8
Andy Good Creek	AGCK	Reference	667555	5488644	2013	1	AGCK_BIC-1_2013-09-15	29	27840	0.7	0.5	1.4	1.8	0.1	24.0	95.1	9
Andy Good Creek	AGCK	Reference	667555	5488644	2015	1	AGCK_BIC-1_2015-09-12	27	7180	0.6	0.6	1.5	1.7	0.1	20.0	97.2	9
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	AGCK_BIC-1_2018-09-08	27	10500	0.5	0.7	1.6	1.5	0.1	18.0	96.0	10
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	AGCK_BIC-1_2019-09-06	27	16280	0.6	0.6	1.5	1.6	0.1	15.0	92.6	9
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	AGCK_BIC-2_2018-09-08	33	11200	0.4	0.8	2.0	1.3	0.1	17.0	88.9	9
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	AGCK_BIC-2_2019-09-06	30	14760	0.6	0.6	1.5	1.7	0.1	16.0	89.6	9
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	AGCK_BIC-3_2018-09-08	32	13760	0.4	0.8	2.1	1.3	0.1	20.0	85.2	9
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	AGCK_BIC-3_2019-09-06	31	12220	0.6	0.6	1.8	1.6	0.1	20.0	87.6	10
Leach Creek	LE1	Reference	659635	5494108	2018	1	LE1_BIC-1_2018-09-13	46	17300	0.1	0.9	3.1	1.1	0.3	25.0	75.7	7
Leach Creek	LE1	Reference	659632	5494112	2019	1	LE1_BIC-1_2019-09-05	41	7360	0.2	0.9	2.9	1.1	0.3	23.0	71.5	5
Leach Creek	LE1	Reference	659632	5494112	2019	2	LE1_BIC-2_2019-09-05	36	9480	0.3	0.9	2.6	1.2	0.2	22.0	81.4	7
Leach Creek	LE1	Reference	659632	5494112	2019	3	LE1_BIC-3_2019-09-05	43	8640	0.3	0.9	2.6	1.1	0.2	26.0	78.2	8
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	RG_CORCK_BIC-1_2012-09-15	30	1230	0.3	0.9	2.5	1.2	0.2	18.0	44.0	4
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	RG_CORCK_BIC-1_2015-09-11	36	29180	0.5	0.7	1.9	1.4	0.1	13.0	17.0	0
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2016	1	RG_CORCK_BIC-1_2016-09-13	37	16180	0.1	0.9	2.7	1.1	0.3	12.0	28.6	3
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2017	1	RG_CORCK_BIC-1_2017-09-14	28	10000	0.3	0.8	2.3	1.2	0.2	8.0	33.8	1
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	RG_CORCK_BIC-1_2018-09-08	31	1560	0.2	0.9	2.7	1.1	0.3	13.0	37.2	4
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	RG_CORCK_BIC-1_2019-09-07	30	11580	0.2	0.9	2.4	1.1	0.3	11.0	15.2	1
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	RG_CORCK_BIC-2_2018-09-08	25	3073	0.2	0.9	2.4	1.2	0.3	7.0	13.0	1
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	RG_CORCK_BIC-2_2019-09-07	28	22360	0.2	0.9	2.5	1.1	0.3	8.0	11.1	0
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	RG_CORCK_BIC-3_2018-09-08	24	5433	0.2	0.9	2.5	1.1	0.4	9.0	20.9	0
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	RG_CORCK_BIC-3_2019-09-07	28	14500	0.2	0.9	2.5	1.1	0.3	10.0	18.3	1
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	RG_MIUCO_BIC-1_2012-09-15	38	1806	0.2	0.9	2.9	1.1	0.3	29.0	87.4	8
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	RG_MIUCO_BIC-1_2015-09-10	37	7820	0.2	0.9	2.6	1.1	0.2	23.0	72.4	9
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2016	1	RG_MIUCO_BIC-1_2016-09-13	37	4175	0.2	0.9	2.9	1.1	0.3	25.0	80.5	9
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2017	1	RG_MIUCO_BIC-1_2017-09-14	38	7120	0.2	0.9	2.8	1.1	0.3	26.0	81.7	7
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	RG_MIUCO_BIC-1_2018-09-10	39	8400	0.1	0.9	3.0	1.1	0.4	27.0	69.3	8
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	RG_MIUCO_BIC-1_2019-09-09	47	10280	0.2	0.9	3.2	1.1	0.3	32.0	54.7	9
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	RG_MIUCO_BIC-2_2018-09-10	34	3200	0.2	0.9	2.8	1.1	0.3	22.0	71.3	8
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	RG_MIUCO_BIC-2_2019-09-09	41	5229	0.2	0.9	2.9	1.1	0.3	27.0	61.2	9
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	RG_MIUCO_BIC-3_2018-09-10	35	7680	0.2	0.9	2.8	1.1	0.3	23.0	66.1	9
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	RG_MIUCO_BIC-3_2019-09-09	44	5200	0.2	0.9	3.0	1.1	0.3	26.0	56.2	11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	RG_MIDCO_BIC-1_2012-09-15	38	11667	0.2	0.9	2.8	1.1	0.3	25.0	57.7	6
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	RG_MIDCO_BIC-1_2015-09-11	37	12360	0.2	0.9	2.7	1.1	0.3	22.0	51.5	7
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2016	1	RG_MIDCO_BIC-1_2016-09-13	46	7500	0.2	0.9	3.2	1.1	0.3	26.0	50.1	6
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2017	1	RG_MIDCO_BIC-1_2017-09-14	46	17580	0.2	0.9	3.0	1.1	0.3	28.0	47.3	6
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	RG_MIDCO_BIC-1_2018-09-09	44	7100	0.2	0.9	2.8	1.1	0.2	21.0	35.5	5
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	RG_MIDCO_BIC-1_2019-09-09	46	18980	0.3	0.9	2.7	1.1	0.2	22.0	26.4	5
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	RG_MIDCO_BIC-2_2018-09-09	34	6050	0.2	0.9	2.7	1.1	0.3	19.0	21.5	4
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	RG_MIDCO_BIC-2_2019-09-09	46	34580	0.5	0.7	2.1	1.4	0.1	23.0	22.0	6
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	RG_MIDCO_BIC-3_2018-09-09	36	6140	0.3	0.9	2.7	1.1	0.2	17.0	26.4	2
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	RG_MIDCO_BIC-3_2019-09-09	40	12040	0.2	0.9	2.7	1.1	0.2	21.0	44.0	7
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	RG_MIDCO_BIC-4_2018-09-09	38	7000	0.2	0.9	2.7	1.1	0.2	24.0	38.0	6
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	RG_MIDCO_BIC-4_2019-09-09	46	30340	0.5	0.7	2.1	1.3	0.1	27.0	15.8	6
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	RG_MIDCO_BIC-5_2018-09-09	38	6350	0.5	0.8	2.3	1.3	0.1	20.0	20.5	6
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	RG_MIDCO_BIC-5_2019-09-09	44	25920	0.3	0.8	2.3	1.2	0.1	25.0	26.2	7
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	RG_MIDAG_BIC-1_2012-09-16	33	10067	0.2	0.9	2.6	1.1	0.2	23.0	86.1	8
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	RG_MIDAG_BIC-1_2015-09-12	36	14520	0.2	0.9	2.4	1.2	0.2	21.0	72.2	10
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	RG_MIDAG_BIC-1_2018-09-08	42	6160	0.2	0.9	3.0	1.1	0.3	23.0	64.6	9
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	RG_MIDAG_BIC-1_2019-09-10	40	6860	0.3	0.9	2.7	1.1	0.2	19.0	37.3	7
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	RG_MIDAG_BIC-2_2018-09-08	41	16220	0.1	0.9	3.0	1.1	0.4	27.0	70.0	8
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	RG_MIDAG_BIC-2_2019-09-10	54	26120	0.2	0.9	2.8	1.1	0.2	31.0	60.4	10
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	RG_MIDAG_BIC-3_2018-09-08	31	7220	0.1	0.9	2.9	1.1	0.4	19.0	74.8	6
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	RG_MIDAG_BIC-3_2019-09-10	37	3489	0.5	0.8	2.3	1.3	0.1	16.0	34.1	7
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	RG_MIULE_BIC-1_2018-09-11	31	7080	0.2	0.9	2.8	1.1	0.4	17.0	62.1	6
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	RG_MIULE_BIC-1_2019-09-06	41	12940	0.2	0.9	3.0	1.1	0.3	25.0	63.7	7
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	RG_MIULE_BIC-2_2018-09-11	41	16420	0.2	0.9	2.9	1.1	0.3	24.0	70.5	8
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	RG_MIULE_BIC-2_2019-09-06	48	17800	0.2	0.9	2.8	1.1	0.2	26.0	61.3	9
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	RG_MIULE_BIC-3_2018-09-11	40	8160	0.2	0.9	2.9	1.1	0.3	23.0	72.3	7
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	RG_MIULE_BIC-3_2019-09-06	40	17740	0.3	0.9	2.6	1.1	0.2	21.0	69.9	8
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	RG_MI5_BIC-1_2012-09-16	38	7600	0.1	0.9	3.1	1.1	0.4	26.0	71.4	10
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	RG_MI5_BIC-1_2015-09-13	26	7120	0.4	0.8	2.2	1.2	0.2	18.0	86.5	8
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	RG_MI5_BIC-1_2018-09-11	42	14040	0.2	0.9	2.8	1.1	0.3	28.0	78.6	8
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	RG_MI5_BIC-1_2019-09-05	37	14560	0.3	0.8	2.3	1.2	0.2	19.0	81.0	6
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	RG_MI5_BIC-2_2018-09-11	35	6480	0.2	0.9	2.8	1.1	0.3	20.0	68.2	6
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	RG_MI5_BIC-2_2019-09-05	43	16220	0.2	0.9	2.7	1.1	0.2	23.0	77.1	8
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	RG_MI5_BIC-3_2018-09-11	30	8880	0.2	0.9	2.7	1.1	0.4	20.0	87.2	9
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	RG_MI5_BIC-3_2019-09-05	35	7960	0.2	0.9	2.5	1.1	0.2	18.0	75.4	7

a. UTM coordinates for 2012 to 2017 data available from the RAEMP; 2019 UTMs included here for reference.

"-" = data not available; % = percent; EPT = ephemeroptera, plecoptera, trichoptera.

Table F-1: Benthic Invertebrate Community Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	% Ephemeroptera	Trichoptera Richness	% Trichoptera	Plecoptera Richness	% Plecoptera	Chironomidae Richness	% Chironomidae	% Oligochaeta	Diptera Richness	% Diptera	% Acari	% Mollusca	% Bivalvia
Michel Creek	12.2	7	23.8	13	55.8	3	3.4	0.9	6	5.2	1.5	0.0	0.0
Michel Creek	49.0	5	1.5	8	47.2	2	1.3	0.0	6	2.0	0.2	0.0	0.0
Michel Creek	47.1	6	5.0	9	31.7	10	14.3	0.0	13	15.7	0.6	0.0	0.0
Michel Creek	50.4	9	5.1	10	12.6	13	30.0	0.0	16	31.1	0.2	0.0	0.0
Michel Creek	53.4	7	4.3	8	19.9	9	19.8	0.0	13	21.2	0.4	0.0	0.0
Michel Creek	62.2	7	9.6	9	14.0	9	12.5	0.1	14	13.5	0.5	0.0	0.0
Michel Creek	49.5	8	10.3	11	20.2	8	18.7	0.6	8	18.7	0.0	0.0	0.0
Michel Creek	44.8	9	3.8	8	50.5	2	0.4	0.0	3	0.6	0.4	0.0	0.0
Michel Creek	49.7	4	5.0	7	25.0	7	17.5	0.0	11	18.9	0.3	0.0	0.0
Michel Creek	23.1	7	21.4	8	18.8	10	30.2	2.0	13	32.8	0.9	0.0	0.0
Michel Creek	33.6	4	11.0	9	15.5	10	30.4	0.3	15	34.2	2.7	0.0	0.0
Michel Creek	44.5	4	0.9	8	52.1	5	1.3	0.1	6	2.0	0.2	0.0	0.0
Michel Creek	42.8	7	5.4	8	21.1	9	27.1	0.0	11	30.7	0.0	0.0	0.0
Michel Creek	44.2	7	18.3	11	23.7	13	9.2	0.7	18	11.0	1.1	0.0	0.0
Michel Creek	46.0	6	18.0	9	19.9	10	11.8	0.9	14	13.7	0.3	0.0	0.0
Andy Good Creek	80.8	3	1.0	7	7.2	5	10.4	0.0	6	10.5	0.5	0.0	0.0
Andy Good Creek	76.4	6	1.3	9	17.4	1	1.7	2.5	2	2.2	0.2	0.0	0.0
Andy Good Creek	68.2	4	4.5	7	24.5	5	1.9	0.0	6	2.5	0.3	0.0	0.0
Andy Good Creek	88.6	2	0.4	6	7.0	6	3.0	0.4	8	3.6	0.0	0.0	0.0
Andy Good Creek	86.4	2	3.4	4	2.8	8	4.7	0.4	10	7.0	0.0	0.0	0.0
Andy Good Creek	81.4	2	1.4	6	6.1	12	9.1	0.2	14	10.7	0.2	0.0	0.0
Andy Good Creek	83.9	2	2.8	5	2.8	7	8.3	0.7	11	9.8	0.0	0.0	0.0
Andy Good Creek	69.0	3	2.0	8	14.1	7	13.5	0.0	10	14.4	0.4	0.0	0.0
Andy Good Creek	76.6	3	3.9	7	7.0	5	6.5	1.1	8	10.8	0.5	0.0	0.0
Leach Creek	39.3	7	11.3	11	25.1	10	11.0	0.1	16	18.6	1.3	0.0	0.0
Leach Creek	28.8	10	29.9	8	12.8	5	6.0	0.0	10	20.7	3.0	0.0	0.0
Leach Creek	35.0	6	34.0	9	12.4	6	7.8	0.2	10	16.0	0.8	0.0	0.0
Leach Creek	32.4	7	33.1	11	12.7	9	7.6	0.2	12	18.8	1.2	0.0	0.0
Corbin Creek	3.3	8	25.6	6	15.1	5	23.2	1.8	8	24.4	1.5	0.0	0.0
Corbin Creek	0.0	5	8.1	8	8.9	10	24.5	2.1	16	78.4	1.1	0.0	0.0
Corbin Creek	0.5	4	12.2	5	15.8	10	39.3	9.5	16	56.7	3.8	0.1	0.1
Corbin Creek	0.2	5	26.4	2	7.2	9	30.0	2.0	15	61.0	1.6	0.2	0.2
Corbin Creek	11.2	4	19.6	5	6.4	5	37.8	9.0	12	49.0	3.8	0.0	0.0
Corbin Creek	0.2	6	8.5	4	6.6	6	58.9	6.2	13	75.8	1.7	0.2	0.2
Corbin Creek	0.3	5	10.4	1	2.4	7	62.4	10.4	13	74.9	1.5	0.0	0.0
Corbin Creek	0.0	5	8.5	3	2.6	7	57.2	15.0	13	69.5	3.6	0.0	0.0
Corbin Creek	0.0	5	10.1	4	10.7	4	43.9	14.7	10	60.7	3.4	0.3	0.3
Corbin Creek	0.1	6	10.8	3	7.4	5	54.8	11.0	12	66.6	4.0	0.0	0.0
Michel Creek	46.2	10	12.0	11	29.2	1	0.3	0.0	5	6.2	1.5	0.0	0.0
Michel Creek	53.2	8	7.2	6	12.0	8	4.3	0.0	12	23.0	0.5	0.0	0.0
Michel Creek	45.8	8	19.2	8	15.6	3	4.8	0.3	7	12.9	1.2	0.0	0.0
Michel Creek	43.5	9	26.1	10	12.1	4	3.4	0.8	7	12.1	2.5	0.0	0.0
Michel Creek	42.6	10	9.5	9	17.1	4	4.3	0.0	9	21.0	5.2	0.0	0.0
Michel Creek	26.8	11	11.3	12	16.5	6	12.1	1.2	10	37.2	2.7	0.0	0.0
Michel Creek	50.9	6	6.9	8	13.4	4	5.9	0.9	8	19.1	1.9	0.0	0.0
Michel Creek	33.1	9	18.9	9	9.3	5	9.1	1.1	10	26.8	2.2	0.0	0.0
Michel Creek	38.8	7	10.9	7	16.4	3	2.1	0.5	7	22.7	3.9	0.0	0.0
Michel Creek	30.2	6	11.0	9	15.0	8	7.3	0.0	13	27.1	6.0	0.0	0.0
Michel Creek	27.7	6	7.1	13	22.9	3	14.3	0.3	6	31.4	1.1	0.0	0.0
Michel Creek	22.3	7	8.6	8	20.6	7	20.6	0.5	12	45.1	0.3	0.0	0.0
Michel Creek	5.9	9	16.0	11	28.3	7	33.9	5.9	13	39.7	1.6	0.0	0.0
Michel Creek	15.1	10	13.3	12	18.9	7	15.7	15.5	13	32.4	1.9	0.0	0.0
Michel Creek	2.8	6	17.7	10	14.9	8	24.2	2.8	15	53.5	6.5	0.0	0.0
Michel Creek	13.9	9	5.7	8	6.8	9	21.0	10.5	17	53.5	7.0	0.0	0.0
Michel Creek	2.2	8	7.2	7	12.1	6	37.7	4.7	11	63.6	9.4	0.0	0.0
Michel Creek	13.1	7	4.8	10	4.1	8	13.0	49.0	16	23.8	3.7	0.0	0.0
Michel Creek	1.0	7	13.4	8	12.1	8	36.2	0.7	12	64.2	7.2	0.3	0.0
Michel Creek	28.4	7	7.1	7	8.5	8	11.5	20.8	14	27.9	4.3	0.0	0.0
Michel Creek	4.3	9	7.1	9	26.6	6	28.1	2.0	10	55.7	3.7	0.0	0.0
Michel Creek	6.9	12	3.9	9	4.9	9	18.9	46.9	14	35.4	1.5	0.0	0.0
Michel Creek	3.9	7	8.1	7	8.4	8	18.6	3.9	11	66.7	7.1	0.0	0.0
Michel Creek	16.5	8	3.9	10	5.9	9	14.7	34.0	14	37.0	2.2	0.0	0.0
Michel Creek	62.9	8	7.6	7	15.6	4	2.0	0.0	6	9.9	3.3	0.0	0.0
Michel Creek	42.8	5	13.4	6	16.0	7	2.2	0.4	11	26.0	0.3	0.0	0.0
Michel Creek	38.3	4	12.3	10	14.0	9	8.1	1.6	14	25.0	7.5	0.0	0.0
Michel Creek	23.9	4	4.7	8	8.7	9	24.8	4.7	14	53.4	2.6	0.0	0.0
Michel Creek	34.5	7	7.5	12	28.0	6	11.8	0.2	10	27.0	0.9	0.0	0.0
Michel Creek	37.8	11	11.0	10	11.6	12	13.5	3.3	17	33.5	2.0	0.0	0.0
Michel Creek	37.4	5	24.1	8	13.3	5	14.4	0.0	9	20.5	4.2	0.0	0.0
Michel Creek	20.4	4	7.0	5	6.7	9	9.3	3.5	15	57.6	2.2	0.0	0.0
Michel Creek	29.9	4	22.3	7	9.9	6	15.5	0.8	9	27.7	8.5	0.0	0.0
Michel Creek	33.1	9	21.8	9	8.8	7	18.4	0.9	10	28.6	5.7	0.0	0.0
Michel Creek	42.4	6	10.1	10	18.0	7	9.4	0.6	13	22.2	4.6	0.0	0.0
Michel Creek	41.9	8	11.5	9	8.0	10	15.2	2.8	15	30.3	4.3	0.0	0.0
Michel Creek	41.9	7	15.4	9	15.0	6	7.8	1.7	12	20.8	4.4	0.0	0.0
Michel Creek	41.0	6	24.8	7	4.1	8	10.6	2.8	14	22.4	3.3	0.0	0.0
Michel Creek	42.8	6	10.9	10	17.8	3	8.6	0.3	8	22.4	3.3	0.0	0.0
Michel Creek	30.1	3	49.7	7	6.7	3	5.1	0.0	6	9.6	0.3	0.0	0.0
Michel Creek	42.9	9	10.0	11	25.8	5	4.1	0.0	11	19.8	1.1	0.0	0.0
Michel Creek	33.8	7	44.0	6	3.3	9	5.5	0.8	12	15.1	2.5	0.0	0.0
Michel Creek	44.4	4	14.5	10	9.3	6	4.9	2.5	10	24.7	3.1	0.0	0.0
Michel Creek	31.4	8	38.2	7	7.4	8	6.5	2.5	12	17.0	2.7	0.0	0.0
Michel Creek	47.7	5	18.7	6	20.7	2	2.7	0.2	6	9.0	2.5	0.0	0.0
Michel Creek	35.7	7	35.2	4	4.5	7	5.0	1.3	11	19.8	3.3	0.0	0.0

Table F-1: Statistical Comparison of Spatial Differences in Benthic Invertebrate Community Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2018 and 2019

Variable	Year	Statistical Test	Overall Comparison	Reference Mean/Median[(a)]	Reference Mean vs. Mine-Influenced Station Comparisons					
			p-value		MIUCO	CORCK	MIDCO	MIDAG	MIULE	MI5
Benthic invertebrate taxonomic richness	2018	K-W	ns	40	-	-	-	-	-	-
(taxa per 3 min kick)	2019	ANOVA	0.002	36	ns	ns	ns	ns	ns	ns
Benthic invertebrate abundance	2018	ANOVA	0.029	12,382	ns	0.024 (-73%)	ns	ns	ns	ns
(organisms per 3 min kick)	2019	K-W	0.04	8,640	ns	ns	ns	ns	ns	ns
Ephemeroptera, Plecoptera, Trichoptera abundance	2018	K-W	0.004	11,720	ns	0.01 (-95%)	ns	ns	ns	ns
(organisms per 3 min kick)	2019	K-W	ns	7,978	-	-	-	-	-	-
Percent Ephemeroptera, Plecoptera, Trichoptera (%)	2018	ANOVA[log]	<0.001	82	ns	<0.001 (-74%)	<0.001 (-15%)	ns	ns	ns
	2019	K-W	<0.001	81	ns	<0.01 (-81%)	<0.01 (-54%)	ns	ns	ns
Emphemeroptera abundance	2018	K-W	0.003	9,060	ns	<0.05 (-99%)	ns	ns	ns	ns
(organisms per 3 min kick)	2019	K-W	0.039	3,180	ns	ns	ns	ns	ns	ns
Percent Ephemeroptera (%)	2018	K-W	0.003	62	ns	<0.01 (-100%)	<0.01 (-40%)	ns	ns	ns
	2019	K-W	0.002	46	ns	<0.01 (-100%)	<0.05 (-48%)	ns	ns	ns

Notes: a) The reference mean was used for the comparison between the reference area and the mine-influenced stations when the test did not require a transformation. For log transformed data the geometric mean was used and for non-parametric data (K-W test) the reference median was used.
The magnitude and direction of difference between the reference mean or median and each station is provided in backets.
% = percent; min = minute; K-W = kruskal-Wallis test; ANOVA = analysis of variance; log = logathrim transformation; < = less than; ns = not significant; p = probability.

Table F-1: Statistical Comparison of Temporal Differences in Benthic Invertebrate Community Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Benthic Invertebrate Community Endpoint	Area	Station	Transformation	Overall ANOVA (*p*-value)	2019 Mean [(a)]	Current year (2019) Compared to Previous Years						
						2012	2013	2014	2015	2016	2017	2018
Benthic Invertebrate Richness (taxa per 3 min kick)	Reference Stations	MI25	-	0.015	39	ns	ns	n/a	ns	ns	ns	ns
		AGCK	-	ns	29	-	-	n/a	-	n/a	n/a	-
	Mine-Influenced Stations	MIUCO	-	ns	44	-	n/a	n/a	-	-	-	-
		CORCK	-	ns	29	-	n/a	n/a	-	-	-	-
		MIDCO	log	ns	44	-	n/a	n/a	-	-	-	-
		MIDAG	-	ns	44	-	n/a	n/a	-	n/a	n/a	-
		MI5	-	ns	38	-	n/a	n/a	-	n/a	n/a	-
Benthic Invertebrate Abundance (organisms per 3 min kick)	Reference Stations	MI25	-	0.033	5,687	ns	ns	n/a	ns	ns	ns	ns
		AGCK	-	0.008	14,420	ns	0.016 (-48%)	n/a	ns	n/a	n/a	ns
	Mine-Influenced Stations	MIUCO	-	ns	6,903	-	n/a	n/a	-	-	-	-
		CORCK	-	0.032	16,147	ns	n/a	n/a	ns	ns	ns	ns
		MIDCO	log	0.003	22,839	ns	n/a	n/a	ns	ns	ns	0.002 (251%)
		MIDAG	-	ns	12,156	-	n/a	n/a	-	n/a	n/a	-
		MI5	-	ns	12,913	-	n/a	n/a	-	n/a	n/a	-
Ephemeroptera, Trichoptera, Plecoptera Abundance (organisms per 3 min kick)	Reference Stations	MI25	-	0.048	4,355	ns	ns	n/a	ns	ns	ns	ns
		AGCK	natural log	ns	12,873	-	-	n/a	-	n/a	n/a	-
	Mine-Influenced Stations	MIUCO	-	ns	3,913	-	n/a	n/a	-	-	-	-
		CORCK	-	0.004	2,300	-	n/a	n/a	0.034 (-12%)	-	-	-
		MIDCO	-	0.001	5,900	ns	n/a	n/a	ns	ns	ns	0.002 (214%)
		MIDAG	-	ns	sign	-	n/a	n/a	-	n/a	n/a	-
		MI5	-	ns	10,100	-	n/a	n/a	-	n/a	n/a	-
Percent Ephemeroptera, Trichoptera, Plecoptera (%)	Reference Stations	MI25	-	ns	75	-	-	n/a	-	-	-	-
		AGCK	natural log	ns	90	-	-	n/a	-	n/a	n/a	-
	Mine-Influenced Stations	MIUCO	-	0.005	57	0.006 (-34%)	n/a	n/a	-	0.016 (-29%)	0.013 (-30%)	ns
		CORCK	-	ns	15	-	n/a	n/a	-	-	-	-
		MIDCO	-	0.043	27	ns	n/a	n/a	ns	ns	ns	ns
		MIDAG	-	ns	44	-	n/a	n/a	-	n/a	n/a	-
		MI5	-	ns	78	-	n/a	n/a	-	n/a	n/a	-
Ephemeroptera Abundance (organisms per 3 min kick)	Reference Stations	MI25	-	ns	2,518	-	-	n/a	-	-	-	-
		AGCK	-	0.013	11,933	-	0.04 (-44%)	n/a	-	n/a	n/a	-
	Mine-Influenced Stations	MIUCO	-	ns	2,020	-	n/a	n/a	-	-	-	-
		CORCK	natural log	ns	13	-	n/a	n/a	-	-	-	-
		MIDCO	-	0.002	3,392	ns	n/a	n/a	ns	0.049 (671%)	ns	0.001(1,698%)
		MIDAG	-	ns	4,077	-	n/a	n/a	-	n/a	n/a	-
		MI5	-	ns	4,287	-	n/a	n/a	-	n/a	n/a	-
Percent Ephemeroptera (%)	Reference Stations	MI25	-	ns	43	-	-	n/a	-	-	-	-
		AGCK	-	ns	82	-	-	n/a	-	n/a	n/a	-
	Mine-Influenced Stations	MIUCO	-	ns	30	-	n/a	n/a	-	-	-	-
		CORCK	natural log	0.038	<1	ns	n/a	n/a	ns	ns	ns	ns
		MIDCO	-	0.017	16	ns	n/a	n/a	ns	ns	ns	ns
		MIDAG	-	0.042	27	0.033 (-56%)	n/a	n/a	ns	n/a	n/a	ns
		MI5	-	0.009	34	ns	n/a	n/a	ns	n/a	n/a	0.013 (-25%)

Notes: a) The 2019 mean was used for the comparison between each year and 2019 when the test did not require a transformation. For log or natural log transformed data the geometric mean was used .
Statistical tests were not carried out for LEI and MIULE because data was not collected at these stations until 2018.
The magnitude and direction of difference between the 2019 mean and each year for each station is provided in backets.
% = percent; min = minute; ANOVA = analysis of variance; log = logathrim transformation; < = less than; ns = not significant; p = probability; n/a = not applicable

APPENDIX G

Benthic Invertebrate Tissue Chemistry

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Li	0.63	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Be	0.03	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	B	1.40	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Na	3686	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Mg	1263	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Al	190	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	P	9806	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	K	10093	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Ca	4932	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Ti	2.75	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	V	0.89	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Cr	0.70	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Mn	12.70	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Fe	191	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Co	0.19	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Ni	3.49	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Cu	7.04	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Zn	171.00	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Ga	0.07	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	As	1.85	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Se	4.87	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Rb	4.13	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Sr	7.69	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Y	0.25	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Zr	0.16	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Mo	0.28	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Ag	0.05	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Cd	0.72	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Sn	0.01	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Sb	0.01	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Cs	0.04	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Ba	4.31	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Re	<LOD	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Tl	0.24	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Pb	0.12	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Bi	0.00	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Th	0.03	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	U	0.06	ppm	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Total.dry.mass	0.58	g	NA	RG_AGCK_INV-1_2012-09-16
Andy Good Creek	AGCK	Reference	667555	5488644	2012	1	16-Sep-12	Composite	Dry.matter	11.00	%	NA	RG_AGCK_INV-1_2012-09-16
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Li	1.18	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Be	0.11	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	B	5.27	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Na	2444	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Mg	1751	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Al	1266	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	P	7415	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	K	6522	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Ca	39179	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Ti	6.84	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	V	3.28	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Cr	1.63	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Mn	362.00	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Fe	632	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Co	46.30	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Ni	44.10	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Cu	13.60	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Zn	256.00	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Ga	0.33	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	As	0.48	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Se	3.89	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Rb	3.05	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Sr	37.70	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Y	0.95	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Zr	0.90	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Mo	0.35	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Ag	0.05	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Cd	1.49	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Sn	0.03	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Sb	0.03	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Cs	0.16	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Ba	43.10	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Re	<LOD	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Tl	0.08	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Pb	0.47	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Bi	0.00	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Th	0.16	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	U	0.44	ppm	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Total.dry.mass	0.51	g	NA	RG_CORCK_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2012	1	15-Sep-12	Composite	Dry.matter	21.20	%	NA	RG_CORCK_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Li	2.02	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Be	0.09	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	B	8.33	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Na	4070	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Mg	1256	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Al	1509	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	P	9482	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	K	9919	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Ca	2058	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Ti	13.40	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	V	3.60	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Cr	1.93	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Mn	79.70	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Fe	947	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Co	0.90	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Ni	3.19	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Cu	15.00	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Zn	156.00	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Ga	0.43	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	As	0.91	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Se	4.55	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Rb	5.27	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Sr	6.20	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Y	0.99	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Zr	0.61	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Mo	0.58	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Ag	0.08	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Cd	2.33	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Sn	0.05	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Sb	0.02	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Cs	0.21	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Ba	24.70	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Re	<LOD	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Tl	0.09	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Pb	0.53	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Bi	0.01	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Th	0.16	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	U	0.07	ppm	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Total.dry.mass	0.54	g	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI25	Reference	668186	5482838	2012	1	15-Sep-12	Composite	Dry.matter	11.90	%	NA	RG_MI25_INV-1_2012-09-15
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Li	1.41	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Be	0.07	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	B	4.03	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Na	3726	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Mg	1393	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Al	1113	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	P	8287	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	K	7734	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Ca	10953	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Ti	11.80	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	V	4.66	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Cr	1.76	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Mn	56.60	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Fe	679	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Co	4.14	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Ni	7.30	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Cu	10.80	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Zn	154.00	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Ga	0.32	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	As	0.74	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Se	5.60	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Rb	3.70	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Sr	14.60	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Y	0.87	ppm	NA	RG_MI5_INV-1_2012-09-16

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Zr	0.71	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Mo	0.34	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Ag	0.10	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Cd	1.35	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Sn	0.03	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Sb	0.02	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Cs	0.13	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Ba	32.90	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Re	<LOD	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Tl	0.06	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Pb	0.40	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Bi	0.00	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Th	0.13	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	U	0.10	ppm	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Total.dry.mass	1.89	g	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2012	1	16-Sep-12	Composite	Dry.matter	20.30	%	NA	RG_MI5_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Li	1.69	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Be	0.06	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	B	3.69	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Na	2957	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Mg	1578	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Al	1106	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	P	8698	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	K	7706	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Ca	6115	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Ti	9.55	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	V	2.74	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Cr	1.42	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Mn	90.30	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Fe	690	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Co	22.60	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Ni	10.80	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Cu	10.90	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Zn	163.00	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Ga	0.32	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	As	0.71	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Se	6.39	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Rb	4.76	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Sr	9.95	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Y	0.47	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Zr	0.54	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Mo	0.27	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Ag	0.07	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Cd	0.93	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Sn	0.03	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Sb	0.01	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Cs	0.14	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Ba	15.50	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Re	<LOD	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Tl	0.08	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Pb	0.38	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Bi	0.01	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Th	0.13	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	U	0.07	ppm	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Total.dry.mass	1.10	g	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2012	1	16-Sep-12	Composite	Dry.matter	18.30	%	NA	RG_MIDAG_INV-1_2012-09-16
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Li	7.77	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Li	9.07	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Li	2.84	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Be	0.33	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Be	0.35	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Be	0.14	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	B	18.90	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	B	19.10	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	B	8.24	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Na	2509	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Na	3248	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Na	3106	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Mg	2056	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Mg	2075	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Mg	1869	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Al	5133	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Al	5187	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Al	4095	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	P	6985	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	P	7044	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	P	7639	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	K	8212	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	K	9516	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	K	9201	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Ca	15074	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Ca	21361	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Ca	12079	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Ti	30.50	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Ti	22.80	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Ti	22.20	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	V	10.70	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	V	10.60	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	V	8.88	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Cr	5.73	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Cr	5.77	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Cr	4.92	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Mn	172.00	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Mn	329.00	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Mn	225	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Fe	3165	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Fe	3433	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Fe	2553	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Co	31.30	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Co	55.40	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Co	47.50	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Ni	17.10	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Ni	32.90	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Ni	25.40	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Cu	13.60	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Cu	11.10	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Cu	13.70	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Zn	171.00	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Zn	153.00	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Zn	169.00	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Ga	1.53	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Ga	1.48	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Ga	1.26	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	As	1.29	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	As	1.39	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	As	1.23	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Se	2.92	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Se	3.84	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Se	4.04	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Rb	12.80	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Rb	12.60	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Rb	10.90	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Sr	33.10	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Sr	35.30	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Sr	24.20	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Y	1.40	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Y	1.72	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Y	1.15	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Zr	1.31	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Zr	1.32	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Zr	1.18	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Mo	0.40	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Mo	0.44	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Mo	0.44	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Ag	0.07	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Ag	0.05	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Ag	0.06	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Cd	0.69	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Cd	0.66	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Cd	0.66	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Sn	0.12	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Sn	0.11	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Sn	0.10	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Sb	0.01	ppm	NA	RG_MIDCO_INV-2_2012-09-15

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Sb	0.02	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Sb	0.02	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Cs	0.59	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Cs	0.57	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Cs	0.52	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Ba	36.70	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Ba	44.10	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Ba	43.70	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Re	<LOD	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Re	<LOD	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Re	0.00	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Tl	0.11	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Tl	0.11	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Tl	0.11	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Pb	1.49	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Pb	1.60	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Pb	1.29	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Bi	0.03	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Bi	0.03	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Bi	0.02	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Th	0.51	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Th	0.52	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Th	0.49	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	U	0.15	ppm	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	U	0.20	ppm	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	U	0.18	ppm	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Total.dry.mass	0.96	g	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Total.dry.mass	1.09	g	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Total.dry.mass	0.76	g	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	2	15-Sep-12	Composite	Dry.matter	21.70	%	NA	RG_MIDCO_INV-2_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	1	15-Sep-12	Composite	Dry.matter	18.10	%	NA	RG_MIDCO_INV-1_2012-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2012	3	15-Sep-12	Composite	Dry.matter	14.70	%	NA	RG_MIDCO_INV-3_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Li	12.5	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Be	0.48	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	B	28.60	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Na	3462	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Mg	2518	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Al	8343	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	P	8329	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	K	11530	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Ca	5078	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Ti	31.30	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	V	15.80	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Cr	9.39	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Mn	350.00	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Fe	5536	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Co	3.60	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Ni	6.93	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Cu	16.10	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Zn	139.00	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Ga	2.41	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	As	2.06	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Se	7.00	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Rb	19.10	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Sr	18.60	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Y	3.42	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Zr	1.74	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Mo	0.68	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Ag	0.06	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Cd	2.94	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Sn	0.12	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Sb	0.01	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Cs	0.91	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Ba	60.60	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Re	<LOD	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Tl	0.14	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Pb	2.10	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Bi	0.04	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Th	0.80	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	U	0.13	ppm	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Total.dry.mass	0.62	g	NA	RG_MIUCO_INV-1_2012-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2012	1	15-Sep-12	Composite	Dry.matter	14.20	%	NA	RG_MIUCO_INV-1_2012-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	11-Sep-15	Composite	Calculated Wet Mass (Aliquot) (g)	0.35	g	MURR	RG_CORCK_INV-1_2015-09-11
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	12-Sep-15	Composite	Measured Aliquot Dry Mass (g)	0.09	g	MURR	RG_CORCK_INV-1_2015-09-12
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	13-Sep-15	Composite	Wet-to-Dry Ratio	3.76	-	MURR	RG_CORCK_INV-1_2015-09-13
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	14-Sep-15	Composite	% Dry Matter	26.6	%	MURR	RG_CORCK_INV-1_2015-09-14
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	15-Sep-15	Composite	Se PPM Dry Mass	3.48	ppm dw	MURR	RG_CORCK_INV-1_2015-09-15
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	16-Sep-15	Composite	Se PPM Wet Mass	0.93	ppm ww	MURR	RG_CORCK_INV-1_2015-09-16
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	11-Sep-15	Composite	Calculated.Wet.Mass..Aliquot...g.	0.35	g	MURR	RG_CORCK_INV-1_2015-09-11
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	11-Sep-15	Composite	Measured.Aliquot.Dry.Mass..g.	0.09	g	MURR	RG_CORCK_INV-1_2015-09-11
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	11-Sep-15	Composite	Wet.to.Dry.Ratio	3.76	NA	MURR	RG_CORCK_INV-1_2015-09-11
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	11-Sep-15	Composite	X..Dry.Matter	26.60	%	MURR	RG_CORCK_INV-1_2015-09-11
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	11-Sep-15	Composite	Se.PPM.Dry.Mass	3.48	PPM	MURR	RG_CORCK_INV-1_2015-09-11
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2015	1	11-Sep-15	Composite	Se.PPM.Wet.Mass	0.93	PPM	MURR	RG_CORCK_INV-1_2015-09-11
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	Composite	Calculated Wet Mass (Aliquot) (g)	0.32	g	MURR	RG_MI25_INV-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	EPH	Calculated Wet Mass (Aliquot) (g)	0.36	g	MURR	RG_MI25_INVEPH-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	RHY	Calculated Wet Mass (Aliquot) (g)	0.13	g	MURR	RG_MI25_INVRHY-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	11-Sep-15	Composite	Measured Aliquot Dry Mass (g)	0.05	g	MURR	RG_MI25_INV-1_2015-09-11
Michel Creek	MI25	Reference	668186	5482838	2015	1	11-Sep-15	EPH	Measured Aliquot Dry Mass (g)	0.05	g	MURR	RG_MI25_INVEPH-1_2015-09-11
Michel Creek	MI25	Reference	668186	5482838	2015	1	11-Sep-15	RHY	Measured Aliquot Dry Mass (g)	0.03	g	MURR	RG_MI25_INVRHY-1_2015-09-11
Michel Creek	MI25	Reference	668186	5482838	2015	1	12-Sep-15	Composite	Wet-to-Dry Ratio	6.21	-	MURR	RG_MI25_INV-1_2015-09-12
Michel Creek	MI25	Reference	668186	5482838	2015	1	12-Sep-15	EPH	Wet-to-Dry Ratio	7.17	-	MURR	RG_MI25_INVEPH-1_2015-09-12
Michel Creek	MI25	Reference	668186	5482838	2015	1	12-Sep-15	RHY	Wet-to-Dry Ratio	4.75	-	MURR	RG_MI25_INVRHY-1_2015-09-12
Michel Creek	MI25	Reference	668186	5482838	2015	1	13-Sep-15	Composite	% Dry Matter	17.5	%	MURR	RG_MI25_INV-1_2015-09-13
Michel Creek	MI25	Reference	668186	5482838	2015	1	13-Sep-15	EPH	% Dry Matter	15.6	%	MURR	RG_MI25_INVEPH-1_2015-09-13
Michel Creek	MI25	Reference	668186	5482838	2015	1	13-Sep-15	RHY	% Dry Matter	14.8	%	MURR	RG_MI25_INVRHY-1_2015-09-13
Michel Creek	MI25	Reference	668186	5482838	2015	1	14-Sep-15	Composite	Se PPM Dry Mass	4.61	ppm dw	MURR	RG_MI25_INV-1_2015-09-14
Michel Creek	MI25	Reference	668186	5482838	2015	1	14-Sep-15	EPH	Se PPM Dry Mass	7	ppm dw	MURR	RG_MI25_INVEPH-1_2015-09-14
Michel Creek	MI25	Reference	668186	5482838	2015	1	14-Sep-15	RHY	Se PPM Dry Mass	5.58	ppm dw	MURR	RG_MI25_INVRHY-1_2015-09-14
Michel Creek	MI25	Reference	668186	5482838	2015	1	15-Sep-15	Composite	Se PPM Wet Mass	0.74	ppm ww	MURR	RG_MI25_INV-1_2015-09-15
Michel Creek	MI25	Reference	668186	5482838	2015	1	15-Sep-15	EPH	Se PPM Wet Mass	0.98	ppm ww	MURR	RG_MI25_INVEPH-1_2015-09-15
Michel Creek	MI25	Reference	668186	5482838	2015	1	15-Sep-15	RHY	Se PPM Wet Mass	1.17	ppm ww	MURR	RG_MI25_INVRHY-1_2015-09-15
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	Composite	Calculated.Wet.Mass..Aliquot...g.	0.32	g	MURR	RG_MI25_INV-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	EPH	Calculated.Wet.Mass..Aliquot...g.	0.36	g	MURR	RG_MI25_INVEPH-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	RHY	Calculated.Wet.Mass..Aliquot...g.	0.13	g	MURR	RG_MI25_INVRHY-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	Composite	Measured.Aliquot.Dry.Mass..g.	0.05	g	MURR	RG_MI25_INV-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	EPH	Measured.Aliquot.Dry.Mass..g.	0.05	g	MURR	RG_MI25_INVEPH-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	RHY	Measured.Aliquot.Dry.Mass..g.	0.03	g	MURR	RG_MI25_INVRHY-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	Composite	Wet.to.Dry.Ratio	6.21	NA	MURR	RG_MI25_INV-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	EPH	Wet.to.Dry.Ratio	7.17	NA	MURR	RG_MI25_INVEPH-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	RHY	Wet.to.Dry.Ratio	4.75	NA	MURR	RG_MI25_INVRHY-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	Composite	X..Dry.Matter	17.50	%	MURR	RG_MI25_INV-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	EPH	X..Dry.Matter	15.60	%	MURR	RG_MI25_INVEPH-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	RHY	X..Dry.Matter	14.80	%	MURR	RG_MI25_INVRHY-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	Composite	Se.PPM.Dry.Mass	4.61	PPM	MURR	RG_MI25_INV-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	EPH	Se.PPM.Dry.Mass	7.00	PPM	MURR	RG_MI25_INVEPH-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	RHY	Se.PPM.Dry.Mass	5.58	PPM	MURR	RG_MI25_INVRHY-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	Composite	Se.PPM.Wet.Mass	0.74	PPM	MURR	RG_MI25_INV-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	EPH	Se.PPM.Wet.Mass	0.98	PPM	MURR	RG_MI25_INVEPH-1_2015-09-10
Michel Creek	MI25	Reference	668186	5482838	2015	1	10-Sep-15	RHY	Se.PPM.Wet.Mass	1.17	PPM	MURR	RG_MI25_INVRHY-1_2015-09-10
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	13-Sep-15	Composite	Calculated Wet Mass (Aliquot) (g)	0.33	g	MURR	RG_MI5_INV-1_2015-09-13
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	14-Sep-15	Composite	Measured Aliquot Dry Mass (g)	0.05	g	MURR	RG_MI5_INV-1_2015-09-14
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	15-Sep-15	Composite	Wet-to-Dry Ratio	6.41	-	MURR	RG_MI5_INV-1_2015-09-15
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	16-Sep-15	Composite	% Dry Matter	13.7	%	MURR	RG_MI5_INV-1_2015-09-16
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	17-Sep-15	Composite	Se PPM Dry Mass	5.11	ppm dw	MURR	RG_MI5_INV-1_2015-09-17
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	18-Sep-15	Composite	Se PPM Wet Mass	0.8	ppm ww	MURR	RG_MI5_INV-1_2015-09-18
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	13-Sep-15	Composite	Calculated.Wet.Mass..Aliquot...g.	0.33	g	MURR	RG_MI5_INV-1_2015-09-13
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	13-Sep-15	Composite	Measured.Aliquot.Dry.Mass..g.	0.05	g	MURR	RG_MI5_INV-1_2015-09-13
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	13-Sep-15	Composite	Wet.to.Dry.Ratio	6.41	NA	MURR	RG_MI5_INV-1_2015-09-13
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	13-Sep-15	Composite	X..Dry.Matter	13.70	%	MURR	RG_MI5_INV-1_2015-09-13
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	13-Sep-15	Composite	Se.PPM.Dry.Mass	5.11	PPM	MURR	RG_MI5_INV-1_2015-09-13
Michel Creek	MI5	Mine-influenced	659387	5496818	2015	1	13-Sep-15	Composite	Se.PPM.Wet.Mass	0.80	PPM	MURR	RG_MI5_INV-1_2015-09-13
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	12-Sep-15	Composite	Calculated Wet Mass (Aliquot) (g)	0.26	g	MURR	RG_MIDAG_INV-1_2015-09-12
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	13-Sep-15	Composite	Measured Aliquot Dry Mass (g)	0.05	g	MURR	RG_MIDAG_INV-1_2015-09-13
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	14-Sep-15	Composite	Wet-to-Dry Ratio	5.12	-	MURR	RG_MIDAG_INV-1_2015-09-14
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	15-Sep-15	Composite	% Dry Matter	23.9	%	MURR	RG_MIDAG_INV-1_2015-09-15
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	16-Sep-15	Composite	Se PPM Dry Mass	7.55	ppm dw	MURR	RG_MIDAG_INV-1_2015-09-16
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	17-Sep-15	Composite	Se PPM Wet Mass	1.47	ppm ww	MURR	RG_MIDAG_INV-1_2015-09-17
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	12-Sep-15	Composite	Calculated.Wet.Mass..Aliquot...g.	0.26	g	MURR	RG_MIDAG_INV-1_2015-09-12
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	12-Sep-15	Composite	Measured.Aliquot.Dry.Mass..g.	0.05	g	MURR	RG_MIDAG_INV-1_2015-09-12
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	12-Sep-15	Composite	Wet.to.Dry.Ratio	5.12	NA	MURR	RG_MIDAG_INV-1_2015-09-12
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	12-Sep-15	Composite	X..Dry.Matter	23.90	%	MURR	RG_MIDAG_INV-1_2015-09-12
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	12-Sep-15	Composite	Se.PPM.Dry.Mass	7.55	PPM	MURR	RG_MIDAG_INV-1_2015-09-12
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2015	1	12-Sep-15	Composite	Se.PPM.Wet.Mass	1.47	PPM	MURR	RG_MIDAG_INV-1_2015-09-12

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	Composite	Calculated Wet Mass (Aliquot) (g)	0.21	g	MURR	RG_MIDCO_INV-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	EPH	Calculated Wet Mass (Aliquot) (g)	0.39	g	MURR	RG_MIDCO_INVEPH-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	RHY	Calculated Wet Mass (Aliquot) (g)	0.27	g	MURR	RG_MIDCO_INVRHY-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	12-Sep-15	Composite	Measured Aliquot Dry Mass (g)	0.04	g	MURR	RG_MIDCO_INV-1_2015-09-12
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	12-Sep-15	EPH	Measured Aliquot Dry Mass (g)	0.05	g	MURR	RG_MIDCO_INVEPH-1_2015-09-12
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	12-Sep-15	RHY	Measured Aliquot Dry Mass (g)	0.05	g	MURR	RG_MIDCO_INVRHY-1_2015-09-12
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	13-Sep-15	Composite	Wet-to-Dry Ratio	4.86	-	MURR	RG_MIDCO_INV-1_2015-09-13
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	13-Sep-15	EPH	Wet-to-Dry Ratio	8.33	-	MURR	RG_MIDCO_INVEPH-1_2015-09-13
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	13-Sep-15	RHY	Wet-to-Dry Ratio	5.54	-	MURR	RG_MIDCO_INVRHY-1_2015-09-13
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	14-Sep-15	Composite	% Dry Matter	16	%	MURR	RG_MIDCO_INV-1_2015-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	14-Sep-15	EPH	% Dry Matter	14.9	%	MURR	RG_MIDCO_INVEPH-1_2015-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	14-Sep-15	RHY	% Dry Matter	14.1	%	MURR	RG_MIDCO_INVRHY-1_2015-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	15-Sep-15	Composite	Se PPM Dry Mass	4.38	ppm dw	MURR	RG_MIDCO_INV-1_2015-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	15-Sep-15	EPH	Se PPM Dry Mass	6.03	ppm dw	MURR	RG_MIDCO_INVEPH-1_2015-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	15-Sep-15	RHY	Se PPM Dry Mass	4.76	ppm dw	MURR	RG_MIDCO_INVRHY-1_2015-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	16-Sep-15	Composite	Se PPM Wet Mass	0.9	ppm ww	MURR	RG_MIDCO_INV-1_2015-09-16
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	16-Sep-15	EPH	Se PPM Wet Mass	0.72	ppm ww	MURR	RG_MIDCO_INVEPH-1_2015-09-16
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	16-Sep-15	RHY	Se PPM Wet Mass	0.86	ppm ww	MURR	RG_MIDCO_INVRHY-1_2015-09-16
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	Composite	Calculated.Wet.Mass..Aliquot...g.	0.21	g	MURR	RG_MIDCO_INV-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	EPH	Calculated.Wet.Mass..Aliquot...g.	0.39	g	MURR	RG_MIDCO_INVEPH-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	RHY	Calculated.Wet.Mass..Aliquot...g.	0.27	g	MURR	RG_MIDCO_INVRHY-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	Composite	Measured.Aliquot.Dry.Mass..g.	0.04	g	MURR	RG_MIDCO_INV-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	EPH	Measured.Aliquot.Dry.Mass..g.	0.05	g	MURR	RG_MIDCO_INVEPH-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	RHY	Measured.Aliquot.Dry.Mass..g.	0.05	g	MURR	RG_MIDCO_INVRHY-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	Composite	Wet.to.Dry.Ratio	4.86	NA	MURR	RG_MIDCO_INV-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	EPH	Wet.to.Dry.Ratio	8.33	NA	MURR	RG_MIDCO_INVEPH-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	RHY	Wet.to.Dry.Ratio	5.54	NA	MURR	RG_MIDCO_INVRHY-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	Composite	X..Dry.Matter	16.00	%	MURR	RG_MIDCO_INV-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	EPH	X..Dry.Matter	14.90	%	MURR	RG_MIDCO_INVEPH-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	RHY	X..Dry.Matter	14.10	%	MURR	RG_MIDCO_INVRHY-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	Composite	Se.PPM.Dry.Mass	4.38	PPM	MURR	RG_MIDCO_INV-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	EPH	Se.PPM.Dry.Mass	6.03	PPM	MURR	RG_MIDCO_INVEPH-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	RHY	Se.PPM.Dry.Mass	4.76	PPM	MURR	RG_MIDCO_INVRHY-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	Composite	Se.PPM.Wet.Mass	0.90	PPM	MURR	RG_MIDCO_INV-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	EPH	Se.PPM.Wet.Mass	0.72	PPM	MURR	RG_MIDCO_INVEPH-1_2015-09-11
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2015	1	11-Sep-15	RHY	Se.PPM.Wet.Mass	0.86	PPM	MURR	RG_MIDCO_INVRHY-1_2015-09-11
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	10-Sep-15	Composite	Calculated Wet Mass (Aliquot) (g)	0.29	g	MURR	RG_MIUCO_INV-1_2015-09-10
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	11-Sep-15	Composite	Measured Aliquot Dry Mass (g)	0.05	g	MURR	RG_MIUCO_INV-1_2015-09-11
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	12-Sep-15	Composite	Wet-to-Dry Ratio	5.77	-	MURR	RG_MIUCO_INV-1_2015-09-12
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	13-Sep-15	Composite	% Dry Matter	14.3	%	MURR	RG_MIUCO_INV-1_2015-09-13
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	14-Sep-15	Composite	Se PPM Dry Mass	4.78	ppm dw	MURR	RG_MIUCO_INV-1_2015-09-14
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	15-Sep-15	Composite	Se PPM Wet Mass	0.83	ppm ww	MURR	RG_MIUCO_INV-1_2015-09-15
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	10-Sep-15	Composite	Calculated.Wet.Mass..Aliquot...g.	0.29	g	MURR	RG_MIUCO_INV-1_2015-09-10
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	10-Sep-15	Composite	Measured.Aliquot.Dry.Mass..g.	0.05	g	MURR	RG_MIUCO_INV-1_2015-09-10
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	10-Sep-15	Composite	Wet.to.Dry.Ratio	5.77	NA	MURR	RG_MIUCO_INV-1_2015-09-10
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	10-Sep-15	Composite	X..Dry.Matter	14.30	%	MURR	RG_MIUCO_INV-1_2015-09-10
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	10-Sep-15	Composite	Se.PPM.Dry.Mass	4.78	PPM	MURR	RG_MIUCO_INV-1_2015-09-10
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2015	1	10-Sep-15	Composite	Se.PPM.Wet.Mass	0.83	PPM	MURR	RG_MIUCO_INV-1_2015-09-10
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2016	1	13-Sep-16	RHY	Calculated Wet Mass (g)	0.33	g	MURR	RG_MIDCO_INVRHY-1_2016-09-13
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2016	1	14-Sep-16	RHY	Measured Aliquot Dry Mass (g)	0.08	g	MURR	RG_MIDCO_INVRHY-1_2016-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2016	1	15-Sep-16	RHY	Wet-to-Dry Ratio	4.2	-	MURR	RG_MIDCO_INVRHY-1_2016-09-15
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2016	1	16-Sep-16	RHY	% Dry Matter	24.0	%	MURR	RG_MIDCO_INVRHY-1_2016-09-16
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2016	1	17-Sep-16	RHY	Se PPM Dry Mass	4.65	ppm dw	MURR	RG_MIDCO_INVRHY-1_2016-09-17
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2016	1	18-Sep-16	RHY	Se PPM Wet Mass	1.12	ppm ww	MURR	RG_MIDCO_INVRHY-1_2016-09-18
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2017	1	14-Sep-17	Composite	Selenium	4.30	ug/g d.w.	SRC	RG_CORCK_INV-1_2017-09-14
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2017	1	14-Sep-17	RHY	Selenium	2.60	ug/g d.w.	SRC	RG_CORCK_INVRHY-1_2017-09-14
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2017	1	14-Sep-17	Composite	Moisture	84.97	%	SRC	RG_CORCK_INV-1_2017-09-14
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2017	1	14-Sep-17	RHY	Moisture	80.27	%	SRC	RG_CORCK_INVRHY-1_2017-09-14
Michel Creek	MI25	Reference	668186	5482838	2017	1	14-Sep-17	Composite	Selenium	2.50	ug/g d.w.	SRC	RG_MI25_INV-1_2017-09-14
Michel Creek	MI25	Reference	668186	5482838	2017	1	14-Sep-17	EPH	Selenium	5.40	ug/g d.w.	SRC	RG_MI25_INVEPH-1_2017-09-14
Michel Creek	MI25	Reference	668186	5482838	2017	1	14-Sep-17	HYD	Selenium	3.20	ug/g d.w.	SRC	RG_MI25_INVHYD-1_2017-09-14
Michel Creek	MI25	Reference	668186	5482838	2017	1	14-Sep-17	RHY	Selenium	5.30	ug/g d.w.	SRC	RG_MI25_INVRHY-1_2017-09-14
Michel Creek	MI25	Reference	668186	5482838	2017	1	14-Sep-17	Composite	Moisture	82.75	%	SRC	RG_MI25_INV-1_2017-09-14
Michel Creek	MI25	Reference	668186	5482838	2017	1	14-Sep-17	EPH	Moisture	87.34	%	SRC	RG_MI25_INVEPH-1_2017-09-14
Michel Creek	MI25	Reference	668186	5482838	2017	1	14-Sep-17	HYD	Moisture	78.09	%	SRC	RG_MI25_INVHYD-1_2017-09-14
Michel Creek	MI25	Reference	668186	5482838	2017	1	14-Sep-17	RHY	Moisture	78.73	%	SRC	RG_MI25_INVRHY-1_2017-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2017	1	14-Sep-17	Composite	Selenium	2.90	ug/g d.w.	SRC	RG_MIDCO_INV-1_2017-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2017	1	14-Sep-17	EPH	Selenium	6.50	ug/g d.w.	SRC	RG_MIDCO_INVEPH-1_2017-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2017	1	14-Sep-17	RHY	Selenium	4.70	ug/g d.w.	SRC	RG_MIDCO_INVRHY-1_2017-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2017	1	14-Sep-17	Composite	Moisture	72.07	%	SRC	RG_MIDCO_INV-1_2017-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2017	1	14-Sep-17	EPH	Moisture	82.23	%	SRC	RG_MIDCO_INVEPH-1_2017-09-14
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2017	1	14-Sep-17	RHY	Moisture	76.84	%	SRC	RG_MIDCO_INVRHY-1_2017-09-14
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2017	1	14-Sep-17	Composite	Selenium	2.80	ug/g d.w.	SRC	RG_MIUCO_INV-1_2017-09-14
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2017	1	14-Sep-17	EPH	Selenium	6.30	ug/g d.w.	SRC	RG_MIUCO_INVEPH-1_2017-09-14
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2017	1	14-Sep-17	RHY	Selenium	6.00	ug/g d.w.	SRC	RG_MIUCO_INVRHY-1_2017-09-14
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2017	1	14-Sep-17	Composite	Moisture	78.95	%	SRC	RG_MIUCO_INV-1_2017-09-14
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2017	1	14-Sep-17	EPH	Moisture	86.84	%	SRC	RG_MIUCO_INVEPH-1_2017-09-14
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2017	1	14-Sep-17	RHY	Moisture	84.42	%	SRC	RG_MIUCO_INVRHY-1_2017-09-14
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Aluminum	270.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Arsenic	1.90	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Barium	14.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Cadmium	1.10	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Cobalt	0.30	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Copper	9.20	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Iron	460.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Lead	0.20	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Manganese	22.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Nickel	4.20	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Selenium	8.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Strontium	18.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Titanium	2.40	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Uranium	0.14	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Vanadium	1.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Zinc	230.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	1	8-Sep-18	Composite	Moisture	86.81	%	SRC	RG_AGCK_INV-1_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Aluminum	180.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Arsenic	1.40	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Barium	3.70	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Cadmium	1.10	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Cobalt	0.20	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Copper	9.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Iron	220.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Lead	0.10	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Manganese	20.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Nickel	3.60	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Selenium	8.60	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Strontium	5.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Titanium	1.80	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Uranium	0.22	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Vanadium	<1	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Zinc	230.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	2	8-Sep-18	Composite	Moisture	89.09	%	SRC	RG_AGCK_INV-2_2018-09-08
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Aluminum	220.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Arsenic	1.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Barium	6.40	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Cadmium	0.80	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Cobalt	0.20	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Copper	9.20	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Iron	210.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Lead	0.10	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Manganese	28.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a] Easting	Northing	Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information Lab	Sample ID
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Nickel	3.30	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Selenium	6.20	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Strontium	6.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Titanium	2.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Uranium	0.08	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Vanadium	<1	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Zinc	200.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2018-09-09
Andy Good Creek	AGCK	Reference	667557	5488648	2018	3	9-Sep-18	Composite	Moisture	79.10	%	SRC	RG_AGCK_INV-3_2018-09-09
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Aluminum	960.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Arsenic	0.60	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Barium	46.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Cadmium	2.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Cobalt	94.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Copper	9.40	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Iron	420.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Lead	0.30	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Manganese	720.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Nickel	86.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Selenium	3.40	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Strontium	150.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Titanium	10.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Uranium	1.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Vanadium	2.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Zinc	350.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	1	8-Sep-18	Composite	Moisture	80.22	%	SRC	RG_CORCK_INV-1_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Aluminum	880.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Antimony	<2	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Arsenic	<1	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Barium	53.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Beryllium	<0.2	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Boron	<20	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Cadmium	2.40	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Chromium	<10	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Cobalt	100.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Copper	9.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Iron	380.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Lead	0.30	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Manganese	780.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Mercury	<0.1	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Molybdenum	<2	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Nickel	88.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Selenium	3.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Silver	<0.2	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Strontium	230.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Thallium	<1	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Tin	<1	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Titanium	8.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Uranium	1.70	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Vanadium	<2	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Zinc	400.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	2	8-Sep-18	Composite	Moisture	77.08	%	SRC	RG_CORCK_INV-2_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Aluminum	400.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Arsenic	0.80	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Barium	17.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Cadmium	0.70	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Cobalt	130.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Copper	10.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Iron	280.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Lead	0.20	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Manganese	470.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Molybdenum	1.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Nickel	72.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Selenium	4.40	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Strontium	43.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Titanium	3.30	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Uranium	0.39	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Vanadium	1.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Zinc	210.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2018-09-08
Corbin Creek	CORCK	Mine-influenced	668539	5487366	2018	3	8-Sep-18	Composite	Moisture	70.80	%	SRC	RG_CORCK_INV-3_2018-09-08
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Aluminum	450.00	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Arsenic	<0.5	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Barium	18.00	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Cadmium	3.10	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Cobalt	0.30	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Copper	19.00	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Iron	540.00	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Lead	0.20	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Manganese	34.00	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Nickel	1.50	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Selenium	3.20	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Silver	0.20	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Strontium	4.00	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Titanium	4.20	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Uranium	<0.05	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Vanadium	2.00	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Zinc	120.00	ug/g d.w.	SRC	RG_LE1_INV-1_2018-09-13
Leach Creek	LE1	Reference	659635	5494108	2018	1	13-Sep-18	Composite	Moisture	80.07	%	SRC	RG_LE1_INV-1_2018-09-13
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Aluminum	3000.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Antimony	<0.2	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Arsenic	1.40	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Barium	31.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Beryllium	0.11	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Boron	9.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Cadmium	2.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Chromium	4.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Cobalt	1.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Copper	16.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Iron	1800.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Lead	1.60	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Manganese	94.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Mercury	0.03	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Molybdenum	0.70	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Nickel	3.80	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Selenium	3.80	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Silver	0.05	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Strontium	8.70	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Thallium	0.10	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Titanium	19.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Uranium	0.10	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Vanadium	7.20	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Zinc	140.00	ug/g d.w.	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	1	10-Sep-18	Composite	Moisture	83.90	%	SRC	RG_MI25_INV-1_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Aluminum	2100.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Antimony	<0.2	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Arsenic	1.30	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Barium	25.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Beryllium	0.08	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Boron	6.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Cadmium	3.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Chromium	3.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Cobalt	0.98	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Copper	18.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Iron	1800.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Lead	1.60	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Manganese	94.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Mercury	0.03	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Molybdenum	0.60	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Nickel	3.30	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Selenium	4.50	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Silver	0.05	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Strontium	5.90	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Thallium	0.10	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Titanium	16.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Uranium	0.08	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Vanadium	4.90	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Zinc	150.00	ug/g d.w.	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	2	10-Sep-18	Composite	Moisture	84.92	%	SRC	RG_MI25_INV-2_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Aluminum	1500.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Antimony	<2	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Arsenic	1.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Barium	28.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Beryllium	<0.2	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Boron	<20	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Cadmium	2.80	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Chromium	<10	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Cobalt	1.30	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Copper	16.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Iron	1000.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Lead	1.20	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Manganese	130.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Mercury	<0.1	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Molybdenum	<2	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Nickel	3.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Selenium	5.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Silver	<0.2	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Strontium	5.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Thallium	<1	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Tin	<1	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Titanium	10.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Uranium	<0.1	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Vanadium	4.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Zinc	150.00	ug/g d.w.	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI25	Reference	668184	5482818	2018	3	10-Sep-18	Composite	Moisture	85.52	%	SRC	RG_MI25_INV-3_2018-09-10
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Aluminum	880.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Antimony	<2	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Arsenic	<1	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Barium	25.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Beryllium	<0.2	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Boron	<20	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Cadmium	1.80	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Chromium	<10	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Cobalt	5.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Copper	14.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Iron	760.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Lead	0.40	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Manganese	77.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Mercury	<0.1	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Molybdenum	<2	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Nickel	9.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Selenium	5.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Silver	<0.2	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Strontium	10.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Thallium	<1	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Tin	<1	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Titanium	5.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Uranium	0.10	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Vanadium	4.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Zinc	160.00	ug/g d.w.	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	1	11-Sep-18	Composite	Moisture	81.87	%	SRC	RG_MI5_INV-1_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Aluminum	1500.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Arsenic	1.40	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Barium	45.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Cadmium	4.30	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Cobalt	11.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Copper	11.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Iron	1400.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Lead	0.90	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Manganese	83.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Nickel	12.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Selenium	8.10	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Strontium	16.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Titanium	10.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Uranium	0.20	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Vanadium	8.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Zinc	160.00	ug/g d.w.	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	2	11-Sep-18	Composite	Moisture	86.84	%	SRC	RG_MI5_INV-2_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Aluminum	6200.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Antimony	<0.2	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Arsenic	2.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Barium	72.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Beryllium	0.20	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Boron	10.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Cadmium	2.50	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Chromium	8.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Cobalt	5.20	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Copper	12.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Iron	4400.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Lead	2.10	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Manganese	140.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Mercury	0.04	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Molybdenum	0.60	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Nickel	14.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Selenium	6.60	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Silver	0.11	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Strontium	30.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Thallium	0.20	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Titanium	32.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Uranium	0.32	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Vanadium	22.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Zinc	160.00	ug/g d.w.	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MI5	Mine-influenced	659496	5496774	2018	3	11-Sep-18	Composite	Moisture	86.56	%	SRC	RG_MI5_INV-3_2018-09-11
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Aluminum	550.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Arsenic	0.80	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Barium	24.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Cadmium	0.70	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Cobalt	44.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Copper	13.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Iron	430.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Lead	0.40	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Manganese	110.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Nickel	21.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Selenium	6.20	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Strontium	18.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Titanium	4.20	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Uranium	0.09	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Vanadium	1.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Zinc	160.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	1	8-Sep-18	Composite	Moisture	79.52	%	SRC	RG_MIDAG_INV-1_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Aluminum	970.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Arsenic	0.60	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Barium	12.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Cadmium	0.50	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Cobalt	24.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Copper	17.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Iron	890.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Lead	0.40	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Manganese	100.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Nickel	13.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Selenium	3.50	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Silver	0.10	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Strontium	18.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Titanium	5.60	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Uranium	0.08	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Vanadium	2.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Zinc	190.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	2	8-Sep-18	Composite	Moisture	79.14	%	SRC	RG_MIDAG_INV-2_2018-09-08
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Aluminum	1800.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Arsenic	0.80	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Barium	22.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Cadmium	0.50	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Cobalt	31.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Copper	14.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Iron	1300.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Lead	0.60	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Manganese	100.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Nickel	10.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Selenium	3.80	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Strontium	16.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Titanium	8.60	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Uranium	0.06	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Vanadium	3.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Zinc	170.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDAG	Mine-influenced	665220	5489324	2018	3	9-Sep-18	Composite	Moisture	70.28	%	SRC	RG_MIDAG_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Aluminum	3700.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Arsenic	1.10	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Barium	39.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Beryllium	0.20	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Cadmium	0.50	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Cobalt	70.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Copper	12.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Iron	2500.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Lead	1.20	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Manganese	350.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Nickel	43.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Selenium	3.80	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Strontium	61.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Titanium	16.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Uranium	0.32	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Vanadium	8.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Zinc	140.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	1	9-Sep-18	Composite	Moisture	75.30	%	SRC	RG_MIDCO_INV-1_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Aluminum	1700.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Arsenic	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Barium	13.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Cadmium	0.30	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Cobalt	39.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Copper	13.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Iron	1000.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Lead	0.50	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Manganese	150.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Nickel	19.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Selenium	3.10	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Strontium	19.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Titanium	9.70	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Uranium	0.09	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Vanadium	4.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Zinc	130.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	2	9-Sep-18	Composite	Moisture	78.58	%	SRC	RG_MIDCO_INV-2_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Aluminum	1500.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Arsenic	0.60	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Barium	22.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Cadmium	0.30	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Cobalt	49.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Copper	14.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Iron	940.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Lead	0.40	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Manganese	160.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Nickel	22.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Selenium	3.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Strontium	48.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Titanium	11.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Uranium	0.17	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Vanadium	3.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Zinc	130.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	3	9-Sep-18	Composite	Moisture	78.32	%	SRC	RG_MIDCO_INV-3_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Aluminum	770.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Arsenic	0.60	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Barium	11.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Cadmium	0.20	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Cobalt	66.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Copper	8.90	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Iron	480.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Lead	0.20	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Manganese	200.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Nickel	22.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Selenium	3.70	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Strontium	10.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Titanium	5.40	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Uranium	0.07	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Vanadium	2.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Zinc	130.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	4	9-Sep-18	Composite	Moisture	73.47	%	SRC	RG_MIDCO_INV-4_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Aluminum	320.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Arsenic	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Barium	8.40	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Cadmium	0.20	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Cobalt	60.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Copper	9.90	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Iron	210.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Lead	0.10	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Manganese	120.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Nickel	16.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Selenium	3.30	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Strontium	8.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Titanium	3.30	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Uranium	0.06	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Vanadium	<1	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Zinc	130.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIDCO	Mine-influenced	667616	5487621	2018	5	9-Sep-18	Composite	Moisture	65.66	%	SRC	RG_MIDCO_INV-5_2018-09-09
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Aluminum	940.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Antimony	<0.2	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Arsenic	0.60	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Barium	16.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Beryllium	0.03	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Boron	2.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Cadmium	1.40	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Chromium	1.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Cobalt	0.66	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Copper	28.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Iron	670.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Lead	0.32	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Manganese	100.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Mercury	0.03	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Molybdenum	0.40	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Nickel	1.40	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Selenium	3.20	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Silver	0.10	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Strontium	5.70	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Thallium	<0.1	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Titanium	8.70	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Uranium	0.03	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Vanadium	2.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Zinc	130.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	1	10-Sep-18	Composite	Moisture	82.26	%	SRC	RG_MIUCO_INV-1_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Aluminum	5200.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Antimony	<0.2	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Arsenic	1.80	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Barium	34.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Beryllium	0.19	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Boron	12.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Cadmium	2.70	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Chromium	6.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Cobalt	2.80	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Copper	17.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Iron	3600.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Lead	1.50	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Manganese	190.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Mercury	0.03	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Molybdenum	0.60	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Nickel	4.50	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Selenium	6.70	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Silver	0.05	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Strontium	10.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Thallium	0.10	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Titanium	28.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Uranium	0.10	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Vanadium	10.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Zinc	130.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	2	10-Sep-18	Composite	Moisture	86.38	%	SRC	RG_MIUCO_INV-2_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Aluminum	1300.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Arsenic	0.90	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Barium	18.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Cadmium	1.70	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Cobalt	1.20	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Copper	18.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Iron	930.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Lead	0.40	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Manganese	140.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Nickel	2.20	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Selenium	5.50	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Strontium	5.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Titanium	9.70	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Uranium	<0.05	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Vanadium	3.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Zinc	120.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIUCO	Mine-influenced	668135	5486767	2018	3	10-Sep-18	Composite	Moisture	87.43	%	SRC	RG_MIUCO_INV-3_2018-09-10
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Aluminum	960.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Antimony	<1	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Arsenic	0.70	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Barium	26.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Beryllium	<0.1	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Boron	<10	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Cadmium	1.30	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Chromium	<5	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Cobalt	14.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Copper	11.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Iron	620.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Lead	0.40	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Manganese	80.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Mercury	<0.05	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Molybdenum	<1	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Nickel	9.20	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Selenium	9.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Silver	<0.1	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Strontium	19.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Thallium	<0.5	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Tin	<0.5	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Titanium	9.20	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Uranium	0.08	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Vanadium	3.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Zinc	170.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	1	11-Sep-18	Composite	Moisture	83.72	%	SRC	RG_MIULE_INV-1_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Aluminum	890.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Antimony	<0.2	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Arsenic	0.60	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Barium	20.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Beryllium	0.03	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Boron	2.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Cadmium	1.40	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Chromium	1.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Cobalt	12.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Copper	12.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Iron	560.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Lead	0.35	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Manganese	56.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Molybdenum	0.30	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Nickel	5.60	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Selenium	6.80	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Silver	0.08	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Strontium	14.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Thallium	<0.1	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Titanium	8.40	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Uranium	0.06	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Vanadium	2.70	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Zinc	190.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	2	11-Sep-18	Composite	Moisture	75.03	%	SRC	RG_MIULE_INV-2_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Aluminum	2300.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Antimony	<0.2	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Arsenic	1.20	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Barium	30.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Beryllium	0.10	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Boron	4.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Cadmium	2.10	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Chromium	3.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Cobalt	24.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Copper	13.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Iron	2000.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Lead	0.83	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Manganese	69.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Molybdenum	0.40	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Nickel	13.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Selenium	11.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Silver	0.07	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Strontium	18.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Thallium	<0.1	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Titanium	17.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Uranium	0.12	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Vanadium	7.20	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Zinc	200.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2018-09-11
Michel Creek	MIULE	Mine-influenced	660503	5493048	2018	3	11-Sep-18	Composite	Moisture	82.42	%	SRC	RG_MIULE_INV-3_2018-09-11
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Aluminum	250.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Aluminum	110.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Aluminum	270.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Antimony	0.01	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Arsenic	1.60	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Arsenic	1.30	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Arsenic	1.20	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Barium	3.60	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Barium	3.20	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Barium	6.60	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Beryllium	0.02	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Beryllium	0.02	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Beryllium	0.02	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Boron	<1	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Boron	<1	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Boron	<1	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Cadmium	1.30	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Cadmium	1.10	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Cadmium	1.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Chromium	0.69	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Chromium	0.33	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Chromium	0.59	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Cobalt	0.24	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Cobalt	0.18	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Cobalt	0.18	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Copper	7.20	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Copper	6.60	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Copper	6.50	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Iron	260.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Iron	200.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Iron	240.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Lead	0.12	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Lead	0.05	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Lead	0.10	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Manganese	8.40	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Manganese	7.30	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Manganese	15.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Mercury	0.01	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Mercury	0.01	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Molybdenum	0.28	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Molybdenum	0.27	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Molybdenum	0.23	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Nickel	3.70	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Nickel	2.30	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Nickel	3.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Selenium	8.30	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Selenium	8.50	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Selenium	5.40	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Silver	0.05	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Silver	0.04	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Silver	0.04	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Strontium	7.20	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Strontium	4.60	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Strontium	7.20	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Thallium	0.54	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Thallium	0.63	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Thallium	0.46	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Tin	0.12	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Tin	0.19	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Titanium	3.10	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Titanium	1.60	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Titanium	2.40	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Uranium	0.09	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Uranium	0.06	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Uranium	0.05	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Vanadium	0.90	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Vanadium	0.40	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Vanadium	0.80	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Zinc	270.00	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Zinc	290.00	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Zinc	190.00	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Moisture	90.77	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Moisture	86.25	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Moisture	84.30	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	1	6-Sep-19	Composite	Weights	0.30	ug/g d.w.	SRC	RG_AGCK_INV-1_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	2	6-Sep-19	Composite	Weights	0.37	ug/g d.w.	SRC	RG_AGCK_INV-2_2019-09-06
Andy Good Creek	AGCK	Reference	667555	5488644	2019	3	6-Sep-19	Composite	Weights	0.43	ug/g d.w.	SRC	RG_AGCK_INV-3_2019-09-06
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Aluminum	590.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Aluminum	190.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Aluminum	160.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a] Easting	Northing	Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information Lab	Sample ID
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Antimony	0.04	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Arsenic	0.24	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Arsenic	0.24	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Arsenic	0.22	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Barium	23.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Barium	6.50	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Barium	9.40	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Beryllium	0.03	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Beryllium	<0.01	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Beryllium	<0.02	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Boron	2.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Boron	<1	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Boron	<2	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Cadmium	1.10	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Cadmium	0.50	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Cadmium	0.54	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Chromium	0.56	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Chromium	0.30	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Chromium	0.20	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Cobalt	31.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Cobalt	15.80	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Cobalt	14.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Copper	8.20	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Copper	10.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Copper	9.60	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Iron	160.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Iron	100.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Iron	89.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Lead	0.26	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Lead	0.07	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Lead	0.06	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Manganese	204.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Manganese	99.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Manganese	88.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Mercury	0.01	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Mercury	0.01	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Mercury	<0.01	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Molybdenum	0.16	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Molybdenum	0.14	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Molybdenum	0.14	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Nickel	26.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Nickel	10.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Nickel	12.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Selenium	2.40	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Selenium	2.70	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Selenium	2.70	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Silver	0.05	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Silver	0.04	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Silver	0.05	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Strontium	52.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Strontium	17.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Strontium	24.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Thallium	0.04	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Thallium	0.03	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Thallium	0.03	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Tin	0.41	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Tin	0.40	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Titanium	12.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Titanium	2.70	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Titanium	2.50	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Uranium	0.36	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Uranium	0.10	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Uranium	0.15	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Vanadium	1.30	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Vanadium	0.50	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Vanadium	0.40	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Zinc	190.00	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Zinc	170.00	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Zinc	180.00	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Moisture	80.56	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Moisture	81.59	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Moisture	80.94	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	1	7-Sep-19	Composite	Weights	0.29	ug/g d.w.	SRC	RG_CORCK_INV-1_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	2	7-Sep-19	Composite	Weights	0.26	ug/g d.w.	SRC	RG_CORCK_INV-2_2019-09-07
Corbin Creek	CORCK	Mine-influenced	668556	5487388	2019	3	7-Sep-19	Composite	Weights	0.15	ug/g d.w.	SRC	RG_CORCK_INV-3_2019-09-07
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Aluminum	2800.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Aluminum	2700.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Aluminum	1800.00	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Antimony	0.10	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Antimony	0.11	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Antimony	0.08	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Arsenic	1.50	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Arsenic	1.10	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Arsenic	0.68	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Barium	45.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Barium	38.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Barium	39.00	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Beryllium	0.11	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Beryllium	0.10	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Beryllium	0.06	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Boron	4.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Boron	4.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Boron	3.00	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Cadmium	6.40	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Cadmium	8.40	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Cadmium	10.60	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Chromium	5.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Chromium	4.10	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Chromium	2.80	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Cobalt	1.40	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Cobalt	1.60	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Cobalt	1.60	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Copper	16.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Copper	20.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Copper	15.00	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Iron	2100.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Iron	1800.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Iron	1100.00	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Lead	1.30	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Lead	0.96	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Lead	0.63	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Manganese	64.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Manganese	64.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Manganese	73.00	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Mercury	0.04	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Mercury	0.04	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Mercury	0.04	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Molybdenum	0.72	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Molybdenum	0.55	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Molybdenum	0.60	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Nickel	5.20	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Nickel	3.70	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Nickel	2.80	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Selenium	5.30	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Selenium	6.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Selenium	6.10	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Silver	0.17	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Silver	0.22	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Silver	0.14	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Strontium	10.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Strontium	7.70	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Strontium	5.40	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Thallium	0.09	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Thallium	0.08	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Thallium	0.06	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Titanium	13.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Titanium	22.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Titanium	16.00	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Uranium	0.33	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Uranium	0.16	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Uranium	0.14	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Vanadium	16.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Vanadium	11.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Vanadium	7.20	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Zinc	120.00	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Zinc	160.00	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Zinc	150.00	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Moisture	83.86	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Moisture	83.61	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Moisture	84.37	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	1	5-Sep-19	Composite	Weights	0.49	ug/g d.w.	SRC	RG_LE1_INV-1_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	2	5-Sep-19	Composite	Weights	0.43	ug/g d.w.	SRC	RG_LE1_INV-2_2019-09-05
Leach Creek	LE1	Reference	659632	5494112	2019	3	5-Sep-19	Composite	Weights	0.31	ug/g d.w.	SRC	RG_LE1_INV-3_2019-09-05
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Aluminum	3400.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Aluminum	1900.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Aluminum	3200.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Antimony	0.06	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Antimony	0.12	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Antimony	0.04	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Arsenic	1.90	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Arsenic	1.20	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Arsenic	1.40	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Barium	23.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Barium	16.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Barium	15.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Beryllium	0.11	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Beryllium	0.07	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Beryllium	0.10	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Boron	10.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Boron	5.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Boron	7.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Cadmium	4.80	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Cadmium	3.40	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Cadmium	3.20	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Chromium	4.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Chromium	2.30	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Chromium	3.90	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Cobalt	3.10	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Cobalt	1.30	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Cobalt	1.20	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Copper	20.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Copper	21.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Copper	27.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Iron	2200.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Iron	1300.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Iron	1500.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Lead	1.60	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Lead	1.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Lead	1.20	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Manganese	64.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Manganese	51.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Manganese	50.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Mercury	0.03	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Mercury	0.04	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Mercury	0.04	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Molybdenum	0.80	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Molybdenum	0.65	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Molybdenum	0.54	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Nickel	3.90	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Nickel	2.70	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Nickel	3.80	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Selenium	5.60	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Selenium	4.40	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Selenium	3.90	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Silver	0.06	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Silver	0.07	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Silver	0.11	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Strontium	11.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Strontium	8.80	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Strontium	6.80	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Thallium	0.16	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Thallium	0.11	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Thallium	0.12	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Titanium	24.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Titanium	15.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Titanium	20.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Uranium	0.15	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Uranium	0.16	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Uranium	0.07	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Vanadium	7.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Vanadium	4.60	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Vanadium	10.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Zinc	150.00	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Zinc	160.00	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Zinc	180.00	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Moisture	88.15	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Moisture	85.49	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Moisture	81.62	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	1	4-Sep-19	Composite	Weights	0.22	ug/g d.w.	SRC	RG_MI25_INV-1_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	2	4-Sep-19	Composite	Weights	0.17	ug/g d.w.	SRC	RG_MI25_INV-2_2019-09-04
Michel Creek	MI25	Reference	668186	5482838	2019	3	4-Sep-19	Composite	Weights	0.34	ug/g d.w.	SRC	RG_MI25_INV-3_2019-09-04
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Aluminum	2500.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Aluminum	2000.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Aluminum	2500.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Antimony	0.15	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Antimony	0.06	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Antimony	0.07	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Arsenic	1.10	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Arsenic	0.94	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Arsenic	1.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Barium	44.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Barium	34.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Barium	32.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Beryllium	0.11	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Beryllium	0.06	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Beryllium	0.09	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Boron	6.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Boron	6.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Boron	4.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Cadmium	2.60	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Cadmium	2.70	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Cadmium	2.50	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Chromium	4.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Chromium	3.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Chromium	3.90	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Cobalt	3.40	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Cobalt	5.30	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Cobalt	3.60	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Copper	10.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Copper	11.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Copper	10.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Iron	2800.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Iron	1400.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Iron	2000.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Lead	1.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Lead	0.59	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Lead	0.97	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Manganese	65.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Manganese	48.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Manganese	60.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Molybdenum	0.56	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Molybdenum	0.45	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Molybdenum	0.44	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Nickel	8.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Nickel	7.40	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Nickel	6.90	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Selenium	5.70	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Selenium	6.80	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Selenium	5.80	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Silver	0.11	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Silver	0.09	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Silver	0.10	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Strontium	19.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Strontium	18.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Strontium	15.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Thallium	0.10	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Thallium	0.08	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Thallium	0.10	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Tin	0.06	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Titanium	23.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Titanium	16.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Titanium	16.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Uranium	0.19	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Uranium	0.12	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Uranium	0.18	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Vanadium	11.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Vanadium	7.60	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Vanadium	10.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Zinc	120.00	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Zinc	140.00	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Zinc	120.00	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Moisture	88.45	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Moisture	87.57	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Moisture	83.45	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	1	5-Sep-19	Composite	Weights	0.26	ug/g d.w.	SRC	RG_MI5_INV-1_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	2	5-Sep-19	Composite	Weights	0.25	ug/g d.w.	SRC	RG_MI5_INV-2_2019-09-05
Michel Creek	MI5	Mine-influenced	659387	5496818	2019	3	5-Sep-19	Composite	Weights	0.39	ug/g d.w.	SRC	RG_MI5_INV-3_2019-09-05
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Aluminum	2900.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Aluminum	4900.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Aluminum	3200.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Antimony	0.05	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Antimony	0.06	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Antimony	0.06	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Arsenic	1.50	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Arsenic	2.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Arsenic	2.10	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Barium	20.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Barium	47.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Barium	34.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Beryllium	0.10	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Beryllium	0.17	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Beryllium	0.12	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Boron	6.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Boron	8.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Boron	6.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Cadmium	1.50	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Cadmium	1.40	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Cadmium	0.75	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Chromium	3.30	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Chromium	5.20	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Chromium	3.70	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Cobalt	24.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Cobalt	10.50	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Cobalt	18.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Copper	11.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Copper	11.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Copper	11.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Iron	1700.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Iron	2700.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Iron	1900.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Lead	0.89	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Lead	1.40	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Lead	1.10	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Manganese	120.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Manganese	138.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Manganese	190.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Mercury	0.03	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Molybdenum	0.48	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Molybdenum	0.50	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Molybdenum	0.71	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Nickel	11.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Nickel	15.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Nickel	33.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Selenium	8.30	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Selenium	10.80	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Selenium	8.50	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Silver	0.06	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Silver	0.07	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Silver	0.06	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Strontium	15.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Strontium	22.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Strontium	14.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Thallium	0.21	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Thallium	0.26	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Thallium	0.18	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Tin	0.30	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Tin	0.19	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Titanium	23.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Titanium	31.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Titanium	22.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Uranium	0.12	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Uranium	0.18	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Uranium	0.20	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Vanadium	6.10	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Vanadium	9.90	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Vanadium	7.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Zinc	190.00	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Zinc	150.00	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Zinc	150.00	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Moisture	90.07	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Moisture	82.94	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Moisture	84.34	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	1	10-Sep-19	Composite	Weights	0.15	ug/g d.w.	SRC	RG_MIDAG_INV-1_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	2	10-Sep-19	Composite	Weights	0.27	ug/g d.w.	SRC	RG_MIDAG_INV-2_2019-09-10
Michel Creek	MIDAG	Mine-influenced	665258	5489417	2019	3	10-Sep-19	Composite	Weights	0.23	ug/g d.w.	SRC	RG_MIDAG_INV-3_2019-09-10
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Aluminum	2400.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Aluminum	1300.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Aluminum	1300.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Aluminum	630.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Aluminum	1600.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Antimony	0.03	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Arsenic	0.87	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Arsenic	0.55	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Arsenic	0.57	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Arsenic	0.39	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Arsenic	0.83	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Barium	10.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Barium	8.80	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Barium	8.60	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Barium	5.90	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Barium	15.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Beryllium	0.09	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Beryllium	0.05	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Beryllium	0.05	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Beryllium	0.02	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Beryllium	0.06	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Boron	5.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Boron	3.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Boron	3.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Boron	2.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Boron	4.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Cadmium	0.38	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Cadmium	0.49	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Cadmium	0.37	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Cadmium	0.30	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Cadmium	0.27	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Chromium	2.60	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Chromium	1.60	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Chromium	1.50	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Chromium	0.77	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Chromium	2.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Cobalt	26.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Cobalt	27.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Cobalt	27.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Cobalt	18.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Cobalt	22.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Copper	13.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Copper	10.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Copper	12.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Copper	13.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Copper	12.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Iron	1700.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Iron	990.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Iron	840.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Iron	380.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Iron	1200.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Lead	0.81	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Lead	0.42	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Lead	0.43	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Lead	0.22	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Lead	0.60	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Manganese	130.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Manganese	107.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Manganese	150.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Manganese	91.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Manganese	207.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Mercury	0.01	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Mercury	0.01	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Mercury	0.01	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Molybdenum	0.26	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Molybdenum	0.26	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Molybdenum	0.31	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Molybdenum	0.22	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Molybdenum	0.45	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Nickel	13.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Nickel	10.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Nickel	14.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Nickel	12.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Nickel	17.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Selenium	2.60	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Selenium	3.40	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Selenium	3.30	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Selenium	2.90	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Selenium	3.20	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Silver	0.06	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Silver	0.05	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Silver	0.06	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Silver	0.07	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Silver	0.04	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Strontium	17.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Strontium	6.60	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Strontium	6.50	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Strontium	5.50	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Strontium	9.40	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Thallium	0.06	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Thallium	0.05	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Thallium	0.04	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Thallium	0.03	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Thallium	0.05	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Titanium	8.20	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Titanium	6.70	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Titanium	8.30	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Titanium	5.10	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Titanium	9.30	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Uranium	0.06	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Uranium	0.05	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Uranium	0.05	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Uranium	0.03	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Uranium	0.08	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Vanadium	4.20	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Vanadium	2.90	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Vanadium	2.70	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Vanadium	1.30	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Vanadium	3.40	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Zinc	120.00	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Zinc	110.00	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Zinc	130.00	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Zinc	120.00	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Zinc	100.00	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Moisture	77.65	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Moisture	80.96	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Moisture	82.60	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Moisture	77.49	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Moisture	78.90	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	1	7-Sep-19	Composite	Weights	0.49	ug/g d.w.	SRC	RG_MIDCO_INV-1_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	2	7-Sep-19	Composite	Weights	0.50	ug/g d.w.	SRC	RG_MIDCO_INV-2_2019-09-07
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	3	9-Sep-19	Composite	Weights	0.40	ug/g d.w.	SRC	RG_MIDCO_INV-3_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	4	9-Sep-19	Composite	Weights	0.43	ug/g d.w.	SRC	RG_MIDCO_INV-4_2019-09-09
Michel Creek	MIDCO	Mine-influenced	667711	5487625	2019	5	9-Sep-19	Composite	Weights	0.31	ug/g d.w.	SRC	RG_MIDCO_INV-5_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Aluminum	2800.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Aluminum	2100.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Aluminum	4100.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Antimony	0.02	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Antimony	0.03	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Antimony	0.03	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Arsenic	1.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Arsenic	0.98	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Arsenic	1.30	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Barium	38.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Barium	20.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Barium	28.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Beryllium	0.10	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Beryllium	0.07	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Beryllium	0.14	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Boron	6.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Boron	5.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Boron	8.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Cadmium	0.98	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Cadmium	1.30	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Cadmium	3.70	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Chromium	3.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Chromium	2.50	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Chromium	3.80	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Cobalt	1.60	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Cobalt	2.30	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Cobalt	3.60	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Copper	13.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Copper	17.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Copper	24.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Iron	1800.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Iron	1400.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Iron	2900.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Lead	0.88	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Lead	0.59	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Lead	1.20	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Manganese	227.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Manganese	140.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Manganese	240.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09

Table G-1: Benthic Invertebrate Tissue Data at Coal Mountain Operations Local Aquatic Effects Monitoring Program Sampling Stations, 2012 to 2019

Watercourse	Station	Reference or Mine-influenced	Location (UTMs)[a]		Year	Replicate	Date	Species/Composite	Parameter/Analyte	Result	Unit	Laboratory Information	
			Easting	Northing								Lab	Sample ID
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Mercury	0.03	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Molybdenum	0.66	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Molybdenum	0.50	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Molybdenum	0.58	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Nickel	3.70	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Nickel	2.60	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Nickel	3.60	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Selenium	5.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Selenium	5.90	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Selenium	6.10	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Silver	0.04	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Silver	0.06	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Silver	0.07	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Strontium	4.60	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Strontium	5.50	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Strontium	6.50	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Thallium	0.07	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Thallium	0.06	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Thallium	0.09	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Tin	0.08	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Tin	0.20	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Tin	<0.1	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Titanium	13.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Titanium	12.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Titanium	14.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Uranium	0.06	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Uranium	0.05	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Uranium	0.07	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Vanadium	4.80	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Vanadium	4.10	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Vanadium	6.50	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Zinc	130.00	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Zinc	120.00	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Zinc	200.00	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Moisture	81.18	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Moisture	84.78	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Moisture	83.84	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	1	9-Sep-19	Composite	Weights	0.28	ug/g d.w.	SRC	RG_MIUCO_INV-1_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	2	9-Sep-19	Composite	Weights	0.21	ug/g d.w.	SRC	RG_MIUCO_INV-2_2019-09-09
Michel Creek	MIUCO	Mine-influenced	668134	5486767	2019	3	9-Sep-19	Composite	Weights	0.22	ug/g d.w.	SRC	RG_MIUCO_INV-3_2019-09-09
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Aluminum	1400.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Aluminum	1400.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Aluminum	3200.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Antimony	0.04	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Antimony	0.03	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Antimony	0.06	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Arsenic	0.61	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Arsenic	0.68	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Arsenic	1.40	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Barium	17.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Barium	22.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Barium	31.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Beryllium	0.05	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Beryllium	0.05	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Beryllium	0.11	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Boron	3.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Boron	4.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Boron	6.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Cadmium	0.72	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Cadmium	1.40	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Cadmium	0.97	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Chromium	1.80	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Chromium	1.60	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Chromium	3.90	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Cobalt	4.30	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Cobalt	13.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Cobalt	6.20	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Copper	14.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Copper	7.20	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Copper	12.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Iron	990.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Iron	960.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Iron	2300.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Lead	0.41	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Lead	0.48	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Lead	1.10	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Manganese	59.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Manganese	109.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Manganese	72.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Mercury	0.02	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Molybdenum	0.28	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Molybdenum	0.24	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Molybdenum	0.44	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Nickel	4.90	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Nickel	6.90	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Nickel	12.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Selenium	5.20	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Selenium	5.20	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Selenium	5.60	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Silver	0.11	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Silver	0.06	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Silver	0.10	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Strontium	10.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Strontium	98.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Strontium	19.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Thallium	0.07	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Thallium	0.08	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Thallium	0.12	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Tin	0.28	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Tin	<0.05	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Titanium	9.10	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Titanium	9.60	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Titanium	18.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Uranium	0.06	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Uranium	0.10	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Uranium	0.14	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Vanadium	3.70	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Vanadium	3.40	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Vanadium	8.60	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Zinc	210.00	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Zinc	100.00	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Zinc	140.00	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Moisture	81.82	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Moisture	81.39	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Moisture	84.72	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	1	6-Sep-19	Composite	Weights	0.39	ug/g d.w.	SRC	RG_MIULE_INV-1_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	2	6-Sep-19	Composite	Weights	0.45	ug/g d.w.	SRC	RG_MIULE_INV-2_2019-09-06
Michel Creek	MIULE	Mine-influenced	660502	5493059	2019	3	6-Sep-19	Composite	Weights	0.36	ug/g d.w.	SRC	RG_MIULE_INV-3_2019-09-06

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